CRITERIA FOR CONSTRUCTION WITHIN THE LIMITS OF DALLAS COUNTY UTILITY AND RECLAMATION DISTRICT LEVEES
Revised: September 14, 2011

1. Purpose.

This document provides guidance to individuals, developers, architect-engineering firms, and local governmental agencies for the construction of new facilities or the modification of existing facilities within the limits of the Dallas County Utility and Reclamation District (DCURD) flood protection levees. DCURD retains the right of review and approval on all proposed improvements and/or modifications that are passed along, over, under, or through the existing levees. The guidance contained in this document applies to the activities described herein in most cases; however DCURD reserves the right to reconsider this guidance at any time due to unknown or unforeseen circumstances, technological advances, additional information, etc.

Geotechnical Levee Modification Guidelines are included in this document as Attachment A. These guidelines shall be used whenever a geotechnical analysis is required in this document. The typical Levee Protection Easement language and document are included in this document as Attachment B. The Levee Protection Easement document contains Exhibits A and B that depict terminology that will be used throughout this document.

2. Project Purpose.

DCURD's levees are designed to provide protection from floodwater from the Elm Fork of the Trinity River. As such, any proposed developments within the levees must provide DCURD's required level of protection from floodwater as the first priority. The role of DCURD is to maintain the integrity of the levees and other facilities while preventing negative impacts to those facilities. DCURD will use its best efforts to not allow the safety of the levee and other facilities to be compromised or the required design capacity of the project to be reduced.

3. General Criteria for Construction Near DCURD Levees.

a. As early as possible during the planning process, discuss preliminary proposals with DCURD and the City of Irving to avoid major revisions or project delay. Concept proposals may be submitted for review.

b. Preliminary design packages shall be submitted to DCURD. The design submittal shall include construction plans, specifications and a geotechnical engineering report. The geotechnical engineering report shall include a site specific slope stability analysis of any proposed structures (such as walls) and the levee.

c. Furnish five (5) sets of plans and specifications for the proposed work to DCURD ten (10) working days in advance of proposed construction to allow adequate time for review and approval. Initial review comments will be provided back to the requesting entity within 10 working days.

d. Construction may not start until contract drawings and plans have received final approval in writing by DCURD. Further, DCURD must be notified in writing 72 hours prior to start of construction after final approval of drawings and plans have been received.

e. If boring, jacking, or tunneling operations are planned; detailed designs, calculations, geotechnical analysis and construction procedures must be provided for review. See subsequent paragraphs for additional details and required procedures.

f. Practice approved construction methods and best management practices to minimize erosion at the construction site. All work shall be performed in such a manner as to be as environmentally friendly as possible. A storm water pollution prevention plan (SWPPP) must be included in the final project submittal.

g. Construction equipment, spoil material, supplies, forms, buildings for inspectors, labs, or equipment and supply storage buildings, etc., shall not be placed or stored on the levee or in the floodplain of the Elm Fork during construction activities. Locations of construction trailers and stockpile areas shall be included on project plans and approved by DCURD.

h. Repair or replace any maintenance and operation roads disturbed during construction to a condition equal to or better than their condition before construction. All roads must be inspected by DCURD prior to completion of the project.

i. The crown or crest of the levee referred to in this document is the original or design levee crest elevation for the DCURD Levee Area as shown on Exhibit B of the Levee Protection Easement. This may or may not be the same as the current levee crest elevation. All modifications shall be based on the higher of the two elevations.

4. Structures Within the Levee Protection Easement

This section addresses structures that are built within the Levee Protection Easement set up by DCURD for properties along the levees. Structures within the Levee Protection Easement shall comply with the following general criteria. DCURD reserves the right to add to or modify these criteria.

a. All walls within the Levee Protection Easement shall be constructed down to elevation 420.0 feet.

b. No openings, passageways, doorways, windows or penetrations of any kind will be allowed in walls within the Levee Protection Easement.

c. Habitable spaces will be allowed behind walls within the Levee Protection Easement.

d. No soil anchors, soil nails or tie backs of any kind will be allowed within the DCURD Levee Area or the FEMA Certified Levee Area.

e. Footings supporting walls within the Levee will not be allowed to extend into the FEMA Certified Levee Areas.

f. Walls within the Levee Protection Easement shall be designed to prevent penetration of water through or under the wall. The proposed top of levee elevation of the DCURD Levee Area will be used as the basis for design of water proofing.

g. Water injection for conditioning of soils will not be permitted within the levee protection easement.

h. Provisions shall be made along the dry side toe of the DCURD Levee for vehicular access by DCURD. The access width to be considered shall be up to 15 feet. This requirement will be reviewed and approved by DCURD on a case by case basis.

i. No trees are permitted within the DCURD Levee Area or the FEMA Certified Levee Area.

5. Pipelines Crossing Over Existing Levees At Grade.

a. DCURD reserves the right to decide if proposed pipeline crossings will be allowed over existing levees at grade. If allowed, the following items shall be provided.

b. Pipelines crossing over the levees at grade will be required to be placed above the DCURD Levee and FEMA Certified Levee Areas.

c. Pipelines crossing over the levees will require rather abrupt line grade changes at the levee crest. Cover the new pipeline by placing new fill uniformly on the slopes and top of the levee to slope away from the pipeline and parallel to the longitudinal axis of the levee. Existing topsoil within the pipeline crossing shall be stripped from the levee. Fill shall be compacted as per the recommendations of a geotechnical engineering report supplied by the entity sponsoring the work. Provide a minimum of 2 feet of cover over the new pipeline. The slope of the fill shall be 1 vertical on 20 horizontal or flatter. Replace the topsoil, reestablish grass on all disturbed areas, and restore any roadways.

d. All valves located within 15 feet of either side of the projected toe of the levee shall be provided in a concrete box enclosure with a manhole type cover. Valve boxes located within the floodplain of the Elm Fork shall be underground and flush with the surface. If the valve box is placed in the levee crest, the bottom of the excavation shall be not lower than one foot above the design water surface elevation. Fill shall be uniformly placed to slope away from the top of the valve box. If possible all valves shall be placed on the landside of levees a minimum of 15 feet from the projected levee toe.

e. Provide water-tight sealed manhole covers for all manholes within the floodplain of the Elm Fork having tops below design water surface elevation. Fasten manhole covers to the manhole structures.

6. Franchise Utility Pipelines Crossing the Levees

a. DCURD reserves the right to decide if proposed franchise utility pipelines crossing the levees will be allowed. If allowed, the following items shall be addressed.

b. Approved franchise utility pipelines will be allowed to notch into the DCURD Levee and FEMA Certified Levee Areas. The maximum depth of the excavated notch that will be allowed is two (2) feet.

c. No franchise utilities carrying liquids will be allowed to notch into the levee.

d. All approved franchise utility pipelines shall be encased within an approved encasement material for the entire length of the levee crossing.

e. No granular material will be allowed as backfill within the excavated notch. Backfill shall be compacted as per geotechnical engineer's recommendations.

f. Pressure grout the product line within the encasement pipe with a cementious, flowable grout prescribed by the geotechnical engineer.

7. Crossing Under Levees with Open Excavation.

DCURD reserves the right to decide if any proposed crossing under existing levees with open excavation will be allowed. If allowed, the following items shall be provided.

a. Provide a temporary ring levee (cofferdam) on the riverside of the existing levee at the location of the subject crossing to the same top elevation as the existing levee. This ring levee shall have a minimum crest width of 10 feet and side slopes of 1 vertical on 3 horizontal or flatter. Construct the levee of impervious materials according to the recommendations provided by a geotechnical engineering report. The geotechnical engineering report is to be provided by the entity sponsoring the project.

b. When the temporary ring levee is complete, excavate through the existing levee using one vertical on three horizontal cut slopes. The toe of the levee and ring levee shall be a minimum of 20 feet (measured horizontally) from the top edge of the excavation.

c. Sources for borrow materials shall originate from recommendations provided in the geotechnical engineering report. In addition, depending on the type of soil and whether or not pervious materials or unstable materials exist in the foundation of the existing levee, it may be desirable to limit the depth of excavation or specify a minimum distance from the land-side toe of the levee. All excavated slopes shall be properly designed and the drawings sealed by a licensed professional engineer.

d. Pipelines crossing under the levees shall be placed below elevation 420.0 feet for the entire length of the DCURD Levee, the FEMA Certified Levee and the Certified Levee for 100-Year Protection. After the pipeline has been placed, the open excavation will be compacted in accordance with the approved geotechnical engineering report. Anti-seep collars will be installed on the pipeline at the boundary of the DCURD Levee and the boundary of the Certified Levee for 100-Year Protection areas. When backfill operations are completed, the entire foundation area to be occupied by the replaced levee fill shall be constructed in accordance with the approved geotechnical engineering report.

e. When the breached levee has been reconstructed to its original grade, remove the temporary ring levee and dress and sod the surface areas of the plugged section.

f. Provide water-tight sealed manhole covers for all manholes within the flood protection project having tops below design water surface elevation. Fasten manhole covers to the manhole structures.

g. The Contractor is responsible for maintaining the temporary ring levee.

8. Crossing Under Levees with Boring or Jacking of Sleeves.

The sequence of work shall be as follows:

a. Excavate the boring and jacking pit (must be on the land side outside the projected toe of the DCURD Levee Area slope).

b. Bore and jack the sleeve to a point beyond the projected riverside toe of the FEMA Certified Levee Area slope.

c. If the difference in the diameters of the bore and sleeve exceeds 3 inches, the annular space shall be pressure grouted with a cementious flowable grout prescribed by the Engineer.

d. Place the product line in the sleeve.

e. Pressure grout the product line in sleeve with a cementious flowable grout prescribed by the geotechnical engineer.

f. Excavate the pit on the riverside and construct a manhole, as previously described, with gate valve placed on inside face of manhole away from channel. Tie line from sleeve under levee into manhole with gate valve.

g. Tie line from sleeve under levee into a manhole on landside.

h. During work on items a through g, a plug will be required to be placed and braced at the open end of the sleeve and pipe located in the jacking pit at the close of work each day. This plug must remain in place until the gate valve is installed and connections made to ensure protection from flooding from the river.

9. Horizontal Directional Drilling Under Levees.

a. Detailed contractual drawings, plans, procedures, and engineering calculations shall be provided to DCURD for review. These must include all the requirements of Paragraph 3 above and the following additional items:

(1) Inside diameter of the final bore hole and outside diameter of the product casing.

(2) Detailed description of construction and horizontal boring methods to be utilized.

(3) If the difference in the diameters of the final bore and product casing exceeds 3 inches, provide the method of pressure grouting the annular space between the outside of the product casing and the inside of the bore to prevent seepage under the levee during maximum river stages.

(4) A profile of the proposed line showing alignment (including location of the river and levees).

(5) Location of entry and exit points, location, elevations and proposed clearances for all utility crossings and structures

(6) Right-of-way lines, property, and other utility right-of-way or easement lines

(7) Depth under the base of the levee, depth of the line under the river channel, and location of both ends of the string. If the proposed depth of the string directly below the base of the levee is less than 30 feet, then detailed engineering

calculations sealed by a licensed professional engineer shall be provided for review. These calculations must show a minimum 1.5 factor of safety against hydro-fracturing to be acceptable.

b. Develop and provide a quality control plan for the project that includes the maximum allowable drilling pressure, gage calibration method, and responsibility for assuring that the pressure is not exceeded. During the drilling process, the pressure in the borehole must be monitored to ensure that the operational drilling pressures remain within the safe limits to prevent soil fracturing. The name of the party responsible for monitoring the work must be specified.

10. Buried Lines Parallel to Levees and Channels.

a. Buried lines parallel to the levees (either on the river side or land side) will not be allowed where the buried lines final location will be within the extended template of the DCURD Levee or FEMA Certified Levee Areas.

b. All buried lines within five (5) feet of the DCURD Levee or FEMA Certified Levee Areas shall be encased with an approved encasement material for the entire distance parallel to the levee.

11. Process for Abandoning Existing Pipelines.

a. Requests to abandon existing buried pipelines within a project shall be submitted in writing to DCURD and the City of Irving.

b. As a minimum, the portion of the abandoned pipeline under a levee shall be completely filled with concrete or grout to prevent seepage through the abandoned line during flood conditions.

c. Any structures associated with abandoned buried pipelines, for example, manholes, shall be removed and the resulting hole filled and compacted in accordance with an approved geotechnical engineering report.

12. Final Approval for Levee Crossings and Disturbance

The following items will be required from DCURD in order to obtain final approval for crossing or disturbing the DCURD levees:

a. A signed letter of approval of construction plans from DCURD prior to construction in the levee areas.

b. A signed letter of approval from DCURD that the levee and all disturbed areas have been adequately restored as per DCURD requirements.

c. A release of liability signed by the requesting entity.

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June 30, 2008

Dallas County Utility and Reclamation District
P.O. Box 140035
Irving, Texas 75014
Attention: Mr. Jacky Knox

Re: **Levee Modification Guidelines**
Urban Center – Las Colinas
Irving, Texas
ALPHA Report No. G080356

This letter presents our Levee Modification Guidelines for Dallas County Utility and Reclamation District (DCURD) existing levees in the Las Colinas urban center area of Irving, Texas. This study was authorized by Mr. Jacky Knox on April 3, 2008 and performed in accordance with ALPHA Proposal No. 22154 dated April 3, 2008. The purpose of the report is to provide geotechnical guidelines and earthwork specifications for increasing the height of existing DCURD levees using on-site soils or soils generally native to the Las Colinas area. Site specific geotechnical investigations and/or slope stability studies will be required.

1.0 GENERAL

1.1 Scope: The work includes excavating, filling, grading, and compacting new earth fill on existing Dallas County Utility Reclamation District (DCURD) levees for the purpose of raising the levees to the grades and lines shown on the project plans and specifications. The information presented herein should not be construed as geotechnical guidelines or recommendations for construction of new walls on levees, or stability analyses of existing levees either as-is or as modified in the future, or geotechnical studies/stability analyses for new levees or realigned levee sections.

It is anticipated that raising the elevation of the levee will be accomplished by adding new fill onto the existing levee section, starting at the base, such that the revised levee section will retain the original sideslope characteristics, or a shallower sideslope if stability studies dictate. This guideline is pertinent to that situation. If a structural wall is planned on top of the levee to achieve the desired elevation, or if a retaining wall system is planned at the base part of the levee to limit the horizontal extent of new fill, a separate geotechnical report will be required, and these guidelines will not be applicable. If a levee section is realigned, then a specific geotechnical investigation will be required.

These guidelines are not intended to cover every situation which may occur during grading and fill placement on DCURD levees. Conditions encountered in the field during construction may dictate modification of these guidelines, with DCURD approval.

ATTACHMENT "A"

1.2 Standards: The following ASTM standards form part of this specification. Any other testing required not specifically referenced to a standard shall be performed under ASTM or other appropriate standards as referenced by the engineer:

D 422 Particle Size Analysis of Soils
D 698 Moisture Density Relationship of Soils and Soil Aggregate Mixtures Using 5.5 Pound Rammer and 12 Inch Drop (Standard Proctor)
D 2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)
D 2488 Description and Identification of Soils (Visual-Manual Procedure)
D 2922 Density of Soil and Soil-Aggregate In-Place by Nuclear Methods
D 3017 Water Content of Soil and Rock In-Place by Nuclear Methods
D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils

2.0 SUBMITTALS

2.1 Items to be Submitted: At a minimum the Developer's Engineer shall submit to DCURD the following information prior to any activities on DCURD Levee Protection Easement Area.

- Test results from an Independent Testing Laboratory indicating suitability of the materials to be used as fill.
- The locations of proposed staging areas, stockpiles, or borrow areas if they are on DCURD property.
- A site specific geotechnical investigation and/or slope stability study will be required.
- Other submittals requested by DCURD or its Consultants. This could include (but is not limited to) samples of materials proposed for use for independent testing by DCURD.

2.2 Review of Geotechnical Studies: DCURD reserves the right to review and comment on aspects of the project geotechnical studies as they relate to potential impact on DCURD Levee Protection Easement Area. DCURD will respond in writing with comments within ten (10) business days following receipt of the geotechnical report.

3.0 MATERIALS

3.1 General Earth Fill: The materials used as general earth fill on the levee shall be limited to clays, shaly clays, and sandy clays classified as CH or CL materials (ASTM D 2487), with a liquid limit greater than or equal to 40 and a plasticity index greater than or equal to 20, and a minimum of 70 percent passing the No. 200 sieve. Materials shall be free of debris, organic materials, cobbles and boulders, or other objectionable materials.

3.2 Topsoil: Materials used for topsoil shall consist of soils which are suitable for this use, that are free of stones, debris or other objectionable materials, and have sufficient organic and humus content to readily support vegetative growth.

3.3 Storage of Materials on City Right-of-Way or DCURD Levee Protection Easement Area (Easement): Materials shall not be stored on City Right-of-Way or Easement without approval from City or DCURD respectively.

4.0 PREPARATION OF SITE and FILL PLACEMENT

4.1 Remove Organic Materials: Remove existing topsoil, grass and weeds, roots, and other vegetation from areas to be filled and graded, to expose levee subgrade soils. If trees are present within the planned grading and fill placement limits on the levee or within DCURD Levee Protection Easement, consult the project geotechnical engineer and DCURD prior to tree removal, to evaluate the effect of tree removal on stability of the levee.

4.2 Benching of Slopes: If fill is to be placed on existing slopes steeper than one (1) vertical to six (6) horizontal (1V:6H), excavate a bench into the existing slope of the levee to allow for horizontal lift placement of fill. Construct the bench in such a manner as to provide a minimum bench width of five (5) ft.

4.3 Scarify and Compact Subgrade: Prior to placement of new fill on the levee, scarify the upper 6 inches of the subgrade, and compact to a minimum of 95 percent of the material's maximum standard Proctor dry density (ASTM D 698) at a moisture content of 0 to 4 percentage points above the material's optimum standard Proctor moisture content. Consult the project geotechnical engineer where loose or soft areas of subgrade are encountered that will not compact.

4.4 Fill Placement: Deposit and place new fill material in horizontal lifts not exceeding 6 inches deep, loose measurement. Manipulate and mix each lift until the material is uniformly mixed and pulverized. Maximum clay lump sizes should not exceed 4 inches.

4.5 Compaction of Fill: Thoroughly compact each lift of fill to a minimum of 95 percent of the material's maximum standard Proctor dry density (ASTM D-698) at a moisture content of 0 to 4 percentage points above standard Proctor optimum moisture content. Compaction shall be accomplished with sheepsfoot roller, rubber-tired rollers, or other kneading-type compactors capable of achieving the desired level of densification.

4.6 Site Grading: Shape and finish earthwork to bring the levee to the finish grades and elevations shown on the plans.

4.7 **Disposal:** Surplus material, excavated material not suitable or required for levee fill, tools, and rubbish shall be removed from Right-Of-Way and Easement and disposed of in a legal manner. Leave City and DCURD property clean to the satisfaction of City and DCURD respectively.

5.0 FIELD QUALITY CONTROL

5.1 **Testing:** Field density testing of the prepared subgrade to receive fill and compacted fill material shall be performed by an Independent Testing Laboratory as approved by DCURD. The testing laboratory shall make a minimum of one (1) density test for each 2,000 sq ft of area per lift, but in no case less than two (2) tests per area to be tested.

5.2 **Test Reports:** A copy of all test reports which pertain to work performed on DCURD property should be submitted to DCURD. DCURD reserves the right to utilize its own Geotechnical Consultant to perform additional field tests and to review testing reports submitted by the Contractor.

Professional services provided in this report were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. ALPHA TESTING, INC. is not responsible for conclusions, opinions or recommendations made by others based on this information. Information contained in this report is intended for the exclusive use of DCURD and their designated representatives, for the addition of new fill onto existing levees. Recommendations presented in this report should not be used for design of any other structure except that specifically described in this report.

ALPHA TESTING, INC. appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing materials testing services during construction, please contact our office.

Sincerely yours,

ALPHA TESTING, INC.

Theodore A. (Tony) Janish, P.E.
Principal

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