General Comments - Entire Regulations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
General Comment on T23		River Partners	In general, we ask that further updates and revisions be made to Title 23, Division 1, to create consistency between the Code of Regulations and the multi-benefit water project framework outlined in the Draft Conservation Strategy and Proposition 1, among other Central Valley conservation planning efforts.	Further updates will be conducted in the future and will consider incorporating regulations that will be consistent with the multi-benefit water project framework outlined in the draft Conservation Strategy and Proposition 1.
General Comment on T23		MSCE	The CVFPB appears to be overreaching into stream and creek areas within Sacramento County where local jurisdictions / agencies currently provide oversight and there are guidelines, standards, etc in place. How is jurisdiction determined for non-levee type creeks and streams?	The Board has jurisdiction over the Sacramento and San Joaquin Rivers and their tributaries and distributaries. The Board is within its authority to regulate streams in Sacramento County. Section 8598 of the Water Code empowers the Board to maintain actions in the name of the people of the State to restrain the diversion of the water of any stream that will increase the flow of water in the Sacramento and San Joaquin Rivers or their tributaries. Section 8609 further empowers the Board to designate floodways throughout the Sacramento and San Joaquin Rivers drainage to control encroachments in, and to preserve the flow regimens of floodways.
General Comment on T23		MSCE	The Board has also enacted standards that are vague and fees that have no nexus. New layers of bureaucracy for permitting have been added to creeks and streams that are already over-regulated. Several changes included in the update conflict or are additive to existing standards and regulations imposed by local and federal agencies.	One of the purposes of giving the public the opportunity to review and comment on the proposed changes to the regulations is to ensure that the regulations do not unnecessarily burden the public. We will address any specific concerns you have that you believe are vague regulations and fees that have no nexus. The fees for the preparation and adoption of environmental documents proposed in the draft were taken from an existing regulation, Title 23, Division 2, Section 503. Unlike other regulatory Boards, the CVFPB does not charge application fees for permits.

General Comments - Entire Regulations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
General Comment on T23		MSCE	The CVFPB is introducing concepts like bridge soffit freeboard and home elevation to areas where implementation may be very costly.	Requirements by the Board for new bridge soffit clearance above the Design Water Surface Elevation and elevation of the finished floor of new homes in Floodways have been in place for several decades. Without adequate soffit clearance, debris can impinge on the bridge and raise the water surface upstream of the bridge significantly -- potentially flooding adjacent properties and damaging any adjacent Levee. New homes should be elevated appropriately to avoid damage during floods; this includes freeboard to prevent damage that can begin from flooding slightly below the finished floor elevation, and to address uncertainty in the Design Water Surface Elevation, wind induced waves, and the potential for larger floods than the Design Flood. In most cases, the additonal project cost created by these requirements is expected to be a very small part of the project cost.
General Comment on T23		MSCE	The process for obtaining an encroachment permit is also of concern. After years in the planning process and the federal permitting process, the CVFP Board will not consider a permit until the improvement plans are prepared. Their asserted authority on upper watershed areas could spin the project around in a series of alternatives analyses, further inviting public comment, and so on. This is an overreach and unnecessary. Where they have permit authority they must have design standards and those must be vetted otherwise the permitting	A primary purpose of having standards in Article 8 of Title 23 is to reduce uncertainty in the Board's requirements and enable applicants to plan and design their projects accordingly. The Board needs a completed project design in order to decide whether to approve it and, if approved, what conditions to include in the Permit. The Board welcomes phone calls and meetings with potential applicants to discuss their projects and identify any issues of concern prior to submitting the application and accompanying plan drawings.
General Comment on T23		MSCE	The CVFPB has also reached into the authority of local and federal jurisdictions and appear to now have established new criteria, standards, or governance over for creeks and streams (non-levees) that include the following; 1) requirements for finish floor elevations; 2) requirements for certain land use due to proximity to floodpalins/floodways; 3) a flood designation that is different than local jurisdictions or FEMA; 4) new erosion control measures and measures for vegetation; and 5) freeboard for bridges at creeks and streams (non-levee).	The Board's authority is discussed in prior responses to comments. Some unleveed streams are federal projects and need to be regulated according to assurnace provided to the federal government. Other streams are regulated as designated floodways pursuant to Water Code 8609. The criteria and standards have been in place for several decades, and are in need of updating. Specific recommendations for improving the updated standards are welcome.

General Comments - Entire Regulations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
General Comment on T23		City of Sacto.	With next release of draft revisions, include “Statement of Reasons” for changes to provide information on Board’s intent with changes.	The Statement of Reasons will be prepared before submittal to the Office of Administrative Law and will be available for public review during the OAL approval process and the associated public review. It is premature to develop the SOR while the standards are being developed and subject to significant changes as a result of public review and comment prior to submittal to OAL.
General Comment on T23		City of Sacto.	Review overlap / inconsistencies in provisions regarding Encroachments, Conforming Existing Encroachments, Nonconforming Existing Encroachments, and Legacy Encroachments.	Outside of the scope of this update.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	n	PlacerFC&WCD	The definition and reference to the "Design Flood" should include reference to a specific flood event size such as the 100-, 200- or 500-year event. Currently there is much ambiguity regarding the acceptable design flood standard, particularly for bridge and culvert replacement projects. We also believe a consistent freeboard standard should be provided to prevent ambiguities we have experienced with permits issued for bridge and culvert designs. A clarified approach for the design consideration of bridge pier debris (including historical evidence) should also be provided, as this has also led to ambiguities in design standards.	The definition for Design Water Surface Elevation has been revised to address the required return period. Bridge soffit clearance requirements have been revised. Specific guidance for debris loading has not been provided in the revisions for bridges, except that for urban areas (a defined term of Urban Criteria Area has been added) the Urban Levee Design Criteria guidance is to be followed (it contains guidance with respect to bridge debris loading). Outside of urban areas, the engineer is still free to use the ULDC guidance for bridge debris.
Section 4 - Definitions	q	DWR	Appears latest version is 30 September 2015	This definition has been removed because it is not used.
Section 4 - Definitions	q	USACE	Consider removing the dates from the USACE publications. This will allow the regulations to reference the most current publications without revision.	The Office of Administrative Law requires that dates of references be cited so that revisions to such references will not apply without updating the regulations through OAL's public process.
Section 4 - Definitions	(q) old	DWR	It appears impervious material was previously used in limited situations. It seems embankment material is used instead and it's in more places. Impervious soil is still used in section 131.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 4 - Definitions	s	DWR	Latest version was March 31, 1998	The definition for EM 1110-2-2902 has been revised in response to the comment.
Section 4 - Definitions	t	DCC Eng.	ER 1110-2-1807 needs definition.	The definition for EM 1110-1-1807 has been removed since it is no longer being referenced.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	v	DWR	Appears to replace "impervious material". It seems embankment material is used instead and it's in more places. For typical repair work FMO does, we would prefer to use local levee materials, which may not meet the "embankment material" criteria, but the repair would still perform well based on keying into the existing levee, good compactive effort, and moisture control. The rural levee repair guidelines states the following for reconstructing embankments: Selecting levee replacement materials considering their compatibility with the blanket and existing levee materials. If the existing levee and foundation materials are fine-grained soils, the partial levee materials should be acceptable levee embankment material that is coarser than the existing levee material to assure proper drainage. If the existing levee and foundation materials are coarse-grained soils, the partial levee materials should be of equal or greater permeability than the existing levee. However, fine-grained materials can be used against a coarse-grained levee if a drainage system is used or a wider levee is constructed. It's not always conservative to use this "embankment material" as defined here in all situations.	Section 120 has been revised to allow limited use in Levees of material that does not meet Embankment Material specifications.
Section 4 - Definitions	a(4)	San JoaquinPW	revised to clarify the definition of the "Adopted Plan of Flood Control" in cases where the flood control easement is less than 10' from the toe of the levee. This has been an issue of confusion that there does not seem to be a consensus on. If the flood control easement is only 5' from the toe of the levee does the property owner have a right to construct a fence 5' from the toe of the levee? Or do the Title 23 regulations trump the easement and therefore require the fence be placed 10' from the toe of levee.	The definition for Adopted Plan of Flood Control has been revised to reference Levee Right of Way. The definition of Levee Right of Way has also been revised significantly so that it is includes fifteen (15) feet from waterside Levee Toe and twenty (20) feet from the landside Levee Toe (except that in Urban Criteria Areas two (2) alternatives may be allowed in developed areas to provide either a ten (10) feet wide clear access zone or a twenty (20) feet wide clear visibility zone) or more if the O&M Manual or real property rights provide additional width. Therefore, for a case where the real property rights extend five (5) feet from the landside Levee Toe (and the O&M Manual has no further requirement), in general the fence may not be constructed at five (5) feet from the landside Levee Toe. It would need to be constructed beyond twenty (20) feet from the landside Levee Toe outside of an Urban Criteria Area. Within an Urban Criteria Area, the fence would also need to be constructed beyond twenty (20) feet from the landside Levee Toe unless the area meets requirements for the Board to allow for the fence either to be constructed beyond ten (10) feet from the landside Levee Toe consistent with providing clear access along the landside Levee Toe, or to be constructed anywhere within a twenty (20) feet wide clear visibility zone -- provided the fence (and vegetation on the fence) does not obstruct visibility.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	(u)	USACE	The ETL 1110-2-571 is unrelated to and does not superseed ETL 1110-2-569. Also ETL 1110-2-571 has been superseeded by ETL 1110-2-583.	The definition for ETL 1110-2-569 has been revised in response to the comment.
Section 4 - Definitions	gg	DCC Eng.	Levee Right of Way. Changing the Levee Right of Way on the landside to 20-feet will have major implications on existing structures outside of the current IO-foot Right of Way. Essentially, this change could be considered a taking of private property and the implications of putting previously compliant structures into non-compliance must be considered carefully before the change is made. Perhaps a larger Right of Way should be reserved to certain kinds of structures that require excavation within 20-feet of the levee toe, such as pools.	The definition of Levee Right of Way has been revised significantly so that it is includes fifteen (15) feet from waterside Levee Toe and twenty (20) feet from the landside Levee Toe (except that in Urban Criteria Areas two (2) alternatives may be allowed in developed areas to provide either a ten (10) feet wide clear access zone or a twenty (20) feet wide clear visibility zone) or more if the O&M Manual or real property rights provide additional width. The Board does not believe this to be a taking of private property. Additional setback distances may be required for activities and structures that could adversely impact the Levee.
Section 4 - Definitions	hh	DCC Eng.	Levee Section. This definition must distinguish between the existing topography of levee or the levee section deemed as the critical levee section (within the levee section) that is described as a 20 foot crown with a 2h: 1v landside slope and a 3h: I v waterside slope. Perhaps the term Critical Levee Section should also be defined for situations when you have an oversized levee and are dealing with penetrations from various types of structures into the levee cross section.	The definition for Levee Section has been revised in response to the comment, but it was not found necessary to also define a Critical Levee Section or Levee Prism.
Section 4 - Definitions	(gg)	KSN	Is this a correct and legal definition. Also, 10 feet from waterside toe may overarch the CCCVFCA argument about channel maintenance being a responsibility of the State/Corps. Perhaps Scott Shapiro needs to look at the prior correspondence and legal positions posed over the years?	The definition for Levee Right of Way has been revised. The Board believes this is a legally sufficient definition and is unrelated to responsibilities for channel maintenance.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	(gg)	DWR	Should the definition of "Levee Right of Way" include seepage/stability berms, drainage features, toe drains, etc.? This idea is in ULDC page 7-24,Where seepage/stability berms and/or relief wells are present, the minimum 20-foot-wide landside zone needs to extend beyond the limits of thosefeatures (and should include seepage collection ditches).I think in most cases it's already included since if a berm is built an easement would have been purchased. The suggestion would to just include some language in the definition section.	The definition for Levee Right of Way has been revised and includes additional features such as seepage berms and relief wells.
Section 4 - Definitions	(hh)	MBK	Suggest adding ", except Small Streams or tributaries with a smaller crown or steeper slopes as provided in the Project as-builts." to capture those smaller stream and tributary designs.	The definition for Levee Section has been revised in response to the comment.
Section 4 - Definitions	(ii)	KSN	It is not clear if they are talking about design section or physical section. In some cases the Corps only recognizes the physical section and ignores the design section. We need to discuss and clarify.	The definition for Levee Toe has not been revised. A specific description of the problem with the definition and an appropriate remedy would be welcomed.
Section 4 - Definitions	(nn)	DWR	Maintenance Activities-Recommend breaking down into 2 (two) type of activities under definitions: minor vs major. The document as it reads now seems to conflict between Maintenance Activities in other sections. For example, it refers to major activities requiring permits but in other sections it refers to maintenance activities do not require permits. This conflicting issue would be clarified by defining the difference between Major maintenance issues and minor maintenance issues.	Outside the scope of this update.
Section 4 - Definitions	(oo)	DWR	Are the current list of streams that "fit" this description going to be labeled? It appears this is the only place in the document that Minor Streams is used, is this going to be used in the future?	The definition for Minor Streams has been removed in response to the comment. A definition for Minor Tributary Levee has been added and is used in Article 8 in reference to Levee crown width, consistent with USACE Sacramento District guidance.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	(oo)	C. Macdonald	Minor Streams: This definition makes a stream a “minor stream” at a location, but not at other locations. A stream could meet the definition in a flat section of water, then in a more turbulent section where there were erosive forces, it wouldn’t meet it. So it’s a definition of a location and not really of a stream. If this only operates for bridges, why not have a soffit requirement in the bridge section?	The definition for Minor Streams has been removed in response to the comment. A definition for Minor Tributary Levee has been added and is used in Article 8 in reference to Levee crown width, consistent with USACE Sacramento District guidance.
Section 4 - Definitions	(oo)	MBK	Definition of “Minor Streams” (oo) – I am concerned that minor streams have previously been defined differently in the original USACE project design and this may cause confusion moving forward. I am familiar with at least one, Dry Creek near Wheatland, where the as-builts have the 12 foot crown and 2:1 slopes for small streams, but the design flood is greater than 8,000 cfs. Suggest adding the catch all of “or where the project as-builts provide for a smaller Levee Section.”	The definition for Minor Streams has been removed in response to the comment. A definition for Minor Tributary Levee has been added and is used in Article 8 in reference to Levee crown width, consistent with USACE Sacramento District guidance.
Section 4 - Definitions	(oo)	USACE	I was asked to look into the definition of "minor" stream and where the group thinks minor is coming from. There was mention that it is coming from USACE design criteria or the '53 MOU and its subsequent supplements. Bottom line, we do not have a definition of minor streams. Current EM 1110-2-1913, Design and Construction of Levees does not use major and minor streams as design criteria. The 1953 MOU and the Sacramento District SOP for levee design use the term "minor tributary streams" when defining which levees can have crown widths of 12 feet instead of the typical 20 feet. The 1953 MOU calls out the minor streams that can have the more narrow crown width on page 15 of the MOU (10 specific water bodies). I do not know where the <8000 cfs, no erosive velocities, and no documented debris issues criteria is coming from.	The definition for Minor Streams has been removed in response to the comment. A definition for Minor Tributary Levee has been added and is used in Article 8 in reference to Levee crown width, consistent with USACE Sacramento District guidance.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	(qq)	USACE	Non Conforming Existing Encroachment. What does "inconsistent" mean? This isnt clear. Does this mean one that isn't permitted and does this put those that aren't permitted in the same category as permitted but not completely conforming to the regulations? Should it read "not permitted or non conforming"?	Outside the scope of this update.
Section 4 - Definitions	(qq)	USACE	This term and definition need to be clarified. The definition of the term makes it difficult to understand the context of Section 108(a)(1)(b). Suggest changing to: "nonconforming encroachments" means an unpermitted Encroachment or use that is not in compliance with these regulations.	Outside the scope of this update.
Section 4 - Definitions	(pp)	DWR	I'm not sure mobile homes are designed for quick removal.	The definition of Mobilehome has been revised in response to the comment.
Section 4 - Definitions	(pp)	C. Macdonald	"Quick" should be replaced with "easily."	The definition of Mobilehome has been revised in response to the comment.
Section 4 - Definitions	(tt)	DWR	There is more to OSHA then just the excavation portion. Suggest just defining OSHA and/or referencing Title 8.	The definition of OSHA Technical Manual has been removed.
Section 4 - Definitions	(vv)	C. Macdonald	"A permit is in effect until revoked." Delete "until" and insert "unless".	The definition of Permit has been revised in response to the comment.
Section 4 - Definitions	(zz)	C. Macdonald	Do we really need a "previously permitted encroachment?" An encroachment is either "permitted" or it's not. Any encroachment with a permit, even if just issued, is a previously permitted encroachment.	The definition of Previously Permitted Encroachment has been removed in response to the comment.
Section 4 - Definitions	(aaa)	C. Macdonald	All levees don't have the shape that you are prescribing in detail in this definition. Is this intended? If a levee has a 1.5:1 waterside slope, is the projected waterside slope above that?	The definition for Projected Levee Section has been revised. It is based on Levees that meet the minimum USACE and Board slope design criteria and as used in Article 8 is somewhat conservative for Levees with overly steep slopes.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 4 - Definitions	(aaa)	DWR	Aren't projected levee slopes used when considering impacts to levees? There could be other impacts besides stability, suggest a more general sentence.The ULDC has the following paragraph:The levee prism should be considered to continue underground based on projection of the above-ground levee slopes. The projected levee slopes are useful for evaluating erosion, excavations, and encroachments near the levee.Stability could be added to the sentence above.	The definition for Projected Levee Section has been revised. It is based on Levees that meet the minimum USACE and Board slope design criteria and as used in Article 8 is for determining distance from the Levee at which a certain activity or Encroachment can occur.
Section 4 - Definitions	(bbb)	USACE	"proposed work" is defined here as something needing a permit that is proposed. The slide from the meeting states that "proposed work covers everything needing a Board permit" but this sounds like work that hasn't been completed yet. What about existing encroachments that are not permitted? There are existing encroachments that need a permit that are already constructed.	Outside the scope of this update.
Section 4 - Definitions	(hhh)	DWR	May consider deleting, seepage berms are typically less then 300 ft in width.	The definition for Seepage Berm has been revised in response to the comment.
Section 4 - Definitions	(uuu)	USACE	Modify definition of USACE to the mission statement: "USACE delivers vital public and military engineering services; partenering in peace and war to strengthen our Nation's security, energize the economy and reduce risks from disasters." or to make it more specific to the Central Valley "USACE means the federal agency which the CVFPB provided assurances to operate and maintain the State Plan of Flood Control facilities." or simply "United States Army Corps of Engineers"	The definition for U.S. Army Corps of Engineers has been revised in response to the comment.
Section 4 - Definitions		City of Sacto	Define freeboard in definitions	A definition for Freeboard has been added.
Section 5 - Delegations	General	City of Sacto.	Include rules/regulations allowing for Board's delegation of permitting authority to local entities	Section 5 - Delegations is not a part of this update.
Section 5 - Delegations	a(3)	KSN	No definition of inconsequential…hydraulic impacts can be an additional permit cost, which for something like a pipe or piling is currently required, however, is likely inconsequential in real terms.	Section 5 - Delegations is not a part of this update.

Article 2 Public Comments

ARTICLE 2 - Definitions and Delegations	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 5 - Delegations	a(3)	DCC Eng.	Section 5, Delegations (3) Need numerical measure to determine whether or not a Proposed Work has inconsequential impacts, i.e. how much the project alters flow velocities or define adequate freeboard.	Section 5 - Delegations is not a part of this update.
Section 5 - Delegations	(b)	USACE	Include pump stations and wet wells	Section 5 - Delegations is not a part of this update.
Section 5 - Delegations	(b)	USACE	Include subsurface investigation (borings dry or wet, test pits, CPT, sonic drilling, in situ testing)	Section 5 - Delegations is not a part of this update.
Section 5 - Delegations	(b)	USACE	Include any excavation for borrow, swimming pools or others.	Section 5 - Delegations is not a part of this update.
Section 5 - Delegations	General comment on Section 5	City of Sacto.	Article 2, Section 5, Delegations – Many delegated permit actions take a long time. In an effort to streamline and expedite process, require permit applications being considered for delegated approval to be available on web, require delegated permit listing to be updated monthly to indicate status, and require issued permits to be available on the web.	Section 5 - Delegations is not a part of this update.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 111 - Intro to Standards	Gen	USACE	It would be difficult establish a baseline of existing infrastructure between 10 and 15 feet therefore adding jurisdiction to 15 feet is extremely difficult without a baseline. Recommend leaving it 10 feet or easement area, whichever is bigger. This way, when new levees are constructed or reconstructed and the Board gets 15 or 20 foot easements, they can easily regulate to the easement area.	This issue arises in the definition of Levee Right of Way in Article 2 and appears throughout Article 8. The Board considered leaving the historic ten (10) feet requirement for setback from the Levee Toe, but chose to increase the setback distance to be more consistent with the setback distance goals of USACE Sacramento District's Geotechnical Levee Practice Standard Operating Procedure and DWR's Urban Levee Design Criteria and the typical real estate acquistion practice of the USACE, the Board, and DWR since 2007.
Section 112 - Streams Regulated and Non-Perm. Work	Gen	USACE	There was a question at the presentation about where the list of regulated streams in 8.1 came from and there was mention that the list came from the USACE. Many of the regulated streams have nothing to do with the Federally authorized Flood risk reduction system in the Central Valley so I am not sure that USACE had any part in the development of this list. I could not find any documentation in our files to support USACE coming up with the list. There are no revisions required by this comment, just wanted to follow up on comments from the public meeting. If you find out otherwise through your update, I would like the documentation for our records.	The designation of regulated streams in the Central Valley is a Board action based on its authority under Sections 8534, 8598, and 8609 of the Water Code. No changes to Table 8.1 are proposed.
Section 112 - Streams Regulated and Non-Perm. Work		PlacerCFC&WCD	The upper watershed extent of Regulated Streams in Placer County under CVFPB jurisdiction appears to be haphazard for a majority of creeks. We recommend setting an elevation based upper limit extent of 250 feet or 500 feet MSL to help clarify this issue. There are recent examples of projects high in the Coon Creek watershed far above 500 feet MSL (e.g, Hidden Falls Park project) where flood encroachment permits were required for minor park landscaping irrigation projects. Within these upper watershed locations, the value of regulatory flood encroachment controls by the CVFPB is questioned, relative to the benefits provided to the far removed State Plan of Flood Control Facilities.	The Board has authority along the Sacramento and San Joaquin Rivers and their tributaries and distributaries. Section 4 provides a definition for "Adopted Plan of Flood Control" where the Board exercises its authority. Due to the substantial effort anticipated for updating Table 8.1, revisions to Table 8.1 are not included in this update.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	MSCE	Clarify the purpose of Table 8.1 and the specific design standards associated with encroachment into listed streams; and	An introduction to Table 8.1 is now included in Section 112 (a). The purpose of Table 8.1 is to identify the streams regulated by the Board. No changes to Table 8.1 are currently proposed. The purpose of Article 8 is to provide design standards for Encroachments. The rulemaking package for the Office of Administrative Law will contain a Statement of Reasons that provides a reason for each standard.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	PlacerCFC&WCD	Table 8.1 – although this update effort was not intended to modify this table, there are significant enough issues that have arisen with Placer County creek extents listed below, that we hope our comments can be addressed. Please clarify the upper reach limit (extents) for Antelope Creek, Auburn Ravine, Coon Creek, Linda Creek and Secret Ravine within Placer County. The current descriptions of the upper limits for each of these creeks is unclear (for example Antelope Creek refers to unknown “settlement ponds”?). The table lists a “Markham Creek” as located within Sutter County only, although the correct name for this creek is “Markham Ravine” and we wonder if the extents listed should include its reach through Placer County through the City of Lincoln limits.	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	DCC Eng.	Revise Steamboat Slough to be in Sacramento and Yolo County (not Yellow).	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	City of Sacto.	Consider again revising Table 8.1. I and others are prepared to make specific recommendations to facilitate timely consideration of changes. If Board’s current schedule for issuing Titles 23 revisions needs to be delayed to allow staff time to revise Table 8.1, request such delay.	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	City of Sacto.	Review/revise extent of streams requiring CVFPB permits, particularly some of the south Sacramento County streams where regulatory authority is extended throughout Sacramento County. Recommend some of these streams such as Morrison, Elder, Florin, Unionhouse and Laguna Creeks have limits of CVFPB regulatory authority reduced to approximate limits of South Sacramento County Streams project. Review extent of Beacon Creek (regulated to Franklin Blvd.) and Unionhouse Creek (regulated in all of Sacramento County).	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	MSCE	Describe how the Adopted Plan of Flood Control informs hydrology and hydraulics decisions on streams listed on Table 8.1; or	In general, each Adopted Plan of Flood Control has an identified Design Flood that is available from the Board. Please refer to the definition of Design Flood and Design Water Surface Elevation. Some streams, typically designated floodways, have a return period for the Design Flood. State Plan of Flood Control Facilities generally have a design stage and discharge, but may not have a designed return period flood. Maps that show design discharge are available from the Department of Water Resources.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	MSCE	Limit the extent of permit authority over only those watershed on which the State has authority and adopted standards, such as designated state floodways and federal project flood control systems.	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	San Joaquin PW	Table 8.1, page 72: For “Old River” revise limits to read “San Joaquin-San Joaquin River to Paradise Cut”. The current wording allows confusion between San Joaquin County and the San Joaquin River.	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 112 - Streams Regulated and Non-Perm. Work	Table 8.1	San Joaquin PW	Table 8.1, page 72: For “Pixley Slough” revise limits to clarify the limits. There is confusion with the current limits because Bear Creek intersects Pixley Slough in two spots. So is the limit from Eight Mile Rd going east to Bear Creek or from Eight Mile Rd going west to Bear Creek. I know that the limit is the former but to someone who doesn’t know better it could easily be confused (see attached image).	Revisions to Table 8.1 are not included in this update due to the substantial effort anticipated for updating Table 8.1.
Section 113 - Dwelling and Structures Within APFC	(b)	USACE	Include the requirement that the dwelling shall not impact the levee integrity such as increase the seepage through the levee or its foundation, decrease the levee slopes stability, increase the erosion potential of the levee or riverbank slopes.	This section has been revised in response to the comment to include this requirement.
Section 113 - Dwelling and Structures Within APFC	(b)(2)	USACE	This definition does not make sense. A new dwelling is new, cannot be constructed prior to adoption of the flood control. Suggest reviewing and revising by removing the word "New".	This section has been revised in response to the comment for clarity.
Section 113 - Dwelling and Structures Within APFC	(b)(3)(A)	USACE	Include the modification cannot be closer than 10 feet from the levee toe.	This section has been revised in response to the comment to include this requirement.
Section 113 - Dwelling and Structures Within APFC	(b)(3)(B)	DWR	Based on the CVFPP this is my understanding of WSE:Urban=200 year Small Communities=100 yearRural=1955/1957 Bullet (ii) states 100 year for non-urban, but my understanding is 100 year is for small communities, but not all of non-urban. The terms listed above are used in the CVFPP.	The section has been revised in response to the comment for clarity, referring to the Design Water Surface Elevation. But the minimum elevation of two (2) feet above the 100-year flood elevation remains for non-urban areas. The CVFPP applies to the community as a whole, not to new construction requirements. Furthermore, SB5 established the 100-year standard for new construction in non-urban areas.
Section 113 - Dwelling and Structures Within APFC	b(3)(B)	DCC Eng.	Section 113, Dwellings and Structures Within an Adopted Plan of Flood Control (b) (3) (B) This section determines that the finish floor of any remodeling, modification, addition, or repair to a Dwelling should be (3) feet above the Design Flood Plane, 100-year or 200-year elevation. This is inconsistent with Article 5 Section 107 (a) (7) and later in this section (d) (4) that requires finished floor to be 2-feet high. Three feet is a new requirement that is also inconsistent with local and existing CVFPB regulations and may create hardship if an existing dwelling already meets the 2-foot standard. Please change this requirement from 3-feet to 2-feet.	This section has been revised in response to the comment, requiring the finished floor to be at least two (2) feet above the Design Water Surface Elevation. This requirement is now consistently applied throughout the Board Standards.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 113 - Dwelling and Structures Within APFC	b(3)(B)(i)	DWR	In section, Section 107, Permitted Work Uses in Designated Floodways the term:"Design Water Surface Elevation is used. "Is Design Flood Plane the same thing? Suggest using the same terms throughout the document	This section has been revised in response to the comment. The Board Standards have been revised to use the term "Design Water Surface Elevation" instead of "design flood plane" throughout.
Section 113 - Dwelling and Structures Within APFC	b(3)(B)(i-iii)	KSN	How will this work…if you are 1 foot above, does any remodel require raising the entire floor or just the remodeled portion?	This requirement applies only to the remodeled portion.
Section 113 - Dwelling and Structures Within APFC	b(6) (C)	KSN	Habitat and vegetation should be required to have the same hydraulic analysis?	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 113 - Dwelling and Structures Within APFC	d(2)	DCCEng.	(d) (1) is hard to follow and would be helped by Figure 8.la please include in the next draft.	Comment originally submitted for (d)(1). This comment appears to apply to Section 113(d)(2). Figure 8.1 is now included.
Section 113 - Dwelling and Structures Within APFC	d(2)	KSN	Does not appear to differentiate between existing or new, so does this make existing structures subject to requirements?	This applies to new and/or unpermitted Dwellings, Dwellings for seasonal occupancy, Buildings, and Mobilehomes.
Section 113 - Dwelling and Structures Within APFC	b(3)(B)	MSCE	Notice Article 8, Section 113, (b)(3)(B) calling for the floor of a new home to be 3' above the 200-yr floodplain. In the flatter areas this will require significant additional fill or raised foundations.	The Board Standards have been revised for clarity, requiring a minimum elevation of two (2) feet above the Design Water Surface Elevation.
Section 113 - Dwelling and Structures Within APFC	General	PlacerCFC&WCD	Building pad elevation standards within these regulations should be consistent with recent SB-5 legislation and ULOP criteria as developed by DWR, and should be consistent with the findings made by local agencies regarding ULOP. This will avoid unnecessary conflicts between these State regulations.	SB-5 requirements are far geographically broader than the Board's requirements within Adopted Plans of Flood Control. Within an Adopted Plan of Flood Control it is reasonable to require freeboard that may not otherwise be required, such as by the Urban Level of Flood Protection, especially within regulated Floodways.
Section 114 - Mobile Homeparks and RV Parks	(b)(2)	USACE	This is the first time when a mobile homes or recreational vehicles are not permitted within 20 feet from the levee or berms toe, or relief wells. Until now the minimum distance was 10 feet for dwellings. Is this 20 feet requirement only for mobile homes? I believe dwellings have a more negative impact than the mobile homes, however, the distance from the levee is only 10 feet. Please review and revise as needed.	This section has been revised, consistent with Dwellings and other Encroachments, to preclude Mobilehomes and Recreational Vehicles from the Levee Right of Way. The definition of Levee Right of Way has been significantly revised.
Section 115 - Dredge, Spoil and Waste Materials	(a)	USACE	The first sentence should be revised to forbid non-hazardous materials to be placed on levee features. The word "may" should be replaced with "shall"	This section has been revised in response to the comment.
Section 116 - Borrow and Excavation Activities		City of Sacto.	Write regulation to cover any excavation that may adversely affect flood control system integrity, most particularly excavation for any purpose near levees during flood season. Make clear the Board's intent to regulate excavation outside the Levee Right of Way which may negatively impact the levee integrity. If limit to borrow, define "Borrow" in Definitions section to include excavation for any purpose	This section has been revised in response to the comment, addressing concerns about Borrow and excavation landward of the Levee. Borrow is now a defined term.
Section 116 - Borrow and Excavation Activities	(a)	USACE	Another condition should be added for the borrow area waterside of the levee: the hydraulic analyses should show that the water elevations upstream and downstream of the borrow area are not changed. Some of the waterside borrow may increase water elevations downstream of the area.	Section 116 (b)(2) has been revised to provide the Board the ability to require a hydraulic study to show no significant change in stage or velocity.
Section 116 - Borrow and Excavation Activities	a(1)	USACE	The word "requirements" is not the proper word to use in this sentence. Suggest rephrasing so that "the borrow activity shall be performed such that it meets the underseepage requirements persuant to EM 1110-2-1913."	This rule has been revised to require that the activity shall not negatively impact Levee stability and underseepage performance. It would not be appropriate to require the Borrow permittee to meet Levee underseepage requirements of EM 1110-2-1913 if the Levee does not already meet these requirements in the absence of the Borrow activity. Nor would it be appropriate to allow the Borrow activity to degrade underseepage performance if the bare minimum requirements of EM 1110-2-1913 are still met.
Section 116 - Borrow and Excavation Activities	(b)(1)	USACE	Does this requirement apply only for the Floodway? This should apply for landside protected area also. Is Floodway only on the waterside of the levee? Geotechnical analyses should be also conducted.	This section has been revised in response to this comment, requiring a landward setback distance or a geotechnical investigation.
Section 116 - Borrow and Excavation Activities	b(2)	Ray Costa	It is a little confusing about the minimum required distance for a landside borrow area. It states "300 to 500 feet". Under what condition is 300 ft required and what condition is 500 ft required? Then it goes on to state "lesser distances" may be allowed. Does that mean less than 300 ft may be ok?	This section and other sections are revised to require four hundred (400) feet setback landward of the Levee Toe for Borrow and other types of excavations. See (b)(5).

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 116 - Borrow and Excavation Activities	(b)(2)	Ray Costa	I know the distances of 300 and 500 feet would be ideal if no investigation are provided but does CVFPB have the jurisdiction to require these distances?	The Board has authority over activities that may affect an Adopted Plan of Flood Control. See 112(a).
Section 116 - Borrow and Excavation Activities	(b)(3)	USACE	If the spur levee is part of the flood protection project, material should not be removed from it unless some analyses are provided. These spur levees are usually constructed for hydraulic reasons, to divert the water toward a direction.	This section has been revised in response to the comment, clarifying the distance within which analysis is required before excavating near a Spur Levee. See (b)(7).
Section 116 - Borrow and Excavation Activities	b(4)	Ray Costa	The side slopes of the perimeter of a borrow area may not exceed 5h:1v unless it can be demonstrated by suitable seepage/stability analyses steeper slopes are appropriate.	This section has been revised in response to the comment. See (b)(8).
Section 116 - Borrow and Excavation Activities	b(5)	Ray Costa	Uses a 400 ft dimension. Should be consistent with whatever is decided by the "300 to 500 feet" comment, above.	This section and other sections regarding the four hundred (400) feet requirement landward of the landside Levee Toe have been revised to be consistently applied for Borrow and other excavation type activites througout the standards.
Section 116 - Borrow and Excavation Activities	(b)(5)	USACE	Actually this sentence may be rephrased to require the borrow area to be graded to drained the water away from the levee. It cannot be a bath tub that accumulates runoff water.	This section has been revised in response to the comment. See (b)(9).
Section 116 - Borrow and Excavation Activities	b(6) (C)	Ray Costa	Upon order of the Board, the Permittee shall restore a damaged levee and/or access ramp to the original profile **and integrity.**	This section has been revised in response to the comment. See (b)(10).
Section 116 - Borrow and Excavation Activities	b(7)(A)	DWR	Can borrow be stored in the channel between levees? The example would be if a low flow channel exists, likely a bypass area.	Temporary storage is allowed. Stockpiles of material and equipment are not allowed during Flood Season. See (b)(15).
Section 116 - Borrow and Excavation Activities	b(7)(B)	DWR	Should this be greater than 10 ft and have controls on slope and height of stockpile? If it's left at 10 ft suggest adding slope and height controls so we don't have a massive stockpile of soil right next to the levee. A large surcharge could cause settlement and impact drainage features.	This section has been revised in response to the comment, addressing potential impacts to Levee integrity and operation and maintenance. See (b)(11).
Section 116 - Borrow and Excavation Activities	b(7)(A&B)	DWR	From Section 119:(7) Upon removal of an earthfill or rockfill dam, the material from the dam may not be stockpiled on the Levee Section, within 10 feet of the landward Levee Toe, or within the Floodway.Is the intent of these bullets (A&B) to say the same thing as above?	The intent is the same but one refers to Borrow and the other refers to dam removal. These sections have been revised for consistency.
Section 116 - Borrow and Excavation Activities	(b)(15)	USACE	I believe it is not a good practice to excavate a borrow waterside of the levee lower than the bottom of the channel. This barrow material at the bottom will be most of the time saturated, depends of the foundation soil. Besides that, it may increase seepage through the levee foundation by decreasing the seepage path. Some of the levees are set back at larger distance form the river to reduce the gradients at the levee landside toe, therefore a borrow area below the bottom of the river reduces this distance considerable, increasing the gradient at the toe of the levee.	This standard requiring a five hundred (500) feet setback is for the purpose of protecting the main channnel from being redirected through the Borrow. Having standing water in the Borrow pit is not a problem for Levee integrity or Floodway capacity. Requirements (a)(1) and (b)(1) should adequately addresses underseepage concerns, which can be significant regardless of the depth of the Borrow pit.
Section 116 - Borrow and Excavation Activities	b(17) & (19)	Ray Costa	Within one (1) mile downstream of a bridge, ...	Standard (b)(21) should apply to both the upstream and downstream sides of a bridge unless otherwise justified.
Section 120 - Levees	a	DWR	Should the ULDC be referenced as well for urban and urbanizing areas? From ULDC:Urban levee design criteria (ULDC) means the levee and floodwall design criteria developed by DWR for providing the urban level of flood protection (Government Code Section 65007(k) and California Water Code Section 9602(i)). I think the ULDC is here to stay and is being used for levee improvements in Urban areas. It generally "raises the bar" beyond what the USACE standards are.	Definitions relating to urban areas and the Urban Levee Design Criteria have been added -- most notably "Urban Criteria Area" -- and used in several sections of these standards. The effect is to require ULDC compliance for regulated work in urban and urbanizing areas.
Section 120 - Levees	a(6)	DWR	Legal issue with just removing abandoned conduit. Don't you need to follow enforcement protocol and clear legal requirement?	This update is limited to Article 8 (and the relevant definitions in Article 2). Enforcement is not addressed in Article 8.
Section 120 - Levees	a(7)	DWR	Generally you want to fill with more permeable soil then what is out there. I would not include "embankment material" for this item.	This section has been revised to allow, under certain circumstances, for placement of material in the Levee that does not meet the requirements of Embankment Material.
Section 120 - Levees	a(9)(B)	USACE	Is the slope 0.25H:1V real? I believe it is a typo and it should be 2.5H:1V.	This standard is correct as written. See Figure 8.02. This enables compaction against a sloping surface when Embankment Material is placed.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 120 - Levees	a(10)	DWR	Is this the same as a pervious toe trench? I don't think I've seen the term "relief trenches". EM 110-2-1913 uses the term "previous toe trench". Suggest changing to "pervious toe trench" to be consistent with USACE. "Toe drain" is used is this document as well.	This section has been revised in response to the comment, saying "pervious toe trench" instead of "relief trench."
Section 120 - Levees	a(10)	USACE	This trench that is used for inspection and seepage cut-off may not have to be constructed at the levee centerline but may be placed under the waterside levee slope.	This section has been revised in response to the comment, allowing for the inspection trench to be located under the waterside Levee slope if justified.
Section 120 - Levees	a(11)	Ray Costa	Meeting a 2 percent organic matter spec will be difficult. Suggest either raising to 4 percent or "no visible organics".	The definition of "Embankment Material" has been changed to require "no visible concentration of organic content."
Section 120 - Levees	a(11)	Ray Costa	Suggest minimum 95% standard Proctor instead of minimum 97%. In my opinion, 95% standard Proctor is about the same as 90% modified Proctor. I realize USACE has been specifying minimum 97% standard Proctor but that seems high to me.	Comparisons between Standard Proctor and Modified Proctor compaction tests were reviewed for various soil types and a five (5) percent difference seems appropriate for clayey soils, as compared to the seven (7) percent difference previously used. This change has been made in this section. However, for consistency with USACE, the ninety seven (97) percent Standard Proctor compaction is not reduced to ninety five (95) percent. Therefore, the Modified Proctor requirement is increased to ninety two (92) percent.
Section 120 - Levees	a(11) (12)	USACE	This requirement matches Sacramento District SOP 003 and it is intended for homogeneous levees. We will revise this SOP for zoned levees. Therefore I suggest a revision of Title 23 also to prevent excessive requests for variation in the future. The zoned levees may have either an impermeable core (10 to 20 feet wide) within the centerline of the levee or a waterside impervious blanket that has minimum 5 feet at the top. The impervious core should be extended to the top of the levee (including freeboard). If an impervious blanket is used, the blanket has to bee at least and along the levee crest to the landside slope and needs to be at least 5 feet thick on the levee crest. The impervious core or blanket should be constructed of CL, ML or SL material. The remaining of the levee may be any random material with the condition that the maximum particle size to be no greater than 4 inches (to be placed and compacted in 6 inches lifts), and have the liquid limit (LL) no greater than 55. If the material has a higher LL than it should be covered by at least 6 feet of low plasticity material. The levee slopes should be covered by at leas 6 inches of a material that allows vegetative growth (grass, not threes or brush) or any kind of erosion protection against run-ff. The same compaction and moisture content requirements should apply for any material placed in the levee embankment.	This section has been revised to address subsequent USACE comments regarding Levee fill material and design. Zoned Levee construction is recognized as an exception, but design details for zoned Levees are not specifically provided in these standards. Furthermore, levee excavation backfill should not necessarily have to meet these requirements. Such backfill should be allowed to meet gradation and compaction of adjacent existing levee fill.
Section 120 - Levees	a(12)	Ray Costa	(17) it is stated previously the standard levee prism is 3h:1v w/s and 2h:1v l/s. Does this conflict with the 3h:1v w/s and l/s requirement here? Should it refer to outside the 2h:1v l/s slope?	This section has been revised in response to the comment, referring to the Levee Section and not using "projected Levee slopes."
Section 120 - Levees	a(12)	Ray Costa	Suggest minimum 92% standard Proctor rather than 90%. (big drop from 97% to 90% standard Proctor, especially compared to drop from 90% modified Proctor to 88%). May need to be revisited based on outcome of comment 4, above.	Comparisons between Standard Proctor and Modified Proctor compaction tests were reviewed for various soil types and a two (2) percent difference seems appropriate for sandy soils that may typically be used outside of the Levee Section.
Section 120 - Levees	a(12)	DWR	When FMO does repairs, typically existing or local soil is used. Good placement and compaction efforts will ensure the repairs will perform better than the adjacent areas. Is "embankment material? Required for small repairs?	This section has been revised to allow, under certain circumstances, for placement of material in the Levee that does not meet the requirements of Embankment Material. See (a)(11).
Section 120 - Levees	a(13)	DWR	Does this limit the use of AB or other structure backfill below a new foundation if it's within a levee embankment?	Yes. If AB is used below the phreatic line and near the landside levee face, it creates potential for internal erosion. On the waterside, it also creates an erosion potential. Only near the top of the Levee on the landside should this be considered.
Section 120 - Levees	a(16)	DWR	What is the intent of this comment? Would index/strength testing always have to be done?	This section has been revised in response to the comment, providing flexibility to the Board. Such testing would not always be needed.
Section 120 - Levees	a(17)	DWR	Isn't the levee right of way 10 ft beyond the waterside and landside toe? This is in the definitions. I'm not sure this paragraph is consistent.	The section has been revised, consistent with other sections.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 120 - Levees	a(17)	DWR	Should material type or consideration of material type be discussed? For example, if you fill a ditch that is 5 ft from the levee toe and soils are sandy you would not want to backfill the ditch with a less permeable material since it will make the existing conditions worse. The ditch should be backfilled with materials that are as permeable or more permeable then the existing conditions.	The requirements in Section 120 (a)(7) have been revised to address this concern.
Section 120 - Levees	a(17)	Ray Costa	Be consistent with designation of California licensed civil engineer. (it is expressed differently throughout the document)	The Board Standards have been revised in response to the comment to use "California registered civil engineer" throughout.
Section 120 - Levees	a(17 & 18)	KSN	Pretty onerous condition for rural districts. Needs to consider previous easements of 10 feet as allowable	This section has been revised to refer to the Levee Right of Way. This issue arises in the definition of Levee Right of Way in Article 2 and appears throughout Article 8. The Board considered leaving the historic ten (10) feet requirement for setback from the Levee Toe, but chose to increase the setback distance to be more consistent with the setback distance goals of USACE Sacramento District's Geotechnical Levee Practice Standard Operating Procedure and DWR's Urban Levee Design Criteria and the typical real estate acquistion practice of the USACE, the Board, and DWR since 2007. In rural districts, the general rule would be fifteen (15) setback from the waterside Levee Toe and twenty (20) feet setback from the landside Levee Toe.
Section 120 - Levees	a(17)	DCC Eng.	Revise to take out the requirements of 20-feet and 15-feet to Levee Right of Way until the decision to expand the Levee Right of Way has been further vetted to expand beyond 10-feet. This will be hard to regulate and could add substantial cost to owners of the ditches, power poles, standpipes, distribution boxes and other above-ground structures. Above-ground sturctures also needs to be defined furtehr. Instead, all new construction that involves excavation shall be located 20 feet beyond the landside Levee Toe and 15 feet beyond the waterside Levee Toe.	This section has been revised to refer to the Levee Right of Way. This issue arises in the definition of Levee Right of Way in Article 2 and appears throughout Article 8. The Board considered leaving the historic ten (10) feet requirement for setback from the Levee Toe, but chose to increase the setback distance to be more consistent with the setback distance goals of USACE Sacramento District's Geotechnical Levee Practice Standard Operating Procedure and DWR's Urban Levee Design Criteria and the typical real estate acquistion practice of the USACE, the Board, and DWR since 2007.
Section 120 - Levees	a(18)	DWR	Confusing. Needs clarification are you talking about Pipelines, not through levee, located alongside	This section has been revised in response to the comment, clarifying that these pipelines are typically parallel to the Levee.
Section 120 - Levees	a(21)	DCC Eng.	Define how far along the levee slope at the 3h:1v slope must go. Please add the slope shall go to the landside levee toeprojection onto the waterside slope. This requirement is beyond the PL84-99 requirements with a 2h:1v waterside levee slope applied to numerous levees. The discrepancy between the USACE Project Levee Standard and the accepted PL84- 99 standard needs to be resolved, the former requires a 3h: I v waterside slope and 2h:1v landside slope and the altter requires 2h:1v waterside slope and 3h:1v landside slope as wellas different crown heights and widths above the 100-year flood elevation. This section should do that. However the application of those standards should account for rural levees and urban levees given the same amount of protection is not needed for both. Also, it must be noted that when a repair occurs aon a levee section it should match the existing slope or 3h:1v or 2h:1v (relative to waterside or landside slope per the standard being applied), whichever is flatter.	This section has been revised to recognize that Delta Levees can have unique design requirements. Waivers of general Levee design requirements can be provided by the Board pursuant to 120 (k). See (k).
Section 120 - Levees	a(21)	DCC Eng.	This section also needs to discuss requirements pertaining to both urban and rural levees	Definitions relating to urban areas and the Urban Levee Design Criteria have been added -- most notably "Urban Criteria Area" -- and used in several sections of these standards. The effect is to require ULDC compliance for regulated work in urban and urbanizing areas. Otherwise, the standards contained in Article 8 apply for rural Levees.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 120 - Levees	a(17)(21)(22)	Ray Costa	it is stated previously the standard levee prism is 3h:1v w/s and 2h:1v l/s. Does this conflict with the 3h:1v w/s and l/s requirement here? Should it refer to outside the 2h:1v l/s slope?	The "Levee Section" definition says "typically" the landside Levee slope is 2h:1v, which is correct. New Levee construction requires 3h:1v landside Levee slope except where a steeper slope is justified (Section 120 (a)(26)), consistent with USACE guidance and the ULDC.
Section 120 - Levees	a(21)(22)	USACE	The existing levee slopes are 3H:1V on the waterside and 2H:1V on the landside. Additional ROW will need to be acquired by the CVFPB to construct levees with both slopes 3H:1V that is not always possible. Same comment applies to the bypass levees. The existing landside slope is also 2H:1V. So far it worked and the stability analyses show this slope is not an issue.	The "Levee Section" definition says "typically" the landside Levee slope is 2h:1v, which is correct. New Levee construction requires 3h:1v landside Levee slope except where a steeper slope is justified (Section 120 (a)(26)), consistent with USACE guidance and the Urban Levee Design Criteria.
Section 120 - Levees	a(27)	USACE	All levee slopes should be protected against run-off erosion with grass or other type of protection.	This requirement has been revised to require grass or other approved ground cover on new and reconstructed Levee slopes that do not have Revetment.
Section 120 - Levees	a(30)(B)	KSN	No definition of reconstruction…could lead to interpretive problems	Definitions are provided where a common dictionary definition is not adequate or available. New definitions should be avoided when the common definition is adequate. In this case the Webster's dictionary definition "the state of being constructed again" is adequate.
Section 120 - Levees	e	USACE	There are more seepage control facilities such as relief wells with their discharge ditches, seepage berms. The same requirements apply to these features also.	Seepage Berms and relief wells have been added to this list.
Section 120 - Levees	e(3)	DWR	If a relief well is installed 15 ft from the levee toe, would the “levee right of way” extend 10 ft landward of the relief well? I’m not sure what a 10 ft setback is referring to.	This has been clarified in the definition for "Levee Right of Way."
Section 120 - Levees	g	DWR	Should a paragraph be added regarding urbanizing levees and reference ULDC?	This section has been revised in response to the comment, requiring protection from the 200-year flood instead of the Standard Project Flood.
Section 120 - Levees	g	USACE	If the proposed project may lead to improvements that will increase the protection to more than 10,000 people, this becomes and urban area and the flood protection for this is 200 year and all the requirements should respect the ULDC requirements	Definitions relating to urban areas and the Urban Levee Design Criteria have been added -- most notably "Urban Criteria Area" -- and used in several sections of these standards. The effect is to require ULDC compliance for regulated work in urban and urbanizing areas.
Section 120 - Levees	a(30)(A)	USACE	There are many bypass levees that have been constructed with 6 feet of freeboard. We would expect those levees to be reconstructed with at least 6 feet of freeboard. The 5 foot minimum standard in this section is not enough. Standard O&M Manual for the SRFCP cites freeboard of 6 feet on Bypass levees in section 4-01. Suggest saying "All bypass levees to be constructed or reconstructed shall have a minimum of: the freeboard shown on the as-constructed drawings or five (5) feet of freeboard above the Design Water Surface Elevation whichever is more, or a Crown Elevation no lower than designed using an approved risk-based analysis."	This section has been revised to add a requirement respecting the previously authorized design crown elevation, in Section 120 (a)(35)(B).
Section 120 - Levees	Fig. 8.01	Ray Costa	Suggest naming what bypass levees are specifically referred to. For instance, there are smaller bypasses that would not necessarily have the same requirements as the larger bypasses (ie, Willow Slough Bypass vs Yolo Bypass). Slopes in table do not match text.	A statement has been included in Section 120 (a)(27) to allow the Board to approve steeper slopes when repairing or reconstructing an exsiting bypass Levee that has steeper slopes and has performed well and meets minimum stability and seepage criteria, consistent with language from the Urban Levee Design Criteria. Figure 8.01 is now Figure 8.02 and has been revised for clarity.
Section 121 - Erosion Control	a(1)	USACE	Actually bedding material is always required under the rock protection unless the rock protection is designed such as to function as a filter also (such as quarry stone that has some fines in it also).	This section is revised to address this comment in (a)(1) and (a)(2).
Section 121 - Erosion Control	a(2)(5)	USACE	The waterside slope is 3H:1V on most of the levees. If it is required to be 4H:1:, additional right of way may be required.	This section has been revised to clarify slope requirements. It is possible that additional right of way could be needed in some locations, but generally this would not be an issue for waterward of the Levee.
Section 121 - Erosion Control	a(6)	USACE	That table shows the same gradation for all water velocities, which may not be sufficient for some higher velocities. The riprap gradations and thickness should be based on the velocity in the water at the design flood	This section has been revised to remove the table and require that Riprap rock armoring and bedding materials be designed by a California registered civil engineer..

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 121 - Erosion Control	a(8)	USACE	The rock protection may not be adequate for velocities higher than 12 fps, unless the stoned are really large. Some other erosion protection measures may be required. (concrete articulated mats, or other similar with these)	This section has been revised to remove discussion of erosion control measures for streams with velocity exceeding twelve (12) feet per second, and design by a California registered civil engineer is required.
Section 121 - Erosion Control	a(9)(10)	USACE	The concrete rubble is controversial for slope protection. The USACE does not consider them as slope protection and the slope protection would be rated Unacceptable if the slope is protected by concrete rubble. The rubble is used by the burrowing animal to hide and the damages of the slopes are hidden by the rubble until the slope fails. Therefore the USACE does not accept concrete rubble as slope protection anymore. Also scouring of the levee slope is possible due to lack of a filter material between the rubble and the underlying slope. Therefore, I suggest not accepting them on the levee slopes in the future since they may lead to Unacceptable rating from the USACE.	This section has been revised to no longer state that broken concrete is allowable.
Section 122 - Irrig. And Drainage Ditches, Tile Drains, and Septic System	a(2)	DWR	Repeated. "Appropriate seepage modeling shall be performed …….	This section has been revised to address the comment.
Section 122 - Irrig. And Drainage Ditches, Tile Drains, and Septic System	a(2)	DWR	Duplicate statement	This section has been revised to address the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	a(1)	USACE	Why is this definition included in this paragraph regarding pipelines. It may be better to be moved to the definition article.	The term "Delta Lowlands" is used only within Section 123. Therefore it is appropriate to have the definition within Section 123.
Section 123 - Pipelines, Conduits, and Utility Lines	(b)	KSN	Need new paragraph to allow for invert of pipe to be above the normal levee crest, and provide for adequate ramps and cover of installed pipe over the "crest"	Section 123 has been significantly revised. This comment is addressed in (d)(5).
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	Gas lines are usually 20 or more feet below crown.	Though many existing gas pipelines may be located below the Levee Crown, new gas pipelines will need to be located above the Levee crown, consistent with USACE guidance.
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	A storm water pipe when its turned on is considered under pressure, define pressure pipelines	A definition for "pressure pipeline" is not provided. Only gravity drains are allowed to be constructed through the base of the Levee, consistent with USACE guidance. The pressure in the drain should be relatively low, limited to what can be achieved by ponding (from rainfall runoff) and gravity, unlike other pipelines that are pressurized.
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	Closure structure is typically located on landward toe and fenced in and locked. How would these positive closure devices get open and how would flood flight officials know how to close gates. Isn't there specific tools you would need to open and close gates? Correct torque? See 2nd comment down.	This section has been revised to clarify that for pipelines open to the Stream, the positive closure device needs to be near the waterside edge of the Levee crown. A requirement has been added in 123(d)(6) to require that closure instructions and any necessary equipment and keys shall be provided to the Local Maintaining Agency, if requested.
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	The word crown and crest used interchangeably…just distracting	The standards have been revised to use "crown" except when elevation is referenced as in "Crest Elevation."
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	Recommend paddle permanently identifying the encroachment and Utility company would provide updates to make sure the flood official has updated information on the paddle and reinforced that positive closure device are tested and operational. Opening/Close instructions of the closure devices should be available for the flood flight official.	This section has been revised in 123(b)(4) for the Permittee to provide, as requested by the Local Maintaining Agency, keys, operation instructions, and other information regarding the Encroachment. Markers were already required.
Section 123 - Pipelines, Conduits, and Utility Lines	b(1)	DWR	Redundant ("in the field")	This section has been revised to address this comment.
Section 123 - Pipelines, Conduits, and Utility Lines	b(2)	DWR	The word crown and crest used interchangeably……just distracting	The standards have been revised to use "crown" except when elevation is referenced as in "Crest Elevation."
Section 123 - Pipelines, Conduits, and Utility Lines	b(2)	DWR	Purpose of statement unclear. Suggest: "Gravity pipelines that penetrate the Levee Section shall be equipped…"	This section has been revised significantly. Gravity drains are discussed in 123(e).
Section 123 - Pipelines, Conduits, and Utility Lines	b(3)	KSN	Need to look this up…and be able to seek variance via permit process with executive decision…may not apply to delta districts due to desire in many cases that pipes be exposed	This section has been revised to allow for exposed pipelines on the landside Levee slope, consistent with EM 1110-2-1913, where acceptable to the Local Maintaining Agency in 123(d)(9).
Section 123 - Pipelines, Conduits, and Utility Lines	b(3)	USACE	I believe 12 inches of drainage around the pipe layer is sufficient (as required by the USACE EM 1110-2-1913	An eighteen (18) inch thick layer is required in EM 1110-2-1913, paragraph 8-5(b)(2).

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	b(4)	KSN	Change to may. In the delta we do not normally cover pipes to allow for inspection, should not be a requirement and should provide for options	This section has been revised to allow for exposed pipelines on the landside Levee slope, consistent with USACE guidance, where acceptable to the Local Maintaining Agency in 123(d)(9).
Section 123 - Pipelines, Conduits, and Utility Lines	b(4)	DCC Eng.	Section 123, Pipelines, Conduits and Utility Lines (b) (4) Local Maintaining Agencies prefer to have these pipes exposed and rest on the exterior of the levee slope. This section needs to be defined further to state whether or not the levee prism is the critical levee section (3h:1v landside, 2h:lv water side 1.5-ft or 3-ft above the 100-yr flood) or if it is outside the existing topography of the levee. This section is suggested to read the pipelines shall beplaced outside the exterior of the levee slope, not buried within the slope unless otherwise directed by the LMA.	This section has been revised to allow for exposed pipelines on the landside Levee slope, consistent with USACE guidance, where acceptable to the Local Maintaining Agency in (d)(9). Also consistent with USACE guidance, the invert of the pipeline shall be placed over the Levee crown. Exceptions are provided in (d)(5).
Section 123 - Pipelines, Conduits, and Utility Lines	b(4)	DWR	What about gas lines 20 feet deep, will there be a layer for design levee prism? How do you calculate levee prism?	Though many existing gas pipelines may be located below the Levee Crown, new gas pipelines will need to be located above the Levee crown, consistent with USACE guidance.
Section 123 - Pipelines, Conduits, and Utility Lines	b(4)	DWR	Define levee prism, how to calculate?	This section has been revised consistent with USACE guidance to require the invert of the pipeline to be placed over the Levee crown, with limited exceptions provided in (d)(5).
Section 123 - Pipelines, Conduits, and Utility Lines	b(5)	USACE	To prevent contradictions with par. 123(b)(4), it should be clearly indicated that the minimum cover at the levee crest should be 24 inches.	This section has been revised to address this comment. See (d)(9) and (d)(10). A new Figure 8.05 is included for clarification.
Section 123 - Pipelines, Conduits, and Utility Lines	b(7)	DWR	Sluice gates, positive closure devices	This section has been revised to only list the appurtinent structures that are not allowed within the Levee Right of Way. Siphon breaker and positive closure device locations are specified.
Section 123 - Pipelines, Conduits, and Utility Lines	b(8)	DWR	Clearly marked? What is meant by “appropriate?”	This section has been revised to address this comment. See (b)(4).
Section 123 - Pipelines, Conduits, and Utility Lines	b(8)	DWR	Signs for every crossing should be available. Simple metal post with paddles to designate crossing (already seen paddles in some LMAs). We need to start thinking about using bar codes to scan codes to retrieve information. Water Control Board has implemented strict flow measurements of irrigation structures and I’ve seen some Irrigation Districts use bar codes to identify location for flow measurements on irrigation structures.	This section has been revised to address this comment. A requirement has been added that the Local Maintaining Agency may require information on the marker. That could include bar codes when such a system has been developed. See (b)(4).
Section 123 - Pipelines, Conduits, and Utility Lines	b(8)	DWR	Siphon breakers should not be considered acceptable markers. Siphon breakers contained in protective housing units flushed to the ground sometimes it make it difficult to find when conducting inspections.	This section has been revised to address this comment. See (b)(4).
Section 123 - Pipelines, Conduits, and Utility Lines	b(8)	DWR	Every levee crossing should have an encroachment identification tag/paddle marker. A marker should include permit information, date installed, owner and contact information for emergencies. Color coding will facilitate routine inspections.	This section has been revised to address this comment. A requirement has been added that the Local Maintaining Agency may require information on the marker. That could include color coding when such a system has been developed. See (d)(2) through (d)(4).
Section 123 - Pipelines, Conduits, and Utility Lines	b(10)	DWR	Is “equivalent” spelled out somewhere?	The word "equivalent" is included in various sections of the standards to allow the Board and applicants reasonable flexibility. And in this case it is appropriate considering that it is encased in concrete.
Section 123 - Pipelines, Conduits, and Utility Lines	b(13)	DWR	Shall? Even pipe lines that have a design life of 50 years?	This section has been revised, but the basis for the comment is not known -- so the language may still be unclear to the commenter.
Section 123 - Pipelines, Conduits, and Utility Lines	b(13)	DWR	Why 15 feet and not use levee right of way?	This section has been revised to address this comment, referring to Levee Right of Way. The definition of Levee Right of Way has significantly changed.
Section 123 - Pipelines, Conduits, and Utility Lines	b(13)	DWR	The original title 23 allowed low-voltage be installed within 10 ft of the levee toe. This change requires them to be installed beyond 15 ft from the levee toe. The criteria below is more strict then the low-voltage one. Suggest reconciling, and likely deleting the exception for low-voltage lines unless we make it less restrictive then “other conduits”.	This section has been revised to address this comment.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	b(14)	DWR	Does this include pipelines and utility lines?	This section has been revised to address this comment. See (b)(1).
Section 123 - Pipelines, Conduits, and Utility Lines	b(14)	KSN	May not be feasible for irrigation pump installations, on waterside of levee. There may be some parallel installations required	This section has been revised to address this comment. See (b)(1).
Section 123 - Pipelines, Conduits, and Utility Lines	b(15)	DWR	Recommend adding and must comply with Professional Engineers Act.	Requiring design by a California registered civil engineer is sufficient; it is not necessary to specify that the civil engineer must comply with the law.
Section 123 - Pipelines, Conduits, and Utility Lines	b(16)	DWR	Are all permits for pressurized pipelines from now on be on an expiration timeline. Will the CVFPB have a database that will warn staff to send a letter to encroachment owner indicating that their permit will be expiring within 6 month – 1 year. Who will be responsible for sending violations and enforcing the violators? What happens to all current pressurize crossings we have about 450 crossings that are gas lines? This new item will add a huge workload for tracking these crossings ….will need new staff to be hired to assist with the paperwork and tracking system that will be required	This section has been revised to require periodic inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which already have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines. See (b)(10).
Section 123 - Pipelines, Conduits, and Utility Lines	b(16)	DCC Eng.	Does this mean the permittee will have to reapply every IO years to renew their permit for a pipe running through the levee crown? This will put undue hardship on property owners and make unnecessary work for the agency unless there is a streamlined administerial process that makes re-application simple. In order to avoid pipe abandonment, which seems to be the intent, rather than requiring a permit, the levee the CVFPB or LMA should check in with the Permittee or require an inspection every 10 years to determine the pipe is still in use. Otherwise this section should be removed as it could be unnecessarily onerous. Re-permitting is already inherent in a pipeline system. Pipelines will deteriorate and will require replacement, at that point the property owner will apply for a new permit and the pipeline will be installed to the current requirements.	This section has been revised to require periodic inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which aleady have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines.
Section 123 - Pipelines, Conduits, and Utility Lines	b(16)	MBK	Permits for pressurized pipes shall have a 10 year end date – this seems excessive. Suggest 25 years to avoid unnecessary permit backlogs or 408 implications. Could also require mandatory administrative review every 10 years rather than “re-apply” for permit that would allow Board to verify continued conformance with current standards.	This section has been revised to require periodic inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which aleady have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	KSN	Annually? Possibly not cost effective for all	This section has been revised to require five (5) year inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which aleady have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	Even conduits and utility lines? It seems this rule would be more for crossings that carry liquids? Why would conduit (communication, fiber optics, and electrical) need annual inspections? What’s the annual threat with these conduits?	This section has been revised to require pressure testing for newly Permitted pressurized pipelines every five (5) years. All pipelines, conduits, and utility lines within the Levee Right of Way need to be inspected every five (5) years, due to potential for deterioration and damage of the pipe material and/or seepage along the pipeline if it crosses the Levee.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	Remove "in the"	The section has been revised to address the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	this is going to add a HUGE work load, who will handle all the paperwork, data management, enforcement, and coordination for this task. We have over 3000 crossings that go through the levee that were either found or indicators found that show crossing might still be present. What happened to video inspections every 5 years?	This section has been revised to require five (5) year inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which aleady have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	We need a new tracking system and how to enforce 100 % of existing crossings without current annual pressure test? We will need a group started at just looking at the pressure tests that will be coming in. Need more staff.	This section has been revised to require five (5) year inspection and testing instead of automatic expiration of the Permit. This standard and other standards apply to new Permits, not existing Permits which aleady have their own conditions established at the time of Permit issuance. The Board will need to enforce these requirements for newly Permitted pipelines.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	We need a strategic plan for addressing which pipes should be pressure tested first? age, pipe material, fluid being transferred….	Board Standards apply to new Permits. Existing Permitted pipelines have conditions on their Permits that the Permittee is required to follow. Overall management of the thousands of existing pipelines for condition and Permit compliance is a separate issue and not a part of the this update.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	Do we have standards for the pressure test? Test times and acceptable pressure drops per pipe size? Will inspector need to be present to confirm pressure test passed? Need staff training.	This section has been revised to provide general guidance on pressure testing. See (b)(10).
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	DWR	What happens to existing pipes?	Board Standards apply to new Permits. Existing Permitted pipelines have conditions on their Permits that the Permittee is required to follow. Overall management of the thousands of existing pipelines for condition and Permit compliance is a separate issue.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	MBK	shall be “annually” pressure tested seems very excessive. Also seems excessive. Current USACE and ULDC requirements are every 5 years. Suggest revising to be consistent with USACE and ULDC.	This section has been revised to require five (5) year inspection and testing instead of annual pressure testing.
Section 123 - Pipelines, Conduits, and Utility Lines	b(17)	USACE	The pressurized pipe should be pressure tested and the gravity flowing lines should be video inspected. Any other testing showing the conditions of the pipe may be accepted. The testing results should be kept on file by the Levee Maintenance Agency	This section has been revised to require pressure testing for newly Permitted pressurized pipelines every five (5) years. Gravity drains, pipelines, conduits, and utility lines within the Levee Right of Way need to be inspected every five (5) years, due to potential for deterioration and damage of the pipe material and/or seepage along the pipeline if it crosses the Levee. See (b)(10).
Section 123 - Pipelines, Conduits, and Utility Lines	b(19)	DWR	Does this include pipe rehabilitation….i believe some of the methods used to rehabilitate a pipe include using plastic liner to line the pipe…. Will this be allowed?	This section has been revised to include Permitting of liners within exsting pipelines, in 123(b)(16).
Section 123 - Pipelines, Conduits, and Utility Lines	b(19)	KSN	Even for conduit or other small pipe install? Common sense says that PVC will not corrode or short as metal conduit will.	This section has been revised to include other types of plastic pipe. The requirement for concrete encasement of plastic pipe follows USACE guidance.
Section 123 - Pipelines, Conduits, and Utility Lines	c(1)	USACE	The compaction requirement is not clear. I suggest to be consistent within the Title 23 and keep the ASTM D698 (or D 1557 throughout the document. It is not practical to use both ASTMs. Also, the moisture content above the optimum is not practical.	This appears to be a comment on Section 123 (c)(2) which has been revised to be consistent with requirements for compaction of fill material outside of the Levee Section as provided in Section 120.
Section 123 - Pipelines, Conduits, and Utility Lines	c(1)	KSN	Should not be required for exposed pipes on levee slope, no cover should be required, if that is what is envisioned…	The requirement for pipe cover on the waterward Levee slope is retained for consistency with USACE guidance for protection against debris loading during high water.
Section 123 - Pipelines, Conduits, and Utility Lines	c(1)	DWR	Recommend repeating the optimum moisture content requirement here.	This section has been revised to address the comment. See (c)(2).
Section 123 - Pipelines, Conduits, and Utility Lines	c(3)	DWR	This previously stated any utility installed outside of the levee right of way is okay. Current version references section 123(F). If a line is outside the levee right of way would pvc or any standard utility be allowed?	This section has been revised significantly. The Board standards do not have requirements for pipelines, conduits, or utility lines that remain entirely outside of the Floodway and the Levee Right of Way. Within the Floodway, in general any standard pipe material may be used. Special requirements apply at great distance from the Levee for pipes that are to be installed under the Levee by horizontal directional drilling (aka boring).
Section 123 - Pipelines, Conduits, and Utility Lines	c(3)	DWR	(g) not (f)?	This section has been revised to address the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	c(3)	DWR	Recommend clarifying when Levee Toe is “Projected”	This section has been revised to address the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	d(6)	USACE	“…shall be tested any time after construction upon request by the Board.” Suggest adding “, but no less often than every five (5) years.” To be consistent with USACE and ULDC standards.	This section has been revised to address the comment by clarifying that a test is required at the end of construction. There is a separate requirement for ongoing five (5) year testing.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	d(6)	DWR	So pressure pipes don't need to be pressure tested every year? Only when the Board requests? As it reads it seems that pressure pipelines will be treated different than drainage, irrigation, conduit, and other pipes. Pressure pipes will have permits expire every 10 years and they don't need to meet the annual pressure test requirement as other pipes do. Isn't there a national requirement for pressure pipelines that requires an owner to comply with every no. of years to show that pressurized gas lines are in good shape and that they meet public safety requirements?	This section has been revised to require pressure testing for newly Permitted pressurized pipelines every five (5) years. Gravity drains, pipelines, conduits, and utility lines within the Levee Right of Way need to be inspected every five (5) years, due to potential for deterioration and damage of the pipe material and/or seepage along the pipeline if it crosses the Levee. We are not aware of such national requirements for pressure lines.
Section 123 - Pipelines, Conduits, and Utility Lines	d(7)	DWR	Suggest specifying source: "with Section V of the OSHA Technical Manual."	This section has been revised to remove references to OSHA because the OSHA rules to protect worker safety may change over time and the Board's regulations would need to reference a specific dated OSHA rule. See (d)(11).
Section 123 - Pipelines, Conduits, and Utility Lines	d(8)	DWR	In which case…	This section has been revised to clarify requirements for concrete and CLSM encasement. See (d)(12).
Section 123 - Pipelines, Conduits, and Utility Lines	d(10)	DWR	In which case…	This section has been revised to remove the exception for CLSM. See (d)(14).
Section 123 - Pipelines, Conduits, and Utility Lines	d(11)	KSN	Again, pipes over the normal levee crest should not require positive closure	This section has been revised to address this comment.
Section 123 - Pipelines, Conduits, and Utility Lines	d(11)	USACE	Not all pressurized pipes need a siphon breaker. The pressurized gas line or other like that do not need a siphon breaker. Regarding the positive closures, these are needed to close the pipe in case of a pipe breach waterside of the levee that may let the water from the river penetrate in the pipe. In that case the positive closure will isolate the waterside of the levee and eventually sacrifice it and keep the crest and landside for protection. Based on EM 1110-2-1913, the pressurized pipes constructed above the levee freeboard may not need a positive closure. However, the SRFCP O&M manual requires positive closure devices unless it can be demonstrated that the devices are not necessary.	This section has been revised to address this comment, requiring a siphon breaker for pressurized pipelines open to the Stream.
Section 123 - Pipelines, Conduits, and Utility Lines	d(12)	DWR	After reading entire section, I'm not sure what is allowed. Previous title 23 said schedule 40 PVC is allowed, but it's been delete in section (g). Is PVC allowed if it's encased in concrete? For example, what is allowed below the DWSE for an Urban levee. Is only cast in place reinforced concrete with a minimum diameter of 6 inches allowed? Outside the levee right of way, what pipe is allowed?	This section has been revised to address this comment, clarifying that plastic pipe (including butt welded high density polyethylene) within the Levee Section or foundation must be encased in concrete, generally consistent with USACE guidance. Within the Levee Section below the DWSE, only gravity drains installed by the open cut method and pipes installed by tunneling, jacking, or boring are permissable. Gravity drains need to be reinforced concrete pipe.
Section 123 - Pipelines, Conduits, and Utility Lines	d(14)	KSN	Change to may…should not be an absolute requirement	This requirement is not changed. Restoration of damaged sod, grass, or non-woody ground cover is important for preventing Levee slope erosion.
Section 123 - Pipelines, Conduits, and Utility Lines	d(15) old	DWR	Good item not sure why it was erased. This year I saw a levee eroded significantly due to a leaky siphon breaker without protective housing. The leak cut into a county road.	This section has been revised in response to the comment to require protective housing for siphon breakers. See (d)(19).
Section 123 - Pipelines, Conduits, and Utility Lines	d(15)	DWR	in which case…	This section has been revised to clarify requirements for concrete and CLSM encasement. Section 4 has been revised to include a definition for CLSM.
Section 123 - Pipelines, Conduits, and Utility Lines	d(16)	Ray Costa	CLSM should also have a maximum hydraulic conductivity requirement (ie, no greater than 1x10e-6 cm/sec)	Article 2 (Section 4) has been revised to include a definition for CLSM in response to the comment, requiring a maximum hydraulic conductivity of 5x10-6 centimeters per second at 28 days.
Section 123 - Pipelines, Conduits, and Utility Lines	d(17)	USACE	The corps requires flexible coupling for the pipeline, not butt-welded to permit movements of the pipes with the earthen embankment. This is clearly indicated in the EM 1110-2-1913.	This section has been revised to include an exception for flexible bolted connections in (d)(16).
Section 123 - Pipelines, Conduits, and Utility Lines	d(17)	DWR	Suggest clarifying other acceptable "equivalent" welds	This section has been revised in response to the comment by removing "or equivalent."

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	e(1)	USACE	The conditions for a pipe to be installed below design water elevation are not related to the height of the levee or the water head on the levee. USACE EM allows only free drainage pipes to be installed below the design water surface elevation with the conditions that the pipe should have a flap gate at the outlet structure and a sluice gate or slide gate in a riser placed at the waterside edge of the levee crest for easy access during flood events. The subparagraphs (A) to (C) do not make sense. This regulation assumes that all levees are maintained in good condition and the other two subparagraphs are related to the design of the levee but have no impact on the pipe.	This section has been revised in response to the comment, consistent with USACE guidance. Maintenance capability is covered in EM 1110-2-1913 paragraph 8-2a.
Section 123 - Pipelines, Conduits, and Utility Lines	e(2)	USACE	The pipes may have any diameter. The 36" diameter is based on the fact that the pipes could be physically inspected and need to be large enough for someone to crawl in the pipe. Now, with modern inspection tools like video inspection, this is not more a need. In reality numerous pipes in the Central Valley have smaller diameter than 36".	This section has been revised in response to the comment to no longer specify a minimum pipe diameter.
Section 123 - Pipelines, Conduits, and Utility Lines	e(3)	USACE	Seepage along the pipe is controlled by the drainage layer at the 1/3 length of the pipe placed on the landsite and day lighted to the natural ground to provide proper drainage and not to accumulate water in the embankment.	This section has been revised to specify a drainage layer for the landside one third (1/3) of the pipe, consistent with USACE guidance, in 123(e)(3).
Section 123 - Pipelines, Conduits, and Utility Lines	f	DWR	Under levee foundation ?	This section has been revised in response to the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	f(1)	DWR	Section (f) is supposed to describe the conditions for installing a pipe under the levee using tunneling, jacking, or boring. However, this statement states tunneling, jacking or boring is not allowed thru the embankment. This statement may be less confusing if stated after all the conditions are listed, perhaps as: “Note: installation of ….”.	This section has been revised in response to the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)	DWR	Perhaps these requirements should be listed in a separate section. Section (f) is supposed to describe conditions for tunneling, jacking, or boring under a levee/channel	This section has been revised in response to the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(M)	DWR	This phrase has not been defined. Suggest replacing with “Levee Section” etc.	This section has been revised in response to the comment. See (f)(2)(K)(ix).
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(N)	DWR	Recommend clarifying locations of “portal” and “outlet” and clarify meaning of “containment cells”	This section has been revised in response to the comment. See (f)(2)(K)(vii).
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(O)	DWR	Recommend clarifying locations of “portal” and “outlet” and clarify meaning of “containment cells”	This section has been revised in response to the comment. See (f)(2)(K)(viii).
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(P)	DWR	This statement may be redundant. First sentence asserts closure devices required for all crossings. This sentence states closure devices required for water crossings? I.e. water pipes that cross the levee that are longer than 100 feet? Recommend removing or explaining.	This section was revised in response to the comment and clarification was provided that requirements for tunneling, jacking, and boring installations under a Stream or Levee are in addition to the requirements of 123(d). See introduction to (f).
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(Q)	DWR	Levee crown?	This section has been revised in response to the comment by removing this requirement which was redundant to 123(d)(6). Section 123(e)(2) outlines closure device requirements for gravity pipes.
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)(Q)	DWR	Closure devices should be described here, within the framework of pipe installation. Closure devices should also be described when detailing existing pipes. Suggest re-wording (P) and (Q) specifically for pipe installation. As stated presently, (P) and (Q) are definitive statements irrespective of pipe installation.	This section has been revised in response to the comment by removing this requirement which was redundant to 123(d)(6). Section 123(e)(2) outlines closure device requirements for gravity pipes.
Section 123 - Pipelines, Conduits, and Utility Lines	f(2)	USACE	Add a requirement that a pipe cannot penetrate an existing seepage cut-off wall . The pipes constructed by directional drilling need to be installed at least 5 feet bellow the cut-off wall tip elevations. For the pipes installed through the levee embankment (i.e. free drainage pipes or the levee freeboard) the cut-off wall may be excavated and removed up to 2 feet below the pipe invert elevation and replaced by an impervious core above the pipe. The core has to be constructed of impervious clay soil such as lean clay, sandy or silty clay.	This section has been revised in response to the comment.
Section 123 - Pipelines, Conduits, and Utility Lines	g(2)	DWR	Can cross?	This section has been revised to not allow use of CMP within a Levee, consistent with existing Board Standards.
Section 123 - Pipelines, Conduits, and Utility Lines	g(2)	DWR	Should clarify either in wording or by drawing the section of levee embankment referenced here.	This section has been revised to not allow use of CMP within a Levee, consistent with existing Board Standards.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 123 - Pipelines, Conduits, and Utility Lines	g(3)	DWR	Wouldn't this be left out if it's okay for urban and non-urban. Are cast-in place reinforced concrete pipes less than 3 inches thick ok in non-urban areas?	This section has been revised to not distinguish between urban and non-urban areas. Three (3) inches of pipe wall thickness may not be adequate cover for the reinforcing steel. See (g)(1).
Section 123 - Pipelines, Conduits, and Utility Lines	g(3)(4)	USACE	Add a requirement that all couplings of cast in place or precast concrete pipe should use rubber gasket to assure water tightness of the pipe.	This section has been revised in response to the comment, except that waterstops are required at joints of cast-in-place concrete pipe. See (g)(1).
Section 123 - Pipelines, Conduits, and Utility Lines	g(5)	DWR	Can steel pipes be installed below the DWSE?	Steel pipes normally need to be installed on the Levee crown, but there are some exceptions. If installed below the DWSE, it could only serve as a form for concrete placement for a cast-in-place reinforced concrete pipe.
Section 123 - Pipelines, Conduits, and Utility Lines	g(5)(B)	USACE	The USACE requires flexible couplings of the pipes not butt-welded pipes for the pipes crossing the levee embankment, including the levee freeboard. This is a big issue since the Corps will not accept butt-welded pipes in the levee except for natural gas lines.	This section has been revised in response to the comment, with provisions for flexible bolted connections in (d)(16).
Section 123 - Pipelines, Conduits, and Utility Lines	g(5)(C)	DWR	Coating inside and out?	This requirement is for protecting the exterior of the steel pipe. A separate requirement for protecting the interior of the steel pipe follows immediately.
Section 124 - Abandoned Pipelines and Conduits	a	DWR	Who is responsible?	The Permittee is responsible for meeting all Permit conditions, unless otherwise stated. Sometimes the Permittee has sold the land on which the pipeline exists and the new land owner would then have responsibility for meeting Permit conditions. If the pipeline is a project feature, then the Local Maintaining Agency will be responsible.
Section 124 - Abandoned Pipelines and Conduits	a(1)	KSN	What does "in general" mean? Used in a few other instances in document	This section has been revised in response to the comment by removing "In general." However, there are still some Board Standards that generally apply, with limited exceptions. The term "in general" may be used in those cases.
Section 124 - Abandoned Pipelines and Conduits	a(1)	DWR	What will happen to the legacy drainage structures that were installed in the 1950s that are no longer functional or meet current standards, we have about 300 crossings that could be classified as drainage.	This issue is addressed in Section 108 and is outside the scope of this update.
Section 124 - Abandoned Pipelines and Conduits	a(1)	DWR	Also what will happen to the pipelines that have been abandoned or no owner can be found? Who will be responsible for the economic cost of removing those pipes? Huge cost for LMAs. Economically it would be easier for LMAs, State LMAs to grout these pipes since it is very costly to remove pipes and cut into the levees and disturb soil. If pipes were allowed to be grouted (case by case basis) they must first meet certain requirements. Before even considering grouting a pipe we will need to determine whether pipe is a good candidate for grouting—need to determine if internal walls have no holes, pipe will need to be cleaned and inspected for leaks.	This issue is addressed in Section 108 and is outside the scope of this update.
Section 124 - Abandoned Pipelines and Conduits	a(1)	DWR	Also shouldn't an owner of a crossing who is planning on selling the property disclose that the pipeline through levee is part of the property. New owner will take ownership of the pipeline? Shouldn't this language be pushed at the county level and Title records to make sure authority is transferred over?	Section 123 has been revised to address this comment by requiring recording on the property deed in (b)(12).
Section 124 - Abandoned Pipelines and Conduits	a(2)	DWR	which shall be determined…"	This section has been revised in response to the comment.
Section 124 - Abandoned Pipelines and Conduits	a(2)	DWR	Section 123 (d)(7) ? This section describes side slopes for pipe installation. If trench slopes for installation are to also govern slopes for excavation, this should be clearly stated. May cause confusion otherwise	This section has been revised in response to the comment.
Section 124 - Abandoned Pipelines and Conduits	a(2)	DWR	Under what circumstances?	This section has been revised in response to the comment.
Section 124 - Abandoned Pipelines and Conduits	a(3)	DWR	Should we define when a levee section is "projected?"	Levee Section and Projected Levee Section are both defined terms in Section 4.
Section 124 - Abandoned Pipelines and Conduits	a(3)	DWR	Need clearer language	This section has been revised, but the basis for the comment is not known -- so the language may still be unclear to the commenter.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 124 - Abandoned Pipelines and Conduits	a(5)	DWR	Previously stated 97% (section 120a-12). Also gave both ASTM D698 and D1557, but here only give one. 90% for ASTM D698 seems low.Looking at the original Title 23, 90% was for ASTM D1557, which make sense. Change ASTM D698 to ASTM D1557 in this sentence.	This requirement applies to compaction of backfill in the Floodway, where less compactive effort is required as compared to a Levee. Compaction requirements are contained within Section 120(a), which is referenced in this standard.
Section 124 - Abandoned Pipelines and Conduits	a(5)	DWR	Backfill or back fill?	"Backfill" is the appropriate term.
Section 124 - Abandoned Pipelines and Conduits	(a)(5)	USACE	Try to use the same ASTM for compaction for consistency. I do not believe a contractor will use two different ASTM for a project.	Both ASTM compaction standards are used consistently throughout the Board Standards. Different contractors can have different preferences.
Section 124 - Abandoned Pipelines and Conduits	a(6)	DWR	Define the word abandoned, please clarify what makes a pipe abandoned?	Definitions are provided where a common dictionary definition is not adequate or available. New definitions should be avoided when the common definition is adequate. In this case the Webster's dictionary definition "to cease from maintaining" is adequate.
Section 124 - Abandoned Pipelines and Conduits	a(6)	DWR	Conflicts with section, removal of abandoned pipes. Item (6) is referring to abandoned pipes within waterside berm are okay if abandoned but IF exposed by bank erosion they will need to be removed.	Section 124(a)(1) refers to pipes in the Levee Right of Way. Section 124(a)(5) refers to within the Floodway. Section 124(a)(6) has been deleted.
Section 124 - Abandoned Pipelines and Conduits	b	DWR	Suggest “abandonment and grouting” rather than “abandonment/grouting”.	This section has been revised in response to the comment, using the term "filling."
Section 124 - Abandoned Pipelines and Conduits	b	DWR	Suggest a consistent term be used throughout for “grouting” regardless of the material used (cementations grout, flowable fill, CLSM). A USACE standard operating procedure uses “abandon and seal an existing pipe”.http://www.lrl.usace.army.mil/Portals/64/docs/Engineering/LSP/ALL_SOPs_2013-12-11.pdf I’m not sure there is a “standard” term used, but we could define it could be defined in the beginning, and that term used throughout the section.	This section has been revised in response to the comment, using the term "filling."
Section 124 - Abandoned Pipelines and Conduits	b(1)	DWR	“concrete” is used below, should it be included in this sentence?	This section has been revised in response to the comment.
Section 124 - Abandoned Pipelines and Conduits	b(1)	DWR	shall be ?	"May" seems to be more appropriate here than "shall" since this is a permissive action. Removal is the normal requirement.
Section 124 - Abandoned Pipelines and Conduits	b(1)	DWR	Agree with “may” be abandoned. Some pipes are too deep to expose and remove.	Noted
Section 124 - Abandoned Pipelines and Conduits	b(2)	DWR	CLSM is used in next few bullets. If concrete is used to abandon a pipe is 3-6 below still applicable?	After discussion with USACE, CLSM has been removed as a potential filling material and grout is the preferred filling material.
Section 124 - Abandoned Pipelines and Conduits	(b)(2)	DWR	The grouting (CLSM) should be installed under pressure to prevent air pockets.	This section has been revised. Pumping in an upslope direction is required to avoid air pockets. Pressure needs to be managed to avoid damage to the Levee.
Section 124 - Abandoned Pipelines and Conduits	b(2)(1)	DWR	If the term “grout” or “fill” or “seal” is used regardless of the material type, I would use that here. Why is just CLSM referenced here?	This section has been revised in response to the comment, using the term"filling." Concrete is no longer allowed.
Section 124 - Abandoned Pipelines and Conduits	b(2)(1)	DWR	Should this be 3 and bullets below continue?	This section has been revised in response to the comment, fixing the incorrect numbering.
Section 124 - Abandoned Pipelines and Conduits	b(6)	DWR	Is staged grouting acceptable? For penetrations along existing roads/highways, it would be much more difficult to remove and replace vs. grout in place. If it’s a non-public road, I concur the preference would be to remove and not grout in place pipes with less then 3 ft of cover.	Staged grouting is not precluded, but would be unusual. The detailed plan for grouting required by (b)(5) needs Board approval.
Section 124 - Abandoned Pipelines and Conduits	b(8)	DWR	For a typical pipe removal I wouldn’t plan to drill a boring. This will add significant cost and time to each pipe removal. If a pipe was inspected, and no voids in the pipe were found, I would plan to grout it with no additional work. In addition, if I was going to removal and backfill I would not drill it. Suggest deleting, or adding at the end stating the board may ask for additional information like borings, soils stratum, etc.	This section has been revised in response to the comment, removing the requirement for soil stratum information that may trigger the need for drilling.
Section 124 - Abandoned Pipelines and Conduits	b(8)	DWR	Don’t you want to confirm if you have a leaky pipe before you grout? Need to determine if pipe leaks and determine if internal erosion has occurred.	This section has been revised in response to the comment, requiring confirmation of pipe soundness before grouting in (b)(4).

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 125 - Retaining Walls	(a)	USACE	This section should clearly state that retaining walls (it's an encroachment) need to be permitted through the Board and USACE.	Adding such a statement would be inconsistent with every other section. Article 3 covers the need for a permit.
Section 125 - Retaining Walls	a(1)	DWR	I'm not sure this is feasible. It's not uncommon for transportation bridges to have some type of abutment wall or wing wall. Also, culverts may have walls as well.	This section has been revised in response to the comment, clarifying that retaining walls parallel to Levee are not allowed except as required at gravity drains. Retaining walls not parallel to the Levee may be allowed.
Section 125 - Retaining Walls	(a)(1)	USACE	Subparagraph (1) is contradictory with (2) and (3). This entire section may need more details. Add that all retaining walls higher than 2 feet should be designed by a PE and the design should be based on geotechnical analyses (slope stability and seepage)	This section has been revised in response to the comment.
Section 125 - Retaining Walls	a(3) old	DWR	Is there a reason this was removed? This would require the drainage behind a wall to be designed.	This was removed because landside Levee slope retaining walls (which would be parallel to the Levee) are no longer allowed, except at gravity drains.
Section 126 - Fences and Gates	(c)(1)	USACE	Agricultural equipment should not be permitted on the levee except for the purpose of maintaining the flood control project.	This comment is already addressed in Section 137(l).
Section 126 - Fences and Gates	(c)(7)	USACE	This is unclear. When are keys provided for access? Only at the time of inspection? Are keys sent to the Board and USACE for our use, as needed? Please clarify to give better direction.	This section has been revised in response to the comment, requiring keys when the locks are installed, in (c)(8).
Section 126 - Fences and Gates	(d)	USACE	This paragraph is confusing. Is it saying a fence may be required to limit future unauthorized encroachments? I'm not sure what the intent is here.	Correct. Sometimes the Levee work will result in development near the Levee that leads to unauthorized Encroachments by adjacent property owners, like putting steps in the Levee and unauthorized plantings. The Board may require installation of a fence in such cases to prevent the unauthorized Encroachments from occurring.
Section 127 - Boating Facilities	(a)(1)	USACE	change "may be performed" to "may be required"	This section has been revised in response to the comment.
Section 127 - Boating Facilities	(a)(2)	USACE	Driven piling cannot penetrate the levee prism or the projected levee prism. Only cast in place piling is accepted within the levee prism.	This section has been revised in response to the comment, requiring cast-in-place piling within the Levee Section and Projected Levee Section.
Section 127 - Boating Facilities	(a)(2)(A)	USACE	Driven piles can promote preferential seepage paths vertically along the piles similar to horizontal pipes through a levee embankment. This can have a negative impact on the levee by exacerbating underseepage. Piles which penetrate through the blanket layer shall be predrilled and encased in concrete, cast against the firm undisturbed earth.	This section has been revised in response to the comment, requiring cast-in-place piling where penetrating a waterside blanket.
Section 127 - Boating Facilities	(a)(2)(A)(ii)	USACE	in what instance would it be proven to be unreasonable. Why is this language added? Suggest removing "unless it can be shown that this standard is not reasonable"	This section has been revised in response to the comment, requiring the top of the piles to be two (2) feet above the Levee Crest Elevation to ensure the boat dock will not drift away even if the Levee is overtopped.
Section 127 - Boating Facilities	(h)	USACE	The crown or any area of the ROW should not be allowed to be used for storage of anything. Generally, maintenance and inspection are impeded when there are encroachments on the levee.	This section has been revised in response to the comment, disallowing storage in the Levee Right of Way. Some existing Permits may allow such storage.
Section 128 - Bridges	(a)	USACE	Somewhere in this paragraph it should be indicated that bridge piles and piers generally should not penetrate the levee embankment. Since this is not always possible, the piles and piers constructed in the levee embankment or in its ROW should be cast in place up to the bottom of the upper impermeable layer of the foundation and can be driven down from this elevation. Any cracks in the levee due to bridge construction should be excavated and the levee embankment repaired to its original grades. The backfill and excavation should respect the requirements of the paragraph on excavation.	This section has been revised in response to the comment.
Section 128 - Bridges	(a)(9)(A)	USACE	Recommend not giving up freeboard under a bridge just because a stream is "minor" There will be an inconsistent amount of freeboard along the levee caused by the bridge. Suggest saying "The required clearance from the bottom members (soffit) of a proposed bridge to the design water surface elevation should be at least as high as the freeboard of the levee at the location of the bridge."	This section has been revised in response to the comment, removing reference to minor streams. Limited exceptions for reduced freeboard are still provided on some unleveed non-project streams.
Section 128 - Bridges	(a)	USACE	Similar to addressing piles and piers through the levee and blanket layer, this section should address this issue to prevent degradation of the performance of the levee due to the installation of bridge peirs and piles through the levee embankment and blanket.	This section has been revised in response to the comment.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 129 - Water, Oil, and Gas Wells	General	MBK	Article 8, Section 129 – Wells could induce underseepage piping or otherwise affect stability - suggest adding requirement that "Any permeant wells installed within 100 feet of the levee toe shall be evaluated and stamped by a California Registered Engineer that it will not affect the integrity of the levee." Distance could be revised, but 100 feet seems reasonable.	This section has been revised in response to the comment, requiring confirmation by a California registered civil engineer that the well will not impact integrity of the Levee.
Section 130 - Patrol Roads and Access Ramps	c	USACE	Access ramps shall be constructed such that material is added to the levee. Access ramps which cut or reduce the levee cross section are not permitted. It is the responsibility of the LMA to maintain the access ramps to maintain access at all time, including during flood season.	This section has been revised in response to the comment, requiring no cutting into the Levee in (b)(3).
Section 130 - Patrol Roads and Access Ramps	b(2&3)	KSN	Needs review by EEA/CHN/BOR. Is this a resonable expectation?	This section has been revised in response to the comment.
Section 131 - Vegetation	Gen	USACE	This entire section should be revised to comply with ETL 1110-2-583, including the restriction on where vegetation can be placed with respect to the levee embankment, distance from levee toes, and vertical clearance above the levee prism and adjacent ROW. This ETL requires vegetation to be no closer than 15 feet from the levee toes or to the easement and not anywhere on the levee crown or slopes, all referred to in the ETL as the vegetation free zone. Also, this ETL requires a minimum vertical clearance of 8ft above the vegetation free zone.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	General	USFWS	We encourage the Board to only include native species in the list of suitable trees and ground covers and remove invasive non-natives from the lists. If Section 131 is read, it is made clear that other types of vegetation may be approved if they are determined to be similar to suitable species. However, our concern is that people will only look at the tables as a source of approved or disapproved vegetation. Our suggestion is to either add additional species to the table or to provide a footnote which reiterates (e) of Section 131. We are attaching a list of woody and herbaceous plants which have been used at Corps of Engineers Sacramento River Bank Protection Project over the last 8 or so years.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	General	USFWS	We also would recommend that you consider including herbaceous plants within the mix that could benefit pollinators, given their decline across the country and considering that many of the Central Valley levees run through agricultural areas. This could potentially benefit the nearby agricultural fields. See appendix A at the following website: http://www.xerces.org/wp-content/uploads/2015/02/NRCS_Specifications_California_CnsrvCvr_web.pdf	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	a(1)	USACE	The definition of an "oversized levee" is not exactly correct. Many levees were constructed with much larger cross sections than what is being described as a "Standard Size Levee". Using the definitions as they are stated will result in unintended consequences of encroachments in the "oversized levees" when they really were designed and should be treated as such.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	a(3)	DCC Eng.	The Standard Levee Slope needs to be consistent throughout the document. Is the standard 2h: lv landside or 3h:1v?	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	i	DWR	If it's within the Levee Right away shouldn't we state it should be kept clear?	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	i	USACE	vegetable gardens are encroachments which can impede inspection of the flood control project. When USACE performs inspections, the area to be inspected is 15 ft from the levee toes unless it is known that the ROW is different. Therefore, gardens should be kept outside the ROW or no closer than 15 ft from the levee toes.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 131 - Vegetation	j(2)	KSN	So we have to blow high volumes of water uphill from a long ways off and not expect to have erosion…? I believe there should be some allowance for irrigating , perhaps surface pipe, only, or temporary until established…something more logical than using a high pressure, high volume nozzle that would be required to irrigate 15 feet from the levee toe.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	j(3)	City of Sacto.	Article 8, Standards, Section 131, Vegetation, Para. (j)(3), state that ditches may not be dug in the Levee Right of Way, or within the Projected Levee Section for irrigation or drainage. Recommend that ditches also be required to comply with regulations for borrow/excavation, i.e. ditch shall not negatively impact the levee integrity.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	l	USACE	Suggest referencing the EM 1110-2-1913 to link those grubbing standards to these regulations.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	k	USACE	Permitting vegetation other than grasses within the vegetation free zone, as defined in ETL 1110-2-583, will require an application for a vegetation variance. This may entail the applicant to demonstrate through analysis that the levee integrity will not be compromised by the vegetation.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation		USACE	Remove non-native species from the list	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	Table 8.2	River Partners	We suggest consulting with resource agency and nonprofit biologists regarding additional native trees and shrubs that could be added to Table 8.2 to enhance habitat under the multi-benefit projct framework.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	Table 8.4	River Partners	The suitable ground cover species listed in Section 131, Table 8.4 lack many native grass and forb species that are recognized as low-growing species suitable for erosion control and ground cover establishment. We suggest adding native grasses and broadleaf forbs that will provide ground cover that may help prevent establishment of invasive species. Many native flowering species can also provide floral resources for pollinators, which may be benefit production on agricultural lands adjacent to existing flood control structures.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	Tables 8.2 -8.5	River Partners	Tables 8.2-8.5 in Section 131 are labeled as partial lists for reference; however, there is concern that partial lists limit Local Maintaining Agencies (LMAs), Reclamation Districts (RDs), and homeowners because they do not have the background to select appropriate species for a specific region. They will take the list at face value, and just select from the partial list. We recommend that there is language from the CVFPB that directs them to natural resources agencies for help.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	(f)(8)	River Partners	We suggest that revision of the suitable species list also include a reevaluation of the management requirements for the individual species. For example, the assumption that creeping wildrye requires maintenance on a regular basis is incorrect based on our 15- year experience using the species broadly across the Central Valley. Also, maintaining agencies may not understand how their management activities may be affecting the long term persistence of some ground cover species. Title 23, Article 8, Section 131(t)(8) states that sod, grasses, perennial flowers, and other non-woody ground covers are permitted on levee slopes and within ten (10) feet of the levee toe if the height does not exceed twelve (12) inches. The height of native grasses will surpass this standard and will trigger maintenance. However, planting a levee with native grasses and then mowing as seed is setting in the spring prevents the seeded grass native grasses from dropping seeds that actually further improve native grass cover. The Conservation Strategy contains specific language to this effect (see section 6-14) which should be reflected in updates to Title 23 regulations.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 131 - Vegetation	Gen	River Partners	In addition, and in conjunction with the updates we have just presented , we suggest that clarity is needed in terms of the criteria for determining suitability of plant species and the process by which decisions are made. Appendix D of the Conservation Strategy describes a framework under development by DWR for objectively determining situations in which woody species will pose unacceptable risks to levee integrity. The effort by DWR and the California Levee Vegetation Research Program should result in an assessment tool that could be incorporated into Title 23 Regulations as guidance for updating lists of suitable species (see Appendix D, section D-11)	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	General	River Partners	A related issue is the lack of a clear discussion in the Title 23 regulations on the important differences between riparian vegetation on levees versus riparian vegetation on broad floodplains. We suggest that, as reflected throughout the Conservation Strategy, development and application of suitability criteria for floodplain vegetation requires a different lens compared to levees. We suggest that the stringent criteria for levee vegetation suitability should not be applied equally to floodplain vegetation suitability, and that doing so will impedethe implementation of the multi-benefit water projects.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	General	River Partners	The emphasis throughout the existing Title 23 regulations is on maintenance of suitable vegetation on levees; however, no mention is made that native riparian vegetation also has the potential to reduce maintenance costs as recognized in the Conservation Strategy. Section 131 (k) attempts to provide language on a number of factors in which native vegetation may be permitted. We ask that the CVFPB also considers the following elements when reviewing and permitting proposed projects.	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 131 - Vegetation	I	Ray Costa	Have spec same as in previous sections of document	Section 131 is not being updated at this time due to ongoing work on this topic and the potential for changes to vegetation policy.
Section 132 - Bicycle Trails	b(13)	DWR	Recommend deleting this. Typically sign posts will placed in a 2 to 3 feet hole and filled with concrete.	This section has been revised in response to the comment, requiring concrete encasement of the post if deeper than twelve (12) inches.
Section 133 - Supplemental Stds. For Residential Encr. In RD 1000	Gen	USACE	No where in this section does it mention that structures, fences, fill etc will only be allowed if anayses demonstrate no negative impact to the design water surface elevation or flood conveyance capacity of the federal project. USACE will not approve a 408 in this area unless no negative effect can be proven. It is important to make this clear to applicants.	This section has been revised in response to the comment, requiring a hydraulic impact analysis pursuant to the One (1) Percent Blockage Criterion (defined in Section 4), consistent with direction provided by USACE.
Section 133 - Supplemental Stds. For Residential Encr. In RD 1001	Gen	USACE	Has the CVFPB re-validated it's hydraulic modeling within this area to ensure that these standards remain valid and do not negatively impact water surface elevations?	The hydraulic modeling allegedly performed decades ago was not found in a search of Board files. This modeling supposedly was the basis for the one hundred fifty (150) feet maximum distance allowance in Section 133. Until such time as the study is found and considered valid, or a new study is performed, this section has been revised in response to the comment, requiring a hydraulic impact analysis pursuant to the One (1) Percent Blockage Criterion (defined in Section 4), consistent with direction provided by USACE.
Section 133 - Supplemental Stds. For Residential Encr. In RD 1002	Gen	USACE	Remove any mention of permitting a new dwelling or modifications to an existing dwelling waterward of a levee regardless of the finished floor elevation.	This section has not been revised in response to the comment to disallow new Dwellings in Floodways. There is no federal prohibition against allowing new Dwellings in Floodways, if properly elevated. But many floodplain managers would consider this to be poor practice. This is an important policy to consider before finalizing the regulations.

ARTICLE 8 - Standards	Sub-section	Stakeholder	Stakeholder Comment	Response to Comment
Section 134 - Supp. Stds. For Yuba River - Daguerre Pt. Dam to Conf. Feather River	Gen	USACE	Some of the Title 23 requirements are related to the design water surface elevation that is the local water surface elevation such as 55/57 profile, 100 year flood, or less. However, the DWR ULDC criteria require all urban levees to be designed for minimum 200 year protection. Therefore these features may be below the new design water surface elevation if the levees are used for urban area certification. I suggest a paragraph at the beginning indicating the CVFPB may require higher flood events than the design flood, otherwise all these levees may be not possible to be certified for urban levees due to all these features contradicting the ULDC requirements (there are requirements regarding encroachments, utility penetration, bridge crossings and others).	The definition for "Design Water Surface Elevation" has been revised to include consideration of the two hundred (200) year flood in urban areas. However, Dwellings on the waterside of the Levee may or may not be considered to be within the urban area protected by the Levee. This is a determination made by the city or county.
Section 134 - Supp. Stds. For Yuba River - Daguerre Pt. Dam to Conf. Feather River	A8- S113, S133, S134, S135	USACE	Remove any mention of permitting a new dwelling or modifications to an existing dwelling waterward of a levee regardless of the finished floor elevation.	This section has not been revised in response to the comment to disallow new Dwellings in Floodways. There is no federal prohibition against allowing new Dwellings in Floodways, if properly elevated. But many floodplain managers would consider this to be poor practice. This is an important policy to consider before finalizing the regulations.
Section 135 - Suppplemental Standards for Butte Basin	A8- S113, S133, S134, S135	USACE	Remove any mention of permitting a new dwelling or modifications to an existing dwelling waterward of a levee regardless of the finished floor elevation.	This section has not been revised in response to the comment to disallow new Dwellings in Floodways. There is no federal prohibition against allowing new Dwellings in Floodways, if properly elevated. But many floodplain managers would consider this to be poor practice. This is an important policy to consider before finalizing the regulations.
Section 137 - Miscellaneous Encroachments	a	KSN	Specify permanent installations. Agriculture often uses portable tanks for temporary uses	This section has been revised in response to the comment, requiring that tanks shall not be installed.
Section 137 - Miscellaneous Encroachments	e	DWR	Not sure this is needed. Comment throughout.	This section has not been revised in response to the comment, in case this requirement is ever needed.

Definitions are provided herein for uses of word and phrases different from that found in common dictionaries. The definitions herein include the plural in addition to the singular.

(a) "Access Ramps" mean those ramps that provide access to the Levee crown from adjacent property and roads.

(b) ~~Adopted Plan of Flood Control.~~ "Adopted Plan of Flood Control" means a flood control or reclamation strategy for a specific area that has been enacted by the Legislature or adopted by the ~~board or the Legislature~~Board and includes the following:

(1) In the case of ~~project~~ State Plan of Flood Control (SPFC) flood channels without ~~levees~~Levees, it means the natural ~~stream~~Stream channel and overbank area at ~~design flood~~Design Flood levels;

(2) In the case of ~~project~~SPFC channels with ~~levees~~Levees, it means the area between and including the ~~project levees~~Levees, and includes:

(A) The Levee Right of Way;

(B) Additional area outside of the ~~project levees~~Levees where ~~encroachments~~Encroachments could affect the integrity, functioning or maintenance of the ~~works~~ SPFC Facilities (generally ~~ten [10]~~ twenty (20) feet landward of the ~~levee toe~~landside Levee Toe);

(~~B~~C) Any flowage areas that are part of the ~~federal or state flood control project~~SPFC; and

(~~C~~D) Areas where there are ~~flowage easements; and~~real property rights for the purpose of operation and maintenance of the Levee and any associated Sacramento-San Joaquin Drainage District (SSJDD) Easements or Flowage Easements;

(3) In the case of ~~designated floodways~~Designated Floodways, it means the area between the ~~encroachment lines. For purposes of this section, boundary lines~~Floodway Encroachment Lines;

(4) The Regulated Streams listed in Section 112 Table 8.1 of this Division;

(5) In the case of Regulated Streams that are neither a SPFC channel nor a Designated Floodway, it means the area within the identified county(s) and associated limits listed in Table 8.1 and ~~encroachment lines are interchangeable terms.~~between a line thirty (30) feet landward of the top of the left bank and a line thirty (30) feet landward of the top of the right bank.~~;~~

~~(4)~~ (6) In the case of a non-SPFC Levee outside of a Designated Floodway, it means the extent of the non-SPFC Levee that has bearing upon an SPFC Levee should the non-SPFC Levee fail and allow flood water to rise against the landside slope of the SPFC Levee and the area within the Levee Right of Way;

(7) Where ~~levees~~SPFC Levees are involved, the ~~"~~"Adopted Plan of Flood Control"~~"~~ means the area within the Levee Right of Way;~~extends at least ten (10) feet landward from the levee toe except where an operation and maintenance manual furnished pursuant to 33 C.F.R. 208.10 or the real property rights acquired by the board specifically provide otherwise.;~~

~~(b) Berm. "Berm" means the strip of ground between the waterward levee toe and the top of the bank of the low water channel.~~

(8) The Levees, channels, facilities, and right of way of the Lower San Joaquin River Flood Control Project;

(9) The regulations of this Division; and

(10) The Central Valley Flood Protection Plan as most recently adopted by the Board.

(c) "Approved Soils Testing Laboratory" means a testing laboratory validated by the U.S. Army Corps of Engineers, meeting the criteria detailed in ASTM D3740 Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering

Design and Construction and ASTM E329 Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction, or equivalent.

(dc) ~~Board.~~ "Board" means ~~The~~the Central Valley Flood Protection Board (formerly the Reclamation Board) of ~~the~~The Natural Resources Agency of the State of California as provided in Water Code ~~section~~Section 8521.

(ed) ~~CEQA.~~"Board Standards" means all sections within Article 8 of this Division.

(f) "Borrow" means any excavation for generation of earthen material.

(g) "Building" means a structure with walls and a roof used for any purpose other than for Human Habitation constructed within a Floodway.

(h) "CEQA" means the California Environmental Quality Act, ~~beginning at~~ Division 13 of the Public Resources Code ~~section~~, beginning at Section 21000.

(~~e~~) i) "Chief Engineer~~. "Chief engineer~~" means the ~~person appointed~~Person appointed by the ~~board~~Board pursuant to Water Code ~~section 8581~~Section 8580 for that purpose.

~~(f)~~ (j) "Conforming Existing Encroachment~~. "Conforming existing encroachment~~" means an existing Encroachment~~facility or use~~ that is consistent with ~~these~~the regulations of this Division and that was in existence prior to the Adopted Plan of Flood Control being enacted by the Legislature or adopted by the Board.

~~(g)~~ (k) "Controlled Low Strength Material (CLSM)" means a flowable fill comprised of Portland Cement, fine aggregates, fly ash, admixtures, and water, designed to be placed or poured into a self-leveling, self-compacting, low strength, cementitious material. CLSM shall have a minimum unit weight of between 90 and 110 pounds per cubic foot, a 28-day unconfined compressive strength between 30 and 200 pounds per square inch (psi), and a maximum hydraulic conductivity of $5x10^{-6}$ centimeters per second at 28 days.

(l) "Crest Elevation~~. "Crest~~ " means the elevation~~" means the elevation~~ of the top of ~~a levee, dike, or dam~~the Levee.

~~(h)~~ (m) "Delta" means the area of the Sacramento-San Joaquin Delta as defined in Section 12220 of the Water Code and the Suisun Marsh, as defined in section 29101 of the Public Resources Code.

(n) "Department~~. "~~" means the Department~~" means the Department~~ of Water Resources of The Natural Resources Agency of the State of California as provided in Water Code ~~section~~Section 120.

(~~i)~~ o) "Designated Floodway~~. "Designated floodway""~~", pursuant to Water Code Section 8609, means either:

(1) ~~the~~The channel of the ~~stream~~Stream and ~~that~~the portion of the adjoining floodplain reasonably required to provide ~~for~~ the passage of ~~a design flood~~the Board adopted Design Flood, as indicated by ~~floodway encroachment lines~~Floodway Encroachment Lines on ~~an~~the Board adopted map; or

(2) ~~the~~The Floodway between existing ~~levees~~Levees as adopted by the ~~board~~Board or the Legislature~~.(j)~~ .

(p) "Design Flood~~. "Design flood~~" means the flood flow or event which the flood control facility or Project Works is designed to convey, or the flood ~~against which protection is provided or may eventually be provided by means of flood protection or control works, or that flood~~ flow or event which the ~~board~~Board otherwise determines to be compatible with future developments.

~~(k)~~

(q) "Design ~~Flood Plane. "Design flood plane~~Water Surface Elevation" means the highest of the following water surface elevations:

(1) The water surface elevation at Design Flood flow as determined by the ~~Army Corps of Engineers,~~USACE or the Board~~, or~~;
(2) The water surface elevation recognized by the Board based upon best available information;
(3) The water surface elevation corresponding to the 100-year flood as determined by the Federal Emergency Management Agency~~, or~~ outside of Urban Criteria Areas; or ~~other higher elevations based upon best available information, as determined by the board~~
(4) The water surface elevation corresponding to the 200-year flood in Urban Criteria Areas, following the Urban Levee Design Criteria.

(r) "Dwelling" means a permanent structure used, intended to be used, or suitable to be used for full or part-time Human Habitation.

(s) "EM 1110-2-1913" means USACE Engineering and Design Manual No. 1110-2-1913 dated April 30, 2000 titled "Design and Construction of Levees". This manual superseded EM 1110-2-1913 dated March 31, 1978.

(t) "EM 1110-2-2902" means USACE Engineering Manual No. 1110-2-2902 dated March 31, 1998 titled "Engineering and Design, Conduits, Culverts and Pipes".

(u) "Embankment Material" means soil with one hundred (100) percent passing the two (2) inch sieve and at least twenty (20) percent passing the No. 200 sieve with a plasticity index between eight (8) and forty (40), a liquid limit of forty five (45) or less, saturated unit weight of at least one hundred and twelve (112) pounds per cubic foot (pcf), no visible concentration of organic content, and without unsatisfactory materials, such as trash, etc. .

~~(l) Dwelling. "Dwelling~~(v) "Encroachment" means installation or placement by whatever means for any purpose, of any Building, Dwelling, structure, bridge, tower, pole, pipe, culvert, fence, projection, object, Obstruction, vegetation and landscaping (planting or removal), embankment, excavation, fill or debris, of any kind or character that is placed in, on, over, under, through, or adjacent to areas covered by an Adopted Plan of Flood Control, and other activities that in the judgment of the Board, may constitute a risk to public safety, or may impact or impede the operations, maintenance, physical integrity, or flood carrying capacity, of any of the following an Adopted Plan of Flood Control.

(w) "Endorsement" means conceptual plan approval, support, or no objection by a Local Maintaining Agency of an application for a Board Permit which may include maintenance based conditions.

(x) "ETL 1110-2-569" means USACE Technical Letter No. 1110-2-569 dated May 1, 2005 titled "Design Guidance for Levee Underseepage"

(y) "Executive Officer" means the Person appointed by the Board pursuant to Water Code Section 8580 for that purpose.

(z) "Floodway" means the area of a river, creek, canal, channel, bypass, or other watercourse and the adjacent land areas that convey flood waters.

(aa) "Floodway Encroachment Lines" means the exterior limits of any Designated Floodway adopted by the Board.

(bb) "Flood Season" means a specific non-permissible work period when work in the Floodways or when cutting into Levee(s) of Regulated Streams within an Adopted Plan of Flood Control is not allowed without written approval from the Chief Engineer or the Executive Officer. This period typically begins on November 1 and, depending on location, ends on either April 15 or July 15. An exception would be the Merced Stream Groups Project which has a Flood Season that ends on May 1. Section 112, Table 8.1 lists the Regulated Streams and their non-permissible work periods.

(cc) "Flowage Easement" means the right to use another's land to overflow, flood and submerge the lands affected; reserving however, to the fee owner of the lands all such rights and privileges as may be used and enjoyed without interfering with or abridging the rights granted in the Flowage Easement.
(dd) "Freeboard" means the vertical distance between the Crest Elevation and the Design Water Surface Elevation, and serves as a factor of safety for containing water in the Stream without overtopping the Levee.
(ee) "Human Habitation" means an improvement of real property used, or intended to be used, ~~or suitable to be used~~ for residential purposes, including~~,~~ but not limited to~~,~~ living, sleeping, cooking, or eating.
~~(m) Encroachment. "Encroachment" means any obstruction or physical intrusion by construction of works or devices, planting or removal of vegetation, or by whatever means for any purpose, into any of the following:~~
~~(1) any flood control project works;~~
~~(2) the waterway area of the project;~~
~~(3) the area covered by an adopted plan of flood control; or (4) any area outside the above limits, if the encroachment could affect any of the above.(n) Floodway. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that convey flood waters.~~
~~(o) Floodway Encroachment Lines. "Floodway encroachment lines" means the exterior limits of any designated floodway.~~
~~(p) Executive Officer. "Executive Officer" means the person appointed by the Board pursuant to Water Code Section 8581 for that purpose.~~
~~(q) Impervious Material. "Impervious material" means soil which has twenty (20) percent or more of its particles passing the No. 200 sieve, a plasticity index of eight (8) or more, and a liquid limit of less than fifty percent (50%).~~
~~(r) Lawful existing encroachment. "Lawful existing encroachment", as used in Water Code section 8709.4(a), shall mean an encroachment for which the board has previously issued a valid permit or otherwise authorized by written instrument approved by the board.~~
~~(s) Levee Section. "Levee section" means the physical levee structure from the landward toe to the waterward toe.~~
~~(t) Levee Toe. "Levee toe~~(ff) "Hydraulic Top of Levee" means the water surface elevation as defined in the Department's Urban Levee Design Criteria.
(gg) "Levee" means a human-made structure, usually an earthen embankment, constructed to contain, control, or divert the flow of water so as to reduce risk from flooding. A Levee may include a floodwall or may be comprised entirely of a floodwall. In general, the Board Standards apply to Levees that are earthen embankments. But some Board Standards may apply to floodwalls, as deemed appropriate by the Board. This definition applies to SPFC and non-SPFC Levees.
(hh) "Levee Right of Way" means the Levee Section and appurtenant Levee features (such as a Seepage Berm, Stability Berm, relief well, or Revetment), plus land parallel to the Levee twenty (20) feet in width landward from the landside Levee Toe and appurtenant Levee features, plus land parallel to the Levee fifteen (15) feet in width waterward from the waterside Levee Toe and appurtenant Levee features, except where a USACE operation and maintenance manual or as-built drawing furnished pursuant to Title 33 Code of Federal Regulations Section 208.10 or Title 33 United States Code Section 408, or real property rights acquired for Levee operation and maintenance provides additional width. Consistent with the Urban Levee Design Criteria, in Urban

Criteria Areas the land parallel to the Levee may be reduced by the Board to ten (10) feet landward of the landside Levee Toe if currently there is development within twenty (20) feet of the landside Levee Toe and acquiring real property rights for a landside zone twenty (20) feet wide would present a major challenge; in such cases the Board may allow Encroachments within the twenty (20) feet wide landside zone if they do not impede visual inspection of the ground surface. -This definition applies to SPFC Levees and non-SPFC Levees.

(ii) "Levee Section" means the physical Levee structure from the landside Levee Toe to the waterside Levee Toe, and typically a 20-foot wide crown, or a 12-foot wide crown for Minor Tributary Levees, and 2h:1v or flatter landside slope and 3h:1v or flatter waterside slope, such as with some bypass Levees, except where a USACE operation and maintenance manual or as-built drawing furnished pursuant to Title 33 Code of Federal Regulations Section 208.10 or Title 33 United States Code Section 408 documents otherwise. In the case of a Levee significantly wider than the Levee Section of a typical Levee, or the width specified in a USACE operation and maintenance manual or as-built drawing, "Levee Section" means the typical Levee width, or width specified in a USACE operation and maintenance manual or as-built drawing, that falls within the wider physical Levee – by matching the Levee centerlines if the locations of both the physical Levee centerline and the specified Levee centerline are known, or matching the waterside Levee crown shoulders if the locations of both centerlines are not known. This definition applies to SPFC and non-SPFC Levees.

This definition applies to SPFC and non-SPFC Levees.

(jj) "Levee Toe" means the point of intersection of the ~~levee~~Levee slope with the natural ground elevation as shown on the USACE as-constructed drawings for the project or best available information.

~~(u) Low-Flow~~(kk) "Local Maintaining Agency" means a local or State agency responsible for operation and maintenance of Levees and other flood control works, such as a reclamation district, Levee district, flood control district, drainage district, the State, county, or city.

(ll) "Low Water Channel~~. "Low-flow channel~~" means the flowage area within a natural channel below ~~top~~Top of ~~bank~~Bank.

~~(v)~~ (mm) "Low Water Crossing" is a structure designed to serve as a bridge when water flow is low. Under high flow conditions, water floods the roadway or deck of the crossing and precludes traffic.

(nn) "Maintenance Activities~~. "Maintenance activities~~" means any work required to retain or maintain the maximum benefits~~intended functions~~ of flood control facilities and of existing ~~encroachments.~~Permitted Encroachments. Maintenance ~~activities~~Activities include but are not limited to control of Encroachments (with or without a Permit), control of unauthorized vehicular access, vegetation management, ~~mowing, tree and brush trimming and removal, revetment~~dredging, erosion control~~ restoration~~, rodent control~~, spraying~~, painting, coating, patching~~, burning~~, and similar ~~works~~activities; but ~~does~~do not include any significant excavation ~~or any excavation~~into the Levee Section during ~~flood season.~~Flood Season without prior written approval from Board staff. Maintenance activities of public agencies consistent with the operation and maintenance manual ~~to maintain the designated level of function of~~or flood control facilities within their jurisdiction~~.~~ generally do not require a Board Permit and are authorized and defined by Water Code sections 8361, 8370 and 12642.~~.~~

(~~w) Mobile Home.~~oo) "Minor Tributary Levee" means a Levee constructed with a crown width of twelve (12) feet in accordance with a USACE operation and maintenance manual or as-built

drawing furnished pursuant to Title 33 Code of Federal Regulations Section 208.10 or Title 33 United States Code Section 408.

(pp) "Mobile ~~H~~home" means ~~a structure transportable in one or more sections and includes any~~both a Mobilehome as defined in Section 18008 Chapter 1, Division 3 of the California Health and Safety Code and a manufactured home~~, but~~ as defined in Section 18007 Chapter 1, Division 3 of the California Health and Safety Code, and does not include a ~~recreational vehicle.~~Recreational Vehicle.

(~~x~~)qq) "Nonconforming Existing Encroachment~~. "Nonconforming existing encroachment~~" means an existing ~~facility~~Encroachment ~~or use~~ that is inconsistent with ~~these regulations.(y) Nonproject Works. "Nonproject works~~ the regulations of this Division.

(rr) "Non-SPFC Facilities" means the entirety or any component of a flood control project within ~~the board's jurisdiction~~areas covered by Adopted Plans of Flood Control that ~~is neither project works nor designated floodways.(z) Obstruction.~~are not State Plan of Flood Control Facilities (SPFC Facilities).

(ss) "Obstruction" means any natural or artificial structure or matter which:

(1) ~~may~~May impede, retard, or change the direction of the flow of water, either in itself or by catching or collecting debris carried by the water; ~~or~~

(2) ~~that is~~Is placed where the flow of water could carry it downstream to the damage or detriment of either life or property~~.~~;

(3) May impede the mode of operation and/or maintenance;

(4) May restrict or significantly delay execution of Board orders or other required actions; or

(5) May adversely affect flood fighting.

~~(aa) Parties. "Parties" means permit applicants, the board, protestants, and interested public agencies.~~

~~(bb) Permit. "Permit" means the approval issued by the board that approves a plan of work, with or without conditions, that results in an encroachment.~~

~~(cc) Permitted Uses. "Permitted uses" means flood control project works~~(tt) "One (1) Percent Blockage Criterion" means an Encroachment, when considered cumulatively with other Encroachments, that blocks less than one (1) percent of the cross sectional area of a Stream will typically not require a hydraulic analysis to determine the Encroachment's impact on Stream stage during design flow; otherwise a hydraulic analysis will normally be required to evaluate the significance of the hydraulic impact. A calculation of blockage should be provided by dividing the blockage area of the Encroachment by the total cross-sectional area of the Floodway conveyance up to the Design Water Surface Elevation. The blockage calculation should be done at the flow cross section within the applicant's proposed Encroachment area where the calculated blockage percentage is the greatest, considering all other existing and authorized Encroachments at the location so as to evaluate the cumulative impact of the Encroachments. If the blockage calculation indicates a Floodway conveyance blockage of less than one (1) percent at the design discharge, typically no additional analysis is required. If the blockage calculation indicates a Floodway conveyance blockage of more than one (1) percent, a hydraulic impact study employing a one (1) dimensional model will normally be required to determine the hydraulic impact of the Encroachment along with all other existing and authorized Encroachments. In some cases, a two (2) dimensional model may be required.

(uu) "Parties" means Permit applicants, the Board, protestants, and interested public agencies.

(vv) "Patrol Road" means a road that provides vehicular access along a Levee crowns and flood channels for inspection, maintenance, and flood fighting. Patrol Roads include landside Levee Toe roadways.
(ww) "Permit" means the Board's written authorization that approves Proposed Work, with or without conditions, resulting in Encroachments, flood control facilities, projects, alterations, improvements, or changes in land uses including environmental stewardship projects occurring in areas covered by Adopted Plans of Flood Control. A Permit may include time limitations. A Permit may be revoked by the Board and a Permitted Encroachment can only be modified or transferred with the written approval of the Board or the Executive Officer. A modified Permit may contain new conditions consistent with the Board Standards. A Permit may be modified by the Board if the authorized project has not commenced within one (1) year of Permit issuance.
(xx) "Permitted Work" means Encroachments, flood control projects and alterations or improvements thereto, or other structures, improvements, ~~and~~or land uses in ~~the floodway~~ an Adopted Plan of Flood Control that alone or cumulatively, in the judgment of the ~~board,~~Board, are in compliance with this Division (unless a variance is authorized by the Board) and will not unduly impede the free flow of water in a ~~stream~~Stream or jeopardize public safety, and which are approved by the Board through issuance of a Board Permit.

~~(ee)~~ (yy) "Permittee" means any Person who has been issued a Permit from the Board.
(zz) "Person" means a person, entity, partnership, firm, corporation, association, organization, or agency.
(aaa) "Projected Levee Section~~. "Projected levee section~~" means the projection of the ~~levee~~Levee slope below natural ground ~~at two (2) feet horizontal to one (1) foot vertical (2:1)~~with 2h:1v landside ~~and three (3) feet horizontal to one (1) foot vertical (3:1)~~ slope and 3h:1v waterside~~.~~ slope, except where a USACE operation and maintenance manual or as-built drawing furnished pursuant to Title 33 Code of Federal Regulations Section 208.10 or Title 33 United States Code Section 408 documents otherwise.
(bbb~~dd~~) ~~Project Works.~~ "Project W~~w~~orks" means the entirety or any component of a flood control project within the area of the B~~b~~oard's jurisdiction that has been approved or adopted by the B~~b~~oard or the Legislature, including state or federally constructed Levees, bank protection, weirs, pumping plants, and any other related flood control works, or rights–of–way.
~~(ff)~~ (ccc) "Proposed Work" means activities within the Board's jurisdiction which require a Board Permit including Encroachments, flood control or environmental stewardship projects, flood system alterations, land use activities, or other proposals within the jurisdiction or authority of the Board. Proposed Work, once issued a Board Permit, becomes "Permitted Work".
(ddd) "Recreational Vehicle~~. "Recreational vehicle~~" means Recreational Vehicle as defined in Section 18010 Chapter 1, Division 3 of the California Health and Safety Code.~~any travel trailer, camp car, motor home, tent trailer, or other similar vehicle, with or without power, which is designed or used for human habitation and which may be moved upon a public highway, but does not include a mobile home.~~
(~~gg) Respondent.~~eee) "Regulated Streams" means the Streams listed in Section 112, Table 8.1 of this Division.
(fff) "Respondent" means the ~~person~~Person named in an enforcement proceeding notice served and filed pursuant to Sections 20, 21, and 22 of this ~~title~~Division.
~~(hh) Revetment.~~(ggg) "Revetment" means a layer or layers of material, such as stone or concrete, to prevent soil erosion.

(~~ii)~~hhh) "River Mile~~. "River mile~~" means the ~~mile~~numbered miles along ~~the~~a river channel ~~indicated on a quadrangle map published~~as determined by the ~~United States Geological Survey~~Sacramento and San Joaquin River Basins Comprehensive Study or as otherwise indicated on a map adopted by the ~~board~~Board.

~~(jj) State Plan of Flood Control. "State Plan of Flood Control" shall have~~(iii) "Sacramento-San Joaquin Valley" means lands in the bed or along or near the ~~same meaning~~banks of the Sacramento River or San Joaquin River, or their tributaries or connected therewith, or upon any land adjacent thereto, or within the overflow basins thereof, or upon land susceptible to overflow therefrom. The Sacramento-San Joaquin Valley does not include lands lying within the Tulare Lake Basin, including the Kings River.

(jjj) "Seasonal Occupancy" means to occupy or reside in a Dwelling only outside of the Flood Season as defined in Section 112, Table 8.1 of this Division.

(kkk) "Secondary Levee" means a Levee within the Floodway of an Adopted Plan of Flood Control that provides flood protection for property within the Floodway and does not provide flood protection for property outside of the Adopted Plan of Flood Control.

(lll) "Seepage Berm" means the earthen feature constructed at the landside Levee Toe which primarily serves to control underseepage.

(mmm) "Significant Damage" means damage or destruction by any cause, to the cumulative extent of more than fifty (50) percent of market value, as calculated with a generally accepted method approved by the Board.

(nnn) "SPFC Levee" as defined in ~~subdivisions (e) and (j~~subdivision (g) of section 5096.805 of the Public Resources Code, ~~including the state~~means a Levee that is part of the facilities of the State Plan of Flood Control, and such Levees are considered Project Works. Prior to Board adoption of the Department's Central Valley Flood Protection Plan in 2012, SPFC Levees were commonly referred to as "Project Levees", "Federal Project Levees", or "Project Works".

(ooo) "Spur Levee" means a Levee that protrudes into the Floodway for the purpose of directing the flow of floodwater. Spur Levees are also sometimes referred to as training Levees.

(ppp) "Stability Berm" means the earthen feature constructed at the landside Levee Toe to enhance landside slope stability.

(qqq) "State Plan of Flood Control" or "SPFC" as defined in subdivision (j) of Section 5096.805 of the Public Resources Code, means the State and federal flood control works, lands, programs, plans, conditions, and mode of maintenance and operations of the Sacramento River Flood Control Project described in Section 8350 of the Water Code, and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section ~~12648~~12645) of Chapter 2 of Part 6 of Division 6 of the Water Code for which the ~~board~~Board or the ~~department~~Department has provided the assurances of nonfederal cooperation to the United States.

~~(kk) Stream.~~(rrr) "State Plan of Flood Control Facilities", hereinafter referred to as "SPFC Facilities", has the same meaning as Facilities of the State Plan of Flood Control defined in subdivision (e) of section 5096.805 of the Public Resources Code, and means the Levees, weirs, channels, and other features of the federally and State-authorized flood control facilities located in the Sacramento River and San Joaquin River drainage basin for which the Board or the Department has given assurances of nonfederal cooperation to the United States required for the project, and those facilities identified in Sections 8361 and Sections 12645 – 12670.23 of the Water Code.

(sss) "Stream" means natural or regulated water flowing in any natural or artificial channel. Streams may be perennial, flowing continuously; intermittent or seasonal, flowing only at certain times of the year; or ephemeral, flowing only in direct response to precipitation.

(~~ll~~)ttt) "Time Variance Request" means a written request to the Board to carry out work within the area of an Adopted Plan of Flood Control during Flood Season, typically approved in two (2) week increments.
(uuu) "Top of Bank~~. "Top of bank~~" means the point of intersection of the ~~berm~~Waterside Berm with the bank.
~~(mm) Toe of Bank.~~(vvv) "Toe of ~~bank~~Bank" means the point of intersection of the bank with the bottom of the channel of a ~~waterway.~~watercourse.
(www) "Tulare Lake Basin" means the Tulare Lake Hydrologic Region as defined in the California Water Plan Update 2009, prepared by the Department pursuant to Chapter 1 (commencing with Section 10004) of Part 1.5 of Division 6 of the Water Code.
(xxx) "Urban Area" means a developed area in which there are ten thousand (10,000) residents or more as defined in Government Code Section 65007(l).
(yyy) "Urban Criteria Area" means an Urban Area or Urbanizing Area, as determined by the governmental agency that exercises land use decision-making in the area, that meets all of the following conditions:

(1) It is located within a flood hazard zone that is mapped as either a special flood hazard area or an area of moderate hazard on the Federal Emergency Management Agency's official (i.e., effective) Flood Insurance Rate Map for the National Flood Insurance Program;
(2) It is located within the Sacramento-San Joaquin Valley;
(3) It is located within an area with a potential flood depth above three (3) feet, from sources of flooding other than localized conditions that may occur anywhere in a community, such as localized rainfall, water from stormwater and drainage problems, and water from temporary water and wastewater distribution system failure; and
(4) It is located within a watershed with a contributing area of more than ten (10) square miles.

(zzz) "Urban Levee Design Criteria" means the Levee and floodwall design criteria developed by the Department for providing the Urban Level of Flood Protection, dated May 2012.
(aaaa) "Urban Level of Flood Protection" means the level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, the Department. "Urban Level of Flood Protection" shall not mean shallow flooding or flooding from local drainage that meets the criteria of the national Federal Emergency Management Agency standard of flood protection.
(bbbb) "Urbanizing Area' means a developed area or an area outside a developed area that is planned or anticipated to have ten thousand (10,000) residents or more within the next ten (10) years as defined in Government Code Section 65007 (m).
(cccc) "U.S. Army Corps of Engineers" and "USACE" mean the federal agency to which the Board provided assurances to operate and maintain SPFC Facilities.
(dddd) "Waterside Berm" means the strip of ground between the waterside Levee Toe and the top of the bank of the Low Water Channel.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8361, 8370, 8521, 8525, 8581, 8608, 8630 and 8710, Water Code

History:

1. Amendment of article 2 heading, new article 2 (sections 4 through 5) and renumbering and amendment of old section 46 to new section 4 filed 9–30–96; operative 10–30–96 (Register 96, No. 40). For prior history, see Register 85, No. 26.
2. Amendment of subsections (a)(1), (a)(3)–(4) and (c) filed 12–1–2009; operative 12–31–2009 (Register 2009, No. 49).
3. Amendment of subsection (p), new subsections (r) and (jj), subsection relettering and amendment of NOTE: filed 2-15-2012: operative 2-15-2012 pursuant to Government Code section 11343.4 (Register 2012. No. 7).

(a) The Board Standards ~~These standards~~ govern the design ~~and~~, construction, operation and maintenance of ~~encroachments~~ Permitted Work which affect ~~the flood control works and floodways~~ an Adopted Plan of Flood Control and are used by the ~~board for the regulation of encroachments. The standards apply~~Board to ~~any work within the limits of, or which can affect, any authorized flood control project or any adopted plan of flood control.(c) These standards~~regulate Permitted Work.
(b) The Board Standards also provide the public with technical information needed to prepare and submit ~~encroachment~~ applications ~~to the board.(d)~~ for Proposed Work requiring a Permit.
(c) Where any provision in ~~this division~~the Board Standards requires the application of judgment, such as where "practical," "feasible," or "reasonable," the burden of proof on such issues as impracticality, ~~unfeasibility~~infeasibility, or unreasonableness lies with the applicant or ~~permittee~~Permittee.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New article 8 (sections 111 through 137) and section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) The ~~board~~Board requires Permit applications to be filed for all ~~proposed encroachments~~Proposed Work within ~~the floodways under its jurisdiction (identified in Table 8.1) and on levees adjacent thereto, on any stream which may affect those floodways~~an Adopted Plan of Flood Control or that may affect an Adopted Plan of Flood Control.

(b) Banks, ~~levees~~Levees, and channels of ~~floodways~~Floodways along any ~~stream, its tributaries~~Stream, tributary, or ~~distributaries~~distributary may not be excavated, cut, filled, obstructed, or left to remain excavated during the ~~flood season~~Flood Season.

(1) The Flood Seasons for ~~the various floodways~~Board Regulated Streams are ~~shown~~listed in Table 8.1.

(2) The ~~board~~Executive Officer or Chief Engineer, at the applicant's prior written request ~~of the applicant~~, may ~~allow work~~approve a Time Variance Request to ~~be done~~authorize performance of Permitted Work during ~~flood season within~~ the ~~floodway,~~Flood Season provided that, in the judgment of the ~~board, forecasts~~Executive Officer or Chief Engineer:

(A) The Permitted Work is not potentially injurious to the Adopted Plan of Flood Control;

(B) The Permitted Work will not constitute a threat to public safety;

(C) Forecasts for weather and ~~river~~Stream conditions are favorable~~.~~ and will be continuously monitored by the applicant; and

~~(c) The following definitions apply to this section:~~

~~(1) Bank. "Bank" means the ground bordering a river, stream, lake, or sea, or forming the edge of a cut or hollow.~~

(D) An emergency action plan is provided that describes personnel, equipment, methods, materials, and time requirements for completing necessary actions if the Permitted Work could adversely impact the flood project integrity or flood operations under unfavorable weather or Stream conditions.

(3) Time Variance Requests shall be submitted to the Chief Engineer, preferably by email, at least seven (7) days prior to the start of work but no more than ten(10) days prior to the start of work. The Time Variance Request submittal may be reduced to less than seven (7) days for Permitted Work of a minor nature that, in the judgment of the Chief Engineer, could not pose a risk to the Adopted Plan of Flood Control regardless of weather or Stream conditions.

(4) Time Variance Request approval may be rescinded at any time based on weather or Stream conditions.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section and table 8.1 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).
2. Amendment of table 8.1 filed 12–1–2009; operative 12–31–2009 (Register 2009, No. 49).

Table 8.1—Regulated Streams and Nonpermissible Work Periods

[1] Flood Season November 1 through July 15
[2] Flood Season November 1 through April 15

Stream Title	*County-Limits*	*Flood Season*
Alta Main Canal	Fresno	1
American River	Sacramento - to Nimbus Dam	2
Antelope Creek	Placer - to settlement ponds	2
Antelope Creek	Tehama	2
Angel Slough	Butte	2
Arcade Creek	Sacramento - to Roseville Road	2
Ash Creek	Modoc	2
Ash Slough	Madera	2
Atherton Cove	San Joaquin - northeast bank only	2
Auburn Ravine	Sutter and Placer	2
Banta Carbona Intake Canal	San Joaquin	2
Beacon Creek	Sacramento - Morrison Creek to Franklin Boulevard	2
Battle Creek	Tehama	2
Bear Creek	Merced	2
Bear Creek	San Joaquin up to Jack Tone Road	2
Bear Creek	Shasta, reach within designated floodway of the Sacramento River	2
Bear River	Sutter Placer & Yuba	2
Berenda Slough	Madera - A venue 21-1/2 to Ash Slough	2
Best Slough	Yuba	2
Big Chico Creek	Butte	2
Black Rascal Creek	Merced	2
Butte Basin	Butte, Glenn, and Colusa	2
Butte Creek	Butte and Glenn - to Skyway Bridge	2
Butte Creek Diversion Canal	Sutter	2
Butte Slough	Sutter	2
Byrd Slough	Fresno	1
Cache Creek	Yolo, Yolo Bypass to 1/2 mile west of I-5	2
Cache Slough	Solano	2
Calaveras River	San Joaquin - to New Hogan Dam	2
Cameron Slough	Fresno within the Kings River designated floodway	1
Canal Creek	Merced	2
Cherokee Creek	Butte	2
Chowchilla Canal Bynass	Merced, Madera and Mariposa	1
Chowchilla River	Merced Madera and Mariposa to Buchanan Dam	2
Chum Creek	Shasta - within Sacramento River floodway	2
Cirby Creek	Placer	2
Clarks Fork	Kings	1
Clear Creek	Shasta - Sacramento River to Whiskeytown Dam	2
Clover Creek	Shasta - to 1.1 miles upstream from Millville Plains Road	2
Clover Creek	Lake	2
Cole Slough	Fresno	1
Colusa Bypass	Colusa	2
Colusa Basin Drain and Canal	Glenn, Colusa, and Yolo	2
Colusa Trough	Colusa	2
Coon Creek	Placer and Sutter	2
Co~~n~~sumnes River	Sacramento	2
Cottonwood Creek	Shasta and Tehama - divides counties - to Dutch Gulch Dam	2
Cottonwood Creek South Fork	Tehama	2

Stream Title	*County-Limits*	*Flood Season*
Cottonwood Creek	Tulare - St. Johns River to Grapevine Creek	2
Cow Creek	Shasta - to 0.6 miles upstream of Millville Plains	2
Cresent Bypass	Kings and Fresno - North Fork Kings River	1
Cross Creek	Kings and Tulare - Nevada Avenue to St. Johns	1
Davis Drain	Yolo	2
Dead Horse Slough	Butte	2
Deer Creek	Sacramento	2
Deer Creek	Tehama	2
Dog Creek	Fresno	2
Dry Creek	Butte	2
Dry Creek	Fresno	2
Dry Creek	Sacramento and Placer - to Antelope Creek	2
Dry Creek	Shasta, reaches within designated floodways of Clear and Cottonwood Creeks	2
Dry Creek	Stanislaus - Tuolimne River to AT &SF RR	2
Dry Creek	Sutter	2
Dry Creek	Tehama	2
Dry Creek	Tulare	2
Dry Creek	Yuba	2
Duck Creek	San Joaquin	2
Duck Creek, South Branch	San Joaquin	2
Duck Slough	Merced	2
Duck Slough	Yolo	2
Dutch John Cut Slough	Kings	1
Dye Creek	Tehama	2
East Sand Slough	Tehama - within Sacramento R. floodway	2
Eastside Bypass	Merced and Madera	1
Edendale Creek	Merced	2
El Capitan Canal	Merced	2
Elder Creek	Tehama - to Ralston Road Bridge	2
Elder Creek	Sacramento County	2
Elk Bayou	Tulare	1
Elk Slough	Yolo	2
Fahrens Creek	Merced	2
Feather River	Butte and Yuba	2
Feather River, North Fork	Plumas	2
Five Mile Slough	Fresno	1
Florin Creek	Sacramento County	2
Fourteenmile Slough	San Joaquin	2
French Camp Slough	San Joaquin	2
Fresno River	Madera to Hidden Dam	2
Fresno River, South Fork	Madera	2
Fresno Slouch	Kinas and Fresno	1
Georgiana Slough	Sacramento	2
Globe Slough	Fresno	1
Gold Run Creek	Butte	2
Haas Slough	Solano	2
Hastings Cut	Solano	2
Honcut Creek	Butte and Yuba - to 112 mile west of S.P .R.R.	2
Hughes Creek	Kings	2
Hutchinson Creek	Yuba	2

Stream Title	*County-Limits*	*Flood Season*
Ida Island	Sacramento	2
Inside Creek	Tulare	1
James Bypass	Kings and Fresno	1
Jack Slough	Yuba	2
Kaweah River	Tulare	1
Kaweah River North Fork	Tulare	1
Kaweah River Middle Fork	Tulare	1
Kaweah River South Fork	Tulare	1
Kern River, South Fork	Kern, Isabella Dam to Tulare County Line	1
Kern River	Kern and Kings	1
Kern River Bypass Channel	Kern and Kings	1
Kings River	Kings, Tulare and Fresno - to Pine Flat Reservoir	1
Kings River, North Fork	Tulare	1
Kings River, South Fork	Tulare	1
Knights Landing Ridge Cut	Yolo	2
Laird Slough	Stanislaus	1
Laguna Creek	Sacramento-Morrison Creek to Franklin Boulevard	2
Laurel Creek	Solano	2
Ledgewood Creek	Solano	2
Linda Creek	Sacramento and Placer	2
Lindo Channel	Butte	2
Lindsey Slough	Solano	2
Little Chico Creek	Butte	2
Little Chico Diversion Canal	Butte	2
Little Cow Creek	Shasta	2
Littlejohns Creek	San Joaquin	2
Lone Tree Creek	San Joaquin	2
Lower San Joaquin River Flood Control Proiect	Fresno, Madera, and Merced	1
Magpie Creek	Sacramento - UP to Raley Boulevard	2
Main Drain Canal	Kern	1
Mariposa Bypass	Merced	1
Mariposa Creek	Merced	2
Markham Creek	Sutter	2
Mayberry Slough	Sacramento	2
McClure Creek	Tehama	2
McCoy Creek	Solano	2
Merced River	Merced	1
Middle Creek	Lake	2
Miles Creek	Merced	2
Mill Creek	Tehama Sacramento River to Hizhwav 99	2
Miners Ravine	Placer - to Interstate 80 Highwav	2
Miner Slouch	Solano	2
Mokelumne River	Sacramento San Joaquin - to Camanche Reservoir	2
Moody Slough	Solano	1
Mormon Slough	San Joaquin	2
Morrison Creek	Sacramento	2
Mosher Slough/Creek	San Joaquin - to Eight mile Road	2
Moulton Bypass and Weir	Colusa	2
Mud Creek	Butte	2

Stream Title	*County-Limits*	*Flood Season*
Mud Slough Creek	Butte	2
Murphy Slough	Butte	2
Natomas Cross Canal	Sutter	2
Natomas East Main Drainage Canal	Sutter and Sacramento	2
Oak Run Creek	Shasta - to 0.6 miles upstream from Millville Plains Road	2
Old River	San Joaquin to Paradise Cut	1
Outside Creek	Tulare	1
Owens Creek	Merced	2
Paddy Creek and South Paddy Creek	San Joaquin to Tully Road	2
Paradise Cut	San Joaquin	1
Paynes Creek	Tehama	2
Pixley Slough	San Joaquin - Eight mile Road to Rear Creek	2
Pleasant Grove Creek Canal	Sutter and Placer - to Union Pacific R.R.	2
Porter Slough	Tulare - Road 192 to Tule River	1
Putah Creek	Yolo Solano - to Monticello Dam	2
Putah Creek South Fork	Solano	2
Red Bank Creek	Tehama, only the reach that confluences with the Sacramento River desiznated floodwav	2
Reeds Creek	Yuba	2
Sacramento Bypass	Yolo	2
Sacramento Deep Water Ship Channel	Solano and Yolo	2
Sacramento River	Ke~~n~~swick Dam - to west end Sherman Island	2
Salt Creek	Shasta	2
Sand Creek	Tulare and n Fresno	2
Sandy Gulch	Butte	2
San Joaquin River	Friant Dam to West End of Sherman Island	1
Scotts Creek	Lake	2
Secret Ravine	Placer	2
Shag Slough	Solano and Yolo	2
Sheep Hollow Creek	Butte	2
Smith Canal	San Joaquin - north levee onlv	2
Sevenmile Slough	Sacramento	2
Simmerly Slough	Yuba	2
Stanislaus River	San Joaquin, Stanislaus, Calaveras, Tuolumne to Goodwin Dam	1
State Main Drain	Sutter	2
Steamboat Slough	Sacramento and Yellow	2
Stockton Diverting Canal	San Joaquin	2
Stony Creek	Tehama and Glenn	2
Sutter Bypass	Sutter	2
Sutter Slouch	Solano , Sacramento & Yolo	2
Sycamore Creek	Butte	2
Sycamore Slough	Yolo	2
Svcamore Slouch	Colusa	2
Thomes Creek	Tehama - within the Sacramento River floodway	2
Threemile Slough	Sacramento	2
Tisdale Bypass	Sutter	2
Tom Paine Slough	San Joaquin - Old River to W.P.R.R.	2
Tule River	Tulare Road 192 to Success Dam	1
Tule River, North Fork	Tulare - confluence at Hickman Creek	1

Stream Title	*County-Limits*	*Flood Season*
Tule River. Middle Fork	Tulare - confluence at Long Canyon	1
Tule River South Fork	Tulare - confluence at Long Branch	1
Tuolumne River	Stanislaus and San Joaquin - to La Grange Dam	1
Ulatis Creek	Solano - to Cache Slouch	2
Unionhouse Creek	Sacramento	2
Wadsworth Canal	Sutter	2
Wadsworth Intercepting Canal, East	Sutter -to Township Road south hank only	2
Wadsworth Intercepting Canal, West	Sutter - south bank only	2
Walker Slough	San Joaquin	2
Walthall Slough	San Joaquin	2
Western Pacific Interceptor Channel	Yuba	2
West Side Canal	Kern	1
Willow Creek	Glenn and Colusa	2
Willow Slough and Bypass	Yolo - to SPRR	2
Wright Cut	Solano - to confluence Cache and Shag Slouch	2
Yankee Slouch	Sutter and Placer	2
Yokohl Creek	Tulare	2
Yolo Bypass	Solano and Yolo	2
Yuba River	Yuba - to Daguerre Point Dam/Highway 70	2

(a) The following definitions apply to this ~~section~~Section:

(1) ~~Existing Dwelling — "Existing Dwelling" means a building used for human habitation constructed within a floodway prior to the adoption of the floodway as an authorized flood control project, as a plan of flood control, or as a designated floodway, or as otherwise permitted by the board.~~ "Existing Building" means a Building constructed within a Floodway prior to the adoption of the Floodway as an Adopted Plan of Flood Control, or as otherwise authorized by the Board.

(2) ~~Existing Mobile Home — "Existing Mobile Home" means a mobile home that was positioned within a floodway prior to the adoption of the floodway as an authorized flood control project, as a plan of flood control, or as a designated floodway, or as otherwise permitted by the board.~~ "Existing Dwelling" means a structure used for Human Habitation constructed within a Floodway prior to the adoption of the Floodway as an Adopted Plan of Flood Control, or as otherwise authorized by the Board.

(3) ~~Existing Structure — "Existing Structure" means a building used for any purpose other than for human habitation constructed within a floodway prior to the adoption of the floodway as an authorized flood control project, as a plan of flood control, or as a designated floodway, or as otherwise permitted by the board.~~ "Existing Mobilehome" means a Mobilehome that was positioned within a Floodway prior to the adoption of the Floodway as an Adopted Plan of Flood Control, or as otherwise authorized by the Board.

~~(4) Human Habitation — "Human Habitation" means an improvement of real property used, or intended to be used, for residential purposes, including but not limited to living, sleeping, cooking, or eating.~~

~~(5) Seasonal Occupancy — "Seasonal Occupancy" means to occupy or reside in a dwelling only during the nonflood season.~~

~~(6)~~ (4) "Residential Development" means ~~any~~a real estate housing development ~~or~~, such as a subdivision ~~where a subdivision map is required~~as defined in the California Code of Regulations Title 7, Division 2, for residential purposes.

(b) Dwellings, Existing Dwellings, Dwellings for Seasonal Occupancy, Buildings, and Existing Buildings~~structures~~ within an ~~adopted plan of flood control must~~Adopted Plan of Flood Control shall comply with the following requirements:

(1) New ~~dwellings, with the exception of dwellings for seasonal occupancy (nonflood season),~~Dwellings are not allowed~~permitted~~ except as provided in subdivisions (d) and (e) of this ~~section~~Section.

(2) New ~~dwellings~~Dwellings for ~~seasonal occupancy~~Seasonal Occupancy, ~~and existing dwellings~~Existing Dwellings, Buildings, and ~~and structures~~Existing Buildings ~~constructed prior to adoption of the plan of flood control~~ are allowed~~permitted~~ within the ~~floodway~~Floodway under the following conditions:

(A) They ~~dwelling or structure is~~are not abandoned and are~~is~~ maintained in a condition suitable for the approved use;

(B) They ~~dwelling or structure~~ do~~es~~ not impede ~~floodflows~~flood flows or increase bank erosion;

(C) They ~~dwelling or structure is~~are properly anchored to prevent flotation during periods of high water;

(D) They shall not impact Levee integrity such as increase the seepage through a Levee or its foundation, decrease Levee slope stability, or increase erosion potential of a Levee;

(~~E~~D) The lowest finished floor level of new ~~dwellings~~Dwellings for ~~seasonal occupancy~~Seasonal Occupancy must be a minimum of two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher~~Design Water Surface Elevation; and

(~~E~~F) New D~~d~~wellings for S~~s~~easonal O~~o~~ccupancy and Buildings may not be constructed ~~on a levee section~~within the Levee Right of Way ~~or within ten (10) feet of a levee toe~~.

(3) Any exterior remodeling, ~~modifications, additions~~modification, addition, or ~~repairs~~repair to the ~~dwelling~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, or Existing Building~~structure, or property~~ which modifies the footprint or consists of replacement of over fifty (50) percent of its market value, as calculated with a generally accepted method approved by the Board, ~~the structure must~~shall have prior approval by the ~~board~~Board and meet the following conditions:

(A) Any remodeling, ~~modifications, additions~~modification, addition, or ~~repairs~~repair may not place the ~~dwelling~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, or Existing Building~~structure~~ closer to the ~~low water channel~~Low Water Channel of the ~~floodway~~Floodway, or within the Levee Right of Way; and

(B) The lowest finished floor of any remodeling, modification, addition, or repair to the ~~design flood plane or~~ Dwelling, Existing Dwelling, or Dwelling for Seasonal Occupancy shall be a minimum of two (2) feet above the ~~100-year flood elevation, whichever is higher.~~Design Water Surface Elevation.

(4) If a ~~dwelling~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, or Existing Building~~structure~~ experiences Significant Damage~~is damaged, due to any cause, to a cumulative extent of more than fifty (50) percent of its market value within a ten year period, the dwelling or structure~~ it ~~may~~shall not be reconstructed or replaced without the approval of the ~~board;~~Board.

(5) ~~If a~~A damaged ~~dwelling~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, or Existing Building~~structure~~ that is not repaired or replaced, shall be completely removed, along with~~the entire dwelling or structure, including~~ all stored materials, equipment, and debris~~, must be completely removed~~ within a reasonable period of time, as determined by the ~~board~~Board, and the area shall be restored so that there is no interference with ~~the adopted plan~~an Adopted Plan of ~~flood control~~Flood Control.

(6) Building~~Structure~~s may be constructed within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control provided they conform to the following:

(A) ~~Structures may~~Buildings shall not be constructed within the Levee Right of Way~~on a levee section or within ten (10) feet of a levee toe~~;

(B) Building~~Structure~~s ~~must~~shall be securely anchored and floodproofed to at least two (2) feet above the ~~100-year flood elevation or two (2) feet above the design flood plane, whichever is higher.~~Design Water Surface Elevation. The floodproofing ~~must~~shall be consistent with the potential uses of the Building~~structure~~;

(C) Building~~Structure~~s ~~must~~shall be located and oriented to have minimal impact on ~~floodflows;~~flood flows. A hydraulic analysis considering the effect of all proposed and Existing Buildings may be required to demonstrate that there are no significant adverse hydraulic impacts due to proposed Buildings. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(D) The number of Building~~structure~~s allowed~~permitted~~ is limited to the minimum reasonably necessary to accomplish an appropriate land use activity.

(c) Mobile ~~homes~~homes within an ~~adopted plan~~Adopted Plan of ~~flood control must~~Flood Control shall comply with the following requirements:

(1) New ~~mobile homes~~Mobilehomes are not allowed~~permitted~~ unless the ~~mobile homes~~Mobilehomes are located within an E~~e~~xisting M~~m~~obile ~~-~~home ~~p~~Park or as provided in subdivisions (d) and (e) of this ~~section~~Section;

(2) Existing ~~mobile homes~~Mobilehomes, not located within a M~~m~~obile ~~-~~home ~~p~~Park (as defined in Section 114 of this Division), may remain and the requirements are the same as those for E~~e~~xisting ~~dwellings; and~~Dwellings;

(3) Owners of E~~e~~xisting ~~mobile homes~~Mobilehomes which are not located within a M~~m~~obile home ~~p~~Park (as defined in Section 114 of this Division) and which are not anchored in place ~~must~~shall have an evacuation plan on record with the ~~board~~Board as defined in Section 114(B)(3) of this Division; and

(4) If flood damage occurs to the M~~m~~obile ~~-~~home due to failure of the evacuation plan or its execution, the ~~mobile home~~Mobilehome may not remain or be replaced within the ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control without the approval of the ~~board~~Board.

(d) Dwellings, Existing Dwellings, Dwellings for Seasonal Occupancy, Buildings, Existing Building~~structure~~s, and ~~mobile homes~~Mobilehomes are allowed~~permitted~~ within designated "Zone B" shallow flooding areas ~~designated as a "zone B"~~ as shown on some ~~designated floodway~~Designated Floodway maps adopted by the ~~board~~Board. The ~~board's zone~~Board's Zone B designation is not to be confused with the Federal Emergency Management Agency's "B ~~-~~zone" which relates to a different floodplain identification. In addition to the other standards in this S~~s~~ection, the following conditions apply to ~~dwellings~~Dwellings, Building~~structure~~s, and ~~mobile homes~~Mobilehomes within a Board-designated ~~zone~~Zone B:

(1) ~~The dwelling, structure, or mobile home is~~ Dwellings, Buildings, and Mobilehomes shall not be allowed~~permitted~~ ~~on a levee section~~within the Levee Right of Way ~~or within ten (10) feet of a levee toe;~~.

~~(2) Dwellings, structures, and mobile homes are permitted to within fourteen (14) feet of the top of a streambank provided the streambank is revetted to board standards;~~

(2) New Dwellings, new Dwellings for Seasonal Occupancy, new Buildings, and Mobilehomes shall not be allowed within twenty (20) feet landward from the furthest upward surface projection of 3h:1v slope tangent to any point on the riverbank profile (refer to attached Figure 8.01). This regulation shall be followed even if any Revetment is to be considered. An erosion analysis shall be performed to evaluate integrity of the streambank.

(3) ~~Dwellings, structures and mobile homes are not permitted within thirty (30) feet of an unrevetted streambank;~~

~~(4)~~ The lowest finished floor ~~level of the dwellings~~of any remodeling, modification, addition, or repair to Dwellings, Existing Dwellings, Dwellings for Seasonal Occupancy, and ~~mobile homes must~~Mobilehomes shall be a minimum of two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher;~~Design Water Surface Elevation.

(~~5~~4) Only the minimum ~~floodway~~Floodway area necessary for the placement of the ~~dwelling~~Dwelling, Dwelling for Seasonal Occupancy, Building~~structure~~, or ~~mobile home~~Mobilehome shall be used. ~~Generally not more than thirty (30) percent of the flood plain area may be used. Designated floodway maps, however, may be more restrictive;~~

(~~6~~5) Sufficient area of the ~~floodway must~~Floodway shall remain clear of the ~~dwelling, mobile home~~Dwelling, Dwelling for Seasonal Occupancy, Building, or Mobilehome~~, or structure~~ to ~~preserve the historical orientation of the floodway and to~~ prevent ~~an~~any increase in ~~streamflow~~Stream stages and velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~7~~6) If a ~~dwelling~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, Existing Building~~structure~~, or ~~mobile home~~Mobilehome experiences Significant Damage~~is damaged due to any cause, cumulatively to the extent of more than fifty (50) percent of its market value~~, ~~it the dwelling, structure, or mobile home may~~shall not be reconstructed or replaced without the approval of the ~~board~~Board.

(~~8~~7) Except for approved mining activities, excavating, or grading that would increase the depth of flooding within a ~~zone~~Zone B and which might interfere with the safe evacuation of the area during flooding is not allowed~~permitted~~.

~~(9) New residential developments may be subject to a higher standard than the 100-year event up to and including the Standard Project Flood, (e.g., floor elevations required to be above the Standard Project Flood) or an equivalent rare flood.~~

(e) New ~~dwellings~~Dwellings, Dwellings for Seasonal Occupancy, Building~~structure~~s, and ~~mobile homes~~Mobilehomes along ~~an unleveed stream~~a Stream without a Levee shall be allowed landward of a minimum of twenty (20) feet from the furthest upward surface projection of 3h:1v slope tangent to any point on the riverbank profile (see Fig. 8.1). Revetment may be added but the structures shall be set back as above. An erosion analysis shall be performed to ensure integrity of the streambank. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant. ~~comply with the following requirements:~~

~~(1) Dwellings, structures, and mobile homes are permitted to within fourteen (14) feet of the top of the streambank provided the streambank is revetted.~~

~~(2) Dwellings, structures and mobile homes are not permitted within (30) feet of an unrevetted streambank.~~

(f) ~~Upon~~Prior to abandonment of the ~~p~~Permitted ~~dwelling or~~Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, Existing Building~~structure~~, ~~the~~or Mobilehome, the Permittee or property owner shall notify the Board in writing of the intent to abandon the Dwelling, Existing Dwelling, Dwelling for Seasonal Occupancy, Building, Existing Building, or Mobilehome and surrender the Permit. The Permittee or property owner shall be responsible for its removal ~~of the dwelling or structure and~~along with all appurtenance~~t structures~~, vehicles, equipment, stockpiles of materials, and debris ~~within a reasonable time~~as directed by the Board.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) The following definitions apply to this section:

~~(1) Existing Mobile Home Park~~ (1) "Existing Mobile ~~H~~home Park" means any area within a ~~floodway~~Floodway where~~on which~~ two (2) or more M~~m~~obile-homes have been maintained prior to the adoption of the area as an ~~authorized flood control project, as a plan of flood control, or as a designated floodway~~Adopted Plan of Flood Control, or as otherwise authorized by the Board.

(2) "Existing Recreational Vehicle Park" means any area within a Floodway where two (2) or more Recreational Vehicles have been maintained prior to the adoption of the area as an Adopted Plan of Flood Control, or as otherwise authorized by the Board.

(3) "Mobilehome Park" means any area within a Floodway where two (2) or more Mobilehomes are maintained.

~~(2) Recreational Vehicle Park~~ (4) "Recreational Vehicle Park" means any area within a ~~floodway~~Floodway where two (2) or more ~~recreational vehicles~~Recreational Vehicles are maintained.

(b) Mobile-home P~~p~~arks are subject to the following requirements:

(1) New Mobile-home ~~p~~Parks are not allowed~~permitted~~ within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control except in ~~floodway~~Floodway areas classified as ~~zone~~Zone B as described in subdivision (~~c~~d~~), section~~) of Section 113~~, Dwellings and Structures Within an Adopted Plan of Flood Control~~ of this Division.

(2) New M~~m~~obile-home ~~p~~Parks are not allowed~~permitted on a levee section~~within the Levee Right of Way~~ or within ten (10) feet~~ of a levee toe, levee toe.

(3) Existing M~~m~~obile-home ~~p~~Parks located within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control may remain if a ~~permit~~Permit from the ~~board~~Board has been obtained, a current implementable evacuation plan is on file with the ~~board~~Board, and the following criteria ~~continue to be~~is continuously enforced:

(A) The locations of all structures, ~~mobile homes, recreational vehicles~~Mobilehomes, Recreational Vehicles, and appurtenances are shown on the evacuation plan.

(B) The location of the river staff gauge and the gauge height that will indicate an evacuation of a M~~m~~obile-home ~~p~~Park are shown on the evacuation plan.

(C) The number of tow vehicles and the usual location of each tow vehicle to be used to evacuate a M~~m~~obile-home P~~p~~ark are shown on the evacuation plan.

(D) The locations of emergency storage areas outside the ~~floodway~~Floodway for the ~~mobile homes, recreational vehicles,~~Mobilehomes, Recreational Vehicles, and portable and floatable structures are shown on the evacuation plan.

(E) The route to be used to evacuate ~~mobile homes~~Mobilehomes from a M~~m~~obile-home ~~p~~Park to the emergency storage area is shown on the evacuation plan.

(F) After the initiation of an evacuation, all ~~mobile homes~~Mobilehomes not anchored in place and all ~~recreational vehicles~~Recreational Vehicles, and portable and floatable structures are removed from the ~~floodway~~Floodway within the time period specified in the evacuation plan.

(G) Existing multiple~~-~~ wide ~~mobile homes~~Mobilehomes, unless specially designed for quick removal, are anchored in place with concrete deadmen.

(H) New multiple~~-~~ wide ~~mobile homes~~Mobilehomes, unless specially designed for quick removal, are not allowed~~permitted~~.

(I) A copy of the evacuation plan is provided to all residents of the M~~m~~obile-home ~~p~~Park.

(J) The Mobilehome ~~p~~Park ~~permittee~~Permittee or the manager has a duplicate of all keys necessary to move a ~~mobile home~~Mobilehome and a signed statement allowing the removal of an absentee owner's M~~m~~obile ~~-~~home during an emergency evacuation.

(K) The ~~permittee of a mobile home~~ Mobilehome ~~p~~Park Permittee accepts sole responsibility for initiating an evacuation of the park.

(L) Mobile ~~homes~~homes not anchored in place, all portable structures, and ~~recreational vehicles~~Recreational Vehicles have axles, wheels, and any required tow hitch installed, and are in a readily movable condition at all times.

(M) Any related structures, such as laundry rooms and~~or~~ storage buildings, are securely anchored to prevent flotation during high water and are not utilized for ~~human habitation~~Human Habitation.

(N) If ~~significant flood damage~~Significant Damage occurs to any of the ~~mobile homes~~Mobilehomes or other park structures due to failure of the evacuation plan or its execution in response to flooding, the park may not continue operating without approval of the ~~board~~Board.

(O) Facilities that would remain in place after evacuation of the park shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(c) Recreational ~~vehicle~~Vehicle ~~P~~parks are subject to the following requirements:

(1) New and ~~E~~existing ~~recreational vehicle~~Recreational Vehicle ~~P~~parks are allowed within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control if a ~~permit~~Permit is obtained from the ~~board~~Board, a current implementable evacuation plan is on file with the ~~board~~Board, and the following requirements are enforced:

(A) The locations of all ~~recreational vehicle~~Recreational Vehicle pads and appurtenances are shown on the evacuation plan.

(B) All ~~recreational vehicles~~Recreational Vehicles have axles, wheels, and any required tow hitch installed, and are in readily movable condition at all times.

(C) At the initiation of an evacuation, all ~~recreational vehicles~~Recreational Vehicles are removed from the ~~floodway~~Floodway within the time period specified in the evacuation plan.

(D) At the initiation of the evacuation, all floatable and portable structures are removed from the ~~floodway~~Floodway within the time period specified in the evacuation plan.

(E) The locations of emergency storage areas outside the ~~floodway~~Floodway for ~~recreational vehicles~~Recreational Vehicles, and portable and floatable structures are shown on the evacuation plan.

(F) The location of the river staff gauge and the gauge height that will initiate an evacuation are shown on the evacuation plan.

(G) Permittees or managers of ~~recreational vehicle~~Recreational Vehicle ~~P~~parks accept sole responsibility for initiating an evacuation.

(H) Any related structures, such as laundry rooms and~~or~~ storage buildings, are securely anchored and are not utilized for ~~human habitation~~Human Habitation.

(I) If ~~significant flood damage~~Significant Damage occurs to any of the ~~recreational vehicles~~Recreational Vehicles or other park structures due to the failure of the evacuation plan or its execution in response to flooding, the park may not continue operating without the approval of the ~~board.~~Board.

~~(d) The following restrictions apply to recreational vehicles within an adopted plan of flood control that are not in a recreational vehicle park:~~

~~(1) The random use of recreational vehicles within an adopted plan of flood control does not require a permit from the board. Recreational vehicles are not permitted overnight within the floodway during the flood season. However, recreational vehicles may be stored in those limited areas where dwellings are permitted.~~

~~(2) It remains the sole responsibility of the property owner to ensure that recreational vehicles do not remain within the floodway overnight during the flood season.~~

(J) Facilities that would remain in place after evacuation of the Recreational Vehicle Park shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(d) Incidental day-use of Recreational Vehicles within an Adopted Plan of Flood Control does not require a Board Permit.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) Dredged, spoil, or waste ~~materials~~material, regardless of their composition, ~~may~~shall not be ~~deposited~~placed on the ~~levee~~Levee crown, ~~levee~~Levee slopes, adjacent Seepage Berm or Stability Berm, Levee Toe drains or relief wells, within any portion of the Levee Right of Way, or within the limits of a ~~project floodway~~Floodway without ~~specific~~ prior approval of the ~~board~~Board.
(b) Suitable dredged, spoil, or waste material may, upon Board approval, be ~~deposited~~placed on or against the landside ~~levee~~Levee slope ~~if the board determines that not~~provided that the applicant submits sufficient evidence demonstrating that placement will not be detrimental to the safety of the ~~levee~~Levee, toe drains, Seepage Berms or relief wells; and will not impact access or flood fighting operations.
(c) Dredged ~~materials must~~material shall be drained of excess moisture before being placed~~used as fill material.~~
~~(d) Dredged, spoil, or waste materials may not be deposited within the~~, and shall have the moisture content controlled to the required limits ~~of the stream channel, project floodway, or within a bypass area without a determination by the board as~~ to ~~the effect~~obtain proper compaction of the ~~deposition regarding~~material.
~~(1) the flood carrying capacity of the stream channel, floodway, or bypass; (2) recreational and environmental factors; and (3) fish and wildlife.~~
(d) All placement of dredged, spoil or waste material shall be done pursuant to all applicable Board Standards and the approved Permit.
(e) Dredged, spoil, or waste material is typically not allowed to be placed in the Floodway, but if approved by the Board the material shall not redirect flows or cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.
(f) Hazardous dredged, spoil, or waste materials may not be placed within an Adopted Plan of Flood Control.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609, 8708, 8709 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) ~~-~~ The removal of earthen material and related activities within the limits of an ~~adopted plan of flood control~~Adopted Plan of Flood Control or that may impact an Adopted Plan of Flood Control are subject to the provisions of this ~~division.~~ Division. ~~The board~~ The Board may limit removal of earthen material for ~~b~~Borrow (mining) and excavation activities based on the ~~area's~~geotechnical characteristics, hydraulics, hydrology, sediment transport, and history of the ~~borrow sites.~~site. The ~~board~~ Board may waive specific requirements for B~~b~~orrow ~~or~~and excavation activities if the ~~permittee~~Permittee provides detailed geotechnical and hydraulic studies which the ~~considers~~Board then deems sufficient to justify the waiver.

~~Borrow~~ The Board may waive the requirement for a Permit or for detailed geotechnical and hydraulic studies for Borrow and excavation activities ~~maya~~of a minor, incidental, or temporary nature. Borrow and excavation activities may be allowed if:

(1) The activity ~~willnot~~shall not negatively impact Levee stability or underseepage performance;

(2) The activity shall not cause an unplanned change of the ~~stream's location~~Stream's alignment;

(~~2~~3) The activity shall not change the sediment transport downstream ~~will not change~~ from the site in a manner that produces or tends to produce increased flood or erosion ~~problems in the area~~concerns; and

(~~3~~4) The activity is consistent with the overall flood control objectives for the area.

(b) General requirements for ~~all~~ B~~b~~orrow P~~p~~ermits include the following, unless other specific provisions for a specific area or ~~stream~~Stream modify these requirements:

(1) A geotechnical investigation may be required before initiating any Borrow activity within a Leveed Floodway. The investigation shall determine if the proposed Borrow activity would affect Levee safety due to underseepage, stability, and/or erosion conditions. Based upon the geotechnical investigation, the Board may deny the Permit or require monitoring, including installation of piezometers and monitoring of pore pressures to demonstrate there is no adverse impact on Levee safety.

(2) A hydraulic study may be required by the Board before initiating any Borrow activity within a Leveed Floodway. The study shall determine if the proposed Borrow activity would increase Stream stages or velocities that may cause or increase erosion conditions. A significant increase in stage or velocity can be the basis for denying a Permit.

(3) The minimum required distance for locating a Borrow area within a Leveed Floodway is three hundred (300) feet measured from the waterside Levee Toe.

(4) No Borrow is allowed within the existing or planned Levee Right of Way.

(5) The minimum required distance for locating a Borrow area on the landside of a Levee without a geotechnical investigation is four hundred (400) feet from the landside Levee Toe. Lesser distances may be allowed if a seepage analysis performed by a California registered civil engineer demonstrates that the Borrow configuration is stable and will not adversely impact the underseepage and stability characteristics of the adjacent Levee. The Board may waive this seepage analysis requirement for a temporary Borrow or for a minor, shallow Borrow that, in the judgment of the Board, poses no risk to the integrity of the Levee.

(6) In Urban Criteria Areas, the seepage modeling shall include evaluation of performance for the Stream stage at the Hydraulic Top of Levee and comply with Levee underseepage requirements of the Urban Levee Design Criteria.

(7) Material may not be removed within fifty (50) feet of the toe of any Spur Levee. Additional analysis shall be performed to verify stability and erosion conditions of the Spur Levee for removal of material within three hundred (300) feet of the toe of the Spur Levee.
(8) In a Floodway or less than four hundred (400) feet landward of the landside Levee Toe, the side slopes of the perimeter of a Borrow area shall be 5h:1v or flatter unless steeper slopes are justified by engineering analyses of seepage, stability, and erosion.
(9) The bottom of a Borrow area landward of a Levee must be located above a 10h:1v slope projected downward from the landside Levee Toe, Seepage Berm toe, or Stability Berm toe unless a geotechnical analysis demonstrates that the Borrow will not adversely impact the integrity of the Levee. If the Borrow area will be seasonally dry and located within four hundred (400) feet of the landside Levee Toe, the bottom shall be graded to drain water away from the Levee Toe.
(10) Any ~~levee~~Levee crown or Access Ramp~~access ramp~~ used to transport B~~b~~orrow material ~~must~~shall be maintained by the P~~p~~permittee in the same or better condition as existed at the start of the ~~b~~Borrow operation.

(A) A surveyed longitudinal profile of the existing ~~levee~~Levee crown roadway and Access Ramp~~access ramp~~s to be utilized for access to the ~~b~~Borrow area ~~must~~shall be submitted to the ~~board~~Board prior to ~~any~~ excavation of Borrow material.

(B) A surveyed longitudinal profile of the ~~levee~~Levee crown roadway and Access Ramp~~access ramp~~s utilized for access to the ~~b~~Borrow area ~~must~~shall be submitted yearly as well as upon abandonment of the ~~b~~Borrow area.

(C) ~~Upon order of the board, t~~The ~~permittee~~Permittee shall restore a damaged ~~levee~~Levee and/or Access Ramp~~access ramp~~ to the ~~original profile.~~

~~2) Land~~integrity, lines, ~~and channel borrow~~grades, and slopes that existed at the start of the Borrow operation.

(D) The Permittee shall provide notifications to the Board when damage has occurred to a Levee and/or Access Ramp. The notifications shall include a scope of work and date when repairs will commence, to provide for inspection of the work by Board staff.

~~(2)~~ (11) Borrow material of any type may not be stored at any time ~~on a levee section or within~~within the Levee Right of Way ~~ten (10) feet of either~~and further setback may be required to prevent the stockpile from adversely impacting Levee integrity or operation and maintenance of the Levee. ~~toe 3~~

~~(3)~~(12) No ~~land and channel~~ ~~b~~Borrow material may be stored in a manner that could destabilize a ~~riverbank, e.g., within thirty (30) feet of the top of bank~~ Waterside Berm. The applicant shall demonstrate that stability of the Waterside Berm and any adjacent Levee are not impacted by the temporary storage of Borrow material.
(~~4~~13) Periodic topographic surveys of the active ~~b~~Borrow area and vicinity may be required.
(~~5~~14) All boundaries of an active ~~b~~Borrow area ~~must~~shall be delineated by steel posts or other permanent markers which are clearly visible.
(~~6~~15) Stockpiles of materials or the storage of equipment, ~~unless securely anchored,~~ downed trees or brush, and floatable material of any kind are not allowed within a ~~floodway~~Floodway during the ~~flood season as defined in Table 8.1~~Flood Season.
~~(7) Excavation is not permitted within one hundred (100) feet of a levee toe or property line within the floodway.~~

~~(8) Material may not be removed within fifty (50) feet of the toe of any spur levee. A spur levee is a levee that protrudes into the floodway for the purpose of directing the flow of floodwater.~~

~~(9~~(16) Channel or ~~berm~~Waterside Berm excavations are not ~~permitted~~ allowed within a ~~leveed floodway~~Leveed Floodway where there is active erosion unless an engineering study demonstrates ~~that the borrow~~the Channel or Waterside Berm excavations will not exacerbate the erosion.

~~(10) The side slopes of the perimeter of a borrow area may not exceed three (3) feet horizontal to one (1) foot vertical.~~

~~(11~~(17) The upstream and downstream ends of a ~~b~~Borrow area connected to ~~the low-channel~~a Low Water Channel shall be transitioned into the channel to prevent an abrupt change in ~~streamflow~~Stream velocity or cause an ~~o~~Obstruction ~~to the flow~~.

~~(12) The bottom of a borrow area that is seasonally dry and located within two hundred (200) feet of a levee toe shall be graded to be reasonably uniform with the gradient sloping towards the low-water channel.~~

~~(13~~(18) When the ~~b~~Borrow area is to be connected to the ~~low-water channel~~Low Water Channel, excavation ~~must~~shall start at the riverward edge of the ~~b~~Borrow area and progress uniformly landward.

(~~14~~19) The bottom elevation of any ~~berm excavation~~Waterside Berm Borrow site may not be lower than the adjacent channel bottom without adequate setback from the channel. Five hundred (500) feet is generally considered an adequate setback.

(~~15~~20) Dredging of material from channel waterways generally ~~must~~shall be confined to the area beyond one hundred (100) feet of the toe of the bank, or the waterside toe of the Levee if there is no bank. The slope of the ~~borrow~~dredging perimeter nearest the toe of the bank, or the waterside toe of the Levee if there is no bank, may not exceed ~~five (5) feet horizontal to one (1) foot vertical.~~5h:1v. Localized exceptions may require bank protection~~.~~. Additional seepage and stability analyses shall be required to verify the integrity of the Levee Section near the dredging area.

(~~16~~21) Before any ~~b~~Borrow operation in a Floodway, including suction dredging, is ~~permitted~~allowed within one (1) mile of a bridge, a study ~~must~~shall be submitted to show ~~that~~ the ~~b~~Borrow operation will not adversely affect any of the bridge footings, piers, or bents.

(~~17~~22) Before any ~~b~~Borrow operation in a Floodway, including suction dredging, is ~~permitted~~allowed within one thousand (1,000) feet of any pipeline or cable crossing beneath the channel, or within one thousand (1,000) feet of a project control structure, e.g., a weir, a study ~~must~~shall be submitted to show that the ~~b~~Borrow operation will not adversely affect that facility. A study may be required for distances greater than one thousand (1,000) feet where deemed appropriate by the ~~board~~Board.

(~~18~~23) Any proposed ~~b~~Borrow operation in a Floodway within one mile of a ~~state~~State highway bridge ~~must~~shall be approved by the California Department of Transportation.

~~(19) A geotechnical investigation is required before initiating any borrow activity within a leveed floodway. The investigation must determine if the proposed borrow activity would increase seepage beneath levees, or expose soils susceptible to erosion.~~

(c) If periodic inspections reveal that a ~~b~~Borrow operation will adversely affect ~~the adopted plan~~an Adopted Plan of ~~flood control~~Flood Control, additional ~~permit~~Permit conditions may be imposed, or the ~~permit~~Permit may be revoked.

~~Excavations made within a Floodway that are not an approved Borrow or excavation activity shall be backfilled in a manner consistent with local conditions. This requirement is generally satisfied by using suitable material and compacting to athe density of the adjacent undisturbed material. Compaction tests by a certified oils aboratory may be required. These requirements may be waived for minor excavations that would have no impact on the floodway.~~

(d) Excavations made within a Floodway that are not an approved Borrow or excavation activity shall be backfilled with suitable material in conformance with Section 120(a) of this Division. Analyses may be required to confirm seepage, stability, and erosion conditions have not been impacted for either the flood channel or adjacent Levee(s). Field density testing by an Approved Soils Testing Laboratory may be required to confirm the minimum relative compaction of backfill. All disturbed surface features shall be completely restored to the original condition. This restoration shall include but is not limited to, sodding, seeding, surfacing, slope protection, and bedding restoration.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

Additional ~~b~~Borrow standards have been established for the removal of material from the ~~floodway~~Floodway of the Yuba River. These additional standards supplement and, where in conflict with, supersede standards in ~~section 116, Borrow and Excavation Activities – Land and Channel~~Section 116 of this Division.

(a) Material may not be removed within ~~three~~four hundred (~~300~~400) feet of the ~~centerline~~waterside Levee Toe of ~~project and local levees~~Levees of the Yuba River.

(b) Material may not be removed within ~~three~~four hundred (~~300~~400) feet of the perimeter of any bank or ~~levee~~Levee protection work.

(c) Between Daguerre Point Dam (approximately River Mile 11.4) and Cenedella Bend (approximately River Mile 4.1), material may not be removed within one thousand five hundred (1,500) feet of the top of the banks of the Yuba River.

(d) The elevation of the bottom of the ~~b~~Borrow area nearest the bank of the river may be no lower than ten (10) feet above the normal low-water elevation of the Yuba River ~~(see Graph 8.1)~~.

(e) Existing ~~b~~Borrow pits or depressions between the ~~levee~~Levee and ~~three~~four hundred (~~300~~400) feet ~~landward~~ waterward of the waterside ~~levee~~Levee ~~centerline~~Toe and adjacent to a proposed ~~b~~Borrow area ~~must~~shall be backfilled to within twenty (20) feet vertically of the ~~levee~~Levee Crest Elevation~~crown~~ by the ~~permittee~~Permittee of the proposed ~~b~~Borrow area. The backfill ~~must~~shall be placed in the ratio of one (1) cubic yard placed in the low areas to ten (10) cubic yards removed from the ~~floodway~~Floodway.

(f) Material may not be removed from the area between nine hundred (900) feet upstream of the ~~Southern~~Union Pacific Railroad bridge (near River Mile 1.2) and the confluence of the Yuba and Feather Rivers.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section and graphic 8.1 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

An additional ~~b~~Borrow standard has been established for the removal of material from the ~~flood ways~~Floodways of the Lower San Joaquin River Flood Control Project. The additional standard supplements and, where in conflict with, supersedes standards in ~~section 116, Borrow and Excavation Activities – Land and Channel. The supplemental standard requires that all berm excavations must connect to the channel, and the bottom of berm excavations must be sloped to drain away from the levee~~Section 116 of this Division.

(a) The supplemental standard requires that all Waterside Berm excavations shall connect to the channel, and the bottom of Waterside Berm excavations shall be sloped to drain away from the Levee.

Note:

Authority cited: Section 8571, Water Code.

Reference:

Sections 8608 and 8710, Water Code.

History:

1. New section filed 9-30-96; operative 10-30-96 (Register 96, No. 40).

(a) Dams and structures that act as dams constructed in the channels of intermittent ~~streams~~Streams must meet the following criteria:

(1) A study shall be submitted to the ~~board~~Board confirming that the installation of a dam will not increase flooding outside of the ~~floodway~~Floodway or increase flood damages ~~to third parties~~ in the ~~floodway~~Floodway.

(2) ~~Erosion control may~~A study shall be ~~required on~~submitted to the Board that evaluates the potential for erosion of the bank or ~~levee~~Levee slopes upstream and downstream of the proposed dam. If the analysis shows the potential for erosion, erosion control shall be required on the bank or Levee slopes upstream and downstream of the proposed dam based on the results of the study.

(3) Earthfill, including sand, and rockfill dams ~~must~~shall be completely removed from the Floodway prior to the beginning of Flood Season each year and may not be reinstalled prior to the end of Flood Season unless approved by the Board. (See Table 8.1.)

(4) All stanchions shall be removed or lowered, and all flashboards and slide gates of a dam shall be removed from the Floodway prior to the beginning of ~~f~~Flood ~~s~~Season each year and may not be reinstalled prior to the end of ~~flood season~~Flood Season unless approved by the Board. (See Table 8.1.)

(5) The ~~permittee must~~Permittee shall remove or lower all stanchions and ~~must~~shall remove the flashboards and slide gates of a dam within twenty~~-~~ four (24) hours after receiving written notification from the ~~board~~Board.

(6) The ~~permittee must~~Permittee shall remove an earthfill or rockfill dam within ninety-six (96) hours after receiving written notification from the ~~board~~Board.

(7) Upon removal of an earthfill or rockfill dam, the material from the dam ~~may~~shall not be stockpiled ~~on the levee section~~within the Levee Right of Way or within the ~~floodway~~Floodway.

(8) The ~~permittee must~~Permittee shall provide warning signs upstream and downstream of a rockfill dam ~~to protect~~at a distance that under normal conditions of visibility the warning will be recognizable by boaters in time to avoid danger.

(b) Crop checks, ditch banks, ditch pads, road fills, and ~~secondary levees~~Secondary Levees installed within ~~floodways and bypasses~~Floodways may not be reinforced or revetted and ~~must~~shall be limited to a height, length, and orientation that will not ~~impair the flood way capacity.~~ cause a significant increase in Stream stage or velocities. ~~-~~Crop checks, ditch banks and ditch pads ~~are~~ limited to a maximum height of three (3) feet above the adjacent natural ground normally do not require a Permit. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) Levees constructed, reconstructed, raised, enlarged, or modified within ~~afloodway~~an Adopted Plan of Flood Control shall be designed and constructed in accordance with ~~the U.S. Army Corps of Engineers~~USACE manual "Design and Construction of Levees" (EM 1110–2–1913 ~~dated March 31, 1978,~~which is incorporated by reference) and USACE technical letter, "Design Guidance for Levee Underseepage" (ETL 1110-2-569) which is incorporated by reference) and as supplemented with the following standards:

(1) Levee construction or reconstruction shall be designed by a ~~civil engineer~~California registered civil engineer.

(2) An engineering analysis that evaluates ~~levee~~Levee embankment and foundation stability shall be submitted to the ~~board~~Board with the ~~P~~permit application. The ~~analysis must~~ analyses shall comply with the following requirements:

(A) Document the basis for selection of the water surface elevation(s) used in the analyses for the Design Water Surface Elevation and, in Urban Criteria Areas, the Hydraulic Top of Levee.

(B) The analyses shall verify that the ~~levee is~~waterside and landside Levee slopes are adequately designed and will be constructed to remain stable under all applicable loading conditions ~~for "Case~~as per EM 1110-2-1913, and, in Urban Criteria Areas, per the Urban Levee Design Criteria.

~~IV – Steady seepage from full flood stage" as defined in the Department of the Army manual, "Design and Construction of Levees" (EM 1110–2–1913), pp.6–6, 6–7.~~

(3) A detailed seepage and slope stability analysis, settlement analysis, ~~using procedures such as those described in the Department of the Army manual, "Settlement Analysis" (EM 1110–1–1904, dated September 30, 1990, which is incorporated by reference), must~~erosion analysis, wind setup, and wave runup analysis for the designed flood event shall be submitted to the ~~board.~~Board. For Levees in Urban Criteria Areas, the analyses shall also comply with the requirements of the Urban Levee Design Criteria.

(4) A copy of all geotechnical studies and tests used ~~in~~during the ~~design determination~~process of designing the ~~levee~~Levee shall be provided to the ~~board~~Board when applying for a ~~P~~permit.

(5) The applicant shall provide the ~~board~~Board with a permanent easement granting the Sacramento and San Joaquin Drainage District all flood control and flood control maintenance rights upon, over, and across the property to be occupied by the proposed flood control works. The easement ~~must~~shall include the ~~area within the proposed floodway, the levee section, and the area at least ten (10) feet~~Levee Right of Way ~~in width adjacent to the landward levee toe~~ if the area is not presently encumbered by a ~~board~~Board easement. The ~~board~~Board may require an easement over a larger area and over any property when it is foreseeable that the proposed activities subject to a ~~permit~~Permit ~~w~~could potentially be injurious to or interfere with the ~~adopted plan of flood control.~~Adopted Plan of Flood Control. The Board may waive the requirement for an easement if property rights satisfactory to the Board are provided through a different mechanism or if the flood control works will not be State Plan of Flood Control Facilities.

(6) All drains ~~and,~~ abandoned conduits, and other penetrations shall be removed from the proposed construction site prior to start of construction.

(7) Prior to construction or enlargement of ~~the embankment~~a Levee, Seepage Berm, or Stability Berm, all voids left after removal of drains, conduits, and other penetrations, and all holes, depressions, and ditches in the foundation area shall be backfilled ~~and~~with compacted ~~to a~~ Embankment Material unless the results of geotechnical analysis requires placement of a more

permeable material. Field density ~~equal to that of~~ testing by an Approved Soils Testing Laboratory will be required to confirm the minimum relative compaction of backfill within or adjacent ~~undisturbed material.~~ to a Levee or Seepage Berm or Stability Berm.

(8) Prior to construction or enlargement of either the ~~embankment~~Levee or Seepage Berm or Stability Berm, all surface vegetation and their roots shall be removed from the area to receive fill ~~to a~~. The depth of stripping is determined by local conditions and normally varies from six (6) to twelve (12) inches. Organic soil and roots one and one~~–~~ half (1–1/2) inches in diameter or larger, shall be removed to a depth of at least three (3) feet from the area to receive fill ~~to a depth of three (3) feet~~.

(9) An inspection trench shall typically be excavated to a minimum depth of six (6) feet beneath ~~levees~~Levees being constructed or reconstructed to a height of six (6) feet or greater. The inspection engineer may allow a lesser depth based on material competency. If necessary to ensure a satisfactory foundation with competent material, the depth of the inspection trench may be required to exceed six (6) feet.

(A) ~~The minimum depth of an inspection trench excavated beneath levees~~If the Levee to be constructed or reconstructed is less than six (6) feet in height ~~must be~~, the depth of the inspection trench beneath the Levee shall be at least equal to the Levee height ~~of the design water surface above natural ground adjacent to the levee~~.

(B) The inspection trench ~~must~~shall have a minimum bottom width of twelve (12) feet, and the side slopes ~~must be one (1) foot horizontal to four (4) feet vertical~~shall be 0.25h:1v, or flatter~~.~~ if required for worker's safety.

(C) The centerline of the inspection trench shall be located approximately under the outer edge of the shoulder of the waterside ~~levee crown.~~Levee crown, unless justified with a geotechnical analysis, subject to Board approval, to be located under the waterside Levee slope.

(10) When subsurface explorations ~~disclose~~indicate a shallow pervious substratum underlying ~~a levee~~the Levee to be constructed or reconstructed, ~~a cutoff~~ where practical the inspection trench ~~must~~shall be ~~excavated~~deepened to penetrate at least two (2) feet into an ~~impervious~~underlying low permeability stratum~~, where practical.~~

~~(11) Cutoff~~. If this is not practical, other seepage control measures such as Seepage Berms, pervious toe trenches ~~shall have a minimum bottom width of twelve (12) feet and the side slopes~~, relief wells, and/or cutoff walls shall be ~~one (1) foot horizontal to four (4) feet vertical, or flatter~~constructed as needed to meet Levee underseepage criteria.

~~(12) Impervious material, with twenty (20) percent or more of its passing the No. 200 sieve, and having a plasticity index of eight (8) or more, and having a liquid limit of less than (50), must be used~~ (11) Fill material for construction of new ~~levees~~Levees and ~~the~~ reconstruction, enlargement, and modification of existing ~~levees.~~ Levees shall consist of Embankment Material, with the following exceptions, provided that exceptions shall not impair the usefulness or serviceability of the Levee:

(A) Special construction details ~~(e.g., 4:1 slopes)~~ may be substituted where ~~these soil properties are~~ Embankment Material is not readily attainable~~. Where the~~;

(B) The design of a new ~~levee~~Levee structure utilizes zones of various materials or soil types~~, the requirements of this subdivision do not apply.~~;

~~(13) Fill material must be placed in four (4) to six (6) inch layers and compacted with a sheepsfoot roller, or equivalent, to a relative compaction of not less than ninety (90) percent per ASTM D1557–91, dated 1991, which is incorporated by reference and above optimum moisture content,~~

~~or ninety-seven (97) percent per ASTM D698-91, dated 1991, which is incorporated by reference and at or above optimum moisture content.~~

~~(14) Fill material placed within two (2) feet of a structure must be compacted by appropriate hand operated compaction equipment.~~

~~(15) Levee fill material must be free of stones or lumps exceeding three (3) inches in greatest dimension, and must be free of vegetative matter or other unsatisfactory material.~~

~~(16) Fill material may only be placed within the area indicated on the submitted plans.~~

(C) The Levee has been excavated, the Levee backfill is localized, typically involving less than ten thousand (10,000) cubic yards of fill, and adjacent undisturbed Levee material does not meet Embankment Material specifications;

(D) The fill or backfill is placed outside of the Levee Section of a wide Levee.

(12) Levee fill that does not meet Embankment Material specifications must be approved by the Board prior to placement. When placed as Levee embankment backfill or as additional Levee fill, it shall be generally consistent with engineering properties of adjacent undisturbed Levee material.

(13) Fill material for Levee embankment construction or backfill within an existing Levee embankment shall be placed and compacted in horizontal lifts with a loose lift thickness no greater than six (6) inches. For major Levee projects utilizing very large equipment, the loose lift thickness may be increased to eight (8) inches if approved by the Board prior to construction. The fill shall be compacted to either a minimum ninety seven (97) percent Standard Proctor dry density according to ASTM D698 or minimum ninety two (92) percent Modified Proctor dry density according to ASTM D1557, or equivalent. Moisture control limits are to be within minus one (-1) percent to plus three (+3) percent of optimum and zero (0) percent to plus four (+4) percent of optimum for ASTM D698 and ASTM D1557, respectively, or equivalent.

(14) Fill material for Seepage Berm and Stability Berm construction or backfill shall be placed and compacted in horizontal lifts no greater than six (6) inches in thickness. For major Levee projects utilizing very large equipment, the loose lift thickness may be increased to eight (8) inches if approved by the Board prior to construction. The fill shall be compacted to either a minimum ninety (90) percent Standard Proctor dry density according to ASTM D698 or minimum eighty eight (88) percent Modified Proctor dry density according to ASTM D1557, or equivalent. Moisture control limits are to be within minus one (-1) percent to plus three (+3) percent of optimum and zero (0) percent to plus four (+4) percent of optimum for ASTM D698 and ASTM D1557, respectively, or equivalent.

(15) Fill material placed outside of the Projected Levee Section shall be compacted to a minimum ninety (90) percent Standard Proctor dry density according to ASTM D698 or a minimum eighty eight (88) percent Modified Proctor dry density according to ASTM D1557, or equivalent, unless otherwise directed. Moisture control limits are to be with minus one (-1) percent to plus three (+3) percent of optimum and zero (0) percent to plus four (+4) percent of optimum for ASTM D698 and ASTM D1557, respectively, or equivalent.

(16) Fill materials placed outside the Levee or Seepage Berm or Stability Berm can consist of either Embankment Materials or native excavated soils.

(17) Where zoning of the Levee and/or Seepage Berm or Stability Berm is consistent with the use of pervious material, it shall be placed in maximum six (6) inch thick layers in a manner that will prevent segregation. Compaction shall be performed to a minimum of seventy (70)

percent relative density according to ASTM Test D2049, or equivalent. The moisture content shall be controlled to achieve the required minimum relative density.

(18) Fill material placed within four (4) feet of a structure or pipeline shall meet all requirements for Embankment Material, but with a maximum plasticity index of thirty five (35), and shall be compacted in horizontal lifts with a loose lift thickness no greater than four (4) inches using appropriate hand operated compaction equipment. Structures that would be easily damaged by soil expansion shall have this plasticity index limited to a maximum of fifteen (15). Horizontal lifts are not required alongside pipelines on Levee slopes.

(19) Fill material may only be placed within the area indicated on the submitted plans.

(~~17~~20) Fill placement on ~~levee slopes must~~the existing Levee slope shall be keyed and benched into the ~~existing levee section whenever there is substantial fill,~~Levee slope. The benches shall extend into the firm soil and shall have minimum width as ~~determined~~required by the ~~board.~~

~~(18)~~equipment, and maximum depth of two (2) feet, and shall extend the full length of the slope. Each fill layer ~~of fill material applied on a levee must~~ shall be ~~keyed into the levee section individually in four (4) to~~less than six (6) ~~inch layers.~~inches thick. These requirements do not apply for repairs of surficial damage.

~~(19) Density tests~~

(21) Field density testing by ~~a certified soils aboratory~~an Approved Soils Testing Laboratory will be required to ~~verify~~ confirm the minimum relative compaction of ~~levee~~Levee embankment fill and trench backfill. Levee embankment fill material index properties, strength tests, and/or permeability tests may be required to verify material suitability.

~~(20) Ditches~~

(22) Existing ditches, power poles, standpipes, distribution boxes, and other above~~-~~-ground structures located within ~~ten (10) feet~~the Levee Right of ~~the levee toe must~~Way shall be relocated ~~a minimum distance of ten (10) feet beyond the levee toes.~~ outside of the Levee Right of Way. The required distance for relocation of ditches shall be determined based on underseepage analyses by a California registered civil engineer in accordance with Section 120(a) of this Division.

(~~21~~23) Pipelines (but not pipeline crossings) located alongside (typically parallel to the Levee) and within ~~ten (10) feet of the levee toe must~~the Levee Right of Way shall be relocated ~~a minimum distance~~outside of ~~ten (10) feet beyond~~ the ~~levee toe~~Levee Right of Way.

(~~22~~24) Construction work of any type may not be done on ~~levees~~Levees or within the ~~floodway~~Floodway during the ~~flood season (see Table 8.1)~~Flood Season unless authorized by the Executive Officer or Chief Engineer pursuant to Section 112 of this Division.

(~~23~~25) The areas adjacent to the ~~levee must~~Levee shall be graded to drain away from the ~~levee toes~~Levee for a minimum distance of fifteen (15) feet waterward of the waterside Levee Toe and twenty (20) feet landward of the landside Levee Toe~~ten (10) feet~~.

(~~24~~26) The finished slope of any ~~project levee~~Levee construction or reconstruction ~~must be three (3) feet horizontal to one (1) foot vertical, or flatter, on the waterside and two (2) feet horizontal to one (1) foot vertical~~shall be 3h:1v, or flatter, on ~~the landside of the levee.~~both waterside and landside slopes. Existing Levees with landside slopes as steep as 2h:1v may be used in Levee reconstruction projects if landside slope performance has been good and through seepage breakout is not a concern, or the reconstruction includes a cutoff wall and meets minimum USACE design criteria for slope stability.

(~~25~~27) The finished slopes of any bypass ~~levee must~~Levee shall be ~~four (4) feet horizontal to one (1) foot vertical~~4h:1v, or flatter~~,~~ on the waterside and ~~three (3) feet horizontal to one (1)~~

~~foot vertical~~3h:1v, or flatter~~,~~ on the landside except as may be approved by the Board when repairing or reconstructing an existing bypass Levee that has been authorized with steeper slopes and the Levee has performed well and meets minimum stability and seepage criteria.~~ of the levee.~~

(~~26~~28) An existing ~~levee section~~Levee Section being reconstructed, realigned, or otherwise altered, and having ~~encroachments~~Encroachments that are located within the ~~levee~~Levee that are to be replaced or changed, ~~must~~shall have detailed plans of the proposed ~~encroachment~~Encroachment changes approved by the ~~board~~Board prior to start of construction.

(~~27~~29) The ~~board~~Board may require the modification, as necessary, of existing pipelines within a ~~levee section~~Levee Section that is being raised to ~~accomodate~~accommodate a higher ~~design water surface elevation~~Design Water Surface Elevation in order to prevent seepage along the pipeline and to prevent backflow through the pipeline during the design event.

~~(28) A~~ (30) Within 120 days upon completion of any Levee project, a set of "as constructed" drawings ~~of any levee project~~, stamped and signed by a California registered civil engineer, shall be submitted to the ~~board, the department and the Corps of Engineers upon completion of the project.~~Board.

(~~29~~31) Stone ~~revetment~~Revetment may be required on ~~levee~~Levee slopes where turbulence, flow, or wave action may cause erosion.

(~~30~~32) Grasses or other approved ground covers shall~~may~~ be required on new and reconstructed ~~levee~~Levee slopes that do not have Revetment.

(~~31~~33) The minimum crown width of a ~~levee~~Levee is normally twenty (20) feet, and twelve (12) feet on ~~minor streams and twenty (20) feet on major streams.~~Minor Tributary Levees. The ~~levee~~Levee crown width for a ~~levee~~Levee on a specific ~~stream~~Stream is defined by the project document and/or operations manual in current use and ~~must~~shall be consistent with minimum width requirements of existing ~~levees~~Levees on the specific ~~stream~~Stream.

(~~32~~34) A ~~levee~~Levee having a crown width of fifteen (15) feet or less ~~must~~shall have vehicular turnouts at approximately two thousand–five hundred (2,500) foot intervals if there is no existing Access Ramp~~access ramp~~ within that distance.

(~~33~~35) As used in this sub-section, the term "approved risk-based analysis" means an analysis which uses simulation modeling of river discharge versus probability of occurrence, river stage versus river discharge estimates, and river stage versus flood damage estimates and accounts for uncertainty in these functions to determine the performance of a proposed flood control feature.

(A) All ~~levees~~Levees to be constructed or reconstructed ~~must~~shall have a minimum of three (3) feet of ~~freeboard~~Freeboard above the ~~design flood plane~~Design Water Surface Elevation, or a ~~crown elevation~~Crest Elevation no lower than designed using an approved risk-based analysis.

~~(B) Unless~~ (B) Bypass Levees to be constructed or reconstructed shall have additional Freeboard as needed for large waves. The Freeboard of reconstructed bypass Levees shall not be reduced from the previously authorized design. Freeboard required for bypass Levees varies from three (3) feet to six (6) feet depending on fetch and authorized design. Freeboard for bypass Levees may be designed using an approved risk-based analysis.

(C) Unless designed using an approved risk-based analysis, the design ~~freeboard~~Freeboard of a ~~levee~~Levee to be constructed or reconstructed ~~must~~shall be appropriately increased ~~when any of~~to address the following conditions ~~exist~~, where applicable:

(i) High velocity ~~streamflow.~~Stream flow
(ii) Excessive wave action~~.~~
(iii) Excessive hydrologic, hydraulic, or geotechnical uncertainty in the ~~levee~~Levee design parameters~~.~~
(iv) Settlement
(v) Superelevation of the water surface on the outside of Stream bends
(vi) Sea level rise
(vii) Increased peak Stream flow for the Design Flood resulting from climate change

~~(C)~~ (D) Unless designed using an approved risk–based analysis, ~~levees~~Levees within one hundred (100) feet of a bridge, or other structure which may constrict ~~floodflows, must~~flood flows, shall have one (1) foot of additional ~~freeboard~~Freeboard.

(b) Unreinforced pavement is not allowed~~permitted~~ on ~~levee~~Levee slopes with the exception of ramps and bike trails. Reinforced pavement shall be designed to withstand a maximum load of sixty-eight thousand (68,000) pounds from two consecutive sets of tandem axles. Soil tests may be required to determine design of the pavement.

(c) Pavement for roadways and similar uses ~~is~~may be allowed~~permitted~~ within the Levee Right of Way~~ten (10) feet of the levee toe~~.

(d) Pavement within the Levee Right of Way~~ten (10) feet of the landside levee toe must~~ shall have appropriate features ~~that~~to intercept seepage and prevent particle migration.

(e) Levee seepage control facilities (e.g., Seepage Berms, relief wells, toe drains, and toe ditches) ~~must~~shall meet the following requirements:

(1) The seepage control facilities ~~must~~shall be designed by a ~~civil engineer~~California registered civil engineer.

(2) All studies and calculations relating to design and maintenance of the seepage control facility ~~must~~shall be submitted to the ~~board~~Board with the Ppermit application.

(3) ~~The appropriate rights-of-way~~A setback for the seepage control facilities ~~must~~shall be included in the ~~levee~~Levee easements, consistent with the Levee Right of Way.

(f) See Figure ~~8.01~~8.02 for illustrated details, dimensions, and terminology for ~~levees~~Levees and ~~floodways~~Floodways.

~~(g) If a proposed project which includes levee~~(g) The Board may require installation of piezometers within the Levee and the Levee Right of Way in association with construction of a new Levee or reconstruction of a Levee, with requirements for monitoring and reporting piezometric readings. Piezometer design and installation shall be approved by the Board prior to installation. Board approval is required before abandoning a piezometer.

(h) The Levee to be constructed, raised, enlarged, or modified shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(i) If a proposed project which includes Levee improvements would result in substantial residential development within an area that without the ~~levee~~Levee improvements would be subject to the Federal Emergency Management ~~Agency s~~Agency's regulatory 100-year ~~flood plain~~floodplain constraints, the ~~board~~Board may require the ~~permittee~~Permittee to mitigate for any increased average annual flood damage by increasing the required level of flood protection provided by the ~~levee improvement~~proposed project, up to and including the ~~Standard Project Flood.~~200-year flood.

(j) The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact of Secondary Levees to be constructed, reconstructed, raised, enlarged, or modified within an

Adopted Plan of Flood Control. In such cases, the design standards in this Section are not required, but are advisable. The Board may deny a Permit if the hydraulic impact is deemed significant.
(k) The Board may waive or modify the requirements of this Section that conflict with other special Levee design requirements for Levees in the Delta outside of an Urban Criteria Area that are to be constructed, reconstructed, raised, enlarged, or modified within an Adopted Plan of Flood Control.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section and figure 8.~~01~~ 02 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).
2. Amendment of subsections (a)(5) and (a)(22) filed 12–1–2009; operative 12–31–2009 (Register 2009, No. 49).

(a) ~~Quarry stone, cobblestone, or their equivalent~~Riprap rock armoring may be used for erosion control along ~~rivers and streams~~Streams if the material meets the criteria below. Typical sections delineating methods of placement and dimensions of ~~revetment~~Revetment using rock ~~and sacked concrete~~ are shown in ~~Figures~~Figure 8.0~~3~~2 ~~and 8.03~~.

(1) Riprap rock armoring and bedding materials shall be designed by a California registered civil engineer.

(2) Bedding materials ~~must~~shall be placed under the stone protection at locations where the underlying soils require such material for stabilization, considering such factors as gradation of the stone protection, soil properties of the base material, tidal fluctuation, wave action, and ~~streamflow~~Stream flow velocity.~~Cobblestone protection must be placed on prepared slopes of three (3) feet horizontal to one (1) foot vertical or flatter.~~

(3) ~~Cobblestone protection, having acceptable cobblestone gradations, may be used where streamflow velocities ten (10) feet from the bank do not exceed eight (8) feet per second.~~ Riprap shall be composed of properly sized quarry stone or equivalent. Quarry stone should be durable and with an angular shape and a specific gravity of two and one-half (2-1/2) or greater. Quarry stone should not be thin or platy.

(4) ~~Quarry stone protection must~~Riprap shall be placed on prepared slopes or fill so that the finished slope of the rock Revetment is no steeper than ~~three (3) feet horizontal to one (1) foot vertical~~one and one-half (1.5) feet horizontal to one (1) foot vertical (1.5h:1v) unless a steeper slope is demonstrated to be stable to the satisfaction of the Board.

~~(5) Quarry stone protection, meeting required gradations and sizes, may be used at locations where streamflow velocities ten (10) feet from the bank do not exceed twelve (12) feet per second.~~

~~(6) Required gradations of cobblestone and quarry stone are as follows:~~

~~Cobblestone~~		~~Quarry stone~~	
~~*Stone Size*~~	~~*Percent Passing*~~	~~*Stone Size*~~	~~*Percent Passing*~~
~~15”~~	~~100~~	~~15”~~	~~100~~
~~10”~~	~~55 to 95~~	~~8”~~	~~80 to 95~~
~~8”~~	~~35 to 65~~	~~6”~~	~~45 to 80~~
~~6”~~	~~10 to 35~~	~~4”~~	~~15 to 45~~
~~3”~~	~~1 to 5~~	~~2”~~	~~0 to 15~~

~~(7) Graded cobblestone and quarry stone must~~(5) Quarry stone shall be placed in a manner which avoids segregation.

~~(8) Where streamflow velocities ten (10) feet from the bank exceed twelve (12) feet per second, special cobble or quarry stone gradation is required. Flow retarding structures, such as retards, wing dams, and rock groins may be permitted at these high streamflow velocity sites.~~

~~(9)~~(6) Alternative bank protection materials may be ~~permitted~~allowed by the ~~board~~Board. Possible alternatives include but are not limited to: ~~sacked concrete; broken concrete free of projecting steel;~~ reinforced concrete~~; precast concrete cribbing;~~, block units, biotechnical treatments, and stone ~~-~~-filled gabion baskets. A complete design by a California registered civil engineer shall be submitted to the Board for approval.

~~(10) Broken concrete used for levee revetment may be no larger than sixteen (16) inches at its maximum dimension.~~

~~(11)~~ (7) Asphalt or other petroleum-based products ~~may~~shall not be used either as fill or as erosion control on a ~~levee section~~Levee Section or within a ~~floodway~~Floodway.

(~~12~~8) The minimum thickness of ~~revetment is eighteen (18) inches~~Revetment shall be the larger of one and one-half (1-1/2) times D50 (rock diameter for which fifty (50) percent is finer by weight) or one (1) times D100 (rock diameter for which one hundred (100) percent is finer by weight) perpendicular to the bank or ~~levee~~Levee slope ~~below the usual water surface and twelve (12) inches~~ .

(9) The Revetment shall extend a minimum of two (2) feet above the ~~usual surface~~Design Water Surface Elevation where feasible.

~~(13) Revetment must~~

(10) If bank erosion is anticipated to occur at the toe of the Revetment, the toe of the Revetment shall be properly keyed to the maximum expected scour depth. If a toe key cannot be placed, a mounded toe shall be designed in such a manner as to be launchable (EM 1110-2-1601) if erosion occurs.

(11) Revetment shall be uniformly placed and ~~properly~~gradually transitioned into the bank, ~~levee~~Levee slope, or adjacent ~~revetment~~Revetment.

(b) When ~~revetment~~Revetment is proposed by an applicant but not required by the ~~board~~Board, the standards relating to ~~revetment~~Revetment bedding, gradation, size, shape, and thickness are recommended but not required.

(c) Revetment placed by a Local Maintaining Agency to repair erosion damage to a Stream bank or Levee may be considered Maintenance Activities.

(d) The Revetment shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section and figures 8.~~02~~ 03 ~~and 8.03~~ filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) Irrigation ditches, drainage ditches, detention and retention ponds, and similar facilities must satisfy the following criteria:

(1) All ditches ~~must~~and ponds shall be located ~~at least ten (10) feet from the levee toe~~outside of the Levee Right of Way.

(2) The bottom of any ~~agricultural~~ ditch or pond landward of the Levee must be located above ~~the~~a 10h:1v slope projected ~~levee slope. Accordingly, a deep~~downward from the landside Levee Toe, Seepage Berm toe, or Stability Berm toe unless a geotechnical analysis demonstrates that the ditch or pond will not adversely impact the integrity of the Levee.

(3) For any ditch ~~may need to be located farther than~~or pond within four hundred (400) feet of the ~~minimum ten (10) feet from~~landside Levee Toe, appropriate seepage modeling shall be performed to demonstrate that the ~~levee toe. (See Figure 8.01.)~~ditch or pond excavation does not result in a configuration whereby the Levee and/or Seepage Berm or Stability Berm does not meet design criteria. The modeling shall assume the ditch or pond is empty unless adequate assurances of a water level in the ditch or pond are provided to the Board and the bottom of the ditch is visible and accessible for inspection of potential boils during high water. The Board may waive this seepage modeling requirement for a temporary ditch or pond or for a minor, shallow ditch or pond that, in the judgment of the Board, poses no risk to the integrity of the Levee.

(4) In Urban Criteria Areas, the seepage modeling shall include evaluation of performance for the Stream stage at the Hydraulic Top of Levee and comply with Levee underseepage requirements of the Urban Levee Design Criteria.

(b) Tile drains, septic systems, and similar facilities must satisfy the following criteria:

(1) ~~All tile~~Tile drains, septic ~~tanks, or leach fields~~systems, and similar facilities must be ~~located~~designed to maintain Levee safety for all seepage and stability conditions and must be located outside of the Levee Right of Way. Where other alternatives for location/features exist, these improvements shall be avoided within at least ~~ten (10~~fifty (50) feet from the ~~levee toe~~Levee Toe.

(2) The bottom of any tile drain, septic tank, or leach field must be located above ~~the~~a 10h:1v slope projected ~~levee slope~~downward from the nearest Levee Toe, Seepage Berm toe, or Stability Berm toe unless a geotechnical analysis demonstrates that the tile drain, septic tank, or leach field will not adversely impact the integrity of the Levee. Appropriate seepage modeling shall be performed to verify the excavation does not result in a configuration whereby the Levee or Seepage Berm or Stability Berm does not meet design criteria, including the Urban Levee Design Criteria in Urban Criteria Areas.

(3) Positive closure valves may be required on a tile drain pipeline to prevent backflow.

Note:

Authority cited: Section 8571, Water Code.

Reference:

Sections 8608 and 8710, Water Code.

History:

1. New section filed 9-30-96; operative 10-30-96 (Register 96, No. 40).

~~(a) The following definitions apply to this section:~~
~~(1) Delta Lowlands. "Delta Lowlands" means those lands within the Sacramento-San Joaquin Delta that are approximately at the five-(5) foot contour and below as shown in Figure 8.04.~~
~~(2) Delta Uplands. "Delta Uplands" means those lands within the Sacramento-San Joaquin Delta that are above the five-(5) foot contour as shown in Figure 8.04.~~
~~(b) Pipelines, conduits, utility lines, and appurtenant structures must conform to the following criteria:~~
~~(1)) Pipelines, conduits, utility lines, utility poles, and appurtenant structures may not be installed within the levee section, within ten (10) feet of levee toes, or within the floodway during the flood season unless authorized by the General Manager based on reservoir levels, stream levels, and forecasted weather conditions on a case-by-case basis, pursuant to section 11.~~
~~(2) Appurtenant structures such as standpipes, utility poles, distribution boxes, guy wires, and anchors, but not including siphon breakers, are generally not permitted in or below the levee crown, on the levee slopes, or within ten (10) feet of the levee toes. Appurtenant structures may be permitted where they will not interfere with levee maintenance or flood fight activities.~~
~~(3) Appropriate, visible markers acceptable to the local maintaining agency may be required to identify the location of buried pipelines, conduits, and utility lines. A siphon breaker or other visible appurtenance may be considered an acceptable marker for the attached buried line. Markers must be made of durable, long lasting, fire-resistant material, and must be maintained by the permittee until the pipeline, conduit or utility line is properly abandoned.~~
~~(4) Pipelines, conduits, and utility lines that pose a threat or danger to levee maintenance or flood fight activities, such as high voltage lines, gas lines, and high pressure fluid lines, must be distinctively labeled to identify the contents.~~
~~(5) Buried high-voltage lines of greater than twenty-four (24) volts are required to be protected with schedule 40 PVC conduit, or equivalent.~~
~~(6) Overhead electrical and communication lines must have a minimum vertical clearance above the levee crown and access ramps of twenty-one (21) feet for lines carrying 750 volts or less, and twenty-five (25) feet for lines carrying higher voltage.~~
~~(7) Fluid- or gas-carrying pipelines installed parallel to a levee must be a minimum distance of ten (10) feet from the levee toe and, where practical, may not encroach into the projected levee slope.~~
~~(8) Low-voltage electrical or communication lines of twenty-four (24) volts or less may be installed parallel to a levee and within ten (10) feet of the levee toe when it is demonstrated to be necessary and to not interfere with the integrity of levee, levee maintenance, inspection, or flood fight procedures.~~
~~(9) The board may require the applicant to have any pipelines, conduits, utility lines and appurtenant structures designed by a registered civil engineer.~~
~~(c) Pipelines, conduits, and utility lines installed within the floodway must conform to the following additional conditions:~~
~~(1) Pipelines, conduits, and utility lines installed within the floodway must have a minimum cover of five (5) feet beneath the low-water channel, and a minimum of two (2) feet in the remaining area of the floodway. A greater depth of cover may be required based upon the feasibility of achieving the required cover or local soil stability and channel hydraulics.~~
~~(2) Open-trench backfill to cover pipes must be placed in a manner consistent with floodway characteristics such as erosion, deposition, and streamflow velocities. This requirement is~~

~~generally ensured by using suitable material and compacting to the density of adjacent undisturbed material. Compaction tests by a certified oils aboratory may be required.~~
~~(3) In general, any standard material may be used for pipelines or conduits to be installed within the floodway ten (10) feet or more from the levee toe or the projected levee slope.~~
~~(4) All debris that accumulates around utility poles and guy wires within the floodway must be completely removed following the flood season and immediately after major accumulations.~~
~~(5) Pipelines and conduits which are open to the waterway and which could cause flood damage from uncontrolled backflow during the design flood event shall have a readily accessible positive closure device. A flap gate is not a positive closure device.~~
~~(d) Pipelines, conduits, and utility lines installed through a levee must conform to the following additional conditions:~~
~~(1) The installation of a fluid- or gas- carrying pipeline in a levee section or within ten (10) feet of the toe parallel to the centerline is not permitted.~~
~~(2) Pipelines, conduits, and utility lines must be installed through a levee as nearly at a right angle to the levee centerline as practical.~~
~~(3) Buried pipelines, conduits, and utility lines that do not surface near the levee toes must have location markers near both levee toes.~~
~~(4) Buried pipelines, conduits, and utility lines that cross the levee at right angles must have a location marker located on the levee slope adjacent to either shoulder.~~
~~(5) Buried pipelines, conduits, and utility lines that cross the levee at other than right angles must have location markers on the levee slopes adjacent to each shoulder.~~
~~(6) Pipelines carrying gas or fluids under pressure must be confirmed free of leaks during construction by pressure tests, X-ray, or equivalent methods, and must be tested anytime after construction upon request of the board.~~
~~(7) Pipelines carrying gas or fluids under pressure must have a readily accessible rapid closure device located within ten (10) feet of the landside levee toe.~~
~~(8) Pipelines and conduits open to the waterway must have a readily accessible positive closure device unless it can be demonstrated it is not necessary. A flap gate is not a positive closure device.~~
~~(9) The side slopes of trenches excavated for the installation of pipelines, conduit, or utility lines may be no steeper than one (1) foot horizontal to one (1) foot vertical. The following are exceptions to this maximum slope requirement:~~
~~(A) For shallow installations above the flood plane, e.g., twelve (12) inches, vertical side slopes may be allowed.~~
~~(B) For that portion of the trench above the design freeboard, vertical side slopes may be allowed.~~
~~(10) The bottom width of trenches excavated for the installation of a pipeline, conduit, or utility line must be two (2) feet wider than the diameter of the pipeline or conduit, or two (2) times the pipe diameter, whichever is greater.~~
~~(11) The minimum cover for pipelines, conduits, and utility lines installed through the levee crown is twenty-four (24) inches. If it becomes necessary to raise a levee crown to provide minimum cover, the longitudinal slope of the crown must be a minimum of ten (10) feet horizontal to one (1) foot vertical. Where twenty-four (24) inches of cover is not practical, a concrete or other engineered cover is required.~~
~~(12) The minimum cover for pipelines, conduits, and utility lines installed within the levee slope is twelve (12) inches. Where the installation will not interfere with levee maintenance or flood fight activities, it may not be necessary to bury the line within the levee slopes.~~

~~(13) When practical, pipelines, conduits, and utility lines installed within a levee section must be separated from parallel pipelines, conduits, and utility lines by a minimum of twelve (12) inches, or the diameter of the largest pipeline, conduit, or utility line, whichever is larger, to a maximum of thirty-six (36) inches.~~

~~(14) When practical, pipelines, conduits, and utility lines must have a minimum vertical spacing of six (6) inches when crossing other pipelines, conduits, or utility lines.~~

~~(15) A siphon breaker with a protective housing may be required and must be installed off the levee crown roadway where it will not interfere with levee maintenance.~~

~~(16) Electrical and communication lines installed through a levee or within ten (10) feet of a levee toe must be encased in schedule 40 PVC conduit or equivalent. Low-voltage lines (24 volts or less) and fiber optic cable may be allowed without conduit if properly labeled.~~

~~(17) A standard reinforced concrete U-wall for levee erosion protection is required at the outlet end of a pipeline or conduit discharging within ten (10) feet of a levee toe. See Figures 8.05 and 8.06 for U-Wall design criteria.~~

~~(18) Existing levee erosion protection must be restored by the permittee if it is damaged during the installation of a pipeline, conduit, or utility line.~~

~~(19) The permittee must replant or reseed levee slopes to restore sod, grasses or other nonwoody ground covers that are destroyed or damaged during the installation of a pipeline, conduit, or utility line.~~

~~(20) Within the levee section or within ten (10) feet of levee toes, any excavation for the installation of a pipeline, conduit, or utility line must be backfilled in four (4) to six (6) inch layers with approved material and compacted to a relative compaction of not less than ninety (90) percent, per ASTM D1557-91, dated 1991, which is incorporated by reference and above optimum moisture content or ninety-seven (97) percent, per ASTM D698-91, dated 1991, which is incorporated by reference and at or above optimum moisture content. Compaction tests by a certified soils laboratory will be required to verify compaction of backfill within a levee.~~

~~(21) Boring a pipeline or conduit through a levee is permitted if the following additional conditions are met:~~

~~(A) The invert of the pipeline or conduitmust be located at least three (3) feet above the design flood plane.~~

~~(B) The pipeline or conduit must be butt-welded. Polyethylene pipes may be used as provided in subdivisions (f)(4)(A), (f)(4)(B), and (f)(4)(C) of this section.~~

~~(C) The pipeline or conduit must be installed by the bentonite boring method orequivalent. The bentonite boring method uses an auger followed by a pipe with multiple port openings through which a bentonite slurry is pumped to ensure sealing of any voids resulting from the boring process.~~

~~(e) Pipelines, conduits, and utility lines may be installed by the open cut method through a levee below the design flood plane, or within the levee foundation under the following conditions:~~

~~(1) One or more of the following conditions must apply:~~

~~(A) The pipeline, conduit, or utility line will be maintained by a public agency with a history of good maintenance based upon annual maintenance or inspection reports.~~

~~(B) The levee is designed to withstand a depth of less than six (6) feet of water measured with respect to the elevation of the landside levee toe.~~

~~(C) The levee is designed to withstand a depth of less than twelve (12) feet of water measured with respect to the elevation of the landside levee toe and provides flood protection for a rural area, or an area where the board anticipates little future urban development.~~

~~(2) Pipelines open to the waterway must be a minimum of thirty (30) inches in diameter, and must have a readily accessible positive closure device installed on the waterward side.~~
~~(3) Seepage along pipelines, conduits, and utility lines must be prevented by either of the following methods:~~
~~(A) The pipeline, conduit, or utility line is encased in reinforced concrete cast against firm undisturbed earth.~~
~~(B) The conduit has reinforced concrete battered walls at an inclination of one (1) foot horizontal to four (4) feet vertical or flatter.~~
~~(4) The work must commence and be completed prior to the flood season.~~
~~(5) Levees located within the Sacramento–San Joaquin Delta lowlands may only be cut below the design flood plane after appropriate engineering studies are performed and approved.~~
~~(f) Pipelines, conduits, and utility lines may be installed under a levee or stream channel by tunneling, jacking, or boring, if the following conditions are met:~~
~~(1) The pipeline, conduit, or utility line is at least thirty (30) feet under the levee.~~
~~(2) The pipeline, conduit, or utility line is verified to have the required cover. A greater depth of cover may be required based upon the feasibility of achieving the required cover or on local soil stability and channel hydraulics.~~
~~(3) If the installation is to be more than fifty (50) feet below the levee and the entire floodway and streambed, the board may waive the requirement for a permit provided a letter of intent is filed with the board prior to commencement of the project.~~
~~(4) The portal and outlet of a tunnel, jacking, or boring must be a minimum distance of ten (10) feet beyond the projected levee slope without an approved stability and analysis.~~
~~(5) Installation may occur during the flood season and when the water surface elevation in the floodway is expected to be above the elevation of the landside levee toe if adequate containment cells are constructed at the portal and outlet.~~
~~(6) The installation of a pipeline, conduit, or utility line under levees in the Sacramento–San Joaquin Delta lowlands requires adequate containment cells at the portal and outlet when the installation is less than fifty (50) feet below the streambed and levee toes.~~
~~(7) Pipelines carrying gas or fluids under pressure below a levee must have provision for rapid closure.~~
~~(8) Pipelines and conduits open to the waterway and below a levee must have a positive closure device which is accessible at all times unless it is demonstrated to be unnecessary. A flap gate is not a positive closure device.~~
~~(g) The following pipe materials are allowed within a levee section when designed to resist all anticipated loading conditions and properly installed:~~
~~(1) Galvanized iron pipe is allowed if all joints are threaded. Galvanized iron pipe joints must be corrosion protected with PVC tape or polyethylene tape wrapped to a thickness of thirty (30) mils or equivalent.~~
~~(2) Schedule 80 polyvinyl chloride (PVC) pipe is allowed if it is entirely buried, all joints are threaded and the components were continually protected from ultraviolet radiation damage or were newly manufactured.~~
~~(3) Polyvinyl chloride (PVC) plastic pipe schedule 40, or better, may be used as a conduit for power or communication cables.~~
~~(4) High–density polyethylene pipe may be used for pipeline or conduit installations provided the following conditions are met:~~

~~(A) High-density polyethylene pipeline or conduit joints must be heat or electrofusion welded (ASTM Standard F1055-93, dated 1993 or D3261-93, dated 1993 which is incorporated by reference).~~
~~(B) High-density polyethylene pipelines and conduits must be designed to resist all anticipated loading conditions, and the design calculations must be submitted to the board.~~
~~(C) High-density polyethylene pipelines and conduits must be ultraviolet radiation protected.~~
~~(5) Cast-in-place reinforced concrete pipes and box culverts may be used above and below the design flood plane if the concrete is at least six (6) inches thick.~~
~~(6) Precast reinforced concrete pipes and box culverts and concrete cylinder pipes may be used above and below the design flood plane if the following conditions are met:~~
~~(A) Precast reinforced concrete pipe meets ASTM Specification C76-90, dated 1990 which is incorporated by reference.~~
~~(B) Precast reinforced concrete pipe joints and precast box culvert joints are encased in reinforced concrete cast-in-place against firm undisturbed earth.~~
~~(C) The cylinders of concrete cylinder pipes are welded and corrosion protected internally and externally.~~
~~(D) When installed below the design flood plane, precast reinforced concrete pipe and concrete cylinder pipe must be encased below the springline in concrete cast against undisturbed earth.~~
~~(7) Steel pipe may be used for all types of pipeline or conduit installations through a levee above the design flood plane if the pipe meets the following requirements:~~
~~(A) The steel pipe is resilient and not materially reduced in quality due to weathering, prior use or other deteriorating conditions.~~
~~(B) The steel pipe joints are butt-welded or threaded.~~
~~(C) The steel pipe installations are corrosion-proofed externally with a coating of material such as coal-tar enamel, asphalt-dipped wrap, mortar, PVC tape, or polyethylene tape wrapped to a thickness of thirty (30) mils, high solids epoxy, or equivalent.~~
~~(D) Unless a continuous internal lining of cement, mortar, or equivalent is provided, as appropriate for the fluid to be conveyed, new steel pipe installations may convey only non-corrosive material, and water is considered corrosive.~~
~~(E) Steel pipe installations must be designed to resist all anticipated loading conditions, and the design calculations must be submitted to the board. Steel pipe meeting the following criteria may be used without submittal of design calculations to the board:~~
~~(i) Twelve-(12) inches in diameter or less ten-(10) gauge steel pipe.~~
~~(ii) Greater than twelve-(12) inches and a maximum of thirty-(30) inches in diameter seven-(7) gauge steel pipe.~~
~~(iii) Greater than thirty-(30) inches and a maximum of forty-eight (48) inches in diameter three-(3) gauge steel pipe.~~
~~(h) The following materials are not allowed for pipelines or conduits used to carry natural gas or fluids:~~
~~(1) Aluminum pipe within a levee section or within ten (10) feet of levee toes.~~
~~(2) Cast iron pipe within a levee section or within ten (10) feet of levee toes.~~
~~(3) Pipe with flanges, flexible couplings, or other mechanical couplings within a levee section or within ten (10) feet of levee toes.~~
~~(4) Prestressed concrete pipe within a levee section or within ten (10) feet of levee toes.~~**~~Note:~~**
~~Authority cited: Section 8571, Water Code~~

~~**Reference:**~~
~~Sections 8608, 8710 and 8712, Water Code~~

~~**History:**~~
~~1. New section and figures 8.04, 8.05 and 8.06 filed 9-30-96; operative 10-30-96 (Register 96, No. 40).~~

(a) The following definition applies to this Section:

(1) "Delta Lowlands" means those lands within the Sacramento–San Joaquin Delta that are approximately at the five (5) foot contour and below as shown in Figure 8.04.

(b) Pipelines, conduits, utility lines, and appurtenant structures shall conform to the following general criteria:

(1) In general, the installation of pipelines, conduits, and utility lines parallel to the Levee is not allowed within the Levee Right of Way, except when installed within or on an authorized structure, such as a pump station.

(2) Pipelines, conduits, utility lines, utility poles, and appurtenant structures shall not be installed within the Levee Right of Way, or within the Floodway during the Flood Season unless authorized by the Executive Officer pursuant to Section 112 of this Division.

(3) Appurtenant structures such as standpipes, utility poles, distribution boxes, guy wires, and anchors are generally not allowed in the Levee Right of Way. Appurtenant structures may be allowed where they will not interfere with Levee Maintenance Activities or flood fight activities.

(4) Appropriate visible markers, such as a metal post with paddle, acceptable to the Local Maintaining Agency shall be required to identify the location of buried pipelines, conduits, and utility lines. Markers shall be made of durable, long lasting, fire-resistant material, and shall be maintained by the Permittee until the pipeline, conduit or utility line is properly removed or abandoned. The Local Maintaining Agency may also require the Permittee to record information on the marker, including but not limited to, Encroachment identification, date of installation, contents, contact information, date of last exercise of any closure device, and date of last inspection or pressure test.

(5) Pipelines, conduits, and utility lines that pose a threat or danger to Levee maintenance or flood fight activities, such as high-voltage lines, gas lines, and high pressure fluid lines, shall be distinctively labeled to identify the contents.

(6) Overhead electrical and communication lines shall have a minimum vertical clearance above the Levee Crest Elevation, Patrol Roads, and Access Ramps of twenty one (21) feet for lines carrying 750 volts or less, and twenty five (25) feet for lines carrying higher voltage.

(7) Fluid or gas carrying pipelines parallel to a Levee shall be installed outside of the Levee Right of Way.

(8) Low–voltage electrical or communication lines of twenty four (24) volts or less may be installed parallel to a Levee within the Levee Right of Way, but beyond fifteen (15) feet waterward of the waterside Levee Toe and twenty (20) feet landward of the landside Levee Toe, when it is demonstrated to be necessary and to not interfere with the integrity of Levee, Levee maintenance, inspection, flood fight procedures, and future planned uses of the Levee Right of Way. Such lines shall be protected within a conduit and encased in concrete or Controlled Low Strength Materials (CLSM) with a minimum thickness of four (4) inches or one-half (1/2) times the conduit exterior diameter, whichever is greater.

(9) The Board shall require the applicant to have any pipelines, conduits, utility lines and appurtenant structures designed by a California registered civil engineer.

(10) All gravity drains, conduits, and utility lines installed within the Levee Right of Way shall be periodically visually inspected no less frequently than every five (5) years. Pressurized pipelines shall be periodically pressure tested no less frequently than every five (5) years against the same benchmark that was set for pressure testing during construction (typically one hundred twenty five (125) percent or more of the design working pressure). With justification satisfactory to the Board, pressurized pipelines may be visually inspected, no less frequently than every five (5) years, instead of pressure tested. Visual inspection of the pipeline interior may be accomplished with an inspector or a camera. Alternative methods for inspection and testing may be approved by the Board for pipelines that do not contain water and would be difficult to inspect by camera, or that would present a hazard if the pipe were to leak during a pressure test (e.g., a petroleum pipeline). Visual inspection of the exterior shall include all exposed areas and should include sample representative areas where the pipeline is in contact with soil. The Board may also require a visual inspection and/or pressure test in response to an unplanned event that may have compromised the integrity of the pipeline, such as evidence of potential damage from vandalism, Levee slope instability, or settlement. A report of the results of inspection and any tests shall be provided to the Board and signed by a California registered civil engineer or a pipeline inspector certified through the National Association of Sewer Service Professionals Pipeline Assessment Certification Program. For pressurized pipelines, conduits, and utility lines within or on Dwellings and structures authorized by the Board within the Levee Right of Way, the Board may waive or reduce these requirements for periodic visual inspection and/or pressure testing.

(11) Permits for gravity drains, pressurized pipelines, conduits, and utility lines within the Levee Right of Way shall be subject to revocation after the date of required inspection and/or pressure test if the inspection and/or pressure test has not been performed, if the report of the inspection and/or pressure test has not been provided to the Board, or if the inspection and/or pressure test revealed a deficiency and that deficiency has not been repaired and documented in a report signed by a California registered civil engineer or a pipeline inspector certified through the National Association of Sewer Service Professionals Pipeline Assessment Certification Program. If the report is not provided to the Board within one (1) year after the date of required inspection and/or pressure test and the Permit has not been revoked or otherwise acted upon by the Board, the Permit automatically expires. Once the Permit has been revoked or has expired, the pipeline, conduit, or utility line shall be removed or properly abandoned by the Permittee at Permittee's expense pursuant to the requirements of Section 124 of this Division, unless the Permittee applies for a new Permit and such Permit is granted. Removal shall be accomplished under supervision of the Board after providing written notice to the Board. Removal shall be performed within ninety (90) days after the Permit is expired, but may occur later with Board approval, such as to avoid excavation in the Levee during the Flood Season. If the Permittee does not remove the pipeline, conduit, or utility line as required by the Board, the Board will remove the Encroachment at the Permittee's expense.

(12) The Board Permit approving the construction or modification of a pipeline, conduit, or utility line within the Levee Right of Way shall run with the land, pursuant to a recorded document executed pursuant to Section 16(f) of this Division. Upon transfer of title of the land, the land owner relinquishing title is responsible to provide written notification to the Board of the title transfer and the new land owner's name and address.

(13) All pipes and structures related to the piping system (e.g., sumps, distribution boxes, etc.) shall be analyzed during design for uplift based on hydraulic gradients determined pursuant to EM 1110-2-1913 using the appropriate water surface elevation(s) pursuant to Section 120(a)(2)(A) of this Division.

(14) Plastic pipe is not allowed within the Levee Section or foundation unless it is encased in concrete, a minimum thickness of four (4) inches or one-half (1/2) times the pipe exterior diameter, whichever is greater. Electrofusion butt welded high-density polyethylene is considered to be plastic for purposes of this requirement.

(15) Plastic pipe and high-density polyethylene pipe within and on the Levee Section shall be protected from being damaged by fire, in areas where the Levee is subject to maintenance burning or wildfires.

(16) A new Permit may be required for installing a liner inside of an existing pipeline, conduit, or utility line if the existing pipeline, conduit, or utility line has a Permit or should have a Permit. The new Permit may establish new conditions consistent with Board Standards. The method of installing the new liner is subject to Board approval and must be appropriate for the demonstrated integrity of the existing pipe and fill all significant voids between the liner and existing pipe without causing damage to the Levee.

(17) The pipelines, soil cover, Revetment, and related structures shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(c) Pipelines, conduits, and utility lines installed within the Floodway shall conform to the following additional conditions:

(1) Pipelines, conduits, and utility lines installed within the Floodway off the Levee Section shall be buried with a depth of cover as determined by a scour analysis performed by a California registered civil engineer. Minimum covers of five (5) feet beneath the Low Water Channel, and two (2) feet in the remaining area of the Floodway are required. As determined from the scour analysis, the same cover as provided beneath the Low Water Channel shall be maintained beyond the Low Water Channel for an appropriate distance, but not less than ten (10) feet, transitioning to the depth of cover required in the remaining area of the Floodway. A greater depth of cover may be required in the remaining area of the Floodway based upon the feasibility of achieving the required cover or local soil stability and channel hydraulics.

(2) Open trench backfill to cover pipes shall be placed in a manner consistent with Floodway characteristics such as erosion, deposition, and Stream flow velocities. This requirement is generally ensured by using suitable material and compacting to at least the density of adjacent undisturbed material, or ninety (90) percent as per ASTM D698 with moisture content within minus one (-1) percent to plus three (+3) percent of optimum, or eighty eight (88) percent as per ASTM D1557 with the moisture content within zero (0) percent to plus four (+4) percent of optimum, or equivalent. Field density testing by an Approved Soils Testing Laboratory shall be required to confirm the minimum relative compaction of trench backfill.

(3) In general, any standard material may be used for pipelines or conduits to be installed within the Floodway fifteen (15) feet or more waterward of the waterside Levee Toe, or the waterside toe of the Projected Levee Section if the location of the waterside Levee Toe is not evident.

(4) All debris that accumulates around utility poles and guy wires within the Floodway shall be completely removed following the Flood Season and immediately after major accumulations.

(d) Pipelines, conduits, and utility lines crossing over, through, or under a Levee shall conform to the following additional conditions:

(1) Pipelines, conduits, and utility lines shall be installed over or through a Levee as nearly at a right angle to the Levee centerline as practical.

(2) Buried pipelines, conduits, and utility lines that do not surface near the Levee Toes shall have location markers near both Levee Toes.

(3) Buried pipelines, conduits, and utility lines that cross the Levee at right angles shall have a location marker located on the Levee slope adjacent to either shoulder. The markers should include Permit information, date installed, owner, and contact information for emergencies.

(4) Buried pipelines, conduits, and utility lines that cross the Levee at other than right angles shall have location markers on the Levee slopes adjacent to each shoulder. At least one of these markers shall include Permit information, date installed, owner and contact information for emergencies.

(5) The invert of all pipelines shall be above the Levee crown, with exceptions for the following situations:

(A) Where the Levee crown has additional fill that has been placed on top of the designed Levee Section, the pipeline may be placed within such fill.

(B) Where a railroad line or paved public roadway for motor vehicle travel occupies the Levee crown, the invert of the pipeline may be placed below the Levee crown to the minimum extent required for establishing adequate cover, but in no case shall the pipeline invert be placed below the Design Water Surface Elevation. In order to minimize the depth of cover, a reinforced concrete cover or other engineered cover is required.

(C) Where the pipeline will serve as a gravity drain pursuant to Section 123(e) of this Division or be installed under the Levee pursuant to Section 123(f) of this Division.

(6) All pressurized pipelines shall have a positive closure device, except for pipelines open to the Stream with the pipeline invert above the Levee crown. For pipelines open to the Stream that have the pipeline invert below the Levee crown, the closure device shall be located at the waterside edge of the Levee crown, so that it is accessible during high water. Manually operated closure devices for pressurized pipelines not open to the Stream, particularly gas lines, shall be located landward of the Levee outside of the Levee Right of Way but no further than one hundred (100) feet from the landside Levee Toe and clearly labeled for contents. Closure devices on pipelines installed by horizontal directional drilling shall be located no farther from the Levee than the nearest points of entry and exit used for installation. Closure devices that can be controlled remotely must be located a reasonable distance from the landside Levee Toe, acceptable to the Board. Closure instructions and any necessary equipment and keys shall be provided to the Local Maintaining Agency, if requested.

(7) Pressurized pipelines shall be confirmed free of leaks during construction by pressure tests, X–ray, or equivalent methods, and shall be tested at the end of construction, or any time necessary, upon request of the Board. Access to the interior of the pipeline for performing periodic pressure tests in subsequent years shall be provided so as to confine the tests to the length of pipeline within the Levee Right of Way.

(8) Backfill for pipelines crossing over the Levee shall be compacted fill, concrete, or CLSM. No anti-seepage collars shall be allowed.

(9) Pipelines on a Levee slope shall be provided with a minimum twelve (12) inches of soil cover locally on the Levee slope which shall be transitioned horizontally to 10:1 slopes (see

Figure 8.05), except where leaving the pipeline exposed on the landside Levee slope is acceptable to the Local Maintaining Agency.

(10) The minimum pipeline cover over or through the Levee crown is twenty- four (24) inches. It is usually necessary to increase the height of the Levee crown to provide the minimum cover, with a gradual transition of fill and Patrol Road surfacing along the longitudinal slope of the crown that is no steeper than 10h:1v. Where twenty four (24) inches of cover is not practical, a reinforced concrete cover or other engineered cover is required (see Figure 8.05).

(11) The slopes of trench walls excavated for the installation of pipelines, conduits, or utility lines that will be backfilled with compacted soil shall be constructed no steeper than 1h:1v, or flatter if required for worker's safety. This requirement does not apply where the backfill will be concrete or CLSM, unless required for worker's safety.

(12) The bottom width of trenches excavated for the installation of a pipeline, conduit, or utility line shall be a minimum of two (2) feet wider than the exterior diameter of the pipeline, conduit, or utility line or two (2) times the exterior diameter of the pipeline, conduit, or utility line, whichever is greater, unless concrete or CLSM is used. If concrete or CLSM is used for backfill, the required width shall be a minimum of eight (8) inches wider than the exterior diameter of the pipeline, conduit, or utility line or two (2) times the exterior diameter of the pipeline, conduit, or utility line, whichever is greater; but the maximum required width is four (4) feet wider than the exterior diameter of the pipeline, conduit, or utility line.

(13) Pipelines, conduits, and utility lines shall have a minimum vertical clearance of six (6) inches between them when crossing other pipelines, conduits, or utility lines.

(14) Pipelines, conduits, and utility lines installed parallel to each other on or within a Levee Section shall be separated with a minimum horizontal clearance of twelve (12) inches, or the exterior diameter of the largest pipeline, conduit, or utility line, whichever is larger.

(15) Pressurized pipelines crossing over the Levee or within the Levee above the Design Water Surface Elevation shall be limited to coated steel and high-density polyethylene unless it can be shown to the satisfaction of the Board that the preferred pipe material is equivalent or superior.

(16) Steel pipelines shall have butt–welded connections, except at structures and except that a minimal number of flexible bolted joints may be allowed for steel pipelines in Levees expected to experience significant settlement after installation of the pipeline (e.g., new Levees, and Levees recently raised or enlarged). A report prepared by a California registered civil engineer shall be submitted for the Board's approval that justifies the need for the flexible bolted joints and estimates expected settlement of the Levee and pipeline, and deflections at the bolted joints.

(17) Steel and high-density polyethylene pipeline connections at structures shall be designed to accommodate deflection and differential settlement without leaking.

(18) High-density polyethylene pipeline joints must be electrofusion butt welded (ASTM Standard F1055-16a, dated 2016, or equivalent).

(19) All pressurized pipelines open to the Stream shall have a siphon breaker with protective housing. The siphon breaker shall be located off the Levee crown roadway near the waterside Levee shoulder.

(20) Electrical lines of greater than twenty- four (24) volts are required to be protected with schedule 40 PVC conduit, or equivalent, encased in concrete with a minimum thickness of four (4) inches or one-half (1/2) times the conduit exterior diameter, whichever is greater.

(21) Electrical and communication lines buried within the Levee Right of Way shall be protected within a conduit and encased in concrete or CLSM with a minimum thickness of four (4) inches or one-half (1/2) times the conduit exterior diameter, whichever is greater.

(22) Existing Levee erosion protection shall be restored by the Permittee if it is damaged during the installation of a pipeline, conduit, or utility line.

(23) The Permittee shall provide for replanting or reseeding Levee slopes to restore sod, grasses, or other non-woody ground covers that are destroyed or damaged during the installation of a pipeline, conduit, or utility line.

(24) The Permittee shall provide for restoring the Levee crown surfacing damaged by the installation of a pipeline, conduit, or utility line.

(25) Within the Levee Right of Way any excavation for the installation of a pipeline, conduit, or utility line shall be backfilled in less than six (6) inch layers with approved material and compacted as per Section 120(a) of this Division, except for backfill accomplished with concrete or CLSM.

(26) No new pipeline penetrations shall be installed through a seepage cutoff wall below the Design Water Surface Elevation.

(e) Gravity drain pipelines crossing the Levee may be installed by the open cut method through a Levee or within the Levee foundation and shall conform to the following additional conditions:

(1) The pipeline shall be maintained by a public agency that can demonstrate good long-term capability for maintenance of the pipeline.

(2) Gravity drain pipelines shall be constructed of reinforced concrete and equipped with a sluice gate or equivalent positive closure device at the waterside edge of the Levee crown and a flap gate at the waterside outlet.

(3) Seepage along gravity drain pipelines shall be controlled by constructing a minimum eighteen (18) inch thick drainage layer around the landside one third (1/3) of the length of the pipeline where landside levee zoning does not provide for such drainage fill , constructed in accordance with EM 1110-2-1913 and EM 1110-2-2902. The drainage layer shall have sufficient permeability to convey seepage and filter compatibility with adjacent Levee and/or foundation materials that it contacts. If a zoned drainage layer is required to achieve this, each layer shall be a minimum of nine (9) inches thick. The terminus of the drainage layer near the landside Levee Toe shall be designed and constructed to allow seepage to exit freely without transporting particles, and to prevent long term contamination of the drainage material. Seepage along the waterward two thirds (2/3) of the pipeline shall be controlled by any of the following methods:

(A) The pipeline is encased in reinforced concrete cast against firm undisturbed earth.

(B) The pipeline is encased in reinforced concrete battered walls at an inclination of one (1) horizontal to four (4) vertical or flatter to facilitate compaction of soil against the structure.

(C) The pipeline is made of reinforced concrete pipe, backfilled with CLSM placed against undisturbed earth to at least one (1) foot above the top of the pipeline.

(4) The Permitted Work shall commence and be completed prior to the Flood Season unless a Time Variance Request is approved by the Chief Engineer.

(5) Levees located within the Delta Lowlands may only be cut below the Design Water Surface Elevation after appropriate engineering studies are performed and approved.

(f) Pipelines, conduits, and utility lines crossing a Stream channel and/or a Levee by tunneling, jacking, or boring (boring is also known as horizontal directional drilling) under the Stream channel and/or under the Levee embankment, shall meet the following additional conditions:

(1) The pipeline, conduit, or utility line shall not pass through the Levee embankment using tunneling, jacking, or boring.

(2) Installation of pipelines, conduits, or utility lines through a Levee foundation or other flood control project feature foundation shall be designed by a California registered civil engineer. The design shall include an analysis of the pipe's ability to sustain installation load and long-term loads. The design shall comply with EM 1110-2-1913 and the following requirements:

(A) The pipeline, conduit, or utility line installed by tunneling or jacking shall be at least thirty (30) feet under the Levee embankment. Borings shall be a minimum of fifty (50) feet below the Levee embankment and channel unless less depth is justified with a geotechnical analysis, but the depth shall not be less than thirty (30) feet. Greater than fifty (50) feet depth may be required for borings over two thousand (2,000) feet long or when installed in adverse ground conditions.

(B) Detailed subsurface investigations shall be performed along the proposed tunneling, jacking, or boring site to determine the stratigraphy and the parameters including the limiting pressures, setback distances, and depth of cover.

(C) Grout improvements and dewatering plans associated with the pipe installation shall be designed by a California registered civil engineer experienced in such works. Plans for the ground improvements and/or dewatering shall be submitted to the Board for approval prior to start of construction.

(D) The Board may require the Permittee to complete a technical questionnaire regarding the proposed pipeline installation, construction methods, installer experience, and other information helpful to the Board for evaluating the proposed project's potential effects on the Levee and Floodway.

(E) The Levee shall be monitored for movement during and after pipe installation and any associated settlement due to pipe installation shall be repaired at the Permittee's expense. Monitoring and remediation plans shall be approved by the Board prior to installation. A survey shall be performed at the Permittee's expense to establish baseline conditions at and near the Levee crossing prior to start of construction.

(F) A contingency plan for anticipated adverse conditions and unintended occurrences during installation that could adversely impact Levee integrity shall be submitted to the Board for approval prior to start of construction.

(G) Thorough documentation of the progress of the installation is required. Such documentation shall include notes on steering and tracking, significant events, rig performance parameters such as thrust and torque, times, distances, and other relevant data. The documentation shall be made available to the Board upon request.

(H) Shaft entrance and exit points for tunneling and jacking shall be located outside of the Levee Right of Way and at least twenty (20) feet beyond the Projected Levee Section and further as needed to keep all shaft components at least twenty (20) feet from the Projected Levee Section.

(I) Fluid jetting is not allowed when crossing through the Levee Right of Way.

(J) The risk of hydraulic fracturing due to high fluid pressures used for excavation during the boring process and the risk of borehole collapse due to high fluid pressures shall be evaluated:

(i) Pressure in the annular space of the borehole shall remain below the maximum allowable pressure throughout the drilling process to minimize the potential for losing drilling mud to the surface. In establishing the maximum allowable drilling fluid pressure, the internal friction angle of the soil, the shear modulus of the soil, the depth of the soil cover, and the initial pore pressure shall be considered.

(ii) The minimum required drilling fluid pressure shall be maintained above the groundwater pressure to prevent collapse of the borehole.

(iii) The minimum required drilling fluid pressure and the maximum allowable drilling fluid pressure shall be estimated prior to construction and clearly stated in the contract documents or in the contractor's submittals.

(K) For boring installations, the following additional requirements apply:

(i) During the drilling process the fluid pressure in the annular space shall be monitored. It is recommended that an external pressure measuring device shall be installed when drilling beneath the flood protection structures.

(ii) The drill shall not penetrate the top stratum within three hundred (300) feet from the Levee center line on the landside. If entering or exiting the top stratum on the waterside of the Levee, the entrance or exit shall be at least twenty (20) feet farther waterward of the waterside Levee Toe than the distance between the waterside Levee Toe and an eroding bank line that meets minimum Levee slope stability requirements.

(iii) The minimum depth of cover for the pipeline, conduit, or utility line shall be established by comparing the maximum borehole pressures to the drilling pressures and the depth of scour as per Section 123(c)(1) of this Division.

(iv) Speed of drilling shall be controlled to maintain the planned line and grade. Drill bit advance rates shall be limited to prevent pressure buildup.

(v) The annular space between the boring and pipeline shall be grouted with cement or a cement-bentonite grout mixture, with grout pressures controlled to prevent hydraulic fracturing of overlying soils.

(vi) The design depth of the pipeline, whenever feasible, shall remain below the water table when drilling within a lateral distance of twenty five (25) feet from the Levee Toe.

(vii) For boring installations outside of the Delta Lowlands, containment cells adequate to hold heavy seepage along the borehole coming from the Stream, shall be constructed at the points of entrance and exit when the installation is less than seventy (70) feet below the streambed and the installation occurs during the Flood Season, except as may be provided through a Time Variance Request granted pursuant to Section 112 of this Division. The containment cells shall be constructed to the elevation of the Design Water Surface Elevation that applies at the Levee crossing.

(viii) For boring installations under Levees in the Delta Lowlands, containment cells adequate to hold heavy seepage along the borehole coming from the Stream shall be constructed at the points of entrance and exit when the installation is less than seventy (70) feet below the streambed. The containment cells shall be constructed to the elevation of the Stream stage at high tide that could be expected during the time of installation. During Flood Season, the Design Water Surface Elevation that applies at the Levee crossing could be expected. The potential for migration of drilling fluid upward through light, weak soils needs to be addressed in the contingency plan.

(ix) Evidence of any drilling fluid returning to the surface or any surface fracturing shall require complete repair of the affected blanket layer, Levee, and flood control project feature in accordance with Board Standards.

(x) Only experienced operators who have "Proof of Training" for horizontal directional drilling by the North American Society of Trenchless Technology shall be allowed to operate the drilling equipment within the Levee Right of Way and within and under the Floodway.

(L) A Levee underseepage analysis may be required by the Board where the installation penetrates a blanket layer that may be important for Levee underseepage performance.

(M) The pipeline shall not penetrate through a cutoff wall that has been installed beneath the Levee embankment, or that is planned for installation. The penetration must be at least five (5) feet lower than the lowest elevation of the cutoff wall.

(N) Any evidence of impending danger to the Levee or flood control project feature shall be immediately reported to the Board. If unplanned deviations from the planned installation occur during installation, the installation shall immediately cease, and the issue shall be reported to the Board. If required by the Board, all equipment shall be removed, and the entire installation shall be grouted.

(O) For tunneling and jacking, the annular space between the casing and the carrier pipe should be filled with grout from the bottom using "pull back tubes." The volume of the space to be filled should be calculated and the material being placed should be measured and monitored as it is placed. Measurements should include volume, pressure, and flow rate as a minimum. A plan prepared by a California registered civil engineer for how this will be accomplished shall be provided to the Board for approval before starting the installation. The plan shall include the placing method, mix design, monitoring plan, measurement plan, and measurement devices.

(P) For tunneling and jacking, a plan prepared by a California registered civil engineer for contact grouting outside of the tunnel shall be provided to the Board for approval before starting installation. The plan needs to address contact grouting, pressure monitoring, injection ports, mix design, and measurement requirements.

(Q) The installed pipeline shall have watertight joints.

(g) Pipe materials allowed on a Levee, within a Levee Section, and under a Levee embankment when designed to resist all anticipated loading conditions and properly installed, are:

(1) Cast-in-place reinforced concrete pipes and box culverts may be used above and below the Design Water Surface Elevation if the concrete wall thickness is at least six (6) inches. The pipeline liner inside of the reinforced concrete is considered to be a form for placement of the concrete and may be constructed of any suitable pipe material that will hold its form for concrete placement. Waterstops shall be installed at the cast-in-place reinforced concrete pipe joints.

(2) Precast reinforced concrete pipes and box culverts and concrete cylinder pipes may be used above and below the Design Water Surface Elevation if the pipe/culvert is adequate to resist all anticipated loads and the following conditions are met:

(A) Precast reinforced concrete pipe meets the ASTM C76 dated November 1, 2016.

(B) Precast reinforced concrete pipe joints and precast box culvert joints shall use rubber gaskets.

(C) The cylinders of concrete cylinder pipes are welded and corrosion protected internally and externally.

(D) When installed below the Design Water Surface Elevation, precast reinforced concrete pipes shall be fully encased in CLSM cast against undisturbed earth to at least one (1) foot above the top of the pipeline, except where a drainage layer is required around the landside one third (1/3) of the length of the pipeline.

(3) Steel pipe may be used for all types of pipeline or conduit installations over a Levee or through a Levee above the Design Water Surface Elevation if the pipe is adequate to resist all anticipated loads and meets the following requirements:

(A) The steel pipe is resilient and not materially reduced in quality due to weathering, prior use or other deteriorating conditions.

(B) The steel pipe installations are corrosion–proofed externally with a coating of material such as coal–tar enamel, asphalt–dipped wrap, mortar, PVC tape, or polyethylene tape wrapped to a minimum thickness of thirty (30) mils, high solids epoxy, or equivalent.

(C) Unless a continuous internal lining of cement, mortar, or equivalent is provided, as appropriate for the fluid to be conveyed, new steel pipe installations may convey only non-corrosive material, and water is considered corrosive.

(D) Steel pipe installations shall be designed by a California registered civil engineer to resist all anticipated loading conditions, and the design calculations shall be submitted to the Board for approval. Steel pipe meeting the following criteria may be used without submittal of design calculations to the Board:

(i) Twelve (12) inches in diameter or less ten (10) gauge steel pipe.

(ii) Greater than twelve (12) inches and a maximum of thirty (30) inches in diameter seven (7) gauge steel pipe.

(iii) Greater than thirty (30) inches and a maximum of forty-eight (48) inches in diameter three (3) gauge steel pipe.

(4) High-density polyethylene pipe may be used for all types of pipeline or conduit installations over a Levee or through a Levee above the Design Water Surface Elevation if the pipe meets the following requirements:

(A) The high-density polyethylene pipe is designed by a California registered civil engineer to resist all anticipated loading conditions, and the design calculations shall be submitted to the Board for approval.

(B) The high-density polyethylene pipe is protected from ultraviolet radiation.

(5) High-density polyethylene and other standard pipe materials not subject to corrosion may be used for borings under Levees, upon approval by the Board.

(h) The following materials are not allowed within the Levee Right of Way for pipelines or conduits used to carry natural gas or fluids:

(1) Aluminum pipe.

(2) Cast iron pipe.

(3) Pipe with flanges, flexible couplings, or other mechanical couplings except where needed for accommodating differential settlement at structures and large deflections associated with pipe settlement in a new Levee or recently enlarged Levee, if approved by the Board.

(4) Prestressed concrete pipe.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8710 and 8712, Water Code

History:

1. New section and figures 8.05 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) ~~Abandoned~~This section describes the criteria with the removal of pipelines, conduits, utility lines, and appurtenances.

(1) Except as provided in Section 124(b) of this Division, Permitted pipelines, conduits, utility lines, and all appurtenances (such as pumps, standpipes, or positive closure structures) that are being abandoned and are located within ~~a levee section, within the projected levee section, or within ten (10) feet of the levee toes~~the Levee Right of Way, shall be completely removed, ~~when practical,~~ and disposed of outside the ~~floodway~~Levee Right of Way and Floodway and the Permit surrendered to the Board.

~~(1) When the invert of an abandoned pipeline or conduit within a levee is above the design flood plane elevation, the pipeline or conduit must be removed.~~

~~(2) An abandoned pipeline or conduit located within one (1) foot of the surface of the levee slope shall be removed.~~

~~(3) When the invert of an abandoned pipeline or conduit within a levee is six (6) feet or less below the design flood plane elevation, the board may require the removal of the pipeline or conduit.~~

~~(4) The side~~ (2) The slopes of ~~an excavation~~ trench walls excavated to remove an abandoned pipeline or conduit from within ~~a levee must be one (1) foot horizontal to one (1) foot vertical~~the Levee Right of Way shall be 1h:1v, or flatter~~.~~ if required for worker's safety. A slope stability analysis may be required where the depth of cut and soil properties indicate a potential for slope instability.

~~(5~~(3) After ~~any~~removal of a pipeline, conduit, utility line, or ~~appurtenance is removed~~appurtenant structure from a ~~levee~~Levee Section or Projected Levee Section, approved backfill shall be keyed ~~into the levee section~~in with each lift and compacted ~~in four (4) to six (6) inch layers with a relative compaction of not less than ninety (90) percent, per ASTM D1557-91, dated 1991, which is incorporated~~as per Section 120(a) of this Division.

(4) Field density testing by ~~reference and above optimum moisture content~~an Approved Soils Testing Laboratory will be required to confirm the minimum relative compaction of Levee embankment fill.

~~(6) Compaction tests by a certified oils aboratory will be required to verify compaction of backfill within a levee or within the projected levee section.~~

~~(b) Abandonment of pipelines and conduits within a floodway must be in a manner consistent with the following:~~

~~(1) After any pipeline, conduit or appurtenance is removed from a floodway, open trench backfill must be placed in a manner consistent with the local conditions. Erosive stream reaches will require methods that compact the backfill to at least the density of that of adjacent soils. Compaction tests by a certified soils laboratory may be required to verify compaction within the floodway.~~

~~(2) Abandoned pipelines or~~(5) Pipelines, conduits ~~within the berm~~, and utility lines to be abandoned in the Floodway shall be removed if required by the Board for preventing interference with channel conveyance, contributing to bank erosion, or becoming exposed by bank erosion where the Board deems any of these situations is arising or may arise in the future, considering Floodway characteristics such as erosion, deposition, and Stream flow velocities. Abandoned pipelines, conduits, and utility lines within the Waterside Berm and ~~within~~ thirty (30) feet of the top of the streambank ~~must not be filled with concrete but may~~shall be removed if exposed by bank erosion.

~~(c)~~ (6) After any pipeline, conduit, utility line, or appurtenance is removed from the Floodway, open trench backfill shall be placed in a manner consistent with local Floodway characteristics so as to not promote erosion or deposition. This requirement is generally ensured by using suitable material and compacting to at least the density of adjacent undisturbed material, or ninety (90) percent as per ASTM D698 with moisture content within minus one (-1) percent to plus three (+3) percent of optimum, or eighty eight (88) percent as per ASTM D1557 with the moisture content within zero (0) percent to plus four (+4) percent of optimum, or equivalent. Compaction testing by an Approved Soils Testing Laboratory shall be required to confirm the minimum relative compaction of trench backfill.

(7) Details for removal of pipelines, conduits, and utility lines, including plans and profiles showing the limits and elevations of pipelines, conduits, and utility lines to be removed relative to the Levee embankment or flood control project feature, excavation and backfill details (such as backfill material and compaction), and existing soil strata shall be provided to the Board for review and approval prior to removal.

(b) This section describes the criteria for the filling of pipelines, conduits, utility lines, and appurtenances abandoned in place.

(1) If approved by the Board, pipelines, conduits, and utility lines penetrating the Levee foundation and that have shown no history of seepage may be abandoned in place.

(2) Pipelines, conduits, and utility lines to be abandoned in place within the Floodway and the Levee Right of Way shall be completely filled with low permeability, low bleed, self-leveling, non-shrink grout. Certain types of cellular concrete may be used provided they can be shown to have similar properties.

(3) In exceptional circumstances, the Board may allow some or all of a pipeline, conduit, or utility line within the Floodway to be abandoned in place without being filled, if it is determined by the Board that it is impractical or unnecessary to remove or fill the pipeline, conduit, or utility line. The Board may require conditions that retain the Board's ability to have the Permittee remove or fill the abandoned pipeline, conduit, or utility line in the future if, in the opinion of the Board, conditions change such that removal or filling becomes necessary.

(4) In exceptional circumstances, if it is determined by the ~~board~~Board that it is impractical or detrimental to the ~~levee~~Levee to remove an abandoned pipeline ~~or conduit from a levee section, the pipeline or~~ , conduit ~~must be completely filled with concrete.~~, or utility line from a Levee Section, the pipeline, conduit, or utility line shall be completely filled. Only pipelines, conduits, and utility lines that have shown no history of seepage and are determined to be sound by inspection or pressure testing shall be abandoned in place by filling. Factors that influence the decision to allow a pipe to be abandoned in place include, but are not limited to:

(A) Pipe material
(B) Pipe depth
(C) Pipe diameter
(D) Pipe length
(E) Levee size
(F) Presence of a railroad or State highway on Levee crown
(G) Presence of a seepage cutoff wall

~~(1) Concrete to be used to fill an abandoned pipeline or conduit must be a three- (3) sack cement mix, or equivalent, with aggregate having a maximum size of three- eighths (3/8) inch, and a water content sufficient to produce a six- (6) to eight- (8) inch slump.~~

~~(2~~(5) A detailed plan for filling an abandoned pipeline ~~or~~, conduit ~~with concrete may be required to~~, or utility line shall be submitted for approval by the ~~board~~Board prior to start of work.

~~(3) A pipeline or conduit to be filled with concrete must have a minimum cover of three (3) feet below the waterward levee slope.~~

~~(4)~~ The plan shall include plan and profile drawings with limits and elevations of pipes to be filled relative to the Levee embankment. See Figure 8.~~07~~06 for illustrated details on ~~sealing~~filling abandoned pipelines and conduits.

(6) The grout or cellular concrete mix shall be approved by the Board prior to use.

(7) Grout or cellular concrete shall be pumped in an "upslope" direction so that the mix is first discharged into the lower end and the upper end is filled last by ponding of the mix, resulting in the pipe being completely filled without voids.

(8) Planned grout (or cellular concrete) pressures are to be provided to ensure that any pipe leaks do not damage the Levee or Levee foundation.

(9) Access points shall be provided along the pipe at sufficient intervals to fill the pipeline, conduit, or utility line.

(10) A pipeline, conduit, or utility line to be filled shall have a minimum depth of cover of three (3) feet below the waterside Levee slope. If the depth of cover is less than three (3) feet, the Board shall require the Permittee to remove the pipeline, conduit, or utility line.

~~(d) Concrete pipes may be plugged with concrete at each end as an alternative to complete filling. The length of each plug shall be a minimum of two (2) feet or twice the diameter of the pipe, whichever is greater.~~

Note:
Authority cited: Section 8571, Water Code

Reference:

Sections 8608 and 8710, Water Code

History:

1. New section and figure 8.06~~7~~ filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) Retaining walls within an ~~adopted plan~~Adopted Plan of ~~flood control must~~Flood Control shall comply with the following requirements:

(1) Retaining walls parallel to the Levee are not allowed within the Levee Right of Way, except as required at gravity drains.

(2) Retaining walls within the Levee Right of Way shall be constructed as nearly at a right angle to the Levee centerline as practical.

(3) Retaining walls within the Levee Right of Way shall be designed by a California registered civil engineer.

(4) Retaining walls in the Floodway greater than three (3) feet in height ~~must~~shall be designed by a ~~licensed civil engineer.~~California registered civil engineer.

~~(2)~~(5) Retaining walls within the Levee Right of Way may be made of reinforced concrete, concrete gravity section, or of equivalent material and durability.

~~(3) Retaining walls in the landside levee slope must have appropriate features that intercept seepage and prevent particle migration.~~

(6) Retaining walls shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8606, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) ~~(a)~~ New fences shall not be constructed on the Levee Section, except as necessary for preventing unauthorized Levee access and protecting structures owned or operated by a public agency.

(1) New fences constructed on the waterside of a Levee that are partially or wholly under water during high water events, and that are located within state maintenance areas within city limits under the jurisdiction of the Board, shall be constructed so as to be removable by the Permittee in segments during times of high water events as the water level rises up the Levee. The Permittee shall remove fence segments at its own expense during high water events so that no part of any fence on the waterside Levee slope is submerged.

(2) Where the distance between fences would be as close as to interfere unreasonably with Levee inspection, channel inspection, Maintenance Activities, flood fight activities, and inspection or maintenance of any feature of an Adopted Plan of Flood Control, the Board may deny approval for additional fences.

(3) If, in the opinion of the Board, a fence becomes unnecessary due to changes in location of public access points or construction of other fences, the Permittee shall remove the fence at the request of the Board.

(b) Fences within ~~a floodway, on a levee~~the Floodway, or ~~near a levee must~~within the Levee Right of Way, but not on the Levee Section, shall conform to the following requirements:

(1) Fences, walls, and similar structures ~~are~~may be allowed~~permitted~~ within ~~floodways~~Floodways if they do not obstruct ~~floodflows~~flood flows or cause the accumulation of debris that would obstruct ~~floodflows~~flood flows. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~A~~2) Fences firmly anchored and constructed parallel to the ~~streamflow~~Stream flow are normally allowed~~permitted~~.

~~(B) Fences not parallel to the streamflow shall be designed and constructed to not adversely affect stages and velocities.~~

~~(2)~~ (3) All fences parallel to a ~~levee must~~Levee shall be located ~~a minimum distance of ten (10) feet off the levee toe.~~

~~(3) Fences crossing a levee, where permitted, must be installed at a right angle across the levee.~~

~~(4) Fences crossing a levee crown must have an opening a minimum~~outside of ~~fourteen (14) feet in width or a suitable gate installed on the levee crown~~the Levee Right of Way.

~~(5) After January 1, 1998, new fences that are designed to give way during high water events shall not be allowed on the water side of a levee. Fences proposed to be constructed after January 1, 1998 on the water side of a levee that are partially or wholly under water during high water events, and that are located within state maintenance areas within city limits under the jurisdiction of the board, shall be constructed so as to be removable by the permittee in segments during times of high water events as the water level rises up the levee. The permittee shall remove fence segments at its own expense during high water events so that no part of any fence on the water side levee slope is submerged.~~

~~(.(6) Where the distance between fences would be so close as to interfere unreasonably with levee inspection, maintenance and flood fight activities, the board may deny approval for additional fences.~~

~~((7~~4) If, in the opinion of the ~~board~~Board, a fence becomes unnecessary due to changes in location of public access points or construction of other fences, the ~~permittee must~~Permittee shall remove the fence at the request of the ~~board~~Board.

(~~b~~c) Gates crossing the Levee crown are allowed by the Board. Gates within a ~~floodway~~Floodway or on a ~~levee must~~Levee shall conform to the following requirements:

(1) The gate width on a ~~levee~~Levee crown ~~must~~shall match or exceed the width of the ~~levee~~Levee crown with a minimum gate width of fourteen (14) feet. A gate width exceeding twenty (20) feet is normally not required. A gate width of less than fourteen (14) feet, but no less than twelve (12) feet, may be allowed on ~~levees~~Levees within ~~urban areas~~Urban Areas if it can accommodate the ~~levee~~Levee maintenance equipment and equipment for responding to flood or fire emergencies ~~and any agricultural equipment~~ which ~~must~~shall use the gates ~~are less than twelve feet in width~~.

(2) Cable or chain gates are not ~~permitted~~ authorized across a ~~levee~~Levee crown or across a ~~levee~~Levee Access Ramp~~access ramp~~.

(3) Gates shall be hinged, and constructed to provide for ease of operation, maximum longevity, and public safety.

(4) Gate posts shall not penetrate the Levee by more than twelve (12) inches unless encased in concrete cast in place against firm undisturbed earth.

(~~4~~5) Gates may be opened by authorized personnel representing the Local Maintaining Agency, Department ~~of Water Resources and maintenance personnel and must~~, Board, or USACE. Gates shall remain open when required for ~~levee~~Levee inspections, ~~maintenance~~Maintenance Activities, construction, high water patrol, and flood fight activities.

(~~5~~6) Where the distance between gates would be so close as to unreasonably interfere with ~~levee~~Levee inspection and maintenance, the ~~board~~Board may deny approval for additional gates.

(~~6~~7) If, in the opinion of the ~~board~~Board, a gate becomes unnecessary due to changes in location of public access points or construction of other gates, the ~~permittee must~~Permittee shall remove the gate at the request of the ~~board~~Board at the Permittee's expense.

(~~7~~8) ~~Keys~~ At the time locks are installed, keys for the locks shall be provided to ~~local~~ the ~~maintaining agency and the~~Local Maintaining Agency, Department ~~of Water Resources~~, Board, and USACE for all locks on gates providing access to the ~~floodway, levee ramp, levee toe~~Floodway, Levee ramps, Levee Toe, and along the ~~levee~~Levee crown.

(~~c~~d) If the ~~board~~Board approves ~~an activity or encroachment~~Proposed Work that directly or indirectly may result in future unauthorized ~~encroachments~~Encroachments (e.g., approving ~~levee~~Levee modifications associated with a new residential development adjacent to the ~~levee~~Levee), the ~~board~~Board may require the ~~permittee~~Permittee to construct a fence parallel to the ~~levee~~Levee at ~~a distance~~the landward limit of the Levee Right of ~~ten (10) feet from the landside levee toe.~~Way. If a fence is required, it ~~must~~shall conform to ~~board standards~~Board Standards.

(~~d~~e) No fence, wall or other barrier may interfere with or preclude legal public access.

Note:

Authority cited: Sections 8571 and 8709.3, Water Code

Reference:

Sections 8608, 8609, 8709.3 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).
2. New subsection (a)(5), subsection renumbering, and amendment of NOTE filed 2–13–98 as an emergency; operative 2–13–98 (Register 98, No. 7). A Certificate of Compliance must be transmitted to OAL by 6–15–98 or emergency language will be repealed by operation of law on the following day.
3. New subsection (a)(5), subsection renumbering, and amendment of NOTE refilled 6–11–98 as an emergency; operative 6–11–98 (Register 98, No. 24). A Certificate of Compliance must be transmitted to OAL by 10–9–98 or emergency language will be repealed by operation of law on the following day.
4. Certificate of Compliance as to 6–11–98 order transmitted to OAL 10–2–98 and filed 11–16–98 (Register 98, No. 47).

(a) The standards for construction of wharves, piers, docks, boat houses, ramps, and similar boating facilities, are as follows:

(1) Boat ramps may not be cut into the ~~levee section~~Levee Section, but may be cut into a ~~berm~~Waterside Berm or placed on a fill. Additional analysis may be required to verify seepage, slope stability, and erosion of the Levee Section have not been impacted.

(2) Boating facilities ~~must~~shall be properly anchored to prevent breakaway during ~~floodflows~~flood flows. Acceptable anchoring methods are as follows:

(A) Driven piling ~~must~~may be installed outside of the Levee Section and Projected Levee Section and shall meet the following criteria:

(i) ~~Timber~~If timber piles ~~must~~are used they shall be a minimum of twelve (12) inches in butt diameter and ~~must~~shall be pressure treated.

(ii) The elevation of the top of each pile ~~must~~shall be a minimum of two (2) feet above the ~~design flood plane.~~lower of the Crest Elevation of the Levee nearest the boat dock and the Levee directly across the Stream.

(iii) The driven piling shall not penetrate a waterside blanket layer that is important for Levee underseepage performance. A geotechnical investigation will normally be required by the Board for making this determination.

(B) ~~Concrete deadmen must~~Cast-in-place piling may be installed within and outside of the Levee Section and Projected Levee Section and shall meet the following criteria:

(i) The piling shall be designed by a California registered civil engineer.

(ii) Piles that penetrate the Levee Section and Projected Levee Section shall be avoided to the extent practical.

(iii) Piles that penetrate the Levee Section, Projected Levee Section, or waterside blanket shall be ~~concrete deadman must~~cast against firm undisturbed earth.

(iv) The elevation of the top of each pile shall be a minimum of two (2) feet above the lower of the Crest Elevation of the Levee nearest the boat dock and the Levee directly across the Stream.

~~be of sufficient size to restrain the boating facility and be a minimum of one (1) cubic yard of concrete.~~

~~(ii) The concrete deadman must be attached to the floating facility with a steel cable, or equivalent, of sufficient size to restrain the facility.~~

(3) All appurtenant facilities, including utilities and walkways, installed on or through a L~~l~~evee S~~s~~ection to provide service to wharves, piers, or docks, shall~~must~~ conform to the appropriate section of the standards.

(b) After each period of high water, all debris caught by a boating facility ~~must~~shall be cleared and disposed of outside the limits of the ~~floodway~~Floodway and ~~levee section~~Levee Section.

(c) In the event that ~~levee~~Levee or bank erosion injurious to the ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control occurs at or adjacent to a boating facility, the ~~permittee~~Permittee of the boating facility is responsible for the repair of the eroded area, and for the placement of adequate ~~revetment~~Revetment to prevent further erosion. Revetment shall meet the standards in Section 121 of this Division.

(d) Any existing ~~levee revetment~~Levee Revetment or bank ~~revetment~~Revetment damaged during the construction or operation of a boating facility ~~must~~shall be restored to its original condition by the ~~permittee~~Permittee of the boating facility.

(e) The ~~levee~~Levee crown may not be used for parking boat trailers or motor vehicles except where there is adequate crown roadway width to provide twenty (20) feet of unobstructed clearance for two~~-~~-way vehicular traffic.
(f) Boating materials, equipment or accessories may not be stored on ~~levee~~Levee slopes.
(g) Floatable boating materials, equipment, or accessories ~~must~~shall be securely anchored when stored in the ~~floodway~~Floodway during the ~~flood season~~Flood Season.
(h) ~~Boating materials, equipment, or accessories may be stored on the levee crown if storage does not prevent adequate inspection and maintenance of the levee, does not obstruct flood fight procedures, and the following additional requirements are met:~~
~~(1) There is adequate levee crown roadway width to provide a minimum of twenty (20) feet of unobstructed clearance for two-way vehicular traffic.~~
~~(2) Where a public road or highway is on the levee crown, the design width of the roadway, including the roadway shoulders, must remain clear.~~
~~(3) Boating materials, equipment, or accessories may not be stored within fourteen (14) feet of the landward levee shoulder.~~
~~(4) Boating materials, equipment or accessories may be stored to within fourteen (14) feet of the waterward levee shoulder provided the waterward levee slope is revetted to the standards in section 121.~~
~~(5) Boating materials, equipment, or accessories may not be stored within thirty (30) feet of the waterward levee shoulder of a levee having an unrevetted waterward slope.~~ Boating materials, equipment, and accessories stored on the Levee crown shall be no closer than thirty (30) feet from the waterside Levee shoulder.
(i) Boating facilities shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

Standards

(a) The standards for construction or modification of bridges within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control are as follows:

(1) ~~Any excavation~~Embankment Materials placed as backfill within the ~~levee section~~Levee Section or near bridge supports within the ~~floodway must~~Floodway shall be ~~backfilled in four (4) inch to six (6) inch layers with approved material. The levee section must be~~ placed and compacted ~~to~~ in conformance with Section 120(a ~~relative compaction~~) of this Division.

(2) Driven piles shall not ~~less than ninety (90) percent per ASTM D1557-91, dated 1991, which is incorporated by reference and above optimum moisture content. Compaction within~~ be placed in the ~~floodway must be to the density~~Levee Right of Way or in a blanket layer on the landside or waterside of the ~~adjacent undisturbed material~~Levee that is important for Levee underseepage performance. A geotechnical investigation will normally be required by the Board for making this determination.

~~(2) Compaction tests by a certified soils laboratory may be required to verify compaction.~~

~~(3)~~ (3) Driven piles shall be installed in a manner such that the driving energy does not cause cracking of the Levee. The Levee condition shall be documented before and after pile driving operations to verify cracking has not developed. All cracks shall be repaired by the Permittee and the repairs are subject to Board approval.

(4) Cast-in-place piles, piers, and bents may be installed within and outside of the Levee Section and Projected Levee Section and shall meet the following criteria:

(A) The piles, piers, and bents shall be designed by a California registered civil engineer.

(B) Piles, piers, and bents that penetrate the Levee Section and Projected Levee Section shall be avoided to the extent practical.

(C) Piles, piers, and bents that penetrate the Levee Section, Projected Levee Section, or blanket layer important for Levee underseepage performance shall be predrilled and cast in place up to the bottom of the upper impermeable layer of the foundation and can be driven down from this elevation. Any cracks in the Levee due to bridge construction shall be excavated and the Levee embankment repaired to its original design grade and dimensions.

(5) Bridge piers and bents within the ~~floodway must~~Floodway shall be constructed ~~parallel to~~in the general direction of ~~streamflow~~Stream flow.

(~~4~~6) Bridge piers and bents placed within a ~~floodway~~Floodway to support a widened portion of an existing bridge ~~must~~shall be constructed in line with existing bents and piers.

(~~5~~7) Erosion control may be required on the channel banks or ~~levee~~Levee slopes upstream and downstream of a proposed bridge.

(~~6~~8) Drainage from a bridge or highway ~~may~~shall not be discharged onto a ~~levee section~~Levee Section or streambank.

(~~7~~9) Plans showing all construction facilities (such as temporary staging, coffer dams, and falsework) which will remain in a ~~floodway~~Floodway during ~~flood season, must~~Flood Season, shall be submitted to the ~~board~~Board for approval prior to installation of these facilities.

(~~8~~10) All temporary construction facilities (such as ~~temporary~~ staging, coffer dams, and falsework) ~~must~~shall be designed to prevent bank erosion ~~during normal flows~~ and, during the Flood Season, to ~~maintain~~withstand potential hydraulic and debris loading while maintaining maximum channel capacity ~~during the flood season.~~. The applicant may be required to demonstrate that the temporary construction facilities are structurally adequate and neither the temporary construction facilities nor the bridge itself will create any significant hydraulic impacts. The Board may require a high water safety plan identifying responsible Parties,

notification procedures, available equipment, emergency protocols, and planned actions in the event of high water.

(~~9~~11) Stockpiled material, temporary buildings, construction equipment, and road detours that may obstruct ~~streamflows must~~Stream flows shall be removed from ~~floodways~~Floodways prior to the ~~flood season~~Flood Season.

~~(10)~~((12) Clearance requirements for the bottom member (soffit) of a bridge shall comply with the following:

(A) The bottom members (soffit) of a proposed bridge ~~must be~~on a Leveed Stream shall be no lower than the Crest Elevation of the adjacent Levee and at least three (3) feet above the ~~design flood plane. The~~Design Water Surface Elevation, whichever is higher. If the bridge spans Levees of unequal Crest Elevation, the lower of the two (2) Crest Elevations may be used. If the proposed bridge replaces an existing bridge, the required clearance may be reduced by the Board to ~~two (2~~three (3) feet ~~on minor streams~~above the Design Water Surface Elevation.

(B) The required clearance may be reduced by the Board to two (2) feet above the Design Water Surface Elevation at sites ~~where significant~~ on Streams that meet all of the following requirements:

(i) The Stream is small;

(ii) The Stream does not have a Levee;

(iii) The Stream is not part of the State Plan of Flood Control;

(iv) Flooding from the Stream would not enter an Urban Criteria Area; and

(v) Significant amounts of ~~stream~~Stream debris are demonstrated to be unlikely.

(~~B~~C) When an existing bridge being widened does not meet the clearance requirement above the ~~design flood plane~~Design Water Surface Elevation, the bottom structural members of the added section may be no lower than the bottom structural members of the existing bridge, except as may be caused by the extension of existing sloped structural members. The Board may require a high water safety plan identifying responsible Parties, notification procedures, available equipment, and emergency protocols for prompt removal and disposal of debris from the bridge during high water.

(~~C~~D) When the clearance requirement above ~~design flood plane~~Design Water Surface Elevation would result in bridge approach ramp fill in the ~~floodway~~Floodway, the clearance requirement may be reduced to the extent that reasonably balances clearance and fill that would obstruct flow, so as to maintain maximum channel capacity. The Board may require a high water safety plan identifying responsible Parties, notification procedures, available equipment, and emergency protocols for prompt removal and disposal of debris from the bridge during high water.

~~(11)~~(E) For arched bridges the clearance area above the Design Water Surface Elevation shall be, at a minimum, equal to the area of clearance if the bridge had a horizontal soffit extending from the abutment three (3) feet above the Design Water Surface Elevation. A hydraulic study is required to demonstrate to the Board's satisfaction that with reasonable debris loading on the bridge members lower than three (3) feet above the Design Water Surface Elevation the hydraulic impact would not be significant. The Board may require a high water safety plan identifying responsible Parties, notification procedures, available equipment, and emergency protocols for prompt removal and disposal of debris from the bridge during high water.

(F) Replacement railroad bridges shall have the soffit members no lower than those of the replaced bridge, but are not required to have a specified amount of clearance above the Design Water Surface Elevation. The Board may require a high water safety plan identifying responsible Parties, notification procedures, available equipment, and emergency protocols for prompt removal and disposal of debris from the bridge during high water.

(13) Vehicular access beneath the bridge for inspection and maintenance shall comply with the following requirements:

(A) Vehicular access from the roadway to the ~~levee~~Levee crown may be required at each end of a bridge.

(B) Vehicular access from the ~~levee~~Levee crown to the ~~floodway~~Floodway and/or the landside ~~levee toe~~Levee Toe beneath the bridge may be required. Ramps may slope upstream as necessary to provide the access required by this subdivision.

~~(12) Approved gates must~~(14) Gates meeting the standards in Section 126 of this Division shall be installed at right angles across the ~~levee~~Levee crown at all points of access to the ~~levee~~Levee from each end of a bridge.

(~~13~~15) Any bridge abandoned or being dismantled ~~must~~shall be completely removed, and ~~must~~shall be disposed of outside the limits of the ~~levee section and floodway~~Levee Right of Way and Floodway. Seepage and slope stability analyses may be required to ensure the removal of the bridge will not be detrimental to the safety of the adjoining Levee or streambank.

(~~14~~16) Pilings, piers, bents, and abutments of bridges being dismantled ~~must~~shall be removed to at least one (1) foot below the natural ground line and at least three (3) feet below the ~~bottom~~thalweg of the ~~low water channel~~mean Low Water Channel.

(~~15~~17) Any bridge that is damaged to the extent that it may impair the channel or ~~floodway~~Floodway capacity ~~must~~shall be repaired or removed prior to the next ~~flood season~~Flood Season.

~~(16) Replacement railroad bridges must have the soffit members no lower than those of the replaced bridge, but are not required to have a specified amount of clearance above the design flood plane.~~

(~~17~~(18) Bridge replacements and new bridges shall be built at an elevation so that there is no depression in the crown of the ~~levee~~Levee.

(19) The bridge shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(b) The standards for ~~maintenance of bridges~~construction or modification of Low Water Crossings within an ~~adopted plan~~Adopted Plan of ~~flood control~~Flood Control are as follows:

(1) Low Water Crossings shall comply with all standards for bridges described in Section 128 (a) above, with the exception of subparagraphs 12 and 17.

(2) Low Water Crossings have no specified clearance above the Design Water Surface Elevation; however, subject to the One (1) Percent Blockage Criterion, a hydraulic analysis shall be submitted to demonstrate that the crossing will not impede flood flows or create significant hydraulic impacts. The Board may deny a Permit if the hydraulic impact is deemed significant.

(3) Pipes used for construction of the Low Water Crossing shall comply with Section 123 of this Division.

(4) Visible markers shall be provided to alert traffic in the event the crossing is submerged.

(c) The standards for maintenance of bridges within an Adopted Plan of Flood Control are as follows:

(1) The area in and around a bridge site ~~must~~shall be kept clear to maintain the design flow capacity.

(2) Trees, brush, sediment, and other debris ~~must~~shall be kept cleared from the bridge site and be disposed of outside the limits of the ~~floodway~~Floodway prior to the ~~flood season~~Flood Season.

~~(3~~(3) Continuous maintenance access shall be provided both upstream and downstream from all bridges.

(4) Any accumulation of debris during high flows ~~must~~shall be immediately removed from a bridge site and disposed of outside the ~~floodway~~Floodway.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) Water wells and any appurtenant structures ~~must~~shall be located outside of the Levee Right of Way and a minimum distance of ~~ten (10~~sixty (60) feet from ~~a levee~~the waterside Levee Toe, landside Levee Toe, Seepage Berm toe, Stability Berm toe, or landward extent of the flood control project feature.

~~(b~~(b) A Board Permit is required for water wells within the Floodway and within one hundred (100) feet of the landside Levee Toe, Seepage Berm toe, Stability Berm toe, or landward extent of the flood control project feature.

(c) Design of a water well within the Floodway and within one hundred (100) feet of the landside Levee Toe, Seepage Berm toe, Stability Berm toe, or landward extent of the flood control project feature is subject to Board approval and shall be evaluated and confirmed by a California registered civil engineer or a California registered engineering geologist as not impacting integrity of the Levee.

(d) Oil wells, gas wells, and any appurtenant structures ~~must~~shall be located a minimum distance of thirty~~–~~ five (35) feet from a ~~levee toe~~Levee Toe, Seepage Berm toe, Stability Berm toe, or landward extent of the flood control project feature.

(~~c~~e) Access roads~~,~~ and foundation pads~~, and stockpiled excavated material~~ within a ~~floodway~~Floodway are normally limited to an elevation of three (3) feet above the natural ground~~. However, if it is determined by the board that such facilities constructed to the normal elevation would have an adverse effect on the flood carrying capacity of the floodway, the allowable elevation shall be lower.~~ and shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~d~~f) Structures and fencing at well sites within the ~~floodway~~Floodway are not ~~permitted~~allowed allowed without approved hydraulic studies demonstrating that the proposed structure or fence would not impair the ~~floodway~~Floodway. New fences shall be in compliance with Section 126(b)(4). The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact, and shall include any impact from access roads and foundation pads. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~e~~g) Stockpiled excavated material and equipment shall be removed from the Floodway prior to Flood Season.

(h) Permits for ~~water~~ wells require that a survey monument and a permanent bench mark ~~must~~shall be installed at the waterside ~~levee toe,~~Levee Toe (or for a Stream without a Levee, the Floodway boundary), as near to the well site as practical, to serve as a vertical control to monitor subsidence.

(i) A survey shall be performed for the well by the Permittee every year until the well is properly abandoned. The surveys shall be provided to the Board within sixty (60) days. If local subsidence that exceeds regional subsidence is detected, the Permittee shall determine the cause of the local subsidence. If the Board determines that the well is causing or contributing to the local subsidence, the Permittee shall immediately abandon the well pursuant to requirements of the local government well abandonment standards and procedures. Copies of documentation of well abandonment shall be provided to the Board for closing the Permit.

(j) Any unused wells in the Floodway shall be abandoned by the Permittee upon Board approval and pursuant to requirements of local government well abandonment standards and procedures. Documentation of well abandonment shall be provided to the Board.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(~~a) The following definitions apply to this section:~~
~~(1) Access Ramps – "Access Ramps" mean those ramps that provide access to the levee crown from adjacent property and roads.~~
~~(2) Patrol Roads – "Patrol Roads" means those roads that provide vehicular access along levee crowns and flood channels for inspection, maintenance, and flood fighting.~~
~~(b~~a) ~~Patrol roads~~Patrol Roads ~~must~~shall meet the following criteria:

(1) ~~Patrol roads~~Patrol Roads on Levee crowns ~~must~~shall be surfaced with a minimum of four (4) inches of compacted~~, class~~ Class 2 aggregate base (Caltrans Spec. 26~~–~~1.02A~~, July 1992) which is incorporated by reference,~~), or equivalent. Additional aggregated base thickness may be required to match the thickness at adjacent Levee sections or to address historic rutting problems.

~~(2) Patrol road surfacing material must be compacted to a relative compaction of not less than ninety (90) percent per ASTM D1557–91, dated 1991, which is incorporated by reference with moisture content sufficient to obtain the required compaction .~~

~~(3) Compaction tests by a certified oils aboratory may be required to verify compaction.~~

~~(4)~~ (2) Aggregate base surfacing for Patrol Roads on Levee crowns shall be compacted to a minimum one hundred (100) percent of Standard Proctor dry density according to ASTM D698 or ninety five (95) percent of Modified Proctor dry density according to ASTM D1557, or equivalent. Moisture control limits are to be within minus one (-1) percent to plus three (+3) percent of optimum and zero (0) percent to plus four (+4) percent of optimum for ASTM D698 and ASTM D1557, respectively, or equivalent. Alternatively, the Permittee may opt to provide relative compaction sufficient to withstand a maximum load of sixty-eight thousand (68,000) pounds from two consecutive sets of tandem axles without significant rutting during periods of seasonal precipitation.

(3) The top twelve (12) inches of subgrade supporting the aggregate base on Levee crown Patrol Roads shall be compacted to the same relative compaction standard as the aggregate base surfacing.

(4) Field density testing by an Approved Soils Testing Laboratory shall be required to confirm the minimum relative compaction.

(5) Any gravel added on top of the aggregate base for Levee crown roadways shall be rolled until it provides a firm and unyielding surface for vehicle travel.

(6) Paved ~~patrol roads~~Patrol Roads ~~must~~shall meet the design requirements for paved bicycle trails~~, section~~ as per Section 132 of this Division.

(~~5) Levee crown~~7) Patrol Road surfacing ~~must~~shall meet the following additional requirements:

(A) Where the Levee crown width is less than sixteen (16) feet, the minimum surfacing width ~~must~~shall be ten (10) feet with a smoothly tapered transition to the edge of the ~~levee~~Levee shoulder.

(B) Where the Levee crown width is sixteen (16) feet or more, the minimum surfacing width ~~must~~shall be twelve (12) feet with a two (2) foot~~–~~ wide taper at each edge of the surfacing.

(C) ~~The crown roadway must~~Patrol Road surfacing on a Levee crown shall be sloped a minimum of two~~–~~ (2) percent.

~~(6~~(D) Whenever possible the minimum surfaced width should allow two vehicles to pass side by side.

(8) Landside Levee Toe Patrol Roads may not be constructed by cutting into the landside Levee slope to provide access.

(9) Any ~~p~~Patrol ~~r~~Road which has been excavated or damaged ~~must~~shall be restored to its original condition.

(b~~c~~) Access ~~ramps~~ Ramps are of two common types, head–on or side approach, and ~~must~~shall meet the following criteria:

(1) Access Ramps~~ramps~~ shall~~must~~ be constructed of approved imported material.

(2) The surfacing for all Access Ramp~~access ramp~~s ~~must~~shall be the same as for ~~patrol roads~~Patrol Roads on Levee crowns. Subdivisions (a~~b~~)(1), (a~~b~~)(2), (a)(3), (a)(4), and (a~~b~~)(~~3~~5) of this S~~s~~ection also apply to Access Ramp~~access ramp~~s.

(3) Any excavation made in a ~~levee section~~Levee Section to key the ramp to the ~~levee must~~Levee shall be backfilled in ~~four (4) to~~maximum six~~–~~ (6) inch layers with approved material and compacted to a relative compaction ~~of not less than ninety (90) percent~~as per ~~ASTM D1557-91, dated 1991, and above optimum moisture content.~~Section 120(a) of this Division. The Access Ramp is to be constructed without cutting into the Levee except as required for keying the fill into the Levee.

(4) ~~Compaction tests~~Field density testing by ~~a certified oils aboratory may~~an Approved Soils Testing Laboratory shall be required to ~~verify~~confirm the minimum relative compaction of Levee embankment subgrades and/or Access Ramps.

(5) All Access Ramp~~access ramp~~s ~~must~~shall be constructed in such a manner so as to direct all surface drainage away from the ~~levee section~~Levee Section.

(6) All Access Ramps shall be constructed with a grade that is no more than ten (10) percent. Waterside Access Ramps shall be constructed with a grade that is no less than five (5) percent.

(7) Approved gates ~~must~~pursuant to Section 126 of this Division shall be installed across Levee Access Ramp~~access ramp~~s at locations where vehicular access by the public is possible.

(~~7~~8) Side approach ramps ~~must~~shall be used on the waterside ~~levee~~Levee slope.

(~~8~~9) Side approach ramps on the ~~waterward~~waterside slope of the ~~levee must~~Levee shall slope downstream. ~~.~~

(~~9~~10) Side approach ramps on the waterside slope of the Levee shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact.

(11) Typical plans for each type of ~~approach~~Access Ramp ~~ramp~~ with restrictions and requirements are shown on Figures 8.~~08~~07 and 8.~~09.~~08.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608 and 8710, Water Code

History:

1. New section and figures 8.0~~7~~8 and 8.0~~8~~9 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

No Proposed Edits for Section 131 Vegetation included in this Draft

(a) The following definitions apply to this section:

(1) Oversize levee. "Oversize levee" means a levee which encompasses the minimum oversized levee cross–section which has a width of thirty (30) feet at design freeboard elevation and standard levee slopes. (See Figure 8.10.)

(2) Standard size levee. "Standard size levee" means a levee which does not meet the requirements for an oversize levee.

(3) Standard levee slopes. "Standard levee slopes" means the landside levee slope is two (2) horizontal feet to one (1) vertical foot and the waterside levee slope is three (3) horizontal feet to one (1) vertical foot.

(b) Suitable vegetation, if properly maintained, is permitted within an adopted plan of flood control.

(c) Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures.

(d) With the exception of naturally occurring vegetation which the owner of the underlying land has no responsibility to maintain, any vegetation which negatively impacts the structural integrity of the adopted plan of flood control, interferes with the successful execution, functioning, maintenance or operation of the adopted plan of flood control, must be removed by the owner. If the owner does not remove such vegetation upon request, the board reserves the right to have the vegetation removed at the owner's expense.

(e) Tables 8.3through 8.6indicate common types of vegetation considered suitable and unsuitable for planting on levees. Other types of vegetation, not listed in Tables 8.3through 8.6, may be approved if determined to be similar to listed suitable species or not detrimental to the integrity, operation, or maintenance of the adopted plan of flood control.

(f) Vegetation and vegetation maintenance standards for levees are as follows:

(1) Vegetation is not permitted on the levee crown roadway. Only properly maintained grasses or suitable ground covers are permitted on other portions of the levee crown.

(2) Vegetation growing on levee slopes but infringing onto the levee crown must be trimmed or sprayed to prevent interference with flood fight, maintenance, or inspection activities.

(3) Tree branches extending above the levee crown or above the area within ten (10) feet of the levee toe, must be pruned to maintain a minimum of twelve (12) feet vertical clearance above the levee crown and above the area within ten (10) feet of the levee toe.

(4) Tree branches above levee slopes must be pruned and maintained so that the distance from the levee slope to the lowest branches, measured normal to the levee slope, is a minimum of five (5) feet.

(5) Trees are not permitted on the crown or slopes of a standard size levee or within ten (10) feet of the toe of a standard or oversize levee. Planted trees must be set back a sufficient distance from the levee toe to conform with the requirements of subdivision (f)(3) of this section throughout the life of the tree.

(6) Trees are permitted on oversize levee slopes according to the following additional criteria:

(A) Trees considered suitable and unsuitable for oversize levees are listed in Tables 8.3 and 8.4 respectively.

(B) Trees which will exceed fifty (50) feet in height when mature are not permitted.

(C) Trees are permitted on the waterside levee slope of oversize levees up to a point five (5) vertical feet below the Design Flood plane.

(D) Trees that, in the judgment of the board, threaten to disturb revetment on levee slopes or interfere with maintenance must be removed.

(E) Fruit and nut trees are not allowed.

(7) Trees, vines, bushes, shrubs, or any other form of woody or herbaceous vegetation that grow in a dense form and prevent visual inspection of the levee slope and toe, produce fruit or nuts that attract burrowing rodents, or are thorny and could interfere with flood fight efforts, are not permitted on the levee or within ten (10) feet of levee toe.

(8) Sod, grasses, perennial flowers, and other nonwoody ground covers are permitted on levee slopes and within ten (10) feet of the levee toe if the height of the vegetation does not exceed twelve (12) inches. Ground covers considered suitable and unsuitable on levee slopes and within ten (10) feet of the levee toe are listed in Tables 8.5 and 8.6, respectively. In areas where vehicular access is maintained along the levee toe, ground covers are generally not permitted. For ground covers with specific maintenance requirements (see Table 8.5):

(A) The permittee is responsible for maintaining the ground cover at a height less than one (1) foot;

(B) The maintaining agency reserves the right to mow the groundcover without prior notification if the height exceeds one (1) foot;

(C) Any irrigation system for the ground cover must be designed to not interfere with mowing;

(D) Ground covers that are required by this subdivision to be mowed are generally allowed only on the upper twenty (20) feet of levee slope.

(9) Thick–stemmed, extremely dense or woody ground covers are not permitted on levee slopes or within ten (10) feet of the levee toe.

(10) Flower gardens where the height of the vegetation does not exceed twelve (12) inches, and which are compatible with flood fight procedures, maintenance, and inspection programs are permitted within ten (10) feet of the levee toe.

(g) Vegetation and vegetation maintenance standards for floodways and bypasses are as follows:

(1) Vegetation is permitted within revetment on streambanks unless, in the judgment of the board, it becomes a threat to the integrity of the revetment.

(2) Invasive or difficult–to–control vegetation, whether naturally occurring or planted, that impedes or misdirects flood flows is not permitted to remain on a berm or within the floodway or bypass.

(3) The board may require clearing and/or pruning of trees and shrubs planted within floodways in order to minimize obstruction of floodflows.

(4) Trees and brush that have been cut down must be burned or removed from the floodway prior to the flood season.

(h) Orchards are not permitted within bypasses but may be planted within other floodways in accordance with the following criteria:

(1) If an orchard is abandoned, all trees must be removed and burned or disposed of outside the floodway prior to flood season.

(2) Trees or brush cut prior to planting an orchard must be removed and burned or disposed of outside the floodway prior to flood season.

(3) Orchard cuttings and any debris that may accumulate in the orchard during the flood season must be removed from the floodway, or must be disposed of in such a manner as to leave no floatable debris within the floodway. Cuttings and other debris must regularly be burned or

removed and disposed of outside the floodway throughout pruning activities so as to leave no floatable debris within the floodway.

(4) Dead trees, stumps, prunings, or other agricultural debris may not be placed on the levee section or within ten (10) of the levee toe.

(5) Tree rows must be parallel to the direction of the overbank flow and may not direct the flow toward the levee.

(6) The spacing between rows must be a minimum of sixteen (16) feet perpendicular to the overbank flow of the stream. The row spacing must be increased if, in the judgment of the board, additional space is necessary for the passage of floodflows.

(i) Vegetable gardens are not permitted on the levee slope. Vegetable gardens may be permitted within ten (10) feet of the levee toe where they will not interfere with maintenance and inspection and meet the following conditions:

(1) No large bushy plants such as corn, tomatoes, grapes and peas are within ten (10) feet of the levee toe;

(2) There is not a maintenance access road along the levee toe;

(3) The adjacent levee slope is not sprayed with herbicide by the maintaining agency; and

(4) The levee is not experiencing burrowing rodent activity. If there is burrowing rodent activity in the immediate vicinity, the vegetable garden permittee shall control the rodents to the satisfaction of the Board or remove the garden.

(j) Irrigation of vegetation on levee slopes must conform to the following criteria:

(1) Permanently installed irrigation systems are permitted on both levee slopes of oversize levees and on the landside slope of standard size levees.

(2) Surface low pressure drip irrigation systems may be used on either the landside or waterside levee slope.

(3) Any water applied to vegetation on the levee slope by any means must be controlled to prevent erosion of the levee slope.

(4) Ditches may not be dug in the levee section, within ten (10) feet of the levee toe, or within the projected levee section for irrigation or drainage.

(5) Watering basins around trees must be limited to a maximum depth of twelve (12) inches.

(6) Permanently installed irrigation pipes may be buried but may be no deeper than eight (8) inches into the levee slope.

(7) A readily accessible shutoff or control valve is required in the supply line of all irrigation systems. The valve must be located a minimum of ten (10) feet landward of the levee toe and must be clearly identified for levee maintenance or flood fight personnel.

(8) Pipes supplying water to permanently installed sprinkler heads must be of approved material such as galvanized iron, schedule 40 polyvinyl chloride (PVC), class L copper, or equivalent. Aluminum pipe is not permitted.

(k) The board may permit, with appropriate conditions, existing nonconforming vegetation after considering a number of factors, including but not limited to:

(1) Age of vegetation;

(2) Type of vegetation;

(3) Location of vegetation;

(4) Size of vegetation;

(5) Physical condition of vegetation;

(6) Whether the vegetation was planted or is naturally occurring;

(7) Condition of the adopted plan of flood control;

(8) Environmental value of the vegetation; and

(9) Ability to inspect and maintain the levee around the vegetation.

(l) Trees removed from the levee and from within ten (10) feet of the levee shall have all roots larger than one– and one–half (1–1/2) inches in diameter removed for a distance of at least three (3) feet from the tree trunk at ground level and the hole filled with impervious soil compacted in four– (4) to six– (6) inch lifts. Compaction within the levee section shall be a relative compaction of not less than ninety percent (90%), per ASTM D1557–91, dated 1991, which is incorporated by reference. Outside of the levee section, the soil shall be compacted to at least the density of adjacent undisturbed material.

Table 8.2
Partial List of Trees *Suitable* for Oversize Levees

Alder, white	*Alnus rhombifolia*
Box Elder	*Acer negundo*
California pepper tree (male only)	*Schinus molle*
Carob tree (male only)	*Ceratonia siliqua*
China-berrv	*Melia azedarach*
Chinese pistache	*Pistacia chinensis*
Coast beefwood	*Casuarina stricta*
Common catalpa	*Catalpa bignonioides*
Crape myrtle	*Lagerstroemia indica*
Dogwood, giant	*Cornus controversa*
Dogwood, Western	*Cornus nuttallii*
Fremont cottonwood (male only)	*Populus fremontii*
Goldenrain tree	*Koelreuteria paniculata*
Hackberry, Chinese	*Ce/tis sinenis*
Hackberry, common	*Celtis occidentalis*
Hackberrv, European	*Celtis australis*
Maidenhair tree (male only)	*Gingko biloba*
Mayten tree	*Maytenus boaria*
Montezuma cypress	*Taxodium mucrontum*
Oak	*Ouercus spp.* *
Pagoda tree	*Sophora japonica*
Redbud, western	*Cercis occidentalis*
Redbud, eastern	*Cercis canadensis*
Sawleaf zelkova	*Zelkova serrata*
Silk tree	*Albizia julibrissin*
Strawberry tree	*Arbutus unedo* or *Arbutus "marina"*
Tallow tree	*Sapium sebiferum*
Tupelo	*Nyssa sylvatica*

Table 8.3
Partial List of Trees *Unsuitable* on Levees

Acacia. Bailev	*Acacia bailevana*
Acacia, kangaroo thorn	*Acacia armata*
Almond	*Prunus dulcis*
Apple, crabapple	*Malus spp.* *
Apricot	*Prunus armeniaca*
Ash, Arizona	*Fraxinus velutina*
Ash, flowering	*Fraxinus ornus*
Ash Modesto	*Fraxinum velutina "Modesto"*
Blue gum	*Eucalyptus globulus*
Cedar**	*Cedrus spp.* *
Cherrv	*Prunus ayium*
Chinese jujube	*Zizyphus jujube*
Chinese wingnut	*Pterocarya stenoptera*
Citrus	*Citrus spp.* *
Coast redwood	*Sequoia sempervirens*
Colorado spruce	*Picea pungens*
Cypress**	*Cupressus spp.* *
Date palm	*Phoenix spp.* *
Elm	*Ulmus spp.**
Fan palm	*Washingtonia spp.**
Fig	*Ficus carica*
Fir**	*Abies spp.* *
Giant sequoia	*Sequoiadendron giganteum*
Grape	*Vitis spp.* *
Hawthorn	*Crataegus spp.* *
Incense cedar**	*Calocedrus decurrens*
Locust	*Robinia spp.* *
Loquat	*Eriobotrya spp.* *
Olive	*Olea europaea*
Osage orange	*Maclura pomifera*
Peach and nectarine	*Prunus perica*
Pecan	*Carya illinoinensis*
Persimmon	*Diospyros spp.* *
Pine**	*Pinus spp.* *
Plum and prune	*Prunus domestica, salicina*
Pomegranate	*Punica granatum*
Quince	*Cydonia oblonga*
Russian olive	*Elaegnus augustifolia*
Salt Cedar	*Tamarisk gallica*
Tree of heaven	*A1lanthus alt1ss1ma*
Walnut	*Juglans spp.* *

*spp. = species
**Conifers whose normal mature height is 50 feet or less may be considered desirable under maintenance conditions that (1) protect the tree from drought, and (2) will assure proper pruning of the lower branches.

Table 8.4
Partial List of Ground Covers *Suitable* on Levees

Aaron's Beard***	*Hypericum calvcinum*
Alvssum	*Alvssum snn.**
Basket-of-gold	*Aurinia saxatile*
Bermuda Grass	*Cynodon dactylon "tifgreen"* *Cynodon dactylon "coastal"* *Cynodon dactylon "Tufcote"*
Blue-eved grass	*Sisvrinchium bellum*
California Poppy	*Eschscholzia californica*
Cape weed	*Arctotheca calendula*
Creeping wild rye***	*Elymus triticoides*
English lvv, miniature***	*Hedera helix, hahni*
Garden lippia	*Phyla nodiflora* *Lippia nodiflora*
Gazania, trailing***	*Gazania spp.**
Green carpet	*Herniaria glabra*
Lupine, dwarf	*Lupinus bicolor*
Mexican evening primrose***	*Oenothera berlandieri*
Palestine orchardgrass	*Dactylis glomerotoa "Palestine"*
Salt grass	*Distichlis spicata*
Spring Cinquefoil	*Potentilla tabernaemontanii*
Stonecrop	*Sedum spp.**
Trailing African daisy	*Osteospermumfruticosum*
Verbena	*Verbena peruviana*
Yellow-eyed grass	*Sisyrinchium californicum*

*spp. = species
**These species have specific requirements for being cut back or other- wise maintained on a regular basis depending on the species.

Table 8.5
Partial List of Ground Covers and Miscellaneous
Species *Unsuitable* on Levees

Bamboo	*Bambusa spp.* *
Blackberry/Raspberry	*Rubus spp.* *
Broom	*Cytisus spp.* *
Cactus	*Cactaceae spp.* *
Century Plant	*Agave americana*
False Bamboo, Common Reed	*Phragmites communis*
Freeway Iceplant	*Carpobrotus spp.* *
Grape	*Vitus spp.* *
Honeysuckle	*Lonicera spp.* *
Horsetail	*Equisetum hyemale*
Ice Plant, Rosea	*Drosanthemum floribundum*
Ice Plant, trailing	*Lampranthus, spectabulis*
Ivy Algerian	*Hedera canariensis*
Ivy, Persian	*Hedera colchica*
Ivy, English except miniature or dwarf varieties	*Hederal helix*
Pampas grass	*Cortaderia selloana*
Periwinkle	*Vinca spp.* *
Perla Grass	*Phalaris tuberosa* var. *hirtiglumis*
Rose	*Rosa spp.* *

*spp. = species

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section, figure 8.10 and tables 8.2 through 8.5 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) It is the ~~board's~~Board's policy to ~~permit~~ allow the construction of paved and unpaved bicycle trails by public agencies on ~~levees~~Levees and within ~~floodways~~Floodways under the ~~board's jurisdiction~~Board's jurisdiction, provided that the flood control purpose of the Levees and ~~floodway~~Floodways ~~facilities~~ remains primary. Bicycle trails ~~must~~shall meet the following general conditions:

(1) Where feasible, the bicycle trail ~~must~~shall be located off of the ~~levee~~Levee.

(2) Repair or replacement of the bicycle trail that is damaged during an emergency flood fight procedure, routine maintenance, or any required improvement activity within an ~~adopted plan~~Adopted Plan of ~~flood control must~~Flood Control shall be made by, and at the sole expense of, the ~~permittee~~Permittee or in accordance with an agreement for maintenance between the ~~permittee~~Permittee and a public agency.

(3) The ~~board~~Board and the ~~local flood control maintaining agency~~Local Maintaining Agency retain the right to temporarily close the bicycle trail for improvement, maintenance, or during emergency flood fight activities.

(4) Bicycle trails within an ~~adopted plan~~Adopted Plan of ~~flood control must~~Flood Control shall be maintained to a level safe for bicycle traffic and acceptable to the ~~local flood control maintaining agency~~Local Maintaining Agency and the Department ~~of Water Resources~~.

(5) The Permittee shall defend, hold harmless, and indemnify the State of California and the Local Maintaining Agency, and each of their boards, elected officials, officers, employees, and agents against all damages and claims of liability of whatever nature which arise from the use of the Levee as a bicycle trail.

(b) Bicycle trails on a ~~levee section~~Levee Section are allowed~~permitted~~ under the following conditions:

~~(1) The permittee shall defend, hold harmless, and indemnify the State of California and the local maintaining agency, and each of their boards, elected officials, officers, employees, and agents against all damages and claims of liability of whatever nature which arise from the use of the levee as a bicycle trail.~~

(~~2~~1) The ~~permittee~~ Permittee ~~must~~ shall submit proposed use restrictions for the bicycle trail, and a plan for enforcement of the restrictions satisfactory to the ~~board~~Board, prior to commencing construction. The restrictions, at a minimum, ~~must~~ shall confine~~restrict~~ public access to the trail and to designated adjacent areas only, and ~~must~~ shall prohibit equestrian and motorized vehicle traffic, except as may be necessary for maintenance, restriction enforcement, and providing for public safety.

(~~3~~2) The ~~permittee~~ Permittee ~~must~~ shall agree to bear the cost of any repairs to a flood control project facility that are made necessary by the presence or use of the bicycle trail.

(~~3~~4) Paved bicycle trails constructed on the ~~levee~~Levee crown ~~must~~shall have a minimum pavement width of twelve (12) feet and a minimum shoulder width of one (1) foot on each side of the pavement. The outer edges of the finished pavement may be no higher than the adjacent shoulders and the cross–section ~~must~~shall be shaped and trimmed to produce a smooth transition from pavement to shoulder.

(~~4~~5) Paved bicycle trails on the ~~levee~~Levee crown ~~must~~shall be designed ~~and paved~~ to withstand a maximum load of sixty-eight thousand (68,000) pounds from two consecutive sets of tandem axles. Soil tests may be required to determine design of the trail.

(~~5~~6) The structural section of paved bicycle trails ~~must~~shall consist of a minimum of six (6) inches of compacted aggregate base beneath two (2) inches of asphalt concrete pavement, or equivalent, on a ~~well compacted levee crown~~subgrade compacted pursuant to Section 120(a)

of this Division. Field density testing by an Approved Soils Testing Laboratory will be required to confirm the minimum relative compaction of the subgrade.

(6~~7~~) The aggregate base shall extend beyond the pavement to allow drainage.

(7~~8~~) The bicycle trail and all bicycle Access Ramp~~access ramp~~s ~~must~~shall be sloped to drain away from the ~~levee~~Levee crown.

(8~~9~~) Bicycle Access Ramp~~access ramp~~s on ~~levee~~Levee slopes ~~must~~shall conform to the criteria set forth ~~in the standards~~ for Access Ramp~~access ramp~~s ~~in section~~as per Section 130 of this Division.

(9~~10~~) The bicycle trail may not be cut into the ~~levee section~~Levee Section but may be placed on fill along the ~~levee~~Levee slope provided it will not interfere with maintenance.

(10~~11~~) The ~~permittee must~~Permittee shall maintain the bicycle trail or provide evidence of agreement with a public agency for that agency to provide maintenance.

(11~~12~~) The ~~permittee~~Permittee may be required to prevent unauthorized vehicular access to bicycle trails by installing gates or physical barriers such as K-rail, which ~~must~~shall be removable to allow access for maintenance, inspection, and emergency vehicles. ~~Vehicular~~If gates are used as vehicular access barriers they will be secured by locks. Keys shall be provided to the Local Maintaining Agency, Department ~~of Water Resources~~, Board, and ~~the local flood control maintaining agency~~USACE.

(12~~3~~) The ~~permittee~~Permittee shall install permanent safety signs at all bicycle access points and at periodic intervals along the trail containing such language as~~:~~ "Levee Maintenance Road", or "Watch for Patrolling Vehicles".

~~Levee Maintenance RoadWatch for Patrolling Vehicles.~~

(13~~4~~) The ~~permittee~~Permittee shall install permanent signs at all bicycle access points to control unauthorized use of bicycle trails.

(14) Sign posts shall not penetrate the Levee by more than twelve (12) inches unless encased in concrete cast in place against firm undisturbed earth.

(c) Bicycle trails within a ~~leveed floodway~~Leveed Floodway are ~~permitted~~ allowed under the following conditions:

(1) The ~~permittee must~~Permittee shall submit proposed use restrictions for the bicycle trail and a plan for enforcement of such restrictions satisfactory to the ~~board~~Board, prior to commencing construction. The restrictions, at a minimum, ~~must~~shall confine~~restrict~~ public access to the trail and to designated adjacent areas only, and shall prohibit equestrian and motorized vehicle traffic, except as may be necessary for maintenance, restriction enforcement, and providing for public safety.

(2) The ~~permittee must~~Permittee shall agree to bear the cost of any repairs to a flood control project facility that ~~are~~is made necessary by the presence or use of the bicycle trail.

(3) Bicycle trails ~~must~~shall be constructed as near to~~at~~ natural ground level ~~wherever~~ as possible~~, and all fills greater than three (3) feet in height must be supported by appropriate engineering studies~~.

(4) The ~~permittee must~~Permittee shall maintain the bicycle trail or provide evidence of an agreement with a public agency for that agency to provide maintenance.

(5) The ~~permittee~~Permittee is required to prevent unauthorized vehicular access to bicycle trails by physical barriers, which ~~must~~shall be removable to allow access for maintenance, inspection, and emergency vehicles. Vehicular access barriers will be secured by locks. ~~Keys~~ At the time locks are installed, keys shall be provided to the Board, Department ~~of Water Resources~~, USACE and the ~~local flood control maintaining agency~~Local Maintaining Agency.

(6) The ~~permittee must~~Permittee shall install permanent signs at all bicycle access points to control unauthorized use of bicycle trails.

(d) ~~Paved~~The bicycle ~~trails within ten (10) feet~~trail shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(e) Whenever possible the Permittee shall consider privacy concerns of ~~the landside levee toe must have appropriate~~adjacent landowners and incorporate features ~~that intercept seepage and prevent particle migration~~into the trail design to mitigate these concerns.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

These supplemental standards apply only to the construction, reconstruction, improvement, or repair of ~~dwellings~~ Dwellings and associated improvements on the left bank ~~waterward~~ Waterside ~~berm~~ Berm and waterward ~~levee~~ Levee slope of the Sacramento River between Levee~~levee~~ miles 0.00 and 18.60, Unit 1, Reclamation District 1000. These standards supplement and, where in conflict with, supersede the standards in ~~sections~~ Sections 111 through 137. While these standards are not specifically for commercial construction, in general, the principles in this section will apply to commercial development. For purposes of administering these standards uniformly between Levee miles 0.00 and 18.60 of Unit 1, this area is considered to be an Urban Criteria Area.

(a) The following definition applies to this Section:

(1) "Garden Highway Levee" means the Levee on which the Garden Highway is located along the Sacramento River between Levee miles 0.00 and 18.60, Unit 1, Reclamation District 1000, the crown of which is the Garden Highway.

(~~a~~b) The owner or ~~permittee~~Permittee must maintain the ~~waterward~~waterside slope of the ~~levee~~Garden Highway Levee and the utilized area within the ~~floodway~~Floodway of the Sacramento River in the manner required by Reclamation District 1000 or any other agency responsible for maintenance.

(~~b~~c) The area between the ~~waterward levee~~waterside Garden Highway Levee crown shoulder and the riverbank may be filled, provided the fill does not extend more than one hundred fifty (150) feet waterward from the centerline of the ~~levee~~Garden Highway Levee crown. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~c~~d) Within the area located between the ~~waterward levee~~waterside Garden Highway Levee crown shoulder and a point sixty-five (65) feet waterward from the centerline of ~~levee~~Garden Highway Levee crown, the following conditions apply:

(1) Where the area is less than one (1) foot above the ~~design flood plane~~Design Water Surface Elevation, driveways and ramps may be constructed at any orientation to the ~~levee~~Levee.

(2) Where the area is less than one (1) foot above the ~~design flood plane~~Design Water Surface Elevation, fences, walls and similar structures parallel to the ~~levee~~Garden Highway Levee must be an open type and constructed to provide for the unobstructed visual inspection of the ~~levee~~Garden Highway Levee slope and toe from the ~~levee~~Garden Highway Levee crown roadway.

(3) Where the entire area is at least one (1) foot above the ~~design flood plane~~Design Water Surface Elevation, no restrictions apply to fences, walls, and similar structures.

(4) Fences, walls, and similar structures shall be designed to meet the requirements of Reclamation District 1000, and these requirements shall be incorporated into Board Permits when applicable.

(5) Elevated walkways and driveways are ~~permitted~~ a without elevation restrictions.

(~~d~~e) Within the area beginning at a point sixty-five (65) feet waterward from the centerline of the ~~levee~~Levee and extending waterward a maximum of one hundred and fifty (150) feet from the centerline of the ~~levee~~Garden Highway Levee crown, the following conditions apply:

(1) Securely anchored fences and structures are allowed~~permitted~~.

(2) Dwellings are allowed~~permitted~~, if the lowest finished floor level is at least two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher.~~Design Water Surface Elevation.

(3) The lowest finished floor level of any addition to an existing ~~dwelling~~Dwelling shall be at least two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher.~~Design Water Surface Elevation.

(4) Dwellings and appurtenant structures are allowed~~permitted within~~if placed no closer than fourteen (14) feet ~~of~~from the top of the riverbank, provided the riverbank is revetted to ~~board standards~~Board Standards.

(5) Dwellings and appurtenant structures are not allowed~~permitted~~ within thirty (30) feet of the top of an unrevetted riverbank.

(6) The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(~~e~~f) Within the area beginning at a point one hundred and fifty (150) feet waterward from the centerline of the ~~levee~~Garden Highway Levee and extending waterward to the top of riverbank, the following conditions apply:

(1) New Dwellings and fences are not allowed~~permitted~~.

(2) Securely anchored structures that do not protrude above natural ground level may be allowed.

(3) Additions may be made to existing ~~dwellings~~Dwellings if the addition extends no farther into the ~~floodway~~Floodway than the original ~~dwelling~~Dwelling.

(4) The lowest finished floor level of any addition to an existing ~~dwelling~~Dwelling shall be at least two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher.~~Design Water Surface Elevation.

(~~f~~g) Materials or equipment stored within the ~~flood way~~Floodway must be securely anchored or removed prior to the ~~flood season~~Flood Season.

(~~g~~h) Downed trees or brush and other floatable material of any kind are not allowed~~permitted~~ to remain within the ~~floodway~~Floodway during the ~~flood season~~Flood Season.

(~~h~~i) The ~~board~~Board ~~permit~~Permit approving the construction, reconstruction, improvement, or repair of a ~~dwelling~~Dwelling shall run with the land, pursuant to a recorded document executed pursuant to ~~section~~Section 16(f). Upon transfer of title of the land, the land owner relinquishing title is responsible to provide written notification to the Board of the title transfer and the new land owner's name and address.

(j) A hydraulic study shall be required by the Board for new Dwellings. The One (1) Percent Blockage Criterion shall apply to additions to existing Dwellings for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code.

Reference:

Sections 8370, 8608 and 8710, Water Code.

History:

1. New section filed 9-30-96; operative 10-30-96 (Register 96, No. 40).

These standards are for ~~dwellings~~construction, reconstruction, improvement, and repair of Dwellings and structures within the Yuba River ~~floodway~~Floodway between Daguerre Point Dam and the confluence with the Feather River. These standards supplement and, where in conflict with, supersede the standards in ~~sections~~Sections 111 through 137 of this Division.

(a) The following definition applies to this ~~section~~Section:

(1) ~~Permanent Dwelling~~ "Permanent Dwelling" means a ~~dwelling~~Dwelling that may be occupied throughout the year.

(b) The lower Yuba River flood channel is divided into Areas A, B, and C, as delineated on Figure 8.~~11.~~11.

(1) Area A is the flow area required to carry one hundred fifty thousand (150,000) cubic feet per second (cfs). ~~Area A and Area B combined is the flow area required to carry two hundred thirty five thousand (235,000) cfs. Area C is the remainder of the floodway within the flood control project levees. A map identifying the exact locations of Areas A, B and C, entitled "1995 Designated Floodway, Yuba River" is incorporated by reference into this regulation. The full size map is available for inspection at the office of the board in Sacramento.~~

~~(c) Encroachments in~~

(2) Area A ~~must conform to~~ and B combined is the ~~general standards~~flow area required to carry two hundred thirty five thousand (235,000) cfs.

(3) Area C is the remainder of the Floodway within the Adopted Plan of Flood Control.

(c) A map identifying the exact locations of Areas A, B, and C, entitled "1995 Designated Floodway, Yuba River" is incorporated by reference into this ~~title~~Division. The full-size map is available for inspection at the Board's office in Sacramento.

(d) ~~, except that~~ New Dwellings, new ~~dwellings~~Dwellings for ~~seasonal occupancy~~Seasonal Occupancy, ~~(as defined in section 113) and~~ new Buildings~~structures~~ are not allowed in Area A~~permitted~~.

(~~d~~e) ~~Encroachments in Area B must conform to the general standards of this title except that dwellings~~New Dwellings, new Dwellings for Seasonal Occupancy, new Building~~structure~~s, and ~~mobile homes~~Mobilehomes may be allowed~~permitted~~ in substantial areas of shallow flooding (water ~~depth~~depths not to exceed one (1) foot ~~or less~~ in a ~~hundred~~ 100-year flood) in Area B if they satisfy the requirements of subdivision (~~e~~f) of this ~~section~~Section and ~~the requirements of section~~Section 113(d~~).~~) of this Division.

(~~e~~f) Area C is considered a "~~zone~~Zone B" as provided in ~~section~~Section 113~~.~~ of this Division. Encroachments in Area C ~~must~~shall conform to the ~~general standards of this division~~Board Standards, and in addition, meet the following requirements:

(1) The ~~design flood plane~~Design Water Surface Elevation for construction of new~~permanent dwellings must~~Dwellings and new Dwellings for Seasonal Occupancy shall correspond to the two hundred thirty~~–~~ five thousand (235,000) cfs flow line or 100~~–~~-year flood elevation outside of Urban Criteria Areas, and the 200-year flood elevation~~,~~ in Urban Criteria Areas, whichever is higher.

(2) New ~~permanent dwellings~~Dwellings are not allowed~~permitted~~ in Area C unless a safe evacuation route, satisfactory to the ~~board~~Board, is available for the ~~dwelling's~~Dwelling's residents.

(3) Roads that would be used to evacuate residents ~~must~~shall be constructed to at least the one hundred fifty thousand (150,000) cfs flow line elevation, 100~~–~~-year flood elevation, or at natural ground elevation, whichever is highest and may not unreasonably obstruct ~~floodflows~~flood flows.

(4) The ~~board~~Board may require the owner of a ~~dwelling~~Dwelling, pursuant to ~~section~~Section 16 of this Division, to execute an agreement in which the owner agrees to evacuate all residents and guests upon order of an authorized government official when flooding is forecasted for the area.

(g) The Board Permit approving the construction, reconstruction, improvement, or repair of a Dwelling or Dwelling for Seasonal Occupancy shall run with the land, pursuant to a recorded document executed pursuant to Section 16(f). Upon transfer of title of the land, the land owner relinquishing title is responsible to provide written notification to the Board of the title transfer and the new land owner's name and address.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609, and 8710, Water Code

History:

1. New section and figure 8.11 filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

~~The~~ (a) These supplemental standards apply to the Butte Basin, as delineated on Figure 8.12 and partitioned into designated Areas B, C, D, E, and Reclamation District 1004. These standards supplement and, where in conflict with, supersede the standards in Sections 111 through 137 of this Division. The basin's boundaries are as follows:

(1) The basin's west boundary is the Sacramento River east bank ~~project levee~~SPFC Levee, and above the Ord Ferry area where there is no ~~project levee~~SPFC Levee, the boundary is the ~~designated floodway of the~~ Sacramento River Designated Floodway adopted November 29, 1988~~.~~,

(2) The east boundary is based on the wetted area of the 1970 flood~~.~~,

(3) The north boundary is the Sacramento River ~~designated floodway~~Designated Floodway in the proximity of Murphy Slough and Golden State Island, and ~~the~~

(4) The south boundary is the Sacramento River between the city of Colusa and the Butte Slough outfall gates, a section of the Butte Slough ~~levee~~Levee in both Colusa and Sutter Counties, and Pass Road in Sutter County. ~~These standards supplement and, where in conflict with, supersede the standards in section 111 through section 137.~~

~~(a~~(5) A map identifying the locations of the above-named areas is incorporated by reference into this Division. A large printed map is available for inspection at the Board's Sacramento office, and is also available online from the Board website.

(b) Approval from the ~~board~~Board is required for any ~~encroachment~~Proposed Work that could reduce or impede ~~floodflows~~flood flows, or would reclaim any of the floodplain within Butte Basin.

(1) ~~Encroachments~~Proposed Work in Reclamation District 1004 ~~are~~is not regulated by the ~~board~~Board.

(2) ~~The~~These supplemental standards do not apply to that portion of Area E located north of the Butte-Sutter County line and its extension westward into Colusa County, and situated adjacent to the Sacramento River ~~project levee~~SPFC Levee where the natural ground level is higher than the 100-year flood elevation.

(3) Except where the activity would potentially affect ~~a project levee or other project feature~~an Adopted Plan of Flood Control, the standards within ~~sections~~Sections 116, 122, 123, 124, 126, 127, 129, 130, 131, 132, and 137 of this Division do not apply to that portion of Area E located south of the Butte-Sutter County line and its extension westward into Colusa County.

~~(b) Approval from the board~~(4) The Proposed Work shall not cause a significant increase in Stream stage or velocities during Flood Season. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(c) Approval from the Board is not required for crop checks less than thirty-six (36) inches in height above the natural ground level. In Areas B, C and D, all crop checks ~~must~~shall be removed prior to ~~flood season~~Flood Season, unless they comply with the requirements of subdivisions (~~d),~~ (~~e~~), (f), and (~~f),~~g), respectively.

(~~c~~d) Except where the activity would potentially affect ~~a project levee or other project feature~~an Adopted Plan of Flood Control, approval from the ~~board~~Board is not required for land leveling or grading, or for drainage and irrigation improvements in Areas C, D, and E that have a localized impact only and comply with subdivisions (~~e),~~ (f), (g), and (~~g)~~ h) of this section.

(~~d~~e) Within Area B, approval from the ~~board~~Board is not required for any ~~encroachment~~Proposed Work that is less than eighteen (18) inches in height above the natural ground level. However, any ~~proposed encroachment~~Proposed Work within a slough or swale must be approved by the

~~board~~Board. Area B extends southerly from Butte Basin's northerly boundary to a line located one thousand (1,000) feet southeasterly and lying parallel to the Parrott Grant line.

(~~e~~f) Within Area C, approval from the ~~board~~Board is not required for any ~~encroachment~~Proposed Work less than thirty-six (36) inches in height above the natural ground level, and having a ~~crest elevation~~Crest Elevation less than seventy two and five~~one~~ tenths (~~70.1~~72.5) feet (~~NGVD~~NAVD88). Area C is the area enclosed within a three- (3) mile radius measured from the center of Moulton Weir and limited by the southeasterly extensions of the north and south training ~~levee~~Levee alignments to the three- (3) mile arc.

(~~f~~g) Within Area D, approval from the ~~board~~Board is not required for any ~~encroachment~~Proposed Work less than thirty-six (36) inches in height above the natural ground level and having a ~~crest elevation~~Crest Elevation less than fifty-~~four~~ seven and three~~nine~~ tenths (~~54.9~~57.3) feet (~~NGVD~~NAVD88). Area D encompasses the Colusa Weir together with its outflow channel enclosed by training ~~levees~~Levees, and an overflow area extending to Butte Creek.

(~~g~~h) Within Area E, approval from the ~~board~~Board is not required for any ~~encroachment~~Proposed Work less than thirty-six (36) inches in height above the natural ground level. The northern boundary of Area E is a line located one thousand (1,000) feet southeasterly of the south Parrott Grant line, and the southern boundary is formed by the Sacramento River between the city of Colusa and the Butte Slough outfall gates, a section of the Butte Slough ~~levee~~Levee in both Colusa and Sutter Counties, and Pass Road in Sutter County.

(~~h~~i) Within that portion of Area E located south of Gridley Road, new and existing recreational structures and, including ~~caretaker, security, and dwellings~~Dwellings for ~~seasonal occupancy~~Seasonal Occupancy ~~(as defined in section 113)~~ may be ~~permitted~~ allowed provided the lowest finished floor level of the structure is at least two (2) feet above the ~~design flood plane or two (2) feet above the 100-year flood elevation, whichever is higher~~Design Water Surface Elevation.

(j) The Board Permit approving the construction, reconstruction, improvement, or repair of a Dwelling for Seasonal Occupancy in Area E shall run with the land, pursuant to a recorded document executed pursuant to Section 16(f). Upon transfer of title of the land, the land owner relinquishing title is responsible to provide written notification to the Board of the title transfer and the new land owner's name and address.

Note:

Authority cited: Section 8571, Water Code.

Reference:

Sections 8608, 8609 and 8710, Water Code.

History:

1. New section and figure 8.12 filed 9-30-96; operative 10-30-96 (Register 96, No. 40).

It is the ~~board's~~Board's policy to ~~permit~~regulate by Permit or other action agricultural land use and the development of suitable wetlands within the Yolo Bypass and Sutter Bypass. The supplemental standards protect the flood control functions of the Yolo and Sutter Bypasses, safeguard existing agricultural land use, and control the development of proposed wetlands.

(a) Final detailed plans for all Proposed Work involving construction, grading and planting ~~must~~shall be submitted to and approved by the ~~board~~Board prior to the start of work.

(b) A detailed operation and maintenance plan ~~must~~shall be submitted to and approved by the ~~board~~Board prior to the start of work.

(c) A profile of the existing ~~levee~~Levee crown roadway and Access Ramp~~access ramp~~s that will be utilized for access to and from the construction area ~~must~~shall be submitted to the ~~board~~Board prior to the start of work.

(d) Any damage to the ~~levee~~Levee crown roadway or Access Ramp~~access ramp~~s attributable to the construction or maintenance of croplands or wetlands ~~must~~shall be promptly repaired by the ~~permittee~~Permittee.

(e) The planting of vegetation or the impoundment of water is not allowed~~permitted~~ within one thousand (1,000) feet of the Fremont Weir structure.

(f) The planting of vegetation or the impoundment of water shall not be allowed~~permitted~~ in any area ~~where there could be an adverse~~unless a hydraulic analysis demonstrates no adverse hydraulic impact. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(g) Irrigated and ~~nonirrigated~~non-irrigated pastures and croplands are allowed without ~~permit~~Permit from the ~~board~~Board when consistent with the ~~board's flowage easements~~Board's Flowage Easements.

(h) The planting of vegetation is generally allowed~~permitted~~ for the development of native marsh, riparian vegetation, and wetlands.

(i) Rooted vegetation and aquatic beds of floating (~~nonrooted~~non-rooted) or submerged vegetation are generally allowed~~permitted~~ to be established in ponded water.

(j) The depth of ponded water ~~must~~shall be controlled to prevent the growth of unauthorized vegetation that could adversely affect the operation of ~~the flood control project~~Adopted Plan of Flood Control.

(k) No permanent ~~berms~~Berms or dikes are allowed~~permitted~~ above natural ground elevation without a detailed hydraulic analysis except where otherwise expressly provided for in reservations contained in easement deeds to the Sacramento and San Joaquin Drainage District.

(l) Required maintenance may include removal, clearing, thinning, and pruning of all vegetation directly or indirectly resulting from the ~~permitted project~~Permitted Work.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

The following standards are to be used as a guide in ~~making application~~preparing applications to the ~~board~~Board for miscellaneous ~~encroachments.~~Encroachments. Not all possible miscellaneous ~~encroachments~~Encroachments, the number being unlimited, are listed. Those listed are typically the type proposed by residents within an ~~adopted plan~~ Adopted Plan of ~~flood control,~~Flood Control and those necessary because of ~~governmental requirements~~federal or State statutes, regulations, and policies.

(a) Tanks used for storage of water or other liquids ~~are~~and water retention basins shall not ~~permitted~~ be installed within ~~a levee section or within ten (10) feet of~~ the ~~levee toe. If placed within~~ Levee Right of Way, or the ~~floodway, or if placed in the projected levee section~~Projected Levee Section and within twenty–five (25) feet of the ~~levee toe,~~ Levee Toes. Tanks storing less than five thousand (5,000) gallons can be stored outside the Levee Right of Way.

(b) The bottom of landside storage tanks and water retention basins shall be located above a 10h:1v slope projected downward from the landside Levee Toe, Seepage Berm toe, or Stability Berm toe unless a geotechnical analysis demonstrates that the storage tank or water retention basin will not adversely impact the integrity of the Levee.

(c) For any storage tank or water retention basin with its bottom more than two (2) feet below ground and within four hundred (400) feet of the landside Levee Toe, appropriate seepage modeling shall be performed to demonstrate that the storage tank or water retention basin does not result in a ~~permit~~configuration whereby the Levee and/or Seepage Berm or Stability Berm does not meet design criteria. The modeling shall assume the storage tank or water retention basin is ~~required.~~empty unless adequate assurances of a fluid level in the storage tank or water retention basin are provided to the Board. The engineering evaluation shall include subsurface investigation and laboratory testing to characterize the foundation of the storage tank or water retention basin and the nearby Levee or flood control project feature. The evaluation shall include slope stability, Levee underseepage, and uplift analyses. The evaluation shall consider aquifer and blanket layer conditions and potential for piping. The evaluation shall use the Design Water Surface Elevation and, in Urban Criteria Areas, the evaluation shall also use Stream stage at the Hydraulic Top of Levee. The Board may waive this seepage modeling requirement for a temporary storage tank or water retention basin or for a minor, shallow storage tank or water retention basin that, in the judgment of the Board, poses no risk to the integrity of the Levee.

~~(b) Landside water retention basins must be located outside of the projected levee section and a minimum distance of twenty–five (25) feet from the levee toe plus any additional distance that may be determined to be required to control seepage.~~

~~(c~~(d) In Urban Criteria Areas, the seepage modeling shall include evaluation of performance for the Stream stage at the Hydraulic Top of Levee and comply with Levee underseepage requirements of the Urban Levee Design Criteria.

(e) Steps for access on ~~levee~~Levee slopes ~~must~~shall conform to the following criteria:

(1) Steps ~~must~~shall be constructed of material resistant to deterioration. Acceptable materials include, but are not limited to, concrete, masonry, stone, ~~pressure-treated lumber,~~ iron, and steel.

(2) Steps constructed on the ~~waterward levee~~waterside Levee slope ~~must~~shall be properly anchored to prevent movement during high water.

(3) Excavation in the ~~levee~~ Levee slope ~~made~~ for ~~the~~ construction of steps may not exceed twelve (12) inches in depth~~.~~

(4) Steps ~~must~~ shall be ~~constructed~~ flush with the ~~levee~~Levee slope.

(5) Handrails are not allowed~~permitted~~ on steps if they interfere with ~~levee~~Levee maintenance unless they are required by law.

(6) Handrails, where allowed~~permitted~~ on ~~waterward levee~~waterside Levee slopes, shall be ~~designed to give way when subjected to~~ removable, or debris ~~loadings~~shall be removed prior to Flood Season and after each flood event.

(7) The ~~permittee~~Permittee is responsible for the maintenance of steps and handrails.

(8) Revetment on a ~~levee~~Levee slope or streambank that is destroyed or disturbed during the construction of steps ~~must~~shall be restored to its original condition by the ~~permittee~~Permittee.

(~~d~~f) Horizontal (elevated) access ~~ways~~walkways, with or without handrails, ~~are~~may be ~~permitted~~ allowed above the landside and ~~waterward~~waterside slopes of the ~~levee~~Levee if they do not interfere with ~~levee~~Levee maintenance and conform to the following criteria:

(1) Horizontal access ~~ways~~walkways may not exceed four (4) feet in width unless the ~~levee slope~~ walkway is see-through and the Levee Slope immediately beneath the ~~access way is revetted to board~~walkway has Revetment that meets standards in Section 121 of this Division.

(2) The bottom elevation of the stringers of horizontal access ~~ways~~walkways above the ~~waterward levee~~waterside Levee slope ~~must~~shall be a minimum of three (3) feet above the ~~design flood plane elevation~~Design Water Surface Elevation.

(3) Handrails on access ~~ways~~walkways may not extend onto the ~~levee~~Levee crown.

(4) On a ~~levee~~Levee where the crown is less than fourteen (14) feet in width, handrails ~~must~~shall be a minimum of seven (7) feet from the centerline of the ~~levee~~Levee.

(5) Access ~~way~~walkway supports, or piers, ~~must~~shall be constructed so as to minimize the possibility of trapping and accumulating floating debris.

(6) Revetment on a ~~levee~~Levee slope or streambank that is destroyed or disturbed during the construction of a walkway ~~must~~shall be restored to its original condition by the ~~permittee~~Permittee.

(7) Maintenance of an access ~~way~~walkway and the adjacent ~~levee slope~~Levee Slope is the responsibility of the ~~permittee~~Permittee, and any erosion of the ~~levee slope must~~Levee Slope shall be promptly repaired.

(~~e~~g) Mailboxes, when required by the U.S. Postal Service, are ~~permitted~~ allowed on a ~~levee section~~Levee Section and ~~must~~shall be placed at the extreme outer edge of the ~~levee~~Levee crown. If the ~~levee~~Levee crown is less than fourteen (14) feet in width, the mailbox ~~must~~shall be a minimum of seven (7) feet from the centerline of the ~~levee.~~Levee. The maximum depth of burial into the Levee is twelve (12) inches unless encased in concrete cast in place against firm undisturbed earth.

(~~f~~h) Traffic control signs, directional or informational signs, and signs providing for public safety are ~~permitted~~ allowed on a ~~levee slope or on the edge of a levee crown.~~Levee slope or on the edge of a Levee crown. The maximum depth of burial into the Levee is twelve (12) inches unless encased in concrete cast in place against firm undisturbed earth.

(~~g~~i) Bus shelters are ~~permitted~~ allowed on a Levee crown, near the shoulder, where sufficient space is available for safe operation of vehicles and the shelter is set back at least ten (10) feet from the levee centerline, provided the shelter will not interfere with Levee maintenance, inspection, or flood fighting. The maximum depth of burial into the Levee is twelve (12) inches unless encased in concrete cast in place against firm undisturbed earth~~a levee section where sufficient area is available for safe operation of vehicles, and the bus shelter is~~s at least seven (7) feet from the centerline of the levee~~.

(~~h~~j) Livestock grazing on ~~levee~~Levee slopes shall not be allowed during the Flood Season without written approval by the Chief Engineer. Grazing shall be controlled to prevent overgrazing and the development of livestock trails~~.~~ on the Levee slope(s).

(~~i~~k) The storage of materials or equipment, unless securely anchored, downed trees or brush, and floatable material of any kind are not allowed within a ~~floodway~~Floodway during the ~~flood season as defined in Table 8.1~~Flood Season.

(~~j~~l) Structures and the storage of material or equipment are not ~~permitted~~ allowed on ~~levee~~Levee slopes.

~~(k) Structures,~~(m) Normally no materials~~, and~~ or equipment may be placed on the ~~levee~~Levee crown, however, materials or equipment may be temporarily placed on the Levee crown during construction if they do not prevent inspection and maintenance of the ~~levee~~Levee, obstruct floodfight procedures, and the following additional requirements are met:

(1) There is adequate ~~levee~~Levee crown width to provide a minimum of twenty (20) feet of unobstructed clearance for two~~-~~-way vehicular traffic.

(2) Where a public road or highway is on the ~~levee~~Levee crown, the design width of the roadway including the roadway shoulders ~~must~~shall remain clear.

(3) Materials or equipment ~~may not be~~ stored ~~within~~on the Levee crown shall be no closer than fourteen (14) feet ~~of~~from the ~~landward levee~~landside Levee shoulder.

(4) Materials or equipment ~~may be~~ stored ~~to within~~on the Levee crown shall be no closer than fourteen (14) feet ~~of~~from the ~~waterward levee~~waterside Levee shoulder provided the ~~waterward levee~~waterside Levee slope ~~is revetted to board~~ has Revetment that meets the standards of Section 121 of this Division.

(5) Materials or equipment ~~may not be~~ stored ~~within~~on the Levee crown shall be no closer than thirty (30) feet ~~of~~from the ~~waterward levee~~waterside Levee shoulder if the waterside Levee slope is not protected from erosion by Revetment meeting the standards in Section 121 of this Division~~of an unrevetted levee~~.

(~~l~~n) Seismic surveys near a ~~levee~~Levee or within a ~~floodway must~~Floodway shall meet the following criteria:

(1) Horizontal shear energy sources may not be used on any ~~levee section~~Levee Section or within fifty (50) feet of the ~~levee toe~~Levee Toe. In areas having soils especially susceptible to damage, a more stringent control may be required.

(2) Energy charges for surveys ~~must~~shall be a minimum distance of two hundred (200) feet from the ~~levee toe~~Levee Toe.

(3) Energy charges for surveys ~~must~~shall not exceed one (1) pound of charge per one hundred (100) feet of distance from the ~~levee toe~~Levee Toe.

(4) Electrical cables used in seismic surveys may not interfere with periodic inspections and maintenance of flood control facilities or with ~~flood fight~~floodfight procedures.

(o) Miscellaneous Encroachments that would remain in the Floodway during the Flood Season shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

Note:

Authority cited: Section 8571, Water Code

Reference:

Sections 8608, 8609 and 8710, Water Code

History:

1. New section filed 9–30–96; operative 10–30–96 (Register 96, No. 40).

(a) The ~~board~~Board may identify the limits of ~~the adopted plan of flood control or flood control works~~an Adopted Plan of Flood Control, SPFC Facilities, Non-SPFC Facilities, other Permitted Work, and Encroachments for purposes of establishing the area of the ~~boards's~~Board's jurisdiction that it actively regulates when:

(1) The point of intersection of the ~~levee~~ Levee slope and natural ground cannot readily be determined, therefore, the existing ~~levee toe~~Levee Toe cannot otherwise be defined~~in accordance with Title 23 Cal Code Regs. Section 4(s)~~.

(2) Features or facilities are proposed to be added that may interfere with the integrity or proper functioning of ~~the adopted plan of flood control~~an Adopted Plan of Flood Control.

Note:

Authority cited: Section 8571, Water Code.

Reference:

Sections 8608, 8609 and 8710, Water Code.

History:

1. New section filed 12–1–2009; operative 12–31–2009 (Register 2009, No. 49).

(a) Definitions: The following definitions apply to this section:

(1) "Adjacent to a Levee" means the bottom of the Pool or Existing Pool is located below a 10h:1v slope projected downward from a landside Levee Toe, Seepage Berm toe, Stability Berm toe, or landward extent of the flood control project feature.

(2) "Existing Pool" means a Pool already constructed with or without a Permit from the Board.

(3) "Pool" means a permanent structure excavated any shape in the ground more than two (2) feet deep, designed for holding water used for bathing or swimming, including but not limited to swimming pools, Jacuzzis, hot tubs, and similar structures whether full or empty. The term "permanent" means the structure remains in place during part or all of the Flood Season.

(b) General: Pools and Existing Pools near the landside Levee Toe or Adjacent to a Levee could have adverse impacts on the stability of the Levee or flood control project feature during high water events, leading to structural damage or failure of the Levee or flood control project feature.

(1) New Pools shall not be constructed and Existing Pools shall not be enlarged within the Levee Right of Way.

(2) New Pools shall not be constructed and Existing Pools shall not be enlarged Adjacent to a Levee unless a geotechnical analysis demonstrates that the Pool will not adversely impact the integrity of the Levee and a Permit is issued by the Board.

(3) Any modification, alteration, addition, or similar activity involving a Pool or Existing Pool that is Adjacent to a Levee may at the Board's discretion trigger an engineering evaluation pursuant to Section 139(c) of this Division and/or issuance of a Permit with conditions.

(4) In exceptional circumstances, the Board may require an engineering evaluation pursuant to Section 139(c) of this Division for any new Pool to be constructed, and for any Existing Pool to be enlarged, within four hundred (400) feet landward of a landside Levee Toe or Adjacent to a Levee. The evaluation shall be submitted to the Board for approval and shall be the basis for determining whether a Board Permit is required. Such exceptional circumstances may apply when there is engineering evidence that the new Pool or Existing Pool to be enlarged may create or significantly aggravate piping of soil from the vicinity of the Levee.

(5) Based on an engineering evaluation provided pursuant to Section 139(b)(4) of this Division, a Board Permit may be required for any new Pool to be constructed or installed, and for any Existing Pool to be enlarged, within four hundred (400) feet landward of the landside Levee Toe that could uplift, or crack from uplift force, or promote piping during high water if the Pool is empty; otherwise a Permit is not required for constructing a new Pool, or enlarging an Existing Pool, that is not Adjacent to a Levee.

(6) Existing Pools Adjacent to a Levee in an Adopted Plan of Flood Control shall comply with Article 6, Section 108 (Existing Encroachments) of this Division.

(c) Engineering evaluations for new Pools to be constructed and Existing Pools to be enlarged within four hundred (400) feet landward of a landside Levee Toe, or Adjacent to a Levee in an Adopted Plan of Flood Control shall comply with the following requirements:

(1) The engineering evaluation shall include subsurface investigation and laboratory testing to characterize the foundation of the Pool or Existing Pool and the nearby Levee or flood control project feature. The evaluation shall include slope stability, Levee underseepage, and Pool uplift analyses for full Pool and empty Pool conditions. The evaluation shall consider aquifer and blanket layer conditions and potential for piping. The evaluation shall use the Design Water Surface Elevation and, in Urban Criteria Areas, the evaluation shall also use Stream stage at the Hydraulic Top of Levee. The Board may waive this engineering evaluation

requirement for a small, shallow New Pool or Existing Pool that, in the judgment of the Board, poses no risk to the integrity of the Levee.

(2) The engineering evaluation shall also evaluate the structural adequacy of the Pool to avoid cracking by uplift forces during high water.

(3) The engineering evaluation shall be performed by a California registered civil engineer.

(4) The engineering evaluation shall provide satisfactory evidence to the Board that the Pool or Existing Pool will not adversely impact the integrity of the Levee or flood control project feature; otherwise the Board will not grant a Permit for the Pool or Existing Pool.

(5) The Board Permit shall require the owner of the Pool or Existing Pool to maintain the Pool or Existing Pool full of water during Flood Season.

(6) The Board Permit shall require conditions associated with access, inspection, and enforcement to ensure that the Pool or Existing Pool is full of water during Flood Season.

(d) New Pools to be constructed and Existing Pools to be enlarged within a Floodway shall comply with the following requirements:

(1) In a Leveed Floodway, a Pool or Existing Pool within three hundred (300) feet of the waterside Levee Toe shall be evaluated by a California registered civil engineer. The engineering evaluation shall include subsurface investigation and laboratory testing to characterize the foundation of the Pool or Existing Pool and the nearby Levee or flood control project feature. The engineering evaluation shall include subsurface investigation and laboratory testing to characterize the foundation of the Pool or Existing Pool and the nearby Levee or flood control project feature.

(2) A Pool or Existing Pool and appurtenances shall not cause a significant increase in Stream stage or velocities. The One (1) Percent Blockage Criterion shall apply for evaluating any hydraulic impact. The Board may deny a Permit if the hydraulic impact is deemed significant.

(e) The Board Permit approving a Pool or Existing Pool shall run with the land, pursuant to a document executed pursuant to Section 16(f) of this Division. Upon transfer of title of the land, the land owner relinquishing title is responsible to provide written notification to the Board of the title transfer and the new land owner's name and address.

(f) Additional Permit conditions may be required by the Board for ensuring a Pool or Existing Pool does not adversely impact the Adopted Plan of Flood Control.

Note:

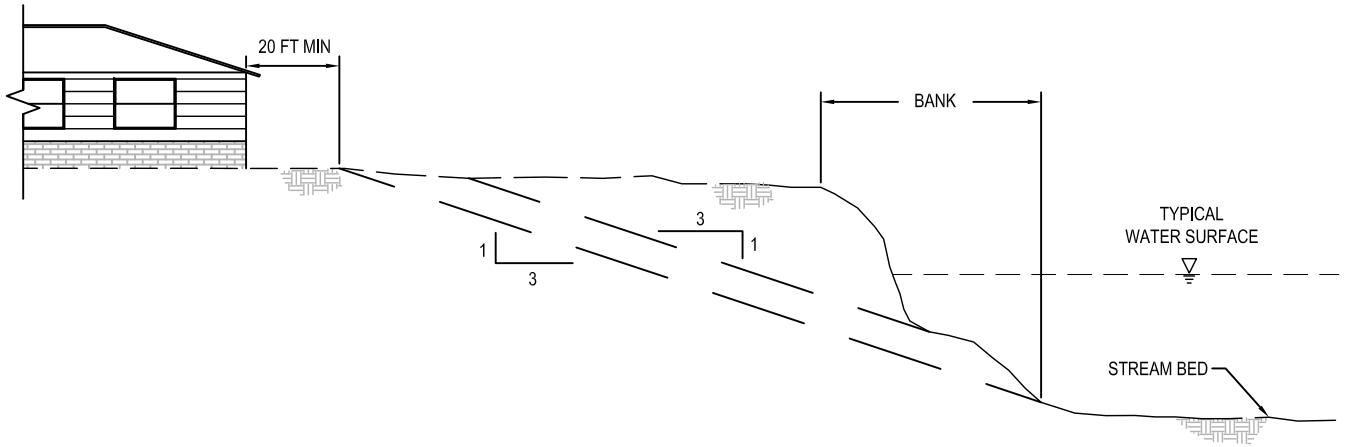
Authority cited:

Reference:

History:

1. New section 139 filed mm-dd-yy.

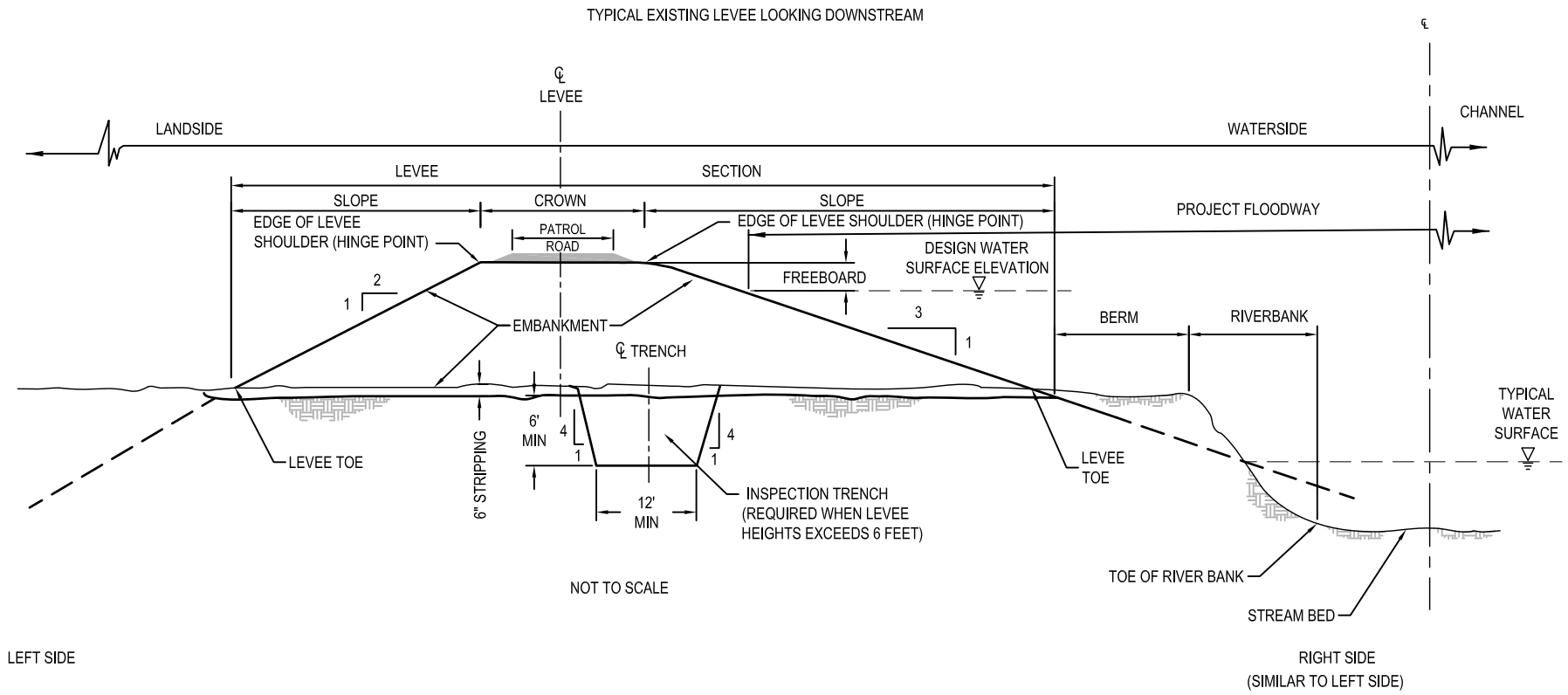
MINIMUM DISTANCE FOR DWELLING, STRUCTURE, OR MOBILE HOME FROM TOP OF BANK



TYPICAL SECTION

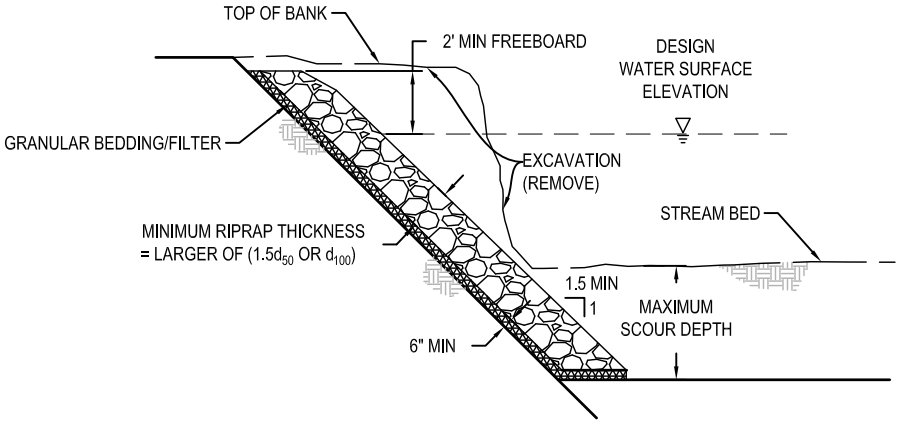
NOT TO SCALE

FIGURE 8.01

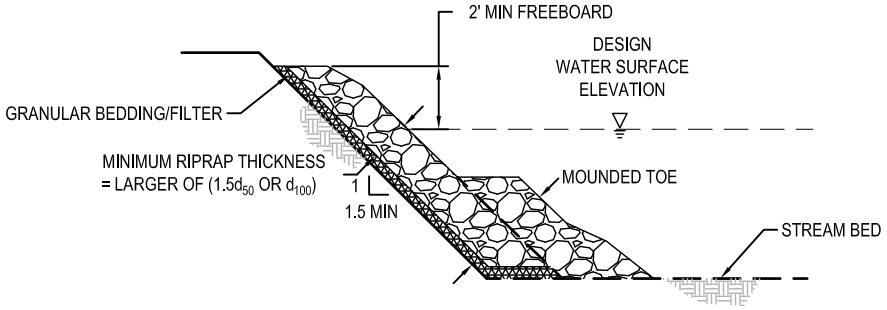


Item	TYPICAL MINIMUM DIMENSIONS OF EXISTING STANDARD LEVEE SECTIONS			
	Main River Channels	Major Tributaries	Minor Tributaries	Bypasses
Crown Width	20'	20'	12'	20'
Landside	1 on 2	1 on 2	1 on 2	1 on 2
Waterside	1 on 3	1 on 3	1 on 3	1 on 3 to 1 on 4
Freeboard	3'	3'	3'	4' to 6'
Patrol Road Width	12'	12'	10'	12'

FIGURE 8.02

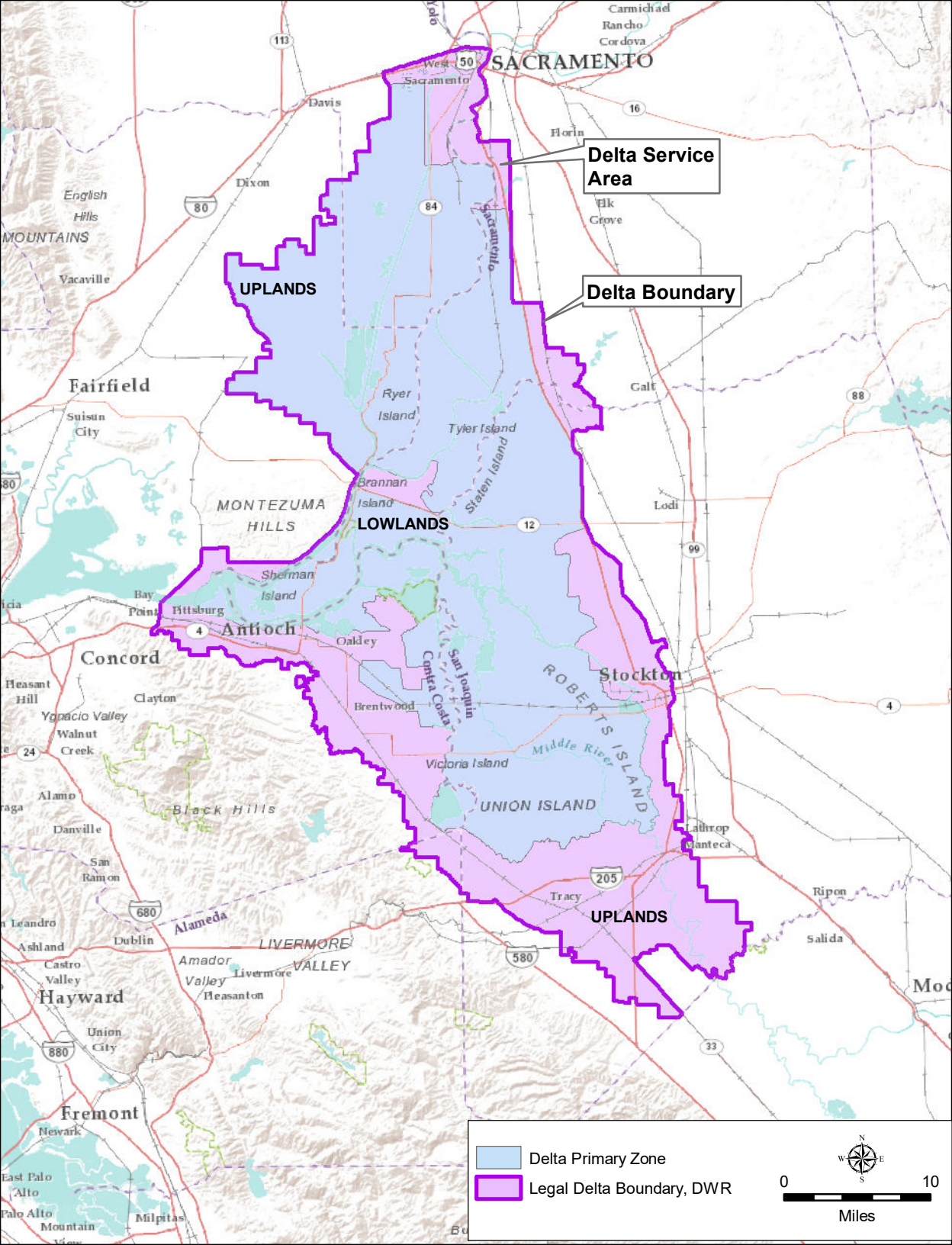


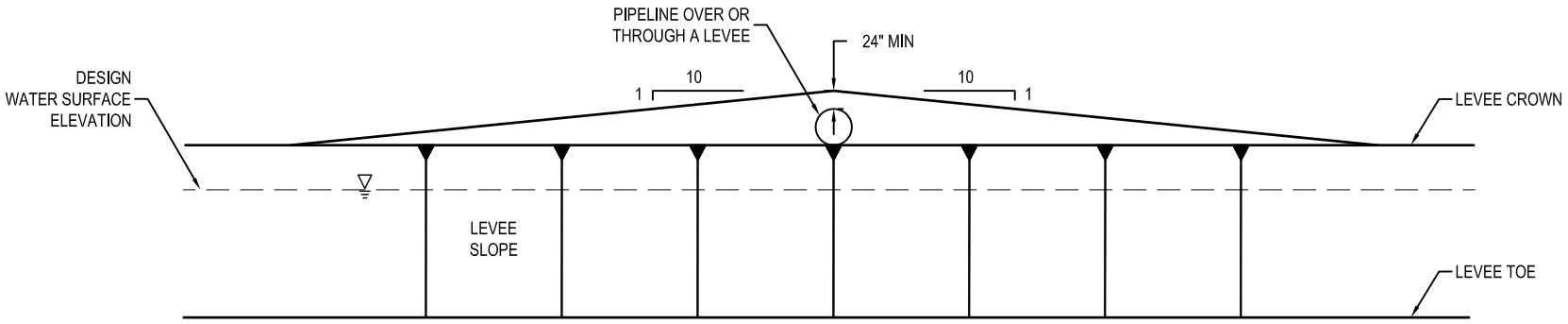
RIPRAP REVETMENT WITH KEYED TOE
TYPICAL SECTION



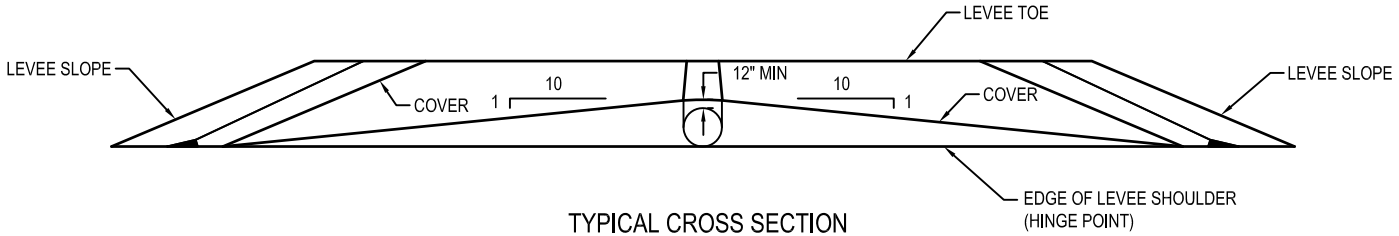
RIPRAP REVETMENT WITH MOUNDED TOE
TYPICAL SECTION

FIGURE 8.03


Delta Service Area
Delta Boundary
UPLANDS
LOWLANDS
UPLANDS
SACRAMENTO
West Sacramento
Davis
Dixon
Florin
Elk Grove
Carmichael
Rancho Cordova
Galt
Lodi
Stockton
Fairfield
Suisun City
Vacaville
English Hills
MOUNTAINS
MONTEZUMA HILLS
Ryer Island
Tyler Island
Staten Island
Brannan Island
Sherman Island
Bay Point
Pittsburg
Antioch
Oakley
Concord
Clayton
Pleasant Hill
Ygnacio Valley
Walnut Creek
Brentwood
Contra Costa
San Joaquin
ROBERTS ISLAND
Middle River
Victoria Island
UNION ISLAND
Lathrop
Manteca
Tracy
Ripon
Salida
Alamo
Danville
Black Hills
San Ramon
Dublin
Alameda
LIVERMORE VALLEY
Amador Valley
Livermore
Pleasanton
Castro Valley
Hayward
Union City
Fremont
Newark
East Palo Alto
Palo Alto
Mountain View
Milpitas
Delta Primary Zone
Legal Delta Boundary, DWR
0
10
Miles



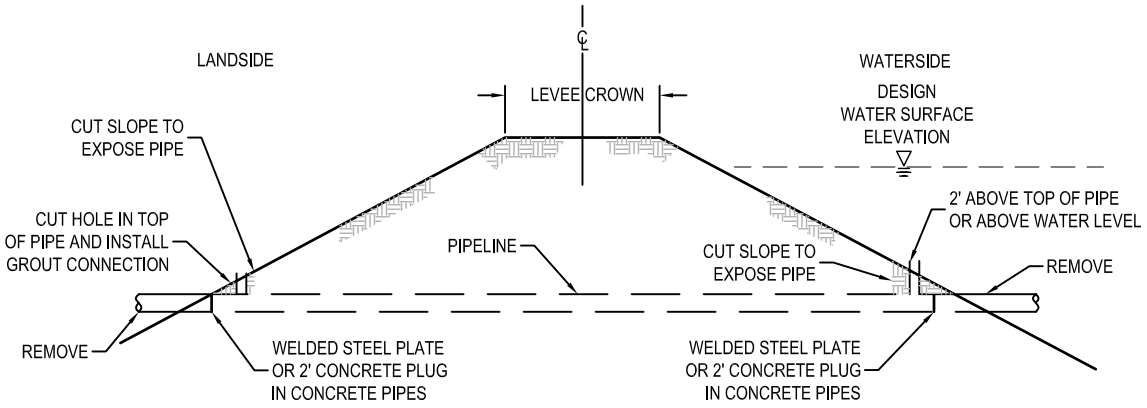
TYPICAL LEVEE PROFILE



TYPICAL CROSS SECTION
(ISOMETRIC) OF PIPELINE ON A LEVEE
SLOPE

FIGURE 8.05

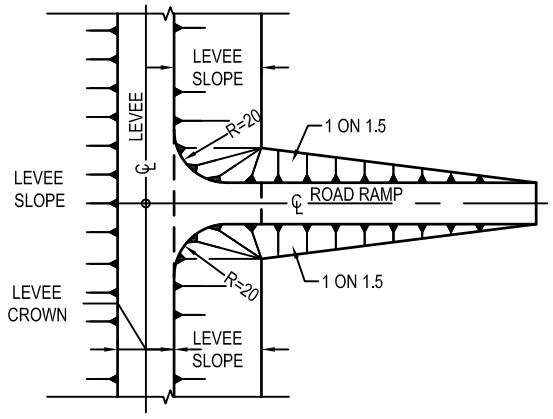
FILLING ABANDONED PIPES



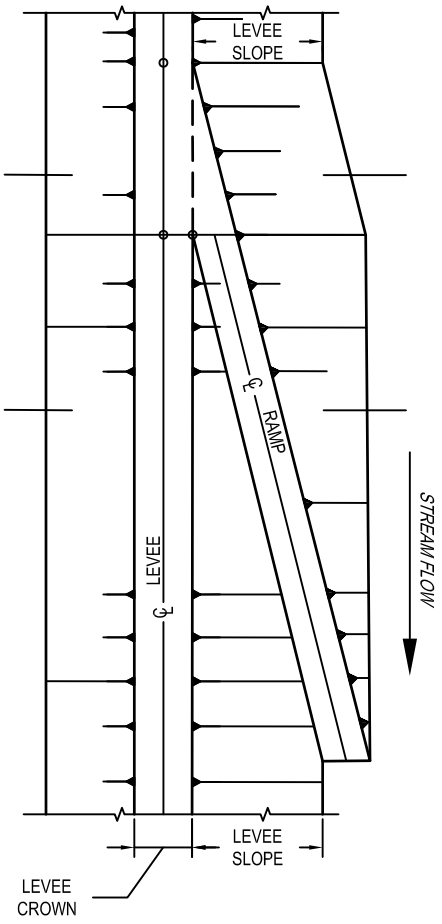
GROUTING OR CELLULAR CONCRETE FILL OF ABANDONED PIPES BELOW DESIGN WATER SURFACE ELEVATION

FIGURE 8.06

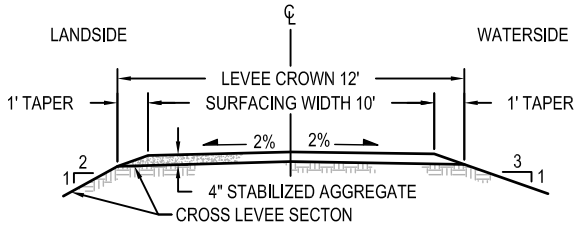
ACCESS RAMPS



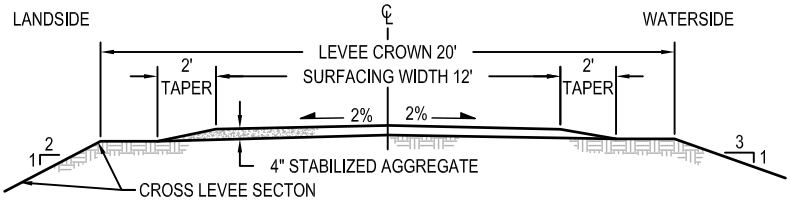
LANDSIDE ACCESS RAMP



WATERSIDE ACCESS RAMP



LEVEE SURFACING FOR 12' PATROL ROAD



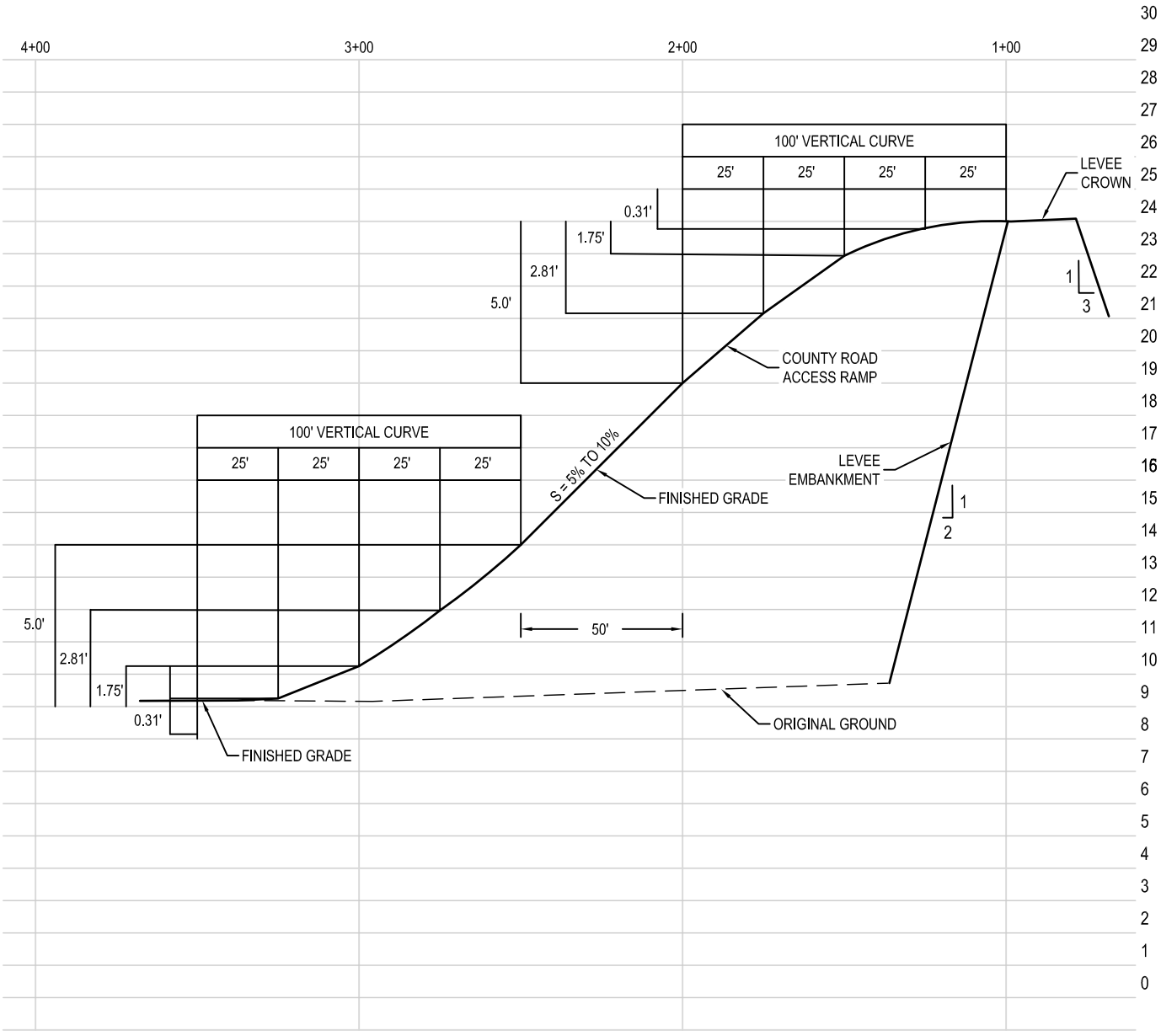
LEVEE SURFACING FOR 20' PATROL ROAD

1. VERTICAL CURVE AT TOP AND BOTTOM OF RAMP.
2. VERTICAL CURVE TO BE 100 FOOT RADIUS.
3. SLOPE OF RAMP TO BE A MINIMUM GRADE OF 5 PERCENT AND A MAXIMUM GRADE OF 10 PERCENT.
4. RAMP TO BE SURFACED WITH 4 INCHES OF CLASS 2 AGGREGATE BASE (AB). (CALTRANS SPEC. 26-1.02B)
5. ALL RAMPS GRADED TO DRAIN AWAY FROM LEVEE SECTION.

FIGURE 8.07

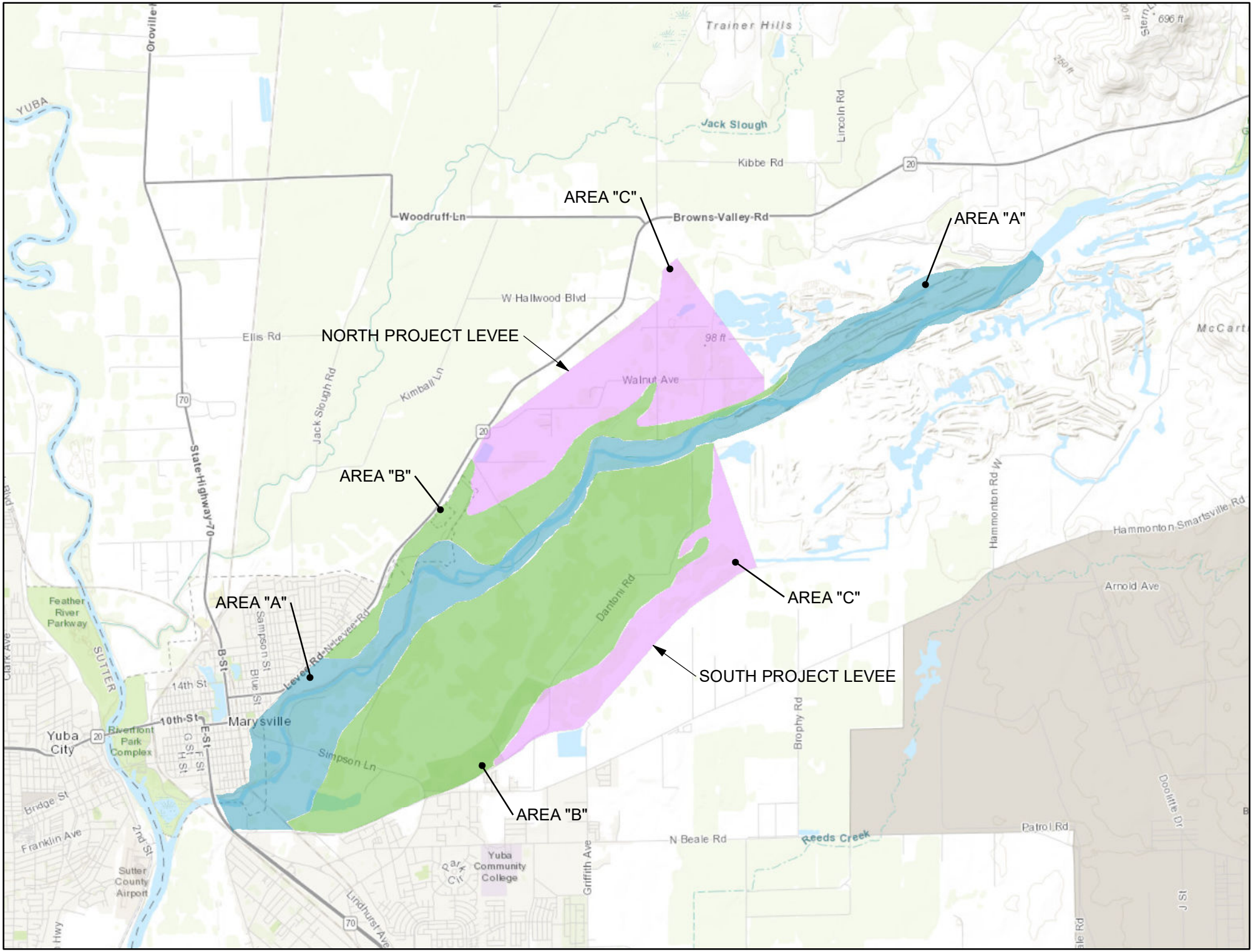
ACCESS RAMP GRADING REQUIREMENTS

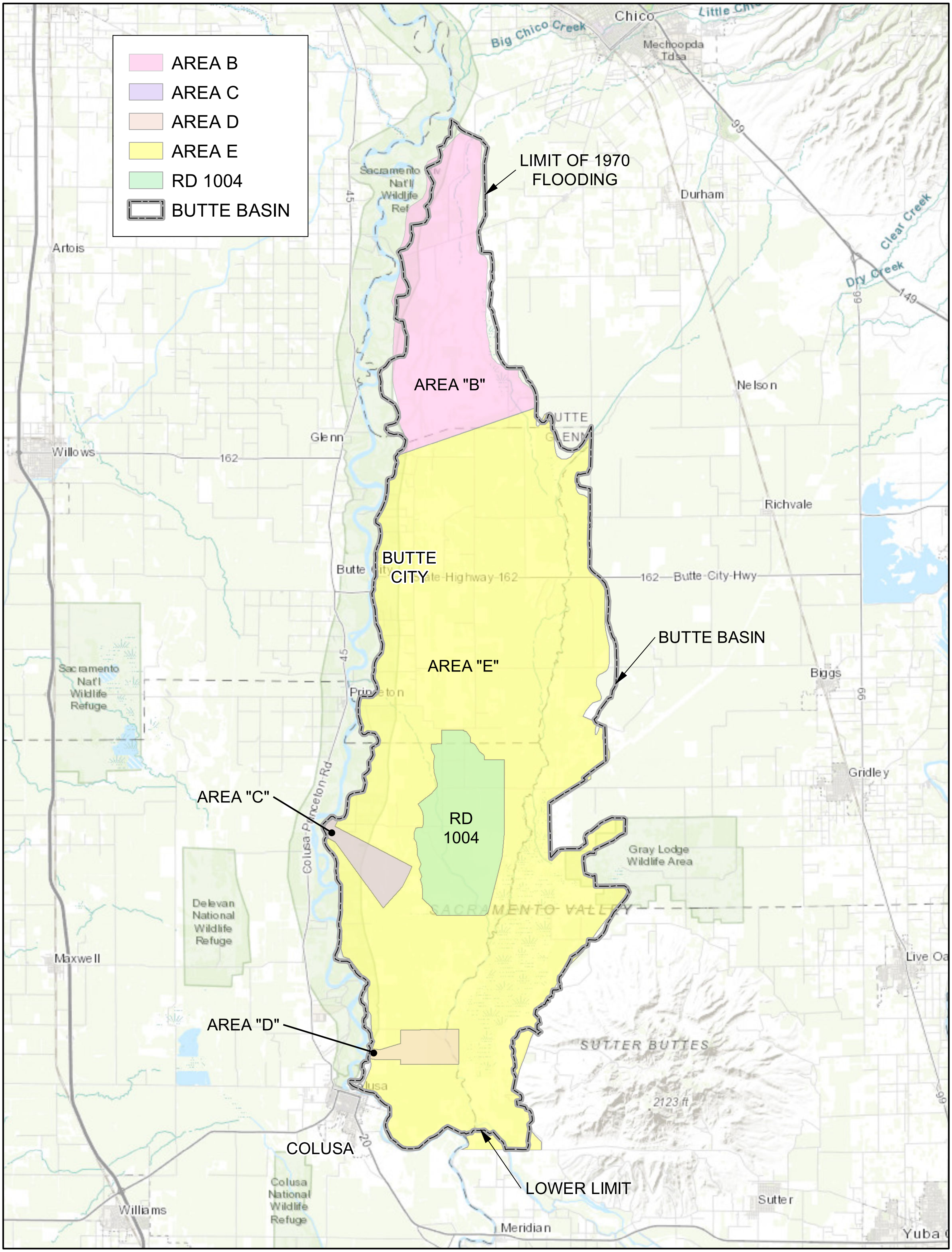
NOTE: THE LOWER VERTICAL CURVE TO BE FIELD ADJUSTED IN EACH LOCATION
TO CORRESPOND WITH EXISTING APPROACH SLOPE AND ELEVATION.



SCALE
HORZ.: 1"=40'
VERT.: 1"=5'

FIGURE 8.08


AREA "C"
AREA "A"
NORTH PROJECT LEVEE
AREA "B"
AREA "A"
AREA "C"
SOUTH PROJECT LEVEE
AREA "B"
Trainer Hills
Jack Slough
Kibbe Rd
Lincoln Rd
Woodruff Ln
Browns Valley Rd
W Hallwood Blvd
Ellis Rd
Walnut Ave
Kimball Ln
Jack Slough Rd
State Highway 70
Hammonton Rd W
Hammonton Smartsville Rd
Arnold Ave
Dantoni Rd
Brophy Rd
Feather River Parkway
Sampson St
Blue St
Levee Rd
B St
14th St
10th St
E St
Marysville
Yuba City
Riverfront Park Complex
Simpson Ln
Bridge St
Franklin Ave
2nd St
Sutter County Airport
Yuba Community College
N Beale Rd
Reeds Creek
Griffith Ave
Lindhurst Ave
Patrol Rd
Doolittle Dr
J St
McCart
YUBA
SUTTER


AREA B
AREA C
AREA D
AREA E
RD 1004
BUTTE BASIN
LIMIT OF 1970
FLOODING
AREA "B"
BUTTE
CITY
AREA "E"
BUTTE BASIN
AREA "C"
RD
1004
AREA "D"
COLUSA
LOWER LIMIT
Chico
Big Chico Creek
Mechoopda
Tdsa
Durham
Clear Creek
Dry Creek
Artois
Sacramento
Nat'l
Wildlife
Nelson
Glenn
Willows
162
Richvale
Butte
162
Butte City Hwy
Biggs
Sacramento
Nat'l
Wildlife
Refuge
Princeton
Gridley
Colusa-Princeton Rd
Gray Lodge
Wildlife Area
Delevan
National
Wildlife
Refuge
SACRAMENTO VALLEY
Maxwell
SUTTER BUTTES
2123 ft
Colusa
National
Wildlife
Refuge
Sutter
Williams
Meridian