Attachment 3

Documents Incorporated by Reference

CENTRAL VALLEY
FLOOD MANAGEMENT
PLANNING PROGRAM

FloodSAFE
CALIFORNIA

2012 Central Valley Flood Protection Plan

Attachment 3: Documents Incorporated by Reference

June 2012

STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

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1.0 Documents Incorporated by Reference

The 2012 Central Valley Flood Protection Plan (CVFPP) incorporates information by reference from several documents that are either linked with CVFPP through legislative requirements or related management policies that adoption of the CVFPP will trigger. This includes *State Plan of Flood Control Descriptive Document* (DWR, 2010a), *Flood Control System Status Report* (DWR, 2011), *Urban Level of Flood Protection Criteria* (DWR, 2012b), and *Urban Levee Design Criteria* (DWR, 2012a). A summary of each document is provided in this attachment.

1.1 Summary: State Plan of Flood Control Descriptive Document

The State Plan of Flood Control (SPFC) Descriptive Document (DWR, 2010a) provides an inventory and description of the flood control projects and works (facilities), lands, programs, plans, conditions, and mode of operations and maintenance (O&M) for the State-federal flood protection system in the Sacramento River and San Joaquin River watersheds of California, and facilities identified in California Water Code Section 8361.

Section 9110 (f) of the California Water Code defines the SPFC as follows:

> *"State Plan of Flood Control" 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, and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section 12648) of Chapter 2 of Part 6 of Division 6 for which the board or the department has provided the assurances of nonfederal cooperation to the United States, and those facilities identified in Section 8361.*

The State-federal flood protection system comprises federally and State of California (State) authorized projects for which the Central Valley Flood Protection Board (Board), formerly The Reclamation Board, or the California Department of Water Resources (DWR) of the State, has

provided assurances of cooperation[1] to the United States federal government. These Board- or DWR-provided assurances, coupled with State authorization, are an important distinction for what constitutes the State-federal flood protection system.[2] Other flood protection facilities in the Sacramento River and San Joaquin River watersheds that are not covered by assurances to the federal government from the Board or DWR are not part of the State-federal flood protection system or SPFC, but are included in the Sacramento-San Joaquin River Flood Management System defined in the California Water Code Section 9611.

The *SPFC Control Descriptive Document* includes details for the following components:

- SPFC Facilities
  - Approximately 1,600 miles of levees
  - Five major weirs spilling floodwaters from the Sacramento River to bypass channels
  - Four dams
  - Two flood relief structures and one natural overflow area from the Sacramento River into the Butte Basin
  - Five control structures directing flow in bypass channels along the San Joaquin River
  - Six major pumping plants
  - Channels
  - Bypasses and sediment basins
  - Environmental mitigation areas
  - Associated facilities, such as bank protection, stream gages, and drainage facilities
- SPFC Lands

[1] At a minimum, the assurances include that the Board or DWR provide without cost to the United States, all lands, easements, and rights-of-way necessary for completion of a project; bear the expense of necessary highway, railroad, and bridge alterations; hold and save the United States free from claims for damages resulting from construction of the works (facilities); and maintain and operate all works (facilities) after they are completed.

[2] SPFC facilities also include other features identified in Section 8361 of the California Water Code.

  - Property rights for SPFC lands are held by the Sacramento-San Joaquin Drainage District (SSJDD), under control of the Board

- SPFC Mode of O&M
  - Mode of O&M for completed facilities of the SPFC that the U.S. Army Corps of Engineers (USACE) has turned over to the Board include O&M manuals, and inspections and maintenance of SPFC facilities by maintaining agencies and flood operations
  - DWR depends on 81 maintaining agencies to keep SPFC levees in good condition; in addition, DWR maintains structures, channels, and levees in specific sections of the Sacramento River Flood Control Project as specified in California Water Code Section 8361 and through State maintenance areas

- SPFC Conditions
  - Assurances of cooperation (as specified in assurance agreements the California Water Code, and agreements) (USACE and Board, 1953)
  - Flood Control Regulations, Section 208.10, 33 Code of Federal Regulations
  - Requirements of standard and unit-specific O&M manuals
  - Design profiles (USACE, 1955 and USACE, 1957)
  - State-adopted conditions, such as the Board Designated Floodway Program

- Programs and Plans Related to SPFC (historical and ongoing)
  - Federal legislation authorizing specific projects and setting partnership requirements for project development with USACE
  - State legislation establishing the roles and responsibilities of the Board, DWR and local agencies regarding flood control
  - State legislation authorizing specific projects and establishing requirements for partnering with the federal government and local entities for project development
  - Partnership agreements with USACE and maintaining agencies
  - As-constructed project documents

- O&M manuals
- *Master Plan for Flood Control in the Butte Basin* (1964)
- *Interim Plan of Flood Control for the Sacramento River from the Butte County Line to Chico Landing* (1984) and *Butte Basin Plan of Flood Control* (1986)
- The ongoing FloodSAFE California (FloodSAFE) Initiative, California Levees Roundtable (Roundtable), *Flood Control System Status Report* (FCSSR), and Central Valley Flood Protection Plan Ongoing projects that have been federally authorized and State-authorized as plans related to the SPFC
- The *Early Implementation Program* and Section 221 of the Flood Control Act of 1970 as ongoing programs related to the SPFC

This *SPFC Descriptive Document* includes a description of what the SPFC is at the time it is produced; it is not a plan for future modifications. However, as the ongoing FloodSAFE Initiative makes changes in the SPFC, updates to the *SPFC Descriptive Document* will be necessary. DWR will prepare future updates when requested by the Board.

1.2 Summary: Flood Control System Status Report

The Flood Control System Status Report (FCSSR) (DWR, 2011) describes the current status (physical condition) of SPFC facilities at a systemwide level. DWR prepared the FCSSR to meet the legislative requirements of California Water Code Section 9120, and to contribute to development of the CVFPP. California Water Code Section 9120 requires the following:

> *(a) The department shall prepare and the board shall adopt a flood control system status report for the State Plan of Flood Control. This status report shall be updated periodically, as determined by the board. For the purpose of preparing the report, the department shall inspect the project levees and review available information to ascertain whether there are evident deficiencies.*
>
> *(b) The status report shall include identification and description of each facility, an estimate of the risk of levee failure, a discussion of the inspection and review undertaken pursuant to subdivision (a), and appropriate recommendations regarding the levees and future work activities.*

To evaluate SPFC conditions, DWR is considering a wide variety of factors that could influence the performance of SPFC levees, channels, and flood control structures. Information from DWR's inspection and evaluation activities are considered as high-level indicators of physical conditions relative to specified standards. For some factors, DWR's approach may differ from an approach that USACE or other agencies would use for other evaluations or purposes. In these cases, the difference is acknowledged, although only DWR's approach is used as the basis for results presented in the FCSSR.

The DWR Levee Evaluations Program, including its Urban Levee Evaluations (ULE) and Non-Urban Levee Evaluations (NULE) projects, is the primary source of information to evaluate the condition of SPFC levees. ULE and NULE both assess geotechnical conditions of levees, but urban levees are undergoing a more comprehensive evaluation because of public safety considerations for densely populated areas. Levee conditions reported in the FCSSR also rely on information from DWR's annual inspections and other available data to supplement the results of the DWR Levee Evaluations Program.

In general, channel conveyance conditions were determined by evaluating whether channels have the ability to pass design capacities presented in O&M manuals and design profiles based on the most recent available hydraulic modeling. Channel conditions reported also include DWR's annual inspections for vegetation and sedimentation. Flood management structure conditions reported are based on DWR's annual inspections.

The FCSSR reflects existing facility conditions (including past performance) at the time the FCSSR was prepared, and some results represent initial findings of ongoing evaluations. Many ongoing inspections, geotechnical evaluations, and hydraulic evaluations will yield additional information on facility conditions. Supplemental investigations are also underway for addressing potential inconsistent findings from other sources, including locally initiated investigations. In addition, subsequent facility improvements, repairs, and reconstruction would likely affect facility conditions reported in the FCSSR. Where applicable, any changes in findings will be reflected in future updates to the FCSSR.

The flood management system has provided tremendous benefits to public safety and property in the Central Valley – it has prevented many billions of dollars in flood damages since facilities were originally constructed. However, when evaluated against modern engineering and safety criteria, some SFPC facilities face a higher chance for failure during a flood event than other facilities. Table 1-1 lists factors that influence facility

performance, findings related to each factor, and the relative threat posed by the factor.

The relative threat posed by each factor is a subjective representation of (1) the prevalence of the factor and (2) to what degree presence of the factor would contribute to a potential facility failure. Factors identified as a "high" relative threat to SPFC facilities generally are the most prevalent and/or would greatly contribute to potential facility failure. Those identified as a "low" relative threat to SPFC facilities generally are the least prevalent and/or would contribute less to potential facility failure. Likewise, factors identified as a "medium" relative threat to SPFC facilities are moderately prevalent and/or would contribute moderately to potential facility failure.

Table 1-1. Summary of Flood Control System Status Report Findings

	Factors	Findings	Relative Threat Posed by Factor[1]
Levees	Overall Levee Condition (multiple factors)	• Approximately half of SPFC urban levees do not meet current levee freeboard, stability, or seepage design criteria at the design water surface elevation. • Approximately three-fifths of SPFC nonurban levees have a high potential for levee failure from under-seepage, through-seepage, structural instability, and/or erosion at the assessment water surface elevation.	See Figure ES-1 in FCSSR
	Levee Geometry Check	• Approximately one-third of SPFC urban levees deviate from current standard levee design prism criteria. • Levee geometry deviates significantly from the standard levee design prism criteria for some nonurban SPFC levees.	Medium
	Seepage	• Approximately one-third of urban levees do not meet current seepage design criteria. • Almost half of SPFC nonurban levees have a high potential for levee failure from under-seepage. • Approximately one-quarter of SPFC nonurban levees have a high potential for levee failure from through-seepage.	High
	Structural Instability	• Approximately one-fifth of SPFC urban levees do not meet current structural stability design criteria. • Approximately one-seventh of SPFC nonurban levees evaluated in the Sacramento River watershed and 1 percent in the San Joaquin River watershed have a high potential for levee failure from structural instability.	Medium

Table 1-1. Summary of Flood Control System Status Report Findings (contd.)

	Factors	Findings	Relative Threat Posed by Factor[1]
Levees	**Erosion**	• Erosion assessments for urban levees are underway, and results are not available at this time. • Almost one-sixth of SPFC nonurban levees have a high potential for levee failure from erosion.	Medium
	Settlement	• Four known localized levee locations have settlement (localized depressions) that endangers the integrity of SPFC levees.	Low
	Penetrations[2]	• More than 6,000 penetration sites are documented in SPFC levees, and many more remain undocumented.	Medium
	Levee Vegetation	• About 15 miles of SPFC levees are noncompliant with *Interim Levee Vegetation Criteria(*DWR, 2007).[3 5]	Low
	Rodent Damage	• More than one-third of the 1,459 miles of SPFC levees studied had at least eight reported occurrences of burrowing activity over a 21-year study span.	Medium
	Encroachments[4]	• 1,223 encroachment sites were identified as partially or completely obstructing visibility and access to the levee and/or were within 10 feet of the landside toe.[5]	Medium
Channels	**Inadequate Conveyance Capacity**	• Approximately half of the 1,016 miles of SPFC channels evaluated are potentially inadequate to convey design flows, and require additional evaluation to confirm conditions. • Approximately one-quarter of channel design capacities reported in O&M manuals do not agree with flows specified in the design profiles.	Medium
	Channel Vegetation	• Of 186 miles of SPFC channels inspected by DWR, 1 location was rated Unacceptable and 54 locations were rated Minimally Acceptable because of vegetation and obstructions.[5]	Low
	Channel Sedimentation	• Of 186 miles of SPFC channels inspected by DWR, 1 location was rated Unacceptable and 23 locations were rated Minimally Acceptable because of shoaling/sedimentation.[5]	Low
Structures	**Inadequate Hydraulic Structures**	• Of 32 SPFC hydraulic structures inspected by DWR, no structures were rated Unacceptable because of structural, vegetation/obstruction, encroachment, or erosion/sedimentation issues.[5]	Low
	Inadequate Pumping Plants	• Of 11 SPFC pumping plants inspected by DWR, none were rated Unacceptable.[5]	Low
	Inadequate Bridges	• Of 10 SPFC bridges inspected by DWR,2 were in need of repairs.[5]	Low

Table 1-1. Summary of Flood Control System Status Report Findings (contd.)

Notes:
[1]The relative threats listed in Table 1-1 were generated based on professional experience of technical staff from DWR and partner agencies.
[2]Penetrations include man-made objects that cross through or under a levee or floodwall and have the potential to provide a preferential seepage path or hydraulic connection with the waterside. Typically, a penetration is a pipe or transportation structure, such as a roadway or rail line.
[3] This finding is based on *Interim Levee Vegetation Criteria* (DWR 2007) and not on USACE levee vegetation criteria. Comparison with USACE levee vegetation criteria would show more SPFC levees as noncompliant.
[4]Encroachments are any obstruction or physical intrusion by construction of works or devices, planting or removal of vegetation, or caused by any other means, for any purpose, into a flood control project, waterway area of the flood control project, or area covered by an adopted plan of flood control (California Code of Regulations Title 23 Chapter 1 Article 2 Section 4 (m)). Encroachments include boat docks, ramps, bridges, sand and gravel mining, placement of fill, fences, retaining walls, pump stations, residential structures, and irrigation and landscaping materials/facilities.
[5] Inspection results reported are from DWR's 2009 Inspections.

Key:
DWR = California Department of Water Resources
FCSSR = Flood Control System Status Report
SPFC = State Plan of Flood Control
USACE = U.S. Army Corps of Engineers

The overall condition of urban levees, nonurban levees, channels, and flood control structures of the SPFC can be summarized as follows:

- **Urban levees** – Approximately half of about 300 miles[3] of SPFC urban levees evaluated do not meet current levee freeboard, stability, or seepage design criteria[4] at the design water surface elevation.

- **Nonurban levees** – Approximately three-fifths of about 1,200 miles of SPFC nonurban levees evaluated have a high potential for failure from under-seepage, through-seepage, structural instability, and/or erosion at the assessment water surface elevation.[5] Nonurban levees were evaluated based on systematic, consistent, repeatable analyses that correlated geotechnical data with levee performance history, not relative to any current design criteria.[6]

- **SPFC channels** – Approximately half of the 1,016 miles of channels evaluated in the SPFC have a potentially inadequate capacity to convey design flows, and require additional evaluation to confirm conditions.

[3] Additional 10 miles of SPFC urban levees are being evaluated, and results will be included in future updates.
[4] Design criteria used were based on the *Design and Construction of Levees Engineering Manual 1110-2-1913 (USACE, 2000)* and *Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento Valley, Version 4* (DWR, 2010c).
[5] Where available, 1955/57 design water surface elevations were used as the assessment water surface elevation. In the absence of 1955/57 design water surface elevations, the assessment water surface elevation was based on freeboard requirements for each levee segment (i.e., generally 3 feet below the levee crest).
[6] This approach was selected because the extent of the NULE Project is significantly greater than the ULE Project, making it difficult to conduct the same level of field explorations and geotechnical data collection performed for ULE levees.

- **SPFC flood control structures** – None of the 32 hydraulic structures or 11 pumping plants inspected by DWR for the SPFC were rated Unacceptable during the 2009 inspections. Of the 10 SPFC bridges inspected by DWR in 2009, 2 were in need of repairs.

Lastly, the FCSSR includes recommendations regarding the levees and future work activities, including next steps for Board adoption of the FCSSR findings, and future periodic updates, as requested by the Board.

1.3 Summary: Draft Urban Level of Flood Protection Criteria

As part of the flood management legislation passed in 2007, all cities and counties within the Sacramento-San Joaquin Valley will be required to make findings related to the urban (200-year) level of flood protection before entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision (see California Government Code Sections 65865.5, 65962, and 66474.5). This requirement applies to urban and urbanizing areas, as defined by California Government Code Section 65007, Paragraphs (j) and (k).

After the Board's adoption of the CVFPP in 2012, cities and counties within the Sacramento-San Joaquin Valley have up to 24 months to amend local general plans, and 36 months to amend local zoning ordinances to be consistent with the CVFPP. Subsequently, by approximately 2015, cities and counties will be required to make findings regarding an urban level of flood protection when considering decisions about entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision.

The draft criteria were developed through a collaborative process, with input from engineering and planning experts from cities and counties and other organizations. Pertinent engineering criteria (such as methods to compute flood depths, and technical standards for levees and floodwalls), are contained in the *Urban Levee Design Criteria* (ULDC) (DWR, 2012a) and are incorporated by reference into the policy-level criteria contained in the *Draft Urban Level of Flood Protection Criteria* (DWR, 2012b).

The purpose of the *Draft Urban Level of Flood Protection Criteria* (DWR, 2012b) is to provide criteria and a systematic approach that assists cities

and counties in making findings about whether an urban level of flood protection is required and exists or will exist for prospective development of properties, projects, or subdivisions under their authority.

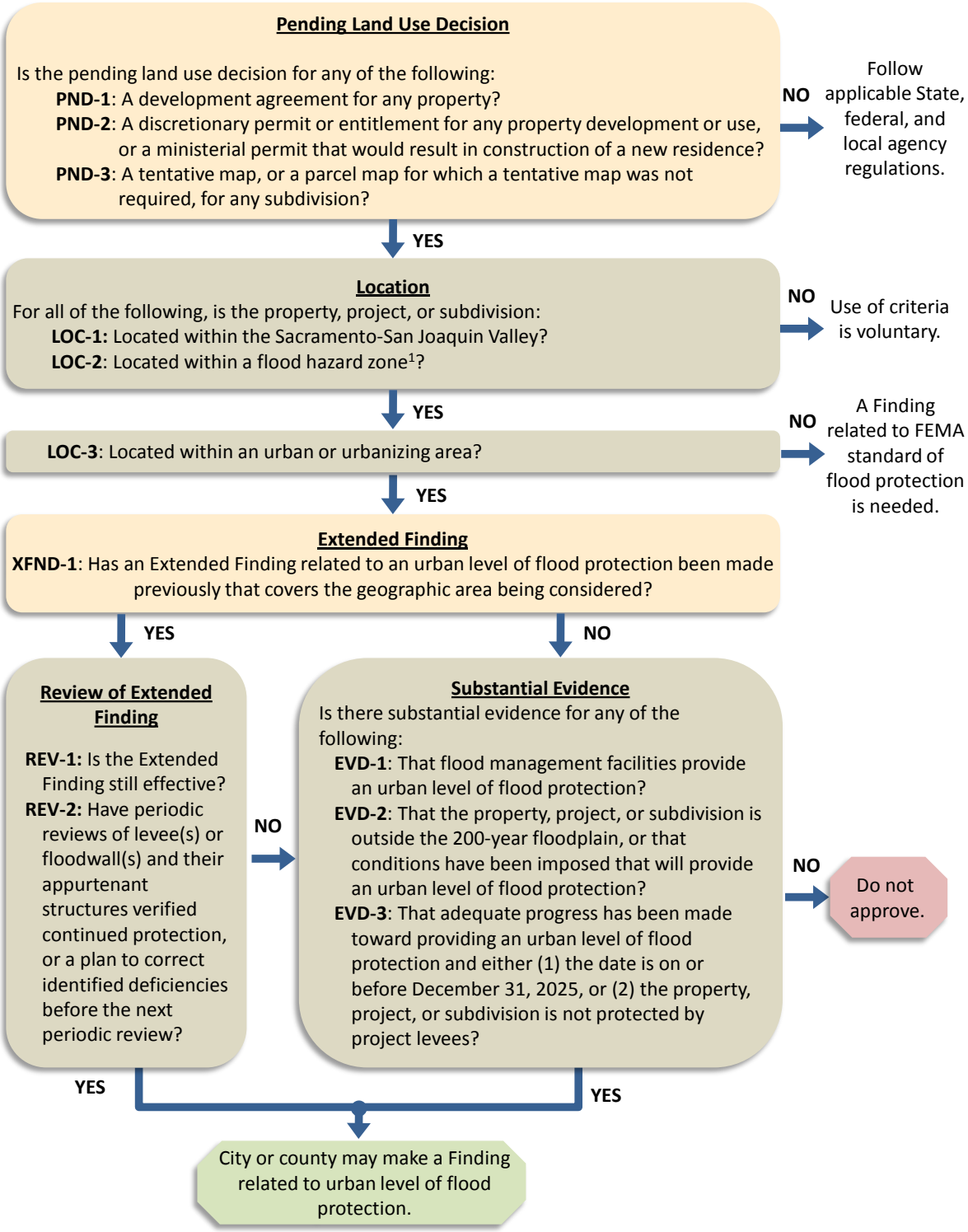
Draft criteria are provided for the following:

- To determine if the type of land use decision is affected by the urban level of flood protection requirements.
- To determine if a property, project, or subdivision is subject to the urban level of flood protection requirements based on its location within the Sacramento-San Joaquin Valley.
- To develop substantial evidence to support a finding or, if a previous finding exists, to determine its continued validity.

Using these criteria, a city or county may then make a finding and approve the land use decision.

The criteria are designed to be evaluated in a conditional sequence, as illustrated in Figure 1-1. The conclusion reached when evaluating one criterion affects, which, if any, subsequent criteria should be considered.

While cities and counties located outside the Sacramento-San Joaquin Valley are not required to make findings related to an urban level of flood protection, these criteria can help inform engineering and local land use decisions for areas at risk of flooding. The *Draft Urban Level of Flood Protection Criteria* (DWR, 2012b) contains procedural criteria for peer review by an independent expert panel, exceptions to the criteria, periodic reviews, and for establishing substantial evidence in the record to support a finding.



1. "Flood hazard zone" means an area subject to flooding that is delineated as either a special hazard area or an area of moderate hazard on an official flood insurance rate map issued by the Federal Emergency Management Agency (California Government Code Section 65007(d)).

Figure 1-1. Flowchart for Cities and Counties to Make Findings Related to an Urban Level of Flood Protection

1.4 Summary: Urban Levee Design Criteria

The *Urban Levee Design Criteria* (ULDC) (DWR, 2012a) provides engineering criteria and guidance for the design, evaluation, and O&M of levees and floodwalls that provide an urban level of flood protection in California, as well as for determining design water surface elevation (DWSE) along leveed and unleveed streams. Other topics beyond design and evaluation are presented to provide reasonable assurance that once a levee or floodwall is found to provide an urban level of flood protection, it will continue to do so.

The ULDC was developed through a collaborative stakeholder involvement process with representatives from cities, counties, flood agencies, and State and federal agencies. The purpose of the ULDC is to provide engineering criteria and guidance to civil engineers to follow in meeting the requirements of California Government Code Sections 65865.5, 65962, and 66474.5, with respect to Finding that levees and floodwalls provide protection against a flood that has a 1-in-200 chance of occurring in any given year. The ULDC also provides engineering criteria and guidance for DWR's urban levee evaluations and participation in urban levee projects. The ULDC may be updated from time to time, either in its current form or as regulations in the California Code of Regulations (CCR). The ULDC is summarized below.

1.4.1 Design Criteria Summary

The ULDC provides design criteria for two types of levees: intermittently-loaded and frequently-loaded. A frequently-loaded levee is defined as a levee that experiences a water surface elevation of 1foot or higher above the elevation of the landside levee toe at least once a day for more than 36 days per year, on average.

Design criteria are summarized in Tables 1-2 and 1-3 for each type of levee. In Table 1-2, Options 1 and 2 represent two options for calculating the design water surface elevation: the Federal Emergency Management Agency (FEMA) Approach, and the U.S. Army Corps of Engineers (USACE) Approach. Criteria in Table 1-3 are additions or exceptions to the criteria in Table 1-2 to include more stringent requirements for design of frequently-loaded levees.

Table 1-2. Urban Levee Design Criteria Summary for Intermittently-Loaded Levees

Parameter	Criteria			
DWSE (Option 1)	Median 200-year WSE			
DWSE (Option 2)	90% assurance 200-year WSE			
MTOL (Option 1)	Median 200-year WSE + higher of (1) 3 feet, or (2) height for wind setup and wave runup			
MTOL (Option 2)	Lower of A or B, where: • A is the higher of (1) 90% assurance 200-year WSE, (2) median 200-year WSE plus 3 feet, or (3) median 200-year WSE plus height for wind setup and wave runup • B is the higher of (1) 95% assurance 200-year WSE, (2) median 200-year WSE plus 2 feet, or (3) median 200-year WSE plus height for wind setup and wave runup			
HTOL (Option 1)	Lower of (1) median 200-year WSE plus 3 feet, or (2) median 500-year WSE			
HTOL (Option 2)	Higher of A or B, where: • A is the lower of (1) median 200-year WSE plus 3 feet, (2) median 500-year WSE, or (3) MTOL (Option 2) • B is the DWSE			
Seepage - Exit Gradient at Levee Toe	For DWSE		For HTOL	
	γ ≥ 112 pcf	γ < 112 pcf	γ ≥ 112 pcf	γ < 112 pcf
	i ≤ 0.5	FS ≥ 1.6	i ≤ 0.6	FS ≥ 1.3
Seepage - Exit Gradient at Seepage Berm Toe	i ≤ 0.8	FS ≥ 1.0	<20% FS degradation for berms less than 100 feet	<10% FS degradation for berms less than 100 feet
Steady-State Slope Stability (Landside)	FS ≥ 1.4		FS ≥ 1.2	
Rapid Drawdown Slope Stability (Waterside)	FS ≥ 1.2 (prolonged high stage) FS ≥ 1.0 (short lasting high stage)			
Seismic Vulnerability	Restore grade and dimensions for at least 10-year WSE plus 3 feet of freeboard or higher for wind setup and wave runup within 8 weeks			
Levee Geometry	For new or extensive reconstruction on a major stream, minimum 20-foot-wide crown, 3h:1v waterside and landside slopes for all levees except bypass levees (4h:1v waterside slope)			

Notes:

- This table only includes criteria that are easily quantified.
- The median 200-year WSE, the 90 percent assurance 200-year WSE, and the 95 percent assurance 200-year WSE in this table are assumed to have been increased appropriately.
- Whichever option is selected, that same option is to be used for the DWSE, MTOL, and HTOL.

Key:
Option 1 = FEMA Approach
Option 2 = USACE Approach
DWSE = design water surface elevation
FS = factor of safety
HTOL = hydraulic top of levee
i = exit gradient
pcf = pounds per cubic foot
MTOL = minimum top of levee
WSE = water surface elevation
γ = saturated unit weight of soil (blanket layer)

Table 1-3. Urban Levee Design Criteria Summary for Frequently-Loaded Levees

Parameter	Criteria	
	For DWSE	For HTOL
Steady-State Slope Stability (Landside)	FS ≥ 1.5	FS ≥ 1.3
Minimum Allowable Rapid Drawdown Slope Stability (Waterside)	FS ≥ 1.2*	
Frequent, Large, Tidal Fluctuations Rapid Drawdown Slope Stability (Waterside)	FS ≥ 1.4**	
Seismic Vulnerability	No significant deformation, usually limited to 3 feet maximum with 1 foot of vertical settlement.	

Notes:
These criteria are additions or exceptions to the criteria presented for intermittently loaded levees.
*Applies for the DWSE.
**Additional criterion that applies for the range of tidal fluctuation, not the DWSE.
Key:
DWSE = design water surface elevation
FS = factor of safety
HTOL = hydraulic top of levee

1.4.2 Operations, Maintenance, Inspection, Monitoring, and Remediation of Poor Performance

At a minimum, the following O&M – related requirements apply to provide reasonable assurance that once a levee is found to provide an urban level of flood protection, it will continue to do so:

- The levee system must have an operation and maintenance manual consistent with USACE requirements (except as may be appropriate to deviate from those requirements comply with the ULDC). In developing or updating the operation and maintenance manual, the civil engineer and/or the levee maintaining agency should consider guidance contained in DWR's Superintendent's Guide to Operation & Maintenance of California's Flood Control Projects (undated).

- All facilities necessary for providing the urban level of flood protection must be operated and maintained by an identified public agency with the authority and resources to do so. Where the levee system has more than one agency with operation and maintenance responsibilities, they will need to coordinate the responsibilities.

- USACE standard inspection requirements for project levees are applicable for all levees and floodwalls considered to provide the urban level of flood protection, including that a public agency (or agencies)

routinely operates and maintains the levee system and inspects the entire levee system at least every 90 days and after every high water event.

- Damage and maintenance inadequacies identified from inspections should be prioritized and addressed in a timely manner, not awaiting the periodic review process.

- It is almost never practical or possible to completely know all of the engineering properties of levees and their foundations. Consequently, there will almost always be some degree of uncertainty that justifies both robust regular inspections and high water monitoring programs for levees and floodwalls protecting urban and urbanizing areas, with all of the attendant appurtenances and features (such as all-weather access roads on levee crowns and near the toe of wide landside berms).

- Monitoring during high water needs to provide for a thorough visual inspection of both the waterside and landside levee slope (and landside berm toe area) at intervals of no more than 1 hour.

- The levee system must have a levee security plan that meets the requirements described in Section 7.18.

- The levee system must have a flood safety plan that meets the requirements described in Section 7.20.

Other requirements, such as for a post-earthquake remediation plan, right-of-way plan, encroachment remediation plan, penetration remediation plan, or flood relief plan – may also apply, depending on the situation.

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2.0 Acronyms and Abbreviations

Board ..... Central Valley Flood Protection Board
CCR ..... California Code of Regulations
CVFMP ..... Central Valley Flood Management Planning
CVFPP ..... Central Valley Flood Protection Plan
Delta ..... Sacramento-San Joaquin Delta
DWR ..... California Department of Water Resources
DWSE ..... Design Water Surface Elevation
FCSSR ..... Flood Control System Status Report
FEMA ..... Federal Emergency Management Agency
FloodSAFE ..... FloodSAFE California
FS ..... factor of safety
HTOL ..... hydraulic top of levee
MOU ..... Memorandums of Agreement
MTOL ..... minimum top of levee
NULE ..... Non-Urban Levee Evaluations
O&M ..... operations and maintenance
pcf ..... pounds per cubic foot
State ..... State of California
SPFC ..... State Plan of Flood Control
SSJDD ..... Sacramento-San Joaquin Drainage District
USACE ..... U.S. Army Corps of Engineers
ULDC ..... Urban Levee Design Criteria
ULE ..... Urban Levee Evaluations
WSE ..... water surface elevation

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