



March 29, 2010

U.S. Army Corps of Engineers
Attention: CECW–CE, Douglas J. Wade
441 G Street, NW
Washington, DC 20314–1000

Subject: Docket Number COE–2010–0007, Response to Public Notice - Process for
Requesting a Variance from Vegetation Standards for Levees and Floodwalls

Dear Mr. Wade:

We are providing you the following comments regarding the proposed variance process for the planting vegetation on Federal project levees and the associated ETL 1110-2-571 Guidance and accompanying Draft Environmental Assessment. As indicated in the Federal Register (Fed Reg. Vol. 75, No. 26, 6364-6368), Docket Number COE-2010-0007, the policy guidance revises the procedures for obtaining variances for vegetation management on Federal project levees, floodwalls and appurtenant structures.

Our comments are relevant to the River Islands project; a 4,800 acre master planned community within the City of Lathrop, California in which I am the project director. River Islands is surrounded by 12 miles of project levees on the Stewart Tract located within the southern portion of California’s Sacramento-San Joaquin Delta; please see Exhibit 1 (attached). The site is also designated by State law to be within the “Secondary Zone” of the Delta, which allows urban development.

On behalf of the River Islands project, I offer the following general comments for your consideration regarding the proposed guidance followed by specific comments related to the applicability of the proposed guidance to our project.

General Comments

The proposed variance process included in ETL 1110-2-571 would allow, under certain circumstances, vegetation to be planted on the lower 2/3 of the waterside of a Federal project levee. Specifically:

“(1) The variance must be shown to be necessary, and the only feasible means, to:

- *preserve, protect, and enhance natural resources, and/or*



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- *protect the rights of Native Americans, pursuant to treaty, statute, or Executive Order.*

(2) *With regard to levee systems, the variance must assure that:*

- *safety, structural integrity, and functionality are retained, and*
- *accessibility for maintenance, inspection, monitoring, and floodfighting are retained. Note that, as used here, the term ‘retained’ refers to the level of functionality and reliability expected under conditions that are fully consistent with the requirements set forth in ETL 11102571 and any other applicable criteria.”*

Standard Levee versus Reinforced Levee

While we appreciate the safety and maintenance concerns associated with vegetation on waterside slopes of *standard* levees, not all levee systems are the same. In this regard, ETL 1110-2-571 and the proposed variance process do not distinguish between a *standard* levee system and a *reinforced* levee system and the applicability of the variance process. For example, Section 5 of the Policy Guidance Letter (see Federal Register at p. 6365) defines a levee system as follows: “A levee system consists of one or more segments and associated features which collectively provide flood, storm, or hurricane damage reduction to a defined area.” (Also see Chapter 3 of ETL 1110-2-571.) While that is true, a standard levee cross section shown as Figure 1 in Exhibit 2 is very different in terms of the nature of the protection and structural integrity afforded than that provided by a reinforced (oversized) levee as shown in Figure 2 of Exhibit 2. Oversized levees provide more open space for maintenance roads and clear zones (when properly planted) thereby retaining accessibility for maintenance, flood fighting and inspection. For example, in the case of a levee system that has a crown width of at least 150 feet, trees and other vegetation with root systems would not cause catastrophic damage due to tree windthrow, erosion, etc., as long as the vegetation is properly planted and maintained. Trees that are planted along the bottom 2/3 of a levee slope that are maintained with at least 8 feet of vertical clearance from grade to branches will provide sufficient viewing corridors for maintenance and floodfighting purposes.

By treating reinforced the same as standard levees, the Corps will hinder efforts to provide riparian and aquatic habitat in areas that would otherwise benefit from such resources without impacting the levee integrity. Consequently, we respectfully request that the Corps revise ETL 1110-2-571 to distinguish standard levees from oversized levees and include a definition of “reinforced levee” in the policy guidance. It should be noted that the California Code of Regulations Title 23 already includes a definition of an “oversized levee” that assumes additional reinforced fill behind a standard levee (included as Section 131(a)(1) of Title 23). The Corp may want to simply incorporate this already vetted definition.

Consistent with the addition of a definition pertaining to “oversized levees,” we also request that the U.S. Army Corps of Engineers (Corps) modify the proposed variance process in Section 6 so that vegetation is permitted on the waterside slope of oversized levees without triggering the need for a variance. We have identified three (3) possible options in clarifying the guidance in this regard. First, Section 6 could be revised to clarify that it applies to levees *other than* an oversized levee as defined in ETL 1110-2-571. Alternatively, ETL 1110-2-571 could be revised to include *an exemption* for vegetation on oversized levees. Third, Section 6 could be revised to allow for a more streamlined process for oversized levees as follows:

6. *Process.* The process for the request and approval of a vegetation variance consists of the following steps.

a. The project sponsor or district (when appropriate as outlined in paragraph 9.g. of this document) shall submit a Vegetation Variance Request, as described in paragraph 7, to the Commander of the appropriate USACE district. The request shall fully explain the nature of the variance being requested and demonstrate compliance with the following two basic criteria.

(1) The variance must be shown to be necessary, and ~~the only~~ a feasible means, to

- preserve, protect, and enhance natural resources, and/or
- protect the rights of Native Americans, pursuant to treaty, statute, or Executive Order.

(2) With regard to levee systems, the variance must assure that

- safety, structural integrity, and functionality are retained, and
- accessibility for maintenance, inspection, monitoring, and floodfighting are retained. Note that, as used here, the term “retained” refers to the level of functionality and reliability expected under conditions that are fully consistent with the requirements set forth in ETL 1110-2-571 and any other applicable criteria.

b. The district Levee Safety Officer (LSO) shall review the request for completeness and compliance, and recommend to the District Commander acceptance or non-acceptance. All review costs incurred by the district shall be funded by the appropriate account, based on authorization (O&M General, Inspection of Completed Works, or Flood Control and Coastal Emergencies).

c. The District Commander shall accept or reject the request. If accepted, the District Commander shall submit the request package through the MSC LSO to the MSC Commander. The MSC Commander shall either accept or reject the

recommended request. If accepted, the MSC Commander shall submit the request to HQUSACE, via the Regional Integration Team (RIT) process, for an Agency Technical Review (ATR).

d. The ATR leader shall concur or non-concur with the variance request and shall include an executive summary, clearly expressing the pertinent rationale. The ATR team may recommend amendments to the request as an alternative to a non-endorsement.

e. The HQUSACE LSO, or the HQUSACE LSO designee, will be the final approving official for the request.

f. The district shall notify the appropriate regional offices of the federal resource agencies when a vegetation variance request has been received.

g. The district shall serve as the main point of contact for coordination with the sponsor during the entire variance request process. If the request is denied at any level (district, MSC, or HQUSACE), the district shall notify the sponsor in writing and include reasons for the denial.

h. All final documentation for the Vegetation Variance Request shall be uploaded by the district to the National Levee Database (NLD).

i. During inspections, levees will be rated for vegetation in accordance with approved variances. The associated vegetation management plan and approved variance shall be added to the levee's operation and maintenance manual as an addendum.

j. Any Variance Request involving a reinforced levee system in which a minimum of 50 feet of engineered fill is placed behind a standard levee system at existing crown elevation shall be approved by the District Commander upon review and verification of the following by the district LSO:

- 1. Engineering plans and specifications of sufficient detail to show that the existing or proposed levee system the minimum engineered fill reinforcement requirement.**
- 2. Geotechnical analysis, soils reports and other documentation demonstrating that the levee system meets all current USACE through and underseepage criteria.**

- 3. Vegetation Maintenance and Planting Plan that includes the type and location of all existing and proposed vegetation. The Vegetation Maintenance and Planting Plan shall also include proposed revisions to any affect O&M plans for maintenance of the existing and proposed vegetation.**
- 4. An Easement Plan that identifies Corps/Local Sponsor jurisdiction and that ensures accessibility for maintenance; inspection, monitoring, and floodfighting are retained.**

Each of these options would enable the preservation, protection and enhancement of natural resources and protect the rights of Native Americans while maintaining the safety, structural integrity and functionality of reinforced (oversized levees) in accordance with the ETL. Note also that the first finding included in the variance process is also requested to be modified to provide clarification that a reinforced levee is an acceptable and feasible alternative by definition.

Specific Comments Regarding the Applicability of ETL 1110-2-571 to the River Islands Project

We have been working with the Sacramento District of the Corps for over four years on an Environmental Impact Statement for the Phase 2 portion of the River Islands project. Phase 2 includes, among other things, a proposal to keep existing vegetation on the waterside levee slopes, as well as restore vegetation that used to exist on these levees in the past. The purpose of protecting existing and planting new vegetation is to provide much needed Shaded Riverine Aquatic Habitat (SRAH) in the San Joaquin River and Old River areas where temperature and other adverse impacts to listed fish species have increased to alarming levels. The provision of this vital habitat would certainly, “preserve, protect, and enhance natural resources” (namely protected fish populations) as stated in finding number 1 of the proposed Corps variance process and endorsed by the U.S. Fish and Wildlife Service and NOAA Fisheries (National Marine Fisheries Service).

It is also important to understand why such plantings in River Islands’ case would not impact levee stability and maintenance as required by the Corps’ proposed second finding for a variance. The River Islands levee program includes the reconstruction of existing project levees that includes engineered fill against the standard project levee that results in an additional 280 feet of crown width behind the standard 20 foot crown. These “superlevees” meet all FEMA and Corps standards, including those for access, under and through seepage and would allow planting to occur on the waterside of the levee without risk of tree root or rodent undermining due to their extreme width. Extensive technical analysis has been undertaken to ensure the stability and structural integrity of the levee system would be maintained should trees become windthrown or otherwise uprooted from levee slopes. Further, all trees planted by River Islands on the waterside levee slopes would be outside the root-free zone as prescribed by the Guidance. Our

geotechnical consultant, Engeo, Inc. has provided a technical letter regarding the superlevee's stability while vegetated; please see Exhibit 3. We have also included a comparison of our superlevee cross section with a typical project levee with the attached Exhibit 4. This exhibit illustrates the significant fill placed behind the existing levee prism.

We have already completed a significant portion of superlevees in our Phase 1 area of the project. These levees already achieve a 200 year level of flood protection for approximately 900 acres of the project site. Plantings on these already-constructed superlevees were contemplated to occur under State law (see e.g., Cal. Water Code §§ 8571, 8608-8610). In this regard, current State of California regulations contained in Title 23 of the Code of Regulations (the regulations enforced by the State of California's Central Valley Flood Protection Board) allow for the planting of certain trees, shrubs and groundcovers on levee slopes defined by the State as "oversized levees." Section 131(a)(1) of Title 23 specifically states that, "an 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 Exhibit 5 attached). As noted, River Islands' levees will be at least ten (10) times the minimum width required by the State of California to allow such plantings.

Moreover, the Central Valley Flood Protection Board approved construction of the Phase 1 superlevees with an easement for the placement of structures and other encroachments that is unique to the superlevee (please see Exhibit 6). This "Easement Plan" (known as Zone A and Zone B) allow for the original Federal project levee prism to remain in place and be fully accessed and protected during a flood fight. This particular Easement Plan ensures that accessibility for maintenance; inspection, monitoring, and floodfighting are retained. We believe that the easements for encroachments approved by the CVFPB provide successful examples of levee systems that provide adequate flood protection while affording opportunities for aquatic habitat and should be adopted by the Corps for all widened and reinforced (oversized) levee sections such as ours.

Based upon the information provided in this letter, we respectfully request that the Corps modify its Guidance to clarify that vegetation on the waterside Federal project levee slope may be permitted for oversized levees without the need for a variance. Accordingly, we request that the Corps consider allowing the vegetation of waterside project levee slopes under the circumstances described for our project without a variance. We believe that the extreme width and advanced technological construction of our superlevee system meets the intent of Corps Guidance, including ETL 1110-2-571, since it would not allow roots or other invasive vegetation to undermine the core structure of the levee system and still provide for the protection, restoration and creation of a vital natural resource. As a result, we would suggest changes to the Guidance as shown in the attached Exhibit 7.

We would be happy to provide any additional information, including engineering and geotechnical analysis that has been performed as part of the design and construction of the

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Re: Comments on Variance Process for Levee Vegetation
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existing superlevee program that specifically ensures the functionality and reliability of the project levees under applicable law.

Should you have any questions regarding this letter, please do not hesitate to call me at (209) 879-7900 or email me at sdelloso@cambaygroup.com.

Sincerely,



Susan Dell'Osso
Project Director
River Islands at Lathrop

Enclosed: *Exhibit 1: River Islands Locational Map*
 Exhibit 2: Standard versus Reinforced Levee
 Exhibit 3: Technical Letter from Engeo, Inc.
 Exhibit 4: Comparative Levee Cross-Sections
 Exhibit 5: Title 23 Oversize Levee Cross Section
 Exhibit 6: Central Valley Flood Protection Board Permit Encroachments
 Exhibit 7: Suggested Guidance Language Modifications with Figure

Copy to: Claire Marie Turner, U.S. Army Corps of Engineers, Sacramento District
 Lisa Clay, U.S. Army Corps of Engineers, Sacramento District
 Patti Johnson, U.S. Army Corps of Engineers, Sacramento District
 Ric Reinhardt, MBK Engineers
 Anna Buising, ICF/Jones and Stokes
 Alicia C. Guerra, Briscoe Ivester & Bazel LLP
 Cary Keaten, City Manager, City of Lathrop

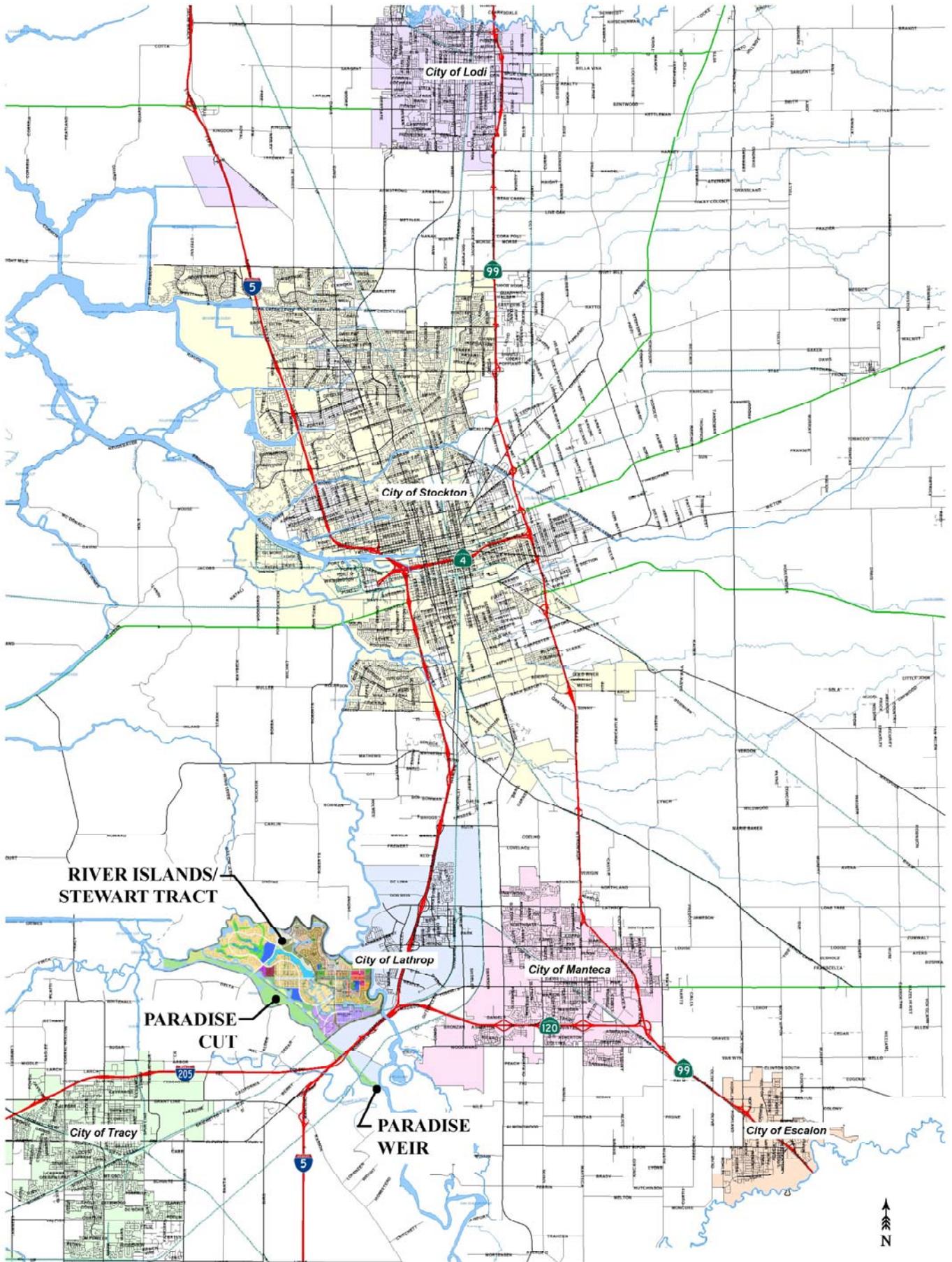
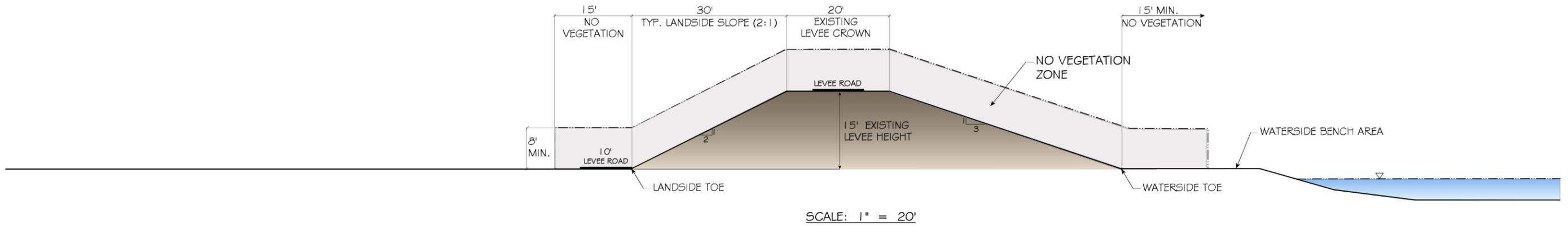


EXHIBIT 1 - LOCATIONAL MAP

TYPICAL PROJECT LEVEE



REINFORCED LEVEE (50' MIN. ENGINEERED FILL REINFORCEMENT)

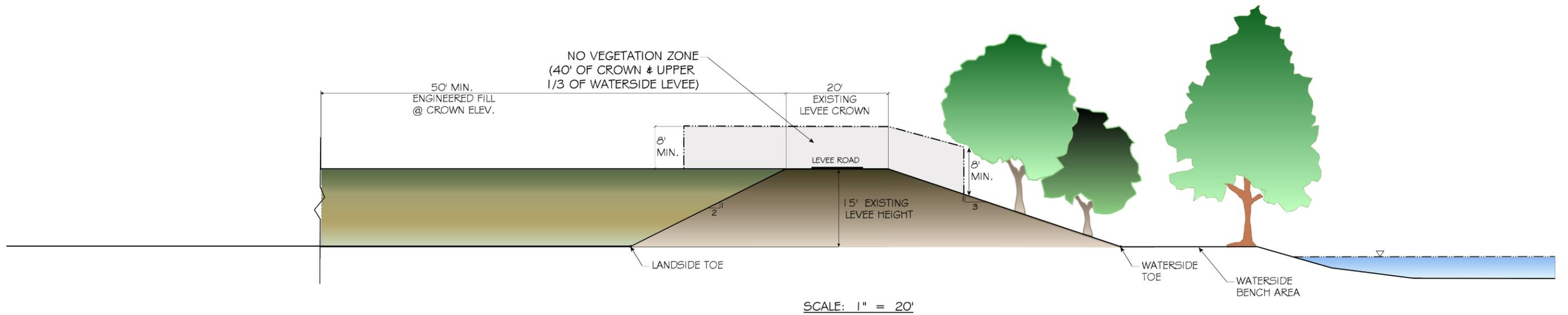


EXHIBIT 2 - STANDARD VERSUS REINFORCED LEVEE

EXHIBIT 3

Project No.
5044.000.001

March 9, 2010

Ms. Susan Dell'Osso
River Islands
73 West Stewart Road
Lathrop, CA 95330

Subject: Docket Number COE-2010-0007
Reclamation District No. 2062 – Stewart Tract

LEVEE STABILITY AND IMPACTS OF VEGETATION

Reference: U.S. Army Corps of Engineers (USACE), Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, Technical Letter No. 1110-2-571; April 10, 2009.

Dear Ms. Dell'Osso:

As you are aware, ENGEO has been providing geotechnical engineering and geologic consultation to RD 2062 for the past 9 years and has assisted in the planning and design of the existing and proposed “oversized” levees surrounding the planned development project. It is our understanding that the purpose of protecting existing vegetation and planting new vegetation is to provide Shaded Riverine Aquatic Habitat (SRAH) in the San Joaquin River and Old River areas.

Recently constructed levees at the subject site have design crown widths of up to approximately 300 feet. The waterside slopes are designed at 3:1 [horizontal:vertical]. Landside slopes are designed at approximately 3 to 5 percent, and reach crown heights meet 200-year plus 3 feet of freeboard requirements. Thus, this levee prism is considered “oversized” and is substantially wider than a standard USACE designed levee having a 20-foot wide crown. Based on our analysis and experience on the project, and given the geometry of the existing and proposed levee, global stability is not a concern along the land or waterside levee slopes. Only shallow surficial failures could be expected in the future.

The stated purpose of the ETL is to provide “guidelines to assure that landscape planting and vegetation management provide aesthetic and environmental benefits without compromising the reliability of levees...”. It is our opinion that landscape planting on the lower 2/3 of the waterside slope of the Project levees will not adversely affect the integrity of the levee or compromise the reliability of the levee to protect the proposed project improvements.

Various stability analyses have been conducted on the land and waterside levee slopes adjacent to Old River and the San Joaquin River. Based on the potential for high variability in the levee geometry for a post-windblown tree analysis, factors-of-safety range from a calculated value of 0.8 to 1.2. However, based on our analyses and review of the geomorphologic data in the surrounding areas, we believe that with levee crown widths that exceed approximately 150 feet or more the levee slopes (such as in the case of the River Islands levees) will behave more like a natural river terrace than as a standard levee subject to complete failure.

We would anticipate that the waterside slopes of the levees could experience occasional shallow slumping failures or localized scour at a fallen tree, but with "oversized" levee dimensions these shallow features pose a negligible risk to the overall levee stability. We understand that a primary argument against the addition of waterside vegetation is that the stability and structural integrity of the levee system could be compromised should trees become windthrown or otherwise uprooted from levee slopes. However, given the oversized nature of the existing and proposed RD 2062 levees, it is our opinion that the addition of vegetation (trees and shrubs) would not cause a detrimental impact to the levee stability or significantly increase the likelihood for through-seepage.

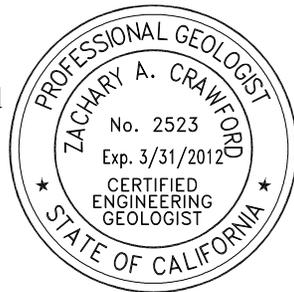
With appropriate setbacks, such as those implemented by the Central Valley Flood Protection Board with the adoption of Encroachment Permit No. 18018-2 and with regular monitoring and maintenance (typical of levee systems generally), if small slumping failures occur in isolated areas along the levee system or if an uprooted tree poses a potential erosion and/or stability issue, we believe that repairs can be made long before the anticipated damage can detrimentally impact the site improvements.

We are pleased to be of service to you on this project. If you have any questions regarding the contents of this report, please do not hesitate to contact us.

Very truly yours,

ENGEO Incorporated

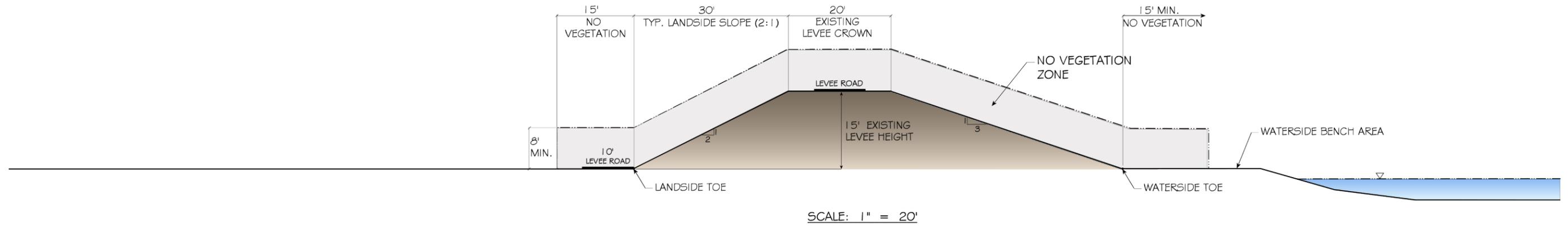

Zac Crawford, CEG
zac/jjt/cjn




Josef J. Tootle, GE



TYPICAL PROJECT LEVEE



**SUPERLEVEE
(300' ENGINEERED FILL REINFORCEMENT)**

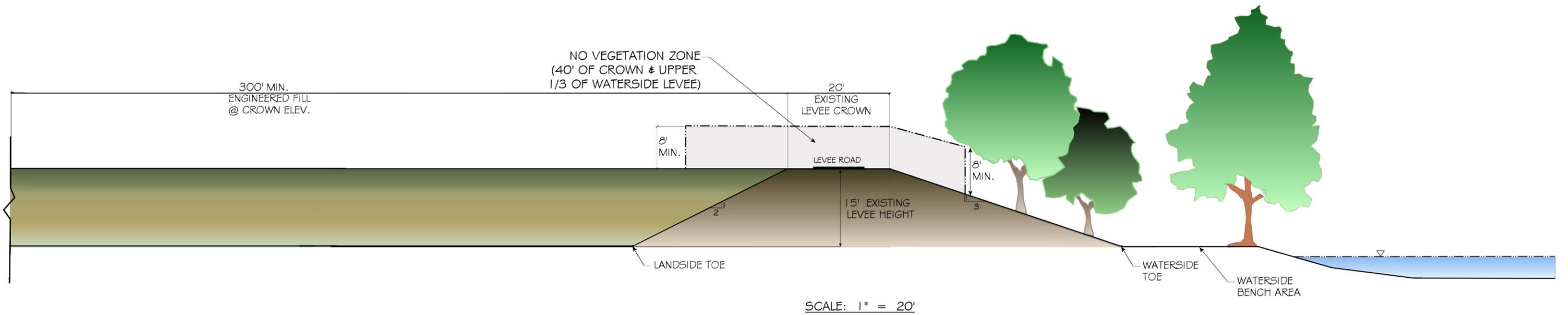


EXHIBIT 4 - COMPARATIVE LEVEE CROSS-SECTIONS

Oversize Levee Section

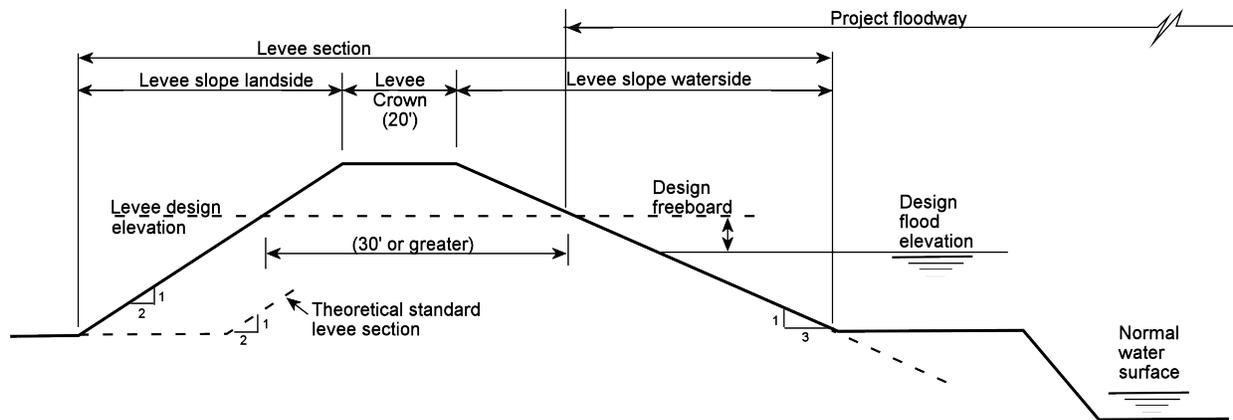


FIGURE 8.10 - TITLE 23 CALIFORNIA CODE OF REGULATIONS

EXHIBIT 6

River Islands Levee Easement

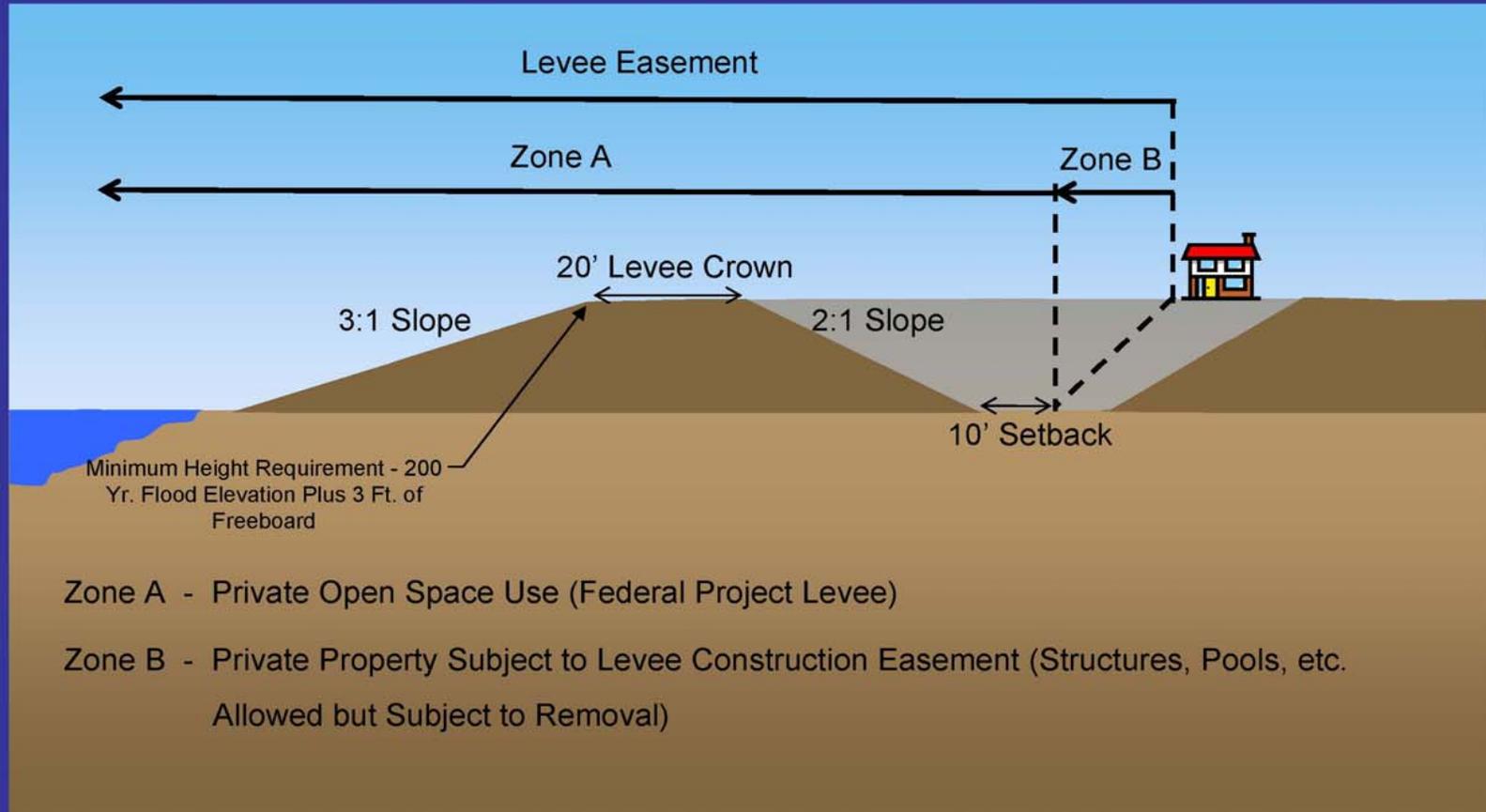


EXHIBIT 7

2-2. Vegetation-Free Zone.

a. The vegetation-free zone is a three-dimensional corridor surrounding all levees, floodwalls, embankment dams, and critical appurtenant structures in all flood damage reduction systems. The vegetation-free zone applies to all vegetation except grass. Grass species are permitted, as described in Paragraph 4-8, for the purpose of erosion control.

b. The primary purpose of the vegetation-free zone is to provide a reliable corridor of access to, and along, levees, floodwalls, embankment dams, and appurtenant structures. This corridor must be free of obstructions to assure adequate access by personnel and equipment for surveillance, inspection, maintenance, monitoring, and flood-fighting. In the case of floodfighting, this access corridor must also provide the unobstructed space needed for the construction of temporary flood-control structures. Access is typically by four-wheel-drive vehicle, but for some purposes, such as maintenance and flood-fighting, access is required for larger equipment, such as tractors, bulldozers, dump trucks, and helicopters. Accessibility is essential to the reliability of flood damage reduction systems.

c. The vegetation-free zone must be wide enough, and tall enough, to accommodate all likely access requirements. The minimum allowable vegetation-free zone dimensions are based on lessons learned from flood-fighting experience and are illustrated in Chapter 6, for a variety of flood damage reduction system configurations. The general rule; the configurations are not meant to be exhaustive however, and other configurations may exist. The general rule for typical configurations (Figures 1 through 25) is as follows:

(1) The minimum height of the corridor shall be 8 feet, measured vertically from any point on the ground.

(2) The minimum width of the corridor shall be the width of the levee, floodwall, or embankment dam, including all critical appurtenant structures, plus 15 feet on each side, measured from the outer edge of the outermost critical structure. In the case of a planting berm (Figures 13, 14, and 15), the 15 feet is measured from the point at which the top surface of the planting berm meets the levee section.

(3) No vegetation, other than approved grasses, may penetrate the vegetation-free zone, with two exceptions, as illustrated in Figure 2:

(a) Tree trunks are measured to their centerline, so one half of the tree trunk may be within the vegetation-free zone.

(b) Newly planted trees, whose crowns can be expected to grow, or be pruned, clear of the vegetation-free zone within 10 years.

d. The minimum vegetation-free zone for oversized levees (as illustrated by Figure 26, Chapter 2) shall be as follows:

(1) The minimum height of the corridor shall be 8 feet, measured vertically from any point on the ground.

(2) The minimum width of the corridor shall include the upper 1/3 of the waterside levee slope (as measured from the waterside levee toe) and a minimum of 40 feet landward from the waterside crown hinge point (as shown on Figure 26).

(3) No vegetation, other than approved grasses, may penetrate the vegetation-free zone, with two exceptions, as illustrated in Figure 2:

(a) Tree trunks are measured to their centerline, so one half of the tree trunk may be within the vegetation-free zone.

(b) Newly planted trees, whose crowns can be expected to grow, or be pruned, clear of the vegetation-free zone within 10 years.

e. The minimum vegetation-free zone dimensions may not be diminished without a formal variance (see Paragraph 1-3b). Due to specific site conditions and project requirements, many levees, floodwalls, embankment dams, and appurtenant structures will be determined, by the project design team, to require a vegetation-free zone larger than the minimum described here.

e. f. Paragraph 2-2 has established the minimum acceptable width of the vegetation-free zone at 15 feet. Other than by variance, as described above, the single exception to this 15-foot minimum requirement arises in the case of an existing project where the width of the existing real estate interest for the project is less than 15 feet. In such a case, the vegetation-free zone width shall be the maximum attainable within the existing real estate interest.

2-3. Vegetation-Management Zone. A recommended alternative to enlarging the vegetation free zone is the addition of an adjacent *vegetation-management zone* (see Figure 22). A vegetation-management zone provides greater opportunity to include vegetation by reserving the option to manage it selectively, as needed. Two of many possible scenarios are presented below.

a. Several trees, just outside the vegetation-free zone, are inhibiting grass growth, through light deprivation and/or the production of their own natural herbicides that limit competition for moisture and nutrients. These trees should be either removed or modified, as appropriate, to assure that grasses thrive and continue to provide effective erosion control.

b. A large tree, outside the vegetation-free zone, becomes a *hazard tree* when its root system is severely damaged by construction activity, thereby increasing its susceptibility to windthrow and the associated risk of damage to a floodwall. This tree should be removed.

2-4. Root Impacts. As stated in Paragraph 2-2, the primary purpose of the vegetation-free zone is access. However, it also serves a secondary purpose: it provides distance between root systems and levees, floodwalls, embankment dams, and appurtenant structures, thereby moderating

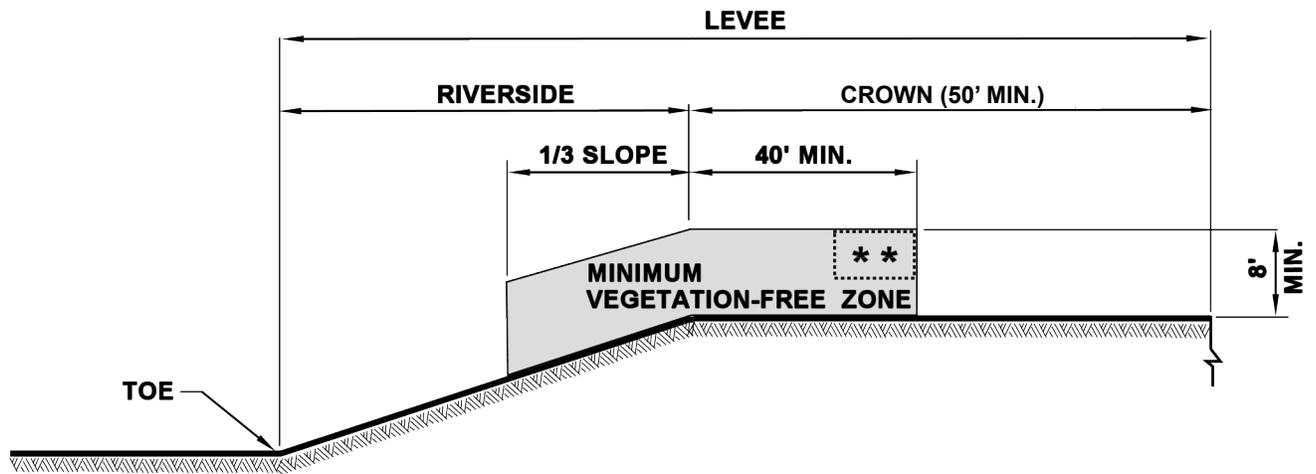
reliability risks associated with the following two situations: potential piping and seepage due to root penetration; and structural damage (a hole in the ground, surrounded by an area of disturbed earth) resulting from a wind-driven tree overturning. Though not adequate for all situations, this 15-foot zone does provide a measure of risk reduction, as follows:

a. Root size and numbers diminish with distance from the tree trunk.

b. The hole and its surrounding area of disturbed earth, created by a tree overturning, typically has a radius ranging from 6 to 12 feet. This secondary effect of the vegetation-free zone is important to the reliability of flood damage reduction systems; it is not a root-free zone but it is a zone of reduced root impact.

2-5. Root-Free Zone. Planting design must consider the possible implications to foundation strength and performance. The integrity of the foundation could be compromised if potential seepage paths were created by root penetration and/or root decay. The root-free zone provides a margin of safety between the greatest expected extent of plant roots and the beginning face of any structure that is critical to the performance and reliability of the flood damage reduction system. The list of such structures includes levees, floodwalls, embankment dams, seepage berms, seepage drains, toe drains, pressure relief wells, and cut-off trenches. These critical structures must be root-free, as illustrated in Figures 13, 14, 15, 17, [19](#), and [19-26](#). The rooting habit of each plant selected for use near a root-free zone must be predictably understood with respect to its potential to invade the root-free zone and compromise the reliability of the flood damage reduction system. Landscape planting plans will reflect full recognition of the importance of selecting appropriate plant species and varieties. Root barriers may be used to provide an added measure of assurance, but they should not be a substitute for adequate distance between plantings and root-free zones. Root barriers shall not retard groundwater or seepage flow. Some root barriers include herbicides to enhance effectiveness; in every case, these shall be evaluated prior to use to assure against negative environmental impacts.

2-6. Water-Current and Wave-Action Barrier. The use of suitable vegetation, such as shrub forms of *Salix* (willow), riverward of the vegetation-free zone is encouraged as an environmentally beneficial means to moderate the erosive potential of water currents and wave action.



**** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS**

Figure 26: Oversized Levee Section.