DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET NW
WASHINGTON, D.C. 20314-1000

CECW-CE

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: Policy Guidance Letter (PGL) – Process for Requesting a Variance from Vegetation Standards for Levees and Floodwalls

1. Purpose. This policy guidance letter (PGL) revises the procedures for obtaining a variance from US Army Corps of Engineers (USACE) mandatory vegetation-management standards contained in Engineer Technical Letter (ETL) 1110-2-571 – *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* pursuant to Section 202(g) of the Water Resources Development Act (WRDA) of 1996. This PGL also includes timeframes and options for existing variances. These procedures align with the USACE Levee Safety Program goals of ensuring life safety as a top priority and applying consistent processes to make well-informed decisions. This PGL supersedes the existing regional variance policy and process contained in Engineer Regulation (ER) 500-1-1 and Engineer Pamphlet (EP) 500-1-1 (including Appendix E), dated 30 September 2001, and will serve as the applicable guidance until this process is incorporated into a USACE engineer publication.

2. Applicability. This PGL applies to all Headquarters USACE (HQUSACE) elements, Major Subordinate Commands (MSCs), districts, and field operating activities having responsibility for Civil Works projects. This policy applies to levees within the USACE Levee Safety Program, including those 1) USACE operated and/or maintained; 2) federally authorized, typically USACE constructed, and locally operated and maintained; and 3) locally constructed and locally operated and maintained, but associated with the USACE Rehabilitation and Inspection Program (RIP) (also known as the P.L. 84-99 program).

3. References.

   a. Engineer Regulation (ER) 500-1-1, Emergency Employment of Army and Other Resources, Civil Emergency Management Program, 30 September 2001.
   b. Engineer Circular (EC) 1110-2-6066, Design of I-Walls, 1 April 2011.
   c. Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010.
   d. Engineer Pamphlet (EP) 500-1-1, Emergency Employment of Army and Other Resources, Civil Emergency Management Program – Procedures, 30 September 2001.
   e. Engineer Manual (EM) 1110-2-1913, Design and Construction of Levees, 30 April 2000.
   f. Engineer Manual (EM) 1110-2-1601, Hydraulic Design of Flood Control Channels, 30 June 1994.

g. Engineer Manual (EM) 1110-2-2502, Retaining and Flood Walls, 29 September 1989.

h. Engineer Technical Letter (ETL) 1110-2-575, Evaluation of I-walls, 1 September 2011.

i. Engineer Technical Letter (ETL) 1110-2-571, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, 10 April 2009.

j. Engineer Technical Letter, (ETL) 1110-2-569, Design Guidance for Levee Underseepage, 1 May 2005.

k. Memorandum, HQ USACE (CECW-HS), Subject: Policy for Development and Implementation of System-wide Improvement Frameworks (SWIFs), 29 November 2011.

4. Background. The purpose stated in Section 202(g) of WRDA of 1996, is "to provide a coherent and coordinated policy for vegetation management for levees" so as to "address regional variations in levee management and resource needs." In general, the resulting policy set forth in ER 500-1-1 allowed the levee sponsor, meeting all eligibility criteria for rehabilitation assistance pursuant to 33 U.S.C. 701n (P.L. 84-99), to seek a variance to USACE vegetation standards when such a variance would preserve, protect, and/or enhance natural resources and/or protect rights of Tribal Nations. However, it was required that the safety, structural integrity, and functionality of the levee, in addition to accessibility for inspection and floodfighting purposes be retained.

5. Definitions. For use in this document:

a. A "levee" consists of one or more earthen embankment or floodwall segments.

b. A "levee system" consists of one or more segments of earthen embankment or floodwall, and all appurtenant structures (such as closures, berms, pumping stations, culverts, and interior drainage) which are interconnected and necessary to reasonably reduce the potential of floodwater entering a defined area.

c. A "variance" is defined as alternative vegetation management standards to be applied to a levee system or portion thereof that provide for the same levee functionality as intended in ETL 1110-2-571.

6. Eligibility Requirements for Requesting a Vegetation Variance.

a. For consideration of a vegetation variance that preserves, protects, and/or enhances natural resources, the requester must demonstrate that a variance is the only reasonable means to achieve the following criteria:

1) comply with applicable law concerning the environment, cultural or historic preservation; or
2) protect the rights of Tribal Nations, pursuant to treaty, statute, or Executive Order; or
3) address a unique environmental consideration, such as to maintain sensitive species populations and to preclude the need for future federal listings under the Endangered Species Act (ESA), endorsed by the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS).

b. Levee systems as described below do not have to meet the criteria established in Paragraph 6.a. in order to be eligible to request a variance:

1) existing levees, federal or non-federal, in which it can be demonstrated through written documentation that there is an existing vegetation variance or vegetation deviation agreement between the local USACE District and the levee sponsor prior to the date of this memorandum; or,
2) levee systems for which a variance is requested for a planting berm.

c. A USACE District may submit a vegetation variance request for the following situations (Note: For Paragraphs 1-3 below, criteria established in Paragraph 6.a. do not have to be met and the USACE District must have concurrence from the levee sponsor):

1) Federally authorized levees that have advanced into the preconstruction, engineering, design (PED) or construction phase of development, but for which USACE has not provided written notice of their completion and of the levee sponsor's duty to begin operation, maintenance, repair, rehabilitation, and replacement as of the date of this memorandum; or,
2) Existing federally authorized levees in which it can be demonstrated that vegetation was previously part of the original design prior to the date of this memorandum or,
3) Existing federally authorized levees in which the existing operations and maintenance (O&M) manual allows vegetation within the vegetation-free zone or,
4) Levee systems for which USACE has operations and/or maintenance responsibilities; or,
5) In areas with ESA considerations or where the rights of Tribal Nations pursuant to treaty, statute, or Executive Order may be impacted, the USACE District may submit, in advance of actual need, cross-sections for P.L. 84-99 repairs that include vegetation, for a specific levee system. The submittal must:

(a) have concurrence from the levee sponsor and, if different from the levee sponsor, the maintaining entity and,
(b) have been shared with and commented on by the appropriate USFWS and/or NMFS office in order to anticipate measures that are likely to adequately address impacts

to listed species and critical habitat in order to streamline formal consultation when repairs are to be implemented.

d. In addition to the requirements in Paragraph 6.a., all vegetation variance requests must also demonstrate that the following are retained:

1) structural integrity, and functionality of the levee system; and,
2) accessibility for operations, maintenance, repair, inspection, monitoring, and floodfighting of the levee system.

7. Process. A request for a vegetation variance can originate from a USACE District (see Paragraph 6.c.) or a levee sponsor. In cases where a levee sponsor is considering applying for a vegetation variance, it is recommended that the levee sponsor contact their respective USACE District and review minimum requirements as set forth in Enclosures 1-3. Early coordination between USACE and the levee sponsor is strongly recommended because it will aid in focusing efforts and minimizing costs. Once the vegetation variance request has been submitted, the following describes the process USACE will follow to review the request.

a. The USACE District shall ensure timely coordination with appropriate federal and state agencies and Tribal Nations concerning regional environmental, cultural, and historic considerations throughout the vegetation variance request process. The USACE District shall notify the appropriate regional offices of the federal resource agencies and Tribal Nations in writing within 30 days upon initiation of a vegetation variance request or when a request has been received.

b. The USACE District (along with the levee sponsor if appropriate) shall initiate timely coordination upon initiation of a vegetation variance request with the MSC and the Vegetation Variance Lead for the Risk Management Center (RMC) to assure that the review process is well coordinated and allows for timely feedback on submittal requirements. This early coordination in the development of the variance request is intended to appropriately scale the scope of the request and/or identify conditions for which variance approval is unlikely.

c. The USACE District Levee Safety Officer (LSO) shall review the variance request for completeness and compliance and recommend initiation of an Agency Technical Review (ATR) to the RMC.

d. The RMC shall lead and manage the ATR for each variance request. HQUSACE will fund the ATR. The timeline for the ATR will depend on the complexity of the request, but will not exceed 90 days after the ATR team receives the final request package unless special circumstances warrant additional time. The ATR will be documented and

certified as per requirements in EC 1165-2-209. Final ATR documentation shall be part of the variance request package. The following are the typical disciplines that will be included on the ATR team: geotechnical, geological, hydraulics/hydrology, environmental/biological sciences, emergency management, operations/maintenance, and landscape architecture. Other disciplines will be added to the ATR team as needed and based on the variance request.

e. Following completion of the ATR, the USACE District Commander shall either endorse or not endorse the request and provide the rationale for the recommendation. If the request is endorsed, the District Commander shall submit the request package through the MSC LSO to the MSC Commander. The USACE MSC LSO shall review the request and recommend to the MSC Commander, either for or against endorsement. The USACE MSC Commander shall either endorse or not endorse the request and provide the rationale for the recommendation. If endorsed, the USACE MSC Commander shall submit the request to HQUSACE, via the Regional Integration Team (RIT) process, for approval.

f. The HQUSACE LSO, or the HQUSACE LSO designee, will be the final approving official for the request and will document the basis for the decision.

g. The USACE District shall serve as the main point of contact for coordination with the levee sponsor throughout the variance request process, including providing the levee sponsor with documentation of final decision of the vegetation variance request.

h. All final documentation for the vegetation variance request shall be uploaded by the USACE District to the National Levee Database (NLD).

i. Upon final approval but prior to implementation of the variance, the USACE District and the requester shall sign a Vegetation Variance Agreement, based on the template at Enclosure 2. The USACE District shall involve the District Office of Counsel in the drafting of the agreement. The agreement can be approved and executed at the District level unless changes to the template are made that would affect the terms of the approved variance. For levee systems with multiple levee sponsors, each levee sponsor must sign the agreement and certificate of authority.

j. During inspections, levees will be rated for eligibility for federal rehabilitation assistance under P.L. 84-99 in accordance with the levee inspection checklist and requirements set forth in an approved variance(s). Levee systems with an Acceptable or Minimally Acceptable rating will remain eligible for federal rehabilitation assistance under P.L. 84-99, including any features associated with an approved variance such as planting berms and overbuilt sections.

k. The associated vegetation management plan and approved variance shall be added to the levee's operation and maintenance (O&M) manual as an addendum.

8. Vegetation Variance Request Submittal Requirements. Submittal requirements are detailed in Enclosure 3.

9. Special Considerations. The following points should be considered prior to initiating a vegetation variance request.

a. This vegetation variance policy does not apply to embankment dams and their appurtenant structures, channels, or shore-line or river-bank protection systems such as revetments, sand dunes, and barrier islands.

b. New federally authorized cost-shared levee projects shall be designed to meet the current vegetation management standards. It should be noted that landside planting berms may be incorporated into a new levee project design without a vegetation variance request.

c. Regional variances or variances that cover all levees within a geographical area will not be issued. Vegetation variances will be considered only for individual levee systems or portions thereof. However, regional conditions, with regard to soils, local climate and vegetation, and other pertinent factors, will be taken into consideration.

d. To ensure the ability to implement floodfighting activities, such as placement of sandbags or other temporary floodfight measures near the waterside crown, and to see areas of distress on the landside during a flood event, typically the upper third of the waterside slope, the crown, the landside slope, and within 15 feet of the landside toe (subject to preexisting real estate interest) of the levee needs to remain vegetation free, as defined in ETL 1110-2-571. Any vegetation variance requests proposed for these areas will be carefully evaluated to ensure requirements in Paragraph 6 are met.

e. The types of approvable vegetation variances near floodwalls may be very limited, especially for I-walls of concern as identified per Paragraph 3.h. For floodwalls, the landside and waterside corridors are areas of particular concern due to potential impacts of root damage to joints, drains, and foundations, as well as, acute tree-overturning damage (breakage, destabilization and displacement). Any vegetation variance requests proposed for areas containing floodwalls will be carefully evaluated to ensure requirements in Paragraph 6 are met.

f. The vegetation variance process is not a mechanism to validate conditions that have developed as a result of inadequate levee operations and maintenance.

g. Past USACE inspection reports that did not identify noncompliant vegetation as a deficiency do not constitute an existing vegetation variance or approved deviation.

h. In the case of a levee sponsor seeking initial eligibility for federal rehabilitation assistance under P.L. 84-99, prior to acceptance, the levee system must meet all eligibility requirements including current vegetation standards or an approved vegetation variance must be obtained if criteria in Paragraph 6 are met.

i. To avoid duplication of effort, vegetation variance applications involving planting berms that are part of a study or PED should take advantage of the analysis and documentation review performed as part of the authorized project (see Enclosure 3, Figure 3).

j. If implementation of a vegetation variance will constitute a modification or is part modification of a federally authorized levee, then the levee sponsor must also seek approval under 33 USC 408 as part of the vegetation variance request. The levee sponsor should work with the USACE District to ensure that the variance request satisfies the requirements of the current guidance on the implementation of 33 USC 408.

k. USACE District costs for processing or submitting a vegetation variance request shall be funded by the appropriate account based on authorization of the levee system (Operations and Maintenance (O&M) General, Inspection of Completed Works, or Flood Control and Coastal Emergencies).

l. For instances in which a request for a vegetation variance accompanies or is part of other actions that require the execution of an agreement between the levee sponsor and USACE (e.g., modifications under 33 USC 408 or P.L. 84-99 repairs), a single agreement that satisfies the requirements for each of the actions should be used. In such cases, the template agreement at Enclosure 2 need not be used, but the substantive terms from the template should be incorporated into the agreement that is signed. The USACE District shall ensure coordination with USACE District Office of Counsel on final agreements.

m. The process outlined in this memorandum may be implemented as part of a system-wide improvement framework (SWIF) per Paragraph 3.k. Enclosure 4 contains scenarios for the vegetation variance process and SWIFs.

10. Timeframes for Existing Vegetation Variances or Other Vegetation Deviations. Deviation from the national standards as defined in ETL 1110-2-571 is permitted only through a

vegetation variance approved by the HQUSACE LSO via the process described herein. USACE recognizes that areas with sensitive environmental considerations will require planning and coordination; therefore, the following provisions are being provided:

a. For levees meeting the requirements of Paragraph 6.b.1, the levee sponsor will have one year from the date of this memorandum to submit a letter of intent to their respective USACE District expressing intent to either submit a vegetation variance request or develop a system-wide improvement framework (SWIF) as per Paragraph 3.k.

   1) If the decision is to submit a vegetation variance, the levee sponsors will have one additional year to submit a vegetation variance request. Until the vegetation request is submitted and the review process is complete, the levee system will continue to be inspected in accordance to the existing vegetation variance or other vegetation deviation for determining P.L. 84-99 rehabilitation assistance eligibility.

   2) If the decision is to develop and implement a SWIF, procedures in Paragraph 3.k. shall be followed. For levee sponsors already implementing an agreed SWIF, no letter of intent is required.

b. For levee sponsors with existing vegetation variances or deviations that do not submit a letter of intent, vegetation variance request, or SWIF by the required timelines, the existing vegetation variances, agreements, or other deviations applied to their levees may no longer be considered valid. The USACE District should verify with the levee sponsors if they wish to continue participating in P.L. 84-99. If the levee sponsor does choose to continue their participation, the USACE District LSO will inform the levee sponsor via letter (copy furnished to the MSC and HQUSACE LSO) of the vegetation management standards to be applied to that levee.

c. For levees that meet the requirements of Paragraph 6.c.2 and/or 6.c.3 and currently have an Acceptable or Minimally Acceptable inspection rating, excluding the vegetation designed into the levee by USACE and/or allowed by USACE in the O&M manual (in other words the levee has been properly maintained in accordance to the current O&M manual), the USACE District will have one year from the date of this memorandum to submit a letter to the MSC LSO expressing intent to either submit a vegetation variance request or pursue a plan to meet ETL 1110-2-571. It must be demonstrated that the letter of intent was coordinated with the levee sponsor (s). For levees that meet the requirements of Paragraph 6.c.2 and/or 6.c.3 and currently have an Unacceptable inspection rating, the levee sponsor must correct the unacceptable deficiencies, excluding the vegetation designed into the levee by USACE and/or allowed by USACE through the O&M manual, prior to the USACE District taking action to seek a vegetation variance or plan to meet ETL 1110-2-571. Should the levee

sponsor seek a SWIF per Paragraph 3.k, then the USACE District shall ensure that its action to pursue a variance or other means to meet ETL 1110-2-571 is incorporated into the comprehensive SWIF process.

d. For levees meeting the requirements of Paragraph 6.c.1, depending on the status of the project phase, USACE Districts must either submit vegetation variance request or pursue a plan to meet ETL 1110-2-571 as soon as possible.

e. For levee systems operated and maintained by USACE, the USACE District will have one year from the date of this memorandum to submit a letter to the MSC LSO expressing intent to either submit a vegetation variance request or pursue a plan to meet ETL 1110-2-571.

f. USACE Districts should copy furnish all letters of intent to the HQUSACE LSO.

11. Environmental Compliance. USACE is responsible for assuring compliance with all applicable environmental requirements before a decision can be made on a vegetation variance request. As a condition of the levee sponsor choosing to participate in P.L. 84-99, the levee sponsor is responsible for providing all background studies, data, and other information required by USACE to complete the environmental compliance processes under the National Environmental Policy Act (NEPA), ESA, and any other applicable environmental resource protection statute (except for those instances in which a USACE District is the proponent of a variance as provided in Paragraph 6.c.). The documentation must analyze, as alternatives, the effects of the implementation of the proposed vegetation variance and the implementation of the national standards. The levee sponsor must commit to implementation of any measures (such as monitoring, reasonable and prudent alternatives, etc.) needed to comply with ESA or other legal requirements before the levee sponsor may participate, or continue participation, in the P.L. 84-99 program and must commit to bearing the costs for implementation of these measures.

12. Submittal Process for New Vegetation Related Science and Technology. For instances in which an entity would like to submit new science or technology related to vegetation for USACE consideration, submitters must ensure that any submitted document produced from research be peer reviewed prior to following the submittal process described below. Documents submitted to USACE through this process must be submitted by the author(s) of the documents. Submittal packages should be sent to the US Army Engineer Research and Development Center (ERDC), 3909 Halls Ferry Road, Vicksburg, MS, 39180, Point of Contact (POC): XXXX.

a. Submittal of a peer-reviewed final document must include the following:

1) cover letter by the submitter requesting USACE consideration for identified relevant areas of application within USACE existing policies; and,
2) documentation of the peer review demonstrating that a standard procedure for peer review was followed; and,
3) relevant documents for the science and technology submitted.

b. Once a submittal package is received, the responsibilities of ERDC are as follows:

1) inform HQUSACE (CERD) of receipt of the submittal; and,
2) review the submittal package to ensure that peer review requirements have been met; and,
3) review, evaluate, and summarize the methods, procedures, and results; and
4) provide the ERDC evaluation and submittal package to HQUSACE within 60 days of receiving the submittal package.

c. Once the ERDC review is received, the responsibilities of HQUSACE (CERD in coordination with applicable Communities of Practice) are as follows:

1) review the ERDC summary and submittal documents for potential applicability within USACE; and,
2) further coordinate with ERDC, if needed; and,
3) provide a written response letter and the basis for the HQUSACE determination to the submitters within 60 days of receiving the ERDC evaluation.

13. After vegetation variance request packages are reviewed through this process, results will be posted by the HQUSACE LSO to the Levee Safety Community of Practice page, on the Technical Excellence Network (TEN) at **https://ten.usace.army.mil**.

14. The points of contact for this guidance are XXXX or XXXX.

JAMES C. DALTON, P.E., SES
Chief, Engineering and Construction
Directorate of Civil Works

Enclosures:

1. Submittal Checklist and Review and Approval Signature Sheet
2. Vegetation Variance Agreement
3. Submittal Requirements
4. Scenarios and Timelines for Attaining Compliance with USACE Standards
5. Scenarios of Responsibility for Pre-Existing Variances and Other Documented Deviations

Enclosure 1 - SUBMITTAL CHECKLIST

VEGETATION VARIANCE REQUEST SUBMITTAL CHECKLIST

The items checked below are submitted herewith, consistent with the requirements outlined in Enclosure 3 (Vegetation Variance Request Submittal Requirements) of Policy Guidance Letter (PGL) – Process for Requesting a Variance from Vegetation Standards for Levees and Floodwalls, dated XXXX.

□ (1) A general description of the levee system.

□ (2) A brief narrative describing the proposed vegetation variance.

□ (3) A brief narrative explaining why the proposed changes are necessary to address the criteria presented in PGL Paragraph 6.

□ (4) Detailed, annotated, plan and section drawings and photographs.

□ (5) All pertinent engineering analyses: cross-section, hydraulic, geotechnical, and structural, as needed.

□ (6) The most recent Routine Inspection Report and Periodic Inspection Report completed by the USACE District.

□ (7) A summary of levee system performance history for all significant flood events.

□ (8) A Vegetation Management Plan, detailing the conditions to be maintained.

□ (9) Any National Environmental Policy Act (NEPA), Endangered Species Act (ESA), or other environmental compliance documentation that the USACE District determines necessary to the review.

□ (10) Any requested excerpts of the current project O&M manual.

□ (11) Any other information, as appropriate to specific conditions.

□ (12) ATR team review documentation.

□ (13) The Requester's primary point(s) of contact (POCs) for this request, as follows.

NAME:	
ORGANIZATION:	
TITLE:	
TELEPHONE:	
E-MAIL ADDRESS:	

Enclosure 1 - REVIEW AND APPROVAL SIGNATURE SHEET

SUBMITTED BY: The *(name of entity)*

(signature)

(full name, typed) DATE

(title, in full)

(If a USACE District is the submitter, additional levee sponsor signature blocks shall be added to ensure all levee sponsors concur. If a levee system has multiple levee sponsors, additional levee sponsor signature blocks shall be added for each levee sponsor's signature.)

REVIEWED BY: US Army Corps of Engineers, *(insert name)* District

(signature)

(full name, typed) DATE

Levee Safety Officer

ENDORSED BY: US Army Corps of Engineers, Risk Management Center

(signature)

(full name, typed) DATE

Leader, Agency Technical Review Team

ENDORSED BY: US Army Corps of Engineers, *(insert name)* District

(signature)

(full name, typed) DATE

Commander

REVIEWED BY: US Army Corps of Engineers, *(insert name)* MSC

(signature)

(full name, typed) DATE

Levee Safety Officer

ENDORSED BY: US Army Corps of Engineers, *(insert name)* MSC

(signature)

(full name, typed) DATE

Commander

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APPROVED BY: US Army Corps of Engineers, HQ

(signature)

(full name, typed) DATE

Levee Safety Officer

Enclosure 2 – VEGETATION VARIANCE AGREEMENT

VEGETATION VARIANCE AGREEMENT
for

(enter the levee system name, location and ID number, as defined in the National Levee Database)

I. Purpose. The purpose of this Agreement is to allow for specific and limited variance from US Army Corps of Engineers (USACE) vegetation standards, for the levee named above.

II. Authority. This Agreement is made pursuant to the authority of Public Law 99, 84th Congress (33 U.S.C. 701n), as regulated by Title 33, Code of Federal Regulations, Sections 203 and 208.10, and as implemented by policy guidance letter, Subject: Policy Guidance Letter – Requesting a Variance from Vegetation Standards for Levees and Floodwalls, dated XXXX.

III. Applicability. This Agreement is applicable only to those portions of the above-named levee system that are identified as *vegetation variance zones* in the attached submittal drawings.

IV. References. *(Insert any references that are applicable, including the existing project cooperation agreement. This could include state law, county ordinances, Federal or state court documents, technical manuals, etc. References may be incorporated into this Agreement.)*

V. Scope. A detailed description of the conditions proposed under this Agreement is provided in attachment *(attach approved vegetation request package)*.

VI. Actions During and After Emergencies.

A. Definition of Emergency. For the purposes of application of this Agreement, the term "emergency" is defined as any situation as declared by the District Commander in which a levee is threatened with either failure or overtopping.

B. Definition of Flood Fight. For the purposes of application of this Agreement, the term "flood fight" is defined as actions taken immediately before or during a flood to protect human life and reduce flood damages, such as evacuation, emergency sandbagging and diking, and providing assistance to flood victims.

C. Conduct of Flood Fight Activities. During an emergency, any responsible party engaged in flood fight activities, to specifically include the USACE, the *(list states, cities, or counties as necessary)*, and the levee sponsor may take whatever actions are necessary to preserve the structural integrity of the levee addressed by this Agreement. Actions necessary to preserve the structural integrity of the system may include removal of any and all vegetation on or near the levee or floodwall.

D. Rehabilitation. Any levee repairs, modifications, or improvements following the emergency event shall be in accordance with current USACE vegetation management standards or the approved vegetation variance for the levee.

VII. Obligations of the Levee Sponsor.

A. The levee sponsor agrees to maintain the levee system in accordance with the attached approved vegetation variance and assume the responsibility for implementing and bearing the costs of any measures that are required for compliance with the ESA or any mitigation requirements that result from environmental compliance processes such as the NEPA or required permits.

B. The levee sponsor shall hold and save the Government free from all damages arising from any and all activities associated with this Agreement.

VIII. Notices.

A. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage prepaid), registered, or certified mail, to the address provided.

B. A party may change the address to which such communications are to be directed by giving written notice to the other parties in the manner provided in Paragraph C (below).

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at such time as it is personally delivered, or, seven calendar days after it is mailed.

IX. Expiration of this Agreement.

(Approval of this agreement may be contingent upon agreement to an expiration mechanism. Use one of the three conditions below to complete this paragraph.)
(This Vegetation Variance is intended to be permanent.)
(This Vegetation Variance shall expire on [insert date].)
(This Vegetation Variance shall expire upon [explain event].)
However, the Corps reserves the right to revoke this Agreement if USACE determines that it results in conditions that threaten levee system reliability and public safety.

X. Signatures.

IN WITNESS HEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the USACE District Commander.

THE DEPARTMENT OF THE ARMY
BY: _____
(signature)
(full name, typed)
DISTRICT COMMANDER
(district name) DISTRICT

DATE: _____

(Other signature blocks may be added as necessary.)

BY: (*name of requester*)
(signature)
(full name, typed)
(title)

DATE: _____

XI. Certificate of Authority.

CERTIFICATE OF AUTHORITY

I, _____, do hereby certify that I am the principal legal officer of the *(Name of Public Sponsor)*, that *(Name of Public Sponsor)* is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the *(Name of Public Sponsor)* in connection with this Vegetation Variance Request and Agreement Addressing the Vegetation Standards for *(enter the levee system name and location, as defined in the National Levee Database)* and that the persons who have executed this Agreement on behalf of *(Name of Public Sponsor)* have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this _____ day of _____ 20__.

_____

(Name of Counsel for signing entity)
(Full Formal title)

Enclosure 3 – Submittal Requirements

VEGETATION VARIANCE REQUEST SUBMITTAL REQUIREMENTS

RECOMMENDED FIRST STEPS

1. Contact the local USACE District. Early coordination may help to focus efforts and minimize costs.

2. Consider submittal requirement in Paragraph 4.b.(2) below. If the *prism* is not smaller than the existing levee cross section, it is unlikely that a variance involving woody vegetation will be approved without compensating structural modifications.

3. Please note the following points:

    a. A variance may not result in an expected level of reliability below that provided by a structure designed to minimum standards as detailed in the following USACE Engineer Manuals (EMs), Engineer Technical Letters (ETLs), and Engineer Circular (EC).

        1) EM 1110-2-1913, Engineering and Design – Design and Construction of Levees, 30 April 2000
        2) EM 1110-2-1601, Engineering and Design – Hydraulic Design of Flood Control Channels, 30 June 1994
        3) EM 1110-2-2502, Engineering and Design – Retaining and Flood Walls, 29 September 1989
        4) ETL 1110-2-575, Evaluation of I-walls, 1 September 2011
        5) ETL 1110-2-569, Engineering and Design – Design Guidance for Levee Underseepage, 1 May 2005 (in-effect through August 2012, content to be incorporated into other guidance)
        6) EC 1110-2-6066, Engineering and Design – Design of I-Walls, 1 April 2011

    b. Minimum design standards may not be sufficient for all situations: sufficiency of minimum standards, for specific conditions, will be subject to engineering analysis and evaluation.
    c. The levee, or floodwall, and any appurtenant structures are designed to function together, as a system. Any likely incidental impacts to system functionality must also be considered.
    d. A request for a vegetation variance for a planting berm need not satisfy the environmental or Tribal criteria outlined in Paragraph 6.a. of the PGL, and it need not address the associated submittal requirement in Paragraph 3 (below).
    e. The graphic information provided in response to the submittal requirements in Paragraph 4 (below), and the *vegetation management plan* provided in response to Paragraph 8 (below), together shall fully define the extent and conditions of the vegetation variance.
    f. The USACE District shall assure the accuracy of all information submitted in satisfaction of the Submittal Requirements.

SUBMITTAL REQUIREMENTS

Information satisfying the numbered requirements below shall be submitted in Adobe Systems portable document format (PDF), under cover of the completed *Submittal Checklist* provided herein, Enclosure 1. The Review and Approval Signature Sheet shall then be attached to the vegetation variance request package for tracking of the review process. Advance coordination between the requestor(s), the USACE District/MSC, and the Risk Management Center (RMC), prior to preparing the variance request, is recommended and may result in situation-specific amendment to these submittal requirements. Any clarifications to this guidance, and examples of vegetation variance request documents, will be available through the USACE District.

1. A general description of the levee system including system name, project authority, location, and National Levee Database (NLD) identification number (available through the USACE District).

2. A brief narrative describing the proposed deviations from the USACE vegetation-free-zone standards prescribed in ETL 1110-2-571 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*. Include a general description of existing and proposed plant locations, and type of vegetation (e.g. tree or shrub). Also include a representative list of species and the following characteristics of each, at maturity and, if different, at the maximum maturity to be permitted under the *vegetation management plan*: height, crown diameter, and root pattern and extent (horizontal and vertical). Cite source(s) used for information on plant characteristics.

3. A brief narrative explaining why the proposed variance(s) are necessary to address the criteria presented in Paragraph 6.a. of the main policy memorandum. Explain why these needs cannot be satisfied at a location other than on the levee; what alternatives to a vegetation variance were considered, and why the requested variance the only reasonable means to address applicable criteria. If Paragraph 6.a. of the PGL does not apply then simply state why it does not.

4. Detailed, annotated, plan and section drawings, and photographs, using an 11 x 17 format at a scale and resolution appropriate to the level of detail and enlarged on-screen viewing, which clearly convey pertinent information as follows:

    a. Provide a plan-view drawing, showing the overall levee system, in context, and identifying each reach to which the variance is to apply. As used here, the term “reach” may be defined as follows: a length of levee that may be accurately represented by a single cross-section drawing and set of conditions. Provide overall stationing (in feet or miles), and identify the beginning and ending points for each levee reach to be considered. The variance request should not include any portion of the levee system for which there are reasonable alternatives; for example, a variance will not be granted for an entire levee system when only a portion of that system meets the criteria described in Paragraph 6.a. of the PGL.

b. Provide a cross-section drawing for each levee reach to which the variance is to apply. Each cross-section drawing shall include the following information.

1) Show, label, and dimension the entire levee and/or floodwall. Include any existing or proposed planning berms. Include any appurtenant structures (e.g. berms, reinforcement, cut-off walls, drains, relief wells) necessary for reliable performance. Include the stream bank (to the stream bottom) and any other pertinent features, such as roads or trails.

2) Show, label, and dimension the levee *prism* (see Figure 1). The prism is the minimum analytical cross section that, given site-specific soil conditions, satisfies all applicable design criteria with regard to seepage and slope stability, as defined in EM 1110-2-1913 and ETL 1110-2-569. In addition, if the USACE District levee design standards exceed the minimums defined in EM 1110-2-1913, or conditions warrant, the USACE District may require a larger prism. The prism must also satisfy the requirements of any other applicable standard. For example, some USACE District projects adhere to the *Code for Utilization of Soil Data for Levees*, Mississippi River Commission, Vicksburg, Mississippi, April 1947, applicable to Mississippi River and Tributaries levees. The determination and documentation of site-specific soil conditions shall be consistent with the requirements and procedures outlined in EM 1110-2-1913, and must be confirmed by the District. The prism shall assume loading to the top of the structure; or, where loading to top of structure is not possible, maximum possible loading. Note: variance approval is unlikely where the analytical prism is equal to or larger than the existing levee cross section.

3) Show, label, and dimension the project right-of-way.

4) Show to-scale, annotated soil profiles, to an appropriate depth but not less than 20 feet below the levee toe. The determination and documentation of site-specific soil conditions shall be consistent with the requirements and procedures outlined in EM 1110-2-1913.

5) Show, label, and dimension the extent of the requested Variance Zone and the remaining Vegetation-Free Zone.

6) Show, label, and dimension any structural modifications proposed in conjunction with existing or proposed vegetation.

7) Include a graphic velocity profile, on the waterside, indicating flow rates at pertinent water surface elevations, including the design-event, the flood of record, and top-of-structure.

8) Indicate the ***normal water elevation***. For variance purposes, the ***normal water elevation*** is that below which riparian terrestrial plant species are unable to thrive, due to the frequency and duration of inundation.

9) Indicate the ***Ordinary High Water Mark***. The ***Ordinary High Water Mark*** is used to establish waterway boundaries, it is a regulatory term defined in ETL 1110-2-571 and in the Code of Federal Regulations (CFR) – 33 CFR Part 328.3 (e).

10) List the dominant plant species likely to occupy the proposed variance zone: include those known to be the largest (in cross-sectional crown area) and to have the most extensive root systems. Cite source(s) used for information on plant characteristics.

(a) Of these species, select the one with the most extensive likely root system: this will often be the species with the largest cross-sectional crown area at maturity. If two species have the most extensive likely root system (one for depth and one for spread) select both.

(b) Develop a cross-sectional illustration of the selected species: if two species were selected, the illustration shall show the larger of the two, with a composite root system showing the complete root systems of both. The entire individual (or composite) shall be shown to-scale, at maturity (or, if different, at the maximum maturity to be permitted under the *vegetation management plan*), as developed in-the-open, under local conditions (e.g. climate, soils, and moisture conditions) – and shall clearly show the typical extent and character of the mature root system, truncated at the point where roots are no greater than 0.5 in. in diameter. Root depth assumptions must be developed specific to species and local conditions. Unless reliable information to the contrary is presented, it shall be assumed that roots greater than 0.5 in. in diameter will extend to the edge of the natural canopy of the mature tree or shrub. The ATR team will determine the acceptability of information on a case-by-case basis.

(c) Place the completed illustration of this individual in the cross-section drawing(s). If specific planting locations are not known, then place an instance of the illustration, centered, on both the upper and lower boundary line of the proposed variance area. If the distance between the two is such that the illustrated root systems do not meet or overlap, then place one or more additional illustrations between the two. In the cross section below each of these illustrations, show the *potential pit*, as an arc (as shown in Figure 2b.), centered under the trunk of each illustrated tree.

c. For each levee reach, provide representative, appropriately-scaled photographs both plan view (aerial) and cross-sectional (oblique angle photos taken from ground level looking towards the cross-sectional view) of the levee clearly showing existing conditions.

d. Provide details of any structural measures (such as armoring or overbuilt sections) intended to preserve system reliability and resiliency by preventing or mitigating vegetation impacts.

5. Provide the following analyses illustrating that the changes proposed will result in conditions consistent with the criteria in PGL Paragraph 6.d. of this policy. Include graphics, text, and other information (e.g. construction materials, methods, and standards) as needed to clearly support conclusions. Analyses must show that the levee *prism* (or floodwall) remains intact and consistent with the design and performance intent of the USACE design standards detailed in EM 1110-2-1913 (EM 1110-2-2502 and/or EC 1110-2-6066 (with consideration of ETL 1110-2-575) for floodwalls) and ETL 1110-2-569.

a. Cross section analysis. The cross-section drawing(s) must demonstrate the following.

1) No significant roots (those greater than 0.5 in. in diameter) will enter the levee *prism* or approach within 8 feet of structures critical to performance, such as drains or seepage-cutoff walls.

2) No tree-overthrow pit will penetrate the levee *prism*. The *assumed pit/mound* is illustrated in Figure 2a and, in plan-view, is less than a full circle; however, because the tree may fall in any direction, the *potential* pit must be assumed to be a full circle. Unless reliable information to the contrary, acceptable to the ATR team, is available for a specific situation, the dimensions provided in Figure 2 shall be used. These dimensions, which are consistent with USACE observation and experience, were derived from field data presented in the following paper:
Clinton, B.D. and C.R. Baker. 2000. Catastrophic windthrow in the southern Appalachians: characteristics of pits and mounds and initial vegetation responses. *Forest Ecology and Management* 126:51-60.

3) No roots or tree-overthrow pit will significantly impact the function of any appurtenant structure, such as those designed to control seepage.

b. Hydraulic analyses must demonstrate the following, assuming worst-case combinations of flow, elevation, hydraulic roughness, duration, and velocity. Analysis must include the full range of flows encompassing the lowest levee-toe elevation to the highest top-of-levee elevation within the variance reach. Generally, the worst-case hydraulic condition results from a high-flow/low-tailwater-elevation combination. However, a full range of flow/tailwater combinations should be analyzed to ensure that the worst-case condition is accounted for. The worst-case size and density of vegetation must also be considered, assuming the highest annual crown foliage density.

1) The overall level of flood risk reduction and reliability of the system must be maintained. Channel geometry and roughness changes shall result in no increase in water surface elevations for the required range of flows, as demonstrated by a graphic and a tabular summary of changes in water surface elevation and velocity that extends sufficiently upstream, because hydraulic impacts are typically transmitted upstream. If an increase in water surface elevations or velocities cannot be avoided, they must be mitigated.

2) Erosion and scour, associated with standing vegetation, will not impact the levee *prism*. This analysis should utilize an appropriate methodology, such as application of an adapted bridge scour model or 2D/3D hydraulic design model, with sediment transport, that shall provide a quantitative assessment of the maximum extent of erosion and local scour potential. This analysis shall provide an estimate of the maximum extent of erosion and scour, which shall be illustrated in the cross-section drawing(s). This assessment shall cover long-term trends as well as event-driven scour/erosion.

3) In the event of waterside tree overthrow, subsequent erosion and scour at the overthrow site will not impact the levee *prism*. Analyses must consider assumed

pit/mound topography (as illustrated in Figure 2a) at all possible points on the variance cross section, determining the worst-case orientation to flow and the resulting extent of erosion and scour. This analysis should utilize an appropriate methodology, such as application of an adapted bridge scour model or 2D/3D hydraulic design model, with sediment transport, that considers the erosion mechanisms and local scour potential. This analysis shall provide an estimate of the maximum extent of erosion and scour, which shall be illustrated in the cross-section drawing(s).

c. Geotechnical analyses or review must determine that the levee *prism*, defined in submittal requirement in Paragraph 4.b.(2) (above), is sufficiently buffered from vegetation impacts.

d. Structural analyses must determine that floodwalls and other non-earthen structures are sufficiently buffered from vegetation impacts and that any proposed structures will function as intended.

e. Analysis must find that access is retained, consistent with the intent of Paragraph 6.d of the main PGL.

6. Provide the most recent Routine Inspection Report and Periodic Inspection Report completed by the USACE district.

7. Provide a summary of levee performance history for all significant flood events. Indicate the levee's authorized capacity (formerly referred to as the design flood or design water surface elevation) and, for each event, the year of occurrence, event probability (e.g., the 0.2% flood), flood duration, and description of any floodfighting challenges, failures, and outcomes.

8. Provide a *vegetation management plan*, detailing (1) the vegetation conditions to be maintained, (2) how and on what schedule the maintenance will be performed, and (3) how the boundaries of the vegetation variance zone will be clearly identifiable, on site, for maintenance and inspection purposes. The ve*getation management plan* shall also stipulate that all grades and cross sections shall be maintained as approved and that any reduction to grade or cross section will be restored in a timely fashion.

9. Provide any National Environmental Policy Act (NEPA), Endangered Species Act (ESA), or any other environmental compliance documentation that the district determines is required to conduct the review. Identify the pertinent paragraphs or sections.

10. Provide excerpts of the current project operations and maintenance (O&M) manual as requested as supplemental information for the review process.

11. Provide other information, as appropriate to specific conditions.

12. Provide the levee sponsor's primary point of contact (POC) for this request.

GLOSSARY OF TERMS USED IN FIGURES 1 – 3

BANK (Figure 1)
The *bank* is the ground line between the bottom and the top of the channel. When there is no significant horizontal separation between the top of the *bank* and the waterside levee *toe*, such that the *bank* slope and the waterside levee *slope* are essentially continuous, then the *bank* becomes critical to levee reliability, as significant erosion of the *bank* may result in a loss of *prism*.

CORRIDORS (Figure 1)
Corridors provide a functional platform from which to conduct operations and maintenance activities, especially those involving major improvements or repairs. In addition, the landside *corridor* provides critical access during floodfighting operations, especially under conditions that prevent adequate access from the *crown*.

CROWN (Figure 1)
The *crown* is the level top of the levee *design cross section*. It serves as the primary means of access for routine operations, but during major flood events may not be useable due either to saturation-induced reduction in stability or to floodfighting measures such as sandbagging.

DESIGN CROSS SECTION (Figure 1)
The *design cross section* consists of the *prism* plus any additional material provided to increase *crown* width and/or flatten *slopes* in order to reduce erosion or improve accessibility. Additional material and placement methods are often similar or identical to that used for the *prism*. While accessibility may be the purpose, the additional material also increases levee resiliency. A levee that meets USACE design standards has a *design cross section* that is equal to or larger than the *prism*.

PIT/MOUND TOPOGRAPHY (Figure 2)
The topography that results from the overturning of a tree; it includes the pit, the mound (or rootball) and the overturned tree.

PLANTING BERM – LANDSIDE (Figure 3)
Additional cross section required to accommodate desired vegetation. It preserves access and protects the *prism* from root-related damage. Analyses results may require cross section in excess of the prescribed minimums. To serve as compensation for lost landside access, the planting-berm *crown* must support all vehicular access necessary to inspection, maintenance, and floodfighting.

PLANTING BERM – WATERSIDE (Figure 3)
Additional cross section required to accommodate desired vegetation. It preserves access and protects the *prism* from root-related damage. Analyses results may require cross section in excess of the minimums. Analysis must show no unacceptable impacts to channel capacity. The berm crown must support all vehicular access necessary to conduct inspection, maintenance, and floodfighting.

PRISM (Figure 1)

The *prism* is the portion of the levee identified as the minimum acceptable cross section as defined in Paragraph 4.b. 2 (above, Enclosure 3), for a given water elevation, such as the design flood event. *Prism* dimensions, slopes, materials, and placement methods are designed to meet standards that will give reasonable assurance of successful performance. The *prism* is not typically designed to control underseepage.

SETBACKS (Figure 1)

Setbacks are a sustainability measure for both the levee and environment. *Setbacks* are an important consideration that should be addressed in the plan-formulation process. While they are critical to sustainability of a floodplain, they are not specifically prescribed in the levee design manual (EM1110-2-1913). The *waterside setback* provides space in which to maintain a measure of floodplain function and riparian habitat: this serves the environment, but also protects the levee from pressures to develop critical riparian habitat. Additionally, in-place riparian habitat serves as a protective buffer between the levee and erosive flows. The *landside setback* reserves space for future levee improvements or repairs: while this space is in reserve it may be used as a recreational greenway and/or a landscape buffer between the levee and adjacent development.

SLOPES (Figure 1)

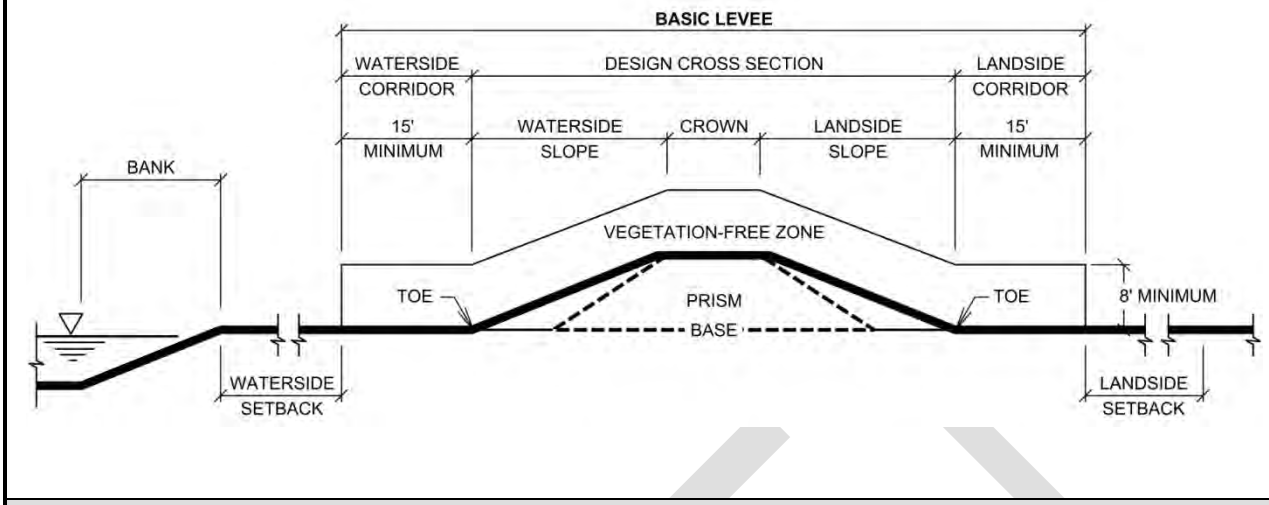
Levee *slopes*, among other considerations, must be sufficiently accessible to facilitate effective operation and maintenance activities that might be impractical on steeper *prism* slopes. A *slope* may have a spatial/functional relationship coincident with a *bank* (see Figures 1a. and 1b., respectively).

TOE (Figure 1)

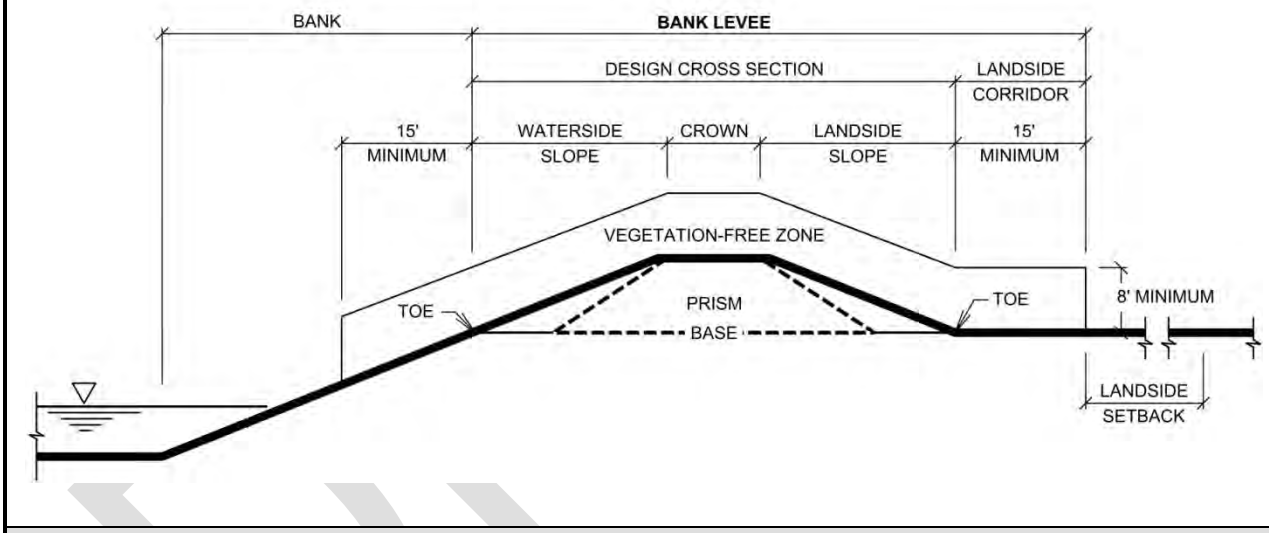
The landside *toe* is generally the point at which the levee *slope* intersects with adjacent level ground. The waterside *toe* is generally the point on the waterside *slope* at which the elevation is equal to that of the landside *toe*. This is a general definition and there are nuances and exceptions.

VEGETATION-FREE ZONE

The vegetation free zone (VFZ) includes the ground on, or within 15 feet of, the levee and its appurtenant structures. The VFZ shall remain free of any vegetation other than grasses, except as allowed in ETL 1110-2-571 and USACE vegetation variance policy.

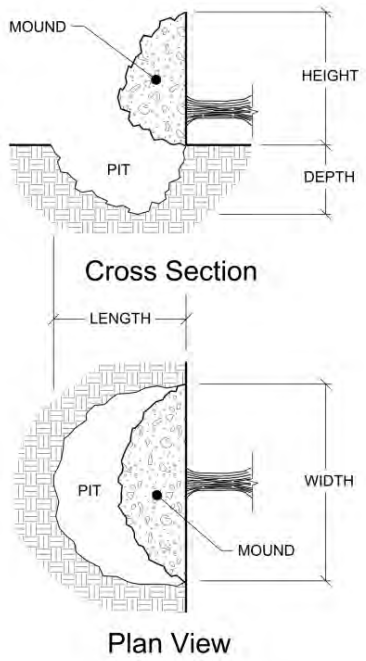


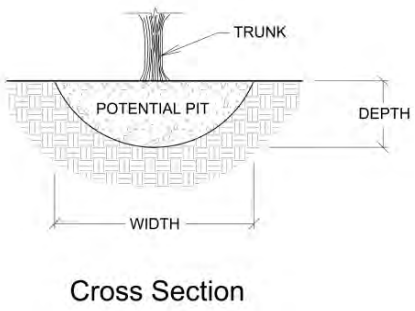
a. *Basic Levee* (above).



b. *Bank Levee* (above).

Figure 1: **Typical Levee Cross Sections.** The purpose of these illustrations is to define terms. These illustrations do not include appurtenant structures and do not represent all possible levee configurations. Analysis such as detailed in Paragraph 5.b.2 (above in Enclosure 3) may or may not show the *prism* to be smaller than the existing levee *cross section*.





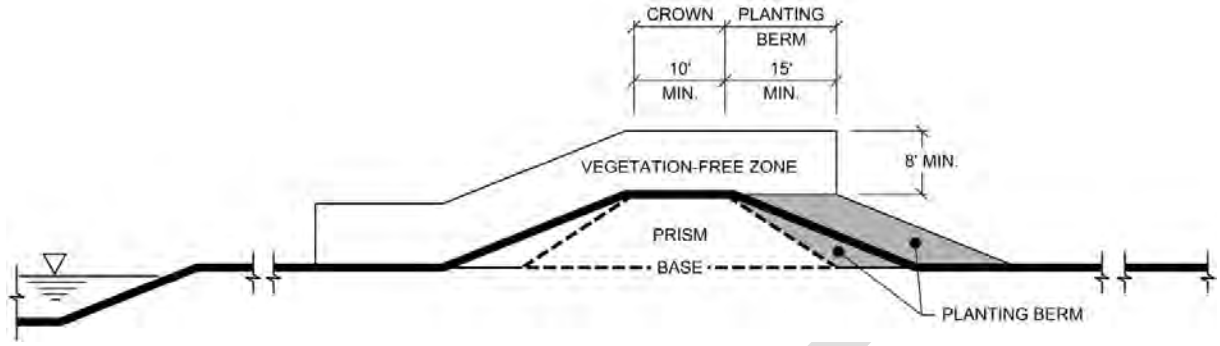
a. Assumed Pit/Mound (above)**.** The *assumed pit/mound* represents the typical configuration and maximum likely dimensions of an overturning alteration to the cross section. It is provided as a standard basis for scour analysis.

b. Potential Pit (above)**.** The *potential pit* is the total cross sectional area subject to loss on overturning. Because the direction of overturning may not be known in advance of overturning, the potential pit must account for overturning in any possible direction. It is provided as a means to determine whether or not overturning alone, without consideration for scour, would impact the prism.

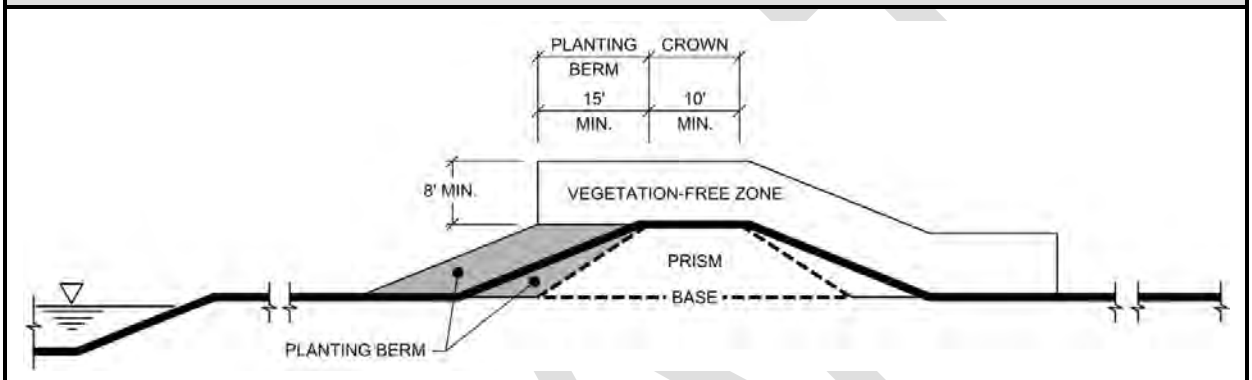
Maximum Plant Height (in feet, at maturity or as maintained)	< 10	10-20	20-30	30-40	40-60	60-80	80-100	>100
Depth (D)	NA	2	3	4	5	6	7	case by case
Length/Height (2D)		4	6	8	10	12	14	
Width (3D)		6	9	12	15	18	21	

c. Pit/Mound Dimension Values (above, in feet)**.** Pit/mound dimensions other than the above may be considered for situations in which (a) the variance request presents reliable supporting information or (b) the ATR team deems it appropriate based on specific conditions.

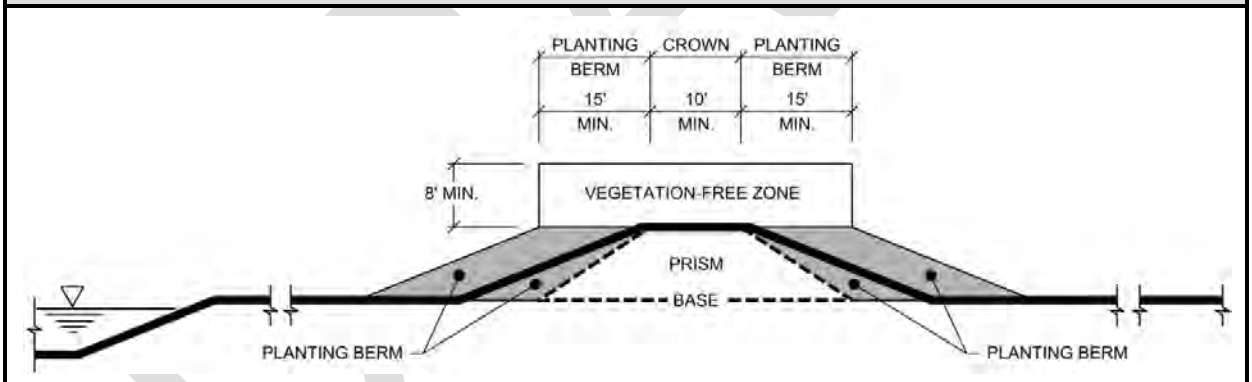
Figure 2: Pit/Mound Topography. The cross sections above assume no slope and must be adapted to actual slope conditions.



a. Landside Planting Berm (above).



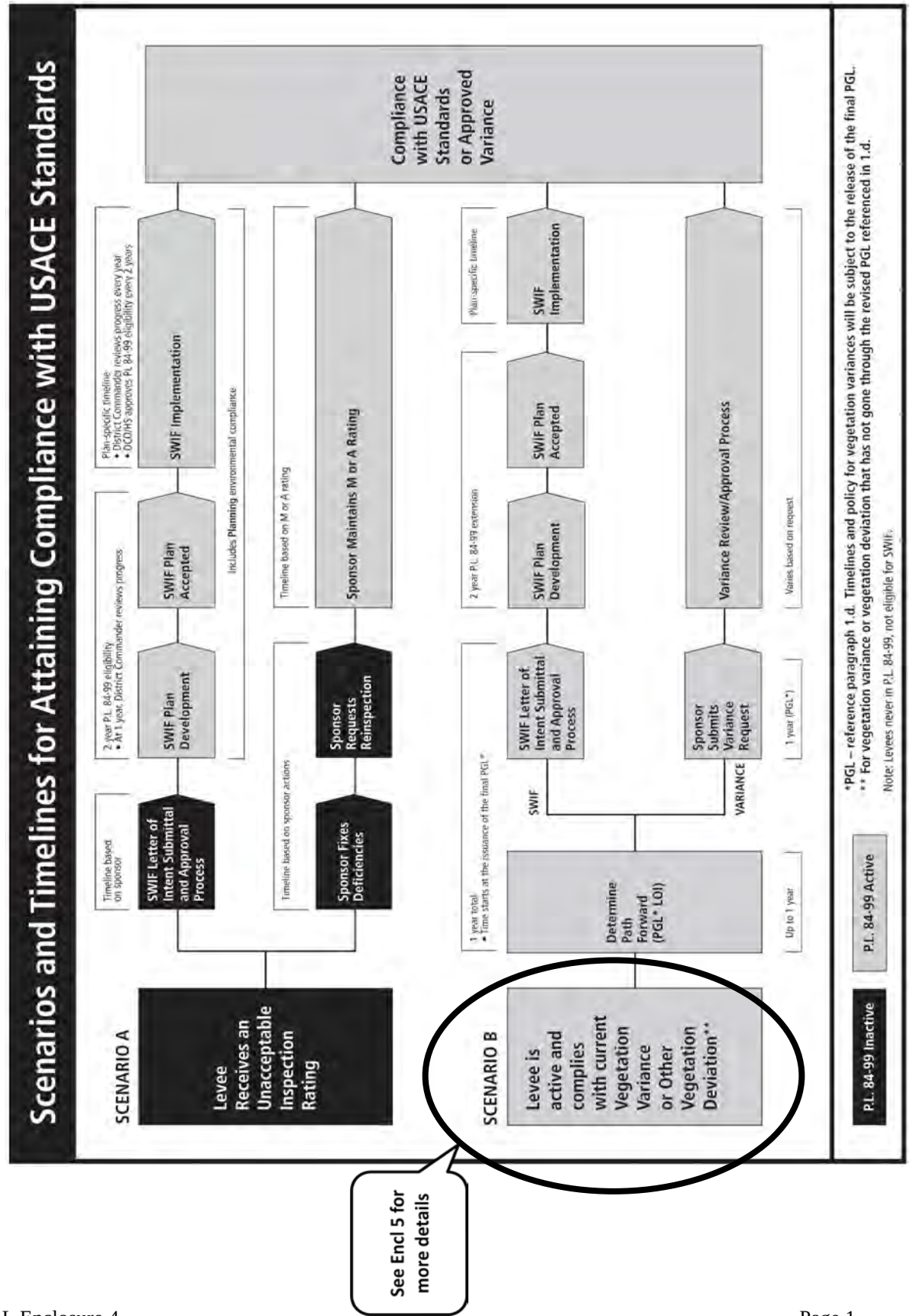
b. Waterside Planting Berm (above).



c. Landside and Waterside Planting Berms (above).

Figure 3: Planting Berms. The examples shown here assume a *basic levee*, with no appurtenant structures. Principles are similar for a *bank levee.* Additional examples are provided in ETL 1110-2-571. The intent of a planting berm is to allow for additional vegetation while preserving adequate access and protecting the *prism* from root-related damage: the result should be a level of reliability equivalent to a standards-compliant, non-vegetated condition. Illustrated above are the minimum acceptable dimensions of planting berms and associated vegetation-free zones. The sufficiency of these minimums must be determined case-by-case: intended vegetation, and site-specific conditions, may require a more robust planting berm. Planting berms may incorporate any existing material that is in excess of the *prism*, as shown above. They may be added to an existing levee, included in new construction, or identified within an existing levee section. Configurations differing from those above may be considered: for example, a planting berm need not necessarily be the full height of the levee *prism*.

Enclosure 4 - SCENARIOS AND TIMELINES FOR ATTAINING COMPLIANCE WITH USACE STANDARDS



Enclosure 5 – SCENARIOS OF RESPONSIBILITY FOR PRE-EXISTING VARIANCES AND OTHER DOCUMENTED DEVIATIONS