

LA PIANTA LLC
List of Proposed Changes to the Draft Tukwila SMP
(January 15, 2008)

This document identifies the significant changes to the Draft Tukwila SMP proposed by La Pianta LLC. Corresponding changes in other sections of the SMP may be required for consistency. The changes were made to documents versions emailed to La Pianta LLC by Carol Lumb of the City of Tukwila on January 13, 2009.

Key

- Printing in Black: original SMP language
- Printing in Blue: changes proposed by the staff and emailed to La Pianta LLC by Carol Lumb on January 13, 2009.
- Printing in Violet: changes proposed by La Pianta LLC. (Our tracking will show only changes made by La Pianta LLC to the word document versions emailed to La Pianta LLC by Carol Lumb, and are “tracked” (with the vertical line) on the left side of the paper. This will allow the staff and the Planning Commissioners to locate La Pianta’s suggested changes to the staff’s document.)
-

A. DEVELOPMENT STANDARDS

1. ATTACHMENT C-3: HEIGHT RESTRICTIONS

La Pianta requests that the Height Restriction should be revised as set forth below. In the alternative, La Pianta requests that the provisions added to Chapter 11 (Attachment E) be revised as provided below.

Revise 9.3(C) as follows:

C. Height Restrictions

1. Except for bridges, approved above ground utility structures, and water dependent uses and their structures, the maximum height for structures shall be as follows:
 - a. 15 feet where located within the River Buffer;
 - b. 45 feet between the outside landward edge of the River Buffer and 200' of the OHWM.

Provided no permit shall be issued for any new or expanded building or structure of more than 35 feet above average grade level on shorelines of the state that will obstruct the view of a substantial number of residences on areas adjoining such shorelines.

~~EXCEPT that this maximum may be increased by one story when:~~

- ~~a. — Development devotes at least 5% of its building or land area to public shoreline access; or~~
- ~~b. — Development devotes at least 10% of its land area to employee shoreline access.~~

~~These criteria do not apply to properties located in the Tukwila Urban Center district.~~

~~2. — In the Transit Oriented Development district, the maximum height for structures is as follows:~~

- ~~a. — 15 feet where located within the River Buffer;~~
- ~~b. — 5 floors/95 feet maximum outside the River Buffer.~~

2. In the Tukwila South area, the maximum height for structures is as follows:

- a. 15 feet where located within the River Buffer;
- b. 45 feet between the landward edge of the River Buffer and 120' from the OHWM.
- c. the maximum height in the area from 120' to 200' from the OHWM shall be governed by the underlying zoning and master plan approvals. Pursuant to RCW 90.58.320, the City finds that overriding considerations of the public interest, including promotion of the economic well being of the City and its citizens by permitting reasonable commercial and industrial development in an already urbanized area, will be served by allowing such development.

For the purposes of this SMP, "Tukwila South" shall mean the existing portion of the City located south of South 178th Street/South 180th Street and west of the Green River, together with the south potential annexation area.

In the alternative, La Pianta requests the following revision to Chapter 11.5:

11.5 Public Access Incentives

1. The minimum yard setback for buildings, uses, utilities or development from non-riverfront lot lines may be reduced as follows:

- a) Where development provides a public access corridor

between off-site areas, or public shoreline areas to public shoreline areas, one side yard may be reduced to a zero lot line placement; or

b) Where development provides additional public access area(s) equal in area to at least 2.5% of total building area, the front yard (the landward side of the development) may be reduced by 50 percent.

2. The maximum height for structures may be increased by one story when:

a) Development devotes at least 5% of its building or land area to public shoreline access; or

b) Development devotes at least 10% of its land area to employee shoreline access.

3. The maximum height for structures may be increased to the height permitted in the underlying zoning district for properties provided that any of the following is satisfied: (i) the applicant dedicates to the benefit of the City an easement within the lesser of (x) the existing crown of the levee, if applicable, or (y) that construct a 14'18' wide paved trail with a two-foot wide shoulder on each side for public access, along the river in areas identified for new shoreline trail segments. In the event that an existing public paved trail exists along the shoreline within the property, the maximum height of structures on such property shall be the height permitted in the underlying zoning district.

2. FLOOD HAZARD REDUCTION

Revise Section 9.5(B), (C) and (E) as follows:

B. Levees, berms and similar flood control structures, whether new or redeveloped, shall be designed in such a way as to ensure structural stability ~~while incorporating mid-slope benches planted with native vegetation suitable for wildlife habitat wherever feasible. Where not feasible to incorporate a mid-slope bench with vegetation, other appropriate habitat improvements must be provided.~~

C. Public funded structural measures to reduce flood hazards shall improve public access or dedicate and provide public access unless public access improvements would cause unavoidable health or safety hazards to the public, inherent and unavoidable security problems, or significant ecological impacts that cannot be mitigated. ~~The City shall be required to pay just compensation to the owner in the event public access is required across private property.~~

E. Rehabilitated or replaced flood control structures must achieve a maximum side slope angle of 2.5:1 (H:V) or if that is not possible, achieve an angle as close to 2.5:1 as possible. Rehabilitated or replaced

structures shall not extend the toe of slope any further waterward of the OHWM than the existing structure.

EXCEPTION: In the Tukwila South area, rehabilitated or replaced flood control structures within the Corps 205 Project must achieve a minimum side slope angle of (i) 2.0H:1V in the area bounded by South 180th Street and South 196th Street, and (ii) 2.5H:1V in the area bounded by South 196th Street and South 204th Street, in each case in satisfaction of the requirements of Army Corps of Engineers (“Corps”) and the King County Flood Hazard Management Plan.

In the event that the City requires additional levee easements as a result of an increased levee profile, the City shall be required to pay just compensation to the owner(s) for such additional easements.

3. PARKING AND LOADING

In addition to the changes already proposed by the City, La Pianta requests the following additional changes:

Delete Section 9.9(D) as it is inconsistent with the revised Chapter 11.

~~E. —Where public access to or along the shoreline exists or is proposed, parking areas shall provide pedestrian access from the parking area to the shoreline.~~

Delete Section 9.9(E). There should be one set of rules for stormwater, and special stormwater regulations should not be created and imposed for shoreline areas. In leveed areas of the shoreline, all stormwater on the landward side will flow to stormwater facilities installed for that area.

~~F. —Parking facilities, loading areas and paved areas shall incorporate low impact development techniques wherever feasible, adequate storm water retention areas, oil/water separators and biofiltration swales, or other treatment techniques and shall comply with the standards and practices formally adopted by the City of Tukwila Public Works Department.~~

4. TREE PROTECTION/LANDSCAPING/VEGETATION MANAGEMENT

- Under “Tree Protection and Retention”

Revise Section 9.10(B)(1) as follows:

1. As many significant trees as reasonably feasible in light of the permitted and proposed uses on the subject property possible are to be

retained on a site proposed for development or re-development, taking into account the condition and age of the trees. The Director of Community Development or the Planning Commission may require alterations in ~~the arrangement of buildings, parking or other elements of a~~ proposed development in order to retain significant trees within the River Buffer, particularly those that provide shading to the river. Trees located within the River Buffer on properties not undergoing development or re-development may not be removed except those that interfere with access and passage on public trails or that present an imminent hazard to existing structures or the public. If the hazard is not readily apparent, the City may require an evaluation by an International Society of Arborists (ISA) - certified arborist.

Revise Section 9.10(B)(2) as follows:

To protect the ecological functions that trees provide to the shoreline, removal of any significant tree in the ~~shoreline jurisdiction~~River Buffer requires a Shoreline Tree Removal and Vegetation Clearing Permit and is generally only allowed on sites undergoing development or redevelopment. Only trees that interfere with access and passage on public trails or trees that present an imminent hazard to existing structures or the public may be removed from sites without an issued building permit or Federal approval. Factors that will be considered in approving tree removal include but are not limited to: tree condition and health, age, risks to structures, and potential for root or canopy interference with utilities.

Revise Section 9.10(B)(6):

6. The City may require the placement and anchoring of ~~removed~~ trees removed from the River Buffer as habitat features along the river bank for development of over 4 residential lots and all non-residential development, as permitted by shoreline conditions, and taking into account potential hazards to boaters, and in accordance with Washington Department of Fish and Wildlife Hydraulics Authorization and Corps of Engineers permit conditions. When conditions prevent placement of tree trunks on-site along the shoreline as large woody debris, the City shall attempt to find an off-site location for eventual placement as part of a restoration project. The applicant will be responsible for the cost of the initial moving the removed trees to the designated location.

Revise Section 9.10(B)(7) and (8) as follows:

7. Dead or dying trees located along-within the ~~shoreline~~River Buffer shall be left in place as wildlife snags, unless they present a hazard to structures, facilities or the public.

8. Topping of trees within the River Buffer is prohibited unless necessary to protect overhead utility lines. Topping of trees within the River Buffer will be regulated as removal and tree replacements will be required.

- Under “Landscaping”

Revise Section 9.10(C)(1) as follows:

1. General Requirements

For any new development or redevelopment that disturbs the River Buffer in the Shoreline Jurisdiction, except single family residential development of 4 or fewer lots, invasive vegetation within the area disturbed by the development or redevelopment must be removed and native vegetation planted and maintained in said disturbed portion of the River Buffer, including the river bank, to improve the ecological functions of the shoreline. Owners shall maintain the native vegetation until it becomes firmly established, but in no event longer than 3 years. The removal and replanting with native plantings on the Corps 205 Project levee shall be subject to the Corps’ standards and regulations.

Revise Section 9.10(C)(1)(a) as follows.

a. If an applicant is required to remove ~~Removal of invasive species shall be done by hand or with hand-held power tools. Where not feasible and mechanized equipment is needed,~~ the applicant must obtain a Shoreline Tree Removal and Vegetation Clearing Permit prior to using mechanized equipment and show how the slope stability of the bank will be maintained and a plan must be submitted indicating how the work will be done and what erosion control and tree protection features will be utilized. Federal and State permits may be required for vegetation removal with mechanized equipment.

Revise Section 9.10(C)(1)(c) as follows.

b. If required pursuant to this Section 9.10(C)(1), removal ~~Removal~~ of invasive vegetation may be phased over several years prior to planting if part of an approved plan to allow for alternative approaches, such as sheet mulching and goat grazing. The method selected shall not destabilize the bank or cause erosion.

Revise Section 9.10(C)(1)(i) as follows.

~~Native vegetation in the shoreline installed in accordance with the preceding standards shall be maintained by the property owner to promote healthy growth and prevent establishment of invasive species. If required pursuant to this Section 9.10(C)(1), invasive plants (such as blackberry, ivy, knotweed, bindweed) shall be removed on a regular basis.~~

Revise Section 9.10(C)(2) as follows:

2. River Buffer Landscaping Requirements in All Shoreline Environments

The River Buffer in all shoreline environments shall function, in part, as a vegetation management area to filter sediment, capture contaminants in surface water run off, reduce the velocity of water run off, and provide fish and wildlife habitat. ~~If and to the extent that a development or redevelopment impacts the River Buffer, the City may impose one or more of the following conditions, if and as necessary; provided, however, that the City may not require plantings on or adjacent to the Corps 205 Project levee that conflict with standards or requirements of the Corps:~~

- Under “Vegetation Management in the Shoreline Jurisdiction”

Revise Section 9.10(D)(1) as follows:

4. Trees and shrubs within the River Buffer may only be pruned for safety, to maintain view or access corridors and trails by pruning up or on the sides of trees, to maintain clearance for utility lines, and/or improving the shoreline ecological function. This type of pruning is exempt from any permit requirements. Topping of trees is prohibited except where absolutely necessary to avoid interference with existing utilities. Owners shall have no obligation to prune or maintain trees and shrubs within the River Buffer or elsewhere within the shoreline area, unless otherwise required by applicable law.

Revise Section 9.10(D)(36) as follows:

4. Use of pesticides ~~and fertilizers~~
- a. Pesticides (including herbicides, insecticides, and fungicides) shall not be used in the ~~shoreline jurisdiction~~River Buffer except where:
- ~~1) Alternatives such as manual removal, biological control, and cultural control are not feasible given the size of the infestation, site characteristics, or the characteristics of the invasive plant species;~~
 - ~~2) The use of pesticides has been approved through a comprehensive vegetation or pest management and monitoring plan;~~

31) The pesticide is applied in accordance with state regulations; and

42) The proposed herbicide is approved for aquatic use by the U.S. Environmental Protection Agency; and

~~b5b3) The use of pesticides in the shoreline jurisdiction is must be approved in writing by the City and. The applicant must presents a copy of the Aquatic NPEDS Pesticide pPermit issued by the Department of Ecology or Washington Department of Agriculture. The owner provides the City with at least thirty (30) days prior written notice of the use of pesticides in the River Buffer, together with a description of the measures to be taken by the owner to show compliance with federal and state laws.~~

Pesticides (including herbicides, insecticides, and fungicides) may be used outside of the River Buffer, provided such substances are used in compliance with federal and state law.

- b. Self-contained rodent bait boxes designed to prevent access by other animals are allowed.
- c. Sports fields, parks, golf courses and other outdoor recreational uses that involve maintenance of extensive areas of turf shall provide and implement an integrated turf management program or integrated pest management plan designed to ensure that water quality in the river is not adversely impacted.

B. USES

- Page 55-56: Under “Urban Conservancy Environment – Uses”

The draft SMP continues to include conditions that are not consistent with state law. Under Washington law, the City cannot mandate a condition that enhances the shoreline habitat. The definition of the concept “no net loss” is intended to guide the Planning Commission and the staff to propose conditions that do not exceed the impact of the development. As the mid-slope bench is intended to improve, i.e. “enhance,” the shoreline habitat, this condition is not supportable under state law. Revise (A)(1)(h) as follows:

- h. Maintenance or redevelopment of levees for flood control purposes, ~~provided that any redevelopment of a levee shall incorporate a mid-slope vegetated bench wherever feasible;~~

In addition to the support facilities for certain types of infrastructure, the actual infrastructure should also be a permitted used. Revise (A)(1)(p) as follows:

Runoff ponds, filter systems, detention ponds and outfall facilities, together with support ~~Support~~ facilities for above or below ground utilities or pollution control, such as runoff ponds, filter systems, detention ponds and outfall facilities, provided they are located at or below grade and as far from the OHWM as technically and practically feasible in the context of the proposed development. (underlined text is proposed new text)

C. PUBLIC ACCESS

- Under “Access and Recreational Use, Comprehensive Plan Goal 5.6”

Amend Policy 5.6.3 so that it reads in its original form.

- Under “11. Public Access to the Shoreline”

Revise Section 11.1 as follows:

11.1 Applicability

A. Public access to or along the shoreline as described in Chapter 11 shall be provided on all property that abuts the Green/Duwamish River shoreline where identified on the Shoreline Public Access Map in accordance with this section as further discussed below except for the development of 9 or fewer single-family lots where any of the following conditions are present: ~~However, private access (shared access among lot owners) to the riverfront for the lots created through the short plat process is required~~

1. Where a development or use will create increased demand for public access to the shoreline and the public has a public access way along the shoreline, the development or use shall provide public access to mitigate this impact; or-
2. Where a development or use will interfere with an existing public access way, the development or use shall provide public access to mitigate this impact. Impacts to public access may include blocking access or discouraging use of existing on-site or nearby accesses; or-
3. Where a use or development will interfere with a public use of lands or waters subject to the public trust doctrine, the development shall provide public access to mitigate this impact; or-
4. Where the development is proposed by a public entity or on public lands.
5. Where identified on the Shoreline Public Access Map.

For the purposes of this section, an “increase in demand for public access” is determined by evaluating whether the development is of a size and type that will generate an increased demand for public access to the shoreline in the vicinity of the development. The City has the burden to demonstrate an increase in demand for public access prior to conditioning approval of a development on the provision of public access. Any public access improvements required as a condition of approval shall be reasonably proportionate to the increase in demand caused by the development. reflects an increase in the land use intensity, for example converting a warehouse to office or retail use, or an increase in the square footage of an existing building.

Revise Section 11.3 as follows:

11.3 Requirements for Shoreline Trails and Riverwalk

~~A. Development on Properties Abutting Existing Green River Trail~~

- ~~1. Applicants are encouraged to dedicate to the City an easement along Development or re-development on their properties abutting the existing for a trail shall upgrade the trail along the property frontage to within the lesser of (i) the existing crown of the levee, if applicable, or (ii) a 18' wide trail meet current the standard of a 16-14 foot wide trail with 2 foot shoulders on each side.~~
- ~~2. Trail connectors shall be provided from the nearest public area (e.g., street, public park or adjoining public access easement). This access may be located in the required side yard setback.~~

~~B. Development on Properties Where New Trails are Planned~~

- ~~— An 18-foot wide trail easement dedicated to the City 16' wide paved trail with a 2' wide shoulder on each side for public access along the river shall be provided in areas identified for new shoreline trail segments (**Shoreline Public Access Map, Map 6**).~~

D. APPLICABILITY (TRIGGERING EVENTS)

- Under “Applicability”

La Pianta recommends the changes proposed by Chuck Maduell, Davis Wright Tremaine LLP, and Jeff Weber, Gordon Derr LLP, attached hereto as Schedule 1.

E. DEFINITIONS & MISCELLANEOUS

- Under “Definitions”

The following definition was derived from a handout provided by Ms. Carol Lumb of the City of Tukwila. Please add the following revised definition to Chapter 3:

No Net Loss: means a standard intended to ensure that shoreline development or uses, whether permitted or exempt, are located and designed to avoid loss or degradation of existing shoreline ecological functions that are necessary to sustain shoreline natural resources. ~~The standard is met when proposed uses or development are in compliance with the provisions of this master program.~~ In cases where unavoidable loss results from allowed uses or developments, the standard is met through ~~appropriate~~ mitigation sufficient to compensate for impacts to pre-existing shoreline ecological functions, consistent with the provisions of this master program. Conditions imposed to achieve the “no net loss” standard shall be related to and roughly proportional to the impacts of the proposed development.

F. TUKWILA SOUTH DEVELOPMENT AGREEMENT

Add the following section:

The obligations set forth in this SMP may be modified, deleted, replaced or amended in a development agreement approved by the City Council pursuant to RCW 36.70B.170–210.

G. BUFFERS

- Under “Buffer in Levee Areas South of I-405 Bridge.”

Revise Section 7.6(B) as follows:

~~For properties located behind the COE Certified 205 levee and County constructed levees, and the non-levee areas on the right bank of the river south of the I-405 Bridge including the south annexation area, the buffer will extend 125 feet landward from the ordinary high water mark, depending on site characteristics, determined at the time of development or redevelopment of the site or when the levee replacement or repair is programmed. This buffer width is the maximum needed to reconfigure the river bank to achieve a slope of 2.5:1, the “angle of repose” or the maximum angle of a stable slope. The actual amount of area needed to achieve a 2.5:1 slope may be less than 125 feet, depending on the~~

~~character of the river bank and can only be determined on a site-by-site basis. The establishment of the 2.5:1 slope along the Corps certified 205 levee in the Tukwila Urban Center, will permit room to incorporate a mid-slope bench that can be planted with vegetation to improve river habitat. As the Corps of Engineers does not permit planting on the levee prism, the only way to improve habitat along the 205 levee portion of the river is to create a bench that can be vegetated that will not create a hazard for the stability of the levee. A ten foot easement necessary to allow access for levee inspection is required on the landward side of the levee at the toe.~~

~~The 125 foot buffer is needed for non-levee areas south of I-405 due to the more constrained channel width and greater river fluctuations.~~

For properties located behind the Corps 205 Project levee, County constructed levees, including the left bank of the south annexation area, or any other levee, the buffer will extend from the OHWM to the greater of (i) seventy (70) feet, or (ii) to the toe of the landward side of the levee.

Working with the subject owners, the City will need to provide a standard for the east bank of the Green River south of I-405. Figure 3 should be revised to be consistent with this change.

The City may not increase the size of the buffer for the following reasons: (i) laying back levees, (ii) increased width of the public path, and (iii) a maintenance easement on the landward side of the levee. If the City wishes to accommodate these features, all of which provide a public benefit, the City must purchase the necessary land.

- Under “Chapter 13. Shoreline Restoration”
 - A. The portion of property that moves from outside shoreline jurisdiction to inside shoreline jurisdiction as a result of the shoreline restoration project:
 1. may be developed for the full range of uses of the underlying zoning consistent with the zoning code, including uses that are not water-oriented.
 2. ~~is not required to obtain a shoreline substantial development permit.~~is not subject to the SMP provisions for public access; ~~and~~
 3. is not subject to shoreline design review; ~~and~~
 4. while required to obtain a shoreline substantial development permit if over the thresholds, is not subject to the development standards set forth in this Program.

The intent of the exemptions identified in A 1-4 is to implement the restoration projects of the Shoreline Master Program Restoration Plan, which reflect the projects identified in the Water Resource Inventory (WRIA) 9 Plan pursuant to Policy 5.2 of this Master Program.

B. In the event that the OHWM moves landward because of a shoreline restoration project, ~~the~~ the Shoreline Residential Environment Buffer, High Intensity or Urban Conservancy Environment Buffer width ~~may~~ shall be reduced by the same number of feet as the distance between the original location and the new location of the OHWM, but in no event shall such buffers be ~~no~~ less than 25 feet ~~measured from the new location of the OHWM for the portion of the property that moves from outside the shoreline jurisdiction to inside shoreline jurisdiction as a result of the shoreline restoration project,~~ subject to the following standards:

1. The 25 foot buffer area must be vegetated according to the requirements of the Vegetation Protection and Landscaping Section or as otherwise approved by the City; and
2. The proponents of the restoration project are responsible for the installation and maintenance of the vegetation.

The River Buffers may be further reduced provided the levees are modified to the preferred profile described elsewhere in this Program.

Schedule 1
Incorporated Revisions

McCULLOUGH HILL, PS

January 15, 2009

VIA HAND DELIVERY

Tukwila Planning Commission
c/o Department of Community Development
6300 Southcenter Blvd., #100
Tukwila, WA 98188

RE: Shoreline Master Program

Dear Commissioners:

We are writing on behalf of La Pianta LLC ("La Pianta"). La Pianta previously provided a number of comments on the draft Shoreline Master Program ("SMP"). City staff then provided responses to the comments made by La Pianta and other interested parties. A number of La Pianta's comments remain to be addressed, however. This letter identifies those comments by general topic and discusses the additional information required to provide a complete response. This letter is intended to provide a broad identification of remaining significant issues and does not constitute agreement that any provision not mentioned is either legal or appropriate.

1. Legality of the SMP

La Pianta provided extensive comments addressing the illegality of the SMP under RCW 82.02.020 and constitutional taking and due process principles. The response provided is that City staff is working with the City Attorney's office. Yet, this response is not meaningful or adequate, either to the public or the Planning Commission.

The Planning Commission has received legal advice publicly on these issues only once, during a presentation made by the City Attorney's Office at a Planning Commission workshop last year. This presentation included erroneous conclusions based on incorrect assumptions and left significant questions unanswered. For example, the presenter opined that the SMP was distinguishable from the *Citizens Alliance v. King County* case (which overturned the King County's critical areas ordinance as a violation of RCW 82.02.020) because the SMP allows buffers to be adjusted on a property specific basis. But the SMP does not allow property-specific adjustments to buffer width. The presenter also indicated that some issues would require further research but additional responses on these issues were never provided to the Planning Commission in a public setting or to the public.

The Planning Commission should not recommend approval of the SMP until it has a full legal analysis of the SMP that is actually proposed.

2. Buffer Width and Levee Profile

La Pianta provided comments relating to the proposed buffer widths. In response to comments, the City made some changes to the buffer, but no significant changes to the buffer width applicable to La Pianta or to the rationale behind the buffer widths. The City has advanced two justifications for the buffer. First, the City Public Works Department has asserted that the buffer is necessary to allow for the future construction of levees with a particular profile (including an overall 2.5:1 slope, mid-slope bench, public path and maintenance easement). Second, the City has asserted that the buffer is necessary due to the width of buffers under the City's sensitive areas ordinance.

In response to statements by the Public Works Department, La Pianta provided a letter from Gary Henderson, P.E., a Senior Principal with Geoengineers, Inc., with 30 years of experience providing geotechnical engineering services throughout the Pacific Northwest. Mr. Henderson opined that the City's desired levee profile, and resulting uniform buffer widths required by the SMP, are not necessary from a technical perspective. The City did not provide adequate technical response to this comment.

Indeed, extensive technical information demonstrates that the Public Works Department is incorrect. The levee profile desired by the City is neither required to prevent scour and erosion nor required by the U.S. Army Corps of Engineers. *See Exhibits A-D.* In light of this information, the City's response to public comment on this issue falls far short.

La Pianta also provided a letter from Andrew Kindig, Ph.D, a professional biologist, opining that the uniform buffer widths required by the SMP in commercial and industrial areas along the Green/Duwamish River are inappropriate. Rather, best available science would require variable buffer widths, which would be considerably less than 100/125 feet in many cases. The City did not provide adequate technical response to this comment. *See Exhibit E.*

La Pianta also commented that the City is improperly placing the burden of providing land for flood control that benefits numerous property owners and others in the City on the shoulders of shoreline property owners. The City responded that shoreline property owners are not unduly burdened because the City will eventually pay for easements if required for future levee improvements to the City's desired levee profile. However, this response misses the point. The establishment of the buffer by the SMP dramatically reduces the value of the buffer property. The City's assurance that it will one day acquire this property (at its post-SMP "fair market value") is not comforting to property owners. Rather, the City's legislative action to reduce the value of property that it will eventually acquire is called precondemnation blight and is illegal.

3. Height limits

La Pianta commented that the SMP reduces heights in the shoreline area without justification. The Shoreline Management Act ("SMA") allows a jurisdiction to permit structures in the shoreline area in excess of 35 feet in height if the structures do not obstruct the view of a "substantial number of

residences.” RCW 90.58.320. La Pianta provided photographs and testimony demonstrating that there are no residential (or any) views of the river from its property that would be blocked by shoreline development. In response, the City amended the SMP to allow development to the height of the underlying zone in the shoreline area (outside the buffer) if public access is provided. This response is not adequate. The City has taken a legally recognized property right belonging to La Pianta, the right to build to the zoned height, without justification. The fact that the City will restore this right if La Pianta gives up another valuable property right in exchange does not make the original action legal. Rather, it is equivalent to a person who steals a car and then offers to sell it back to its rightful owner. The City must reconsider this approach.

4. Landscaping

La Pianta provided comments on the landscaping requirements of the SMP. La Pianta commented that under Washington law the City cannot legally require a property owner to remove non-native vegetation and replant and maintain an area if such actions are not necessary to mitigate an impact of proposed development. No adequate response was provided to this legal comment during the presentation to the Planning Commission by the City Attorney’s Office or otherwise. In addition, La Pianta commented that several of the specific landscaping requirements are unduly burdensome to property owners. While the City made some changes to the landscaping requirements, the changes do not remedy these issues, and La Pianta’s previous comments remain valid.

5. Economic impacts

La Pianta commented that the City could not responsibly or legally take action on the SMP without first analyzing its economic impacts. *See* RCW 90.58.100(2); WAC 173-26-191(1)(b). The City refused to conduct an economic impact analysis. This response is inadequate.

6. No Net Loss

La Pianta commented on the definition of no net loss. The definition as currently drafted does not incorporate the concepts of nexus and rough proportionality inherent in the term “no net loss.” La Pianta’s proposed amendments to this definition are included in Exhibit F.

7. Public Access

La Pianta and others commented that the public access provisions of the SMP were illegal. In response, staff made extensive changes to the public access provisions of the SMP. However, the public access requirements remain problematic. The new provisions presume that an increase in development intensity corresponds to an increased demand for public access. This is not necessarily the case and the City has provided no factual information supporting this assumption. The regulations also fail to make access improvement requirements proportionate to the increase in demand. Finally, the new provisions fail to take into account the width of the crown of existing levees. If a public path along the crown of an existing levee is required, the width of the access should be dictated by the available width on the crown of the levee.

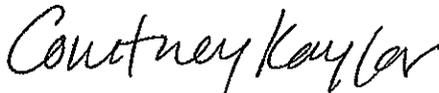
8. Applicability and Nonconformity

La Pianta and others commented on the provisions regarding applicability of the new SMP and nonconformity. City staff made substantial revisions to these sections that clarified these requirements. La Pianta believes that these provisions remain overly broad, however.

La Pianta's specific suggestions for amendments to the language of the SMP are attached to this letter as Exhibit F.

Thank you for your consideration of these comments.

Sincerely,



Courtney A. Kaylor

CAK:lde

Enclosures

cc: Client

Exhibit A

Memorandum Reviewing the Public Works Department Memoranda

Review of Information Memorandum
Prepared by the City of Tukwila Public Works Department
(December 2, 2008)

The City of Tukwila Public Works Department ("PWD") prepared two memoranda, dated September 9, 2008 and October 10, 2008, that were intended to explain the factors for the City's proposed buffers in the draft Shoreline Management Program update. Unfortunately, these memoranda contain substantive errors of fact and uses inaccurate assumptions. As these memoranda are the central component of the City's basis for the proposed buffers, the Planning Commission should be made aware of the incorrect information it has received. The purpose of this memorandum is to identify and explain the defects in the memoranda.

September 9, 2008 Memorandum

Pg 3: line 7	Issue: "The levee on the west side of the Duwamish River was built in 1991..."
--------------	---

The PWD memorandum mistakenly asserts that the levees comprising the 205 Project were constructed in 1991. In fact, the levees existed prior to 1991. In 1991, the height of certain portions of the levees were raised. The PWD's memorandum should clarify that: (i) the levees comprising the 205 Project were constructed prior to 1991, and (ii) the slopes of the levees in the 205 Project were not changed because of the work in 1991. We have enclosed copies of the plans from that 1991 work on file with the City, wherein the Planning Commission can confirm that the levees were already in existence, that the levees were constructed at a slope of 2H:1V or steeper, and that stretches of the levees were not affected by the work in 1991.

As the work in 1991 only raised the heights of the levees comprising the 205 Project, it is unclear what is the purpose of referring to this project in this memorandum.

Pg 3: line 8	Issue: "...This standard established the angle of the waterside slope at 2:1..."
--------------	---

Again, as noted above, the levees comprising the 205 Project were already in existence prior to the 1991 project. The work in 1991 did not establish the slopes at 2H:1V, but rather, only added height to certain stretches of the levee. Furthermore, the PWD's memorandum omits the fact that approximately 2.2 miles of the 5.6 miles of 205 Project levees were constructed at a slope of less than 2H:1V.

Pg 3: line 11-12	Issue: "...The Corps rejected the Repair to Pre-Flood Condition Alternative because of the past history of repeated and costly repair projects..."
------------------	---

In making this statement, the PWD's memorandum fails to make clear to the Planning Commission certain vital facts. First, the PWD's memorandum does not provide the important context that the Corps rejected the alternative of restoring the Pre-Flood Condition for an approximately 800-foot stretch of shoreline on one side of the Green River damaged in a severe storm in November 2006 ("Site 5"). Based on the conditions for this one small 800-foot section of the river, the PWD is imposing a standard for over 27 miles of shoreline. Second, the Corps did not reject its minimum standard of 2H:1V for this stretch of the river. In fact, the Corps never even considered its minimum standard as an alternative for Site 5. Among several other options not pertinent here, the Corps chose between two alternatives (i) the *Pre-Flood Condition* or (ii) a 2.5H:1V profile. The PWD's statement implies that the Pre-Flood Condition alternative was the Corps' 2H:1V minimum standard, which was not the case. In fact, the Pre-Flood Condition of the levee at Site 5 was 1.5H:1V. It is unknown whether the Corps would have accepted a 2H:1V profile for Site 5.

However, we can determine if the Corps believes its minimum standard of 2H:1V standard is still acceptable. The PWD's memorandum fails to inform the Planning Commission of the repair at the other location damaged in the November 2006 storm ("Site 3"), where the Corps considered both the alternative of laying back the levee at Site 3 to a 2.5H:1V profile or returning it to the Pre-Flood Condition. For the repair of this site, the Corps chose the Pre-Flood Condition alternative. The Pre-Flood Condition of Site 3 was a levee with a slope of 2H:1V. In other words, the Corps can accept and has already selected a levee slope profile of 2H:1V when it could have chosen a 2.5H:1V profile.

Pg 3: line 12-13	Issue: "... The Corps' Project Information Report states, 'The repair to pre-flood condition is not acceptable since the scour would occur again.'..."
------------------	---

The PWD's memorandum does not provide the *complete quote* from the Corps' Project Information Report. The Report reads as follows: "At this location, the repair to pre-flood condition is not acceptable since the scour would occur again... ." (*emphasis added*) The Corps' conclusion was focused solely on the damage to the levee at Site 5 and not elsewhere. The omission of the phrase, "At this location," significantly changes the meaning of the sentence, as the Corps could not under any circumstances be understood to be making this conclusion for the entire Green River shoreline. Unfortunately, the PWD memorandum's failure to quote the Corps accurately is particularly material as this statement is used to justify the significant expansion of the buffer along the City's entire Green River shoreline.

As noted above, the PWD's memorandum fails to inform the Planning Commission that the Corps selected a 2H:1V levee profile for Site 3 when it could have chosen a 2.5H:1V profile. Regarding the damage at Site 3, the Corps' Project Information Report reads: "The recommended alternative is also the least cost alternative. It is the repair to Pre-Flood Condition Alternative. This would replace the riprap on the levee face and return the levee to the pre-flood level of protection. The levee overburden will be excavated from the bench; the bench will be graded back to 7.5 feet from 15 feet to allow for a 2H:1V slope. ..." (emphasis added) Based on its conclusions for Site 3, the Corps still deems its minimum standard of 2H:1V as acceptable.

Pg 3: line 15-17	Issue: "Other contributing factors are contained in the 2006 King County Flood Hazard Management Plan: 'Levee slope is extremely over-steepened at approximately 1.4H:1V to 1.8H:1V'"
------------------	---

The PWD's memorandum fails to inform the Planning Commission that the quote applies specifically to River Mile 15.02 to River Mile 15.20 (page 248 of the King County Flood Hazard Management Plan), which is the approximate location of Site 5 discussed above. The PWD memorandum's use of this quotation implies that the cited conditions apply everywhere in the 205 Project area, which is plainly untrue. To clarify the intent of this statement, the PWD's memorandum should state that all of the PWD's conclusions and recommendations are limited solely to the approximately 0.2 mile stretch of river from River Mile 15.02 to River Mile 15.20.

The PWD's memorandum also does not include the array of slopes for the remainder of the Green River shoreline in the City, which runs from River Mile 3.71 to River Mile 17.3. The Green River meanders 13.6 miles through the City of Tukwila, and the King Country Flood Hazard Management Plan has identified only six (6) potential levee rehabilitation projects along the Green River in the City of Tukwila (*See attached Schedule 1*). These six areas of potential concern collectively span approximately one (1) mile of the possible 27 miles of riverbank (13.6 miles x 2 banks). Despite that fact, the PWD's memorandum recommends that all 27 miles of the river be subject to the same levee profile needed for one problematic 800-foot stretch of shoreline. More troubling, the Planning Commission will not be able to determine whether the 2.5H:1V profile was absolutely necessary for Site 5 as the Corps never considered the alternative of a 2H:1V profile for that stretch of shoreline.

Unfortunately, the Planning Commission is left with the impression that the entire Green River shoreline, or more charitably, the portion of the Green River south of I-405, is facing extremely over-steepened conditions when that is plainly untrue. More disturbingly, the PWD's memorandum fails to disclose to the Planning

Commission vital information that the Corps has selected a 2H:1V profile for one of the damaged stretches of the river.

Pg 3: line 21-22	Issue: "In other words, returning the levee to the Pre-Flood Condition using the Corps' minimum design standard would not solve the problem..."
------------------	--

The PWD's memorandum again is in confusion of the facts. At Site 5, the Pre-Flood Condition levee was sloped at 1.5H:1V, which the Corps chose not to restore. However, a levee of 1.5H:1V does not meet minimum Corps standards. So, the Corps did not reject its minimum design standards for Site 5 by not selecting the Pre-Flood Condition alternative. Unfortunately, the Corps did not consider a profile of 2H:1V as one of the alternatives; so, we cannot determine whether the Corps minimum design standard would have been acceptable for Site 5.

However, as previously established, the Corps did find its minimum design standard of a 2H:1V profile acceptable for Site 3. In that case, the Corps did choose the alternative to return the levee to its Pre-Flood Condition of 2H:1V. So, the memorandum and the Public Works Director's testimony on September 17, 2008, when he stated that the Corps' minimum standard of 2H:1V was not "good enough" (Transcript, Page 49, Tukwila Planning Commission Workshop, September 17, 2008), were both incorrect. As evidenced by the Corps' Project Information Report for the repair of Site 3, the Corps has not abandoned its 2H:1V minimum standard.

Pg 3: line 26-33	Issue: "...To overcome the existing problems and to reduce future maintenance and repair costs, the Corps chose to lessen the overall slope to a stable grade... [and] this type of profile would become the template for future levee repair and construction projects."
------------------	--

The Corps chose this template for the repairs at Site 5 only and did not choose it for the repairs at Site 3. The Corps has not revised its minimum standards of 2H:1V, which are still in effect as of today, nor amended or revised its regulations or standards regarding the maintenance or certification of the 205 Project levees. In fact, King County has also adopted the Corps' standard for the 205 Project area in the King County Flood Hazard Management Plan.

Conclusion

As is readily apparent above, the PWD's memorandum is incomplete and incorrect, which may result the Planning Commission rendering decisions based upon a misleading set of facts, assumptions, and incomplete disclosures. The PWD memorandum fails to clarify that its basis for the buffer along the entire shoreline is predicated upon the remedies required for one problematic 800-foot

section of the shoreline. Furthermore, the PWD's memorandum dated October 10, 2008 did not clarify or correct any of the mistakes described above. To avoid adopting an overly broad policy unsuited for the actual conditions along the shoreline, the Planning Commission must be provided with a memorandum citing correct facts, fully disclosed circumstances and context.

Schedule 1

Potential Levee Repair Projects in the City of Tukwila

Project Name	Slopes	Bank	Location (RM)
(1) Desimone Levee Project 3	1.6-1.9	Right	14.83-14.89
(2) Desimone Levee Project 4	1.6-1.9	Right	15.01-15.34
(3) Segale Levee Project 1	1.4-1.8	Left	15.02-15.20
(4) Desimone Levee Project 1	1.4-1.8	Right	14.65-14.73
(5) Desimone Levee Project 2	1.7-2.0	Right	14.73-14.83
(6) Segale Levee Project 2	1.3-1.6	Left	15.7-15.9

Schedule 2

Army Corps Project Information Report

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
TUKWILA 205
GRE-3-07

PART 1. PROJECT EXECUTIVE SUMMARY

PROJECT NAME: Tukwila 205

PROJECT FUNDING CLASS: 310

PROJECT CWIS NUMBER: 091634

NON-FEDERAL SPONSOR: City of Tukwila

LOCATION AND DESCRIPTION: The Tukwila Section 205 Levee is located on the left bank of the Green River from approximately river mile (RM) 12.6 to RM 17.0, in the City of Tukwila, in King County, Washington. The levees protect a flood plain that extends over 1000 acres of an industrialized area with light manufacturing, warehouses, and major high end shopping malls to major discount warehouses like Home Depot. While the Corps recently re-certified the levees, the County considers them to be over steepened and has prior plans for levee setback and construction of a levee toe buttress at a cost of \$1.9 million dollars at one of the damage locations.

DESCRIPTION OF DAMAGE: During the November 2006 flood, the Tukwila levee soils became saturated during the peak high flow. The Non-federal sponsor, City of Tukwila, requested that the District review 9 potential damage sites, (sites 1-9). Approximately 1600 linear feet of damage was seen on the levee on the riverward slope (800 linear feet at site 3 and 800 linear feet at site 5). The damage at these two sites is due to toe scour. The other 7 sites were inspected and it has been determined that no action is required at this time (1, 2, 4, 6-9).

PROPOSED REPAIR: The recommended alternative for Site 3 consists of armoring the riverward slopes over the damaged lengths of approximately 800 lineal feet. The levee will be graded to allow a 2H: 1V slope, a 3 foot blanket of class IV riprap placed for armor rock, then hydro-seeded. The proposed repair will return the damaged portions of the levee, restoring the levee to match the pre-flood Level of Protection (LOP).

The recommended alternative for Site 5 consists of laying back the existing levee system to an over all 2 1/2H 1V slope. This will be achieved by setting back the current levee and constructing a 2H: 1V levee – Bench - 2H: 1V levee system. A toe structure will be constructed to prevent future scour and a 3 foot blanket of class IV riprap will be placed for armor rock, then hydro-seeded. These features are necessary to return the project to its pre-flood LOP.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

SUMMARIZED FINANCIAL AND ECONOMIC DATA:

TOTAL CONSTRUCTION COST	Total
Construction subtotal	\$ 1,172,400
S&A (6%)	\$ 70,300
Contingency (10%)	\$ 117,200
Total Construction Cost	\$ 1,359,900
Total Engineering and Design (6%) (Fed Cost)	\$ 81,600
Total Project Costs, 100% Federal	\$ 1,441,500
B/C ratio	12

POINT OF CONTACT: Doug Weber, CENWS-OD-EM, (206) 764-3406

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

PART 2. PROJECT REPORT

1. Project Identification

- a. Project Name: Federally Authorized Tukwila 205 Levee
- b. Project Funding Class: 310
- c. Project CWIS Number: 091634

2. Project Authority

- a. Classification: Federal
- b. Authority: CAP, Section 205
- c. Estimated original cost of project: Unknown
- d. Construction completion date of the original project: 1992
- e. PL 84-99 rehabilitations have most recently been completed in: 1996

3. Sponsor

- a. Sponsor Identification: City of Tukwila
POC for City of Tukwila: Ryan Larson, Senior Engineer
6300 Southcenter Boulevard
Tukwila, WA 98188
(206) 431-2456
POC for King County: Andy Levesque, (206) 296-8379
- b. Application for Assistance:
 - (1) Date of Issuance of District's public Notice: 29 November 2006
 - (2) Date of NFS's written request: 28 December 2006

Additional information:

REPORT PURPOSE: This report provides pertinent information regarding the project, the repair plan, estimated quantities, costs and benefit ratios to restore the existing levees to pre-flood condition. Due to the dynamic process of rivers, damages induced by rivers on levees and other structures continuously changes, therefore information including project description, actions etc. contained within this document are subject to change with out notice prior to and during construction.

4. Project Location

- a. City: Tukwila
County: King
State: Washington
Basin: Green River
River: Green River
River Mile: 12.6 to 17
River Bank: Site 3 and 5 left bank

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

b. Narrative: The Tukwila Section 205 Levee is located on the left bank of the Green River from approximately river mile (RM) 12.6 to RM 17.0, in the City of Tukwila, in the Green River Basin in King County, Washington. The flood plain protection extends over 1000 acres of an industrialized area with light manufacturing, warehouses, and major high end shopping malls to major discount warehouses like Home Depot.

5. Project Design. The Tukwila levee system is an urban Flood Control Works (FCW). The system consists of an earthen material levee with armor rock on the riverward side. Slumping has been observed at some locations since 1990. Part of the levee system is described in the *2006 King County Flood Hazard Management Plan*:

Levee slope is extremely over-steepened at approximately 1.4H: 1V to 1.8H: 1V, and therefore lacks adequate structural stability to provide minimum factors of safety for several modes of failure. No toe buttress structure has ever been constructed in this sub-reach. The riverward slopes are largely dominated by invasive blackberries and reed canary grass.

The Tukwila Levee system was recently re-certified in the Federal Levee Program. Prior to the November 2006 flood, the levee offered greater than 100-year level of protection (LOP).

6. Disaster Incident: In early November 2006 a large rainfall event fell over Western Washington, including 8.7" inches of rain over a 24 hour period at Howard Hanson Dam. The Green River is regulated by Howard Hanson Dam so that the discharge from the dam combined with the downstream flow doesn't exceed 12,000 cubic feet per second (cfs) at the USGS Auburn gage #12113000.

- The combination of excessive rainfall and high freezing level produced daily average discharges above 10,000 cfs in the Green River at the Auburn gage for approximately three days with a peak discharge of about 12,000 cfs for a few hours.
- Based on the regulated discharge at the Auburn gage, daily discharges above 10,000 cfs for one or more days have been observed in 9 of the 44 years since regulation began with Howard Hanson Dam, which has an estimated return interval of approximately 5 years.
- Peak instantaneous Inflows to the Howard Hanson Dam of 23,500 cfs were observed during this event, which has an estimated return interval of approximately 15 years.
- Mean Daily discharges at the Auburn gage of between 10,000 cfs and 12,000 cfs have been observed in 10 out of 44 years, which has estimated return interval of approximately 5 years.

This yields an estimated return interval for the November 2006 event on the Green River levees of between 5 and 15 years.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRB-3-07

7. Project Damages: The Non-federal sponsor requested that the District review 9 sites for potential damages. Peak high flow in November 2006 resulted in damages to two separate levee sections of the Federally Authorized Lower Green River Flood Control Project. During the site visit on November 18, 2006 flows were ~2500 cfs, stage 56.37 ft. The levee soils became saturated during the peak high flow. Prior to the flood the levee offered greater than 100-year level of protection. In the current damaged state, the levee offers 10-year level of protection (based on failure at flows of 11,500 cfs, stage of 62.3 ft).

Damage Locations:

1. Upstream of S. 180th Bridge, Site 3 – There is observed 800 feet of toe scour on the bench and levee erosion. The levee slope is nearly vertical and there is toe scour.
2. Across from CAT Dealer Site 5 – The Corps observed on the outside bend of the levee approximately 800 feet of toe scour that may have been caused by the high flows.

8. Project Performance Data

- a. Inspection Results.
 - (1) Date of Last Inspection: Fall 2007
 - (2) Type of Last Inspection: For site 1 - immediately following a high water period. For sites 2, 3, and 4 - Periodic Inspection of Federal Flood Control Work.
 - (3) Project Condition Code of Last Inspection: Acceptable
 - (4) Status: Eligible
- b. Sponsor's Annual O&M Costs: Not known
- c. The levee is well maintained by City of Tukwila.

9. Project Alternatives Considered

Multiple alternatives were considered including, the No-Action alternative, the Setback Levee Alternative, the Repair to Pre-Flood Condition Alternative and the Non-Structural Alternative for all four sites.

a. No Action Alternative

The No Action Alternative was rejected. The levee is intended to provide flood protection for infrastructure and life. The levee will not perform as designed in its current condition. The results of a levee failure would include damages to businesses and infrastructure in the intended protected area. The area is quite urbanized and there are many people within the immediate area behind the levee, a levee failure in this reach could result in loss of life.

b. Repair to Pre Flood Condition Alternative

The Repair to Pre-Flood Condition would replace the lost levee material. A blanket of riprap would be placed on the levee face from the toe to the 100-year elevation. The levee side-slopes are steep. There is very little room for an adequate toe. The riprap on the

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

levee face above ordinary high water (OWH) will be covered with a soil layer and willows would be planted at the OWH line.

c. Retaining Wall Alternative

This repair would involve excavating the levee below the foundation, installing a wall on the landward side of the levee footprint, installing a PCC retaining wall which would allow adding a toe, and gentler slope which would help reduce the effects of scour along this reach. Willows would be planted at the OWH elevation. This solution would return the levee to pre-flood level of protection. This solution was determined not to be the most cost effective when compared to other alternatives with similar protection and as such was not selected.

d. Remove and Repair with Geo-textile Wrap wall Alternative

Excavate and remove the levee below the foundation and create a soil wrap wall armoring the riverward face. The steep slopes would be accommodated with this alternative. This solution was determined inadequate to withstand the expected velocities during a 100-year event without additional backslope footprint and was not evaluated further.

e. Layback Levee Alternative

This alternative would include removing the existing levee and laying back the top so that it is further landward than the existing levee crest. A new toe and bench on the river side will be created to reduce the effects of scour. This alternative provides the proper level of benefits for the least amount of cost for Site 5 and as such has been selected. This is the sponsor preferred alternative. Note that the new toe of the levee is in the same place as the pre-flood condition – so therefore the levee itself is not being setback from the river. This is appropriately described as changing the slope of the levee as opposed to a levee setback. A setback levee is defined by moving the entire levee landward, including the toe. In either case, additional real estate rights of way need to be acquired.

f. Non-Structural Alternative

This alternative would relocate all existing commercial, industrial and residential structures, utilities and other infrastructure within the damage area protected by this levee system. This was not a viable alternative for our sponsor. The costs associated with this alternative were deemed too high for the level of benefit associated with this alternative.

10. Recommended Alternatives

At site 3 (upstream of S. 180TH bridge): The recommended alternative is also the least cost alternative. It is the repair to Pre-Flood Condition Alternative. This would replace the riprap on the levee face and return the levee to the pre-flood level of protection. The levee overburden will be excavated from the bench; the bench will be graded back to 7.5 feet from 15 feet to allow for a 2H: 1V slope. A 3' blanket of Class IV riprap placed on the levee slope from the toe to the approximately 20 feet up the elevation. A lift of topsoil will cover the riprap from the OWH elevation to the crown and hydro-seeded. A

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

willow lift will be planted above the OHW elevation. The repair of the damages will be a total of 800 lineal feet.

At site 5 (upstream of the floodwall): The recommended alternative is the setback levee alternative. This is the least cost technically acceptable alternative. At this location, the "repair to pre-flood condition" is not acceptable since the scour would occur again. The setback levee alternative would involve setting back the existing levee system to an over all 2 1/2H 1V slope. This will be achieved by setting back the current levee and constructing a 2H: 1V levee – Bench - 2H: 1V levee system A toe structure will be constructed to prevent future scour and a 3 foot blanket of class IV riprap will be placed for armor rock, then hydro-seeded.

Willows would be planted at the OHW elevation. The repair of the damages will be a total of 800 lineal feet to allow tie in at the upstream and downstream ends. This solution would return the levee to pre-flood level of protection and reduce the effects of scour. A ramp would be constructed to allow equipment access, and would be removed at the end of construction.

Should the appropriate real estate rights of way not be acquired in time to allow construction of the preferred alternative this summer, the "repair to pre flood condition alternative" will be constructed within the existing footprint and with available real estate.

11. Real Estate

The Tukwila 205 Levee Rehabilitation effort consists of repairing portions of the levee located in Section 35, Township 23 North, Range 4 East, Willamette Meridian, King County, Washington. The rehabilitation effort involves restoring Site 3 to pre-flood conditions and Site 5 consists of a levee set back. See Section 10 Recommended Alternative for a more detailed description of the proposed repair. The placing of a single line of willows at the ordinary high water line will not require additional land acquisition, however, the levee set back will.

The City of Tukwila is the Non-Federal Sponsor (NFS), and will need to provide written acknowledgement of its continued obligations under the January 31, 1999 Local Cooperation Agreement (LCA), to provide the usual a-b-c's before any work is accomplished. The NFS is also responsible for acquiring all lands, easements, and rights of way, and disposal areas and performing any necessary relocations associated with setback of the levee at Site 5. The NFS must demonstrate to the satisfaction of the Corps of Engineers (COE) Real Estate Division that it has sufficient interests and area in the lands identified as necessary for construction, operation and maintenance of the entire rehabilitation effort, including ingress and egress to the levee before the COE advertises for construction.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

The NFS will be required to provide the COE Real Estate Division with a fully executed lands certification and authorization for entry document, attorney's certificate and title reports not more than 90 days old at the time it certifies all the necessary lands available.

For the lands needed for the proposed levee rehabilitation effort the NFS will need to acquire and certify at a minimum the below perpetual levee flood protection easement, permanent road easement for ingress and egress, and temporary work area easement.

Flood Protection Levee Easement -- A perpetual and assignable right and easement in the land described in Exhibit _____, by this reference made a part hereof, to construct, maintain, repair, operate, patrol and replace a flood protection levee, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired.

Perpetual Road Easement -- A perpetual and assignable easement and right-of-way in, on, over and across the land described in Exhibit ___ for the location, construction, operation, maintenance, alteration and replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; (reserving, however, to the grantors, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land [**Include the following language if it applies:** "at the locations indicated in (Exhibit ___")]) subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Temporary Work Area Easement -- A temporary and assignable easement and right-of-way in, on, over, and across the land described in Exhibit _____ for a period not to exceed one year, beginning with date possession of the land is granted to the Grantee for use by the United States, its representatives, agents, and contractors as a work area, including the right to borrow and/or deposit fill, and waste material thereon, move, store, and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Lower Green River, Section 205 Flood Control Project (AKA Tukwila 205), Job No. GRE-03-07, together with the right to trim, cut, fell, and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject to existing easements for public roads.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

The NFS may also need to provide a suitable disposal site by acquiring a temporary disposal area (using the above temporary work area easement); however, if the NFS is unable to provide a suitable disposal area, then the material will be taken to a commercial site for disposal.

The final location of work area easements to support the construction of the rehabilitation effort, including access routes for ease of construction, and the need for a temporary disposal site will be determined in the next phase – E&D. Additionally, if the COE, Real Estate Division determines the NFS does not have adequate real property interests for the lands needed for the proposed rehabilitation effort, including additional damage not visible at the time of inspection because of the presence of vegetation, then acquisition of property interests may be necessary. The need for the NFS to acquire or cure its existing property interests could result in further delay of repairing the damaged levee as proposed in the project schedule – see section 15 of this report. Also as part of the land certification process for the levee rehabilitation effort and the entire Lower Green River Section 205 Flood Control Project (AKA Tukwila Section 205 Project), the NFS will need to provide title reports, not more than 90 days old at the time of land certification demonstrating its interest in lands.

Any questions regarding types or level of property interests needed for the proposed project should be coordinated with COE, Real Estate Division.

12. Economic Evaluation.

Benefits attributable to the proposed levee repair are calculated on the difference in probabilities associated with the Level of Protection¹ (LOP) provided by the levee in the repaired condition compared to the damaged or post event condition. With repair, the levee will be restored to a 100-year plus level of protection. In accordance with EP500-1-1, the economic life applicable to non-Federal urban levees shall be 50-years, or the degree of protection afforded by the project, whichever is less. Therefore, the following economic analysis is based on FY07 discount rate of 4.875 percent with an economic life of 50 years. Prior to the event, this levee provided protection from floods with a greater 100 year recurrence interval. The recent high water event caused damages to the levee that degraded the LOP to an event estimated at a 10-year recurrence interval. The properties protected by this levee are in the north end of the Kent Valley in the city of Tukwila on the left bank of the Green River.

¹ Note concerning the use of the phrase Level of Protection. The US Army Corps of Engineers emphasizes that we do not protect against anything, we reduce potential risks; and, damages and descriptions of this risk reduction are given in terms of performance. For example 100-year Level of protection in terms of risk reduction performance means that there is a 90% probability of containing inside the banks of the river a flow or stage that is expected to have a frequency or annual probability of 1%. However, the data requirements and analysis required to define the level of performance is typically out of scope for this level of study, so “Level of Protection” in this document shall imply nothing more than a high probability of containing a flow or stage of the frequency indicated by the specified “Level of Protection”.

PROJECT INFORMATION REPORT
 REHABILITATION OF FLOOD CONTROL WORKS
 GRE-3-07

The flood plain protected extends over 1000 acres of an industrialized area with light manufacturing, warehouses, and major high end shopping malls to major discount warehouses like Home Depot. There are probably hundreds of parcels of land with hundreds of buildings in this part of the flood plain. An evaluation of the first eight parcels in the immediate vicinity of the damaged sites which covered a little over 26 acres of the 1000 plus similar acres showed 9 structures with a total depreciated replacement value of \$16 Million. If the levee is not repaired the expected annual damages (EAD) to just these 9 structures and their contents are approximately \$1,292,000. With repair the EAD is about \$356,000. Therefore the approximate EAD of at least \$936,000 in damages are considered as preventable with rehabilitation and taken as benefits.

		June, 2007 Prices
BENEFITS		
Annual Damage Prevented (EAD)	Greater Than	\$ 936,000
 COSTS		
First Cost:		\$ 1,441,500
Annual Cost:		
Interest and Amortization (50 years @ 4.875%)		\$ 77,000
Operation & Maintenance		\$ 2,000
Total Annual Costs		\$ 79,000
 Benefit-to-Cost Ratio	 Greater Than	 12 to 1

The following checks were performed:

1. Value property protected Greater Than \$ 16,000,000
2. Value of Cropland: Not Applicable
3. Net Farm Income: Not Applicable

Distribution of Project Benefits: There are probably 200 to 400, property owners in the protected area with similar properties. Of the 9 properties selected for analysis at least one, the Home Depot warehouse store had more than 25% of the value of properties analyzed, however if a full inventory were done it is unlikely that any individual beneficiary receives greater than 25 percent of the total project benefits.

13. Environmental

The Green river contains spawning populations of fall Chinook, Coho, Pink, and fall chum salmon, and winter and summer steelhead. Small numbers of sockeye salmon are also found. Bull trout use the lower river for feeding and rearing. The project area contains limited rearing habitat for these species. No spawning occurs in the project area.

PROJECT INFORMATION REPORT
 REHABILITATION OF FLOOD CONTROL WORKS
 GRE-3-07

The following species are listed under the Endangered Species Act (ESA) and may be found in the project area:

Puget Sound Chinook <i>Oncorhynchus tshawytscha</i>	Threatened
Coastal/Puget Sound Bull Trout <i>Salvelinus confluentus</i>	Threatened
Marbled Murrelet <i>Brachyramphus marmoratus</i>	Threatened
Northern Spotted Owl <i>Strix occidentalis Caurina</i>	Threatened
Puget Sound Steelhead <i>Oncorhynchus mykiss</i>	Threatened

The project area is critical habitat for Chinook salmon and bull trout. No critical habitat has yet been designated for steelhead.

All in-water work will be conducted will be targeted for construction during the in-water work window (July 1 – September 15), which was approved for this project by the Washington Department of Fish and Wildlife (WDFW) and the National Marine Fisheries Service (the published work window for the Green River is August 1-31). Assuming the preferred alternative is built within the approved work window, it is expected that the project is not likely to adversely affect listed species.

Issues:

a. Water Quality. Short-term, discountable adverse impacts may result from the repairs to the levee. A temporary increase in turbidity due to fill placement is expected. Turbidity will be monitored during construction. If turbidity exceeds water quality standards, construction will recommence when turbidity returns to acceptable levels.

b. Fish and Wildlife. When completed the repair is not intended to lessen habitat conditions as compared with conditions pre-existing the flood event. Short-term, discountable adverse impacts may result from construction activities during repairs to the levee. If present, fish and wildlife may be temporarily displaced from this area by short-term increases in noise and turbidity. Proposed plantings should increase the vegetative cover along the levee in the long-term.

In water construction will likely occur during the approved WDFW work window. Resloping along 800ft of the levee will result in widening of the Green River channel resulting in slight increases in fish habitat. Limited vegetation other than non-native Himalayan blackberry currently exists at the project site. Willow plantings will aid in shading the river and developing a vegetative riparian corridor.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

c. Wetlands. A wetlands biologist will determine if a reconnaissance of the proposed access alignment, staging area, and construction footprint will be necessary. Currently no jurisdictional wetlands have been identified.

d. Cultural Resources. A search of the Department of Archaeology and Historic Preservation (DAHP) electronic Historic Sites Inventory Database did not produce evidence for the presence of an historic property listed on the National Register of Historic Places (NRHP) or the Washington State Historic Sites Register at or near the two damaged levee locations. The Area of Potential Effects (APE) will include the area to be repaired, new access points and all other area where new ground disturbing activities will take place. Prior to levee repairs a Corps or contract archaeologist will survey the two damaged areas at low water and determine if there is a potential for the proposed levee rehabilitations to cause effects to historic properties. Ground disturbing activities on the landward side of the existing levee, such as those associated with the setback of a levee, would have a higher potential of encountering archaeological deposits or materials. If during the survey it is determined that the proposed repairs have a potential to cause effects to historic properties, then archaeological testing may be necessary as part of the survey work. Construction monitoring may also be necessary during certain phases of construction. A National Historic Preservation Act Section 106 compliance report will be prepared that includes the two levee repair sites. The report will include the findings of the investigations for each repair site, including possible subsurface testing, recommendations for archaeological monitoring during construction (if found to be necessary) and a determination of effects to historic properties. If archaeological monitoring is recommended at one or both of the repair locations, the report will include a monitoring plan and protocols to be followed during construction. The protocols will include an inadvertent discovery clause that will apply when an archaeological monitor is not present. The Corps' determinations of effects to historic properties and monitoring plan, if one is required, must be reviewed and concurred with by the DAHP, and reviewed by the Muckleshoot Tribe prior to construction.

e. Recreation. This section of levee is part of the Green River Trail in King County. This trail is heavily used by walkers, joggers, cyclists, and other recreational enthusiasts. Construction to repair this part of the levee will temporarily close this section of the trail and cause recreational activities to be routed around the area.

f. Coordination. The proposed work is formally coordinated throughout the planning, design, and construction phases with the following agencies and Tribe:

- (1) U.S. Fish and Wildlife Service
- (2) NOAA Fisheries
- (3) Muckleshoot Indian Tribe
- (4) Washington Department of Fish and Wildlife
- (5) Washington Department of Ecology

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

- (6) State Historic Preservation Office
- (7) King County
- (8) City of Tukwila

Their recommendations will be considered and implemented as appropriate. The design will be coordinated with and reviewed by the above listed agencies. In accordance with ER 200-2-2, Procedures for Implementing NEPA, paragraph 8, Emergency Actions, the environmental effects of the proposed levee rehabilitation will be considered during the planning process. An environmental assessment (EA) is being prepared to evaluate probable impacts of the project on the existing environment. Factors addressed by the evaluation include public safety, water quality, wetlands, threatened and endangered species, noise, economics, fish, and wildlife. The EA will be coordinated with applicable Federal and State resource agencies. The NEPA process will be concluded as pursuant to requirements in ER 200-2-2. In addition, the requirements for compliance with the ESA will also be completed. The Non-federal sponsor will be required to obtain all applicable local and state permits. Pursuant to 33 U.S. Code Section 1344(f)(1)(B), emergency reconstruction of recently damaged parts of levees does not require a Clean Water Act Section 404 evaluation, provided that the work is conducted for maintenance purposes. Analogizing to 33 Code of Federal Regulations section 323.4(a)(2), rehabilitation may not include any modification that changes the character, scope, or size of the original fill design. Concerning scope and size, the proposed repair will not require a Section 404(b)(1) evaluation as long as the footprint of the levee repair that falls within waters of the United States is no larger than the pre-damage footprint. All work on this project either will be conducted outside the limits of Section 404, or will result in restoration of the pre-existing levee profile, will remain within the existing footprint, and will be conducted with the same character and materials. Since the application of Section 404 is not triggered, a Section 401 water quality certification from the Department of Ecology is not required. A Coastal Consistency Determination will be completed prior to construction. Analogizing to the Regional Conditions accompanying Nationwide Permit 3, which addresses repair and maintenance of levee structures within Washington, where a Section 401 Certification is not required due to application of 33 U.S. Code section 1344(f)(1)(B), the Coastal Consistency determination need not be submitted to the State for concurrence.

g. Environmental enhancement features. Project construction will include the following environmental enhancement features: Approximately 800 linear feet of the levee is proposed to be re-sloped resulting in a slightly wider river channel. Willow stakes will be planted along the repair sections.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

14. Interagency Levee Task Force

HQUSACE has not directed activation of an Interagency Levee Task Force for the flood event associated with the November 2006 floods in Western Washington. However, informal coordination with FEMA is ongoing.

15. Project Management

a. Funding Authority

- (1) Program and Appropriation: FCCE, 96x3125
- (2) Project Funding Class: 310
- (3) Project CWIS Number: 091634

b. Project Funds - Project Cost Estimate at April 2007 Price Level

The cost estimate is presented by the details of each damage site first, followed by a project summary table that adds S&A, Contingency, and E&D.

Lower Green River Flood Control Project, Site 5 -800 feet of toe scour and levee erosion

Item	Quantity	Unit of Measure	Unit Cost	Amount
Material Site 5				
Class IV Riprap	7,300	TONS	\$ 36	\$262,800
Spall Rock (2"-4")	2,000	TONS	\$ 20	\$40,000
Gravel Filter Material	1,000	CY	\$ 20	\$20,000
Granular Fill	1,000	CY	\$ 20	\$20,000
Topsoil	400	CY	\$ 26	\$10,400
Asphalt (repair damage from trucks/equip on path & parking lot)	3,600	SY	\$ 22	\$79,200
Saw cut and dispose of Asphalt Path and Parking Lot	350	TONS	\$ 100	\$35,000
Create access ramp (4' high x 60' long x 12' wide) from pkg. lot	50	CY	\$ 20	\$1,000
Cut out asphalt/levee & create ramp to bench then replace	600	CY	\$ 5	\$3,000
Disposal of access ramp	50	CY	\$ 2	\$100
Disposal of	4,000	CY	\$ 10	\$40,000

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

unsatisfactory material					
Clearing and grubbing	500	TONS	\$ 100	\$50,000	
Willows	500	EA	\$ 5	\$2,500	
Hydroseeding	2,000	SY	\$ 10	\$20,000	
Total Materials				\$588,000	
Equipment Site 5	HRS (REG)	\$/HR	HRS (OT)	\$/HR	Total
Rubber Tire Loader 644, 5 cy bucket with teeth	80	\$ 135	40	\$ 150	\$16,800
Mobilization/Demobilization	1	LS			\$2,500
200 Excavator with hydraulic Thumb and muck bucket	160	\$ 150	80	\$ 165	\$37,200
Mobilization/Demobilization	1	LS			\$2,500
10 ton roller (for compacting levee when replacing)	80	\$100	40	\$115	\$12,600
Mobilization/Demobilization	1	LS			\$2,500
Truck and trailer for material disposal	80	\$125	40	\$140	\$15,600
Subtotal					\$89,700
Total Equipment and Materials					\$677,700

Lower Green River Flood Control Project, Site 3 - 800 feet of toe scour and levee erosion

Item	Quantity	Unit of Measure	Unit Cost	Amount
Material Site 3				
Class IV Riprap	7,200	TONS	\$ 36	\$259,200
Spall Rock (2"-4")	2,500	TONS	\$ 20	\$50,000

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

Gravel Filter Material	250	CY	\$ 20	\$5,003	
Topsoil	75	CY	\$ 26	\$1,952	
Asphalt (repair damage from trucks/equip on path & parking lot)	3,600	SQ	\$ 22	\$79,200	
Saw cut and dispose of Asphalt Path and Parking Lot	350	TONS	\$ 100	\$35,000	
Create access ramp (4' high x 60' long x 12' wide) from pkg. lot	55	CY	\$ 20	\$1,107	
Cut out asphalt/levee & create ramp to bench then replace	600	CY	\$ 5	\$3,000	
Disposal of access ramp	55	CY	\$ 1	\$55	
Disposal of unsatisfactory material	1,000	CY	\$ 1	\$1,000	
Clearing and grubbing	100	TONS	\$ 100	\$10,000	
Willows	100	EA	\$ 5	\$500	
Total Materials				\$446,100	
Equipment Site 3	HRS (REG)	\$/HR	HRS (OT)	\$/HR	Total
Rubber Tire Loader 644, 5 cy bucket with teeth	40	\$ 135	20	\$ 150	\$8,400
Mobilization/Demobilization	1	LS			\$2,500
200 Excavator with hydraulic Thumb and muck bucket	80	\$ 150	40	\$ 165	\$18,600
Mobilization/Demobilization	1	LS			\$2,500
10 ton roller (for compacting levee	40	\$100	20	\$115	\$6,300

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

when replacing)					
Mobilization/Demobilization	1	LS			\$2,500
Truck and trailer for material disposal	40	\$125	20	\$140	\$7,800
Subtotal					\$48,600
Total Equipment and Materials					\$494,700

TOTAL CONSTRUCTION COST	Total
Construction subtotal	\$ 1,172,400
S&A (6%)	\$ 70,300
Contingency (10%)	\$ 117,200
Total Construction Cost	\$ 1,359,900
Total Engineering and Design (6%) (Fed Cost)	\$ 81,600
Total Project Costs, 100% Federal	\$ 1,441,500
B/C ratio	12

c. Project Repair Schedule

The Work Window (work allowed in the water) is 1 August – 31 August. Work performed outside this window will only consist of work that is not in the water.

RESPONSIBLE PARTY	MILESTONE TAKS	MILESTONE DATE
COE	PIR Approval	January 29, 2008
COE	E&D complete	February 15, 2008
COE	LOA and LER Cert Documents to Non-federal Sponsor, and Designs for Review NLT	February 15, 2008
COE	Obtain E&D funds	Obtained
COE	E&D review finalized and complete	March 6, 2008
City of Tukwila	Sign LOA by Non-federal Sponsor	March 7, 2008
COE	Environmental Documentation	March 18, 2008
City of Tukwila	Non-federal Sponsor certifies lands	April 4, 2008
City of Tukwila	Non-federal Sponsor provides cash contribution	April 18, 2008
COE	RE Division Certifies Lands Available	May 2, 2008
COE	Solicit contractors	May 5, 2008
COE	Award contract	June 20, 2008
COE	Initiate construction	July 1, 2008
COE	Complete construction	September 15, 2008

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

d. Project Authentication

Prepared by: Laura Orr, (206) 764-3575

Emergency Management approval by: Paul Komoroske, (206) 764-3406

District-level approval by: Diane Parks (206) 764-3431

e. Technical Points of Contact

Emergency Management: Doug Weber, (206) 764-3406

Economics: Don Bisbee, (206) 764-3713

Environmental: Rustin Director, (206) 764-3636

Cultural resources: Ron Kent, (206) 764-3576

Engineering and design: Cathie Desjardin, (206) 764-3542

Program Management: Doug Weber, (206) 764-3406

Real Estate: Cindy Luciano, (206) 764-3748

Hydraulics and Hydrology: Lynne Melder, (206) 764-6471

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

Appendix A: Project Sponsor's request for Rehabilitation Assistance.



King County

Water and Land Resources Division
Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Suite 600
Seattle, WA 98104-2466
206-296-6379 206-296-0192 Fax

December 28, 2006

Doug Weber
U.S. Army Corps of Engineers
PO Box C-3755
4735 East Marginal Way South
Seattle, WA 98124-2253

RE: November 2006 Flood Damage - Request for PL 84-99 Assistance

Dear Mr. Weber:

I first want to take this opportunity to thank you and your colleagues at the U.S. Corps of Engineers- Seattle District Office for your assistance and support as a result of the November 2006 flood event. The close communication on dam operations and flood damage inspections was integral to the success of the coordinated regional response throughout King County. I look forward to our continued work together on these efforts.

The purpose of this letter is to notify you of flood related damages to several levees on the Green, Mainstem Snoqualmie, South Fork Snoqualmie, Middle Fork Snoqualmie, Ragging, Toit, and Cedar Rivers that occurred as a result of the November 2006 flood event, and to officially request the assistance of the U.S. Army Corps of Engineers- Seattle District Office in constructing levee repairs at these locations. Requests for assistance on the White, South Fork Skykomish the Sammamish Rivers are not being pursued at this time.

The attached table contains brief summaries of the damaged levee locations, approximate lengths of damages, preliminary cost estimates, and notes on their eligibility for assistance under the PL 84-99 program. These summaries of observed damages are based on observations made by King County staff and, in some instances, were observed jointly with U.S. Army Corps of Engineers staff following the flood event.

It is anticipated that joint low-water inspections of the levee damages identified in this letter will be needed in the near future to more accurately assess, quantify and prioritize damages and associated repair needs along with more detailed cost estimates based on the preferred design alternative. Please note that our requests for assistance may also be augmented as additional damages are identified as we continue to thoroughly inspect levee systems through the county.

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

Doug Weber
December 28, 2006
Page 2

I would also like to include with this request for assistance an immediate re-inspection of the portion of the Horseshoe Bend Levee just upstream of Central Place to determine whether an emergency repair is warranted. Both King County and U.S. Army Corps of Engineers staff recently observed three new sinkholes on the back slope of this levee, one of which is in the same location as evidence of front slope movement. If emergency repairs are warranted, I would like to request that we take immediate action to address the damages at this location.

King County would like to remain active participants in the development of levee repair design alternatives during preparation of the project information report for these sites. In addition, we would like to explore options that would allow the County and the District to play an active role in the design and construction of these projects consistent with the successful approach currently underway at the Briscoe Levee repair site.

Thank you for your consideration in this matter. If you have any questions or need additional information regarding this request, or would like to schedule a meeting or joint inspection of these sites, please contact me at 206-296-8011.

Sincerely,

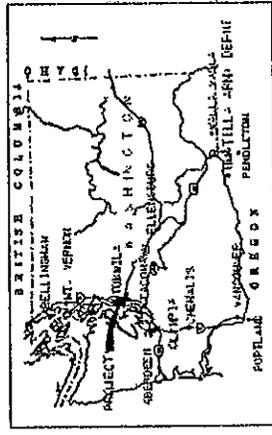
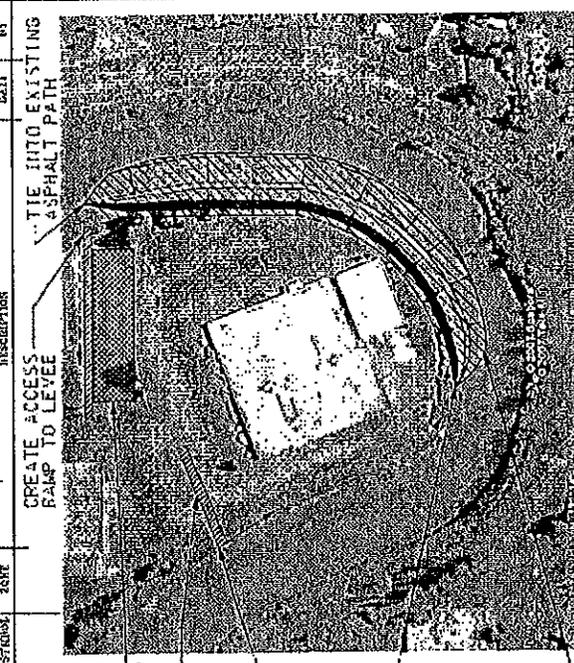


Steve Heifetz, Manager
River and Floodplain Management Unit

cc: Andy Lavesque, Senior Engineer, King County River and Floodplain Management Unit
Tom Bean, Senior Engineer, King County River and Floodplain Management Unit
John Koon, GRPCZD Program Coordinator, King County River and Floodplain
Management Unit
Nancy Fargenburg, Program/Project Manager, King County River and Floodplain
Management Unit
Frisilla Kaufmann, Program/Project Manager, King County River and Floodplain
Management Unit
Deborah Schisler, Engineer, King County River and Floodplain Management Unit

Attachment

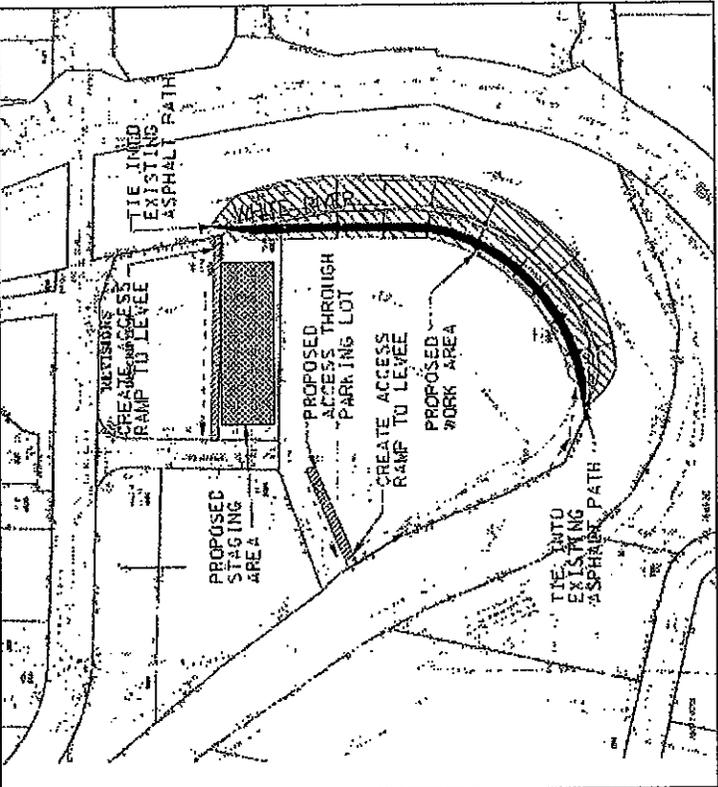
STANDARD	DATE	DESCRIPTION	DATE	BY



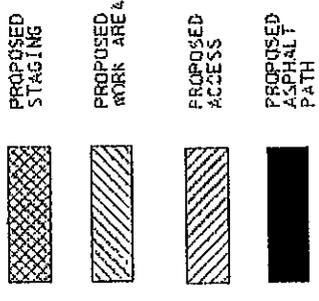
U. S. ARMY ENGINEER DISTRICT, SEATTLE
 CORPS OF ENGINEERS
 SEATTLE, WASHINGTON

LOWER GREEN RIVER
 FLOOD CONTROL PROJECT
 TUKWILA LEVEE SITE 3

SIZE: 11x17 INCH NO. FILE NO. SHEET



- NOTES:
1. EXCAVATE OVERBURDEN CREATING A 2H:1V OR GENTLER SLOPE. DISPOSE OF EXCESS MATERIAL.
 2. CREATE A SMALL 10' BENCH WITH 2H:1V SLOPE.
 3. CREATE A SMALL 5' AT TOE AND ARMOR LEVEE FACE UP TO BENCH ELEVATION. COVER WITH 1' TOPSOIL & HYDROSEED DISTURBED SOIL.
 4. PLANT 1 LIFT OF WILLOWS ON 6" CENTER JUST ABOVE DRW ELEVATION.
 5. REMOVE AND REPLACE CHAIN LINK FENCE AS NECESSARY.
 6. REVEGETATE DISTURBED BACKSLOPE WITH COMPARABLE LANDSCAPING.
 7. SITE INFRASTRUCTURE MUST BE RETURNED TO PRE-CONSTRUCTION CONDITION (IE. ASPHALT PATH, ACCESS RAMPS, FENCE, ETC).
 8. PARKING LOT PARKING SPACES WILL BE USED AS ACCESS ROAD

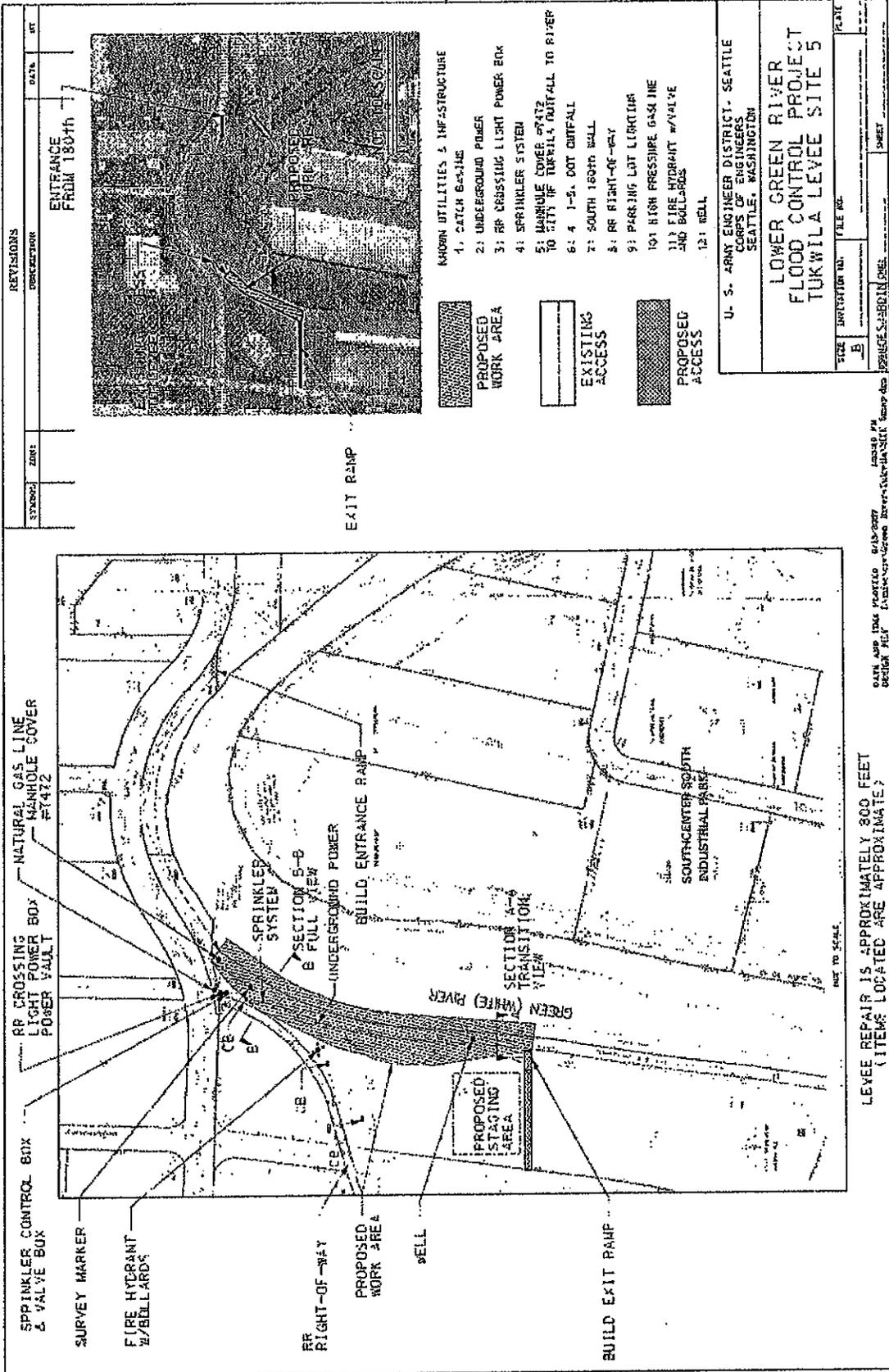


LEVEE REPAIR IS APPROXIMATELY 200 FEET

NOT TO SCALE

1053405.48
 1/20/2007
 1053405.48
 1/20/2007
 1053405.48
 1/20/2007

PROJECT INFORMATION REPORT REHABILITATION OF FLOOD CONTROL WORKS GRE-3-07



LEVEE REPAIR IS APPROXIMATELY 800 FEET
(ITEMS LOCATED ARE APPROXIMATE)

DATE: APR 10, 1984
DRAWN BY: J. J. BROWN
CHECKED BY: J. J. BROWN
SCALE: AS SHOWN

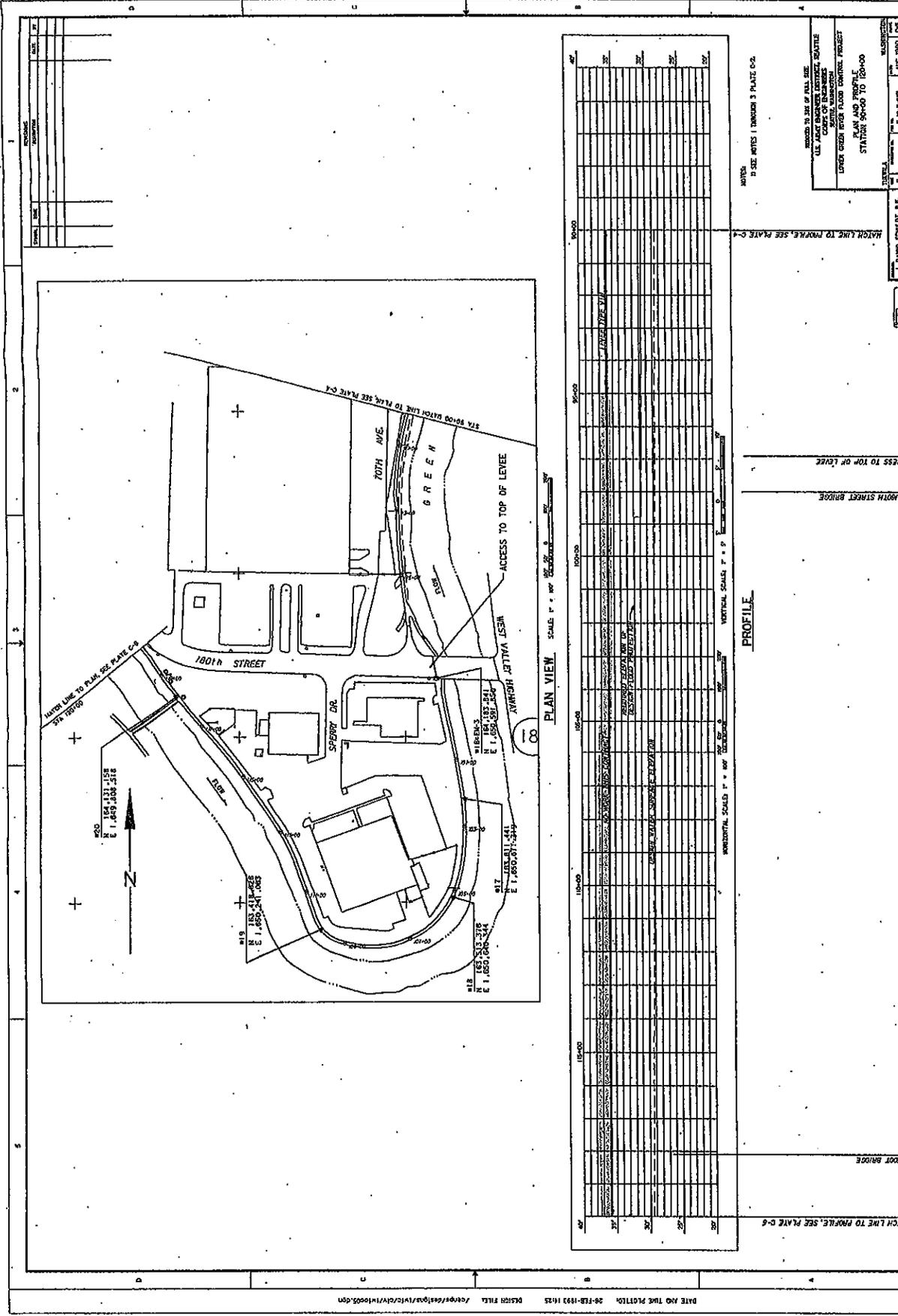
Appendix Z: PIR Review Checklist

PROJECT INFORMATION REPORT
REHABILITATION OF FLOOD CONTROL WORKS
GRE-3-07

ATTACHMENTS

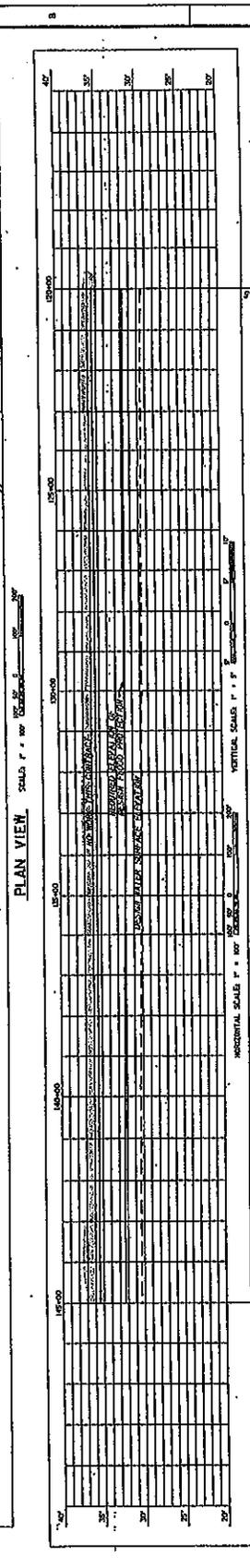
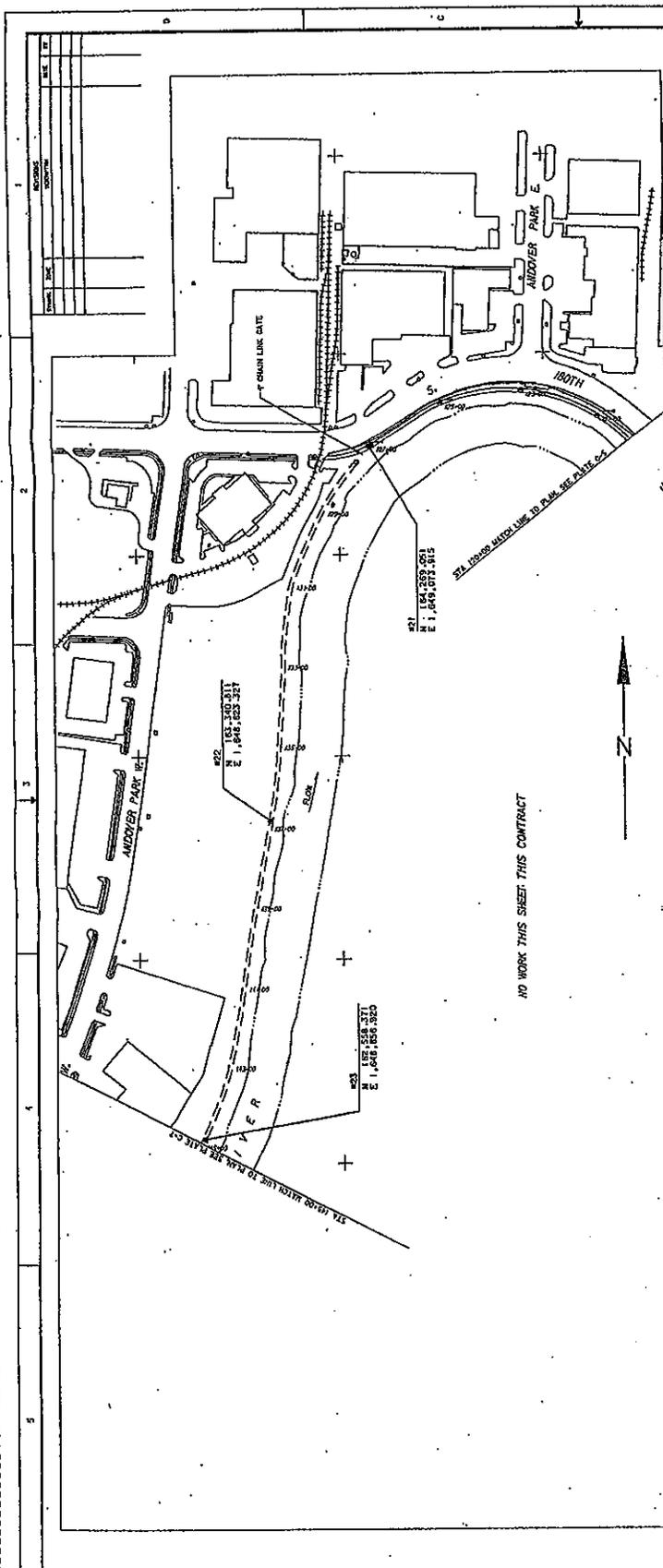
Schedule 3

1991 Project Plans



NO.	DATE	REVISIONS

STATION	ELEVATION	REMARKS
100+00		
100+10		
100+20		
100+30		
100+40		
100+50		
100+60		
100+70		
100+80		
100+90		
101+00		
101+10		
101+20		
101+30		
101+40		
101+50		
101+60		
101+70		
101+80		
101+90		
102+00		
102+10		
102+20		
102+30		
102+40		
102+50		
102+60		
102+70		
102+80		
102+90		
103+00		
103+10		
103+20		
103+30		
103+40		
103+50		
103+60		
103+70		
103+80		
103+90		
104+00		
104+10		
104+20		
104+30		
104+40		
104+50		
104+60		
104+70		
104+80		
104+90		
105+00		
105+10		
105+20		
105+30		
105+40		
105+50		
105+60		
105+70		
105+80		
105+90		
106+00		
106+10		
106+20		
106+30		
106+40		
106+50		
106+60		
106+70		
106+80		
106+90		
107+00		
107+10		
107+20		
107+30		
107+40		
107+50		
107+60		
107+70		
107+80		
107+90		
108+00		
108+10		
108+20		
108+30		
108+40		
108+50		
108+60		
108+70		
108+80		
108+90		
109+00		
109+10		
109+20		
109+30		
109+40		
109+50		
109+60		
109+70		
109+80		
109+90		
110+00		
110+10		
110+20		
110+30		
110+40		
110+50		
110+60		
110+70		
110+80		
110+90		
111+00		
111+10		
111+20		
111+30		
111+40		
111+50		
111+60		
111+70		
111+80		
111+90		
112+00		
112+10		
112+20		
112+30		
112+40		
112+50		
112+60		
112+70		
112+80		
112+90		
113+00		
113+10		
113+20		
113+30		
113+40		
113+50		
113+60		
113+70		
113+80		
113+90		
114+00		
114+10		
114+20		
114+30		
114+40		
114+50		
114+60		
114+70		
114+80		
114+90		
115+00		
115+10		
115+20		
115+30		
115+40		
115+50		
115+60		
115+70		
115+80		
115+90		
116+00		
116+10		
116+20		
116+30		
116+40		
116+50		
116+60		
116+70		
116+80		
116+90		
117+00		
117+10		
117+20		
117+30		
117+40		
117+50		
117+60		
117+70		
117+80		
117+90		
118+00		
118+10		
118+20		
118+30		
118+40		
118+50		
118+60		
118+70		
118+80		
118+90		
119+00		
119+10		
119+20		
119+30		
119+40		
119+50		
119+60		
119+70		
119+80		
119+90		
120+00		
120+10		
120+20		
120+30		
120+40		
120+50		
120+60		
120+70		
120+80		
120+90		
121+00		
121+10		
121+20		
121+30		
121+40		
121+50		
121+60		
121+70		
121+80		
121+90		
122+00		
122+10		
122+20		
122+30		
122+40		
122+50		
122+60		
122+70		
122+80		
122+90		
123+00		
123+10		
123+20		
123+30		
123+40		
123+50		
123+60		
123+70		
123+80		
123+90		
124+00		
124+10		
124+20		
124+30		
124+40		
124+50		
124+60		
124+70		
124+80		
124+90		
125+00		
125+10		
125+20		
125+30		
125+40		
125+50		
125+60		
125+70		
125+80		
125+90		
126+00		
126+10		
126+20		
126+30		
126+40		
126+50		
126+60		
126+70		
126+80		
126+90		
127+00		
127+10		
127+20		
127+30		
127+40		
127+50		
127+60		
127+70		
127+80		
127+90		
128+00		
128+10		
128+20		
128+30		
128+40		
128+50		
128+60		
128+70		
128+80		
128+90		
129+00		
129+10		
129+20		
129+30		
129+40		
129+50		
129+60		
129+70		
129+80		
129+90		
130+00		
130+10		
130+20		
130+30		
130+40		
130+50		
130+60		
130+70		
130+80		
130+90		
131+00		
131+10		
131+20		
131+30		
131+40		
131+50		
131+60		
131+70		
131+80		
131+90		
132+00		
132+10		
132+20		
132+30		
132+40		
132+50		
132+60		
132+70		
132+80		
132+90		
133+00		
133+10		
133+20		
133+30		
133+40		
133+50		
133+60		
133+70		
133+80		
133+90		
134+00		
134+10		
134+20		
134+30		
134+40		
134+50		
134+60		
134+70		
134+80		
134+90		
135+00		
135+10		
135+20		
135+30		
135+40		
135+50		
135+60		
135+70		
135+80		
135+90		
136+00		
136+10		
136+20		
136+30		
136+40		
136+50		
136+60		
136+70		
136+80		
136+90		
137+00		
137+10		
137+20		
137+30		
137+40		
137+50		
137+60		
137+70		
137+80		
137+90		
138+00		
138+10		
138+20		
138+30		
138+40		
138+50		
138+60		
138+70		
138+80		
138+90		
139+00		
139+10		
139+20		
139+30		
139+40		
139+50		
139+60		
139+70		
139+80		
139+90		
140+00		
140+10		
140+20		
140+30		
140+40		
140+50		
140+60		
140+70		
140+80		
140+90		
141+00		
141+10		
141+20		
141+30		
141+40		
141+50		
141+60		
141+70		
141+80		
141+90		
142+00		
142+10		
142+20		
142+30		
142+40		
142+50		
142+60		
142+70		
142+80		
1		



MATCH LINE TO PROFILE, SEE PLATE C-7

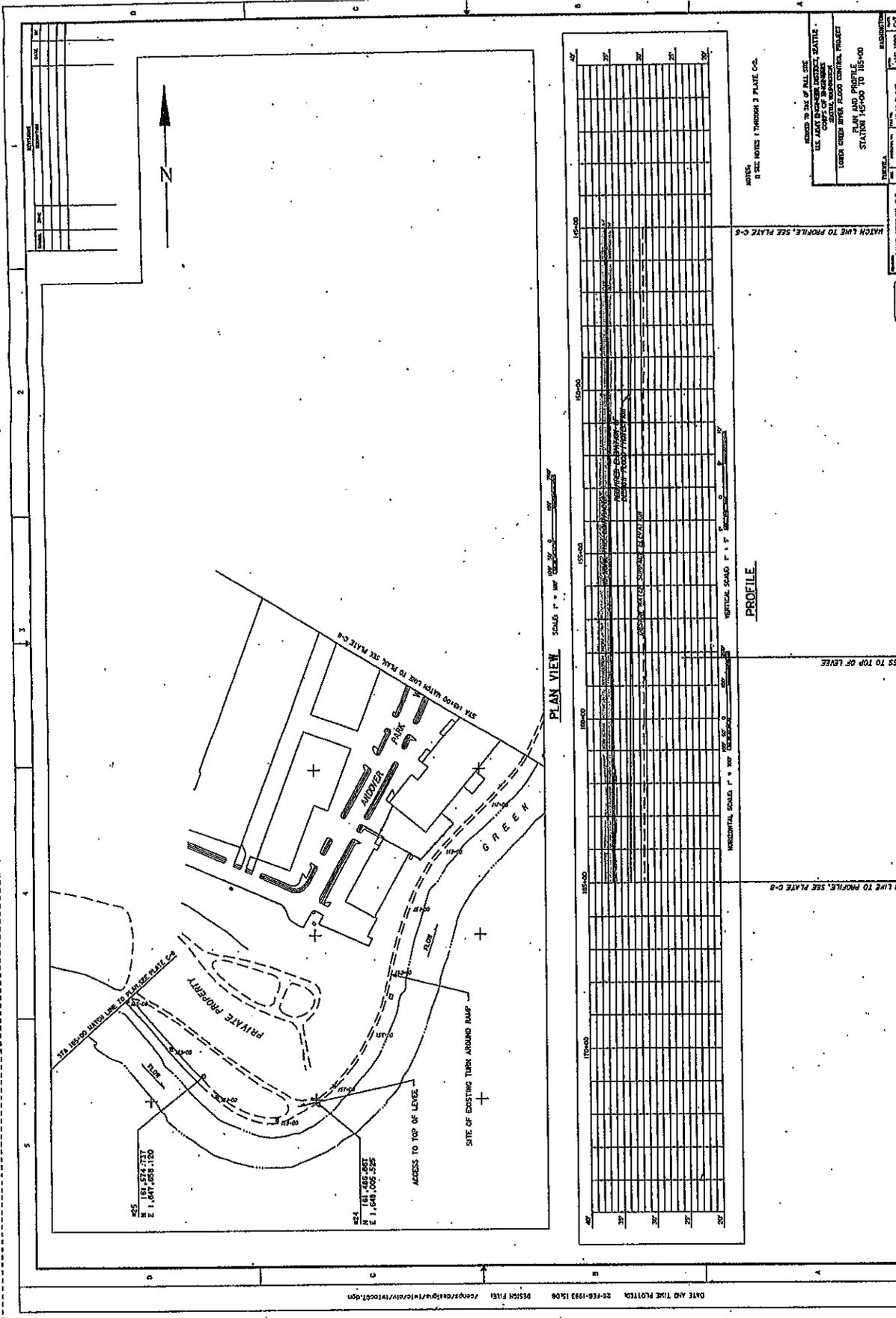
MATCH LINE TO PROFILE, SEE PLATE C-5

EXISTING GROUND SURFACE WITH TRANSACK
 (SEE EXISTING CONTRACT)
 (SEE EXISTING CONTRACT)
 (SEE EXISTING CONTRACT)

NOTES:
 1. SEE NOTES 1 THROUGH 3 PLATE C-6.
 2. SEE NOTES 1 THROUGH 3 PLATE C-6.
 3. SEE NOTES 1 THROUGH 3 PLATE C-6.

REVISIONS:
 1. SEE NOTES 1 THROUGH 3 PLATE C-6.
 2. SEE NOTES 1 THROUGH 3 PLATE C-6.
 3. SEE NOTES 1 THROUGH 3 PLATE C-6.

DATE: 2-12-93
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 PROJECT: [Name]
 STATION: 180+00 TO 184+00



NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		



PLAN VIEW SCALE: 1" = 100'

PROFILE

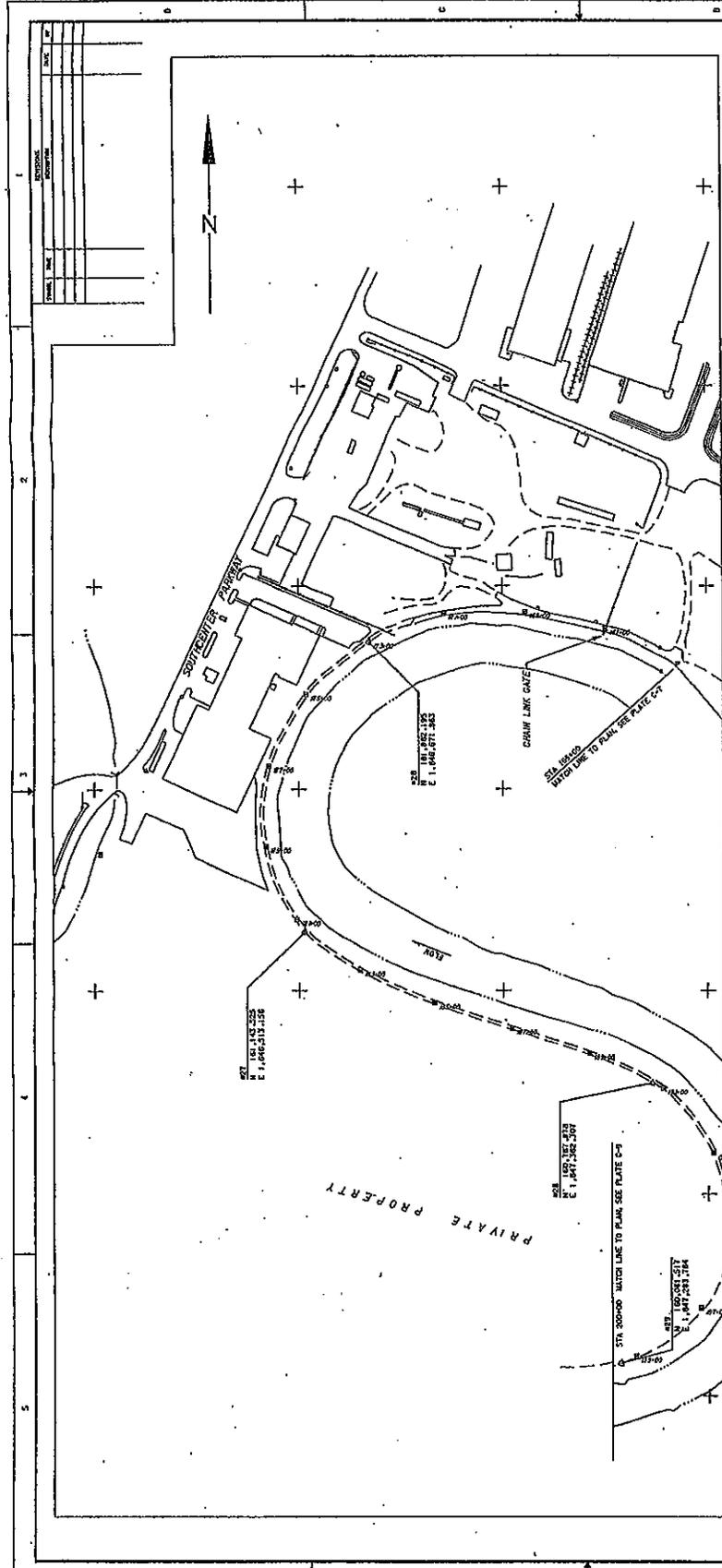
NOTES:
1. SEE NOTES THROUGH 3 PLATE C-8.

DESIGNED TO THE USE OF FULL SIZE
U.S. ARMY ENGINEERING DISTRICT, WASHINGTON, D.C.
LAWRENCE ENGINEERING CONSULTANTS, INC.
STATION 145+00 TO 145+00

DATE AND TIME PLOTTED: 28-FEB-1983 15:08
DESIGN FILE: /c:\engr\ksh\p\145\145\145loc1.dsn
E. DAVIS, SURVEYOR, P.E.
145-145-145
1983

MATCH LINE TO PROFILE, SEE PLATE C-8

55 TO TOP OF LEV. SEE PLATE C-8

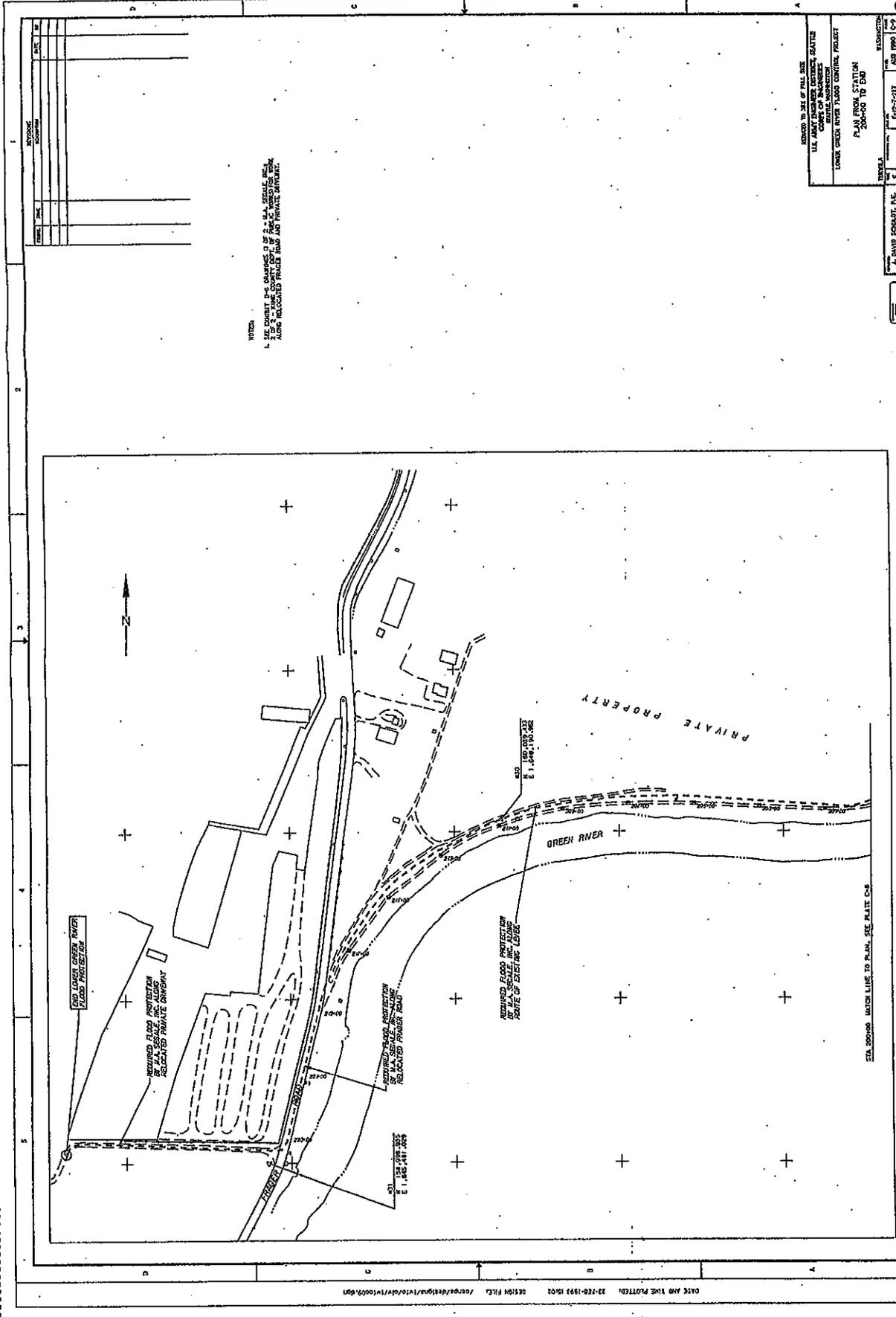


PLAN VIEW SCALE: 1" = 60'

STATION	VERTICAL CURVE DATA	VERTICAL SCALE: 1" = 60'
180+00		
181+00		
182+00		
183+00		
184+00		
185+00		
186+00		
187+00		
188+00		
189+00		
190+00		
191+00		
192+00		
193+00		
194+00		
195+00		
196+00		
197+00		
198+00		
199+00		
200+00		
201+00		
202+00		
203+00		
204+00		
205+00		
206+00		
207+00		
208+00		
209+00		
210+00		
211+00		
212+00		
213+00		
214+00		
215+00		
216+00		
217+00		
218+00		
219+00		
220+00		
221+00		
222+00		
223+00		
224+00		
225+00		
226+00		
227+00		
228+00		
229+00		
230+00		
231+00		
232+00		
233+00		
234+00		
235+00		
236+00		
237+00		
238+00		
239+00		
240+00		
241+00		
242+00		
243+00		
244+00		
245+00		
246+00		
247+00		
248+00		
249+00		
250+00		
251+00		
252+00		
253+00		
254+00		
255+00		
256+00		
257+00		
258+00		
259+00		
260+00		
261+00		
262+00		
263+00		
264+00		
265+00		
266+00		
267+00		
268+00		
269+00		
270+00		
271+00		
272+00		
273+00		
274+00		
275+00		
276+00		
277+00		
278+00		
279+00		
280+00		
281+00		
282+00		
283+00		
284+00		
285+00		
286+00		
287+00		
288+00		
289+00		
290+00		
291+00		
292+00		
293+00		
294+00		
295+00		
296+00		
297+00		
298+00		
299+00		
300+00		

MATCH LINE TO PLATE C-7
 SEE PLATE C-7
 UNDER THESE OTHER PLANS: CAPITAL PROJECT
 PLAN AND PROFILE
 STATION 180+00 TO 300+00
 SOUTH WASHINGTON
 U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL BUREAU OF SURVEY
 WASHINGTON, D.C.

NOTES:
 1. SEE NOTES 1 THROUGH 3 PLATE C-2.



NO.	DATE	DESCRIPTION	BY	CHKD.

NOTES
 1. SEE CONSENT, P.C. DRAWINGS 2 OF 2 FOR PROTECTIVE WORK. ALSO, RELOCATED FLOOD WALL AND PRIVATE PROPERTY.

DESIGNED TO SIZE OF FULL SIZE
 U.S. ARMY ENGINEER DISTRICT, SEATTLE
 CONTRACT NO. W66-001-000000000000
 LOCAL GREEN RIVER FLOOD CONTROL PROJECT
 P.M. STATION
 20+00 TO 20+00
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 DATE: 02-22-99

STA. 20+00.00 WATER LINE TO P.M. SEE PLATE C08

OLD GREEN RIVER
 OLD FLOOD WALL

REMOVED FLOOD PROTECTION
 RELOCATED PRIVATE PROPERTY

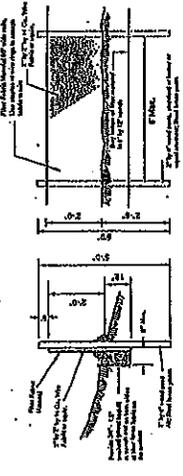
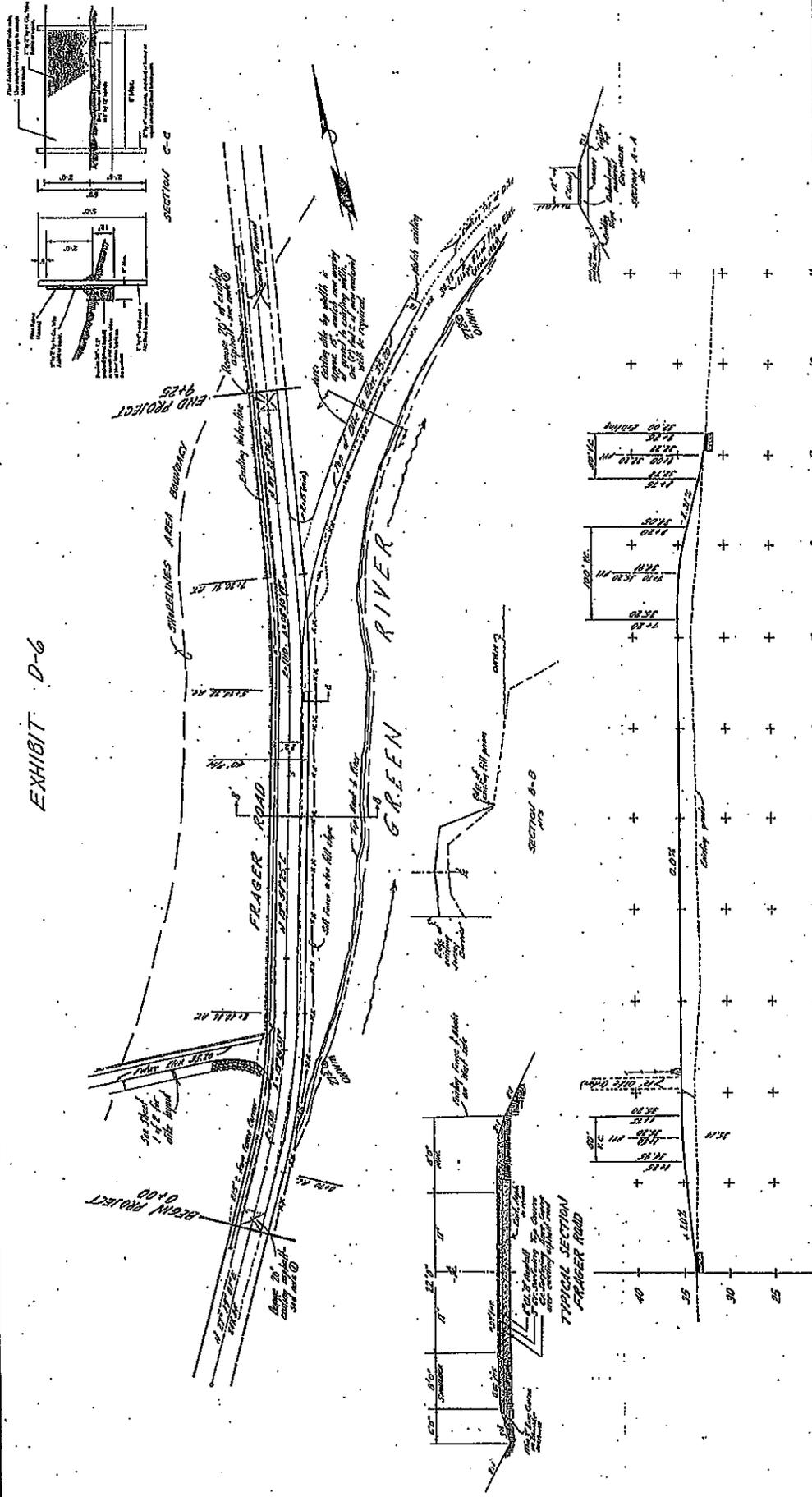
REMOVED FLOOD PROTECTION
 RELOCATED PRIVATE PROPERTY

REMOVED FLOOD PROTECTION
 RELOCATED PRIVATE PROPERTY

AND
 E 1, 100, 110, 120

GREEN RIVER
 PRIVATE PROPERTY

EXHIBIT D-6



Stationing	Notes	1	2	3	4	5	6	7	8	9	10	11
40+00												
35+00												
30+00												
25+00												
20+00												
15+00												
10+00												
5+00												
0+00												

KING COUNTY DEPT. OF PUBLIC WORKS
 EXHIBIT D-6
 SHEET No. 2 of 2 SHEETS
 MAINTENANCE DIVISION

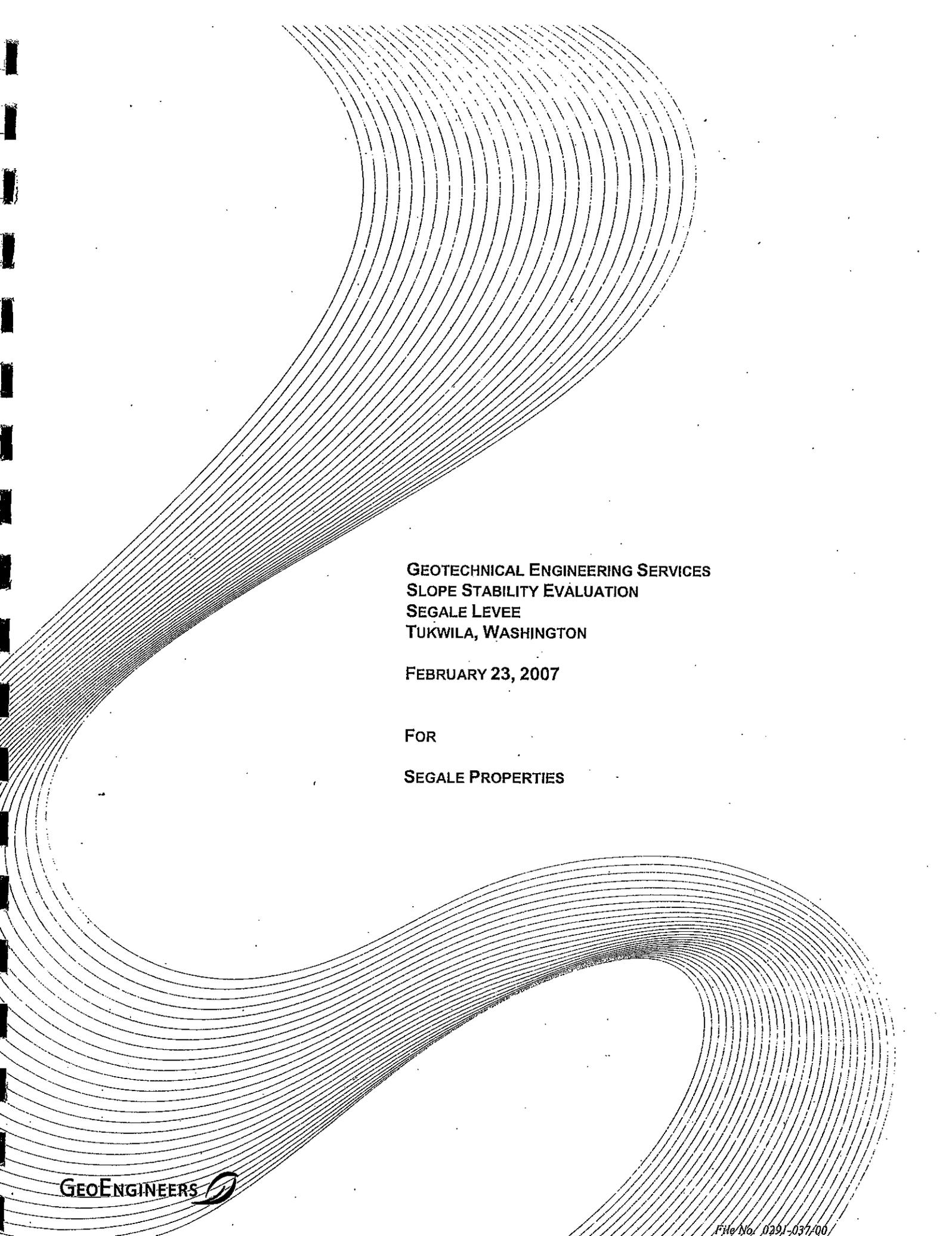


At 0:10 PM of the 10th day of June 1911, the undersigned, Engineer in Charge of the Public Works Department, King County, Washington, do hereby certify that the above is a true and correct copy of the original plans and specifications for the improvement of the Frager Road, as shown on the attached sheets, and that the same have been approved by the Board of Public Works of King County, Washington.

W. H. BROWN, Engineer in Charge
 King County Department of Public Works

Exhibit B

Report by Geoengineers

The background of the page is a decorative graphic consisting of numerous thin, parallel, curved lines that sweep across the page from the left side towards the right, creating a sense of motion and depth.

**GEOTECHNICAL ENGINEERING SERVICES
SLOPE STABILITY EVALUATION
SEGALE LEVEE
TUKWILA, WASHINGTON**

FEBRUARY 23, 2007

FOR

SEGALE PROPERTIES

TABLE OF CONTENTS

	<u>Page No.</u>
INTRODUCTION AND PROJECT DESCRIPTION.....	1
SCOPE	1
PREVIOUS REPORTS.....	1
FIELD EXPLORATIONS	2
FIELD EXPLORATIONS	2
SITE CONDITIONS	2
SURFACE CONDITIONS.....	2
GEOLOGY.....	2
SUBSURFACE CONDITIONS	2
GROUNDWATER CONDITIONS.....	2
ANALYSIS	3
SEEPAGE.....	3
Flood Control Effects on Water Levels	3
Seepage Soil Parameters.....	3
Method of Seepage Analysis	3
Seepage Analysis Results	4
LEEVE STABILITY	4
Soil Parameters	4
Method of Analysis.....	4
Stability Analysis Results	4
CONCLUSIONS AND RECOMMENDATIONS.....	5
LIMITATIONS	5
REFERENCES	6

List of Figures

- Figure 1. Vicinity Map
- Figure 2. Site Plan
- Figure 3. Generalized Cross Section

APPENDICES

Appendix A – Field Explorations

Appendix A Figures

- Figure A-1. Cone Penetrometer Data CPT-1
- Figure A-2. Cone Penetrometer Data CPT-2
- Figure A-3. Cone Penetrometer Data CPT-3

Appendix B – Report Limitations And Guidelines For Use

**GEOTECHNICAL ENGINEERING SERVICES
SLOPE STABILITY EVALUATION
SEGALE LEVEE
TUKWILA, WASHINGTON
FOR
SEGALE PROPERTIES**

INTRODUCTION AND PROJECT DESCRIPTION

This report presents the results of our geotechnical engineering services for the evaluation of the stability of the west levee along the Green River located between about South 180 Street and South 200th Street in Tukwila, Washington. This portion of the levee is approximately 2.4 miles in length and is situated within the area known as the Tukwila 205 section. The project location is shown on the Vicinity Map, Figure 1. The project alignment is shown with respect to existing site features on the Site Plan, Figure 2.

Our understanding of the project is based on our review of existing geotechnical reports and evaluations completed by others, as well as several meetings with representatives of Segale Properties. The purpose of our services was to evaluate whether the river bank could be constructed at an inclination of at least 2H:1V (horizontal to vertical) with an adequate factor of safety to satisfy the United States Army Corp of Engineers' (USACE) stability standards as set forth in the 1913 USACE Levee Design Manual. The existing river bank slopes along this portion of the canal are approximately 1.5H to 1.8H:1V.

King County is evaluating passing an ordinance that would require flattening the slopes to reduce the risk of flooding of adjacent land.

SCOPE

Our geotechnical engineering services for this project consisted of reviewing previous reports and explorations for the site, conducting subsurface explorations, and providing geotechnical engineering conclusions and recommendations for safe river bank slope inclinations for the levee. Our specific scope of services included:

- Reviewing previous geotechnical reports prepared for projects in the site vicinity;
- Completing cone penetration tests (CPTs) to characterize the subsurface conditions at selected locations;
- Completing engineering analysis to evaluate the stability of a proposed 2H:1V slope and commenting on the feasibility of designing and constructing a levee that would conform to the guidelines set forth in the USACE 1913 Design Manual for Levees;
- Providing geotechnical recommendations for the project; and
- Preparing this geotechnical report.

PREVIOUS REPORTS

As part of our engineering analysis, we reviewed several documents that described the subsurface conditions and geotechnical engineering properties of the soils as well as engineering evaluations. We reviewed the following documents:

- GeoEngineers, Inc., December 1998, Report, Geotechnical Engineering Services, Proposed Warehouse Building Development, Tukwila, Washington.
- GeoEngineers, Inc., March 1999, Report, Geotechnical Engineering Services, Levee Seepage Evaluation, Proposed Warehouse Building Development, Tukwila, Washington.
- King County, October 2006, Briscoe Levee Supplementary Stability Evaluation: Project No. 011068

- King County, January 2007, Overview of Flood Plan Issues related to the Segale Levee.
- Shannon & Wilson, Inc., 1995, Geotechnical Report, Segale Levee Seepage and Stability Studies, Tukwila, Washington.
- Shannon & Wilson, Inc., 1999, Summary Report: Slope Stability Analysis of Four Green River Bank Stabilization Repair Projects, King County, Washington.
- Shannon & Wilson, Inc., 2002 Preliminary Risk-Based Flood Damage Analysis, Green River Flood Control Zone District, King County, Washington.

FIELD EXPLORATIONS

FIELD EXPLORATIONS

The subsurface conditions along the project alignment were evaluated by reviewing available geotechnical information and by advancing three cone penetration test (CPT) probes. The CPTs were advanced to approximately 40 feet below the ground surface on December 26, 2006. The approximate locations of the explorations completed for this project are presented on the Site Plan, Figure 2. Details of the field exploration program and logs of the explorations are presented in Appendix A.

SITE CONDITIONS

SURFACE CONDITIONS

The site is located along the west bank of the Green River between South 180th Street and South 200th Street, a length of approximately 2.4 miles. The levee is approximately 30 to 35 feet high measured from the bottom of the river to the crest and approximately 3 to 8 feet high on the land side. The width of the crest at the top of the levee is on the order of 10 to 15 feet. The river flows in a northerly direction, and the topography along the crest of the levee is relatively flat. The river bank slopes down from the crest at inclinations of approximately 1.5H to 1.8H:1V (horizontal to vertical). The land side slopes down at an inclination of approximately 1.5H:1V. The area to the west of the levee consists of existing commercial properties and undeveloped land.

GEOLOGY

Published geologic information for the project vicinity includes a U.S. Geological Survey Map titled "Geologic Map of the Des Moines 7.5' Quadrangle, King County, Washington" (Booth and Waldron, 2004). Based on the geologic map and our evaluation of existing explorations, we interpret the soils as younger alluvium deposited by the Green River. The alluvium generally consists of moderately well sorted silt, sand, and gravel.

SUBSURFACE CONDITIONS

The soils interpreted from the CPT explorations completed along the levee generally consist of alluvium. Overbank alluvial deposits consisting of interbedded very loose to medium dense sands with variable silt content and very soft to medium stiff silt were observed in the upper 30 to 35 feet of each exploration. Medium dense to dense older alluvial sands were encountered below the overbank deposits in each of the explorations. Each of the explorations was terminated in the medium dense to dense older alluvial sands.

GROUNDWATER CONDITIONS

The groundwater levels in the vicinity of the project will likely be closely related to the water level of the Green River. Based on our experience in the project vicinity and the exploration logs completed by others along the levee alignment, we anticipate that static groundwater levels are on the order of 12 to 15 feet below the ground surface. Groundwater levels will typically fluctuate as a function of season, precipitation, river level and other factors.

ANALYSIS

SEEPAGE

The stability of the levee is significantly influenced by the groundwater level and the permeability of soils within the levee. The permeability affects the seepage and the rate of change in the phreatic surface when the river level changes. A higher groundwater level in the levee relative to the river level reduces levee stability. The key issue related to the stability analysis is determining the decrease in the groundwater level as the river level goes down (rapid drawdown condition). We accordingly completed seepage analysis to evaluate the groundwater level (phreatic surface) during the rapid drawdown condition and used the results in the stability analysis described below.

Flood Control Effects on Water Levels

The flow within the Green River is controlled by the Howard A. Hanson (HAH) Dam which is operated by the U.S. Army Corp of Engineers (USACE). The dam is located upstream of the project site. The primary purpose of the dam is to control flooding along the lower portion of the Green River. Water from heavy precipitation or runoff is stored behind the dam and then released in a controlled manner.

We understand that during periods of significant releases from the HAH dam, the river level within this stretch of the Green River can rise to within about 2 feet of the top of the levee. The river level may stay at this elevation for periods of up to 10 days. Regulatory policies for the operation of the dam specify that the drawdown rate within the Green River should not exceed 1 foot per hour. The USACE typically operates the dam such that the maximum rate of drawdown is 1 to 2 feet per day. We developed a time history of river level elevations as a function of time for use as input to our seepage analyses based on our understanding of the flood control effects on the river. This is discussed in more detail in subsequent sections.

Seepage Soil Parameters

Besides water level data, parameters for the seepage analysis include the soil permeability, the density, specific gravity and moisture content. Soil permeability has a significant influence on seepage and groundwater levels in the levee. Soils with low permeability, such as silt and clay, take longer to drain after saturation and water levels remain elevated in the levee during rapid drawdown conditions. Soils with higher permeability, such as sand and gravel, drain fairly quickly resulting in less discrepancy between the river level and the phreatic surface in the levee.

Shannon and Wilson performed several soil permeability tests on typical levee soils. Their results indicate a permeability on the order of 3×10^{-5} cm/sec (~ 0.085 ft/day) for the sandy silt, a permeability on the order of 1×10^{-3} cm/sec (~ 2.8 ft/day) for the fine sand with some silt and a permeability on the order of 5×10^{-3} cm/sec (14.2 ft/day) for the fine sand. The predominant soil type in the upper portions of the levees where the maximum drawdown occurs is fine sand with varying amounts of silt. We chose a permeability of 5 ft/day to represent this material.

Method of Seepage Analysis

The phreatic surface within the generalized embankment section was evaluated using the computer software program Seep/W Version 6.2 (GEO Slope International, Ltd, 2004). This program is a two dimensional finite element program that divides the levee cross section into hundreds of small triangular-shaped elements, each of which has specific soil properties. The initial groundwater conditions are input as the normal river level. A function representing the change in river level with time is then activated along the slope of the levee in the river. After initialization, SEEP/W then calculates the changes in the groundwater level (phreatic surface) throughout the levee as the river level rises during flood stage and decreases over time using defined river level curves for the rapid drawdown condition.

Seepage Analysis Results

The results of the seepage analysis were used to develop the phreatic surface within the embankment for fast and slow drawdown rates. The phreatic surface shown in Figure 2 represents the worst-case condition where the water level in the levee is the highest relative to the adjacent river level. This typically occurs during rapid-drawdown when the river level just reaches the normal river level.

LEEVE STABILITY

Soil Parameters

For the slope stability analysis we used the effective stress soil strength parameters presented in Shannon & Wilson's January 1999 geotechnical report. Specifically, we used an effective friction angle of 33 degrees and cohesion of 15 psf for the soils within the embankment. We understand these parameters were chosen by Shannon & Wilson based on their review of laboratory testing completed by the Corps of Engineers.

Method of Analysis

The stability of a generalized section through the levee was evaluated using the computer software program Slope/W Version 5.20 (GEO Slope International, Ltd, 2004). The program uses limit equilibrium methods to evaluate the stability of a slope and provides an estimate of the factor of safety with respect to slope failure. We evaluated the stability of a 2H:1V (horizontal to vertical) slope during static and rapid drawdown conditions. A generalized schematic of the embankment is presented in Figure 2. We included a 2-foot-thick layer of rip rap in our analysis.

The static (steady state seepage) condition consisted of evaluating the stability of a 2H:1V slope during normal operating conditions. For this condition we assumed the water level within the Green River would be 15 feet above the bottom of the river. This scenario is generally consistent with the static condition analysis provided by Shannon & Wilson in their 1999 report. However, we included the layer of rip rap that has been observed and documented by the USACE to exist along this stretch of the Green River in our analysis.

We also evaluated the stability of the slope during rapid drawdown conditions for the phreatic surface derived from the seepage analysis. This method of analysis differed from previous evaluations completed by others. The previous evaluations had approached the rapid drawdown scenario from the conservative standpoint that during drawdown there would be no drainage or dissipation of pore pressures within the embankment. Essentially, the water level in the Green River was lowered from the flood stage to the normal stage but the embankment remained completely saturated with a phreatic surface at the elevation of the flood stage.

Stability Analysis Results

The results of our slope stability analysis for the proposed 2H:1V slope for the steady state and rapid drawdown conditions are presented in the table below.

Table 1.0 Slope Stability Results

Condition	USACE Required Factor of Safety	Factors of Safety	
Steady State	1.4	1.4	
Rapid Drawdown	1.0	Drawdown Rate	
		1 ft/hr	¼ ft/hr
		1.12	1.2

CONCLUSIONS AND RECOMMENDATIONS

We are in general agreement with the effective stress soil strength parameters chosen by Shannon & Wilson and have utilized the same soil parameters in our stability analysis. Based on the results of our analysis, it is our opinion that the embankment slopes may be engineered to provide adequate factors of safety during the steady state and rapid drawdown conditions to meet the required factors of safety set forth by the USACE (1.4 for steady state and 1.0 for rapid drawdown).

The previous analysis completed by Shannon and Wilson indicated a factor of safety of 0.7 for the 2H:1V slope during the rapid drawdown condition. In our analysis, we estimate a factor of safety of 1.1 to 1.2 depending on the drawdown rate with the minimum factor of safety of 1.1 at the maximum drawdown rate of 1 foot per hour. The difference in the results can be attributed to the assumptions made about the phreatic surface within the embankment. Shannon & Wilson assumed no change of the water level in the embankment during the rapid drawdown period. It is our opinion that this assumption is very conservative and not representative of what is likely to occur.

Based on the soils conditions, field testing by Shannon & Wilson and our experience, we estimated the permeability of the soils and evaluated the change in the water level within the embankment (phreatic surface) by modeling the seepage with computer software. Based on our understanding of the soils and our analysis, it is our opinion that during rapid drawdown at a rate of 1 foot per hour, partial drainage of the levee embankment will occur. The results of our analysis provided an estimate of the phreatic surface at different stages during the drawdown of the river. We completed our stability analysis by selecting the critical phreatic surface that corresponds to the river level reaching the normal operating level 15 feet above the bottom of the river.

The results of our analysis indicate a 2H:1V slope may be designed and constructed such that the factors of safety against slope instability for the steady state and rapid drawdown conditions (1 foot per hour) set forth by the USACE are met or exceeded. This assumes that the slopes are constructed with at least 2 feet of correctly sized riprap, and that the slope and toe of the embankment are protected against erosion.

LIMITATIONS

We have prepared this report for the exclusive use of Segale Properties, and their authorized agents for the Segale Levee Stability Evaluation Project in Tukwila, Washington. Our report and interpretations should not be construed as a warranty of the subsurface conditions.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

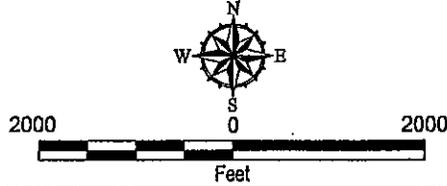
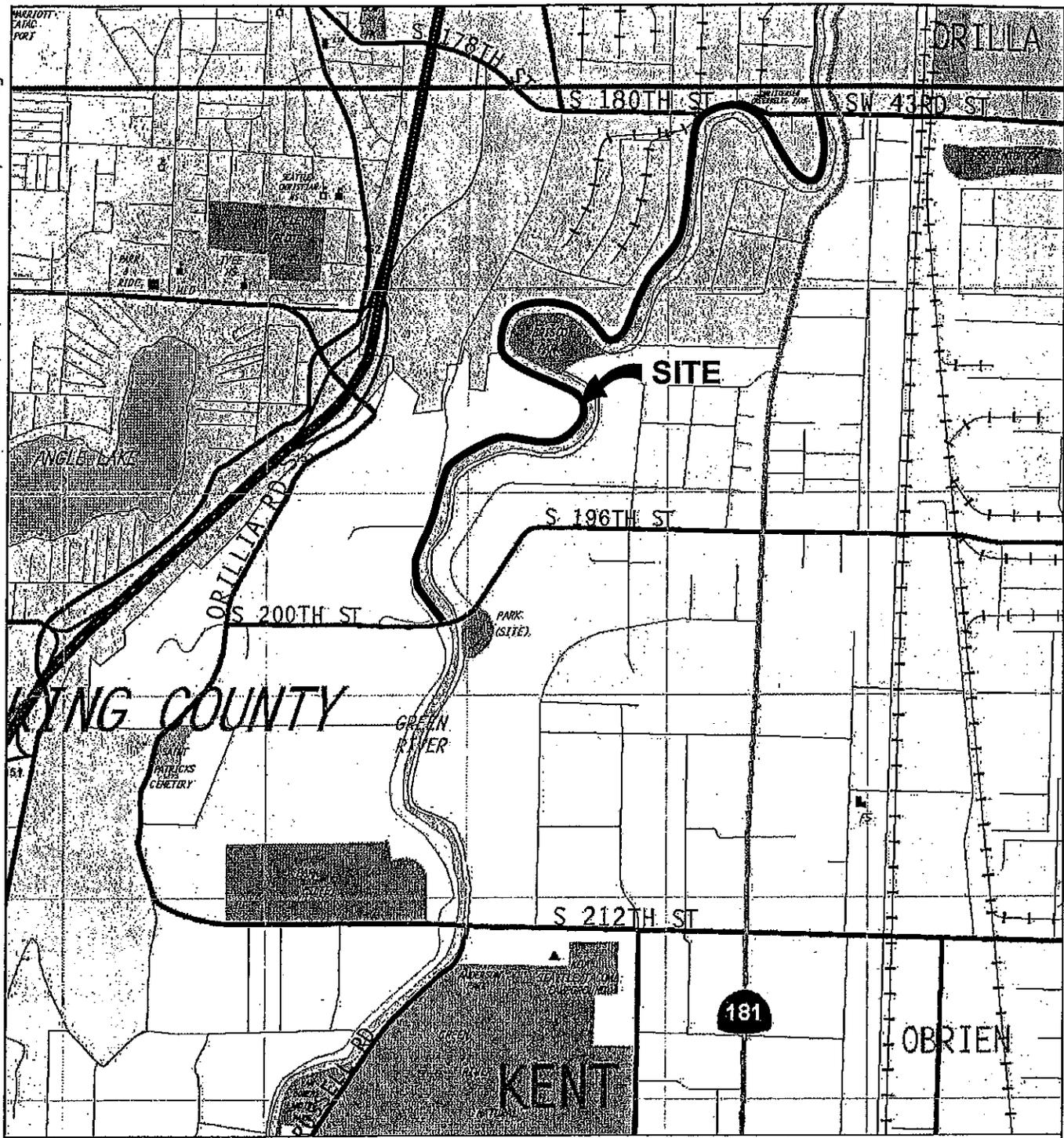
REFERENCES

Booth, D. B. and Waldron, H. H., 2004, Geologic Map of the Des Moines 7.5' Quadrangle, King County Washington, Scientific Investigations Map 2855.

Seep/W, Version 6.2, Computer Software, Geo-scope International, LTD. 2004.

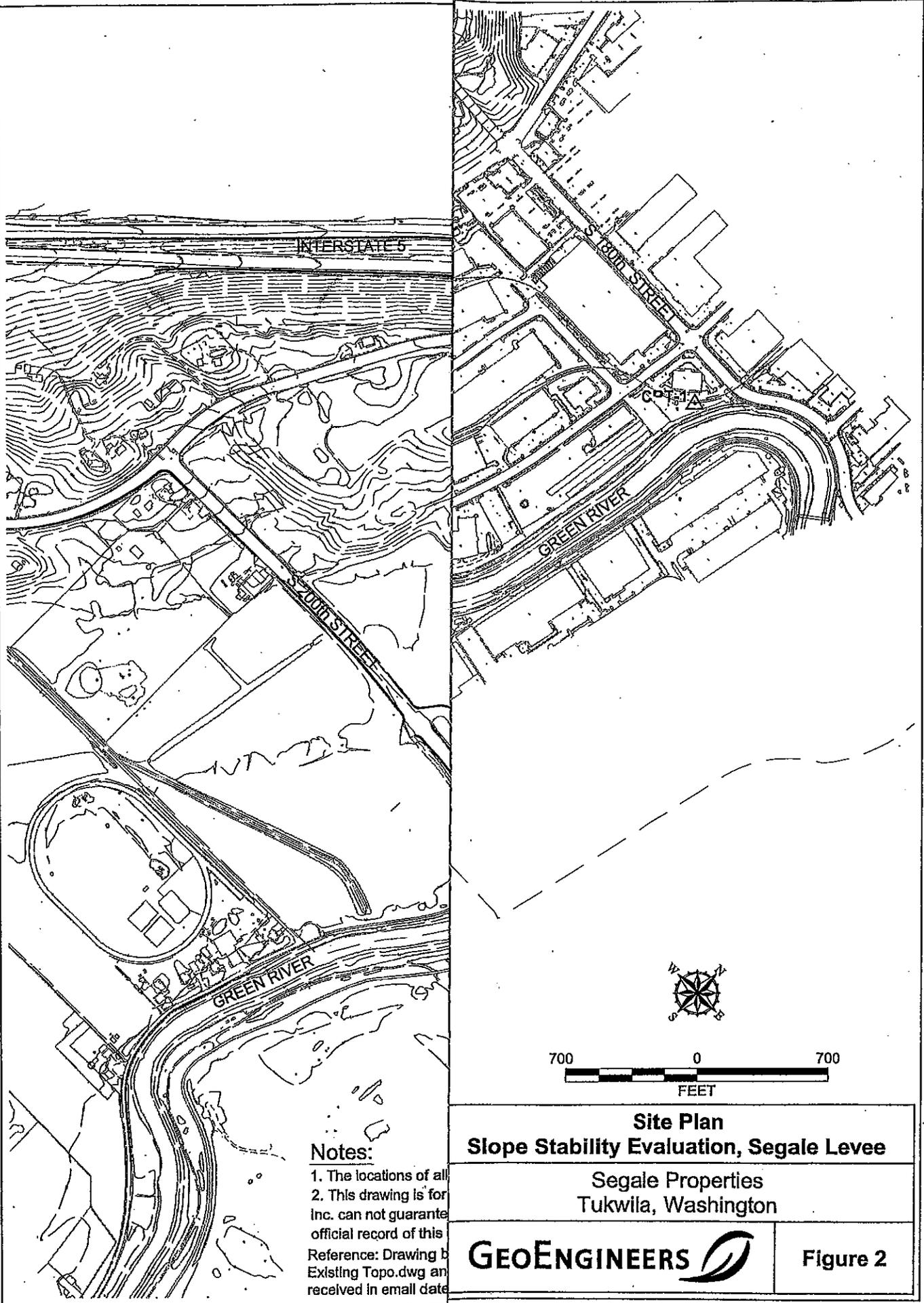
Slope/W Version 5.20, Computer Software. GEO-SLOPE International, Ltd. 2004.

REDM\P:\ 0291037\00\CAD\029103700VM.dwg
Layout Tab Name: Figure 1
KGO:SES 02/12/07
Xref: N/A
Image: YES



Vicinity Map Slope Stability Evaluation, Segale Levee	
Segale Properties Tukwila, Washington	
GEOENGINEERS 	Figure 1

Reproduced with permission granted by THOMAS BROS. MAPS.
This map is copyrighted by THOMAS BROS. MAPS. It is
unlawful to copy or reproduce all or any part thereof, whether
for personal use or resale, without permission.



Notes:

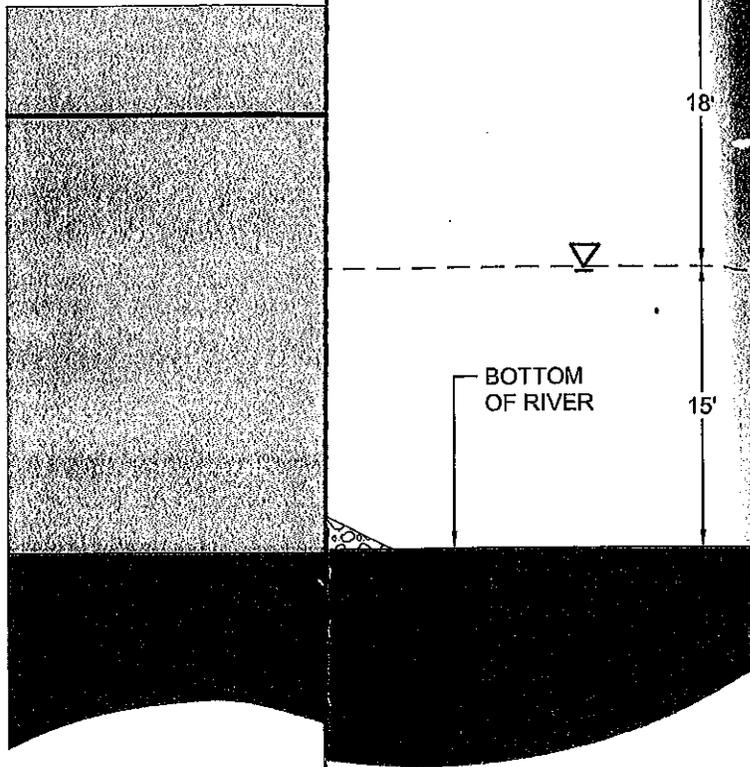
- 1. The locations of all
 - 2. This drawing is for
- Inc. can not guarantee
official record of this
Reference: Drawing b
Existing Topo.dwg an
received in email date

**Site Plan
Slope Stability Evaluation, Segale Levee**

Segale Properties
Tukwila, Washington



Figure 2



Notes:

- 1. The locations of all features shown are approximate.
- 2. This drawing is for information purposes. It is intended to be used as an official record of this communication.

Reference: Drawing from sketch from GeoEngineers staff.

**Generalized Cross Section
Slope Stability Evaluation, Segale Levee**

Segale Properties
Tukwila, Washington



Figure 3

APPENDIX A FIELD EXPLORATIONS

GENERAL

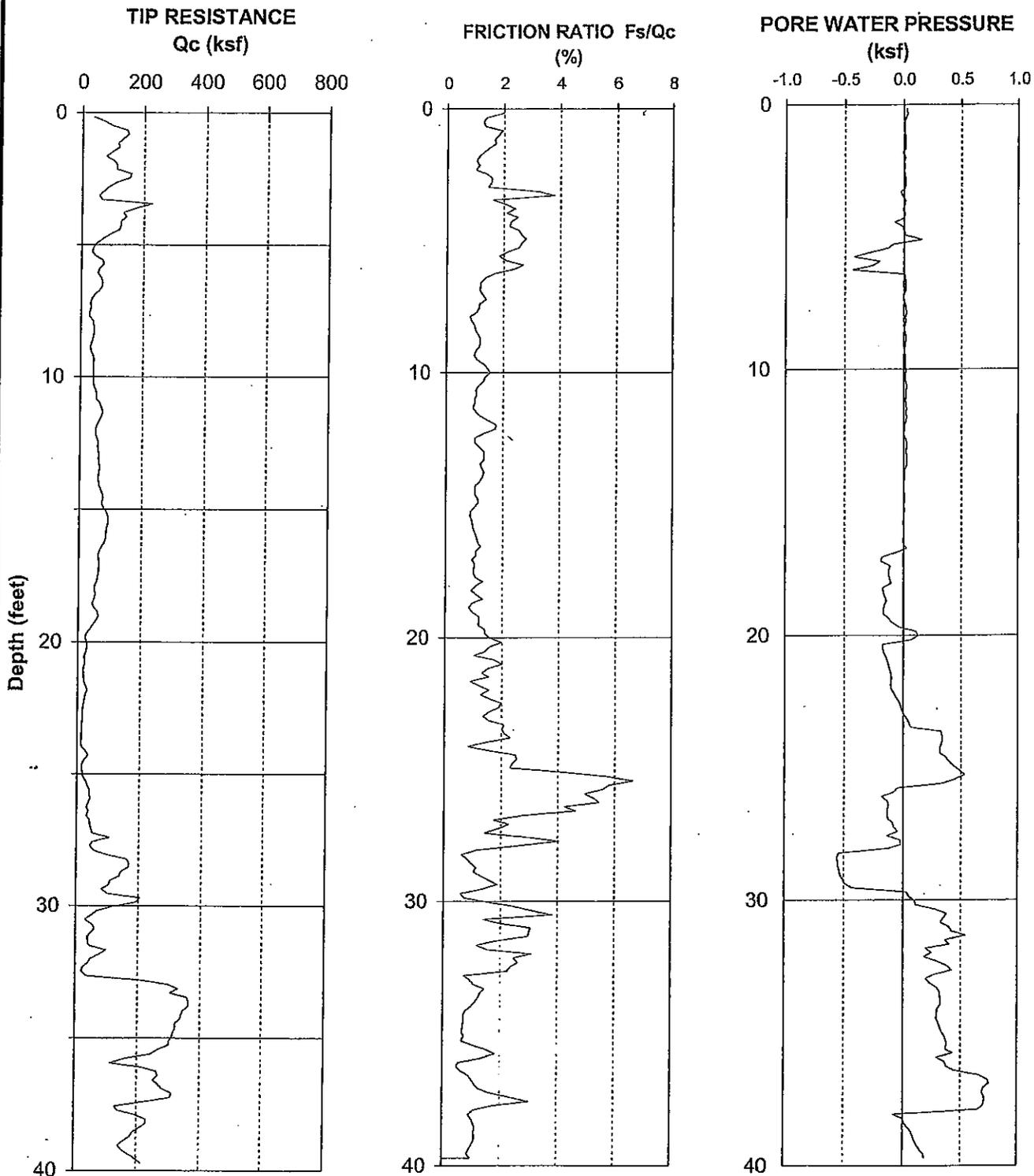
Subsurface conditions were explored at the site by advancing three cone penetration tests. The CPTs were completed by Northwest Cone Explorations on December 26, 2006. The approximate locations of the explorations are shown on the Site Plan, Figure 2.

CONE PENETRATION TESTS

A CPT sounding involves pushing an instrumented probe into the ground and recording the tip resistance and sleeve friction at regular intervals. The resistance and friction data is used to evaluate the type of soil being penetrated, the soil density, and the soil strength through use of engineering correlations.

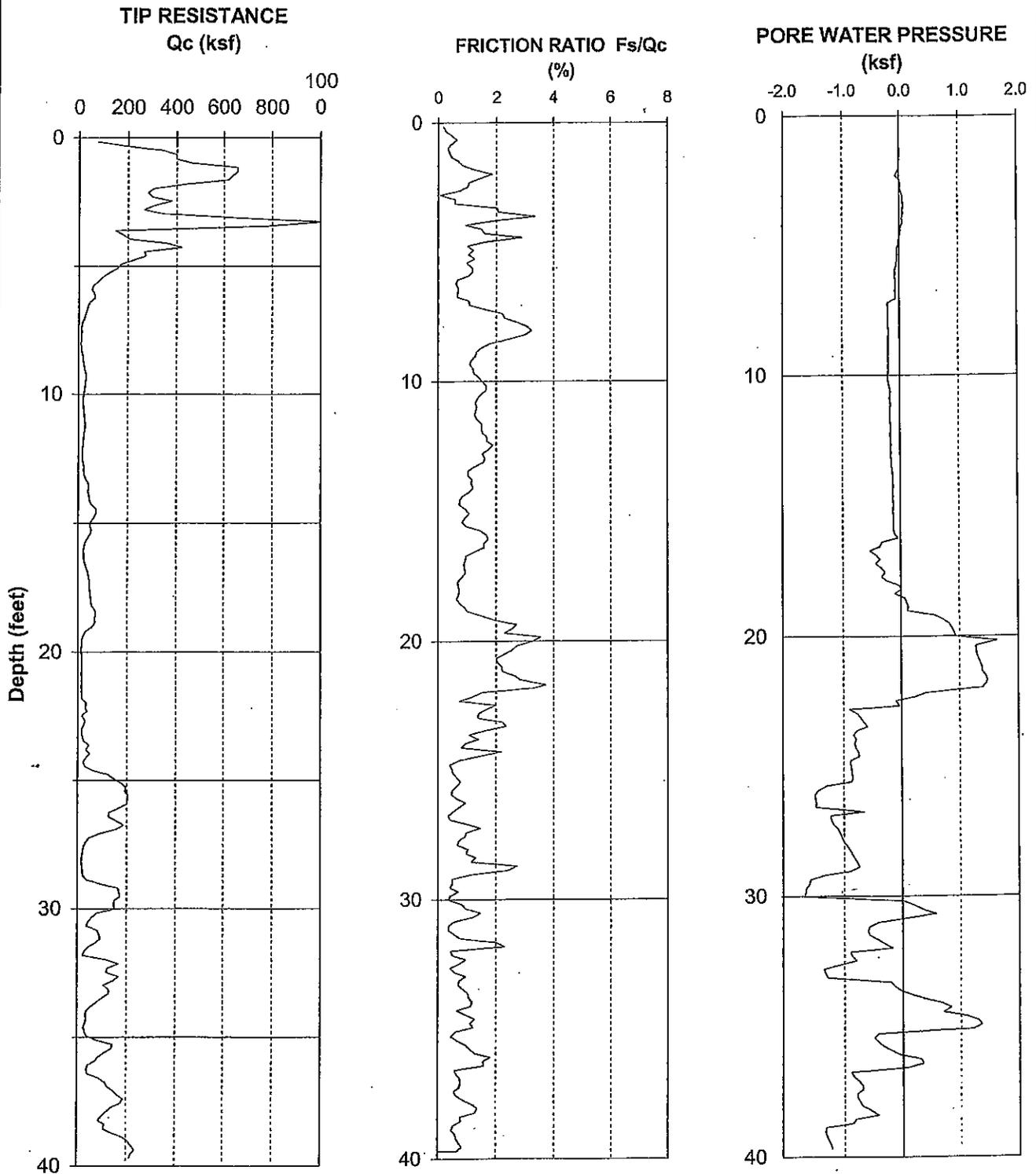
The cone penetration tests (CPTs) were completed using an electric cone. The logs of the CPT soundings are presented in Figures A-1 to A-3. The CPT soundings were advanced to depths of about 40 feet below the existing ground surface. The CPT soundings were backfilled in general accordance with procedures outlined by the Washington State Department of Ecology.

Segale Level Slope Stability Evaluation CPT-1



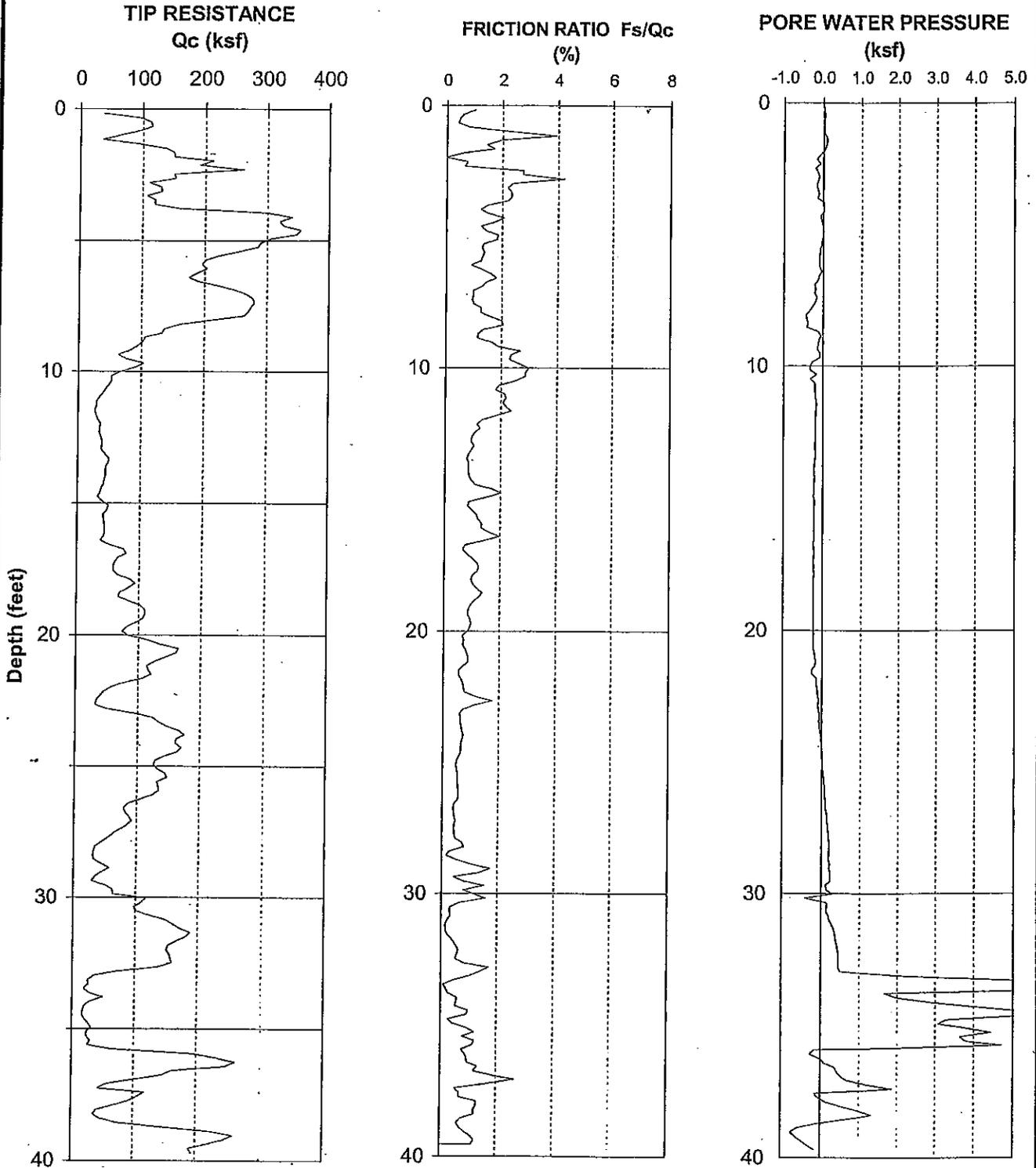
0291-037-00 KGO: 02-01-07 P:\0291037\00\working\CPT-LIQ Ver 1.3 (CPT-1).xls

Segale Level Slope Stability Evaluation CPT-2



0291-037-00 KGO: 02-01-07 P:\0291037\00\working\CPT-LIQ Ver 1.3 (CPT-2).xls

Segale Level Slope Stability Evaluation CPT-3



0291-037-00 KGO: 02-01-07 P:\10\0291037\00\working\CPT-LIQ Ver 1.3 (CPT-3).xls

APPENDIX B REPORT LIMITATIONS AND GUIDELINES FOR USE¹

This appendix provides information to help you manage your risks with respect to the use of this report.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Segale Properties, and their authorized agents. This report may be made available to prospective contractors for their bidding or estimating purposes, but our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with which there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for the Segale Levee Stability Evaluation Project in Tukwila, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

SUBSURFACE CONDITIONS CAN CHANGE

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

MOST GEOTECHNICAL AND GEOLOGIC FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

GEOTECHNICAL ENGINEERING REPORT RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT COULD BE SUBJECT TO MISINTERPRETATION

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE EXPLORATION LOGS

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

CONTRACTORS ARE RESPONSIBLE FOR SITE SAFETY ON THEIR OWN CONSTRUCTION PROJECTS

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

GEOTECHNICAL, GEOLOGIC AND ENVIRONMENTAL REPORTS SHOULD NOT BE INTERCHANGED

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

BIOLOGIC POLLUTANTS

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Exhibit C

Amendment of King County Flood Hazard Management Plan



KING COUNTY

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

Signature Report

January 17, 2007

Ordinance 15673

Proposed No. 2006-0293.3

Sponsors Constantine and Hague

1 AN ORDINANCE relating to river and floodplain
2 management, adopting the 2006 King County Flood Hazard
3 Management Plan as a functional plan of the King County
4 Comprehensive Plan; and amending Ordinance 11112,
5 Section 1, and K.C.C. 20.12.480.
6
7

8 STATEMENT OF FACTS:

- 9 1. Six major river systems flow through King County - the South Fork
10 Skykomish, Snoqualmie, Sammamish, Cedar, Green and White rivers -
11 and their significant tributaries, the Tolt, Raging, Miller and Greenwater
12 rivers. Other tributaries and smaller streams include Tokul creek, Kimball
13 creek, Coal creek (Snoqualmie), Issaquah creek, Fifteen Mile creek and
14 Holder creek.
- 15 2. River and stream flooding impact private property, businesses, public
16 and private infrastructure such as parks and utilities, transportation
17 corridors, and can directly and indirectly result in loss of life.

18 3. King County adopted the policies of the 1993 Flood Hazard Reduction
19 Plan as operating principles to guide King County's River Management
20 Program and to meet the intent of the water and natural resource policies
21 of the 1994, 2000 and 2004 King County Comprehensive Plans. The
22 Flood Hazard Reduction Plan is listed as a functional plan of the King
23 County Comprehensive Plan 2004 in Technical Appendix A (Capital
24 Facilities).

25 4. The 2006 Flood Hazard Management Plan is an update to the 1993
26 Flood Hazard Reduction Plan to respond to aging flood protection
27 infrastructure and unmet maintenance needs, new or updated federal
28 regulatory requirements, environmental impacts of past flood hazard
29 management practices and changes in watersheds since 1993.

30 5. The 2006 King County Flood Hazard Management Plan meets the
31 requirements of the National Flood Insurance Program's Community
32 Rating System, which provides a thirty-five-percent discount on federally-
33 backed flood insurance premiums for unincorporated King County
34 property owners. Savings are approximately two hundred eighty-three
35 dollars per year for the average flood insurance policy.

36 6. The 2006 King County Flood Hazard Management Plan complies with
37 the federal Disaster Mitigation Act and will assure that King County
38 remains eligible and competitive for state and federal programs providing
39 technical and financial assistance to local communities for flood hazard
40 management.

41 7. The 2006 King County Flood Hazard Management Plan considers the
42 impact of flood hazard management policies and actions on habitat for
43 Puget Sound Chinook salmon and bull trout, which are listed as threatened
44 under the federal Endangered Species Act.

45 8. The 2006 King County Flood Hazard Management Plan proposes
46 project actions to repair, replace, and in some cases remove, levee and
47 flood protection infrastructure to ensure King County can adequately
48 reduce flood risks and address critical infrastructure needs.

49 9. The 2006 King County Flood Hazard Management Plan is necessary to
50 protect life and safety, valuable public and private property, the regional
51 economy and general welfare of King County and its residents.

52 10. Implementation of the 2006 King County Flood Hazard Management
53 Plan will require additional funds to ensure timely implementation of the
54 projects and programs that are outlined in the plan to reduce flood risks
55 and infrastructure needs on major rivers in King County and to address
56 subregional flood risks and infrastructure needs on tributaries, and that
57 carry out the flood risk policies and other policy objectives of the plan, as
58 are identified by the council, executive and cooperating jurisdictions.

59 11. The King County executive has transmitted a proposed ordinance
60 (Proposed Ordinance 2006-0334) proposing the formation of a countywide
61 flood control zone district and the dissolution of existing flood control
62 zone districts within the county.

63 12. Chapter 7 of the King County Flood Hazard Management Plan
64 identifies the creation of a countywide flood control zone district and an
65 annual assessment as the preferred alternative for financing of projects
66 listed in the plan. Proposed Ordinance 2006-0293 cannot and does not
67 create a county flood control zone district or levy an assessment. Creation
68 of such a district can only be accomplished through a separate legislative
69 action by the council. The legislation to accomplish has been transmitted
70 under Proposed Ordinance 2006-0334. Separate legislation would also be
71 needed to levy an assessment.

72 13. Support for and approval of King County Flood Hazard Management
73 Plan does not constitute a commitment, either by the council as a whole or
74 by individual members of the council, to establish of a specific funding
75 mechanism or tax assessment. Further deliberation on funding issues and
76 discussions with other local governments in King County will take place
77 as part of the council's deliberation on Proposed Ordinance 2006-0334
78 establishing a county flood control zone district.

79 BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

80 SECTION 1. Ordinance 11112, Section 1, and K.C.C. 20.12.480 are each hereby
81 amended to read as follows:

82 The King County Flood Hazard ~~((Reduction))~~ Management Plan ~~((policies))~~, as
83 shown in Attachment ~~((A [to Ordinance 11112] and incorporated herein by reference,~~
84 ~~are))~~ A to this ordinance is adopted as ~~((operating principles))~~ a functional plan to guide
85 King County's ~~((flood-hazard-reduction))~~ river and floodplain management program~~((s))~~

86 and to meet the intent of the ~~((water and natural resource))~~ natural environment, and
87 facilities and services policies of the King County Comprehensive Plan. As an
88 amplification and augmentation of the King County Comprehensive Plan, ~~((the policies))~~
89 the flood hazard management plan constitutes official county policy with regard to
90 ~~((flood hazard reduction and flood plain))~~ river and floodplain management in King
91 County. For each site-specific project, such as levee improvements or concentrated areas
92 of home buyouts or elevations, a project summary is included to provide a better
93 understanding of the flood or erosion conditions of concern and the action or actions
94 proposed to address them. Project summaries, and references to easements, buffers or
95 levee improvements, including levee laybacks, in connection with such project
96 summaries are intended to function at the level of planning documents and do not assume
97 that the nature and scope of each of the described projects are the final project or action
98 that are described in this chapter 5 or in Appendices E, F and G of Attachment A to this
99 ordinance. The proposed projects and actions are not intended to substitute for the site-
100 specific analysis to determine what is required for each of the site specific capital projects
101 that will be recommended and adopted as part of an annual capital improvement plan.
102 The priority, scope, nature and cost of the proposed projects or actions may change as the
103 hydraulic, engineering and geotechnical conditions at each site are analyzed in greater
104 detail, and as engineering alternatives are developed, analyzed, reviewed and negotiated
105 with federal, state, local and tribal agencies and affected property owner or owners.
106 However, while the plan sets forth what the county currently believes are best practices,
107 nothing in this plan creates or precludes the creation of new land use requirements, laws
108 or regulations. ~~For the reach of the Tukwila 205 levee and any extensions thereon~~

109 ~~between South 180th Street and South 204th Street, the setback, easement, and slope~~
110 ~~design recommendations of the King County Flood Hazard Management Plan are~~
111 ~~satisfied if the repair, extension or modification of an existing levee or the design of a~~
112 ~~new levee meet the design guidelines and factors of safety in United States Army Corps~~
113 ~~of Engineers Engineering Manual for the Design and Construction of Levees (EM-1110-~~
114 ~~2-1913) dated April 30, 2000, as most currently updated.~~

115 SECTION 2. It is the intent of the county to take timely action to ensure adequate
116 funding is available for the implementation of projects and programs that are outlined in
117 the plan to reduce flood risks and infrastructure needs on major rivers in King County
118 and to address such subregional flood risks and infrastructure needs on tributaries and in
119 jurisdictions that have regulations consistent with the plan, that carry out the flood risk
120 policies and other policy objectives of the plan, as may be identified by the executive, the
121 executive's staff and cooperating jurisdictions. Such subregional flood risks and
122 infrastructure needs as may be identified would also recognize past investments in flood
123 risk reduction and local cost shares for any future funding.

124 SECTION 3. Severability. If any provision of this ordinance or its application to

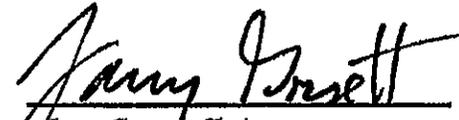
Ordinance 15673

125 any person or circumstance is held invalid, the remainder of the ordinance or the
126 application of the provision to other persons or circumstances is not affected.
127

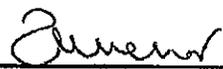
Ordinance 15673 was introduced on 7/10/2006 and passed as amended by the Metropolitan King County Council on 1/16/2007, by the following vote:

Yes: 9 - Mr. Gossett, Ms. Patterson, Ms. Lambert, Mr. von Reichbauer, Mr. Dunn, Mr. Ferguson, Mr. Phillips, Ms. Hague and Mr. Constantine
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON


Larry Gossett, Chair

ATTEST:


Anne Noris, Clerk of the Council

APPROVED this 24 day of January, 2007.

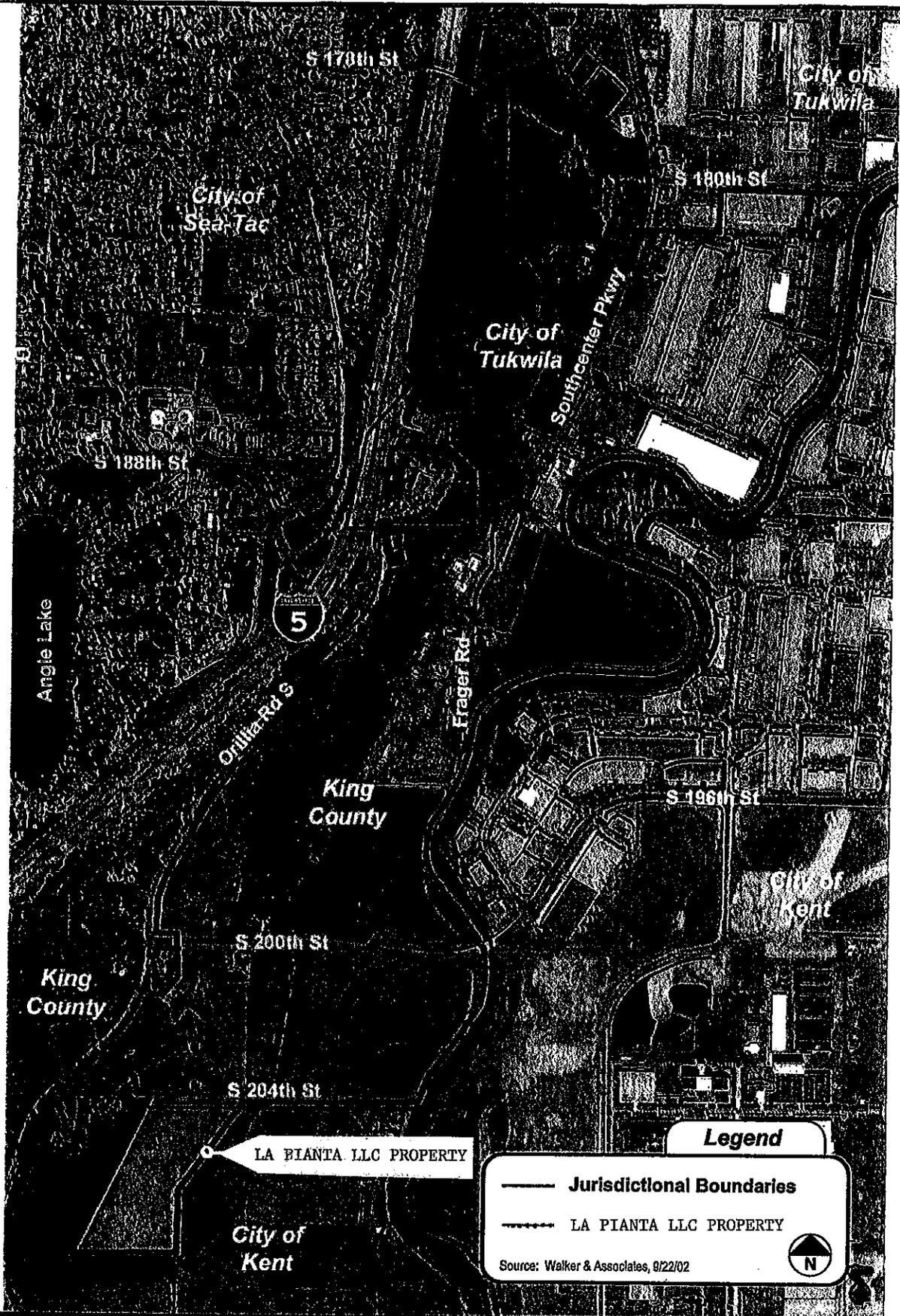

Ron Sims, County Executive

Attachments A. 2006 King County Flood Hazard Management Plan dated December 5, 2006

RECEIVED
2007 JAN 25 AM 11:40
KING COUNTY COUNCIL

Exhibit D

Aerial Photograph of the La Pianta LLC Property



Site Map

Exhibit E

Letter from Andy Kindig, Ph.D.

January 13, 2009
Project No. 195

Mr. Mark Segale
Segale Properties
PO Box 88028
Tukwila, WA 98138

**RE: Tukwila Shoreline Master Plan; Green River Setbacks at the Tukwila South
205 Levee**

Dear Mr. Segale,

My comments on appropriate setbacks to provide for buffer functions and values on the Green River where levees are present were sent to you in a letter dated October 16, 2008 (attached for convenience to this letter). I understand that letter was submitted to the City as part of its Shoreline Master Program Update hearing and public comment process. The City's response was the following:

"Staff's reading of WAC 173-26-221 (2)(a)(ii) is that it is inconsistent for the river buffer to be smaller than the SAO buffer for smaller fish-bearing watercourses."

This reply from City staff is inadequate response to the October 16, 2008 letter for the reasons explained below.

WAC 173-26-221 (2)(a)(ii) says the following:

"Provide a level of protection to critical areas within the shoreline area that is at least equal to that provided by the local government's critical area regulations adopted pursuant to the Growth Management Act for comparable areas other than shorelines."

The reference to "level of protection" does not equate to "width of buffer" in this code. The reference means the benefits that buffers supply to streams in their existing conditions must be equally protected.

Briefly summarized, the October 16, 2008 letter set forth the rationale behind shoreline buffer protections as they are reflected in best available science. It is the city's obligation to use best available science to determine how to best protect existing shoreline "functions and values". "Functions and values" with regard to shoreline buffers are those environmental attributes that are essential to or help support the (in this case)

riverine environment in terms of water quality and habitat quality. There is nothing magical about a fixed rubber stamp buffer width that will protect water quality and habitat quality functions as they exist. Rather, for the reasons set forth in the October 16th letter, science is used to define the various existing functions, and how wide a buffer needs to be to make sure those functions continue to support the river. The width the buffer needs to be varies with the circumstances. As the October 16th letter makes clear, the presence of a levee precludes most functions from "reaching over the levee" to serve the river. Therefore, setting a buffer wider than the levee does not provide any additional function benefit, or provide any additional protection of existing functions.

In essence, city staff missed the point of both the WAC and the October 16th letter in its reply. The city needs to protect shoreline functions as they currently exist equally to how they would be protected under the Sensitive Areas Ordinance. The Sensitive Areas Ordinance buffer widths are based on how wide they need to be to protect the functions and values of other smaller streams in the city, which are typically not contained within levees. In smaller streams without levees, protecting existing stream functions could well require larger buffers than for the levee portions of the Green River, because there is no dividing levee preventing more distant functions from being delivered to the stream. Equal protection of existing functions will occur if the Green River buffer matches the levee, because there are no appreciable functions landward of the levee to protect. The levee prevents this potential. The reasons for this are contained in the October 16th letter.

Sincerely,

A handwritten signature in black ink that reads "Andrew C. Kindig". The signature is written in a cursive, slightly stylized font. The first name "Andrew" is written in a larger, more prominent script, and "C. Kindig" follows in a similar but slightly smaller script. The signature is positioned above the typed name and title.

Andrew C. Kindig, Ph.D.
Principal Biologist
A.C. Kindig & Co.

A.C. Kindig & Co.

ENVIRONMENTAL CONSULTING

PO Box 2486
Redmond, Washington 98073

October 16, 2008
Project No. 195

Mr. Mark Segale
Segale Properties
PO Box 88028
Tukwila, WA 98138

RE: Tukwila Shoreline Master Plan; Green River Setbacks at the Tukwila South 205 Levee

Dear Mr. Segale,

This letter is a written summary of our conversation about the City of Tukwila Planning Commission's work on the Shoreline Master Program (SMP) update. The Planning Commission is considering city staff's recommendation for a watercourse buffer of 125 feet for commercial zones along the Green River Type 1 watercourse urban conservancy shoreline south of I-405. It is my understanding this recommendation is made on the general pretext that best available science supports a 100 foot buffer around Class 2 streams under the City's Sensitive Areas. It is my understanding this recommendation reasons that since best available science determined a 100 foot buffer was warranted for Class 2 streams in the city under its Sensitive Areas Ordinance (SAO) (18.45.100), similar scaled buffers should be warranted for commercial-zoned reaches of the Type 1 Green River south of I-405 under the SMP, irrespective of actual bank-side or riparian conditions.

Best available science should be used to determine an appropriate buffer width as one facet of many environmental and public use considerations in an SMP. It is well established in the City's existing SMP (18.44) and in the City's SAO (18.45.100.B) that buffers are preserved to protect existing riparian and stream functions. This is also emphasized in the June 2003 *Best Available Science Issue Paper: Watercourses* by Adolfson Associates, Inc. that the City is using as a supporting document to the SMP update. Adolfson (2003) found that in the lower sections of streams in the City of Tukwila, "...urbanization has encroached on the riparian zone, and the ability of buffers to perform functions such as large woody debris recruitment or water quality improvement has been compromised." The Green River has several very different bank-side conditions within the City of Tukwila which include the U.S. Army Corps 205 levees and non-205 levees adjacent to the Tukwila South Project (north and south of S. 196th Street, respectively; see City Shorelines Map 8), along with revetments and unprotected banks elsewhere in the City. These levee-caused differences in bank conditions affect riparian function potential to a far greater extent than the limitations noted by Adolfson (2003) for urbanization alone. Levees strongly affect the buffer widths that best

available science indicates are warranted to preserve existing functions, because they affect the functions by their presence. Uniform shoreline buffers are not appropriately applied to the non-uniform Green River bank-side conditions consisting of levees, revetments, and natural banks.

The 100-foot buffers for a Class 2 watercourse under the SAO assume the functions to be protected exist to usual potentials along the watercourse. However, where levees are present, many functions do not exist, and those that do are usually reduced in potential as discussed below.

This summary of riparian function potential speaks specifically to the levee riparian condition along the Tukwila South property owned by Segale Properties. Eight functional attributes of riparian buffers are identified and described in Table 1. Table 1 summarizes how each of these functions are severed or reduced by the presence of the levee. It is important to keep in mind that maintenance of the levee requires that large trees do not grow on the levee slopes or top, and certainly could not be allowed to senesce and fall after maturity with root wads into the river. The physical presence of the levee and its maintenance requirements separate the river from the uplands on the other side of the levee structure, and thereby sever some riparian functions. Other riparian functions are altered or impaired.

As shown in Table 1, the levee precludes some important riparian functions from occurring at all, and greatly restricts most other functions. The levee does provide protection of the river from human disturbance (by forming a substantial physical barrier between the river and residential or commercial activity on the upland) and for that function the levee is superior to what is normally a vegetative buffer function. Levees also physically separate the river from urban stormwater runoff, which is treated and detained before point release to the river in accordance with city stormwater requirements. There is no reliance on vegetative buffers to treat or intercept incidental sheetflow storm runoff from urbanized areas where levees are present. Where riparian functions are operating despite levee structures, the functions are generally restricted to the river-side slope of the levee. The levee structure provides a barrier to transmission of functions from the upland side of the levee to the river side of the levee.

The overall conclusion is that if best available science is employed with the goal of identifying suitable buffers for the Green River where 205 and non-205 levees exist, then the buffers do not need to extend beyond the levees themselves.

Sincerely,

A handwritten signature in black ink that reads "Andrew C. Kindig". The signature is written in a cursive, somewhat stylized font. The first name "Andrew" is written in a larger, more prominent script, and the last name "Kindig" is written below it, also in a cursive style. The signature is positioned above the typed name and title.

Andrew C. Kindig, Ph.D.
Principal Biologist
A.C. Kindig & Co.

Table 1. Stream Buffer Functional Potential Where Levees Exist

Stream Buffer Function	Mode of Effect	Potential with a Levee
<p>Water Quality, Temperature & Shade</p>	<p>Vegetation adjacent to streams can improve water quality by filtering pollutants, removing nutrients, or preventing sediment introduction, and lowering temperature through shading.</p>	<p>In urban areas, development eliminates natural infiltration pathways to streams, changing the hydrologic flow paths to favor piped drainage systems that either bypass the riparian area, or channel flow through the riparian area. Much of the natural buffer functions for hydrologic and water quality functions (peak flow attenuation, base flow releases, and water quality treatment) are removed from riparian buffer control by storm drain systems.</p> <p>Levees preclude upland stormwater sheetflow from reaching the river. Therefore, the only possible water quality function is from the riverside slope of the levee, where shrubs and grasses protect from erosion from natural rainfall. There are no pollution generating surfaces on the river side of the levee to cause pollutants such as fertilizers, suspended solids, oils, or heavy metals. Trees are not allowed to grow on the levee to lower temperature on the river by shading, so temperature control is not possible. Shade from trees on the upland side of the levee could not reach across the levee to provide meaningful shade. Detention and water quality treatment requirements are regulated for stormwater runoff from new development and redevelopment on the upland side of the levee.</p>
<p>Stream Food Delivery</p>	<p>Vegetation and plant material falling into the stream form an important part of the aquatic ecosystem food chain, especially in smaller stream channels.</p>	<p>CONCLUSION: Only the river side slope of the levee provides protection from sediment erosion due to natural rainfall falling on the levee slope. This function can be provided by grasses and shrubs that currently exist on the levee slope. No other water quality functions are possible.</p> <p>Particulate matter delivered by the adjacent riparian area directly or indirectly provides nutrients and energy for organisms eventually consumed by fish. Terrestrial insects living in the adjacent vegetation also contribute to the productivity of a stream. The majority of material comes from directly over, or within a very short distance of the stream.</p> <p>The upland slope of a levee directs vegetation and plant material away from, not towards the stream.</p> <p>CONCLUSION: Only the river side slope of the levee provides leaf litter and insect function potential. This function can be provided by grasses and shrubs that currently exist on the levee slope.</p>

Stream Buffer Function	Mode of Effect	Potential with a Levee
Microclimate	Riparian vegetation protects streams from climate changes caused by widespread development away from the stream, including soil and air temperature, humidity, and wind.	<p>There is no direct link between microclimate and the condition of salmonid habitat that appears in the literature. However, it has been suggested that microclimate needs protection (in addition to shade or temperature control, discussed below) to maintain desirable assemblages of plants and animal species, including insects, beneficial to fish. If protection to natural forested microclimate conditions is the goal, the literature reports buffers of 100 to over 500 feet of riparian forest could be necessary. However the levee prevents forested conditions adjacent to the river from occurring, and therefore precludes microclimate function from occurring. In addition, in urban areas, relative humidity and temperatures are controlled by surrounding development and not by forest.</p> <p>CONCLUSION: The levee precludes microclimate function.</p>
Large Woody Debris	Large woody debris (LWD) consists of downed tree stems and branches and is a functionally important structural component of stream channels.	<p>The probability that a falling tree will reach a stream is a function of its distance from the stream, tree size, ground slope near the stream, and predominant wind direction. In a mature coniferous forest, the majority (70 to 90 percent) of LWD in a stream comes from within 50 feet of the stream; 90 to 99 percent comes from within 100 feet, and virtually all LWD contributed to streams in a typical Puget Sound lowland forested region comes from within a distance equal to approximately 150 feet. However, mature trees are not allowed to develop on a levee, and the physical levee structure prevents mature trees on the upland side of the levee from reaching the river.</p> <p>CONCLUSION: The levee precludes large woody debris function.</p>
Human Access Control	Buffers can provide a method of reducing direct encroachment of humans	<p>The levees provide protection from direct human impact by trampling, bank erosion, refuse dumping, and noise that can be issues along more natural stream banks. Upland activities, both residential and commercial, are hidden from the river by the levee.</p> <p>CONCLUSION: The levee provides all human access control function, irrespective of the type of land use (i.e., commercial vs. residential) that exists.</p>
Wildlife Habitat	Riparian-dependent wildlife need protection of streamside habitat to meet their needs, and wildlife use stream buffers as migration corridors.	<p>Levee structures and maintenance preclude both a natural river/bank-side transition, as well as most native forest vegetation upon which most riparian dependent wildlife depend. Therefore, the habitat value where levees exist is severely constrained. There is some benefit to the river side of the levee from reducing upland human disturbance from reaching the river corridor and immediate bank-side, but this comes at the cost of the riparian zone being restricted to the river side slope of the levee.</p> <p>CONCLUSION: Riparian-related habitat conditions are poor and wildlife migration is largely restricted to the river-side slope of the levee.</p>

Stream Buffer Function	Mode of Effect	Potential with a Levee
<p>Channel Migration</p>	<p>The channel migration zone (CMZ) is that area of the landscape that encompasses the lateral extent of likely stream channel movement over time due to stream bank erosion and new channel incision.</p>	<p>As channels move, new large woody debris and stream gravels are recruited resulting in the creation of new mainstem fish habitat. The abandoned mainstem channels often remain as side channels and backwaters offering off-channel rearing habitat opportunities for juvenile salmonids and their prey. However, the levees are designed to prevent stream migration, and are maintained to keep streams confined.</p> <p>CONCLUSION: The levee precludes channel migration function.</p>
<p>Bank Stability</p>	<p>Roots from vegetation growing along the streambank help stabilize soils and reduce erosion. Overhanging roots also provide habitat for fish where streams undercut the root balls.</p>	<p>The soil stabilizing benefits of root structures is greatest within one-half of the crown diameter of the vegetation growing along the bank. Along the levee, this is restricted to small shrubs.</p> <p>CONCLUSION: Only the river side slope of the levee provides bank stability potential from small shrubs.</p>