JEO CONSULTING GROUP INC

CITY OF FREMONT NEBRASKA

July 2020

Fremont Levee Evaluation
Fremont, Nebraska

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1. INTRODUCTION

The City of Fremont, Nebraska (City) retained JEO Consulting Group, Inc. (JEO) to evaluate the Fremont, Farmland, and Railroad Levee (Levee) and provide recommendations to meet the United States Army Corps of Engineers (USACE) Public Law (PL) 84-99 Rehabilitation Program criteria. The Levee is not recognized on the National Levee Database and is not active in the PL 84-99 program. The scope of work included in this evaluation included a site visit, limited topographic and right-of-way survey, evaluation of hydraulic conditions along the Levee, a geotechnical investigation and evaluation, and reporting. Terracon Consultants Inc (Terracon) was hired by JEO as a sub-consultant to perform the geotechnical investigation and evaluation components of this project; see Appendix A for a copy of the geotechnical report.

2. LEVEE SYSTEM BACKGROUND

The Levee lies southwest and south of Fremont, Nebraska. It is approximately 2.6 miles in length and provides the City flood risk reduction from the Platte River.

The upstream end of the Levee lies approximately 700-feet east of Ridge Road and approximately 1,300-feet south of W Military Avenue; the Levee ties into relative high ground in this area. The downstream end of the Levee ties into the upstream end of the Valley - Union and No Name Dikes System - Platte River LB (NF) (herein also referred to as Union Dike) at the railroad, approximately 100-feet south of Hills Farm Road. The Union Dike was not a part of this evaluation. However, the National Levee Database lists the Valley - Union and No Name Dikes System as having three segments; the upstream segment where the interface exists between the Fremont, Farmland, and Railroad Levee system is named the Valley - Union Dike - Platte River LB (NF) - BNSF Railroad Tie-Off, which appears to utilize the railroad embankment. Segments of the Union Dike are listed as having a 50-year design frequency. Information from the National Levee Database can be found in Appendix B.

The history of the Fremont, Farmland, and Railroad Levee, including its original construction, was not investigated during this evaluation. Figure 1 shows the Levee as well as locations damaged in the March 2019 flood events; these damages are discussed in Section 3. Due to the lack of information on the Levee's history, a levee stationing system was developed by JEO for this project based on the Levee's length. This stationing is shown on many of the Figures in this report. The City currently owns many of the parcels on which the Levee resides. However, some portions of the Levee prism are located on privately owned land; land rights are discussed further in Section 14.

3. MARCH 2019 FLOOD DAMAGE ASSESSMENT

In August 2019, JEO inspected the Levee for damages that occurred during the March 2019 flood events. During this effort, JEO identified two damaged locations: Sites 1 and 2, refer to Figure 1. Site 1 was divided into four sections (Sites 1A, 1B, 1C, and 1D). Sites 1A and 2 were completely breached. Sites 1B, 1C, and 1D were partially breached. JEO provided a Flood Damage Assessment report that identified these Levee damages, recommended projects for permanent repair, and provided preliminary estimated repair costs. The damage assessment can be found in Appendix C. Damage Sites 1 and 2 have been temporarily repaired with earthwork placement, back to pre-flood dimensions. The City has indicated permanent

repairs will be completed in the future. Permanent repairs will potentially include improvements recommended in this report.

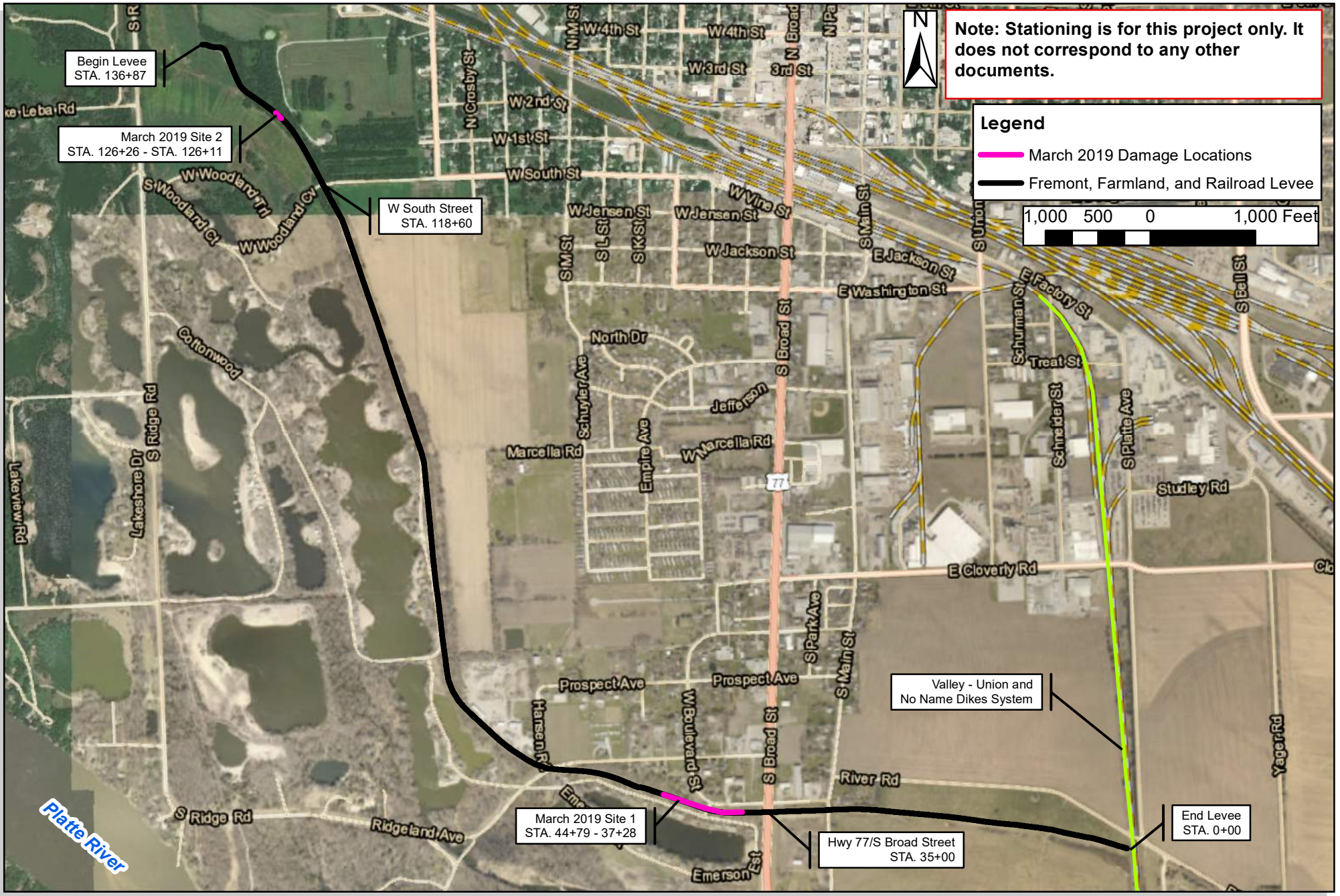

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Figure 1: Fremont Levee Evaluation Overview Map

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4. SITE VISIT

A Levee project area site visit was performed November 18, 2019 by Dan Fricke, Ross Lawrence, and Megan Gren (JEO Consulting Group, Inc.) and Ed Prost (Terracon Consultants Inc.). This site visit took place after the City had mowed the Levee to increase accessibility and visibility of the Levee system. For the inspection, we walked and drove directly on top of or beside the Levee, where accessible, and noted items that may affect the Levee's PL 84-99 Rehabilitation Program eligibility, including animal burrows, vegetation, encroaching utilities, and erosion. The inspection generally utilized the USACE inspection report and engineering judgment. Some areas of the Levee, mainly the landward slope, were not accessible due to dense woody vegetation. Findings from the site visit, including photos and inspection notes, have been compiled in Appendix D.

5. FREMONT SOUTHEAST BELTWAY PROJECT

The Nebraska Department of Transportation (NDOT), in cooperation with the City, has proposed a project, the Fremont Southeast Beltway Project, for a new four-lane divided expressway on the south side of the City. The proposed work extends from the north side of the Highway 77 bridge to Highway 275's intersection with Morningside Road. See Figure 2 for an overview of the project with respect to the Levee. As shown on Figure 2, the proposed work intersects the Levee at approximately three locations. The existing and proposed conditions are summarized in Table 1. The information provided by NDOT can be found in Appendix I.

Table 1: Summary of Elevation Changes for Fremont Southeast Beltway

JEO Levee Station	Existing Elevation (ft)	Proposed Elevation (ft)	Elevation Change (ft)
35+00	1200.69	1200.85	0.16
16+00	1191.01	1203.89	12.88
9+50	1197.34	1211.46	14.12

As detailed in Table 1, the Levee increases in height at all intersections with the beltway project. The intent of this evaluation was to focus on the existing condition of the Levee with respect to applicable criteria; therefore, the following analyses detailed in this report did not account for these raises in Levee elevations. However, this information was included as the roadway embankment will alter the Levee, it will be the primary flood risk reduction embankment for some length and will be on top of the existing Levee alignment once completed. Typically, roadways are not designed/built to levee standards, but do modify flood risks and provide flood risk reduction, especially as the roadway embankment sizes increase. Coordination with NDOT is recommended to determine how the City can coordinate flood risk reduction and levee alignment needs going forward, including inspection, operations and maintenance responsibilities, and alteration oversight, among other items.

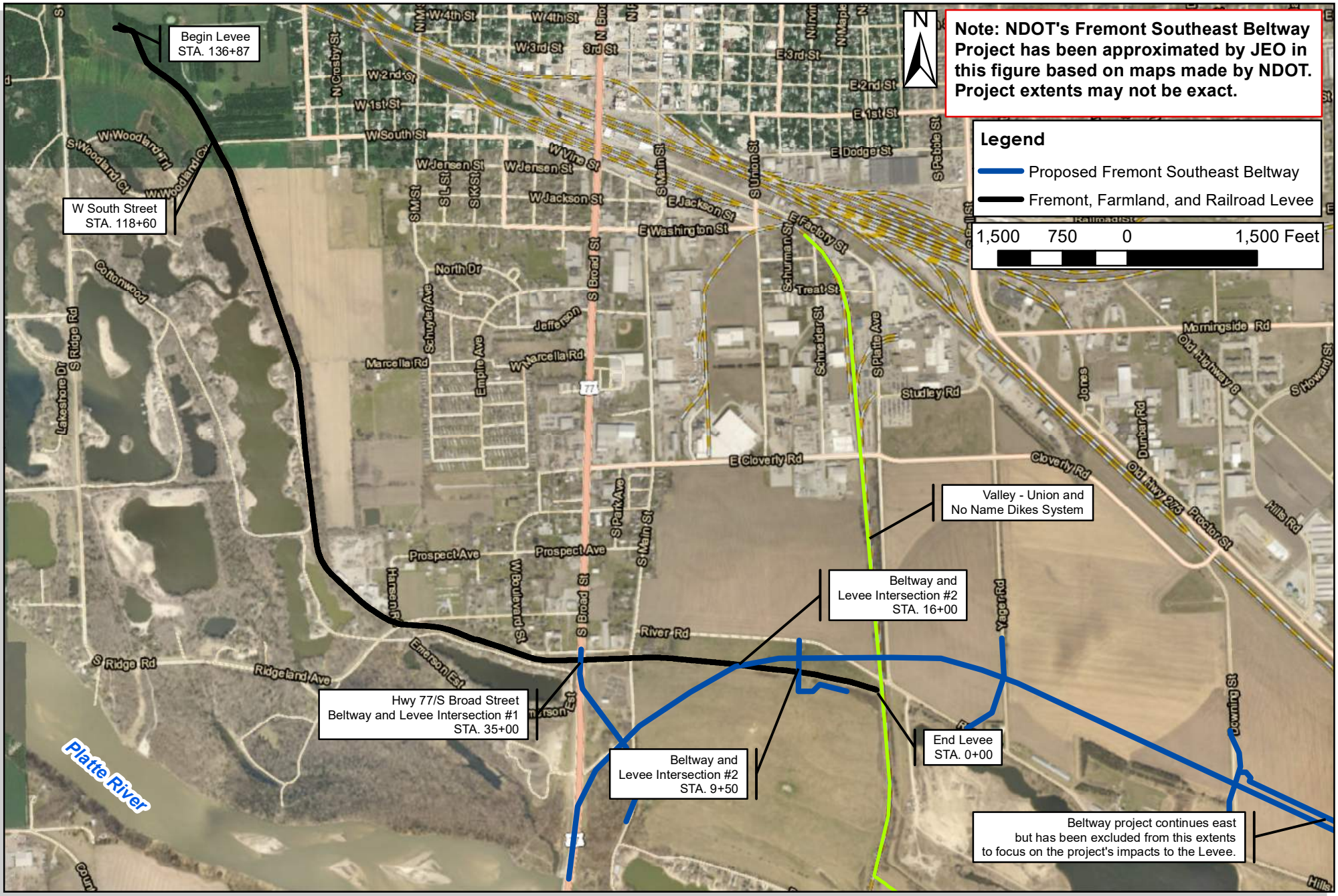

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Figure 2: Fremont Southeast Beltway Project Map

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6. PL 84-99 BACKGROUND

The PL 84-99 Rehabilitation Program is the discretionary authority given to the USACE by Congress to act and react to emergencies caused by floods, contaminated water sources, drought, or dam failures. This authority allows the USACE to repair and/or rehabilitate any qualified flood control project whether it is federally or privately constructed. To be eligible for rehabilitation assistance under PL 84-99, projects constructed by non-federal interests must meet certain criteria and standards set forth by the USACE. The 'project' discussed in this evaluation is the non-federally constructed Fremont, Farmland, and Railroad Levee. The general criteria that must be met for eligibility in the USACE Rehabilitation Program is as follows. The Levee must:

- Be publicly owned and sponsored.
- Protect against a minimum of a 10-year flood event with at least 2-feet of freeboard.
- Consist of a physical cross section and material makeup sufficient to provide reliable flood protection, including protection against slides, seepage, and erosion control.
- Be operated and maintained to prevent unwanted vegetation growth and encroachments that may adversely impact levee inspections and/or levee performance during a flood event.

Inclusion into the Rehabilitation Program must be requested through completion and submission of a form (included in Appendix E). Once the request is received, the USACE will complete an Initial Eligibility Inspection and make a determination. The findings of this evaluation should be considered a precursor to the USACE Initial Eligibility Inspection as they provide the City with recommended actions to complete prior to submitting a request to the USACE. See Section 10 for details of the PL 84-99 evaluation and anticipated eligibility status.

7. SURVEY

As part of the project, survey data was collected by JEO in March 2020. Survey included topographic features (top of levee, toe, cross-sections at bore locations) and vegetation. Right-of-way boundaries were provided by the City and were researched by JEO; see Appendix F for supporting available right-of-way information.

8. HYDRAULICS

Flood modeling for the Platte River in the effective FIS, dated May 4, 2009, is based on a 1-Dimensional (1D) HEC-2 model developed by USACE and is not georeferenced in a hydraulic model format. However, this data is available within the DFIRM database of the effective FIRM for regulatory flood model cross section locations. This information, along with the FIS profiles, was used to develop water surface rasters in GIS based on the effective FIRM cross sections and FIS profiles. These water surface rasters were used in conjunction with field survey to complete the freeboard analysis based on the regulatory flood models.

In 2017, flood modeling was completed by the Nebraska Department of Transportation (NDOT) for the US 30 – North Bend to Fremont project that produced a georeferenced version of the regulatory model formatted for HEC-RAS. This modeling was submitted to the Federal Emergency Management Agency (FEMA) as part of a Conditional Letter of Map Revision (CLOMR) for this project and has been reviewed

and approved as part of the approval of the CLOMR case number 16-07-1718R. However, this model is still a 1D model that is not fully based on current terrain data, as the model development pre-dated the best available LiDAR, dated 2016. Because it is 1D, this modeling also did not take into account certain terrain features important to actual flooding performance in the Platte River overbanks and potential for velocity impact areas near the Levee system. This is due to limited cross section locations and that cross sections do not take into account all details of the terrain, such as localized constrictions or potential velocity impact areas created by the network of road embankments in the floodplain upstream of the Levee system.

For this reason, JEO utilized the baseline cross section spatial locations developed for the 1D HEC-RAS model to develop a 1-Dimensional/2-Dimensional (1D-2D) model for the reach of the Platte River adjacent to the Levee system. This model was developed to more thoroughly evaluate flooding characteristics and potential localized high velocity flow impacts to the Levee system. However, because this 1D-2D model is not the effective regulatory model, it was not used for freeboard assessment purposes. Below is a more detailed description regarding the development of the 1D-2D model.

Hydraulic Model Development

Using HEC-RAS 5.07, a 1D-2D hydraulic model of the Platte River was developed to evaluate the flow characteristics and flood extents along Fremont. The primary purpose of this model was to evaluate the velocity profile of flood flows along the levee embankment, as velocity information is limited in the FIS. This model was not intended for use with the freeboard assessment, which was completed using the FIS profiles. The model spans from County Road 36 to Highway 275, east to west, respectively; and from Highway 30 to the right bank of the Platte River, north to south, respectively. It combines 1D cross-sections from the NDOT CLOMR model from the US 30 North Bend to Fremont Project, dated April 2017 with 1D components adjusted to the best available LiDAR and 2D components added by JEO.

The Platte River was modeled using a 1D hydraulic model of the main channel, which was coupled to a 2D hydraulic model of the left overbank area using a lateral structure. The 1D portion of the hydraulic model includes one stream reach, 32 cross-sections, and two bridges, one for Highway 77 and one for the Union Dike Railroad. These components were retrieved from the NDOT CLOMR HEC-RAS model, as stated previously. For each cross-section and bridge, JEO updated terrain to match best available light, detection, and ranging (LiDAR) topographic data. This was based on the 2016 Eastern Nebraska Urban Area data set as the original model's terrain was considered outdated. Bridges from the NDOT RAS model were utilized as-is, except where minor adjustment was needed to match bridge deck elevations into best available terrain data. The overbank areas were modeled using 2D flow areas derived from the LiDAR topographic data. HEC-RAS flow area meshes can be structured or unstructured cells, varying in number of sides from 3-8 sides. For this model, typical computational cells were 100-foot by 100-foot squares. Breaklines were used along roadway centerlines, embankment centerlines, and the Levee centerline to ensure crown elevations were captured. A LiDAR based lateral structure, along the Platte River's left bank, was used to connect the 1D channel to the 2D overbank. Refer to Figure 3 for the geometry layout of the HEC-RAS model.

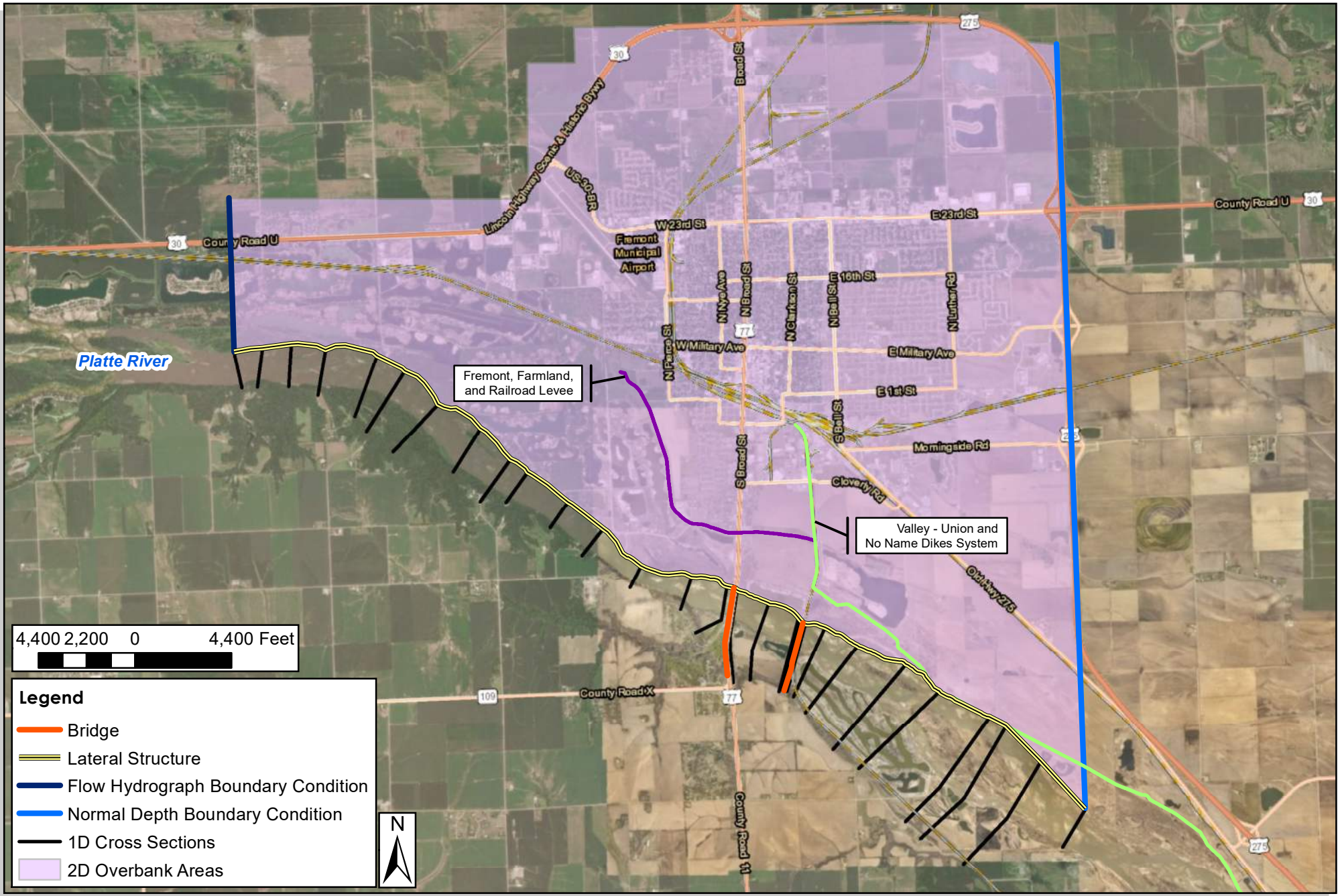

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Figure 3: Hydraulic Model Geometry Layout

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Manning's 'n' values from the NDOT CLOMR model were utilized for the 1D portion. In general, a Manning's 'n' value of 0.025 was assigned to the 1D Platte River channel due to the channel being very wide and sandy while 1D overbank values ranged from 0.06 to 0.095 due to added roughness from more vegetation and dense trees. The 2D area was assigned Manning's 'n' values based on the 2011 National Land Cover Database (NLCD) data.

Two model scenarios were executed: one for a flow hydrograph that peaks at 130,000 cubic feet per second (cfs) and one for a flow hydrograph that peaks at 150,000 cfs, both utilizing approximately 48-hour flood event durations. The 130,000 cfs and 150,000 cfs flows are adjusted values based on the 100-year peak flow of 119,500 cfs, detailed in the USACE's December 2018 Lower Platte River Flood Frequency Update, for the Fremont area. Currently, the USACE is in the process of updating their evaluation to include the March 2019 flow event, which is anticipated to increase the previously identified peak flow values. Discussions with USACE and a review of the draft revised hydrology evaluation provided by USACE in April 2020 indicated likely increases of 15-20% in the peak flows due to inclusion of the March 2019 flow event. Therefore, JEO used a range of possible flows to account for the increased 100-year peak flow result and to evaluate the variability of potential impacts of higher potential flood flows.

Both flows were input into the model via a "flow hydrograph" boundary condition at the upstream-most cross section to represent the flow of the Platte River entering the modeled area. A normal depth boundary condition was applied to the downstream-most cross section with a slope of 0.001 ft/ft based on the adjacent stream bed slope. Additionally, a normal depth boundary condition was placed along the downstream edge of the 2D overbank area; it was assigned a slope of 0.01 ft/ft. Normal depth conditions represent how and where flow will exit the modeled area.

Model Results

HEC-RAS produces maps of results at user designated time stamps in a model. The model for this project contained approximately 288, 10-minute intervals. This means there were nearly 288 results maps for each result (ponding depth, water surface elevation, velocity, etc.). HEC-RAS also produces maps of maximum or minimum results. For example, the maximum depth map would show the maximum depth of water at every location in the model – regardless of the time the maximum depth occurs. That is, in a map of maximum depth, neighboring locations may be showing different results occurring at different times.

As an example, and for the City's information, Figures 4 and 5 show the maximum depth results for the 130,000 cfs and 150,000 cfs results – respectively. Figure 6 compares the 130,000 cfs and 150,000 cfs maximum ponding extents. Velocity results are discussed in the next section.

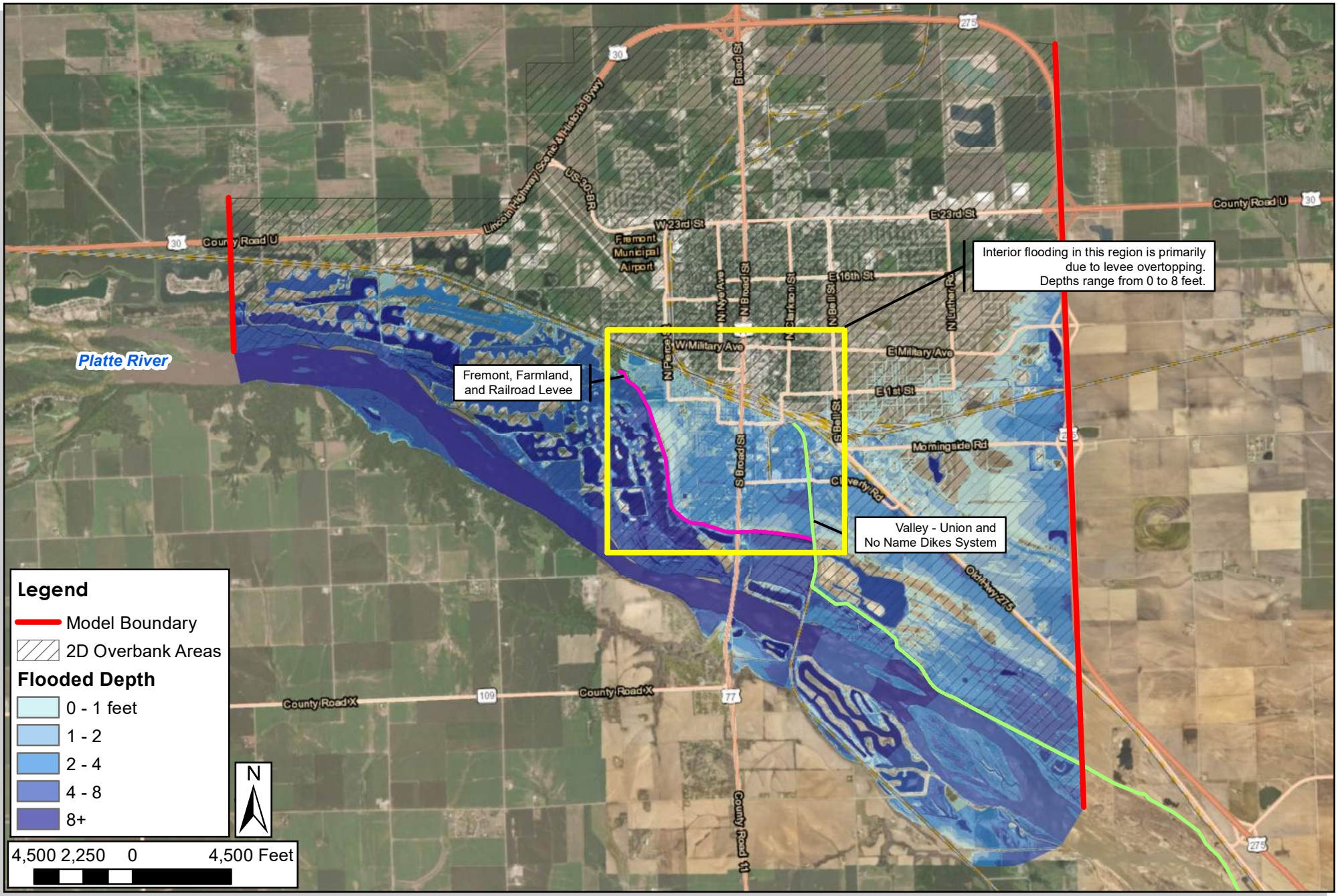

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Figure 4: Hydraulic Model Maximum Depth for 130k Flow

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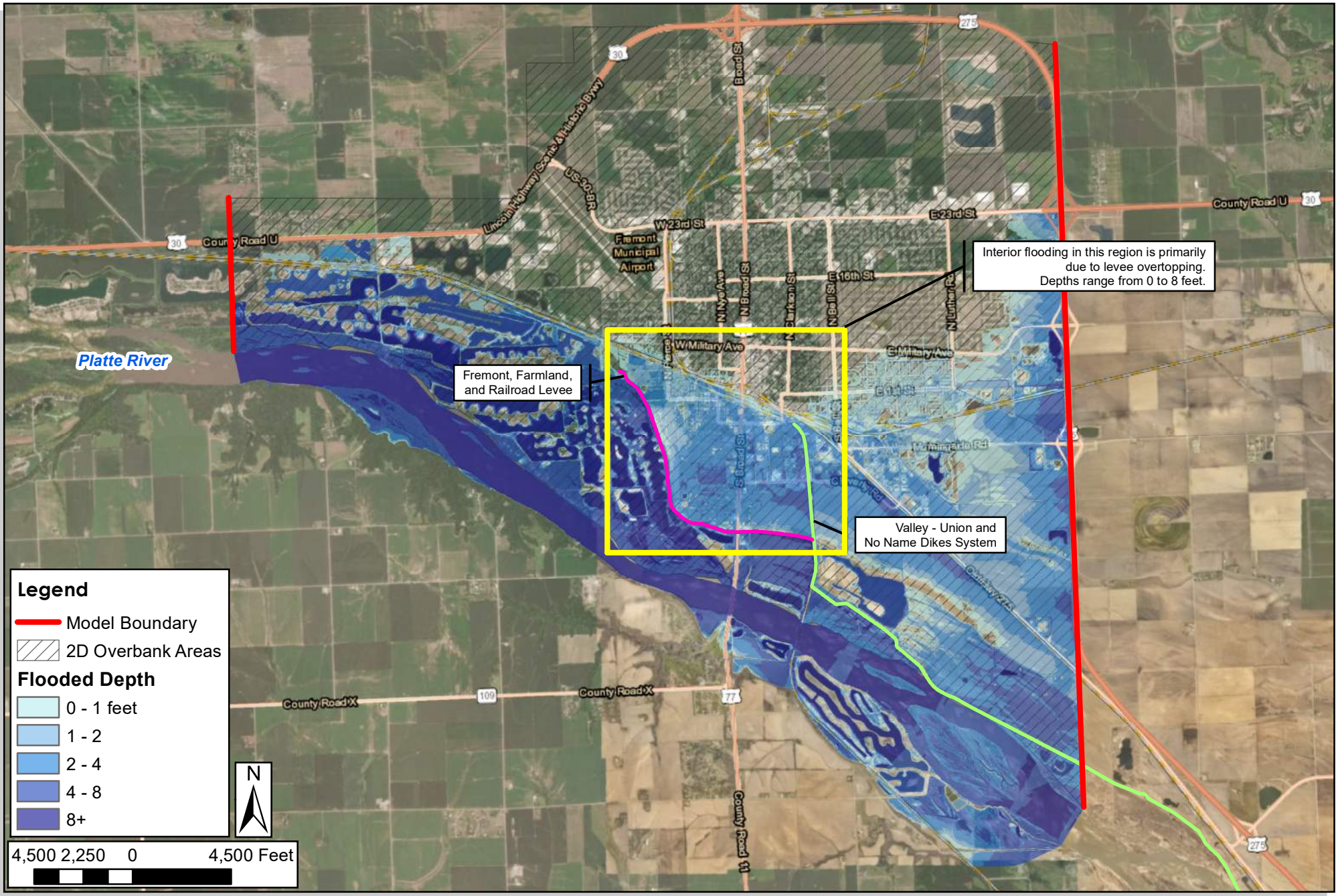

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Figure 5: Hydraulic Model Maximum Depth for 150k Flow

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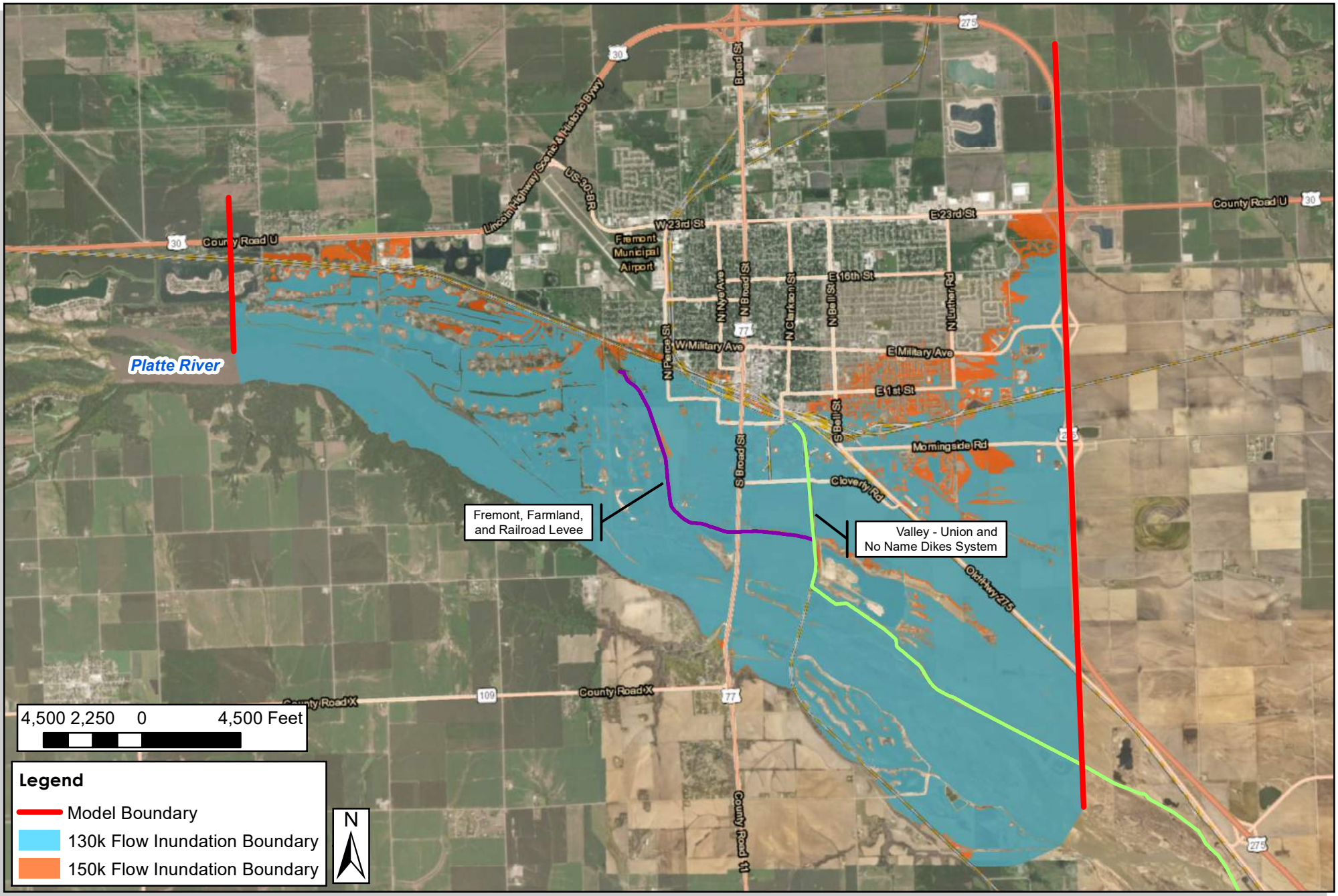

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Figure 6: Hydraulic Model Ponding Results

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VELOCITY ASSESSMENT

Using the HEC-RAS model results, flow velocities near the Levee side slopes were analyzed to determine whether potential for erosion existed on the Levee embankment. Specifically, the velocity results were analyzed to determine what velocities were prior to overtopping. Prior to overtopping, the results indicate that velocities along the riverward Levee embankment are minor (approximately 1 ft/s). Therefore, an erosion control project was not considered necessary for the Levee.

However, looking at the maximum velocity results, at any given time, it is shown that higher velocities do exist once the Levee is overtopped. This is due to concentration of flow through the overtopped area; this can increase the potential for erosion. Figure 7 illustrates the velocity distribution. In this figure, higher velocities (up to 13.4 ft/s) are seen near W South Street, just northwest of Emerson Lake, and at the downstream end of the Levee. These are areas that overtop during the 130,000 cfs and 150,000 cfs events, according to the HEC-RAS model.

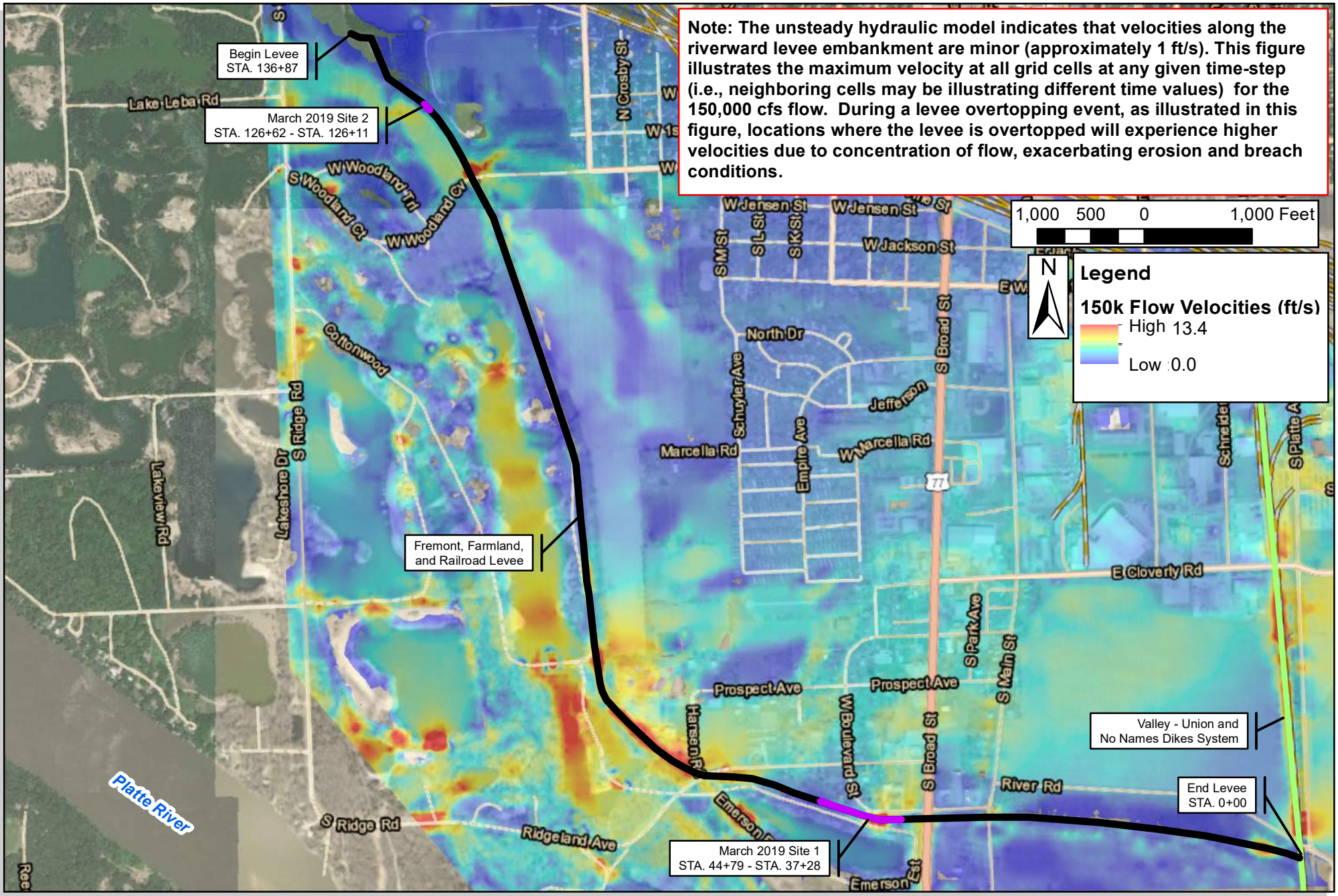

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Figure 7: Maximum Velocity Raster

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FREEBOARD ANALYSES

Freeboard is the additional height of the Levee above a given design event flood elevation. PL 84-99 criteria requires that the Levee maintain a freeboard of 2-feet for the 10-year event. To determine whether the Levee met this criterion and to provide information on the Levee's level of risk reduction, freeboard analyses were performed for the 10-year, 50-year, and 100-year events.

The freeboard analyses for this evaluation were completed using the 10-year, 50-year, and 100-year water surface elevation information from the effective Dodge County Flood Insurance Study (FIS). The FIS water surface profiles account for ice effects and are based on discharges of 62,000 cfs, 106,000 cfs, and 132,000 cfs for the 10-year, 50-year, and 100-year events, respectively. The water surface profiles used for the assessment were based on the 'with levee' profiles in the FIS. Top of Levee elevations were from JEO topographic survey data, retrieved March 2020. It should be noted that the FIS water surface profiles were used for the freeboard analyses to more closely align with FEMA's freeboard analysis procedures since these are the effective regulatory flood profiles.

For these analyses, the surveyed top of Levee elevations and the water surface elevations were compared. In ArcMap 10.7.1, an alignment representing the existing Levee was created from JEO's survey points and was divided into 25-foot segments. Each segment was assigned a surveyed Levee top elevation and a water surface elevation from surfaces created from survey data and the FIS data, respectively. The existing freeboard was then calculated as the difference between the Levee top elevation and water surface elevations, for each alignment segment.

Freeboard Results

Freeboard for the 10-year event is over 2-feet for the entire Levee system, and therefore, meets the PL 84-99 requirement. Figure 8 illustrates freeboard for the 10-year event. As is shown, freeboard varies considerably, ranging from 3.28-feet to 9.77-feet.

Freeboard for the 50-year event ranges from 0.6- feet to 7.02-feet, and freeboard for the 100-year event ranges from -1.34-feet to 3.77-feet. These results indicate that the Levee is overtopped for the 100-year event. Therefore, the Levee provides between a 50-year and a 100-year level of risk reduction based on the current regulatory model data. Figures 9 and 10 illustrate these findings. As is shown, approximately 1.5-miles of the Levee is at risk of overtopping for the 100-year event.

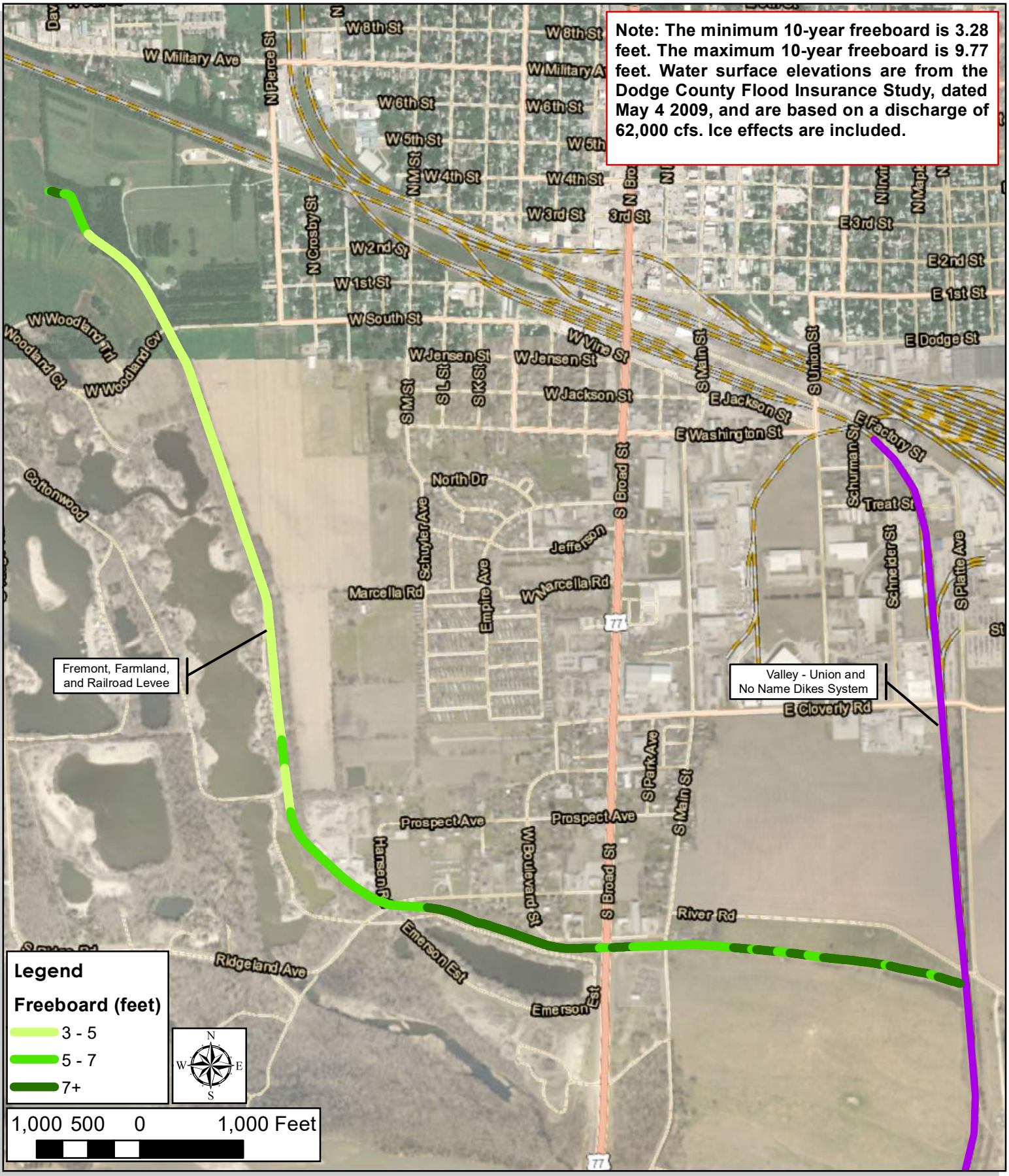

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Figure 8: 10-Year Freeboard

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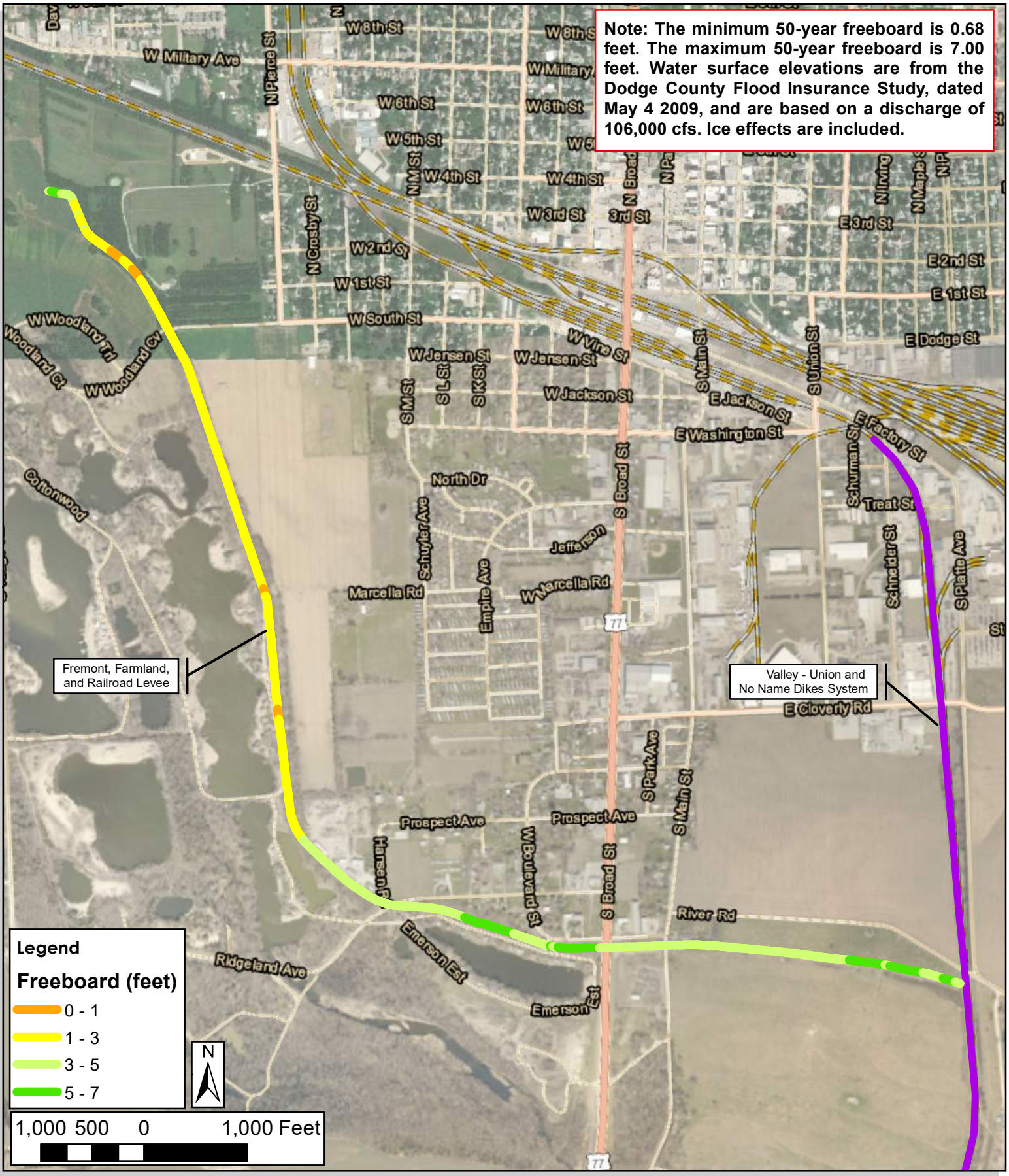

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Figure 9: 50-Year Freeboard

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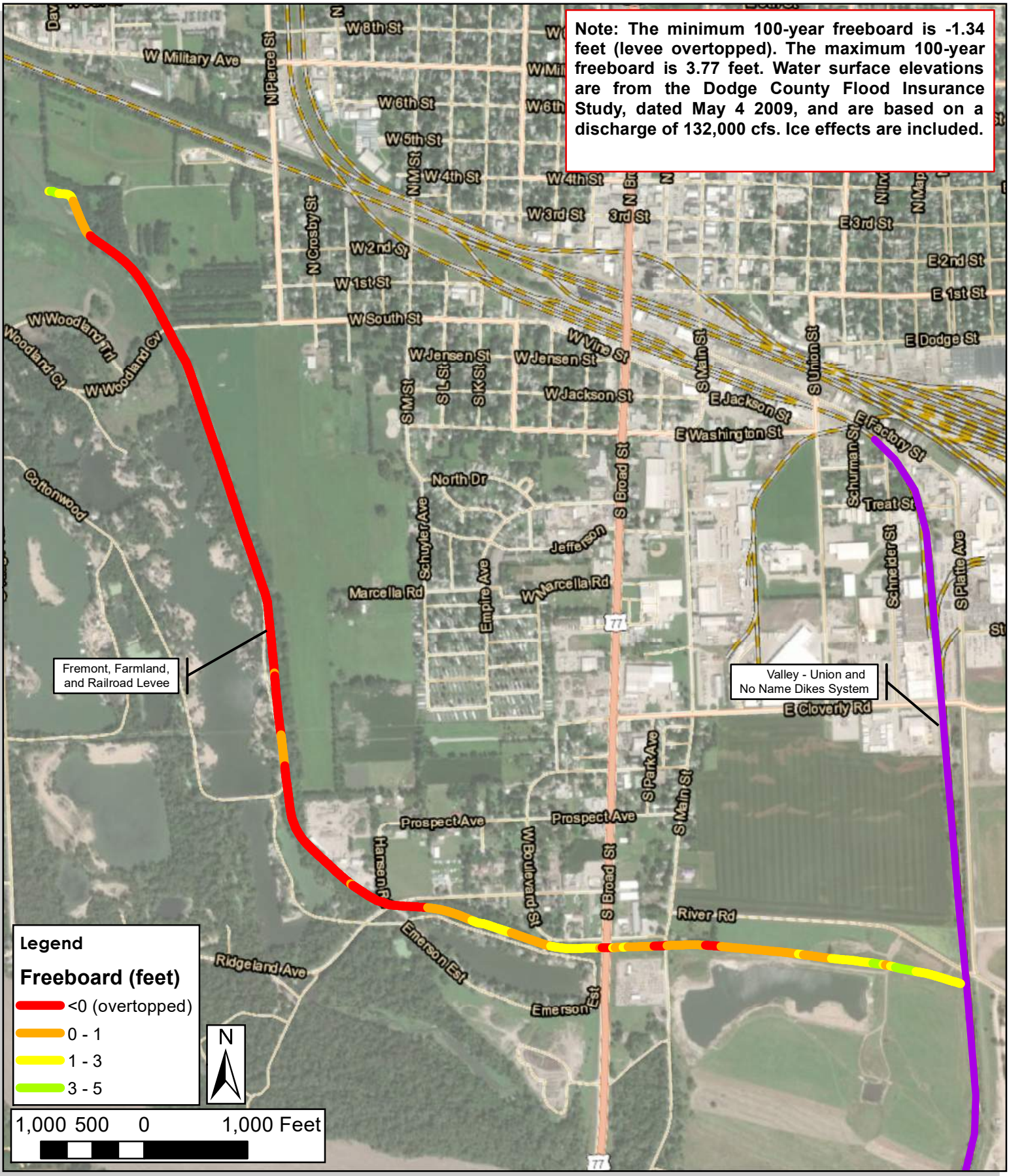

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Figure 10: 100-Year Freeboard

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HIGH GROUND TIE-IN ASSESSMENT

The high ground surrounding the Levee system was assessed to determine whether overtopping and flanking risk exists that could potentially reduce the Levee's effectiveness. In ArcMap 10.7.1, using the best available LiDAR data, an alignment was drawn along high ground, from the upstream end of the Levee to the east edge of Ridge Road. This alignment was divided into 25-foot segments. Each segment was assigned a water surface elevation from the 10-year, 50-year, and 100-year FIS water surface elevation rasters and was assigned a Levee top elevation from the LiDAR surface. Segments with WSEs greater than the Levee top elevation were marked as having overtopping potential.

For the 10-year and 50-year events, no overtopping risk was identified. For the 100-year event, three areas, totaling approximately 200-feet, were identified as at risk of overtopping. These are shown in Figure 11. The areas with 100-year event overtopping potential of about one foot (1-foot) deficient in elevation. Overtopping/flanking potential could be altered, either increased or decreased, if changes are made to the high ground tie-in area between the upstream end of the Levee and Ridge Road. This high ground tie-in area is currently privately owned. To prevent an alteration of this area that may impact overtopping potential due to terrain modifications, it is important the City work with the owners to either acquire easements or ownership if possible, or otherwise monitor, review and approve any proposed improvements to ensure alterations do not negatively impact the performance of the Levee.

No analysis was done of the downstream tie-in area for two reasons. First, the Levee ties directly into the Union Dike Railroad and Union Dike. Secondly, the area downstream of the Levee is subject to change in the future with the NDOT's proposed bypass project.

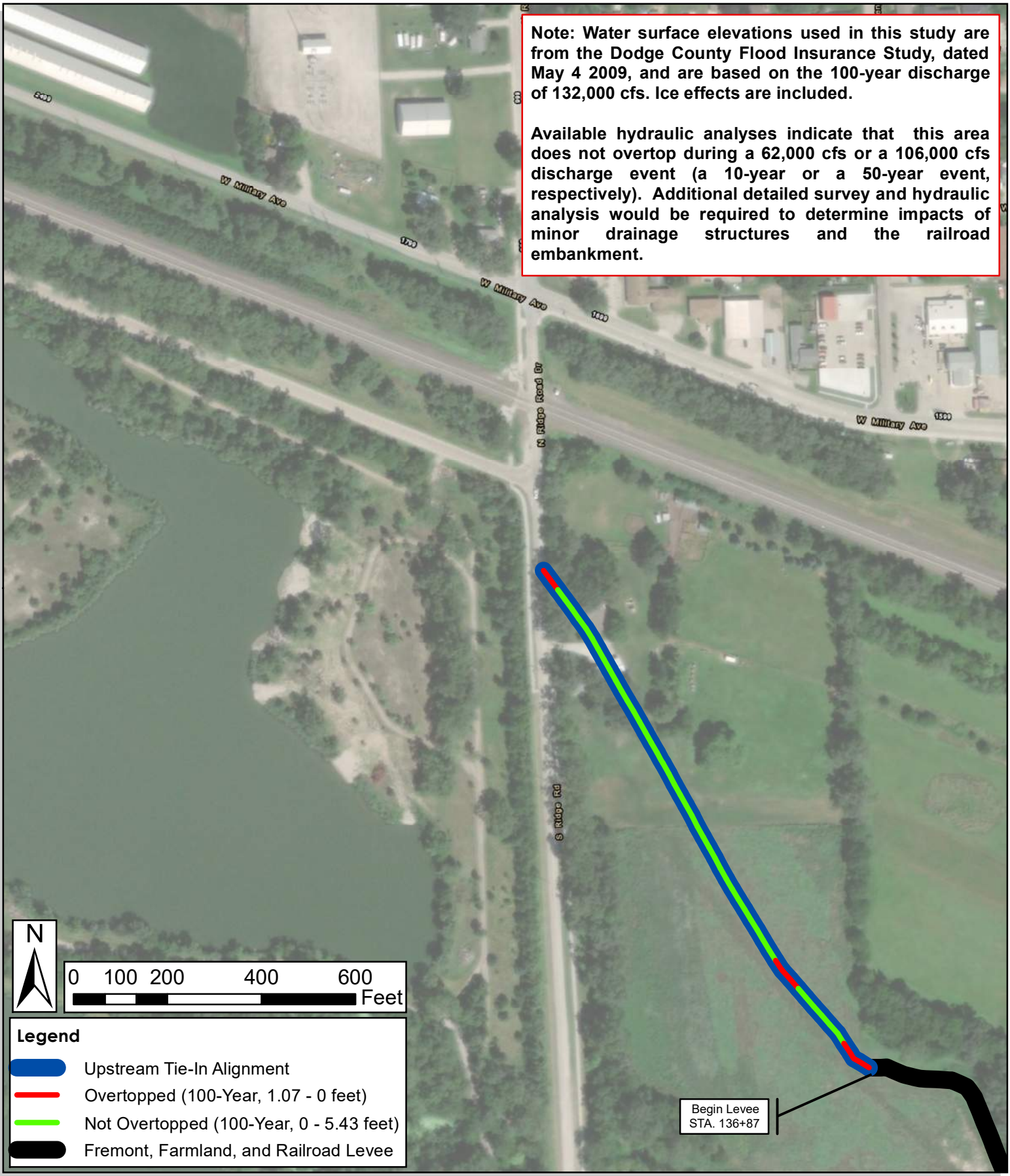

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Figure 11: Upstream High Ground Tie-In Assessment

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9. GEOTECHNICAL EVALUATION

A preliminary subsurface exploration and evaluation of the existing Levee was performed to describe the subsurface conditions encountered in the soil borings, to present the test data, and to provide a preliminary geotechnical evaluation of the Levee for underseepage stability and slope stability. The preliminary field exploration included five borings performed to depths ranging from about 15 to 30-feet below the existing ground surface along the existing Levee alignment. The Geotechnical Engineering Report is included in Appendix A, which contains the evaluation results as well as the individual boring logs and the approximate boring locations.

The limited geotechnical evaluation for the selected locations was completed in general accordance with the USACE Circular No. 1110-2-6067 dated August 31, 2010 and the USACE Engineering Manual EM 1110-2-1913, dated April 30, 2000, as modified by ETL 1110-2-569, Design Guidance for Levee Underseepage, dated May 1, 2005.

The geotechnical evaluation consisted of preliminary stability analyses of the Levee slopes and underseepage analyses of the Levee. The results of the preliminary geotechnical evaluation indicate no concern related to slope stability of the Levee at the two representative critical section locations. The preliminary evaluation does identify underseepage (excessive exit gradient) concerns at one of the representative section locations. Further details of the preliminary findings can be found in the complete geotechnical report in Appendix A. The boring and evaluation locations were determined after a review of existing information provided by the USACE and those which appear to be the critical cross sections based on geometry of the section and soil conditions encountered in the nearest borings, however it should be noted that the preliminary evaluation was limited in nature due to the availability of funding, and further evaluation is recommended prior to design and construction of any permanent improvements. The recommendation for the location of excessive underseepage is construction of a landside toe drain or seepage berm. This is somewhat corroborated by USACE findings within the Section 205/General Investigative Study completed for flood risk reduction at Fremont, in that it recommended a seepage berm in concert with the levee alternative in this reach as well. Due to the maintenance and inspection requirements of a toe drain, a seepage berm is the preferred alternative, if the necessary right of way can be obtained and if analysis shows a seepage berm (without a toe drain) can sufficiently reduce the exit gradient.

Note the evaluation was completed for water loaded at the top of the levee. The minimum level of loading for PL 84-99 eligibility is the 10-year event plus 2-feet of freeboard. This is lower than the evaluated loading (top of the levee). This indicates that while the levee would be more stable under lower loading conditions, the concern for seepage and stability performance issues increases as the loading increases. As stated, the evaluation indicated excessive exit gradients for top of levee loading at one location. Any proposed change to the Levee physical dimensions (e.g. levee raise) or material makeup may have an impact on the slope and underseepage stability of the Levee.

10. PL 84-99 REQUIREMENTS EVALUATION

Relevant USACE documents were reviewed and the information contained outlines the standards to which the Levee system must meet or exceed in order to be eligible for inclusion in the Rehabilitation Program

under PL 84-99. Instances where the Levee system falls short of these standards, herein referred to as 'deficiencies', were identified and developed into recommended projects, along with the other findings of this evaluation. To best illuminate deficiencies, or potential deficiencies, as well as the components without deficiencies, a mock initial eligibility and continuing eligibility inspection was completed, and the results are included in Appendix G. Appendix G also includes PL 84-99 guidance from USACE. When completing inspections, the USACE uses four ratings; Acceptable, Minimally Acceptable, Unacceptable, and Not Applicable. These ratings are commonly abbreviated as A, M, U, N/A. The inspection form includes 86 rated items. Note this mock inspection was based on engineering judgment and subject to limitations during the walkthrough, the USACE may discover additional items and categorize them differently based on their judgment. The *anticipated* ratings are summarized as follows:

- A – 13
- M – 6
- **U – 4**
- N/A – 63

A single U-rating could cause the Levee system to be ineligible for inclusion in the Rehabilitation Program until the deficiency is addressed satisfactorily. The anticipated U-rated items along with brief descriptions are:

  - Public Sponsor – The City currently does not hold sufficient right-of-way or easements to operate and maintain the Levee system.
  - Unwanted Vegetation Growth – Dense forested areas are present within the 'vegetation-free zone'. Also called the 'clear-zone', this area/corridor consists of the Levee embankment plus 15-feet from the Levee landside and riverside toe of slope.
  - Erosion/Bank Caving – Erosion and bank caving occurred at five locations during the March 2019 flood event. Two complete and three partial Levee breaches have compromised the integrity of the Levee. The breaches have been temporarily repaired and are expected to be permanently fixed in the future.
  - Animal Control – Multiple animal burrows in the embankment were identified during the site visit. Burrows must be filled and compacted, and an animal control program must be established.

M-rated items alone should not be grounds for exclusion from the Rehabilitation Program, however, they are deficiencies that require attention and should be improved by the City. The anticipated M-rated items along with brief descriptions are:

  - Operation and Maintenance Manuals – Prior to this evaluation, the City did not have an operation and maintenance (O&M) manual. A draft O&M manual has been developed and the City should continue towards finalizing and implementing the manual.
  - Encroachments – Encroachments such as utilities and fences are present within the clear-zone.
  - Emergency Supplies and Equipment – Verification and documentation of adequate City flood fighting materials and supplies is required. Adequate sources of flood fighting materials and equipment likely exist within the city limits, but documentation of sources or stockpile locations, deployment locations, and quantities is required.

- Flood Preparedness and Training – Verification and documentation of an adequate preparedness and flood response plan including system-specific emergency procedures and emergency contact personnel is required.
- Slope Stability – Inspection has identified multiple areas of minor slope erosion/stability problems. The preliminary geotechnical investigation and evaluation indicated low concern for slope stability issues at the limited evaluation locations.
- Seepage – There is no known evidence of seepage problems. However, the preliminary geotechnical investigation and evaluation indicated a seepage concern at one of the limited evaluation locations.

The following sections identify and detail the recommended projects to correct or improve the Levee system deficiencies discussed within the scope of this evaluation.

11. OPERATION AND MAINTENANCE

Development and routine updating of an Operation and Maintenance (O&M) Manual will serve as a practical outline for persons having inspection, maintenance, and/or operation responsibilities under both normal and high-water conditions. The O&M Manual should include sections/details that cover topics such as:

- Levee System Description
- Flood Event History
- Hydrology and Hydraulics Characteristics
- Points of Contact
- Recommended Maintenance Activities and Frequency
- Recommended Inspection Responsibilities and Checklists
- Emergency Preparedness Plan

Appendix H includes a sample O&M Manual. This document should be used as an outline to guide development of a basic manual. Certain items listed above, such as the Emergency Preparedness Plan will take some additional time and coordination to develop triggers, stakeholders, and emergency actions.

12. RECOMMENDED PROJECTS

Based on the November 2019 site visit and the hydraulic and geotechnical analyses completed, the listed projects are recommended. Additional detail is located on the following Project sheets.

- Project 1: Address March 2019 Flood Damages
- Project 2: Right-of-Way Acquisition
- Project 3: Tree Clearing
- Project 4: Encroachment Coordination
- Project 5: Eliminating Low Spots
- Project 6: Geotechnical Considerations
- Project 7: Operation and Maintenance Manual (O&M) Development

13. PROJECT 1: ADDRESS MARCH 2019 FLOOD DAMAGES

RECOMMENDATION

It is recommended that Sites 1 and 2 be permanently repaired of the damages sustained in the March 2019 flood event. The damages assessment report completed as a component of this scope can be found in Appendix C.

14. PROJECT 2: RIGHT-OF-WAY ACQUISITION

RECOMMENDATION

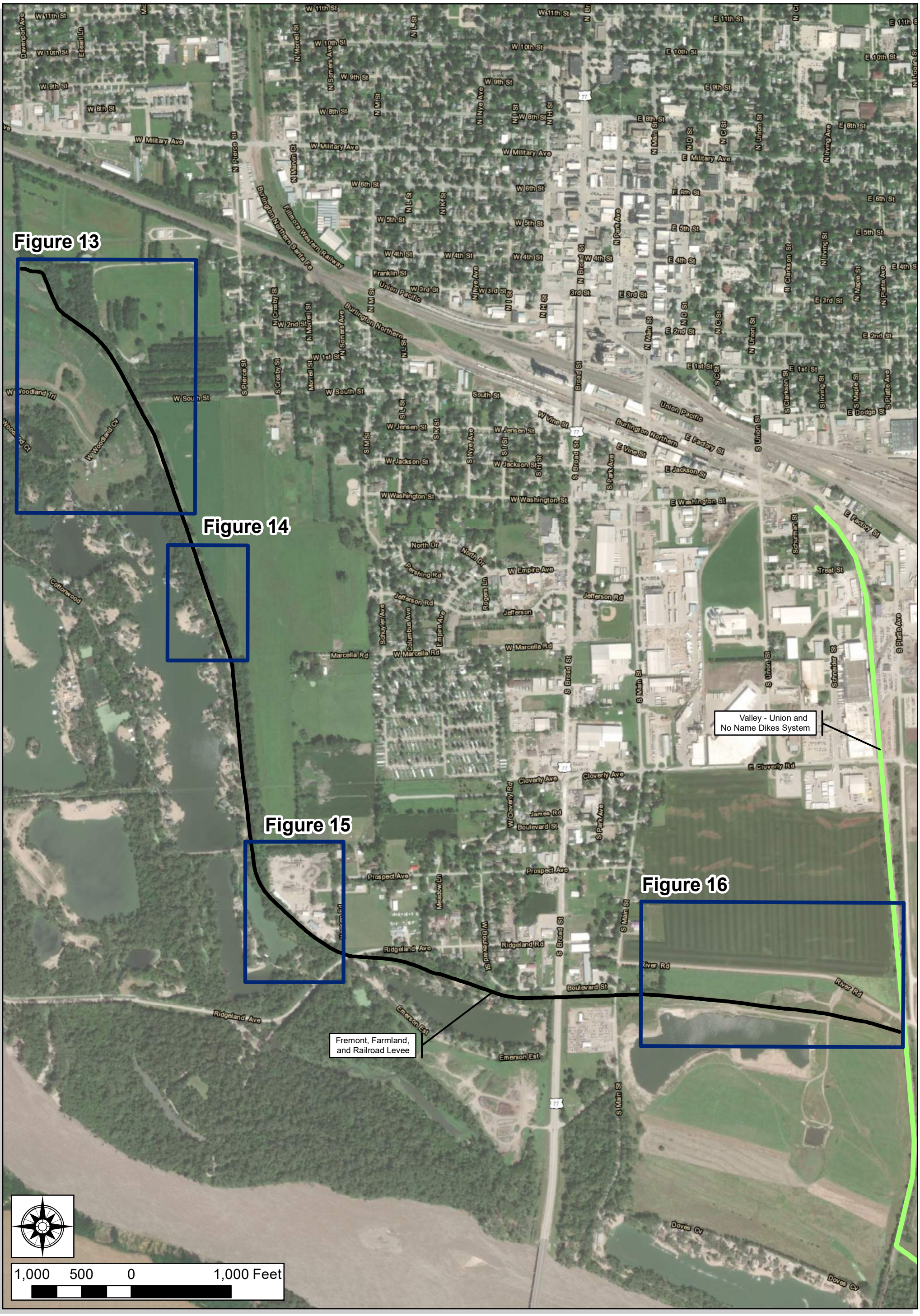
It is recommended the Levee right-of-way (ROW) be extended, at least, 15-feet from the Levee toe to ensure the City can maintain the 15-foot clear zone required by PL 84-99.

Based on 2016 Dodge and Sarpy County aerial imagery and surveyed ROW data, it is estimated approximately 2.9 acres of additional ROW need attained by the City to meet the 15-foot clear zone requirement, based on the existing Levee elevations (i.e., the scenario where Levee is not raised). Figures 12 through 16 show areas where additional ROW is needed.

If the City intends to raise the Levee and adheres to the general 3:1 (H:V) side slopes and an extended face raise, for every 1-foot of vertical raise an additional 6-feet of clear zone would be required (3-feet of clear zone on each side of the Levee). To illustrate potential additional ROW need for a raise scenario, a conceptual offset of 20-feet from the Levee toe was applied. In this scenario, it was estimated approximately 1 acre of ROW, in addition to the 2.9 acres mentioned earlier, would need to be obtained by the City to gain 20-feet of clear zone off the current Levee toe. This 20-foot conceptual section is provided for reference.

ASSUMPTIONS AND NOTES

1. 15-foot clear zone was delineated from JEO topographic survey, taken March 2020, and 2016 Eastern Nebraska Urban Area LiDAR data.
2. ROW information is from JEO topographic survey, taken March 2020.



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Revised: 07/01/2020
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Project: 190908.00

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Figure 12: Right of Way Acquisition Figure Map
Levee Evaluation

Fremont, NE

JEO CONSULTING GROUP INC

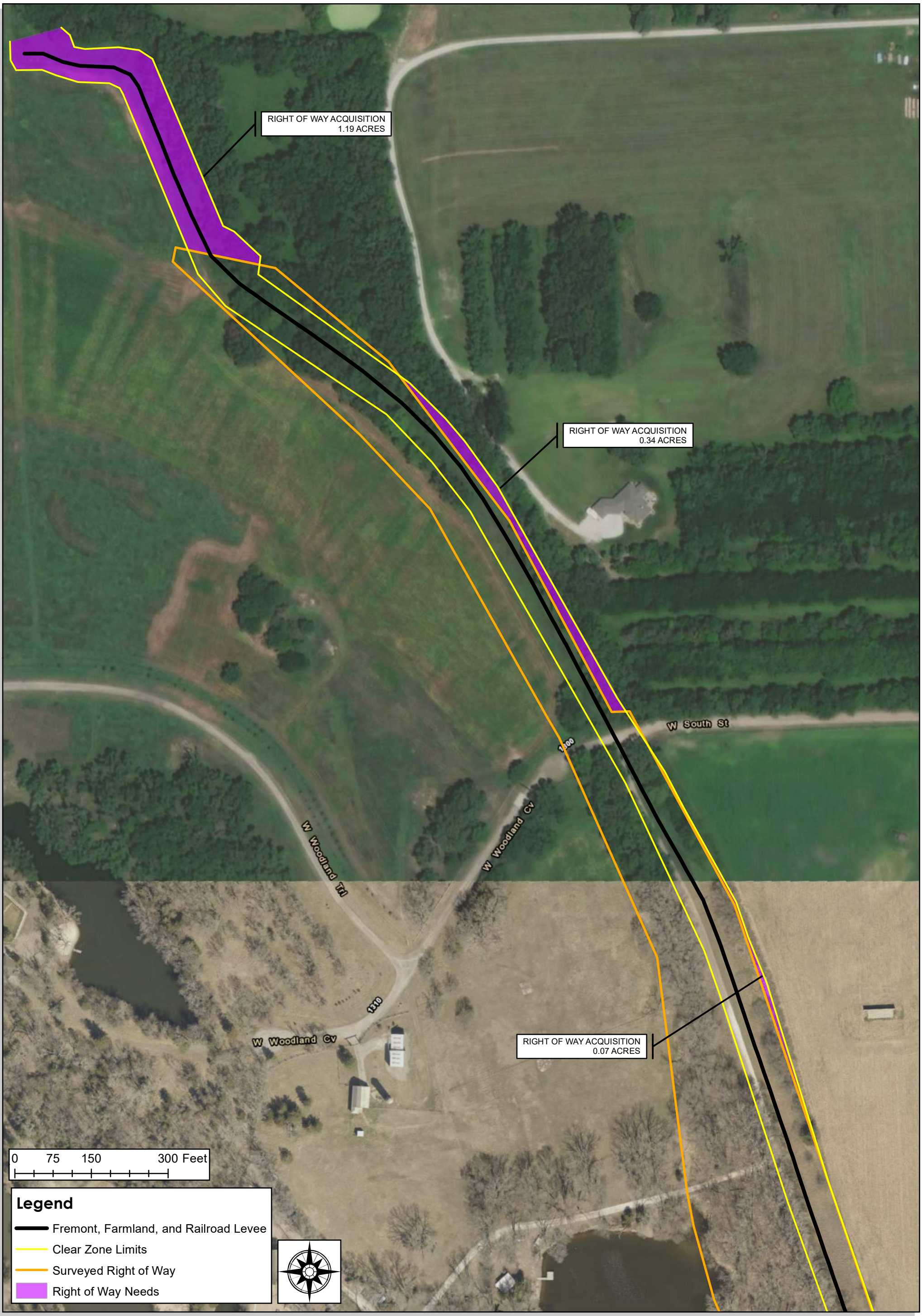

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Figure 13: Tree Removal Figure Map
Levee Evaluation

Fremont, NE

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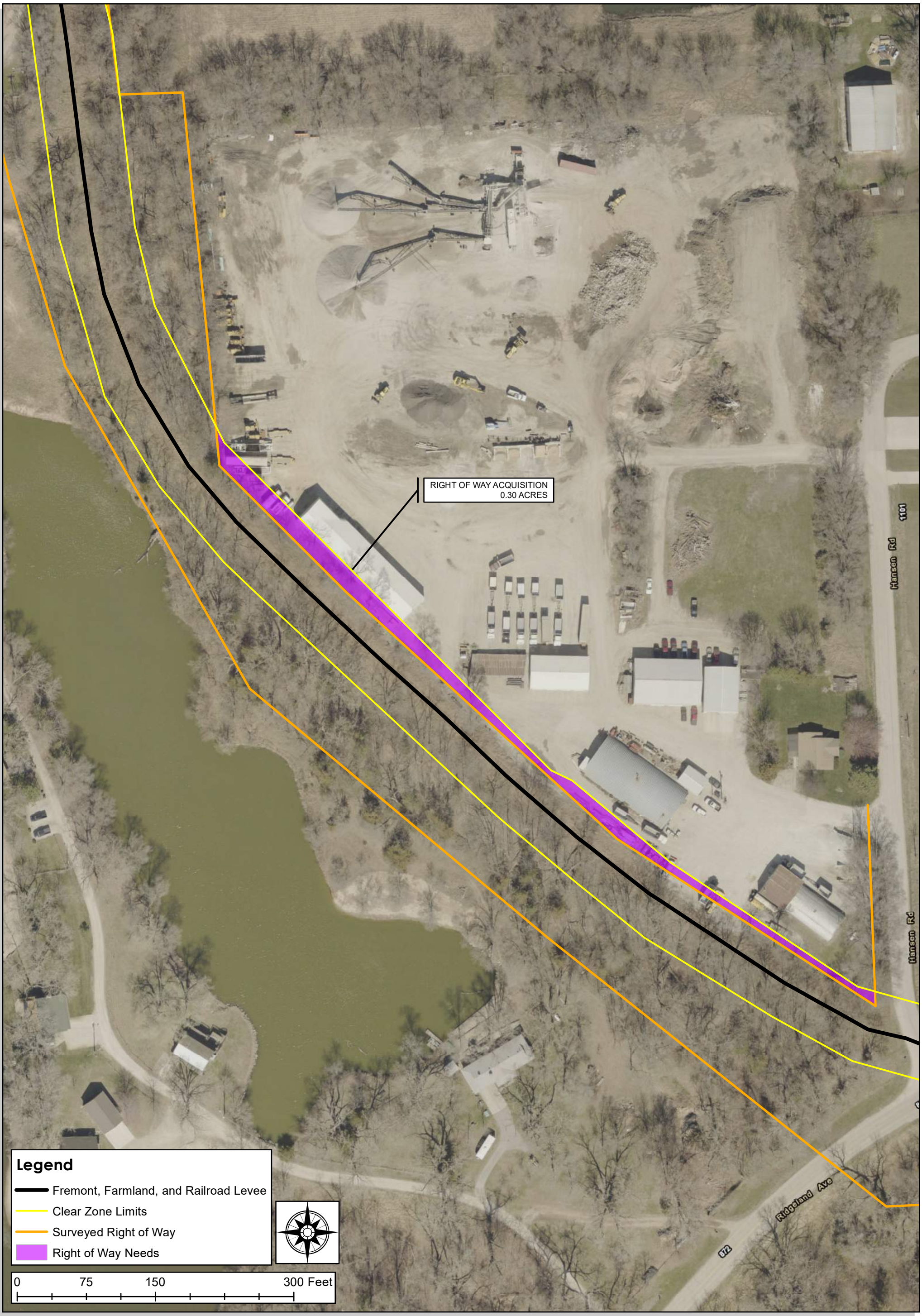

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Figure 14: Right of Way Acquisition
Levee Evaluation

Fremont, NE

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RIGHT OF WAY ACQUISITION
0.21 ACRES

Legend

- Fremont, Farmland, and Railroad Levee
- Clear Zone Limits
- Surveyed Right of Way
- Right of Way Needs

0 75 150 300 Feet

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Figure 15: Right of Way Acquisition
Levee Evaluation

Fremont, NE

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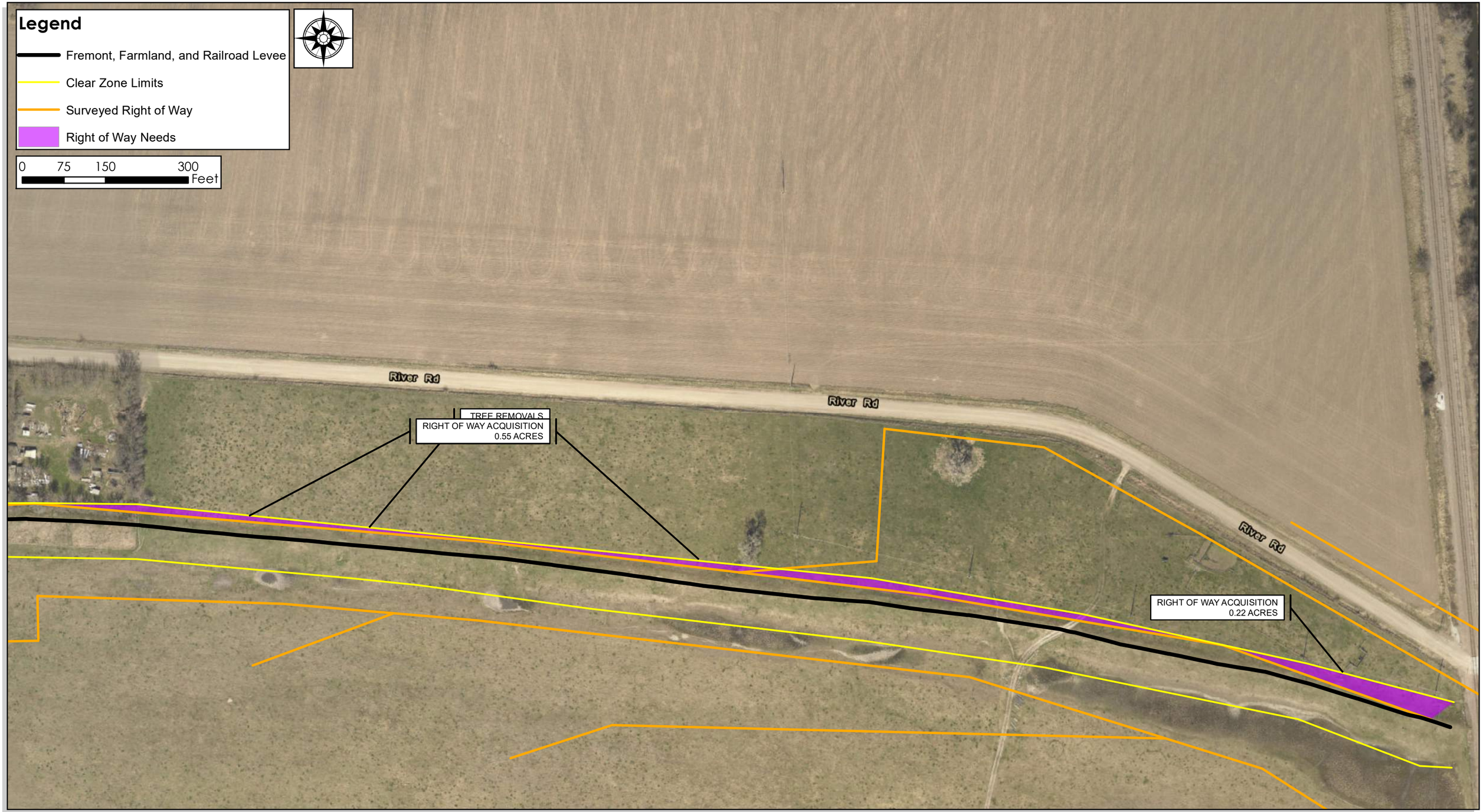

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Figure 16: Right of Way Acquisition
Levee Evaluation
Fremont, NE

JEO CONSULTING GROUP INC

15. PROJECT 3: TREE CLEARING

EXISTING CONDITIONS

During the site visits, it was noted that dense woody vegetation surrounds the Levee along most of its length. The woody vegetation includes minor shrubs to trees up to approximately 8-feet in diameter. The woody vegetation exists on the riverside and landside of the Levee, as well as some minor amounts within the Levee prism.

PRIMARY RECOMMENDATION

To reduce the potential for adverse performance and to meet PL 84-99 criteria for unwanted vegetation, it is recommended all woody vegetation within 15-feet of the Levee toe, including root-balls, are removed to create a "15-foot vegetation clear zone" (clear zone). The USACE's 15-foot clear zone promotes effective levee maintenance/inspection and helps prevent interference with proper levee function.

It is recommended all trees, shrubs, and woody vegetation within the tree clearing limits are completely removed, including all roots and root balls. Cavities created by removal should be filled with clean, homogenous, native soils – likely a lean clay. Filling of cavities should be completed in lifts, and the fill material should be compacted to a proper density for a levee system.

Using ArcMap 10.7.1, 2016 Dodge and Sarpy County aerial imagery, surveyed right-of-way and topographic data, and Dodge County LiDAR, it was estimated approximately 5.2 acres of dense tree masses plus 30 individual trees need removed to create a 15-foot clear zone. As part of this analysis, removals were categorized as "Within ROW" or "Outside of ROW". See Figures 17 through 21 and Table 2 for a summary.

Table 2: Tree Removal Summary

Location	Tree Removals	Additional Individual Tree Removals[1]					
	By Acre[2]	12-inch Diameter	15-inch Diameter	18-inch Diameter	24-inch Diameter	30-inch Diameter	36-inch Diameter
Within ROW	4.85	7	5	5	10	1	1
Outside of ROW	0.35	0	0	1	0	0	0

[1] Estimated from JEO topographic survey, taken March 2020.
[2] Dense tree masses; individual trees not surveyed/counted.

ESTIMATED CONCEPT PROJECT COST

A breakdown of the estimated project cost is included in Table 3 below.

Table 3: Conceptual Opinion of Probable Construction Costs for Project 3

Item #	Description	Unit	Quantity	Unit Price	Total
1.	Mobilization	LS	1	$15,000.00	$15,000
2.	Bonding and Insurance	LS	1	$5,000.00	$5,000
3.	12-inch Tree Removal	EA	7	$750.00	$5,250
4.	15-inch Tree Removal	EA	5	$1,000.00	$5,000
5.	18-inch Tree Removal	EA	6	$1,250.00	$7,500
6.	24-inch Tree Removal	EA	10	$1,500.00	$15,000
7.	30-inch Tree Removal	EA	1	$2,250.00	$2,250
8.	36-inch Tree Removal	EA	1	$2,750.00	$2,750
9.	Tree Removal by Acre	AC	5.2	$25,000.00	$130,000
10.	Compacted Backfill [1]	CY	340	$15.00	$5,025
11.	Seeding and Site Restoration	AC	5.2	$5,000.00	$26,000
				Construction Subtotal	$218,780
				Contingency 20%	$43,756
				Total Opinion of Construction Cost	$262,536
[1] Compacted backfill quantity was estimated using 2.5 CY per tree and 20 trees per acre.					

Clear Zone vs. ROW Tree Removal Consideration

Often in an urban area, maintaining the Levee ROW can be a challenge as encroachments placed by multiple entities sometimes are not approved, in addition to vegetation management. As a consideration, trees within the Levee ROW, including those outside the clear zone, could be removed. This is not required for PL 84-99 but does provide for additional risk reduction and more clearly defines the Levee ROW for operation and maintenance requirements. In total, this amounts to an additional 14.6 acres and 11 individual tree removals of various sizes. These numbers are based on 2016 Dodge and Sarpy County aerial imagery and are in addition to those shown in Table 3 Cost for Project 3. There are areas where the Levee ROW is substantially greater than the clear zone, so a balance could be struck between excessive vegetation removal and clearly defining the Levee ROW.

ASSUMPTIONS AND NOTES

1. 15-foot clear zone was delineated from JEO topographic survey, taken March 2020, and 2016 Eastern Nebraska Urban Area LiDAR data.
2. Quantities are based on 2016 Dodge and Sarpy County aerial imagery and supplemental survey data from March 2020.
3. Right-of-way information is from JEO topographic survey, taken March 2020.
4. The unit price for tree removals assumes removed materials will be hauled off site by Contractor.
    - Price may be reduced by having Contractor chipping and spreading trees on site, as long as proper seeding can be established.

Note: Only the stretch of levee with tree removals is shown on this map. There is levee downstream not shown.

1,000 500 0 1,000 Feet

Figure 18

Figure 19

Figure 20

Figure 21

Fremont, Farmland, and Railroad Levee

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Software: ArcGIS 10.7.1
Project: 190908.00

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Figure 17: Tree Removal Figure Map
Levee Evaluation

Fremont, NE

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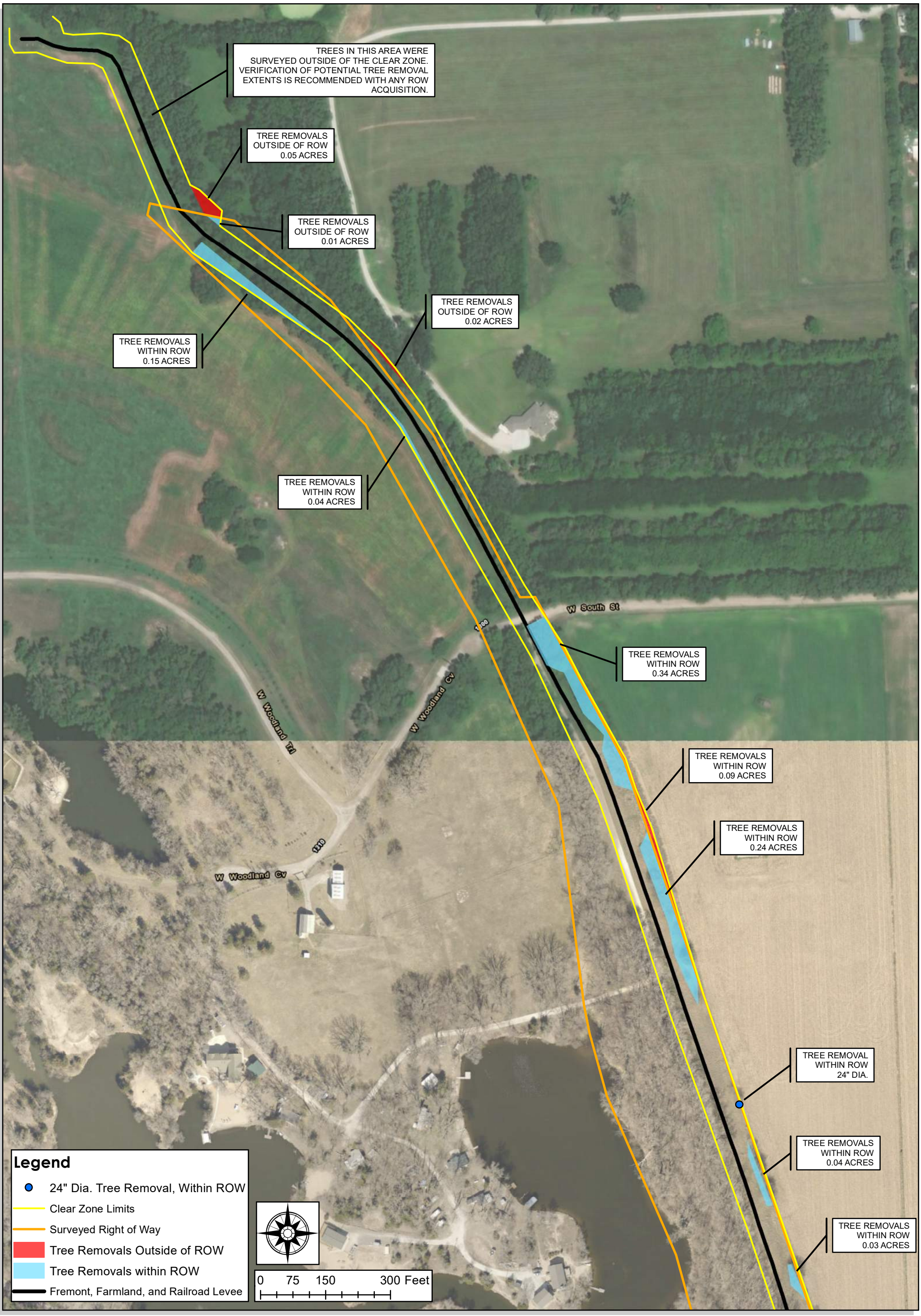

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Project: 190908.00

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Figure 18: Tree Removal Levee Evaluation

Fremont, NE

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Figure 19: Tree Removal Levee Evaluation

Fremont, NE

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TREE REMOVALS WITHIN ROW 0.49 ACRES

TREE REMOVALS OUTSIDE OF ROW 0.01 ACRES

TREE REMOVALS WITHIN ROW 0.53 ACRES

TREE REMOVALS WITHIN ROW 0.02 ACRES

TREE REMOVALS WITHIN ROW 0.89 ACRES

TREE REMOVALS WITHIN ROW 0.04 ACRES

TREE REMOVALS WITHIN ROW 0.02 ACRES

TREE REMOVALS WITHIN ROW 0.02 ACRES

Prospect Ave

Ridgeland Ave

Meadow Ln

W Boulevard St

Hansen Rd

Emerson Est

Legend

- 12" Dia. Tree Removal, Within ROW
- 15" Dia. Tree Removal, Within ROW
- 18" Dia. Tree Removal, Within ROW
- 18" Dia. Tree Removal, Outside of ROW
- 24" Dia. Tree Removal, Within ROW
- 30" Dia. Tree Removal, Within ROW
- 36" Dia. Tree Removal, Within ROW
- Clear Zone Limits
- Tree Removals Outside of ROW
- Tree Removals within ROW
- Surveyed Right of Way
- Fremont, Farmland, and Railroad Levee

0 75 150 300 Feet

Created By: MRG
Date: 02/17/2020
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Software: ArcGIS 10.7.1
Project: 190908.00

Figure 20: Tree Removal
Levee Evaluation

Fremont, NE

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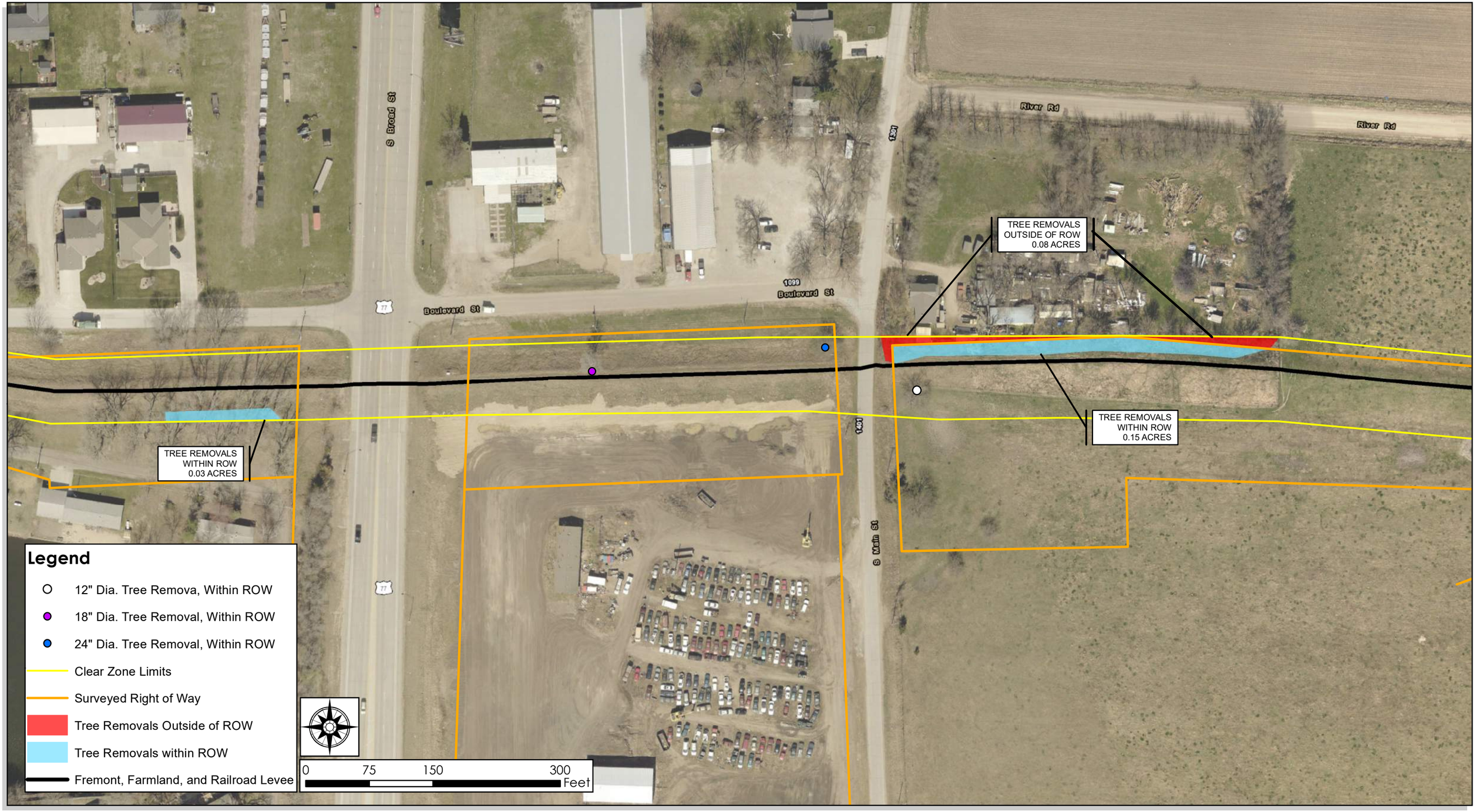

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Figure 21: Tree Removal Levee Evaluation

Fremont, NE

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16. PROJECT 4: ENCROACHMENT COORDINATION

EXISTING CONDITIONS

Encroachments, for the purposes of this evaluation, were generally considered to be anything other than the Levee embankment within the Levee right-of-way or its general vicinity. Encroachments are a concern for the following reasons: 1) they potentially inhibit or eliminate the ability to flood fight during high water events; 2) they potentially inhibit or eliminate the ability to perform maintenance tasks or inspect the Levee during normal time periods or high water events; and 3) can negatively impact the performance of the Levee and contribute to a critical failure path that would otherwise not exist.

During the November 2019 site visit, multiple encroachments, mainly trees, fences, and utilities, were noted; refer to Appendix D for a summary. Encroachments are generally disallowed as they are problematic in conducting Levee operations and can contribute to Levee failure, as mentioned previously. Those that are allowed need to be designed and engineered such that the likelihood of potential failure is reduced; typically, coordination with the Sponsor would be required and USACE review would be recommended to place an encroachment into the Levee right-of-way to ensure proper design considerations are employed, if allowable.

RECOMMENDATION

When assessing encroachments that have already been constructed there is an opportunity to reduce risk with a variety of actions ranging from simply understanding the nature of the encroachment to removal of the encroachment and restoration of the Levee. The City should develop and employ standard protocol for any existing and proposed encroachments including a review of whether it is necessary to be within the Levee clear zone or right-of-way and, if so, technical review coordination with the USACE should be completed.

Additionally, it is recommended that all encroachments be removed from the clear zone except those considered minor/minimal which do not create operational issues or paths to failure. If the encroachment is substantial (e.g., power poles) and does create an operational or maintenance deficiency, a programmatic approach can be taken with respective stakeholders. Where removal is not an option, or if completed in a manner which phases the work out into the distant future, a process should be employed to analyze the encroachment to determine its effects on the system and, if necessary, mitigate risk with structural or non-structural measures.

ASSUMPTIONS AND NOTES

1. Encroachments, fences and utilities, were noted during the November 2019 site visit. Measurements from the Levee to encroachments were taken, where accessible. Measurements are from the field identified Levee toe.
2. Trees were identified through the site visit, 2016 Dodge and Sarpy County aerial imagery, and JEO topographic survey data, dated March 2020.
3. Costs for utility and fence coordination were not estimated due to the limited scope of this study. Tree removal cost estimates are located in Section 15: Project 3.

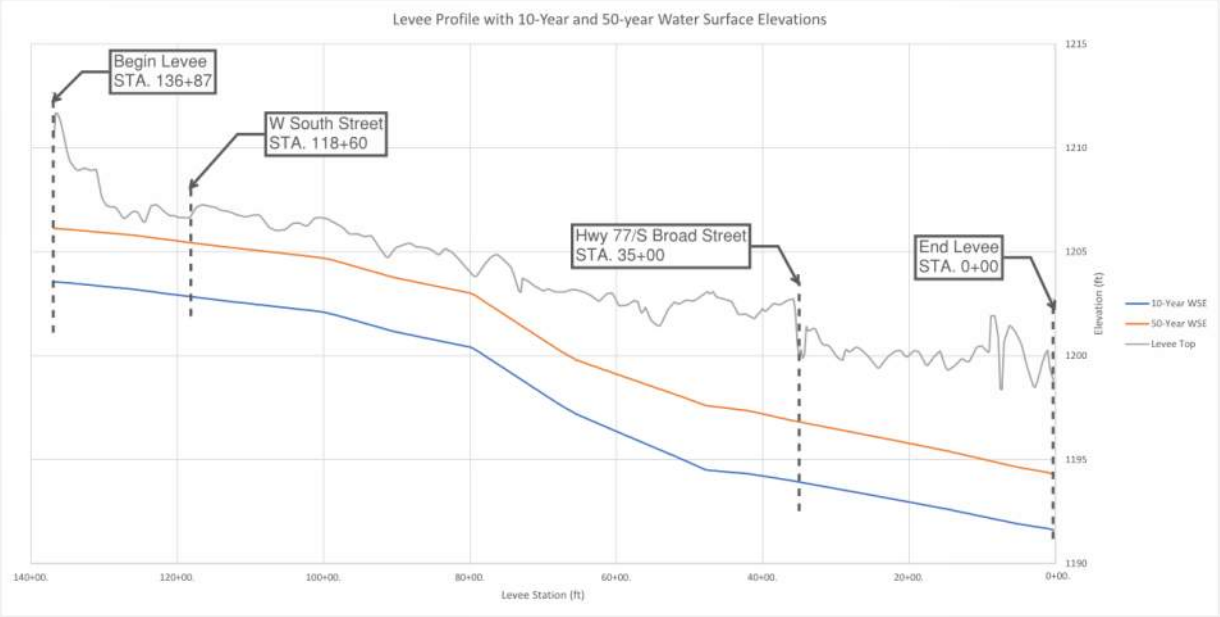
17. PROJECT 5: ELIMINATING LOW SPOTS

EXISTING CONDITIONS

The freeboard analyses (Section 8) showed that freeboard varies considerably for the 10-year and 50-year events – approximately 6.5-feet. Figure 22 provides a profile view of the Levee top, the 10-year water surface elevations, and the 50-year water surface elevations. Figure 23 provides a detailed visual of how the 50-year freeboard varies gradually, along the Levee and where relative low spots exist.

A Levee raise across approximately of 5,400-feet would be required to provide consistent freeboard for the 50-year event plus 2-feet of freeboard. The average raise would be 0.5-feet to meet this goal.

Figure 22: Levee and Water Surface Elevation Profiles



RECOMMENDATION

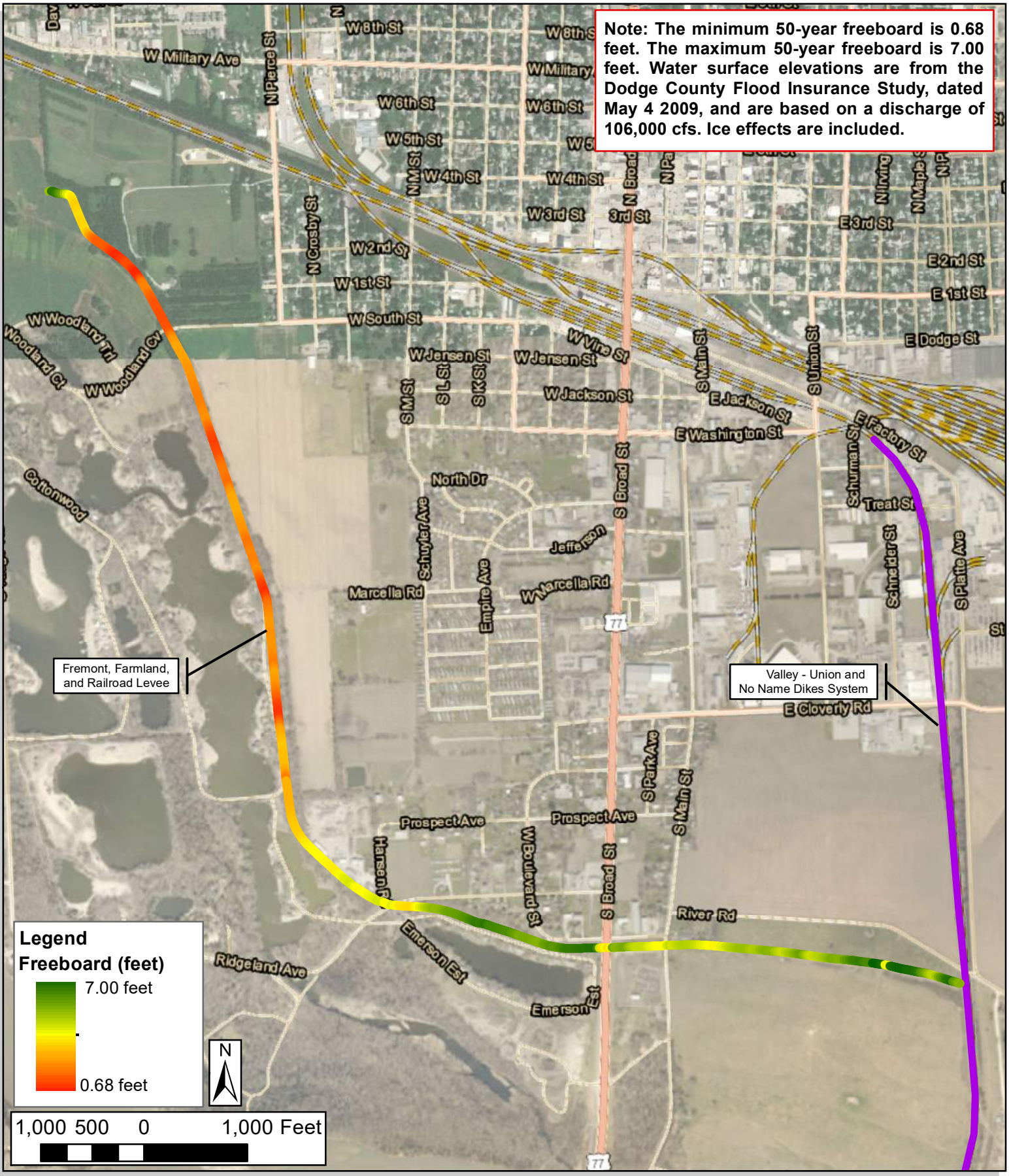
If the City desires to improve the Levee past the minimum PL 84-99 freeboard requirements, it is recommended improvements achieve a consistent minimum level of risk reduction for a given goal event; such an example is to provide for a 50-year level of risk reduction plus 2-feet freeboard.

In the event of Levee overtopping during a flood, a consistent level of risk reduction will decrease the likelihood of overtopping at one or more locations prior to the larger system being overtopped. These smaller overtopping areas create concentrated flow and erosive velocities that may escalate to a breach event. Referencing Figures 23 and 7 the correlation between relative freeboard and maximum velocity is illustrated. For example, during an overtopping event (e.g. 150,000 cfs) the areas of lowest relative freeboard will experience greater flow depths and potentially erosive velocities. This would take more evaluation and conceptual cost development than allows in this scope. A detailed cost estimate was not developed for a concept raise; however, to add some perspective a general cost was developed based on the required raise for the scenario described above (average 0.5-feet of height across 5400-feet of length). With a conceptual fill volume compared to the damage assessment cost estimate, a cost of approximately $400,000-$600,000 could be expected. This is a conceptual cost, that does not include the necessary tree

removals, right of way acquisition, etc., and would require more detailed evaluation and design to assess further.

If eliminating low spots or a raise to improve consistency is pursued, focus should include but not be limited to:

1. Utilizing the best available hydraulic profile data for a consistent top of Levee elevation (or developing one for this specific purpose),
2. Maximum upstream/downstream flanking/overtopping elevations that effectively control the overall system's level of performance,
3. Identifying low/controlling "hard spots", such as road crossings, where Levee raise costs may be prohibitive, and therefore this will either be the maximum Levee height or temporary emergency actions such as sandbag closures require erection),
4. Potential embankment seepage and stability impacts of an elevated water level loading (i.e., if the top of Levee increases so does the maximum water level and associated geotechnical performance parameters),
5. Impacts of a raise on horizontal features along the Levee, such as homes and infrastructure, and
6. Impacts of a raise on available ROW and additional acquisitions.
7. Avoidance or minimization of disturbance to wetlands and/or waters of the US.



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Revised: 04/28/2020
Software: ArcGIS 10.7.1
File: 190908.00

Figure 23: 50-Year Freeboard

Fremont, NE

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18. PROJECT 6: GEOTECHNICAL CONSIDERATIONS

EXISTING CONDITIONS

The site visit and the available topographic data indicate the embankment is relatively consistent in shape and generally has side slopes of 3H:1V. For the purposes of PL 84-99 eligibility the intent of the criteria is likely met, to be determined after further coordination with the USACE. The preliminary geotechnical evaluation indicates no stability concerns at the two evaluated locations and a seepage concern at one out of the two evaluated locations.

RECOMMENDATION

Understanding that the Levee may not perform as desired at top of levee loading should be incorporated into O&M activities, including an Emergency Preparedness Plan (EPP). Additional investigation and analysis would support a better understanding of the Levee performance for a wide range of conditions and more critical sections along its horizontal length. The findings of the preliminary geotechnical evaluation are based on top of levee water loading, which is higher than the PL 84-99 eligibility criteria of the 10-year event plus 2-feet. Even though the PL 84-99 criteria minimum is lower than the top of levee, it is likely reliance on the Levee and flood fighting may occur to, at, and above the top of levee loading. Therefore, consideration should be given to either or both EPP actions and triggers as well as further investigation and analysis. The further analysis may indicate other weak spots and it would also optimize the extent of underseepage control where underseepage concerns have been identified.

It is recommended that further analysis be conducted prior to or in accordance with other proposed improvements. The priority should be within the vicinity of the area of underseepage concern identified in the preliminary evaluation (approximate Station 121+60) and should expand from there. The previous borings conducted by USACE should be reviewed in more detail and incorporated into analysis, where appropriate. Typically to determine performance of the overall system in more detail or in support of improvements, two borings or sample points along the levee every 500-feet should be collected and reviewed to determine the extent of additional slope stability and underseepage analyses for the existing conditions. There are potentially multiple proposed conditions from other proposed projects/improvements that should be discussed, especially those regarding right-of-way acquisition and levee height changes. For example, Project 5: Eliminating Low Spots, recommends constructing a consistent top of levee for a given level of risk reduction (e.g. 50-year plus 2-feet freeboard). If the City is to consider this improvement, the resulting levee geometry, material makeup, and any necessary stability and underseepage control features should be considered when determining the right-of-way extents and associated benefits/costs with proceeding with said project.

Through the Section 205/General Investigation study of flood risk reduction for Fremont, the USACE collected a number of sample data and evaluation points. Draft information informed this current effort. Some data should be able to be utilized in future evaluations. For planning purposes and subject to available data, further detailed analysis of the system could range from $40,000 to $80,000.

19. PROJECT 7: OPERATION AND MAINTENANCE MANUAL (O&M) DEVELOPMENT

EXISTING CONDITIONS

Currently, the City does not have a formal Operation and Maintenance (O&M) Manual. Aside from being a best management practice, the City will need to develop and maintain an O&M Manual to be accepted into the PL 84-99 Rehabilitation Program and to remain in good standing.

RECOMMENDATION

A sample partially completed O&M Manual document is provided in Appendix H. This document provides the City with an outline of what is typically included in an O&M Manual and this document should be used to guide development of a complete document. The level of detail and supporting information included in O&M Manuals vary depending on Owner preferences and system needs. The City could develop a basic O&M Manual from the sample provided by filling in the missing information from their knowledge of the system. A more detailed, comprehensive manual should include items such as an EPP and Project Plates. Project Plates are drawings of the system developed from survey information and include plan and profile, right-of-way, utilities, access locations, and other relevant information. The EPP should be informed by the understanding of water loading at the top of the levee may create conditions where failure has a greater likelihood of occurrence. This would likely require action triggers to occur at lower levels than if the levee was known to be stable at top of levee loading.

The cost for completing an O&M manual and additional features can vary widely. Full topographic survey of the Levee to support project plate development could be on the order of $30,000. City staff can likely undertake some manual/information development. For budgeting purposes staff time can be utilized to fill in basic manual details; $40,000 can be budgeted for O&M Manual development efforts including completing manual details, development of project plates, and development and exercising of an EPP.

20. RECOMMENDED ACTIONS AND NEXT STEPS

The following projects and activities are recommended for completion as either a requirement for USACE PL 84-99 Rehabilitation Program eligibility or as a minimum best practice. Further coordination with the USACE related to program eligibility may indicate additional requirements based on professional judgment or District guidance. The following Table 4 summarizes the actions required for PL 84-99 eligibility as well as best practices and additional considerations for the City in their Levee sponsorship role. Based on coordination with the City, its stated goal is PL 84-99 eligibility; therefore, items listed as being an eligibility requirement would be a priority action.

Table 4: Recommended Actions and Next Steps

Action/Activity	Report Project ID (if applicable)	Addresses USACE PL 84-99 Eligibility Requirement?	Best Practice Measure?	Preliminary Cost Estimate
Address March 2019 flood damages	1	Yes	Yes	$510,000
Acquire necessary ROW for control of the Levee and clear zone	2	Yes	Yes	Required footprint has been identified, real estate/easement costs can be applied for total cost
Remove woody vegetation from clear zone	3	Yes	Yes	$265,000
Review encroachments and ensure they do not pose any concerns related to operation or maintenance; address as necessary	4	Yes	Yes	Staff time; cost is to be determined if coordination or removal is City responsibility
Repair animal burrows, monitor and develop control plan		Yes	Yes	Maintenance crew time and materials
Address low spots for desired consistent level risk reduction	5	No, the 10-year event plus 2-feet of freeboard requirement appears to be met with the effective regulatory data.	Yes, this would address consistency concerns	Dependent upon level of additional risk reduction and consistency desired. See above section for some detail regarding potential cost for a given scenario.

Action/Activity	Report Project ID (if applicable)	Addresses USACE PL 84-99 Eligibility Requirement?	Best Practice Measure?	Preliminary Cost Estimate
Further geotechnical evaluation to identity/optimize seepage improvement project(s)	6	No (Pending USACE coordination)	Yes, operation and flood fighting likely to occur to top of levee (see Sections 9 and 18 for more information)	$40,000-$80,000 depending on scope and available existing data Potential project cost(s) to be informed by additional evaluation
Collect full topographic survey of Levee Complete O&M Manual and develop/exercise EPP	7	Topographic data developed to date could be used to develop basic project plates (alignment, top of Levee profile, current ROW, etc.). The USACE may desire more detail and, if so, additional data can be collected. The completion of the O&M Manual addresses PL 84-99 Eligibility Requirements	Yes	Full topographic survey can vary, assume $30,000 for planning purposes For planning purposes $40,000 can be budgeted for consultant time to complete the O&M Manual including exercises
Develop controls and/or monitor upstream and downstream tie in locations to ensure they are not degraded		No, however if not maintained, upstream and downstream tie in point degradation can create eligibility concerns.	Yes	Staff time; there may be cost implications if real estate is required
Coordinate with NDOT on Southeast Beltway and Levee overlap		To be determined: USACE coordination through program enrollment will determine potential impacts of the beltway project on the Levee.	Yes	Staff time

Action/Activity	Report Project ID (if applicable)	Addresses USACE PL 84-99 Eligibility Requirement?	Best Practice Measure?	Preliminary Cost Estimate
Consider FEMA Levee accreditation and any necessary improvements		No, USACE PL 84-99 is not reliant upon FEMA Levee accreditation; FEMA does rely on PL 84-99 active/inactive designation (post-enrollment) as a consideration in mapping status.	Best practices for Levee sponsorship can be achieved without FEMA Levee accreditation; however, FEMA Levee accreditation requires practices to be implemented and therefore can be a tool to ensure best practices are implemented.	Further evaluation and design would be required. Upstream and downstream flanking elevations, road crossings and geotechnical performance improvements could be significant cost and feasibility considerations.

As the required items for PL 84-99 eligibility are being addressed, USACE coordination could begin to get the process started. The tree removal project is likely the largest technical need for eligibility, therefore, coordination with USACE Omaha District could begin as that project proceeds and is completed.

21. CONCLUSION

To meet PL 84-99 Rehabilitation Program criteria and improve the Fremont, Farmland, and Railroad Levee, a preliminary evaluation of the Levee's existing conditions and performance was completed. Certain deficiencies were identified, and seven potential projects are recommended: Address March 2019 Flood Damages, Right-of-Way Acquisition, Tree Clearing, Encroachment Coordination, Eliminating Low Spots, Geotechnical Considerations, and Operation and Maintenance Manual Development. Project sheets in this assessment contain details for each project recommendation. Implementation of all these projects and activities will be useful for the City in their efforts to meet PL 84-99 Rehabilitation Program criteria and reduce flood risk.

This preliminary evaluation included limited review and data collection. Though the recommended projects in this report support the Levee's acceptance into the USACE Rehabilitation Program and reduce flood risk, they will not eliminate flood risk. Additional measures, including operational and non-structural considerations, as well as flood insurance, would add to a holistic approach to flood risk reduction.

APPENDIX A – GEOTECHNICAL EVALUATION

Geotechnical Engineering Report

Fremont Levee Preliminary Evaluation

Fremont, Nebraska

June 3, 2020

Terracon Project No. 05165169

Prepared for:

JEO Consulting Group, Inc.

Omaha, Nebraska

Prepared by:

Terracon Consultants, Inc.

Omaha, Nebraska

June 3, 2020

JEO Consulting Group, Inc
11717 Burt Street
Suite 210
Omaha, NE 68154-1510

Attn: Mr. Dan Fricke, PE, CFM, LEED AP
P: (402) 392-9917 ext. 1504
E: dfricke@jeo.com

Re: Geotechnical Engineering Report
Fremont Levee Preliminary Evaluation
Fremont, Nebraska
Terracon Project No. 05195169

Dear Mr. Fricke:

Terracon Consultants, Inc. (Terracon) has completed a subsurface exploration for the referenced project. The accompanying engineering report presents the preliminary findings of the subsurface exploration and geotechnical conditions of the levee and adjacent areas (embankment and foundation stability and underseepage only).

We appreciate the opportunity to be of service to you on this project. Please contact us if you have any questions concerning this report, or if we may be of further service.

Sincerely,

Terracon Consultants, Inc.

Gopala K. Allam, E.I.
Senior Staff Engineer

Edward D. Prost, Jr., P.E.
Principal

GKA/EDP:gka

Distribution: Addressee (PDF)
Mr. Ross Lawrence, JEO Consulting Group, Inc. (PDF)

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GEOTECHNICAL ENGINEERING REPORT
FREMONT LEVEE PRELIMINARY EVALUATION
FREMONT, NEBRASKA

Terracon Project No. 05195169

June 3, 2020

INTRODUCTION

This report presents the results of the preliminary subsurface exploration and our evaluation of the existing Levee in Fremont, Nebraska. The levee is about 1.9 miles in length extending in a west to northwest direction from a location near the intersection of US Highway 77 and Boulevard Street to a location about 1300 feet north of West South Street and about 850 feet east of Ridge Road. The levee acts as flood protection from the Platte River.

The preliminary field exploration included five borings performed to depths ranging from about 15 to 30 feet below the existing ground surface in the proposed levee alignment.

The individual boring logs are included in Appendix A. The approximate boring locations are shown on the **Exploration Plans**, also included in Appendix A.

The purposes of this preliminary report are to describe the subsurface conditions encountered in the soil borings, to present the test data, and to provide a preliminary geotechnical evaluation of the levee for underseepage stability and, slope stability for the levee. General site development and earthwork recommendations are also provided.

Our work was completed in general accordance with our proposal agreement no. P05195169 dated October 29, 2020.

Our geotechnical evaluation was completed in general accordance with the USACE Circular No. 1110-2-6067 dated August 31, 2010 and the USACE Engineering Manual EM 1110-2-1913, dated April 30, 2000, as modified by ETL 1110-2-569, Design Guidance for Levee Underseepage, dated May 1, 2005.

PROJECT DESCRIPTION

Site Description

Item	Description
Location	The levee is located landward of the left (north) bank of the Platte River on the south side of Fremont, Nebraska.

Item	Description
Existing improvements	The project currently consists of earthen levee about 1.9 miles in length extending in a west to northwest direction from a location near the intersection of US Highway 77 and Boulevard Street to a location about 1300 feet north of West South Street and about 850 feet east of Ridge Road. The levee acts as flood protection from the Platte River. Much of this levee appeared to be in place at the time of a soil survey in 1918. We understand that several breaches occurred during the flooding that occurred in March of 2019, including one north of West South Street, and several in the vicinity of Emerson Lake.
Current ground cover	Based on Google Earth and site visits, the majority of the site appears to be grass covered, with signficant large tree growth along some portions of the levee, especially on the landside of the levee.
Existing topography	Based on the Google Earth map, most of the site is relatively level (other than the levee section) and previous man placed fill.
Existing Subsurface Data	Soil borings completed by or for the US Army Corps of Engineers. Borings in general vicinity indicate fill and alluvial clay over silt and sand.

Project Description

Item	Description
Structure	Earthen levee appears to generally be less than 6 feet in height.
Site Development	Repair of breaches, improvements where required for seepage, stability or hydraulics.
Grading	Not known.

Should any of the above information or assumptions be inconsistent with the planned construction, please let us know so we may make any necessary modifications.

SITE VISIT

A Terracon Engineer visited the site with representatives of JEO Consultants, Inc. on November 18, 2019 to visually observe the conditions, vegetation and general topography along the levee. We rode along the levee crest most of the length in a pick-up truck and walking along several sections. The topography along the top of the levee was relatively consistent, gradually lowering in elevation to the south and east, however, the riverside and landside of the levees contained areas of thick vegetation, including mature trees, some within the section of the levee, and the

topography undulated with higher and lower areas, apparently including some lower areas, possibly including previous river channels and areas of anticipated fill placement of unknown origin. A few areas where breaches of the levee occurred during the 2019 Spring flooding were pointed out by JEO. These breaches had been filled or repaired such that the conditions that existed during and after the flood were no longer visible, however, in some locations there appeared evidence of washout or gulleys that had formed on the landside, apparently from water flowing through the breaches.

One of the significant concerns related to the levee that was observed during the site visit is the significant tree and vegetative growth along the levee slopes and near the levee toes that would require significant clearing and root removal to meet certification requirements and allow the installation of drains or berms, if needed.

During our visit, we also walked the levee east of US Highway 77 to near the railroad crossing, however, it is our understanding that this area is not within the current area of interest for this study.

SUBSURFACE CONDITIONS

Subsurface Profile

We have developed a general characterization of the soil and groundwater conditions based upon our review of the boring information. This characterization, termed GeoModel, forms the basis for our geotechnical evaluations and recommendations for site preparation and earthwork, and foundation options. Conditions encountered at each boring location are indicated on the individual boring logs. The GeoModel and individual logs are provided in **Exploration Results**.

The GeoModel is based upon our boring information across the site. Variations can occur between boring locations and across the site. Previous construction and grading may have created additional variations.

Groundwater

The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed are noted on the attached boring logs and are summarized below.

Boring Number	Location	Depth to groundwater while drilling, ft.
FL-20-02	Top of Levee	6
FL-20-02R	Riverside of Levee	7
FL-20-03L	Landside of Levee	9
FL-20-03	Top of Levee	15
FL-20-04	Top of Levee	23

A relatively long period of time is necessary for a groundwater level to develop and stabilize in a borehole. Longer term monitoring in cased holes or piezometers would be required for a more accurate evaluation of the groundwater conditions.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structures may be higher or lower than the levels indicated on the boring logs. It is also our experience that perched water can develop overlying compacted clay fill and native fat clay. The possibility of groundwater level fluctuations and development of perched water conditions should be considered when developing the design and construction plans for the project.

ENGINEERING RECOMMENDATIONS

Geotechnical Considerations

The geotechnical evaluations for this project consisted of preliminary stability analyses of the levee slopes, and underseepage analyses of the levee. In addition to the soil boring information provided in this exploration, Terracon was provided with a large amount of data and analyses provided by the US Army Corps of Engineers (USACE). This data involved the exploration and analysis for a study of a mostly new levee alignment just to the landside of the existing levee, in most locations, and along an alternate route south of Emerson Lake. Soil borings FL07-2, FL07-3, FL07-4, FL07-7, and FL07-10 were drilled near the alignment of the levee section that is the subject of the current study. The results of the study by the USACE appears to have indicated the need for construction of a berm along most of the levee to provide the required seepage gradient to meet USACE requirements for a levee.

For our evaluation, we have used the cross sections prepared by JEO that were deemed representative of the critical areas of the levee with regard to slope stability and underseepage. The critical sections were selected based on geometry and soil conditions. The typical section consists of side slopes of about 3H:1V or flatter with a crest width ranging from about 8 to 15 feet and a

bottom width ranging from about 40 to 70 feet. The flood level was assumed to be at the crest of the levee for analysis of underseepage and slope stability.

In summary, our analyses indicate no concern related to slope stability of the levee, meeting or exceeding requirements set by the US Army Corps of Engineers in the manuals and guidance documents as described in the following sections of this report. The results of the initial seepage analysis for the proposed levee sections indicated excessive gradient and seepage at the toe if no remedial measures are included for the levee section at FL-20-03.

We recommend a toe trench drain or a seepage berm be installed to address seepage concerns for the levee section at FL-20-03..

Soil borings were completed within (FL-20-03) and near the breach area (FL-20-04) north of West South Street to observe and compare the materials and compaction of the levee soils in these two sections. Based on visual observation, the materials and moisture conditions appeared to be very similar in each of the borings, however, we did not obtain adequate information from the borings to evaluate the compaction level.

As mentioned in the Site Visit section, the breaches had been repaired at the time of our site visit, therefore, we are not able to determine if the failure breaches experienced during the 2019 Spring flood were due to overtopping or the development of excessive seepage gradients and subsequent development of boils and undermining of the levee section, however, if the water levels during the flooding were near the top of the levee, it is our opinion, it is more likely that the failures were due to deficiencies in the levee section (such as height or compaction or unfilled burrows) and not the foundation soils, based on our understanding of the limited amount of repair needed beyond the levee section.

Slope Stability

Selection of Critical Sections

The cross sections selected for slope stability analyses are those which appear to be the critical cross sections based on the geometry of the section and soil conditions encountered in the nearest borings. Slope stability analysis plots are provided in Appendix B. The top and toe elevations of the levee are based on the information from the cross sections prepared by JEO.

Selection of Strength Parameters

The strength parameters of the clay soils selected for the slope stability analyses were determined from a combination of laboratory data of the on-site soils, published correlations, and previous experience with similar soils.

Unconsolidated undrained (UU) total stress parameters were used for "End of Construction" analysis conditions for clay soils. The UU parameters for clay soils were estimated from hand penetrometer readings. The interpreted UU shear strength of the native clay soils were generally taken as 1/3 to 1/2 of the hand penetrometer values and typically ranged from about 500 to 1500 psf.

Consolidated undrained (CU) total stress parameters were estimated based on the soil type and unconfined compression strength, and used for staged "Rapid Drawdown" analysis conditions for clay soils.

Drained strength parameters used for "Steady State" analysis conditions were estimated from correlations of fully softened secant friction angle with clay fraction and liquid limit (Stark et. al 2005). The drained strength parameters were also utilized for the staged "Rapid Drawdown" analyses in conjunction with the estimated CU total stress parameters. The input parameters and results from the fully softened drained strength evaluation are presented in Appendix B.

Strength parameters for sands were estimated from correlations of friction angle with SPT blow counts (Peck et. al 1974).

The following table lists the strength parameters utilized for the slope stability analyses:

Soil	UU (Total Stress)		CU (Total Stress)		Drained (Effective Stress)	
	c	Φ	c	Φ	c'	Φ'
Clay	500-900 psf	0°	500 psf	16°	0 psf	30°
Silt/Sand	0 psf	28°-35°	0 psf	28°-35°	0 psf	28°-35°

Stability Analysis and Results

Analyses of slope stability were completed utilizing computer-aided limit equilibrium methods (Morgenstern-Price Method) with the computer program "SLOPE/W" developed by Geo-Slope International Ltd. The analysis procedure used a grid and radius search method within defined limits to automatically determine the critical potential slide surfaces for a given location and condition. Please refer to Table 6.1b from EM 1110-2-1913 for target factor of safety and associated references. The following table presents the results of our slope stability analyses.

Analyses were performed for end of construction, steady state, and rapid drawdown conditions, utilizing methods in general accordance with those described in EM 1110-2-1902 and EM 1110-2-1913, including a staged method of analysis for the rapid drawdown condition.

The following table presents the results of slope stability analysis calculated at corresponding critical section locations:

Critical Section	Top of Levee Elevation, ft.	Analysis Condition	Required Minimum Factor of Safety [1]	Factor of Safety Obtained from Analysis
FL-20-02	1206.6	End of Construction	1.4	1.67
		Steady State	1.4	1.44
		Rapid Drawdown	1.0 – 1.2	1.85
FL-20-03	1206.9	End of Construction	1.4	> 2
		Steady State	1.4	> 2
		Rapid Drawdown	1.0 – 1.2	>2

1. Reference table 6.1b from EM 1110-2-1913.

Based on our analyses, it appears that the existing levee configuration will generally provide adequate slope stability for the loading conditions used in our analysis.

Slope stability analysis plots and results are provided in Appendix B. The stability analyses do not take into account the potential for migration of soils due to moderate to high exit seepage gradients near the toe of the levee. Underseepage analyses were completed to evaluate this potential and are addressed in the following section.

Underseepage

Selection of Critical Sections

The cross sections selected and analyzed for underseepage was that which appeared to be critical based on the geometry of the section and the anticipated soil conditions from the nearest borings. Underseepage calculations and thickness of the clay blanket on the wet side and dry side of the levee are provided in Appendix B. The top and toe elevations of the levee are based on the information from the cross sections prepared by JEO.

Underseepage Analysis and Results

The procedures outlined in Appendix B of USACE EM-1110-2-1913 were utilized to perform an underseepage analysis.

The permeability of the sands were based on correlations with gradation developed by Hazen, k=C x D_{10}^2, where k is the estimated permeability of the sand. The parameters used in our analysis for the granular soils are presented in the following table.

Soil Description	D_{10} value estimated from Grain Size Distribution Curves (mm)	Coeff. Of Permeability (ft/sec)
Fine Sand	0.158	8.19e-004

Ratios of Permeability of Pervious Stratum to Landside Top Stratum (k_f/k_{bl}) used in our analysis

Soil Description	$(k_f/k_{bl})^1$
Clay	400
Silt	300
Silty Sand	150

1. TM 3-424 Table 38

The depth of the sand aquifer was estimated based on the Nebraska well log information available in and around Fremont. From well log data, the thickness of the sand aquifer was estimated to be about 60 to 80 feet and we utilized this value for our analysis.

The following table presents the upward exit gradients calculated at these critical section locations along with other information used in our analyses:

Critical Section	Top of Levee Elevation, ft.	Riverside Toe of Levee Elevation, ft.	Calculated Upward Exit Gradient
FL-20-02	1206.6	1196	0.31
FL-20-03	1206.9	1199.6	**0.71**

The underseepage analysis procedure utilized for the above cases consists of the determination of hydraulic gradient at the toe of the levee and then determining the upward exit gradient. The clay blanket, where indicated by the nearest boring, was assumed to exist on both sides of the levee and to be semipervious.

The USACE design guidance states that an exit gradient should be less than 0.5. If the exit gradient is greater than 0.5, then landside trench drains along the toe of the levee, or seepage berms, or relief wells should be designed to provide an exit gradient of about 0.5 or less.

As indicated above, underseepage analysis was performed at critical section location FL-20-03 indicated the exit gradient to be greater than the allowable 0.5. This is apparently due to the relatively thin clay layer observed and modeled for this section based on the boring log.

Remedial measures such as providing landside trench drains along the toe of the levee, seepage berms, or relief wells are required by the USACE design guidance documents to reduce the exit gradients. In our experience, with the given site conditions, we anticipate toe drains or seepage berms would be the more favorable options for remediating the excessive seepage gradients, and due to the maintenance associated with drains, berms are generally preferred if adequate right of way can be reasonably obtained.

GENERAL COMMENTS

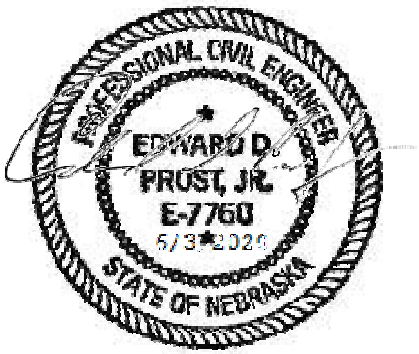
Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered

valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.



APPENDIX A
FIELD EXPLORATION

SITE LOCATION

Fremont Levee Preliminary Exploration ■ Fremont, NE
May 22, 2020 ■ Terracon Project No. 05195169

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Fremont Levee Preliminary Exploration ■ Fremont, NE
May 22, 2020 ■ Terracon Project No. 05195169

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Fremont Levee Preliminary Exploration ■ Fremont, NE
May 22, 2020 ■ Terracon Project No. 05195169

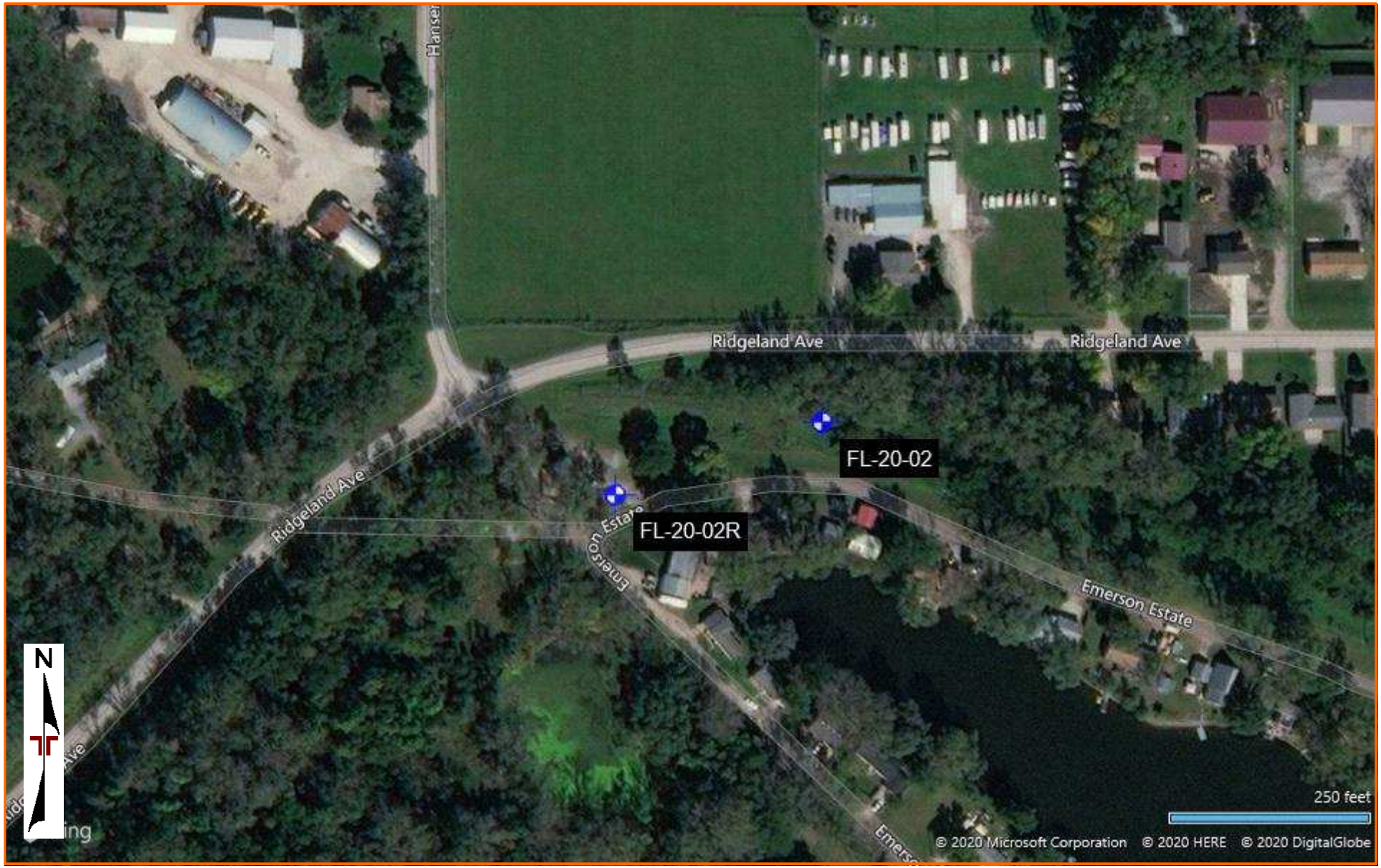


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Field Exploration Description

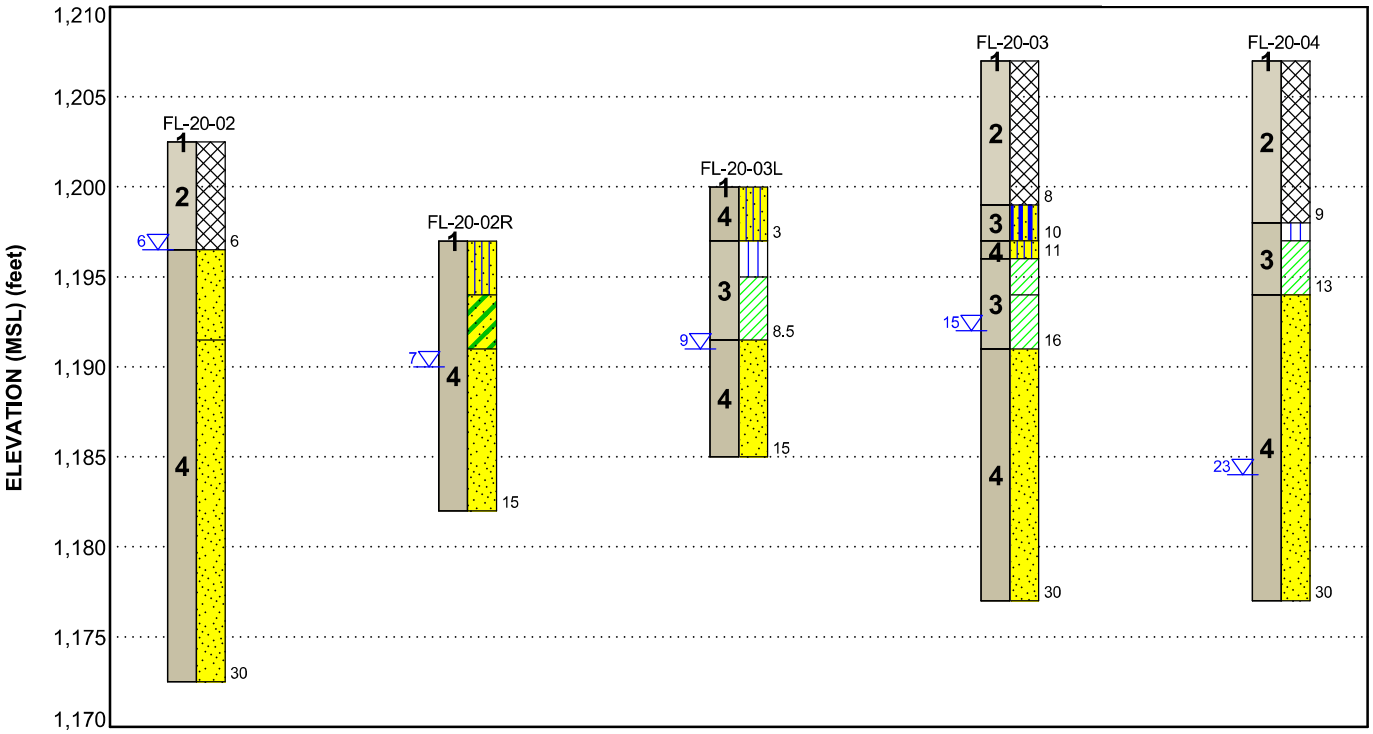
The boring locations were staked and surveyed by JEO Consulting Group. Terracon drill crew obtained GPS coordinates at each boring locations. The ground surface elevations at borings were provided by JEO Consulting Group and have been rounded to the nearest ½-foot. The approximate boring locations are shown on the **Exploration Plans** included in Appendix A.

The borings were advanced with an ATV-mounted drilling rigs utilizing continuous flight hollow stem augers to advance the boreholes. Representative samples were obtained using thin-walled tube and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, 3-inch OD, seamless steel tube with a sharp cutting edge is pushed hydraulically into the ground to obtain relatively undisturbed samples of cohesive or moderately cohesive soils. In the split-barrel sampling procedure, a standard 2-inch O.D. split-barrel sampling spoon is driven into the ground with an automated 140-pound hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the standard penetration resistance value. These values are indicated on the boring log at the depths of occurrence. The samples were sealed and transported to the laboratory for testing and classification.

The drill crew prepared field logs for the borings. The logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Water levels observed during drilling were measured and recorded on the field log. The boring logs included with this report represent an interpretation of the field logs and include modifications based on laboratory observations and testing of the samples.

GEOMODEL

Fremont Levee Preliminary Exploration ■ Fremont, NE
Terracon Project No. 05195169



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial Materials**	Grass, root zone
2	**Existing Fill (Levee)**	Silty Sand
3	**Alluvial Clays and Silts**	Silt, Lean Clay, Lean Clay with sand, Sandy Silt
4	**Alluvial Sands**	Silty Sand, Clayey Sand, Fine Sand, Fine to Coarse Sand

LEGEND

- Fill
- Clayey Sand
- Sandy Silt
- Poorly-graded Sand
- Silt
- Silty Sand
- Lean Clay

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

BORING LOG NO. FL-20-02

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4139° Longitude: -96.5067°
Northing: 595075.15 Easting: 2598038.198

Surface Elev.: 1202.5 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1														
2			Grass, root zone at surface **FILL - SILTY SAND**, trace roots, light brown to light gray				12				9		NP	23
							18				6			
		6.0	1196.5	5	▽									
			FINE SAND (SP), light brown to light gray, very loose to loose				10	1-1-2-2 N=3			5			
							8	3-2-3-4 N=5			22			
		11.0	1191.5	10										
4			**FINE TO COARSE SAND (SP)**, light brown to light gray, medium dense				12	4-9-11-13 N=20			17			
							5	2-5-5-6 N=10			17			
			Trace gravel below about 16 feet	15										
							6	2-4-6-4 N=10			16			
							6	3-5-5-4 N=10			14			2
				20										
			Loose at about 23 feet				7	2-2-2-5 N=4			14			
				25										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Energy transfer ratio of 93.6%; hammer efficiency correction is 1.56 (October 2019)

WATER LEVEL OBSERVATIONS

▽ *6 ft., While Drilling*

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-06-2020 | Boring Completed: 03-06-2020

Drill Rig: 735 | Driller: C. Nelson

Project No.: 05195169

BORING LOG NO. FL-20-02

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4139° Longitude: -96.5067°
Northing: 595075.15 Easting: 2598038.198

Surface Elev.: 1202.5 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
4			**FINE TO COARSE SAND (SP)**, light brown to light gray, medium dense *(continued)*											
			Dense at about 28 feet				21	16-23-24-12 N=47			9			
		30.0		30										
			Boring Terminated at 30 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ 6 ft., While Drilling

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-06-2020 Boring Completed: 03-06-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

BORING LOG NO. FL-20-02R

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4136° Longitude: -96.5077°
Northing: 594974.119 Easting: 2597784.076

Surface Elev.: 1197 (Ft.)

DEPTH	ELEVATION (Ft.)
0.0	1197
3.0	1194
6.0	1191
15.0	1182

MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1											
				17		500 (HP)		11	104		
	5			6	2-3-3-4 N=6			22			33
4		▽		13	2-5-4-5 N=9			15			
				7	3-4-3-3 N=7			17			
	10										
				12	3-5-4-3 N=9			14			
	15										

Grass, root zone at surface
SILTY SAND (SM), trace roots, mottled gray

CLAYEY SAND (SC), dark gray, loose

FINE TO COARSE SAND (SP), trace gravel, light brown to light gray, loose

Boring Terminated at 15 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Energy transfer ratio of 93.6%; hammer efficiency correction is 1.56 (October 2019)

WATER LEVEL OBSERVATIONS

▽ *7 ft., While Drilling*

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-06-2020 Boring Completed: 03-06-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/17/20

BORING LOG NO. FL-20-03L

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4295° Longitude: -96.5145°
Northing: 600672.611 Easting: 2595688.092

Surface Elev.: 1200 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1														
4			Grass, root zone at surface **SILTY SAND (SM)**, trace roots, light brown to light gray				14		500 (HP)		21	94		
		3.0												
			1197											
			SILT (ML), trace sand, dark gray, soft				15		2000 (HP)	830				
		5.0												
			1195	5										
3			**LEAN CLAY (CL)**, trace sand, dark gray, medium stiff				8		500 (HP)	1100	24	97	29-17-12	77
		8.5												
			1191.5											
4			**FINE TO COARSE SAND (SP)**, light brown to light gray, medium dense	10	▽		6	4-5-7 N=12			18			
			Loose, trace gravel at about 13.5 feet				7	2-1-5 N=6			15			
		15.0		15										
			1185											
			Boring Terminated at 15 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Energy transfer ratio of 93.6%; hammer efficiency correction is 1.56 (October 2019)

WATER LEVEL OBSERVATIONS

▽ 9 ft., While Drilling

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-05-2020 Boring Completed: 03-05-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/17/20

BORING LOG NO. FL-20-03

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4302° Longitude: -96.5156°
Northing: 600914.834 Easting: 2595351.751

Surface Elev.: 1207 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1														
2			Grass, root zone at surface **FILL - SILTY SAND**, trace roots, light brown to light gray				10				12			
							18				10			
				5			18				7			
		8.0	1199											
3			**SANDY SILT (ML)**, dark gray, loose				8	2-2-2-3 N=4			20			
		10.0	1197	10										
4		11.0	**SILTY SAND (SM)**, light brown 1196				10			910	23 9 23	89 89		
3			**LEAN CLAY (CL)**, trace sand, dark gray, soft											
		13.0	1194											
			SILT (ML), trace sand, light gray, medium stiff				12		1500 (HP)	1720	27	100	29-21-8	91
		16.0	1191	15	▽									
4			**FINE TO COARSE SAND (SP)**, trace gravel, light brown to light gray, medium dense				8	3-7-8-4 N=15			17			
			Loose at about 18 feet				10	2-3-6-6 N=9			19			
				20										
							6	2-7-10-6 N=17			14			6
				25										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Energy transfer ratio of 93.6%; hammer efficiency correction is 1.56 (October 2019)

WATER LEVEL OBSERVATIONS

▽ *15 ft., While Drilling*

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-05-2020 Boring Completed: 03-05-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/17/20

BORING LOG NO. FL-20-03

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4302° Longitude: -96.5156°
Northing: 600914.834 Easting: 2595351.751

Surface Elev.: 1207 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
4														
			FINE TO COARSE SAND (SP), trace gravel, light brown to light gray, medium dense *(continued)*											
			Dense at about 28 feet				15	10-17-14-16 N=31			12			
		30.0	1177	30										
			Boring Terminated at 30 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *15 ft., While Drilling*

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-05-2020 Boring Completed: 03-05-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

BORING LOG NO. FL-20-04

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4306° Longitude: -96.5159°
Northing: 601056.473 Easting: 2595275.982

Surface Elev.: 1207 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1														
2			Grass, root zone at surface **FILL - SILTY SAND**, trace roots, light brown to light gray				11		1000 (HP)		12	100		
							10				8			19
				5			10				8			
		9.0	1198											
			SILT (ML), trace sand, dark gray, stiff				6		2500 (HP)		19 9 19	94		
		10.0	1197	10										
3			**LEAN CLAY (CL)**, trace sand, dark gray, medium stiff				14		1500 (HP)		23	94	29-15-14	65
		13.0	1194											
4			**FINE TO COARSE SAND (SP)**, light brown to light gray, loose to medium dense				13	2-2-3-4 N=5			17			
				15										
							8	5-8-8-7 N=16			17			
			Trace gravel below about 18 feet				10	5-5-7-7 N=12			17			
				20	▽									
							11	5-5-6-7 N=11			14			
				25										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Energy transfer ratio of 93.6%; hammer efficiency correction is 1.56 (October 2019)

WATER LEVEL OBSERVATIONS

▽ *23 ft., While Drilling*

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-05-2020 | Boring Completed: 03-05-2020

Drill Rig: 735 | Driller: C. Nelson

Project No.: 05195169

BORING LOG NO. FL-20-04

PROJECT: Fremont Levee Preliminary Exploration

CLIENT: JEO Consulting Group Inc
Omaha, NE

SITE:
Fremont, NE

LOCATION See Exploration Plan

Latitude: 41.4306° Longitude: -96.5159°
Northing: 601056.473 Easting: 2595275.982

Surface Elev.: 1207 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
4														
			FINE TO COARSE SAND (SP), light brown to light gray, loose to medium dense *(continued)*											
			Dense at about 28 feet				9	5-18-20-23 N=38			12			5
		30.0	1177	30										
			Boring Terminated at 30 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ 23 ft., While Drilling

Terracon
15080 A Cir
Omaha, NE

Boring Started: 03-05-2020 Boring Completed: 03-05-2020

Drill Rig: 735 Driller: C. Nelson

Project No.: 05195169

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/17/20

APPENDIX B
LABORATORY TESTING AND ANALYSIS RESULTS

Laboratory Testing

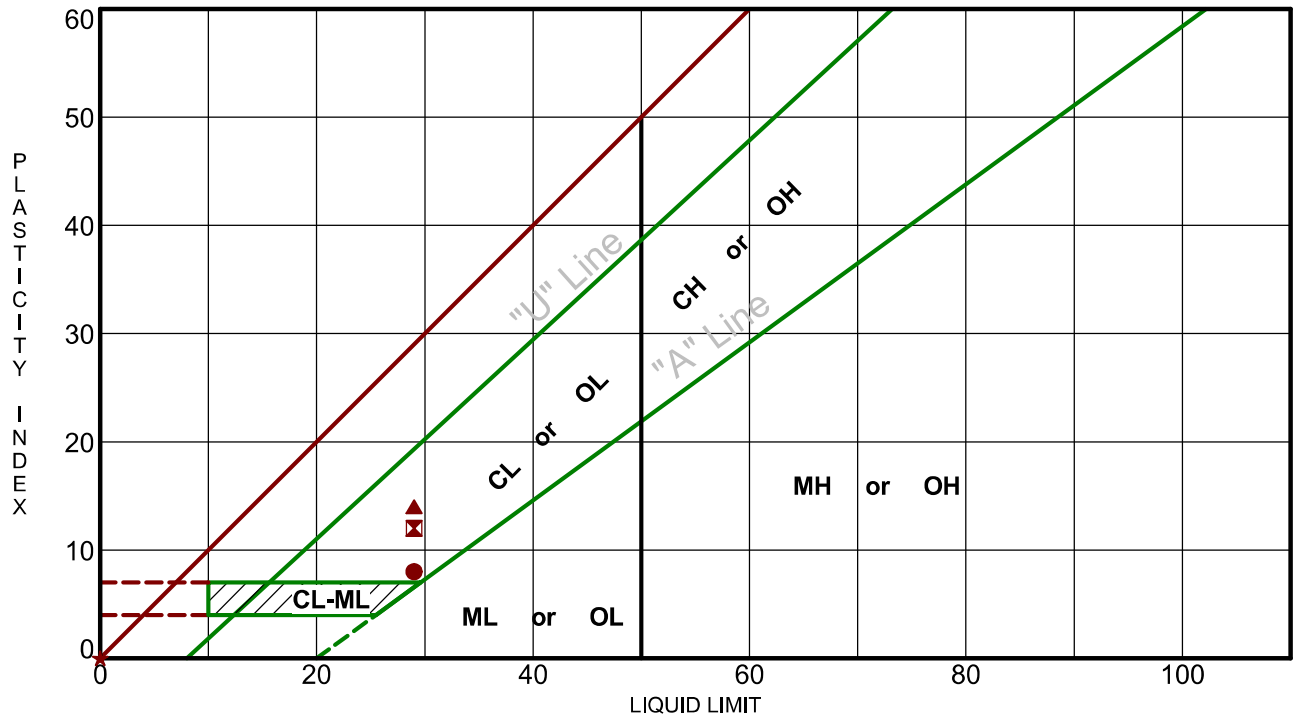
Water content tests (ASTM D2216) were performed on the samples. Density determinations (ASTM D7263) were performed on most of the thin-walled tube samples. The unconfined compressive strength of many samples was estimated with a hand penetrometer test. In addition, four Atterberg limits tests (ASTM D4318) and nine grain size analyses (ASTM D422) were performed on selected samples. The results of these laboratory tests are provided on the boring logs or plotted and included in Appendix B.

The samples were classified in the laboratory based on visual observation, texture, and plasticity (ASTM D2488). Additional laboratory testing could be performed to more accurately classify the samples. The soil descriptions for native soils presented on the boring logs are in accordance with our enclosed General Notes and Unified Soil Classification System (USCS, ASTM D2487 and ASTM D2488). The estimated group symbol for the USCS is also shown on the boring logs for native soils, and a brief description of the USCS is included in the attached figures.

Procedural standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	FL-20-03	13 - 15	29	21	8	91.2	CL	Lean Clay
⊠	FL-20-03L	5 - 7	29	17	12	76.7	CL	Lean Clay with Sand
▲	FL-20-04	10 - 12	29	15	14	64.8	CL	Sandy Lean Clay
★	FL-20-02	1 - 3	NP	NP	NP	22.5	ML	Silt

PROJECT: Fremont Levee Preliminary Exploration

PROJECT NUMBER: 05195169

SITE: Fremont, NE

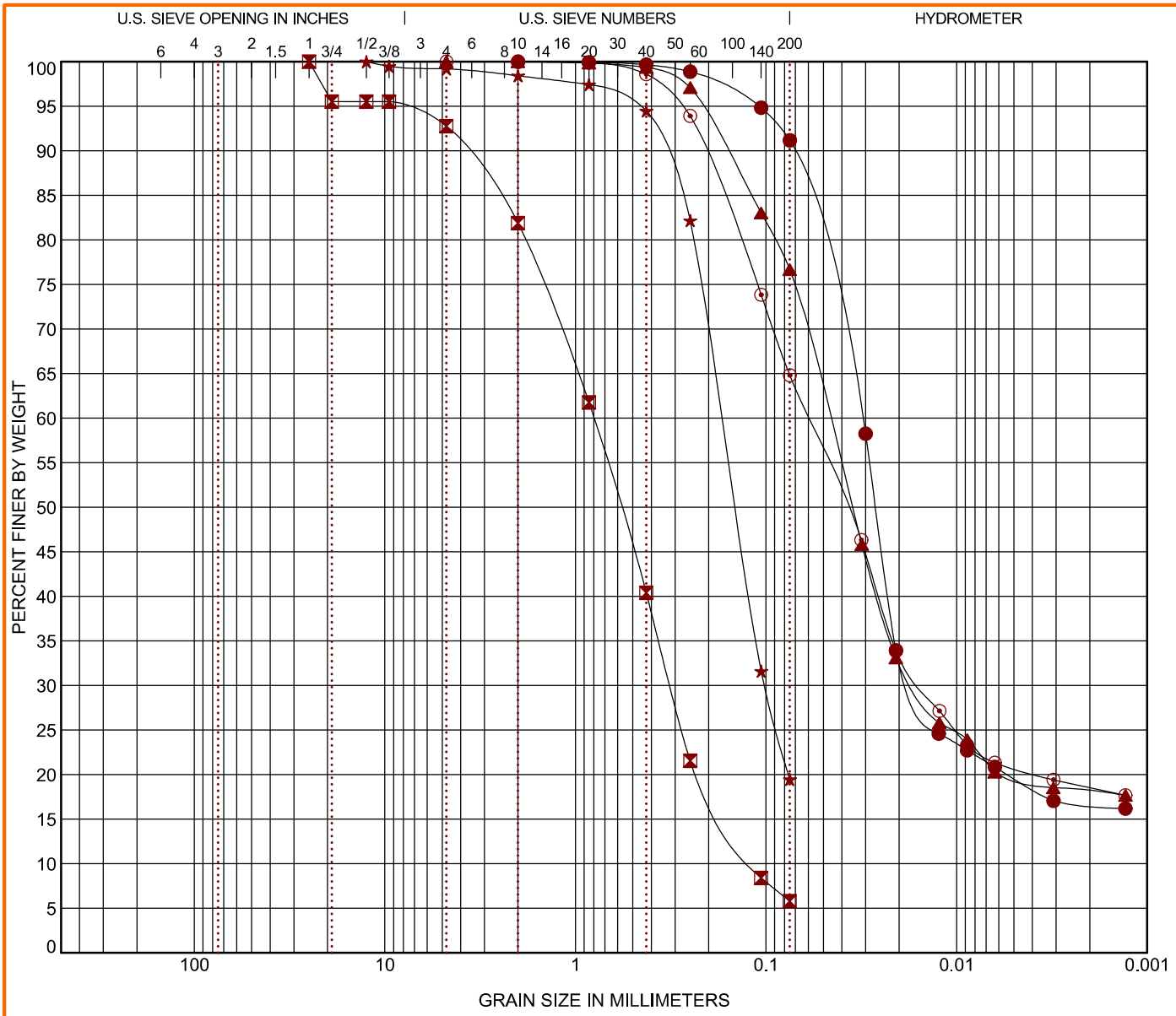
Terracon
15080 A Cir
Omaha, NE

CLIENT: JEO Consulting Group Inc
Omaha, NE

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/8/20

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	FL-20-03	13 - 15	Lean Clay (CL)	27	29	21	8		
⊠	FL-20-03	23 - 25		14				1.07	6.82
▲	FL-20-03L	5 - 7	Lean Clay with Sand (CL)	24	29	17	12		
★	FL-20-04	3 - 5	Silty Sand (SM)	8					
⊙	FL-20-04	10 - 12	Sandy Lean Clay (CL)	23	29	15	14		

Boring ID		Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	FL-20-03	13 - 15	2	0.031	0.017		0.0	0.0	8.8	71.6		19.6
⊠	FL-20-03	23 - 25	25	0.803	0.317	0.118	0.0	7.2	87.0		5.8	
▲	FL-20-03L	5 - 7	4.75	0.047	0.017		0.0	0.0	23.3	57.0		19.7
★	FL-20-04	3 - 5	12.5	0.172	0.101		0.0	0.8	79.7		19.5	
⊙	FL-20-04	10 - 12	4.75	0.06	0.015		0.0	0.0	35.2	44.1		20.7

PROJECT: Fremont Levee Preliminary Exploration

PROJECT NUMBER: 05195169

SITE: Fremont, NE

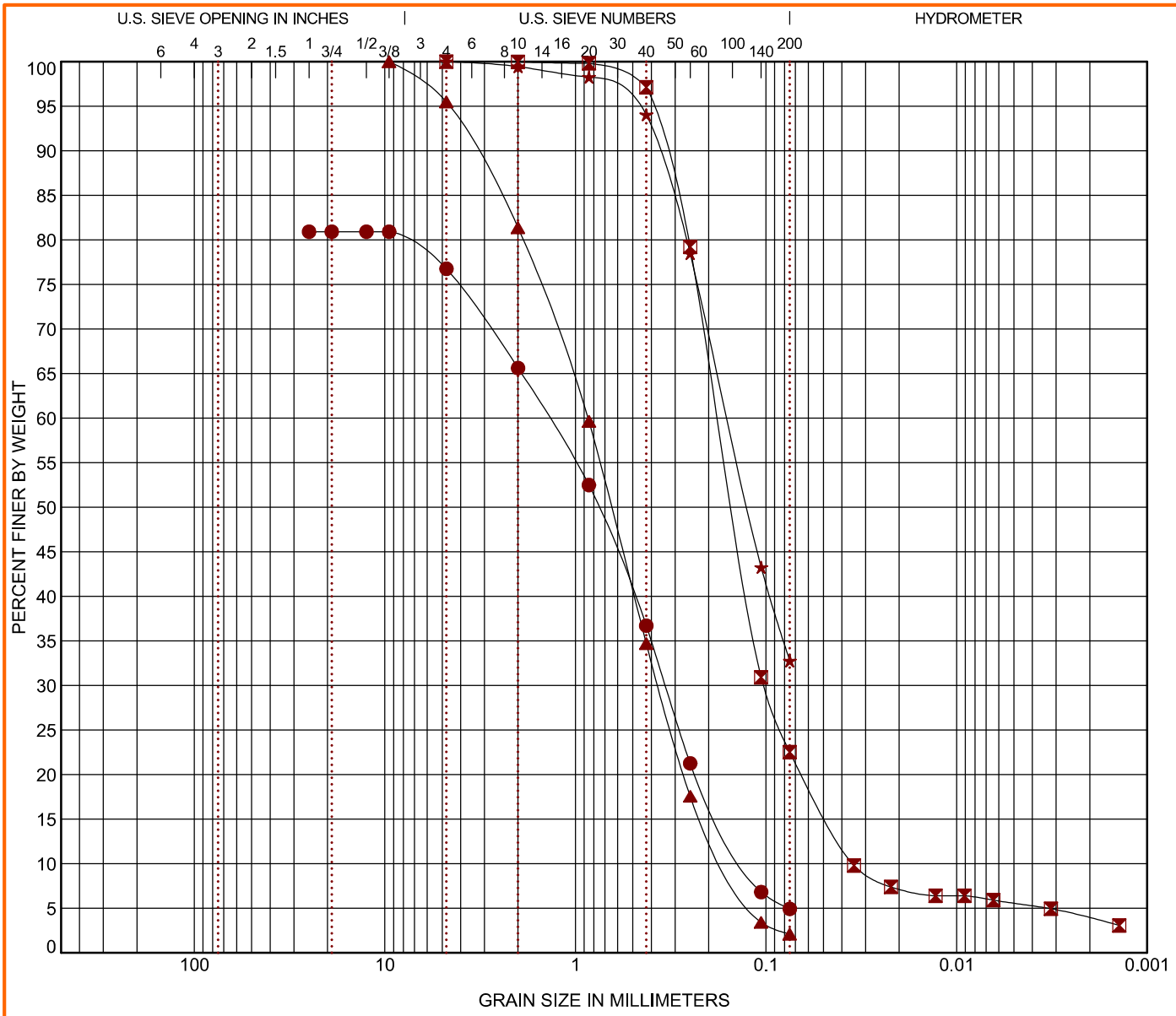
Terracon
15080 A Cir
Omaha, NE

CLIENT: JEO Consulting Group Inc
Omaha, NE

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/8/20

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	FL-20-04	28 - 30	Poorly Graded Sand with Gravel (SP)	12				0.64	10.83
⊠	FL-20-02	1 - 3	Silt (ML)	9	NP	NP	NP	1.68	5.09
▲	FL-20-02	18 - 20	POORLY GRADED SAND (SP)	14				0.99	5.46
★	FL-20-02R	3 - 5	Silty Clayey Sand (SC-SM)	22					

Boring ID		Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	FL-20-04	28 - 30	25	1.387	0.338	0.128		4.2	71.8		4.9	
⊠	FL-20-02	1 - 3	4.75	0.178	0.102	0.035	0.0	0.0	77.5	16.9		5.6
▲	FL-20-02	18 - 20	9.5	0.862	0.367	0.158	0.0	4.5	93.4		2.1	
★	FL-20-02R	3 - 5	4.75	0.159			0.0	0.0	67.2		32.8	

PROJECT: Fremont Levee Preliminary Exploration

SITE: Fremont, NE

Terracon
15080 A Cir
Omaha, NE

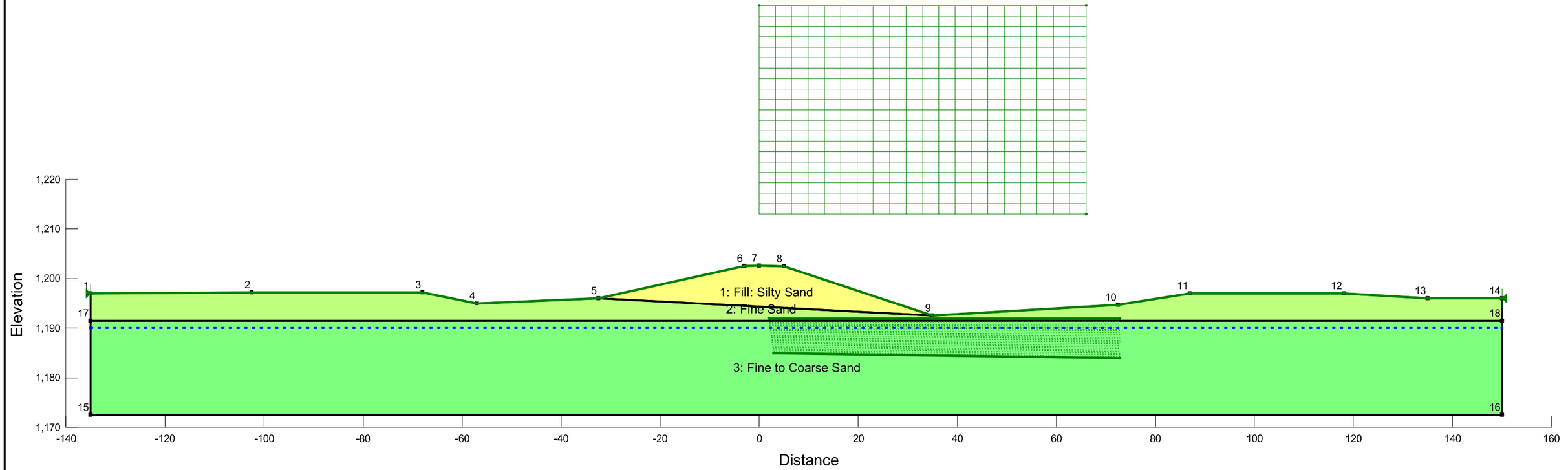
PROJECT NUMBER: 05195169

CLIENT: JEO Consulting Group Inc
Omaha, NE

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 05195169 FREMONT LEVEE PRE.GPJ TERRACON_DATATEMPLATE.GDT 4/8/20

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - EOC.gsz

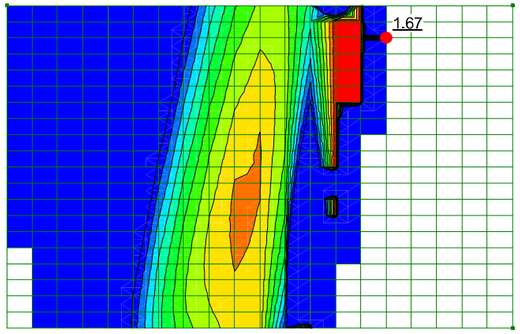
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	
	Fine Sand	Mohr-Coulomb	125	0	29	
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	1

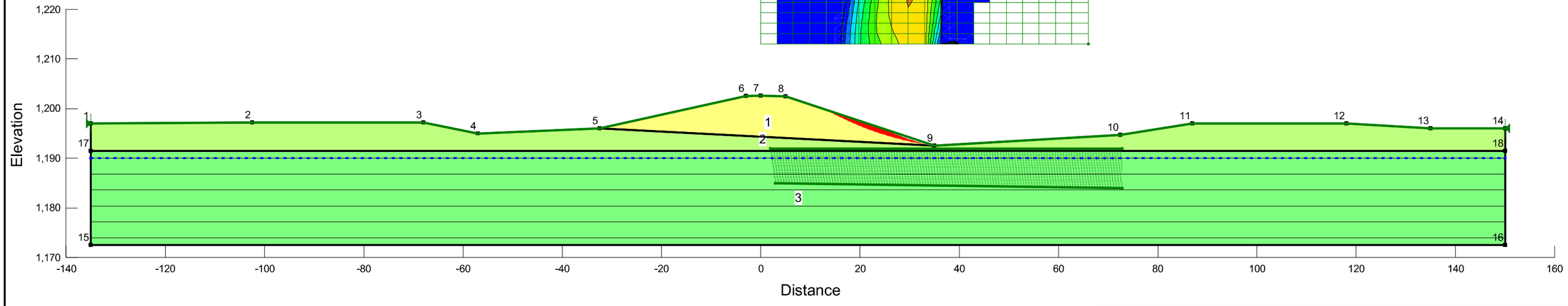


FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - EOC.gsz	
4/30/2020	1:237.33978

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - EOC.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	
	Fine Sand	Mohr-Coulomb	125	0	29	
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	1





FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - EOC.gsz	
4/30/2020	1:237.33978

FL-20-02

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Preliminary Evaluation
Created By: Allam, Gopala K.
Last Edited By: Prost, Ed
Revision Number: 23
Date: 4/30/2020
Time: 9:49:44 AM
Tool Version: 8.16.5.14710
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - EOC.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-02

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Grid and Radius
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack
  - Tension Crack Option: (none)

F of S Distribution

F of S Calculation Option: Constant
Advanced
Number of Slices: 50
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °

Fine Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °

Fine to Coarse Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Grid

Upper Left: (-0.0068, 1,255.002) ft
Lower Left: (65.99831, 1,255.002) ft
Lower Right: (65.99831, 1,213.0081) ft
Grid Horizontal Increment: 20
Grid Vertical Increment: 20
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (1.93797, 1,191.9918) ft
Upper Right Coordinate: (72.89997, 1,191.9918) ft
Lower Left Coordinate: (2.9664, 1,184.9688) ft
Lower Right Coordinate: (72.89997, 1,183.9655) ft
Number of Increments: 25

Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-135, 1,197) ft
Right Coordinate: (150, 1,196) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-135	1,190
Coordinate 2	150	1,190

Points

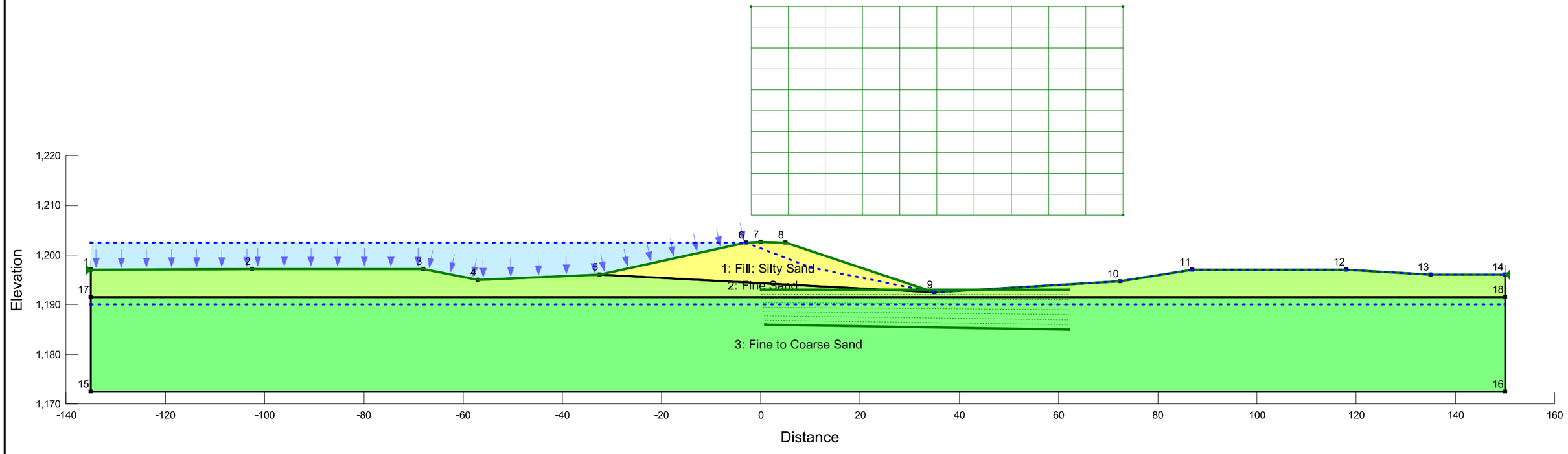
	X (ft)	Y (ft)
Point 1	-135	1,197
Point 2	-102.5	1,197.2
Point 3	-68	1,197.2
Point 4	-57	1,195
Point 5	-32.5	1,196
Point 6	-3	1,202.51
Point 7	0	1,202.63
Point 8	5	1,202.48
Point 9	35	1,192.5
Point 10	72.5	1,194.7
Point 11	87	1,197
Point 12	118	1,197
Point 13	135	1,196
Point 14	150	1,196
Point 15	-135	1,172.5
Point 16	150	1,172.5
Point 17	-135	1,191.5
Point 18	150	1,191.5

Regions

	Material	Points	Area (ft^2)
Region 1	Fill: Silty Sand	5,6,7,8,9	311.33
Region 2	Fine Sand	17,1,2,3,4,5,9,10,11,12,13,14,18	1,177.7
Region 3	Fine to Coarse Sand	15,17,18,16	5,415

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - SS.gsz

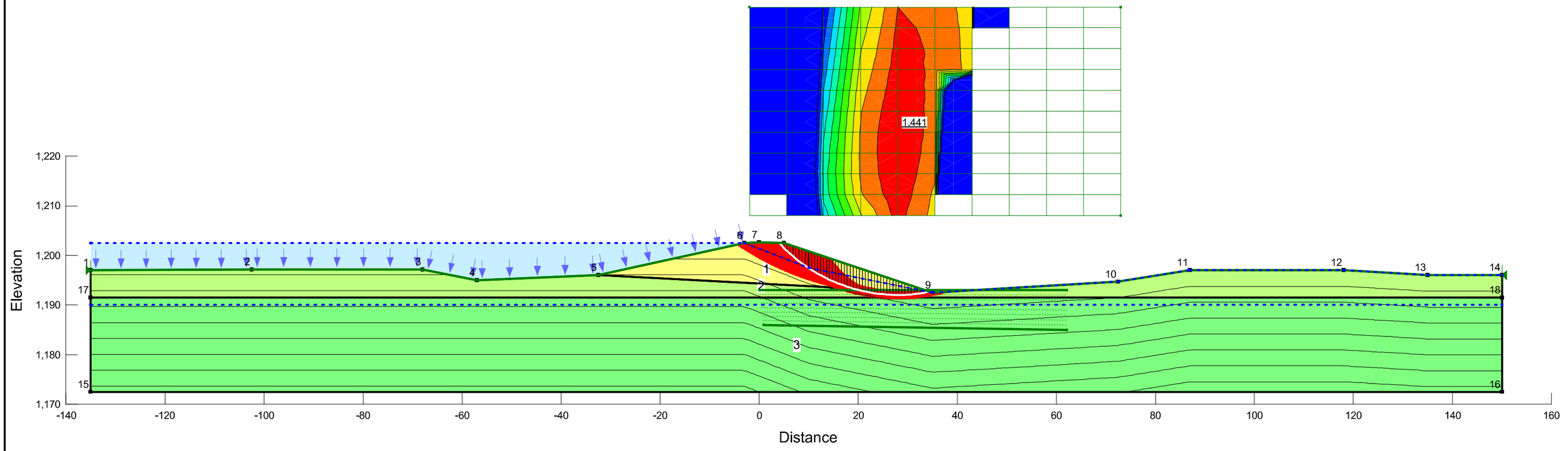
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	2
	Fine Sand	Mohr-Coulomb	125	0	29	2
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	2



FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - SS.gsz	
4/17/2020	1:237.33978

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - SS.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	2
	Fine Sand	Mohr-Coulomb	125	0	29	2
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	2



FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - SS.gsz	
4/16/2020	1:237.33978

FL-20-02

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Preliminary Evaluation
Created By: Allam, Gopala K.
Last Edited By: Allam, Gopala K.
Revision Number: 23
Date: 4/16/2020
Time: 11:32:53 AM
Tool Version: 8.16.5.15361
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - SS.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 4/16/2020
Last Solved Time: 11:32:58 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-02

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Grid and Radius
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack

Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 50
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Fine Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Fine to Coarse Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Slip Surface Grid

Upper Left: (-1.97875, 1,250.002) ft
Lower Left: (72.99701, 1,250.002) ft
Lower Right: (72.99701, 1,208.0081) ft
Grid Horizontal Increment: 10
Grid Vertical Increment: 10
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (0.02425, 1,192.9918) ft
Upper Right Coordinate: (62.12361, 1,192.9918) ft
Lower Left Coordinate: (0.92423, 1,185.9688) ft
Lower Right Coordinate: (62.12361, 1,184.9655) ft
Number of Increments: 8
Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-135, 1,197) ft
Right Coordinate: (150, 1,196) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-135	1,190
Coordinate 2	150	1,190

Piezometric Line 2

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-135	1,202.51
Coordinate 2	-3	1,202.51
Coordinate 3	10	1,197.5
Coordinate 4	35	1,192.5
Coordinate 5	72.5	1,194.7
Coordinate 6	87	1,197
Coordinate 7	118	1,197
Coordinate 8	135	1,196
Coordinate 9	150	1,196

Points

	X (ft)	Y (ft)
Point 1	-135	1,197
Point 2	-102.5	1,197.2
Point 3	-68	1,197.2
Point 4	-57	1,195
Point 5	-32.5	1,196
Point 6	-3	1,202.51
Point 7	0	1,202.63

Point 8	5	1,202.48
Point 9	35	1,192.5
Point 10	72.5	1,194.7
Point 11	87	1,197
Point 12	118	1,197
Point 13	135	1,196
Point 14	150	1,196
Point 15	-135	1,172.5
Point 16	150	1,172.5
Point 17	-135	1,191.5
Point 18	150	1,191.5

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9	311.33
Region 2	Fine Sand	17,1,2,3,4,5,9,10,11,12,13,14,18	1,177.7
Region 3	Fine to Coarse Sand	15,17,18,16	5,415

Current Slip Surface

Slip Surface: 650
F of S: 1.441
Volume: 94.061872 ft³
Weight: 11,757.734 lbs
Resisting Moment: 160,892.51 lbs-ft
Activating Moment: 111,635.99 lbs-ft
Resisting Force: 4,546.8706 lbs
Activating Force: 3,155.2994 lbs
F of S Rank (Analysis): 1 of 1,089 slip surfaces
F of S Rank (Query): 1 of 1,089 slip surfaces
Exit: (34.42413, 1,192.6916) ft
Entry: (4.0260494, 1,202.5092) ft
Radius: 32.748065 ft
Center: (28.011554, 1,224.8057) ft

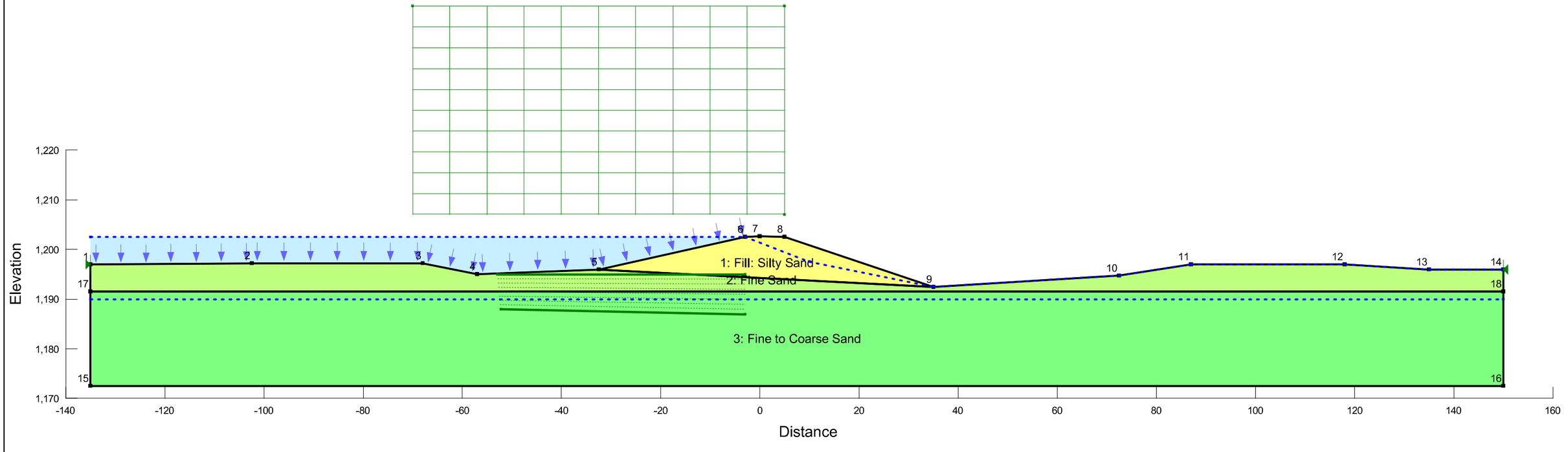
Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	4.269537	1,202.2529	-158.77425	21.965814	12.175849	0
Slice 2	4.7565123	1,201.751	-139.16455	65.052462	36.059169	0
Slice 3	5.3025207	1,201.2142	-118.79814	102.99314	57.090031	0
Slice 4	5.9075622	1,200.6462	-97.905809	135.58888	75.158144	0
Slice 5	6.5126037	1,200.1061	-78.753522	166.02849	92.031096	0
Slice 6	7.1176452	1,199.5921	-61.22928	194.55552	107.84389	0
Slice 7	7.7226867	1,199.1026	-45.235271	221.38163	122.71384	0
Slice 8	8.3277282	1,198.6362	-30.685515	246.68998	136.74249	0
Slice 9	8.9327697	1,198.1918	-17.504002	270.63795	150.01707	0
Slice 10	9.5378112	1,197.7682	-5.6231877	293.3593	162.61172	0
Slice 11	9.9201659	1,197.5086	1.3817863	307.52698	169.69905	0
Slice 12	10.298902	1,197.2635	11.028241	321.71665	172.2174	0
Slice 13	10.896707	1,196.888	26.996869	343.35471	175.36002	0
Slice 14	11.494511	1,196.5302	41.865746	363.50772	178.28905	0

Slice 15	12.092316	1,196.1893	55.676163	382.30359	181.05254	0
Slice 16	12.69012	1,195.8648	68.465547	399.84765	183.6881	0
Slice 17	13.287925	1,195.5561	80.267907	416.22392	186.22346	0
Slice 18	13.885729	1,195.2627	91.114203	431.4962	188.67682	0
Slice 19	14.483534	1,194.9842	101.03267	445.70894	191.05718	0
Slice 20	15.081338	1,194.7201	110.04909	458.88794	193.36453	0
Slice 21	15.679143	1,194.4701	118.18703	471.04098	195.59014	0
Slice 22	16.276947	1,194.2339	125.46805	482.15842	197.7167	0
Slice 23	16.874751	1,194.0111	131.91189	492.21386	199.71865	0
Slice 24	17.472556	1,193.8014	137.5366	501.1648	201.5624	0
Slice 25	18.07036	1,193.6045	142.35871	508.95355	203.20684	0
Slice 26	18.668165	1,193.4203	146.39332	515.5083	204.60377	0
Slice 27	19.275093	1,193.2461	149.69218	520.80252	205.70982	0
Slice 28	19.891143	1,193.082	152.24465	524.69434	206.45224	0
Slice 29	20.507194	1,192.9306	154.00149	526.96731	206.73833	0
Slice 30	21.123245	1,192.7918	154.974	527.49876	206.49385	0
Slice 31	21.739296	1,192.6654	155.17234	526.16159	205.6427	0
Slice 32	22.355346	1,192.5513	154.60562	522.82791	204.10895	0
Slice 33	22.971397	1,192.4493	153.28193	517.373	201.81897	0
Slice 34	23.587448	1,192.3593	151.20843	509.67954	198.70378	0
Slice 35	24.203499	1,192.2812	148.39132	499.64197	194.70141	0
Slice 36	24.819549	1,192.215	144.83596	487.17092	189.75936	0
Slice 37	25.4356	1,192.1605	140.54684	472.19732	183.83686	0
Slice 38	26.051651	1,192.1178	135.52764	454.6762	176.90694	0
Slice 39	26.667702	1,192.0866	129.78121	434.58979	168.95815	0
Slice 40	27.283752	1,192.0671	123.30964	411.94987	159.99589	0
Slice 41	27.899803	1,192.0592	116.11421	386.79909	150.04308	0
Slice 42	28.515854	1,192.0629	108.19545	359.21119	139.1403	0
Slice 43	29.131905	1,192.0782	99.553121	329.29002	127.34525	0
Slice 44	29.747955	1,192.1051	90.186202	297.16734	114.73152	0
Slice 45	30.364006	1,192.1437	80.092903	262.99942	101.38674	0
Slice 46	30.980057	1,192.1939	69.270649	226.96276	87.410163	0
Slice 47	31.596108	1,192.2558	57.716063	189.24877	72.909769	0
Slice 48	32.212158	1,192.3296	45.424952	150.05804	57.999071	0
Slice 49	32.828209	1,192.4153	32.392283	109.59421	42.793728	0
Slice 50	33.44426	1,192.5129	18.612153	68.057785	27.408162	0
Slice 51	33.991882	1,192.6092	5.7672148	30.446035	13.679693	0
Slice 52	34.327805	1,192.6726	-2.3836407	6.9250102	3.8385958	0

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz

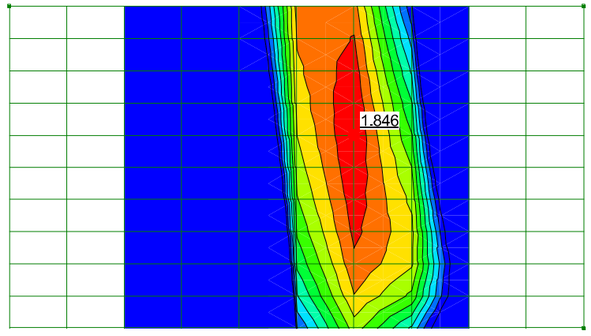
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)	Piezometric Line	Piezometric Line After Drawdown
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	5	28	2	1
	Fine Sand	Mohr-Coulomb	125	0	29	5	28	2	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	0	35	2	1

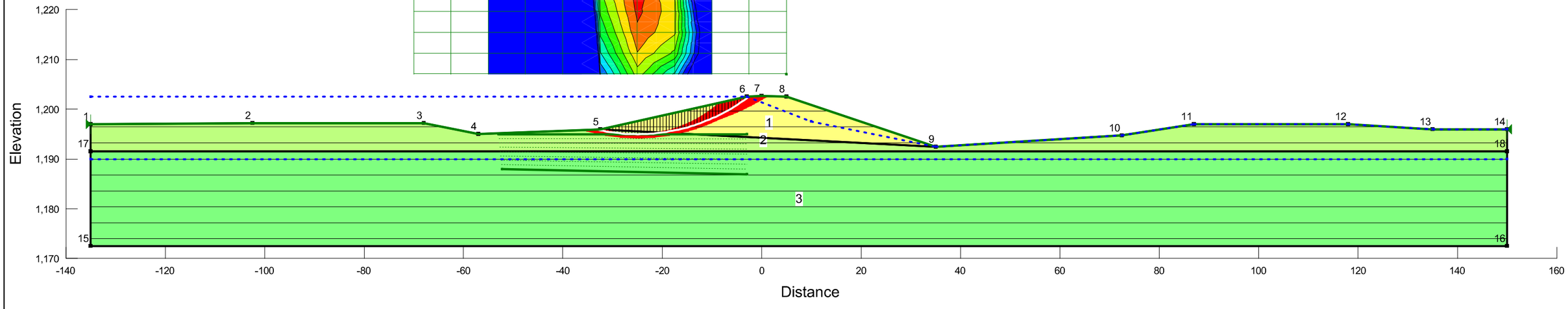


FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz	
5/20/2020	1:237.33978

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)	Piezometric Line	Piezometric Line After Drawdown
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	5	28	2	1
	Fine Sand	Mohr-Coulomb	125	0	29	5	28	2	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	0	35	2	1





FL-20-02	
05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz	
4/30/2020	1:237.33978

FL-20-02

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Preliminary Evaluation
Created By: Allam, Gopala K.
Last Edited By: Prost, Ed
Revision Number: 51
Date: 4/30/2020
Time: 11:15:06 AM
Tool Version: 8.16.5.14710
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 4/30/2020
Last Solved Time: 11:15:14 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-02

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: Yes

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Grid and Radius
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack

Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 50
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Cohesion R: 5 psf
Phi R: 28 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Fine Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Cohesion R: 5 psf
Phi R: 28 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Fine to Coarse Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Cohesion R: 0 psf
Phi R: 35 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Slip Surface Grid

Upper Left: (-69.97875, 1,249.002) ft
Lower Left: (4.99701, 1,249.002) ft
Lower Right: (4.99701, 1,207.0081) ft
Grid Horizontal Increment: 10
Grid Vertical Increment: 10
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (-52.97981, 1,194.9918) ft
Upper Right Coordinate: (-3.00072, 1,194.9918) ft
Lower Left Coordinate: (-52.25548, 1,187.9688) ft
Lower Right Coordinate: (-3.00072, 1,186.9655) ft
Number of Increments: 8
Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-135, 1,197) ft
Right Coordinate: (150, 1,196) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-135	1,190
Coordinate 2	150	1,190

Piezometric Line 2

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-135	1,202.51
Coordinate 2	-3	1,202.51
Coordinate 3	10	1,197.5
Coordinate 4	35	1,192.5
Coordinate 5	72.5	1,194.7
Coordinate 6	87	1,197
Coordinate 7	118	1,197
Coordinate 8	135	1,196
Coordinate 9	150	1,196

Points

	X (ft)	Y (ft)
Point 1	-135	1,197
Point 2	-102.5	1,197.2
Point 3	-68	1,197.2
Point 4	-57	1,195
Point 5	-32.5	1,196
Point 6	-3	1,202.51
Point 7	0	1,202.63
Point 8	5	1,202.48
Point 9	35	1,192.5
Point 10	72.5	1,194.7
Point 11	87	1,197
Point 12	118	1,197
Point 13	135	1,196
Point 14	150	1,196
Point 15	-135	1,172.5
Point 16	150	1,172.5
Point 17	-135	1,191.5
Point 18	150	1,191.5

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9	311.33
Region 2	Fine Sand	17,1,2,3,4,5,9,10,11,12,13,14,18	1,177.7
Region 3	Fine to Coarse Sand	15,17,18,16	5,415

Current Slip Surface

Slip Surface: 433
F of S: 1.846
Volume: 73.496294 ft³
Weight: 9,187.0368 lbs
Resisting Moment: 128,161.7 lbs-ft
Activating Moment: 69,410.394 lbs-ft
Resisting Force: 3,308.3242 lbs
Activating Force: 1,791.8803 lbs
F of S Rank (Analysis): 1 of 1,089 slip surfaces
F of S Rank (Query): 1 of 1,089 slip surfaces
Exit: (-33.434591, 1,195.9619) ft
Entry: (-2.5408743, 1,202.5284) ft
Radius: 37.21264 ft
Center: (-24.993294, 1,232.2044) ft

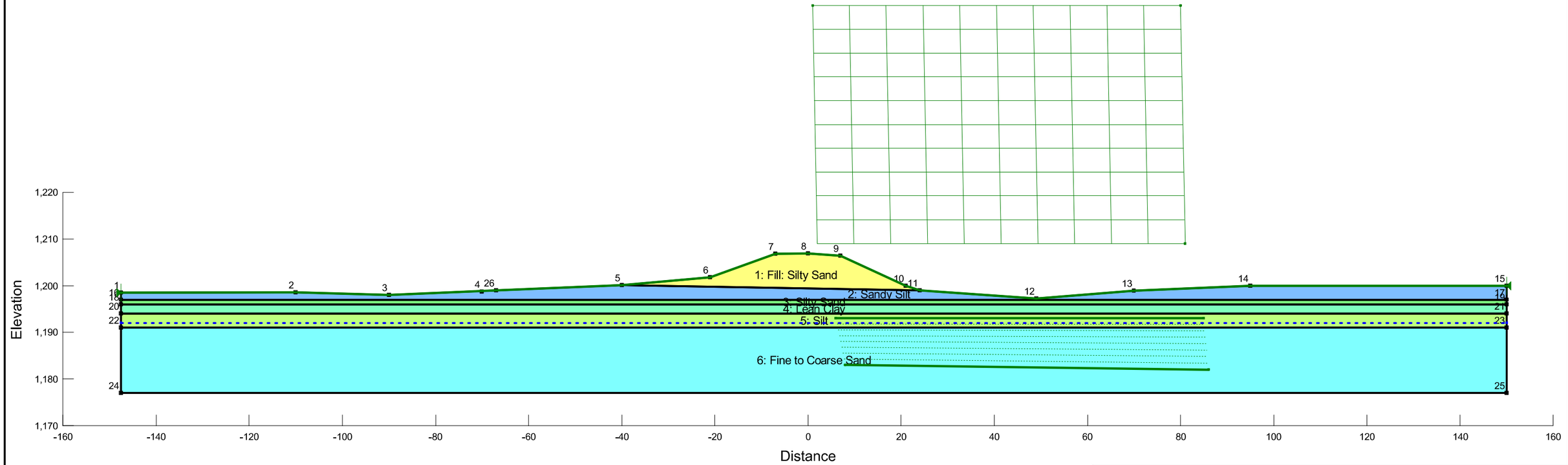
Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	-33.200943	1,195.909	-368.7227	8.4202778	4.6674362	0
Slice 2	-32.733648	1,195.8065	-362.32525	24.941087	13.82507	0
Slice 3	-32.184388	1,195.6946	-355.34573	50.595658	0	24.441746
Slice 4	-31.553164	1,195.576	-347.93963	85.253606	0	37.323877

Slice 5	-30.921941	1,195.4685	-341.2342	118.62946	0	49.537768
Slice 6	-30.290717	1,195.3722	-335.22332	150.62708	0	61.076009
Slice 7	-29.659493	1,195.2869	-329.90155	181.15257	0	71.932822
Slice 8	-29.028269	1,195.2126	-325.26411	210.1168	0	82.104283
Slice 9	-28.397045	1,195.1491	-321.30689	237.43775	0	91.588493
Slice 10	-27.765822	1,195.0966	-318.0264	263.04254	0	100.3857
Slice 11	-27.134598	1,195.0548	-315.41977	286.86911	0	108.49835
Slice 12	-26.503374	1,195.0238	-313.48473	308.86747	0	115.93115
Slice 13	-25.87215	1,195.0035	-312.21959	329.00055	0	122.69097
Slice 14	-25.240927	1,194.994	-311.62326	347.24465	0	128.78685
Slice 15	-24.609703	1,194.9951	-311.69522	363.5895	0	134.22978
Slice 16	-23.978479	1,195.007	-312.43554	378.03789	0	139.03266
Slice 17	-23.347255	1,195.0296	-313.84486	390.60499	0	143.20998
Slice 18	-22.716031	1,195.0629	-315.9244	401.3174	0	146.77773
Slice 19	-22.084808	1,195.107	-318.67595	410.2119	0	149.75302
Slice 20	-21.453584	1,195.1619	-322.10194	417.33411	0	152.15393
Slice 21	-20.82236	1,195.2277	-326.20535	422.7369	0	153.99912
Slice 22	-20.191136	1,195.3043	-330.98982	426.47881	0	155.30762
Slice 23	-19.563015	1,195.3915	-336.42934	428.61913	0	156.097
Slice 24	-18.937995	1,195.4891	-342.52203	429.23792	0	156.39083
Slice 25	-18.312976	1,195.5977	-349.29682	428.41692	0	156.21312
Slice 26	-17.687956	1,195.7173	-356.75981	426.21935	0	155.5807
Slice 27	-17.062937	1,195.848	-364.9178	422.70644	0	154.50927
Slice 28	-16.437918	1,195.99	-373.7783	417.93619	0	153.01317
Slice 29	-15.812898	1,196.1434	-383.34962	411.96221	0	151.10511
Slice 30	-15.187879	1,196.3083	-393.64088	404.83275	0	148.79592
Slice 31	-14.562859	1,196.485	-404.66206	396.5897	0	146.09436
Slice 32	-13.93784	1,196.6735	-416.42403	387.26785	0	143.00688
Slice 33	-13.31282	1,196.874	-428.93867	376.8941	0	139.53744
Slice 34	-12.687801	1,197.0868	-442.21887	365.48684	0	135.68736
Slice 35	-12.062782	1,197.3122	-456.27865	353.05534	0	131.45515
Slice 36	-11.437762	1,197.5502	-471.13322	339.59918	0	126.83638
Slice 37	-10.812743	1,197.8013	-486.79908	325.10772	0	121.82356
Slice 38	-10.187723	1,198.0656	-503.29415	309.5596	0	116.40604
Slice 39	-9.5627039	1,198.3436	-520.63784	292.92213	0	110.5699
Slice 40	-8.9376845	1,198.6354	-538.85126	275.15075	0	104.29792
Slice 41	-8.3126651	1,198.9416	-557.9573	256.18841	0	97.56949
Slice 42	-7.6876457	1,199.2625	-577.98087	235.96481	0	90.360569
Slice 43	-7.0626262	1,199.5985	-598.94907	214.39562	0	82.643654
Slice 44	-6.4376068	1,199.9502	-620.89145	191.38151	0	74.387751
Slice 45	-5.8125874	1,200.318	-643.84025	166.80708	0	65.558361
Slice 46	-5.187568	1,200.7024	-667.83075	140.53951	0	56.117464
Slice 47	-4.5625486	1,201.1042	-692.9016	112.42702	0	46.023516
Slice 48	-3.9375291	1,201.524	-719.09528	82.296949	0	35.231445
Slice 49	-3.3125097	1,201.9625	-746.45858	48.702178	26.996058	0
Slice 50	-2.8562901	1,202.2929	-767.07545	22.690859	12.577749	0
Slice 51	-2.6267273	1,202.4638	-777.74105	6.2242825	3.4501761	0

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - EOC.gsz

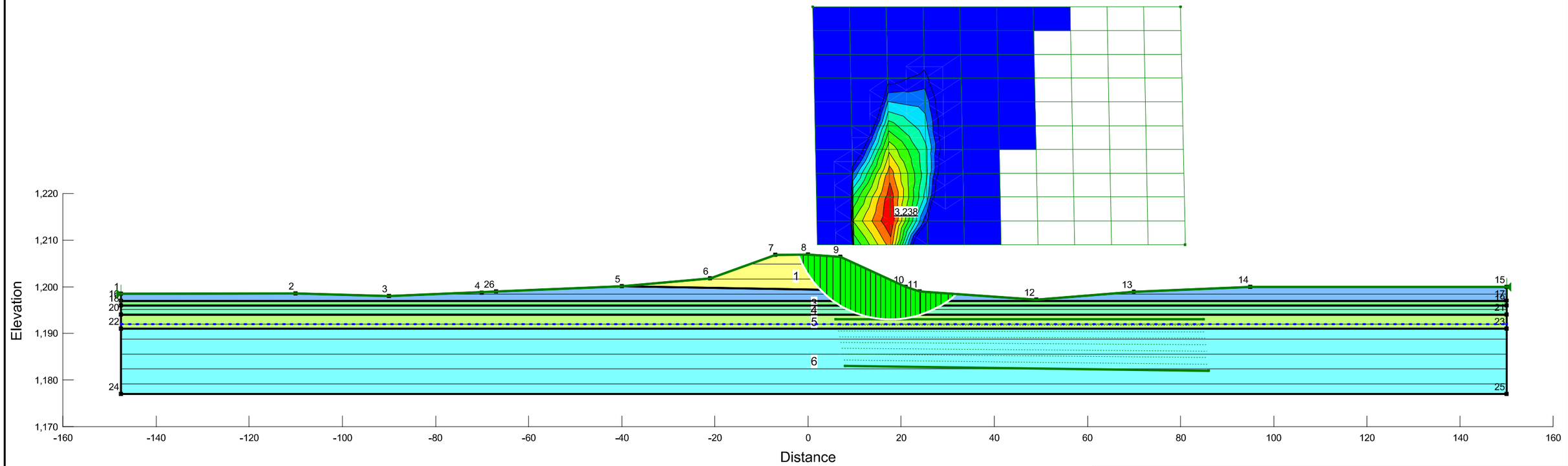
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	1
	Lean Clay	Mohr-Coulomb	115	500	0	1
	Sandy Silt	Mohr-Coulomb	115	0	28	1
	Silt	Mohr-Coulomb	115	900	0	1
	Silty Sand	Mohr-Coulomb	125	0	29	1



FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - EOC.gsz	
4/17/2020	1:252.36129

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - EOC.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	1
	Lean Clay	Mohr-Coulomb	115	500	0	1
	Sandy Silt	Mohr-Coulomb	115	0	28	1
	Silt	Mohr-Coulomb	115	900	0	1
	Silty Sand	Mohr-Coulomb	125	0	29	1



FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - EOC.gsz	
4/16/2020	1:252.36129

FL-20-03

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Evaluation
Created By: Allam, Gopala K.
Last Edited By: Allam, Gopala K.
Revision Number: 8
Date: 4/16/2020
Time: 11:23:20 AM
Tool Version: 8.16.5.15361
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - EOC.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 4/16/2020
Last Solved Time: 11:23:42 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-03

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Grid and Radius
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack

Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Silt

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 900 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Lean Clay

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 500 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Fine to Coarse Sand

Model: Mohr-Coulomb

Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Sandy Silt

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Grid

Upper Left: (1, 1,260) ft
Lower Left: (80, 1,260) ft
Lower Right: (81, 1,209) ft
Grid Horizontal Increment: 10
Grid Vertical Increment: 10
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (6, 1,193) ft
Upper Right Coordinate: (85, 1,193) ft
Lower Left Coordinate: (8, 1,183) ft
Lower Right Coordinate: (86, 1,182) ft
Number of Increments: 8
Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-147.5, 1,198.5) ft
Right Coordinate: (150, 1,200) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-147.5	1,192
Coordinate 2	150	1,192

Points

	X (ft)	Y (ft)
Point 1	-147.5	1,198.5
Point 2	-110	1,198.6
Point 3	-90	1,198
Point 4	-70	1,198.7
Point 5	-40	1,200.1
Point 6	-21	1,201.8
Point 7	-7	1,206.87
Point 8	0	1,206.9
Point 9	7	1,206.41
Point 10	21	1,200
Point 11	24	1,199
Point 12	49	1,197.2
Point 13	70	1,198.9
Point 14	95	1,200
Point 15	150	1,200
Point 16	-147.5	1,197
Point 17	150	1,197
Point 18	-147.5	1,196
Point 19	150	1,196
Point 20	-147.5	1,194
Point 21	150	1,194
Point 22	-147.5	1,191
Point 23	150	1,191
Point 24	-147.5	1,177
Point 25	150	1,177
Point 26	-67	1,199

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9,10,11	245.69
Region 2	Sandy Silt	16,1,2,3,26,5,11,12,13,14,15,17	626.47
Region 3	Silty Sand	18,16,17,19	297.5
Region 4	Lean Clay	20,18,19,21	595
Region 5	Silt	22,20,21,23	892.5
Region 6	Fine to Coarse Sand	22,23,25,24	4,165

Current Slip Surface

Slip Surface: 874
F of S: 3.238
Volume: 232.93842 ft³
Weight: 28,119.458 lbs
Resisting Moment: 448,413.66 lbs-ft
Activating Moment: 138,504.92 lbs-ft
Resisting Force: 19,306.509 lbs
Activating Force: 5,962.7273 lbs
F of S Rank (Analysis): 1 of 1,089 slip surfaces
F of S Rank (Query): 1 of 1,089 slip surfaces

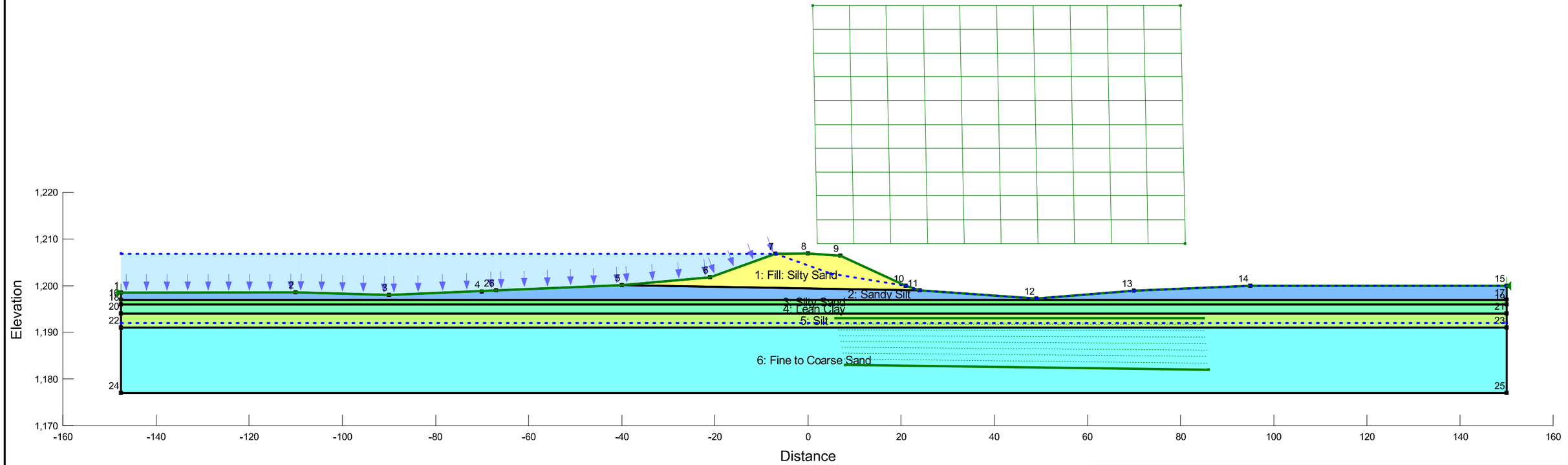
Exit: (31.836544, 1,198.4358) ft
Entry: (-2.1302408, 1,206.8909) ft
Radius: 21.1 ft
Center: (17.7, 1,214.1) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	-1.5976806	1,205.6715	-853.10345	105.21865	58.323652	0
Slice 2	-0.5325602	1,203.5333	-719.67623	299.83685	166.20228	0
Slice 3	0.64863084	1,201.7209	-606.58485	463.9699	257.18271	0
Slice 4	1.9458925	1,200.0977	-505.29561	609.9705	338.11217	0
Slice 5	3.2805851	1,198.7245	-419.60915	735.8653	391.26652	0
Slice 6	4.6527086	1,197.5406	-345.73046	843.05331	448.25939	0
Slice 7	6.0972085	1,196.5	-280.8	948.39971	525.70655	0
Slice 8	6.9278233	1,195.9571	-246.92589	1,018.5163	0	500
Slice 9	7.5351597	1,195.6199	-225.88365	1,036.8145	0	500
Slice 10	8.605479	1,195.0698	-191.55655	1,062.2044	0	500
Slice 11	9.6757984	1,194.5939	-161.86034	1,084.0165	0	500
Slice 12	10.746118	1,194.1869	-136.46154	1,102.2533	0	500
Slice 13	11.821206	1,193.8433	-115.02221	1,115.1784	0	900
Slice 14	12.901064	1,193.5605	-97.372587	1,132.9806	0	900
Slice 15	13.980923	1,193.3376	-83.465741	1,144.5985	0	900
Slice 16	15.060781	1,193.1728	-73.181734	1,149.1544	0	900
Slice 17	16.140639	1,193.0647	-66.435173	1,145.6197	0	900
Slice 18	17.220497	1,193.0124	-63.171498	1,132.8649	0	900
Slice 19	18.300355	1,193.0155	-63.364723	1,109.7212	0	900
Slice 20	19.380213	1,193.074	-67.016378	1,075.0528	0	900
Slice 21	20.460071	1,193.1884	-74.155575	1,027.8417	0	900
Slice 22	21.5	1,193.3512	-84.316514	978.03656	0	900
Slice 23	22.5	1,193.5596	-97.321599	926.48432	0	900
Slice 24	23.5	1,193.8195	-113.53546	863.03393	0	900
Slice 25	24.059361	1,193.9812	-123.62915	825.41862	0	900
Slice 26	24.671926	1,194.1938	-136.89019	729.77918	0	500
Slice 27	25.778334	1,194.6169	-163.29346	668.51318	0	500
Slice 28	26.884742	1,195.1139	-194.30593	594.14841	0	500
Slice 29	27.99115	1,195.6907	-230.30266	507.48693	0	500
Slice 30	29.302792	1,196.5	-280.8	310.45303	172.08692	0
Slice 31	30.505058	1,197.3391	-333.15843	166.57052	88.567118	0
Slice 32	31.392715	1,198.057	-377.95442	56.499348	30.041236	0

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - SS.gsz

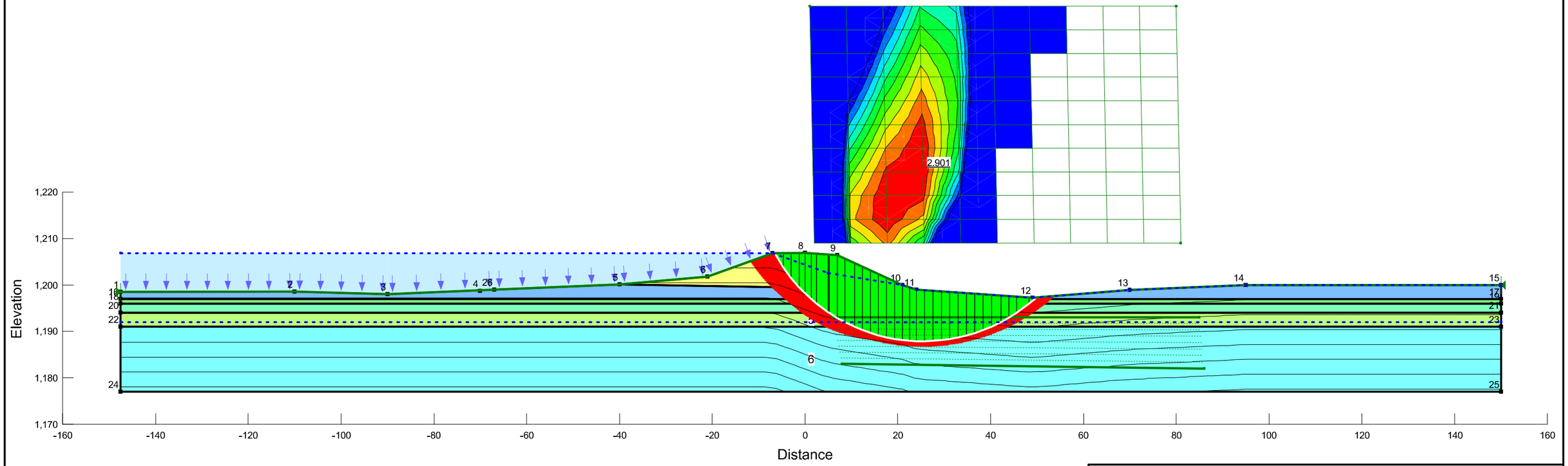
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	2
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	2
	Lean Clay	Mohr-Coulomb	115	500	0	2
	Sandy Silt	Mohr-Coulomb	115	0	28	2
	Silt	Mohr-Coulomb	115	900	0	2
	Silty Sand	Mohr-Coulomb	125	0	29	2



FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - SS.gsz	
4/17/2020	1:252.36129

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - SS.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Piezometric Line
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	2
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	2
	Lean Clay	Mohr-Coulomb	115	500	0	2
	Sandy Silt	Mohr-Coulomb	115	0	28	2
	Silt	Mohr-Coulomb	115	900	0	2
	Silty Sand	Mohr-Coulomb	125	0	29	2



FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - SS.gsz	
4/16/2020	1:252.36129

FL-20-03

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Evaluation
Created By: Allam, Gopala K.
Last Edited By: Allam, Gopala K.
Revision Number: 10
Date: 4/16/2020
Time: 11:32:04 AM
Tool Version: 8.16.5.15361
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - SS.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 4/16/2020
Last Solved Time: 11:32:10 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-03

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Grid and Radius
- Critical slip surfaces saved: 1
- Resisting Side Maximum Convex Angle: 1 °
- Driving Side Maximum Convex Angle: 5 °
- Optimize Critical Slip Surface Location: No
- Tension Crack

Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Silt

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 900 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Lean Clay

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 500 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Fine to Coarse Sand

Model: Mohr-Coulomb

Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Sandy Silt

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 2

Slip Surface Grid

Upper Left: (1, 1,260) ft
Lower Left: (80, 1,260) ft
Lower Right: (81, 1,209) ft
Grid Horizontal Increment: 10
Grid Vertical Increment: 10
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (6, 1,193) ft
Upper Right Coordinate: (85, 1,193) ft
Lower Left Coordinate: (8, 1,183) ft
Lower Right Coordinate: (86, 1,182) ft
Number of Increments: 8
Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-147.5, 1,198.5) ft
Right Coordinate: (150, 1,200) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-147.5	1,192
Coordinate 2	150	1,192

Piezometric Line 2

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-147.5	1,206.87
Coordinate 2	-7	1,206.87
Coordinate 3	5	1,202.5
Coordinate 4	21	1,200
Coordinate 5	24	1,199
Coordinate 6	49	1,197.2
Coordinate 7	70	1,198.9
Coordinate 8	95	1,200
Coordinate 9	150	1,200

Points

	X (ft)	Y (ft)
Point 1	-147.5	1,198.5
Point 2	-110	1,198.6
Point 3	-90	1,198
Point 4	-70	1,198.7
Point 5	-40	1,200.1
Point 6	-21	1,201.8
Point 7	-7	1,206.87
Point 8	0	1,206.9
Point 9	7	1,206.41
Point 10	21	1,200
Point 11	24	1,199
Point 12	49	1,197.2
Point 13	70	1,198.9
Point 14	95	1,200
Point 15	150	1,200
Point 16	-147.5	1,197
Point 17	150	1,197
Point 18	-147.5	1,196
Point 19	150	1,196
Point 20	-147.5	1,194
Point 21	150	1,194
Point 22	-147.5	1,191
Point 23	150	1,191
Point 24	-147.5	1,177
Point 25	150	1,177
Point 26	-67	1,199

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9,10,11	245.69
Region 2	Sandy Silt	16,1,2,3,26,5,11,12,13,14,15,17	626.47
Region 3	Silty Sand	18,16,17,19	297.5

Region 4	Lean Clay	20,18,19,21	595
Region 5	Silt	22,20,21,23	892.5
Region 6	Fine to Coarse Sand	22,23,25,24	4,165

Current Slip Surface

Slip Surface: 761
F of S: 2.901
Volume: 520.83151 ft³
Weight: 62,377.905 lbs
Resisting Moment: 1,157,626.4 lbs-ft
Activating Moment: 399,019.93 lbs-ft
Resisting Force: 28,476.524 lbs
Activating Force: 9,814.5362 lbs
F of S Rank (Analysis): 1 of 1,089 slip surfaces
F of S Rank (Query): 1 of 1,089 slip surfaces
Exit: (49.797622, 1,197.2646) ft
Entry: (-6.5752564, 1,206.8718) ft
Radius: 36.416459 ft
Center: (25.4, 1,224.3) ft

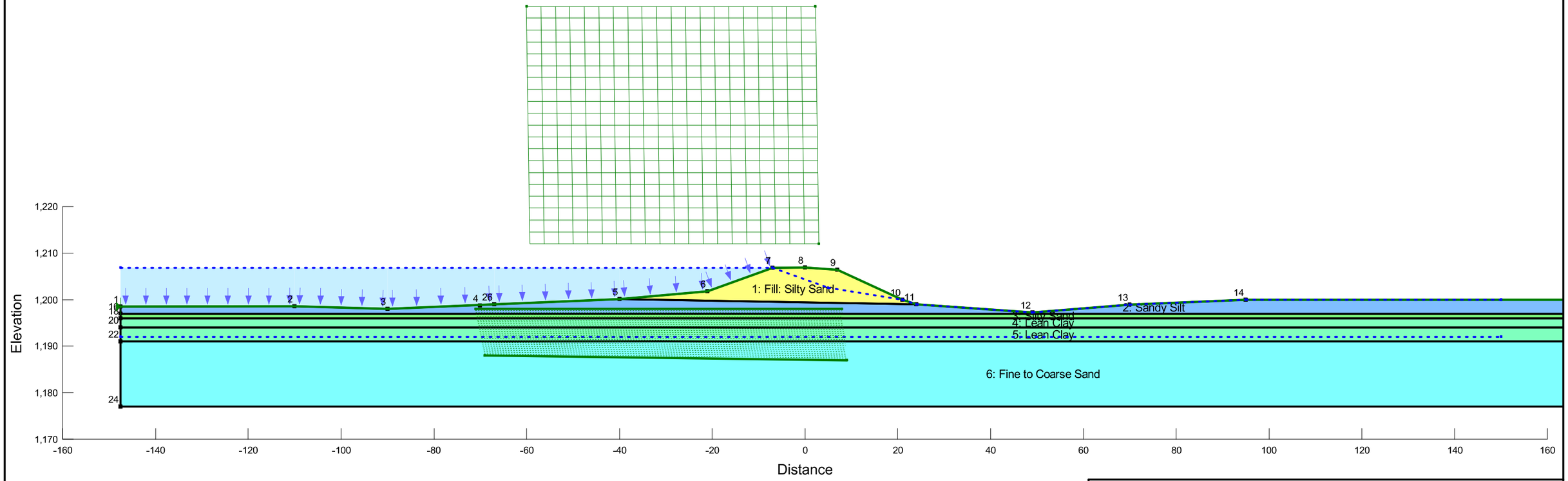
Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	-6.521559	1,206.774	-4.8827311	9.0794507	5.0328217	0
Slice 2	-5.5906391	1,205.2492	69.111436	168.07078	54.854062	0
Slice 3	-3.8361943	1,202.6382	192.16791	442.93741	139.0038	0
Slice 4	-2.0817496	1,200.4437	289.23639	672.98165	212.71347	0
Slice 5	-0.60226359	1,198.8186	357.02347	842.02897	257.882	0
Slice 6	0.64939349	1,197.602	404.49674	956.35231	293.42681	0
Slice 7	1.8900254	1,196.5	445.07106	1,057.3904	339.41418	0
Slice 8	3.7406319	1,195.0669	492.44272	1,170.3195	0	500
Slice 9	5.0996477	1,194.0669	525.25328	1,274.7224	0	500
Slice 10	6.0996477	1,193.437	554.81211	1,275.8582	0	900
Slice 11	7.790653	1,192.437	600.72481	1,360.0792	0	900
Slice 12	9.6206383	1,191.5	641.34878	1,393.5351	0	900
Slice 13	11.52164	1,190.6447	676.18625	1,451.8123	543.09924	0
Slice 14	13.244978	1,189.9841	700.60116	1,461.9299	533.08814	0
Slice 15	14.968316	1,189.4212	718.92502	1,462.4868	520.64754	0
Slice 16	16.691654	1,188.9512	731.44971	1,453.2833	505.43335	0
Slice 17	18.414993	1,188.5705	738.40473	1,433.8956	486.98794	0
Slice 18	20.138331	1,188.2762	739.96711	1,403.7135	464.76023	0
Slice 19	21.75	1,188.0748	728.53476	1,377.1757	454.1833	0
Slice 20	23.25	1,187.9548	704.81871	1,355.9725	455.9428	0
Slice 21	24.896668	1,187.8981	688.73227	1,352.3135	464.6446	0
Slice 22	26.690005	1,187.9175	679.46494	1,364.4768	479.65048	0
Slice 23	28.483342	1,188.0255	664.66802	1,363.3472	489.2204	0
Slice 24	30.276678	1,188.2229	644.29173	1,347.5824	492.44943	0
Slice 25	32.070015	1,188.5112	618.24348	1,315.8387	488.46141	0
Slice 26	33.863351	1,188.8927	586.38437	1,266.8311	476.45391	0
Slice 27	35.656688	1,189.3703	548.52349	1,199.3919	455.74299	0
Slice 28	37.450025	1,189.9481	504.40974	1,112.5211	425.80416	0
Slice 29	39.243361	1,190.6313	453.72014	1,005.4207	386.30487	0

Slice 30	41.179362	1,191.5	390.81656	982.46472	0	900
Slice 31	43.064197	1,192.4692	321.87007	854.59238	0	900
Slice 32	44.755202	1,193.4692	251.87272	724.28582	0	900
Slice 33	46.95972	1,195	146.44657	427.0826	0	500
Slice 34	48.659368	1,196.2828	58.764529	128.54102	38.677744	0
Slice 35	49.250607	1,196.7828	27.300059	58.045638	17.042553	0
Slice 36	49.649418	1,197.1323	7.5059209	15.120804	4.0489054	0

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz

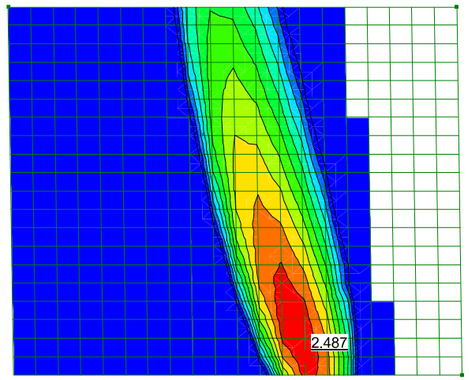
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)	Piezometric Line	Piezometric Line After Drawdown
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	0	29	2	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	0	35	2	1
	Lean Clay	Mohr-Coulomb	115	0	30	500	16	2	1
	Sandy Silt	Mohr-Coulomb	115	0	28	0	28	2	1
	Silty Sand	Mohr-Coulomb	125	0	29	0	29	2	1

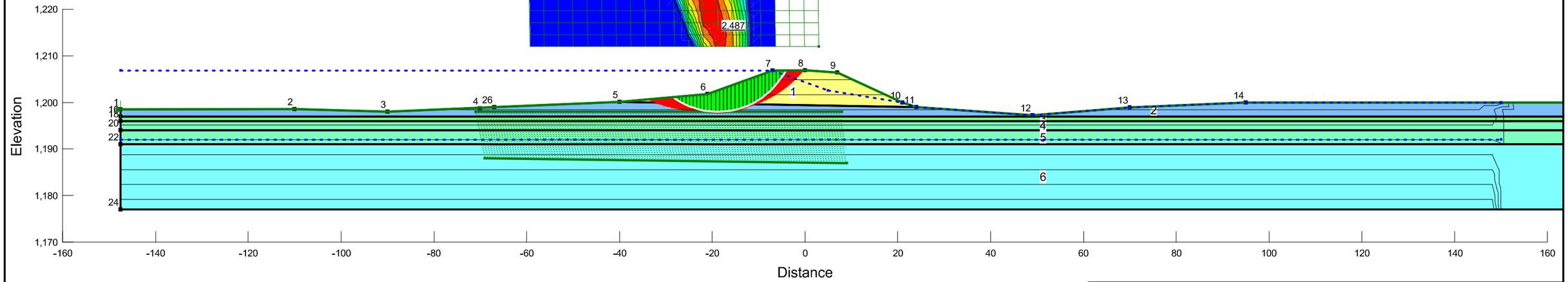


FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz	
5/18/2020	1:252.36129

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)	Cohesion R (psf)	Phi R (°)	Piezometric Line	Piezometric Line After Drawdown
	Fill: Silty Sand	Mohr-Coulomb	125	0	29	0	29	2	1
	Fine to Coarse Sand	Mohr-Coulomb	125	0	35	0	35	2	1
	Lean Clay	Mohr-Coulomb	115	0	30	500	16	2	1
	Sandy Silt	Mohr-Coulomb	115	0	28	0	28	2	1
	Silty Sand	Mohr-Coulomb	125	0	29	0	29	2	1





FL-20-03	
05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz	
5/18/2020	1:252.36129

FL-20-03

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Evaluation
Created By: Allam, Gopala K.
Last Edited By: Prost, Ed
Revision Number: 32
Date: 5/18/2020
Time: 3:40:46 PM
Tool Version: 8.16.5.14710
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 5/18/2020
Last Solved Time: 4:43:04 PM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

FL-20-03

Description: Fremont Levee
Kind: SLOPE/W
Method: Morgenstern-Price
Settings
Side Function
Interslice force function option: Half-Sine
PWP Conditions Source: Piezometric Line
Apply Phreatic Correction: Yes
Use Staged Rapid Drawdown: Yes
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Grid and Radius
Critical slip surfaces saved: 1
Resisting Side Maximum Convex Angle: 1 °
Driving Side Maximum Convex Angle: 5 °
Optimize Critical Slip Surface Location: No
Tension Crack

Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Fill: Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Cohesion R: 0 psf
Phi R: 29 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Silty Sand

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 29 °
Phi-B: 0 °
Cohesion R: 0 psf
Phi R: 29 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Lean Clay

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °
Phi-B: 0 °
Cohesion R: 500 psf
Phi R: 16 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Fine to Coarse Sand

Model: Mohr-Coulomb

Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 35 °
Phi-B: 0 °
Cohesion R: 0 psf
Phi R: 35 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Sandy Silt

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Cohesion R: 0 psf
Phi R: 28 °
Pore Water Pressure
Piezometric Line: 2
Piezometric Line After Drawdown: 1

Slip Surface Grid

Upper Left: (-60.03404, 1,263) ft
Lower Left: (2.21304, 1,263) ft
Lower Right: (3.00098, 1,212) ft
Grid Horizontal Increment: 20
Grid Vertical Increment: 20
Left Projection Angle: 0 °
Right Projection Angle: 0 °

Slip Surface Radius

Upper Left Coordinate: (-71, 1,198) ft
Upper Right Coordinate: (8, 1,198) ft
Lower Left Coordinate: (-69, 1,188) ft
Lower Right Coordinate: (9, 1,187) ft
Number of Increments: 25
Left Projection: No
Left Projection Angle: 135 °
Right Projection: No
Right Projection Angle: 45 °

Slip Surface Limits

Left Coordinate: (-147.5, 1,198.5) ft
Right Coordinate: (250, 1,200) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-147.5	1,192
Coordinate 2	150	1,192

Piezometric Line 2

Coordinates

	X (ft)	Y (ft)
Coordinate 1	-147.5	1,206.87
Coordinate 2	-7	1,206.87
Coordinate 3	5	1,202.5
Coordinate 4	21	1,200
Coordinate 5	24	1,199
Coordinate 6	49	1,197.2
Coordinate 7	70	1,198.9
Coordinate 8	95	1,200
Coordinate 9	150	1,200

Points

	X (ft)	Y (ft)
Point 1	-147.5	1,198.5
Point 2	-110	1,198.6
Point 3	-90	1,198
Point 4	-70	1,198.7
Point 5	-40	1,200.1
Point 6	-21	1,201.8
Point 7	-7	1,206.87
Point 8	0	1,206.9
Point 9	7	1,206.41
Point 10	21	1,200
Point 11	24	1,199
Point 12	49	1,197.2
Point 13	70	1,198.9
Point 14	95	1,200
Point 15	250	1,200
Point 16	-147.5	1,197
Point 17	250	1,197
Point 18	-147.5	1,196
Point 19	250	1,196
Point 20	-147.5	1,194
Point 21	250	1,194
Point 22	-147.5	1,191
Point 23	250	1,191
Point 24	-147.5	1,177
Point 25	250	1,177
Point 26	-67	1,199

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9,10,11	245.69
Region 2	Sandy Silt	16,1,2,3,26,5,11,12,13,14,15,17	926.47
Region 3	Silty Sand	18,16,17,19	397.5
Region 4	Lean Clay	20,18,19,21	795
Region 5	Lean Clay	22,20,21,23	1,192.5
Region 6	Fine to Coarse Sand	22,23,25,24	5,565

Current Slip Surface

Slip Surface: 4,317
F of S: 2.487
Volume: 92.758165 ft³
Weight: 11,422.327 lbs
Resisting Moment: 107,228.38 lbs-ft
Activating Moment: 43,117.112 lbs-ft
Resisting Force: 5,863.4899 lbs
Activating Force: 2,357.3971 lbs
F of S Rank (Analysis): 1 of 11,466 slip surfaces
F of S Rank (Query): 1 of 11,466 slip surfaces
Exit: (-28.507821, 1,201.1282) ft
Entry: (-4.1583681, 1,206.8822) ft
Radius: 16.55 ft
Center: (-18.824895, 1,214.55) ft

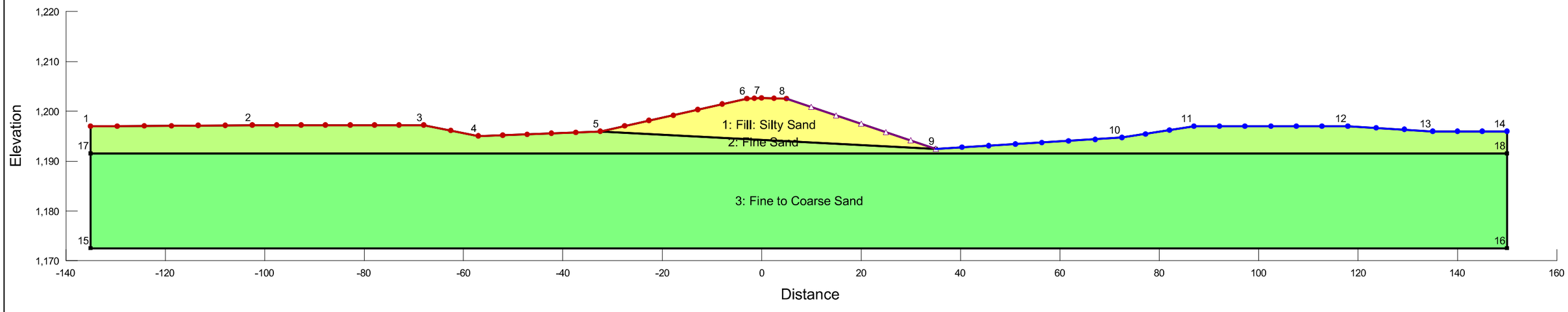
Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	-28.166805	1,200.8949	-555.04463	39.942785	22.140647	0
Slice 2	-27.484772	1,200.4522	-527.41531	117.67297	65.227194	0
Slice 3	-26.802739	1,200.055	-502.63209	190.30718	105.48899	0
Slice 4	-26.0716	1,199.6772	-479.05883	257.85742	137.10522	0
Slice 5	-25.291354	1,199.3215	-456.86045	321.95933	171.18881	0
Slice 6	-24.511108	1,199.013	-437.61414	378.00372	200.98814	0
Slice 7	-23.730861	1,198.7491	-421.14644	425.49756	226.24107	0
Slice 8	-22.950615	1,198.5276	-407.31962	464.15883	246.79763	0
Slice 9	-22.170369	1,198.3466	-396.02505	493.94255	262.63391	0
Slice 10	-21.390123	1,198.2048	-387.17838	515.03955	273.85139	0
Slice 11	-20.577143	1,198.0985	-380.54747	544.11402	289.31056	0
Slice 12	-19.731429	1,198.0303	-376.28909	580.0453	308.41556	0
Slice 13	-18.885715	1,198.0055	-374.74412	606.41314	322.43559	0
Slice 14	-18.040001	1,198.024	-375.90033	624.05519	331.81603	0
Slice 15	-17.194287	1,198.086	-379.76686	633.91927	337.06086	0
Slice 16	-16.348573	1,198.1919	-386.37458	636.98644	338.6917	0
Slice 17	-15.502859	1,198.3426	-395.77739	634.20473	337.21264	0
Slice 18	-14.657145	1,198.5393	-408.05442	626.43589	333.08187	0
Slice 19	-13.811431	1,198.7839	-423.31361	614.4149	326.6902	0
Slice 20	-12.965717	1,199.0785	-441.69685	598.71989	318.34501	0
Slice 21	-12.120003	1,199.4261	-463.38735	579.74916	308.2581	0
Slice 22	-11.305717	1,199.8133	-487.54773	555.61749	307.9838	0
Slice 23	-10.52286	1,200.2401	-514.18075	528.5461	292.97788	0

Slice 24	-9.7400019	1,200.7244	-544.40114	498.26278	276.19157	0
Slice 25	-8.9571442	1,201.2725	-578.60366	464.29707	257.36407	0
Slice 26	-8.1742865	1,201.8928	-617.30918	425.89504	236.07747	0
Slice 27	-7.3914288	1,202.5966	-661.22474	381.93389	211.70941	0
Slice 28	-6.6077784	1,203.4007	-711.40616	317.29393	175.8789	0
Slice 29	-5.8233351	1,204.3295	-769.35917	230.01996	127.50214	0
Slice 30	-5.0388918	1,205.4207	-837.45217	129.9384	72.02603	0
Slice 31	-4.4025191	1,206.4476	-901.52943	38.064648	21.099579	0

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz

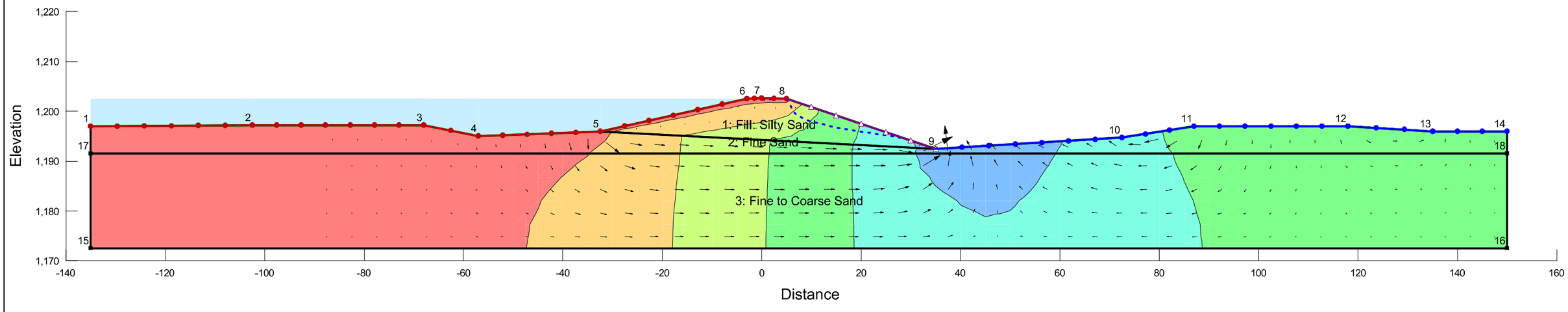
Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content (ft^3/ft^3)	Mv (/psf)
	Fill: Silty Sand	Saturated Only	5.46e-006	1	0	0	0
	Fine Sand	Saturated Only	0.000819	1	0	0	0
	Fine to Coarse Sand	Saturated Only	0.000819	1	0	0	0



Steady-State Seepage
05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz
6/3/2020 1:237.33978

Title: 05195169 - Fremont Levee Preliminary Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz

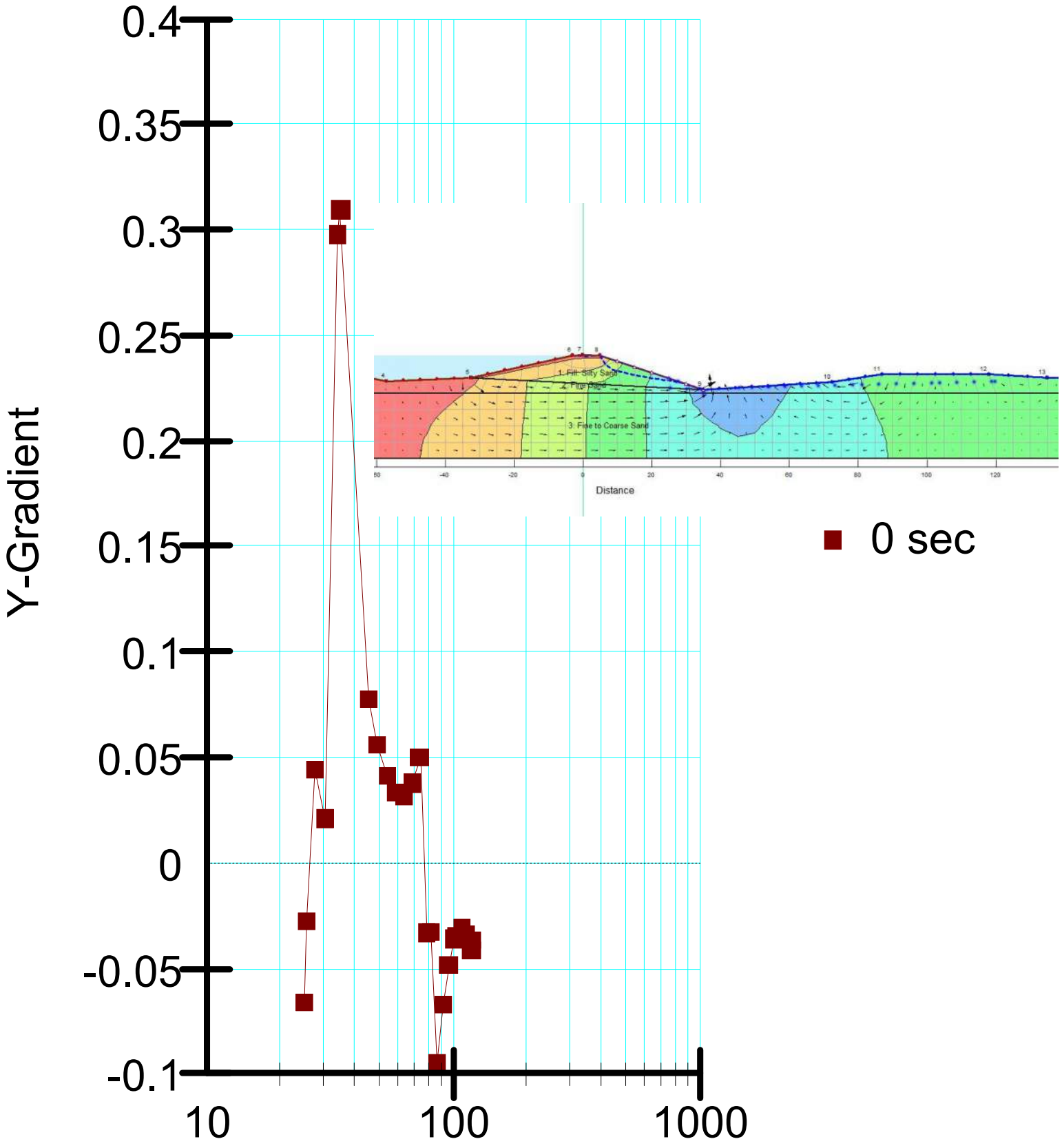
Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content (ft^3/ft^3)	Mv (/psf)
	Fill: Silty Sand	Saturated Only	5.46e-006	1	0	0	0
	Fine Sand	Saturated Only	0.000819	1	0	0	0
	Fine to Coarse Sand	Saturated Only	0.000819	1	0	0	0



Steady-State Seepage
05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz
6/3/2020 1:237.33978

Y-Gradient

FL-20-02



Steady-State Seepage

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Preliminary Evaluation
Created By: Allam, Gopala K.
Last Edited By: Allam, Gopala K.
Revision Number: 56
Date: 6/3/2020
Time: 6:09:49 PM
Tool Version: 8.16.5.15361
File Name: 05195169 Fremont Levee Evaluation FL-20-02 - RDD.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 6/3/2020
Last Solved Time: 6:09:51 PM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Mass(M) Units: Pounds
Mass Flux Units: lbs/sec
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Steady-State Seepage

Kind: SEEP/W
Method: Steady-State
Settings

Include Air Flow: No
Control
Apply Runoff: Yes
Convergence
Maximum Number of Iterations: 500
Minimum Pressure Head Difference: 0.005
Significant Digits: 2
Max # of Reviews: 10
Hydraulic Under-Relaxation Criteria
Under-Relaxation Initial Rate: 1
Under-Relaxation Min. Rate: 0.1
Under-Relaxation Reduction Rate: 0.65
Under-Relaxation Iterations: 10
Equation Solver: Parallel Direct
Time
Starting Time: 0 sec
Duration: 0 sec
Ending Time: 0 sec

Materials

Fill: Silty Sand

Model: Saturated Only
Hydraulic
Sat Kx: 5.46e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft^3/ft^3
Mv: 0 /psf

Fine Sand

Model: Saturated Only
Hydraulic
Sat Kx: 0.000819 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft^3/ft^3
Mv: 0 /psf

Fine to Coarse Sand

Model: Saturated Only
Hydraulic
Sat Kx: 0.000819 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft^3/ft^3
Mv: 0 /psf

Boundary Conditions

Zero Pressure

Type: Pressure Head 0
Review: No

Potential Seepage Face

Type: Total Flux (Q) 0
Review: Yes

Total Head (Elev. 1202.51 feet)

Type: Head (H) 1202.51
Review: No

Points

	X (ft)	Y (ft)
Point 1	-135	1,197
Point 2	-102.5	1,197.2
Point 3	-68	1,197.2
Point 4	-57	1,195
Point 5	-32.5	1,196
Point 6	-3	1,202.51
Point 7	0	1,202.63
Point 8	5	1,202.48
Point 9	35	1,192.5
Point 10	72.5	1,194.7
Point 11	87	1,197
Point 12	118	1,197

Point 13	135	1,196
Point 14	150	1,196
Point 15	-135	1,172.5
Point 16	150	1,172.5
Point 17	-135	1,191.5
Point 18	150	1,191.5

Lines

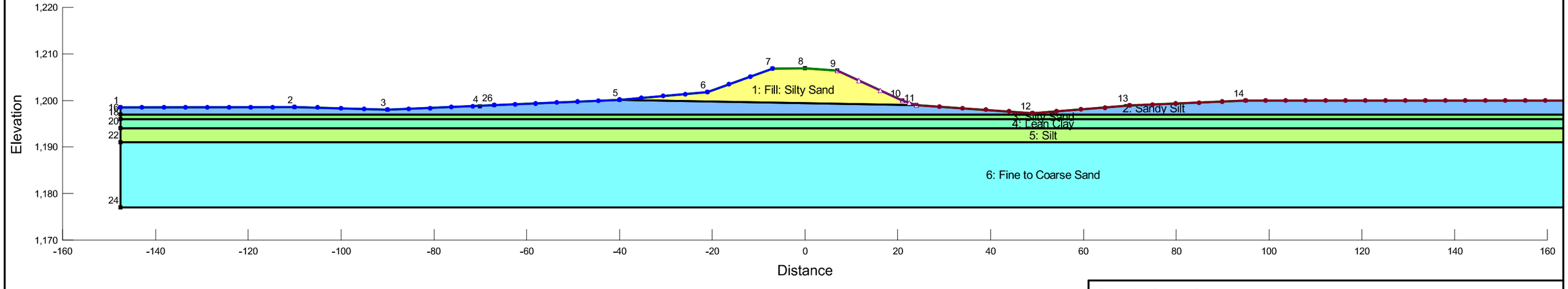
	Start Point	End Point	Hydraulic Boundary	Length (ft)	Angle (°)
Line 1	5	6	Total Head (Elev. 1202.51 feet)	30.21	12.4
Line 2	6	7	Total Head (Elev. 1202.51 feet)	3.0024	2.29
Line 3	7	8	Total Head (Elev. 1202.51 feet)	5.0022	-1.72
Line 4	8	9	Potential Seepage Face	31.616	-18.4
Line 5	9	5		67.591	-2.97
Line 6	17	1		5.5	90
Line 7	1	2	Total Head (Elev. 1202.51 feet)	32.501	0.353
Line 8	2	3	Total Head (Elev. 1202.51 feet)	34.5	0
Line 9	3	4	Total Head (Elev. 1202.51 feet)	11.218	-11.3
Line 10	4	5	Total Head (Elev. 1202.51 feet)	24.52	2.34
Line 11	9	10	Zero Pressure	37.564	3.36
Line 12	10	11	Zero Pressure	14.681	9.01
Line 13	11	12	Zero Pressure	31	0
Line 14	12	13	Zero Pressure	17.029	-3.37
Line 15	13	14	Zero Pressure	15	0
Line 16	14	18		4.5	90
Line 17	18	17		285	0
Line 18	15	17		19	90
Line 19	18	16		19	90
Line 20	16	15		285	0

Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9	311.33
Region 2	Fine Sand	17,1,2,3,4,5,9,10,11,12,13,14,18	1,177.7
Region 3	Fine to Coarse Sand	15,17,18,16	5,415

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz

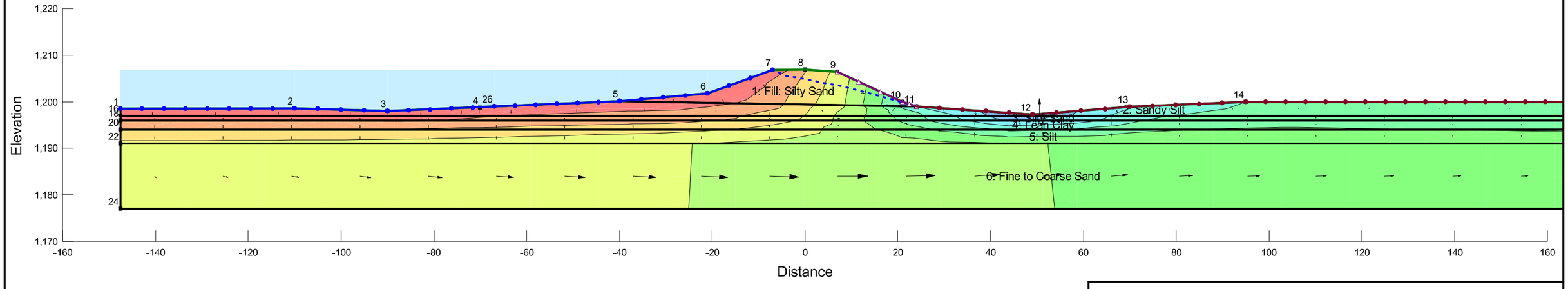
Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content (ft^3/ft^3)	Mv (/psf)
	Fill: Silty Sand	Saturated Only	5.46e-006	1	0	0	0
	Fine to Coarse Sand	Saturated Only	0.000819	1	0	0	0
	Lean Clay	Saturated Only	2.05e-006	1	0	0	0
	Sandy Silt	Saturated Only	2.73e-006	1	0	0	0
	Silt	Saturated Only	2.73e-006	1	0	0	0
	Silty Sand	Saturated Only	5.46e-006	1	0	0	0



Steady-State Seepage
05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz
6/3/2020 1:252.36129

Title: 05195169 - Fremont Levee Evaluation
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz

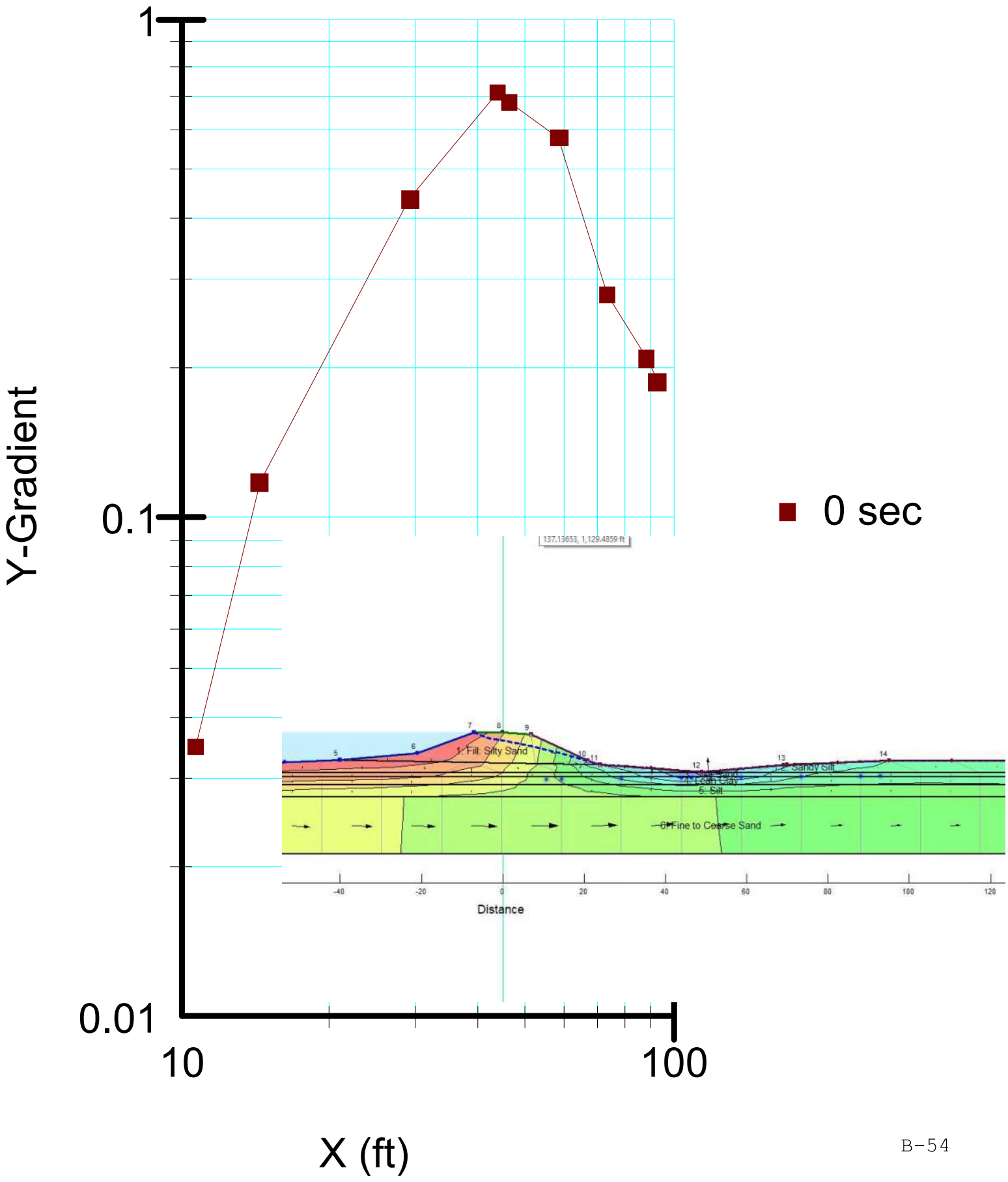
Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content (ft^3/ft^3)	Mv (/psf)
	Fill: Silty Sand	Saturated Only	5.46e-006	1	0	0	0
	Fine to Coarse Sand	Saturated Only	0.000819	1	0	0	0
	Lean Clay	Saturated Only	2.05e-006	1	0	0	0
	Sandy Silt	Saturated Only	2.73e-006	1	0	0	0
	Silt	Saturated Only	2.73e-006	1	0	0	0
	Silty Sand	Saturated Only	5.46e-006	1	0	0	0



Steady-State Seepage	
05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz	
6/3/2020	1:252.36129

Y-Gradient

FL-20-03



Steady-State Seepage

File Information

File Version: 8.16
Title: 05195169 - Fremont Levee Evaluation
Created By: Allam, Gopala K.
Last Edited By: Allam, Gopala K.
Revision Number: 37
Date: 6/3/2020
Time: 6:17:19 PM
Tool Version: 8.16.5.15361
File Name: 05195169 Fremont Levee Evaluation FL-20-03 - RDD.gsz
Directory: N:\Projects\2019\05195169\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\SLOPEW\
Last Solved Date: 6/3/2020
Last Solved Time: 6:17:21 PM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Mass(M) Units: Pounds
Mass Flux Units: lbs/sec
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Steady-State Seepage

Kind: SEEP/W
Method: Steady-State
Settings

Include Air Flow: No
Control
Apply Runoff: Yes
Convergence
Maximum Number of Iterations: 500
Minimum Pressure Head Difference: 0.005
Significant Digits: 2
Max # of Reviews: 10
Hydraulic Under-Relaxation Criteria
Under-Relaxation Initial Rate: 1
Under-Relaxation Min. Rate: 0.1
Under-Relaxation Reduction Rate: 0.65
Under-Relaxation Iterations: 10
Equation Solver: Parallel Direct
Time
Starting Time: 0 sec
Duration: 0 sec
Ending Time: 0 sec

Materials

Fill: Silty Sand

Model: Saturated Only
Hydraulic
Sat Kx: 5.46e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft^3/ft^3
Mv: 0 /psf

Silt

Model: Saturated Only
Hydraulic
Sat Kx: 2.73e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft^3/ft^3
Mv: 0 /psf

Silty Sand

Model: Saturated Only
Hydraulic
Sat Kx: 5.46e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft³/ft³
Mv: 0 /psf

Lean Clay

Model: Saturated Only
Hydraulic
Sat Kx: 2.05e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft³/ft³
Mv: 0 /psf

Fine to Coarse Sand

Model: Saturated Only
Hydraulic
Sat Kx: 0.000819 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft³/ft³
Mv: 0 /psf

Sandy Silt

Model: Saturated Only
Hydraulic
Sat Kx: 2.73e-006 ft/sec
Ky'/Kx' Ratio: 1
Rotation: 0 °
Volumetric Water Content: 0 ft³/ft³
Mv: 0 /psf

Boundary Conditions

Zero Pressure

Type: Pressure Head 0
Review: No

Potential Seepage Surface

Type: Total Flux (Q) 0
Review: Yes

Total Head (El. 1206.87 feet)

Type: Head (H) 1206.87
Review: No

Points

	X (ft)	Y (ft)
Point 1	-147.5	1,198.5
Point 2	-110	1,198.6
Point 3	-90	1,198
Point 4	-70	1,198.7
Point 5	-40	1,200.1
Point 6	-21	1,201.8
Point 7	-7	1,206.87
Point 8	0	1,206.9
Point 9	7	1,206.41
Point 10	21	1,200
Point 11	24	1,199
Point 12	49	1,197.2
Point 13	70	1,198.9
Point 14	95	1,200
Point 15	250	1,200
Point 16	-147.5	1,197
Point 17	250	1,197
Point 18	-147.5	1,196
Point 19	250	1,196
Point 20	-147.5	1,194
Point 21	250	1,194
Point 22	-147.5	1,191
Point 23	250	1,191
Point 24	-147.5	1,177
Point 25	250	1,177

Point 26	-67	1,199

Lines

	Start Point	End Point	Hydraulic Boundary	Length (ft)	Angle (°)
Line 1	5	6	Total Head (El. 1206.87 feet)	19.076	5.11
Line 2	6	7	Total Head (El. 1206.87 feet)	14.89	19.9
Line 3	7	8		7.0001	0.246
Line 4	8	9		7.0171	-4
Line 5	9	10	Potential Seepage Surface	15.398	-24.6
Line 6	10	11	Potential Seepage Surface	3.1623	-18.4
Line 7	11	5		64.009	-0.985
Line 8	16	1		1.5	90
Line 9	1	2	Total Head (El. 1206.87 feet)	37.5	0.153
Line 10	2	3	Total Head (El. 1206.87 feet)	20.009	-1.72
Line 11	3	26	Total Head (El. 1206.87 feet)	23.022	2.49
Line 12	26	5	Total Head (El. 1206.87 feet)	27.022	2.33
Line 13	11	12	Zero Pressure	25.065	-4.12
Line 14	12	13	Zero Pressure	21.069	4.63
Line 15	13	14	Zero Pressure	25.024	2.52
Line 16	14	15	Zero Pressure	155	0
Line 17	15	17		3	90
Line 18	17	16		397.5	0
Line 19	18	16		1	90
Line 20	17	19		1	90
Line 21	19	18		397.5	0
Line 22	20	18		2	90
Line 23	19	21		2	90
Line 24	21	20		397.5	0
Line 25	22	20		3	90
Line 26	21	23		3	90
Line 27	23	22		397.5	0
Line 28	23	25		14	90
Line 29	25	24		397.5	0
Line 30	24	22		14	90

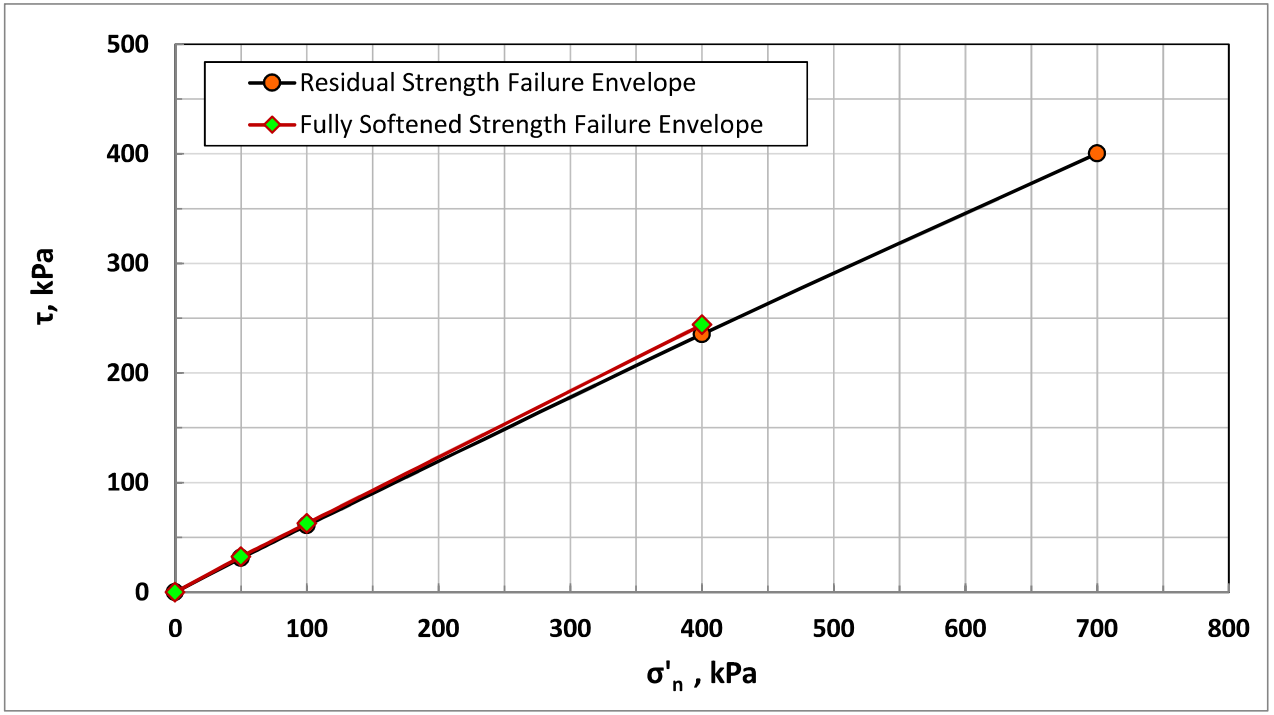
Regions

	Material	Points	Area (ft²)
Region 1	Fill: Silty Sand	5,6,7,8,9,10,11	245.69
Region 2	Sandy Silt	16,1,2,3,26,5,11,12,13,14,15,17	926.47
Region 3	Silty Sand	18,16,17,19	397.5
Region 4	Lean Clay	20,18,19,21	795
Region 5	Silt	22,20,21,23	1,192.5
Region 6	Fine to Coarse Sand	22,23,25,24	5,565

Drained Residual and Fully Softened Secant Friction Angles & Shear Stresses

Equations developed by Stark and Hussain (2010)

Input		Output	ϕ'r, degrees				τ, kPa					
CF, %	LL, %		50	100	400	700	0	50	100	400	700	σ'n, kPa
19.6	29		31.8	31.3	30.5	29.8	0.00	31.06	60.87	235.32	400.32	Residual
			33.0	32.1	31.4		0.00	32.46	62.76	244.03		Fully Softened



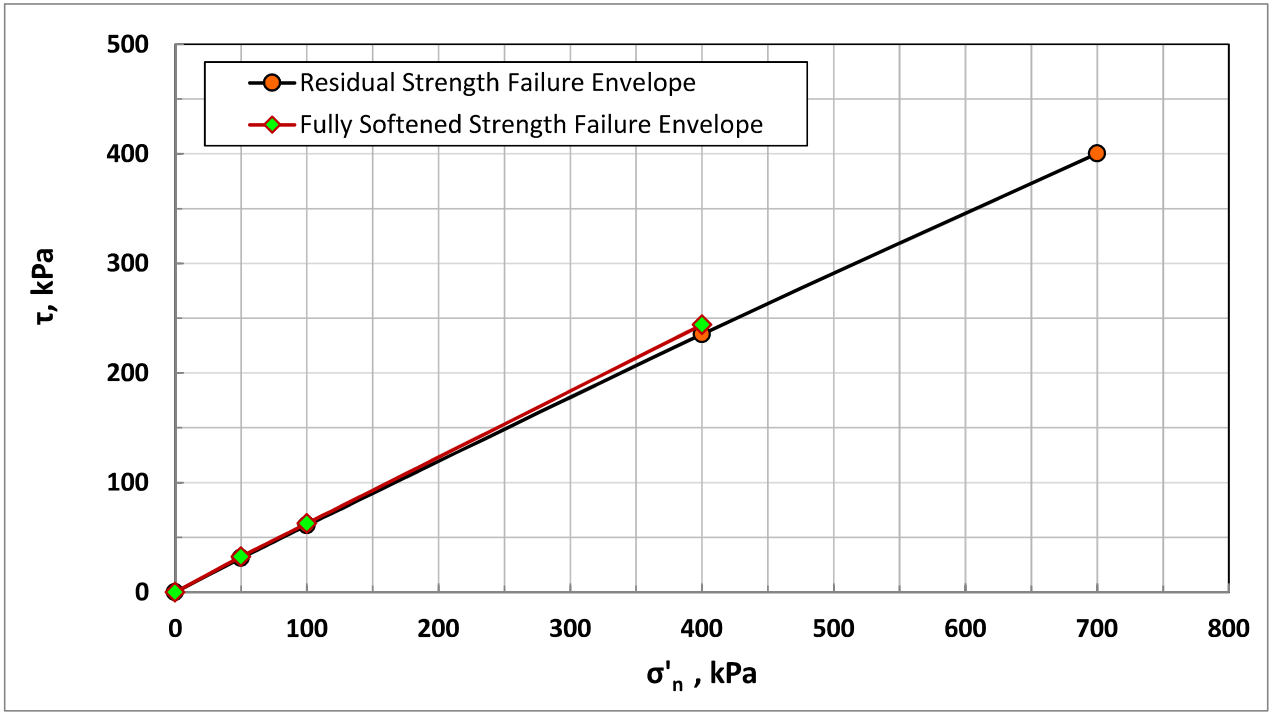
Important Note:

Valide for:	LL Range	
	Minimum	Maximum
Fully Softened		
Group #1	20	79
Group #2	30	130
Group #3	30	300
Residual		
Group #1	24	79
Group #2	30	130
Group #3	40	300

Drained Residual and Fully Softened Secant Friction Angles & Shear Stresses

Equations developed by Stark and Hussain (2010)

Input		Output	ϕ'_r, degrees				τ, kPa					
CF, %	LL, %		50	100	400	700	0	50	100	400	700	σ'_n, kPa
19.7	29		31.8	31.3	30.5	29.8	0.00	31.06	60.87	235.32	400.32	Residual
			33.0	32.1	31.4		0.00	32.46	62.76	244.03		Fully Softened



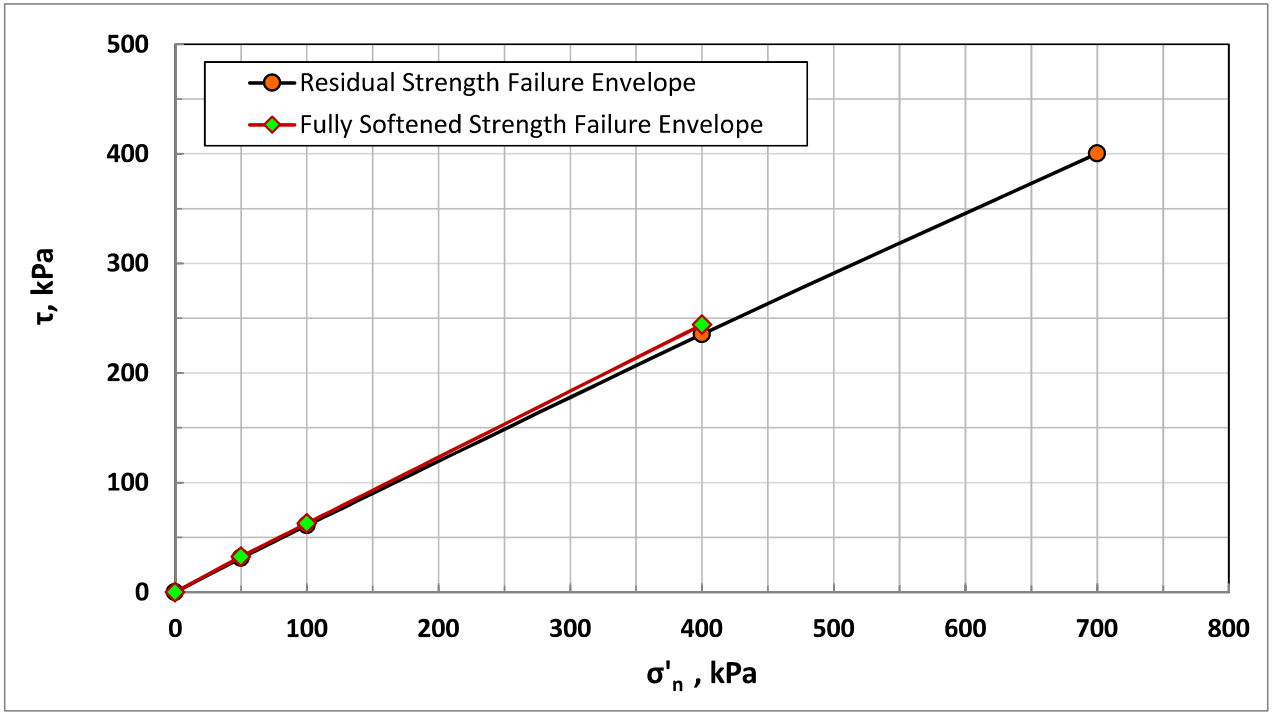
Important Note:

Valide for:	LL Range	
	Minimum	Maximum
Fully Softened		
Group #1	20	79
Group #2	30	130
Group #3	30	300
Residual		
Group #1	24	79
Group #2	30	130
Group #3	40	300

Drained Residual and Fully Softened Secant Friction Angles & Shear Stresses

Equations developed by Stark and Hussain (2010)

Input		Output	ϕ'_r, degrees				τ, kPa					
CF, %	LL, %		50	100	400	700	0	50	100	400	700	σ'_n, kPa
20.7	29		31.8	31.3	30.5	29.8	0.00	31.06	60.87	235.32	400.32	Residual
			33.0	32.1	31.4		0.00	32.46	62.76	244.03		Fully Softened



Important Note:

Valide for:	LL Range	
	Minimum	Maximum
Fully Softened		
Group #1	20	79
Group #2	30	130
Group #3	30	300
Residual		
Group #1	24	79
Group #2	30	130
Group #3	40	300

APPENDIX C
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
Fremont Levee Preliminary Exploration ■ Fremont, NE
Terracon Project No. 05195169

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Shelby Tube Standard Penetration Test	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 500	0 - 1
Loose	4 - 9	Soft	500 to 1,000	2 - 4
Medium Dense	10 - 29	Medium Stiff	1,000 to 2,000	4 - 8
Dense	30 - 50	Stiff	2,000 to 4,000	8 - 15
Very Dense	> 50	Very Stiff	4,000 to 8,000	15 - 30
		Hard	> 8,000	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

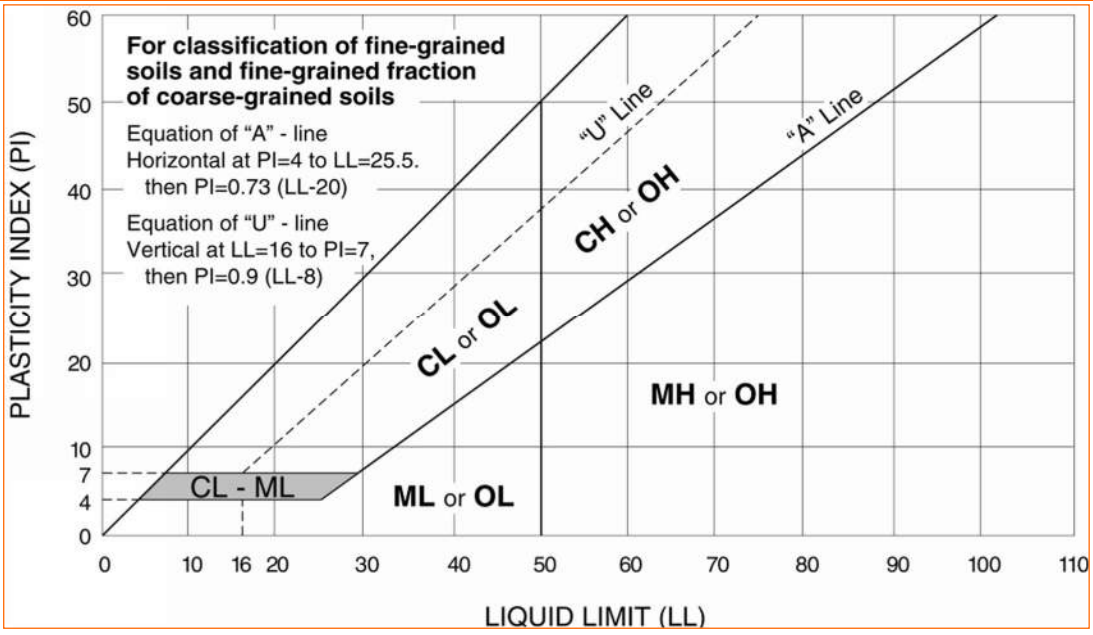
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



APPENDIX B – NATIONAL LEVEE DATABASE INFORMATION

Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

Identification

System Name
Valley - Union and No Name Dikes System - Platte River LB (NF)

System Type
Levee System

System ID
4705000164

Prior IDs
No Data Entered

Responsible Organization
USACE - Omaha District

Interested Federal Agencies
No Data Entered

Project

Description

The Valley - Union and No Name Dikes System - Platte River LB is located in southern Dodge County and northwestern Douglas County in Nebraska. It is comprised of two segments; the upstream segment, Union Dike, ties into the BNSF railroad embankment south of Fremont, NE and follows the left bank of the Platte River to the Union Pacific railroad embankment west of the City of Valley. The Papio-Missouri River Natural Resources district is the sponsor for both segments. The downstream segment, No Name Dike, begins at the Union Pacific railroad and terminates near the Rogert Airstrip, about 2 miles south of Valley. Originally built in the 1930's It is the downstream segment of a two-segment system with Union Dike. The Union Dike was originally constructed in 1919, but underwent major improvements in 1990. The segment was accepted into the PL 84-99 Flood Damages and Rehabilitation Assistance Program in 1992. The levee segment is approximately 9.8 miles long, has a crown width of 12 feet, 3:1 (Horizontal:Vertical) riverward side slopes, 5:1 (Horizontal:Vertical) landward side slopes and an average height of 7 feet. The levee provides protection for 2,691 people and 1,675 structures, including airports, medical providers, law enforcement and fire stations, schools and museums, hazardous material facilites, and oil and gas facilities. The No Name Dike was constructed in the 1930's, but was improved in the early 1990's. The segment was accepted into the PL 84-99 Program in 1993. The levee segment is approximately 2.3 miles long, has a crown width of 12 feet, 3:1 (Horizontal:Vertical) side slopes, and an average height of 7 feet. The segment provide protection for 13 people and 24 structures. System features include gravity drainage structures to conduct drainage to the Platte River and seepage berms to control seepage under the levee.

Valley - Union and No Name Dikes System - Platte River LB (NF)

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

Info Map DOWNLOAD DATA

Risk Characteristics

Risk	Not Screened
People at Risk	6,254
Structures at Risk	1,354
Property Value	$1.29B
Assessment Date	N/A

Risk Characterization Summary

In Progress

Risk Classification Rating Definitions

High Level Risk Assessments (0)

Filter

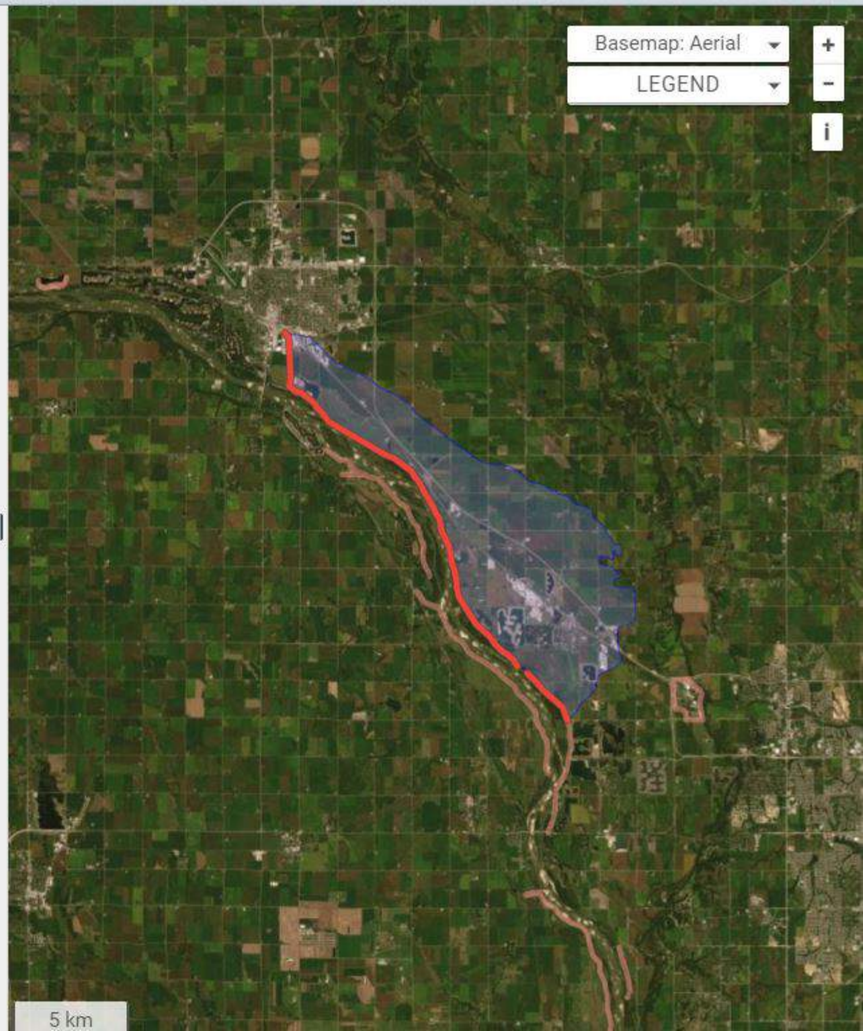
There are no high level risk assessments for this levee system

Results per page: 5 0- 0 of 0

Risk Attachments (0)

Columns Filter

Risk - There are no attachments meeting the parameters



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

SUMMARY | SYSTEM | SEGMENTS | RISK | FEMA - NFIP/FIRM | FEATURES | PROFILE | ATTACHMENTS

Valley - Union Dike - Platte River LB (NF) - BNSF Railroad Tie-Off

Identification

Segment Name: Valley - Union Dike - Platte River LB (NF) - BNSF Railroad Tie-Off

Alias: No Data Entered

Segment ID: 4704100021

Prior IDs: No Data Entered

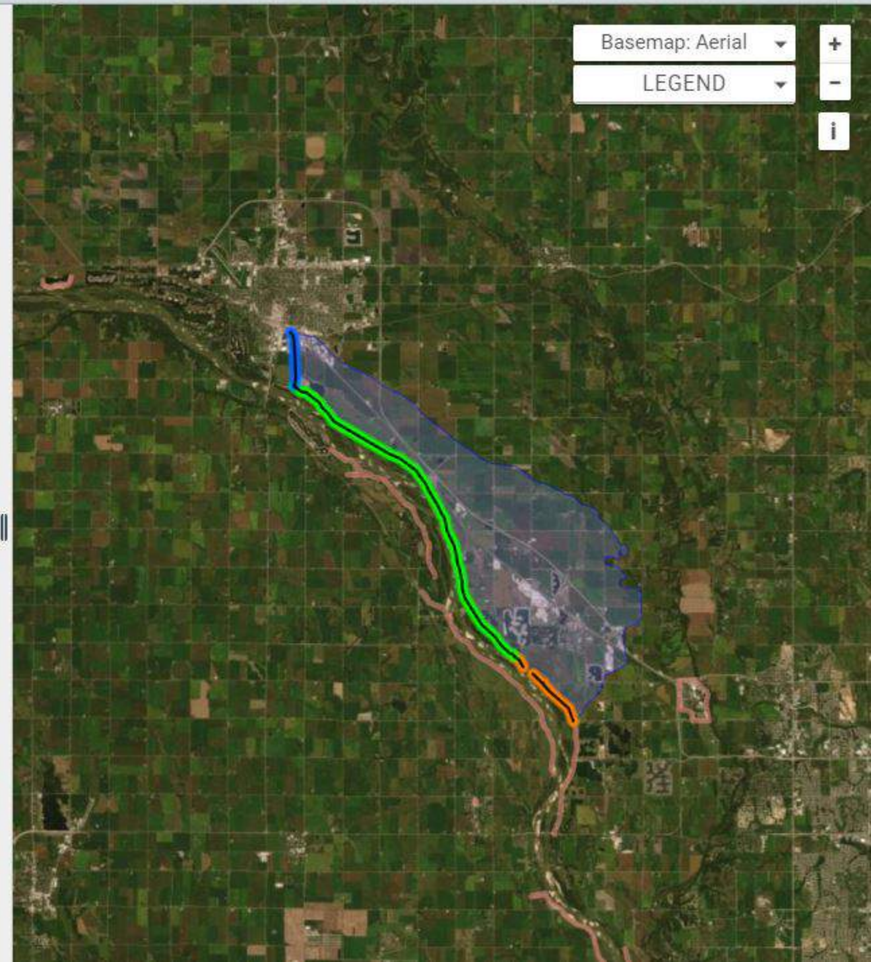
Interested Federal Agency: No Data Entered

Authorization

Category: Locally Constructed, Locally Operated and Maintained

Sponsor & Maintaining Organizations

Name	Role	Type
Burlington Northern Sante Fe Railroad	Sponsor	Private Sector
Burlington Northern Sante Fe Railroad	Maintenance Agency	Private Sector



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

SUMMARY | SYSTEM | SEGMENTS | RISK | FEMA - NFIP/FIRM | FEATURES | PROFILE | ATTACHMENTS

Valley - Union Dike - Platte River LB (NF) - BNSF Railroad Tie-Off (cont.)

Design

Flow (cfs)
No Data Entered

Frequency
No Data Entered

Construction

Start Date
No Data Entered

End Date
No Data Entered

Length
1.45 Miles

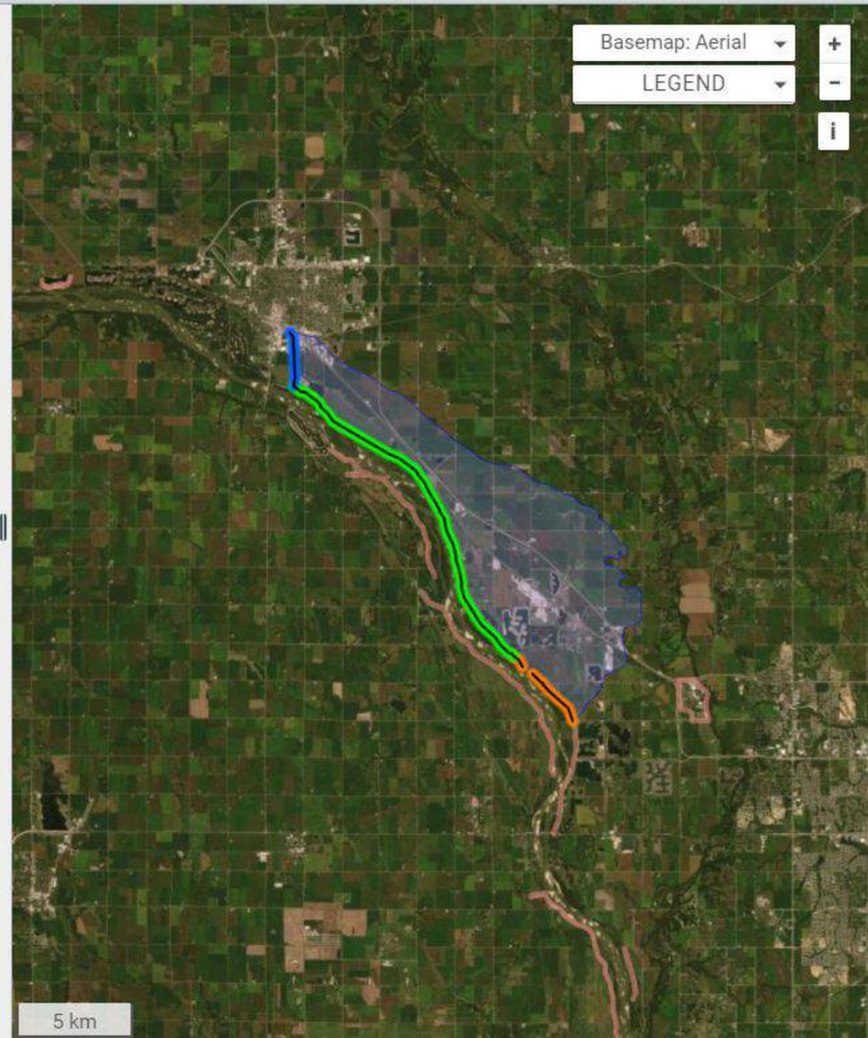
Eligibility

Non-Federal IEI Date
No Data Entered

P2 Project Data

Miscellaneous

Non Project
Yes



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

Valley - No Name Dike - Platte River LB (NF)

Valley - Union Dike - Platte River LB (NF)

Identification

Segment Name
Valley - Union Dike - Platte River LB (NF)

Alias
No Data Entered

Segment ID
4704000148

Prior IDs
No Data Entered

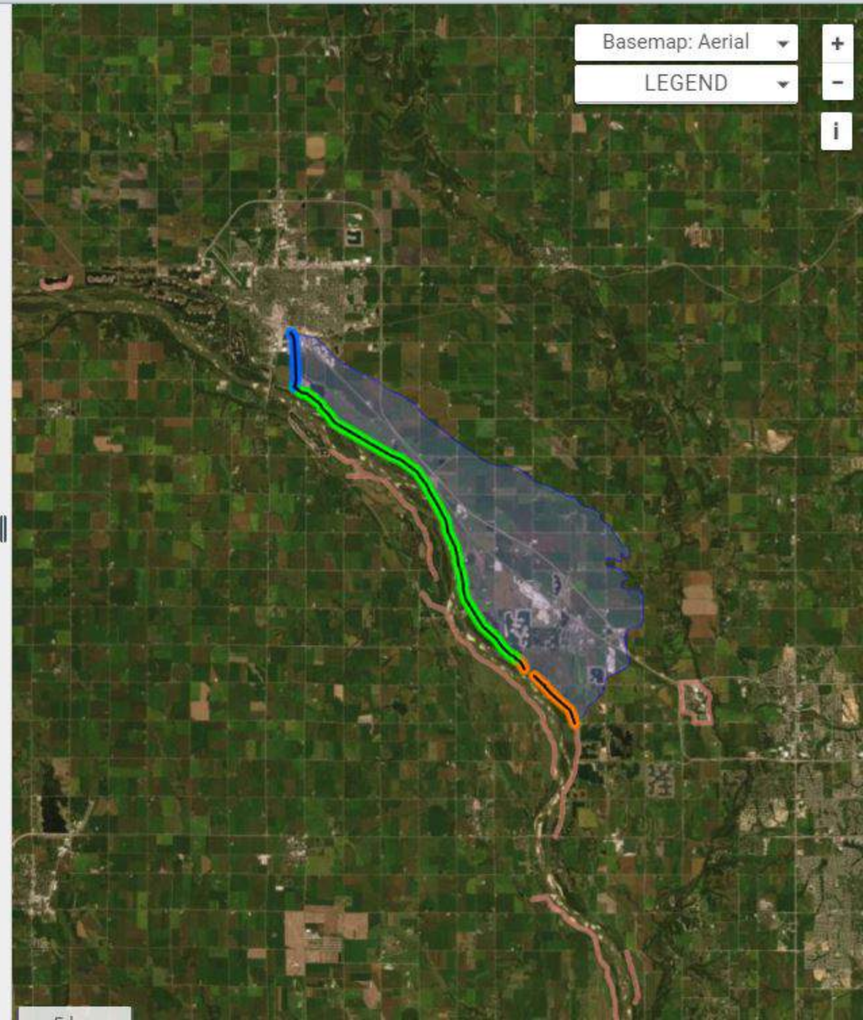
Interested Federal Agency
No Data Entered

Authorization

Category
Locally Constructed, Locally Operated and Maintained

Loading sponsorships...

Design



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

SUMMARY | SYSTEM | SEGMENTS | RISK | FEMA - NFIP/FIRM | FEATURES | PROFILE | ATTACHMENTS

Valley - Union Dike - Platte River LB (NF) (cont.)

Design

Flow (cfs)
No Data Entered

Frequency
0.02

Construction

Start Date
No Data Entered

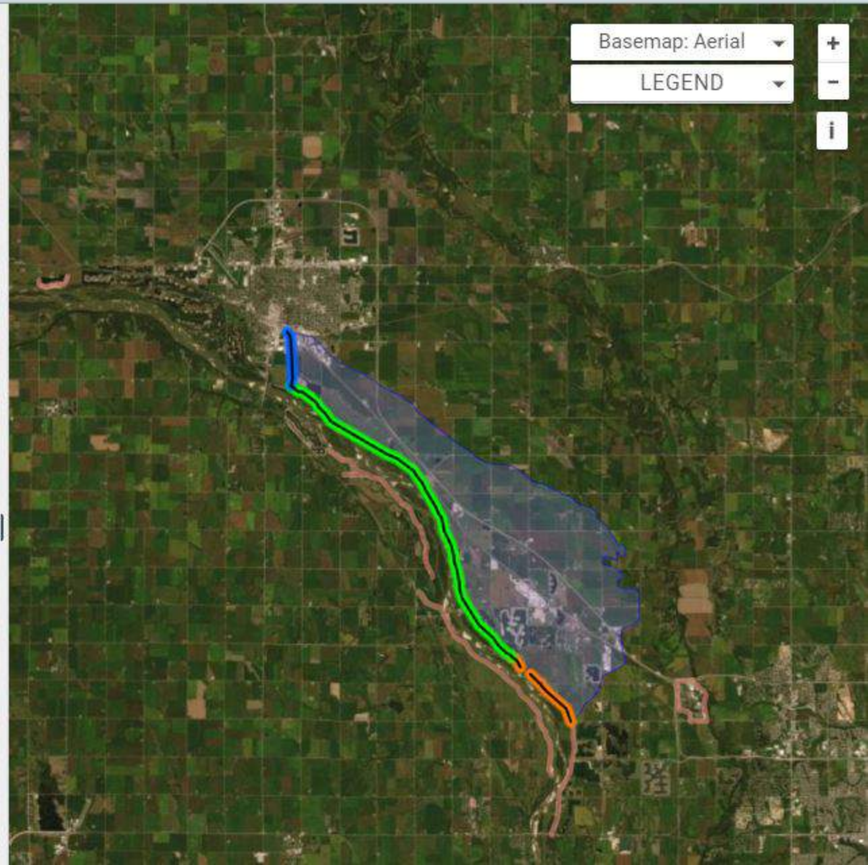
End Date
No Data Entered

Length
9.76 Miles

Eligibility

Non-Federal IEI Date
No Data Entered

P2 Project Data



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

SUMMARY | SYSTEM | SEGMENTS | RISK | FEMA - NFIP/FIRM | FEATURES | PROFILE | ATTACHMENTS

Valley - No Name Dike - Platte River LB (NF)

Identification

Segment Name
Valley - No Name Dike - Platte River LB (NF)

Alias
No Data Entered

Segment ID
4704000147

Prior IDs
No Data Entered

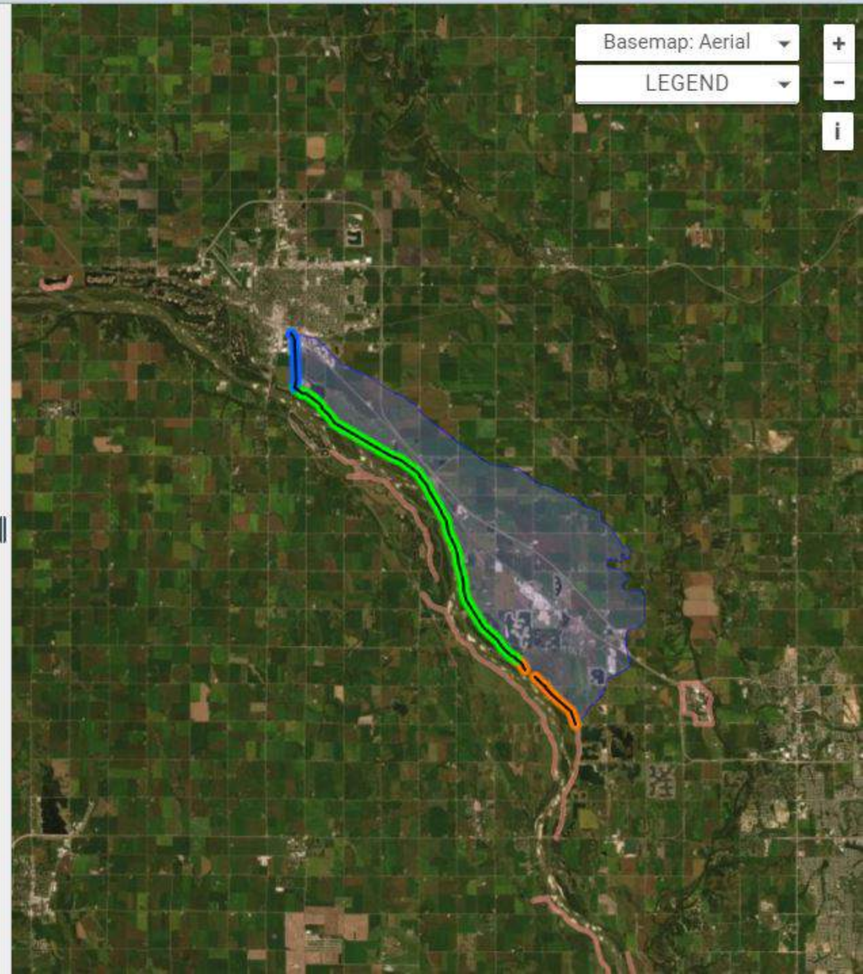
Interested Federal Agency
No Data Entered

Authorization

Category
Locally Constructed, Locally Operated and Maintained

Sponsor & Maintaining Organizations

Name	Role	Type
Papio-Missouri River NRD	Sponsor	Water Agency
Papio-Missouri River NRD	Maintenance Agency	Water Agency



Valley - Union and No Name Dikes System - Platte River LB (NF)

Info Map DOWNLOAD DATA

Location Leshara, Saunders County, Nebraska USACE Districts Omaha FEMA Regions 7

Design

Valley - No Name Dike - Platte River LB (NF) (cont.)

Flow (cfs)
No Data Entered

Frequency
0.02

Construction

Start Date
11/15/1989

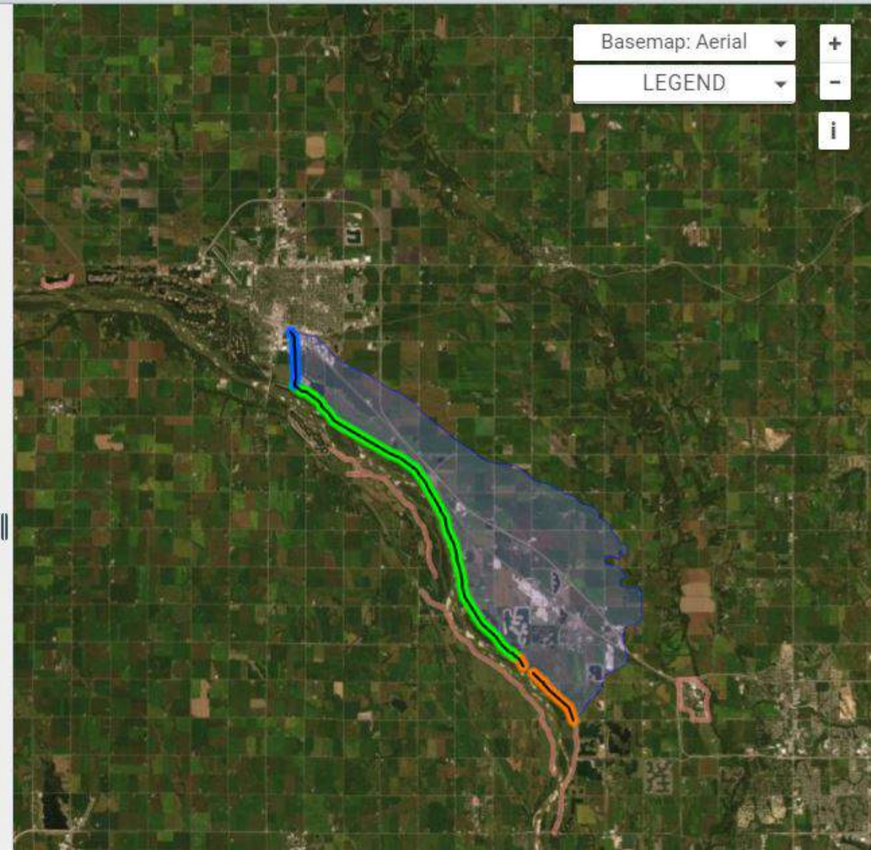
End Date
10/01/1993

Length
2.05 Miles

Eligibility

Non-Federal IEI Date
No Data Entered

P2 Project Data



APPENDIX C – FLOOD DAMAGE ASSESSMENT REPORT

Flood Damage Assessment Report– August 22, 2019
Farmland, Fremont, & Railroad Dike – Emergency Repairs
Dan Fricke, PE; Assisted by Megan Gren, EI and Mark Bacon, Intern

BACKGROUND

In March 2019, significant flooding was experienced on many river systems throughout Nebraska. Rare circumstances, including significant localized snowpack, deep frost, extended cold weather into March, untimely rain events, and rapid warming, created record flows in the Platte River. The Farmland, Fremont, & Railroad Dike (levee system) in the City of Fremont, NE (the City) was directly affected by these flows. Two portions of the levee system experienced complete breaches that allowed water to enter the City. The City contracted JEO Consulting Group, Inc (JEO) to assess the damage and recommend repairs to restore the levee to its pre-flood condition. This assessment focuses on two areas of need along the levee system.

ASSESSMENT

This report outlines the findings from site visits completed by employees of JEO Consulting Group, Inc. on August 19, 2019 by Dan Fricke, Mark Bacon, and Megan Gren. During the site visit, two locations within the levee system were noted as having substantial damage that require attention. Figure 1, located in Appendix A, provides an overview of the levee system and the two sites' locations.

This report describes the findings of the site visit and provides recommended actions and estimated costs to restore the sites to their pre-flood condition. An initial cost opinion is in Appendix B. It should be noted that it is possible there are locations in need of repair that were not observed due to obstructions such as dense vegetation. All distances and measurements should be considered approximate as they were taken by hand in the field with approximations made in areas where measurements could not be taken; topographic survey would be required to determine more exact dimensions.

Site 1

Findings

Site 1 is composed of 4 breaches. Just west of Highway 77 near Emerson Estates, the Platte River broke through the levee system causing one large complete breach and three other partial breaches all within approximately 720 feet of one another. The levee embankment in this area is approximately 6-feet tall, above natural grade. At Site 1, the levee runs along and through private property, though it is JEO's understanding that the City has an easement for the levee corridor here. Figure 2, in Appendix A, shows all four locations within Site 1.

Site 1a

Site 1a is located 920 feet from the west edge of Highway 77, measured along the levee embankment, and is the largest of the four breaches within Site 1. Here, the floodwaters cut completely through the levee. The levee is approximately 45 feet wide at its base and the breach is an average of 50 feet in length (along the levee corridor). Landside of the breached area, the grade is approximately 6 feet lower than the riverside ground due to scour and erosion around tree roots. The depth of the breach, from top of levee, ranges from 6 feet to 12 feet. Just to the west of the breached area, additional erosion has occurred around a 4-foot diameter tree at the levee's riverside toe.

Throughout the breached area, sediment, debris, and fallen trees deposited by the floodwaters are present. The landside area surrounding the breach is forested with trees ranging from 4 inches to 6 feet in diameter. There were 8 trees identified as being larger 2-foot in diameter or larger, some of which may be located on private property.

Site 1a – Looking northeast from the riverside toward the breach and private property (August 2019)

Site 1a – Looking northwest from the riverside toward the breach and private property (August 2019)

Site 1a – Looking east towards landside toe, 4 foot diameter tree, and eroded ground (August 2019)

Site 1a – Looking northwest towards breach, indicated by the red line (June 2019)

Site 1b

Site 1b is located 650 feet from the west edge of Highway 77, measured along the levee embankment, and is a partial levee breach about 15 feet long. Here, the levee is approximately 3 feet lower than pre-flood. Due to dense vegetation, tall grass, the exact dimensions of this breach are unknown. There is one large tree, approximately 5 feet in diameter abutting the levee toe in line with the breach's center.

Site 1b – Looking northeast towards breach (August 2019)

Site 1b – Looking northwest towards breach and 5 feet diameter tree (August 2019)

Site 1c

Site 1c is located 630 feet from the west edge of Highway 77, measured along the levee embankment, and is a partial levee breach about 5 feet long. Here, the levee is approximately 3 feet lower than pre-flood. Due to dense vegetation, tall grass, the exact dimensions of this breach are unknown.

Site 1c – Looking northeast towards breach (August 2019)

Site 1d

Site 1d is located 200 from the west edge of Highway 77, measured along the levee embankment, and is a partial levee breach about 10 feet long. Here, the breach depth varies from 2 – 5 feet. Due to dense vegetation, tall grass, the exact dimensions of this breach are unknown. On the landside, a 2-foot diameter tree and a sand pile abut the levee toe. On the riverside, there is a 2-foot diameter tree approximately 10 feet from the levee toe. It is assumed the sand was deposited by the flood.

Site 1d – Looking north towards breach (August 2019)

Recommendations

The recommendations for the various Site 1 repairs are described separately in the following text as Site 1a is significantly different than the others. However, they were combined into one cost estimate assuming that is how it would be bid and constructed.

Due to the proximity of the private property that abuts the levee's landside toe, it is anticipated that some access and work will occur on private property. Therefore, coordination and possible temporary easements will be necessary with the adjacent properties. No utilities were evaluated and should be identified during design.

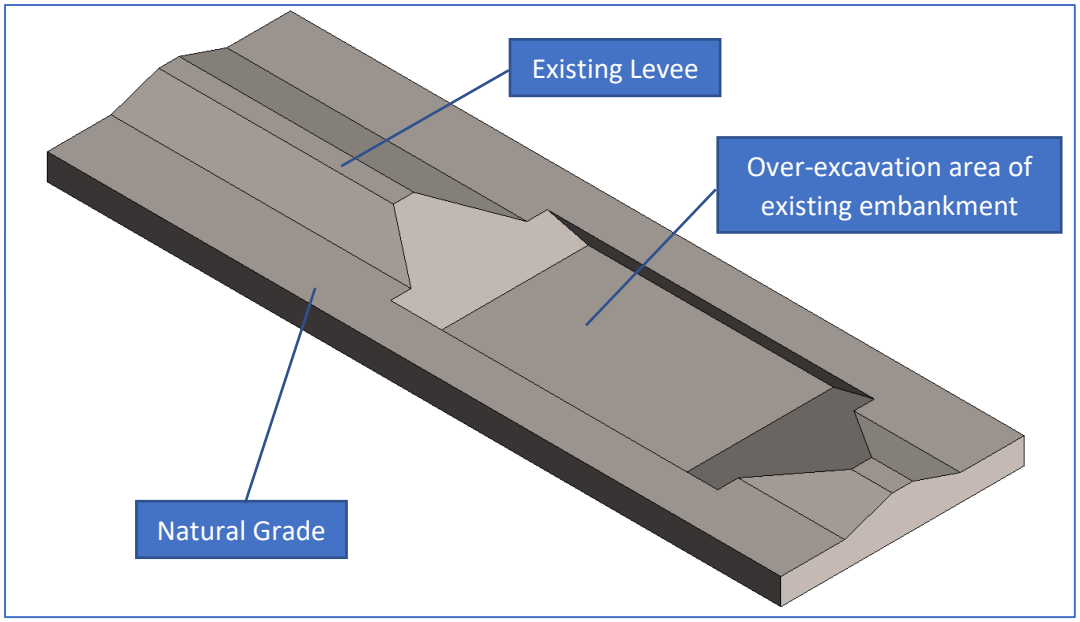
The conceptual construction cost including professional services to address these Site 1 repairs is $313,798. Refer to Appendix B for a conceptual cost estimate breakdown.

Site 1a

To restore Site 1a to its pre-flood condition, it is recommended the sediment, debris, and fallen trees be removed from the breached area. Additionally, clearing and grubbing as well as large tree removals should be completed. The number of large tree removals depends on land ownership; for this assessment, all 8 trees have been planned for removal.

Next, the breach should be over-excavated to create a stable and homogenous base to build from, see Example 2 below. Vertically, the breached area should be excavated 5 feet below the lowest elevation in the breach to create an even surface on which fill can be placed, this would also help account for potential scour hole deposition that occurred during flooding. Horizontally, the breach should be excavated 10 feet from the up- and downstream faces of the breach as well as in the riverside and landside directions. The walls of the excavated area should all be sloped back at a 4:1 slope (horizontal to vertical) for proper fill placement and compaction. Benching may be possible in lieu of a 4:1 slope layback. Dewatering is not anticipated at this depth, however shallower excavation depths could be considered to avoid dewatering, to be determined in design.

Suitable compacted lean clay fill should then be placed in the over-excavated bottom area to tie into undisturbed surrounding grade. Waste and fill material should be disposed of and acquired from, respectively, commercial sources or other areas that are permitted for these uses. Fill should also be placed in the eroded area riverside of the levee surrounding the breach location. To fill these areas, approximately 1,050 cubic yards are needed. This quantity is based on an over-excavation area of 65 feet wide (45 feet plus 20 feet over-excavation) by 70 feet long (50 feet plus 20 feet over-excavation) and an over-excavation depth of 5 feet; this quantity assumes 25% additional fill for the eroded areas. Fill should be placed in appropriate lifts and compacted.



Site 1a – Example proposed site preparation for reconstruction

To reconstructed levee section should have a 10 foot wide top, 3:1 levee face side-slopes (horizontal to vertical), and a length of approximately 150 feet to fill the breached and excavated area. Based on this evaluation, approximately 2,250 cubic yards of material will be needed to restore the area. Temporary erosion control measures may also be needed during/after construction. After fill and topsoil placement, the disturbed area should be seeded, and appropriate erosion control measures should be placed as necessary.

Costs for restoring Site 1a are in Appendix B. For this assessment, all Site 1 repairs have been combined.

Sites 1b, 1c, and 1d

To restore Site 1b, 1c, and 1d to their pre-flood condition, debris and vegetation should be removed from the breach areas. There are three large diameter trees which should be removed to better facilitate construction and to clear the vegetation free zone. The breaches should then be over-excavated 3 feet below their s' lowest elevation to create an even surface to build from; the breaches' internal faces should be sloped back at 4:1 (horizontal to vertical). The over-excavation may need to be wider to facilitate fill placement and compaction.

To rebuild these locations, suitable compacted lean clay fill should be placed to create a 10-foot wide top and to tie into the surrounding undisturbed levee. For these areas, the placed fill is estimated to be approximately 6-foot tall ranging from 50-75 feet along the levee, with 3:1 side-slopes (horizontal to vertical). It is estimated 1,490 cubic yards will be required to fill these locations; this includes fill to replace over-excavation. Temporary erosion control measures may also be needed during/after construction. After fill and topsoil placement, the disturbed area should be seeded, and appropriate erosion control measures should be placed as necessary.

A detailed conceptual cost estimate for restoring Sites 1b, 1c, and 1d are in Appendix B. For this assessment, all Site 1 repairs have been combined.

Site 2

Findings

Site 2 is located approximately 750 northwest of W South Street, measured along the levee embankment. The site is located within a 200-foot wide City-owned parcel. Within this parcel, the levee's riverside is open grassy area with a small stand of trees, and the levee's landside is forested. See Figure 3 in Appendix A for more detail on Site 2.

At this location, floodwaters completely cut through the levee, leaving an approximate 100-foot long breach, based on photos captured during the flood. In late March, this breach was temporarily repaired by placing fill, broken concrete, and riprap in the open area. On the August 19 site visit, the temporarily repaired breach was completely covered in dense vegetation. Based on LiDAR, the breach's base width is 45 feet and that the breach depth ranges from 6 feet to 10 feet. However, in the field, it appeared that 3 – 5 feet of erosion had occurred landside of the levee making the levee appear approximately 15 feet tall from the landside.

Landside of the breach, debris and fallen trees littered the forested area. Additionally, as stated above rootballs of the standing trees here were exposed due to soil loss from the floodwaters.

Site 2 – Looking southwest from levee top towards northwest face of levee breach (March 2019, from City)

Site 2 – Looking southwest from riverside towards northwest face of levee breach (March 2019, from City)

Site 2 – Looking west towards temporarily repaired breached area from breach landside (August 2019)

Site 2 – Landside, eroded ground, exposed tree roots and woody debris (August 2019)

Recommendation

Due to the City-owned land the levee is located within at this site, it is not anticipated that any easements will be necessary. However, discussion with adjacent property owners is recommended to coordinate potential construction work and access as well as any easements determined necessary in design. No utilities were evaluated and should be identified during design.

The conceptual construction cost estimate including professional services to address these Site 2 repairs is $278,670. Refer to Appendix B for a conceptual cost estimate breakdown.

To restore Site 2 to its pre-flood condition, vegetation, fallen/eroded trees, and any debris as well as the material placed as a temporary repair should be removed from the site. Next, the breach should be over-excavated to create a stable area to build from. Vertically, the breached area should be excavated 5 feet below existing undisturbed ground to create an even surface to place fill on. Horizontally, the breach should be excavated 10 feet from the up- and downstream faces of the breach as well as in the riverside and landside directions. The walls of the excavated area should all be sloped back at a 4:1 slope (horizontal to vertical).

Suitable lean clay fill should then be placed and compacted in the over-excavated bottom area to tie into undisturbed surrounding ground. Fill should also be placed in the eroded area landside of the levee surrounding the breach location. Large tree removal will be necessary to complete this work. To fill these areas, approximately 1,800 cubic yards are needed. This quantity is based on an over-excavation area of 65 feet wide (45 feet plus 20 feet over-excavation) by 120 feet long (100 feet plus 20 feet over-excavation) and an over-excavation depth of 5 feet; this quantity assumes 25% additional fill for the eroded areas.

To replace the lost levee section, suitable compacted fill should then be placed to construct a berm matching the undisturbed levee's height. For this assessment, an average berm of 8 feet high, 280 feet long, with a 10-foot top width, and 3:1 (horizontal to vertical) side-slopes was assumed. The average height assumed is based on LiDAR and assumes the erosion landside of the levee will be repaired prior to placing berm fill. Based on these dimensions, 2,000 cubic yards of fill are needed for the berm. Temporary erosion control measures may also be needed during/after construction. After fill and topsoil placement, the disturbed area should be seeded, and appropriate erosion control measures should be placed as necessary.

The conceptual construction cost estimate for restoring Site 2 is in Appendix B.

Appendices:

A — Maps and Figures

- Figure 1
- Figure 2
- Figure 3

B — Opinion of Project Costs

- Site 1
- Site 2

APPENDIX A: MAPS AND FIGURES

Created By: MRB
Date: August 2019
Revised:
Software: ArcGIS 10.4.1
File: Overview.mxd

Figure 1:
Flood Damage Assessment Overview Map

Fremont, Nebraska

JEO CONSULTING GROUP INC

Created By: MRB
Date: August 2019
Revised:
Software: ArcGIS 10.4.1
File: Overview.mxd

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plat.

Figure 2:
Site 1 Overview

Fremont, Nebraska

JEO CONSULTING GROUP INC

Created By: MRB
Date: August 2019
Revised:
Software: ArcGIS 10.4.1
File: Overview.mxd

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plat.

Figure 3:
Site 2 Overview

Fremont, Nebraska

JEO CONSULTING GROUP INC

APPENDIX B: OPINION OF PROJECT COSTS

ENGINEER'S BUDGETARY OPINION OF PROBABLE COST
Farmland, Fremont, & Railroad Dike - Emergency Repairs
Fremont, NE
JEO Project No. 190908.00

Date Prepared:
August 22, 2019

ESTIMATE OF QUANTITIES

Item #	Description	Unit	Quantity	Unit Price	Total
Site 1					
1.	Mobilization	LS	1	$16,000.00	$16,000
2.	Clearing and Grubbing	LS	1	$9,000.00	$9,000
3.	Tree Removal (2' - 4' Dia.)	EA	9	$2,500.00	$22,500
4.	Tree Removal (> 4' Dia.)	EA	2	$4,500.00	$9,000
5.	Debris Removal	LS	1	$7,750.00	$7,750
6.	Excavation and Removal	CY	4,020	$7.00	$28,140
7.	Topsoil, 6"	CY	890	$30.00	$26,700
8.	Embankment for Breach and Erosion Repair	CY	4,790	$20.00	$95,800
9.	Seeding	AC	1.1	$5,000.00	$5,500
10.	Erosion Control	LS	1	$3,750.00	$3,750
				Site 1 Construction Subtotal	$224,140
				Contingency 20%	$44,830
				Total Opinion of Site 1 Construction Cost	**$268,970**
	Engineeering and Construction Services (Engineering, Geotechnical, Survey, Legal, Construction)			20%	$44,828
				Total Opinion of Site 1 Cost	**$313,798**
Site 2					
1.	Mobilization	LS	1	$19,000.00	$19,000
2.	Clearing and Grubbing	LS	1	$10,000.00	$10,000
3.	Tree Removal (> 2' Dia.)	LS	1	$15,000.00	$15,000
4.	Debris Removal	LS	1	$7,500.00	$7,500
5.	Excavation and Removal (Over-Excavation and Temporary Repairs)	CY	3,100	$10.00	$31,000
22.	Topsoil, 6"	CY	1,010	$30.00	$30,300
7.	Embankment for Breach and Erosion Repair	CY	3,800	$20.00	$76,000
8.	Seeding	AC	1.25	$5,000.00	$6,250
9.	Erosion Control	LS	1	$4,000.00	$4,000
				Site 2 Construction Subtotal	$199,050
				Contingency 20%	$39,810
				Total Opinion of Site 2 Construction Cost	**$238,860**
	Engineeering and Construction Services (Engineering, Geotechnical, Survey, Legal, Construction)			20%	$39,810
				Total Opinion of Site 2 Cost	**$278,670**
Construction Total					
				Construction Subtotal - All Groups	$423,190
				Contingency (20%)	$84,640
				Total Opinion of Construction Cost - All Groups	**$507,830**

Notes:
1. Easements were not considered and are not a part of this cost opinion.
2. Utility coordination was not considered and is not a part of this cost opinion.

APPENDIX D – SITE VISIT SUMMARY

Inspection Summary
Fremont, NE
April 28, 2020

Background

On November 18, 2019, Dan Fricke, Ross Lawrence, and Megan Gren (JEO Consulting Group, Inc.) and Ed Prost (Terracon Consultants Inc.) inspected the Fremont, Farmland, and Railroad Levee (Levee) in Fremont, NE to document any damages and/or insufficiencies in the levee system.

Findings

During the site visit, items with potential to hinder the Levee's performance were noted. These items include:

- Animal Burrows
- Uneven levee crest (additional fill, rutting, depressions)
- Debris
- Slope erosion, steep slopes
- Encroachments
    - Fences
    - Utilities
    - Large trees, woody vegetation
- Damaged/breached areas from March 2019 flood events

Along the Levee, approximately 50 total locations were noted as affected by one of the items listed above. These are shown on Figure 1.

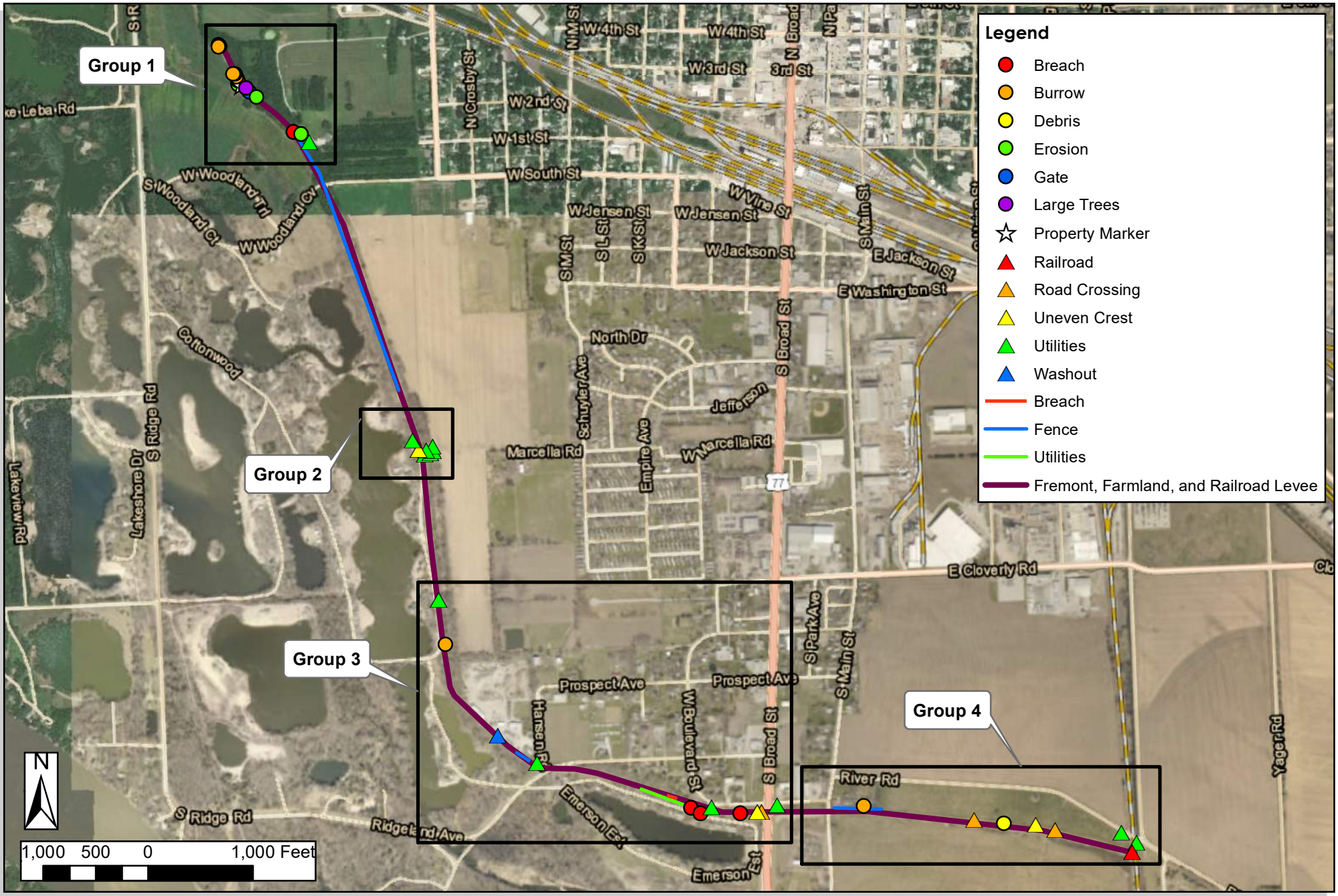
Photo Log

Following, is a photo log containing photos and brief descriptions of items noted during the levee inspection. For clarity, the items noted are organized by location (group) and by category. See Figure 1 for a visual of this organization. Within each group, photos are organized by category, in alphabetical order.

There are 13 categories:

1. Breach
2. Burrow
3. Debris
4. Erosion
5. Gate
6. Fence
7. Large Trees
8. Property Marker
9. Railroad
10. Road Crossing
11. Uneven Crest
12. Utilities
13. Washout

See Figures 2 – 5 for a visual mapping of photo locations within each group.



Created By: MRG
Date: 01/20/2020
Software: ArcGIS 10.7

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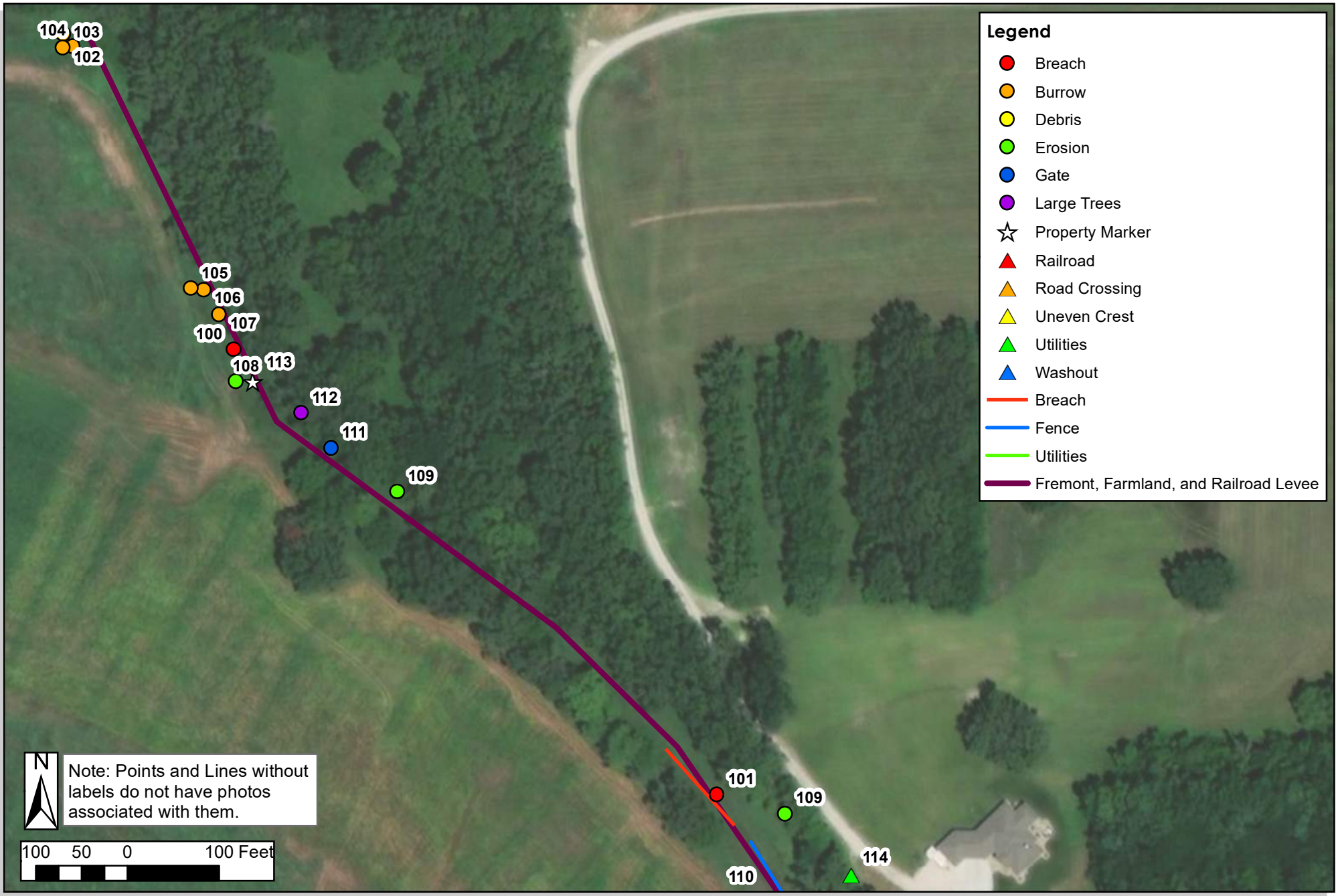
Figure 1: Fremont Levee Evaluation
Site Visit Overview & Photo Directory

Fremont, Nebraska

JEO CONSULTING GROUP INC



Created By: MRG
Date: 01/20/2020
Software: ArcGIS 10.7

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plat.

Figure 2: Group 1 Photo Directory

Fremont, Nebraska

JEO CONSULTING GROUP INC

Group 1

	**Category:** Breach **ID:** 100 **Orientation:** Looking upstream. **Description:** There is a slight depression in the riverside levee side slope. Depression continues to top of levee. Approximately 6 – 8" deep, 5 – 8' wide, along levee.
	**Category:** Breach **ID:** 101 **Orientation:** Looking upstream. **Description:** This is the location of Site 2 in JEO's Flood Damage Assessment Report dated August 22, 2019. This breach was temporarily repaired by the City. It was estimated to be 100 feet wide, along the levee, and 6' to 10' tall originally. There is landside erosion making the breach approximately 15' tall in some locations. This breach cut completely through the levee prism.
	**Category:** Burrow **ID:** 102 **Orientation:** Looking at riverside levee slope.

Group 1

	**Category:** Burrow **ID:** 103 **Orientation:** Looking at riverside levee slope.
	**Category:** Burrow **ID:**104 **Orientation:** Looking at landside levee slope.
	**Category:** Burrow **ID:** 105 **Orientation:** Looking at riverside levee slope.

Group 1

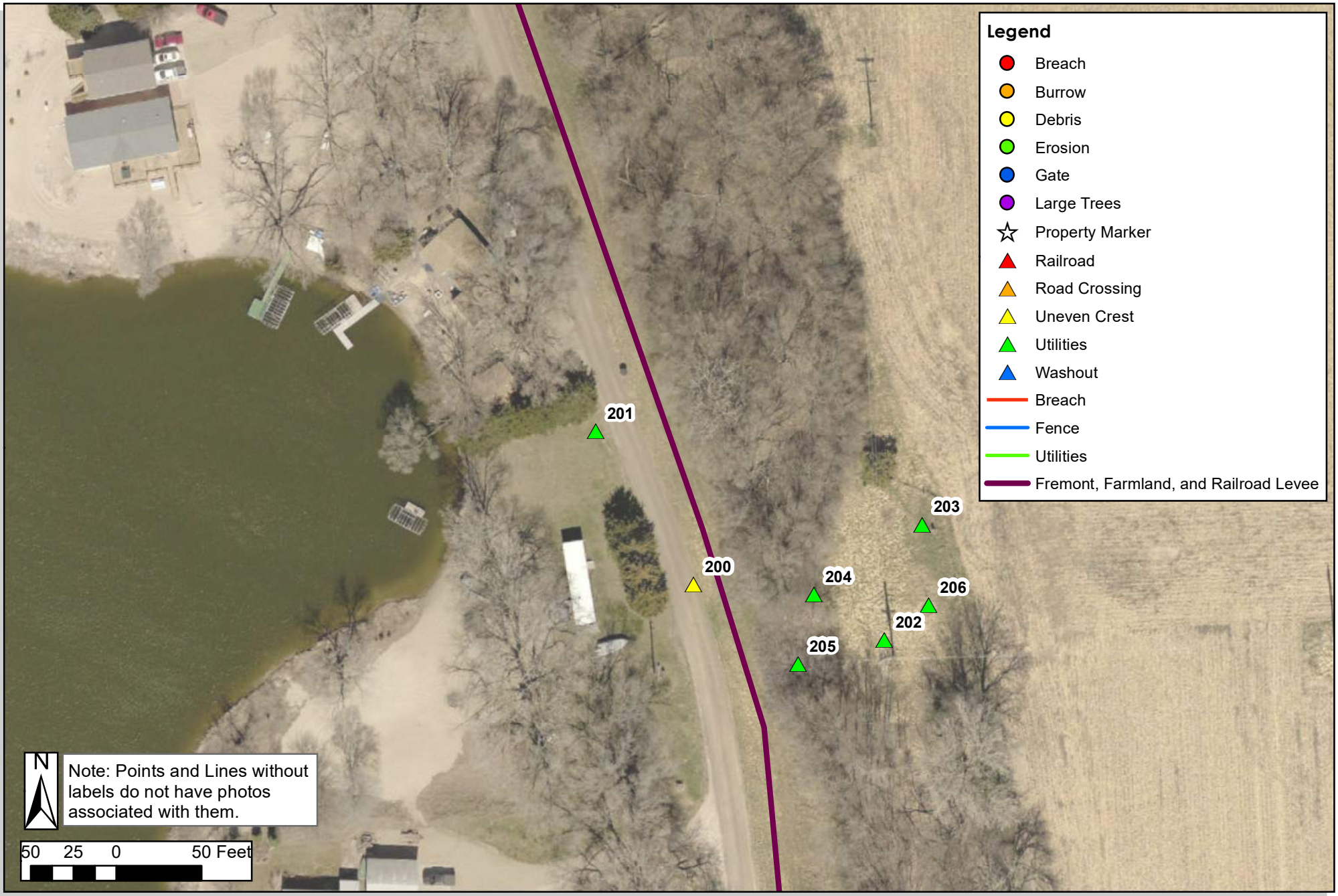
	**Category:** Burrow **ID:** 106 **Orientation:** Looking at riverside levee slope.
	**Category:** Burrow **ID:** 107 **Orientation:** Looking at riverside levee slope.
	**Category:** Erosion **ID:** 108 **Orientation:** Looking upstream. **Description:** Depression on riverside levee slope and levee crest, approximately 4-8” deep and 8’ wide, along levee.

Group 1

	**Category:** Erosion **ID:** 109 **Orientation:** Looking downstream. **Description:** Steep slope along levee landside, side slope of approximately 50-55%.
	**Category:** Fence **ID:** 110 **Orientation:** Looking downstream, southeast from levee. **Description:** Barbed wire fence with wooden posts along riverside of levee, approximately 5-10’ off levee toe.
	**Category:** Gate **ID:** 111 **Orientation:** Looking downstream.

Group 1

	**Category:** Large Trees **ID:** 112 **Orientation:** Looking northeast from levee. **Description:** Forested area with multiple large trees along levee landside. The one shown here is approximately 3’ in diameter.
	**Category:** Property Markers **ID:** 113 **Orientation:** Looking south from levee. **Description:** Property markers in the field on the riverside of the levee.
	**Category:** Utilities **ID:** 114 **Orientation:** Looking north from levee. **Description:** Transformer on landside of levee.



Created By: MRG
Date: 01/20/2020
Software: ArcGIS 10.7

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plat.

Figure 3: Group 2 Photo Directory

Fremont, Nebraska

JEO CONSULTING GROUP INC

Group 2

	**Category:** Uneven Crest **ID:** 200 **Orientation:** Looking upstream. **Description:** Levee top is rounded is rounded/peaked.
	**Category:** Utilities **ID:** 201 **Orientation:** Looking west from levee. **Description:** Hydrant located riverside of levee, approximately 115 feet from levee.
	**Category:** Utilities **ID:** 202 **Orientation:** Looking northeast. **Description:** Power pole located landside of levee, approximately 85 feet from levee.

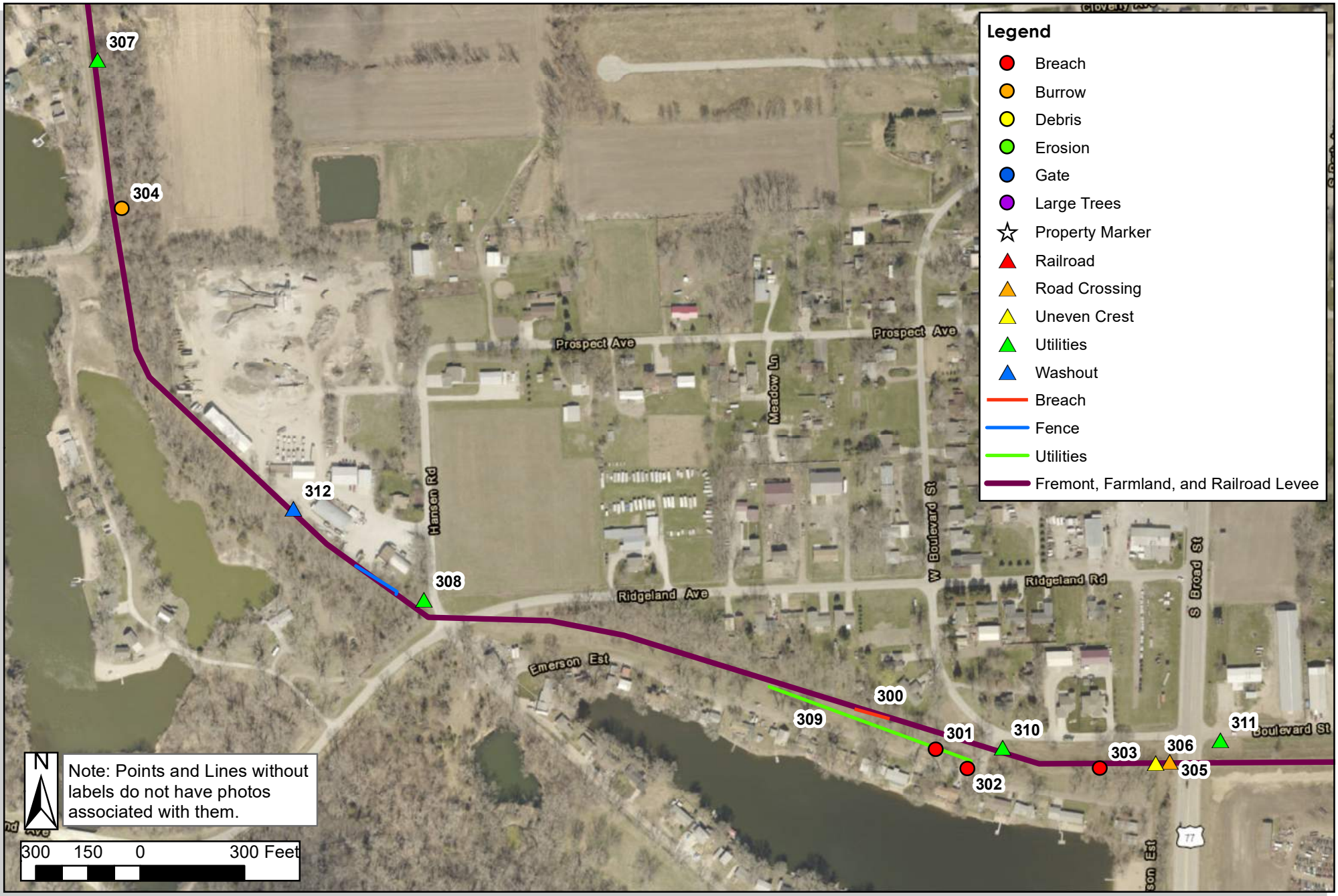
Group 2

Category: Utilities
ID: 203
Orientation: Looking northeast.
Description: Plastic pipe, possibly for irrigation, located landside of levee, approximately 125 feet from levee.

Category: Utilities
ID: 204
Orientation: Looking northeast.
Description: Water utility located landside of levee, approximately 50 feet from levee.

Group 2

	**Category:** Guy Wire **ID:** 205 **Orientation:** Looking northeast from levee.
	**Category:** Utilities **ID:** 206 **Orientation:** Looking southwest toward landside levee slope. **Description:** Hydrant located landside of levee, approximately 115 feet from levee.



Created By: MRG
Date: 01/20/2020
Software: ArcGIS 10.7

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Figure 4: Group 3 Photo Directory

Fremont, Nebraska

JEO CONSULTING GROUP INC

Group 3

	**Category:** Breach **ID:** 300 **Orientation:** Looking upstream. **Description:** This is the location of Site 1a in JEO's Flood Damage Assessment Report dated August 22, 2019. This breach was temporarily repaired by the City. It was estimated to be 50 feet wide, along the levee, and 6' to 12' tall. This breach cut completely through the levee prism.
	**Category:** Breach **ID:** 301 **Orientation:** Looking towards the landside levee slope, north. **Description:** This is the location of Site 1b in JEO's Flood Damage Assessment Report dated August 22, 2019. This breach was temporarily repaired by the City. It was estimated to be 15 feet wide, along the levee. This breach was approximately 3' in depth. It did not cut completely through the levee prism.
	**Category:** Breach **ID:** 302 **Orientation:** Looking towards the landside levee slope, northwest. **Description:** This is the location of Site 1c in JEO's Flood Damage Assessment Report dated August 22, 2019. This breach was temporarily repaired by the City. It was estimated to be 5 feet wide, along the levee. This breach was approximately 3' in depth. It did not cut completely through the levee prism.

Group 3

	**Category:** Breach **ID:** 303 **Orientation:** Looking towards the landside levee slope, northeast. **Description:** This is the location of Site 1d in JEO's Flood Damage Assessment Report dated August 22, 2019. This breach was temporarily repaired by the City. It was estimated to be 10 feet wide, along the levee. This breach was approximately 2-5' in depth. It did not cut completely through the levee prism.
	**Category:** Burrow **ID:** 304 **Orientation:** Looking east from levee. **Description:** Burrow on landside levee slope, towards the top of the levee.
	**Category:** Road Crossing **ID:** 305 **Orientation:** Looking downstream, across Hwy 275.

Group 3

Category: Uneven Crest
ID: 306
Orientation: Looking upstream.
Description: Low spot approximately 6” deep, approximately 2’ wide.

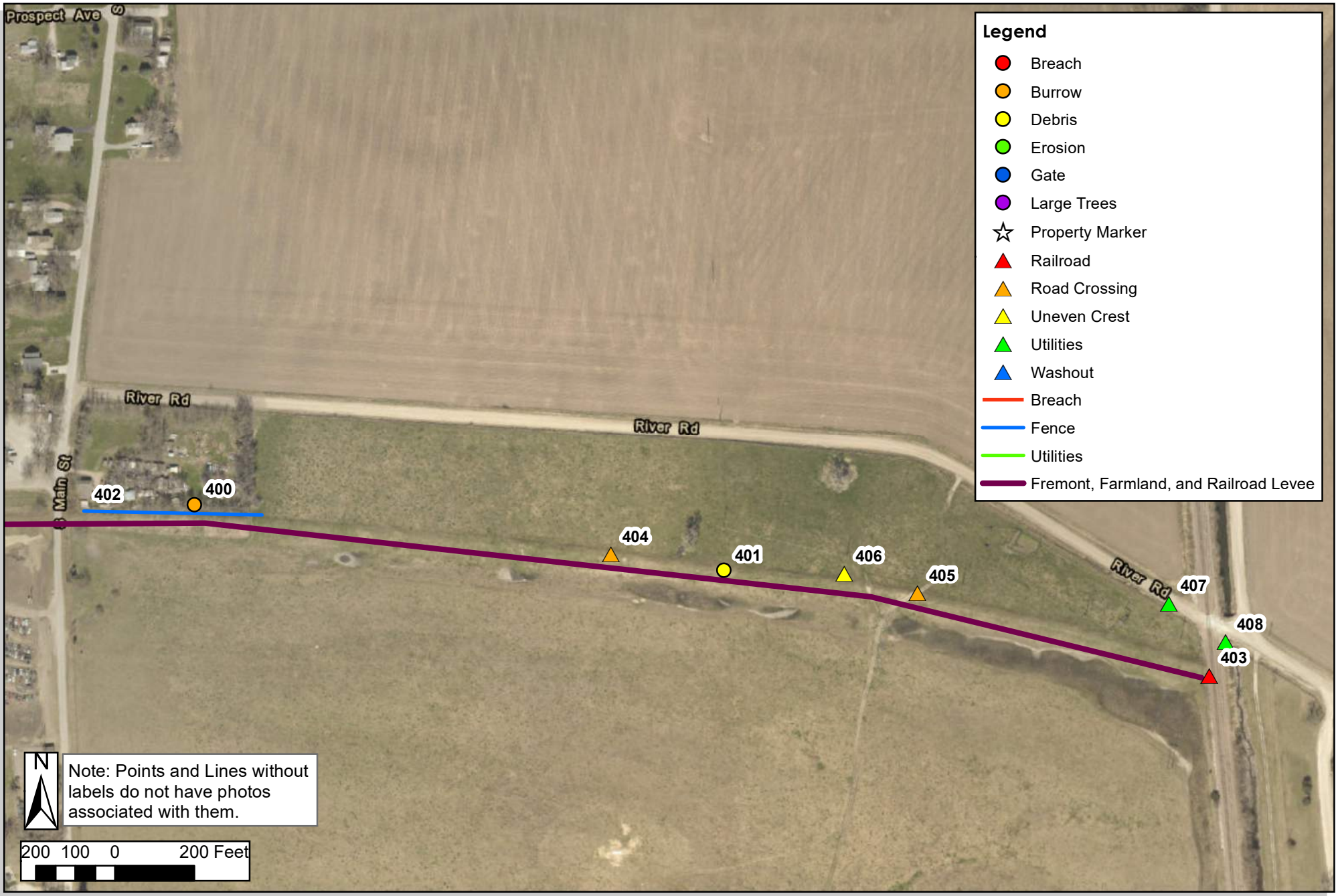
Category: Utilities
ID: 307
Orientation: Looking east from levee.
Description: Power lines running over levee from east to west.

Group 3

	**Category:** Utilities **ID:** 308 **Orientation:** Looking northeast. **Description:** Electric utility, located 10-15’ from levee.
	**Category:** Utilities **ID:** 309 **Orientation:** Looking west. **Description:** Power poles and lines located approximately 50 feet from levee.
	**Category:** Utilities **ID:** 310 **Orientation:** Looking toward landside levee slope. **Description:** Manhole, possibly sanitary, located approximately 10’ from levee, near Hansen Road.

Group 3

	**Category:** Utilities **ID:** 311 **Orientation:** Looking northwest from levee towards Hwy 77. **Description:** Fiber and electric.
	**Category:** Washout **ID:** 312 **Orientation:** Looking northeast from levee. **Description:** Concrete washout.



Created By: MRG
Date: 01/20/2020
Software: ArcGIS 10.7

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plat.

Figure 5: Group 4 Photo Directory

Fremont, Nebraska

JEO CONSULTING GROUP INC

Group 4

	**Category:** Burrow **ID:** 400 **Orientation:** Facing north. **Description:** Burrow on the landside of the levee.
	**Category:** Debris **ID:** 401 **Orientation:** Looking northeast from levee. **Description:** Debris pile located landside of the levee, approximately 150’ away.
	**Category:** Fence **ID:** 402 **Orientation:** Looking northeast from levee. **Description:** Barbed wire fence with wooden posts along landside of levee toe bordering private property.

Group 4

Category: Railroad
ID: 403
Orientation: Looking southeast, looking south, looking north.
Description: Railroad tie-off.

Group 4

Category: Road Crossing
ID: 404
Orientation: Looking northeast, looking south, looking downstream.
Description: Dirt and grass covered road across levee.

Group 4

Category: Road Crossing
ID: 405
Orientation: Looking upstream, looking south.
Description: Dirt and rock covered road across levee.

Category: Uneven Crest
ID: 406
Orientation: Looking downstream.
Description: Long peak/pile of material and vegetation, approximately 2-3’ high.

Group 4

<table>
<tr><td>  </td><td>Category: Utilities
ID: 407
Orientation: Looking northeast.
Description: Fiber optic on landside toe near railroad crossing.</td></tr>
<tr><td>  </td><td rowspan="2">Category: Utilities
ID: 408
Orientation: Looking northwest, looking south.
Description: Twin CMP culverts under River Road, approximately 60” diameter.</td></tr>
<tr><td>  </td></tr>
</table>

APPENDIX E – REHABILITATION PROGRAM APPLICATION FORM

Appendix A
Request for Application into the Rehabilitation Program

District Engineer
U.S. Army Corps of Engineers, Omaha
1616 Capitol Avenue, OD-E
Omaha, Nebraska 68102-4901
402-995-2448

Date of Request: ____

Dear Sir:

The purpose of this letter is to request the Omaha District Corps of Engineers to consider the levee project described below for inclusion into the Corps Emergency Rehabilitation Program for non-Federal Flood Control Projects under Public Law 84-99.

Project Location

State: _____ Township: _____

County: _____ Range:_____

River or Stream: _____ Section: _____

The requirements of the program as outlined by the Omaha District Corps of Engineers are understood and a public entity has either been obtained or is being pursued to be the Project Sponsor for the levee project.

Sincerely,

Point of Contact:

Name: _____

Address: _____

Telephone: _____

Title: _____

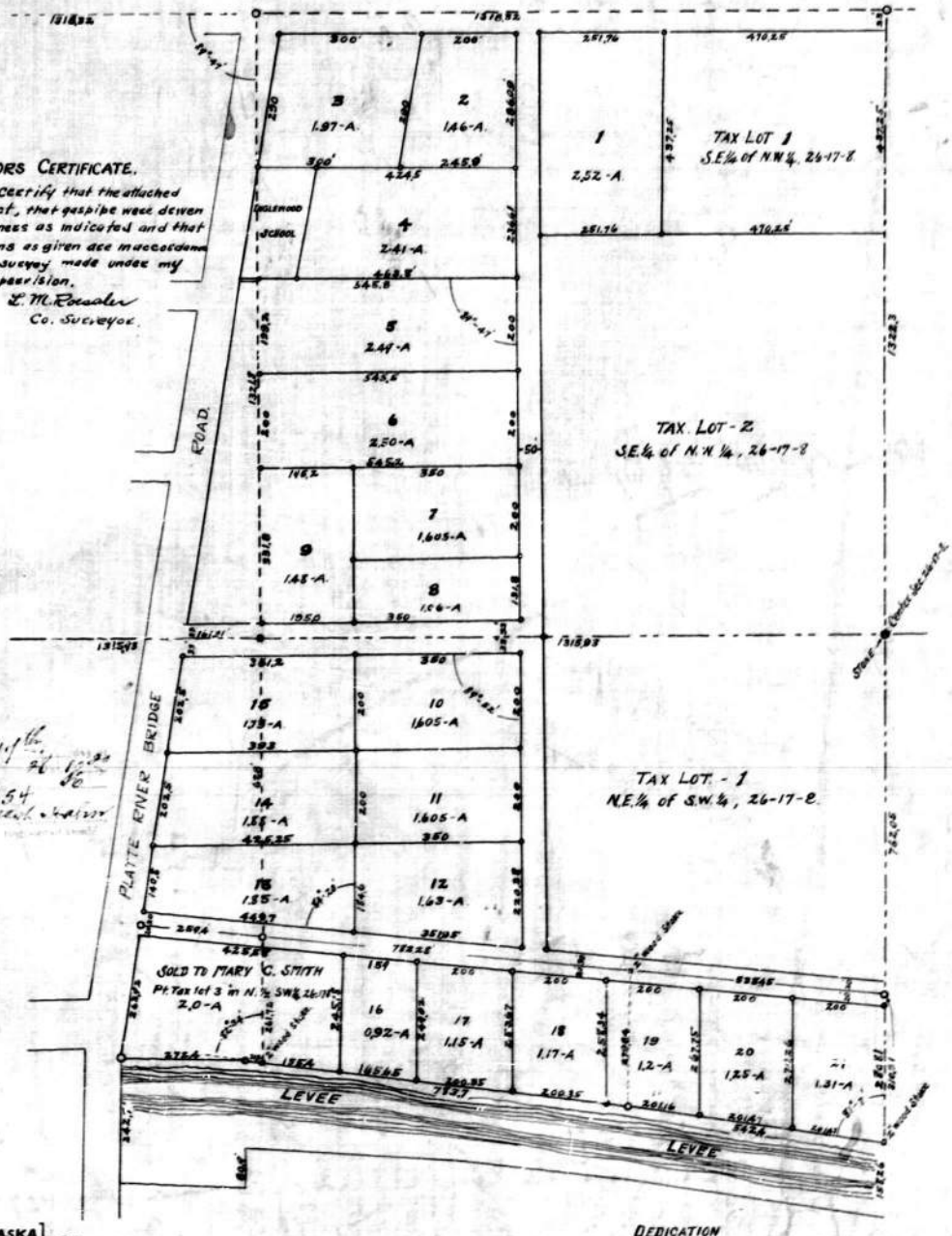
_____
(Owner(s) Name and Signature)

APPENDIX F – RIGHT-OF-WAY BOUNDARY INFORMATION

168

EAST INGLEWOOD SUBDIVISION OF PART OF THE S.E¼ OF THE N.W¼ OF SECTION 26, TWP. 17 N., RANGE 8 E. OF THE 6th P.M. AND PART OF THE N. ½ OF THE S.W.¼ OF SAID SEC. 26, TWP. 17 N., RANGE 8 E. OF THE 6th P.M.

SCALE 1" = 200' SEPTEMBER 1928. L. M. Roessler COUNTY SURVEYOR.



STATE OF NEBRASKA } SS.
COUNTY OF DODGE }

On the 7th day of Sept. A.D. 1928 before me a Notary Public in and for said County personally came L. D. Richards and R. P. Richards to me personally known to be the PRESIDENT and SECRETARY of the FREMONT STOCK YARDS AND LAND COMPANY a corporation and to be the identical persons whose names are affixed to the foregoing dedication as grantors and acknowledge the instrument to be their voluntary act and deed for the purpose therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Seal of Office the day and year last above mentioned.

Gwendolyn D. Buntinger
NOTARY PUBLIC

DEDICATION

Know All Men By These Presents, that we, the Fremont Stock Yards And Land Company, a Corporation are the owners of part of the S.E¼ of the NW¼ of Section 26, Twp 17-N, R8E, and part of the N½ of the S.W¼ of said Section 26, Twp 17-N, R8E, of the 6th P.M., Dodge County, Nebraska, and do hereby Subdivide into lots numbered from One (1) to Twenty-one (21) inclusive, as EAST INGLEWOOD SUBDIVISION OF PART OF THE S.E¼ OF THE NW¼ OF SECTION 26, TWP 17-N, R-8 E, AND PART OF THE N½ OF THE SW¼ OF SAID SECTION 26, TWP 17-N, R8E, OF THE 6th P.M. and do hereby dedicate to Public use all streets indicated on said plat and do further declare such Platting and Subdivision to be in accordance with our wishes and the voluntary act and deed of said owners. SIGNED THIS 7th DAY OF Sept. A.D. 1928.

IN PRESENCE OF
Gwendolyn D. Buntinger
NOTARY PUBLIC.

Fremont Stock Yards and Land Company
L. D. Richards PRESIDENT.
R. P. Richards SECRETARY.

#458

PLAT # 453

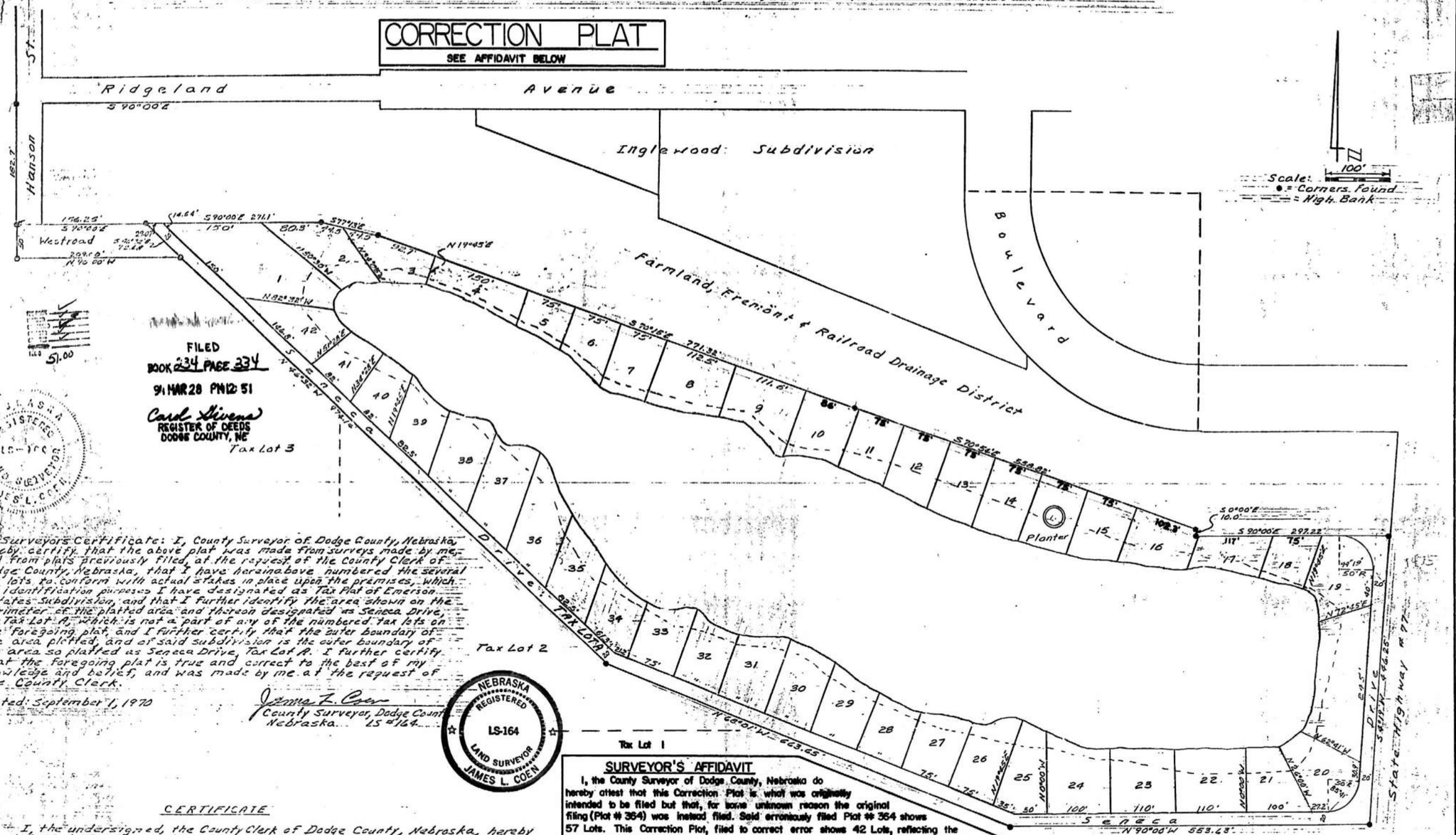
CORRECTION Tax Plat of # EMERSON ESTATES Subdivision

CORRECTION

A Tax plat of Sub-lot B of Lot 221, Lot 245, all of Lots 209, 208, 210, 211, 213 & 214 lying South of the Farmland Fremont & Railroad Drainage District Right-of-Way, the North 275' of Lots 48 & 49 lying West of Highway 77, the South 170' of Lots 54, 55 & 56, and Lots 209, 212, 215, 216, 217 & 218; all in Inglewood Subdivision in Sec. 26 & 27, T.17N., R8E of the 6th P.M. & the subdivision of parts of T.L. #1 in SE¼ SE¼, T.L. #2 in NE¼ SE¼ & T.L. #3 in NW¼ SE¼ all in Sec. 27 T17N, R8E of 6th P.M.

CORRECTION PLAT

SEE AFFIDAVIT BELOW



FILED
BOOK 234 PAGE 334
91 MAR 28 PM 12:51
Carol Stivens
REGISTER OF DEEDS
DODGE COUNTY, NE

51.00

ALASKA REGISTERED LS-164 LAND SURVEYOR JAMES L. COEN

NEBRASKA REGISTERED LS-164 LAND SURVEYOR JAMES L. COEN

Surveyors Certificate: I, County Surveyor of Dodge County, Nebraska, hereby certify that the above plat was made from surveys made by me and from plats previously filed at the request of the County Clerk of Dodge County, Nebraska, that I have hereinabove numbered the several tax lots to conform with actual stakes in place upon the premises, which for identification purposes I have designated as Tax Plat of Emerson Estates Subdivision, and that I further identify the area shown on the perimeter of the platted area and thereon designated as Seneca Drive, as Tax Lot A, which is not a part of any of the numbered tax lots on the foregoing plat, and I further certify that the outer boundary of the area plotted, and of said subdivision is the outer boundary of the area so platted as Seneca Drive, Tax Lot A. I further certify that the foregoing plat is true and correct to the best of my knowledge and belief, and was made by me at the request of the County Clerk.

Dated: September 1, 1970

James L. Coen
County Surveyor, Dodge County
Nebraska LS #164

CERTIFICATE

I, the undersigned, the County Clerk of Dodge County, Nebraska, hereby certify that the above plat was caused to be made by me for taxation purposes and further certify that I have signed and executed said plat by reason of the failure of the owner to do the same.

In testimony whereof I have hereunto set my signature and seal this 1st day of September, 1970

Gladys McMullen - Deputy
County Clerk, Dodge County, Nebraska.

SURVEYOR'S AFFIDAVIT

I, the County Surveyor of Dodge County, Nebraska do hereby attest that this Correction Plat is what was originally intended to be filed but that, for some unknown reason the original filing (Plat # 364) was instead filed. Said erroniously filed Plat # 364 shows 57 Lots. This Correction Plat, filed to correct error shows 42 Lots, reflecting the original intent. The leasing of lots, the improvements on said leased lots and the taxation of same has been and are, in fact, based upon this Plat of 42 Lots and there have been no taxations based upon the erroniously filed Plat # 364. Further, there have been no transfers of land ownership referenced to either Plat.

This Plat for all intents and purposes has been used as if it had been filed Sept. 17, 1970 instead of Plat # 364. Said usage of this Plat shall continue to be used instead of Plat # 364 and shall be referenced as "CORRECTION PLAT # 453 OF EMERSON ESTATES."

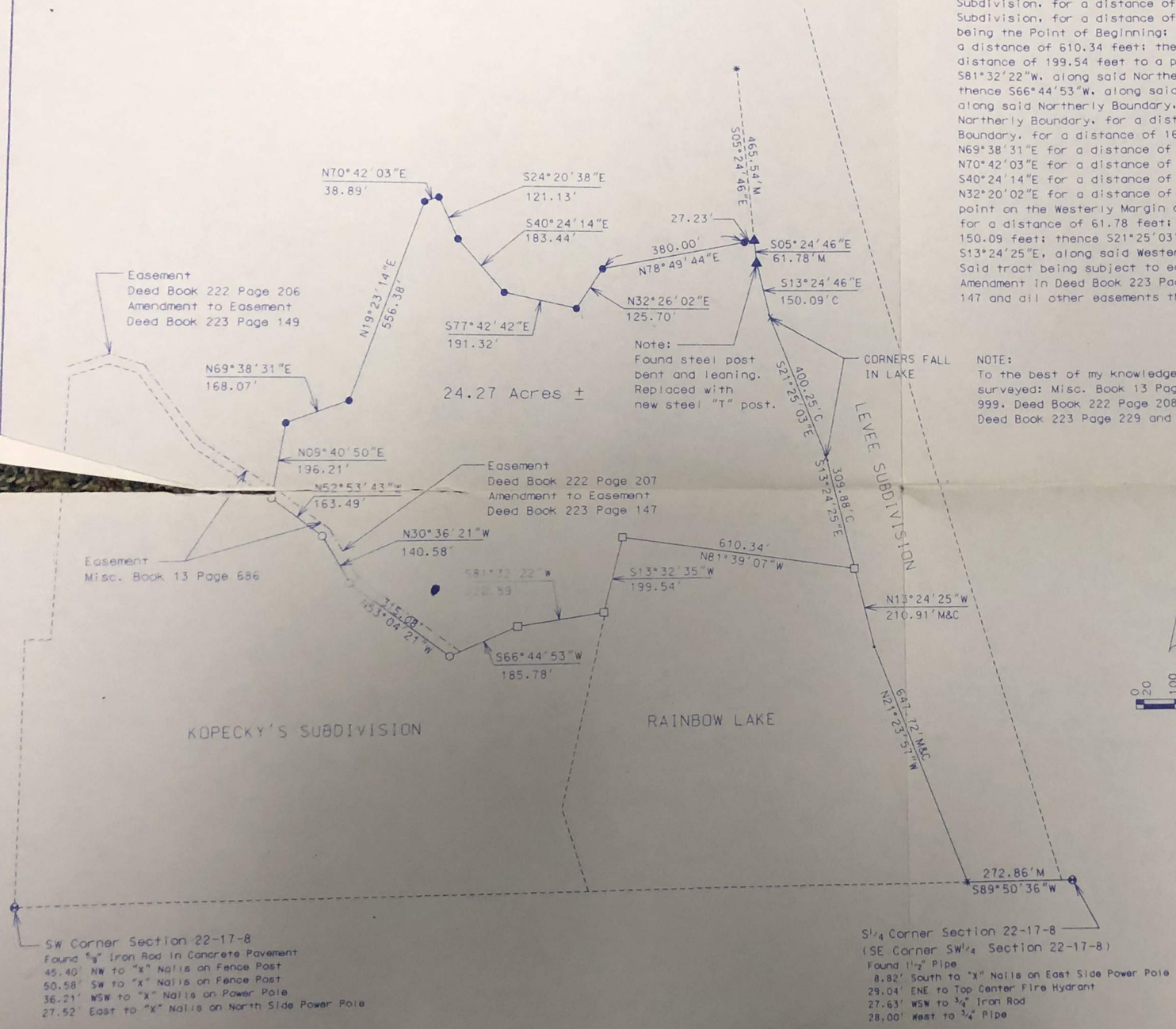
James L. Coen
Dodge County Surveyor
L.S. # 164

Dated: 3-28-94

COEN ENGINEERING

PROJECT EMERSON ESTATES	
LOCATION Sec. 26 & 27, T17N, R8E of 6th PM	
SCALE: As Shown	DRAWN BY J.L.C.
DATE: June 2, 1970	REVISED
PREPARED BY J.L.C.	DRAWING NUMBER 1 of 1

STANDARD BLUE PRINT, OMAHA, NEBR.



LEGAL DESCRIPTION

A tract of land located in the Southwest Quarter of Section 22, Township 17 North, Range 8 East of the 6th P.M. Dodge County, Nebraska containing 24.27 Acres more or less and being more particularly described as follows:
Commencing at the Southeast Corner of said Southwest Quarter and going S89°50'36"W, on an assumed bearing, along the South Margin of said SW1/4 for a distance of 272.86 feet to a point on the Westerly Margin of Levee Subdivision; thence N21°23'57"W, along said Westerly Margin of Levee Subdivision, for a distance of 647.72 feet; thence N13°24'25"W, along said Westerly Margin of Levee Subdivision, for a distance of 210.91 feet to the Northeasterly Corner of Rainbow Lake, said point being the Point of Beginning; thence N81°39'07"W, along the Northerly Boundary of Rainbow Lake, for a distance of 610.34 feet; thence S13°32'35"W, along the Westerly Boundary of Rainbow Lake, for a distance of 199.54 feet to a point on the Northerly Boundary of Kopecky's Subdivision; thence S81°32'22"W, along said Northerly Boundary of Kopecky's Subdivision, for a distance of 220.59 feet; thence S66°44'53"W, along said Northerly Boundary for a distance of 185.78 feet; thence N53°04'21"W, along said Northerly Boundary, for a distance of 315.08 feet; thence N30°36'21"W, along said Northerly Boundary, for a distance of 140.58 feet; thence N52°53'43"W, along said Northerly Boundary, for a distance of 163.49 feet; thence N09°40'50"E for a distance of 196.21 feet; thence N69°38'31"E for a distance of 168.07 feet; thence N19°23'14"E for a distance of 556.38 feet; thence N70°42'03"E for a distance of 38.89 feet; thence S24°20'38"E for a distance of 121.13 feet; thence S40°24'14"E for a distance of 183.44 feet; thence S77°42'42"E for a distance of 191.32 feet; thence N32°20'02"E for a distance of 125.70 feet; thence N78°49'44"E for a distance of 407.23 feet to a point on the Westerly Margin of Levee Subdivision; thence S05°24'46"E, along said Westerly Margin, for a distance of 61.78 feet; thence S13°24'46"E, along said Westerly Margin, for a distance of 150.09 feet; thence S21°25'03"E, along said Westerly Margin, for a distance of 400.25 feet; thence S13°24'25"E, along said Westerly Margin, for a distance of 309.88 feet to the Point of Beginning.
Said tract being subject to easements recorded in Misc. Book 13 Page 686, Deed Book 222 Page 206. Amendment in Deed Book 223 Page 149, Deed Book 222 Page 207, Amendment in Deed Book 223 Page 147 and all other easements that may pertain to said tract.

NOTE:
To the best of my knowledge the following listed easements do not pertain to the tract of land surveyed: Misc. Book 13 Page 683, Misc. Book 13 Page 684, Misc. Book 17 Page 306 Misc. Book 17 Page 999, Deed Book 222 Page 208, Deed Book 222 Page 209, Deed Book 222 Page 210, Deed Book 223 Page 148, Deed Book 223 Page 229 and Deed Book 223 Page 252.

Marvin L Winkelman
L.S. No 289

0 20 100 200 400

- SUBDIVISIONAL CORNERS FOUND
- * CORNERS FOUND 3/4" PIPE
- ○ CORNERS FOUND 1/2" PIPE
- □ CORNERS FOUND 3" PIPE
- ● CORNERS PLACED (5/8" X 24" IRON ROD)
- ▲ CORNERS PLACED (STEEL "T" POST)

C = COMPUTED
M = MEASURED

I, the undersigned licensed land surveyor, do hereby certify that I have supervised the surveying of the above described tract and that all bearings and distances are true and correct, to the best of my knowledge.

NEBRASKA REGISTERED LS-289 LAND SURVEYOR MARVIN L. WINKELMAN

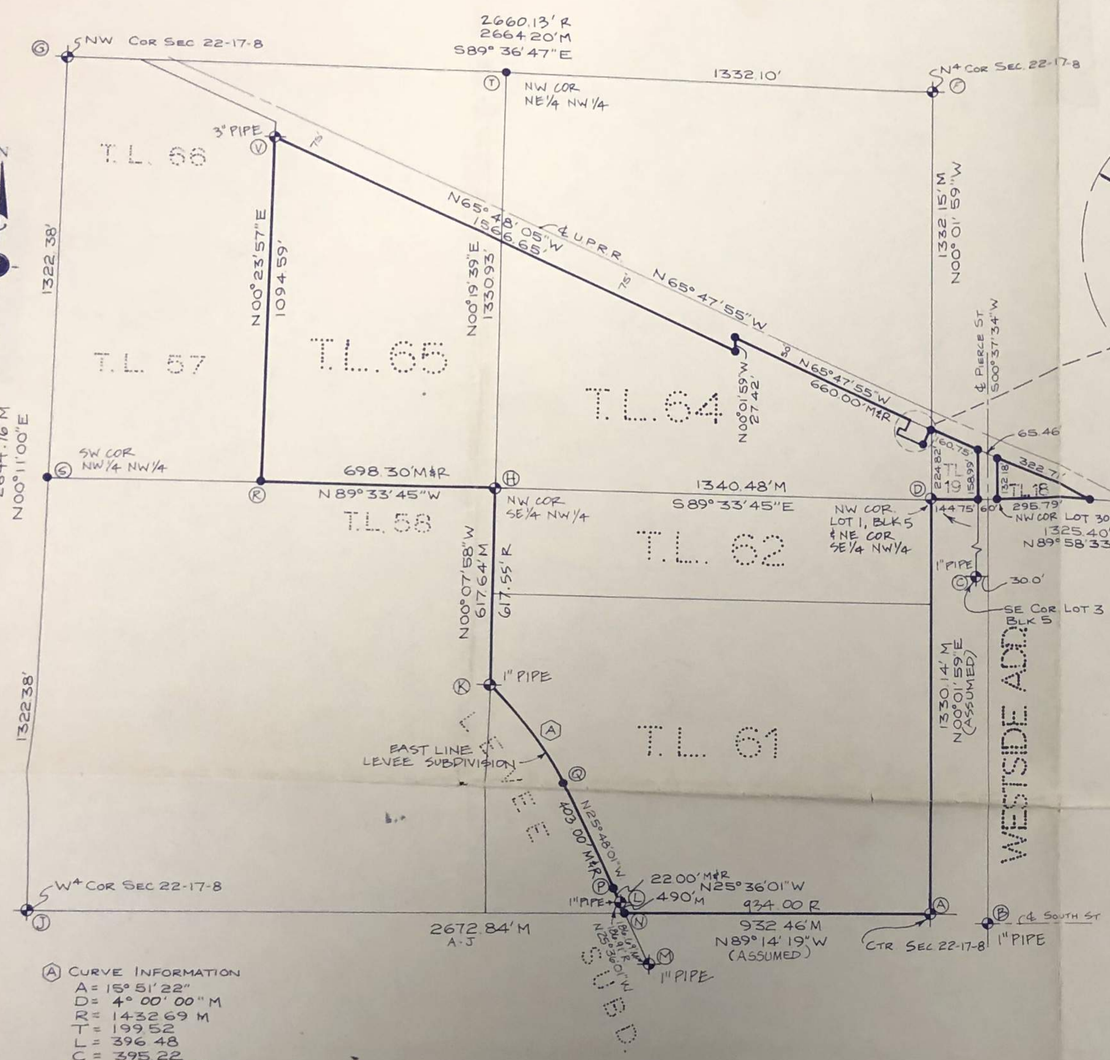
Coen Engineers, Inc.

BY Marvin L Winkelman

L.S. No. 289

COEN ENGINEERS, INC.
809 SOUTH BROAD ST.
FREMONT, NE

PROJECT: Murphy Survey	
LOCATION: SW1/4 Sec. 22 T17N R8E of 6th P.M. Dodge County, Nebraska	
SCALE: As Shown	DRAWN BY: NCK
DATE: October 31, 1997	REVISED:
PREPARED BY COEN ENGINEERS, INC.	DRAWING NUMBER 1 of 1



(A) Curve Information
A = 15° 51' 22"
D = 4° 00' 00" M
R = 1432.69 M
T = 199.52
L = 396.48
C = 395.22
CB = N 34° 12' 24" W

DODGE COUNTY
SEC 22-17-8E

VICINITY SKETCH

- Corner Found
- Corner Set
- O Temporary Point
- R Recorded Distance
- M Measured Distance

SURVEYOR'S CERTIFICATE:
I hereby certify that this plat of a survey was made by me or under my supervision and is true and accurate to the best of my knowledge, and that I am a duly Registered Land Surveyor under the laws of the State of Nebraska.

Jerry G. Hain LS 362

NEBRASKA REGISTERED LS-362 LAND SURVEYOR JERRY G. HAIN

RECEIVED
APR 21 1986
SURVEY RECORD REPOSITORY
$ ____
Dodge County
86-87

LEGAL DESCRIPTION: Tax Lots 18, 19, 61, 62, 64 and 65, located in the North Half Section 22, Township 17 North, Range 8 East of the Sixth P.M., Dodge County, Nebraska, containing 68.68 acres.

FIELD NOTES: Found existing monuments of record at points A, B, C, D, E, F, G, H, J, K, L, M and U. Produced and measured line AJ N89°14'19"W (assumed bearing) 2,672.84 feet. Produced and measured line ML N25°36'01"W, 186.69 feet. Set point N at the intersection of lines AJ and ML. Set points P and Q at record angles and distances from line ML and point L. Set 5/8 inch by 24 inch rebar, wood hub and lath at points shown as corners set except at points S and T. All lines produced, angles and distances measured as shown on plat with Nikon Total Station DMT1 S/N 84269.

CORNER TIES (Horizontal Distance)

CENTER OF SEC 22-17-8
Found 1½" pipe
S 36.50' nail "X" L.P.
N 5.30' nail "X" P.P.
E 0.35' Dodge County bearing post
W 33.00' steel gate post

NE COR SE¼NW¼ SEC 22-17-8
Found 2" x 3/4" steel bar
S 2.05' nail "X" P.P.
NW 83.36' SE Cor barn foundation
ESE 18.49' NE Cor shed

NW COR SE¼NW¼ SEC 22-17-8
Found 1½" sq. bolt w/limestone on N side
SSW 7.02' nail "X" F.P.
SW 24.52' nail "X" R.R. tie C.F.P.
E 2.80' nail "X" 12" cedar tree
NNW 4.15' nail "X" 12" cedar tree

N¼ COR SEC 22-17-8
Found 2½" pipe
N 0.12' steel post
SE 25.50' NW Cor house foundation
SW 28.34' NE Cor house foundation
NW 49.49' nail "X" L.P.
E 16.76' nail "X" P.P.

NW COR NE¼NW¼ SEC 22-17-8
Drill hole in conc pavement
S 8.3' centerline Military Avenue
ENE 36.36' top nut fire hydrant
NW 34.90' nail "X" L.P.
SE 80.20' nail "X" P.P.
E 0.40' centerline paving of Ed Earl Lane

NW COR SEC 22-17-8
Found drill hole in Conc
ENE 26.09' nail top gate post
SW 43.15' nail "X" P.P.
W 41.13' nail "X" P.P.
S 53.0' centerline conc pavement W
NW 49.34' nail "X" R.R. tie F.P.
W 9.23' centerline pavement

SW COR NW¼NW¼ SEC 22-17-8
Set conc nail in pavement
SE 77.67' nail top fence post
W 39.23' nail "X" P.P.
NW 52.40' nail "X" R.R. tie fence post
SW 58.06' nail "X" R.R. tie fence post
W 0.25' centerline pavement

W¼ COR SEC 22-17-8
Found conc nail in centerline joint of pavement
W 34.48' nail "X" P.P.
SE 45.50' nail "X" 18" tree
NE 114.54 nail "X" Dodge County bearing post

SE COR NW¼NE¼ SEC 22-17-8
Found 3" pipe
W 0.60' N-S chain link fence
N 13.15' light pole
SE 8.90' NW Cor building

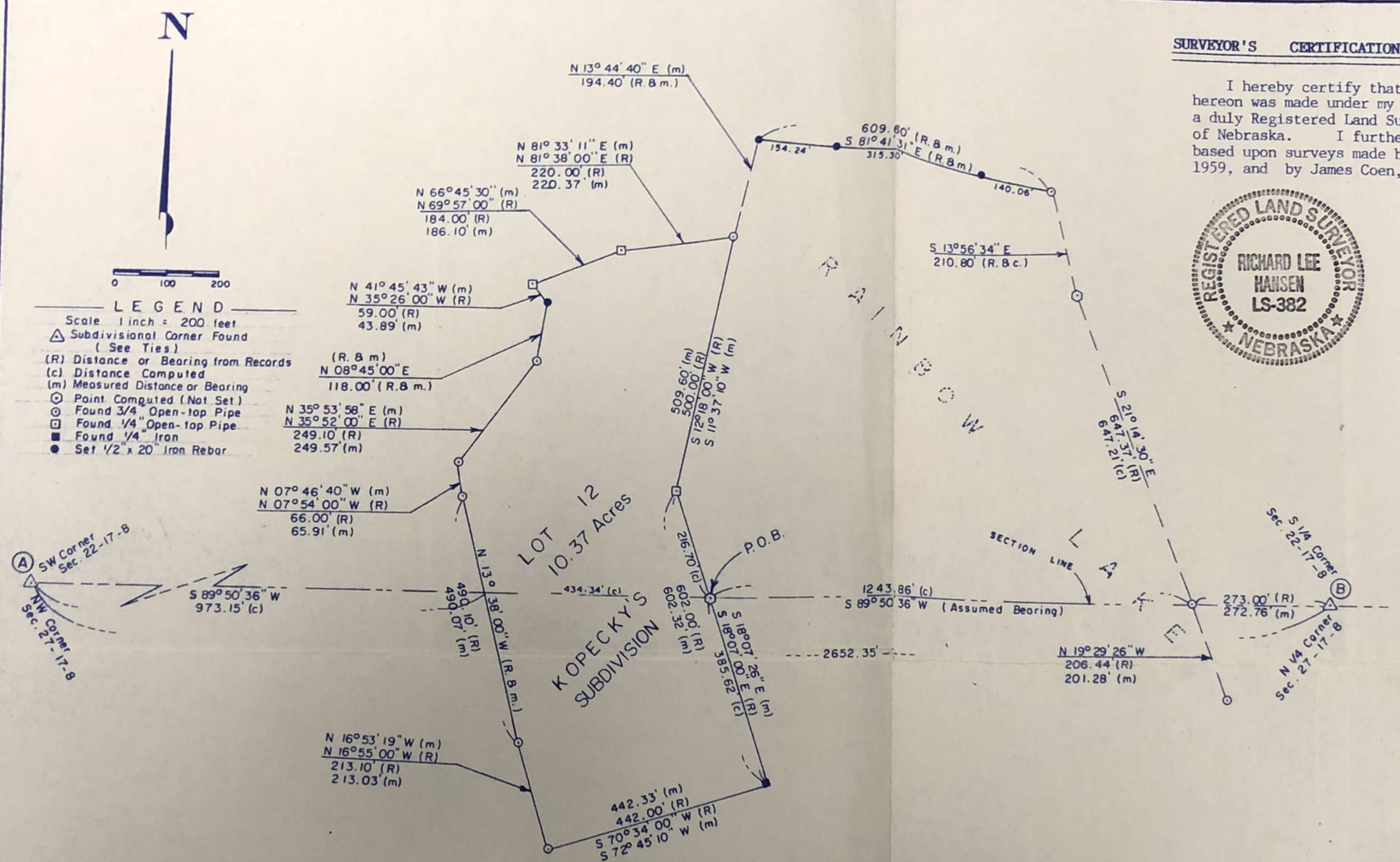
REVISIONS	BY

JOHNSON ERICKSON O'BRIEN & ASSOCIATES
ENGINEERING
ARCHITECTURE
SURVEYING

402 443-4661
P.O. BOX 207
WAHOO, NEBRASKA
68066

402 873-6766
P.O. BOX 116
NEBRASKA CITY, NE
68410

DATE	APR 10, 1986
SCALE	1" = 300'
DRAWN	GLB
JOB NO.	88-51
FIELD BOOK NO.	FREMONT #3
DWG. NO.	
SHEET	1 OF 1



SURVEYOR'S CERTIFICATION:

I hereby certify that the survey shown and described hereon was made under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Nebraska. I further certify that this survey was based upon surveys made by Willis Lind, LS-4, dated Sept. 1959, and by James Coen, LS-164 (no date given).

REGISTERED LAND SURVEYOR
RICHARD LEE HANSEN
LS-382
NEBRASKA

Richard L. Hansen

Richard L. Hansen
Registered Land Surveyor
Registration No. LS-382
Date: September 1, 1993
Client: Robert Stern, for
Rainbow Fleet of Lincoln

LEGAL DESCRIPTION:

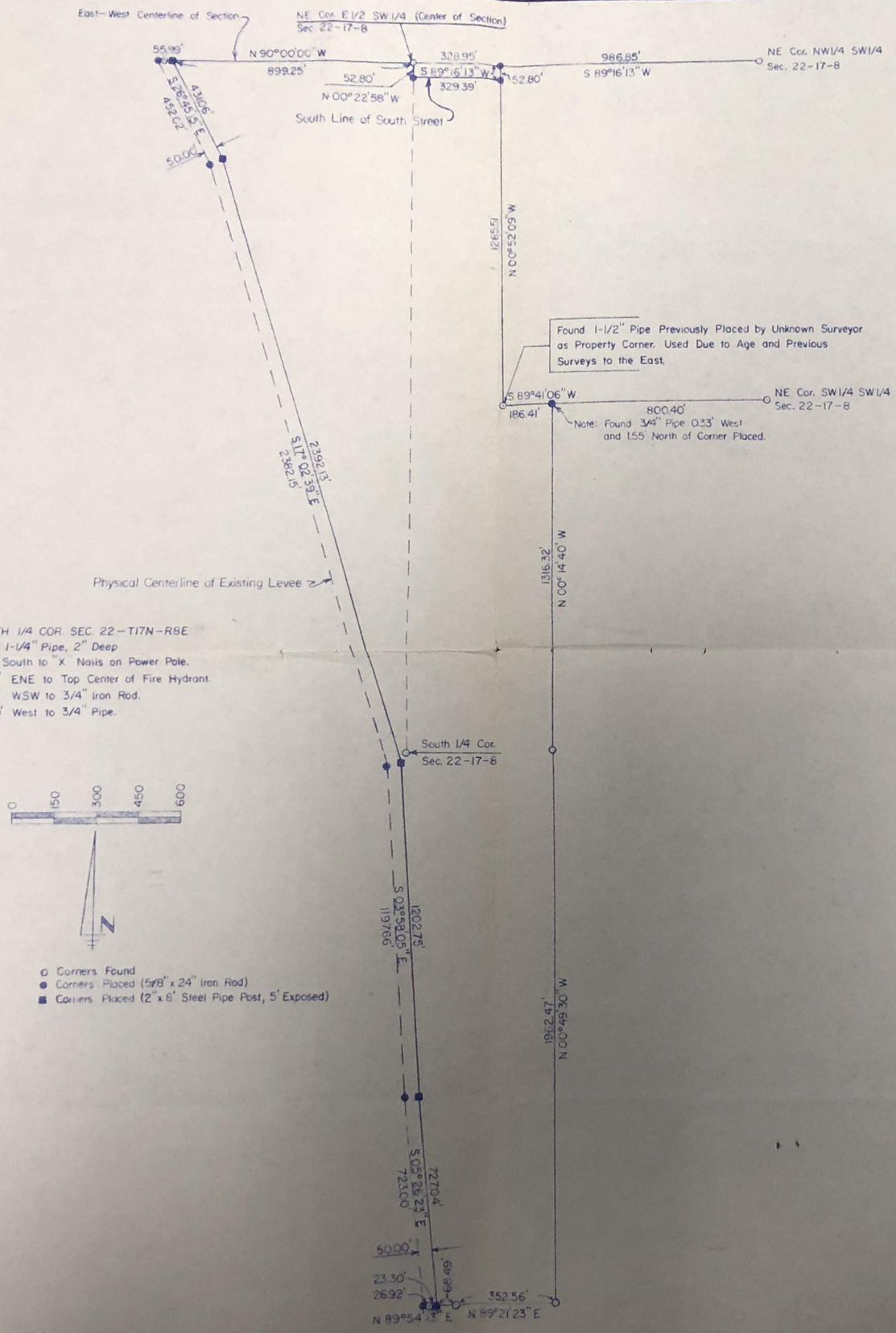
Lot 12, Kopecky's Subdivision, as Lot Corners were found and have been accepted as the True Lot Corners, lying in the S½ SW¼ in Section 22 and in the N½ NW¼ of Section 27, all lying in Township 17 North, Range 8 East of the 6th P.M., Dodge County, Nebraska, and more particularly described as follows: From the S¼ Corner of said Section 22, T 17 N, R 8 E; thence S 89°50'36" W (assumed bearing) along the south line of the SW¼ of said Section 22 a distance of 1243.86 feet to the Point Of Beginning; Thence S 18°07'26" E a distance of 385.62 feet to a point found; Thence S 72°45'10" W a distance of 442.33 feet to a point found; Thence N 16°53'19" W a distance of 213.03 feet to a point found; Thence N 13°38'00" W a distance of 490.07 feet to a point found; thence N 07°46'40" W a distance of 65.91 feet to a point found; Thence N 35°53'58" E a distance of 249.57 feet to a point found; Thence N 08°45'00" E a distance of 118.00 feet to a point Set; Thence N 41°45'43" W a distance of 43.89 feet to a point found; Thence N 66°45'30"E a distance of 186.10 feet to a point found; Thence N 81°33'11" E a distance of 220.37 feet to a point found; Thence S 11°37'10" W a distance of 509.60 feet to a point found; Thence S 18°07'26" E a distance of 216.70 feet to the Point Of Beginning; and containing 10.37 Acres, more or less.

TIES TO SUBDIVISIONAL CORNERS

(A) SW Corner of Sec. 22-17-8
FOUND 3/4" REBAR IN CENTERLINE OF CONCRETE ON RIDGE ROAD
147.0' North to centerline of entrance to Lake Fremont West
27.0' East to 'x' Nails in power pole
35.43' West to 'x' Nails in power pole

(B) S¼ Corner of Sec. 22-17-8
FOUND 1¼" PIPE, BURIED 2' DEEP
8.82' South to 'x' Nails in power pole
29.04' ENE to top center of fire hydrant
27.63' WSW to 3/4" Iron Rod
28.00' West to 3/4" Pipe

BESCO
BLAIR ENGINEERING & SURVEYING CO. INC.
1570 Washington Street
P.O. Box 100
Blair, Nebraska 68008
Blair
(402)426-9414



LEGAL DESCRIPTION:

A tract of land located in the E1/2 of the SW1/4, in the W1/2 of the SE1/4 of Sec. 22, in the E1/2 of the NW1/4, and in the W1/2 of the NE1/4 of Sec. 27, all in Township 17 North, Range 8 East of the 6th P.M., Dodge County Nebraska, containing 73.91 acres, more or less, and being more particularly described as follows: Commencing at the NE Cor. of the E1/2 of the SW1/4 of Sec. 22 and going thence N 90°00'00" W on an assumed bearing, along the North Margin of said E1/2 SW1/4 of Sec. 22 for a distance of 899.25 ft., thence S 26°45'15" E for a distance of 4310.6 ft., thence S 17°02'39" E for a distance of 2392.13 ft., thence S 03°58'05" E for a distance of 1202.75 ft., thence S 05°26'23" E for a distance of 727.04 ft., thence N 89°54'13" E for a distance of 68.49 ft., thence N 89°21'23" E for a distance of 352.56 ft., thence N 00°49'30" E for a distance of 1962.47 ft., thence N 00°14'40" W for a distance of 1316.32 ft., thence S 89°41'06" W for a distance of 186.41 ft., thence N 00°52'09" W for a distance of 1265.51 ft. to a point 52.80 ft. South of the North Margin of the W1/2 of the SE1/4 of Sec. 22, thence S 89°16'13 W parallel to said North Margin W1/2 SE1/4 for a distance of 329.39 ft. to a point on the West Margin of the W1/2 SE1/4 of Sec 22, thence N 00°22'58" W along said West Margin for a distance of 52.80 ft. to the point of beginning.

Surveyor's Certificate:

I, the undersigned licensed land surveyor, do hereby certify that I have supervised the surveying of the above described tract and that all bearings and distances are true and correct, to the best of my knowledge.

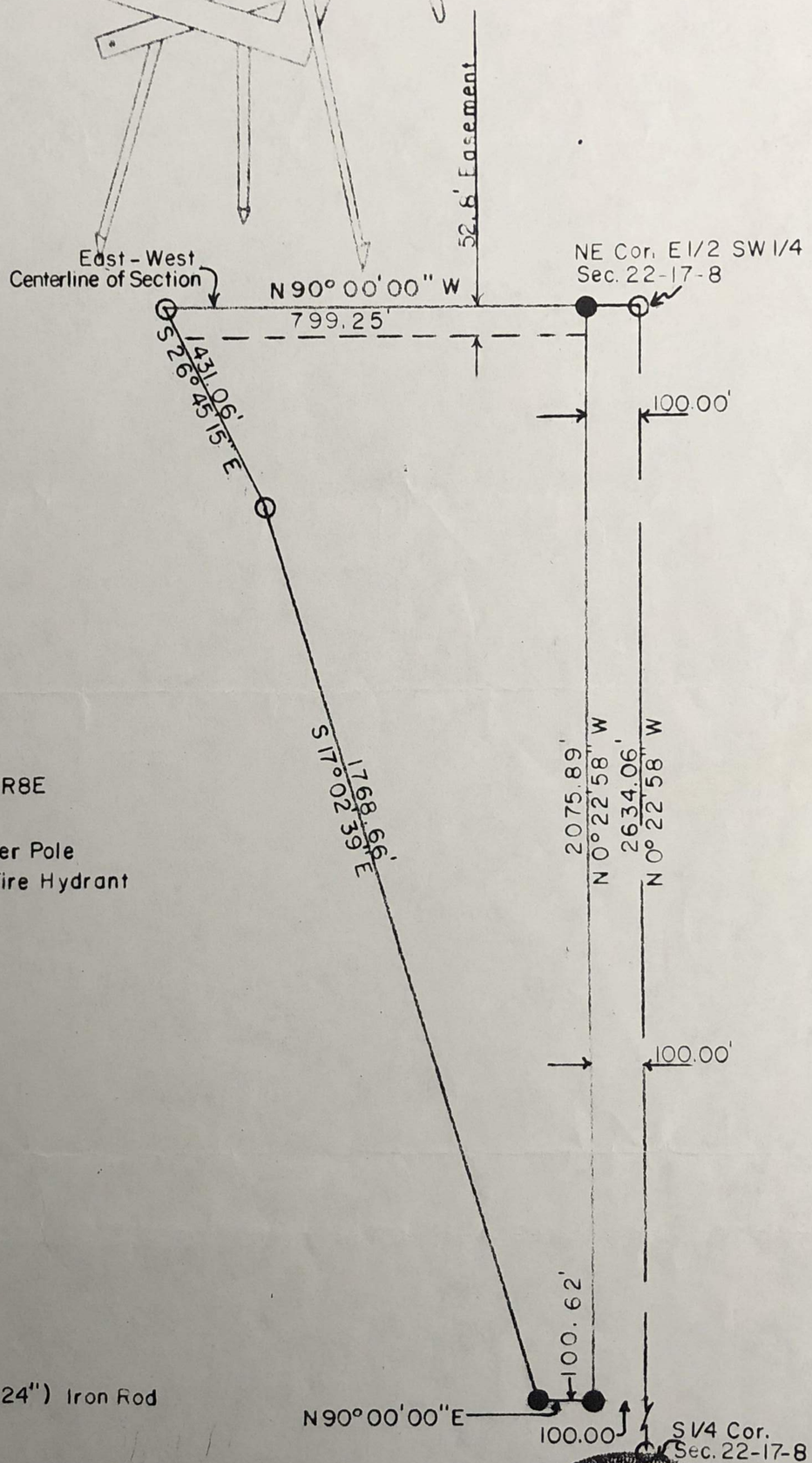
By _____ L.S. No. 164

NEBRASKA REGISTERED LAND SURVEYOR JAMES L. COEN

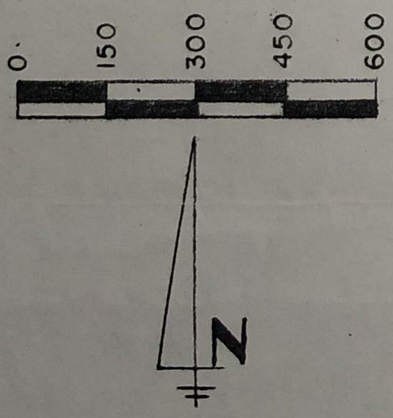
COEN ENGINEERING

PROJECT: Larry Murphy Survey	
LOCATION: Part Section 22 and part Section 27 all in T17N R8E of the 6th PM, Dodge County Nebraska	
SCALE: As Shown	DRAWN BY: S.J.W.
DATE: June 20, 1986	REVISED
PREPARED BY: Coen Engineers Inc.	DRAWING NUMBER: 1 of 1

A tract of land located in the E½ of the SW¼ Section 22, Township 17 North, Range 8 East of the 6th P.M., Dodge County Nebraska, containing 19.96 acres, more or less, and being more particularly described as follows: Commencing at the NE Cor. of the E½ of the SW¼ of Sec. 22 and going thence N90°00'00"W on an assumed bearing along the North Margin of said E½ SW¼ for a distance of 100.00 ft. to the point of beginning; thence continuing N90°00'00"W along said North Margin for a distance of 799.25 ft.; thence S26°45'15"E for a distance of 431.06 ft.; thence S17°02'39"E for a distance of 1768.66 ft.; thence N90°00'00"E for a distance of 100.62 ft. to a point 100.00 ft. West of the East Margin of the E½ SW¼ of Section 22; thence N0°22'58"W parallel to and 100.00 ft. West of said East Margin for a distance of 2075.89 ft. to the point of beginning, and subject to a permanent easement across the North 52.8 ft.



SOUTH 1/4 COR. SEC.22-T17N-R8E
Found 1-1/4" Pipe, 2" Deep
8.82' South to "X" Nails on Power Pole
29.04' ENE to Top Center of Fire Hydrant
27.63' WSW to 3/4" Iron Rod
28.00' West to 3/4" Pipe



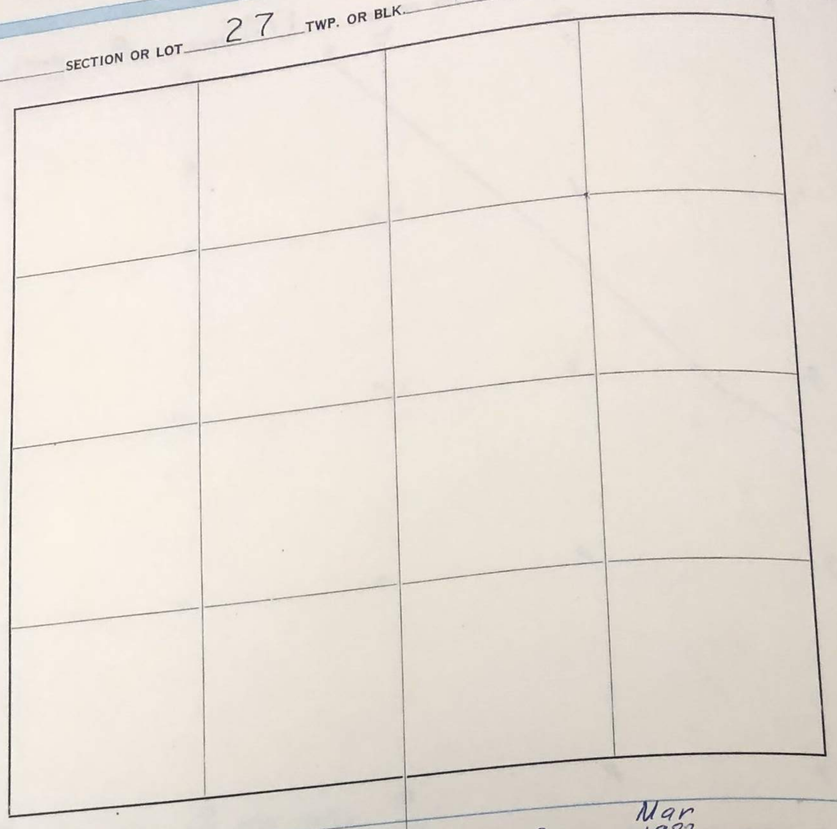
○ Corners Found
● Corners Placed (5/8"x24") Iron Rod

I, the undersigned licensed land surveyor, do hereby certify that I have supervised the surveying of the above described tracts and that all bearings and distances are true and correct, to the best of my knowledge.

COEN ENGINEERING
BY James L. Coen
L. S. No. LS-164

PROJECT Herb Riecken Survey
DATE October 30, 1986

SECTION OR LOT 27 TWP. OR BLK. 17 RANGE 8 (EAST / WEST) 6TH P. M.



No. 1 See Sec. 21-17-8 # 5 Pg 410

No. 8 See Sec. 28-17-8 #4 Page 417

No. 4: Coen 1967

Dug and found GP as called for.

Raised with ¾" bolt to within 2" of the surface.

35.0 to nail in East fence cor. post.

72.9 to nail in NW power pole

In line with fence East

No. 3: Coen 1973, March 1983

In line with Power Poles East

20.45 E to spike in N side Power Pole

97.0 WNW to cor fen. post chain link fence

~~51.4 to nail in top of fence post~~

151.6 W to gaspipe

No. 4: COEN Jan. 1976

FD. 2" GP WITH CONC. BLOCK

40.85 NE TO NAIL IN TOP

37.05 N TO NAIL IN TOP OF FENCE POST

57.7 NW TO NAIL IN TOP OF FENCE POST

No. h: See Sec. 28-17-8 Page 417 # c

No. X: See Sec. 28-17-8 Page 417 # X.

No. 2 Coen Mar 1983

G.P.

8.83 S. to 'x' nails E side power pole

29.2 ENE to top center fire hydrant

No. b Coen Mar. 1983

10.7 S to x nails E side power pole

14.65 SW to top center fire hydrant

0.24 N of straight line

1323.82 W to N¼ Cor.

1325.65 E to NE Cor.

FRONT

Blue Border 100% LINEN LEDGER

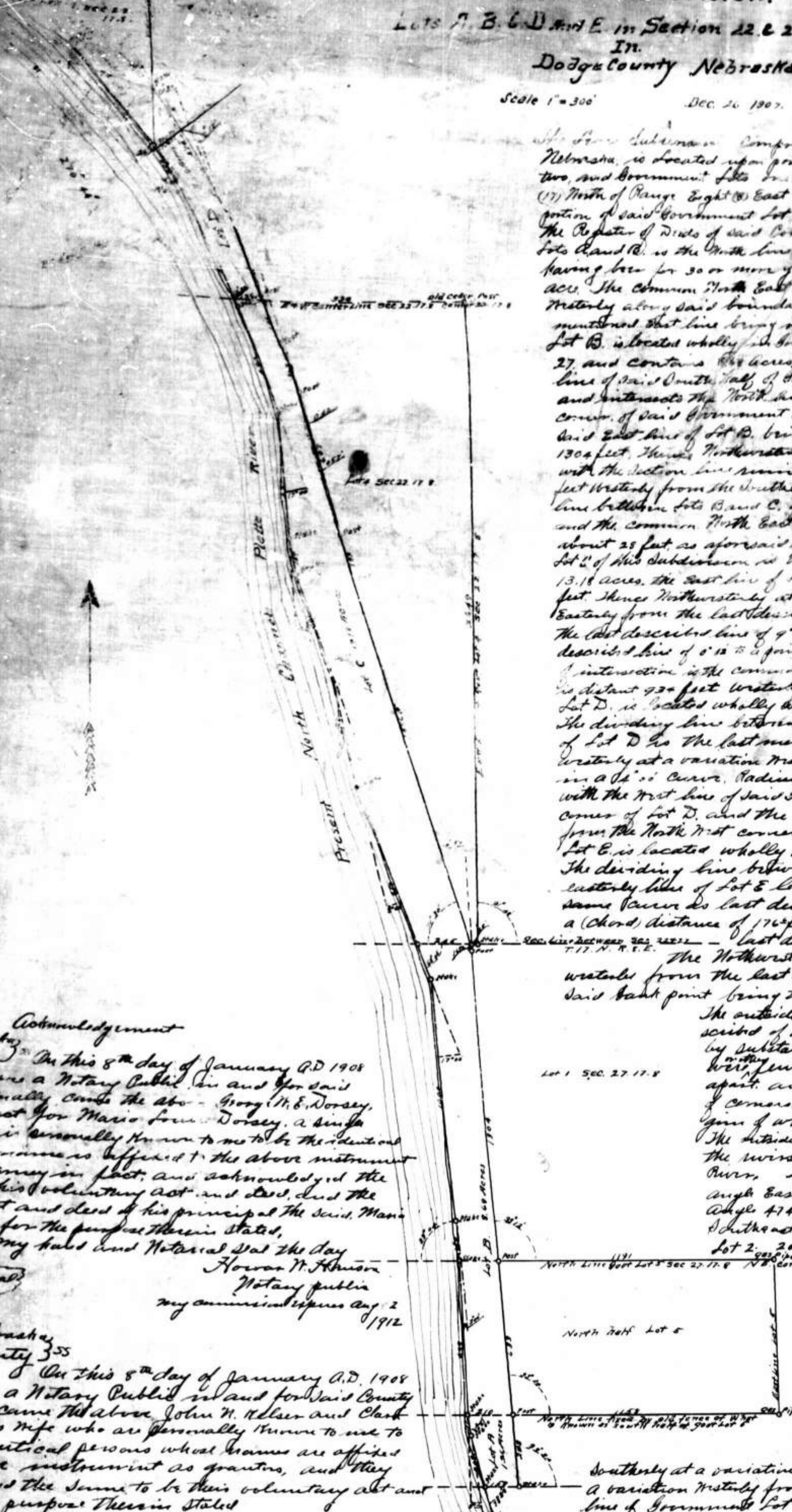
98

18

The Levee Subdivision.

Lots A. B. C. D. and E. in Section 22 & 27. T 17. R. 8.
In
Dodge County Nebraska.

Scale 1" = 300'   Dec. 26 1907.



The Levee Subdivision comprising Lots A. B. C. D. and E. in the County of Dodge [illegible] Nebraska, is located upon portions of Government Lots [illegible] two, and Government Lots one (1) and five (5) in Section Twenty seven (27) [illegible] (17) North of Range Eight (8) East in said County. Lot A of this Subdivision [illegible] portion of said Government Lot 5 in Section 27, known for many years [illegible] the Register of Deeds of said County, as South half of said [illegible] Lots A and B. is the North line of said South half of Government [illegible] having been for 30 or more years fixed by a permanent wire and [illegible] acre. The common North East corner of Lot A. and South East [illegible] Westerly along said boundary fence line from the East [illegible] Government Lot 5. [illegible] mentioned that line being indicated by present cross fence [illegible] at said point. Lot B. is located wholly in Government Lot 1, and North Half of Government Lot 5 in Section 27 and contains 8.69 acres. The East line of said Lot B. leaves the [illegible] line of said South Half of Government Lot 5. as herein first described at an angle [illegible] and intersects the North line of Government Lot 5 at a point 1191 feet [illegible] corner of said Government Lot 5. said corner being indicated by [illegible] said East line of Lot B. being progressed Northerly from said last described point of [illegible] 1304 feet. Thence Northwesterly at an angle westerly [illegible] from last described line [illegible] inter[illegible] with the Section line running East and West between said Sections 22 and 27 at a point [illegible] feet Westerly from the South East corner of Government Lot 4. in said Section 22. The dividing line between Lots B and C. of this Subdivision is the Section line between said Sections 22 and 27 and the common North East corner of Lot B. and South East corner of Lot C. is distant Westerly about 25 feet as aforesaid from the South East corner of said Government Lot 4.

Lot C. of this Subdivision is wholly within said Government Lot 4. of Section 22. and contains 13.18 acres. The East line of Lot C. is the last mentioned East line of Lot B progressed North Westerly 1076 feet. Thence Northwesterly at a variation of 0°57' 199 feet. Thence Northwesterly at a variation Easterly from the last described line of 0°41' 607 feet. Thence Northwesterly at a variation Westerly from the last described line of 9°21' 207 feet. Thence Northwesterly at a variation westerly from the last described line of 0°12' to a point of intersection with the North line of said Government Lot 4 said point of intersection is the common North East corner of Lot C. and the South East corner of Lot D. and is distant 934 feet Westerly from the North East corner of said Government Lot 4.

Lot D. is located wholly within Government Lot 2. of said Section 22. and contains 2.60 Acres. The dividing line between Lots C. and D. is the North line of said Government Lot 4. The line of Lot D as the last mentioned line of Lot C. progresses Northwesterly 22 feet Thence Northwesterly at a variation Westerly of 0°12' from the last described line, 403 feet. Thence Northwesterly in a 14°00' Curve, Radius 1432.69 feet a (Chord) distance of 514 feet to a point of intersection with the West line of said Government Lot 2. said point of intersection is the common North East corner of Lot D. and the North East corner of Lot E. and is distant Southerly 556 feet from the North West corner of said Government Lot 2. in Section 22.

Lot E. is located wholly within Government Lot 1 in said Section 22. and contains 1.07 acres. The dividing line between Lots D and E. is the west line of Government Lot 2. The North-easterly line of Lot E leaves the North East corner of said lot in a continuation of the same Curve as last described in Lot D. and runs thence Northwesterly in said curve a (Chord) distance of 176 feet. Thence Westerly at a variation Southerly from the Chord of said last described arc of 28°38' 200 feet said last mentioned point being the Northwest corner of said Lot E. Thence Southerly at right angles Southwesterly from the last described line of 90°00' 28 feet to the Northerly bank of the Platt River said bank point being the Southwest corner of said Lot E.

The outside Easterly, Northeasterly and Northerly line as hereinbefore described of all said Lots A. B. C. D and E. is marked at frequent intervals by substantial cedar fence posts firmly set in position where a permanent wire fence is to be, and the location of certain of said posts and their distance apart, and all the said distances, degrees, of angles and curvatures, locations of corners, and Government lines are clearly marked on the plat, on the margin of which this is written.

The outside Westerly and Southwesterly line of said Lots A. B. C. D and E. being the riverside, correspond substantially with the present bank of the Platte River. The Southwesterly line of Lot E. leaves the west line thereof at an angle Easterly from said west line of 59°00', and runs Southeasterly at same angle 474 feet, said point being the Southeast corner of said Lot E. and said Southeast corner being distant Southerly along the west line of Government Lot 2. 200 feet from the Northeast corner of said Lot E. Thence said last described river line of the Subdivision progresses Southeasterly 26 feet, Thence it runs Southeasterly at a variation westerly from the last described line 4°00', 200 feet, Thence Southerly at a variation westerly from the last described line 14°00' 510 feet, Thence Southerly at a variation Westerly from the last described line of 5°00' 480 feet Thence Southerly at a variation Westerly from the last described line of 17°00' 527 feet, Thence Southerly at a variation easterly from the last described line of 8°00', 150, Thence Southerly at a variation Easterly from the last described line of 8°00' 400 feet. Thence Southerly from the last described line of 8°00' 520 feet. Thence Southerly at a variation Easterly from the last described line of 8°00' 850 feet, Thence Southerly at a variation Westerly from the last described line of 17°00' 1000 feet. Thence Southerly at a variation Westerly from the last described line 130 feet, to an intersection with the North line of Government Lot 5. Thence progressing the last described river line 633 feet to the point of intersection of same with the South line of Lot B. of this Subdivision, said point of intersection being the Southwest corner of said Lot B. and being distant Westerly 210 feet from the Southeast corner of said Lot. Thence running Southerly at a variation Easterly from the last described river line, of 8°26' 97 feet. Thence Southerly at a variation Easterly from the last described line of 6°23' 208 feet, said last named point being being the South West corner of Lot A. of this Subdivision, Thence Easterly parallel to North line of said Lot A. 153 feet said last named point being the South East corner of said Lot A. Thence Northerly on the East line of said Lot A. 298 feet to the Northeast Corner of said Lot as first hereinbefore located and described. The East line of said Lot A. is the East line of Lot B progressed Southerly. All of the above mentioned points of divergence and lot corners in said Westerly or river bank line of this Subdivision are marked by stakes, firmly driven in the ground, and all stakes, dimensions and degrees of angle and curvature, are clearly marked on the plat on the margin of which this is written. The Southwest Corner of Lot C. of this Subdivision is distant Westerly 246 feet from the South East Corner of said Lot C. The Southwest Corner of Lot D. of this Subdivision is distant Westerly 126 feet from the Southeast corner of said Lot D.

We the undersigned being the several owners and proprietors, and all the owners and proprietors of the land comprised in the Levee Subdivision. in the County of Dodge and State of Nebraska John N. Kelser, being the owner of the land comprised in Lot A. of said Subdivision, Marie L. Dorsey being the owner of of the land comprised in Lots. B. C and D. of said Subdivision and Theodore G. Dockstader being the owner of the the land comprised in Lot E. of said Subdivision, do hereby declare that the Subdivision of that part of Government Lots one (1) two (2) and four (4) in Section Twenty two 22, and of Government Lots one (1) and five (5) in Section Twenty seven (27) all in Township Seventeen (17) North of Range Eight (8) East of the Sixth (6) P.M. in Dodge County, Nebraska, as hereinbefore described and as indicated by the above and foregoing plat on the margin of which this is written, is in accordance with our wishes, and our free consent.

In Witness Whereof we have hereunto set our hands this 8th day of January A.D. 1908.

In presence of
Howard N. Hanson as to
George M. E. Dorsey
John N. Kelser
Clara L. Kelser
John Fleming

Marie Louise Dorsey
By George M. E. Dorsey her attorney in fact.
John N. Kelser
Clara L. Kelser
Theodore Dockstader

Acknowledgement

State of Nebraska }
Dodge County } ss

On this 8th day of January A.D 1908 before me a Notary Public in and for said County, personally came the above George M. E. Dorsey, attorney in fact for Marie Louise Dorsey, a single woman, who is personally known to me to be the identical person whose name is affixed to the above instrument as said attorney in fact, and acknowledged the same to be his voluntary act and deed, and the voluntary act and deed of his principal the said, Marie Louise Dorsey for the purpose therein stated,

Witness my hand and Notarial Seal the day aforesaid

(Seal)

Howard N. Hanson
Notary public
my commission expires Aug 2 1912

State of Nebraska }
Dodge County } ss

On this 8th day of January A.D. 1908 before me a Notary Public in and for said County personally came the above John N. Kelser and Clara L. Kelser his wife who are personally known to me to be the identical persons whose names are affixed to the above instrument as grantors, and they acknowledged the same to be their voluntary act and deed for the purpose therein stated

Witness my hand and Notarial Seal the day aforesaid

(Seal)

Howard N. Hanson.
Notary Public
my commission expires Aug 2 1912

State of New York }
New York County } ss

On this 21st day of January A.D. 1908 before me a Notary Public in and for said County, personally came the above Theodore G. Dockstader, a widower who is personally known to me to be the identical person whose name is affixed to the above instrument as grantor, and he acknowledged the same to be his voluntary act and deed for the purpose therein stated,

Witness my hand and Notarial seal the day aforesaid

(Seal)

Isaac R. Storm,
Notary Public
Notary Public Kings County Certificate filed in New York, my commission expires March 30th 1908.

State of Nebraska }
Dodge County } Surveyors Certificate

I, A. H. Norris being duly sworn do depose and say that I am a practical Surveyor, and that I staked off the Levee Subdivision Lots A. B. C. D and E. inclusive in the County of Dodge and State of Nebraska, and that the above plat and description is correct, and in accordance with the Survey.

A H Norris
Surveyor

Sworn to and subscribed by A. H. Norris before me this 8th day of January A.D 1908.

(Seal)

James F. Hanson.
Notary Public
My commission expires Dec. 19 1909.

Jan 24
08 2:30
P.M.
$ 2.90
Jno O'Connor

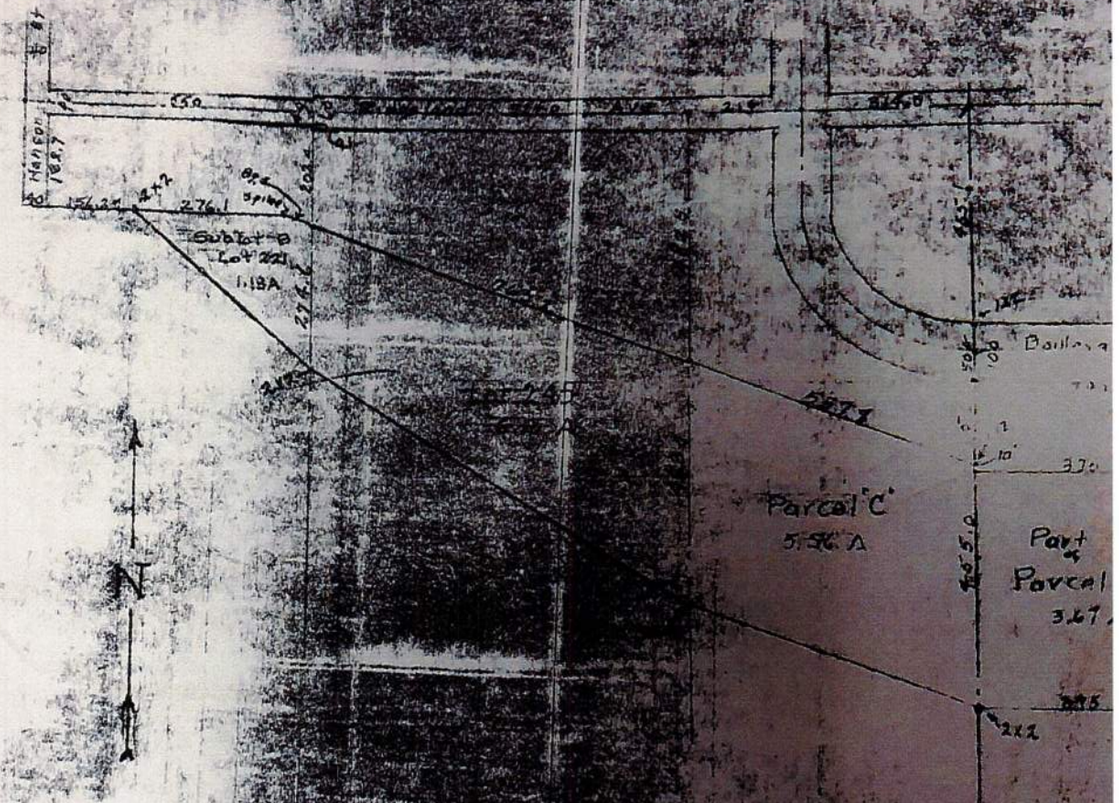
To the Office of County Surveyor

DODGE COUNTY

In compliance with Section 15 of L.B. No. 153 Serial No. 182 Nebraska State Statutes 1957, I, the undersigned Registered Land Surveyor, do hereby, submit for filing, the following, legal description, plat, and transcript of field notes.

Legal Description: Sublot B of Lot 221 Parcel C and part of Parcel A West of Hiway 77

Plat to scale showing plot surveyed with all pertinent points.



Date of Survey June 30 1964 & July 1st 1964

Date Received

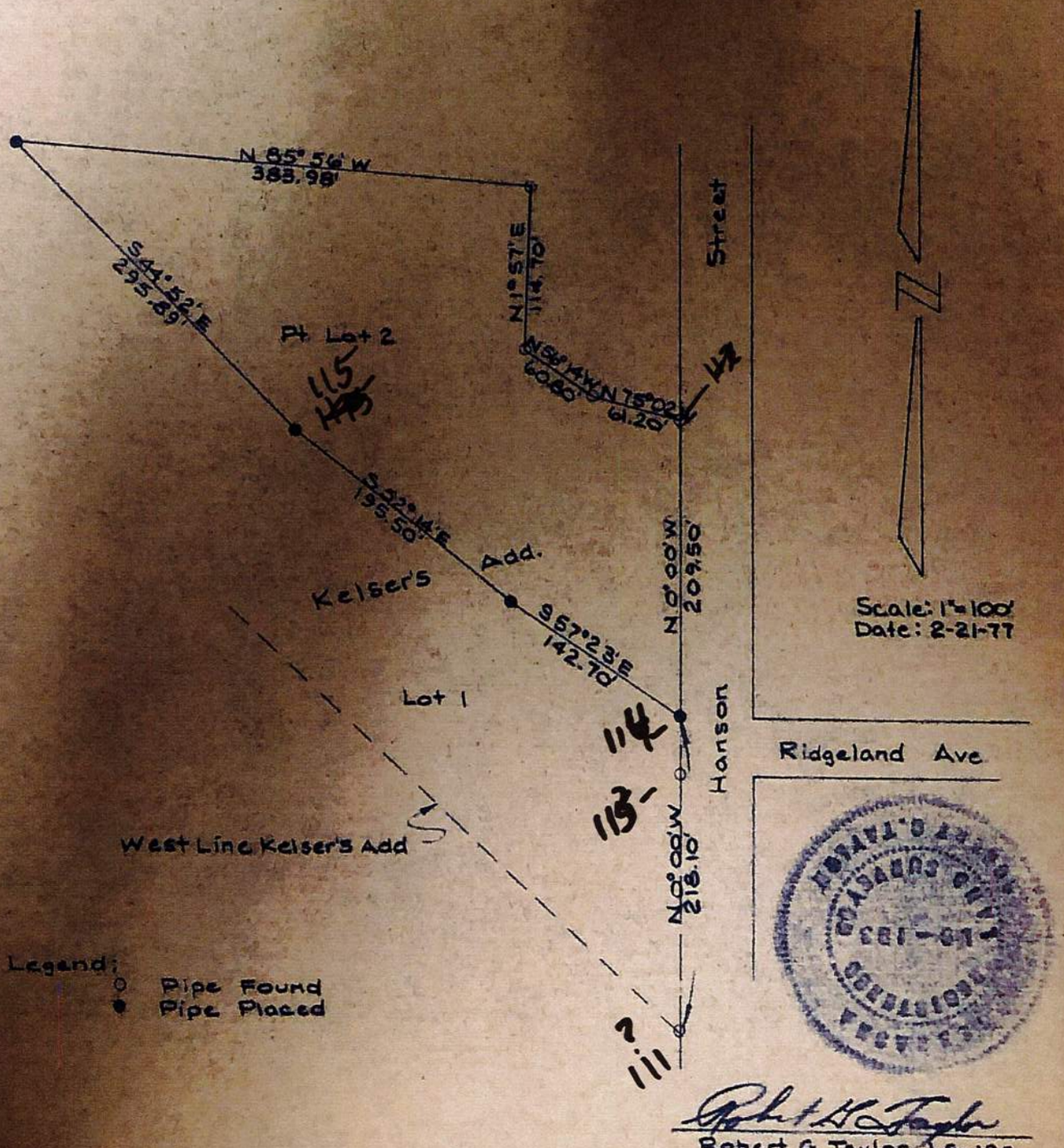
Legal Description:

A tract of land located in lot 2 Kelser's Addition to Inglewood, Dodge County, Nebraska; Section 27, Township 17 North, Range 8 East, of the 6TH P.M., and being more particularly described as follows:

Commencing at a point where the west line of Kelser's Addition extended and the west line of Hanson Street extended south intersect, thence:

N 0° 00' W along the west line of Hanson Street extended 218.10', said point being the point of beginning:
" Continuing N 0° 00' W 209.50'
" N 75° 02' W 61.20'
" N 56° 14' W 60.80'
" N 1° 57' E 114.70'
" N 85° 56' W 383.98'
" S 44° 52' E 295.89'
" S 52° 14' E 195.50'
" S 67° 23' E 142.70' to the point of beginning.

Containing 1.928 acres.

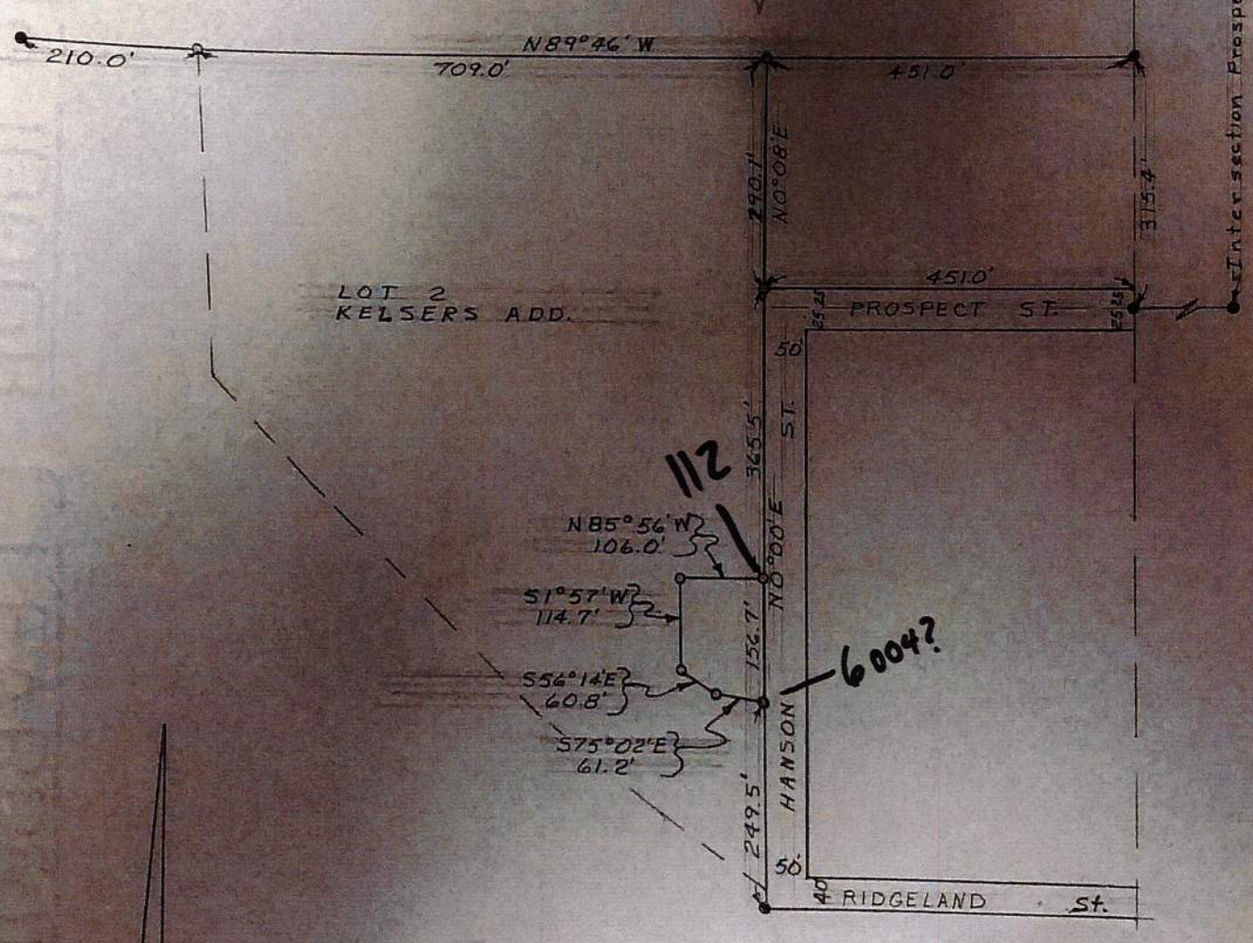


Robert G. Taylor LS-193

LEGAL DESCRIPTION

A tract of land located in lot 2 of Kelsers Addition, Inglewood Nebr in section 27, Township 17 North, Range 8 East of the 6th P.M. and being more particularly described as follows:

Commencing at a point where the South margin of Ridgeland St & the West margin of Hanson St. intersect, and going thence N0°00'E along the West margin of Hanson St. for a distance of 249.5' to the Point of beginning; thence continuing N0°00'E along the West margin of Hanson St. for a distance of 156.7'; thence N85°56'W for a distance of 106.0'; thence S1°57'W for a distance of 114.7'; thence S56°14'E for a distance of 60.8'; Thence S75°02'E for a distance of 61.2' to the point of beginning. Containing 0.35 Acres more or less.



NEBRASKA REGISTERED LS-289 LAND SURVEYOR MARVIN L. WINKELMAN

PROJECT SATORIE SURVEY
DATE MARCH 29, 1971

COEN ENGINEERING
BY Marvin L. Winkelman
L. S. No 289

OFFICIAL SURVEY RECORD

SAUNDERS and DODGE COUNTY, NEBRASKA

Survey of PART OF SECTIONS 26, 27, 34 and 35

~~Section~~ ____, T. 17 N, R. 8 E,

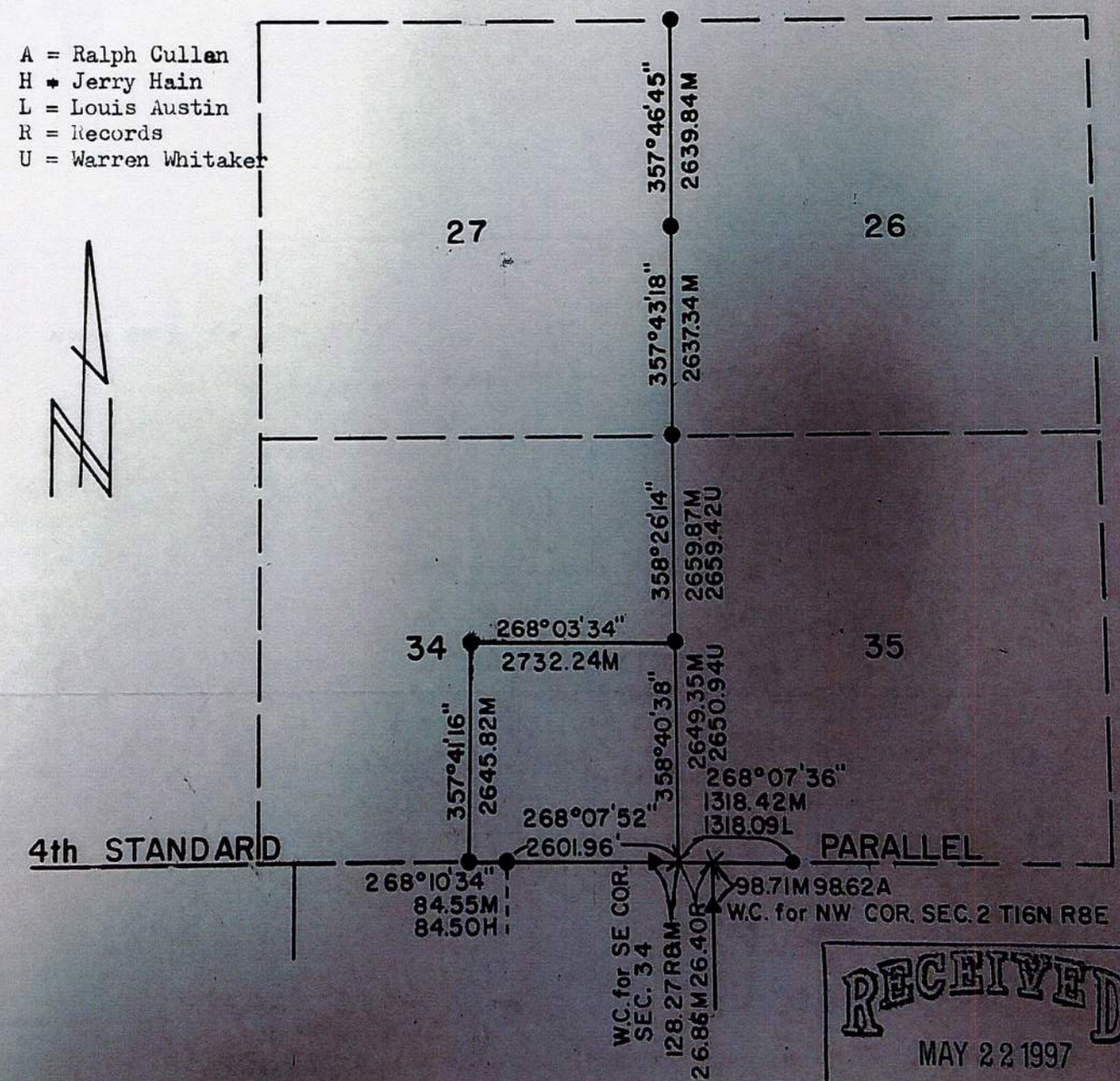
of 6th P.M.

County Survey No ____

Surveyor's Proj. No F-77-2(1040) C.N. 12192

Date ____ 19__ Weather ____

Field Notes: Origin of Survey, descriptions of corners found and restored, distances chained, angles measured.



RECEIVED
MAY 22 1997
SURVEY RECORD REPOSITORY
$5.00 DODGE County

361-422 1/11

LAND SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS SURVEY WAS MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF NEBRASKA

NEBRASKA REGISTERED LS-521 LAND SURVEYOR KENT A. KENNEDY

Signed this 22 Day of May 1997

Name Kent Kennedy

Surveyors license No L.S. 521

LAND SURVEYORS SEAL

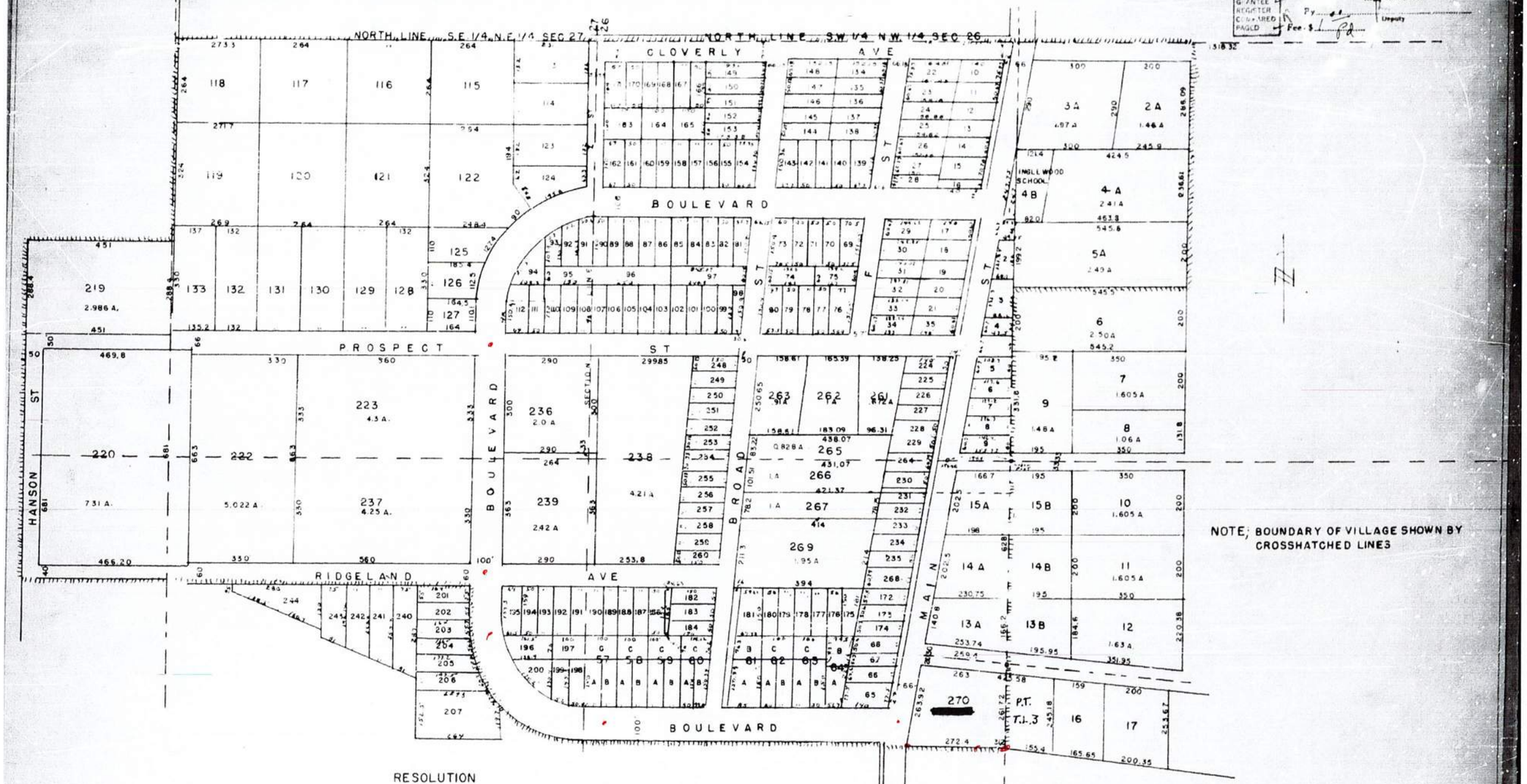
316

VILLAGE OF INGLEWOOD

SEC'S 26 & 27 TWP. 17 R. 8 E.

SCALE 1" = 200'

STATE OF NEBRASKA } ss.
DODGE COUNTY }
Filed for record this 26th day of August A.D. 1959, at 9:15 o'clock A.M. and recorded in Book R of Misc. Rec. page 227
Kitty A. Rouch
Register of Deeds
By ____ Deputy
INDEXED
GRANTOR
GRANTEE
REGISTER
COMPARED
PAGED
Fee $ 1.50



NOTE; BOUNDARY OF VILLAGE SHOWN BY CROSSHATCHED LINES

RESOLUTION

WHEREAS, THIS BOARD HAS ON FILE A PETITION FOR ESTABLISHING THE VILLAGE OF INGLEWOOD AS AN INCORPORATED VILLAGE. AND,

WHEREAS, THE PETITION HAS THE LEGAL NUMBER OF SIGNATURES AND THE LEGAL NUMBER OF INHABITANTS,

NOW THEREFORE BE IT RESOLVED, THAT THIS BOARD APPROVED THE PRAYER OF THE PETITIONERS FOR THE ESTABLISHMENT OF INGLEWOOD AS AN INCORPORATED VILLAGE.

JULY 22 1959
DATED

DODGE COUNTY BOARD OF SUPERVISORS

CLAUD H. HOPPEL CHAIRMAN

ATTEST: C.H. Dahl
C.H. DAHL COUNTY CLERK

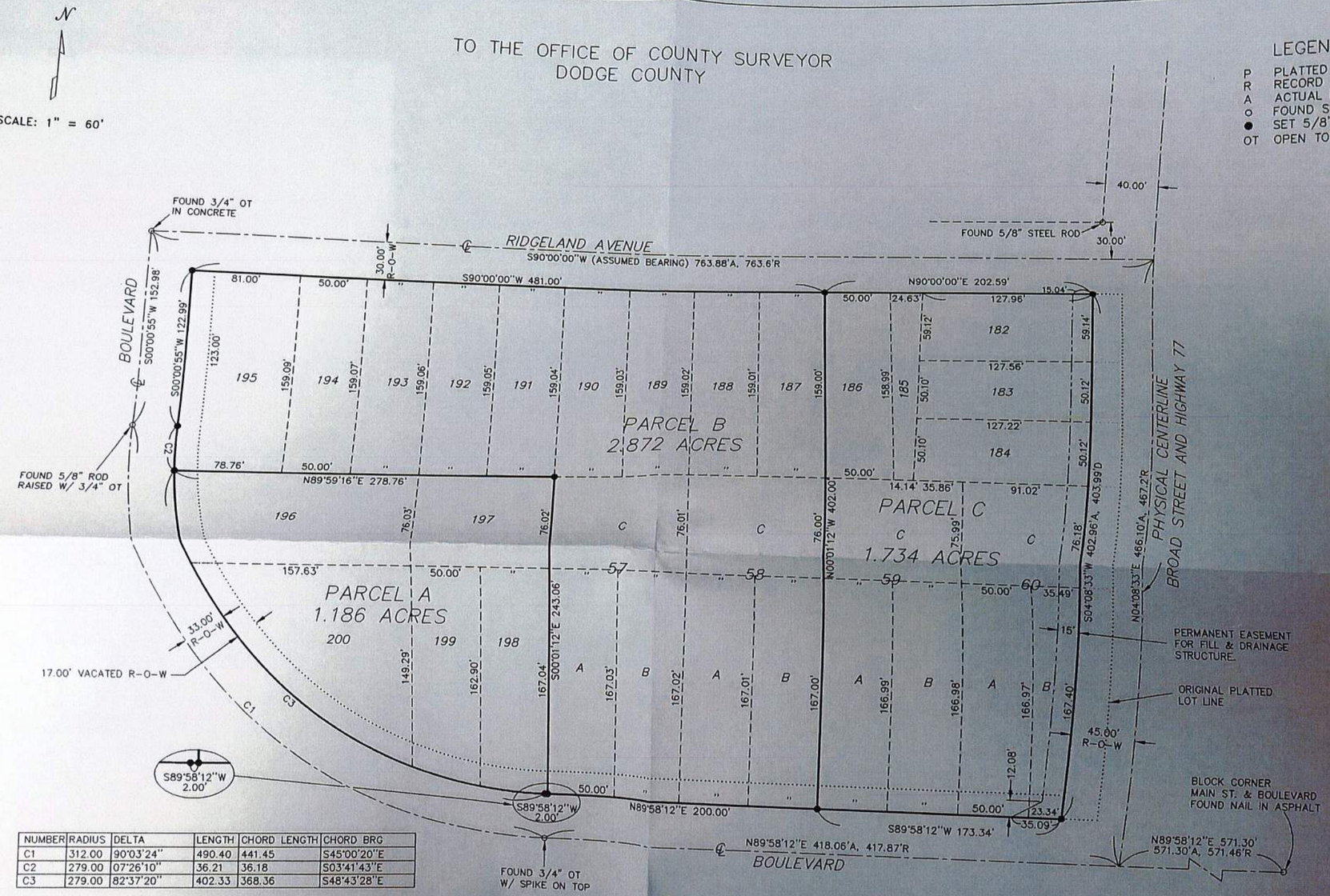
THE ABOVE PLAT WAS MADE FROM PLATS ON FILE IN THE REGISTER OF DEEDS OFFICE, DODGE COUNTY NEBRASKA AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

Kulles Lund
COUNTY SURVEYOR L.S. 4

TO THE OFFICE OF COUNTY SURVEYOR
DODGE COUNTY

SCALE: 1" = 60'

LEGEND
P PLATTED DISTANCE
R RECORD DISTANCE
A ACTUAL DISTANCE
o FOUND SURVEY MONUMENT
● SET 5/8" DIA. X 2' REBAR
OT OPEN TOP PIPE



NUMBER	RADIUS	DELTA	LENGTH	CHORD LENGTH	CHORD BRG
C1	312.00	90°03'24"	490.40	441.45	S45°00'20"E
C2	279.00	07°26'10"	36.21	36.18	S03°41'43"E
C3	279.00	82°37'20"	402.33	368.36	S48°43'28"E

LEGAL DESCRIPTIONS:

PARCEL A:
LOTS 196, 197, 198, 199, 200 AND THE VACATED 17.00 FEET OF BOULEVARD ADJACENT TO SAID LOTS 196, 198, 199 AND 200, ALL IN THE VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA, CONTAINING 1.186 ACRES, MORE OR LESS.

PARCEL B:
LOTS 57A, 57B, 57C, 58A, 58B, 58C, 187, 188, 189, 190, 191, 192, 193, 194, 195 AND THE VACATED 17.00 FEET OF BOULEVARD ADJACENT TO SAID LOTS 57A, 57B, 58A, 58B AND 195, ALL IN THE VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA, CONTAINING 2.872 ACRES, MORE OR LESS.

PARCEL C:
LOTS 59A, 59B, 59C, 60A, 60B, 60C, 182, 183, 184, 185 AND 186, AND THE VACATED 17.00 FEET OF BOULEVARD ADJACENT TO LOTS 59A, 59B, 60A AND 60B, EXCEPTING THEREFROM STATE HIGHWAY RIGHT-OF-WAY; SUBJECT TO A PERMANENT EASEMENT FOR FILL AND DRAINAGE STRUCTURES; CONTAINING 1.734 ACRES, MORE OR LESS.

NEBRASKA REGISTERED LS-503 LAND SURVEYOR STEPHEN W. DODD

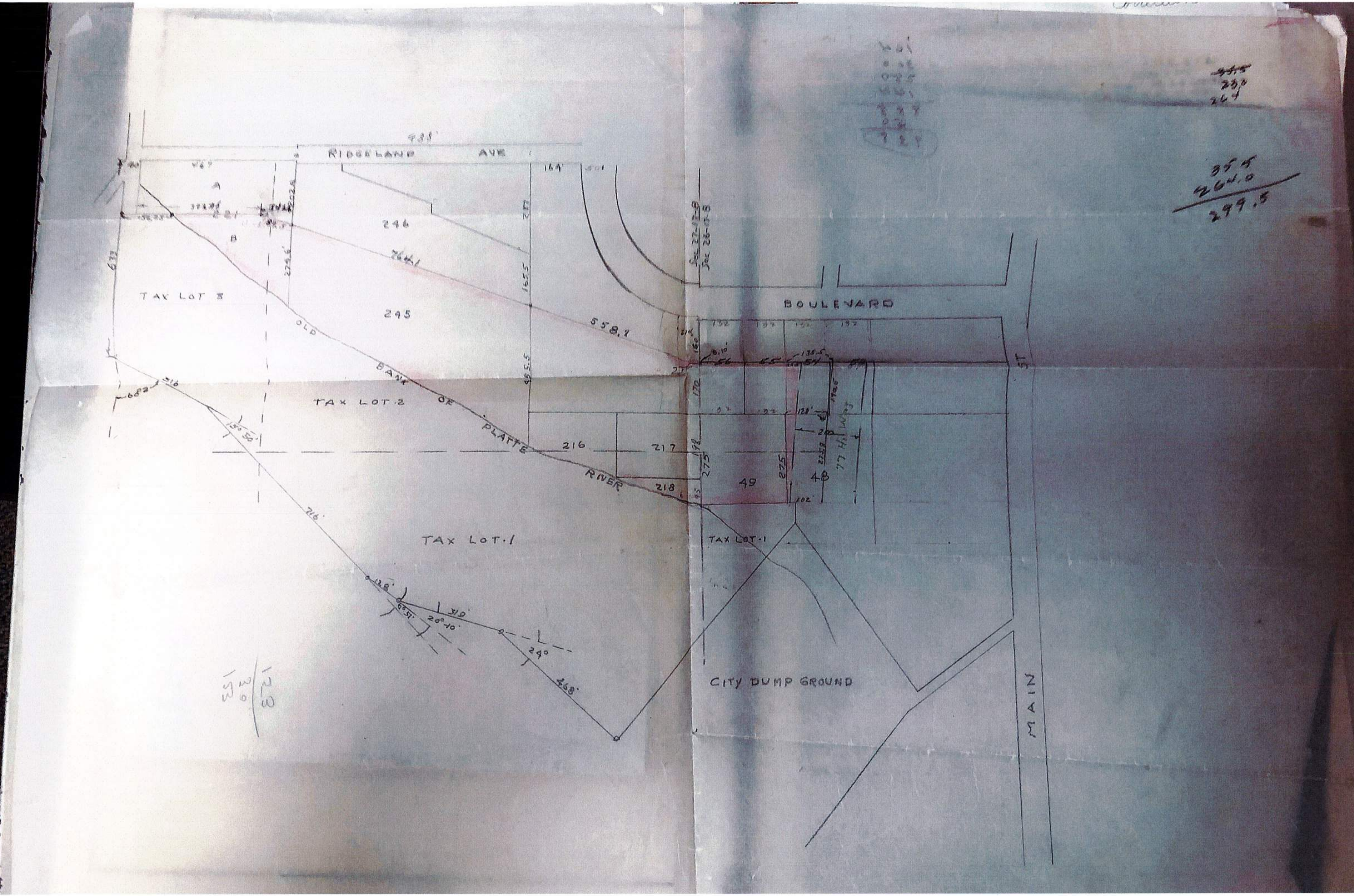
I HEREBY CERTIFY THAT THIS PLAT, MAP, SURVEY OR REPORT WAS MADE BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF NEBRASKA.

Stephen W. Dodd
STEPHEN W. DODD, LS-503

12/14/2001
DATE

RECEIVED
MAR 0 6 2002
SURVEY RECORD REPOSITORY
Dodge County
537-221

Dodd Engineering & Surveying
Stephen W. Dodd
P.E. & L.S.
Ph. 402-727-9067, FAX 721-0509
208 N. Main, P.O. Box 1855
Fremont, NE 68026-1855


RIDGELAND AVE
938'
A
B
246
245
TAX LOT 3
TAX LOT 2
TAX LOT 1
OLD BANK OF PLATTE RIVER
558.7
216
217
218
49
48
BOULEVARD
ST
MAIN
CITY DUMP GROUND
77 Hi Way
Sec 22-17-8
Sec 26-17-8
716'
468'
24°
355
264.0
299.5

HANSON ST.

40'

60' RIDGELAND AVE.

164'

A

247

15&25'

221

202.4'

B

246

287'

623'

224.6'

1655'

TAX LOT-3
6.2-A

245

OLD BANK OF PLATTE RIVER

455.5'

Sec. 27-17-8
Sec. 26-17-8

BOULEVARD

ST.

316'

60.2'

75°50'

TAX LOT-2
4.7-A.

216

217

275'

275'

218

49

716'

TAX LOT-1.
12.7-A

TAX LOT-1
1A-A

128'

63°51'

20°10'

318'

24°

468'

CITY DUMP GROUND

MAIN

At the request of The County Clerk I. have Re-platted A Portion Of Lots 44 and 49 Inglewood Sub-division And A Portion Of Old River Bed, All In The SW¼ - SW¼ Sec. 26; 17; 8. As Tax Lot-1. A Portion Of Old River Bed In SE¼-SE¼ Sec. 27-17-8 As Tax Lot-1. A Portion Of Old River Bed In The NE¼-SE¼ Sec 27; 17; 8 As Tax Lot-2, Also A Portion of Old River Bed In NW¼-SE¼ SEC 27-17-8 As Tax Lot 3.

SCALE 1" = 200'

OCT. 20, 1932

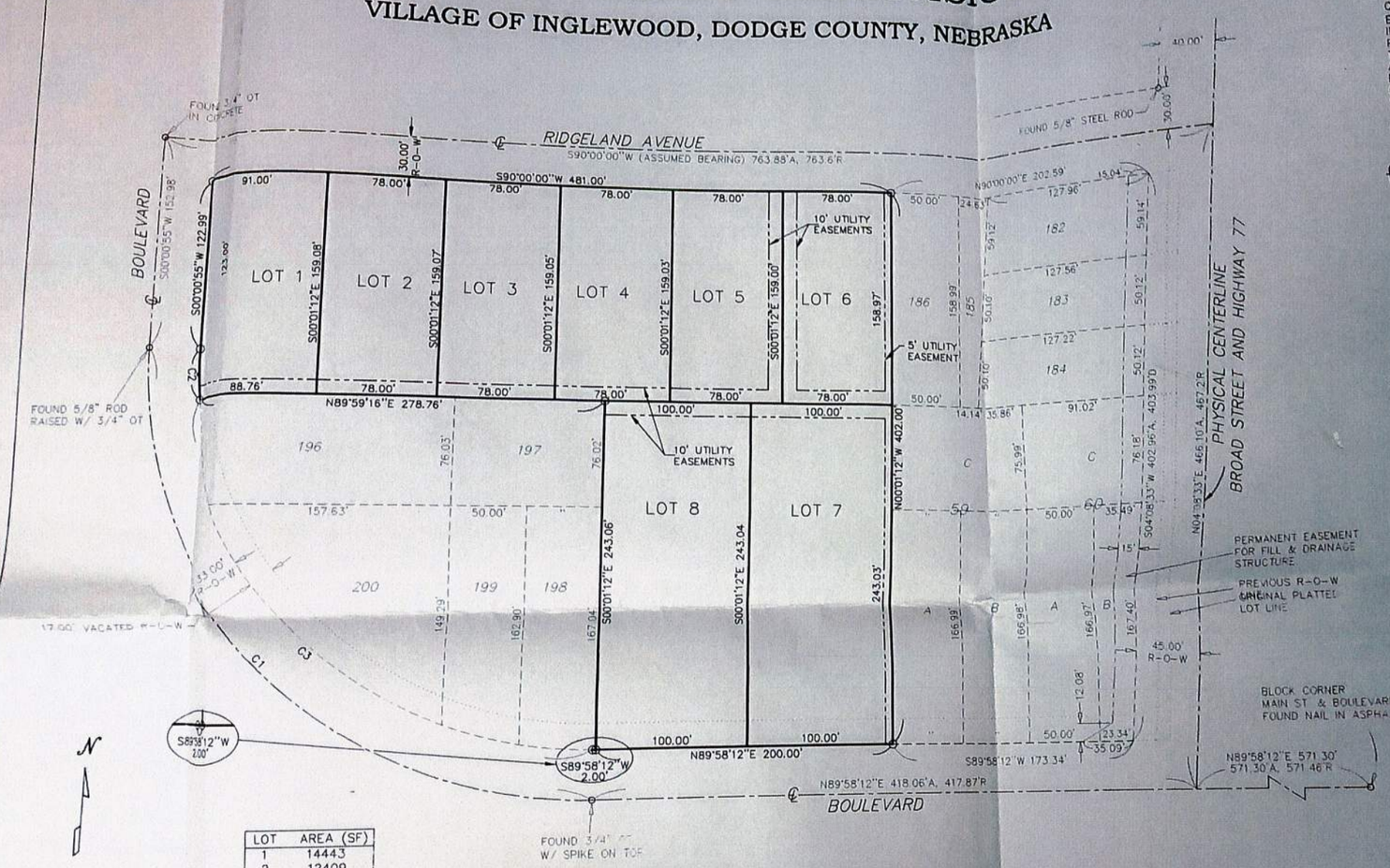
L. M. Roessler
County Engineer.

Plat # 501

FILED
BOOK 203 PAGE 270
2002 FEB -4 AM 10: 05

34.50

FINAL PLAT OF
BUCKLIN ACRES SUBDIVISION
VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA



LOT	AREA (SF)
1	14443
2	12409
3	12407
4	12405
5	12403
6	12401
7	24303
8	24305

SCALE: 1" = 60

LEGEND

P PLATTED DISTANCE
R RECORD DISTANCE
A ACTUAL DISTANCE
o FOUND SURVEY MONUMENT
OT OPEN TOP PIPE

NUMBER	RADIUS	DELTA	LENGTH	CHORD LENGTH	CHORD BRG
C1	312.00	90°03'24"	490.40	441.45	S45°00'20"E
C2	279.00	07°26'10"	36.21	36.18	S03°41'43"E
C3	279.00	82°37'20"	402.33	368.36	S48°43'28"E

NOTE:
ALL DIMENSIONS, BEARINGS AND ANGLES ARE ACTUAL UNLESS OTHERWISE NOTED.

LEGAL DESCRIPTION:

LOTS 57A, 57B, 57C, 58A, 58B, 58C, 187, 188, 189, 190, 191, 192, 193, 194, 195, AND THE VACATED 17.00 FEET OF BOULEVARD ADJACENT TO SAID LOTS 57A, 57B, 58A, 58B AND 195, ALL IN THE VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA, CONTAINING 2.872 ACRES, MORE OR LESS.

DEDICATION

KNOW ALL MEN BY THESE PRESENTS: THAT PEBLEY CONSTRUCTION INC., MARTY WILLIAMSON, AND ROGER CHISHOLM; OWNERS AND PROPRIETORS OF THE TRACT OF LAND SHOWN AND DESCRIBED HEREON, HAVE CAUSED THE SAME TO BE DIVIDED INTO LOTS, AND STREETS, SAID SUBDIVISION TO BE KNOWN AS BUCKLIN ACRES SUBDIVISION, THE LOTS TO BE NUMBERED AS SHOWN AND WE APPROVE THE DISPOSITION OF THE PROPERTY AS SHOWN ON THIS PLAT AND WE HEREBY DEDICATE TO THE PUBLIC FOR PERPETUAL PUBLIC USE EASEMENTS AT THE LOCATIONS AND TO THE WIDTHS SHOWN HEREON TO THE VILLAGE OF INGLEWOOD, ANY PUBLIC OR PRIVATE UTILITY COMPANY, AND FOR THE USE OF ABUTTING PROPERTY OWNERS, PERPETUAL EASEMENTS AT THE LOCATION AND WIDTHS SHOWN FOR THE SOLE PURPOSE OF CONSTRUCTION AND MAINTENANCE OF UTILITY LINES AND PIPES AND DRAINAGE FACILITIES. NO PERMANENT BUILDING OR RETAINING WALL SHALL BE PLACED IN THE ABOVE DESCRIBED EASEMENT WAYS, BUT THE SAME MAY BE USED FOR GARDENS, LANDSCAPING AND OTHER PURPOSES THAT DO NOT THEN OR LATER INTERFERE WITH THE AFORESAID USES OR RIGHTS HEREIN GRANTED.

IN WITNESS WHEREOF, I DO HEREBY SET MY HANDS THE 28th DAY OF January, 2002, A.D.

Pebley Construction Inc by Gary Pebley
PEBLEY CONSTRUCTION INC., GARY PEBLEY, PRESIDENT

Marty Williamson
MARTY WILLIAMSON

Roger Chisholm
ROGER CHISHOLM

ACKNOWLEDGEMENT
STATE OF NEBRASKA)
) SS.
COUNTY OF DODGE)

ON THIS 28th DAY OF January A.D. 2002, BEFORE ME, A GENERAL NOTARY PUBLIC, PERSONALLY APPEARED GARY PEBLEY, MARTY WILLIAMSON, AND ROGER CHISHOLM WHO ARE KNOWN TO ME TO BE THE IDENTICAL PERSONS WHOSE NAMES APPEAR ON THE FOREGOING DEDICATION, AND WHO HEREBY ACKNOWLEDGE THE SIGNING OF SAID INSTRUMENT TO BE THEIR VOLUNTARY ACT AND DEED.

WITNESS MY HAND AND OFFICIAL SEAL DATE LAST AFORESAID.

Stan B. Darling
GENERAL NOTARY PUBLIC

STAN B. DARLING
My Comm. Exp. Jan 17, 2003

COMMISSION EXPIRES _____

PLANNING COMMISSION APPROVAL

ON THIS 17th DAY OF Dec, 2001, THIS PLAT OF BUCKLIN ACRES SUBDIVISION WAS APPROVED AND ACCEPTED BY THE PLANNING COMMISSION OF THE VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA.

John A. McKeon
CHAIR

VILLAGE BOARD OF TRUSTIES ACCEPTANCE

ON THIS 17th DAY OF Dec, A.D. 2001, THIS PLAT OF BUCKLIN ACRES SUBDIVISION WAS APPROVED AND ACCEPTED BY RESOLUTION OF THE VILLAGE BOARD OF TRUSTIES, THE VILLAGE OF INGLEWOOD, DODGE COUNTY, NEBRASKA.

Emil Hancock
MAYOR

Sarah L Cole
CLERK

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY AS THE UNDERSIGNED REGISTERED LAND SURVEYOR, THAT I HAVE SURVEYED THE TRACT OF LAND SHOWN AND DESCRIBED HEREON, AND THAT PERMANENT MARKERS HAVE BEEN FOUND OR WILL BE SET AS DESCRIBED HEREON, ON OR BEFORE MAY 1, 2002.

Stephen W. Dodd
STEPHEN W. DODD, LS-503

1/3/2002
DATE

NEBRASKA REGISTERED LS-503 LAND SURVEYOR STEPHEN W. DODD

Ph. 402-727-9067, FAX 721-0509

FINAL PLAT

Plat # 361

STATE OF NEBRASKA, DODGE COUNTY ss.
30th June 72
3:17 P. 6
misc. 694 3.25
Kitty A. Roush

Plat
RIVER-ROAD SUBDIVISION
Located in Sec. 27, T17N, R8E

DEDICATION

Know all men by these presents, that Raymond S. & LaVerna C. Satorie, husband & wife, being the record title owners of the tract of land shown on the left, do hereby subdivide & plat said tract as River-Road Subdivision. Said subdivision consists of 16 lots, their number & dimensions being shown on this plat.

Island Drive & Lakeview Drive are platted 30' in width, are shown & platted for the sole & only use as private access to the above mentioned 16 lots for their exclusive use and neither shall be construded by this dedication as being public.

An easement across the front 10 ft of all lots within this subdivision is reserved for the sole purpose of constructing & maintaining utility lines & pipes.

By affixing our signatures hereto, we hereby acknowledge this dedication & plat to be our voluntary act & deed.

Raymond S. Satorie — Raymond S. Satorie
LaVerna C. Satorie — LaVerna C. Satorie

State of Nebraska) ss
County of Dodge)

On this 27th day of June, 1972, before me, a notary public in & for said County, personally came Raymond S. & LaVerna C. Satorie, husband & wife to me personally known to be the identical persons whose names are affixed here to be the grantors & do acknowledge this dedication & plat, to be their voluntary act & deed.

My commission expires Feb. 1, 1973 — Eleanore M. Grange
Notary

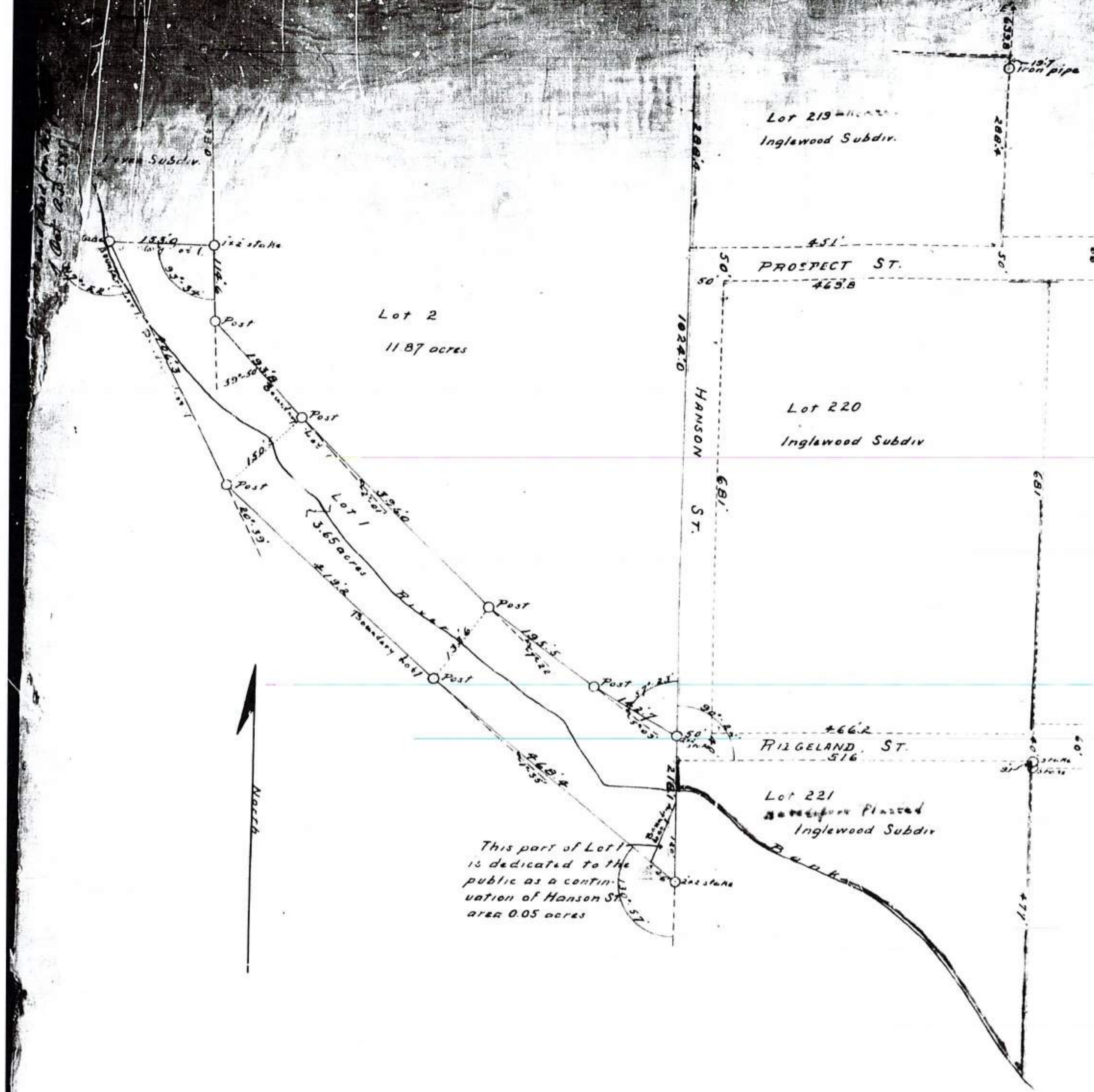
APPROVAL

The City of Fremont, Nebraska hereby approves this platting of River-Road Subdivision this 27 day of June, 1972.

City Clerk — Mayor — Arthur G. Peters

Surveyor's Certificate: I, the undersigned Licensed Land Surveyor do hereby certify that I have supervised the surveying of the above shown tract, that pipe have been placed as shown, which is 10 back from the waters edge on the lake side, that all bearings & distances are true & correct to the best of my knowledge.
Dated: June 26, 1972
James B. Coen L.S.

COEN ENGINEERING	PROJECT: River-Road Subdivision	
	LOCATION: In Sec. 27, T17N, R8E	
	SCALE: 1" = 100'	DRAWN BY: JC
	DATE: June 26, 1972	REVISED
	PREPARED BY: J. Coen	DRAWING NUMBER: Sheet 1 of 1



KELSER'S ADDITION
—TO—
INGLEWOOD SUBDIVISION

PART OF SECTION 27 TWP. 17 N. R. 8 E.

SCALE 1" = 100' NOV. 19, 1912.

Kelser's Addition to Inglewood Subdivision in the County of Dodge and State of Nebraska, is located as a part of the southwest quarter of the northeast quarter (SW¼NE¼) and a part of the northwest quarter of the southeast quarter (NW¼SE¼) of section twenty-seven (27) township seventeen (17) north range eight (8) east of the sixth (6th) principal meridian. The northeast corner of Lot two (2) is the northwest corner of Lot two hundred and nineteen (219) Inglewood Subdivision as heretofore platted and recorded, being six hundred thirty-nine and eight tenths (639.8) feet south and four hundred and fifty-one (451) feet west of the northeast corner of the southwest quarter of the northeast quarter of section twenty-seven (27) aforesaid. The northwest corner of Lot two (2) is the northeast corner of Lot A Levee Subdivision as heretofore platted and recorded, being six hundred thirty-nine and eight tenths (639.8) feet south and eleven hundred fifty-eight and five tenths (1158.5) feet west of the northeast corner of the southwest quarter of the northeast quarter of section twenty-seven (27) aforesaid. The corners of all lots are marked as indicated on the plat on the margin of which this is written.

John N. Kelser and Clara L. Kelser, his wife, being the owners and proprietors of the land comprised in Kelser Addition to Inglewood Subdivision in the County of Dodge and State of Nebraska do hereby declare that the subdivision of that part of the southwest quarter of the northeast quarter and that part of the northwest quarter of the southeast quarter all in section twenty-seven (27) aforesaid, as indicated by the plat on the margin of which this is written, is in accordance with their wishes and their free consent.

In witness whereof the said John N. Kelser and Clara L. Kelser have set their hands this 17th day of January AD 1913

In the presence of

[illegible]

John N. Kelser

[illegible]

State of Nebraska }
Dodge County } SS

Be it remembered that on this 17th day of January A.D. 1913 before me a Notary Public in and for said County personally came the above named John N Kelser and Clara L. Kelser husband and wife, who are to me personally known to be the identical persons whose names are subscribed to the foregoing instrument as the Grantors therein named and they acknowledged the said instrument to be their voluntary act and deed.

Witness my hand and Notarial Seal on the day and date last above written.

[illegible]

Notary Public

My commission expires [illegible]

I Arthur H Norris, being first duly sworn, do depose and say that I am a practical surveyor and that I have accurately surveyed and laid out Kelser's Addition to Inglewood Subdivision in Dodge County, Nebraska, and that the above plat and description are in accordance with said survey.

Witness my hand this [illegible] day of [illegible] A.D. 191[illegible]

[illegible]

Subscribed and sworn to before me this 17th day of January A.D. 1913.

Donald E. [illegible]

Notary P[illegible]

My Commission expires

PLAT OF HORMEL ISLAND which includes the south ½ of Govt Lot 7, Govt lots 8 and 9 together with parcels of real estate adjoining said lots on the north east and south and located in Sections 27, 26, 34 and 35, Twp 17 N. R. 8 E. of 6th P.M. Total ac 164.3
Scale 1" = 200' Nov. 29, 1966.
L.M. Boessler
County Surveyor

27

Bay Scout Camp

PUBLIC ROAD

DEVELOPMENT

NW-SW

NE-SW

NORTH

NW-SE

HANSON ST.

RIDGELAND AVE.

PUBLIC ROAD

NE-SE

NW-SW

CHANNEL OF PLATTE RIVER

WEST BANK OF NORTH CHANNEL OF PLATTE RIVER

GOVERNMENT LOT 8

SW-SW

SE-SW

SW-SE

SE-SE

SW-SW

GOVERNMENT LOT 9

PLATTE RIVER

Timber Line

Sand Bar

Sand Bar

Sand Bar

Water Line

End of Island in 1912

SEC. 27-17-8 | SEC. 26-17-8
SEC. 34-17-8 | SEC. 35-17-8

PLATTE RIVER BRIDGE

containing 21.62 acres, more or less

Scale: 1" = 200'

O = Corners Placed
● = Corners Fd.

Gov. Lot 4
& accretion

Fd. Pipe established by Scott (Dep. State Surveyor) as on South Line NE¼ SE¼ NW¼

N 87°48' W
448.81'

S 87°25' W
337.69'

NW Cor. of Lot A of Levee Sub'd Pl. G.P.

N 88°02' W
919.00'

Old Fence as shown as North Line of South Half of G.L.5

451.00'

NE Cor. of South Half of G.L.5. Fd. G.P.

N 15°45' W
215.27'

Placed G.P.

Lot A
Levee Sub

N 15°45' W
208.00'

Placed G.P. (1.1S N & 3.90' E. of Fd. G.P.)

N 18°08' W
754.82'

S 2°51' E
713.79'

N 25°04' W
406.30'

Kelser's Add.

Placed G.P. (2.16S & 2.59' E. of Fd. G.P.)

159.21

1239.96'
S 1°45' W

West Line of Hansen St

N 45°43' W
419.20'

West Line Kelser's Add

Placed G.P. (0.95S. & 0.58' E. of Fd. G.P.)

N 47°18' W
465.40'

G.P. 'X' in Conc

33.39'

Fd. G.P.

G.P.

NW Line of Public Road

245.25'
N 55°35' E

E. Public Road

'X' in Conc.

163.5'
N 46°01' E

GP

Fd. 'X' in Conc.

P.I. @ Pt. #19 has curve with 25' tangents & 1' external.
P.I. @ Pt. #20 has curve with 48' tangents & 5' external.

West Line of Hansen St. extended South.

Fd. Shaft

453.93'
S 1°45' W

N 2°11' E
736.60'

Gov. Lot 7 (NW)
& accretion

S 5°45' W
737.73'

21.62 acres

NW Cor. G.L.7
Fd. Well Point

821.63

Fd. G.P.

S 87°48' E
312.00'

North Line of G.L.7

Falls in Lake

S W Cor. of N½ of G.L.7
Fd G.P.

1087.72
S 87°49' E

South Line of N½ of G.L.7

Fd G.P.

550.00
S 87°49' E

Placed G.P.

197.06'
S 68°00' E

COORDINATES

Point No.	North	East
1	6361.02	3769.45
2	6376.50	3318.72
3	6408.04	2400.26
4	6404.62	2062.58
5	6421.88	1614.10
6	6317.56	2414.99
7	6115.51	2464.37
8	5747.48	2636.51
9	5454.79	2934.62
10	5137.14	3280.85
11	4683.42	3267.21
12	4937.54	2636.53
13	4958.50	2086.93
14	5692.57	2160.85
15	5704.55	1849.08
16	5736.06	1028.06
17	5000.00	1000.00
18	4849.62	2884.68
19	4963.16	2972.32
20	5102.01	3174.48
21	5184.34	3229.70

Surveyor's Certificate: I, the undersigned Licensed Land Surveyor, do hereby certify that I have supervised the surveying of the above shown tract, that corners have been placed or found as shown, and all bearings and distances are true and correct, to the best of my knowledge.

James L. Cox
L.S. #164

Dated: April 3, 1970

Plat of
A TRACT OF LAND IN SEC. 27-T17N-R8E
containing 21.62 acres, more or less

Scale: 1" = 200

○ = Corners Placed
● = Corners Fd.

Gov. Lot 4 & accretion

Fd. Pipe established by Scott (Dep. State Surveyor) as on South Line NE¼ SE¼ NW¼

N 87°48' W 448.81'

S 87°25' W 337.69'

NW Cor. of Lot A of Levee Sub'd Pl. G.P.

N 88°02' W 919.00'

Old Fence as shown as North Line of South Half of G.L.5

451.00'

NE Cor. of South Half of G.L.5. Fd. G.P.

N 1°45' W 919.67'

Placed G.P.

Lot A Levee Sub

N 13°44' W 208.00'

Placed G.P. (1.15 N & 3.90' E. of Fd. G.P.)

N 18°08' W 754.82'

S 2°25' E 718.19'

N 25°04' W 406.30'

Kelser's Add.

Placed G.P. (2.16 S & 2.59' E. of Fd. G.P.)

N 45°43' W 419.20'

West Line Kelser's Add

Placed G.P. (0.95 S. & 0.58' E. of Fd. G.P.)

N 47°18' W 468.40'

G.P. 'X' in Conc

33.39'

Fd. G.P.

N 55°35' E 245.25'

G.P.

NW Line of Public Road

E. Public Road

'X' in Conc.

N 46°01' E 163.5'

S 68°03' E 149.06'

GP

Fd. 'X' in Conc.

P.I. @ Pt. #19 has curve with 25' tangents & 1' external.
P.I. @ Pt. #20 has curve with 48' tangents & 5' external.

West Line of Hansen St

S 1°45' W 1239.96'

West Line of Hansen St. extended South.

S 1°45' W 453.93'

Fd. Shaft

Fd. G.P.

821.63

NW Cor. G.L.7 Fd. Well Point

North Line of G.L.7

S 87°48' E 312.00'

Falls in Lake

N 2°11' E 736.60'

Gov. Lot 7 (N½) & accretion

S 5°45' W 737.78'

21.62 acres

SW Cor. of N½ of G.L.7 Fd G.P.

1087.72

South Line of N½ of G.L.7

S 87°49' E

Fd G.P.

550.00

S 87°49' E

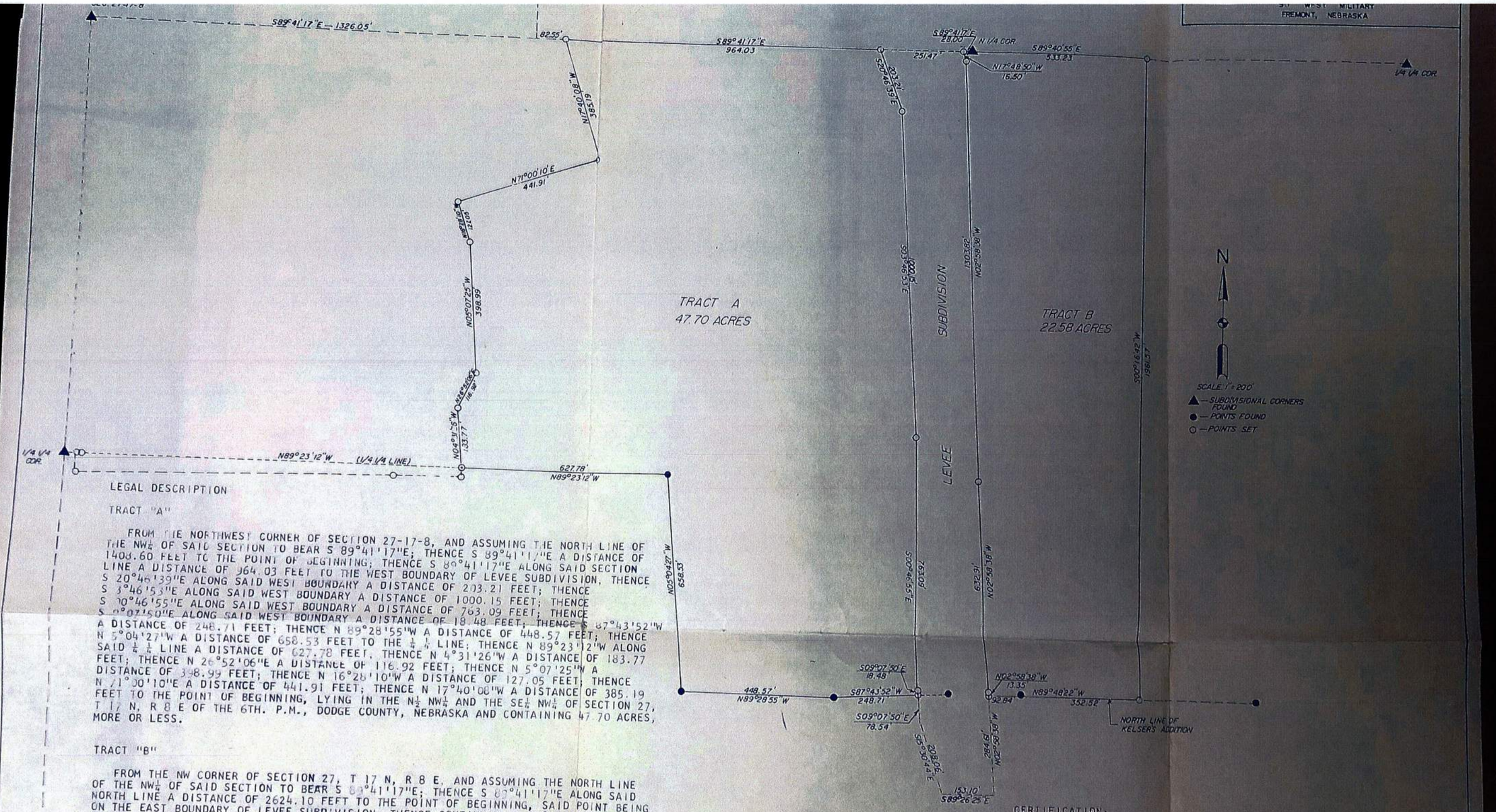
Placed G.P.

COORDINATES

Point No.	North	East
1	6361.02	3769.45
2	6376.50	3318.72
3	6408.04	2400.26
4	6404.62	2062.53
5	6421.88	1614.10
6	6317.56	2414.99
7	6115.51	2464.37
8	5747.48	2636.51
9	5454.79	2936.62
10	5137.14	3280.85
11	4683.42	3267.21
12	4937.54	2636.63
13	4958.50	2086.93
14	5692.57	2160.85
15	5704.55	1849.08
16	5736.06	1028.06
17	5000.00	1000.00
18	4849.62	2854.68
19	4963.16	2972.32
20	5102.01	3174.48
21	5184.24	3229.70

Surveyor's Certificate: I, the undersigned Licensed Land Surveyor, do hereby certify that I have supervised the surveying of the above shown tract, that corners have been placed or found as shown, and all bearings and distances are true and correct, to the best of my knowledge.

James L. Fee



LEGAL DESCRIPTION

TRACT "A"

FROM THE NORTHWEST CORNER OF SECTION 27-17-8, AND ASSUMING THE NORTH LINE OF THE NW¼ OF SAID SECTION TO BEAR S 89°41'17"E; THENCE S 89°41'17"E A DISTANCE OF 1408.60 FEET TO THE POINT OF BEGINNING; THENCE S 89°41'17"E ALONG SAID SECTION LINE A DISTANCE OF 964.03 FEET TO THE WEST BOUNDARY OF LEVEE SUBDIVISION, THENCE S 20°46'39"E ALONG SAID WEST BOUNDARY A DISTANCE OF 203.21 FEET; THENCE S 3°46'53"E ALONG SAID WEST BOUNDARY A DISTANCE OF 1000.15 FEET; THENCE S 0°46'55"E ALONG SAID WEST BOUNDARY A DISTANCE OF 763.09 FEET; THENCE S 0°07'50"E ALONG SAID WEST BOUNDARY A DISTANCE OF 18.48 FEET; THENCE S 87°43'52"W A DISTANCE OF 248.71 FEET; THENCE N 89°28'55"W A DISTANCE OF 448.57 FEET; THENCE N 5°04'27"W A DISTANCE OF 658.53 FEET TO THE ¼ ¼ LINE; THENCE N 89°23'12"W ALONG SAID ¼ ¼ LINE A DISTANCE OF 627.78 FEET, THENCE N 4°31'26"W A DISTANCE OF 183.77 FEET; THENCE N 26°52'06"E A DISTANCE OF 116.92 FEET; THENCE N 5°07'25"W A DISTANCE OF 398.99 FEET; THENCE N 16°26'10"W A DISTANCE OF 127.05 FEET; THENCE N 71°00'10"E A DISTANCE OF 441.91 FEET; THENCE N 17°40'08"W A DISTANCE OF 385.19 FEET TO THE POINT OF BEGINNING, LYING IN THE N½ NW¼ AND THE SE¼ NW¼ OF SECTION 27, T 17 N, R 8 E OF THE 6TH. P.M., DODGE COUNTY, NEBRASKA AND CONTAINING 47.70 ACRES, MORE OR LESS.

TRACT "B"

FROM THE NW CORNER OF SECTION 27, T 17 N, R 8 E, AND ASSUMING THE NORTH LINE OF THE NW¼ OF SAID SECTION TO BEAR S 89°41'17"E; THENCE S 89°41'17"E ALONG SAID NORTH LINE A DISTANCE OF 2624.10 FEET TO THE POINT OF BEGINNING, SAID POINT BEING ON THE EAST BOUNDARY OF LEVEE SUBDIVISION; THENCE CONTINUING S 89°41'17"E A DISTANCE OF 28.00 FEET TO THE N¼ CORNER OF SECTION 27; THENCE S 89°40'55"E ALONG THE NORTH LINE OF THE NE¼ OF SAID SECTION A DISTANCE OF 533.23 FEET; THENCE S 00°16'42"W A DISTANCE OF 1961.57 FEET TO A POINT ON THE NORTH LINE OF KELSER'S ADDITION; THENCE N 89°48'22"W A DISTANCE OF 445.36 FEET TO A POINT ON THE EAST BOUNDARY OF LEVEE SUBDIVISION; THENCE N 02°58'38"W ALONG SAID EAST BOUNDARY A DISTANCE OF 1950.08 FEET; THENCE N 17°48'50"W ALONG SAID EAST BOUNDARY A DISTANCE OF 16.50 FEET TO THE POINT OF BEGINNING, LYING IN THE W½ NE¼ AND THE NE¼ NW¼ OF SECTION 27, T 17 N, R 8 E OF THE 6TH. P.M., DODGE COUNTY, NEBRASKA, AND CONTAINING 22.58 ACRES, MORE OR LESS.

NEBRASKA REGISTERED LS-235 LAND SURVEYOR WARREN D. WHITAKER

CERTIFICATION:

I, THE UNDERSIGNED REGISTERED LAND SURVEYOR, HEREBY CERTIFY THAT I HAVE SUPERVISED THE SURVEY OF THE TRACTS OF LAND SHOWN AND DESCRIBED HEREON, AND THAT ALL BEARINGS AND DIMENSIONS SHOWN ARE REPRESENTATIVE OF ACTUAL FIELD MEASUREMENTS TAKEN WITH A WILD T-1-A THEODOLITE TYPE TRANSIT AND A HEWLETT-PACKARD HP-3800-A ELECTRONIC DISTANCE MEASURING DEVICE.

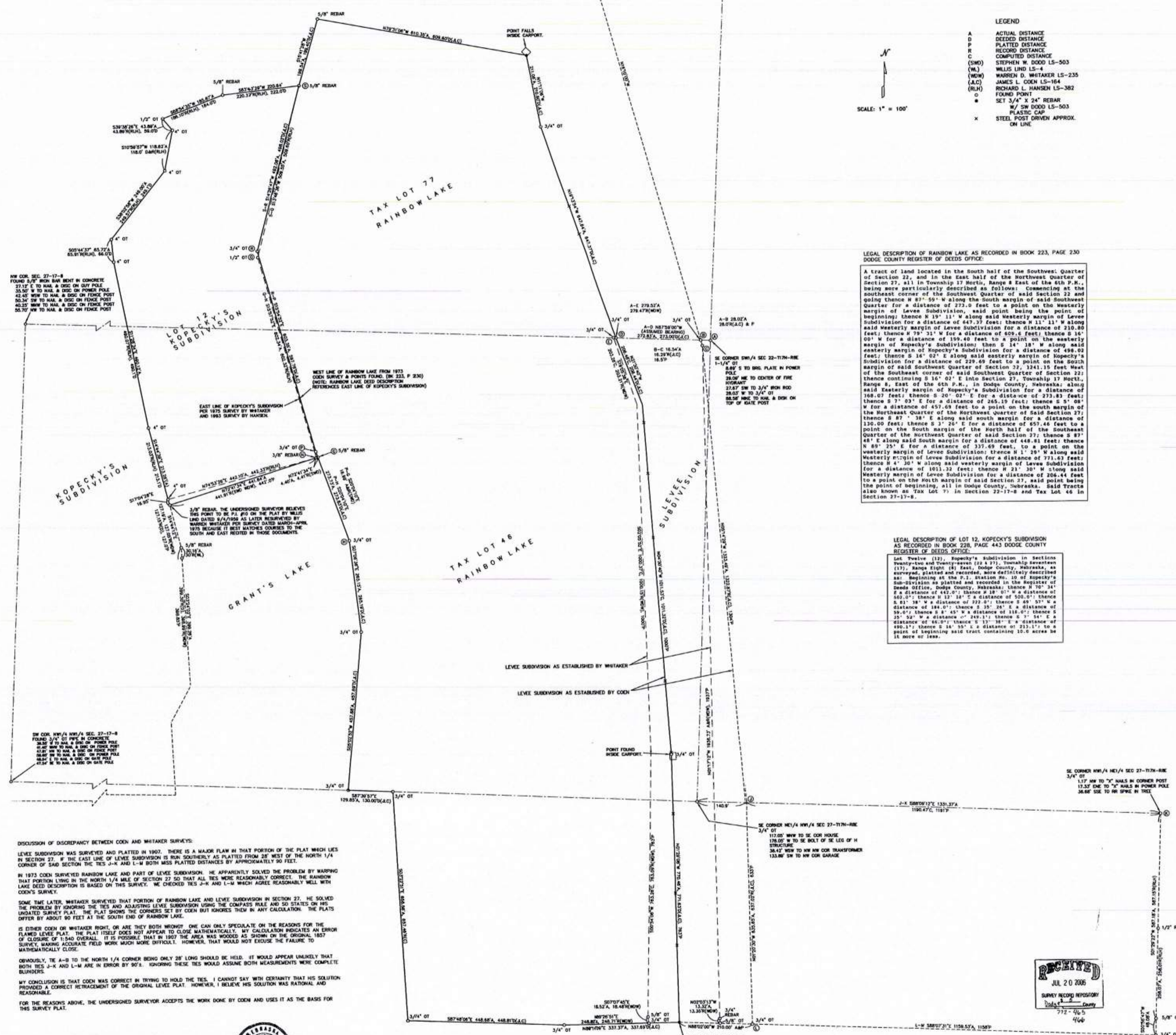
I FURTHER CERTIFY THAT PERMANENT MARKERS HAVE BEEN PLACED OR FOUND AT THE POINTS INDICATED HEREON AND THAT THIS SURVEY IS BASED ON INFORMATION OF RECORD IN THE DODGE COUNTY SURVEYORS OFFICE.

I FURTHER CERTIFY THAT IN THE ABSENCE OF ANY ORIGINAL SURVEY POINTS, THE ORIGINAL BOUNDARY OF LEVEE SUBDIVISION WAS ADJUSTED USING THE COMPASS RULE OF ADJUSTMENT TO FIT ACTUAL SURVEY MEASUREMENTS OF THE SUBDIVISION LINES WHICH WERE THE BASIS OF THE ORIGINAL BOUNDARY SURVEY OF SAID LEVEE SUBDIVISION.

Warren D. Whitaker

WARREN D. WHITAKER
REGISTERED LAND SURVEYOR
REGISTRATION NO. LS-235

TO THE OFFICE OF COUNTY SURVEYOR
DODGE COUNTY



LEGEND

A	ACTUAL DISTANCE
D	DEEDED DISTANCE
P	PLATTED DISTANCE
R	RECORD DISTANCE
C	COMPUTED DISTANCE
(SWD)	STEPHEN W. DODD LS-503
(WL)	WILLIS LIND LS-4
(WDW)	WARREN D. WHITAKER LS-235
(JLC)	JAMES L. COEN LS-164
(RLH)	RICHARD L. HANSEN LS-382
o	FOUND POINT
•	SET 3/4" X 24" REBAR W/ SW DODD LS-503 PLASTIC CAP
x	STEEL POST DRIVEN APPROX. ON LINE

LEGAL DESCRIPTION OF RAINBOW LAKE AS RECORDED IN BOOK 223, PAGE 230 DODGE COUNTY REGISTER OF DEEDS OFFICE:

A tract of land located in the South half of the Southwest Quarter of Section 22, and in the East half of the Northwest Quarter of Section 27, all in Township 17 North, Range 8 East of the 6th P.M., being more particularly described as follows: Commencing at the southeast corner of the Southwest Quarter of said Section 22 and going thence N 87° 59' W along the South margin of said Southwest Quarter for a distance of 273.0 feet to a point on the Westerly margin of Levee Subdivision, said point being the point of beginning; thence N 19° 11' W along said Westerly margin of Levee Subdivision for a distance of 647.37 feet; thence N 11° 11' W along said Westerly margin of Levee Subdivision for a distance of 210.80 feet; thence N 79° 31' W for a distance of 609.6 feet; thence S 16° 00' W for a distance of 199.40 feet to a point on the easterly margin of Kopecky's Subdivision; then S 14° 18' W along said easterly margin of Kopecky's Subdivision for a distance of 498.02 feet; thence S 16° 02' E along said easterly margin of Kopecky's Subdivision for a distance of 229.69 feet to a point on the South margin of said Southwest Quarter of Section 22, 1241.15 feet West of the Southeast corner of said Southwest Quarter of Section 22; thence continuing S 16° 02' E into Section 27, Township 17 North, Range 8, East of the 6th P.M., in Dodge County, Nebraska; along said Easterly margin of Kopecky's Subdivision for a distance of 368.07 feet; thence S 20° 02' E for a distance of 273.83 feet; thence S 7° 03' E for a distance of 265.19 feet; thence S 5° 08' W for a distance of 457.69 feet to a point on the south margin of the Northeast Quarter of the Northwest Quarter of Said Section 27; thence S 87 ° 38' E along said south margin for a distance of 130.00 feet; thence S 3° 26' E for a distance of 657.46 feet to a point on the South margin of the North half of the Southeast Quarter of the Northwest Quarter of said Section 27; thence S 87° 48' E along said South margin for a distance of 448.81 feet; thence N 89° 25' E for a distance of 337.69 feet, to a point on the westerly margin of Levee Subdivision; thence N 1° 20' W along said Westerly margin of Levee Subdivision for a distance of 771.63 feet; thence N 4° 30' W along said westerly margin of Levee Subdivision for a distance of 1011.32 feet; thence N 21° 30' W along said Westerly margin of Levee Subdivision for a distance of 206.44 feet to a point on the North margin of said Section 27, said point being the point of beginning, all in Dodge County, Nebraska. Said Tracts also known as Tax Lot 77 in Section 22-17-8 and Tax Lot 46 in Section 27-17-8.

LEGAL DESCRIPTION OF LOT 12, KOPECKY'S SUBDIVISION AS RECORDED IN BOOK 228, PAGE 443 DODGE COUNTY REGISTER OF DEEDS OFFICE:

Lot Twelve (12), Kopecky's Subdivision in Sections Twenty-two and Twenty-seven (22 & 27), Township Seventeen (17), Range Eight (8) East, Dodge County, Nebraska, as surveyed, platted and recorded, more definitely described as: Beginning at the P.I. Station No. 10 of Kopecky's Sub-Division as platted and recorded in the Register of Deeds Office, Dodge County, Nebraska; thence N 70° 34' E a distance of 442.0'; thence N 18° 0?' W a distance of 602.0'; thence N 12° 38' E a distance of 500.0'; thence S 81° 38' W a distance of 222.0'; thence S 69° 57' W a distance of 184.0'; thence S 35° 26' E a distance of 59.0'; thence S 8° 45' W a distance of 118.0'; thence S 35° 52' W a distance of 249.1'; thence S 7° 54' E a distance of 66.0'; thence S 17° 38' E a distance of 490.1'; thence S 16° 55' E a distance of 213.1'; to a point of beginning said tract containing 10.0 acres be it more or less.

DISCUSSION OF DISCREPANCY BETWEEN COEN AND WHITAKER SURVEYS:

LEVEE SUBDIVISION WAS SURVEYED AND PLATTED IN 1907. THERE IS A MAJOR FLAW IN THAT PORTION OF THE PLAT WHICH LIES IN SECTION 27. IF THE EAST LINE OF LEVEE SUBDIVISION IS RUN SOUTHERLY AS PLATTED FROM 28' WEST OF THE NORTH 1/4 CORNER OF SAID SECTION THE TIES J-K AND L-M BOTH MISS PLATTED DISTANCES BY APPROXIMATELY 90 FEET.

IN 1973 COEN SURVEYED RAINBOW LAKE AND PART OF LEVEE SUBDIVISION. HE APPARENTLY SOLVED THE PROBLEM BY WARPING THAT PORTION LYING IN THE NORTH 1/4 MILE OF SECTION 27 SO THAT ALL TIES WERE REASONABLY CORRECT. THE RAINBOW LAKE DEED DESCRIPTION IS BASED ON THIS SURVEY. WE CHECKED TIES J-K AND L-M WHICH AGREE REASONABLY WELL WITH COEN'S SURVEY.

SOME TIME LATER, WHITAKER SURVEYED THAT PORTION OF RAINBOW LAKE AND LEVEE SUBDIVISION IN SECTION 27. HE SOLVED THE PROBLEM BY IGNORING THE TIES AND ADJUSTING LEVEE SUBDIVISION USING THE COMPASS RULE AND SO STATES ON HIS UNDATED SURVEY PLAT. THE PLAT SHOWS THE CORNERS SET BY COEN BUT IGNORES THEM IN ANY CALCULATION. THE PLATS DIFFER BY ABOUT 90 FEET AT THE SOUTH END OF RAINBOW LAKE.

IS EITHER COEN OR WHITAKER RIGHT, OR ARE THEY BOTH WRONG? ONE CAN ONLY SPECULATE ON THE REASONS FOR THE FLAWED LEVEE PLAT. THE PLAT ITSELF DOES NOT APPEAR TO CLOSE MATHEMATICALLY. MY CALCULATION INDICATES AN ERROR OF CLOSURE OF 1:540 OVERALL. IT IS POSSIBLE THAT IN 1907 THE AREA WAS WOODED AS SHOWN ON THE ORIGINAL 1857 SURVEY, MAKING ACCURATE FIELD WORK MUCH MORE DIFFICULT. HOWEVER, THAT WOULD NOT EXCUSE THE FAILURE TO MATHEMATICALLY CLOSE.

OBVIOUSLY, TIE A-B TO THE NORTH 1/4 CORNER BEING ONLY 28' LONG SHOULD BE HELD. IT WOULD APPEAR UNLIKELY THAT BOTH TIES J-K AND L-M ARE IN ERROR BY 90'±. IGNORING THESE TIES WOULD ASSUME BOTH MEASUREMENTS WERE COMPLETE BLUNDERS.

MY CONCLUSION IS THAT COEN WAS CORRECT IN TRYING TO HOLD THE TIES. I CANNOT SAY WITH CERTAINTY THAT HIS SOLUTION PROVIDED A CORRECT RETRACEMENT OF THE ORIGINAL LEVEE PLAT. HOWEVER, I BELIEVE HIS SOLUTION WAS RATIONAL AND REASONABLE.

FOR THE REASONS ABOVE, THE UNDERSIGNED SURVEYOR ACCEPTS THE WORK DONE BY COEN AND USES IT AS THE BASIS FOR THIS SURVEY PLAT.

I HEREBY CERTIFY THAT THIS PLAT, MAP, SURVEY OR REPORT WAS MADE BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF NEBRASKA.

STEPHEN W. DODD, LS-503

NEBRASKA REGISTERED 7/14/2006 LS-503 LAND SURVEYOR STEPHEN W. DODD

RECEIVED JUL 20 2006 SURVEY RECORD REPOSITORY Dodge County 772-465 466

Dodd Engineering & Surveying LLC

Ph. 402-727-9067, FAX 721-0509
402 North D St., P.O. Box 1855
Fremont, NE 68026-1855

BOUNDARY SURVEY OF RAINBOW LAKE AND LOT 12 KOPECKY'S SUBDIVISION
SECTIONS 22 & 27, T17N, R8E, DODGE COUNTY, NEBRASKA.

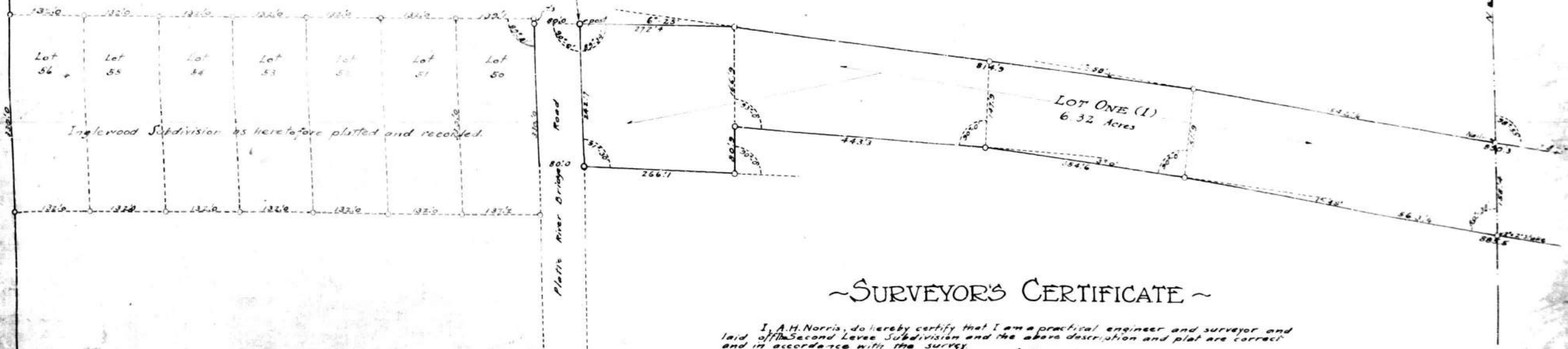
THE SECOND LEVEE SUBDIVISION
LOCATED IN SECTION 26, TOWNSHIP 17, RANGE 8, IN DODGE COUNTY, NEBRASKA.

14 cor. W. line Sec 26-17-8 Iron pipe

Center of Sec 26-17-8 Stone

THE SECOND LEVEE SUBDIVISION in the County of Dodge and State of Nebraska is located on portions of South West quarter and South East quarter of Section Twenty six (26) Township seventeen (17) North of Range Eighteen East of 6th P.M. being particularly bounded and described as follows: Commencing at a corner fence post in the east margin of the Platte River Bridge road 1011 feet east and 882.3 feet south of the northwest corner of the South west quarter of Section 26, Township 17 Range 8 East in Dodge County, Nebraska, said point being 7.3 feet south and 30 feet west of the northeast corner of Lot 50 of Inglewood Subdivision as platted and recorded; thence south 89°-14 east 272.4 feet, thence south 22°-49 east 814.9 feet, thence south 80°-51 east 342.6 feet to a 30 penny nail driven in the root of the southwest tree in the cottonwood grove, said nail being on the east line of the South west quarter of said Section 26 and 1072.4 feet south of the center of said section; thence south 80°-51 east 347.7 feet, thence south [illegible] east 560 feet, more or less, to the west margin of the right-of-way of the Chicago, Burlington & Quincy Railway Company; thence south [illegible] east 275 feet to the west margin of the right-of-way of the Chicago, Burlington & Quincy Railway Company; thence south 32°-26' west 391.9 feet, thence north 76°-56' west 550.8 feet, thence north 80° 28' west [illegible] feet, said stake being on the South west quarter of said Section 26 and 1231 feet south of the center of said section; thence north 89°-[illegible] west 443.3 feet, thence south 1°-49' west 80.9 feet, thence north 88°-11' [illegible] north 0°-20' east along the east margin of said road 242.1 feet, to the place of beginning, Lots numbered One (1) and Two (2) of said Subdivision, as per plat on the margin hereof, engineer. One (1) is that part of said Subdivision located in the South East quarter of the South East quarter of said section, containing 4.70 acres.

This point is the west side corner post in fences from [illegible] and is 882.3 south and 10.10 east of ¼ corner on the west line of Section 26, T.17 N.R.8 E. and also is 7.3 south and 30.10 east of the northeast corner of Lot 50, Inglewood Subdivision.



The Fremont Stock Yards and [illegible] SECOND LEVEE SUBDIVISION [illegible] that the Subdivision into lots [illegible] the margin of which this is made [illegible]
IN WITNESS WHEREOF, The said [illegible] hereto by its President and Secretary [illegible]

In presence of

State of Nebraska } ss.
DODGE County }

Be it remembered that on this [illegible] before me, a Notary Public in and for said County, personally came the above named L. D. Richards and [illegible] to me personally known to be the president and secretary of the Fremont Stock Yards and Land Company, a corporation, and the persons whose names are subscribed to the foregoing instrument as such officers, and acknowledged the execution thereof to be their voluntary act and deed as such officers, and the voluntary act and deed of said Fremont Stock Yards and Land Company.
IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal at my office in Fremont in said County, the day and year last above written.

~SURVEYOR'S CERTIFICATE~

I, A.H. Norris, do hereby certify that I am a practical engineer and surveyor and laid off the Second Levee Subdivision and the above description and plat are correct and in accordance with the survey.
WITNESS my hand this 20th day of December, 1913.

A. H. Norris

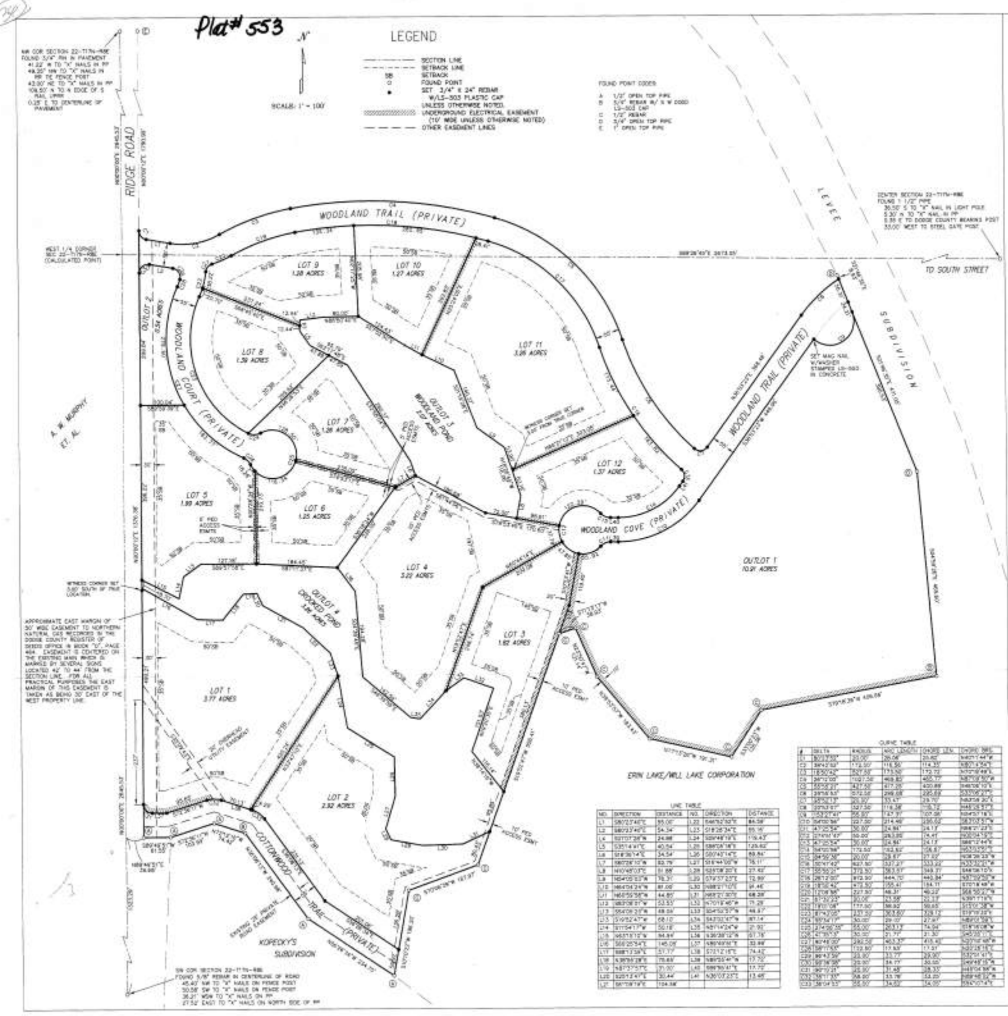
Subscribed and sworn to before me this 20th day of December 1913.

Donald E. Hanson
Notary Public

My commission expires [illegible] 1917

601

Plat# 553



LINE TABLE

NO.	DIRECTION	DISTANCE	NO.	DIRECTION	DISTANCE
L1	S80°23'40"E	55.00'	L22	S46°52'30"E	84.58'
L2	S80°23'40"E	54.34'	L23	S18°28'34"E	55.16'
L4	S01°07'28"W	24.88'	L24	S09°48'19"E	119.43'
L5	S35°14'41"E	40.54'	L25	S86°08'18"E	125.62'
L6	S18°30'14"E	34.54'	L26	S00°40'14"E	89.84'
L7	S80°28'10"W	82.79'	L27	S18°44'00"W	76.11'
L8	N10°48'03"E	51.88'	L28	S25°08'20"E	27.42'
L9	N54°05'03"W	76.31'	L29	S74°57'23"E	72.99'
L10	N64°04'24"W	81.00'	L30	N88°21'10"E	91.46'
L11	N60°59'58"W	44.85'	L31	N88°21'30"E	68.28'
L12	S80°08'01"W	53.53'	L32	N70°19'46"W	71.29'
L13	S54°09'29"W	48.04'	L33	S04°50'57"W	46.87'
L13	S19°52'47"W	68.10'	L34	S43°03'47"W	87.14'
L14	S11°54'17"W	50.18'	L35	N51°14'24"W	21.92'
L15	N63°18'10"W	94.84'	L36	N36°39'12"W	51.78'
L16	S66°25'54"E	145.08'	L37	N80°49'08"E	32.88'
L17	S88°13'38"E	57.77'	L38	S72°12'16"E	74.42'
L18	N36°59'28"E	75.69'	L39	N89°55'41"W	17.72'
L19	N87°27'57"E	31.00'	L40	S89°55'41"E	17.72'
L20	S20°12'47"E	30.44'	L41	N36°03'23"E	13.48'
L21	S61°09'19"E	104.38'			

CURVE TABLE

#	DELTA	RADIUS	ARC LENGTH	CHORD LEN.	CHORD BRG.
C1	80°23'52"	20.00'	28.06'	25.82'	S40°11'44"W
C2	38°42'52"	172.50'	116.56'	114.35'	N80°14'54"E
C3	18°50'42"	527.50'	173.50'	172.72'	N70°18'49"E
C4	26°12'00"	1027.50'	469.85'	465.77'	S87°08'50"W
C5	55°58'21"	427.50'	417.25'	400.89'	S46°06'10"E
C6	29°55'53"	572.50'	299.08'	295.69'	S33°06'27"E
C7	95°52'13"	20.00'	33.47'	29.70'	N83°59'30"E
C8	20°53'07"	327.50'	119.38'	118.72'	N45°25'57"E
C9	153°27'41"	55.00'	147.31'	107.08'	N04°57'18"E
C10	54°00'56"	227.50'	214.49'	206.62'	S63°02'51"W
C11	47°25'54"	30.00'	24.84'	24.17'	N86°21'23"E
C12	274°51'47"	30.00'	263.85'	74.41'	[illegible]
C13	47°25'54"	30.00'	24.84'	24.17'	S86°12'44"E
C14	54°00'56"	172.50'	162.62'	156.67'	[illegible]
C15	84°59'36"	20.00'	29.67'	27.02'	N08°39'33"W
C16	50°47'42"	427.50'	337.27'	333.22'	N32°32'21"W
C17	55°55'21"	372.50'	363.51'	349.37'	S46°06'10"E
C18	26°12'00"	972.50'	444.70'	440.84'	S87°08'50"W
C19	18°50'42"	472.50'	155.41'	154.71'	S70°18'49"W
C20	12°08'58"	227.50'	48.31'	48.22'	S68°30'27"W
C21	51°33'24"	20.00'	23.58'	22.11'	N39°11'15"W
C22	18°01'08"	177.50'	58.92'	58.65'	S17°12'38"W
C23	87°43'05"	237.50'	363.60'	329.12'	S19°10'23"E
C24	55°34'17"	30.00'	29.10'	27.97'	N69°12'38"E
C25	274°00'55"	55.00'	263.13'	74.04'	S18°16'08"W
C26	41°35'13"	30.00'	21.77'	21.30'	[illegible]
C27	80°48'00"	282.50'	463.37'	415.40'	N27°10'48"W
C28	58°11'55"	122.50'	17.83'	17.81'	N22°28'15"E
C29	90°43'59"	23.30'	33.77'	29.90'	S32°01'47"E
C30	93°36'58"	20.00'	34.77'	30.55'	S49°49'15"W
C31	90°10'21"	20.00'	31.45'	28.35'	N48°04'58"W
C32	38°11'35"	58.00'	33.78'	33.20'	N58°48'52"W
C33	38°04'33"	58.50'	34.62'	34.00'	S54°07'47"E

BOOK 2007 PAGE 2245

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62.50

FINAL PLAT FOR

WOODLAND LAKES SUBDIVISION

A PLANNED PRIVATE RURAL SUBDIVISION

PART OF THE W1/2 OF SECTION 22, TOWNSHIP 17 NORTH, RANGE 8 EAST OF THE 6TH P.M., DODGE COUNTY, NEBRASKA.

LEGAL DESCRIPTION:

A PARCEL OF LAND LOCATED IN THE SW1/4 AND THE NW1/4 OF SECTION 22, TOWNSHIP 17 NORTH, RANGE 8 EAST OF THE 6TH P.M., DODGE COUNTY, NEBRASKA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 22;

THENCE N00°00'00"E ALONG THE WEST LINE OF SAID SECTION 22 A DISTANCE OF 1323.29 FEET;

THENCE N88°49'51"E A DISTANCE OF 38.88 FEET TO THE EAST RIGHT-OF-WAY LINE OF RIDGE ROAD, THE POINT OF BEGINNING;

THENCE N00°00'12"E A DISTANCE OF 1376.38 FEET;

THENCE ALONG A 20.00 FOOT RADIUS CURVE TO THE LEFT AN ARC DISTANCE OF 28.06 FEET THROUGH A CENTRAL ANGLE OF 80°23'52" HAVING A CHORD DIRECTION S40°11'44"E AND A CHORD LENGTH OF 25.83 FEET;

THENCE S80°23'40"E A DISTANCE OF 55.00 FEET;

THENCE ALONG A 172.50 FOOT RADIUS CURVE TO THE LEFT AN ARC DISTANCE OF 116.56 FEET THROUGH A CENTRAL ANGLE OF 38°42'52" HAVING A CHORD DIRECTION N80°14'54"E AND A CHORD LENGTH OF 114.35 FEET;

THENCE ALONG A 527.50 FOOT RADIUS CURVE TO THE RIGHT AN ARC DISTANCE OF 173.50 FEET THROUGH A CENTRAL ANGLE OF 18°50'42" HAVING A CHORD DIRECTION N70°18'49"E AND A CHORD LENGTH OF 172.72 FEET;

THENCE ALONG A 1027.50 FOOT RADIUS CURVE TO THE RIGHT AN ARC DISTANCE OF 469.86 FEET THROUGH A CENTRAL ANGLE OF 26°12'00" HAVING A CHORD DIRECTION S87°08'50"E AND A CHORD LENGTH OF 465.77 FEET;

THENCE ALONG A 427.50 FOOT RADIUS CURVE TO THE RIGHT AN ARC DISTANCE OF 417.25 FEET THROUGH A CENTRAL ANGLE OF 55°55'21" HAVING A CHORD DIRECTION S46°06'10"E AND A CHORD LENGTH OF 400.89 FEET;

THENCE ALONG A 572.50 FOOT RADIUS CURVE TO THE LEFT AN ARC DISTANCE OF 299.08 FEET THROUGH A CENTRAL ANGLE OF 29°55'53" HAVING A CHORD DIRECTION S33°06'27"E AND A CHORD LENGTH OF 295.69 FEET;

THENCE ALONG A 20.00 FOOT RADIUS CURVE TO THE LEFT AN ARC DISTANCE OF 33.47 FEET THROUGH A CENTRAL ANGLE OF 95°52'13" HAVING A CHORD DIRECTION N83°59'30"E AND A CHORD LENGTH OF 29.70 FEET;

THENCE N36°03'23"E A DISTANCE OF 368.46 FEET;

THENCE ALONG A 327.50 FOOT RADIUS CURVE TO THE RIGHT AN ARC DISTANCE OF 119.38 FEET THROUGH A CENTRAL ANGLE OF 20°53'07" HAVING A CHORD DIRECTION N46°29'57"E AND A CHORD LENGTH OF 118.72 FEET TO A POINT ON THE SOUTHWESTERLY LINE OF LEVEE SUBDIVISION;

THENCE S21°48'35"E ALONG SAID SOUTHWESTERLY LINE A DISTANCE OF 471.05 FEET;

THENCE S04°58'28"E ALONG SAID SOUTHWESTERLY LINE A DISTANCE OF 463.60 FEET TO THE NORTHEAST CORNER OF ERIN/WILL LAKE;

THENCE S78°18'39"W ALONG THE NORTHERLY LINE OF SAID ERIN/WILL LAKE A DISTANCE OF 406.88 FEET;

THENCE S33°00'23"W ALONG SAID NORTHERLY LINE A DISTANCE OF 128.36 FEET;

THENCE N77°13'26"W ALONG SAID NORTHERLY LINE A DISTANCE OF 191.31 FEET;

THENCE N39°53'57"W ALONG SAID NORTHERLY LINE A DISTANCE OF 183.40 FEET;

THENCE N23°50'47"W ALONG SAID NORTHERLY LINE A DISTANCE OF 121.14 FEET;

THENCE S71°13'17"W ALONG SAID NORTHERLY LINE A DISTANCE OF 38.93 FEET TO THE NORTHWEST CORNER OF SAID ERIN/WILL LAKE;

THENCE S18°52'47"W ALONG THE WESTERLY LINE OF SAID ERIN/WILL LAKE A DISTANCE OF 588.41 FEET;

THENCE S70°06'38"W ALONG SAID WESTERLY LINE A DISTANCE OF 167.97 FEET;

THENCE S10°10'22"W ALONG SAID WESTERLY LINE A DISTANCE OF 106.20 FEET TO THE NORTHERLY LINE OF KOPECKY'S SUBDIVISION;

THENCE N58°56'34"W ALONG SAID NORTHERLY LINE OF KOPECKY'S SUBDIVISION A DISTANCE OF 234.70 FEET;

THENCE N36°08'13"W ALONG SAID NORTHERLY LINE OF KOPECKY'S SUBDIVISION A DISTANCE OF 240.88 FEET;

THENCE N72°12'16"W ALONG SAID NORTHERLY LINE OF KOPECKY'S SUBDIVISION A DISTANCE OF 74.42 FEET;

THENCE S72°38'11"W ALONG SAID NORTHERLY LINE OF KOPECKY'S SUBDIVISION A DISTANCE OF 103.99 FEET TO THE NORTHWEST CORNER OF SAID KOPECKY'S SUBDIVISION;

THENCE S88°49'51"W A DISTANCE OF 81.95 FEET TO THE POINT OF BEGINNING, CONTAINING 46.80 ACRES, MORE OR LESS.

NOTES:

1. WOODLAND LAKES IS A PLANNED DEVELOPMENT. THE DEVELOPMENT PLAN HAS BEEN APPROVED BY THE CITY OF FREMONT AND IS FILED AT THE CITY OF FREMONT PUBLIC WORKS DEPARTMENT. ALL REQUIREMENTS OF SAID DEVELOPMENT PLAN SHALL APPLY.
2. WELL AND SEPTIC SYSTEM LOCATIONS ARE SHOWN ON THE DEVELOPMENT PLAN. ADDITIONAL SETBACKS SHALL APPLY TO SEPTIC SYSTEMS AND RESERVE AREAS PER SAID DEVELOPMENT PLAN.
3. RESTRICTIVE COVENANTS HAVE BEEN FILED AT THE DODGE COUNTY REGISTER OF DEEDS OFFICE. ALL REQUIREMENTS OF SAID RESTRICTIVE COVENANTS SHALL APPLY.
4. PRIVATE STREETS SHALL SERVE AS EASEMENTS FOR UNDERGROUND ELECTRICAL, TELEPHONE, CABLE TELEVISION AND EXISTING OVERHEAD UTILITY LINES.
5. EASEMENT TO SOUTH STREET EAST OF LEVEE IS RECORDED IN MISCELLANEOUS BOOK 17, PAGE 306 AT THE DODGE COUNTY REGISTER OF DEEDS OFFICE.

DEDICATION

KNOW ALL MEN BY THESE PRESENTS, THAT CYNTHIA A. CHRISTENSEN AND THOMAS A. F. CHRISTENSEN, OWNERS AND PROPRIETORS OF THE TRACT OF LAND SHOWN AND DESCRIBED HEREON, HAVE CAUSED THE SAME TO BE DIVIDED INTO LOTS AND PRIVATE STREETS, SAID SUBDIVISION TO BE KNOWN AS WOODLAND LAKES SUBDIVISION. THE LOTS TO BE NUMBERED AS SHOWN AND WE APPROVE THE DISPOSITION OF THE PROPERTY AS SHOWN ON THIS PLAT AND WE HEREBY GRANT PERPETUAL EASEMENTS AT THE LOCATIONS AND TO THE WIDTHS SHOWN HEREON TO THE CITY OF FREMONT, ANY PUBLIC OR PRIVATE UTILITY COMPANY, AND FOR THE USE OF ABUTTING PROPERTY OWNERS, FOR THE SOLE PURPOSE OF CONSTRUCTION AND MAINTENANCE OF UTILITY LINES AND PIPES AND DRAINAGE FACILITIES. NO PERMANENT BUILDING OR RETAINING WALL SHALL BE PLACED IN THE ABOVE DESCRIBED EASEMENT WAYS, BUT THE SAME MAY BE USED FOR GARDENS, LANDSCAPING AND OTHER PURPOSES THAT DO NOT THEN OR LATER INTERFERE WITH THE AFORESAID USES OR RIGHTS HEREIN GRANTED.

WE, OUR SUCCESSORS, ASSIGNS AND HEIRS, ACCEPT RESPONSIBILITY FOR PROVIDING MAINTENANCE, REPAIR AND REPLACEMENT OF SAID PRIVATE STREETS AND ACCESS FOR EMERGENCY VEHICLES.

IN WITNESS WHEREOF, WE DO HEREBY SET OUR HANDS THE

____ DAY OF 12-21, 2006, A.D.

CYNTHIA A. CHRISTENSEN

THOMAS A. F. CHRISTENSEN

ACKNOWLEDGEMENT

STATE OF NEBRASKA)
) SS
COUNTY OF DODGE)

ON THIS 21 DAY OF December A.D. 2006, BEFORE ME, A GENERAL NOTARY PUBLIC, PERSONALLY APPEARED CYNTHIA A. CHRISTENSEN AND THOMAS A. F. CHRISTENSEN, WHO ARE KNOWN TO ME TO BE THE IDENTICAL PERSONS WHOSE NAMES APPEAR ON THE FOREGOING DEDICATION, AND WHO HEREBY ACKNOWLEDGE THE SIGNING OF SAID INSTRUMENT TO BE THEIR VOLUNTARY ACT AND DEED.

WITNESS MY HAND AND OFFICIAL SEAL DATE LAST AFORESAID.

GENERAL NOTARY PUBLIC

COMMISSION EXPIRES ____

PLANNING COMMISSION APPROVAL

ON THIS 20th DAY OF November A.D. 2006, THIS PLAT OF WOODLAND LAKES SUBDIVISION WAS APPROVED AND ACCEPTED BY THE PLANNING COMMISSION OF THE CITY OF FREMONT, DODGE COUNTY, NEBRASKA.

CHAIRMAN

CITY COUNCIL ACCEPTANCE

ON THIS 28th DAY OF November, THIS PLAT OF WOODLAND LAKES SUBDIVISION WAS APPROVED AND ACCEPTED BY RESOLUTION OF THE CITY COUNCIL THE CITY OF FREMONT, DODGE COUNTY, NEBRASKA.

MAYOR CLERK

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY AS THE UNDERSIGNED REGISTERED LAND SURVEYOR THAT I HAVE SURVEYED THE TRACT OF LAND SHOWN AND DESCRIBED HEREON, AND THAT PERMANENT MARKERS HAVE BEEN FOUND OR WILL BE SET AS DESCRIBED HEREON, WITHIN 60 DAYS OF THE FILING OF THIS PLAT AT THE DODGE COUNTY REGISTER OF DEEDS OFFICE.

STEPHEN W. DODD, LS-503

12/21/2006

DATE

NEBRASKA REGISTERED LS-503 LAND SURVEYOR STEPHEN W. DODD

Dodd Engineering & Surveying LLC

WOODLAND LAKES SUBDIVISION

A PLANNED PRIVATE RURAL SUBDIVISION

FINAL PLAT

SHEET 1 OF 1

APPENDIX G – MOCK INSPECTION AND PL 84-99 GUIDANCE

PUBLIC LAW 84-99
REHABILITATION ASSISTANCE FOR
NON-FEDERAL FLOOD CONTROL PROJECTS

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
READINESS BRANCH
1616 CAPITOL AVENUE
OMAHA, NEBRASKA 68102-4901

24 HOUR TELEPHONE NO.
402-995-2448

June 2018

PUBLIC LAW 84-99
REHABILITATION ASSISTANCE FOR
NON-FEDERAL FLOOD CONTROL PROJECTS

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APPENDIX D: PUBLIC SPONSOR FORM

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DEFINITIONS

Emergency. A situation involving a natural or technological disaster that would result in an unacceptable hazard to human life, a significant loss of property, or significant economic hardship.

Flood. Abnormally high water flow or water level that overtops the natural or artificial confining boundaries of a waterway. A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of river and/or tidal waters and/or the unusual accumulations of waters from any sources.

Flood Control Project(s). Structures designed and constructed to have appreciable and dependable effects in preventing damage caused by irregular and unusual rises in water level. Flood Control Projects may include levees, channels, floodwalls, dams and Federally authorized and constructed hurricane or shore protective structures. Structures designed and constructed to protect against salt water intrusion or tidal fluctuations, channel alignment, navigation, recreation, fish and wildlife, land reclamation, or to protect against land erosion are not considered to be Flood Control Projects. A riprap bank erosion control structure is not considered to be a flood control project.

Level of Protection. The degree of protection against flooding provided by a Flood Control Project, normally expressed in terms of the cyclical flood-level against which protection is provided.

Principal or Main Levee. A structure, normally of earth or stone, built generally parallel to a river to protect land from flooding. A levee is a complete unit, designed and intended for flood control. A levee (excluding a ring levee) is always tied to high ground at both ends.

Public Law 84-99. Public Law 84-99 is the discretionary authority given to the Corps of Engineers by Congress to act and react to emergencies caused by floods, contaminated water sources, drought, or dam failures. This authority allows the Corps to repair and/or rehabilitate any qualified flood control project whether it is federally or privately constructed.

Secondary Levee. A levee that is landward of the main or principal levee. The level of protection of a secondary levee is always less than the level of protection provided by the main levee.

What is the purpose of this document?

The purpose of this document is to explain to non-federal interests (local interests) the Corps of Engineers Rehabilitation Program for non-federal flood control projects under public law 84-99 (PL 84-99).

The Corps of Engineers has authority under PL 84-99 to supplement local efforts in the repair of flood control projects which are damaged by a flood. To be eligible for rehabilitation assistance under PL 84-99, projects constructed by non-federal interests must meet certain criteria and standards set forth by the Corps of Engineers. These criteria and standards are outlined and explained within this document.

Since the majority of non-federal flood control projects in the Omaha District are levees, the term "Levees" will be used throughout this document in lieu of "non-federal flood control projects", regardless of the type of structure.

What criteria must my levee meet in order to be eligible for the Corps of Engineers Rehabilitation Program?

Your levee must have a public sponsor as defined by your state laws. This sponsor will be the public representative for your levee and will represent you in all matters concerning your levee. Public sponsors must be one of the following:

- A legal subdivision of a state government or a state itself.
- A local unit of government.
- A state chartered organization such as a levee board.
- A qualified Indian tribe or tribal organization.

The function of your levee must be for the purpose of providing flood protection. Your levee is not eligible for the rehabilitation program if it was built for a non-flood related purpose such as channel alignment, recreation, fish and wildlife, land reclamation, drainage, or to protect against land erosion.

Your levee must provide complete flood protection. A levee system which provides complete flood protection is one that is technically sound (i.e. levee is tied off to high ground, is geotechnically stable, etc.), well maintained, and provides reliable flood protection.

Your levee must protect against a minimum of a 10-year flood event for an urban area and a 5-year flood event for an agricultural area.

Your levee must be a primary levee. Secondary levees are not eligible for the rehabilitation program. Exceptions to this policy may be granted if the secondary levee was designed to protect human life or the levee is a major component of the primary levee system and is necessary to assure the flood control protection of the total system.

Your levee must be constructed in accordance with all applicable federal state and local permits, codes, ordinances, and their applicable laws in order to be eligible for the rehabilitation program. This includes flood plain management ordinances in counties where no flood insurance programs exist.

How do I apply for consideration to participate in the Corps of Engineers Rehabilitation Program?

To apply for eligibility under the Corps of Engineers Rehabilitation Program you need to complete the form in Appendix A and mail it to the Corps of Engineers office (Omaha District Readiness Branch) cited on the front page of this publication. The best time to apply is during non-flood periods, this allows the Corps time to determine the eligibility of your levee for inclusion into the program prior to your next flood season.

How is my eligibility for inclusion into the Corps of Engineers Rehabilitation Program determined?

Upon receiving the above-mentioned request, an Initial Eligibility Inspection (IEI) will be made by the Corps of Engineers to review your design documents relative to levee construction and height (if available), your maintenance program and to perform a technical evaluation of your levee. This inspection will determine the adequacy of your levee to provide reliable flood protection.

The Initial Eligibility Inspection Form (Appendix C) has been developed to establish minimum performance levels for non-federal levees to be eligible for the Corps of Engineers rehabilitation program. The following is a summary of the ratings:

<u>Rating Guide</u>

A – Acceptable	No work required. Continue Operation and Maintenance as usual.
M – Minimally Acceptable	A deficient condition exists which should be improved by the levee sponsor/owner.
U – Unacceptable	A condition exists which requires immediate corrective action to be taken by the sponsor/owner before the levee is eligible for inclusion into the PL 84-99 Rehabilitation Program.

After the initial inspection has been completed, an inspection a letter will be sent to you identifying the results and transmitting a copy of the inspection report. This inspection report will cite your levee's eligibility to be included in the Corps of Engineers program; and, will identify any deficiencies requiring correction or upgrades necessary prior to inclusion into the rehabilitation program.

If there are deficiencies or required upgrades necessary to meet Corps of Engineers standards, you will be notified of what corrective action is required and given a specific time frame to complete the work. If you do not complete the required work within the given time frame you will ineligible for inclusion into the Rehabilitation Program. No further inspections of your levee will be made until the Omaha District Readiness Branch office is notified in writing that the corrective actions have been completed.

If you do not agree with the results of the Corps of Engineers evaluation of your levee, you may choose to provide your own detailed engineering study (Engineer Certified) for consideration.

Once I am in the Rehabilitation Program how is my levee's eligibility maintained?

Once in the program, the project sponsor is required to ensure adequate maintenance and operation of the levee. Guides to assist in the maintenance and inspection of your levee are included in the Non-Federal Levee Owner's Manual located at the following website:

http://www.nws.usace.army.mil/Portals/27/docs/emergency/LeveeOwnersManual(final).pdf.

The Corps of Engineers will continue to inspect your levee on a regular basis (approximately every two years) in order to confirm the condition of the levee, to detect any changed conditions which could impact the integrity of your levee, and to evaluate the maintenance program. During these inspections, the levee will be rated using a form similar to the one found in the Levee Owner's Manual, Appendix C. The project sponsor will be invited, and is encouraged, to attend the periodic inspections and will be notified of the results of these inspections and advised of any corrective measures required.

What if there is a problem with my levee that I/Sponsor am unsure of how to correct?

The Corps of Engineers will provide technical assistance upon request. To request technical assistance, contact the Omaha District Readiness Branch. The contact information is cited on the front page of this publication.

What do I do when my levee is damaged by a flood?

You must submit a request for Corps of Engineers assistance. A sample copy of the request form is located in Appendix B. This request must be submitted within 30 days after the flood event.

Upon receipt of this request, the Corps of Engineers will inspect your project to determine the extent of the damage, the best repair alternative and whether or not the cost of repair is economically feasible.

The project sponsor will be notified verbally and in writing of the inspection results and the intent of the Corps of Engineers to participate in the repair.

If the Corps of Engineers does plan to provide rehabilitation assistance, the project sponsor will be required to furnish formal written assurances of local cooperation to the Corps of Engineers prior to the authorization of any repairs to your levee. The purpose of this agreement is to obtain an understanding between the Corps of Engineers and the sponsor, concerning the responsibilities of each party. The items of local cooperation which are required are discussed in the following paragraphs.

Local Cooperation Agreement

The following paragraphs briefly describe the items included in the local cooperation agreement. This agreement must be executed prior to receiving rehabilitation assistance.

Provide without cost to the United States, the necessary land, easements and rights-of-way including borrow and disposal areas (suitable to the Corps of Engineers) as necessary to perform the required construction, and to secure all necessary permits prior to initiation of construction by the Corps of Engineers. Easements (which extend for the life of the project) will also be provided for future maintenance, operation, and inspection.

Hold and save the United States free from damages due to any authorized work, exclusive of damages due to the fault or negligence of the United States or its contractors.

Contribute 20 percent of the construction cost for rehabilitation repairs. Contributed costs may be in the form of cash (provided prior to the award of a federal contract for authorized work) or *in-kind* services such as labor and/or equipment, etc. or a combination of both cash and, *in-kind* services. The value of in-kind contributions will be determined by the Disctrict Engineer. Items of cooperation required by the Corps of Engineers such as lands, easements and rights-of-way, are not considered to be contributed costs.

Maintain and operate, in a manner satisfactory to the Corps of Engineers, (1) all the repair or restoration work after completion and (2) all inter-related portions of the flood control works not reqiring repair or restoration such as levees, berms, drainage structures, bank protection, etc.

Relocations (i.e. Roadway, utilities, etc.) required to repair the levee.

Since I'm in the Corps of Engineers Rehabilitation Program, can I be certain of receiving assistance when my levee is damaged?

There *should be* no problem as long as your levee is in good standing (meets current eligibility criteria) at the time of the flood and the following stipulations are met:

1) The damage to your levee must have been by a flood; damages by other occurrences, natural or man-made, are not eligible for Corps of Engineers assistance.

2) Damages to your levee must be greater than $15,000 or they will be considered normal maintenance *and not* eligible for Corps of Engineers assistance.

3) Any deficient or deferred maintenance existing when flood damages occur will be accomplished by or at the expense of the project sponsor prior to or concurrently with authorized rehabilitation work. When work by the Corps of Engineers corrects deferred maintenance the estimated cost of this work will be added as contributed funds over and above the 20% outlined in the local cooperation agreement.

4) The benefits provided by your project must exceed the cost of the repairs.

What do I do if I have questions or need additional information on Corps of Engineers Rehabilitation Program?

Please feel free to telephone or write the Corps of Engineers Office identified below.

ADDRESS: Department of the Army
Corps of Engineers, Omaha District
Readiness Branch
1616 Capitol Avenue
Omaha, Nebraska 68102-4901

TELEPHONE: (402) 995-2448

Appendix A
Request for Application into the Rehabilitation Program

District Engineer
U.S. Army Corps of Engineers, Omaha
1616 Capitol Avenue, OD-E
Omaha, Nebraska 68102-4901
402-995-2448

Date of Request: ____

Dear Sir:

The purpose of this letter is to request the Omaha District Corps of Engineers to consider the levee project described below for inclusion into the Corps Emergency Rehabilitation Program for non-Federal Flood Control Projects under Public Law 84-99.

Project Location

State: _____ Township: _____

County: _____ Range:_____

River or Stream: _____ Section: _____

The requirements of the program as outlined by the Omaha District Corps of Engineers are understood and a public entity has either been obtained or is being pursued to be the Project Sponsor for the levee project.

Sincerely,

Point of Contact:

Name: _____

Address: _____

Telephone: _____

Title: _____

_____
(Owner(s) Name and Signature)

Appendix B
Request for Rehabilitation Assistance

U.S. Army Corps of Engineers, Omaha District DATE:
Request:_____
Attention: Readiness Branch
1616 Capitol Avenue
Omaha, Nebraska 68102

Dear Sir/Madam:

The purpose of this letter is to request Rehabilitation Assistance from the U.S. Army Corps of Engineers (USACE) under Public Law 84-99 for the repair of the _____ _____ levee (or other type of flood control project) that was damaged by (flood)(high waters) during (date: month/day/year) _____ . The project is Active in the Rehabilitation Program, and was last inspected by the USACE on _____. The location of the levee and a brief description of the damage are as follows:

Project Identification Number _____ River or Stream _____
Bank (circle): Left, Right, Both
Description of Damage _____

_____

City: _____ County _____ State _____

Section _____ Township _____ Range _____

Public Sponsor Point of Contact:

Name_____
Address _____
Telephone (C) _____ (H) _____

If this project is eligible for PL 84-99 Rehabilitation Assistance, I further request that the USACE take all necessary steps to accomplish the appropriate repairs. It is agreed that the required items of local cooperation will be provided should the flood control project be eligible for Rehabilitation Assistance under PL 84-99 and the repair work is accomplished by the USACE.

I hereby certify that the right-of-way which is required for any authorized repair work is presently available, and this letter constitutes permission for the Government and its agents to enter and use said right-of-way in undertaking authorized repair work.

Sincerely,

_____

This is a preliminary evaluation of the Fremont levee system utilizing the USACE Inspection Report

Flood Damage Reduction Segment / System Inspection Report

US Army Corps of Engineers®

Name of Segment / System: Fremont, Farmland, and Railroad Levee

Public Sponsor(s): City of Fremont, Nebraska

Public Sponsor Representative: _____

Sponsor Phone: _____

Sponsor Email: _____

Corps of Engineers Inspector: _____ Date of Inspection: _____

Inspection Report Prepared By: _____ Date Report Prepared: _____

Internal Technical Review (for Periodic Inspections) By: _____ Date of ITR: _____

Final Approved By: _____ Date Approved: _____

Type of Inspection:

- ☐ **Initial Eligibility Inspection**
- ☐ **Continuing Eligibility Inspection (Routine)**
- ☐ **Continuing Eligibility Inspection (Periodic)**

Overall Segment / System Rating:

- ☐ **Acceptable**
- ☐ **Minimally Acceptable**
- ☐ **Unacceptable**

Contents of Report:

- ☐ **Instructions**
- ☐ **Initial Eligibility Inspection**
- ☐ **General Items for All Flood Control Works**
- ☐ **Levee Embankment**
- ☐ **Concrete Floodwalls**
- ☐ **Sheet Pile and Concrete I-walls**
- ☐ **Interior Drainage System**
- ☐ **Pump Stations**
- ☐ **FDR System Channels**

Note: In addition to the report contents indicated here, a plan view drawing of the system, with stationing, should be included with this report to reference locations of items rated less than acceptable. Photos of general system condition and any noted deficiencies should also be attached.

US Army Corps
of Engineers®

Flood Damage Reduction Segment / System
Public Sponsor Pre-Inspection Form

The following information is to be provided by the levee district sponsor prior to an inspection. This information will be used to help evaluate the organizational capability of the levee district to manage the levee segment / system maintenance program.

1. Levee segment / system and district: (name of the segment / system and levee district)
2. Reporting period: (month/day/year to month/day/year)
3. Summary of maintenance required by last inspection report:
4. Summary of maintenance performed this reporting period:
5. Summary of maintenance planned next reporting period:
6. Summary of changes to segment / system since last inspection:
7. Problems/ issues requiring the assistance of the US Army Corps of Engineers:

Public Sponsor Pre-Inspection Report

The following information is to be provided by the levee district sponsor prior to an inspection

8. Levee district organization: (elected or appointed levee district officials and key employees)

Name	Position	Mailing Address	Phone Number	Email Address

General Instructions for the Inspection of Flood Damage Reduction Segments / Systems

A. Purpose of USACE Inspections:

The primary purpose of these inspections is to prevent loss of life and catastrophic damages; preserve the value of Federal investments, and to encourage non-Federal sponsors to bear responsibility for their own protection. Inspections should assure that Flood Damage Reduction structures and facilities are continually maintained and operated as necessary to obtain the maximum benefits. Inspections are also conducted to determine eligibility for Rehabilitation Assistance under authority of PL 84-99 for Federal and non-Federal systems. (ER 1130-2-530, ER 500-1-1)

B. Types of Inspections:

The Corps conducts several types of inspections of Flood Damage Reduction systems, as outlined below:

Initial Eligibility Inspections	Continuing Eligibility Inspections	
	Routine Inspections	**Periodic Inspections**
IEIs are conducted to determine whether a non-Federally constructed Flood Damage Reduction system meets the minimum criteria and standards set forth by the Corps for initial inclusion into the Rehabilitation and Inspection Program.	RIs are intended to verify proper maintenance, owner preparedness, and component operation.	PIs are intended to verify proper maintenance and component operation and to evaluate operational adequacy, structural stability, and safety of the system. Periodic Inspections evaluate the system's original design criteria vs. current design criteria to determine potential performance impacts, evaluate the current conditions, and compare the design loads and design analysis used against current design standards. This is to be done to identify components and features for the sponsor that need to be monitored more closely over time or corrected as needed. (Periodic Inspections are used as the basis of risk assessments.)

C. Inspection Boundaries:

Inspections should be conducted so as to rate each Flood Damage Reduction "Segment" of the system. The overall system rating will be the lowest segment rating in the system.

Project	System	Segment
A flood damage reduction project is made up of one or more flood damage reduction systems which were under the same authorization.	A flood damage reduction system is made up of one or more flood damage reduction segments which collectively provide flood damage reduction to a defined area. Failure of one segment within a system constitutes failure of the entire system. Failure of one system does not affect another system.	A flood damage reduction segment is defined as a discrete portion of a flood damage reduction system that is operated and maintained by a single entity. A flood damage reduction segment can be made up of one or more features (levee, floodwall, pump stations, etc).

D. Land Use Definitions:

The following three definitions are intended for use in determining minimum required inspection intervals and initial requirements for inclusion into the Rehabilitation and Inspection Program. Inspections should be considered for all systems that would result in significant environmental or economic impact upon failure regardless of specific land use.

Agricultural	Rural	Urban
Protected population in the range of zero to 5 households per square mile protected.	Protected population in the range of 6 to 20 households per square mile protected.	Greater than 20 households per square mile; major industrial areas with significant infrastructure investment. Some protected urban areas have no permanent population but may be industrial areas with high value infrastructure with no overnight population.

E. Use of the Inspection Report Template:

The report template is intended for use in all Army Corps of Engineers inspections of levee and floodwall systems and flood damage reduction channels. The section of the template labeled “Initial Eligibility" only needs to be completed during Initial Eligibility Inspections of Non-Federally constructed Flood Damage Reduction Systems. The section labeled "General Items" needs to be completed with every inspection, along with all other sections that correspond to features in the system. The section labeled "Public Sponsor Pre-Inspection Report" is intended for completion before the inspection, if possible.

F. Individual Item / Component Ratings:

Assessment of individual components rated during the inspection should be based on the criteria provided in the inspection report template, though inspectors may incorporate additional items into the report based on the characteristics of the system. The assessment of individual components should be based on the following definitions.

Acceptable Item	Minimally Acceptable Item	Unacceptable Item
The inspected item is in satisfactory condition, with no deficiencies, and will function as intended during the next flood event.	The inspected item has one or more minor deficiencies that need to be corrected. The minor deficiency or deficiencies will not seriously impair the functioning of the item as intended during the next flood event.	The inspected item has one or more serious deficiencies that need to be corrected. The serious deficiency or deficiencies will seriously impair the functioning of the item as intended during the next flood event.

G. Overall Segment / System Ratings:

Determination of the overall system rating is based on the definitions below. Note that an Unacceptable System Rating may be either based on an engineering determination that concluded that noted deficiencies would prevent the system from functioning as intended during the next flood event, or based on the sponsor's demonstrated lack of commitment or inability to correct serious deficiencies in a timely manner.

Acceptable System	Minimally Acceptable System	Unacceptable System
All items or components are rated as Acceptable.	One or more items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable items would not prevent the segment / system from performing as intended during the next flood event.	One or more items are rated as Unacceptable and would prevent the segment / system from performing as intended, or a serious deficiency noted in past inspections (which had previously resulted in a minimally acceptable system rating) has not been corrected within the established timeframe, not to exceed two years.

H. Eligibility for PL84-99 Rehabilitation Assistance:

Inspected systems that are not operated and maintained by the Federal government may be Active in the Corps' Rehabilitation and Inspection Program (RIP) and eligible for rehabilitation assistance from the Corps as defined below:

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
The system is active in the RIP and eligible for PL84-99 rehabilitation assistance.	The system is Active in the RIP during the time that it takes to make needed corrections. Active systems are eligible for rehabilitation assistance. However, if the sponsor does not present USACE with proof that serious deficiencies (which had previously resulted in a minimally acceptable system rating) were corrected within the established timeframe, then the system will become Inactive in the RIP.	The system is Inactive in the RIP, and the status will remain Inactive until the sponsor presents USACE with proof that all items rated Unacceptable have been corrected. Inactive systems are ineligible for rehabilitation assistance.

I. Reporting:

After the inspection, the Corps is responsible for assembling an inspection report (or a summary report if it was a Periodic Inspection) including the following information:

a. All sections of the report template used during the inspection, including the cover and pre-inspection materials. (Supplemental data collected, and any sections of the template that weren't used during the inspection do not need to be included with the report.)

b. Photos of the general system condition and noted deficiencies.

c. A plan view drawing of the system, with stationing, to reference locations of items rated less than acceptable.

d. The relative importance of the identified maintenance issues should be specified in the transmittal letter.

e. If the Overall System Rating is Minimally Acceptable, the report needs to establish a timeframe for correction of serious deficiencies noted (not to exceed two years) and indicate that if these items are not corrected within the required timeframe, the system will be rated as Unacceptable and made Inactive in the Rehabilitation Inspection Program.

J. Notification:

Reports are to be disseminated as follows within 30 days of the inspection date.

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
Reports need to be provided to the local sponsor and the county emergency management agency.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, and to the FEMA region.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, FEMA region, and to the Congressional delegation within 30 days of the inspection.

Anticipated status is preliminarily identified

Initial Eligibility

For use only during Initial Eligibility Inspections of Non-Federally Constructed Flood Damage Reduction Segments / Systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Public Sponsor (A or U only)	U	**A**	The Public Sponsor is a legally constituted public body with full authority and capability to perform the terms of its agreement as the non-Federal partner of the Corps for a segment / system, able to pay damages, if necessary, in the event of its failure to perform. The public sponsor may be a State, County, City, Town, Federally recognized Indian Tribe or tribal organization, Alaska Native Corporation, or any political subpart of a State or group of states that has the legal and financial authority and capability to provide the necessary cash contributions and the lands, easements, rights-of-way, relocations, borrow, and dredged or excavated materials disposal areas (LERRD's) necessary for the segment / system, and who could legally hold and save the Federal government free from damages that could potentially arise during post-flood rehabilitations or other work on the segment / system.	System lacks sufficient ROW to maintain the clear zone.
		U	The segment / system does not have a public sponsor as defined above.	
2. Flood Protection (A or U only)	A	**A**	The principal function of the segment / system is to protect people or property from floods.	
		U	The segment / system was built or is primarily used for channel alignment, navigation, recreation, fish and wildlife, land reclamation, drainage, to protect against land erosion or tidal inflows, or for some other non-flood related purpose.	
3. Segment / System Completion (A or U only)	A	**A**	Segment / System construction is fully completed.	
		U	The segment / system is still under construction.	
4. Construction Compliance (A or U only)	A	**A**	Appropriate local, State, tribal, and/or Federal permits (right-of-way, easements, regulatory permits, etc.), or waivers thereof, have been obtained for FDR segment / system construction and subsequent modifications. The segment / system was constructed in accordance with all applicable Federal, state and local codes, ordinances, and applicable laws.	Any available documentation should be compiled within the O&M Manual and provided to USACE if requested.
		U	The appropriate permits (or waivers thereof) have not been obtained for the segment / system, or the segment / system was not constructed in accordance with applicable codes, ordinances, and laws.	
5. Primary Levee	A	**A**	In the case of a levee segment / system, the levee is a primary levee or is a secondary levee which is designed to protect human life.	
		U	The levee is a secondary levee and was not designed to protect human life.	
		N/A	The FDR segment / system is not a levee segment / system.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

Initial Eligibility

For use only during Initial Eligibility Inspections of Non-Federally Constructed Flood Damage Reduction Segments / Systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
6. Minimum Elevation[1] (A or U only)	A	**A**	• **Urban Levees and Floodwalls**- Minimum elevation corresponding to a flood level with 10% probability of occurring in a given year (10-year flood). • **Agricultural Levees and Floodwalls**- Minimum elevation corresponding to a flood level with 20% probability of occurring in a given year (5-year flood). • **Flood Damage Reduction Channels**- Minimum capacity is for a flood with a 10% probability of occurring in a given year (10-year flood). Improved channels must additionally provide drainage for at least 1.5 square miles of land and have a capacity of at least 800 cfs. (Interior drainage channels within the protected area of a levee segment / system are not considered to be flood damage reduction channels under the RIP.)	Urban levee with elevation above the 10-year flood, plus 2-feet freeboard. Overtopping discharge is approximately the 100-year flood.
		U	The FDR segment / system does not meet requirements for minimum elevation, capacity, or drainage area.	
7. Physical Location and Cross Section (A or U only)	A	**A**	The physical location, cross section, and other design elements of the FDR system are sufficient to provide reliable flood protection. The FDR segment / system forms a properly closed segment / system. See Table 5-4, EP 500-1-1.	See JEO Levee Evaluation Report: Section 8
		U	The FDR segment / system was not constructed in an appropriate location, does not have an appropriate cross section, is not a properly closed segment / system, or has other shortcomings with design elements necessary for providing reliable flood damage reduction.	
8. Embankment Fill Material[2]	A	**A**	Embankment fill material is uniform and adequately compacted throughout the entire FDR segment / system, and the type of embankment material is suitable to prevent slides and seepage problems.	See boring logs in Appendix A. Embankment fill material in the upper 6-ft + consists of silty sand and is relatively uniform.
		U	Embankment fill material is not uniform, or there is no compaction and evidence indicates a need for compaction, or the type of embankment material is unsuitable and is likely to contribute to the development of slides or seepage problems.	
9. Foundations[2]	A	**A**	Foundation material and construction methods adequately address piping, sand boils, seepage, or settlements that would reduce the level of protection.	Geotechnical evaluation indicates excessive underseepage at one evaluation location, for top of levee loading. Concern is reduced for lower loading (e.g., 10-year event); however more evaluation locations or higher water level loading may indicate underseepage control features may be needed. Limits TBD.
		U	Foundation material and construction methods are such that excessive uncontrolled seepage, sand boils, and piping will occur. Performance history indicates significant uncontrolled seepage, sand boils or piping.	
10. Erosion Control	A	**A**	Erosion protection is capable of handling the designed flow velocity for the level of protection for the entire FDR segment / system. The FDR segment / system is protected against bank caving and slides in all necessary areas, and has adequate drainage to protect FDR segment / system slopes from runoff erosion.	Velocity assessment indicates velocities along the levee embankment are low, prior to overtopping, and a fully vegetated embankment should reduce erosive potential.
		U	Erosion protection is not present and there is evidence indicating a need for erosion protection.	

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Initial Eligibility

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
11. Interior Drainage System[3] (including culverts, gates, pump stations)	N/A	**A**	Given the level of protection provided by the FDR system, interior drainage structures are appropriately sized, situated, and constructed to move anticipated runoff and seepage out of the protected area. Pump stations will not become inundated during regular operation and their power system is adequately designed and reliable.	There are no known interior drainage penetrations through the levee system, pump stations, gates, etc.
		U	Interior drainage structures are undersized, poorly constructed, poorly situated, or unreliably designed.	
		N/A	The issue of interior drainage does not apply to this type of FDR segment / system.	
12. Structures[3]	N/A	**A**	Structures are designed and constructed to withstand anticipated loadings.	There are no known structures in the levee system.
		U	Structures are unreliably designed or inadequately constructed.	

[1] Depending on available data and local Corps policy, the minimum elevation required may be calculated using traditional methods, with the addition of 1 foot of freeboard in agricultural areas and 2 feet of freeboard in urban areas, or using annual exceedance probability, which numerically accounts for the natural variation and uncertainty when estimating discharge-probability and stage-discharge functions so that additional requirements for elevation are based on the level of uncertainty in the data.
[2] This item should be evaluated based on a review of performance history. If this is not available, some form of engineering assessment is required.
[3] Documentation (plans, at a minimum) required for any necessary engineering evaluation is to be provided by the public sponsor.

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General Items for All Flood Damage Reduction Segments / Systems

For use during all inspections of all Flood Damage Reduction Segments / Systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Operations and Maintenance Manuals	M	**A**	Levee Owner's Manual, O&M Manuals, and/or manufacturer's operating instructions are present.	O&M manual development is underway; needs to be finalized.
		M	Sponsor manuals are lost or missing or out of date; however, sponsor will obtain manuals prior to next scheduled inspection.	
		U	Sponsor has not obtained lost or missing manuals identified during previous inspection.	
2. Emergency Supplies and Equipment (A or M only)	M	**A**	The sponsor maintains a stockpile of sandbags, shovels, and other flood fight supplies which will adequately supply all needs for the initial days of a flood fight. Sponsor determines required quantity of supplies after consulting with inspector.	Needs detail development, in conjunction with O&M manual.
		M	The sponsor does not maintain an adequate supply of flood fighting materials as part of their preparedness activities.	
3. Flood Preparedness and Training (A or M only)	M	**A**	Sponsor has a written system-specific flood response plan and a solid understanding of how to operate, maintain, and staff the FDR system during a flood. Sponsor maintains a list of emergency contact information for appropriate personnel and other emergency response agencies.	Needs detail development, in conjunction with O&M manual.
		M	The sponsor maintains a good working knowledge of flood response activities, but documentation of system-specific emergency procedures and emergency contact personnel is insufficient or out of date.	

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Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Unwanted Vegetation Growth[1]	U	**A**	The levee has little or no unwanted vegetation (trees, bush, or undesirable weeds), except for vegetation that is properly contained and/or situated on overbuilt sections, such that the mandatory 3-foot root-free zone is preserved around the levee profile. The levee has been recently mowed. The vegetation-free zone extends 15 feet from both the landside and riverside toes of the levee to the centerline of the tree. If the levee access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-301 or Corps policy for regional vegetation variance.	Dense forested areas are present within the recommended vegetation-free zone and/or the Levee easement. Tree removal is necessary. Recommendations for tree removal can be found in JEO's Levee Evaluation Report: Project 2.
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the levee.	
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above and must to be removed to reestablish or ascertain levee integrity.	
2. Sod Cover	A	**A**	There is good coverage of sod over the levee.	
		M	Approximately 25% of the sod cover is missing or damaged over a significant portion or over significant portions of the levee embankment. This may be the result of over-grazing or feeding on the levee, unauthorized vehicular traffic, chemical or insect problems, or burning during inappropriate seasons.	
		U	Over 50% of the sod cover is missing or damaged over a significant portion or portions of the levee embankment.	
		N/A	Surface protection is provided by other means.	
3. Encroachments	M	**A**	No trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the levee.	During JEO's November 2019 site visit, encroachments such as utilities and fences encroach upon or cross the levee prism. These encroachments generally do not interfere with the levee functionality or expected operations. Encroachments are noted in JEO's Inspection Summary located in Appendix D of JEO's Levee Evaluation Report.
		M	Trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the levee.	
4. Closure Structures (Stop Log, Earthen Closures, Gates, or Sandbag		**A**	Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.	

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Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
Closures) (A or U only)	N/A	U	Any of the following issues is cause for this rating: Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within the anticipated warning time. The storage vaults cannot be opened during the time of inspection. Components of closure are not clearly marked and installation instructions/ procedures are not readily available. Trial erections have not been accomplished in accordance with the O&M Manual.	No closure structures are known to exist along the Levee.
		N/A	There are no closure structures along this component of the FDR segment / system.	
5. Slope Stability	M	A	No slides, sloughs, tension cracking, slope depressions, or bulges are present.	During JEO's November 2019 site visit, multiple sites of minor slope erosion were noted. Erosion is described in JEO's Inspection Summary located in Appendix D of JEO's Levee Evaluation Report. The Geotechnical Evaluation Report located in Appendix A identified no immediate threat to the levee embankment related to slope stability at the locations analyzed.
		M	Minor slope stability problems that do not pose an immediate threat to the levee embankment.	
		U	Major slope stability problems (ex. deep seated sliding) identified that must be repaired to reestablish the integrity of the levee embankment.	
6. Erosion/ Bank Caving	U	A	No erosion or bank caving is observed on the landward or riverward sides of the levee that might endanger its stability.	Two complete and three partial breaches occurred during the March 2019 flood event. These breaches are noted in JEO's Flood Damage Assessment Report located in Appendix C of the JEO Levee Evaluation Report. The Geotechnical Evaluation Report located in Appendix A, notes that the breaches were likely caused by localized levee overtopping and the erosive velocities encountered, rather than a slope stability or underseepage failure.
		M	There are areas where minor erosion is occurring or has occurred on or near the levee embankment, but levee integrity is not threatened.	
		U	Erosion or caving is occurring or has occurred that threatens the stability and integrity of the levee. The erosion or caving has progressed into the levee section or into the extended footprint of the levee foundation and has compromised the levee foundation stability.	
7. Settlement[2]	A	A	No observed depressions in crown. Records exist and indicate no unexplained historical changes.	Variation in crown is likely due to original construction and/or past settlement. The embankment has been in place for many years and any settlement is assumed to have occurred already. Crown elevation variability is above minimum for PL 84-99 eligibility.
		M	Minor irregularities that do not threaten integrity of levee. Records are incomplete or inclusive.	
		U	Obvious variations in elevation over significant reaches. No records exist or records indicate that design elevation is compromised.	
8. Depressions/ Rutting	A	A	There are scattered, shallow ruts, pot holes, or other depressions on the levee that are unrelated to levee settlement. The levee crown, embankments, and access road crowns are well established and drain properly without any ponded water.	
		M	There are some infrequent minor depressions less than 6 inches deep in the levee crown, embankment, or access roads that will pond water.	
		U	There are depressions greater than 6 inches deep that will pond water.	
9. Cracking	A	A	Minor longitudinal, transverse, or desiccation cracks with no vertical movement along the crack. No cracks extend continuously through the levee crest.	
		M	Longitudinal and/or transverse cracks up to 6 inches in depth with no vertical movement along the crack. No cracks extend continuously through the levee crest. Longitudinal cracks are no longer than the height of the levee.	

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Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		U	Cracks exceed 6 inches in depth. Longitudinal cracks are longer than the height of the levee and/or exhibit vertical movement along the crack. Transverse cracks extend through the entire levee width.	
10. Animal Control	U	**A**	Continuous animal burrow control program in place that includes the elimination of active burrowing and the filling in of existing burrows.	Multiple burrows were noted during JEO's November 2019 site visit. These are identified in JEO's Inspection Summary located in Appendix D of JEO's Levee Evaluation Report. An animal control plan must be developed as part of the O&M program.
		M	The existing animal burrow control program needs to be improved. Several burrows are present which may lead to seepage or slope stability problems, and they require immediate attention.	
		U	Animal burrow control program is not effective or is nonexistent. Significant maintenance is required to fill existing burrows, and the levee will not provide reliable flood protection until this maintenance is complete.	
11. Culverts/ Discharge Pipes[3] (This item includes both concrete and corrugated metal pipes.)	N/A	**A**	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A	There are no discharge pipes/ culverts.	
12. Riprap Revetments &		**A**	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	

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Levee Embankments

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Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
Bank Protection	N/A	**M**	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
13. Revetments other than Riprap	N/A	**A**	Existing revetment protection is properly maintained, undamaged, and clearly visible.	
		M	Minor revetment displacement or deterioration that does not pose an immediate threat to the integrity of the levee. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant revetment displacement, deterioration, or exposure of bedding observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Revetment protection is hidden by dense brush and trees.	
		N/A	There are no such revetments protecting this feature of the segment / system.	
14. Underseepage Relief Wells/ Toe Drainage Systems	N/A	**A**	Toe drainage systems and pressure relief wells necessary for maintaining FDR segment / system stability during high water functioned properly during the last flood event and no sediment is observed in horizontal system (if applicable). Nothing is observed which would indicate that the drainage systems won't function properly during the next flood, and maintenance records indicate regular cleaning. Wells have been pumped tested within the past 5 years and documentation is provided.	
		M	Toe drainage systems or pressure relief wells are damaged and may become clogged if they are not repaired. Maintenance records are incomplete or indicate irregular cleaning and pump testing.	
		U	Toe drainage systems or pressure relief wells necessary for maintaining FDR segment / system stability during flood events have fallen into disrepair or have become clogged. No maintenance records. No documentation of the required pump testing.	
		N/A	There are no relief wells/ toe drainage systems along this component of the FDR segment / system.	
15. Seepage	M	**A**	No evidence or history of unrepaired seepage, saturated areas, or boils.	There is no known evidence of seepage given the limited loadings; however, analysis suggests seepage concern at one evaluated location.
		M	Evidence or history of minor unrepaired seepage or small saturated areas at or beyond the landside toe but not on the landward slope of levee. No evidence of soil transport.	
		U	Evidence or history of active seepage, extensive saturated areas, or boils.	

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Levee Embankments

For use during Initial and Continuing Eligibility Inspections of levee segments / systems

[1] If there is significant growth on the levee that inhibits the inspection of animal burrows or other items, the inspection should be ended until this item is corrected.
[2] Detailed survey elevations are normally required during Periodic Inspections, and whenever there are obvious visual settlements.
[3] The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

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Floodwalls

For use during Initial and Continuing Eligibility Inspections of all floodwalls

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Unwanted Vegetation Growth[1]	N/A	**A**	A grass-only or paved zone is maintained on both sides of the floodwall, free of all trees, brush, and undesirable weeds. The vegetation-free zone extends 15 feet from both the land and riverside of the floodwall, at ground-level, to the centerline of the tree. Additionally, an 8-foot root-free zone is maintained around the entire structure, including the floodwall toe, heel, and any toe-drains. If the floodwall access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-301 and/or Corps policy for regional vegetation variance.	
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the floodwall.	
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above. This vegetation threatens the operation or integrity of the floodwall and must be removed.	
2. Encroachments		**A**	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the floodwall.	
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the floodwall.	
3. Closure Structures (Stop Log Closures and Gates) (A or U only)		**A**	Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.	
		U	Any of the following issues is cause for this rating: Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within the anticipated warning time. The storage vaults cannot be opened during the time of inspection. Components of closure are not clearly marked and installation instructions/ procedures are not readily available. Trial erections have not been accomplished in accordance with the O&M Manual.	
		N/A	There are no closure structures along this component of the FDR segment / system.	
4. Concrete Surfaces		**A**	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	
		M	Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	

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Floodwalls

For use during Initial and Continuing Eligibility Inspections of all floodwalls

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**U**	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
5. Tilting, Sliding or Settlement of Concrete Structures[2]		**A**	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. The integrity of the structure is not in danger.	
		U	There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
6. Foundation of Concrete Structures[1]		**A**	No active erosion, scouring, or bank caving that might endanger the structure's stability.	
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. For the purposes of inspection, the erosion or scour is not closer to the riverside face of the wall than twice the floodwall's underground base width if the wall is of L-wall or T-wall construction; or if the wall is of sheetpile or I-wall construction, the erosion is not closer than twice the wall's visible height. Additionally, rate of erosion is such that the wall is expected to remain stabile until the next inspection.	
		U	Erosion or bank caving observed that is closer to the wall than the limits described above, or is outside these limits but may lead to structural instabilities before the next inspection. Additionally, if the floodwall is of I-wall or sheetpile construction, the foundation is unacceptable if any turf, soil or pavement material got washed away from the landside of the I-wall as the result of a previous overtopping event.	
7. Monolith Joints		**A**	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
		M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	

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Floodwalls

For use during Initial and Continuing Eligibility Inspections of all floodwalls

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**U**	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no monolith joints in the floodwall.	
8. Underseepage Relief Wells/ Toe Drainage Systems		**A**	Toe drainage systems and pressure relief wells necessary for maintaining FDR segment / system stability during high water functioned properly during the last flood event and no sediment is observed in horizontal system (if applicable). Nothing is observed which would indicate that the drainage systems won't function properly during the next flood, and maintenance records indicate regular cleaning. Wells have been pumped tested within the past 5 years and documentation is provided.	
		M	Toe drainage systems or pressure relief wells are damaged and may become clogged if they are not repaired. Maintenance records are incomplete or indicate irregular cleaning and pump testing.	
		U	Toe drainage systems or pressure relief wells necessary for maintaining FDR segment / system stability during flood events have fallen into disrepair or have become clogged. No maintenance records. No documentation of the required pump testing.	
		N/A	There are no relief wells/ toe drainage systems along this component of the FDR segment / system.	
9. Seepage		**A**	No evidence or history of unrepaired seepage, saturated areas, or boils.	
		M	Evidence or history of minor unrepaired seepage or small saturated areas at or beyond the landside toe but not on the landward slope of levee. No evidence of soil transport.	
		U	Evidence or history of active seepage, extensive saturated areas, or boils.	

[1] Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.
[2] The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Vegetation and Obstructions	N/A	**A**	No obstructions, vegetation, debris, or sediment accumulation noted within interior drainage channels or blocking the culverts, inlets, or discharge areas. Concrete joints and weep holes are free of grass and weeds.	
		M	Obstructions, vegetation, debris, or sediment are minor and have not impaired channel flow capacity or blocked more than 10% of any culvert openings, but should be removed. A limited volume of grass and weeds may be present in concrete channel joints and weep holes.	
		U	Obstructions, vegetation, debris, or sediment have impaired the channel flow capacity or blocked more than 10% of a culvert opening. Sediment and debris removal required to re-establish flow capacity.	
2. Encroachments		**A**	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the interior drainage system.	
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of this component of the interior drainage system.	
3. Ponding Areas		**A**	No trash, debris, structures, or other obstructions present within the ponding areas. Sediment deposits do not exceed 10% of capacity.	
		M	Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit operations and maintenance. Sediment deposits do not exceed 30% of capacity.	
		U	Trash, debris, excavations, structures, or other obstructions, or other encroachments or activities noted that will inhibit operations, maintenance, or emergency work. Sediment deposits exceeds 30% of capacity.	
		N/A	There are no ponding areas associated with the interior drainage system.	
4. Fencing and Gates[1]		**A**	Fencing is in good condition and provides protection against falling or unauthorized access. Gates open and close freely, locks are in place, and there is little corrosion on metal parts.	
		M	Fencing or gates are damaged or corroded but appear to be maintainable. Locks may be missing or damaged.	
		U	Fencing and gates are damaged or corroded to the point that replacement is required, or potentially dangerous features are not secured.	
		N/A	There are no features noted that require safety fencing.	
5. Concrete Surfaces (Such as gate		**A**	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
wells, outfalls, intakes, or culverts)	N/A	**M**	Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	
		U	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
6. Tilting, Sliding or Settlement of Concrete and Sheet Pile Structures[2] (Such as gate wells, outfalls, intakes, or culverts)		**A**	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. The integrity of the structure is not in danger.	
		U	There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
7. Foundation of Concrete Structures[3] (Such as culverts, inlet and discharge structures, or gatewells.)		**A**	No active erosion, scouring, or bank caving that might endanger the structure's stability.	
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. The rate of erosion is such that the structure is expected to remain stabile until the next inspection.	
		U	Erosion or bank caving observed that may lead to structural instabilities before the next inspection.	
		N/A	There are no concrete items in the interior drainage system.	
8. Monolith Joints		**A**	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
		M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**U**	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no monolith joints in the interior drainage system.	
9. Culverts/ Discharge Pipes[4]		**A**	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A	There are no discharge pipes/ culverts.	
10. Sluice / Slide Gates[5]		**A**	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
		M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
		U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
		N/A	There are no sluice/ slide gates.	

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
11. Flap Gates/ Flap Valves/ Pinch Valves[1]	N/A	**A**	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
		M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
		U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
		N/A	There are no flap gates.	
12. Trash Racks (non-mechanical)		**A**	Trash racks are fastened in place and properly maintained.	
		M	Trash racks are in place but are unfastened or have bent bars that allow debris to enter into the pipe or pump station, bars are corroded to the point that up to 10% of the sectional area may be lost. Repair or replacement is required.	
		U	Trash racks are missing or damaged to the extent that they are no longer functional and must be replaced. (For example, more than 10% of the sectional area may be lost.)	
		N/A	There are no trash racks, or they are covered in the pump stations section of the report.	
13. Other Metallic Items		**A**	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
		M	Corrosion seen on metallic parts appears to be maintainable.	
		U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
		N/A	There are no other significant metallic items.	
14. Riprap Revetments of Inlet/ Discharge Areas		**A**	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
15. Revetments other than Riprap		**A**	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	

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Interior Drainage System

For use during Initial and Continuing Eligibility Inspections of interior drainage systems

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**M**	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There are no such revetments protecting this feature of the segment / system.	

[1] Proper operation of this item must be demonstrated during the inspection.
[2] The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.
[3] Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.
[4] The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.
[5] Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

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Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Pump Stations Operating, Maintenance, Training, & Inspection Records	N/A	**A**	Operation, maintenance and inspection records are present at the pump station and are being used and updated, and personnel have been trained in pump station operations. Names and last training date shown in the record book.	
		M	Operation, maintenance and inspection records are present but not adequately used and updated.	
		U	No operation, maintenance and inspection records are present, or refresher training for personnel has not been conducted.	
2. Pump Station Operations and Maintenance Equipment Manuals		**A**	Operation and Maintenance Equipment Manuals and/or posted operating instructions are present and updated as required, and adequately cover all pertinent pump station features. O&M manuals include points of contact for manufacturers and suppliers of major equipment used in the facility.	
		M	Operation and Maintenance Equipment Manuals and/or posted operating instructions are present and adequately cover all pertinent pump station features. However, they are incomplete and the necessary updates have not been made.	
		U	Operation and Maintenance Equipment Manuals are not available.	
3. Safety Compliance		**A**	Safety compliance inspection reports by applicable local, state, or federal agencies available for review.	
		M	No safety compliance inspection reports are available for review.	
4. Communications (A or M only)		**A**	A telephone, cellular phone, two-way radio, or similar device is available to pump station operator and maintenance personnel.	
		M	A telephone, cellular phone, two-way radio, or similar device is not available to pump station operator and maintenance personnel.	
5. Plant Building		**A**	The building is in good structural condition with no major foundation settlement problems. The roof is not leaking, intake & exhaust louvers are clear of debris, fans are operational, etc.	
		M	There are minor structural defects, minimal foundation settlement, leaks, or other conditions noted that need repair. Defects do not threaten the structural integrity or stability of the building, and will not impact pumping operations.	
		U	The structural integrity or stability of the building is threatened, or there is damage to the building that threatens safety of the operator or impacts pumping operations.	
6. Fencing and Gates[1]		**A**	Fencing is in good condition and provides protection against falling or unauthorized access. Gates open and close freely, locks are in place, and there is little corrosion on metal parts.	
		M	Fencing or gates are damaged or corroded but appear to be maintainable. Locks may be missing or damaged.	
		U	Fencing and gates are damaged or corroded to the point that replacement is required, or potentially dangerous features are not secured.	

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Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		N/A	There are no features noted that require safety fencing.	
7. Pumps[1]	N/A	**A**	All pumps are properly maintained and lubricated. Systems are periodically tested and documented for review. No vibration, cavitation noises or unusual sounds are noted when the pump is operated. Bearing temperature sensor records don't indicate any problems.	
		M	Minor deficiencies noted that need to be closely monitored or repaired, such as the presence of slight vibrations, leakage of packing gland, bearing temperature sensors are inoperable or no record is present. However, the pumps are operational and are expected to perform through the next period of usage.	
		U	Major deficiencies identified that may significantly reduce pumping operations. For example, bearing sensor records indicate problems, excessive vibration noted, impellers are badly corroded, or there are eroded or missing blades.	
8. Motors, Engines, Fans, Gear Reducers, Back Stop Devices, etc.		**A**	All items are operational. Preventative maintenance and lubrication is being performed and the system is periodically subjected to performance testing. Instrumentation, alarms, bearing sensors and auto shutdowns are operational.	
		M	Systems have minor deficiencies, but are operational and will function adequately through the next flood. Bearing sensors are not operational.	
		U	One or more of the primary motors or systems is not operational, or noted deficiencies have not been corrected.	
9. Sumps / Wet well		**A**	Clear of debris, sediment, or other obstructions. Procedures are in place to remove debris accumulation during operation.	
		M	Debris, sediment, or other obstructions may be present and must be removed, but the sump/ wet well will function as intended during the next flood. Procedures are in place to remove debris accumulation during operation.	
		U	Large debris or excessive silt present which will hinder or damage pumps during operation, or no procedures established to remove debris accumulation during operation.	
10. Mechanical Operating Trash Rakes[1]		**A**	Drive chain, bearing, gear reducers, and other components are in good operating condition and are being properly maintained.	
		M	The trash rake is in need of maintenance, but is still operational.	
		U	Trash rake not operational or deficiencies will inhibit operations during the next flood event.	
		N/A	There are no mechanical trash rakes.	
11. Non-Mechanical Trash Racks		**A**	Trash racks are fastened in place and properly maintained.	
		M	Trash racks are in place but are unfastened or have bent bars that allow debris to enter into the pipe or pump station, bars are corroded to the point that up to 10% of the sectional area may be lost. Repair or replacement is required.	

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Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**U**	Trash racks are missing or damaged to the extent that they are no longer functional and must be replaced. (For example, more than 10% of the sectional area may be lost.)	
		N/A	There are no trash racks, or they are covered in the pump stations section of the report.	
12. Fuel System for Pump Engines		**A**	Fuel system is operational, day tank present and operational, fuel fresh and rotated regularly.	
		M	Fuel system is operational and of adequate capacity, but day tank is missing or fuel is not fresh and rotated regularly.	
		U	Fuel system not functional.	
		N/A	No fuel system.	
13. Power Source		**A**	The normal power source and backup generators, if installed, are operational, properly exercised and well maintained. Surge protection, grounding, lightning protection, transformers, and automatic/manual transfer of main power to backup system is working.	
		M	Normal power source and backup units, if applicable, are operational with minor discrepancies or maintenance, inspection and exercising record is present but not up to date. Preventative maintenance or repairs are required.	
		U	Normal power source or generators are not operational and must be repaired; or generator, if required, is not on site.	
14. Electrical Systems[2]		**A**	Operational and maintained free of damage, corrosion, and debris. Preventative maintenance and system testing is being performed periodically.	
		M	Operational with minor discrepancies. Preventative maintenance or repairs are required, but the components are expected to function adequately during the next flood event.	
		U	Components of the electrical system will not function adequately during the next flood event and must be replaced.	
15. Megger Testing on Pump Motors and Critical Power Cables		**A**	Results of megger tests on pump motors or critical power cables show that the insulation meets manufacturer's or industry standards. Tested within the last year.	
		M	Megger testing not conducted within the past year. If megger tests on pump motors indicate that insulation resistance is below the manufacturer's or industry standard, but the resistance can be corrected with proper application of heat, this is minimally acceptable. (The application of heat does not relate to critical power cables.)	
		U	Megger tests not conducted within past two years, or tests indicate that insulation resistance is low enough that the equipment will not be able to meet design standards of operation; or evidence of arcing or shorting is detected visually.	

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Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
16. Enclosures, Panels, Conduit and Ducts	N/A	**A**	All enclosures, panels, conduits, and ducts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
		M	Minor surface corrosion which appears to be maintainable. Cleaning and painting required.	
		U	Severely corroded and must be replaced to prevent failure, equipment damage, or safety issues.	
17. Intake and Discharge Pipelines		**A**	Intake and discharge pipelines have no corrosion and paint is intact, except for minor touch up required. Pipe couplings and anchors have no leakage or corrosion.	
		M	Intake and discharge pipelines have minor corrosion and repair and painting is required. Pipe coupling with anchors have minor leakage, corrosion and require bolts to be tightened.	
		U	Intake and discharge pipelines have major corrosion and replacement is required. Pipe coupling with anchors have major leakage and is heavily corroded and requires replacement.	
18. Sluice/ Slide Gates[3]		**A**	Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.	
		M	Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.	
		U	Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.	
		N/A	There are no sluice/ slide gates.	
19. Flap Gates/ Flap Valves/ Pinch Valves[1]		**A**	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
		M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
		U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
		N/A	There are no gates on discharge lines from pump station.	
20. Cranes[1]		**A**	Cranes operational and have been inspected and load tested in accordance with applicable standards within the last year. Documentation is on hand.	

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Pump Stations

For use during Initial and Continuing Eligibility Inspections of pump stations

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**M**	Cranes have not been inspected or operationally tested within the past year, or there are visible signs of corrosion, oil leakage, etc, requiring maintenance.	
		U	Cranes are not operational, and this may prevent the pump station from functioning as required. No documentation available on cranes.	
		N/A	There are no cranes.	
21. Other Metallic Items (Equipment, Ladders, Platform Anchors, etc)		**A**	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	
		M	Corrosion seen on metallic parts appears to be maintainable.	
		U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
		N/A	There are no other significant metallic items.	

[1] Proper operation of this item must be demonstrated during the inspection.
[2] Check motor control center, circuit breakers, pilot lights, volt meters, ammeters, sump level indicator, gate position indicators, remote operating systems, including SCADA and telemetry systems. Also, check interior and exterior lighting; especially lighting near trash rack screens, ladders, walkways, etc.
[3] Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.

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Flood Damage Reduction Channels

For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Vegetation and Obstructions	N/A	**A**	No obstructions, vegetation, debris, or sediment accumulation within the channel. Concrete channel joints and weep holes are free of grass and weeds.	
		M	Obstructions (including log jams), vegetation, debris, or sediment are minor and have not impaired channel flow capacity, but should be removed. Sediment shoals have not developed to the extent that they can support vegetation other than non-aquatic grasses. A limited volume of grass and weeds may be present in concrete channel joints and weep holes.	
		U	Obstructions (including log jams), vegetation, debris or sediment have impaired the channel flow capacity. Sediment shoals are well established and support woody and/or brushy vegetation. Sediment and debris removal required to re-establish flow capacity.	
2. Shoaling[1] (sediment deposition)		**A**	No shoaling or minor, non-vegetated shoaling is present.	
		M	More widespread vegetated and non-vegetated shoaling is present. Non-aquatic grasses are present on shoal. No trees or brush is present on shoal, and channel flow is not significantly reduced. Sediment and debris removal recommended.	
		U	Shoaling is well established, stabilized by saplings, brush, or other vegetation. Shoals are diverting flow to channel walls. Channel flow capacity is reduced and maintenance is required.	
3. Encroachments		**A**	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the channel.	
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the channel.	
4. Erosion		**A**	No head cutting or horizontal deviation observed.	
		M	Head cutting and horizontal deviation evident, but is less than 1 foot from the designed grade or cross section.	
		U	Head cutting and horizontal deviation of more than 1 foot from the designed grade or cross section. Corrective actions required to stop or slow erosion.	
5. Concrete Surfaces		**A**	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	
		M	Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	

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Flood Damage Reduction Channels

For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**U**	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
		N/A	There are no concrete items in the channel.	
6. Tilting, Sliding or Settlement of Concrete Structures[2]		**A**	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. The integrity of the structure is not in danger.	
		U	There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of I-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
		N/A	There are no concrete items in the channel.	
7. Foundation of Concrete Structures[3]		**A**	No active erosion, scouring, or bank caving that might endanger the structure's stability.	
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. For the purposes of inspection, the erosion or scour is not closer to the riverside face of the wall than twice the floodwall's underground base width if the wall is of L-wall or T-wall construction; or if the wall is of sheetpile or I-wall construction, the erosion is not closer than twice the wall's visible height. Additionally, rate of erosion is such that the wall is expected to remain stabile until the next inspection.	
		U	Erosion or bank caving observed that is closer to the wall than the limits described above, or is outside these limits but may lead to structural instabilities before the next inspection. Additionally, if the floodwall is of I-wall or sheetpile construction, the foundation is unacceptable if any turf, soil or pavement material got washed away from the landside of the I-wall as the result of a previous overtopping event.	
		N/A	There are no concrete items in the channel.	
8. Slab and Monolith Joints		**A**	The joint material is in good condition. The exterior joint sealant is intact and cracking/ desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

Flood Damage Reduction Channels

For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
	N/A	**M**	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	
		U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no concrete items in the channel.	
9. Flap Gates/ Flap Valves/ Pinch Valves[4]		**A**	Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.	
		M	Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.	
		U	Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.	
		N/A	There are no flap gates.	
10. Riprap Revetments & Banks		**A**	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
11. Revetments other than Riprap		**A**	Existing revetment protection is properly maintained, undamaged, and clearly visible.	
		M	Minor revetment displacement or deterioration that does not pose an immediate threat to the integrity of the levee. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant revetment displacement, deterioration, or exposure of bedding observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Revetment protection is hidden by dense brush and trees.	
		N/A	There are no such revetments protecting this feature of the segment / system.	

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

Flood Damage Reduction Channels

For use during Initial and Continuing Eligibility Inspections of flood damage reduction channels

[1] If weather and flow conditions allow, inspectors should walk in the channel and probe shoal areas in order to estimate extent of blockage of the cross-sectional area where shoaling is present.
[2] The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.
[3] Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.
[4] Proper operation of this item must be demonstrated during the inspection.

Key: A = Acceptable. M = Minimally Acceptable; Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction

Flood Damage Reduction Segment / System
Supplemental Data Sheet

This form is intended for the Corps' internal use and may not need to be updated with every inspection.

Name of Segment / System: Fremont, Farmland, and Railroad Levee
Sponsor: City of Fremont, Nebraska
Location: Fremont,Nebraska; southwest side of the City
River Basin: Platte River
Project Description: Earthen embankment; upstream end begins approximately 700 feet east of Ridge Road and approximately 1300 feet south of W Military Avenue; it then runs southeast and east to the Valley - Union and No Name Dikes System - Platte River LB (NF); in total, it is approximately 2.5 miles long.
Authority that Project was Constructed Under: Constructed by local interests
Date of Construction: Early 1900's
Approximate Annual Maintenance Costs: TBD

Construction:	☐ Federally Constructed	☒ Non-Federally Constructed
Maintenance:	☐ Federally Maintained	☒ Non-Federally Maintained

National Flood Insurance Program:

a. Is the project currently NFIP? ☐ Yes ☒ No
b. If in the NFIP, Date of Certification (per 44 CFR 65.10):

Datum Information:

a. Datum used for the design and construction of this project is: N/A
b. Current recommended datum for this project is: Stateplane, NAVD88
c. Has the Project been converted to the current recommended datum? ☐ Yes ☒ No

Levee Embankment Data:

a. Levee Designed Gage Function Reading/Station: Upstream gage: Platte River at North Bend, NE
b. Level of Protection Provided: 10 year plus 2 feet freeboard
c. Average Height of Levee: 6 to 8-feet
d. Average Crown Width: 10-feet
e. Average Side Slope: 3:1

Protected Features (For use in preparing estimates and PIRs):

a. Total acres protected:
b. Total agriculture production acres protected:
c. Towns:
d. Businesses:
e. Residences:
f. Roads:
g. Utilities:
h. Barns:
i. Machine Sheds:
j. Outbuildings:
k. Irrigation Systems:
l. Grain Bins:
m. Other Facilities:

APPENDIX D
Non-Federal Levee System
Public Sponsor Assurances and Agreement Form

The U.S. Army Corps of Engineers is authorized by Public Law 84-99 to provide supplemental assistance to rehabilitate and inspect Flood Control Works (FCW). A requirement for acceptance into the Rehabilitation and Inspection Program (RIP) requires all FCW's to have a Public Sponsor as defined by their state law. The sponsor will be the public representative for the project in all matters concerning the levee system. Public sponsors must be one of the following:

- A legal subdivision of a state government or a state itself;
- A local unit of government;
- A state chartered organization such as a levee board; or
- A qualified Indian tribe or Tribal organization.

The sponsor will be responsible for the Operation and Maintenance (O&M) of the FCW. The O&M are routine maintenance performed to ensure that the FCW functions as it was intended, e.g. operate all gates, maintain the vegetation, prevent encroachments, etc. The Levee Owner's Manual for Non-Federal Flood Control Works RIP under the PL 84-99 program describes in detail the Operation & Maintenance (O&M) required for a levee system.

The Corps of Engineers has the authority under Public Law 84-99 to supplement local efforts in the repair of <u>non-Federal</u> (constructed by non-Federal interests or by Work Projects Administration (WPA)) flood control projects damaged by flood.

a. For a non-Federal flood control project to be eligible for Rehabilitation Assistance, it must have been inspected, evaluated, and accepted into the Corps Rehabilitation and Inspection Program (i.e., granted Active status) ***prior*** to the onset of the flood, and still be active (based on the latest Continuing Eligibility Inspection) at the time of the flood.

b. Rehabilitation Assistance will be provided by the Corps only when the work is economically justifiable, the damage was sustained during the recent flood event, and the cost of repairs is more than $15,000.

c. Repairs of non-Federal projects are cost shared between the Public Sponsor and the Corps of Engineers. The Local Sponsor must provide 20 percent of the cost of the rehabilitation.

d. The non-Federal public sponsor must sign a Local Cooperation Agreement (LCA) prior to repair of FCW, reference Attachment A for more details.

e.

Appendix D
Non-Federal Levee System
Public Sponsor Assurances and Agreement Form (cont)

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and
SPONSOR
for
REHABILITATION OF A FEDERAL/NON-FEDERALLY BUILT
FLOOD CONTROL WORK

THIS AGREEMENT, entered into this ___ day of _____, ____(Yr), by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") acting by and through the District Commander, Omaha District, U.S. Army Corps of Engineers, and the Peru Drainage District #6 (hereinafter referred to as the “Public Sponsor").

WITNESSETH THAT:

WHEREAS, pursuant to 33 U.S.C. 701n, the Government is authorized to assist in the repair or restoration of flood control improvements threatened or destroyed by flood;

WHEREAS, via written correspondence, the Public Sponsor has requested the Government to repair or restore a certain flood control work damaged by recent flooding or coastal storms in accordance with 33 U.S.C. 701n and established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in the rehabilitation effort in accordance with the terms of this Agreement;

NOW, THEREFORE, the Government and the Public Sponsor agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this agreement:

A. The term "Rehabilitation Effort" shall mean the restoration of the levee to the original design grade and cross sections that existed prior to the flood event as generally described in a report entitled, “Project Information Report, Rehabilitation of Damaged Flood Control Works, (Project) Flood Control Project, (City), (State)”,

prepared by the District Commander, U.S. Army Engineer District Omaha, dated _____ (Date) and approved by the Division Commander on _____ (Date). See attached Exhibit “A” for a complete listing of damages to be repaired.

B. The term "Rehabilitation Effort costs" shall mean all costs incurred by the Public Sponsor and the Government, in accordance with the terms of this Agreement, directly related to implementation of the Rehabilitation Effort. The term shall include, but is not necessarily limited to, actual construction costs, including supervision and inspection costs; costs of contract dispute settlements or awards; and the cost of investigations to identify the existence of hazardous substances as identified in Article XIA. The term shall not include any costs for operation and maintenance; any costs that correct deferred or deficient maintenance; any increased costs for betterments or Public Sponsor preferred alternatives; or the costs of lands, easements, rights-of-way, relocations, or suitable borrow and dredged or excavated material disposal areas required for the Rehabilitation Effort.

C. The term "betterment" shall mean the design and construction of a Rehabilitation Effort feature accomplished on behalf of, or at the request of, the Public Sponsor in accordance with standards that exceed the standards that the Government would otherwise apply for accomplishing the Rehabilitation Effort.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND PUBLIC SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States and using those funds and funds provided by the Public Sponsor, shall expeditiously implement the Rehabilitation Effort, applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The Public Sponsor shall be afforded the opportunity to review and comment on solicitations for all contracts, including relevant plans and specifications, prior to the issuance of such solicitations. The Contracting Officer will, in good faith, consider the comments of the Public Sponsor, but award of contracts, modifications or change orders, and performance of all work on the Rehabilitation Effort (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Contracting Officer.

B. As further specified in Article III, the Public Sponsor shall provide all lands, easements, and rights-of-way and suitable borrow and dredged or excavated material disposal areas, and perform all relocations determined by the Government to be necessary for construction, operation, and maintenance of the Rehabilitation Effort and the Project.

C. The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Rehabilitation Effort and any related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

D. The Public Sponsor agrees to participate in and comply with the policies and procedures of the U.S. Army Corps of Engineers Rehabilitation and Inspection Program.

E. The Public Sponsor may request the Government to accomplish betterments. The Public Sponsor shall be solely responsible for any increase in costs resulting from the betterments and all such increased costs will be paid in advance by the Public Sponsor in accordance with Article IV.

ARTICLE III - LANDS, RELOCATIONS, DISPOSAL AREAS, AND PUBLIC LAW 91-646 COMPLIANCE

A. The Government shall provide the Public Sponsor with a description of the anticipated real estate requirements and relocations for the Rehabilitation Effort. Thereafter, the Public Sponsor shall furnish all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform any relocations, as may be determined by the Government in that description, or in any subsequent description, to be necessary for the construction, operation, and maintenance of the Rehabilitation Effort. The necessary lands, easements, and rights-of-way may be provided incrementally for each construction contract. All lands, easements, and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the solicitation of that construction contract.

B. The Public Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights of way, and performing relocations for construction, operation, and maintenance of the Rehabilitation Effort, including those necessary for relocations, borrow materials, and dredged and excavated material disposal, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - OPERATION AND MAINTENANCE

A. After the Contracting Officer has determined that construction of the Rehabilitation Effort is complete and provided the Public Sponsor with written notice of such determination, the Public Sponsor shall operate and maintain the Project, at no cost to the Government, in accordance with specific directions prescribed by the Government in Engineer Regulation 500-1-1 and any subsequent amendments thereto.

B. The Public Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land that the Public Sponsor owns

or controls for access to the Project for the purposes of inspection, and, if necessary, for the purpose of completing, operating, and maintaining the Project. If an inspection shows the Public Sponsor for any reason is failing to fulfill the Public Sponsor's obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Public Sponsor. If, after 30 calendar days from receipt of such notice, the Public Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon lands the Public Sponsor owns or controls for access to the Project for the purposes of completing, operating, and maintaining the Project, or to deny further assistance under Public Law 84-99. No action by the Government shall operate to relieve the Public Sponsor of responsibility to meet the Public Sponsor obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE V - FEDERAL AND STATE LAWS

In the exercise of the Public Sponsor's rights and obligations hereunder, the Public Sponsor agrees to comply with all applicable Federal and state laws and regulations.

ARTICLE VI - RELATIONSHIP OF PARTIES

The Government and the Public Sponsor act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, nor employee of the other.

ARTICLE VII - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE VIII - COVENANT AGAINST CONTINGENT FEES

The Public Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Public Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in the Government's discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE IX - TERMINATION OR SUSPENSION

If at any time the Public Sponsor fails to carry out its obligations under this Agreement, the District Commander shall terminate or suspend work on the Rehabilitation Effort, unless the District Commander determines that continuation of work on the Rehabilitation Effort is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with this Rehabilitation Effort and Project. However, deferral of future performance under this agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously incurred. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Rehabilitation Effort and proceed to a final accounting in accordance with Article IV of this Agreement. In the event that either party elects to defer future performance under this Agreement pursuant to this Article, such deferral shall remain in effect until such time as either the Government or Public Sponsor elects to proceed with further construction or terminates this Agreement.

ARTICLE X - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the Contracting Officer, the Public Sponsor shall perform, or cause to be performed, such investigations for hazardous substances as are determined necessary by the Government or the Public Sponsor to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Sections, 9601-9675, on lands necessary to Rehabilitation Effort construction, operation, and maintenance. All actual costs incurred by the Public Sponsor that are properly allowable and allocable to performance of any such investigations for hazardous substances shall be included in total Rehabilitation Effort costs and cost shared as a construction cost.

B. In the event it is discovered through an investigation for hazardous substances or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the Rehabilitation Effort contain any hazardous substances regulated under CERCLA, the Public Sponsor and the Government shall provide prompt notice to each other, and the Public Sponsor shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

C. The Government and the Public Sponsor shall determine whether to initiate construction of the Rehabilitation Effort, or, if already in construction, to continue with construction of the Rehabilitation Effort, or to terminate construction of the Rehabilitation Effort for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Rehabilitation Effort. Should the Government and the Public Sponsor determine to

proceed or continue with the construction after considering any liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total Rehabilitation Effort costs as defined in this Agreement. In the event the Public Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Public Sponsor's responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Rehabilitation Effort or proceed with further work as provided in Article XI of this Agreement.

D. The Public Sponsor and Government shall consult with each other to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C of this Article shall not relieve any party from any liability that may arise under CERCLA.

E. As between the Government and the Public Sponsor, the Public Sponsor shall be considered the operator of the Project (which the Rehabilitation Effort is repairing and restoring) for purposes of CERCLA liability. To the maximum extent practicable, the Public Sponsor shall operate and maintain the Project in a manner that will not cause liability to arise under CERCLA.

ARTICLE XI - NOTICES

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

If to the Public Sponsor:
(Sponsor Address)

If to the Government:
District Commander
Omaha District, Corps of Engineers
1616 Capitol Avenue
Omaha, NE 68102-4901

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

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

either personally delivered, or, seven calendar days after it is mailed, as the case may be.

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

THE DEPARTMENT OF THE ARMY	PUBLIC SPONSOR
BY: _____	BY: _____
John L. Hudson Colonel, Corps of Engineers District Commander	NAME Sponsor/Drainage District TITLE
DATE: _____	DATE: _____

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

DATED this _____ day of _____, (year).

Sponsor Name
TITLE

APPENDIX E
MAINTENANCE GUIDE

The purpose of this maintenance guide is to provide guidance for the maintenance of your levee. The following paragraphs outline maintenance standards and procedures for various project elements.

1. EARTH EMBANKMENTS. Earth embankments shall be maintained to remedy any adverse conditions threatening the integrity of the structure. Cracks, ruts, washes, settlements, or sloughing caused by erosive elements either natural or man- made should be promptly repaired by replacing any loss of material from the crown or slopes with like material and compacting it to proper density. Embankment crowns shall be graded as necessary to drain freely such that impoundment of water on the crown does not occur. After repairs, the embankment should be graded sufficiently smooth to provide for ease of maintenance and to prepare the necessary surface for establishing sturdy vegetative growth.

2. EROSION PROTECTION OF REVETTED AREAS. Erosion protection or revetted areas shall be maintained to provide the intended degree of protection and to insure the integrity of the main structure or earth embankment. Stone or riprap materials which have been displaced, washed out, deteriorated or should be replenished with sufficient quantities of like material, of proper size and quality to provide the necessary protection required. Areas where bedding or bank material beneath riprap is exposed or disturbed shall be repaired with suitable material and compacted prior to placement of stone or riprap.

3. CHANNELS, FLOODWAYS, OR PONDING AREAS. Shall be maintained to avoid significant increases in the floodway water surface elevations. If the capacity of these areas is reduced by earth deposits, debris, trash, undesirable vegetation, or unauthorized structures or encroachments, the obstructions should be removed and properly disposed of. Removal of normal or annual siltation is the responsibility of the sponsor's Operation and Maintenance program. All undesirable brush and trees larges than 2-inches in diameter should be removed.

4. SLOPE STABILTY. The cross-section template data shown below should be used as a guide for inspection of levee slopes made of different materials. Reference Page 3, Figure 1.

LEVEE CROSS SECTION TEMPLATE DATA

LEVEE MATERIAL	MAX RIVERWARD SIDE-SLOPE	MAX LANDWARD SIDE-SLOPE	MAXIMUM HEIGHT	MINIMUM TOP WIDTH
Clay	1V on 2 1/2H	1V on 2 1/2H	12 Feet	10 Feet
Sand	1V on 3H	1V on 4H	15 Feet	10 Feet

Flatter side-slopes may be required if the levee height exceeds the values listed, or if ordinary maintenance of the slopes are reduced because of the steeper side-slope. The judgment of the inspector will be used for materials other than clay or sand.

5. MINIMUM LEVEE SETBACK. Levee setbacks are principle control measures for foundation underseepage landside and embankment stability riverside. Both eliminate hazards by providing additional weight and additional length. The landside setback is required to reduce upward seepage forces and uplift pressures at the toe of the berm, while the riverside setback reduces the effects of damage from wave action. Reference Page 3, Figure 1.

6. VEGETATIVE GROWTH.

A. Sod Cover. Maintenance, including reseeding, mowing, and fertilizing of sod growth on earth embankments is required as sod is one of the most effective means of protecting flood control structures such as levees against erosion from rain, current, and wave wash. Periodic mowing is essential to ***maintain*** a good sod growth and should be done at intervals necessary to control weeds and other noxious growth. The last mowing of the season should be accomplished under conditions which will allow the grass to obtain a height of approximately 8" to 10" going into the winter season. Mowing shall be performed to a distance of at least 15 feet beyond the toe of the embankment. Whenever possible, initial mowing should be made after 15 July to allow habitat for wildlife hatching. Also, local interests are encouraged to sell hay from their projects to help offset their cost of maintaining the structure. In addition, programs of fertilizing and reseeding are encouraged to maintain a heavy sod cover.

B. Undesirable Growth of Trees, Brush and Weeds. Undesirable growth which affects the maintenance, inspections and stability of the structure, or interferes with and/or jeopardizes proper operation of the project during high water conditions shall be cleared and disposed of. Spraying with herbicides as needed during the growing season may be desirable for weed and brush control. Herbicides shall be used in accordance with state laws and regulations. Absolutely no undesirable growth should be allowed to grow on earth embankments, immediately adjacent to floodwalls or similar structures, or within revetted areas. The root-free and vegetation-free zones shall be maintained.

C. Root-Free Zone Policy. The root-free zone provides a space between the greatest expected extent of plant roots and the beginning face of the basic project structure. The bottom of the root-free zone is the external limits of the cross section of the levee, floodwall or embankment dam established for stability and/or seepage control. **NO** roots will be permitted to penetrate into the root-free zone.

D. Vegetation-Free Zone Policy. The vegetation-free zone is required for maintenance and flood-fighting activities and must be accessible at **ALL** times. This is the area adjacent to the landside and riverside toe of the levee, floodwall or embankment dam and appurtenant structure. **NO** type of vegetation, except grass, is permitted in this area.

(1) Levees. All vegetation will be located **OUTSIDE** the limits of the basic levee project structure, see Figure 1. This basic levee project structure is the engineered feature required for human safety. See Figure 1 for a diagram and terms used to describe a normal levee structure. *Note:* The vegetation-free zone is 15 feet beyond of the levee toe and toe drain, see Figures 2 & 3.

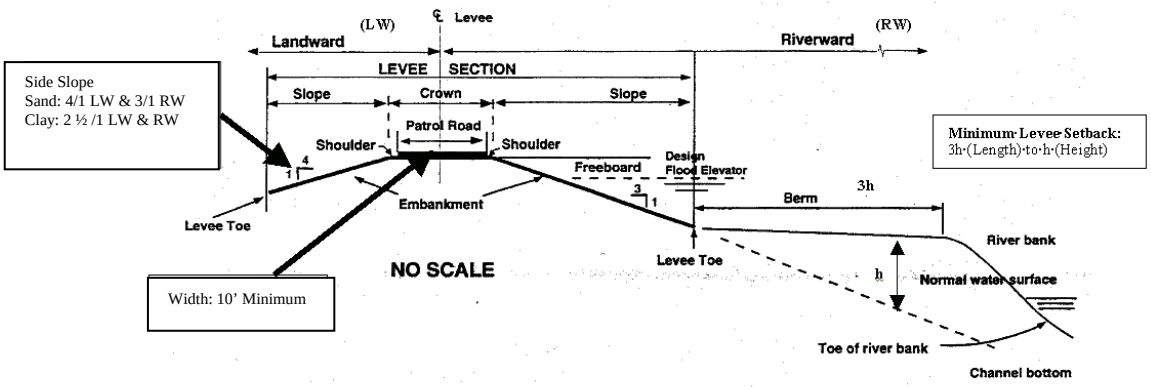
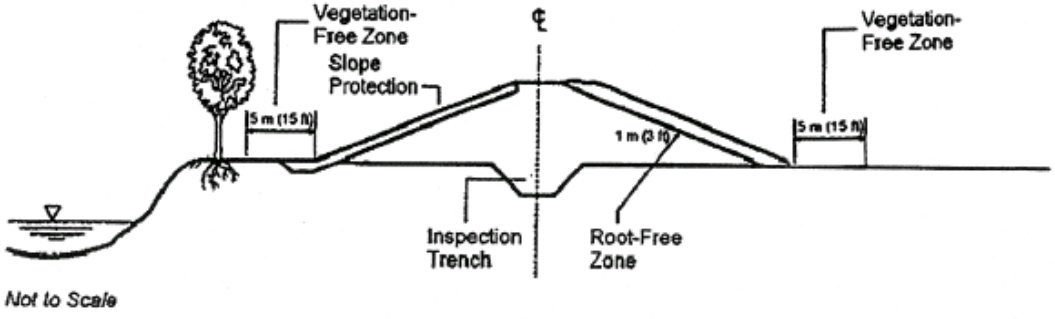
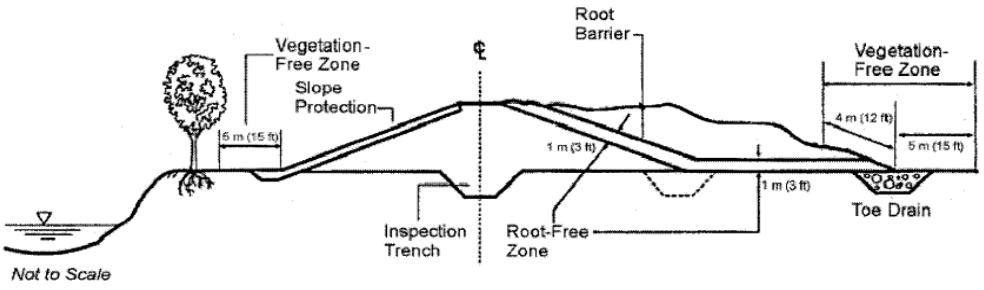


Figure 1. Normal levee structure.



a. Vegetation- and root-free zones

Figure 2. Basic Levee Project Structure.



b. Toe Drain

Figure 3. Basic Levee Structure with Toe Drain

(2) Floodwalls. Floodwalls are used where land and/or materials used to construct a levee are not economically available. The two most common types of floodwalls are the inverted T-Type reinforced concrete wall and the cantilever I-type sheet piling wall. *Note:* The vegetation-free and root-free zones are 8 feet beyond any toe drains, see Figures 4 & 5.

a. Inverted T-Type. A vegetation and root free zone will be established at the top outside edge of the toe. This T-type may have a toe drainage system to check & control piping & boils, control seepage, and control uplift pressures. These walls must be protected from invasion of roots, which could clog the drainage system. See Figure 4, which shows (a) Vegetation-Free Zone, (b) Root-Free Zone with vertical joint occurring at section, (c) Additional Soil Cover, and (d) Basic Structure.

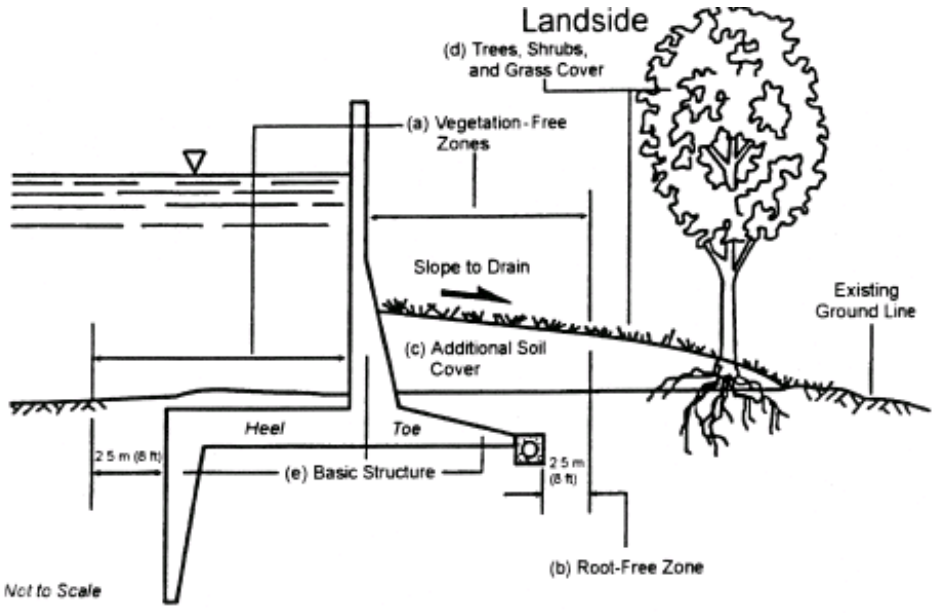


Figure 4. Inverted T-Type Floodwall

b. Cantilever I Type. Vegetation & root free zones will be established similar to that of the T-type walls. See Figure 5, which shows (a) Vegetation-Free Zone, (b) Root-Free Zone with vertical joint occurring at section, and (c) Basic Structure.

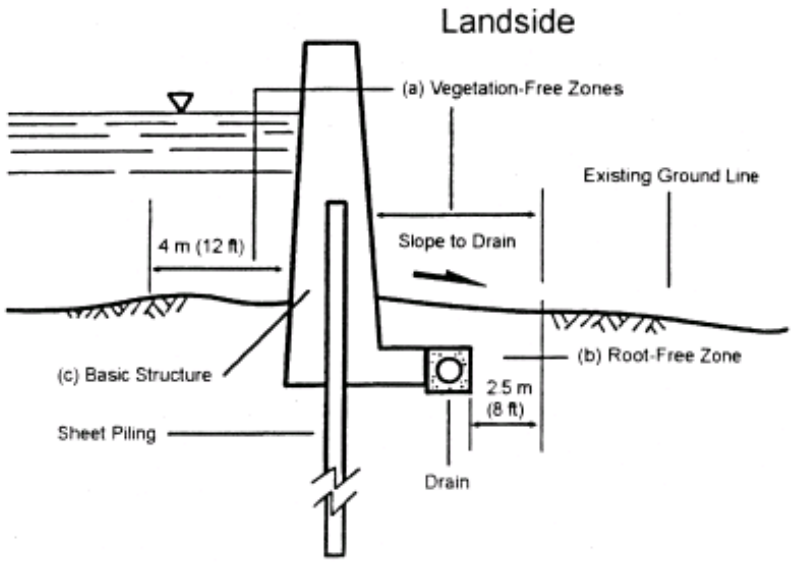


Figure 5. Cantilever I-Type Floodwall.

(3) EMBANKMENT DAMS – Two types of dams to consider are earth dams and rock-filled dams.

a. Earth and Rock-fill Dams – A 50 foot vegetation free zone will be established downstream of the toe of the dam in the floodplain and on abutments because of the need for access for maintenance, and construction equipment during periods of flooding.

7. VEGETATION GROWTH VARIANCES. The Omaha District policy is in accordance with EM 1110-2-301 regarding guidelines for vegetation on FCW projects. Some local jurisdictions have passed laws and ordinances prohibiting tree cutting or tree root removal. ER 500-1-1, in implementing 33 CFR Part 203 and Public Law 84-99, takes precedence over state and local laws and ordinances addressing this matter. This situation applies even when the public sponsor is performing this work on Non-Federal FCWs. However, a public sponsor of an Active project may seek a vegetation variance from Corps policy to allow additional vegetation to grow on levees.
The vegetation variance must be in writing to the District Emergency Management Office. Contact the Emergency Management Office for specific vegetation variance criteria.

A. Public Sponsor Requirements. The Public Sponsor will be required to submit a plan for variance which clearly describes the types and locations for vegetative growth, maintenance schedule, and an engineering determination that the plan does not affect the operation, flood fight, or structural integrity of the project. The plan will be reviewed by the Corps of Engineers and if approved formally adopted into the existing Operation and Maintenance Manual for the project.

8. CONTROL OF GRAZING, ENCROACHMENT, AND TRESPASS. All feasible efforts such as fencing, gates, surveillance, etc., shall be made to discourage and/or control grazing, encroachment by construction of unauthorized vehicular traffic, etc., through over or adjacent to the project. Damages resulting from such activities should be repaired to preserve the integrity of the structure and project.

9. CONTROL OF BURROWING ANIMALS. An effective program shall be maintained for controlling burrowing animals. All animal burrows in earth embankments or immediately adjacent to the flood control structures should be properly filled,
compacted, and reseeded as necessary to preserve the structure's integrity and function. One of the best ways to control burrowing animals is to control the vegetative growth. Burrowing animals like to hide under tall vegetation such as, brush, tall weeks, etc.

10. MAINTENANCE OF ROADWAYS, GATES, AND FENCES. Access roads to and on embankments, or other flood control structures, should be bladed, and if applicable, surfacing material replenished as

necessary to keep the roadway shaped properly and free of ruts, pockets, and washes. Ramp embankments shall be maintained to their net section and design grade to assure proper access. Maintenance should be performed to repair fences, gates, etc., used to restrict encroachment and trespassing onto the structure or within the project's right-of-way, especially where private or public roads cross over such structures.

11. BANK CAVING CONDITIONS *RIVERWARD* OF FLOOD CONTROL STRUCTURE. Caving which may endanger the stability and/or function of the structure must be corrected immediately. This may require stabilization of the river bank by any acceptable and proven method (technical assistance can be requested from the Corps of Engineers), or in extreme cases, relocation or setback of the flood control structure. Note that work within the river channel which involves adding of material will require a 404 permit from the Corps of Engineers.

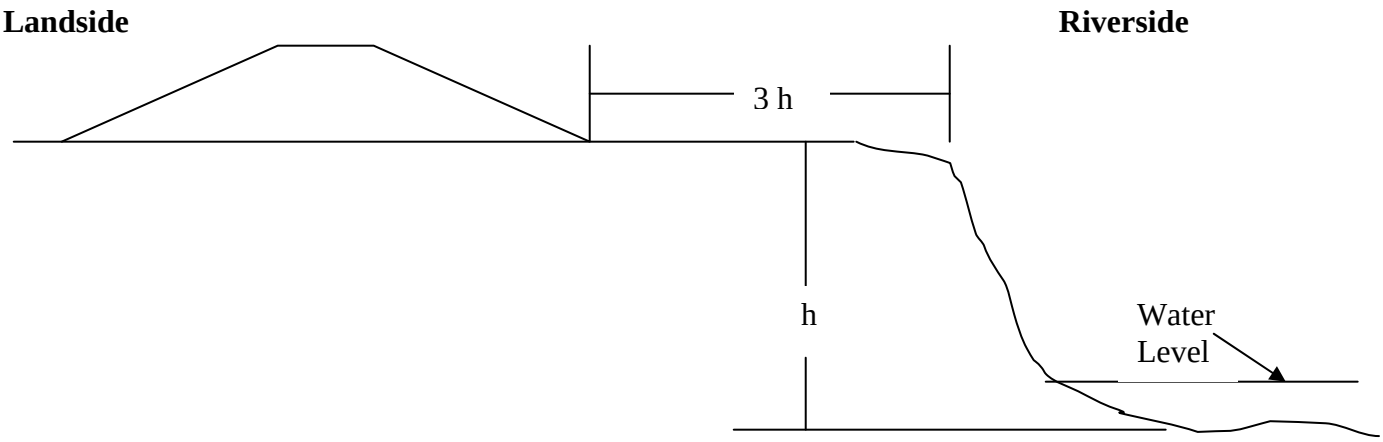
12. MISCELLANEOUS FLOOD CONTROL FACILITIES, STRUCTURES AND APPURTENANCES. Miscellaneous flood control facilities, structures, culverts, flap gates, manually operated gates or valves, (inlets or outlets, etc.) which are constructed on, over, or through flood control structures, shall be maintained in good operating condition. The condition of these facilities or structures shall be inspected annually, and those items which are operative only during high water stages shall be checked carefully and repaired prior to the high water season.

13. FLOODWALLS AND OTHER FLOOD CONTROL RELATED STRUCTURES OR APPURTENANCES *MADE OF CONCRETE OR* SIMILAR MATERIALS.
Structures applicable to this category, which are deteriorated or showing signs of settlement shall be promptly repaired, replaced, corrected and routinely maintained to function as intended.

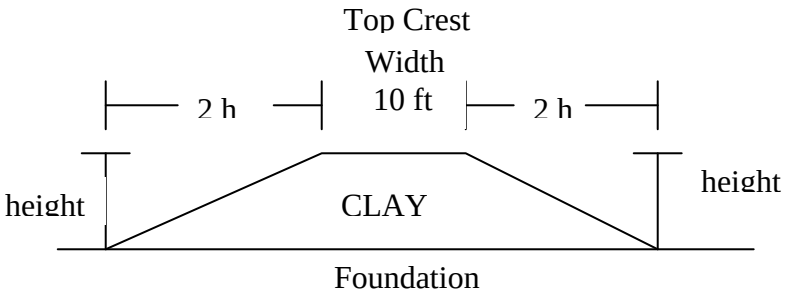
14. POOR MAINTENANCE. Rehabilitation assistance will not be provided to an FCW that, as a result of poor maintenance, has deteriorated to the point that substantial reconstruction is required.

15. DEFICIENT OR DEFERRED MAINTENANCE. If deficient or deferred project maintenance is outstanding when damage to an FCW occurs, then the deficient and deferred maintenance will be accomplished by or at the expense of the public sponsor, either prior to or concurrently with the approved Rehabilitation Assistance.

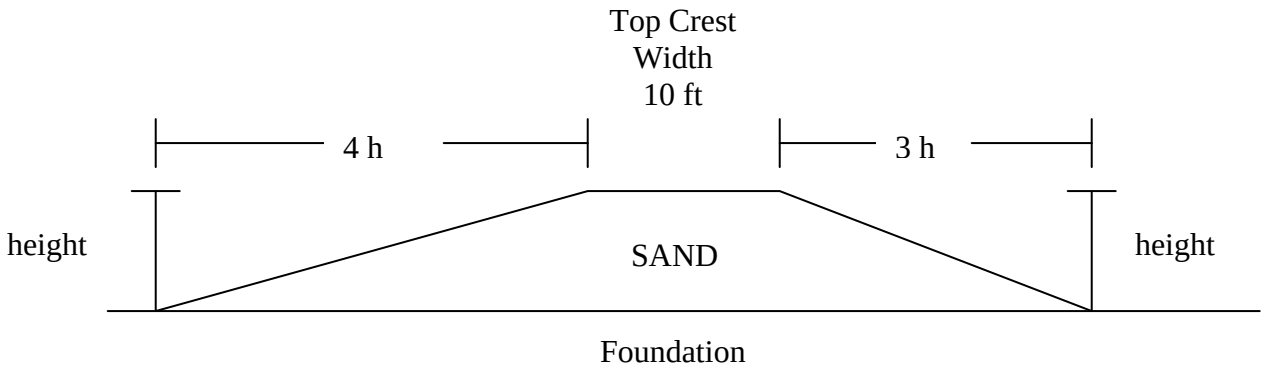
APPENDIX F
MINIMUM SETBACK REQUIREMENTS



MINIMUM LEVEE SETBACK



MINIMUM CROSS_SECTION FOR CLAY LEVEE



MINIMUM CROSS_SECTION FOR SAND LEVEE

CECW-OE

Pamphlet
No. 500-1-1

30 September 2001

Emergency Employment of Army and Other Resources
CIVIL EMERGENCY MANAGEMENT PROGRAM - PROCEDURES
RCS CECW-O-65
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CHAPTER 1
INTRODUCTION

1-1. Purpose. This pamphlet prescribes processes and procedures for the management and execution of the Civil Emergency Management (CEM) Program of the U.S. Army Corps of Engineers (USACE) under the authorities of 33 USC 701n (commonly referred to as Public Law (PL) 84-99); The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.) (The Stafford Act); Army Regulation (AR) 500-60, Disaster Relief; Engineer Regulation (ER) 500-1-1, Civil Emergency Management Program; and ER 1130-2-530, Flood Control Operations and Maintenance Policies. This pamphlet is a companion document to, and must be used in conjunction with, ER 500-1-1. For clarity and ease of usage, chapter numbering in this pamphlet replicates that used in ER 500-1-1. In case of a discrepancy between this pamphlet and ER 500-1-1, ER 500-1-1 governs.

1-2. Applicability. This pamphlet applies to HQUSACE elements, Major Subordinate Commands (MSC's), districts, laboratories, the 249th Engineer Battalion (Prime Power), and other field operating activities (FOA) of USACE. This pamphlet is applicable in the fifty states, the District of Columbia, and the territories of the United States, unless provided otherwise by law. For instance, certain Stafford Act provisions apply to the Federated States of Micronesia, the Marshall Islands, and the Republic of Palau. The Pacific Ocean Division and Honolulu District are permitted to conduct preparedness activities that support authorized Stafford Act activities in these areas. Supplementation of this pamphlet is not permitted.

1-3. Distribution Statement. Approved for public release, distribution is unlimited.

1-4. References. See ER 500-1-1, Appendix A.

1-5. Glossary of Acronyms and Terms. See the Glossary at the end of this pamphlet.

1-6. Responsibilities. The emergency management authorities and responsibilities of commanders at all levels within USACE are contained in ER 500-1-1, Chapter 1.

1-7. Mission Statement. The mission statement for USACE Civil Emergency Management is shown in Figure 1-1, on page 1-2.

USACE continuously provides timely, effective, and efficient disaster preparedness, response, recovery, and mitigation projects and services on a nationwide basis to reduce loss of life and property damage under DOD, USACE, FEMA, and other agencies' authorities.

Figure 1-1. USACE Emergency Management Mission Statement

CHAPTER 2
CEM PROGRAM IMPLEMENTATION

2-1. Authorities. Refer to Chapter 2, ER 500-1-1.

2-2. Funding for the CEM Program. ER 11-1-320 provides policies and procedures for funding for the CEM Program. This pamphlet contains supplementary and amplifying processes and procedures regarding funding actions. Figure 2-1 below summarizes funding action procedures and requirements for CEM Program implementation.

FUNDS REQUEST MATRIX

	Cat 100		Cat 200							
	Normal	Out of Cycle	Flood or Coastal Storm (Victim District) (210)	Other Natural Disaster (Victim District) (210)	Support to Victim District (210)	AAR (220)	Post Flood Response (230)	Supplies and Equipment (240)	Support from Others (250)	Operational Support (260)
Requesting Office	EM/PM	EM/PM	EM	EM	EM	EM	EM	EM	EM	EM
Supporting Reqts	IAW Annual budget cycle reqt	Justification			Requires formal task or directive from UOC, MSC HQ, or victim district.	IAW ER 500-1-1	Written request from Governor and State request for FEMA Disaster Declaration	IAW ER 500-1-1	IAW ER 500-1-1. Requires Class 210 Declara-tion of Emer-gency.	IAW ER 500-1-1 for authorized orgns.
DE Decl of Emergency Required?	No	No	Yes (1)	Yes (1)	No	No	Yes (1)	No	No	No

	Cat 300						Cat 400			Cat 500	
	Rehab (310/320/ 330)	Rehab Invest (340)	IEI's (350)	CEI's (360)	ILTF (370)	FCW Database (380)	Invest/Tech Asst/ PIR Prep (430)	Contamin'd Water Project (410)	Drought Project (420)	Invest/Tech Asst/ PIR Prep (520)	Advance Measures Project (510)
Requesting Office	EM	EM	EM	EM	EM	EM	EM	EM	EM	EM	EM
Supporting Reqts	Approved PIR.	Rehab request from public sponsor of active FCW project.	Request from public sponsor for IEI	Part of annual FCCE budget request.	HQUSACE approval to activate ILTF	Part of annual FCCE budget request.	Request from appropriate State official	Governor's request	Governor's request	Request from appropriate State official	Governor's request
DE Decl of Emergency Required?	No	No	No	No	No	No	No	Yes (1)	Yes (1)	No	Yes (1)

NOTES (1) Is delegated to D/DE or any supervisor down to Acting EM Chief level unless withdrawn by DE. Declaration explicitly directs EOC activation.

Figure 2-1. Funds Request Matrix

a. For transfer of funds authority, refer to ER 11-2-201.

b. Reprogramming of Category 100 funds will be in accordance with ER 11-2-201.

c. No reprogramming of Category 200 - 500 funds is permitted.

d. Refer to ER 37-2-10 for guidance on establishment of appropriate cost accounts.

2-3. Cooperation Agreements (CA's). CA's for USACE assistance are required by ER 500-1-1, paragraph 2-4. Use of these CA's is mandatory unless HQUSACE has granted an exception. Previous versions of Project Cooperation Agreements, Cooperation and Participation Agreements, Local Cooperation Agreements, etc., for PL 84-99 activities are obsolete and will not be used.

a. Prescribed CA formats are located in:

(1) Chapter 4 of this pamphlet for Emergency Assistance and Post Flood Response.

(2) Appendix B of this pamphlet for Rehabilitation Assistance.

(3) Chapter 6 of this pamphlet for Emergency Water Assistance Due to Contaminated Water Source, and Emergency Water Assistance Due to Drought.

(4) Chapter 7 of this pamphlet for Advance Measures.

b. Use of a CA allows for a complete understanding between USACE and the public sponsor regarding assistance provided by USACE. USACE policy (set forth in 33 CFR Part 203 and ER 500-1-1) requires districts to obtain an agreement (the CA) that the public sponsor agrees to provide LERRD's, to hold and save the Government free from damages, and to operate and maintain the completed work. Other provisions may be necessary, depending on the type of assistance provided. Districts will ensure the appropriate provisions are included in the CA. Some typical provisions are:

(1) Removal of Temporary Work. A provision that the public sponsor will be responsible to remove all temporary work constructed by USACE. Removal must be initiated within 30 days after the conclusion of the flood event. The wording must not preclude the use of other Federal assistance programs to fund removal. This provision is typical of floodfight and Advance Measures assistance.

(2) Upgrade of Temporary Work. A provision that if the public sponsor desire to retain the temporary flood control structure after the immediate flood threat has passed, the structure must be upgraded to meet requirements of a permanent structure and, if not a

Federal project, meet the requirements for Active status in the Rehabilitation and Inspection Program. Actions to initiate upgrade of the works must be initiated within 30 days after the conclusion of the flood event. Local interests should accomplish the improvements with their own funds; however, they may request assistance under other applicable Corps authorities, such as a Section 205 study. The upgraded project must comply with all local and/or Federal permits, environmental concerns, and all legal requirements. This provision is typical of floodfight and Advance Measures assistance.

(3) Maintenance Deficiencies. A provision explaining that maintenance deficiencies and deferred maintenance will be corrected by, or at the expense of, the public sponsor.

(4) Cost Sharing or Payment to the Government. A provision specifying the conditions for cost sharing or payment to the United States.

(5) Permits. A provision specifying responsibility for obtaining permits.

c. The CA will be executed with the public sponsor.

d. Failure by a public sponsor to comply with the terms of a CA will jeopardize future Federal assistance to that public sponsor.

2-4. ENGLink. ENGLink is the designated information and reporting mechanism for Civil Emergency Management purposes in USACE. ENGLink will be used at all times as the primary source for reporting and briefing activities if access is available. All specified reports and processes will be accomplished in ENGLink using guidance provided by Headquarters USACE and the Tactical Support Center. The National FCW Database will reside on ENGLink.

2-5. Deployable Tactical Operating System (DTOS). DTOS is a command and control concept that employs four tiers of capability. DTOS is centrally funded by HQUSACE through the Tactical Support Center. For additional information, refer to paragraph 3-6.

2-6. The Emergency Management Cycle. The emergency management cycle, portrayed in Figure 2-2, is the principal model used by USACE to address natural disasters.

2-7. Coordinating Instructions.

a. Emergency Management Boundaries. In accordance with ER 500-1-1, paragraph 2-3.d., when established Civil Works boundaries are temporarily realigned for emergency management purposes, HQUSACE will be notified of any realignments. Notification will be via Spot Report (SPOTREP) and Situation Report (SITREP).

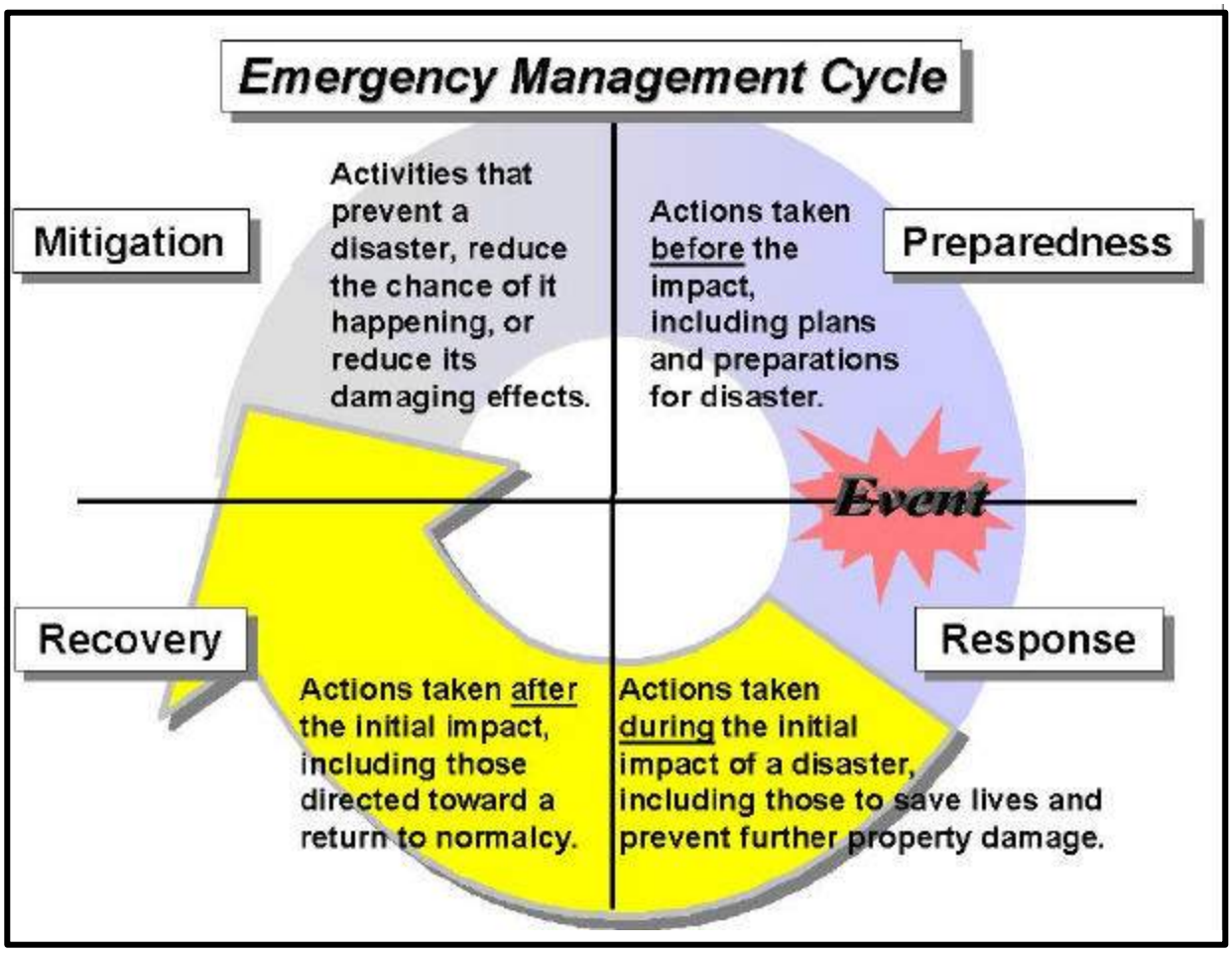

Figure 2-2. The Emergency Management Cycle

b. Interdivisional Assistance/Augmentation. An MSC commander may request interdivisional assistance, and/or augmentees, in the event divisional personnel resources are insufficient to cope with an emergency. Requests for assistance involving positions the supported MSC has been unable to fill with Division resources/volunteers will be submitted to the UOC. The principal method for requesting interdivisional assistance and augmentation is the ENGLink Deployment Module.

CHAPTER 3
DISASTER PREPAREDNESS

3-1. Policy. Refer to Chapter 3, ER 500-1-1.

3-2. The Emergency Manager. The Emergency Manager serves as principal advisor to the Commander on all matters related to natural and technological disasters and national security emergencies, civil disturbances, and terrorism activities. During emergencies, the Emergency Manager provides overall management of emergency/disaster operations and planning activities, typically is the official who directly represents the commander for disaster related matters.

a. Subject Matter Expertise. The Emergency Manager is the subject matter expert on PL 84-99 and the Stafford Act, and is well versed about authorized projects, Continuing Authorities Programs, other USACE emergency authorities, and the Support for Others Program, and how those authorities interface with PL 84-99 and Stafford Act activities. The Emergency Manager is knowledgeable of the functions of all elements within the command. The Emergency Manager is also knowledgeable of other agencies' emergency management authorities, particularly those of the Natural Resources Conservation Service and the Federal Highways Administration.

b. Command Preparedness Activities. The Emergency Manager is responsible for all Command Preparedness activities. This includes the conduct of emergency planning, training, and exercises; the implementation of a viable corrective actions program; and maintenance of the organization's EOC staff and facility in a high state of preparedness. The Emergency Manager is directly responsible for the execution of operational response and recovery missions.

c. Rehabilitation and Inspection Program. The Emergency Manager oversees the Rehabilitation and Inspection Program. This incorporates the Flood Control Works Database, Initial Eligibility Inspections and Continuing Eligibility Inspections, and Rehabilitation Assistance when necessary, and includes all Federal and non-Federal flood control works.

d. Support to Other Corps Elements. The Emergency Manager is responsible for managing the organization's CEM Program support to other Corps elements. This includes ensuring that functional (support) personnel are trained and positions are staffed, staffing Planning and Response Teams, and assisting personnel deploying in support of other Corps elements. The Emergency Manager is responsible for overwatching all administrative functions associated with the organization's personnel while deployed.

3-3. Operation Plans (OPLAN's).

a. Definition. An Operation Plan (OPLAN) is a proposal for executing a command decision or project. It represents the command's preparation for future or anticipated operations.

b. Requirements. Requirements for OPLAN's are contained in ER 500-1-1, paragraph 3-3.b.

c. OPLAN Format. The format at Figure 3-1 will be the basic format used for preparation of Emergency Management OPLAN's in USACE. Additional guidance regarding format and content may be found in Field Manual (FM) 101-5, Appendix H. FM 101-5 may be accessed through the General Dennis J. Reimer Training and Doctrine Digital Library at http://www.adtdl.army.mil/atdls.htm.

_____
(Classification)

Copy _____ of _____ copies
Issuing Headquarters
Place of Issue
Date-time group of signature

OPERATION PLAN _____ (common or code name)
(number)

References:

Time Zone Used Throughout the Plan:

Task Organization*: (State the allocation of units/resources, to include augmentation teams and major liaison elements.)*

1. SITUATION
   a. Supporting agencies
      (1) DOD
      (2) FEMA
      (3) Federal (non-DOD)
      (4) State/tribal/Local
   b. Assumptions *(List all assumptions, e.g., percentage availability of district personnel after the disaster strikes, availability of communications means, EOC activation level, etc.)*

2. MISSION

3. EXECUTION
   Commander's Intent: *(State the commander's intent, previously derived during the planning process.)*
   a. Concept of Operations. *(The concept describes the major efforts done to execute the plan, and major supporting efforts necessary to support the operating elements.)*

Figure 3-1. OPLAN Format

b. Specified tasks. *List, in separate subparagraphs, specific tasks to be executed by subordinate elements. This could include activities such as closing locks to recreational boat traffic, staffing a water control center on a 24-hour basis, installing stoplog closures at a certain river stage, moving construction equipment from a project location to a staging area, or uploading sandbags on a vehicle.)*

c. Coordinating Instructions.

(1) Time or condition when the plan becomes effective *(May be upon issuance of the commander's Declaration of Emergency.)*

(2) Commander's Critical Information Requirements

(3) Risk reduction/safety *(List only those measures unique to the plan and not included in unit SOP's.)*

(4) Environmental considerations *(If extensive, refer to the environmental annex.)*

(5) Others as required

4. SERVICE SUPPORT

a. Support concept. *(State the concept of logistical support.)*

b. Contracting, materiel, and services.

c. Medical evacuation and hospitalization.

d. Personnel. *(Individual or team augmentation request system.)*

5. COMMAND AND SIGNAL

a. Command. *(State the primary and at least one alternate location for the Emergency Operations Center and for principal subordinate elements such as Resident Offices.)*

b. Signal. *(List specific communications instructions not covered by SOP. Identify required reports, to include format and report submission times.)*

ACKNOWLEDGE:

NAME (Commander's last name)
RANK (Commander's rank)

OFFICIAL:
Name and position
ANNEXES:

_____
(Classification)

Figure 3-1. OPLAN Format (Continued)

3-4. Exercises.

a. Frequency. MSC's and districts are required to conduct an exercise at least once every two years. See ER 500-1-1, paragraph 3-6.a. regarding waivers of exercise requirements.

b. After Action Reports. After action reports for exercises conducted will follow the format specified in Figure 4-13.

c. Office of Primary Responsibility. The Readiness Support Center has primary USACE responsibility for designing and supporting exercises. This includes contract support.

3-5. Emergency Operations Centers (EOC's) and Facility Support.

a. Dedicated EOC's. Headquarters USACE, MSC's, districts, the 249th Engineer Battalion (Prime Power), and the Topographic Engineering Center (TEC) will provide a dedicated facility for an EOC to provide command and control for emergency operations. This paragraph sets minimum requirements for an EOC and is applicable to all MSC's, Districts, the 249th Engineer Battalion (Prime Power), and the Topographic Engineering Center. Other laboratories and FOA's may establish EOC's commensurate with their emergency responsibilities. Funding will be provided by budgeted FCCE appropriations. (Note: Additional requirements for operability during national emergencies or exercises should also be incorporated into plans, and funded under other programs as appropriate.)

b. Minimum Requirements for the EOC.

(1) Power. Uninterrupted power is critical to 24-hour operations. The EOC will have an emergency backup generator and an uninterrupted power source (UPS) system. Generators will have a sufficient supply of fuel to operate for at least seven days without restocking.

(2) Auxiliary Heating Ventilation/Air Conditioning (HVAC). HVAC will be provided for the EOC in order to ensure operability during weekends and/or after duty hours, and shall be capable of being powered by the emergency backup generator. For buildings where the entire HVAC system must be on to heat/cool the EOC, the controls in the EOC will allow for system activation, or arrangements must be made to have the system activated during these times. Independent systems may be provided if economical and feasible.

(3) Communications Connectivity. Data communications from the point of origin in the EOC to its final destination (i.e., HQUSACE, MSC, Districts, Labs, and CEAP-A Processing Centers, worldwide access gateways such as Internet, FEMA, and various DOD locations)

will be provided. Space must be allocated for communications and information processing equipment. Critical components located outside the EOC that are necessary to maintain communication (e.g., radio, LAN/WAN, telephone), and electronic mail servers will meet emergency power and HVAC requirements. E-mail and other software capabilities may be provided to the EOC using a file server either within the EOC, or elsewhere within the facility headquarters.

(4) Furniture. Furniture suitable and conducive to an EOC in the quantity necessary to meet the staffing level specified by emergency plans will be provided. Modular or customized furniture is permitted for enhancement of operations. Specialized design for command and control systems furniture modules is permitted.

(5) Dual Use Space. Spaces designated as dual use will be designed, configured, and prewired to serve the operational mode of the EOC. Dual use of facility and equipment for meetings, classrooms, or computer training centers may be practical; however, the ultimate control and coordination of the space shall be retained by the Emergency Manager. For USACE elements located in high risk areas, where the EOC is activated frequently, the dual use strategy is not appropriate. Because the EOC must be available for activation at any time, noncompatible use such as storage is not permitted.

(6) Location. EOC's should be located in the most appropriate portion of the building to minimize the risk of threats while enhancing operations. Items to consider include flood/storm surge, access during power outages when elevators are unavailable, and physical security.

(7) Access. The EOC will be configured to eliminate nonessential pedestrian traffic. Consideration should be given to limiting the number of entrances (consistent with life safety codes), and providing for a reception area that is screened from the main part of the EOC. All EOC areas, including those areas that consist of dual use space, shall have adequate physical security measures.

(8) Storage of Classified Information. For USACE elements with military and national security responsibilities, EOC's must be capable of operating as a restricted area. EOC's will have approved containers for storage of classified material in the EOC, or in an area that is continuously accessible from the EOC.

c. EOC Facility Design. EOC's will include all the physical elements necessary to support the systems and staff in performing the tasks and activities required by USACE missions and emergency operations functions. EOC's will vary in size and configuration based on threat levels and activities supported. Functions common to all EOC's include Crisis Management Team and Crisis Action Team operations, administrative tasks,

planning, crisis communication and information handling, briefing and display, status tracking, and emergency reporting.

(1) Staff Work Area. Full time staff must have dedicated space for non-crisis daily activities. Many of these activities must continue during emergencies. Staff work area requirements are calculated by providing a minimum of 125 sq. ft. for each staff position. Individual work areas must provide a minimum of 64 sq. ft. when modular furniture is used, or 90 sq. ft. when standard office furniture is used. Emergency Managers should be provided closed door privacy, with a minimum of 150 sq. ft. The staff areas must be located in or adjacent to the EOC operations area.

(2) EOC Operations Room. All MSC's and Districts shall provide a dedicated operations room to coordinate major events and events that happen with little or no warning. The layout and configuration of the operations room may support dual use of the facility during noncrisis period unless it is anticipated that the EOC will be activated 50 percent or more of the year. Operations rooms should accommodate at least 10 members of the crisis action team (CAT), dependent on local requirements. The minimum size of the operations room shall allow 64 sq.ft. per CAT member, and a minimum of 200 sq. ft. for display and common equipment. Wall display areas or track-mounted modular display systems, projection screens, white boards, television monitors, large format multi-scan monitors, and similar equipment can be provided to meet operational requirements.

(3) Communications Room. A communications room shall be provided adjacent to the operations room to house radio transmitters/radio control modules. Optimally, the communications room will be separated from the operations room by a glass partition. The communications room will be a minimum of 100 sq.ft., and ideally at least 150 sq. ft. It must contain sufficient space to accommodate all required radio/communications equipment and communications support equipment. The communications room must have proper ventilation, meet equipment cooling requirements, and allow for sufficient operator space.

(4) Briefing Room. The briefing room should be a highly capable multimedia/audio visual center that can display information from various sources (e.g., television, computer, 35 mm slide projector, videocassette recorder). The briefing room will be a minimum of 200 sq. ft., with 15 to 20 sq.ft. provided for each additional person above eight being briefed. The briefing room will consist of an audience area, a control area, podium, and display screens and devices. An additional equipment room/area is required, containing a minimum of 40 sq.ft. for rack mounted electronic equipment and similar items. The control area will contain a console to support computers, video recorders, the master system controller, and related equipment.

(5) Storage Area. Secure storage space is required for EOC equipment and supplies, EMHV items, life support supplies, publications, deployment kits, and similar items. These materials can be stored in the EOC or in a nearby secured area accessible by Emergency Management staff. The size of the storage area is dependent upon the amount of materials and equipment that must be readily accessible during emergencies.

(6) Other Equipment. EOC design and layout shall also provide adequate space for administrative and clerical support, copy machines, supplies, file units, GIS systems, and bookcases.

d. Briefing and Display. Emergency operations briefing and display systems will include all equipment necessary to display needed information. Briefing and display systems will be configured to provide timely graphics, imagery and data displays to enhance the decision making process. A centralized audiovisual control system allowing placement of information on large screen displays or monitors throughout the EOC is authorized. The size and complexity of the briefing and display systems will vary according to the threat in the element's area of responsibility. EOC's that are typically activated 50% of the time shall have dual screen electronic briefing capability. Other EOC's will have either single or dual screen system depending on local requirements. Functional areas to be considered in designing a briefing and display system include: switching and distribution, audio support, external audio/video/data interfaces, audio visual peripheral devices, display systems, briefings presentation systems, and briefing control.

(1) Security Requirements. Briefing and Display Systems shall be designed and accredited to handle classified information if applicable to mission requirements.

(2) Presentation Software. Divisions and districts should develop standardized templates for use during emergencies. Formatted displays for briefings are an important component in expediting display of decision support information in a time sensitive environment. ENGLink formats should be used to the maximum extent possible.

e. Communications. The EOC communications systems shall include all the equipment necessary for voice, data, and facsimile necessary to support emergency operations. Basic communications systems may include telephone service (voice/data/ facsimile), network service (LAN/WAN), HF radio communications, tactical radio communications, and satellite communications.

(1) Telephone Communications. The voice, data, and facsimile service constitute the primary means of communications for EOC's during both normal and emergency operations. Each EOC shall have telephone conferencing and classified capability. Each EOC shall maintain at least two Secure Telephone Unit (STU) instruments, unless HQUSACE grants an exception. Each EOC shall also maintain at least two facsimile

machines, one dedicated to incoming calls and one dedicated to outgoing calls. An additional facsimile accredited for use with a STU is required for classified communications. For smaller offices, the secure facsimile machine may substitute for the outgoing facsimile machine.

(2) Network Services. Network Services consist of LAN and WAN access. Connectivity to the WAN from the LAN should be provided on the EOC segment to guarantee connectivity to the WAN during emergencies.

f. Life Support Capabilities. In an emergency situation there may be occasions when critical life support supplies and equipment are not available. It is therefore necessary for all EOC's to have these items on hand to provide for sustained operations of at least 72 hours duration for EOC and support staff element. Many life support items are perishable and should be inspected and replaced as needed. Required items may vary by MSC/district depending on the threat, and may include:

(1) Lighting. Battery operated and/or chemical light sources.

(2) Water. In areas where the water supply may be vulnerable, EOC's should stock a minimum of one gallon per person per day. Additional water is also needed for sanitation, cleaning, and cooking.

(3) Rations. Military Meals, Ready-To-Eat (MRE's) are available through the General Services Administration (GSA). Also available from commercial sources are freeze-dried foods and similar items. Two meals a day per person should be the minimum amount stored.

(4) Medical Assistance. First aid kits will be available throughout the EOC. Several members of the EOC staff should be trained in First Aid/CPR.

(5) Life Saving Kit. Following a disaster, EOC facilities may be damaged, and members of the staff may be required to assess damage to the structure, turn off utility systems, or gain emergency access or egress. A basic kit should contain a battery powered AM/FM broadcast radio, hard hats, gloves, eye guards, dust masks, flashlights with batteries, safety vest, grease markers, light sticks, shovel, ax, wrecking bar, pick mattock, hammer, rake, hacksaw, adjustable wrenches, and screwdrivers.

(6) Personnel Support Items. A variety of personnel support items may be required in or near the EOC to sustain staff during extended periods in the EOC. Required functions may include cooking/dining, refrigeration, cleaning, and sleeping arrangements, as well as personal hygiene and sanitation. Items may include cots and bedding, refrigerator, microwave oven, sink, shower, coffee maker, and a food preparation counter.

g. Alternate EOC's. Each MSC and district will have the capability to establish command and control to sustain operations if their primary EOC is unavailable. SOP's shall be developed for activation of an alternate facility under an all hazard concept. MSC's and districts will establish procedures for deployment of personnel and equipment to the alternate EOC during duty and non-duty hours. Alternate EOC's will have the same functional capabilities as the primary EOC. Equipment may be austere, but at a minimum will include computer hardware/software, telephones, radio communications, fax machine, printers, and the current contracting package sufficient to establish Command and Control. This paragraph does not supersede other existing requirements for alternate headquarters under other plans. The Alternate EOC concept may be accomplished by:

(1) The fly away kit concept, i.e., planning that includes development of SOP's and checklists that pre-identify commercial/military facilities such as barracks, motel/hotels, equipment, and predesignated staff; or,

(2) Use of a designated preselected and pre-stocked alternate EOC(s); or,

(3) Relocation to another USACE element that has an operating EOC. This option may require partnering agreements that are renewed periodically.

3-6. The Deployable Tactical Operations System (DTOS). DTOS is a command and control concept that employs four tiers of capability.

a. Tiers of Capability.

(1) Tier 1 - Fly Away Kits (FAK's). Each district has been provided with a fly away kit (FAK) that enables a small group of personnel to communicate and maintain records on a laptop computer.

(2) Tier 2 - Rapid Response Vehicles. HQUSACE has procured six Rapid Response Vehicles (RRV's). These vehicles provide work space, communications, and life support capability for six to eight personnel. For planning purposes, RRV's have an operational range of 18 hours of driving time from home station.

(3) Tier 3 - Deployable Tactical Operations Centers. HQUSACE has procured three Deployable Tactical Operations Centers (DTOC's). These systems provide work space, communications, and life support capability for approximately 40 personnel. For planning purposes, DTOC's have an operational range of 36 hours driving time from home station.

(4) Tier 4 - Containerized Tactical Operations Centers. HQUSACE has procured two Containerized Tactical Operations Centers (CTOC's). These systems functionally are similar to the DTOC for office support equipment, communications equipment, and computers. However, the CTOC components are containerized for rapid air movement, and are intended for use in insular and remote areas.

b. Control of DTOS Assets.

(1) Tier 1. FAK's are under the operational control of district engineers.

(2) Tier 2. RRV's are under the operational control of HQUSACE, and may be deployed only as directed by HQUSACE. Divisions or districts requiring RRV support will submit requests through channels to the USACE Operations Center.

(3) Tier 3. DTOC's are under the operational control of HQUSACE, and may be deployed only as directed by HQUSACE. Divisions or districts requiring DTOC support will submit requests through channels to the USACE Operations Center.

(4) Tier 4. CTOC's are under the operational control of HQUSACE, and may be deployed only as directed by HQUSACE. Divisions or districts requiring CTOC support will submit requests through channels to the USACE Operations Center.

c. Planning. When appropriate to do so, divisions and districts should incorporate the use of DTOS (to include FAK's) into disaster preparedness plans. The planning assumption should be made that the appropriate configuration would be available, based on standard stationing of available assets.

d. Funding for DTOC/CTOC/RRV Deployment. The requesting division/district is responsible for providing the custodial district of the DTOC/CTOC/RRV with funds for deploying the requested asset. The requesting division/district will use FCCE funds (Class 210, 230, 510, or 520 only) or FEMA funds, based on the mission requirements, to fund DTOC/CTOC/RRV deployments and maintenance needs in support of PL 84-99 and Stafford Act missions and activities. Normal FAK operations and maintenance are funded by Class 110. Contact the Tactical Support Center if replacement of a FAK component is needed.

e. DTOS Use in Exercises and Displays. All DTOS assets are available for employment during exercises, in consonance with exercise objectives, available funding, level of commitment of DTOS assets, etc. Displays of DTOS assets at other than Emergency Management-related functions must be funded by the requesting office.

3-7. Emergency Management High Visibility Items.

a. Description. Emergency Management High Visibility (EMHV) items are items that are used to easily identify USACE personnel and equipment at disaster locations. For personnel, EMHV items are typically shirts, jackets, vests, and hats that are worn by the individual. Banners and magnetic signs are normally used to identify USACE owned or contracted equipment. Refer to http://www.nap.usace.army.mil/emo/shirts.htm for additional information.

b. Stockage Level. Divisions/districts will maintain a stock of EMHV items commensurate with the size of the division/district, the staffing requirements for Planning and Response Teams (and comparable elements), and the potential number of deploying personnel when supporting a victim division/district.

c. EMHV Items for Individual Filler Personnel Supporting a Victim District. For a minimum of two weeks after the declaration or onset of a disaster operation, the home division/district Emergency Manager will provide deploying organizational personnel with sufficient quantities of EMHV items. Later deploying personnel will be provided EMHV items for as long as the supporting division/district has supplies available. This is to preclude an unnecessary logistics burden on the victim district.

CHAPTER 4
EMERGENCY OPERATIONS

Section I - General

4-1. General. See ER 500-1-1, Chapter 4, for pertinent policy information.

4-2. Authorities. The authority to perform Emergency Operations, to include Response Operations and Post Flood Response activities, is provided by PL 84-99, and implemented by ER 500-1-1 and this pamphlet. Funding requirements are addressed in ER 11-1-320, Figure 2-1 of this pamphlet, and throughout this chapter. Where other Federal agencies have adequate emergency authorities, or when other USACE authorities exist that can adequately address the situation, USACE assistance under PL 84-99 is not permitted.

4-3. Operational Procedures - General.

a. Levels of EOC Activation. EOC's are activated commensurate with mission requirements. Commanders may direct subordinate elements to increase or decrease the element's level of activation. All changes in level of activation will be immediately reported to higher headquarters and the UOC via Situation Report (SITREP).

(1) Level I - Normal Operations. This level is for normal, day to day operations. The EOC is prepared for activation to a higher level.

(2) Level II - Emergency Watch. This level represents an augmentation to the normal Emergency Management staff, and/or extended hours of operation for the EOC. Level II activations are typical of responses to watches and warnings, and other disaster activities that do not merit a higher level of activation.

(3) Level III - Partial Activation. This level represents partial activation of the EOC in response to a threat situation, ongoing operation, or intensive recovery activities. Level III activations typically have the EOC staffed for 10 or more hours per day, seven days per week. CAT representatives are present on at least a part time basis.

(4) Level IV - Full Activation. This level represents full activation of the EOC in response to a threat situation or ongoing operation. The EOC is staffed on a 24-hour per day, seven-day per week basis. Most or all CAT representatives are present on a full time or part time basis.

b. Declaration of Emergency. District commanders will issue a Declaration of Emergency in order to implement their response operations and Post Flood Response authorities. A Declaration of Emergency is required in all cases where USACE activities

will be funded under Class 210 (except for Support to Victim Districts) or Class 230 criteria. Declarations of Emergency are not issued at MSC level or at HQUSACE.

(1) The Declaration of Emergency may initially be verbal, but must be made in writing and reported in the district's SITREP within 24 hours of the declaration.

(2) Authority to issue a Declaration of Emergency is delegated to Deputy District Engineers, and all supervisors in the chain from the District Commander to the Chief of Emergency Management, inclusive. For purposes of a Declaration of Emergency, "Chief of Emergency Management" includes an acting Chief of Emergency Management. District commanders may withhold authority to issue a Declaration of Emergency. Withholding of authority may be done either by written correspondence, or via a published OPLAN.

(3) A general format for a Declaration of Emergency is provided at Figure 4-1.

c. Field Investigations (Class 210 and Class 230). The concept of USACE field investigations during the response phase applies to investigations prior to, during, and after a flood or coastal storm or other disaster. Field investigations may be conducted at the MSC or district's initiative, or may be conducted based on a request by state or local officials. In either case, there must be sufficient reason to believe that further FCCE-funded Corps activity or effort will result from the investigation, e.g., the need for USACE floodfighting effort to supplement state and local response efforts. Field investigation funding is not to be used for data gathering activities or general studies efforts that are traditionally funded by the General Investigations appropriation.

(1) SITREP Requirements. A SITREP is required for all field investigations. This either may be a separate, independent SITREP, or may be an additional item included in another SITREP.

(2) Post Flood Response Situations. Field investigations for potential Post Flood Response Assistance are conducted during or immediately following the flood or coastal storm event. (Post Flood Response Assistance is not authorized for other types of disasters.) The purpose of the field investigation is to enable USACE to prepare for and conduct an expeditious response to the governor's request for assistance. Field investigations for potential or expected Post Flood Response Assistance may occur prior to receipt of the Governor's request for assistance if requested by an appropriate State official.

d. Technical Assistance (Class 210). USACE emergency operations technical assistance for any disaster consists of providing review and recommendations, and technical expertise, in support of tribal, state, and local efforts. The following are examples of technical assistance:

(1) Providing experienced personnel at the disaster site to give guidance on flood fight techniques and emergency construction methods.

(2) Providing personnel to inspect existing flood protection projects and/or structurally threatened dams to identify problem areas and recommend corrective measures.

(3) Providing hydraulic or hydrologic analysis, geotechnical evaluations, topography and stream data, maps, and historic flood or storm information.

e. Direct Assistance (Class 210). Emergency operations direct assistance under PL 84-99 is limited to flooding and coastal storm-related emergencies only. As an exception to this limitation, USACE may always use its resources to assist in rescue operations to save lives in any disaster situation. Any USACE equipment and personnel used in a lifesaving rescue operation should be directed by a local official such as a law enforcement officer or firefighter, or other officials duly appointed to conduct rescue operations.

f. Reporting (Class 210 and 230). Reporting will be done in accordance with Section V of this chapter.

g. EMHV Requirements. USACE personnel arriving in the disaster area within two weeks of the onset of the disaster must bring appropriate EMHV items with them from their assigned districts. Follow-on personnel arriving after the first two weeks should bring EMHV items with them if available. The supported district must plan to issue EMHV as needed in the disaster area.

h. Support to Victim Districts (Class 210). If a supporting district has one or more Planning and Response Teams (PRT's), or other supporting personnel, on "alert" status, or a movement order for such personnel has been ordered, any support needed at the supporting district to assist their departure/deployment will be funded under Class 210 by the supporting district.

4-4. Funding - General. ER 11-1-320 prescribes general funding procedures for PL 84-99 emergency operations Category 200 activities.

a. Cost Accountability. All costs associated with emergency operations will be maintained separately. MSC's and districts may not reprogram FCCE funds except as specifically allowed in ER 11-1-320 and ER 11-2-201. Allowable FCCE costs include the following activities:

(1) USACE labor costs, including regular time, overtime, hazard pay, and shift differential pay. (Refer to ER 11-1-320 regarding specific details for General Expense-funded personnel.) FCCE funds will be used for labor that supports the EOC, disaster field teams, and other personnel directly supporting emergency operations. Water control personnel, and project personnel accomplishing emergency operations at USACE-operated and maintained projects or projects under construction, will not be funded with FCCE funds.

(2) Emergency hire of skilled or unskilled workers, normally for one month or less.

(3) Travel and/or per diem for USACE personnel or emergency hired personnel.

(4) Transportation costs of supplies and equipment.

(5) Contract costs.

(6) Costs incurred by other DOD agencies, over and above their normal operating expenses, for their support to USACE.

(7) Purchase of supplies and materials.

(8) Replenishment of used stockpiled items.

(9) Rental or lease of field offices.

(10) Equipment charges.

b. Fiscal Closeout. Emergency Management elements will ensure that actions for closing out emergency activities are accomplished as specified in ER 11-1-320. Districts will submit a SPOTREP or SITREP for each fiscal closeout completed. Fiscal closeouts will be accomplished within the following time frames:

(1) Class 210 Activities: Within 75 days of return of the EOC to Level I (normal) activations.

(2) Class 220 Activities. Within 30 days of submission of the After Action Report.

(3) Class 230 Activities. Within 70 days of the receipt of the Governor's request for Post Flood Response assistance.

(4) Class 240 and Class 250 Activities. Within 60 days of completion of funded activities.

CEXXX-CO-E 28 June 20xx

MEMORANDUM FOR See Distribution

SUBJECT: Declaration of Emergency: June 20xx Flood, Xxxxx District, Elizabeth River and Tributaries

1. In accordance with ER 500-1-1, a Declaration of Emergency has been declared to exist in the Xxxxx District as of 1200 hours 28 June 20xx.

2. Level of Activation. The Emergency Operations Center is activated at Level II effective 281200Jun20xx. The EOC will be manned daily from 0600 - 1800 IAW District OPLAN 2001-01 by all Level II-designated personnel. During unmanned periods, telephone messages will be received by the duty officer via the 24-hour emergency number (899) 555-1234. The Crisis Management Team's initial meeting is set for 0900 hours 29 June in the EOC.

3. Expenses incurred as a result of this Emergency will be those involved with the flood operation, i.e., EOC operations, issuance or transportation of sandbags, forecasting, flood sector engineers, or flood reconnaissance. No charges will be made prior to the date of this declaration. Costs relating to Dam or Lake observation must be charged to O&M work items.

LOCATION	CATEGORY CODE / CATEGORY ELEMENT / WORK ITEM		
Elizabeth River & Tribs	021000	BBA00	002LSL

4. Paid overtime is authorized under the following criteria:

a. All personnel, regardless of grade, engaged in flood emergency operations may be paid overtime.

b. Earning of GS employees exempt from FLSA are subject to limitation contained in 5 USC 6547. Earnings under the provision of FLSA are not subject to the aforementioned limitation.

c. A copy of this order, attached to DA Form 5172-R, Overtime Request and Authorization, overrides the requirements outlined in Xxxxx District Regulation 690-1-600, paragraph 4, dated 1 May 1999.

GEORGE H. GABION
Colonel, EN
Commanding

DISTRIBUTION:
as required

Figure 4-1. Format for Declaration of Emergency

Section II. Response Operations - Floods and Floodfights

4-5. Operational Procedures - Floods and Floodfights.

a. USACE Assistance. USACE emergency assistance during floods and coastal storms will be of a temporary nature to meet the immediate threat, and will supplement tribal, state, and local efforts. USACE efforts are not intended to provide permanent solutions to flood problems, and are not intended to overcome the lack of adequate flood protection in a locality.

b. Floodfights. USACE floodfights will be planned and conducted in accordance with sound principles of engineering judgement and economic sense.

c. Direct Assistance. Direct assistance may include, but is not limited to, the issuance of supplies, the loan of equipment, rescue operations, conducting flood fight operations, and contingency contracting. All loaned supplies and equipment will be hand receipted to the receiving agency. A CA is required for emergency assistance requiring USACE contingency contracting, or when USACE force labor accounts are used. See Figure 4-2 for the CA for Emergency Assistance.

(1) Supplies and Equipment. Issuance of supplies and equipment to non-Federal interests is permitted only in declared emergencies (reference paragraph 4-3.b., above). Government supplies and equipment should be made available only if the arrival or non-availability of local supplies and equipment will cause delays in an effective response effort. During emergency situations, Class 210 funding will be used to purchase or rent materials and equipment, and to replace items issued from disaster preparedness and other stocks. USACE supplies (e.g., sandbags or plastic sheeting) and equipment (e.g., pumps and generators) may be loaned to state and local officials for use in supplementing their flood fighting operations. All such supplies and equipment will be hand receipted to the receiving agency. The hand receipt will contain an agency billing address, and a statement similar to the following: *"I understand that my agency will be required to return loaned equipment and reimburse the US Army Corps of Engineers for expended supplies. Reimbursement may be in the form of (a) replacement in kind with an equivalent quality to those issued; (b) paying the cost for the Corps of Engineers to replace the supplies with those of an equivalent quality; or (c) returning in good, usable condition those supplies not used; or (d) any combination of the above. I understand that my agency will be billed for supplies not replaced, and agree to remit payment within 30 days of the bill date."*

(a) All unused stocks loaned to local interests will be returned to USACE when the operation is complete.

(b) District commanders may waive loan replacement requirements for expendable supplies (sandbags, plastic sheeting, etc.) when a Presidential disaster or emergency declaration under the Stafford Act has been made. No waivers are permitted for loaned equipment. No waivers are permitted for supplies if no Presidential disaster or emergency declaration is made, unless an exception is approved by HQUSACE.

(c) Local interests will return loaned equipment in the same condition as it was when lent. If equipment is damaged or lost, either the equipment will be replaced in kind, or reimbursement made to USACE by the hand-receipting agency.

(2) Flood Fight Operations. USACE may direct flood fight operations upon request of an appropriate state or local official. However, legal responsibility remains with the requesting state or local official/agency.

(3) Contingency Contracting. USACE may award contracts for emergency operations. Contingency contracting may be equipment rental, fixed price construction contract, Job Order Contracts, etc. Districts are encouraged to use innovative methods, such as Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts, to improve response capabilities. Examples of allowable types of emergency work include the construction of temporary levees; the repair, strengthening, or temporary raising of levees or other flood control works; removal of stream obstructions that may induce localized flooding; and removal of debris under bridges that may induce localized flooding.

(4) Supply Procurement. Before contracting for supplies, particularly sandbags, from commercial sources during a flood fight, USACE stockpiles, and GSA or Defense Logistics Agency (DLA) supply sources should be used if timely delivery can be made. Good forecasting and anticipation of upcoming events is critical during a flood fight, because of substantial cost reductions available when delivery can be made two or three days out rather than requiring one-day delivery.

d. Operations in Support of Other Commands. Class 210 funds may be requested by the supporting command for administrative support of deploying personnel. Class 210 funds may be used to prepare orders, provide travel assistance, and perform closeout activities.

4-6. Funding. Funding for all aspects of floodfights will be in accordance with paragraph 4-4, above. All Class 210 funds for flood fights use CWIS number 05480.

4-7. Cooperation Agreement - Emergency Assistance.

a. Requirement. A Cooperation Agreement is required whenever direct Emergency (Flood Fight) Assistance is provided to a state, tribal, or local entity. The CA format for

Emergency Assistance is at Figure 4-2. Paragraph 2-3 above, and paragraph 2-4 of ER 500-1-1 will be complied with for all CA's.

b. Technical Assistance and Rescue Operations. No CA is required if only rescue operations and/or technical assistance for floodfighting are provided.

COOPERATION AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
EMERGENCY ASSISTANCE (FLOOD or COASTAL STORM)

THIS AGREEMENT, entered into this ____ day of _____, 20___, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") acting by and through the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____[PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), acting by and through _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, 33 USC 701n authorizes the Chief of Engineers to flood fight and perform rescue operations.

WHEREAS, the Public Sponsor has requested assistance under 33 USC 701n, and the Public Sponsor qualifies for such assistance in accordance with the established policies of the U.S. Army Corps of Engineers.

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate with the terms of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. The Government will perform the work described in its scope of work (attached) that is made part of this agreement.

2. The Public Sponsor will:

a. Provide without cost to the Government all lands, easements, rights-of-ways, relocations, and borrow and dredged or excavated material disposal areas necessary for the work.

b. Hold and save the Government free from damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except damages due to the fault or negligence of the Government or its contractors.

c. Operate, maintain, repair, replace, and rehabilitate the completed work in a manner satisfactory to the Government.

d. Remove, at no cost to the Government, all temporary work constructed by the Government.

3. (Add others as applicable)

4. ATTACHMENTS:

a. Exhibit A - Government Scope of Work.

b. (Add others as applicable)

IN WITNESS WHEREOF, the parties hereto have executed this agreement of the day and year first above written.

THE DEPARTMENT OF THE ARMY

BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
ADDRESS:

THE [NAME OF PUBLIC SPONSOR]

BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
ADDRESS:

Figure 4-2. Cooperation Agreement for Emergency Assistance

Section III. Response Operations - Disasters Other Than Floods

4-8. Operational Procedures - Other than Floods.

a. PL 84-99 Authority. Under PL 84-99 authority, operations during non-flood emergencies are limited to activation of EOC's, rescue operations, the provision of limited technical assistance, and liaison activities. These activities are properly funded under Class 210 until the situation clarifies, and disengagement of USACE resources or the identification of more appropriate USACE resources and funding can be made.

b. Stafford Act/Federal Response Plan. EOC operations in support of FEMA mission assignments are funded under Class 210.

(1) Class 210 funds may not be used for deployment or prepositioning of USACE personnel and/or equipment in anticipation of a FEMA mission assignment.

(2) Class 210 funds may be used for USACE personnel that deploy *for training purposes* in support of a FEMA mission assignment. This would normally be limited to newly designated ESF-3 team leaders/assistant team leaders, and personnel newly assigned to a position that requires them to be familiar with ROC or DFO operations. Use of Class 210 funds for this purpose requires HQUSACE (CECW-OE) approval.

4-9. Funding - Other Than Floods. Funding will be in accordance with paragraph 4-4 above, and ER 11-1-320. All Class 210 funds for non-flood related emergencies will use CWIS number 05480.

4-10. Cooperation Agreements - Other Than Floods. Because USACE can provide only rescue operations and technical assistance under its PL 84-99 authority for non-flood related disasters, no CA's are required for non-flood response operations.

Section IV. Post Flood Response

4-11. Operational Procedures - Post Flood Response.

a. Coordination Requirement. All potential or planned Post Flood Response Assistance must be telephonically coordinated between the MSC and HQUSACE (CECW-OE). After coordination with HQUSACE, all potential or planned Post Flood Response Assistance must be coordinated by the MSC with the appropriate FEMA region prior to execution of the work.

b. Governor's Request. A written request from the governor to the district commander for Post Flood Response Assistance will be provided concurrently with or immediately after

the governor's request to FEMA for an emergency or disaster declaration. The district will immediately notify the MSC and HQUSACE of receipt (or anticipated receipt) of a governor's request for Post Flood Response Assistance. After telephonic coordination with HQUSACE (CECW-OE), approval level for Post Flood Response Assistance is the District Commander or Acting District Commander. Approval may not be delegated.

c. Types of Post Flood Response Assistance. Post Flood Response Assistance may be technical assistance or direct assistance. Examples of actions accomplished under Post Flood Response direct assistance include:

(1) Clearance of debris necessary to reopen critical transportation routes. (For Post Flood Response Assistance, "clearance" is defined as moving the debris to the side of the road. It does not include hauling the debris to a landfill or disposal area, unless immediate removal is necessary to prevent endangerment to public health and safety.)

(2) Temporary restoration of critical transportation routes or public services or facilities.

(3) Clearance of debris from under bridges or in channels or culverts, when flooding of or extensive damage to public facilities would result if the debris were not removed. If the threat of flooding (from either riverine flow or rainfall) has abated, then such debris clearance is not permitted.

(4) Other assistance required to prevent immediate loss of life, as determined by the MSC or district commander.

(5) Other assistance required to prevent immediate extensive damage to public property, as determined by the MSC or district commander.

d. Field Investigations. Field investigations for potential Post Flood Response Assistance may be conducted during or immediately following the disaster event to enable an expeditious response to the governor's request for assistance. Field investigations for potential or expected Post Flood Response Assistance may occur prior to receipt of the Governor's request for assistance if requested by an appropriate State-level official.

e. The 10-Day Limit. Post Flood Response Assistance is statutorily limited to a 10-day period from the date of the Governor's request to FEMA for an emergency or disaster declaration under authority of the Stafford Act. The day of receipt of the governor's request for Post Flood Response Assistance is considered to be Day Zero. All Post Flood Response Assistance, to include contracted activities, must cease by 2400 local time of Day Ten.

4-12. Funding - Post Flood Response. All EOC activities will continue to be funded under Class 210. All activities that are directly related to the Post Flood Response effort will be funded under Class 230, in accordance with Chapter 3 of ER 11-1-320. This includes field investigations that are done based on anticipated tribal or State requests for Post Flood Response Assistance.

4-13. Cooperation Agreement - Post Flood Response.

a. Requirement. A Cooperation Agreement is required whenever direct Post Flood Response Assistance is provided to a state, tribal, or local entity. The CA format for Post Flood Response Assistance is at Figure 4-3. Paragraph 2-3 of this pamphlet, and paragraph 2-4 of ER 500-1-1 will be complied with for all CA's.

b. Technical Assistance. The provision of only technical assistance for Post Flood Response does not require a CA.

COOPERATION AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
POST FLOOD RESPONSE ASSISTANCE (FLOOD or COASTAL STORM)

THIS AGREEMENT, entered into this ____ day of _____, 20___, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____ _____ [PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT] acting in accordance with the request of the Governor of the State.

WITNESSETH THAT:

WHEREAS, pursuant to 33 USC 701n, in any case in which the Chief of Engineers is otherwise performing work in an area for which the Governor of the affected State has requested a determination that an emergency exists or a declaration that a major disaster exists under The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.), the Chief of Engineers is authorized to perform on public and private lands and waters for a period of ten days following the Governor's request any emergency work made necessary by such emergency or disaster which is essential for the preservation of life and property, including, but not limited to, channel clearance, emergency shore protection, clearance and removal of debris and wreckage endangering public health and safety, and temporary restoration of essential public facilities and services; and,

WHEREAS, the Governor has requested the Government to undertake authorized Post Flood Response activities in accordance with 33 U.S.C. 701n, and established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in accordance with the terms of this Agreement;

NOW, THEREFORE, the parties agree as follows:

1. The Government will perform the work described in its scope of work (attached) that is made part of this agreement.

Figure 4-3. Cooperation Agreement for Post Flood Response Assistance

2. The Public Sponsor will:

a. Provide without cost to the Government all lands, easements, rights-of-ways, relocations, and borrow and dredged or excavated material disposal areas necessary for the work.

b. Hold and save the Government free from damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except damages due to the fault or negligence of the Government or its contractors.

c. Operate, maintain, repair, replace, and rehabilitate the completed work in a manner satisfactory to the Government.

d. Remove, at no cost to the Government, all temporary work constructed by the Government.

3. (Add others as applicable)

4. ATTACHMENTS:

a. Exhibit A - Government Scope of Work.

b. (Add others as applicable)

IN WITNESS WHEREOF, the parties hereto have executed this agreement of the day and year first above written.

THE DEPARTMENT OF THE ARMY

BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]

ADDRESS:

THE [NAME OF PUBLIC SPONSOR]

BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]

ADDRESS:

Figure 4-3. Cooperation Agreement for Post Flood Response Assistance (Continued)

Section V. Reporting

4-14. Overview.

a. Need. Timely, accurate reporting is necessary to allow the Commander, USACE, to direct and execute the Command's mission. In addition, information is necessary to allow the Commander, USACE, and the senior USACE staff to work with FEMA, other Federal agencies, and Congressional offices regarding the disaster event. Every emergency situation with the potential for USACE involvement, or which may result in regional or national media attention involving USACE, will be reported immediately. The fastest means of reporting that is available will be used to initially notify HQUSACE. This is normally telephonic reporting to the UOC. ENGLink will be used for subsequent reporting.

b. Reports Required.

(1) Situation Report (SITREP). See paragraph 4-15. (RCS CECW-O-65).

(2) Disaster Recovery SITREP. See paragraph 4-16. (RCS CECW-O-65).

(3) Spot Report (SPOTREP). See paragraph 4-17.

(4) After Action Report (AAR). See paragraph 4-18.

4-15. Situation Reports (SITREP's).

a. General. The SITREP will be the official source for reporting information pertaining to the event.

(1) SITREP's will be submitted on all potential and actual disasters with USACE involvement.

(2) SITREP's will be submitted on all natural or technological emergencies with potential USACE involvement, or that may produce regional or national media interest in USACE operations, activities, or facilities.

(3) SITREP's will be submitted whenever there is a change in EOC activation level.

(4) SITREP's may be submitted in any other case at the discretion of the MSC/district.

b. SITREP Format. SITREP's will follow the format outlined in Figure 4-4, with applicable information provided under appropriate sections and appendices.

(1) The format for mandatory appendices to the basic SITREP are at Figures 4-5 through 4-7.

(2) The formats for "as needed" appendices D and E to the basic SITREP are at Figures 4-8 and 4-9. All additional appendices will be appropriately formatted for the information presented.

c. Methods of Submitting SITREP's. The principal means of providing SITREP's will be ENGLink. Email or high speed digital facsimile (fax) will normally be the secondary means of transmitting SITREP's (and other reports). Fax will be the primary means of transmitting maps and other information not suitable to electronic mail. The sending element, via telephonic confirmation, is responsible for ensuring that transmitted critical information has been received.

d. Notification and SITREP Submissions for Major Emergencies. Initial notification of a major emergency event will be provided telephonically and followed by a SITREP based on the best information available. These SITREP's will not be delayed in order to collect and compile additional data. Supplemental spot reports will be provided as conditions warrant and in accordance with HQUSACE reporting requirements.

e. Frequency of Reporting.

(1) During major events with widespread impacts, or any event with significant USACE involvement, daily SITREP's will be submitted.

(2) When the situation has stabilized, and response operations have essentially concluded, SITREP's will be submitted on at least a weekly basis. The weekly SITREP's will be submitted on the first business day of the week. See paragraph 4-16 for continuation of SITREP's via the Disaster Recovery SITREP.

f. SITREP's for Post Flood Response Situations. SITREP's on situations where Post Flood Response Assistance is requested or anticipated will address the extent of assistance required, FEMA coordination, state and local actions, and planned USACE activities. Follow-on reports should address status of efforts, summary of actions accomplished (USACE, other Federal, state and local), and unmet requirements.

g. SITREP's During Advance Measures Operations. When Advance Measures projects are being investigated, and when Advance Measures projects using a temporary standard of construction (the typical case) are being executed, SITREP's will be submitted on a daily basis. When Advance Measures projects using a permanent standard of construction are being executed, or when the Advance Measures project consists primarily of long term technical assistance, SITREP's will be submitted on at least a weekly basis, on the first

business day of the week. SITREP's will address project progress/completion status, impediments to project completion, results of investigations, the projection for when floodfight operations may need to begin, and other pertinent information.

h. Reporting During Non-Duty Hours. During non-duty hours, initial reports on emergencies or significant changes in conditions of ongoing emergencies that the Commander, USACE or staff need to be immediately aware of will be provided by telephone, through command channels, to the UOC Chief (CECS-OPS) or the Chief, Civil Emergency Management Branch, or the designated duty officer at their home telephone or pager number. A follow-up SITREP will be provided the next business day.

i. Distribution of Reports. MSC commanders will furnish information copies of situation reports on events to the CONUSA, unified, or designated commander, as well as the appropriate FEMA Regional Director(s) using the fastest electronic means available. Other concerned officials should be similarly informed. District commanders will furnish information copies of SITREP's to state emergency management agencies and other agencies and officials, as required. When appropriate, SITREP's will be furnished to interested local congressional offices.

j. Termination of SITREP Submissions. If no Disaster Recovery SITREP's are required in accordance with paragraph 4-16. below, SITREP submissions can be terminated upon fiscal closeout of the funds received for the event.

BASIC SITREP FORMAT	
1. SITREP:	The word "SITREP" followed by the District name, date, local time, and Zulu Date-Time-Group (DTG)
2. DISASTER NR.:	The assigned number for this disaster event.
3. CATEGORY:	Short description of the type of SITREP. Examples: - Storm - Flood (or Potential Flood) - Post Flood Response* - Hurricane (or Tropical Storm) - Earthquake - Volcano - Tornadoes - Pollution Spill - Support to Law Enforcement - Support to Military Operation - Mobilization** **Used only if there were no SITREP's for the associated storm or flood.* ***Requires HQUSACE authorization to use.*
4. EVENT NAME:	The assigned name of the event.
5. SEQUENCE NR.:	Use "Initial" for the first report. Subsequent reports will begin with "2" and be sequentially numbered thereafter. For the last report, use the next sequential number followed by "and Final". If Disaster Recovery Reports will follow, use the next sequential number followed by " Disaster Recovery SITREP's to follow."
6. SITUATION:	A summary of the situation that answers the questions what, where, and when. This paragraph may be a narrative or in bullet format.
7. PAST 24:	A narrative or bullet form statement of USACE actions, activities, and situations that have occurred in the previous 24 hours, or since the last SITREP.
8. NEXT 24:	A narrative of planned and anticipated actions for the next 24 hours or the next reporting period.
9. OTHER EFFORTS:	Commander's Assessment, if needed. A summarization of efforts taken by other agencies, state/local governments, and organizations. Examples include FEMA, military agencies, Red Cross, etc.
10. APPENDICES - MANDATORY	A. FCCE Funds B. FEMA Funds (by mission assignment) C. Personnel
11. APPENDICES - AS NEEDED	D. Reservoir Status E. River Stage Data F. Weather and Rainfall Data (actual and/or projected) G. FEMA Mission Assignments - Operational Report H. FCW Rehab Status I. - Z. Others

Figure 4-4. Format for Situation Report

FCCE FUNDS - APPENDIX A				
CLASS	**FUNDS PROVIDED**	**FUNDS OBLIGATED**	**FUNDS EXPENDED**	**REMARKS**
210				
220				
230				
240				
250				
310				
320				
330				
340				
370				
410				
420				
430				
510				
520				

Figure 4-5. Format for Appendix A to Basic SITREP

FEMA FUNDS - APPENDIX B					
MISSION NR.	**MISSION NAME**	**FUNDS RECEIVED**	**FUNDS OBLIGATED**	**FUNDS EXPENDED**	**REMARKS**

Figure 4-6. Format for Appendix B to Basic SITREP

PERSONNEL - APPENDIX C						
MSC/DISTRICT ORGANIC ASSETS		TDY PERSONNEL (NONORGANIC)				
MIL (OFF/WO/ENL)	CIV	249TH EB (OFF/WO/ENL)	MIL (OFF/WO/ENL)	CIV, SAME MSC	CIV, OTHER MSC	OTHER
REMARKS: (Note significant changes in personnel numbers, arrival/departure of PRT's, etc. Personnel from the 249th Engineer Battalion (Prime Power) will be reported separately from other nonorganic military personnel.) The "Other" category includes contractors, and personnel from non-USACE DOD or Federal agencies.						

Figure 4-7. Format for Appendix C to Basic SITREP

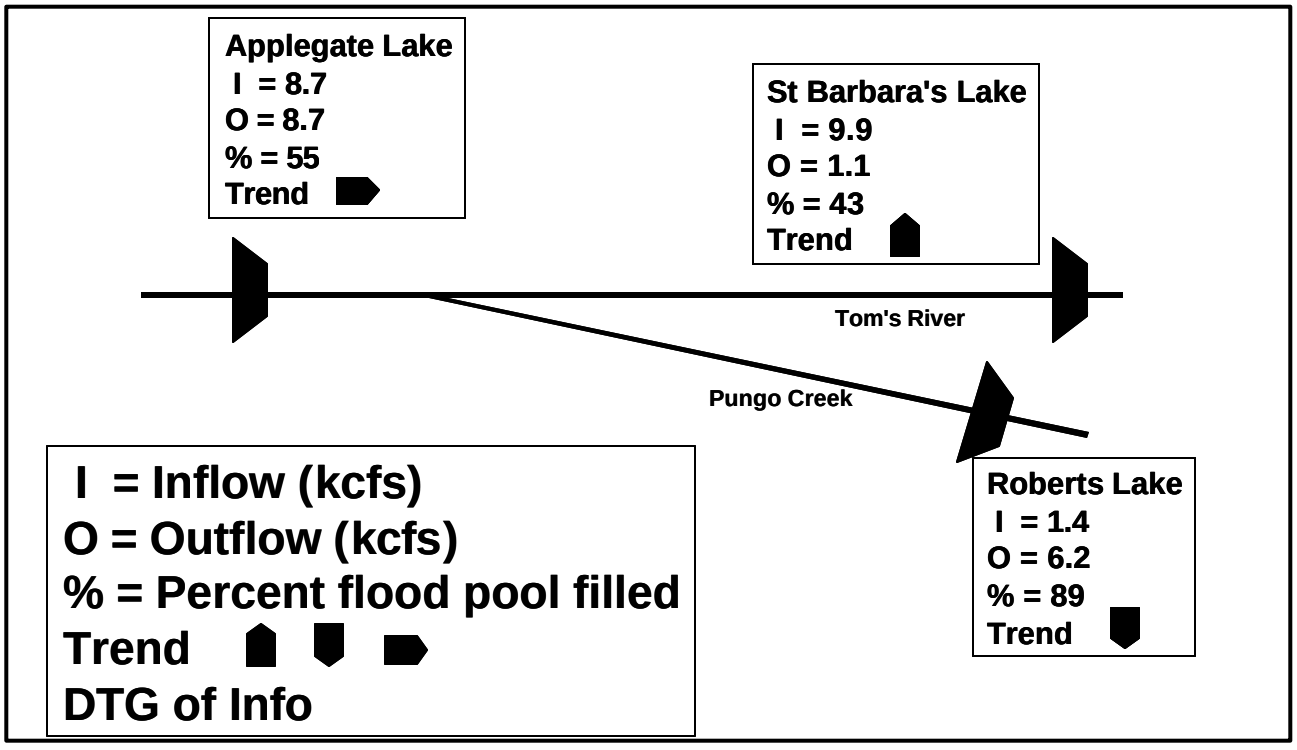

Figure 4-8. Format for Appendix D to Basic SITREP

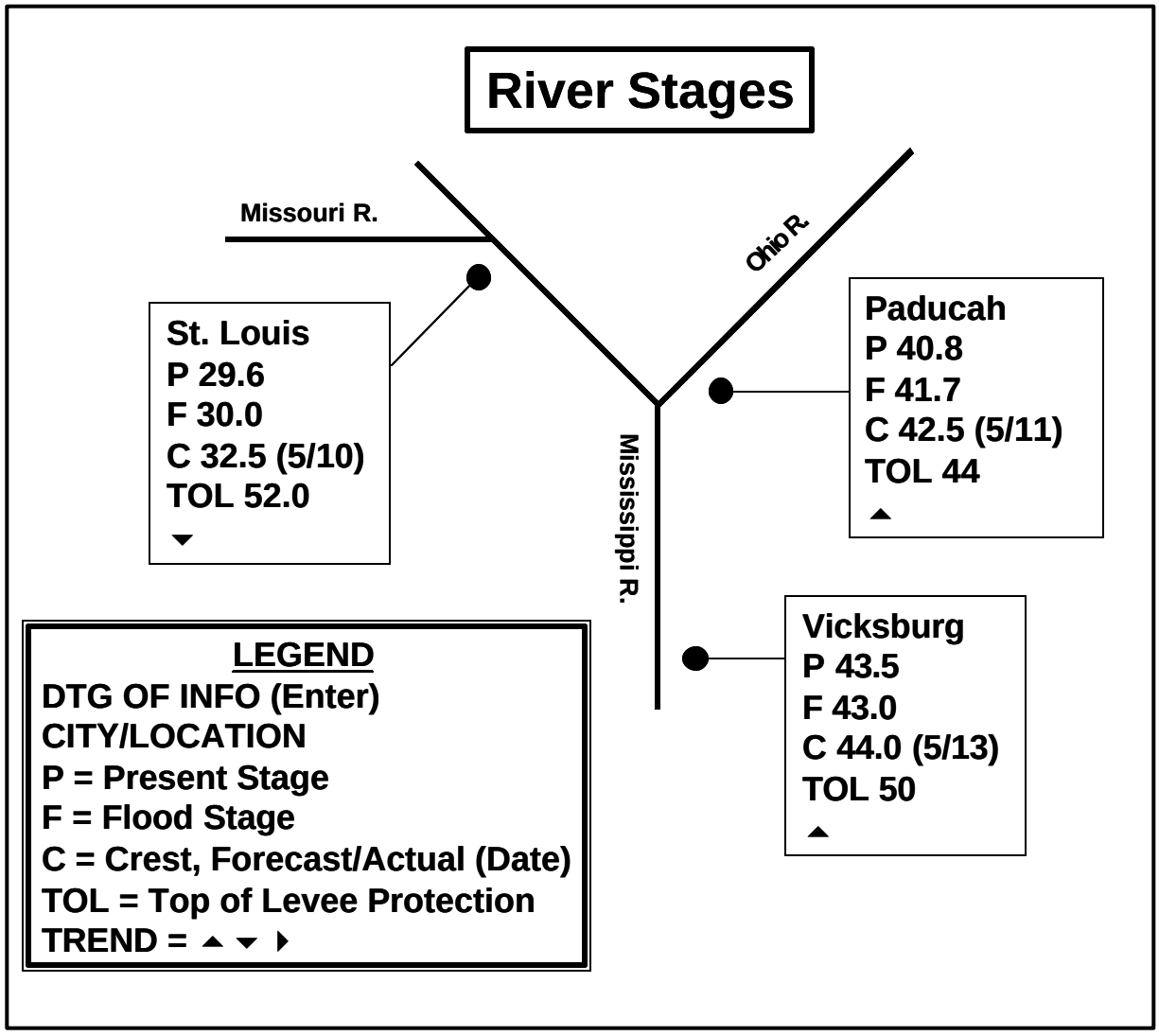

Figure 4-9. Format for Appendix E to Basic SITREP

4-16. Disaster Recovery SITREP's. Many PL 84-99 and Stafford Act operations involve long term recovery activities such as levee rehabilitations or debris disposal missions. As the response requirements for a disaster diminish, recovery activities become the focus of effort. While the immediate crisis has been resolved, there is a continuing need to effectively manage the recovery effort. This need will be accomplished through the Disaster Recovery SITREP, which is a continuation of the situation reports with a focus on recovery activities. Guidance in paragraph 4-15. above will be followed, except as modified by this paragraph, or specific HQUSACE-issued guidance.

a. Format. The format for the Disaster Recovery Report is at Figure 4-10. Appendices involving activities that are either completed, or no longer pertinent to the management process, may be omitted.

b. Frequency.

(1) Through Physical Completion. Until all FCW rehabilitation projects and all FEMA missions are physically completed, Disaster Recovery SITREP's will be provided twice monthly, on the first business day of each month, and the 15th of each month (or the last business day prior to the 15th if the 15th is a weekend or holiday). If necessary or directed by HQUSACE, report submission times and frequencies may be changed. For the purpose of Disaster Recovery SITREP's, FCW rehabilitation projects are considered physically complete when all construction efforts on the project are completed, except for minor cleanup; seeding or sod placement; punch list items; or additional pump station or relief well work. FEMA missions are considered physically completed when all contractual commitments are completed, with the exception of site restoration activities for debris reduction.

(2) Through Fiscal Completion. Until fiscal closeout of all missions and rehabilitation work has been completed, but after physical completion of all rehabilitation projects and FEMA missions, Disaster Recovery SITREP's will be provided on at least a monthly basis. Disaster Recovery SITREP's will be submitted on the 15th of each month, or the last work day prior to the 15th if the 15th is a weekend or holiday.

c. Additional Distribution. When appropriate, Disaster Recovery SITREP's will be furnished to interested local congressional offices, and other agencies as needed.

d. FCW Rehabilitation Status Format. The format for Appendix H, FCW Rehabilitation Status, is at Figure 4-11.

DISASTER RECOVERY SITREP FORMAT	
1. SITREP:	The phrase "SITREP - Disaster Recovery Report" followed by the District name, date, local time, and Zulu Date-Time-Group (DTG)
2. DISASTER NR.:	The HQUSACE-assigned number for this disaster event. *(Same as was used on earlier SITREP's for the event)*
3. CATEGORY:	Short description of the type of disaster. *(Same as was used on earlier SITREP's for the event).*
4. EVENT NAME:	The assigned name of the event. *(Same as was used on earlier SITREP's for the event*
5. SEQUENCE NR.:	Continue sequential numbering from previous SITREP's. For the last report, use the next sequential number followed by "and Final".
6. SITUATION:	A summary of the situation that answers the questions what, where, and when. This paragraph may be a narrative or in bullet format.
7. PAST 24:	A narrative or bullet form statement of USACE actions, activities, and situations that have occurred in the previous 24 hours, or since the last SITREP.
8. NEXT 24:	A narrative of planned and anticipated actions for the next 24 hours or the next reporting period.
9. OTHER EFFORTS:	Commander's Assessment, if needed. A summarization of efforts taken by other agencies, state/local governments, and organizations. Examples include FEMA, military agencies, Red Cross, etc.
10. APPENDICES - MANDATORY	A. FCCE Funds B. FEMA Funds (by mission assignment) C. Personnel
11. APPENDICES - AS NEEDED	D, E, F. (See Figure 4-4.) G. FEMA Mission Assignments - Operational Report H. FCW Rehab Status I. - Z. Others

Figure 4-10. Format for Disaster Recovery SITREP

FCW Rehabilitation Status

#	FCW Name	Dist	Active Project?	Report Start Date	Report to MSC	Report Approval	E&D Date	Cont Award	Const Start	Const Compl	Fed Cost	Remarks
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
										Total		

FIGURE 4-11. Format for Appendix H to Disaster Recovery SITREP

4-17. Spot Reports (SPOTREP's). SPOTREP's are used to provide new information or update existing information when the urgency of reporting requires immediate transmission to higher headquarters, and cannot wait for the next scheduled SITREP submission. Information of a critical nature should be immediately transmitted via a SPOTREP, without necessarily waiting for all pertinent details. However, the submitting organization must ensure that information provided in the SPOTREP is accurate (based on the best available information) prior to submission. Figure 4-12 provides the format for SPOTREP's. SPOTREP's will be numbered using the number of the last submitted SITREP, followed by a lower case letter in alphabetical order starting with "a". For example, the third SPOTREP submitted after SITREP 4 would be numbered SPOTREP 4.c.

SPOTREP FORMAT	
1. SPOTREP:	The word "SPOTREP" followed by the District name, date, local time, and Zulu Date-Time-Group (DTG)
2. DISASTER NR:	The HQUSACE-assigned number for this disaster event, from the SITREP.
3. CATEGORY:	Category used in the corresponding SITREP.
4. EVENT NAME:	The assigned name of the event.
5. SEQUENCE NR:	Use the number of the last submitted SITREP, followed by a lower case letter in alphabetical order starting with "a".
6. Information	Report information using any appropriate format, to include narrative, picture, graph, or chart.

Figure 4-12. Format for SPOTREP Submission

4-18. After Action Reports and Procedures.

a. Critique Sessions. Following major events, an after action critique session to discuss operation successes and lessons learned may be conducted. Critique sessions may be requested by divisions or districts, may be at the request of HQUSACE, or may be combined with a joint FEMA-USACE session. Funding for extraordinary costs of critique sessions will be requested under Class 220.

b. After Action Report (AAR). The AAR is a summary of disaster operations and interagency coordination. Its intended use is to improve the conduct of future operations, as well as serving as the consolidated historical record of the disaster. The AAR will include a discussion of the emergency situation, the types of assistance provided, coordination with FEMA and other agencies, effectiveness of the response, strengths and weaknesses of the operation, specific problems and suggested solutions, general appraisal and comments, conclusions, and recommendations. The format is at Figure 4-13. Explanatory information is provided at Figure 4-14. The report will be submitted through

the MSC to Commander, USACE (CECW-OE and CECS-O), within 120 days after most emergency activities (or most FCW rehabilitation projects, if there are many such projects) are complete. Three copies of the AAR will be furnished to the Readiness Support Center. Copies of the AAR will also be furnished to other agencies and organizations as appropriate. MSC's may consolidate multi-district events into a single AAR. AAR's are required for:

(a) Any event involving over $500,000 in total FCCE expenditures, excluding investigations, AAR expenses, and Category 300 activities.

(b) Any event with Category 300 expenditures in excess of $1,000,000.

(c) Any other event when directed by MSC or HQUSACE.

c. Funding. ER 11-1-320 establishes funding procedures for After Action Reporting activities.

4-19. Disaster Audit. At the request of HQUSACE, a disaster audit may be performed on USACE emergency operations. The audit will include an analysis of the nature of the work performed and emergency funding by category/class, and an evaluation of contracting methods used during all phases of the disaster response and recovery. Of particular importance is the manner in which the scope of work of emergency contracts was defined by the contracting officer, and what monetary controls were used to determine needs for increases in funds.

AFTER ACTION REPORT FORMAT
for

_____
(name of event)
USACE Disaster Number _____

Part I. Cover Letter.

Part II. After Action Report.

Table of Contents

Executive Summary

Chapter 1. General background information, to include
a. the authority to prepare the report.
b. the impacted area, basin topography, weather conditions, magnitude of the earthquake, etc.
c. flood damage reduction systems, particularly reservoirs.
Chapter 2. Event specific information, including antecedent conditions, weather, pool stages, river conditions, snowpack, etc. Place voluminous tabular data, maps, etc., in an appendix.
Chapter 3. Emergency operations of the Corps element(s) involved.
Chapter 4. Commander's assessment of the division/district's operational response.
Chapters 5. - X. As needed.

Part III. Appendices.
Appendix A. Cost information.
Appendix B. PL 84-99: Separate projects and major activities.
Appendix C. FEMA Mission Assignments.
Appendix D-X. As needed.
Appendix Y. Lessons Learned.
Appendix Z. Distribution.

Figure 4-13. Format for After Action Report

Part I. Cover Letter: From commander of element preparing AAR to next higher commander.

Part II. After Action Report

Table of Contents: Self explanatory.

Executive Summary: One to two page executive summary of the AAR. Limited to two pages in length.

Chapter 1. This chapter should be prepared in sufficient detail so that a historical researcher, years in the future, will be able to understand what happened.
Chapter 2. Self explanatory.
Chapter 3. Either a straight chronological approach, or chronological for each division/district involved, may be used. This chapter should also include appropriate reference to FEMA operations. Divide into sections if necessary.
Chapter 4. Self explanatory. If a division level AAR, commander's assessments for each participating district may be included. If a multi-division AAR, commander's assessments for each division are required.
Chapter 5. - X. Self explanatory.

Part III. Appendices to the After Action Report

Appendix A. A cost summary and cost breakdowns for the event will be provided. The first figure or table presented will be a one page summary of all costs (e.g., FCCE, FEMA, O&M Gen, etc.) of the event's operations. The second and third figures/tables will be separate summaries of FCCE costs (by category/class) and ESF-3 costs (by mission), respectively, with explanatory remarks. For FCCE costs, costs to undertake major (i.e., costing more than $500,000) Advance Measures or rehabilitation projects will be shown separately. These cost figures will also be further broken down by state. Other figures, charts, and tables will be presented as needed.
Appendix B. Each separate project and major activity (e.g., a significant floodfight) within Categories 200-500 will be addressed in narrative format. This may be either in a single appendix for a small event, or in individual tabs to the appendix when large numbers of projects/efforts are involved.
Appendix C. Each ESF-3 mission assignment will be addressed in a separate paragraph or tab in the appendix.
Appendix D-X. Self explanatory.
Appendix Y. Lessons Learned will be in the following format, and sequentially numbered:
- Issue.
- Discussion.
- Recommendation.
- Responsible office for correcting/addressing the situation.

Appendix Z. Distribution. Self explanatory.

Figure 4-14. Explanatory Guidance for AAR Preparation

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CHAPTER 5
REHABILITATION AND INSPECTION PROGRAM

Section I - General

5-1. Rehabilitation and Inspection Program (RIP) - Overview. The RIP is the USACE program that provides for the inspection and rehabilitation of Federal and non-Federal flood control projects, and the inspection and rehabilitation of Federally authorized and constructed Hurricane/Shore Protection Projects (HSPP's). Districts will implement the RIP in accordance with ER 500-1-1, this pamphlet, and ER 1130-2-530 (for Federal projects). The RIP includes:

a. FCW Database. The maintenance of the FCW Database for all FCW's (including HSPP's). (See paragraph 5-3.)

b. Initial Eligibility Inspections. The performance of Initial Eligibility Inspections (IEI's) for non-Federal FCW's. (See paragraph 5-5.)

c. Continuing Eligibility Inspections. The performance of Continuing Eligibility Inspections (CEI's) for Federal and non-Federal FCW's. (See paragraph 5-6.)

d. Rehabilitation Assistance. The rehabilitation of damaged FCW (Section III of this chapter) and nonstructural alternative projects (NSAP's) (Section IV of this chapter).

e. HSPP's. For clarity and simplicity, procedures for HSPP's are separately addressed in Section V of this chapter.

5-2. RIP Philosophy. The Corps of Engineers has a long tradition of, in an unbiased manner, conducting operations and administering programs that balance the competing goals of many interests. The RIP is this process in a microcosm. The principal reason the RIP exists is to ensure continuation of reliable protection - flood damage reduction - for people's lives, communities, and improved property. This protection is provided within the legal parameters of PL 84-99, other applicable Corps authorities, and the need to provide proper stewardship of the taxpayers' dollars with which the Corps is entrusted. The Corps must balance local interests and concerns, stewardship of funds, environmental sensitivity, and sound engineering judgment. The Corps must continue, and improve upon, this tradition, ensuring the integrity of the mission accomplishment process.

5-3. FCW Database. Districts have had a longstanding requirement to maintain an FCW database. This database must include all known FCW's, Federal and non-Federal, as well as all Corps owned and operated FCW's. Corps operated dams need not be included in the Database. Funding for database maintenance will be provided through the annual

FCCE budget submission in Class 380. The database should include the information listed in Figure 5-1 for all Active projects, and as much information as is available for Inactive projects. Until the Corps-wide FCW database is developed in ENGLink, districts will determine their own methods for maintaining their databases. Supporting documentation and pertinent correspondence concerning FCW's will be appropriately maintained in district files.

FCW DATABASE

Part I. GENERAL

1.	Project Name	The legal name of the FCW.
2.	State	Self explanatory.
3.	County	Self explanatory.
4.	City	Self explanatory.
5.	CWIS Number	The Civil Works Information System number (if one is assigned.) *(Mandatory for all Federal projects.)*
6.	River	The name of the river which the FCW is on.
7.	River Basin	The name of the river basin.
8.	Type of FCW	Indicate levee, dam, channel, floodway, etc., or combination thereof.
9.	Other Purpose	Indicate if the project has another purpose other than flood control and protection.

Part II. PUBLIC SPONSOR INFORMATION

10.	Public Sponsor	The name of the FCW's Public Sponsor.
11.	Point of Contact	The principal point of contact for the Public Sponsor.
12.	Public Sponsor's Address/Phone No.	Self explanatory.
13.	Owners/ Percentage of Ownership	Individuals and entities (e.g., corporations) that own the protected land. Indicate the percentage of land owned by each individual/entity. If there are eight or fewer owners, list all. If there are more than eight owners, list all owners owning more than 15% of the protected land.

Part III. TECHNICAL DATA

14.	Dimensions	Describe the physical features of the FCW. For example, if the FCW is a levee, provide the dimensions for the height, crown width, side slopes, length, etc. In place of a narrative description, a sketch of the FCW may be made as an attachment to the Data Sheet.
15.	Material	Describe the material (e.g., type of soil, gradation of riprap) used in the construction of the FCW.
16.	Drainage Area	The total drainage area of the FCW at the downstream end of the project. (Estimate if the information is not readily available.)

Figure 5-1. Flood Control Works Database

17.	Level of Protection	Estimate the level of protection in terms of exceedance frequency in percent chance.
18.	Freeboard	Self explanatory. (Also includes risk and uncertainty data, if applicable.)
19.	Geotechnical	Statement describing the geotechnical aspects of the FCW.
20.	Hydraulic Design	Statement describing the hydraulic features of the FCW.
21.	Gage Locations	List the locations of gages in the vicinity of the flood control work.

Part IV. ECONOMIC INFORMATION

22.	Area Protected	The total area protected by the FCW in terms of square miles.
23.	Land Use/Value	List all the different land usage, the area of the land usage in terms of percentage of total area protected, and value of the land usage, such as:

Agricultural	50%	$20,000
Residential	10%	$450,000
Undeveloped land	10%	$10,000
Public recreation	10%	$25,000
Commercial retail	10%	$650,000
Industrial	10%	$950,000

Part V. HISTORY

24.	Historic Floods	List all past historic flood events that caused considerable damages to the FCW.
25.	Previous Repairs	List all dates, expenses, and sources of funds spent on previous repairs due to flood damages. Do not include routine maintenance costs.

Part VI. CURRENT STATUS

26.	Active/Inactive	Self explanatory.

Part VII. RESULTS OF INITIAL ELIGIBILITY INSPECTION

27.	1st Inspection	The date the first Initial Eligibility Inspection was performed.
28.	Project Condition	The project condition code for the first inspection.
29.	Dates of Later Inspections	The dates of later inspections performed, if the project failed to receive an "A" or "M" project condition code on the first IEI.
30.	Last IEI	The date of the IEI in which the project gained active status.
31.	Deficiencies	List all the deficiencies noted during the inspection(s).
32.	Inspectors	Name, Title or position, Grade, and office of the inspector(s).

Part VIII. CONTINUING ELIGIBILITY INSPECTIONS

33.	Inspections	Results and ratings. Each Continuing Eligibility Inspection conducted will be listed separately. Deficiencies will be noted. The latest rating will also be entered in Item 26.

Figure 5-1. Flood Control Works Database (Continued)

5-4. The Inspection of Completed Works (ICW) Program. The ICW Program is the O&M, General-funded program within the RIP that addresses Federally-constructed flood damage reduction projects turned over to non-Federal sponsors for operations and maintenance. The ICW Program's critical function in the RIP is the funding responsibility for CEI's of Federal projects. ICW funds are also used for technical review and approval of activities when a public sponsor seeks USACE approval for activities that may affect the integrity and/or reliability of its project. ICW funds at HQUSACE are managed by CECW-OE, and are budgeted on an annual basis. Refer to ER 1130-2-530 for additional ICW Program information. Conflicts between ER 1130-2-530 and ER 500-1-1 will be referred to HQUSACE (CECW-OE) for resolution.

Section II - Inspections

5-5. Overview of Inspections. A sound, consistent, comprehensive system of inspecting flood control works is the foundation of the RIP. Such a system encourages public sponsors to properly maintain their projects, allowing citizens and communities protected by the projects to be confident that their safety is provided for. The RIP includes two types of inspections, IEl's and CEI's. An inspection results in a project status of either Active or Inactive. Refer to ER 500-1-1, paragraphs 5-6. and 5-8. for additional information.

a. The Inspection Guide. IEI's and CEI's use the same form (the "Inspection Guide") to record inspection results. The Inspection Guide is in Appendix A.

b. Inspection Methodology.

(1) Individual items of each component of a project are *rated,* using the Inspection Guide (Appendix A), and the rating codes and criteria shown in Table 5-1, below.

RATING CODES FOR INDIVIDUAL RATED ITEMS

SYMBOL	*RATING CODE*	*DEFINITION*
S	Satisfactory	The rated item is in satisfactory condition, and will function as designed and intended during the next flood event.
M	Marginally Satisfactory	The rated item has a minor deficiency that needs to be corrected. The minor deficiency will not seriously impair the functioning of the item during the next flood event. The overall reliability of the project will be lowered because of the minor deficiency.
U	Unsatisfactory	The rated item is unsatisfactory. The deficiency is so serious that the item will not adequately function in the next flood event, compromising the project's ability to provide reliable flood protection.

TABLE 5-1. Rating Codes for Individual Rated Items

(2) The lowest rating code for any rated item will determine the overall *condition* of the project. Project condition codes are shown in Table 5-2, below.

(a) If all rated items are rated as Satisfactory, the project condition is Acceptable. An Acceptable condition means that the FCW will function as designed and intended, with a high degree of reliability, during a flood event, and that necessary cyclic maintenance is being adequately performed.

(b) If one or more rated items are rated as Marginally Satisfactory, with no rated items rated as Unsatisfactory, then the project condition is Minimally Acceptable. The project will function as designed and intended, but with a lesser degree of reliability than what the project should provide.

(c) One or more rated items with a rating of Unsatisfactory will result in a project condition of Unacceptable. An Unacceptable condition means that one or more deficient conditions exist that are so serious that the FCW does not provide reliable protection against the threat of a flood. These deficiencies can reasonably be foreseen to prevent the project from functioning as designed, intended, or required.

PROJECT CONDITION CODES

SYMBOL	*CONDITION*	*DEFINITION*
A	Acceptable	No immediate work required, other than routine maintenance. The flood control project will function as designed and intended, with a high degree of reliability, and necessary cyclic maintenance is being adequately performed.
M	Minimally Acceptable	One or more deficient conditions exist in the flood control project that need to be improved/corrected. However, the project will essentially function as designed and intended, but with a lesser degree of reliability than what the project should provide. Specific items of the project must be improved/corrected.
U	Unacceptable	One or more deficient conditions that can reasonably be foreseen to prevent the project from functioning as designed, intended, or required.

TABLE 5-2. Project Condition Codes

(3) The project condition determines the project's *status* in the RIP, as shown in Table 5-3, below. If the project condition is Acceptable, the project is in Active status in the RIP. If the project condition is Minimally Acceptable, the project is in Active status in the RIP. If the project condition is Unacceptable, then the project is in Inactive status in the RIP.

PROJECT STATUS		
IF THE LOWEST RATING FOR A RATED ITEM IS:	***THEN THE PROJECT CONDITION IS:***	***AND THE PROJECT STATUS IS:***
Satisfactory	Acceptable	Active
Marginally Satisfactory	Minimally Acceptable	Active
Unsatisfactory	Unacceptable	Inactive

Table 5-3. Project Status

5-6. Initial Eligibility Inspections (IEI's). Initial Eligibility Inspections are conducted only on non-Federal flood control works. The intent of the IEI is to assess the project's design, construction, and maintenance. This assessment allows the Corps to make a rational determination of potential eligibility for Rehabilitation Assistance in the event a future flood damages the project. The IEI consists of two parts, an engineering assessment and a maintenance assessment, and uses the Inspection Guide in Appendix A. (Pump stations, if present, are also assessed for both maintenance and engineering criteria. There are separate engineering and maintenance sections in the Inspection Guide for pump stations.) The engineering assessment reviews the hydraulic/hydrologic aspects and the geotechnical situation of the project. The maintenance assessment determines the level and adequacy of routine and periodic maintenance being perfo rmed by the project sponsor.

a. Level of Detail. The IEI will be performed using on site inspections, and technical analyses of available data. The IEI will determine the general functional and structural integrity of the project, and thus the project's ability to provide reliable protection against floods. The IEI will also determine an estimated level of protection.

b. Engineering Assessment. The engineering assessment answers the question "will this project provide an acceptable level of protection against flooding, given the physical characteristics of the project itself, and the hydraulic and hydrologic conditions with which the project must contend?"

(1) Hydrologic and Hydraulic Analysis.

(a) Investigation procedures may include noting stream characteristics such as meandering, braiding, and excessive depositions. Observation should also include things that may affect future stream changes, such as debris on bridge structures, and historical changes, as related by local interests or news accounts of flooding events.

(b) Collection of data such as high water marks, location of bench marks, bridge cross-sections, flooding, and gage information may be available through searching in-house files or contacting the local Department of Highways, County Engineer, and/or state water agencies. Agencies with the US Department of Interior, such as the U.S. Geological Survey (USGS) and Bureau of Indian Affairs (BIA), and the Natural Resources Conservation Service (NRCS) or Forest Service of the U.S. Department of Agriculture may be a good source of information on flooding. Another valuable source of information may be to obtain photographs of impacted areas through contacts with local residents and the news media. Generally, the public sponsor should provide most of this information in conjunction with the request to conduct the IEI.

(c) Gauge data and/or regional equations are generally the first choice for estimating peak flood flow probability, where applicable. The USGS has published information on estimating the probability of floods in a location without any gauges. These documents are available to provide a simple means of obtaining flood probabilities that are essentially unaffected by changes in the watershed, conveyance, storage, or runoff characteristics for natural sites without gauges. The USGS also has flood probability data for various gauged locations. Regional equations and other types of relations, rather than the USGS information may be used. Watershed modeling may be done, if necessary, on a limited basis, if the watershed characteristics have been altered.

(d) Available data and/or profiles based on known water surface and flow information are generally the first choice for water surface profiles. However, when water surface profiles are not available and simple procedures, such as end area slope, are not applicable, the profiles can be computed with cross-sections, roughness values, and computer programs such as HEC-2. Roughness values can be estimated from field inspection and photographs of the channel and over bank areas. Cross-sections can usually be developed using recent aerial photos, topographic maps, and from over bank and channel cross section surveys gathered by inspectors. Other information (e.g., levee location, distances, floodways, and historical high water marks) may also be needed for hydrologic study.

(e) The inspection will document the effectiveness of existing erosion control features, and/or the need for protection against erosion in areas being threatened by wave action or surface flows, including erosion around appurtenant structures. Inspector(s) knowledgeable in bank protection, sediment transport, and river morphology and generally familiar with the region should perform the inspection.

(2) Geotechnical Analyses.

(a) The geotechnical assessment will be based primarily on a detailed visual inspection using the parameters provided in Section I of the Inspection Guide in Appendix A. Soil

samples should be taken as deemed necessary by the geotechnical evaluator, who will then decide how extensive the analysis should be. Soil samples will only be taken and analyzed if all other portions of the IEI indicate that the project is likely to gain an Active status.

(b) The IEI should identify critical areas where slope stability appears weakest and document the location, reach, and cross-section at these points. Appropriate monitoring and evaluations should be recommended to document changes at these locations. Table 5-4 is provided as a guide for the initial visual inspection and evaluation of slope stability. Significant deviations from the table values, i.e., a steeper slope, are generally sufficient to cause the rating to be Unsatisfactory and the project condition to be Unacceptable, absent major mitigating circumstances that would lead to a different assessment.

Cross Section Template Data				
Levee Material	**Maximum Riverward Side-Slope**	**Maximum Landward Side Slope**	**Maximum Height**	**Minimum Top Width**
Clay	1V on 2 1/2H	1V on 2 1/2H	12 Ft	10 Ft
Sand	1V on 3H	1V on 4H	15 Ft	10 Ft

TABLE 5-4. Levee Cross Section Template Data

(c) IEI's should generally be conducted coincident with low or normal river stages, to allow maximum access to all portions of the project. However, observations during high river stages to assess seepage problems or related concerns may also be necessary, at the district's discretion.

c. Funding. IEI's will be funded under Class 350. Funding for IEI's will be requested from HQUSACE on an as needed basis, in accordance with ER 11-1-320.

5-7. Continuing Eligibility Inspections (CEI's). The purpose of a CEI is to verify that an Active FCW continues to meet minimum acceptable performance levels for the RIP. CEI's are intended to detect significant changes to project conditions from the conditions that existed during the IEI or the previous CEI (if one has been conducted) which affect the integrity of the FCW, or which may affect the integrity of the FCW in the future.

a. CEI's for Non-Federal FCW's. Item evaluations and overall project conditions are the same as those used for IEI's. (See paragraphs 5-4 and 5-5 above.) Districts will conduct CEI's using the Inspection Guide (Appendix A).

(1) Cycle. CEI's for non-Federal FCW will normally be conducted on a biennial cycle. Those projects that historically have been well maintained may be extended to a triennial inspection cycle.

(2) Funding. CEI's for Non-Federal FCW's are conducted using FCCE funds, Class 360, budgeted for and requested on an annual basis.

b. CEI's for Federal FCW's. CEI's for Federal FCW's will be conducted in accordance with ER 1130-2-530. Alternatively, the Inspection Guide at Appendix A may be used.

(1) Cycle. CEI's for Federal FCW will normally be conducted on a biennial cycle. Those projects that historically have been well maintained may be extended to a three-year or four-year inspection cycle, in accordance with ER 1130-2-530.

(2) Funding. Federal FCW's are inspected using Inspection of Completed Works (ICW) funds from the Operations and Maintenance, General appropriation, Class 60223. ICW funds at HQUSACE are managed by the Civil Emergency Management Branch, CECW-OE, and are budgeted for on an annual basis in accordance with the annual budget Engineer Circular.

5-8. Reporting and Processing Results of Inspections, and General Information.

a. IEI's. Results of IEI's will be provided to the sponsor and maintained at districts, and pertinent data recorded in the FCW Database. A copy of the inspection report will be sent to the public sponsor within 30 days of the completed inspection. If any items of an IEI are rated as Marginally Satisfactory, the sponsor's notification of Active status will include a statement that the Marginally Satisfactory item(s) must be upgraded to Satisfactory within three years, or any shorter period of time deemed reasonable by the district.

b. CEI's. Results of CEI's will be provided to the sponsor and maintained at districts, and pertinent data recorded in the FCW Database. A copy of the inspection report will be sent to the public sponsor within 30 days of the completed inspection. For an FCW with a project condition of Unacceptable, a copy of the inspection report will be sent via registered or certified mail to the public sponsor within 15 business days of completion of the inspection. If any rated items on a CEI are rated as Marginally Satisfactory, the public sponsor's notification will include a statement that the Marginally Satisfactory item(s) must be upgraded to Satisfactory within one year, or any shorter period of time deemed reasonable by the district. FCW's that have undergone a CEI and received a project condition code of Acceptable or Minimally Acceptable will retain an Active status in the RIP.

c. Unacceptable Condition. An FCW that has an overall project condition of Unacceptable is immediately placed in an Inactive status, and the FCW Database appropriately updated.

d. Notification Requirements. For notification requirements for the FEMA region, and for state and local level emergency management agencies, refer to ER 500-1-1, paragraph 5-5.c.

e. Maintenance of Records. The district will maintain records of all inspection reports for a minimum of ten fiscal years, or longer if warranted or needed for historical purposes.

f. Eligibility Disagreements. If a public sponsor disagrees with an Unacceptable condition given by USACE for an IEI or CEI, the district will inform the sponsor of its right to submit a reclama. Refer to paragraph 5-5.d., ER 500-1-1, for applicable policy.

g. Funding.

(1) Inspections of non-Federal FCW's will be funded under Class 350 (IEI's) and Class 360 (CEI's). District annual budgets will include funds for CEI's only. Funding for IEI's will be requested from HQUSACE on an as needed basis.

(2) Funding for CEI's of Federal FCW's will be from the Inspection of Completed Works program. This funding is provided from O&M, General, 96x3123.

h. Provision of Information to Sponsors of Inactive FCW. Districts will maintain an active outreach effort to provide sponsors of Inactive FCW with information and Levee Owners Manuals concerning upgrading their projects in order to become eligible for the RIP. Refer to ER 500-1-1, paragraph 5-21, for additional information.

i. Multiple Sponsors. In accordance with ER 500-1-1, paragraph 5-2.s., if a flood control project (or separable element of the project) falls under the jurisdiction of more than one public sponsor, the entire project (or separable element) will be reported as a single entity, not as separate reaches. The inspection and rating determination will be done without regard to the particular reach operated and maintained by an individual sponsor. The entire FCW will receive a single project condition code. The project condition code will be shared by the multiple sponsors, and will determine Active/Inactive status for the entire project.

j. Interrelationship with the Natural Resources Conservation Service. The existing Memorandum of Agreement between the Natural Resources Conservation Service (NRCS) and USACE divides responsibility between the two agencies regarding general eligibility for rehabilitation assistance. For flood control projects located in watersheds of less than 400 square miles, the NRCS lead responsibility for rehabilitation assistance. For flood control projects located in watersheds of greater than 400 square miles, USACE is responsible for Rehabilitation Assistance.

k. Regional Variances for Vegetation Standards. Policy for regional variances is provided in ER 500-1-1, paragraph 5-22. Procedures for addressing and processing regional variations for vegetation standards are covered in Appendix D.

5-9. (Reserved.)

Section III - Providing Rehabilitation Assistance

5-10. Procedures After Occurrence of a Flood Event.

a. Notice to Public Sponsors.

(1) District commanders will issue a Notice to Public Sponsors immediately after significant flood events to alert public sponsors of Active projects that a submittal deadline is in effect for USACE assistance to repair damaged FCW under PL 84-99. The notice format is provided at Figure 5-2. Issuance of a Notice to Public Sponsors will be noted in the next SITREP submitted.

(2) The notice will be provided directly to all public sponsors of Active FCW within the flood event area, and to the state emergency management agency.

(3) The submittal deadline for public sponsors to apply for Rehabilitation Assistance will be 30 calendar days from the date the flood waters recede to bankfull. This date will be prominently noted in the Notice to Public Sponsors.

(4) Under special or unusual circumstances, MSC commanders may approve extension of the deadline for an additional 30 days.

(5) When the notice period ends, the district will summarize the data regarding rehabilitation requests, to include known dispositions and funding data, via SITREP.

b. Request for Rehabilitation Assistance. The public sponsor must provide a written request for Rehabilitation Assistance within the 30-day time frame (or 60-day if extended). Districts will verify the status (Active or Inactive) of all requests for assistance on non-Federal FCW, and then proceed accordingly. No investigations will be accomplished or PIR's prepared for Inactive FCW. PIR preparation and processing procedures are addressed in paragraph 5-10, below.

c. PIR Funding. See ER 11-1-320, Chapter 3, for general information and procedures for funding actions regarding PIR's.

(1) For relatively small flood events, Class 340 funds should be separately requested for each individual project requiring preparation of a PIR.

(2) For large scale events, bulk funding may be requested by the district. A separate CWIS number (issued by CECW-OE) will be used for bulk funding for a given flood event. If the flood event within the district encompasses more than one state, then a separate CWIS number will be issued for each state.

(3) PIR activities (Class 340 funds) will be closed out within 90 days from the date the project is approved or disapproved. If a PIR was not prepared, the closeout will be within 90 days from the date of the determination of ineligibility for Rehabilitation Assistance.

d. Interagency Levee Task Force. See paragraph 5-15 below.

5-11. PIR Preparation and Processing.

a. Sponsor Request for Rehabilitation. Upon receipt of a public sponsor's request for Rehabilitation Assistance, the district will first check to ensure that the FCW is Active. If Active, the district will request funds to perform a field investigation to determine the extent of damages. (Refer to paragraph 5-16 for requests for a Nonstructural Alternative Project in lieu of structural Rehabilitation Assistance.) If merited, the District will then prepare a Project Information Report (PIR).

(1) The BCR must be greater than 1.0 for the PIR to be approved. If the district determines during the PIR preparation that the BCR will be less than 1.0, it will cease further work on the PIR and notify the public sponsor appropriately.

(2) If estimated repair costs for damages to an FCW total less than $15,000, USACE mandatorily considers the damage to be the sponsor's O&M responsibility to repair. Districts may use a higher threshold than the $15,000 specified to define the sponsor's O&M responsibility.

(3) The PIR will be prepared in accordance with the format in Figure 5-3. The PIR Review Checklist, Appendix Z of the PIR, is provided at Figure 5-4.

(a) The PIR Review Checklist must be completed and signed by the Emergency Manager or project officer for the Rehabilitation Assistance.

(b) References in the Checklist refer to both ER 500-1-1, designated with "ER" followed by the paragraph number, and this pamphlet, designated with "EP" followed by the paragraph number.

b. District Time Frame. The district will transmit the PIR to the MSC no later than 40 calendar days from the date the sponsor's request is received at the district or termination of the flood event, whichever is later. In cases where significant numbers of PIR's must be prepared, or when weather conditions or other circumstances limit ability to complete the PIR's, the district commander may, with concurrence of the MSC, extend the 40 day period.

c. Approval Process. The MSC will act on the PIR within 10 business days after receipt.

d. Approval Authority. Approval of PIR's is delegated to the MSC Commander, or a Deputy Division Engineer. Further delegation of approval authority is not permitted.

(1) When necessary, a division may broker the PIR review process to another district within the division. However, approval authority for the PIR's will remain at the MSC level. The Pacific Ocean Division may broker PIR review process work to the South Pacific Division or its subordinate districts.

(2) PIR's that involve highly complicated or unusual circumstances may be forwarded, at the MSC's discretion, to HQUSACE (CECW-OE) for action.

e. Funding - Approved PIR's.

(1) Upon notification by the MSC that a PIR has been approved, the district will request funds for engineering and design in accordance with ER 11-1-320. HQUSACE will normally provide funds within 5 days of the funding request.

(2) When the project is ready for contract award, the district will request funds for construction and supervision and administration. HQUSACE will normally provide funds within 3 days of the request. When warranted, districts will note the need for a faster provision of funds.

(3) Funding necessary to review and process the PIR's at MSC level (or at the brokered district) will normally be provided by the district submitting the PIR.

5-12. Approved Rehabilitation Projects. The district should obtain a signed CA within 30 days of PIR approval. The actual construction for the rehabilitation project will commence within 60 calendar days following PIR approval or execution of the CA, whichever is later. "Actual construction" is defined as the issuance of the Notice to Proceed to the prime contractor for the initial phase of the contract. When unable to meet this requirement, the district will report the circumstances via SITREP.

a. Contingency Contracting. Expedient contracting procedures (see Chapter 11) will be used to ensure rapid accomplishment of the required rehabilitation work. District contracting offices will document procedures for all pertinent unusual and compelling circumstances.

b. Notification of Completed Rehabilitation Projects. District Emergency Management personnel will ensure that the public sponsor is notified when the USACE work is completed.

c. Fiscal Close Out. The district Emergency Management office will ensure that actions for fiscally closing out FCCE activities are completed in a timely manner. Close out activities will be in accordance with ER 11-1-320. Districts will fiscally close each project, and offer unobligated funds for revocation, within 60 days of the physical completion date of the project. When a contractor claim or a similar need to retain project funds is anticipated, sufficient funds to meet the claim may be retained by the district, but all other remaining funds must be offered for revocation. If the funds retained for anticipated claims/costs are insufficient, additional funding may be requested.

5-13. Cooperation Agreements - Rehabilitation Assistance.

a. Non-Federal Projects. Prior to USACE providing Rehabilitation Assistance for non-Federal FCW's, a CA must be executed between the public sponsor and USACE. The format for CA's for rehabilitation of non-Federal FCW's is in Appendix B, Figure B-1.

b. Federal Projects. For rehabilitation of Federal FCW's (excluding HSPP's), a CA is occasionally not needed, because of the existence of the Project Cooperation Agreement (PCA) from the original construction of the project. In lieu of a CA, the district will notify the public sponsor in writing of the public sponsor's requirements, citing the original PCA. If no record of a PCA can be found, or the existing PCA is inadequate, then a CA is required as for a non-Federal FCW. The format for CA's for rehabilitation of Federal projects is in Appendix B, Figure B-2.

c. Local Responsibilities. Before or during the preparation of the supporting documents for a PIR, the district will ensure the public sponsor is aware of required contributions and commitments.

d. Deviation from Approved CA Language. Refer to ER 500-1-1, paragraph 2-4.a.

e. Signature of CA's. Refer to ER 500-1-1, paragraph 2-4.b.

5-14. Initial Repairs - Breached Levees.

a. Policy. For policy regarding Initial Repairs, refer to ER 500-1-1, paragraph 5-14.

b. Justification for Initial Repairs. When a levee breach merits consideration of Initial Repairs, the district will submit a written memorandum through command channels to HQUSACE (CECW-OE). The memorandum will address the justification for Initial Repairs (paragraph 5-14.a., ER 500-1-1), provide rough cost estimates, and provide a schedule for completion of each breached levee. The schedule will include events through completion of permanent repairs for each project. Enclosed with the memorandum will be Class 340 funding requests for each project for which Initial Repairs are requested.

c. PIR's for Initial Repairs. HQUSACE (CECW-OE) will approve/disapprove all requests for consideration of Initial Repairs. Class 340 funds will be provided for approved requests. The district will conduct a field investigation and prepare an abbreviated PIR (see d., below) for projects with approved requests. An approved request to prepare the PIR does not presuppose approval of either the Initial Repairs or final repairs for the levee project.

d. PIR Preparation. The PIR for an Initial Repair will use the format in Figure 5-3. Information will be provided for each paragraph at a level of detail sufficient to justify undertaking the Initial Repair. Initial Repairs tend to be relatively costly, so as the District prepares the Initial Repair PIR, it must be cognizant of the requirement that the BCR of the final repair must be greater than 1.0 for the final repair to be approved.

(1) Paragraph 9 must address the existence of any blow holes or scour areas that will impact the cost of returning the levee to its original footprint and alignment.

(2) Paragraph 11 and Appendix F of the PIR must justify both the Initial Repair and the final repair, since initial repair costs must be included in the costs during the overall economic analysis for final repairs. (Refer to ER 500-1-1, paragraph 5-14.e.)

(3) Paragraph 12 must indicate the results of initial coordination with the appropriate resource agencies.

(4) Paragraph 14 must address the proposed contracting strategy for completing the Initial Repair.

e. Initial Repair PIR Approval.

(1) Approval authority for Initial Repair PIR's is delegated to Division Commanders, unless the level of protection the Initial Repair provides exceeds a 25-year level of protection. In such cases, the Division Commander will forward the Initial Repair PIR to HQUSACE (CECW-O) for approval. Division commanders may further delegate approval authority only to permanently assigned Deputy Division Engineers or members of the Senior Executive Service on the division staff.

(2) Approval of an Initial Repair PIR indicates that the Initial Repair is necessary, and can be completed either during the current flood season, or prior to the next flood season, and that there is strong support in the local community for undertaking the Initial Repair.

(3) Approval of an Initial Repair PIR will include the following statements:

(a) "Approval of this Initial Repair is in accordance with current USACE policy."

(b) "This initial Repair provides a ___ *(fill in the blank)* year level of protection."

(c) "Based on all available evidence, the final repair of this flood control project will have a benefit to cost ratio greater than 1.0, including the costs of the Initial Repair and the benefits lost to the final repair because of the protection provided by the Initial Repair."

(d) A statement directing that the most expedient contracting procedures available will be used to ensure rapid accomplishment of the required rehabilitation work.

NOTICE TO PUBLIC SPONSORS

US ARMY CORPS OF ENGINEERS

REPLY TO:
CORPS OF ENGINEERS, ____ DISTRICT
Emergency Management Division
Street Address
City, State, Zip

DATE: 1 June 20__

APPLICATION PERIOD EXPIRES 1 JULY 20__

REHABILITATION ASSISTANCE FOR FLOOD-DAMAGED FLOOD CONTROL PROJECTS

Public Sponsors of flood control projects that sustained damages due to flooding during the period 17 May 20____ to 31 May 20____, have until 1 July 20____ to apply for Public Law 84-99 Rehabilitation Assistance from the US Army Corps of Engineers, _____ District.

The Corps of Engineers has authority under Public Law 84-99 to supplement local efforts in the repair of both Federal (Corps-constructed, locally operated and maintained) and non-Federal (constructed by non-Federal interests or by the Work Projects Administration (WPA)) flood control projects damaged by flood.

a. For a non-Federal flood control project to be eligible for Rehabilitation Assistance, it must have been inspected, evaluated, and accepted into the Corps Rehabilitation and Inspection Program (i.e., granted Active status) *prior to* the onset of the flood, and still be Active (based on the latest Continuing Eligibility Inspection) at the time of the flood.

b. For a Federal flood control project to be eligible for Rehabilitation Assistance, it must be in an Active status by having passed its last Inspection of Completed Works inspection.

c. Rehabilitation Assistance will be provided by the Corps only when the work is economically justifiable, the damage was sustained during the recent flood event, and the cost of repairs is more than $15,000.

d. Rehabilitation Assistance for a non-Federal project is cost shared between the Public Sponsor and the Corps of Engineers. The Public Sponsor must provide 20 percent of the cost of the Rehabilitation Assistance.

All requests for assistance made to the Corps will be coordinated with the Federal Emergency Management Agency (FEMA) and the Natural Resources Conservation Service (NRCS) to prevent duplication of benefits.

If the Public Sponsor believes that its project may qualify for Rehabilitation Assistance, a written request must be submitted to the Corps of Engineers at the address above. The request must be signed by an officer or responsible official of the Public Sponsor, and must include:

- Name and telephone number of the Public Sponsor's point of contact;
- Legal name of the flood control project;
- Date and results of the last inspection by the Corps of Engineers;
- Location of the flood control project by township, section, range, city, and county;
- Location(s) of the damaged section(s), and extent of the damage at each location; and
- Waterway causing the flood.

Upon receipt of the Public Sponsor's request, the Corps of Engineers will schedule an inspection with the Public Sponsor. If you have any questions, contact the Corps of Engineers at *phone number* for assistance.

[SIGNATURE BLOCK OF DISTRICT ENGINEER]

Figure 5-2. Format for Notice to Public Sponsors

PROJECT INFORMATION REPORT
REHABILITATION OF DAMAGED FLOOD CONTROL WORKS

GENERAL ORGANIZATION OF THE PIR

Part I. Executive Summary. *(A one to two page overview of the rehabilitation project, similar in content to a fact sheet or an information paper. All pertinent information regarding the project, the repair plan, costs, and the benefit cost ratio are presented.)*

Part II. Basic Report

1. Project Identification
   a. Project Name *(Include both the formal name, and any popularly used or former names.)*
   b. Project's Funding Class *Class 310 for Federal FCW, Class 320 for non-Federal FCW*
   c. Project's CWIS Number (if none exists, so state)
2. Project Authority
   a. Classification *(Federal or non-Federal.)*
   b. Authority *(If a Federal project, provide the authority under which it was originally constructed. If a non-Federal project, provide known information.)*
   c. Estimated original cost of project.
   d. Construction completion date of original project.
   e. Provide additional information regarding major modifications/improvements/ betterments, to include those done by the Corps.
3. Public Sponsor(s)
   a. Sponsor Identification. *(Include name, address, phone number, etc.)*
   b. Application for Assistance.
      (1) Date of Issuance of District's public notice.
      (2) Date of public sponsor's written request. *(Include at Appendix A.)*
4. Project Location *(Provide location and project maps, drawings, photos of the undamaged project, and other supporting information at Appendix B, Tab 1.)*
   a. City, County, State, Basin, River on which project is located, River Mile, River Bank (left/right).
   b. Narrative providing a general description of the project, including special features such as stoplog closures, riprapped areas, etc.

Figure 5-3. PIR Format, Rehabilitation of Damaged Flood Control Works

Part II. Basic Report (continued)

5. Project Design *(Provide a narrative of the project design. Indicate whether the project is an Urban FCW; an Agricultural FCW with urban/developed areas; or an Agricultural FCW. Indicate if the project is a multipurpose project. Include drawings, photos, etc. in Appendix B, Tab 2.)*

6. Disaster Incident *(General, brief, description of the disaster. Include start date and end date. Place voluminous or extensive information in Appendix C.)*

7. Project Damages *(Provide a detailed description of damages incurred by the project in the flood event. Tabular data, photos of damaged areas, etc., will be placed in Appendix D.*

8. Project Performance Data

a. Inspection results

(1) Date of last inspection

(2) Type of last inspection (IEI, CEI, or other - with explanation)

(3) Project Condition Code of last inspection. *Provide narrative of any special or unusual situations, as needed.)*

b. Sponsor's annual O&M cost. *(Also include any other significant work undertaken.)*

c. Estimated cost to repair maintenance deficiencies. *(Include descriptions of and cost estimates for deferred and/or deficient sponsor maintenance.)*

9. Project Repair Alternatives Considered *(In a narrative, with tabular data and/or drawings included as needed, summarize the repair alternatives considered. The final paragraph will indicate the recommended alternative, and the rationale for the recommendation. Explanation must be detailed if an other than lowest cost to the Federal government alternative is recommended. If applicable, indicate public sponsor's preference for any alternative other than the lowest cost to the Federal government, to include cost data. If the sponsor has requested an NSAP, include narrative of structural repair alternative as well as NSAP data. Detailed cost data calculations and other voluminous information will be placed in Appendix E.)*

10. Recommended Alternative. *(Provide detailed narrative of repair alternative (or NSAP alternative) recommended. Include drawings, maps, etc., as needed, or refer to their location in Appendix E.)*

11. Economics *(Refer to Appendix C of EP 500-1-1 for format. Provide a detailed narrative for the recommended alternative. Provide a brief narrative of the economics for each other alternative, using the same order as used in paragraph 9, above, if needed. Include tabular and supporting data in Appendix F.)*

Figure 5-3. PIR Format, Rehabilitation of Damaged Flood Control Works (Continued)

Part II. Basic Report (continued)

12. Environmental *(Provide a general summary of environmental considerations, to include any potential "show stoppers". Specific statements will be provided in Appendix G as separate tabs. Required statements include:*
Tab G-1. A statement on the effect of proposed work on the environment.
Tab G-2. Environmental Assessment.
Tab G-3. Considerations under Section 7 of the Endangered Species Act of 1973 (PL 93-205).
Tab G-4. Archeological Investigations and Salvage Activities considerations.
Tab G-5. Section 404(b) evaluations.
Tab G-6. A statement on the applicability of EO 11988.
Tab G-7 to G-x. As needed.

13. Interagency Levee Task Force *(Provide information concerning the establishment of an Interagency Levee Task Force.)*

14. Project Management.

a. Funding Authority
(1) Program and Appropriation: FCCE, 96x3125
(2) Class: 310 *or* 320.
(3) CWIS Number:

b. Project Funds
(1) Total estimated cost for recommended repair option, including S&A and contingency amount. (Include Federal share and non-Federal share separately.)
(2) Other non-Federal costs (e.g., LERRD's, betterments, deferred/ deficient maintenance
(3) E&D costs

c. Project Repair Schedule
(1) Expected project approval date
(2) Complete construction plans and specs
(3) Contract advertisement
(4) Contract bid opening
(5) Contract award
(6) Notice to proceed issuance
(7) Construction start
(8) Construction completion
(9) Construction final inspection
(10) Fiscal closeout completed

Figure 5-3. PIR Format, Rehabilitation of Damaged Flood Control Works (Continued)

Part II. Basic Report (continued)

PROJECT AUTHENTICATION:

Prepared by: *(name)* *(date)* *(phone)*

Emergency Management approval by: *(name)* *(date)* *(phone)*

District-level approval by: *(name)* *(date)* *(phone)*

Technical Points of Contact *(name and phone number)*:
Emergency Management:
Economics:
Environmental:
Engineering and design:
Program/project management:
Other:
Other:

Part III. Appendices and Tabs

A. Project Sponsor's request for Rehabilitation Assistance
B. Project location and design data, maps, and related information
C. Disaster Incident
D. Damages
E. Repair Alternatives
F. Economics
G. Environmental
H-Y. As needed.
Z. PIR Review Checklist

Figure 5-3. PIR Format, Rehabilitation of Damaged Flood Control Works (Continued)

PIR Review Checklist for FCW Rehabilitation Projects

	YES	NO	N/A	
1.	____	____		The project is active in the RIP. [ER, 5-2.a.]
2.	____	____		The project was damaged by flood(s) or coastal storm(s). [ER, 5-2.]
3.	____	____		The Public Sponsor has requested Rehabilitation Assistance in writing. [EP, 5-10.b.]
4.	____	____		The Public Sponsor has agreed to sign the Cooperation Agreement, which will occur before USACE begins rehabilitation work. [ER, 5-10.]
5.	____	____		The estimated construction cost of the rehabilitation is greater than $15,000, and is not considered sponsor maintenance. [ER, 5-2.q.]
6.	____	____		The repair option selected is the option that is the least cost to the Federal government, or, the sponsor's preferred alternative is selected with all increases in cost paid by the public sponsor. PIR includes justification for non-select of the least cost alternative. [ER, 5-2.h. and 5-11.e.(3)]
7.	____	____		The public sponsor is aware of the opportunity to seek a nonstructural alternative project, and has decided to proceed with a structural rehabilitation. [ER, 5-16]
8.	____	____	____	The cost estimate in the PIR itemized the work to identify the Public Sponsor's cost share. [ER, 5-11]
9.	____	____		The rehabilitation project has a favorable benefit cost ratio of greater than 1.0:1. [ER, 5-2.r.]
10.	____	____		The proposed work will not modify the FCW to increase the degree of protection or capacity, or to provide protection to a larger area. [ER, 5-2.n.]
11.	____	____	____	Betterments are paid 100 percent by the Public Sponsor. [5-2.o.]
12.	____	____	____	The CA contains a provision for 80% Federal and 20% local cost share for non-Federal projects. [ER, 5-11.a.]
13.	____	____	____	Cost for any betterments are identified separately in the cost estimate. [ER, 5-2.o.]

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FIGURE 5-4. PIR Review Checklist (Appendix Z) for FCW Rehabilitation Projects

PIR Review Checklist for FCW Rehabilitation Projects (Continued)

	YES	NO	N/A	
14.	____	____	____	Repair of deliberate levee cuts is the responsibility of the public sponsor, except as provided for in ER 500-1-1, paragraphs 5-2.j. and 4-3.h. [ER, 5-2.j. and 4-3.h.]
15.	____	____		All deficient and deferred maintenance will be paid for or accomplished by the Public Sponsor, without receiving credit toward any sponsor's cost share. [ER, 5-2.g.]
16.	____	____	____	Any relocation of levees is adequately justified. [ER, 5-2.h.]
17.	____	____		USACE assistance does not correct design or construction deficiencies. [ER, 5-12.a.]
18.	____	____		An assessment of environmental requirements was completed. [ER, 5-13., and EP, Figure 5-3, paragraph 12.]
19.	____	____		The project complies with NEPA, and required documentation was completed and placed in Appendix G of the PIR. [ER, 2-3.k.; ER, 5-13.; and EP, Figure 5-3, paragraph 12.]
20.	____	____		The Endangered Species Act was appropriately considered. [ER, 5-13.g., and EP, Figure 5-3., paragraph 12.]
21.	____	____		EO 11988 requirements were considered in the process of evaluating the proposed project for rehabilitation. [ER, 5-13.f., and EP, Figure 5-3, paragraph 12.]
22.	____	____		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 5-11.a.(3)(a)]
23.	____	____	____	The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

EM REVIEWING OFFICIAL'S SIGNATURE

_____
NAME
TITLE
TELEPHONE NUMBER

Page Z-2

FIGURE 5-4. PIR Review Checklist (Appendix Z) for FCW Rehabilitation Projects (Continued)

PIR Review Checklist for Initial Repair of FCW Rehabilitation Project

	YES	NO	N/A	
1.	____	____		The project is active in the RIP. [ER, 5-2.a., and 5-6.]
2.	____	____		The project was damaged by flood(s) or coastal storm(s). [ER, 5-2.a.]
3.	____	____		The Public Sponsor has requested Rehabilitation Assistance in writing. [ER, 5-10.b.]
4.	____	____		The public sponsor has agreed to sign the Cooperation Agreement, and is cognizant that undertaking an initial repair may preclude a permanent repair, if the BCR of the permanent repair is not met [ER, 5-10., and ER, 5-14.e.]
5.	____	____		The cost of initial and final repairs must meet the BCR criteria and meets the criteria in ER 500-1-1, paragraph 5-14.a.(4). [ER, 5-2.r., and ER, 5-14.d.]
6.	____	____		The repair option selected is the option that is the least cost to the Federal government, or, the sponsor's preferred alternative is selected with all increases in cost paid by the public sponsor. [ER, 5-2.h. and 5-11.e.(3)]. [ER, 5-2. h.]
7.	____	____		The public sponsor is aware of the opportunity to seek a nonstructural alternative project, and has decided to proceed with a structural rehabilitation. [ER, 5-16.]
8.	____	____	____	The cost estimate in the PIR itemized the work to identify the Public Sponsor's cost share. [ER, 5-11.]
9.	____	____		The rehabilitation project has a favorable benefit cost ratio of greater than 1.0:1. [ER, 5-2.r.]
10.	____	____		The proposed work will not modify FCW to increase the degree of protection or capacity, or to provide protection to a larger area. [ER, 5-2.n.]

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FIGURE 5-5. PIR Review Checklist (Appendix Z) for Initial Repair, FCW Rehabilitation Projects

PIR Review Checklist for Initial Repair FCW Rehabilitation Projects (Continued)

	YES	NO	N/A	
11.	____	____	____	The CA contains a provision for 80% Federal and 20% local cost share for non-Federal projects. [ER, 5-11a]
12.	____	____		An assessment of environmental requirements was completed. [ER 5-13., and EP, Figure 5-3, paragraph 12.]
13.	____	____		The project complies with NEPA, and required documentation was completed and placed in Appendix G of the PIR. [ER, 2-3.k.; ER, 5-13.; and EP, Figure 5-3, paragraph 12.]
14.	____	____		The PIR states that the consultation for Section 7 (50 CFR 402) has been accomplished or will be accomplished as soon after repairs have started as possible. [ER, 5-13.g.]
15.	____	____		EO 11988 requirements were considered in the process of evaluating the proposed project for rehabilitation. [ER, 5-13.f., and EP, Figure 5-3, paragraph 12.]
16.	____	____	____	Any relocation of levees is adequately justified. [ER, 5-2.h.]
17.	____	____		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 5-11.a.(3)(a)]
18.	____	____	____	The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE

_____
NAME
TITLE
TELEPHONE NUMBER

Page Z-2

FIGURE 5-5. PIR Review Checklist (Appendix Z) for Initial Repair, FCW Rehabilitation Projects (Continued)

Section IV - Interagency Levee Task Forces and Nonstructural Alternatives to Structural Levee Rehabilitation

5-15. Interagency Levee Task Forces.

a. Policy. Policy concerning Interagency Levee Task Force operations is in ER 500-1-1, paragraph 5-24. Reference should also be made to ER 500-1-1, Chapter 5, Section IV, regarding nonstructural alternative projects.

b. Funding and Eligible Costs. ILTF costs eligible for FCCE funding will be provided under Class 370. (See ER 11-1-320 for procedures and descriptions of Class 370 funds.) Under no circumstances may Class 370 funds be used to fund personnel, per diem, or related costs for personnel of other Federal agencies, or state, tribal, or local agencies.

c. Basic Charter. Figure 5-6 provides the Basic Charter for operating the ILTF. Each ILTF will operate under the guidelines of the Basic Charter until such time as a revised charter is agreed upon and signed by the participating agencies. Significant changes to the revised charter from the Basic Charter will be coordinated with HQUSACE (CECW-OE) prior to distribution of the revised charter for signature by the participating agencies.

d. Preplanning. Divisions (and lead districts as designated by the division) are encouraged to preplan ILTF organization and planning efforts with other Federal agencies and state counterparts. Preparation and signature of memoranda of understanding (MOU's) to supplant the Basic Charter are permitted. The general procedures, signature authorities, and leadership responsibility in an MOU will follow the spirit and intent of the Basic Charter. Should it be necessary, exceptions to policy may be requested from HQUSACE (CECW-OE) concerning MOU provisions. No additional commitment of USACE funding responsibility (paragraph 9 of the Charter) is allowed.

Organizational Charter
Interagency Levee Task Force
(Levee and Environmental Restoration Projects)

1. Authority: This Charter is established under the authority of the Office of Management and Budget (OMB)/Council on Environmental Quality (CEQ) memorandum dated February 18,1997; Subject: Floodplain Management and Procedures for Evaluation and Review of Levee and Associated Restoration Projects, and Engineer Regulation 500-1-1. This charter will remain in effect until revised by mutual agreement of the participating agencies, but shall terminate (absent any revisions or agreed upon extensions) one year from the date set forth below.

2. Purpose: The purpose of this Charter is to establish the Interagency Levee Task Force (ILTF) for _____ *(enter common name of disaster/flood event, and FEMA disaster declaration number)* to enable the joint Federal-State *(add tribal, if applicable)* partnership team to assist in the rapid and effective recovery of the communities and areas affected by the aforementioned disaster event. The recovery effort, encompassing Federal, state, *(tribal*), and local programs and authorities, will strive to minimize risk to life and improved property, while ensuring a reasonable, cost effective approach to flood damage mitigation efforts, flood plain management, and the protection of important environmental and natural resources.

3. Goals: To achieve its purpose, the ILTF will:

a. Ensure continued coordination and collaboration with all agencies regarding applicable authorities and programs. All alternatives for reducing vulnerability to flood damages, including permanent evacuation of floodprone areas, installation or upgrading of flood warning systems, creation of additional natural and artificial storage, adequately sized and maintained levees, and environmental restoration and ecosystem management alternatives will be considered.

b. Ensure that nontraditional (alternative) approaches to flood damage reduction are considered and implemented, to the extent feasible.

c. Not deny any party access to existing programs for levee repair and associated restoration, so long as such rehabilitation work is in accord with sound financial and environmental practices, nor create unnecessary or avoidable delays to such rehabilitation work.

d. Pursue potential funding mechanisms from any source in order to address comprehensive study efforts within (and upstream of) the flood affected area.

e. Develop, implement, and maintain an effective Public Outreach Program.

Figure 5-6. Interagency Levee Task Force Basic Charter Format

4. Agency Applicability: This Charter is applicable to those agencies self-identified as active partners in this effort to effect the Purpose of this Charter.

5. Direction and Control: In accordance with the OMB/CEQ guidance referenced in Paragraph 1, this ILTF works under the leadership of the U.S. Army Corps of Engineers, specifically, the Commander _____ Division.

6. Membership:

a. The ILTF will include senior member representatives from each involved Federal agency. The ILTF will include the participation of appropriate State, *tribal*, and local agencies.

b. The Commander, _____ Division, U.S. Army Corps of Engineers, or his/her designated representative, is the Chairman of the ILTF and the designated Lead Corps Official (LCO). The LCO will designate the ILTF Chief of Staff, who will report directly to the LCO, and be responsible for the day to day operation of the ILTF. Other Federal member representatives include representatives of:

- the Federal Emergency Management Agency;
- the Department of Interior (U.S. Fish and Wildlife Service, Bureau of Reclamation, Bureau of Land Management and U.S. Geological Survey)
- Environmental Protection Agency
- Department of Agriculture (Natural Resources Conservation Service)
- Department of Commerce (National Marine Fisheries Service and the Economic Development Administration)
- Department of Housing and Urban Development
- Department of Transportation
- U.S. Small Business Administration

c. Representatives from Native American Tribes, as appropriate to location of proposed projects.

d. State member representatives for *state* will include the _____, _____, and other agencies as appropriate.

9. Funding: Federal agencies will fund participation for their representatives. The Federal Emergency Management agency will provide space requirements, communications, and automation needs, administrative support, etc., for the ILTF staff until the Disaster Field Office for *FEMA disaster number* closes. Funding provisions for activities after the DFO closes will be provided through the U.S. Army Corps of Engineers or through other funding as may be available. State, tribal, and local agencies will fund participation of their own representatives.

Figure 5-6. Interagency Levee Task Force Basic Charter Format (Continued)

10. Administration and Procedures:

a. The ILTF Chairman or ILTF Chief of Staff is responsible for announcing meetings and preparation of a summary of each meeting.

b. Paragraph 9 provides details for funding administrative support. Should the DFO close prior to completion of administrative activities under the ILTF, the U.S. Army Corps of Engineers will assume responsibility.

c. Proposed agency structural rehabilitation projects will be staffed to other ILTF agencies expeditiously. This staffing will be done directly from the submitting agency to all other agencies, electronically, or through the ILTF. The ILTF staff will facilitate this process as needed. Agencies will have two working days to provide comments and suggestions to the submitting agency. The ILTF will meet as requested, by any agency, to review proposals for repair, and restoration of flood damaged levees and associated systems for a decision on applicability of non-traditional alternatives. Periodic meetings to discuss procedural activities and/or processes will convene as necessary. These meetings may include activities related to short and long term flood plain management issues. The use of electronic reporting and commenting will expedite the review process.

d. The ILTF Chairman or Chief of Staff will facilitate each meeting in a manner designed to promote active participation of all members.

e. Resolution of issues that impact National floodplain management policy or cut across agency lines may be identified by the ILTF addressed through the Headquarters, US Army Corps of Engineers, to OMB/CEQ.

f. Monthly reports will be prepared by the ILTF. The report will be submitted through Headquarters, US Army Corps of Engineers, to OMB. Each member agency will receive copies of the monthly report for its use, and may include it in any agency reports. The monthly reports will include but are not be limited to, information on applications received, comments received, actions taken, and dollars spent. Further, the report will address activities relative to any comprehensive long-term studies.

12. This Charter is adopted by the undersigned:

[Insert agencies as appropriate.]

Figure 5-6. Interagency Levee Task Force Basic Charter Format (Continued)

5-16. Nonstructural Alternative Projects.

a. Policy. Refer to ER 500-1-1, Chapter 5, Section IV for policy regarding NSAP's.

b. Procedures, Processing, and Approval. Procedures for processing and approving NSAP's will be in accordance with paragraphs 5-10 and 5-11 above. The public sponsor must request the NSAP in writing, even if a structural rehabilitation has previously been requested in writing.

c. PIR Format and PIR Review Checklist. The PIR format in Figure 5-3 will be used for NSAP's. The PIR Review Checklist for NSAP's is provided at Figure 5-7. The Checklist must be completed and signed by the Emergency Manager or the Project Officer for the NSAP.

d. Non-qualifying Structural Rehabilitation. In some cases, a public sponsor will want a structural rehabilitation of a project, but the PIR process will reveal some impediment (typically a BCR less than 1.0) that precludes undertaking the structural rehabilitation. In such cases, if the public sponsor then opts for an NSAP, the following procedures will apply:

(1) If the PIR for the structural rehabilitation has been completed or substantially completed, the district will prepare an addendum to the PIR, addressing those portions of the PIR that have changed significantly.

(2) If the PIR for the structural rehabilitation has not been substantially completed, then the district will determine the NSAP cost cap (ER 500-1-1, paragraph 5-17.b.) and complete the PIR for the NSAP only option.

e. Cooperation Agreement. A Cooperation Agreement is required for an NSAP. Guidance will be requested from HQUSACE (CECW-OE) regarding the CA format to be used for NSAP's.

PIR REVIEW CHECKLIST FOR NONSTRUCTURAL ALTERNATIVE PROJECTS

	YES	NO	
1.	___	___	The NSAP has been requested in writing by the public sponsor. [ER, 5-16.]
2.	___	___	The principal purpose(s) of the NSAP is/are (1) floodplain restoration, (2) provision or restoration of floodways; and/or (3) reduction of future flood damages and associated FCW repair costs. [ER, 5-16.a.]
3.	___	___	A sponsor, either a public sponsor or another Federal agency, has been identified to sponsor the NSAP. [ER, 5-16.b.]
4.	___	___	USACE is not responsible for any operation, maintenance, or management of the NSAP. [ER, 5-16.c.]
5.	___	___	The NSAP public sponsor has indicated it has the financial capability and willingness to implement, operate, and maintain the NSAP. [ER, 5-16.e.]
6.	___	___	The district has complied with all environmental considerations. [ER, 5-13. and 5-16.k., and EP, Figure 5-3, paragraph 12.]
7.	___	___	USACE costs for implementing the NSAP are in accordance with policy. [ER, 5-17.c.]
8.	___	___	Other (non-USACE) costs to implement the NSAP are adequately addressed. [ER, 5-18.b.]
9.	___	___	The NSAP sponsor understands, and is willing to have in the CA, the restrictions of further USACE PL 84-99 assistance. [ER, 5-16.j. and 5-18.e.]
10.	___	___	The CA will include a statement of legal restrictions placed on the formerly protected land. [5-18.g.] *(Agency)* is responsible for obtaining the legal restrictions.
11.	___	___	The public sponsor has agreed to sign a Cooperation Agreement. [ER, 5-18.]
12.	___	___	The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 5-16.c.]
13.	___	___	The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE:
NAME:
TITLE:
TELEPHONE NUMBER:

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Figure 5-7. PIR Review Checklist (Appendix Z), Nonstructural Alternative Project

Section V - Inspections and Rehabilitation Assistance for Hurricane/Shore Protection Projects

5-17. Inspections of HSPP's.

a. Guidance. The guidance provided in this section supplements and amplifies policies and guidance contained in ER 1130-2-530, ER 500-1-1, and Operations and Maintenance Manuals for HSPP's.

b. Initial Eligibility Inspection. As with any other Federal FCW project, no Initial Eligibility Inspection is performed on an HSPP. HSPP's (to include separable elements thereof) are granted Active status in the RIP upon transfer of Operation and Maintenance responsibility to the public sponsor. Any separable (or creditable) element constructed by the public sponsor that is part of the Federal project (i.e., accorded that status either through statutory language or through the Project Cooperation Agreement for the project), after it has been inspected and approved by the District, is considered part of the HSPP, with Active status.

c. Continuing Eligibility Inspections.

(1) CEI's for HSPP's are normally conducted on an annual basis, shortly before the onset of the most probable storm season (e.g., prior to the 1 June start of the Atlantic hurricane season.) For those HSPP's located in areas that are not subject to an annual storm season, the CEI will be scheduled based on district work load while being cognizant of annual funding cycles, prior inspection history, and sponsor preference. Project inspections will include periodic beach profiles, surveys, data collection, and other activities sufficient to document current beach sand volumes.

(2) Districts will use either inspection criteria specified by the HSPP's O&M Manual, or district-developed inspection criteria. In either case, the results of the CEI must be ultimately summarized in the project condition code of Acceptable, Minimally Acceptable, or Unacceptable, which is then entered into the FCW Database. (Refer to Table 5-2 for definitions of the project condition codes.)

(3) CEI results, to include the project condition code and other pertinent data, will be entered in the district's FCW database.

(4) Copies of each CEI will be provided to the public sponsor and forwarded to the MSC Emergency Management Office within one week of finalization of the CEI by the district.

d. Funding. HSPP inspections are funded by the Inspection of Completed Works program, from the Operations and Maintenance, General appropriation, Class 60223.

5-18. Procedures for HSPP Rehabilitation Assistance.

a. Notice to Public Sponsors. After any storm, hurricane, tsunami, typhoon, or similar event that could damage HSPP's, the district will telephonically contact the public sponsors of potentially affected HSPP's. If there is any indication that any HSPP has sustained damage, the district will prepare a Notice to Public Sponsors substantially similar to the format at Figure 5-2. The Notice to Public Sponsors will be mailed to all HSPP public sponsors in the potentially affected area.

b. Public Sponsor's Request. The public sponsor must submit a written request for assistance within 30 days of issuance of the Notice to Public Sponsors. Upon receipt of a public sponsor's written request for HSPP Rehabilitation Assistance, the district will check to ensure that the HSPP is Active. Next, the district will review information submitted by the public sponsor, district records on the project (to include the last and next scheduled renourishment effort), weather/storm records and data, and any other current information available. This review is a check for reasonableness of damages incurred by the project (as identified by the public sponsor in its request for assistance) that could be eligible for HSPP Rehabilitation Assistance. If the HSPP is Active and there is reasonable evidence that the storm event can meet the definition of an extraordinary storm (refer to ER 500-1-1, paragraph 5-20.d.), the district will request funds to perform a field investigation (Class 340) to determine the extent of damages.

(1) If the field investigation provides sufficient evidence that major damages have occurred (for either hardened features of the project, or loss of significant quantities of sand), the district will prepare a complete PIR. See paragraph c., below.

(2) The district will notify the public sponsor in writing that the PIR preparation is ongoing. This reminder will include renourishment cost share arrangements of the HSPP, and emphasize that the local cost share percentage must be received in a timely fashion so as to allow the Rehabilitation Assistance effort to be completed before the next storm season, or within one year, whichever is less.

(3) If the field investigation provides insufficient evidence that major damages have occurred, the district will notify the public sponsor by certified mail (return receipt requested) that the project is ineligible for HSPP Rehabilitation Assistance. The notification will include a summarization of the reason(s) why the HSPP is ineligible for HSPP Rehabilitation Assistance. A copy of the notification, the return receipt, and supporting documentation (e.g., site visit MFR, storm records, photographs, etc.) will be filed (hard copy or electronically) and maintained by the district for a minimum of five years. In addition, the FCW Database will be annotated regarding the ineligibility determination, and the location of supporting documentation. A complete PIR will not be prepared.

c. PIR Preparation. A PIR for HSPP Rehabilitation Assistance will be prepared using the format and directions at Figure 5-8.

(1) The policy of ER 500-1-1, paragraph 5-20, will be adhered to in the completion of the PIR.

(2) The PIR (paragraph 10) will contain detailed justification to substantiate a finding that the storm meets the criteria of "extraordinary storm", as defined by ER 500-1-1, paragraph 5-20.d.

(3) The PIR (paragraph 12) will provide detailed justification of the need for HSPP Rehabilitation Assistance. This justification includes substantiating that restoration to a pre-storm condition is necessary to allow for adequate functioning of the project (ER 500-1-1, paragraph 5-20.a.) This justification also includes meeting the criterion for "significant amounts of damage" (ER 500-1-1, paragraph 5-20.d.)

(4) For the economics portion of the PIR, refer to Appendix C for the format. Recreation benefits cannot be used in determining benefits for HSPP Rehabilitation Assistance.

d. Determining Cost Share Allocation - Renourishment. It will be rare that any FCCE-funded rehabilitation effort involving sand renourishment will not include cost sharing for periodic renourishment in accordance with the project PCA. Cost sharing is addressed in paragraph 14 of the PIR. To determine the cost sharing formula for renourishment, the total volume of sand for the complete renourishment effort (which is generally defined as that volume of sand necessary to restore the project to its design profile) will be determined. The portion eligible for HSPP Rehabilitation Assistance will be that amount necessary to restore the project to the pre-storm level/condition of the project, or the amount needed for adequate functioning of the project, whichever is less. The cost for that volume of sand not eligible for FCCE-funded HSPP Rehabilitation Assistance but necessary to restore the design profile will be cost shared based on the renourishment formula of the project PCA between USACE (CG funds) and the public sponsor. The cost of dredge mobilization/demobilization will be borne proportionally between FCCE, CG, and public sponsor contributions.

e. Other Costs. Damages to hard features of the HSPP, e.g., seawalls, groins, or jetties, caused by an extraordinary storm will be rehabilitated at 100% Federal cost. These costs will be addressed separately in paragraph 14 of the PIR. Public sponsor costs for deferred and deficient maintenance (which specifically excludes all renourishment costs) will also be provided in paragraph 14.

f. PIR Completion. The PIR will be completed as expeditiously as possible, but no later than 40 days after receipt of the public sponsor's request for assistance.

(1) The PIR Review Checklist for HSPP Rehabilitation Assistance, Appendix Z of the PIR, is at Figure 5-9. The Checklist must be completed and signed by the Emergency Manager or the project officer for the HSPP Rehabilitation Assistance. References in the Checklist refer to both ER 500-1-1, designated with "ER" followed by the paragraph number, and this pamphlet, designated with "EP" followed by the paragraph number.

(2) Upon completion of the PIR, if all requirements for eligibility for HSPP Rehabilitation Assistance are met, the PIR, and a request for Class 330 Engineering and Design funds (see ER 11-1-320, Chapter 3) will be forwarded by cover letter to the MSC. The cover letter must be signed by the District Engineer, Acting District Engineer, or Deputy District Engineer. The cover letter will contain a summary of the schedule to carry out the HSPP Rehabilitation Assistance.

(3) If the district determines that the HSPP is ineligible for HSPP Rehabilitation Assistance, the district will notify the public sponsor by certified mail (return receipt requested) of the determination. The notification will include a summarization of the reason(s) why the HSPP is ineligible for HSPP Rehabilitation Assistance, and a copy of the PIR. A copy of the notification, the PIR, the return receipt, and other supporting documentation (e.g., storm records, photographs, etc. not included in the PIR) will be filed (hard copy or electronically) and maintained by the district for a minimum of five years. In addition, the FCW Database will be annotated regarding the ineligibility determination, and the location of supporting documentation.

g. District Time Limit. The district will transmit the cover letter, PIR, and funding request to the MSC no later than 45 calendar days from the date the sponsor's request is received at the district. In cases where significant numbers of PIR's must be prepared, or when weather conditions or other circumstances limit ability to complete the PIR's, the district commander may, with written concurrence of the MSC, extend the 45-day period. However, the district will employ all possible measures, to include overtime, weekend work, available ID/IQ contracts and other contracting strategies, and TDY of personnel from other districts to attempt to meet the 45-day period.

h. Coordination for Cost Share Requirements. No later than the date of submission of the PIR, and based on renourishment cost sharing arrangements in the project's PCA, the district will begin coordination (through the MSC) with HQUSACE (CECW-B) for necessary CG funds. In addition, coordination with the public sponsor regarding local cost share requirements will be begun. Inability of the public sponsor to meet its cost share requirement in a timely manner may jeopardize the availability of FCCE funds to provide HSPP Rehabilitation Assistance.

i. MSC Action. The MSC will act on the PIR within 10 business days after receipt. If the PIR is disapproved, it will be returned to the district with instructions to notify the public sponsor in accordance with paragraph f.(3) above. Otherwise, the MSC will endorse the cover letter, with the MSC disposition recommendation to HQUSACE, ATTN: CECW-OE. The MSC Commander, Acting Commander, or a Deputy Division Engineer must endorse the cover letter.

(1) The MSC will verify that the proposed HSPP Rehabilitation Assistance complies with the policy set forth in ER 500-1-1, Chapter 5, Section V, and the procedures set forth above.

(2) If the MSC determines a technical review is necessary, then it will telephonically contact HQUSACE (CECW-OE) for guidance.

j. HQUSACE Action. The Civil Emergency Management Branch will review the submitted PIR and prepare the appropriate decision document for action by the Director of Civil Works. PIR's that are disapproved will be returned through command channels to the submitting district, which will notify the public sponsor in accordance with paragraph f.(3) above.

k. E&D Funding for Approved HSPP PIR's. Upon HQUSACE approval of the HSPP PIR, Engineering and Design funds will be provided by HQUSACE based on the district's funding request.

l. Cooperation Agreement for HSPP Rehabilitation Assistance. A Cooperation Agreement for HSPP Rehabilitation Assistance is required. The CA must be signed before rehabilitation work may begin. The CA is provided at Appendix B, Figure B-3.

(1) Signature of CA's. The district engineer or deputy district engineer may sign the Cooperation Agreement.

(2) Deviation from Approved CA Language. Significant deviation from the specified CA format at Figure 5-10 requires prior coordination with HQUSACE. Under no circumstances will any deviation cause USACE to incur, or be obligated to provide in the future, additional costs, except as specifically approved by HQUSACE.

m. Construction Funding. When the Cooperation Agreement for HSPP Rehabilitation Assistance has been signed, and the project is ready for contract award, FCCE funds for construction, supervision and administration, and contingency amounts will be requested by the district. HQUSACE will normally provide funds within 3 days of the request. CG

funds will also be requested in accordance with standard procedures, if the request has not already been submitted.

(1) Contingency amounts for the FCCE-funded portions of dredge mobilization/ demobilization costs and sand renourishment (dredging) costs are limited to 15 percent of the construction cost estimates of those items.

(2) Contingency amounts for all other allowable FCCE-funded costs are limited to 10 percent.

5-19. Construction, Reporting, and Closeout of Approved HSPP Rehabilitation Assistance Projects.

a. Construction Commencement. The actual construction (defined as the issuance of the Notice to Proceed) for HSPP Rehabilitation Assistance will commence within 60 calendar days following PIR approval or execution of the CA, whichever is later. When unable to meet this requirement, the district will report the circumstances via a Disaster Recovery SITREP, to include the revised schedule for work.

b. Reporting. Reporting of HSPP Rehabilitation Assistance progress will be by Disaster Recovery SITREP's. Refer to Chapter 4, Section V for procedures and formats.

c. Notification of Completed Rehabilitation Projects. When the FCCE-funded contract work (to include any force labor efforts) for HSPP Rehabilitation Assistance is completed, the district will notify the public sponsor in writing that the USACE work is completed. The notification will remind the public sponsor of its continued requirements for local cooperation (from the PCA) and any additional requirements specified in the CA.

d. Fiscal Close Out. The district Emergency Management office will ensure that actions for fiscally closing out FCCE-funded HSPP Rehabilitation Assistance activities are completed in a timely manner. Close out activities will be in accordance with ER 11-1-320. Districts will fiscally close each project, and offer unobligated FCCE funds for revocation, within 60 days of the physical completion date of the project. When a contractor claim or a similar need to retain project funds is anticipated, sufficient funds to meet the claim may be retained by the district, but all other remaining FCCE funds must be offered for revocation. If the funds retained for anticipated claims/costs are insufficient, additional FCCE funding may be requested.

PROJECT INFORMATION REPORT
REHABILITATION EFFORT FOR THE
(insert name)
HURRICANE/SHORE PROTECTION PROJECT

Part I. Executive Summary. Provide a one page executive summary of the PIR, to include the estimated cost, BCR, and the need to undertake the rehabilitation effort using FCCE funds.

Part II. Basic Report. Use the following paragraph numbers.

1. NAME AND LOCATION - *Project name; city, county, and state where project is located.*
2. PUBLIC SPONSOR - *Name, address, telephone number, and email address for the public sponsor of the Hurricane/Shore Protection Project.*
3. POC FOR PUBLIC SPONSOR - *Name, address, telephone number, and email address for the individual who will serve as the public sponsor's single point of contact for the rehabilitation effort.*
4. PROJECT AUTHORIZATION - *Cite the authorization for construction of the HSPP, e.g., "Section 301 of PL 89-298, passed on 27 October 1965 in accordance with the report of the Chief of Engineers as described in House Document 91, 89th Congress, dated 15 June 1964." Cite any pertinent amendments to the law or modifications to the project (to include funding changes) in a similar fashion. Place a copy of the project entry from the District's project notebook or Digital Project Notebook in Appendix C.*
5. PROJECT CLASSIFICATION - *Provide a statement similar to "This project was Federally designed and constructed to protect against hurricane wave action from a 50-year storm."*
6. DESIGN DATA OF PROJECT - *Provide a brief description/overview of the project design data. Place extensive documentation, records, or data in Appendix D.*
7. MAINTENANCE. *Provide a brief statement regarding the scope, extent, and average annual costs for the public sponsor's OMRR&R responsibilities. Do not include any periodic nourishment efforts cost shared with USACE. Place supporting or extensive documentation, tables, survey reports, etc., in Appendix E.*

Figure 5-8. PIR Format, HSPP Rehabilitation Assistance

8. PERIODIC NOURISHMENT. *Provide a brief statement regarding the project's historical nourishment efforts, and the next scheduled or anticipated renourishment effort, with volumetric estimate. Include Federal and public sponsor cost share percentages from the project PCA. Cite GDM estimates or other documentation as needed if there is insufficient historical data available. Place supporting or extensive documentation, tables, survey reports, etc., in Appendix F.*
9. PREVIOUS PL 84-99 ASSISTANCE. *Provide a brief statement regarding previous PL 84-99 Rehabilitation Assistance, or assistance provided by any other Federal agency such as FEMA or FDAA. If no previous Federal assistance has been provided, so state. Place extensive documentation, records, or data in Appendix G.*
10. DISASTER INCIDENT. *Provide a brief description of weather system or event that caused the damage to the HSPP. Provide a brief, supportable statement that summarizes why the weather system or event meets the definition of extraordinary storm provided in ER 500-1-1, paragraph x-x. Place supporting documentation, tables, maps, weather reports, hurricane tracking charts, etc., in Appendix H.*
11. DAMAGE DESCRIPTION. *Provide a brief description of the damage incurred by the project. Address shoreline changes, volumetric changes, damages to hard features (e.g., groins, seawalls), etc. Address the level and extent of the project's remaining protection. Place supporting documentation, beach profile data, photos, etc., in Appendix I.*
12. NEED FOR PL 84-99 REHABILITATION. *Based on the policy contained in ER 500-1-1, paragraph 5-20, state why it is necessary to undertake the proposed rehabilitation effort under authority of PL 84-99. Specifically address the immediate threat to life and property, and the need for immediate action. Include an estimate of the project's remaining protection. Address when the next storm season will occur.*
13. PROPOSED WORK. *Describe the work proposed to be undertaken by this rehabilitation effort. Include extensive tabular data, supporting documentation, and alternatives considered but not selected in Appendix J.*
14. COST ESTIMATE. *Summarize (in narrative and tabular form) the total cost of the proposed work, to include FCCE/CG/local cost shares. Place supporting figures, calculations, historical or reference cost data, dredge mobilization/demobilization costs, determination of cost share percentages, etc., in Appendix K.*

Figure 5-8. PIR Format, HSPP Rehabilitation Assistance (Continued)

15. ECONOMICS. *Refer to Appendix C of EP 500-1-1 for format. Provide the benefit to cost ratio, and a narrative summary of the major components/ efforts that affect benefits and costs. Place the economic justification, interest rates used, period of analysis used, damages prevented charts, price data, etc. in Appendix L.*
16. ENVIRONMENTAL CONSIDERATIONS. *Provide a general summary of environmental considerations, to include any potential "show stoppers". Specific statements will be provided in Appendix M as separate tabs. Required statements include:*
    Tab M-1. A statement on the effect of proposed work on the environment.
    Tab M-2. Environmental Assessment.
    Tab M-3. Considerations under Section 7 of the Endangered Species Act of 1973 (PL 93-205).
    Tab M-4. Archeological Investigations and Salvage Activities considerations.
    Tab M-5. Section 404(b) evaluations.
    Tab M-6. A statement on the applicability of EO 11988.
    Tab M-7 to M-x. As needed.
17. PERMITS. *List the need for any permits (Federal, state or local) and indicate potential problems with obtaining these permits.*

Part III. Appendices

Appendix A. Public sponsor's request for assistance.
Appendix B. Project map(s).
Appendix C. Project Overview (from District project notebook/Digital Project Notebook).
Appendix D. Project Design Data
Appendix E. Project Maintenance Data
Appendix F. Periodic Renourishment Data
Appendix G. Previous PL 84-99 or Other Federal Agency Assistance.
Appendix H. Disaster Incident.
Appendix I. Damage Description.
Appendix J. Proposed Work.
Appendix K. Cost Estimate Data.
Appendix L. BCR Data.
Appendix M. Environmental Considerations.
Appendix N. - Y. (As needed.)
Appendix Z. PIR Review Checklist.

Figure 5-8. PIR Format, HSPP Rehabilitation Assistance (Continued)

PIR Review Checklist for HSPP Rehabilitation Assistance

	YES	NO	N/A	
1.	____	____		The project is a Federally authorized and constructed hurricane or shore protection project. [ER, 5-20.a.]
2.	____	____		The project is Active in the RIP. [ER, 5-2.a.] Last inspection date: _____
3.	____	____		The Public Sponsor has requested HSPP Rehabilitation Assistance in writing. [EP, 5-18.b.]
4.	____	____		The FCCE-funded HSPP Rehabilitation Assistance is necessary (a) to allow for adequate functioning of the project; (b) to reduce the immediate threat to life and improved property; and (c) is to a level no more than the pre-storm condition. [ER, 5-20.a., c., and d.]
5.	____	____		There is sufficient evidence in the PIR to support a finding that the HSPP was damaged by an extraordinary storm. [ER, 5-20.e.]
6.	____	____		There are "significant amounts of damage" to the HSPP. [ER, 5-20.e.(2)] The criterion used to make this determination is: _____ the cost of the construction effort to effect repair of the HSPP *(exclusive of dredge mob/demob costs)* (a) exceeds $1 million and (b) is greater than 2 percent of the original project construction costs (expressed in current day dollars.); or, ____ the cost of the construction effort to effect repair of the HSPP *(exclusive of dredge mob/demob costs)* exceeds $6 million; or, ____ more than one-third of the planned or historically placed sand for renourishment was lost. ____ only hard features are involved.
7.	____	____		The public sponsor has agreed to sign the Cooperation Agreement, which will occur before USACE begins rehabilitation work. [EP, 5-18.l.]
8.	____	____		The rehabilitation project has a favorable benefit cost ratio of greater than 1.0:1. [ER, 5-20.a.]
9.	____	____		The Public Sponsor has access to sufficient funds to meet its required cost contributions. [EP, 5-18.h.]

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Figure 5-9. PIR Review Checklist (Appendix Z), HSPP Rehabilitation Assistance

PIR Review Checklist for HSPP Rehabilitation Assistance

	YES	NO	N/A	
10.	____	____	____	The cost estimate in the PIR itemizes the work and identifies the Public Sponsor's cost responsibility for items such as deferred and deficient maintenance. [ER, 5-2.g.]
11.	____	____		The cost estimate in the PIR allocates costs between what may be paid for under PL 84-99 Rehabilitation Assistance, and what is cost shared between the Corps (using CG funds) and the public sponsor under periodic renourishment terms of the project PCA. [EP, 5-18.d.]]
12.	____	____		Dredge mobilization/demobilization costs are borne proportionally among contributing sources of funds for sand renourishment. [ER, 5-20.i.]
13.	____	____		Contingency funds for the FCCE-funded portion of the project are limited to 15 percent for dredging-related costs, and 10 percent for all other costs. [ER, 5-2.v.]
14.	____	____		The repair option selected is the option that is the least cost to the Federal government. [ER, 5-2.h.]
15.	____	____		The benefit cost ratio calculation excludes all recreation benefits. [ER, 5-20.a.]
16.	____	____	____	Betterments are paid by the Public Sponsor. [ER, 5-2.o.]
17.	____	____	____	Cost for any betterments are identified separately in the cost estimate. [ER, 5-2.o.]
18.	____	____		Based on the projected schedule, project history, anticipated degree of contention of undertaking the project, and similar items, the Rehabilitation Assistance will be finished prior to the onset of the next storm season, or within one year of the date of occurrence of the damage, whichever is less. [ER, 5-20.j.]
19.	____	____		The proposed work will not modify the HSPP to increase the degree of protection or capacity, or provide protection to a larger area. [ER, 5-2.n.]

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Figure 5-9. PIR Review Checklist (Appendix Z), HSPP Rehabilitation Assistance (Continued)

PIR Review Checklist for HSPP Rehabilitation Assistance

	YES	NO	N/A	
20.	____	____		An assessment of environmental requirements was completed. [ER, 5-13.e.]
21.	____	____		The Endangered Species Act was appropriately considered. Dredging will not be adversely impacted. [ER, 5-13.e.]
22.	____	____		The Archeological and Historical Preservation Act was appropriately considered. [ER, 5-13.h.]
23.	____	____		EO 11988 was appropriately considered. [ER, 5-13.f.]
24.	____	____		Other permitting and evaluations were appropriately considered, and result in no impediment to the Rehabilitation Assistance effort. [ER, 5-13.a.]
25.	____	____		The cover letter forwarding the PIR to the MSC will contain the projected schedule for completing the Rehabilitation Assistance. [EP, 5-18.f.(2)]
26.	____	____		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 5-18.f.(1)
27.	____	____		The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE

_____
NAME:
TITLE:
TELEPHONE NUMBER:

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Figure 5-9. PIR Review Checklist (Appendix Z), HSPP Rehabilitation Assistance (Continued)

Section VI - Dams

5-20. Dams.

a. Federal Dam Projects.

(1) Inspections. There is no IEI for a Federal dam. CEI's will be conducted in accordance with the schedule provided in the O&M manual, and funded by the Inspection of Completed Works program.

(2) Rehabilitation Assistance. In the event that a Federal dam is damaged in a flood or coastal storm, the rehabilitation effort will procedurally be handled the same as a Federal FCW, except that approval level for the PIR is HQUSACE (CECW-O). Refer to Section III of this chapter for procedures. Class 310 funds are used for Rehabilitation Assistance for Federal dams.

b. Non-Federal Dam Projects. A non-Federal dam can gain an Active status in the RIP. To do so, it must have flood control as its principal function, and be able to contain a 200-year storm before use of the spillway in its normal flood control pool.

(1) Inspections.

(a) Initial Eligibility Inspection. Due to the unique aspects of dams and dam construction, it will be a non-Federal expense to compile the necessary data (e.g., ground borings, seismic considerations, design specifications, as-builts of the structure, etc.) and provide it to the Corps. This Corps "office review" will occur prior to any on-site IEI. The inspection criteria for a dam IEI will be provided by HQUSACE concurrently with Class 350 funds.

(b) Continuing Eligibility Inspections. The inspection criteria for a dam CEI will be provided by HQUSACE concurrently with the provision of requested Class 350 funds.

(2) Rehabilitation Assistance. In the event that a non-Federal dam is damaged in a flood or coastal storm, the rehabilitation effort will procedurally be handled the same as a Federal FCW, except that approval level for the PIR is HQUSACE (CECW-O). Refer to Section III of this chapter for procedures. Class 320 funds are used for Rehabilitation Assistance for non-Federal dams.

CHAPTER 6
EMERGENCY WATER ASSISTANCE

Section I - Emergency Water Assistance Due to Contaminated Water Source

6-1. General. See ER 500-1-1, paragraph 6-1, for pertinent policy.

6-2. Philosophy and Sense of Urgency. The operating philosophy for providing Emergency Water Assistance is that USACE will act expeditiously to preclude human suffering. Under Emergency Water Assistance, the Corps may provide water to any locality confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality. Corps assistance is supplemental to State and local assistance, but timeliness of ability to provide assistance must be given great weight.

6-3. Procedures.

a. Initial Request and Report. HQUSACE will be immediately notified of any request or anticipated request for assistance under this authority. Notification will be both telephonically and via SITREP.

b. Eligibility. Districts will promptly determine potential eligibility for assistance. If the request appears to be a likely candidate for assistance, the district will request Class 430 funding (see ER 11-1-320), and prepare a PIR in accordance with paragraph 6-4. below.

c. Declaration of Emergency. District commanders must issue a Declaration of Emergency for Emergency Water Assistance prior to submission of the PIR to the MSC for approval.

(1) The Declaration of Emergency may initially be verbal, but must be reported in the district's Situation Report (SITREP) within 24 hours of the declaration.

(2) Authority to issue a Declaration of Emergency is delegated to Deputy District Engineers, and all supervisors in the chain from the District Commander to the Chief of Emergency Management, inclusive. For purposes of a Declaration of Emergency, "Chief of Emergency Management" includes an acting Chief of Emergency Management. District commanders may withhold authority to issue a Declaration of Emergency. Withholding of authority may be done either by written correspondence, or via a published OPLAN.

d. Governor's Request. The district will ensure a formal request for Emergency Water Assistance is received from the governor or his/her authorized representative prior to submission of the PIR to the MSC.

e. MSC Approval Process. The MSC commander will act on the PIR within 2 days of receipt. Coordination with HQUSACE (CECW-OE) is required prior to MSC approval. Concurrently with providing approval notification to the district, MSC's will submit the request, with supporting documents, to HQUSACE for funding. The district will notify the requester of any approval or disapproval action in writing with a preliminary verbal notification, as appropriate.

f. Direct Application by Local Entity. In the event political subdivisions make direct application for Emergency Water Assistance to the district, they will be advised to coordinate their request with the appropriate state agencies. To the extent feasible, all potential requesters of assistance will be advised of the need to go through the state to request assistance, and that USACE will take no action except in response to a request from the state. Federally recognized Indian tribes and Alaska Native Corporations need not go through the State.

g. Coordination. Regardless of whether a request is expected to be approved or disapproved, early coordination with managers of other Federal, state and local programs is necessary to ensure that appropriate assistance is provided in a timely manner.

h. Ineligible Request. If a request is clearly ineligible for assistance under this authority, the district receiving the request will advise the state in writing of such ineligibility. Copies of such letters will be forwarded to the MSC for their information. No PIR will be prepared in such cases. However, available data and background information for such a determination will be maintained by the district.

6-4. PIR Preparation.

a. PIR Format. The basic format for preparation of the Emergency Water Assistance Due to Contaminated Source PIR is at Figure 6-1.

b. Alternatives and Cost Estimates. The PIR will address all feasible alternatives to resolve the situation. The PIR will include cost estimates for all alternatives. Cost estimates will be broken out into Federal and non-Federal components, if applicable.

c. Environmental Consideration. An assessment of environmental impacts will be a part of the PIR. Once a project has been approved, districts will ensure any necessary supplements or changes to the environmental documentation are done.

d. Approval Level. PIR approval level is the Division Engineer or a deputy division engineer.

e. PIR Review Checklist. The PIR Review Checklist (Figure 6-2) will be included as Appendix Z to the PIR. The checklist must be completed and signed by the Emergency Manager or the Project Officer for the assistance project. References in the Checklist refer to both ER 500-1-1, designated with "ER" followed by the paragraph number, and this pamphlet, designated with "EP" followed by the paragraph number.

6-5. Cooperation Agreement. During the PIR preparation, the district will ensure the public sponsor is aware of required contributions and commitments, and that the sponsor intends to sign the CA and meet its commitments. Once the PIR is approved, the CA will be executed prior to providing Emergency Water Assistance. See Figure 6-3 for the CA format.

6-6. Funding and Cost Information.

a. Investigation Costs. All costs associated with investigation and preparation of the Project Information Report will be under Class 430. If multiple locations in a single state are involved, investigations and PIR activities may be bulk funded.

b. Cost Share. Approved Emergency Water Assistance projects are funded at 100 percent Federal cost for eligible costs under Class 410. All other costs are the responsibility of the public sponsor.

c. Eligible Costs.

(1) All investigation and PIR preparation costs.

(2) Purchase of water, either bottled or bulk.

(3) Transportation of water, to include small diameter pipeline and tank trucks, and associated loading and unloading costs.

(4) Distribution of water, if the normal water distribution system cannot be used. However, State or local support using, e.g., the National Guard is the typical method for operating distribution points.

(5) Water quality monitoring and testing.

(6) Technical assistance.

d. Costs Not Eligible for FCCE Funding.

(1) Repair of contaminated water treatment plants or water distribution systems.

(2) Construction of new water treatment plants or water distribution systems.

(3) Water treatment, if USACE is providing only raw water for use by the existing water treatment plant.

e. Funding. Refer to ER 11-1-320 for funding procedures.

f. Benefit to Cost Ratio. No benefit to cost ratio is needed for Emergency Water Assistance. Costs for Emergency Water Assistance projects must be prudent, reasonable, supportable, and defensible.

PROJECT INFORMATION REPORT
EMERGENCY WATER ASSISTANCE DUE TO CONTAMINATED SOURCE

Part I. Executive Summary

Part II. Basic Report

1. LOCATION - *City, county, and state.*

2. PUBLIC SPONSOR - *Name, address, telephone number, email address for the public sponsor of the proposed project.*

3. DESCRIPTION OF THE PROBLEM - *Affected locality and its water supply capability; cause of contamination (if known); health hazards, actions the public sponsor has taken to address the situation, actions taken by the State to address the situation (to include involvement of the National Guard), actions taken by other Federal agencies (e.g., Department of Agriculture), etc.*

4. COURSE OF ACTION OPTIONS - *List options available to correct the problem. Extensive information or tabular data will be placed in Appendix B.)*

5. PROPOSED WORK - *Of the options in paragraph 4. above, provide an explanation and description of the proposed work. Necessary additional information may be placed in Appendix B.*

6. BENEFICIARIES - *List of communities and quantities of people benefiting from the proposed work.*

7. PUBLIC SPONSOR'S SHARE OR CONTRIBUTION - *Description of form or method of public sponsor's contribution to resolving the problem.*

8. ENVIRONMENTAL CONSIDERATIONS. *Provide a general summary of environmental considerations. Specific statements, e.g., statement on effect of work on environment; Environmental Assessment, Section 7 of the Endangered Species Act of 1973 (PL 93-205) considerations; Archeological Investigations and Salvage Activities consideration per ER 1105-2-460, permits, etc, will be provide in Appendix C, as separate annexes.*

9. PERMITS. *List the need for any permits (Federal, state or local) and indicate potential problems with obtaining these permits.*

Part III. Appendices

Appendix A. Governor's request for assistance; any other correspondence from the potential project sponsor.

Appendix B. Data to support courses of action.

Appendix C-Y. As needed.

Appendix Z. PIR Review Checklist.

Figure 6-1. PIR Format, Emergency Water Assistance Due to Contaminated Water Source

PIR REVIEW CHECKLIST
EMERGENCY WATER ASSISTANCE DUE TO CONTAMINATED SOURCE

	YES	NO	N/A	
1.	___	___		Has a written request for assistance from the governor been received? [ER, 6-1.a.]
2.	___	___		Is the contaminated water source established and documented in the PIR? [ER, 6-1.b.]
3.	___	___		Is USACE assistance supplementing tribal, state, and/or local efforts? [ER 6-1.c.]
4.	___	___		Is the proposed work temporary? [ER, 6-1.d.]
5.	___	___		Are the local interests correcting the deficient or deferred maintenance? [ER, 6-1.d.]
6.	___	___		Are the local interests assessing and correcting the situation that caused or is causing the contamination? [ER, 6-1.d.]
7.	___	___		Will USACE proposed assistance last 30 days or less? [ER, 6-1.e.]
8.	___	___		Are business and commercial firms excluded from getting water for commercial purposes from this USACE assistance? [ER, 6-1.h.]
9.	___	___		Was EPA notified? [ER, 6-1.i.]
10.	___	___	___	Are military bases and other Federal areas excluded from getting water from this USACE assistance? [ER, 2-3.c.]
11.	___	___	___	Are farms and ranches excluded from getting water for irrigation or for watering livestock purposes from this USACE assistance? [ER, 6-1.c.]
12.	___	___		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 6-4.e.]
13.	___	___		The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE
NAME
TITLE
TELEPHONE NUMBER

Page Z-1

Figure 6-2. PIR Review Checklist (Appendix Z), Emergency Water Assistance Due to Contaminated Water Source

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
EMERGENCY WATER ASSISTANCE DUE TO CONTAMINATED WATER SOURCE

THIS AGREEMENT, entered into this ____ day of _____, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and _____ _____ [PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, 33 U.S.C. 701n authorizes the Chief of Engineers to provide emergency supplies of water, on such terms as he determines to be advisable, to any locality which he finds is confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality;

WHEREAS, the Public Sponsor has requested, in writing, emergency water assistance pursuant to 33 U.S.C. 701n, and the Public Sponsor qualifies for such assistance in accordance with the established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate with the terms of this Agreement.

NOW, THEREFORE, the parties agree as follows:

1. The Government will perform the work described in its scope of work (attached) that is made part of this agreement.

2. The Public Sponsor will:

a. Provide without cost to the Government all lands, easements, rights-of-ways, relocations, and borrow and dredged or excavated material disposal areas necessary for the work.

b. Hold and save the Government free from damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except damages due to the fault or negligence of the Government or its contractors.

Figure 6-3. Cooperation Agreement for Emergency Water Assistance Due to Contaminated Water Source

c. Operate, maintain, repair, replace, and rehabilitate the completed work in a manner satisfactory to the Government; and,

d. Remove, at no cost to the Government, all temporary work constructed by the Government.

3. (Add as applicable.)

4. ATTACHMENTS:

a. Exhibit A - Written request for assistance from the Public Sponsor.

b. Exhibit B - Government Scope of Work.

IN WITNESS WHEREOF, the parties hereto have executed this agreement of the day and year first above written.

THE DEPARTMENT OF THE ARMY	**THE [NAME OF PUBLIC SPONSOR]**
BY: _____	BY: _____
[SIGNATURE]	[SIGNATURE]
[TYPED NAME]	[TYPED NAME]
[TITLE IN FULL]	[TITLE IN FULL]
ADDRESS:	ADDRESS:

Figure 6-3. Cooperation Agreement for Emergency Water Assistance Due to Contaminated Water Source (Continued)

Section II - Emergency Water Assistance Due to Drought

6-7. General. See ER 500-1-1, paragraph 6-5, for pertinent policy.

6-8. Procedures.

a. Initial Request and Report. HQUSACE will be immediately notified of any request for assistance under this authority. Notification will be both telephonically and via SITREP.

b. Eligibility. Districts will promptly determine potential eligibility for assistance. If the request appears to be a likely candidate for assistance, the district will request Class 430 funding (see ER 11-1-320), and prepare a PIR in accordance with paragraph 6-9. below.

c. Declaration of Emergency. District commanders must issue a Declaration of Emergency for Emergency Water Assistance prior to submission of the PIR to the MSC.

(1) The Declaration of Emergency may initially be verbal, but must be made in writing and reported in the district's ENGLINK Situation Report (SITREP) within 24 hours of the declaration.

(2) Authority to issue a Declaration of Emergency is delegated to Deputy District Engineers, and all supervisors in the chain from the District Commander to the Chief of Emergency Management, inclusive. For purposes of a Declaration of Emergency, "Chief of Emergency Management" includes an acting Chief of Emergency Management. District commanders may withhold authority to issue a Declaration of Emergency. Withholding of authority may be done either by written correspondence, or via a published OPLAN.

d. Governor's Request. The district will ensure a formal request for Emergency Water Assistance is received from the governor prior to submission of the PIR to the MSC.

e. Approval Process.

(1) The MSC will act on the PIR within 2 days of receipt from the district.

(2) HQUSACE will expeditiously act on the PIR upon receipt from the MSC. HQUSACE action includes the requirement for a Drought Distressed Area designation by the Director of Civil Works or the ASA(CW). After a Drought Distressed Area designation has been made, approval level for PIR's is the Chief, Operations Division. HQUSACE will expeditiously provide funding for approved PIR's.

f. Scope of Assistance. A Drought Distressed Area designation by the Director of Civil Works or the ASA(CW) does not provide for an unlimited number of projects. Therefore, to the greatest extent possible, the district must identify the total amount of assistance required, the duration of the assistance, and the total estimated cost of providing the assistance. Separate projects must be individually justified in separate PIR's. However, a project may have multiple components that provide assistance in different areas by different means. For example, assistance to a large, rural county could consist of a small diameter pipeline to the large town in the county, and trucking bulk water to outlying towns.

6-9. Considerations for Assistance. In evaluating requests for Emergency Water Assistance for potential eligibility, the following are examples of actions that should be undertaken by state and/or local interests prior to the USACE consideration of the request:

a. Declaration of a drought emergency is made by state and/or other appropriate authority.

b. Available state and local resources are fully used, to include funds, labor, and equipment such as National Guard trucks to haul water. Assistance and support from other Federal agencies that may have applicable assistance authorities should be sought prior to the request being considered under PL 84-99 authority. Other Federal agencies that may have some assistance authorities are:

(1) Small Business Administration (SBA).

(2) Farmers Home Administration (FmHA).

(3) Economic Development Administration (EDA).

(4) Federal Emergency Management Administration (FEMA). [Note: A request for a presidential disaster declaration is not required as a prerequisite for USACE assistance.]

(5) Natural Resources Conservation Service (NRCS).

(6) Bureau of Indian Affairs (BIA) for assistance on tribal lands.

c. Mandatory water conservation measures have been instituted to reduce demand.

d. The use of available water is prioritized. Human consumption and sanitary needs take priority over industrial processes and irrigation of crops.

e. Appropriate experts establish minimum requirements for public health and welfare (examples: xx gallons per day per person for human consumption, health, and sanitation.) This is generally between 2 and 5 gallons per person per day.

f. Operation of water treatment facilities is modified to allow processing of alternate water sources that may be available.

g. Water processing and distribution systems are evaluated to identify losses and repairs are undertaken to minimize such losses.

h. Non-potable water is used in situations where it can be safely used to meet a portion of the community's requirements.

i. Where the problem is maintaining well production, available alternatives such as lowering production or deepening wells are being addressed.

j. A long term solution is being expeditiously executed.

6-10. PIR Preparation.

a. The format for the PIR is at Figure 6-4.

b. The PIR will address all feasible alternatives to resolve the situation. The PIR will include cost estimates for all alternatives. Cost estimates will be broken into Federal and non-Federal components, if applicable. Non-Federal costs include the purchase of water.

c. Environmental Consideration. An assessment of environmental impacts will be a part of the PIR. Once a project has been approved and the project has begun, districts will ensure any necessary supplements or changes to the environmental documentation are done.

d. The existence of drought conditions must be verified in the PIR in sufficient detail and with sufficient justification to merit a drought distressed area declaration. Supporting data should include such information as:

(1) Abnormally low groundwater levels, soil moisture, and stream flows, as defined by indicators such as the Palmer Index.

(2) Extremely low aquifer levels when compared to historical norms, drastically low water production levels, and indications that the conditions are not a recurring situation or the continuation of a long term trend.

(3) Abnormally low runoff from rainfall or snowpack into rivers, streams, lakes, or other storage areas, resulting in reduced or lost water supply source.

e. The PIR Review Checklist (format at Figure 6-5) will be included as Appendix Z to the PIR. The Checklist must be completed and signed by the Emergency Manager or the Project Officer for the Emergency Water Assistance project.

6-11. Cooperation Agreement. During the preparation of the PIR, the district will ensure the project sponsor is aware of required contributions and commitments, and intends to sign the CA and meet its commitments. Once the PIR is approved, the CA will be executed prior to providing Emergency Water Assistance. See Figure 6-6 for the CA format.

6-12. Funding and Cost Information.

a. Investigation Costs. All costs associated with investigation and preparation of the Project Information Report will be under Class 430. If multiple locations in a single state are involved, investigations and PIR activities may be bulk funded.

b. Cost Share - Other Than Well Drilling. Approved drought assistance projects are funded at 100% Federal cost for allowable expenses under Class 420. All other expenses, to specifically include the purchase of water, are a local responsibility.

c. Allowable Costs for FCCE Funding - Other Than Well Drilling.

(1) All investigation and PIR preparation costs.

(2) Transportation of water, to include construction of small diameter pipelines, purchase or lease of pumps, and use of tank trucks.

d. Costs Not Eligible for FCCE Funding - Other Than Well Drilling.

(1) Purchase of water, either bottled or bulk.

(2) Construction of new water treatment plants or water distribution systems.

(3) Water treatment.

(4) Operations and maintenance of pumps and pipeline systems, and related activities.

e. Well Drilling.

(1) Payment by Applicant for Well Drilling. Included in the USACE authority is the capability to drill wells for assistance applicants. When a well drilling project is approved, the applicant must secure the necessary funding for well construction from internal, commercial, or other sources. The proposed payment plan will be included in the PIR. If the applicant prefers repayment of government costs for well drilling, the district will contact HQUSACE (CECW-OE) for guidance.

(2) Availability of Private Contractors. USACE will not undertake well construction when private business can do the work in a reasonable time. As part of the investigation and PIR process, the district commander may advertise the need for such well drilling, but not identify the applicant. Contractors will be asked to respond to USACE by a specific date if they can supply the services. The names of those responding will be provided to the applicant.

f. Benefit to Cost Ratio. No benefit to cost ratio is needed for Emergency Water Assistance.

PROJECT INFORMATION REPORT
EMERGENCY WATER ASSISTANCE DUE TO DROUGHT

Part I. Executive Summary

Part II. Basic Report

1. LOCATION - *City, county, and state.*

2. PUBLIC SPONSOR - *Name, address, telephone number, email address for the public sponsor of the proposed project.*

3. DESCRIPTION OF THE PROBLEM - *Affected locality and its water supply capability; brief summarization of the drought conditions; health hazards (if any); actions the public sponsor and the State have taken to address the situation (to include involvement of the National Guard); actions taken by other Federal agencies (e.g., Department of Agriculture); etc.*

4. COURSE OF ACTION OPTIONS - *List options available to correct the problem. Extensive information or tabular data will be placed in Appendix C.)*

5. PROPOSED WORK - *Of the options in paragraph 4. above, provide an explanation and description of the proposed work. Necessary additional information may be placed in Appendix C.*

6. BENEFICIARIES - *List of communities and numbers of people benefiting from the proposed work.*

7. PUBLIC SPONSOR'S SHARE OR CONTRIBUTION - *Description of form or method of public sponsor's contribution to resolving the problem.*

8. ENVIRONMENTAL CONSIDERATIONS. *Provide a general summary of environmental considerations. Specific statements, e.g., statement on effect of work on environment; Environmental Assessment, Section 7 of the Endangered Species Act of 1973 (PL 93-205) considerations; Archeological Investigations and Salvage Activities consideration per ER 1105-2-460, permits, etc, will be provided in Appendix C, as separate annexes.*

9. PERMITS. *List the need for any permits (Federal, state or local) and indicate potential problems with obtaining these permits.*

Part III. Appendices

Appendix A. *Governor's request for assistance; any other correspondence from the potential project sponsor.*

Appendix B. *Data and documentation to justify issuance of a drought distressed area declaration from the Assistant Secretary of the Army for Civil Works.*

Appendix C. *Data to support courses of action, and Environmental Statements*.

Appendix D-Y. *As needed (e.g., payment plans.)*

Appendix Z. *PIR Review Checklist.*

Figure 6-4. PIR Format, Emergency Water Assistance Due to Drought

PIR REVIEW CHECKLIST - EMERGENCY WATER ASSISTANCE DUE TO DROUGHT

	YES	NO	N/A	
1.	___	___		Has a written request for assistance from the governor been received? [ER, 6-5.a.]
2.	___	___		Is there sufficient data to support a declaration of a drought distressed area by the ASA(CW)? [ER, 6-5.b.]
3.	___	___		Is USACE's authority the only Federal authority able to provide the needed assistance? [ER, 6-9.b.]
4.	___	___		Is USACE assistance supplementing tribal, state and/or local efforts? [ER, 6-5.]
5.	___	___	___	If water needs to be purchased, will the local interests pay for it? [ER, 6-5.e.]
6.	___	___	___	If a well is to be constructed, have the local interests agreed to pay for the cost? [ER, 6-5.j.]
7.	___	___	___	Has the district ensured there are no contractors available to perform drilling of wells? [ER, 6-5.i.]
8.	___	___		Are the local interests formulating a credible long term solution? [ER, 6-5.b.]
9.	___	___		Are business and commercial firms (other than farmers and ranchers), and recreation interests, excluded from getting water for commercial or recreational purposes from this USACE assistance? [ER, 6-5.d.]
10.	___	___	___	Are military bases and other Federal areas excluded from getting water from this USACE assistance? [ER, 2-3.c.]
11.	___	___	___	Are farms and ranches (not including cases of well drilling) excluded from getting water for irrigation or for livestock watering purposes? [6-5.d.]
12.	___	___		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 6-10.e.]
13.	___	___		The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE
NAME
TITLE
TELEPHONE NUMBER

Z-1

Figure 6-5. PIR Review Checklist (Appendix Z), Emergency Water Assistance Due to Drought

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
EMERGENCY WATER ASSISTANCE DUE TO DROUGHT

THIS AGREEMENT, entered into this _____ day of _____, 20___, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____ _____[PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, 33 USC 701n authorizes the Secretary of the Army, acting through the Chief of Engineers, U.S. Army Corps of Engineers, to provide assistance for emergency water supplies to political subdivisions within areas he determines to be drought distressed;

WHEREAS, the Public Sponsor has requested, in writing, assistance pursuant to 33 U.S.C. 701n, and the Public Sponsor qualifies for such assistance in accordance with the established policies of the U.S. Army Corps of Engineers;

WHEREAS, the Public Sponsor is located within an area which the Government has determined to be drought distressed; and, the Government has determined that, as a result of the drought, the Public Sponsor has an inadequate supply of water for human consumption, and water cannot be obtained by the Public Sponsor from other sources; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate with the terms of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. The Government agrees to perform the Emergency Water Assistance developed by the Government and as described in the attached scope of work.

2. The Public Sponsor will:

a. Provide, without cost to the Government, the required storage facility at the terminal point as determined by the Government to be needed for the emergency water supplies;

b. Purchase the supply of water or acquire any water right required for a source of water supply;

c. Develop a plan of action and initiate such necessary actions to restore a source of water supply or assume the responsibility for the transportation of a supply of water as soon as practicable;

Figure 6-6. Cooperation Agreement for Emergency Water Assistance Due to Drought

d. Obtain all necessary Federal, state, and local permits required for the provision of said emergency water supplies prior to the commencement of the work by the Government.

e. Hold and save the Government free from damages arising from provision of assistance under this agreement, except damages due to the fault or negligence of the Government or its contractors.

f. (Specify others as needed.)

3. ATTACHMENTS:

a. Exhibit A - Written request for assistance.

b. Exhibit B - Government's Scope of Work.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

THE DEPARTMENT OF THE ARMY	**THE [NAME OF PUBLIC SPONSOR]**
BY: _____	BY: _____
[SIGNATURE]	[SIGNATURE]
[TYPED NAME]	[TYPED NAME]
[TITLE IN FULL]	[TITLE IN FULL]
DATE: _____	DATE: _____
ADDRESS:	ADDRESS:

Figure 6-6. Cooperation Agreement for Emergency Water Assistance Due to Drought (Continued)

CHAPTER 7
ADVANCE MEASURES

7-1. General. See Chapter 7, ER 500-1-1, for pertinent policy.

7-2. Types of and Eligibility for Advance Measures Assistance. Advance Measures assistance may be in the form of technical or direct assistance. Refer to ER 500-1-1, paragraphs 7-2 and 7-3, for types of and eligibility for Advance Measures assistance that may be provided.

7-3. Advance Measures Situations and Applications.

a. Imminent Danger of Flooding. Advance Measures Assistance may be provided in order to prevent or reduce flood damage when there is an imminent threat of unusual flooding. Advance Measures assistance is limited to those necessary to prevent or reduce impacts of floods that (1) pose a significant threat to life and/or improved property, and, (2) the proposed assistance is beyond the capability of local interests and the State to perform in a timely manner.

b. Imminent Danger of Levee Failure/Overtopping. Advance Measures Assistance may be provided for levee projects that are in imminent danger of failure/overtopping. In such cases, Advance Measures can be employed to undertake minimum corrective action to ensure the stability, integrity, and safety of such projects. Actions should be limited to those necessary to prevent imminent failure of a project that (1) poses a significant threat to life and/or property, and, (2) the proposed assistance for the project is beyond the capability of local interests and the State to perform in a timely manner.

c. Snowmelt from Abnormally High Snowpack. Advance Measures to prevent predicted riverine or closed-basin flooding from heavy snowmelt are appropriate when based on measured conditions. Indicators to be measured include snow depths, snow water content, soil moisture content and frost penetration depth. Based on these measured conditions, and published forecasts, USACE and the National Weather Service (NWS) can forecast river/lake stages to determine if an imminent flood threat exists.

d. Federal Channels. Channel clearance and dredging to restore original project design capacity is permitted if predicted flood flows cannot be passed and flooding is likely to occur.

e. Non-Federal Channels. Channel clearance and dredging to restore original project design capacity is permitted if predicted flood flows cannot be passed and flooding is likely to occur. Field reconnaissance will determine the required additional capacity to pass the predicted flood flows.

f. Snags/Log Jams/Debris Obstructions. Removal of snags, log jams, and debris in streambeds is permitted to prevent the impoundment of water that would cause unusual flooding and produce significant amounts of damage to improved property.

g. Dam Failures.

(1) Advance Measures assistance is permitted to relieve the threat of flooding from dam failures when predicted inflows/river stages will result in catastrophic failure. An imminent loss of life or damage to improved property downstream of the dam must exist. Assistance may involve dewatering of the impoundment, controlled breaching of the structure, or repair/strengthening of the structure, depending on the time available and the costs involved versus the benefits. Permanent restoration/rehabilitation of the structure is the owner's responsibility.

(2) USACE may assist state and local interests in the formulation of an evacuation plan.

(3) If actual dam failure is occurring, response operations using Class 210 funds should be undertaken in accordance with Chapter 4, ER 500-1-1.

h. High Lake Levels. If an imminent flood threat period exists due to record or near record lake levels and significant flood damage will occur during lake storm seasons, the construction of temporary flood control works and/or the modification of existing flood control works is authorized. If the high lake levels are cyclical, and recurring imminent flood threat periods can be expected, a waiver of the local sponsor requirements to remove the temporary flood control works may be requested in order to require the local sponsor to maintain and upgrade the flood control works. State and/or local fund contributions will normally be 25 percent of the cost of construction.

7-4. Procedures.

a. Initial Report. A telephonic report or situation report will be made through MSC to HQUSACE (CECW-OE) as soon as there is an indication that an Advance Measures request may be received.

b. Governor's Request. The Governor's letter will contain the following information:

(1) A description of the state and/or local efforts undertaken.

(2) A statement that the State has committed all available resources.

(3) The specific location(s) and type of assistance needed.

(4) The name of the project sponsor.

(5) Additional commitments to be accomplished by the State.

c. Actions Following Receipt of Governor's Request. Following receipt of the Governor's written request, an investigation will be conducted to determine if USACE Advance Measures assistance is appropriate, and the type of USACE assistance to be provided.

d. Processing and Approval Process. If assistance appears appropriate, an Advance Measures PIR will be prepared by the District in accordance with Figure 7-1. The PIR Review Checklist (format at Figure 7-2) will be included as Appendix Z to the PIR. The Checklist must be completed and signed by the Emergency Manager or the Project Officer for the Advance Measures project. The PIR will be submitted through the MSC to HQUSACE (CECW-OE) as expeditiously as possible, but not later than 30 days after the date of the Governor's written request. A separate PIR will be prepared for each requested project. The MSC will act on the PIR within 5 days of receipt. HQUSACE will take action within 5 calendar days of receipt of the recommendation from the MSC commander. To expedite the review process, MSC's are encouraged to submit the district's PIR for concurrent MSC and HQUSACE review.

e. Cooperation Agreement. A CA (see Figure 7-3) will be executed with the public sponsor prior to the provision of assistance.

f. Denial Letter. If USACE assistance is denied, the district will transmit a letter to the Governor detailing why assistance is not available. A copy of the request and denial letter will be furnished to HQUSACE through MSC headquarters.

g. Funding. Funding will be in accordance with ER 11-1-320. For the execution of an approved Advance Measures project, funds will normally be provided concurrently with the approval of the project.

h. USACE Costs.

(1) Field Investigation Costs. Any expenses for conducting the preliminary review and for the preparation of the PIR and supporting documents will be charged as field investigation costs. Any technical assistance provided is also a field investigation cost. Field investigation costs will be charged to Class 520.

(2) Project Costs. These costs are any expenses necessary for the preparation of the plans and specifications, purchases, equipment rentals, contracts, and supervision and inspection during construction phase. Project costs will be charged to Class 510.

i. Fiscal Closeouts. EM elements will ensure that actions for closing emergency activities are accomplished in accordance with ER 11-1-320, within 60 days of completion of Advance Measures activities.

PROJECT INFORMATION REPORT
ADVANCE MEASURES

Part I. Executive Summary

Part II. Basic Report

1. NAME AND LOCATION - *Project name; city, county, and state.*

2. PUBLIC SPONSOR - *Name, address, telephone number, and email address for the public sponsor of the proposed project.*

3. SUMMARY OF THE CONDITIONS CAUSING THE IMMINENT THREAT OF UNUSUAL FLOODING - *Additional documentation may be included at Appendix B.*

4. COURSE OF ACTION OPTIONS - *List options available to address the problem. Extensive information or tabular data will be placed in Appendix C.)*

5. PROPOSED WORK - *Of the options in paragraph D. above, provide an explanation and description of the proposed work. Necessary additional information may be placed in Appendix C.*

6. ECONOMICS. - *Refer to Appendix C of EP 500-1-1 for economics format. State the benefit cost ratio of the proposed option, and the anticipated damages avoided attributable to the Advance Measures project. Provide a description of the communities and numbers of people benefiting from the proposed work. The detailed economic information and calculation of the BCR will be provided in Appendix D of the PIR.*

7. PUBLIC SPONSOR'S SHARE OR CONTRIBUTION - *Description of actions the local interests and the State are undertaking to resolve the problem.*

8. ENVIRONMENTAL CONSIDERATIONS. *Provide a general summary of environmental considerations. Specific statements, e.g., statement on effect of work on environment; Environmental Assessment, Section 7 of the Endangered Species Act of 1973 (PL 93-205) considerations; Archeological Investigations and Salvage Activities consideration per ER 1105-2-460, permits, etc, will be provide in Appendix C, as separate annexes.*

9. PERMITS. *List the need for any permits (Federal, state or local) and indicate potential problems with obtaining these permits.*

Part III. Appendices

Appendix A. Governor's request for assistance; any other correspondence from the potential project sponsor.

Appendix B. Data and documentation addressing the imminent threat of unusual flooding.

Appendix C. Data to support courses of action.

Appendix D. Economic data, to include calculation of benefit to cost ratio.

Appendix E-Y. As needed.

Appendix Z. PIR Review Checklist.

Figure 7-1. PIR Format, Advance Measures

PIR REVIEW CHECKLIST FOR ADVANCE MEASURES

	YES	NO	N/A	
1.	___	___		An imminent threat of unusual flooding has been established. [ER, 7-1.a.]
2.	___	___		There are no other USACE authorities that apply - Advance Measures is the only USACE option available to address this situation. [ER, 7-1.a.]
3.	___	___		The assistance supports and supplements tribal, state and local efforts. [ER, 7-1.b.]
4.	___	___		The governor requested the assistance in writing. [ER, 7-1.c.]
5.	___	___		The assistance is not solely for erosion control. [ER, 7-1.d.]
6.	___	___		The work does not make a permanent modification to an existing project to increase the degree or level of protection. [ER, 7-1.f.]
7.	___	___		The project has a favorable (>1.0) benefit cost ratio. [ER, 7-1.g.]
8.	___	___		The work is temporary in nature. [ER, 7-1.h.]
9.	___	___	___	If the work is not temporary in nature, the sponsor is willing and able to cost share at 75% Federal and 25% local share. [ER, 7-1.m.(2)]
10.	___	___		Any permanent work is justified and properly documented. [7-1.h.]
11.	___	___		The public sponsor has agreed to sign a Cooperation Agreement. [ER, 7-1.i.]
12.	___	___		The public sponsor has agreed to remove all temporary work to be constructed by USACE, or upgrade it to USACE standards. [ER, 7-1.i.]
13.	___	___		The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 7-4.d.]
14.	___	___		The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

REVIEWING OFFICIAL'S SIGNATURE:
NAME:
TITLE:
TELEPHONE NUMBER:

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Figure 7-2. PIR Review Checklist (Appendix Z) for Advance Measures

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
ADVANCE MEASURES ASSISTANCE

THIS AGREEMENT, entered into this _____ day of _____, 20_____, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____[PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, 33 U.S.C. 701n authorizes the Chief of Engineers to provide Advance Measures.

WHEREAS, the Public Sponsor has requested, in writing, assistance under 33 U.S.C. 701n and qualifies for such assistance in accordance with the established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in accordance with the terms of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. The Government will perform the work described in its scope of work, which is made part of this agreement.

2. The Public Sponsor will:

a. Provide without cost to the Government all lands, easements, rights-of-ways, relocations, and borrow and dredged or excavated material disposal areas necessary for the work.

Figure 7-3. Cooperation Agreement for Advance Measures Assistance

b. Hold and save the Government free from damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except damages due to the fault or negligence of the Government or its contractors.

c. Operate, maintain, repair, replace, and rehabilitate the completed work in a manner satisfactory to the Government; and

d. Remove all temporary work constructed by the Government, with initiation of removal within 30 days of the conclusion of the flood event.

3. The Public Sponsor further agrees to: (Add as applicable)

4. ATTACHMENTS:

a. Exhibit A - Written request for assistance from the Public Sponsor.

b. Exhibit B - Government Scope of Work.

c. Add others as applicable.

IN WITNESS WHEREOF, the parties hereto have executed this agreement of the day and year first above written.

THE DEPARTMENT OF THE ARMY	**THE [NAME OF PUBLIC SPONSOR]**
BY: _____	BY: _____
[SIGNATURE]	[SIGNATURE]
[TYPED NAME]	[TYPED NAME]
[TITLE IN FULL]	[TITLE IN FULL]
ADDRESS:	ADDRESS:

Figure 7-3. Cooperation Agreement for Advance Measures Assistance (Continued)

CHAPTER 8
Hazard Mitigation

8-1. Implementation. See paragraphs 8-1 and 8-2, ER 500-1-1 for pertinent policy.

8-2. Background.

a. Objective. The primary objective of hazard mitigation is to reduce or avoid Federal expenditures resulting from flood situations through a coordinated interagency and intergovernmental team approach that develops flood hazard mitigation recommendations.

b. Interagency Agreement. The Office of Management and Budget issued a memorandum on 10 July 1980, which directed 12 Federal departments and agencies to cooperate in the establishment of regional Hazard Mitigation Teams (HMT's). The primary purpose of HMT's is to prepare Hazard Mitigation Reports within 15 days of Presidentially declared flood disasters. FEMA coordinates the 12 Federal departments and agencies in the development of an interagency agreement that establishes common policy and guidelines to implement the hazard mitigation program. The result is the "Interagency Agreement for Non-Structural Flood Damage Reduction Measures as Applied to Common Flood Disaster Planning and Post Flood Recovery Practices." The agreement was signed by the following departments and agencies:

(1) Federal Emergency Management Agency (FEMA).

(2) Department of Agriculture (USDA).

(3) Department of the Army (DA) (Redelegated to USACE).

(4) Department of Commerce (DOC).

(5) Department of Health and Human Services (HHS).

(6) Department of Education (DE).

(7) Department of Housing and Urban Development (HUD).

(8) Department of Interior (DOI).

(9) Department of Transportation (DOT).

(10) Environmental Protection Agency (EPA).

(11) Small Business Administration (SBA).

(12) Tennessee Valley Authority (TVA).

8-3. HMT Concept of Operation.

a. Hazard mitigation teams are established in each of the 10 Federal regions. USACE represents the Secretary of the Army on the HMT. A FEMA representative normally serves as the team leader.

b. The most significant role of the HMT is to provide advice and recommendations based on observations and analysis during the 15-day period following the Major Disaster Declaration by the President. This role is distinct from many others in that the team neither provides emergency relief nor makes binding decisions on recovery activities. The main objective is to identify opportunities to minimize future Federal expenditures for disaster recovery operations.

c. The HMT has the responsibility to prepare a Hazard Mitigation Report within 15 days of a presidentially declared disaster. In extraordinary circumstances involving large scale, major disasters, the FEMA Regional Director (RD) may determine that a preliminary Hazard Mitigation Report will be submitted within 15 days followed by a more detailed report within 30 days from the Presidentially declared disaster. In accomplishing this task, the HMT conducts the operation in the following phases:

(1) Receives briefing on the disaster from the NWS, USACE, FEMA, local interests, and any other agencies that have pertinent information that would be beneficial to the team.

(2) Visit as much of the disaster area as possible in one or two days. If the area is too large to visit in this time frame, visit representative samples of each type flood damage.

(3) Each team member should watch for areas in which flood damages can be reduced or prevented by either structural or nonstructural measures. Team members should be aware that they can make suggestions that may be a local responsibility or other Federal or State agency responsibility to implement.

(4) The team should discuss all recommendations made by each team member, decide if it is a viable recommendation, and if so, then decide who will write the issue in the HMT Report.

(5) After recommendations are written, they should be reviewed, edited, and agreed upon by the team and then combined to form the HMT Report.

(6) The report is required to be written within 15 days following a Presidential Major Disaster Declaration.

(7) After completion of the report, USACE should recommend that FEMA meet with local officials and discuss recommendations in the report since many of the recommendations are normally local interest responsibilities.

(8) FEMA is responsible for distribution of the report to all involved agencies and to concerned congressional interests.

8-4. Procedures.

a. Representative. The HMT representative will serve as the MSC's primary member on the regional HMT within its Civil Works boundaries.

b. Participation. After a flood disaster, when the FEMA RD activates the HMT (or a portion thereof), the RD will designate the team leader, and notify the team members. The USACE representative will attend all meetings and respond to the HMT requirements. Where more than one MSC is affected within a disaster area, MSC commanders will mutually agree upon a lead USACE representative. The MSC(s) not providing the lead USACE representative may participate in the HMT to assist the lead USACE representative with the overall USACE coordination. The lead USACE representative is responsible for coordination of all activities and recommendations with the appropriate districts and MSC's. MSC's will notify HQUSACE (CECW-OE) of any USACE participation in HMT activities.

c. Responsibilities. The USACE HMT representative will ensure that:

(1) The HMT is provided with information about USACE programs, the availability of funds from USACE authorities, status of ongoing projects, previously published studies, hydrological information, and damage assessment.

(2) USACE expertise is used in identifying mitigation opportunities and coordinate with affected districts.

(3) The HMT is provided with the USACE evaluation of mitigation alternatives and recommendations.

(4) Liaison between the HMT and USACE is constantly maintained before, during, and after field activities.

d. Activities. The USACE representative will be knowledgeable in the following activities:

(1) Civil Works programs.

(2) USACE regulations and authorities.

(3) Completed and ongoing Civil Works projects and studies.

(4) Regulatory and permit requirements and activities.

(5) PL 84-99 activities.

(6) General knowledge of other agency programs.

e. Information and Data. The USACE representative will be prepared to provide the HMT with the information or data that are currently available in MSC or district offices. Examples are:

(1) Flood frequency analyses.

(2) Aerial photographs.

(3) Mapping.

(4) Damage assessments.

(5) Economic data.

(6) Flood inundation maps.

f. USACE Comments. MSC commanders will provide to FEMA, within 20 days of receipt of the Hazard Mitigation Report (also known as the 15-day report), comments to the recommendations made by the Hazard Mitigation Report. A copy of these comments, along with a copy of the Hazard Mitigation Report will be forwarded to HQUSACE, ATTN: CECW-OE. The USACE comments will provide FEMA with:

(1) Technical corrections to the Hazard Mitigation Report;

(2) Any nonconcurrence to the recommendations of the Hazard Mitigation Report; and,

(3) A schedule to accomplish the recommendations for which USACE is assigned the lead and USACE concurs. The schedule will be in tabular forms showing recommendations, proposed schedule, current status, and remarks columns.

g. USACE 90 Day Status Report. MSC commanders will provide, within 90 days of receipt of the Hazard Mitigation Report, input to the FEMA Post Flood Recovery Progress Report. The Status Report will be prepared and submitted by MSC's providing FEMA with:

(1) A status of progress made in implementing the recommendations of the Hazard Mitigation Report.

(2) A description of problems or issues that have developed after completion of the report.

(3) Recommendations for further actions.

h. District Commanders will:

(1) Be prepared to support MSC's with HMT requirements.

(2) Ensure the recommendations of the Hazard Mitigation Report are implemented in accordance with MSC authorities and schedule.

(3) Provide the MSC with comments, input to the Hazard Mitigation Reports, and input to the Status Reports.

i. USACE Costs. All costs for HMT activities will be maintained by MSC's. USACE-funded costs will be limited to:

(1) Travel and per diem.

(2) Regular and overtime labor for MSC and district personnel. This does not include regular labor for General Expense-funded personnel.

(3) Reproduction costs for pertinent HMT reports. USACE will not be responsible for funding the complete HMT report.

8-5. Funding. HMT activities are funded under Class 610. Refer to ER 11-1-320 for funding procedures. Fiscal closeout of Class 610 activities will occur within 60 days of completion of travel for HMT activities.

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CHAPTER 9
DEPARTMENT OF THE ARMY ASSISTANCE UNDER AR 500-60

9-1. General.

a. Policy. For policy regarding this subject, see ER 500-1-1, paragraph 9-1.

b. Procedures for DOD Support. If an MSC or district requires support that may be available from another DOD activity, it may request such support in accordance with that activity's procedures. An example of this would be obtaining a helicopter from a nearby Army installation or Navy base.

c. AR 500-60 Contracting. No emergency contracting is permitted under authority of AR 500-60 unless funds are provided by the requesting Federal activity. If a DOD activity requests a USACE district to provide contracting assistance, the contingency contracting policy and strategy of Chapter 11, ER 500-1-1, should be used to the maximum extent possible.

d. Stafford Act. ER 500-1-28, Response Planning Guide, and the Federal Response Plan should be referred to for USACE-FEMA coordination involving possible or actual Stafford Act mission taskings.

9-2. USACE Procedures.

a. MSC's will:

(1) Establish and maintain liaison with CONUS Army (CONUSA) commanders, CINC's, FEMA Regional Directors, USCG regional commanders, and other appropriate Federal, state, and local government agencies.

(2) Ensure that USACE procedures for disaster relief are coordinated with CONUSA or unified commanders.

(3) Ensure procedures are developed to provide engineering, construction management, and contracting support to engineer and troop units involved in disaster relief operations, when requested.

(4) Furnish CINC's and CONUSA commanders information on floods or other disasters or emergencies, and on activities undertaken by the USACE MSC and/or district.

b. Districts will:

(1) Be prepared to provide assistance and support under AR 500-60.

(2) Assist MSC's with points of contact at military installations within their Military boundaries.

(3) Establish procedures to process requests for DOD resources in disasters and emergencies.

(4) Establish procedures to provide engineering, construction management, and contracting support to engineer and troop units involved in disaster relief operations.

(5) Furnish copies of situation reports to the CINC's, CONUSA commanders, and other appropriate agencies using the fastest electrical means available.

c. Activation and Employment of the 249th Engineer Battalion. MSC and district commanders do not have the authority to activate the 249th Engineer Battalion (Prime Power). This authority rests at HQUSACE. Requests to use an element of the 249th Engineer Battalion (Prime Power) that is working within the MSC or district boundaries should be submitted to the UOC for action.

CHAPTER 10
NATIONAL OIL AND HAZARDOUS SUBSTANCE POLLUTION CONTINGENCY PLAN (NCP)

10-1. General. Planning and procedures to respond to releases requiring remedial action under the NCP are not governed by ER 500-1-1, and are not funded by the FCCE appropriation. See ER 500-1-1, Chapter 10, for pertinent policy.

10-2. Authority. USACE has authority to remove sunken vessels or similar obstructions under Sections 15, 19, & 20 of the River and Harbors Act of 1899, as amended by the Water Resources Act of 1986.

10-3. Background.

a. NCP. The NCP provides for an efficient, coordinated and effective response to discharges of oil and releases of hazardous substances, pollutants and contaminants in accordance with the authorities of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Clean Water Act (CWA).

b. National Response Team (NRT). The NRT is responsible for national response and preparedness, planning, coordinating regional planning, and providing policy guidance and support to the RRT's. There are 15 federal agencies on the NRT, including DOD. The Federal agencies may be requested to provide assistance during preparedness planning, or in an actual response. CECW-OE, in conjunction with CECS-OPS, provides USACE representation to the NRT.

c. Regional Response Team (RRT). The RRT serves as the regional organization for planning and coordination of preparedness and response actions. The RRT is composed of representatives from the same agencies that make up the NRT, along with representatives from tribal, state, and local governments.

d. On Scene Coordinator and Remedial Project Manager (OSC/RPM). The OSC/RPM directs the response efforts at the scene of a discharge or release. In general, the OSC/RPM is predesignated by the regional or district head of the lead agency. The Environmental Protection Agency (EPA) or the US Coast Guard (USCG) normally provides the OSC. However, for releases from vessels or facilities under the jurisdiction, custody or control of DOD, DOE, or other federal agency, the OSC/RPM will be provided by the federal agency responsible for the release, except for the special conditions stated in the NCP. The USCG will provide the OSC for oil discharges, including those from a Federal agency facility or vessel, within or threatening the coastal zone and inland waterways. Other conditions on designation of the OSC/RPM are included in the NCP.

e. Activation.

(1) The NRT may be activated as a response team when: (a) the response capability of the region where the incident occurs is exceeded; or (b) the incident crosses regional boundaries; or (c) the incident involves a significant threat to public health, welfare, or the environment, substantial amounts of property, or substantial threats to natural resources; or (d) if requested by any NRT member.

(2) The RRT will be activated as an incident response team upon request from the OSC/RPM or from any RRT member. The RRT may also be activated when: (a) the response capability of the OSC/RPM is exceeded; or (b) the incident crosses state boundaries; or (c) the incident poses a substantial threat to public health, welfare or the environment, or to regionally significant amounts of property.

10-4. USACE Participation. USACE is included in the NCP as a branch of DOD that has "relevant expertise" that can be used in response to discharges or releases. USACE MSC's provide members for the RRT.

10-5. Procedures.

a. USACE Projects. Planning, prevention, control and reporting of discharges and releases for project offices that operate and maintain completed USACE projects are subject to the applicable provisions of AR 200-1 and ER 1130-2-434.

b. Non-USACE Activities. Planning, preparedness and response assistance to discharges and releases from non-USACE activities are subject to the applicable provisions of AR 500-60. USACE facilities and resources available outside the region should be considered in the development of regional and on-scene coordinator contingency plans. For discharges, USACE hopper dredges and USACE reserve fleet of contractor owned hopper dredges should be included, when appropriate, in the regional and on-scene coordinator contingency plans.

c. Notification. Notice of an oil discharge or release of a hazardous substance in an amount equal to or greater than the reportable quantity must be made immediately to the National Response Center, HQ USCG, Washington, D.C. telephone (800) 424-8802 or (202) 267-2675. Notification procedures for USACE projects shall be similar to those identified in Chapter 8 of AR 200-1. Information on reportable quantities for oil and hazardous substances is referenced in AR 200-1. Requirements for submitting situation reports are included in Chapter 4, Section V.

d. Funding.

(1) The responsible USACE element will fund the cleanup of USACE-caused discharges and releases.

(2) Oil and hazardous material spill response plans required on USACE operated and maintained projects will be funded from appropriate project funds.

(3) Preparedness planning activities in support of the NCP, including participation on the RRT, are funded under Class 110.

(4) USACE participation in discharge and release response and cleanup operations under the NCP is done on a reimbursable basis. Funding is the responsibility of the agency requesting USACE assistance.

(5) Activation/operation and related command and control activities in the EOC will be funded under Class 210.

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CHAPTER 11
CONTRACTING

11-1. General. Refer to ER 500-1-1, Chapter 11, for pertinent policy.

11-2. Contracting Philosophy and Commander's Intent for Emergency Work. Almost all contract work funded by the Flood Control and Coastal Emergencies appropriation under Classes 210, 230, 310, 320, 330, 410, 420, and 510 is explicitly defined as "emergency work" by ER 500-1-1, paragraph 11-1.b. Thus, this definition invokes all aspects of the Federal Acquisition Regulation, as supplemented, dealing with matters of exigency, urgency, and immediacy. It is the stated intent of the USACE Commander that all contract work funded by FCCE Categories 200 through 500 take maximum advantage of all available contracting mechanisms to expedite completion of such work.

11-3. Contracting Procedures and Execution. The full spectrum of contracting methods and contract types is available for use during emergencies. Normal procurement procedures will be modified as necessary to minimize the delay of the urgent operations, and to meet local antecedent conditions, provided that the basic principles of the applicable laws and regulations are met.

FOR THE COMMANDER:

5 Appendices
(See Table of Contents)

ROBERT CREAR
Colonel, Corps of Engineers
Chief of Staff

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Appendix A
REFERENCES

USACE policy on publications states that publications will be kept up to date via the USACE publications home page. The address for the USACE publications home page is www.usace.army.mil/publications.

Section I
Related Public Laws

PL 77-228
Section 5, Flood Control Act of August 18, 1941.

PL 93-288
Robert T. Stafford Disaster Relief and Emergency Assistance Act. (Note: FEMA no longer refers to the Stafford Act as "PL 93-288". The designation is provided as information only.)

40 CFR Part 300
National Oil and Hazardous Substances Pollution Contingency Plan.

Section II
Required Regulations and Manuals

AR 25-400-2
The Modern Army Record Keeping System (MARKS).

AR 200-1
Environmental Protection and Enhancement.

AR 500-60
Disaster Relief.

AR 700-131
Loan or Lease of Army Material

Army Federal Acquisition Regulation Supplement Manual No. 2
Contingency Contracting.

ER 5-1-11
USACE Business Process.

ER 10-1-2
US Army Corps of Engineers Division and District Offices.

ER 11-1-320
Civil Works Emergency Management Programs.

ER 11-2-201
Civil Works Activities - Funding, Work Allowances, & Reprogramming.

ER 37-2-10
Accounting and Reporting, Civil Works Activities.

ER 200-2-2
Procedures for Implementing NEPA.

ER 200-2-3
Environmental Compliance Policies.

ER 500-1-28
Response Planning Guide (Emergency Employment).

ER 700-1-1
USACE Supply Policies and Procedures.

ER 750-1-1
Materiel Maintenance Policies.

ER 1105-2-100
Planning Guidance Notebook.

ER 1130-2-530
Flood Control Operations and Maintenance Policies.

ER 1140-1-211
Support for Others: Reimbursable Work.

ER 1165-2-26
Implementation of Executive Order 11988 on Flood Plain Management.

ER 1165-2-30
Acceptance and Return of Required, Contributed, or Advanced Funds.

ER 1165-2-119
Modifications to Completed Projects.

EFARS
Engineer Federal Acquisition Regulations Supplement.

EP 1165-2-1
Policy Digest.

EP 500-1-1
Civil Emergency Management Program - Procedures.

EM 385-1-1
USACE Safety and Health Requirements Manual.

EM 1110-2-301
Guidelines for Landscape Planting at Flood walls, Levees, and Embankment Dams.

Section III
Related Regulations, Manuals, and Documents

DOD Directive 3025.1
Military Support to Civil Authorities.

DOD Directive 5030.41
Oil and Hazardous Substances Pollution Prevention and Contingency Program.

DOD Manual 3025.1
DOD Manual For Civil Emergencies.

FM 100-19
Domestic Support Operations.

FM 100-23-1
Multiservice Procedures For Humanitarian Assistance Operations.

ER 360-1-1
Public Affairs.

ER 405-1-12
Real Estate Handbook.

ER 690-1-321
Staffing for Civilian Support to Emergency Operations.

ER 1105-2-100
Planning Guidance Notebook.

ER 1110-2-1941
Drought Contingency Plans.

APPENDIX B - INSPECTION GUIDE FOR FLOOD CONTROL WORKS

INSPECTION GUIDE FOR FLOOD CONTROL WORKS

Name of Project: _____ **Date** _____

Public Sponsor: _____

SUMMARY OF INSPECTION:

THE PROJECT CONDITION AS A RESULT OF THIS (INITIAL)(CONTINUING) *(circle one)* **ELIGIBILITY INSPECTION IS:**

- ☐ **ACCEPTABLE**
- ☐ **MINIMALLY ACCEPTABLE**
- ☐ **UNACCEPTABLE.**

[NOTE: Refer to Page 10 of the Inspection Guide for Rating Codes for Individual Rated Items, and Project Condition Codes used in this inspection.]

CORPS OF ENGINEERS INSPECTORS:

_____ _____

_____ _____

PUBLIC SPONSOR REPRESENTATIVES

_____ _____

COMMENTS:

☐ **Check if additional comments are attached.**

PAGE 1 OF 10

Figure B-1. Inspection Guide for Flood Control Works

RATED ITEM	S	M	U	EVALUATION
SECTION I				***FCW ENGINEERING - FOR USE DURING INITIAL ELIGIBILITY INSPECTION OF NONFEDERAL PROJECTS***
1. Level of Protection				The designed section is for an exceedance frequency greater than 10% chance (10 yr.) with minimum freeboard of 2 feet/60 cm (urban levee) *or* the designed section is for an exceedance frequency between 20% to 10% chance (5-10 yr.) with minimum freeboard of 1 foot/30cm (agricultural levee).
2. Erosion Control				S Erosion protection in active areas is capable of handling the designed flow velocity for the level of protection for the entire FCW.
				M Erosion protection is capable of handling the designed flow velocity for the level of protection for 75% or more of the FCW.
				U Erosion protection measures protect less than 75% of the FCW; or if erosion protection was not present and there is evidence indicating a need for erosion protection.
3. Embankment				S Fill material for embankment is suitable to prevent slides and seepage for the existing side slopes. Fill material is uniform and adequately compacted through the entire FCW.
				M Material is adequate and suitable to prevent major slides and capable of handling localized seepage for the existing side slopes. Fill material is uniform and adequately compacted in 75% or more of the FCW.
				U Material is unsuitable and likely to cause numerous slides and allow excessive uncontrolled seepage. Fill material is not uniform, or there is no compaction and evidence indicates a need for compaction.
4. Foundation				S Foundation materials will not cause piping, sand boils, seepage, or settlements that reduce the level of protection.
				M Foundation materials may show signs of excessive seepage, minor sand boils, and localized settlements.
				U Foundation materials are unsuitable and likely to cause excessive uncontrolled seepage, sand boils, and/or piping.
5. Structures				S Structures are capable of performing their design functions and show no signs of failure.
				M Structures are performing their design functions but show signs of overtopping and bypassing flows.
				U Structures are not performing their design functions or show signs of structural failure. **PAGE 2 OF 10**

RATED ITEM	S	M	U	EVALUATION	
SECTION II				***FCW MAINTENANCE - FOR USE DURING ALL INSPECTIONS***	
6. Depressions				S	Minimal depressions or potholes; proper drainage.
				M	Some depressions that will not pond water.
				U	Depressions 15 cm (6") vertical or greater which endangers the integrity of the levee.
7. Erosion				S	No erosion observed.
				M	LEVEE: Erosion of levee crown or slopes that will not interrupt inspection or maintenance access. OTHER FCW: Erosion gullies less than 15 cm (6 inches) deep or deviation of 30 cm (1 foot) from designed grade or section.
				U	LEVEE: Erosion of levee crown or slopes that has interrupted inspection or maintenance access. OTHER FCW: Erosion gullies greater than 15 cm (6 inches) or deviation of 30 cm (1 foot) or more from designed grade or section.
8. Slope Stability				S	No slides present. Erosion of slopes less than 10 cm (4") deep.
				M	Minor superficial sliding that with deferred repair does not pose an immediate threat to FCW integrity. No displacement or bulges.
				U	Evidence of deep seated sliding (60 cm (2 ft.) vertical or greater) requiring repairs to re-establish FCW integrity.
9. Cracking				S	No cracks in transverse or longitudinal direction observed in the FCW.
				M	Longitudinal cracks are no longer than the levee height. No displacement and bulging. No transverse cracks.
				U	Longitudinal cracks are greater than levee height, with *or without* some bulging observed. Transverse cracks are evident
10. Animal Control				S	Continuous animal burrow control program that eliminates any active burrowing in a short period of time. Program includes filling in of existing burrows.
				M	Animal burrows present that will not result in seepage or slope stability problems.
				U	Animal burrows present that would result in possible seepage or slope stability problems.

	RATED ITEM	S	M	U	EVALUATION	
	SECTION II - Continued				***FCW MAINTENANCE - FOR USE DURING ALL INSPECTIONS***	
11.	**Unwanted Vegetation Growth**				S	A- No large brush or trees exist in the FCW. Grass cover well maintained. CHANNELS: Channel capacity for designed flows is not affected.
					M	Minimal tree (5 cm (2") diameter or smaller) and brush cover present that will not threaten FCW integrity. (NOTE: Trees that have been cut and removed from levees should have their roots excavated and the cavity filled and compacted with impervious material). CHANNELS: Channel capacity for designed flows is not adversely affected.
					U	Tree, weed, and brush cover exists in the FCW requiring removal to re-establish or ascertain FCW integrity. (NOTE: If significant growth on levees exists, prohibiting rating of other levee inspection items, then the inspection should be ended until this item is corrected.) CHANNEL: Channel obstructions have impaired the floodway capacity and hydraulic effectiveness.
12.	**Encroachments**				S	No trash, debris, excavations, structures, or other obstructions present.
					M	Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities occurring that will not inhibit operations and maintenance performance.
					U	Trash, debris, excavations, structures or other obstructions present, or inappropriate activities that would inhibit operations and maintenance performance.
13.	**Riprap/ Revetments/ Banks**				S	Existing protection works are being properly maintained and are undamaged.
					M	No scouring activity that could undercut banks/riprap, erode embankments, or restrict desired channel flow.
					U	Meandering and/or scour activity that is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence, meandering, or shoaling.
14.	**Stability of Concrete Structures**				S	Any tilting, sliding, or settling of structures, if present, has been secured, preserving the integrity or performance.
					M	Uncorrected sliding or settlement of structures of a magnitude that does not affect performance.
					U	Tilting or settlement of structures that has resulted with a threat to the structure's integrity and performance.

	RATED ITEM	S	M	U	EVALUATION	
	SECTION II - Continued				***FCW MAINTENANCE - FOR USE DURING ALL INSPECTIONS***	
15.	**Concrete Surfaces**				S	Negligible spalling or scaling. No cracks present that are not controlled by reinforcing steel or that cause integrity deterioration or result in inadequate structure performance.
					M	Spalling, scaling and cracking present but immediate integrity or performance of structure not threatened.
					U	Surface deterioration or deep, controlled cracks present that result in an unreliable structure.
16.	**Structural Foundations**				S	No scouring or undermining near the structures.
					M	Scouring near the footing of the structure but not close enough to affect structure stability during the next flood event.
					U	Scouring or undermining at the foundation that has affected structure integrity.
17.	**Culverts**				S	[a] No breaks, holes, cracks in the culvert that would result in any significant water leakage. No surface distress that could result in permanent damage. [b] Negligible debris or silt blocking culvert section. No or minimal debris or sediment present which has negligible effect on operations of the culvert.
					M	[a] Integrity not threatened by spalls, scales, or surface rusting. Cracks present but resulting leakage not affecting the structure. [b] Debris or sediment present, which is proposed to be removed prior to the next flood event, that minimally affects the operations of the culvert.
					U	[a] Culvert has deterioration such as surface distress and/or has significant leakage in quantity or degree to threaten integrity. [b] Accumulated debris or settlement which has not been annually removed and severely affects the operations of the culvert.
18.	**Gates**				S	Gates open easily and close to a tight seal. Materials do not have permanent corrosion damage and appear to have historically been maintained adequately.
					M	Gates operate but leak when closed; however, leakage quantity is not a threat to performance. All appurtenances of the facility are in working condition.
					U	Gates leak significantly when closed or do not operate. Gates and appurtenances have damages that threaten integrity and/or appear not to have been maintained adequately.
19.	**Closure Structures**				S	Closure structure in good repair. Placing equipment readily available at all times.
					U	Closure structure in poor condition. Parts missing. Placing equipment may not be available within normal warning time.

RATED ITEM	S	M	U	EVALUATION	
SECTION II - Continued				***FCW MAINTENANCE - FOR USE DURING ALL INSPECTIONS***	
20. Motors				S	All motors, if present, are operational. Preventive maintenance is occurring and system is performance tested periodically.
				M	All motors are operational and minor discrepancies are such that motors could be expected to perform through the next projected period of usage.
				U	Motors are not operational, or noted discrepancies have not been corrected.
21. Power				S	Adequate, reliable, and enough capacity to meet demands.
				U	Power source not considered reliable to sustain operations during flood condition.
22. Metallic items				S	All metal parts in a plant/building protected from permanent damage from corrosion. Gates operable.
				M	Corrosion on metal parts appears maintainable. Gates operable.
				U	Metal parts need replacement, may fail, or will not function.

REMARKS FOR SECTIONS I AND II.

PAGE 6 OF 10

	RATED ITEM	S	M	U		EVALUATION
	SECTION III					***FOR USE DURING ALL INITIAL and CONTINUING ELIGIBILITY INSPECTIONS***
23.	Pump Station Size					Pump station has adequate capacity (considering pumping capacity, ponding areas, etc.) to handle expected inflow volumes.
	SECTION IV					***FOR USE DURING ALL INITIAL and CONTINUING ELIGIBILITY INSPECTIONS***
24.	Operations and Maintenance Manual					Operations and Maintenance (O&M) Manual is present and adequately covers all pertinent areas. All necessary updates to the Manual have been done.
25.	Operating Log					Pump Station Operating Log is present and being used. Operators are trained on proper usage.
26.	Annual Inspection					Annual inspection is being performed by the public sponsor.
27.	Plant Building				S	Plant building is in good structural condition. No apparent major cracks in concrete, no subsidence, roof is not leaking, etc. Intake louvers clean, clear of debris. Exhaust fans operational and maintained. Safe working environment.
					M	Spalling and cracking are present, or minimal subsidence is evident, or the roof leaks, or other conditions are present that need repair but do not threaten the structural integrity or stability of the building.
					U	Any condition that does not meet Minimally Acceptable standard.
28.	Pumps				S	All pumps are operational. Preventive maintenance and lubrication are being performed. System is periodically subjected to performance testing. No evidence of unusual sounds, cavitation, or vibration.
					M	All pumps are operational and deficiencies/minor discrepancies are such that pumps could be expected to perform through the next expected period of usage.
					U	One or more primary pumps are not operational, or noted discrepancies have not been corrected.
29.	Motors, Engines, and Gear Reducers				S	All items are operational. Preventive maintenance and lubrication being performed. System is periodically subjected to performance testing. Instrumentation, alarms, and auto shutdowns are operational.
					M	All systems are operational and deficiencies/minor discrepancies are such that pumps could be expected to perform through the next expected period of usage.
					U	One or more primary motors are not operational, or noted deficiencies/discrepancies have not been corrected.

RATED ITEM	S	M	U	EVALUATION	
SECTION IV Continued				***FOR USE DURING ALL PUMP STATION INSPECTIONS***	
30. Trash Rakes				S	Drive chain, bearings, gear reducers, and other components are in good operating condition and properly maintained.
				M	Drive chain, bearings, gear reducers, and other components are capable of performing as designed through the next flood event.
				U	Proper operation would be inhibited during the next flood event.
31. Other Metallic Items				S	All metal parts in plant/building are protected from permanent damage by corrosion. Equipment anchors show no rust or deterioration.
				M	Corrosion on metallic parts (except equipment anchors) appears maintainable.
				U	Any condition that does not meet at least Minimum Acceptable standards.
32. Insulation Megger Testing				S	Results of megger test show that insulation meets manufacturer's or industry standard. Test not more than 24 months old.
				M	Results of megger test show that insulation resistance is lower than manufacturer's or industry standard, but can be corrected with proper application of heat.
				U	Insulation resistance is low enough to cause the equipment to not be able to meet its design standard of operation.
33. Power				S	Adequate, reliable, and enough capacity to meet demands. Backup generators are on hand and deemed reliable, or feasible plan exists to obtain backup power. Backup units are properly sized, operational, periodically exercised, and properly maintained.
				U	Power source not considered reliable to sustain operations during flood condition.
34. Pump Control System				S	Operational and maintained free of damage, corrosion, or other debris.
				M	Operational with minor discrepancies. Will function adequately in the next flood event.
				U	Not operational; uncorrected discrepancies noted from previous inspections; capability to adequately function in the next flood event is suspect.
35. Sumps				S	Clear of debris and obstructions. Mechanisms are in place to maintain this condition during operations.
				M	Clear of large debris, minor obstructions present. Mechanisms are in place to deter any further accumulation during operation. Sump will function as intended.
				U	Large debris or major obstructions present, or no mechanism exists to prevent debris accumulation during operation.

	RATED ITEM	S	M	U	EVALUATION
	SECTION IV - Continued				***FOR USE DURING ALL PUMP STATION INSPECTIONS***
36.	Intake/Discharge Gates.				Functional. Electric operators maintained. (S or U only.)
37.	Cranes				Operational. Inspected and load tested in accordance with OSHA requirements. (S or U only.)
38.	Telephone Communications				Telephone communication is available in the pump station. Alternatively, two-way radio, cellular telephone, or similar device is available, or, access to a telephone is within a reasonable driving distance. (S or U only.)
39.	Safety				No exhaust leaks in building. Fuel storage/distribution meets state/local requirement. Fire extinguishers on hand, of sufficient quantity, and properly charged. Safety hardware installed. Required safety items (e.g., aural protectors) used. (S or U only.)

Remarks for Pump Station - Sections III and IV of Inspection Guide.

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Instructions and Information for the Inspection Guide

RATINGS: The following terms and definitions are used in the conduct of this inspection for rating items and components of this project:

S - Satisfactory: The rated item is in satisfactory condition, and will function as designed and intended during the next flood event.

M - Marginally Satisfactory: The rated item has a minor deficiency that needs to be corrected. The minor deficiency will not seriously impair the functioning of the item during the next flood event. The overall reliability of the project will be lowered because of the minor deficiency.

U - Unsatisfactory: The rated item is unsatisfactory. The deficiency is so serious that the item will not adequately function in the next flood event, compromising the project's ability to provide reliable flood protection.

DETERMINATION OF PROJECT CONDITION CODE: The lowest single rating given for a rated item will determine the overall condition of the project. If all rated items are rated as Satisfactory, the project condition will be Acceptable. If one or more rated items are evaluated as Marginally Satisfactory, with no rated items evaluated as Unsatisfactory, then the project condition will be Minimally Acceptable. One or more rated items with a rating of Unsatisfactory will result in a project condition of Unacceptable.

STATUS: Acceptable and Minimally Acceptable projects are in Active status. Unacceptable projects are in Inactive status. Projects in Inactive status are not eligible for consideration for Rehabilitation Assistance from the US Army Corps of Engineers in the event of damage from a flood or coastal storm.

GENERAL INSTRUCTIONS.

1. Section I will be used on all IEI's.
2. Section II will be used on all CEI's.
3. All rated items in Sections I and II must have a rating given.
4. Additional areas for inspection will be incorporated by the inspector into this guide if the layout or physical characteristics of the project warrant this. Appropriate entries will be made in the REMARKS block.

FOR PROJECTS WITH PUMP STATIONS:

5. Section III and IV will be used on all IEI's and CEI's for projects with pump stations. A pump station must have the primary purpose of flood control, not interior drainage. The district will determine, based on appropriate study, if adequate capacity exists. Lack of adequate capacity mandates a rating of Unsatisfactory and a condition of Unacceptable.
6. The lowest rating for a rated item on either the levee inspection (Sections I and II) or the pump station (Sections III and IV) determines the overall project condition.
7. A non-Federal pump station located behind a Federal levee will be treated as a separate FCW, will not be incorporated into the Federal levee project, and will be inspected as a separate entity. The lowest rated item on the pump station inspection determines the project condition code for the pump station. This is independent of the Federal project inspection.
8. Additional areas for inspection will be incorporated by the inspector into this guide if the layout or physical characteristics of the pump station warrant this. Appropriate entries will be made in the REMARKS block.

APPENDIX C
COOPERATION AGREEMENTS, REHABILITATION OF FEDERAL AND NON-FEDERAL FLOOD CONTROL WORKS

C-1. Purpose. This Appendix provides the format for Cooperation Agreements for rehabilitation of non-Federal flood control works (Figure C-1.), rehabilitation of Federal flood control works (Figure C-2.), and rehabilitation of HSPP's (Figure C-3.)

C-2. Reference. Refer to Chapter 5, Section III, for information on Rehabilitation Assistance and use of these cooperation agreements.

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COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and
_____
for
REHABILITATION OF A NON-FEDERAL FLOOD CONTROL WORK

THIS AGREEMENT, entered into this ____ day of _____, 20_____, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____ [PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, pursuant to 33 U.S.C. 701n, the Government is authorized to assist in the repair or restoration of flood control improvements threatened or destroyed by flood;

WHEREAS, via written correspondence, the Public Sponsor has requested the Government to repair or restore a certain flood control work damaged by recent flooding or coastal storms, in accordance with 33 U.S.C. 701n and established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in the rehabilitation effort in accordance with the terms of this Agreement;

NOW, THEREFORE, the Government and the Public Sponsor agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this agreement:

A. The term "Rehabilitation Effort" shall mean [DESCRIBE THE WORK TO BE UNDERTAKEN PURSUANT TO THIS AGREEMENT IN SUFFICIENT DETAIL AS IS NECESSARY TO AVOID ANY CONFUSION OVER WHAT WORK IS OR IS NOT INCLUDED], as generally described in a report entitled _____ [SPECIFY THE REPORT] prepared by the District Engineer, U.S. Army Engineer District _____, dated _____, and approved by the Division Engineer on _____.

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works

B. The term "Rehabilitation Effort costs" shall mean all costs incurred by the Public Sponsor and the Government, in accordance with the terms of this Agreement, directly related to implementation of the Rehabilitation Effort. The term shall include, but is not necessarily be limited to, actual construction costs, including supervision and inspection costs; costs of contract dispute settlements or awards; and the cost of investigations to identify the existence of hazardous substances as identified in Article XIA. The term shall not include any costs for operation and maintenance; any costs that correct deferred or deficient maintenance; any increased costs for betterments or Public Sponsor preferred alternatives; or the costs of lands, easements, rights-of-way, relocations, or suitable borrow and dredged or excavated material disposal areas required for the Rehabilitation Effort.

C. The term "betterment" shall mean the design and construction of a Rehabilitation Effort feature accomplished on behalf of, or at the request of, the Public Sponsor, in accordance with standards that exceed the standards that the Government would otherwise apply for accomplishing the Rehabilitation Effort.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND PUBLIC SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States and using those funds and funds provided by the Public Sponsor, shall expeditiously implement the Rehabilitation Effort, applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The Public Sponsor shall be afforded the opportunity to review and comment solicitations for all contracts, including relevant plans and specifications, prior to the issuance of such solicitations. The Contracting Officer will, in good faith, consider the comments of the Public Sponsor, but award of contracts, modifications or change orders, and performance of all work on the Rehabilitation Effort (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Contracting Officer.

B. As further specified in Article III, the Public Sponsor shall provide all lands, easements, and rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform all relocations determined by the Government to be necessary for construction, operation, and maintenance of the Rehabilitation Effort and the Project.

C. As further specified in Article IV, the Public Sponsor shall contribute, in cash, in-kind services, or a combination thereof, a contribution toward construction of the Rehabilitation Effort in an amount equal to 20 percent of total Rehabilitation Effort costs.

D. The Public Sponsor shall not use Federal funds to meet its share of total Rehabilitation Effort costs under this Agreement unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

E. The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Rehabilitation Effort, and any related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

F. The Public Sponsor agrees to participate in and comply with the policies and procedures of the U.S. Army Corps of Engineers Rehabilitation and Inspection Program.

G. The Public Sponsor may request the Government to accomplish betterments. The Public Sponsor shall be solely responsible for any increase in costs resulting from the betterments and all such increased costs will be paid in advance by the Public Sponsor in accordance with Article IV.

ARTICLE III - LANDS, RELOCATIONS, DISPOSAL AREAS, AND PUBLIC LAW 91-646 COMPLIANCE

A. The Government shall provide the Public Sponsor with a description of the anticipated real estate requirements and relocations for the Rehabilitation Effort. Thereafter, the Public Sponsor shall furnish all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform any relocations, as may be determined by the Government in that description, or in any subsequent description, to be necessary for the construction, operation, and maintenance of the Rehabilitation Effort. The necessary lands, easements, and rights-of-way may be provided incrementally for each construction contract. All lands, easements, and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the solicitation of that construction contract.

B. The Public Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights of way, and performing relocations for construction, operation, and maintenance of the Rehabilitation Effort, including those necessary for relocations, borrow materials, and dredged and excavated material disposal, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - METHOD OF PAYMENT

A. The Public Sponsor shall provide, during the period of construction, cash payments, in-kind services, or a combination thereof, required to meet the Public Sponsor's obligations under Article II of the Agreement. Rehabilitation Effort costs are currently estimated to be $_____ and the Public Sponsor's share (cash and services in kind) of total Rehabilitation Effort costs is currently estimated to be $_____. In order to meet the Public Sponsor's cash payment requirements, the Public Sponsor must provide a cash contribution estimated to be $_____. The dollar amounts set forth in this paragraph are based upon the Government's best estimates that reflect projections of costs, price level changes, and anticipated inflation. Such cost estimates are subject to adjustments based upon costs actually incurred and are not to be construed as the total financial responsibilities of the Government and the Public Sponsor.

B. The required cash contribution shall be provided as follows: At least ten calendar days prior to the award of the first construction contract, the Government shall notify the Public Sponsor of the Public Sponsor's estimated share of the total Rehabilitation Effort costs including the Public Sponsor's estimated share of the costs attributable to the Rehabilitation Effort incurred prior to the initiation of construction.

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

Within five calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the required contribution by delivering a check payable to "FAO, USAED _____" to the Contracting Officer representing the Government. The Government shall draw on the funds provided by the Public Sponsor such sums as the Government deems necessary to cover contractual and in-house fiscal obligations attributable to the Rehabilitation Effort as they are incurred, as well as Rehabilitation Effort costs incurred by the Government. In the event that Rehabilitation Effort costs are expected to exceed the estimate given at the outset of construction, the Government shall immediately notify the Public Sponsor of the additional contribution the Public Sponsor will be required to make to meet the Public Sponsor's share of the revised estimate. Within ten calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the additional required contribution.

C. During the period of construction, the Government will provide periodic financial reports on the status of the total Rehabilitation Effort costs and status of contributions made by the Public Sponsor. Upon completion of the Rehabilitation Effort and resolution of all relevant contract claims and appeals, the Government shall compute the Rehabilitation Effort costs and tender to the Public Sponsor a final accounting of the Public Sponsor's share of Rehabilitation Effort costs.

1. In the event the total contribution by the Public Sponsor is less than the Public Sponsor's required share of total Rehabilitation Effort costs, the Public Sponsor shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet the Public Sponsor's required share of Rehabilitation Effort costs.

2. In the event total contribution by the Public Sponsor is more than the Public Sponsor's required share of Rehabilitation Effort costs, the Government shall, no later than 90 calendar days after the final accounting is complete, subject to the availability of funds, return the excess to the Public Sponsor; however, the Public Sponsor shall not be entitled to any refund for in-kind services. In the event the existing funds are not available to repay the Public Sponsor for excess contributions provided, the Government shall seek such appropriations as are necessary to repay the Public Sponsor for excess contributions provided.

ARTICLE V - CREDITING OF IN-KIND SERVICES

The Government has approved a credit for In-Kind Services, compatible with the Rehabilitation Effort, in the estimated amount of $ _____ for implementation of such services by the Public Sponsor. The affording of such credit shall be subject to an onsite inspection by the Government to verify that the work was accomplished in a satisfactory manner and is suitable for inclusion in the Rehabilitation Effort. The actual amount of such credit shall be subject to an audit conducted to determine reasonableness, allocability, and allowability of costs. The Government shall apply the credit amount toward any additional cash contribution required under this Agreement. The Public Sponsor shall not receive credit for any amount in excess of such additional cash contribution, nor shall the Public Sponsor be entitled to any reimbursement for any excess credit amount.

ARTICLE VI - OPERATION AND MAINTENANCE

A. After the Contracting Officer has determined that construction of the Rehabilitation Effort is complete and provided the Public Sponsor with written notice of such determination, the Public Sponsor

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

shall operate and maintain the Project, at no cost to the Government, in accordance with specific directions prescribed by the Government in Engineer Regulation 500-1-1 and any subsequent amendments thereto.

B. The Public Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land that the Public Sponsor owns or controls for access to the Project for the purposes of inspection, and, if necessary, for the purpose of completing, operating, and maintaining the Project. If an inspection shows the Public Sponsor for any reason is failing to fulfill the Public Sponsor's obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Public Sponsor. If, after 30 calendar days from receipt of such notice, the Public Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon lands the Public Sponsor owns or controls for access to the Project for the purposes of completing, operating, and maintaining the Project, or to deny further assistance under Public Law 84-99. No action by the Government shall operate to relieve the Public Sponsor of responsibility to meet the Public Sponsor obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE VII - FEDERAL AND STATE LAWS

In the exercise of the Public Sponsor's rights and obligations hereunder, the Public Sponsor agrees to comply with all applicable Federal and state laws and regulations.

ARTICLE VIII - RELATIONSHIP OF PARTIES

The Government and the Public Sponsor act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, nor employee of the other.

ARTICLE IX - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE X - COVENANT AGAINST CONTINGENT FEES

The Public Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Public Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in the Government's discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

ARTICLE XI - TERMINATION OR SUSPENSION

If at any time the Public Sponsor fails to carry out its obligations under this Agreement, the District Engineer shall terminate or suspend work on the Rehabilitation Effort, unless the District Engineer determines that continuation of work on the Rehabilitation Effort is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with this Rehabilitation Effort and Project. However, deferral of future performance under this agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously incurred. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Rehabilitation Effort and proceed to a final accounting in accordance with Article IV of this Agreement. In the event that either party elects to defer future performance under this Agreement pursuant to this Article, such deferral shall remain in effect until such time as either the Government or Public Sponsor elects to proceed with further construction or terminates this Agreement.

ARTICLE XII - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the Contracting Officer, the Public Sponsor shall perform, or cause to be performed, such investigations for hazardous substances as are determined necessary by the Government of the Public Sponsor to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Sections, 9601-9675, on lands necessary to Rehabilitation Effort construction, operation, and maintenance. All actual costs incurred by the Public Sponsor that are properly allowable and allocable to performance of any such investigations for hazardous substances shall be included in total Rehabilitation Effort costs and cost shared as a construction cost.

B. In the event it is discovered through an investigation for hazardous substances or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the Project or the Rehabilitation Effort contain any hazardous substances regulated under CERCLA, the Public Sponsor and the Government shall provide prompt notice to each other, and the Public Sponsor shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

C. The Government and the Public Sponsor shall determine whether to initiate construction of the Rehabilitation Effort, or, if already in construction, to continue with construction of the Rehabilitation Effort, or to terminate construction of the Rehabilitation Effort for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Rehabilitation Effort. Should the Government and the Public Sponsor determine to proceed or continue with the construction after considering any liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total Rehabilitation Effort costs as defined in this Agreement.

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

In the event the Public Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Public Sponsor's responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Rehabilitation Effort or proceed with further work as provided in Article X of this Agreement.

D. The Public Sponsor and Government shall consult with each other to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C of this Article shall not relieve any party from any liability that may arise under CERCLA.

E. As between the Government and the Public Sponsor, the Public Spons or shall be considered the operator of the Project (which the Rehabilitation Effort is repairing and restoring) for purposes of CERCLA liability. To the maximum extent practicable, the Public Sponsor shall operate and maintain the Project in a manner that will not cause liability to arise under CERCLA.

ARTICLE XIII - NOTICES

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

If to the Public Sponsor:
_____
_____
_____

If to the Government:
District Engineer
_____
_____

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

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

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

THE DEPARTMENT OF THE ARMY
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

THE [NAME OF PUBLIC SPONSOR]
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Continued)

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

DATED this _____ day of _____, 20_____

_____
[SIGNATURE OF CA SIGNATORY]
[TYPED NAME]
[TYPED TITLE]

FIGURE C-1. Cooperation Agreement for Rehabilitation of Non-Federal Flood Control Works (Concluded)

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
REHABILITATION OF A FEDERAL FLOOD CONTROL WORK

THIS AGREEMENT, entered into this _____ day of _____, 20_____, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____ [PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, the Government constructed a flood control project (hereinafter referred to as the project) authorized by _____ [LEGAL AUTHORIZATION FOR CONSTRUCTION] and governed by the *(Project Cooperation Agreement) (Cooperation and Participation Agreement) (Agreement of Local Assurances) (other)* dated _____ and entitled _____ _____ , and which remains in full effect;

WHEREAS, pursuant to 33 U.S.C. 701n, the Government is authorized to assist in the repair or restoration of flood control improvements threatened or destroyed by floods;

WHEREAS, via written correspondence, the Public Sponsor has requested that the Government repair or restore the project, which was damaged by recent flooding or coastal storms, in accordance with 33 U.S.C. 701n and established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in the rehabilitation effort of the authorized project in accordance with the terms of this Agreement;

NOW, THEREFORE, the Government and the Public Sponsor agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this agreement:

A. The term "Rehabilitation Effort" shall mean [DESCRIBE THE WORK TO BE UNDERTAKEN PURSUANT TO THIS AGREEMENT IN SUFFICIENT DETAIL AS IS NECESSARY TO AVOID ANY CONFUSION OVER WHAT WORK IS OR IS NOT INCLUDED], as generally described in the [SPECIFY APPROVED REPORT] dated ____ and approved by the Division Engineer on _____.

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works

B. The term "Rehabilitation Effort costs" shall mean all costs incurred by the Public Sponsor and the Government, in accordance with the terms of this Agreement, directly related to implementation of the Rehabilitation Effort. The term shall include, but is not necessarily be limited to: actual construction costs, including supervision and inspection costs; costs of contract dispute settlements or awards; and the cost of investigations to identify the existence of hazardous substances as identified in Article XIA. The term shall not include any costs for operation and maintenance; any costs to correct deferred or deficient maintenance; any costs for betterments; any costs for Public Sponsor-preferred alternatives; or the costs of lands, easements, rights-of-way, relocations, or suitable borrow and dredged or excavated material disposal areas required for the Rehabilitation Effort.

C. The term "betterment" shall mean the design and construction of a feature accomplished on behalf of, or at the request of, the Public Sponsor in accordance with standards that exceed the standards that the Government would otherwise apply for accomplishing the Rehabilitation Effort.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND PUBLIC SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States, and using those funds *(and using funds provided by the Public Sponsor)* shall expeditiously implement the Rehabilitation Effort, applying those procedures usually followed or applied in Government construction of Federal projects, pursuant to Federal laws, regulations, and policies. The Public Sponsor shall be afforded the opportunity to review and comment on solicitations for all contracts, including relevant plans and specifications, prior to the issuance of such solicitations. The Contracting Officer will, in good faith, consider the comments of the Public Sponsor, but award of contracts, modifications or change orders, and performance of all work on the Rehabilitation Effort (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Contracting Officer.

B. As further specified in Article III, the Public Sponsor shall provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform all relocations determined by the Government to be necessary for construction, operation, and maintenance of the project and the Rehabilitation Effort.

C. As further specified in Article IV, the Public Sponsor shall contribute, in cash, in-kind services, or a combination thereof, a contribution toward construction of the Rehabilitation Effort in an amount equal to $_____ towards the total Rehabilitation Effort costs.

D. The Public Sponsor shall not use Federal funds to meet its share of total Rehabilitation Effort costs under this Agreement unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized by statute.

E. The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Rehabilitation Effort and any authorized project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

F. The Public Sponsor agrees to continue to participate in and comply with the policies and procedures of the U.S. Army Corps of Engineers Rehabilitation and Inspection Program, and of Title 33, Code of Federal Regulations, Part 208.10 (33 CFR 208.10).

G. The Public Sponsor may request the Government to accomplish betterments. The Public Sponsor shall be solely responsible for any increase in costs resulting from the betterments and all such increased costs will be paid in advance by the Public Sponsor in accordance with Article IV.

ARTICLE III - LANDS, RELOCATIONS, AND PUBLIC LAW 91-646

A. The Government shall provide the Public Sponsor with a description of the anticipated real estate requirements and relocations for the Rehabilitation Effort. Thereafter, the Public Sponsor shall furnish all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform any relocations, as may be determined by the Government in that description, or in any subsequent description, to be necessary for the construction, operation, and maintenance of the Rehabilitation Effort and the authorized project. The necessary lands, easements, and rights-of-way may be provided incrementally for each construction contract. All lands, easements, and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the advertisement of that construction contract.

B. The Public Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights of way, required for construction, operation, and maintenance of the Rehabilitation Effort, including those necessary for relocations, borrow materials, and dredged or excavated material disposal , and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - METHOD OF PAYMENT

A. The Public Sponsor shall provide, during the period of construction, cash payments, in-kind services, or a combination thereof, required to meet the Public Sponsor's obligations under Article II of the Agreement. Rehabilitation Effort costs are currently estimated to be $_____ and the Public Sponsor's share (cash and services in kind) of total Rehabilitation Effort costs is currently estimated to be $_____. In order to meet Public Sponsor's cash payment requirements, the Public Sponsor must provide a cash contribution estimated to be $_____. The dollar amounts set forth in this paragraph are based upon the Government's best estimates that reflect projections of costs, price level changes, and anticipated inflation. Such cost estimates are subject to adjustments based upon costs actually incurred, and are not to be construed as the total financial responsibilities of the Government and the Public Sponsor.

B. The required cash contribution shall be provided as follows: At least ten calendar days prior to the award of the first construction contract, the Government shall notify the Public Sponsor of the Public Sponsor's estimated share of the total Rehabilitation Effort costs including the Public Sponsor's estimated share of the costs attributable to the Rehabilitation Effort incurred prior to the initiation of construction.

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

Within five calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the required contribution by delivering a check payable to "FAO, USAED _____" to the Contracting Officer representing the Government. The Government shall draw on the funds provided by the Public Sponsor such sums as the Government deems necessary to cover contractual and in-house fiscal obligations attributable to the Rehabilitation Effort as they are incurred, as well as Rehabilitation Effort costs incurred by the Government. In the event that total Rehabilitation Effort costs are expected to exceed the estimate given at the outset of construction, the Government shall immediately notify the Public Sponsor of the additional contribution the Public Sponsor will be required to make to meet the Public Sponsor's share of the revised estimate. Within ten calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the additional required contribution.

C. During the period of construction, the Government will provide periodic financial reports on the status of the total Rehabilitation Effort costs and status of contributions made by the Public Sponsor. Upon completion of the Rehabilitation Effort and resolution of all relevant contract claims and appeals, the Government shall compute the total Rehabilitation Effort costs and tender to the Public Sponsor a final accounting of the Public Sponsor's share of Rehabilitation Effort costs.

1. In the event the total contribution by the Public Sponsor is less than the Public Sponsor's required share of total Rehabilitation Effort costs, the Public Sponsor shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet the Public Sponsor's required share of the total Rehabilitation Effort costs.

2. In the event total contribution by the Public Sponsor is more than the Public Sponsor's required share of total Rehabilitation Effort costs, the Government shall, no later than 90 calendar days after the final accounting is complete, subject to the availability of funds, return the excess to the Public Sponsor; however, the Public Sponsor shall not be entitled to any refund for in-kind services. In the event the existing funds are not available to repay the Public Sponsor for excess contributions provided, the Government shall seek such appropriations as are necessary to repay the Public Sponsor for excess contributions provided.

ARTICLE V - CREDITING OF IN-KIND SERVICES

The Government has approved a credit for In-Kind Services, compatible with the Rehabilitation Effort, in the estimated amount of $ _____ for implementation of such services by the Public Sponsor. The affording of such credit shall be subject to an onsite inspection by the Government to verify that the work was accomplished in a satisfactory manner and is suitable for inclusion in the Rehabilitation Effort. The actual amount of such credit shall be subject to an audit conducted to determine reasonableness, allocability, and allowability of costs. The Government shall apply the credit amount toward any additional cash contribution required under this Agreement. The Public Sponsor shall not receive credit for any amount in excess of such additional cash contribution, nor shall the Public Sponsor be entitled to any reimbursement for any excess credit amount.

ARTICLE VI - OPERATION AND MAINTENANCE

A. After the Contracting Officer has determined that construction of the Rehabilitation Effort is complete and provided the Public Sponsor with written notice of such determination, the Public Sponsor

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

shall continue to operate and maintain the completed Rehabilitation Effort as part of the project, at no cost to the Government, in accordance with specific directions prescribed by the Government in Title 33, Code of Federal Regulations, Part 208.10, Engineer Regulation 500-1-1, and any subsequent amendments thereto.

B. The Public Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land that the Public Sponsor owns or controls for access to the project for the purposes of inspection, and, if necessary, for the purpose of completing, operating, and maintaining the Project. If an inspection shows the Public Sponsor for any reason is failing to fulfill the Public Sponsor's obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Public Sponsor. If, after 30 calendar days from receipt of such notice, the Public Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon lands the Public Sponsor owns or controls for access to the authorized project for the purposes of completing, operating, and maintaining the project. No action by the Government shall operate to relieve the Public Sponsor of responsibility to meet the Public Sponsor obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE VII - FEDERAL AND STATE LAWS

In the exercise of the Public Sponsor's rights and obligations hereunder, the Public Sponsor agrees to comply with all applicable Federal and state laws and regulations.

ARTICLE VIII - RELATIONSHIP OF PARTIES

The Government and the Public Sponsor act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, nor employee of the other.

ARTICLE IX - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE X - COVENANT AGAINST CONTINGENT FEES

The Public Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Public Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in the Government's discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

ARTICLE XI - TERMINATION OR SUSPENSION

If at any time the Public Sponsor fails to carry out its obligations under this Agreement, the District Engineer shall terminate or suspend work on the Rehabilitation Effort, unless the District Engineer determines that continuation of work on the Rehabilitation Effort is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with this Rehabilitation Effort. However, deferral of future performance under this agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously incurred. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Rehabilitation Effort and proceed to a final accounting in accordance with Article IV of this Agreement. In the event that either party elects to defer future performance under this Agreement pursuant to this Article, such deferral shall remain in effect until such time as either the Government or Public Sponsor elects to proceed with further construction or terminates this Agreement.

ARTICLE XII - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the Contracting Officer, the Public Sponsor shall perform, or cause to be performed, such investigations for hazardous substances as are determined necessary by the Government of the Public Sponsor to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Sections, 9601-9675, on lands necessary to Rehabilitation Effort construction, operation, and maintenance. All actual costs incurred by the Public Sponsor that are properly allowable and allocable to performance of any such investigations for hazardous substances shall be included in Rehabilitation Effort costs and cost shared as a construction cost.

B. In the event it is discovered through an investigation for hazardous substances or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the Rehabilitation Effort contain any hazardous substances regulated under CERCLA, the Public Sponsor and the Government shall provide prompt notice to each other, and the Public Sponsor shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

C. The Government and the Public Sponsor shall determine whether to initiate construction of the Rehabilitation Effort, or, if already in construction, to continue with construction of the Rehabilitation Effort, or to terminate construction of the Rehabilitation Effort for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Rehabilitation Effort and the authorized Project. Should the Government and the Public Sponsor determine to proceed or continue with the construction after considering any liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total Rehabilitation Effort costs as defined in this Agreement. In the event the Public Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Public Sponsor's responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Rehabilitation Effort, or proceed with further work as provided in Article X of this Agreement.

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

D. The Public Sponsor and Government shall consult with each other to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C of this Article shall not relieve any party from any liability that may arise under CERCLA.

E. As between the Government and the Public Sponsor, the Public Sponsor shall be considered the operator of the project (which the Rehabilitation Effort is repairing and restoring) for purposes of CERCLA liability. To the maximum extent practicable, the Public Sponsor shall operate and maintain the authorized project in a manner that will not cause liability to arise under CERCLA.

ARTICLE XIII - NOTICES

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

If to the Public Sponsor:
_____
_____
_____

If to the Government:
District Engineer
_____
_____

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

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

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

THE DEPARTMENT OF THE ARMY
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

THE [NAME OF PUBLIC SPONSOR]
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Continued)

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

DATED this _____ day of _____, 20_____

_____
[SIGNATURE OF CA SIGNATORY]
[TYPED NAME]
[TYPED TITLE]

Figure C-2. Cooperation Agreement for Rehabilitation of Federal Flood Control Works (Concluded)

COOPERATION AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
and

_____

for
REHABILITATION OF A FEDERAL HURRICANE/SHORE PROTECTION PROJECT

THIS AGREEMENT, entered into this _____ day of _____, 20_____, by and between THE DEPARTMENT OF THE ARMY (hereinafter referred to as the "Government") represented by the District Engineer, _____ District, U.S. Army Corps of Engineers, and the _____ [PUBLIC SPONSOR], (hereinafter referred to as the "Public Sponsor"), represented by _____ [TITLE OF PERSON SIGNING THIS AGREEMENT].

WITNESSETH THAT:

WHEREAS, the Government constructed a Hurricane/Shore Protection Project (hereinafter referred to as the HSPP), authorized by _____ [SPECIFY LEGAL AUTHORIZATION] and governed by the *(Project Cooperation Agreement) (Cooperation and Participation Agreement) (Agreement of Local Assurances) (other)* dated _____ and entitled _____ _____ which remains in full effect;

WHEREAS, pursuant to 33 U.S.C. 701n, the Government is authorized to assist in the repair and restoration of any federally authorized hurricane or shore protective structure damaged or destroyed by wind, wave, or water action of other than an ordinary nature;

WHEREAS, via written correspondence, the Public Sponsor has requested the Government to repair or restore the HSPP which was damaged by wind, wave, or water action of an other than an ordinary nature, in accordance with 33 U.S.C. 701n, and established policies of the U.S. Army Corps of Engineers; and,

WHEREAS, the Public Sponsor hereby represents that it has the authority and legal capability to furnish the non-Federal cooperation hereinafter set forth and is willing to participate in the HSPP Rehabilitation Effort in accordance with the terms of this Agreement;

NOW, THEREFORE, the Government and the Public Sponsor agree as follows:

ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this agreement:

A. The term "Rehabilitation Effort" shall mean [DESCRIBE THE WORK TO BE UNDERTAKEN PURSUANT TO THIS AGREEMENT IN SUFFICIENT DETAIL AS IS NECESSARY TO AVOID ANY

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance

CONFUSION OVER WHAT WORK IS OR IS NOT INCLUDED], as generally described in a report entitled _____ [SPECIFY THE REPORT] prepared by the District Engineer, U.S. Army Engineer District _____, dated _____ and approved by the Division Engineer on _____;

B. The term "Rehabilitation Effort costs" shall mean all costs incurred by the Public Sponsor and the Government directly related to construction of the Rehabilitation Effort. Such term shall include, but is not necessarily be limited to: actual construction costs, including supervision and inspection costs; costs of contract dispute settlements or awards; and the cost of investigations to identify the existence of hazardous substances as identified in Article XIA. The term shall not include any costs for operation and maintenance; any costs that correct deferred or deficient maintenance; any increased costs for betterments or Public Sponsor-preferred alternatives; periodic nourishment under the project authorization; or the costs of lands, easements, rights-of-way, borrow, or relocations.

C. The term "betterment" shall mean the design and construction of a Rehabilitation Effort feature accomplished on behalf of, or at the request of, the Public Sponsor, in accordance with standards that exceed the standards that the Government would otherwise apply for accomplishing the Rehabilitation Effort.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND PUBLIC SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States and using funds provided by the Public Sponsor, shall expeditiously construct the Rehabilitation Effort, applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The Public Sponsor shall be afforded the opportunity to review and comment on all solicitations for all contracts, including relevant plans and specifications, prior to the issuance of such solicitations. The Contracting Officer will, in good faith, consider the comments of the Public Sponsor, but award of contracts, modifications or change orders, and performance of all work on the Rehabilitation Effort (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Contracting Officer.

B. As further specified in Article III, the Public Sponsor shall provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform all relocations determined by the Government to be necessary for construction, operation, and maintenance of the Rehabilitation Effort and the HSPP.

C. As further specified in Article IV, the Public Sponsor shall contribute, in cash, in-kind services, or a combination thereof, a contribution toward construction of the Rehabilitation Effort in an amount equal to _____ percent of Rehabilitation Effort costs.

D. The Public Sponsor shall not use Federal funds to meet its share of Rehabilitation Effort costs under this Agreement unless the expenditure of such funds is expressly authorized by statute as verified in writing by the Federal granting agency.

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

E. The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the Rehabilitation Effort, the HSPP, and any related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

F. The Public Sponsor agrees to continue participate in and comply with the policies and procedures of the U.S. Army Corps of Engineers Rehabilitation and Inspection Program and the *(Project Cooperation Agreement) (Cooperation and Participation Agreement) (Agreement of Local Assurances) (other)* cited above.

G. The Public Sponsor may request the Government to accomplish betterments. The Public Sponsor shall be solely responsible for any increase in costs resulting from the betterments and all such increased costs will be paid in advance by the Public Sponsor in accordance with Article IV.

ARTICLE III - LANDS, RELOCATIONS, AND PUBLIC LAW 91-646

A. The Government shall provide the Public Sponsor with a description of the anticipated real estate requirements and relocations for the Rehabilitation Effort. Thereafter, the Public Sponsor shall furnish all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform any relocations, as may be determined by the Government in that description, or in any subsequent description, to be necessary for the construction, operation, and maintenance of the Project and the Rehabilitation Effort. The necessary lands, easements, and rights-of-way may be provided incrementally for each construction contract. All lands, easements, and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the advertisement of that construction contract.

B. The Public Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights of way, required for construction, operation, and maintenance of the Project and the Rehabilitation Effort, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - METHOD OF PAYMENT

A. The Public Sponsor shall provide, during the period of construction, cash payments, in-kind services, or a combination thereof, required to meet the Public Sponsor's obligations under Article II of the Agreement. Rehabilitation Effort costs are currently estimated to be $_____ and the Public Sponsor's share (cash and services in kind) of Rehabilitation Effort costs is currently estimated to be $_____. In order to meet the Public Sponsor's cash payment requirements, the Public Sponsor must provide a cash contribution estimated to be $_____. The dollar amounts set forth in this paragraph are based upon the Government's best estimates that reflect projections of costs, price level changes, and anticipated inflation. Such cost estimates are subject to adjustments based upon costs actually incurred and are not to be construed as the total financial responsibilities of the Government and the Public Sponsor.

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

B. The required cash contribution shall be provided as follows: At least ten calendar days prior to the award of the first construction contract, the Government shall notify the Public Sponsor of the Public Sponsor's estimated share of the Rehabilitation Effort costs including the Public Sponsor's estimated share of the costs attributable to the Rehabilitation Effort incurred prior to the initiation of construction. Within five calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the required contribution by delivering a check payable to "FAO, USAED _____" to the Contracting Officer representing the Government. The Government shall draw on the funds provided by the Public Sponsor such sums as the Government deems necessary to cover contractual and in-house fiscal obligations attributable to the Rehabilitation Effort as they are incurred, as well as Rehabilitation Effort costs incurred by the Government. In the event that total Rehabilitation Effort costs are expected to exceed the estimate given at the outset of construction, the Government shall immediately notify the Public Sponsor of the additional contribution the Public Sponsor will be required to make to meet the Public Sponsor's share of the revised estimate. Within ten calendar days thereafter, the Public Sponsor shall provide the Government the full amount of the additional required contribution.

C. During the period of construction, the Government will provide periodic financial reports on the status of the total Rehabilitation Effort costs and status of contributions made by the Public Sponsor. Upon completion of the Rehabilitation Effort and resolution of all relevant contract claims and appeals, the Government shall compute the total Rehabilitation Effort costs and tender to the Public Sponsor a final accounting of the Public Sponsor's share of total Rehabilitation Effort costs.

1. In the event the total contribution by the Public Sponsor is less than the Public Sponsor's required share of total Rehabilitation Effort costs, the Public Sponsor shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet the Public Sponsor's required share of the total project costs.

2. In the event total contribution by the Public Sponsor is more than the Public Sponsor's required share of total Rehabilitation Effort costs, the Government shall, no later than 90 calendar days after the final accounting is complete, subject to the availability of funds, return the excess to the Public Sponsor; however, the Public Sponsor shall not be entitled to any refund for in-kind services. In the event the existing funds are not available to repay the Public Sponsor for excess contributions provided, the Government shall seek such appropriations as are necessary to repay the Public Sponsor for excess contributions provided.

ARTICLE V - CREDITING OF IN-KIND SERVICES

The Government has approved a credit for In-Kind Services, compatible with the Rehabilitation Effort, in the estimated amount of $ _____ for implementation of such services by the Public Sponsor. The affording of such credit shall be subject to an onsite inspection by the Government to verify that the work was accomplished in a satisfactory manner and is suitable for inclusion in the Rehabilitation Effort. The actual amount of such credit shall be subject to an audit conducted to determine reasonableness, allocability, and allowability of costs. The Government shall apply the credit amount toward any additional cash contribution required under this Agreement. The Public Sponsor shall not receive credit for any amount in excess of such additional cash contribution, nor shall the Public Sponsor be entitled to any reimbursement for any excess credit amount.

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

ARTICLE VI - OPERATION AND MAINTENANCE

A. The Public Sponsor maintains responsibility for operating and maintaining the HSPP at all times. After the Contracting Officer has determined that construction of the Rehabilitation Effort is complete and provided the Public Sponsor with written notice of such determination, the Public Sponsor shall operate and maintain the HSPP, to include those areas restored by the Rehabilitation Effort, at no cost to the Government, in accordance with specific directions prescribed by the Government in Engineer Regulation 500-1-1 and any subsequent amendments thereto and other applicable authorities.

B. The Public Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land that the Public Sponsor owns or controls for access to the HSPP for the purposes of inspection, and, if necessary, for the purpose of completing, operating, and maintaining the HSPP. If an inspection shows the Public Sponsor for any reason is failing to fulfill the Public Sponsor's obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Public Sponsor. If, after 30 calendar days from receipt of such notice, the Public Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon lands the Public Sponsor owns or controls for access to the Project for the purposes of completing, operating, and maintaining the project, or to deny further assistance under Public Law 84-99. No action by the Government shall operate to relieve the Public Sponsor of responsibility to meet the Public Sponsor obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE VII - FEDERAL AND STATE LAWS

In the exercise of the Public Sponsor's rights and obligations hereunder, the Public Sponsor agrees to comply with all applicable Federal and state laws and regulations.

ARTICLE VIII - RELATIONSHIP OF PARTIES

The Government and the Public Sponsor act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, nor employee of the other.

ARTICLE IX - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE X - COVENANT AGAINST CONTINGENT FEES

The Public Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Public Sponsor for the purpose of securing business. For breach or

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in the Government's discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE XI - TERMINATION OR SUSPENSION

If at any time the Public Sponsor fails to carry out its obligations under this Agreement, the District Engineer shall terminate or suspend work on the Rehabilitation Effort, unless the District Engineer determines that continuation of work on the Rehabilitation Effort is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with this Rehabilitation Effort and the HSPP. However, deferral of future performance under this agreement shall not affect existing obligations or relieve the parties of liability for any obligation previously incurred. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to the Rehabilitation Effort and proceed to a final accounting in accordance with Article IV of this Agreement. In the event that either party elects to defer future performance performance under this Agreement pursuant to this Article, such deferral shall remain in effect until such time as either the Government or Public Sponsor elects to proceed with further construction or terminates this Agreement.

ARTICLE XII - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the Contracting Officer, the Public Sponsor shall perform, or cause to be performed, such investigations for hazardous substances as are determined necessary by the Government of the Public Sponsor to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Sections, 9601-9675, on lands necessary to Rehabilitation Effort construction, operation, and maintenance. All actual costs incurred by the Public Sponsor that are properly allowable and allocable to performance of any such investigations for hazardous substances shall be included in total Rehabilitation Effort costs and cost shared as a construction cost.

B. In the event it is discovered through an investigation for hazardous substances or other means that any lands, easements, rights-of-way, or disposal areas to be acquired or provided for the HSPP or the Rehabilitation Effort contain any hazardous substances regulated under CERCLA, the Public Sponsor and the Government shall provide prompt notice to each other, and the Public Sponsor shall not proceed with the acquisition of lands, easements, rights-of-way, or disposal areas until mutually agreed.

C. The Government and the Public Sponsor shall determine whether to initiate construction of the Rehabilitation Effort, or, if already in construction, to continue with construction of the Rehabilitation Effort, or to terminate construction of the Rehabilitation Effort for the convenience of the Government in any case where hazardous substances regulated under CERCLA are found to exist on any lands necessary for the Rehabilitation Effort. Should the Government and the Public Sponsor determine to proceed or continue with the construction after considering any liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total Rehabilitation Effort costs as defined in this Agreement.

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

In the event the Public Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Public Sponsor's responsibilities under this paragraph upon direction by the Government, the Government may either terminate or suspend work on the Rehabilitation Effort or proceed with further work as provided in Article X of this Agreement.

D. The Public Sponsor and Government shall consult with each other to assure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C of this Article shall not relieve any party from any liability that may arise under CERCLA.

E. As between the Government and the Public Sponsor, the Public Sponsor shall be considered the operator of the HSPP (which the Rehabilitation Effort is repairing and restoring) for purposes of CERCLA liability. To the maximum extent practicable, the Public Sponsor shall operate and maintain the HSPP in a manner that will not cause liability to arise under CERCLA.

ARTICLE XIII - NOTICES

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

If to the Public Sponsor:
_____
_____
_____

If to the Government:
District Engineer
_____
_____

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

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

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

THE DEPARTMENT OF THE ARMY
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

THE [NAME OF PUBLIC SPONSOR]
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Continued)

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

DATED this _____ day of _____, 20_____

_____
[SIGNATURE OF CA SIGNATORY]
[TYPED NAME]
[TYPED TITLE]

FIGURE C-3. Cooperation Agreement for HSPP Rehabilitation Assistance (Concluded)

APPENDIX D
ECONOMIC ANALYSIS

D-1. Economic Justification Determination. The economic analysis for every type of FCCE-funded emergency assistance will be conducted in accordance with ER 1105-2-100, Appendices D and E. Some of the key points of these principles are discussed as follows:

a. Sunk Costs. Costs for all previous work on the project, including previous PL 84-99 rehabilitation, are sunk costs and will not be used in the economic justification.

b. Discount Rate. Economic justification analysis will use the current Federal discount rate for water resources evaluation.

c. Level of Detail. The benefits of project rehabilitation are determined by comparison of the with and without project conditions. The economic analysis will be prepared in level of detail commensurate with the complexity of the project. Also in the analysis, the greater the effect a particular benefit item has on project justification, the greater the level of detail of its evaluation. It is not intended that the analyses for rehabilitation projects be exhaustive, but should provide sufficient data to document the steps used in formulating the proposed plan of rehabilitation.

d. Period of Analysis. The same period of time over which all project costs and benefits are analyzed is used for all alternatives. The period of analysis for rehabilitation work should not exceed the remaining physical life of the entire project. Any exception to the above will require justification in the PIR.

(1) Federal Projects. The economic life of federally constructed projects shall be the shortest time period determined by the following criteria:

(a) Fifty years.

(b) The degree of protection afforded by the project.

(c) The anticipated remaining life of the project assuming ordinary maintenance without major component rehabilitation (e.g. pumping plants, earth fill levees, riprap protection, etc.)

(2) Non-Federal Agricultural Projects. Ten years, or the degree of protection provided, whichever is less.

(3) Non-Federal Urban Projects. Use same criteria as for Federal projects, d.(1) above.

e. Price Level. All costs and benefits used in a feasibility analysis must be expressed in the same price level. Data initially based on different price levels must be converted to the selected project analysis price level using an appropriately documented price index for the items in question. Many indices are available, such as Construction cost index, Engineering News Record Construction cost index, etc.

f. Specific Data. The following specific methodology applies NED Benefit/Cost Analysis to the PL 84-99 rehabilitation program. The result of each step will be presented in the report.

(1) Determine the area protected by the project being rehabilitated.

(2) Inventory land use, crops, and structures existing in the project area. The inventory may be done by census or, if that is not feasible or cost effective, by statistically appropriate sampling. This inventory is the basis for future damages and damages avoided. Historical and inspection report data may provide valuable assistance in determining nonrecurring damages (see paragraph f(4) and Figure D-1 below).

(3) Determine and display property damaged from historical floods. Historical data and public records are valuable tools in establishing parameters used in determining project rehabilitation. Data may also be obtained from various sources including newspapers and city, state, and Federal offices. See various samples in Figure D-2.

(4) Estimate the average annual damages for conditions without Federal rehabilitation, using the standard stage-damage-frequency integration techniques. Estimate the average annual damages with the proposed rehabilitation using the same techniques. All flood-related property damage may be used in the present flood event. However, if property is completely destroyed during the present flood event and will not be replaced in kind, damage will be considered to be non-recurring and not included in average annual damage calculations. The analysis and description of the "without project" condition should address the benefits associated with the remaining level of protection.

(5) Determine land use with the project. If different from that without the project, then compute any increases in net income attributable to the project; e.g., where the project permits farming of land not farmed in the without condition (be sure to deduct any induced flood losses from average annual benefits).

(6) Determine project capital and maintenance costs by standard techniques and analyze. Present average annual costs and benefits as shown in Figure D-3.

g. Checks. The following checks will always be applied to ensure economic viability and the results thereof displayed in the format shown in paragraph titled "Presentation" below.

(1) Check to see if the first cost of protection (or of the repairs) exceeds the value of property protected. The cost of protection should not exceed the value of the property to be protected. The value of property to be protected will be determined by use of real estate appraisals, comparable sales, tax records, etc., and will be presented by type of property as shown in Figure D-3.

(2) The value of cropland will be separately presented by each crop. Annual benefits per acre should bear a reasonable relationship to the value of cropland. Benefits per acre in excess of 5% of the market value should be carefully reviewed to ensure against over estimation. The effect of crop rotation will also be considered.

(3) The average annual benefits for cropland should not exceed the net income of such land. Net income is defined as the market value of producers' outputs less the market value of the producers' input, exclusive of the cost of the intermediate goods or services. The following sources of information are acceptable: Farm budget data or reports prepared and made available to the public by other local, state and Federal agencies dealing with farm income information. All significant deviation from farm production data furnished by the U.S.D.A and/or Bureau of Reclamation must be explained in detail.

h. Other. Identify the number of project beneficiaries (e.g., number of farms, number of residences receiving flood protection); identify the magnitude of benefits received by any single beneficiary if these benefits exceed 25 percent of total benefits.

i. Presentation. The example in Figure D-3 illustrates the "check" requirements for agriculture-type damages. This information will be included in the appropriate paragraph and/or appendix of the Project Information Report.

August 1977 flood

Residential

	Damage	Value
House and contents	$ 44,200	$ 90,200
Outbuilding and contents	14,900	40,700
Irrigation well*	21,500	21,500
Metal silo*	39,720	39,720
Grain bin*	9,900	9,900
TOTAL	$130,220	$202,020

June 1983 flood

Residential

	Damage	Value
House and contents	$ 59,200	$124,500
Outbuilding and contents	25,100	60,500
TOTAL	$ 84,300	$185,000

*Property which is destroyed and will not or has not been repaired after reviewing historical damages will not be used in calculating average annual damages.

FIGURE D-1. Land Use of Area Protected

May 1935 - 25,230 CFS	
Residential damage	$ 75,918
Agriculture damage	42,729
Other damage (commercial/industrial)	34,700
TOTAL DAMAGE	$153,347
August 1977 - 15,700 CFS	
Residential damage	$129,800
Agriculture damage	120,210
Other damage (commercial/industrial)	66,400
TOTAL DAMAGE	$316,410
June 1983 - 27,500 CFS	
Residential damage	$ 84,300
Agriculture damage	271,000
Other damage (commercial/industrial)	121,900
TOTAL DAMAGE	$477,200

FIGURE D-2. Damages from Historical Floods

Tchula Creek levee in Tchula County provides protection to 1,000 acres from a five-year flood event. The land use within the protected area is 40 percent improved pasture, 40 percent woodland, and 20 percent soybeans. The area contains four residential properties with estimated average structural value of $7,500 and content values estimated at $2,500 each, or estimated value of $10,000 per property. The analysis is based on present price levels and current discount rate. Annual benefits for the rehabilitation work are listed below:

I. Average Annual Damages Prevented:

Agricultural Crops	$ 6,400	
Soybeans (200 acres)		5,200
Pasture (400 acres)		1,200
Residential Structures	400	
Total Average Annual Benefits	$ 6,800	

II. First Cost $ 24,000

III. Annual Cost

Interest and Amortization at 6-3/8% (5-year economic life)	$ 5,700
Operation & Maintenance (verify cost)	300
Total Average Annual Cost	$ 6,000

IV. The following checks were performed:

1. Total value of property protected

Residential (4 at $10,000)	$ 40,000
Pasture (400 ac at $600/ac)	240,000
Soybeans (200 ac at $1,500/ac)	300,000
Total	$580,000

2. Value of Cropland

Crops	Value	x 5%	
Soybeans	$1,500	$75	$5,200/200= $26 (less than 75)
Pasture	$600	$30	$1,200/400= $3 (less than 30)

3. Net Farm Income

	Net Farm Income/Acre (from Tchula County) Crop Farm Budget Sheets	Benefits/Acre
Soybeans	$95	$26 (less than $95)
Pasture	$6	$3 (less than $6)

4. Distribution of project benefits: Three out of the four residences each obtain 30 percent of the total benefits while the fourth residence obtains the remaining 10 percent.

FIGURE D-3. Check Requirements for Agricultural-type Damages

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APPENDIX E
REGIONAL VARIANCES TO LEVEE VEGETATION STANDARDS

E-1. Background, Authority, Applicability. Refer to ER 500-1-1, paragraph 5-22.

E-2. Summary. In general, the policy set forth in ER 500-1-1, paragraph 5-22 allows a public sponsor of a flood control levee to seek a variance from standing Corps policy so as to allow additional vegetation to grow on levees, when such vegetation would preserve, protect, and/or enhance natural resources, and/or protect rights of Native Americans, while maintaining the safety, structural integrity, and functionality of the levee, retaining accessibility for inspection and flood fighting purposes, and not allowing the level of protection to fall below the minimum permissible for PL 84-99 acceptability, or for levee certification under the National Flood Insurance Program.

E-3. Regional Variance Agreements.

a. No Blanket Regional Variances. Blanket regional variances to levee vegetation standards are not permitted and will not be issued.

b. Regional Variance Agreements. The use of Regional Variance Agreements (RVA) is encouraged. An RVA is a memorandum of agreement to which the Corps, and appropriate tribal, state, and local entities, are signatories. RVA's are intended to simplify the regional variance process and be a cost-saving measure for both the Corps and other RVA signatories, and for public sponsors whose Active projects fall under the areal jurisdiction of an RVA. The format for an RVA is at Figure D-1.

(1) RVA Signature Authority - Corps. Refer to ER 500-1-1, paragraph 5-22.e.

(2) RVA Signature Authority - Tribal, State and Local Agencies. Division/district commanders will determine (or acknowledge) the appropriate level of tribal, state, and local signatories, dependent upon the RVA area coverage and other appropriate factors. A signatory from the responsible state or local emergency management agency (or equivalent) is required on all RVA's not signed by the responsible chief executive (e.g., state governor, county executive, city mayor) of the highest non-Federal non-tribal political echelon involved.

(3) Geographical Limitation of RVA's. A single RVA will, as a minimum, cover a county, parish, or independent city, or a watershed area as defined by the United States Geological Survey. RVA's may not cross Corps division boundaries.

(4) Developing RVA's. Corps, tribal, State, and local involvement in the development of RVA's is essential, as is inclusion of all pertinent fields of expertise. Certain features and conditions may merit specific consideration in the RVA development.

(a) Levee Materials and Construction Standards. Levees are constructed of different materials, and to different compaction standards. Levees constructed of silty sand or other permeable material must generally be larger, with flatter slopes, so as to avoid piping problems. For such levees, vegetation would be more limited in species, size, and density, than on levees of similar configuration constructed of less permeable material.

(b) Hydrologic and Hydraulic Conditions. Water volume, velocity, depth, bank slope, bend curvature, level of protection provided by the levee, and flood history determine flood conditions, and help in the establishment of suitable and unsuitable species and vegetation density.

(c) Risk. Consideration must be given to the potential impacts of a catastrophic failure of a levee. For example, a straight levee section adjacent to agricultural land or park land may be more amenable to allowing more vegetation than a levee on the outside of a bend in the river, or a straight reach of levee that is immediately upstream of a hospital or water treatment plant.

(5) Processing Signed RVA's. A copy of each signed RVA will be provided to each signatory, and other offices/agencies as necessary. A copy of each signed RVA will be provided to HQUSACE, ATTN: CECW-OE, upon signature.

E-4. Request for Regional Variance - No RVA Applicable. A public sponsor must request a Regional Variation in writing.

(1) The request must contain the substantive information, requirements, and conditions addressed in paragraph D-3 above and/or contained in the RVA format at Figure D-1.

(2) The request must contain a written acknowledgement from the state, county, or equivalent level emergency management agency.

(3) The request must include a map of an appropriate scale indicating the location of the levee, the location of critical public facilities and bridges, and the location of hazardous materials.

E-5. Request for Regional Variance - Applicable RVA Exists. A public sponsor must request a Regional Variation in writing, citing the applicable RVA.

(1) The request must reference applicable sections of the RVA.

(2) The request must identify critical areas (e.g., locations of public facilities, bridges, etc.) and locations of hazardous materials. The request will be similar to a request for a variance when no RVA exists, except that those areas addressed by the applicable RVA will merely be referenced, and no acknowledgement from the state or local emergency management agency is needed.

E-6. District Approval.

(1) RVA Signature Authority - Corps. Refer to ER 500-1-1, paragraph 5-22.e.

(2) Approved Regional Variances will be provided to the public sponsor.

(3) The FCW Database will be updated to reflect that a Regional Variance has been granted.

(4) The District will take appropriate action to incorporate the allowances of the Regional Variation into the procedures for conducting Continuing Eligibility Inspections and flood fighting activities for the levee.

E-7. Funding. Extraordinary funding for RVA activities may be requested under FCCE Class 350.

REGIONAL VARIANCE AGREEMENT
Addressing the Levee Vegetation Standards for
(enter appropriate geographical or political region)

I. Purpose. The purpose of this Regional Variance Agreement is to allow for regional variances to standard US Army Corps of Engineers policies regarding the types and amount of vegetation permitted on levees, when such variances allow for the continuance of flood damage reduction benefits of levees while preserving, protecting, and enhancing natural resources, and/or protecting the rights of Native Americans pursuant to treaty and statute.

II. Authority. This Agreement is made pursuant to the authority of Public Law 99, 84th Congress (PL 84-99), (33 U.S.C. 701n) (69 Stat. 186), as regulated by Title 33, Code of Federal Regulations, Sections 203 and 208.10, and as implemented by Engineer Regulation (ER) 500-1-1 and ER 1130-2-530.

III. Applicability. This Regional Variance Agreement is applicable to *(enter the precise political entity, watershed entity(ies), or other description of the geographical region to which this agreement applies),* and to public sponsors of all levees with an Active status (in accordance with ER 500-1-1) which are located in the region or area just described. Certain provisions of Paragraph VI. below may be limited in the geographical area to which they are applicable.

IV. References. *(Include any references that are applicable. This could include state law, county ordinances, Federal or state court documents, technical manuals, etc. References may be incorporated into the Regional Variation Agreement.)*

V. Actions During Emergencies.

A. Definition of Emergency. For the purposes of application of this Agreement, the term "emergency" is defined as any situation in which a levee is threatening to either fail or overtop.

B. Conduct of Flood Fight Activities. During an emergency, any responsible party engaged in flood fight activities, to specifically include the US Army Corps of Engineers, the *(list states, cities, or counties as necessary)*, and the public sponsors

Figure E-1. Format for Regional Variance Agreement

of levees, may take whatever actions are necessary to preserve the structural integrity of any levees addressed by this Agreement. Actions necessary to preserve the structural integrity of a levee specifically include remove of any and all vegetation on or within 50 feet of a levee.

VI. General Riparian Vegetation Management Guidelines.

A. Vegetation Allowed Without Restriction. The plants species *(listed below) or (listed at Attachment 1)* are generally recognized as not being detrimental to levee stability, and are permitted without restriction on levees, except as addressed in Paragraph VII of this Agreement.

B. Allowable Vegetation, Limited in Size or Density. The plants species *(listed below) or (listed at Attachment 2)* are generally recognized as not being detrimental to levee stability when moderate quantities of the species are present, and are permitted on levees (except as addressed in Paragraph VII of this Agreement) under the following guidelines:

(1) Basic Levee Sections. *Specify limitations, e.g., "Non-herbaceous vegetation with a mainstem diameter greater than 5 inches measured at the ground will be removed. Non-herbaceous vegetation with a mainstem diameter less than 5 inches measured at the ground will be selectively removed so that the horizontal distance between such vegetation will generally be at least 25 feet apart.* [Note: Limitations may be portrayed in a tabular format for ease and clarity. Limitations may be further limited to specified levee slopes, e.g., slopes greater than 3H:1V, or to critical reaches, e.g., adjacent to a public facility or a highway bridge.]

(2) Overbuilt Levee Sections. *Address allowances and limitations in a manner similar to subparagraph (1) above.*

(3) *Other.*

C. Vegetation Not Permitted. The plant species and noxious weeds *(listed below) or (listed at Attachment 3)* and other non-native species are generally recognized as being detrimental to levee stability, and will be removed/controlled.

D. Use of Herbicides. *Address the uses and limitations on the uses of herbicides.*

Figure E-1. Format for Regional Variance Agreement (Continued)

VII. Limitations.

A. Crowns and Crown Roads. Levee crown roads (also known as patrol roads), the entire levee crown, and the riverward and landward slopes of the levee within two feet of the crown are permitted to have only grass or sod. The grass or sod will be kept mowed, so that the height does not exceed 6 inches.

B. Areas of Concrete Revetments. All vegetation will be removed from within concrete revetted areas. All non-herbaceous vegetation that is within 3 feet of a concrete revetted area will be removed. All woody vegetation that threatens the structural integrity of a concrete revetment will be removed. *Mechanical and/or spraying may be used for control of vegetation.*

C. Areas of Emplaced Riprap. *Specifically address allowances and limitations on vegetation in riprapped areas.*

D. Detrimental Affects. Any vegetation that can be reasonably foreseen to detrimentally affect any inspection, patrolling operation, or flood fight operation, in either daytime or nighttime conditions, is not permitted.

E. *Other.*

VIII. Rehabilitation of Damaged Levees. In the event that a levee covered by this Agreement receives Rehabilitation Assistance in accordance with ER 500-1-1, the Corps generally prefers to allow levees to naturally revegetate. In the event that natural revegetation will not provide reasonable and timely sod growth to the rehabilitated sections of the levee, the following will govern replacement/ reestablishment of vegetation on the rehabilitated levee slopes:

A. Habitat for Fauna Endangered Species. Vegetation listed in *(Paragraph VI.A. and B.) or (Attachment 1 and 2)* that is considered habitat for endangered fauna species present on or around the levee may be used to reestablish the vegetation if reasonable and prudent to do so.

B. Select Native Plantings, or Other Acceptable Vegetation. Select native plantings, or other acceptable vegetation listed in *(Paragraph VI.A. and B.) or (Attachment 1 and 2)* may be used to reestablish the vegetation if reasonable and prudent to do so.

Figure E-1. Format for Regional Variance Agreement (Continued)

IX. Obligations of the Signatories of the Agreement.

A. Signatories shall hold and save the Government (the US Army Corps of Engineers) free from all damages arising from the any condition, situation, or event that may arise that is pursuant to or related to the implementation of this Agreement.

B. The public sponsors of levees active in the Rehabilitation and Inspection Program that receive a Regional Variance based on this Agreement agree to participate in and comply with the policies and procedures of the U.S. Army Corps of Engineers Rehabilitation and Inspection Program.

X. Notices.

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

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

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

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

THE DEPARTMENT OF THE ARMY
BY: _____
[SIGNATURE]
[TYPED NAME]
DISTRICT ENGINEER
[_____ DISTRICT]
DATE: _____

THE [NAME OF ENTITY]
BY: _____
[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]
DATE: _____

Other signature blocks will be added as necessary.

Figure E-1. Format for Regional Variance Agreement (Concluded)

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Glossary of Acronyms and Terms

Section I. Acronyms.

AAR - After Action Report
ACOM - Atlantic Command. (Obsolete term. See USJFCOM.)
AFARS - Army FAR Supplement
AR - Army Regulation
ASA(CW) - Assistant Secretary of the Army for Civil Works
BCR - Benefit Cost Ratio
BPP - Bank Protection Project
C&P - Cooperation and Participation Agreement. Obsolete term, see *CA*.
CA - Cooperation Agreement
CAT - Crisis Action Team
CEAP - Corps of Engineers Automation Plan
CECW-OE - The HQUSACE Civil Emergency Management Branch
CEI - Continuing Eligibility Inspection
CEQ - Council on Environmental Quality
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CFS - Cubic feet per second.
CG - Commanding General
CONUS - Continental United States (i.e., the contiguous 48 states)
CONUSA - Continental United States Army
CRREL - Cold Regions Research and Engineering Laboratory
CWA - Clean Water Act
CWIS - Civil Works Information System (See also PWI.)
CZM - Coastal Zone Management
dbh - diameter at breast height
DCO - Defense Coordinating Officer
DFAR - Defense FAR Supplement
DFO - Disaster Field Office
DLA - Defense Logistics Agency
DOC - Department of Commerce
DOD - Department of Defense
DOE - Department of Energy
DOI - Department of Interior
DOMS - Directorate of Military Support
DOT - Department of Transportation
DSR - Damage Survey Report
E&D - Engineering and Design
EC - Engineer Circular

ECA - Evaluation and Corrective Action
EDA - Economic Development Administration
EFARS - Engineer FAR Supplement
EM - Engineer Manual, Emergency Manager, Emergency Management
EMHV - Emergency Management High Visibility
EO - Executive Order
EOC - Emergency Operations Center
EP - Engineer Pamphlet
EPA - Environmental Protection Agency
ER - Engineer Regulation
ERDC - Engineer Research and Development Center
ESF - Emergency Support Function
FAD- Funding Authorization Document
FAR - Federal Acquisition Regulation
FCCE - Flood Control and Coastal Emergencies
FCO - Federal Coordinating Officer
FCW - Flood Control Works
FEMA - Federal Emergency Management Agency
FmHA - Farmers Home Administration
FOA - Field Operating Agency
FONSI - Finding of No Significant Impact
FORSCOM - Forces Command
FRP - Federal Response Plan
GIS - Geographic Information Systems
GSA - General Services Administration
HBPP - Hurricane/Beach Protection Project
HFSSB - High Frequency Single Side Band
HHS - Health and Human Services
HMT - Hazard Mitigation Team
HQUSACE - Headquarters, U.S. Army Corps of Engineers
HSPP - Hurricane or Shore Protection Project
HUD - Housing and Urban Development
ICW - Inspection of Completed Works
IEI - Initial Eligibility Inspection
ILTF - Interagency Levee Task Force
JTF - Joint Task Force
LERRD's Lands, easements, rights-of-way, relocations, and borrow and dredged or excavated materials disposal areas.
LOA - Lead Operating Agency
LCO - Lead Corps Official (for ILTF)
LNO - Liaison Officer
MOA - Memorandum of Agreement

MSC - Major Subordinate Command (synonymous with Division)
MSCA - Military Support to Civil Authorities
NCP - National Contingency Plan (National Oil and Hazardous Substance Pollution Contingency Plan)
NED - National Economic Development
NEPA - National Environmental Protection Act
NHPA - National Historic Preservation Act
NRCS - Natural Resources Conservation Service
NRT - National Response Team
NSAP - Nonstructural Alternatives Project
NWP - Nationwide Permit
NWS - National Weather Service
O&M - Operations and Maintenance
OCE-P - Office of the Chief of Engineers, Pentagon
OMB - Office of Management and Budget
OMRR&R - Operation, Maintenance, Repair, Replacement, and Rehabilitation
OSC/RPM - On Scene Coordinator/Remedial Project Manager
PACOM - Pacific Command
PCA - Project Cooperation Agreement.
PDA - Preliminary Damage Assessment
PIR - Project Information Report
PL - Public Law
PWI Project Work Item.
RD - Regional Director
RIP - Rehabilitation and Inspection Program
RS/GIS - Remote Sensing/Geographic Information System
RRT - Regional Response Team
RSC - Readiness Support Center
S&A - Supervision and Administration
S&I - Supervision and Inspection
SAACONS - Standard Army Automated Contracting System
SBA - Small Business Administration
SCS - Soil Conservation Service (See NRCS)
SITREP - Situation Report
SOP - Standard Operating Procedure
SPOTREP - Spot Report
SPS - Standard Procurement System
STU - Secure Telephone Unit
TEECA - Training, Evaluation, Exercise, and Corrective Action
TVA - Tennessee Valley Authority
USACE - U.S. Army Corps of Engineers
USACOM - United States Atlantic Command

USC - United States Code
USCG - United States Coast Guard
USJFCOM - US Joint Forces Command
USDA - United States Department of Agriculture
US&R - Urban Search and Rescue
WPA - Works Progress (later Work Projects) Administration
WRDA - Water Resources Development Act

Section II. Terms.

A-B-C's or a-b-c's. A generic term referring to the items of local cooperation the public sponsor is required (as provided for in the CA) to provide as a condition for receiving Corps assistance. For most types of Corps assistance, the a-b-c's the public sponsor must agree to provided are (a) provide without cost to the United States all lands, easements, rights of way, relocations, and borrow and dredged or excavated material disposal areas necessary for the authorized work; (b) hold and save the United States free from all damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except for damages due to the fault or negligence of the United States or its contractors; and (c) operate, maintain, repair, replace, and rehabilitate the work after its completion. Additional items of local participation may be required, such as the removal of temporary emergency flood damage reduction measures. MSC's and districts are not authorized to change or delete a-b-c requirements, without written permission from HQUSACE.

Active. A status applied to FCW concerning participation in the Rehabilitation and Inspection Program under authority of PL 84-99. An Active project must have met USACE criteria for entry and been entered into the RIP. Only Active projects may receive Rehabilitation Assistance to repair damages caused by a flood event or coastal storm.

Agricultural Levee. A levee that provides at least a 5-year flood protection to predominantly agricultural areas or agribusinesses. May be Federal or non-Federal.

Bank Protection Project. Any project or technique used to prevent erosion of or failure of a streambank.

Beach Nourishment Projects. Projects designed and constructed to build or maintain a beach by placement of material to nourish and stabilize the shoreline. See HSPP.

Betterment. During repair of an FCW, any construction effort that increases the area protected, provides features that did not exist prior to the flood event, or increases the degree or level of protection provided by the FCW. Examples of betterments include increasing the height of a levee, or providing riprap where none previously existed.

Category 100, 200, etc. Feature numbers in the appropriation structure for FCCE under Appropriation 96x3125. For authoritative definitions, refer to ER 11-1-320. For informational purposes, categories are:

(a) Category 100. Disaster Preparedness. MSC and district disaster preparedness programs, to include salaries of emergency management personnel, supplies, training, etc. Also includes EOC facilities, and funding for the Readiness Support Center.

(b) Category 200. Emergency Operations. Includes Emergency Response and Post Flood Response, field investigations during flood events, and preparation of after action reports.

(c) Category 300. Rehabilitation. Rehabilitation Assistance to Federal and non-Federal FCW's and Federally constructed hurricane and shore protection projects, associated investigation costs, etc. Includes inspection of non-Federal FCW, and maintenance of the FCW database.

(d) Category 400. Emergency Water. Assistance to drought distressed regions or localities with a contaminated source of water supply, and costs of associated investigations.

(e) Category 500. Advance Measures. Assistance against an identified, imminent flood threat, and costs of associated investigations.

(f) Category 600. Hazard Mitigation costs of participation in an activated Interagency HMT under the direction of FEMA.

C.F.S. (Cubic Feet per Second). Also **cfs**. The amount of flow passing a given point in a stream channel. One cubic foot per second is equivalent to approximately 7.5 gallons per second.

Channel. A natural or artificial watercourse with definite bed and banks to confine and conduct flowing water.

Channel Capacity. The maximum flow that can pass through a channel without overflowing the banks.

Class. A subdivision of categories in the appropriation structure. For example, category 400 is divided into Classes 410, 420, and 430. See also *Category*.

Contingency Contracting. The necessity for protection or restoration of flood protection projects requires immediate actions. To meet these requirements, justification exists for contracting procedures other than full and open competition (as allowed by FAR 6.302.) These contingency or emergency contracting procedures should comply with FAR 6.302-2.

Cooperation Agreement. An agreement entered into by a District Commander (acting as the agent for the Department of the Army on behalf of the United States Government) and

the public sponsor for the purpose of identifying each party's rights and obligations concerning the expenditure of Federal funds under authority of PL 84-99.

Deliberate Levee Cut. A deliberate cut made in a levee, with the intention of either protecting the integrity of the structure (or an adjacent structure) from actual or forecasted river stages, or reducing the overall anticipated damages expected to occur to the existing structure by the current flood event. See also Dewatering Levee Cut.

Dewatering Levee Cut. A deliberate cut in a levee used as an engineering/construction method to dewater the area behind the levee when pumping this contained water is not considered a feasible, timely, or economical alternative. A dewatering levee cut is a type of deliberate levee cut that is never eligible for PL 84-99 assistance.

Dike. In most areas of the United States, a structure (earth, rock, or timber) built part way across a river for the purpose of maintaining a navigation channel. In other areas, the term is used synonymously with levee. Generally constructed of earth, stone, timber, concrete, or similar material.

Division. See Major Subordinate Command.

Drainage Structure. Generally, any feature or system (e.g., culverts) constructed for the purpose of discharging surface water run-off. Such structures are components of interior drainage systems.

Drought Distressed Area. An area that the ASA(CW) has determined to have an inadequate water supply that is causing, or is likely to cause, a substantial threat to the health and welfare of the inhabitants of the area, including a threat of damage or loss of property.

Eligible Levee. A levee categorized as "active" in the RIP, for which USACE can provide assistance under authority of PL 84-99 to repair damage caused by a flood event.

Emergency. A situation involving a natural or technological disaster that would result in an unacceptable hazard to human life, a significant loss of property, or significant economic hardship.

Emergency Assistance. All USACE activities that assist a non-Federal entity that use FCCE funding from Category 200, 300, 400, and/or 500.

Emergency Preparedness. All those activities and measures designed or undertaken to prepare for or minimize the effects of a hazard upon the civilian population, to deal with the immediate emergency conditions that would be created by the hazard, and to effectuate

emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by the hazard.

Federally Authorized Projects/Federal Projects. An FCW project built by USACE that was authorized for construction by Congress or by USACE continuing authorities (e.g., Section 205.)

Federal FCW/Federal Levee/Federal Dam. A Federally authorized FCW, levee, levee system, or dam project. FCW constructed by non-Federal interests, or other (non-USACE) Federal agencies, and incorporated into a Federal system by specific Congressional action (i.e., United States law) are also designated as Federal FCW's. Construction by, or previous rehabilitation or reconstruction of a non-Federal FCW by a Federal Agency (to include USACE, FEMA, NRCS, and EDA) does not make the levee a Federal levee. Levees constructed under the authority of the Works Progress Administration are not Federal levees. Section 14 projects constructed under authority of PL 79-526 are not Federal FCW's.

Federal Response Plan (FRP). The FRP is the Federal government's plan to address the consequences of any disaster or emergency situation in which there is a need for Federal response assistance under authorities of the Stafford Act, as amended. The FRP is an interagency document produced under the leadership and direction of the Federal Emergency Management Agency. USACE is the Federal agency responsible for Emergency Support Function #3, Public Works and Engineering. FRP planning and preparedness activities in USACE are funded by the FCCE account under PL 84-99 authority.

Fiscal Completion. Once all expenses have been charged and all financial activities for a specific project are complete, the funding accounts that support the project are closed, and the project is then considered fiscally complete.

Flood. Abnormally high water flows or water level that overtops the natural or artificial confining boundaries of a waterway. A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of river and/or tidal waters and/or the unusual accumulations of waters from any sources.

Flood Control Project. See flood control work.

Flood Control Work(s) (FCW). Structures designed and constructed to have appreciable and dependable effects in preventing damages caused by irregular and unusual rises in water level. FCW may include levees, channels, floodwalls, dams, and Federally authorized and constructed hurricane or shore protective structures. Structures designed and constructed to protect against salt water intrusion or tidal fluctuations, channel

alignment, navigation, recreation, fish and wildlife, land reclamation, or to protect against land erosion are not considered to be FCW's. A riprap bank erosion control structure is not considered to be a flood control work.

Flood Fighting. Actions taken immediately before or during a flood to protect human life and to reduce flood damages, such as evacuation, emergency sandbagging and diking, and providing assistance to flood victims.

Flood Plain. Any normally dry land area that is susceptible to being inundated by any natural source, such as a stream, during floods. USACE, as a matter of policy, encourages local governments to zone their flood plains against development and thereby avoid property damage and reduce obstruction to passage of floodwaters.

Flood Stage. The water surface elevation of a river, stream, or body of water, above which flooding and damages normally begin to occur, normally measured with respect to a specific reference gage. Flood stage is normally the level at which a river overflows its banks. Flood stage for any particular geographic area is unique to that geographic area.

Flooding. See Flood.

Floodwall. A type of flood control work usually constructed of stone or reinforced concrete, and which may occasionally have plastic or steel components. Floodwalls are generally constructed in urban areas where insufficient area exists to construct earthen levees.

Floodway. Designated land left essentially clear of development, for the purpose of passing floodwaters. In some areas, floodway is used to designate the 100-year flood plain.

Freeboard. A factor of safety usually expressed in feet above a flood level for purposes of designing flood protection facilities and for floodplain management. Freeboard tends to compensate for the many uncertain factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge obstructions, and the hydrological effect of urbanization of the watershed. Freeboard is being replaced as a technique through risk and uncertainty management.

Haul Road. Any privately owned road used by Corps vehicles or Corps contractor's vehicles to haul rock, earth fill, or other borrow materials to the site of a repair/floodfight/rehabilitation effort, or on which empty vehicles return. This includes haul roads specifically constructed for a repair/rehabilitation effort. Also included are levee crown roads and levee patrol roads that are not public roads, if their principal purpose is for access for maintenance, inspection, and floodfight purposes. All public roads are specifically excluded, to include any public roads that are situated on levees.

Hazard. An emergency or disaster resulting from a natural hazard or an accidental or man-caused event.

Hazard Mitigation. Any activity that permanently eliminates or reduces the long-term vulnerability to life and property from natural and technological hazards. Hazard mitigation refers to the concept of decreasing the severity of the effects of flooding on people and property by reducing the cause, occurrence, exposure, and effects of the flood hazard.

Hazard Mitigation Team. An interagency team assembled under FEMA leadership to investigate and document strategies to reduce or avoid Federal expenditures resulting from flooding situations or other types of natural disasters.

Hundred Year Flood. More accurately referred to as a "one percent chance flood," a flood of a magnitude that, according to historical statistics, has one chance in one hundred of occurring in any given year.

Hurricane/Shore Protection Project. A type of FCW project designed and constructed to prevent damage and flooding caused by a hurricane or tsunami, and their associated storm surges.

Hydraulics. The science of dealing with the mechanical properties of liquids that describes the specific pattern and rate of water movement in the environment.

Hydrology. The science dealing with properties, distribution, and circulation of water on and below the surface of the land and in the atmosphere.

Imminent Threat. A subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that threat is to develop in a given geographical location, and how likely the threat will produce catastrophic consequences to life and improved property. Implicit in the timing aspect can be considerations of time (e.g., a storm front's predicted path) or season (e.g., a snowpack that will melt in the coming spring runoff) or of known cyclical activities (e.g., rising water levels in the Great Lakes), but occurring inside the normal Corps decision and execution cycle for small project construction.

Inactive. A status applied to FCW concerning participation in the RIP. An Inactive project is, simply, any project that is not Active. It includes formerly Active FCW that left Active status in the RIP, either voluntarily or involuntarily, as well as those FCW that have never been Active in the RIP. See also "Active."

Infiltration. That portion of precipitation that is absorbed by the land surface.

Initial Repair. A hastily effected temporary repair of a breached levee that provides a 10- to 25-year level of protection for a short (less than 12 month) period of time until the permanent repair can be designed and executed.

Interior Drainage. Natural or modified outflow of streams within a levee'd area for the conveyance of run-off. Interior drainage systems are not components of flood control works.

Lead Operational Authority. Within military commands, this is a delegated authority to plan and execute missions for a higher headquarters.

Levee. A structure, normally of earth or stone, built generally parallel to a river to protect land from flooding. A levee is a complete unit, designed and intended for flood control. A levee (excluding a ring levee) is always tied to high ground at both ends.

Level of Protection. The degree of protection against flooding provided by an FCW, normally expressed in terms of the cyclical flood-level against which protection is provided.

Local Cost Share. That portion of the cost of undertaking assistance authorized under PL 84-99 (e.g., repairing a damaged Active levee) for which the public sponsor is responsible. The local cost share may be paid either in cash or as work-in-kind, or as a combination of the two.

Local Sponsor. See Public Sponsor.

LERRD's Lands, easements, rights-of-way, relocations, and dredged materials disposal areas.

Major Flood. A flood event determined to be a 100-year event or better, or a series of weather events over a short period of time (normally seven days or less), which causes loss of human life and/or property damage exceeding $1 million.

Major Subordinate Command. The intermediate level USACE headquarters organization, subordinate to HQUSACE, and above the district-level. Also Division.

Military Support to Civil Authorities. Those activities and measures taken by DOD components to foster mutual assistance and support between DOD and any civil government agency in planning or preparedness for, or in the application of resources for response to, the consequences of civil emergencies or attack. See DODD 3025.1.

National Contingency Plan (40 CFR Part 300.) A Federal plan intended to effectuate the powers and responsibilities for responding to nonradiological oil and hazardous substance

discharges, releases, or substantial threats of releases as specified in the CERCLA, as amended, and the authorities established by Section 311 of the CWA, as amended.

Natural Disaster. Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, or other catastrophe that causes, or which may cause, substantial damage or injury to civilian property or persons.

Navigation Channel. The channel maintained in a body of water for the purpose of assuring a depth adequate for commercial vessels.

Non-Federal Levee/Non-Federal Project/Non-Federal FCW. A flood control work not authorized by Congress, or under other Federal agency authority. Works Progress Administration (WPA) projects are considered non-Federal FCW for the application of PL 84-99 authority.

Non-Federal Sponsor. See public sponsor.

Nonstructural Alternative Project. A type of project, authorized by an amendment to PL 84-99 contained in WRDA 96, that, in lieu of a structural rehabilitation effort, allows for restoration of floodways, flood plains, and/or the reduction of future flood damages and associated FCW rehabilitation costs.

Political Subdivision. A city, town, borough, township, county, parish, district, association, or other public body created by or pursuant to state law and having jurisdiction over the water supply of such public body.

Project. A generic term used to describe the planned or executed construction of a structure or system.

Project Cooperation Agreement. An agreement entered into by a District Commander (acting as the agent for the Department of the Army on behalf of the United States Government) and the public sponsor for the purpose of identifying each party's rights and obligations concerning the expenditure of Federal funds under USACE authority other than that of PL 84-99. See also Cooperation Agreement.

Public Road. Any road available for general use by the public. Any road for which a public agency or public entity has ongoing and/or statutory maintenance responsibility.

Public Sponsor. A public sponsor must be a public entity that is a legally constituted public body with full authority and capability to perform the terms of its agreement as the non-Federal partner of the Corps for a project, and able to pay damages, if necessary, in the event of its failure to perform. A public sponsor may be a State, county, city, town, Federally recognized Indian Tribe or tribal organization, Alaska Native Corporation, or any political subpart of a State or group of states that has the legal and financial authority and capability to provide the necessary cash contributions and lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas (LERRD's) necessary for the project.

Reach. A section or segment of a levee, which in and of itself does not provide complete protection against a flood. Also, a segment of a river, typically indicated by reference to river mile markers or geographical features.

Rehabilitation and Inspection Program (RIP). A component of the Civil Emergency Management Program concerned with the inspection and rehabilitation of FCW's.

Rehabilitation Assistance. Repair and restoration under authority of PL 84-99 of an Active FCW damaged in a flood event.

Rehabilitation Project. An action or series of actions focused of the repair of an Active flood control work to return the FCW's level of protection to its pre-flood/pre-storm level.

Repair and Rehabilitation. The terms "repair", "rehabilitation", or "repair and rehabilitation" mean the repair or rebuilding of a flood control structure, after the structure has been damaged by a flood, hurricane, or coastal storm, to the level of protection provided by the structure prior to the flood, hurricane, or coastal storm. The terms do not include improvements (betterments) to the structure, nor does "repair and rehabilitation" include any repair, reconstruction, or rehabilitation activities of a flood control structure which, in the normal course of usage, has become structurally unsound and is no longer fit to provide the level of protection for which it was designed.

Riverine. Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Run-off. That portion of precipitation, which is not intercepted by vegetation, absorbed by the land surface or evaporated and thus flows overland into a depression, stream, lake, or ocean.

SAACONS. The Standard Army Automated Contracting System, used for comprehensive management of the contracting process. SAACONS is being replaced by SPS.

Saturation.

(1) Soil Saturation. A condition in soil in which all spaces between the soil particles are filled with water. Such conditions normally occur after prolonged periods of rainfall and/or snowmelt. The result of a saturated condition is that any additional rainfall or snowmelt runs off into streams and rivers instead of soaking into the ground.

(2) Levee saturation. Soil saturation that has occurred in an earthen levee because of floodwaters remaining above flood stage for extremely long periods of time. This condition can lead to catastrophic failure of the levee.

Secondary Levee. A levee that is riverward of the main or principal levee. The level of protection of a secondary levee is always less than the level of protection provided by the main levee.

Stafford Act. The common name for the principal emergency management authority of the Federal Emergency Management Agency. Codified as 42 U.S.C. 5121 et seq.

SPS. The Standard Procurement System, used for comprehensive management of the contracting process. This new system is replacing SAACONS.

Stream. A body of water flowing in a definite natural or manmade course that has the potential to flood. The term stream refers to rivers, streams, creeks, brooks, etc., and includes intermittent streams that are subject to flooding.

Substantial Property Damage. Damage caused by a flood event, the value of which generally exceeds $1 million.

Unusual Flooding. For use with Advance Measures, a subjective determination of the potential level of flooding that considers potential to approach an area's flood of record, a catastrophic level of flooding, or a greater than 50-year level of flooding.

Urban areas. Cities, towns, or other incorporated or unincorporated political subdivisions of States that provide general local government for specific population concentrations, and occupy an essentially continuous area of developed land containing such structures as residences, public and commercial buildings, and industrial sites.

Urban Levee. A levee that provides a high degree of flood protection (10 year or greater) to a predominantly urban area.

Work-in-Kind. That portion of a public sponsor's cost share to rehabilitate a non-Federal FCW that is a non-cash contribution. The work-in-kind may be in the form of labor, equipment, supplies, and/or services. Labor is defined as blue collar-type of work normally paid on an hourly wage basis, comparable to Federal Wage Grade positions.

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
CECW-OE Washington, D.C. 20314-1000

Regulation
No. 500-1-1

30 September 2001

Emergency Employment of Army and Other Resources
CIVIL EMERGENCY MANAGEMENT PROGRAM

Supplementation to this regulation is permitted but not required. If supplements are issued, USACE Commanders will provide a copy of their supplement to HQUSACE (CECW-OE), Washington, DC, 20314-1000 through chain of command channels.

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Chapter 1
Introduction

1-1. Purpose. This regulation prescribes policies for the Civil Emergency Management (CEM) Program of the U.S. Army Corps of Engineers (USACE) under the authorities of 33 U.S.C. 701n (commonly referred to as Public Law (PL) 84-99); the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.) (The Stafford Act); Army Regulation (AR) 500-60, Disaster Relief; and Engineer Regulation (ER) 1130-2-530, Flood Control Operations and Maintenance Policies.

1-2. Applicability. This regulation applies to HQUSACE elements, Major Subordinate Commands (MSC's), districts, laboratories, the 249th Engineer Battalion (Prime Power), and other field operating activities (FOA) of USACE. This regulation is applicable in the fifty states, the District of Columbia, and the territories of the United States unless provided otherwise by law. For instance, activities governed by the Stafford Act also apply to the Federated States of Micronesia, the Marshall Islands, and the Trust Territory of the Pacific Islands.

1-3. Distribution Statement. Approved for public release, distribution is unlimited.

1-4. References. See Appendix A.

1-5. Glossary of Acronyms and Terms. See the Glossary at the end of this regulation.

1-6. Responsibilities. The emergency management authorities and responsibilities of commanders at all levels within USACE are executed through the Chief, Readiness/ Emergency Management element.

a. USACE. The Commander, USACE will:

(1) Establish policies and procedures to implement the CEM Program to provide assistance under PL 84-99, AR 500-60, and in support of other Federal agencies.

(2) Establish and maintain a readiness/emergency management organization.

(3) Provide guidance to subordinate elements in supporting other agencies with emergency/disaster and response assistance.

(4) Maintain all USACE elements in a high state of readiness to respond to disasters and emergencies.

(5) Manage the Flood Control and Coastal Emergencies (FCCE) appropriation that is authorized by PL 84-99.

(6) Maintain liaison with and coordinate the CEM Program with appropriate Federal agencies and ensure timely support to requests for assistance.

(7) Manage those preparedness activities necessary to support the Federal Emergency Management Agency (FEMA) under the Stafford Act and ER 500-1-28.

(8) Establish and maintain the USACE Operations Center (UOC) in accordance with EP 500-1-1. Establish and maintain a Crisis Management Team (CMT), Crisis Action Team (CAT), and establish and maintain appropriate response and support rosters.

(9) Maintain a training program.

(10) Conduct exercises.

b. Major Subordinate Commands. MSC Commanders will:

(1) Establish and maintain a separate readiness/emergency management organization, to include personnel, space, and facilities, necessary to manage the CEM Program.

(2) Through publication of supplements, or other appropriate documents, develop guidance and procedures to implement emergency/disaster and response authorities within MSC boundaries.

(3) Conduct exercises.

(4) Establish and maintain liaison with appropriate Federal and military agencies to coordinate the CEM Program. As a minimum, this will include FEMA Region headquarters, Environmental Protection Agency (EPA) Region headquarters, Continental United States Army (CONUSA) headquarters, and U.S. Coast Guard (USCG) Districts.

(5) Oversee and coordinate CEM Program activities MSC-wide.

(6) Allocate funding for the CEM Program to district commanders.

(7) Provide guidance to subordinate elements in supporting other agencies with disaster assistance.

(8) Establish and maintain an Emergency Operations Center (EOC) in accordance with EP 500-1-1. Establish, train, and maintain a CMT, CAT, and appropriate response and support rosters. (See paragraph 3-3c.)

(9) Maintain a training program.

(10) Review and endorse district requests for out of cycle programming.

(11) Develop a plan for establishment of an alternate EOC and reconstitution of the MSC and, in coordination with HQUSACE, have a backup command (another MSC or a subordinate district) designated to assume command if a disaster so warrants.

(12) Manage MSC preparedness activities necessary to support FEMA under the Stafford Act and ER 500-1-28, to include serving as Lead Division, when so designated, for a given type of Planning and Response Team (PRT).

(13) Provide USACE representation on Regional Response Teams (RRT's) and Hazard Mitigation Teams (HMT's), and other teams as needed.

c. Districts. District Commanders will:

(1) Establish and maintain a separate readiness/emergency management organization, to include personnel, space, and facilities, necessary to manage the CEM Program, and assign Program Management responsibility for all emergency management and Inspection of Completed Works activities to the Emergency Manager or Chief of Readiness/ Emergency Management.

(2) Establish and maintain operational plans and procedures to respond to emergencies and disasters within delegated authorities and geographic areas of responsibility.

(3) Develop and execute the Rehabilitation and Inspection Program (RIP) in accordance with Chapter 5 of this regulation.

(4) Ensure personnel are prepared to respond to emergencies and disasters.

(5) Establish and maintain an EOC and appropriate response and support rosters.

(6) Conduct training and exercises.

(7) Establish and maintain liaison with appropriate officials from military, Federal, state, local and charitable agencies. This will include state emergency management agencies.

(8) Manage allocated funds.

(9) Establish, train, and maintain a CMT and CAT. (See paragraph 3-3c.) Establish, train, and maintain other teams as needed or directed, to specifically include Planning and Response Teams.

(10) Develop a plan for establishment of an alternate EOC and reconstitution of the district and, in coordination with the MSC, have a backup command designated to assume command and/or district responsibilities if a disaster so warrants.

(11) Manage preparedness activities necessary to support/execute FEMA activities under the Stafford Act and ER 500-1-28.

(12) Execute a comprehensive evaluation program in accordance with current guidance.

(13) Maintain stocks of emergency supplies and equipment for floodfight response. (See paragraph 3-8.b.(1)). Maintain appropriate stockage levels of Emergency Management High Visibility (EMHV) items.

(14) Provide technical assistance as needed for CEM Program-related activities.

(15) Integrate FCCE-funded projects into the district's Program (or Project) Review Board process. This specifically includes all PL 84-99 assistance efforts funded by the following FCCE classes: 310, 320, 330, 410, 420, and 510. This may also include all other classes of FCCE-funded work.

d. Philadelphia District. The Commander, Philadelphia District, will:

(1) Act as the designated office of primary responsibility for the procurement, distribution, and storage of EMHV items such as caps, shirts, jackets, magnetic signs, etc.

(2) Prepare and submit budget request for EMHV items directly to HQUSACE.

(3) Be prepared to supply bulk issues of EMHV items.

e. Other Elements, General. The Engineer Research and Development Center, Laboratories and FOA's will:

(1) Provide general and direct support to HQUSACE, MSC's, and districts.

(2) Develop response plans to provide specialized technical support/assistance to mission requirements.

(3) Designate staffing for mission requirements in support of MSC's.

(4) Participate in CEM Program exercises and training.

f. Cold Regions Research and Engineering Laboratory (CRREL). The Remote Sensing/Geographic Information Systems (RS/GIS) Center of CRREL will:

(1) Provide direct support to CECW-OE for the CEM Program. Coordinate CEM Program remote sensing and GIS activities of all USACE laboratories.

(2) Provide direct support to MSC and district CEM Program activities.

(3) Develop response plans and provide staff as necessary to HQUSACE.

(4) Coordinate and manage the staffing of RS/GIS field teams as necessary during emergencies.

(5) Provide analytical support as required.

g. 249th Engineer Battalion. The Commander, 249th Engineer Battalion will:

(1) Provide advice and technical assistance to all USACE elements in all aspects of electrical power and distribution systems.

(2) Be prepared to provide operating elements and command and control elements to produce and distribute electrical power with organic assets, military standard equipment, and/or commercially procured assets.

h. Readiness Support Center. The Chief, Readiness Support Center will:

(1) Provide general support of CECW-OE as directed.

(2) Coordinate and train specialized cadres, teams, or individuals, as required by HQUSACE.

(3) Coordinate activation and deployment of Urban Search and Rescue (US&R) cadre members with respective home MSC/District.

(4) Provide technical support and assistance to MSC's and districts in the development of response plans as requested.

(5) Be prepared to provide and deploy personnel to disaster sites to provide technical assistance and advice.

(6) Serve as the program manager for the Evaluation and Corrective Action Program.

(7) Serve as the program manager for the Independent Assessment Team process.

i. Tactical Support Center. The Chief, Tactical Support Center will:

(1) Provide general and direct support of HQUSACE as directed.

(2) Serve as USACE Program Manager for the Deployable Tactical Operating System (DTOS).

(3) Serve as the USACE Program Manager and functional proponent for ENGLink.

(4) Serve as the functional proponent for USACE HF radio operations and VSAT operations.

(5) Provide technical support, assistance, and technical expertise to all levels of USACE regarding construction and upgrade of Emergency Operations Centers.

(6) Be prepared to provide and deploy personnel to disaster sites to provide technical assistance and advice.

CHAPTER 2
IMPLEMENTATION OF THE CIVIL EMERGENCY MANAGEMENT PROGRAM

2-1. Authorities.

a. PL 84-99. The authority for USACE to provide emergency response/ disaster assistance is PL 84-99 (33 U.S.C. 701n). The appropriation for this authority is Flood Control and Coastal Emergencies, 96x3125. Under PL 84-99, the Chief of Engineers is authorized to undertake activities, including disaster preparedness, Advance Measures, emergency operations (Disaster Response and Post Flood Response), rehabilitation of flood control works (FCW) threatened or destroyed by flood, protection or repair of Federally authorized shore protective works threatened or damaged by coastal storm, provision of emergency water due to drought or contaminated source, emergency dredging, and flood-related rescue operations. Most USACE preparedness activities in support of the Federal Response Plan (FRP) are funded under FCCE appropriations. Appendix B provides a copy of PL 84-99.

b. The Stafford Act. PL 93-288, The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.)(The Stafford Act). In accordance with The Stafford Act and the FRP, FEMA may direct Federal agencies to use available personnel, supplies, facilities, and other resources to provide assistance in the event of a major disaster or emergency declaration. Under the FRP, the Department of Defense (DOD) has responsibility for Emergency Support Function (ESF) #3, Public Works and Engineering. DOD has designated USACE as its operating agent for ESF #3, to include planning, preparedness, and response, with assistance to be provided by other branches of DOD as needed. See ER 500-1-28 for USACE FRP activities.

(1) In accordance with the Stafford Act, FEMA may direct USACE (as the operating agent for DOD) to use its available personnel, supplies, facilities and other resources to provide assistance in case of a major disaster or emergency declaration by the President.

(2) At any time before a Presidential disaster declaration is made, FEMA may direct DOD (which in turn may direct USACE) to perform any emergency work necessary, with or without reimbursement of agency costs.

(3) Hazard Mitigation Teams (HMT's). Under the Interagency Agreement for Non-structural Flood Damage Reduction Measures as Applied to Common Flood Disaster Planning and Post Flood Recovery Practices, USACE has a standing mission to participate on interagency HMT's.

c. AR 500-60.

(1) Under AR 500-60, USACE commanders may provide USACE resources and assistance when required by imminently serious disasters or emergencies. Provision of resources is generally limited to those actions necessary to save human life, prevent immediate human suffering, or lessen major property damage or destruction. No contracting is permitted for AR 500-60 support, unless the requesting agency provides the funds needed to award and administer the contract. The USACE commander providing AR 500-60 assistance to civil authorities is not required to obtain an agreement for reimbursement from the requesting agency before providing assistance.

(2) Under AR 500-60 and The National Oil and Hazardous Substance Pollution Contingency Plan (NCP), USACE is responsible for responding to oil or hazardous substance releases as part of the Federal effort. This effort is coordinated by the USCG for coastal and inland waterway systems and the EPA for all other areas.

2-2. Funding for the CEM Program. The Commander, USACE has promulgated ER 11-1-320 to address funding policies and issues for Emergency Management.

a. Reprogramming. Reprogramming will be done in accordance with ER 11-2-201. Only Category 100 funds may be reprogrammed.

b. Cost Accounts. Refer to ER 37-2-10, Chapter 8 for establishment of appropriate cost accounts.

c. Elimination of Delegation of Authority. The concept of "delegation of authority" for the FCCE appropriation has been eliminated.

2-3. General CEM Program Policies.

a. Priority of USACE Emergency Assistance. USACE must be responsive to the public need in case of disasters or emergencies to provide assistance to save human life, prevent immediate human suffering, and/or mitigate property damage. It is the policy of the United States Army Corps of Engineers that all commanders will always give emergency assistance requirements first priority. Commanders will provide immediate response using all available resources and expedited procedures, to include emergency contracting actions when appropriate.

b. Application of Policy. MSC's and districts will apply Corps policy as contained in this regulation without deviation, unless an exception to policy has been granted by HQUSACE. All USACE actions will be undertaken with cognizance of the principle that Federal assistance is supplemental to State and local efforts.

c. Limitations on USACE Assistance Under PL 84-99. USACE emergency/disaster assistance is limited to the preservation of life and the protection of residential and commercial developments, to include public and private facilities that provide public services.

(1) Exclusive direct assistance to individual homeowners, property owners, or businesses (to include agricultural businesses), is not permitted.

(2) Exclusive direct assistance to a single public or publicly owned facility (e.g., a municipal water treatment plant) is permitted.

(3) USACE assistance may not be provided to or on military installations, or on other Federal lands, except on a cost reimbursable (e.g., Support for Others) basis. This limitation does not apply to those lands held in trust by the Federal Government for Federally recognized Indian tribes.

d. Lead Districts and Emergency Management Boundaries.

(1) The established Civil Works boundaries will be adhered to in defining areas of responsibility for PL 84-99 emergency management response and recovery activities.

(2) MSC's will designate a lead district for each state and territory for PL 84-99-related activities, under the "one door to the Corps philosophy." In those situations where a state is within the boundaries of more than one MSC, the MSC's will coordinate to designate the lead district. Response planning efforts for FRP activities will be done in accordance with ER 500-1-28.

(3) MSC commanders may mutually agree to temporary realignment of boundaries for emergency management purposes. HQUSACE will be notified of any realignments.

e. Interdivisional Assistance. MSC commanders may request interdivisional assistance in the event their resources are insufficient to cope with an emergency. Requests for assistance involving positions the supported MSC has been unable to fill with Division resources/volunteers will be coordinated through the UOC. The UOC will task other MSC's as needed.

f. Reporting. Higher headquarters will be notified of actual or potential emergency situations as soon as possible. Procedures and formats of EP 500-1-1 and ENGLink will be followed. Refer to EP 500-1-1, Chapter 4, Section V, for reporting procedures and formats.

g. Use of Funds from Other Federal Agencies. A public sponsor may use funds from other Federal agencies for meeting all or part of the local cost share for assistance under PL 84-99,

provided the granting agency confirms in writing that such use of the funds is not prohibited by law.

h. Other USACE Authorities. Where other Federal agencies have applicable emergency authorities, or other USACE authorities are more appropriate, USACE assistance under PL 84-99 is not permitted.

i. Release of Information.

(1) All information released to the media and the public must be cleared through the Public Affairs Office of the echelon employing current Department of Defense Principles of Information.

(2) Any information about the approval-disapproval status of any PL 84-99 project will not be released until a decision is made by the approving command.

(3) Information about the status of ongoing projects, schedules, and information obtained in the field may be released, if available.

(4) Information regarding damage estimates prepared by USACE elements for FEMA for Stafford Act related activities, will not be released outside USACE unless the information has been coordinated with, and approval has been obtained from, FEMA.

j. Cost Sharing. USACE activities, except loaned supplies and equipment, FCW rehabilitation work, and Advance Measures projects involving a permanent standard of construction, will normally be 100 percent Federally funded. FCCE funds will not be used to reimburse state or local governments for their costs in a disaster response.

k. Environmental Documentation.

(1) Emergency flood control, shore protection, and other disaster activities performed by USACE under PL 84-99, and USACE response and recovery actions requested by FEMA under The Stafford Act, are not subject to the National Environmental Policy Act (NEPA) documentation requirements of ER 200-2-2 if risk to life, health, property, or severe economic losses is imminent.

(a) District commanders shall consider the probable environmental consequences when determining appropriate emergency measures and describe proposed NEPA documentation or exclusion, as appropriate.

(b) Actions taken to restore facilities to pre-disaster conditions will not be construed to be either major Federal actions or as having significant effects.

(2) On occasion, emergency activities will occur which are considered major in scope and for which potentially significant environmental impacts are anticipated (e.g., comparable to the 1980 Mt. St. Helens eruption.) When the situation does not allow time to observe the provisions of NEPA, the Council on Environmental Quality will be consulted through HQUSACE for alternate arrangements in accordance with ER 200-2-2. The Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency situation. (Reference: Section 1506.11, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.)

l. Flood Plain Management (Executive Order (EO) 11988). ER 1165-2-26 implements EO 11988 for USACE.

(1) PL 84-99 Activities. Emergency activities under PL 84-99 are generally exempt from the provisions of EO 11988. However, the spirit and intent of the Order shall prevail, to the extent practicable, dependent on the urgency of the situation. Documentation for recommended projects shall include steps taken toward compliance or reasons for noncompliance.

(2) The Stafford Act, as amended. USACE will follow the guidance of FEMA in the performance of Stafford Act activities. Decisions on whether the requirements of EO 11988 are applicable to any particular action are the responsibility of FEMA.

m. Safety. All CEM Program activities will be conducted in accordance with Engineer Manual (EM) 385-1-1.

n. Requesting Authority. Any reference to "Governor" of a state will also mean:

(1) The governor of United States commonwealths, territories, and possessions.

(2) The mayor, as it pertains to the City of Washington, D.C.

(3) The chief executive (e.g., president, governor) or governing council of a Federally recognized Indian tribe or Alaska Native Corporation.

o. Work for Other Federal Agencies. Authority to provide services to other Federal agencies is provided in 31 USC 1535 (the Economy Act) and in 10 USC 3036(d). ER 1140-1-211 provides additional guidance.

p. Work for State and Local Governments.

(1) Authority to provide services to state and local governments is provided in 31 USC 6505 (the Intergovernmental Cooperation Act) and 10 USC 3036(d). ER 1140-1-211 provides detailed instructions.

(2) USACE may provide personnel to assist communities with public information programs for awareness and knowledge of flood hazards and flood fighting methods.

(3) The policy guidance that governs USACE acceptance of contributed funds for PL 84-99 approved projects is ER 1165-2-30.

q. Security. In disaster and contiguous areas, USACE depends upon duly constituted authorities (e.g., state and local police, U.S. Marshals Service, etc.) for the control of personnel circulation, vehicular traffic, and the maintenance of law and order. The HQUSACE Security Office and MSC/district security officers are responsible for coordinating activities to ensure the security of Government property and work sites, and unimpeded deployment of USACE personnel.

r. Definition of a Public Sponsor. A public sponsor must be a public entity that is a legally constituted public body with full authority and capability to perform the terms of its agreement as the non-Federal partner of the Corps for a project, and able to pay damages, if necessary, in the event of its failure to perform. A public sponsor may be a State, county, city, town, Federally recognized Indian Tribe or tribal organization, Alaska Native Corporation, or any political subpart of a State or group of states that has the legal and financial authority and capability to provide the necessary cash contributions and lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas (LERRD's) necessary for the project.

s. Contingency Amounts for Initial Funding for Contracting. For all types of construction contracting using P L 84-99 funds (Categories 200-500), contingency amounts are limited. For dredging contracts, the maximum allowable contingency percentage is 15 percent of the construction cost of the project. For all other types of contracts, the maximum allowable contingency percentage is 10 percent of the construction cost of the project.

2-4. Policy on Cooperation Agreements.

a. General. In providing emergency assistance (to include flood fight assistance, Rehabilitation Assistance, Emergency Water Assistance, and Advance Measures) to a public sponsor under this regulation, a Cooperation Agreement (CA) is required to assure a firm understanding between USACE and the public sponsor. CA formats are provided in EP 500-1-1. CA's that contain special or unusual conditions, that may obligate USACE to undertake

actions that are not specifically addressed in ER 500-1-1/EP 500-1-1, or that waive any rights or legal protections (e.g., a deference to a state law) require HQUSACE approval. Model CA's and typical provisions are in EP 500-1-1.

b. CA Signature Authority. The CA will be executed with the public sponsor. The district engineer or deputy district engineer will sign the CA for USACE.

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CHAPTER 3
DISASTER PREPAREDNESS

3-1. Disaster Preparedness Policy. MSC and district commanders will be prepared to provide immediate and effective response and assistance prior to, during, and after emergencies and disasters. Preparedness includes an emergency management organization, planning, training, exercises, adequate command and control facilities, supplies, tools and equipment, and the FCW inspection component of the Rehabilitation and Inspection Program.

3-2. Preparedness Budget. MSC's and district's are funded annually from the FCCE Appropriation, 96x3125. Funds are allocated to division commanders for distribution to districts in accordance with HQUSACE guidance.

3-3. Organization. MSC and district commanders will provide adequate staffing for a readiness/emergency management organization to accomplish the preparedness mission as defined by this regulation, ER 10-1-2, ER 500-1-28, and other appropriate documents. In addition to a full time readiness/emergency management staff, MSC's and districts will have cadre(s) or team(s) readily available to:

a. Provide assistance under USACE authorities for flood emergencies and other natural disasters.

b. Execute responsibilities and missions under the Stafford Act and the FRP in accordance with ER 500-1-28.

c. Staff a CMT.

(1) The CMT will consist of the Emergency Manager, and senior representatives from technical and functional areas (e.g., engineering, project management, contracting, real estate, logistics, human resources, etc.)

(2) When the magnitude of an emergency situation demands a separate management element, and in accordance with guidance and direction from the MSC/District Commander, the CMT will:

(a) Provide guidance and direction for MSC/district activities during emergency situations.

(b) Set response and recovery priorities.

(c) Provide overall management to response and recovery activities.

d. Staff a CAT. The CAT is a group of staff action officers, project managers, functional representatives, and support personnel necessary to operate an Emergency Operations Center.

3-4. Planning and OPLAN's.

a. Plans. HQUSACE, MSC's, and districts will prepare and maintain necessary plans for emergencies and disaster assistance, establishing an alternate EOC, and reconstituting the MSC/district. The plan or plans will be published as Operation Plans (OPLAN's), or standing operating procedures (SOP's), and will address emergency/disaster assistance procedures under all applicable authorities and potential mission assignments. Other OPLAN's or SOP's may be developed to enhance emergency operations.

b. OPLAN's.

(1) Definition. An Operation Plan (OPLAN) is a proposal for executing a command decision or project. It represents the command's preparation for future or anticipated operations.

(2) OPLAN Preparation Requirement. Each division and district will have, as a minimum, an OPLAN that addresses a generic disaster within the division/district. The OPLAN will include general topics such as activating, staffing, and operating the EOC; reporting requirements; notification and alert rosters; and organizing for response to disasters. The OPLAN will have one or more appendices that specifically address the disaster(s) most likely to impact the division/district. Specific OPLAN's addressing different types of disasters may be prepared in addition to the basic disaster OPLAN. OPLAN's prepared under auspices of the Catastrophic Disaster Preparedness Program, the National Emergency Preparedness Program, or the Catastrophic Disaster Response Plans efforts will suffice to meet OPLAN preparation requirements of this paragraph.

c. OPLAN Reviews.

(1) OPLAN's will be reviewed and updated annually to reflect administrative changes such as new key personnel, changes in phone numbers, etc.

(2) The division/district's generic or principal disaster OPLAN will be reviewed, revised, and republished biennially.

d. Format. The format at Figure 3-1 of EP 500-1-1 will be the basic format used for preparation of Emergency Management Operation Plans (OPLAN's) in USACE.

e. Privacy Act. Any personnel directories prepared must comply with the Privacy Act.

3-5. Training. MSC's and districts will ensure personnel assigned emergency assistance responsibilities are properly trained to accomplish them. This includes, but is not limited to, personnel assigned to the EOC, CMT, CAT, Regional Operations Center, Emergency Response Team, Planning and Response Team, levee inspection missions, etc.

3-6. Exercises.

a. Requirement. MSC's and districts are required to conduct an exercise at least once every two years, consistent with available funding. This requirement may be waived by the MSC/District Commander if an actual emergency response was conducted during the two-year period that was of sufficient magnitude to have adequately trained CMT/CAT members and other personnel. The MSC/District Emergency Manager will make a written recommendation to the commander concerning the need for an exercise, with the commander making the final decision.

b. After Action Reports. After action reports (AAR) for exercises conducted will be prepared in accordance with EP 500-1-1 and forwarded to the next higher headquarters and to HQUSACE.

c. Funding. When an MSC or district determines that a programmed exercise is not needed for a given year, any funds allocated for such an exercise will be immediately offered for revocation.

3-7. EOC and Facility Support. MSC's, districts, the 249th Engineer Battalion (Prime Power) and the Topographic Engineering Center will provide a dedicated facility for an EOC to provide command and control for emergency/disaster response and recovery activities. EOC and facility support will be provided in accordance with EP 500-1-1, paragraph 3-5.

3-8. Equipment and Supplies.

a. Equipment and Supplies for Readiness/Emergency Management personnel, and Planning and Response Teams. MSC's and districts will maintain equipment and supplies to be readily available for use by the EOC, disaster field offices, disaster field teams, Planning and Response Teams, and similar entities. Equipment procured for field use may be special, compact, lightweight and/or portable. Such equipment and supplies may include, but are not limited to, the following:

(1) Field kits, office supplies, pagers, telephone answering machines, notebook computers, and telephones. Computers of any kind other than notebook computers are specifically excluded.

(2) Safety and protective items such as hard hats, overshoes, safety glasses, and rain gear. FCCE funds should not to be used to procure such safety and protective items for individuals whose normal job duties require such items.

(3) USACE EMHV items. EMHV items will be used during disaster/emergency responses. MSC's and districts are required to stock those EMHV items centrally procured by the Philadelphia District. MSC Emergency Managers may approve MSC/district requests for EMHV items not centrally procured that are needed to meet mission accomplishment. Items procured under authority of this paragraph will have standard Corps logos on them. No MSC or district name or identification is permitted.

(4) Audio and video equipment and supplies.

(5) Communication devices for weather and news data, if such data are not readily available through Internet sources.

b. Equipment and Supplies for Emergency Operations.

(1) Equipment and supplies may be stockpiled for use during emergency operations and exercises.

(2) Accountability for all equipment and supplies will be maintained in accordance with ER 700-1-1.

(3) Equipment and supplies will not be issued for stockpile to any non-USACE activity.

(4) Pumps and certain other types of equipment (e.g., sandbag filling machines) for use by non-Federal interests during flood emergencies may be procured. Maintenance on pumps and equipment will be funded under Class 240. Maintenance and repair of pumps and equipment in the inventory will be in accordance with ER 750-1-1.

CHAPTER 4
EMERGENCY OPERATIONS - RESPONSE OPERATIONS

4-1. Policy. USACE may provide emergency assistance under PL 84-99 (Class 210, Response Operations, or Class 230, Post Flood Response) to save lives and protect improved properties (e.g., public facilities/services and residential/commercial developments) during or following a flood or coastal storm. USACE may provide technical assistance to save lives and protect improved properties (e.g., public facilities/services and residential/commercial developments) during or following other types of natural disasters.

a. Principle of USACE Emergency Assistance. USACE emergency assistance will be undertaken only to supplement state and local efforts. State, tribal, and local interests must commit all available resources, i.e., work force, supplies, equipment, funds, National Guard assets, etc., as a general condition of USACE assistance.

b. Assistance for Ice Jams. Assistance regarding ice jam clearing and ice jam blasting is limited to technical assistance. USACE will not participate in, nor contract for, ice blasting or ice jam clearing operations.

c. All assistance provided by USACE is subject to the policy in Chapter 2, and this chapter.

4-2. Authorization. MSC and district commanders must request funding prior to activation and/or provision of assistance. Specific exemptions to this are provided at ER 11-1-320. Where other Federal agencies have adequate emergency authorities, USACE assistance under PL 84-99 is not permitted.

4-3. Emergency Operations - Flood Response Operations.

a. Declaration of Emergency. District commanders will issue a Declaration of Emergency in order to implement their flood response operations authorities.

(1) The Declaration of Emergency may initially be verbal, but must be made in writing and reported in the district's SITREP within 24 hours of the declaration.

(2) Authority to issue a Declaration of Emergency is delegated to Deputy District Engineers, and all supervisors in the chain from the District Commander to the Chief of Emergency Management, inclusive. For purposes of a Declaration of Emergency, "Chief of Emergency Management" includes an acting Chief of Emergency Management. District commanders may withhold authority to issue a Declaration of Emergency, either by written correspondence, or via a published OPLAN.

b. Scope of Assistance. USACE assistance during flood fighting operations will be of a temporary nature to meet the immediate threat and to supplement state and local efforts. It is not intended to provide permanent solutions to flood problems.

c. Flood Fight Efforts. USACE flood fight efforts will be in accordance with sound principles of engineering judgement and economic justification.

d. Technical Assistance. Technical assistance consists of providing review and recommendations in support of state and local efforts, and helping determine feasible solutions to uncommon situations. The following are examples of technical assistance:

(1) Providing experienced personnel to give guidance on flood fight techniques and emergency construction methods.

(2) Providing personnel to inspect existing flood protection projects and/or structurally threatened dams to identify problem areas and recommend corrective measures.

(3) Providing hydraulic or hydrologic analysis, geotechnical evaluations, topography and stream data, maps, and historic flood or storm information.

e. Direct Assistance. Direct assistance may include, but is not limited to, the issuance of supplies, the loan of equipment, rescue operations, directing flood fight operations, and contingency contracting. Direct assistance under PL 84-99 is limited to flooding and coastal storm-related emergencies only.

(1) Supplies and Equipment. Issuance of supplies and equipment to non-Federal interests is permitted only in declared flood emergencies. Government supplies and equipment should be made available if the arrival or non-availability of local supplies and equipment will cause delays in the response effort. All unused stocks on loan will be returned to USACE when the operation is complete. USACE supplies and equipment may be loaned to tribal, state, and local officials for use in supplementing their flood fighting operations. Loaned supplies and equipment should be returned in the same condition as it was when lent, replaced in kind, or reimbursement made to USACE. District commanders may waive loan replacement requirements for expendable supplies when a presidential disaster declaration under authority of the Stafford Act has been made. Reimbursement is required for all other situations.

(2) Rescue. USACE may use its resources to assist in rescue operations. Any USACE equipment and personnel used in the operation should be directed by a local official such as a law enforcement officer, or tribal/state/city/county officials duly appointed to conduct rescue operations.

(3) Directing Flood Fight Operations. USACE may direct flood fight operations upon request of an appropriate state or local official. However, legal responsibility remains with the requesting state or local official.

(4) Contingency Contracting.

(a) USACE may award contracts for emergency operations, when reasonable and prudent to do so. Actions will conform with Army Federal Acquisition Regulation Supplement Manual No. 2, entitled Contingency Contracting, and other current guidance. See Chapter 11 for additional information.

(b) Flood fight assistance to a single FCW project/levee district anticipated to exceed $1 million must be coordinated with HQUSACE prior to execution.

(5) A CA is required for all direct assistance and contingency contracting performed. See EP 500-1-1, Chapter 4, Figure 4-2 for the CA format.

(6) Supply. Before commercially contracting for supplies, particularly sandbags during a flood fight, USACE stockpiles, GSA stocks, or Defense Logistics Agency (DLA) supply sources should be given first consideration if timely delivery can be made and the costs are less than or equal to that of the commercial source for equivalent sandbags. All applicable supply and contracting directives will be followed. Contingency contracting methods may be used if needed to meet the mission requirement.

f. Data Collection. Incidental to ongoing flood response operations, the recording of flood data that is (1) unique to the basin, and (2) would be irretrievably lost if not collected during or immediately after a flood, can be accomplished where no other authority exists and no other funds are available. Data collection efforts will be limited to those situations involving record or near-record flood levels, or a set of highly unique circumstances not previously encountered.

(1) Acceptable data collection activities include: ground and aerial photography (not to include controlled aerial photography or map preparation); setting of high water marks for future recovery and documentation under other authorities; and basic hydrologic data not obtainable under other programs, from USACE project activities, or from other agencies.

(2) Detailed flood damage surveys or analysis, collection of economic data, hydrologic studies, compilation of comprehensive flood data, sedimentation surveys, collection of data on socio-economic impacts, and detailed frequency analysis cannot be undertaken using this authority.

(3) Any data collected should be maintained at the district as a permanent reference file. All data collection activities should be substantially complete when the emergency response/Post Flood Response activities are complete.

g. Flood Fighting - Agricultural Levees. Flood fight activities on agricultural levees will be limited to the provision of technical assistance to local interests.

h. Deliberate Levee Cuts.

(1) Effecting a deliberate levee cut to maintain the structural integrity of the levee and/or reduce expected repair costs is a responsibility of the public sponsor. Deliberate levee cuts normally will not be carried out by USACE.

(2) Repairs of deliberate levee cuts are not eligible for Rehabilitation Assistance. An exception will be made for those levees that were deliberately breached after consultation with the Corps, and the Corps acknowledged the validity of the need for the deliberate breach to protect the integrity of the levee (or an adjacent levee system) and thereby reduce overall damages.

i. Ending Flood Response Activities. Field flood response activities substantially terminate when floodwaters recede to bankfull, absent a short-term (less than 72 hours) threat of a return to flood conditions.

j. Reporting. Reporting will be in accordance with the procedures of EP 500-1-1.

k. After Action Reports. After action reports will be prepared as required in Chapter 4, EP 500-1-1, in the format specified.

l. Haul Roads. Refer to paragraph 5-2.t. for policy regarding restoration of haul roads.

m. Pumps. Exclusive of Corps project operations, USACE-owned and USACE-leased pumps are to be used only for floodfight purposes, and not for dewatering purposes.

4-4. Emergency Operations - Disasters Other Than Floods. Under PL 84-99 authority, operations during non-flood emergencies are limited to activation of EOC's, rescue operations, the provision of limited technical assistance, and liaison activities. These activities are properly funded under Class 210 until the situation clarifies, and disengagement of USACE resources or the identification of more appropriate USACE resources and funding can be made. District commanders will issue a Declaration of Emergency in order to implement their response operations authorities.

(1) The Declaration of Emergency may initially be verbal, but must be made in writing and reported in the district's SITREP within 24 hours of the declaration.

(2) Authority to issue a Declaration of Emergency is delegated to Deputy District Engineers, and all supervisors in the chain from the District Commander to the Chief of Emergency Management, inclusive. For purposes of a Declaration of Emergency, "Chief of Emergency Management" includes an acting Chief of Emergency Management. District commanders may withhold authority to issue a Declaration of Emergency, either by written correspondence, or via a published OPLAN.

4-5. Post Flood Response. Following floods, hurricanes, or coastal storms, but *prior to* a Presidential declaration pursuant to the Stafford Act, USACE may provide Post Flood Response assistance. A Declaration of Emergency is required.

a. Limitation of Activities. Post Flood Response activities are limited to actions to save lives and protect improved property (e.g., public facilities/services, and residential or commercial developments).

b. Limitation of Scope of Post Flood Response. Post Flood Response activities are limited to major floods, hurricanes, and coastal storms.

c. Debris Clearance - Transportation Routes. Clearance of debris from transportation routes is permitted when it is required to prevent loss of life or significant damage to public property, as determined by the MSC or district commander. Clearance of debris may be undertaken to reopen critical transportation routes, e.g., for emergency vehicles and access to medical facilities. Debris removal (i.e., movement of the debris to a disposal area or dump) will not be undertaken under Post Flood Response.

d. Debris Clearance - Blockage. Clearance of debris blocking critical water intakes, sewer outfalls, etc., may be undertaken.

e. Debris Clearance - Water Courses. Clearance of drainage channels, bridge openings, or structures blocked by flood-deposited debris may be undertaken if critical for the restoration of public services and access, public safety, or to prevent further significant damages.

f. Restoration of Transportation. Restoration of critical transportation routes, public facilities, and public services may be undertaken.

g. Limitation of Assistance. Assistance to individual homeowners and businesses (to include agricultural property) is not permitted.

h. Coordination Requirement. All potential work must be coordinated by the MSC or district with the appropriate FEMA region prior to execution of the work.

i. Governor's Request. A written request for Post Flood Response from the governor to the district commander will be provided concurrently with or immediately after the governor's request to FEMA for a disaster declaration under the Stafford Act. This request must:

(1) Indicate that the recovery work is beyond the capability of the state to accomplish;

(2) Identify specific damage locations; and,

(3) Detail specific requirements for USACE assistance.

j. The Ten Day Rule. USACE assistance may be provided for a maximum of ten (10) days from the date of receipt of the governor's request for assistance. Subsequent requests for additional assistance resulting from the same disaster will not extend the 10-day period or trigger a new 10-day period. No work, including contract work, shall be performed after the 10-day period expires. No work shall be initiated subsequent to a Presidential disaster declaration. No work shall be initiated after denial of such a request for a declaration.

k. Types of Assistance. Post Flood Response assistance may be technical assistance and/or direct assistance.

(1) Prior to providing any Post Flood Response technical assistance, the providing district must notify its higher headquarters that technical assistance will be provided.

(2) Prior to providing any Post Flood Response direct assistance by contract, HQUSACE approval is required. Direct assistance shall be limited to alleviation of life threatening situations.

l. All Post Flood Response direct assistance activities require a CA. See EP 500-1-1, Chapter 4, Figure 4-3, for the CA format.

m. No data collection efforts of any kind are permitted under Post Flood Response.

4-6. Funding. ER 11-1-320 prescribes funding procedures for activities under PL 84-99. When Emergency Operations - Response Operations activities are initiated, appropriate funds must be immediately requested in accordance with ER 11-1-320. FCCE funding for flood fights is normally applicable only to those projects for which the public sponsor has full operation and maintenance responsibility, regardless of a project’s status in the RIP.

a. Corps Operated and Maintained Flood Damage Reduction Projects. For a project that is funded with USACE Operations and Maintenance, General (O&M Gen) funds, emergency work will be funded using project funds. If project funds are not adequate to fund the emergency work, then Class 210 funding can be requested as a last resort to undertake the emergency work required. Project funds available at a later date will be used to reimburse FCCE funds expended during the operation.

b. USACE-Funded Flood Damage Reduction Projects Under Construction. Emergency work on USACE projects under construction is to be funded from project funds. If the legal limitation on expenditure of funds is or may be reached, then Class 210 funding can be requested, as a last resort, to undertake the emergency work required.

4-7. Reporting. Reporting will be done as addressed in Chapter 4, Section V, EP 500-1-1, or as modified by HQUSACE.

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CHAPTER 5
REHABILITATION AND INSPECTION PROGRAM (RIP)

Section I - General

5-1. Rehabilitation and Inspection Program. The RIP is the USACE program that provides for inspections of FCW's, the rehabilitation of damaged FCW's, and the rehabilitation of Federally authorized and constructed hurricane or shore protection projects (HSPP).

5-2. RIP Policy. USACE may rehabilitate FCW damaged or destroyed by flood, and Federally authorized and constructed hurricane or shore protective structures damaged or destroyed by wind, wave, or water action of an other than ordinary nature. This assistance may be provided subject to the policy of Chapter 2, and the policy, criteria, and conditions of this chapter. All aspects of work related to rehabilitation of damaged flood control works and HSPP's are to be addressed using all available methods of urgency, exigency, and expediency, consistent with providing responsive, cost effective assistance. Contracts for repair of damaged FCW's will be awarded within 60 days of project approval, or, if the equipment rental method of repair is used, then the repair work must be initiated within 60 days of project approval. Any exception to this 60-day time frame must be approved by the MSC, and reported via SITREP. See paragraph 5-20.j. for time frames for HSPP Rehabilitation Assistance.

a. Rehabilitation Assistance and Active Status. Rehabilitation Assistance is limited to Federal and non-Federal FCW's, and Federally authorized and constructed HSPP's, that are in an Active status in the RIP at the time of the hurricane, storm, or flood event and which are damaged by floods, hurricanes, or coastal storms. See paragraph 5-6 below for information on Active status. No flood control project deemed to be in an unacceptable condition (e.g., for severe deficient maintenance, or unsound engineering) will be placed in an Active status. No flood control project will be placed in an Active status if the public sponsor does not have apparent intent or capability to adequately maintain the project.

b. Rehabilitation Assistance Scope. Rehabilitation Assistance is limited to repair or restoration of an FCW to its pre-disaster condition and level of protection (e.g., the actual elevation of the levee, allowing for normal settlement.)

(1) Improvements to design and equipment (e.g., geomembranes) that are a result of state of the art technology, and are commonly incorporated into current designs in accordance with sound engineering principles, are permissible, and are not considered betterments.

(2) Increasing the cross section (but not the height) of a levee is not considered a betterment if the increase is considered to be reasonable and necessary.

c. Rehabilitation Assistance Not Permitted. Structures built for channel alignment, navigation, recreation, fish and wildlife, land reclamation, drainage diversion, or to protect against land or shoreline erosion or salt water intrusion are not FCW's, and are not permitted Rehabilitation Assistance. Section 32 streambank erosion demonstration projects are not permitted Rehabilitation Assistance.

d. Damage from Other Than Floods and Coastal Storms. FCW's damaged by occurrences other than floods, hurricanes, or coastal storms (e.g., non-flood disasters such as earthquakes or volcanic eruptions) are permitted RIP Rehabilitation Assistance. In such instances, HQUSACE approval is required prior to initiation of the PIR, and project approval authority will be at HQUSACE level.

e. Bank protection works, river control structures, or other projects constructed by USACE (to include Section 14 projects and specifically authorized bank protection projects) are not eligible to receive Rehabilitation Assistance. Exceptions may be granted by HQUSACE on a case-by-case basis. No FCCE funds will be expended investigating potential exceptions without prior approval from HQUSACE. The project approval process of this chapter and EP 500-1-1 will be followed for exceptions when approved. For exceptions to be considered:

(1) No other repair authority may exist.

(2) There must be a significant Federal interest in restoring the project. Mere construction of the project by USACE, ongoing maintenance by the public sponsor, and/or existence of a PCA does not constitute significant Federal interest. Significant Federal interest includes a favorable determination that the structure would likely be constructed as a new project under contemporary USACE criteria for a similar type of project.

(3) Rehabilitation must be beyond normal Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) provisions for which the project was designed and agreed to in the PCA executed between USACE and the public sponsor.

f. Poor Maintenance. Rehabilitation Assistance will not be provided to an FCW that, as a result of poor maintenance, has deteriorated to the point that substantial reconstruction is required.

g. Deficient or Deferred Maintenance. If deficient or deferred project maintenance is outstanding when damage to an FCW occurs, then the deficient and deferred maintenance will be accomplished by or at the expense of the public sponsor, either prior to or concurrently with approved Rehabilitation Assistance. When work accomplished by USACE corrects

accumulated deferred or deficient maintenance, the estimated deferred maintenance cost will be borne by the public sponsor and paid prior to the start of actual project rehabilitation. This work will not be creditable toward the sponsor's cost share.

h. Alternative Plans. In providing Rehabilitation Assistance, alternative plans (e.g., levee setback, revetments, bulkheads, or sea walls) for providing equivalent protection by an FCW will be developed and compared on a technical and economic basis. Any increase in Federal cost resulting from a public sponsor's preference of any alternative, other than the one that is least expensive to the Federal Government when all Federal costs are included, will be borne by the public sponsor.

i. Design and Construction Deficiencies. Rehabilitation Assistance will not be used to correct design or construction deficiencies of existing projects constructed by USACE, except as a last resort emergency measure to protect human life.

j. Deliberate Levee Cuts. Repair of deliberate levee cuts is a public sponsor responsibility. It will be accomplished at non-Federal expense, except in cases where the cut was made in accordance with paragraph 4-3.h.

k. Rehabilitation Assistance at Military Installations. FCW Rehabilitation Assistance on military installations will not be accomplished under PL 84-99. Rehabilitation work at military installations may be provided under 10 U.S.C. 2854 or other applicable authorities.

l. Channel Projects. Restoration of channel improvement projects to pre-flood hydraulic capacity is permitted under PL 84-99 when floodwaters have deposited debris and silt such that the channel capacity has been decreased to 75 percent or less of the pre-flood capacity. Removal of normal or annual siltation will not be funded using FCCE funds, as this is a normal sponsor O&M responsibility.

m. Loss of Vegetative Cover. When loss of vegetative cover is a direct result of the flood event, to include those losses caused by prolonged inundation, use of FCCE funding for revegetation is appropriate. Areas outside of structural damage should be evaluated based on the threat to the structural integrity of the unit, the probability of natural revegetation, and past maintenance practice. The possibility of natural revegetation will always be considered as the primary option for revegetation.

n. Modification Limitation. Rehabilitation Assistance will not be used to modify an FCW to increase the degree of protection or capacity, to provide protection to a larger area, or to correct deficiencies in the project.

o. Betterments. Betterments wanted and paid for by the public sponsor may be accomplished provided they are related to the basic rehabilitation project and they can be accommodated in the construction of the basic rehabilitation project. Betterments are funded 100 percent by the public sponsor. The costs of such betterments will not be included in the rehabilitation project cost or economic evaluation. For informational purposes only, betterment costs will be included with cost estimate data.

p. Dewatering. Only dewatering costs incurred by a Corps contractor that are associated with actual repair activities are eligible for Corps funding. Dewatering for other purposes (e.g., to return agricultural land to production) is the responsibility of the public sponsor, and is not eligible for Corps funding.

q. Minimum Required Construction Cost. If the estimated construction cost (not including contingency amounts, or E&D or S&A amounts) to repair damages to an FCW is less than $15,000, then no Rehabilitation Assistance is permitted. The repair will be mandatorily categorized as sponsor maintenance, and will be the public sponsor's O&M responsibility to repair. Determination of the estimated construction cost is made without regard to any cost sharing requirements.

r. Benefit Cost Ratio. Rehabilitation Assistance projects must have a favorable BCR (i.e., > 1.0) in accordance with the Principles and Guidelines contained in Chapter 6, ER 1105-2-100, regarding National Economic Development (NED) Benefit Cost Analysis.

s. Projects with Multiple Public Sponsors. For each hydrologically independent FCW project with multiple public sponsors, the entire FCW must meet all RIP provisions to be eligible for Active status and for Rehabilitation Assistance. It is the responsibility of the multiple public sponsors, and not of USACE, to coordinate all necessary sponsor actions, responsibilities, and obligations under the RIP.

t. Haul Roads. Haul road restoration activity is an acceptable cost under authorized PL 84-99 activities when Corps activity has degraded the haul road’s condition from the condition that existed immediately prior to the beginning of the Corps activity.

(1) All contracts for floodfight efforts or rehabilitation efforts will contain the following clause, or wording that is similar in spirit and intent: “The contractor shall preserve and protect all existing private access roads, haul roads, and/or right-of-way roads. At completion of the work and prior to the contractor leaving the project/work site, the contractor shall restore to pre-project conditions all such roads at its own expense. Restoration/repair efforts shall include replacement of base rock and/or surface treatment as required.”

(2) When administering floodfight or rehabilitation contracts with the haul road restoration clause, the responsible district will be diligent in recording and documenting the pre-project

condition of the haul roads to be used. Documentary evidence will include a statement or record addressing the overall condition of the haul road, and photographs and/or videotape of the haul road. For floodfight activities that begin in the hours of darkness, all efforts will be made to record haul road conditions as soon as weather/light conditions allow.

(3) Haul road restoration activity is not intended to restore the haul road to its original design standard, or to the "acceptable" standard set forth for non-Federal levees in EP 500-1-1. It is, instead, intended to restore the haul road to its pre-project condition. Proper stewardship of funds will be exercised, e.g., if a floodfight operation caused additional gravel to be placed on the levee crown road to provide an adequate bearing surface for haul vehicles, then the restoration effort would likely consist of a limited amount of grading, but not gravel removal. Districts will exercise good judgment in requiring haul road restoration when the levee rehabilitation effort will occur shortly after the floodfight effort is completed.

(4) For repairs done by equipment rental contracts or Corps force labor accounts, the responsible district will ensure that its actions are in accord with the contract requirements specified above.

u. Debris Detention Basins. Debris detention basins, if a designed and integral component of a flood control project, may be rehabilitated for damages caused by a flood event. However, removal of accumulated debris is the public sponsor's O&M responsibility, and is not eligible for Rehabilitation Assistance.

v. Standard Limits for Costs.

(1) For construction contracting using PL 84-99 funds, contingency amounts are limited in order to allow HQUSACE maximum flexibility to address new emergencies. For dredging contracts, the maximum allowable contingency percentage is 15 percent of the construction cost of the project. For all other types of contracts, the maximum allowable contingency percentage is 10 percent of the construction cost of the project.

(2) E&D costs for projects where the construction cost is less than $100,000 are limited to a maximum of 10 percent.

(3) E&D costs for projects where the construction cost is greater than $100,000 are limited to a maximum of six percent, or $11,000, whichever is greater.

(4) S&A costs for projects where the construction cost is less than $100,000 are limited to a maximum of 10 percent.

(5) S&A costs for projects where the construction cost is greater than $100,000 are limited to a maximum of six percent, or $11,000, whichever is greater.

(6) Should circumstances merit higher amounts for E&D and/or S&A, then justification will be included in the initial funding request, or with a supplemental funding request.

5-3. Eligibility for Inclusion in the RIP.

a. General. Eligibility for inclusion in the RIP specifies the broad categories of FCW's that can be admitted into the RIP. Eligibility for inclusion implies no obligation on the part of USACE or on the part of the public sponsor. The following types of FCW are eligible for inclusion in the RIP:

(1) Federally authorized and constructed HSPP's.

(2) Federally constructed, locally maintained levees and floodwalls.

(3) non-Federally constructed, locally maintained levees and floodwalls that provide a minimum of a 10-year level of protection with 2 feet of freeboard to an urban area, or a minimum of a 5-year level of protection with 1 foot of freeboard to an agricultural area.

(4) Federally constructed, locally maintained flood control channels.

(5) non-Federally constructed, locally maintained flood control channels that provide a minimum of a 10-year level of protection. [NOTE: Interior drainage channels within the protected area of a levee system are not flood control channels.]

(6) Pump stations integral to FCW.

(7) Federally constructed, locally maintained flood control dams.

(8) non-Federally constructed, locally maintained flood control dams.

b. Ineligible Categories. The following categories of FCW are ineligible for inclusion in the RIP:

(1) Structures built for channel alignment, navigation, recreation, fish and wildlife, land reclamation, bank protection, or drainage diversion. Structures built to protect against land or shoreline erosion. Structures built to protect against salt-water intrusion.

(2) Those FCW operated and maintained by USACE or other Federal agencies. This category includes those FCW operated with USACE Operations and Maintenance, General funds, and FCW funded with Mississippi River and Tributaries funds.

(3) USACE or other Federal agency projects uncompleted or under construction.

(4) Any non-Federal FCW under construction.

(5) Projects built by USACE under authority of Section 32 of the Streambank Erosion Control Evaluation and Demonstration Act of 1974.

(6) Those FCW constructed, modified, or repaired with financial assistance from other Federal agencies (e.g., Bureau of Reclamation, FEMA, and Natural Resources Conservation Service), unless exceptions are granted by HQUSACE.

(7) Secondary levees, unless they protect human life.

(8) Channel-type FCW with a drainage area less than 1.5 square miles, or a capacity less than 800 cfs.

(9) Any levee (other than a ring levee that provides 360 degrees of protection) that is not tied to high ground at each end of the levee. High ground may be natural (e.g., a bluff, a hill, or a slope) or constructed (e.g., a highway bridge or overpass embankment, an elevated roadway, or a floodwall.)

5-4. Funding.

a. Inspections. Funding for Initial Eligibility Inspections (IEI's), and Continuing Eligibility Inspections (CEI's) for non-Federal FCW's, will be in accordance with ER 11-1-320. Funding for the maintenance inspections (CEI's) of Federal FCW will be O&M, General, 96x3123.

b. FCW Rehabilitation Investigations and Rehabilitation Work. These activities will be funded in accordance with ER 11-1-320.

c. FCW Database Management. FCW Database management is a primary and inherent emergency management responsibility. Funding for management of the FCW Database is provided for under the annual Class 380 allocation.

***Section II* - Administration of the RIP**

5-5. RIP Establishment and Maintenance. Districts will establish and maintain a RIP in accordance with this chapter and EP 500-1-1. The RIP includes the establishment and maintenance of an automated FCW database for FCW's, the performance of Initial Eligibility Inspections (IEIs) for non-Federal FCW's, the performance of Continuing Eligibility Inspections (CEI's) for FCW's, and rehabilitation of damaged FCW.

a. FCW Database. Districts will establish and maintain an automated FCW Database of all known FCW's, Federal and non-Federal. The FCW Database will include the information listed in EP 500-1-1 for all Federal projects, all non-Federal Active projects, and for previously Active but currently Inactive projects. The FCW Database will include as much information as is available for Inactive projects. A nationwide levee database is being developed. Refer to EP 500-1-1, paragraph 5-3, for procedures regarding the FCW Database.

b. Inspection Process. Refer to EP 500-1-1, paragraph 5-5, regarding general information on the USACE inspection methodology, rating codes, project condition codes, and related items for RIP inspections.

(1) Non-Federal FCW.

(a) Request for IEI. The public sponsor of an Inactive non-Federal FCW may request an IEI for the purpose of becoming Active in the RIP. Funding for IEI's will be requested from HQUSACE on an as needed basis.

(b) IEI's. The IEI will consist of an on-site inspection of the FCW using the Inspection Guide in EP 500-1-1, Appendix A. The IEI will be used to establish the acceptable and minimum performance levels for non-Federal FCW to gain an Active status in the RIP. IEI's will be conducted by technical staff experienced in FCW design, construction, maintenance, and damage investigations.

(c) First CEI After IEI. The first CEI following the IEI will be accomplished within two years after Active status is attained, or after the sponsor has notified the district that all minimally acceptable ratings have been upgraded to an acceptable level, whichever is earlier.

(d) CEI's. CEI's will normally be conducted biennially for non-Federal FCW. For sponsors of projects with historically good ratings, the district may extend the frequency of inspection to a triennial basis. Districts will conduct CEI's using the Inspection Guide in Appendix A, EP 500-1-1 for all non-Federal FCW's in an Active status. A project condition code (in accordance with paragraph 5-5, EP 500-1-1) will be given for each CEI conducted.

(2) Federal FCW's.

(a) IEI's. IEI's are not conducted on Federal FCW's. Federal FCW's are considered to be in an Active status when the Corps turns over the project to the public sponsor for operation and maintenance.

(b) CEI's. CEI's will be conducted at least biennially for Federal FCW, unless ER 1130-2-530 permits a longer period. The CEI is used to verify that the FCW continues to meet minimum acceptable performance levels for the RIP. Districts will conduct CEI's using the

Inspection Guide in EP 500-1-1, or in accordance with ER 1130-2-530. A project condition code (in accordance with paragraph 5-5, EP 500-1-1) will be given for each CEI conducted.

c. Reporting Results of Inspections.

(1) IEI's. Results of IEI's will be provided to the public sponsor within 30 days of the inspection. The district will prominently note that Marginally Satisfactory item(s) must be upgraded to Satisfactory within no more than three years. The district should consider notifying the FEMA Region, the state emergency management agency, and the local level (e.g., county) emergency management agency of inspection results. These notifications may be done on an inspection by inspection basis, or via a consolidated report covering multiple inspections.

(2) CEI's. Results of CEI's will be provided to the public sponsor within 30 days of the inspection. FCW's that have undergone a CEI with a project condition code of Acceptable or Minimally Acceptable will retain an Active status in the RIP. The district will prominently note that Marginally Satisfactory items must be upgraded to Satisfactory within a period of not more than two years. As an exception to this, if the CEI is within the three-year grace period of the IEI that resulted in a project condition code of Minimally Acceptable, then the public sponsor will have the original IEI three year period, but no additional time, to upgrade the Marginally Satisfactory items from the IEI.

(3) An FCW that receives a project condition code of Unacceptable is immediately placed in an Inactive status. See paragraph 5-8.

(4) When an Active FCW changes to Inactive status because of an Unacceptable condition on a CEI, in addition to notifying the public sponsor, the district will notify the state emergency management agency and the local level (e.g., county) emergency management agency. The purpose of these notifications is to ensure that the responsible emergency management officials are aware that the Inactive flood control project will no longer provide a reliable level of protection against flooding, and the agencies may need to review or adjust their emergency response plans. These notifications may be done on an inspection by inspection basis, or via a consolidated report covering multiple inspections, and may include both IEI and CEI.

(5) When a levee that has been certified for the National Flood Insurance Program receives a project condition code of Unacceptable, the district will notify the MSC in writing. The MSC will notify the appropriate FEMA region of the Unacceptable condition.

d. Eligibility Disagreements. If a public sponsor disagrees with an Unacceptable condition given by USACE for an IEI or CEI, the district will inform the sponsor of its right to submit a reclama. The reclama must include pertinent engineering data. Validation of or comment on the reclama by a responsible Professional Engineer is preferable, but not mandatory, at the

public sponsor's option. If the district stands by its original decision after considering the reclama, the district will notify the sponsor in writing of why it rejects the reclama, and advise the sponsor of its right to appeal to the Division Engineer.

(1) Districts and MSC's will submit appeals up to the Chief, Operations Division, HQUSACE. The decision at USACE Headquarters will be considered final.

(2) If the sponsor's reclama is upheld on appeal, then the FCW will return to an Active status. Any damage incurred by the FCW during the reclama/appeal process will be eligible for Rehabilitation Assistance (assuming all other criteria are met) if the appeal is upheld.

e. Information for Sponsors of Inactive FCW. Districts will be proactive in providing information to sponsors of Inactive FCW concerning upgrading their projects in order to become Active in the RIP. This includes providing Levee Owner's Manuals.

5-6. Active Status. Only those FCW in an Active status at the time of the flood or storm event may receive Rehabilitation Assistance under authority of PL 84-99. A project is considered Active if it has a public sponsor, and meets one of the following:

a. Is a non-Federal FCW that has:

(1) Received an IEI by USACE, with a project condition code of Acceptable or Minimally Acceptable, and,

(2) Received a project condition code of Acceptable or Minimally Acceptable on the latest CEI.

b. Is a non-Federal FCW that was damaged in a flood, but has a valid written request from the public sponsor requesting an IEI on file at the responsible district headquarters that was received prior to the flood event, but for which the IEI had not been performed by USACE. Projects in this category will be given an IEI, and must be subsequently determined to meet all eligibility requirements needed for Active status in order to be placed in an Active status and be eligible to receive Rehabilitation Assistance. Sound engineering judgement and reasonable extrapolations will be applied when inspecting and evaluating the damaged levee.

c. is a Federally constructed, locally maintained FCW that met acceptable ICW maintenance standards during the latest CEI.

d. is a Federally authorized and constructed HSPP that met acceptable ICW maintenance standards during the latest ICW inspection.

5-7. (Reserved.)

5-8. Inactive Status. Any FCW eligible for inclusion in the RIP (see paragraph 5-3) that is not in an Active status is considered to be in an Inactive status. Inactive status includes any FCW that was previously in an Active status, but was removed from Active status by USACE because of reasons such as receiving a project condition code of Unacceptable on a CEI, dissolution of the public sponsor, or withdrawal of sponsorship by the public sponsor. Inactive FCW will not receive PL 84-99 Rehabilitation Assistance. FCW remain in an Inactive status until receiving a project condition code of Acceptable or Minimally Acceptable on an IEI.

Section III - Rehabilitation Assistance

5-9. Actions After Occurrence of a Flood Event.

a. Notice to Public Sponsors. District commanders will issue a Notice to Public Sponsors immediately after significant flood events to alert public sponsors of Active projects that a submittal deadline is in effect for USACE assistance to repair damaged FCW under PL 84–99. The submittal deadline will be 30 calendar days from the date the floodwaters recede to bankfull. For special conditions, MSC commanders may extend the deadline for an additional 30 days. The format is provided in EP 500-1-1, Chapter 5, Figure 5-2.

b. Project Information Reports (PIR's). PIR's for Rehabilitation Assistance will be prepared in accordance with EP 500-1-1, paragraph 5-11.

(1) Benefit to Cost Ratio. The BCR must be greater than 1.0 for the PIR to be approved.

(2) PIR Approval Authority. The approval authority for Rehabilitation Assistance PIR's is the Division Commander. The Division Commander may delegate approval authority to a member of the Senior Executive Service on the division staff, or a permanently designated Deputy Division Engineer. Further delegation of authority to approve PIR's is not permitted.

c. Interagency Process for Nonstructural Alternatives. The intent of this interagency process is to allow those agencies with programs for nonstructural alternatives to repairing levees the opportunity to work with public sponsors who may wish to consider a nonstructural alternative. When needed, an Interagency Levee Task Force (ILTF), headed by USACE, will be implemented. (See paragraph 5-24 for additional information regarding the ILTF.) To implement the interagency *Federal Levee Policy*, MSC's will notify other Federal agencies, such as the Natural Resources Conservation Service (NRCS) and the U.S. Fish and Wildlife Service, of all applications for Rehabilitation Assistance being processed by USACE.

d. General Procedures. For general procedures to be followed after occurrence of a flood event, refer to EP 500-1-1, Chapter 5, Section III.

5-10. Cooperation Agreements.

a. Non-Federal FCW's. Prior to USACE providing Rehabilitation Assistance for FCW's, a CA will be executed between the public sponsor and USACE. The CA for Rehabilitation Assistance is provided in EP 500-1-1, Appendix B, Figure B-1.

b. Federal FCW's. A CA is generally not used for Rehabilitation Assistance on a Federal FCW, because Federal projects have a Project Cooperation Agreement (PCA) from the original construction of the project. In lieu of a CA, the district will notify the public sponsor of its requirements (e.g., normal a-b-c's) via memorandum. In the event that no PCA exists from the original construction, or no PCA was executed when a non-Federal FCW was declared to be a Federal FCW through Congressional Act, or the original PCA does not adequately cover required aspects of the current rehabilitation effort, then a CA is required. The CA for Rehabilitation Assistance is provided in EP 500-1-1, Appendix B, Figure B-2.

5-11. Cost Share Determination.

a. Cost Sharing Percentages. Rehabilitation of non-Federal projects will be cost shared at 80 percent Federal and 20 percent from the public sponsor for cost sharable items. Rehabilitation of Federal projects will be at 100 percent Federal cost for cost sharable items. See paragraph d. below for cost sharable items.

b. USACE Costs. USACE will fund, at 100 percent Federal cost, costs associated with the preparation and approval of PIR's, and engineering and design costs for approved projects. USACE costs will also include updating O&M Manuals for Federal projects to reflect changed conditions due to the rehabilitation effort.

c. Public Sponsor Costs. The public sponsor is responsible for providing certain items at 100 percent local cost. These items do not constitute credit towards the public sponsor's local cost share. Public sponsor costs include:

(1) any costs associated with normal a-b-c's.

(2) accomplishment of normal or deferred or deficient maintenance items.

(3) any betterments to the project.

d. Cost Sharable Items. Cost sharable items include construction costs, supervision and administration (S&A) costs, and contingency costs for construction.

e. Exceptions to Normal Cost Sharing and Cost Sharable Items. Under certain circumstances, cost sharing, USACE costs, and cost sharable items (subparagraphs a., b., and d., above), will be modified as follows:

(1) Transportation of borrow material from the closest acceptable borrow source (as determined by USACE) is a cost sharable item. Increased (incremental) transportation costs of borrow material not from the closest acceptable borrow source (as determined by USACE) will be borne 100 percent by the public sponsor. These incremental costs are not creditable toward the public sponsor's cost share.

(2) As an exception to paragraph b. above, cost sharing for PIR's and engineering and design work is required under the following conditions:

(a) Once a Project Information Report is approved, any additional investigation costs or E&D costs incurred because of a sponsor-requested change to the scope of work, FCW alignment, or similar items will be cost shared at 50 percent Federal cost and 50 percent local cost. If the sponsor-requested change results in a lower overall Federal cost, then the Federal cost share will revert to 100 percent.

(b) Once a PIR has been approved, any additional project costs incurred because of a public sponsor’s inability or unwillingness to sign the CA (regardless of the reason leading to the inability or unwillingness) within a reasonable time will be cost shared at 50 percent Federal and 50 percent local. A “reasonable time” is defined as 30 days, absent extraordinary circumstances.

(3) If the public sponsor prefers an alternative method of repair that is not the least cost to the Federal government alternative, the public sponsor shall pay 100 percent of the additional costs above the least cost alternative.

f. Manner of Contribution. The local cost share contribution may be cash, work in kind, or a combination of these.

(1) Work in kind consists of labor, equipment, supplies, and/or services provided by the public sponsor. Labor is defined as blue collar-type work normally paid on an hourly wage basis, comparable to Federal Wage Grade positions.

(2) Credit for accomplishment of work in kind is determined by the estimated cost for USACE to perform or contract for the same work. When determining work-in-kind effort, public sponsors will not to be penalized for contracting or work efficiencies.

(3) Work in kind done by the public sponsor will be inspected by USACE to ensure it conforms to USACE requirements.

g. Use of Funds from Other Federal Agencies. A public sponsor may use funds from other Federal agencies to meet its local cost share, provided the granting Federal agency confirms in writing that use of such funds is not prohibited by law.

h. Final Accounting. Upon project completion, a final accounting will be performed to determine proper payment of the local cost share. Any work in kind performed will be credited first, and then cash payments will be credited. If the actual amount of the local share exceeds 20 percent, then any cash payments above the 20 percent level will be refunded to the public sponsor, in accordance with ER 11-1-320. No reimbursement for work-in-kind in excess of 20 percent is authorized.

5-12. Special Circumstances for USACE Constructed FCW.

a. Design/Construction Deficiencies. Policy on correction of design and/or construction deficiencies at USACE-constructed, locally operated and maintained projects is set forth in ER 1165-2-119. It states that work to correct design or construction deficiencies may be recommended for accomplishment under existing project authority without further Congressional authorization, if applicable requirements are met. Deficiencies will not be corrected with FCCE funds, except as a last resort emergency measure to protect human life.

b. Changed Conditions. In instances where the need for project modification is due to changed physical condition since project construction, the project should be reviewed under the authority of Section 216 of the 1970 Flood Control Act, or other appropriate study authority. Where appropriate, necessary Congressional authorization should be pursued to correct problems with the project. Deficiencies due to changed conditions will not be corrected with FCCE funds.

5-13. Environmental Considerations.

a. General. Most rehabilitation projects fall under the exemptions contained in 33 CFR 323.4 or are permitted by Nationwide Permit Number 3 (NWP 3) (Maintenance) or by NWP 31 (Maintenance of Existing Flood Control Activities). Regional General Permits issued by District Commanders may also allow for certain maintenance or repair activities. For work not so exempted or permitted by general permits, the standard permit evaluation will be followed unless the MSC Commander approves the use of emergency procedures, in accordance with 33 CFR 325.2(e)(4), based on a determination that normal procedures will result in an unacceptable hazard to life, a significant loss of property, or an immediate and significant economic hardship.

(1) NWP 3 authorizes the repair, rehabilitation, or replacement of previously authorized and currently serviceable structures or fill under the authorities of both Section 404 and Section 10 of the Rivers and Harbors Act of 1899.

(2) NWP 31 authorizes the maintenance of existing flood control facilities (including debris basins, detention/retention basins, and channels), that were previously authorized by the Corps by Individual Permit, General Permit, by 33 CFR 300.3, or did not require a permit at the time it was constructed, or were constructed by the Corps and transferred to a non-Federal sponsor for operation and maintenance (i.e., a Federal project).

(3) Section 404(f)(1) of the CWA, as implemented by 33 CFR 323.4(a)(2), specifically exempts routine maintenance of levees (which includes tree cutting and tree root removal) from the requirement to obtain a Department of the Army (DA) Permit, pursuant to Section 404. This exemption is applicable to all levees constructed before 1972, and to those levees that were constructed since that date, that required and received DA Permits for construction. It is assumed that any non-Federal levee that is Active in the RIP has been appropriately investigated and determined to be in compliance with applicable provisions of the CWA, and has received the necessary permits for construction.

(a) The routine maintenance exemption applies only within the physical limits of the levee.

(b) The requirements for (and exemptions from) DA Section 404 Permits apply only to those levees involving work within the waters of the United States (U.S.) (as defined at 33 CFR Part 328).

(c) Levees (or sections of levees) that are not within the waters of the U.S. do not require DA approval, either under Section 404 or Section 10.

(d) Other permits (e.g., from a State Fish and Wildlife Agency) may be required regardless of the need for a DA permit.

(e) Levee maintenance does not include any modification that changes the character, scope, or size of the original fill design for the levee.

(4) Some local jurisdictions have passed laws and ordinances prohibiting tree cutting or tree root removal. ER 500-1-1, in implementing 33 CFR Part 203 and Public Law 84-99, takes precedence over state and local laws and ordinances addressing this matter. This situation applies even when the public sponsor is performing (or contracting for) this work on a non-Federal levee.

(5) Mechanized tree and root removal within nonstructural channels may require authorization under Section 404 and/or Section 10.

(6) EM 1110-2-301, Guidelines for Landscape Planting at Floodwalls, Levees, and Embankment Dams, provides criteria for the design of landscape plantings at levees. Refer to this manual for guidance on root-free and vegetation-free zones.

b. Water Quality. If the processing of an individual DA Permit is required, a Section 401 Water Quality Certificate, or waiver thereof, must be obtained from the state, if a DA Section 404 discharge is involved. District commanders will establish reasonable periods of time for states to act on 401 certification requests in accordance with 33 CFR 325.2(b)(I)(ii) and will seek to obtain advance 401 certification from states to cover emergencies.

c. Coastal Zone Management. District commanders will develop procedures with those states having approved Coastal Zone Management (CZM) plans to ensure that those states complete their actions on CZM certifications as quickly as possible.

d. Inclusion in Operation Plans. The procedures developed to implement subparagraphs b. and c. above will be included in the MSC and District Operation Plans for disasters. Similar procedures will be arranged with states that have assumed control of the Corps Section 404 permit program through transfer.

e. Environmental Assessment. An environmental assessment will be made of actions to be taken on each approved project. Guidance provided in paragraph 2-3.k. will be followed.

f. Executive Order 11988. The provisions of EO 11988 are normally not applicable to the rehabilitation of FCW to pre-disaster condition. However, a major rehabilitation project, one requiring extensive engineering and design and a significantly changed footprint, is to be evaluated for its impact on the floodplain. In those instances where the overall impacts of the project could be so adverse that restoration would be imprudent, repairs will be made only if the project protects human life and does not create a 1-foot increase in the floodway water surface elevation used to design the main levee. The repair of pump stations is not considered to be adverse and incompatible development of the floodplain, and should not affect approval of a Project Information Report.

g. Endangered Species Act. The Endangered Species Act procedures contained in 50 CFR Part 402 (Section 7) and in ER 1105-2-100, paragraph 7-33b.(10), will be implemented at the earliest possible moment, after the initial repairs have started, so as to avoid delays that could cause unacceptable risks to life or property.

h. National Historic Preservation Act. Section 106 of the National Historic Preservation Act of 1966 requires the Corps to take into account the effects of its undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures defining how the Corps meets these

statutory responsibilities are contained in 36 CFR Part 800, “Advisory Council on Historic Preservation: Protection of Historic Properties.” Specific procedures to be followed during a disaster or emergency are contained in section 800.12, “Emergency situations.” MSC's and districts may develop, in consultation with the Advisory Council and others, standard procedures during a disaster and/or emergency; they may follow provisions of programmatic agreements that contain specific provisions for addressing historic properties in emergencies; or, in the absence of specific procedures, provide opportunities to comment as specified in section 800.12(b)(2). Procedures for processing Department of the Army Permits in emergency situations are described in 33 CFR Part 325.2(e)(4) and the treatment of historic properties in permit areas can be found in Appendix C of Part 325.

5-14. Initial Repairs - Breached Levees. In some circumstances, such as when a massive breach occurs and typical rehabilitation time would be significant, initial repairs may be justified. Initial repairs are intended to restore a minimum level of protection (normally a 10- to 25-year level of protection) to reduce the threat of recurrence of substantial damages to life and property, until such time as the standard rehabilitation process can be finished. Preparation of an Initial Repairs PIR requires CECW-OE concurrence. Approval authority for an Initial Repairs PIR is the Division Commander. See EP 500-1-1, paragraph 5-14.e. for additional information.

a. Justification for Initial Repairs. The following justification criteria for Initial Repairs have been developed. The closing of breached levee sections using Initial Repairs may be considered if:

(1) For Federal and non-Federal urban levees, the threat to life and property is considered greater than was present in the pre-flood condition.

(2) For Federal and non-Federal levees which protect predominantly agricultural areas but have one or more urbanized areas, the risk of flooding in the urbanized areas in the current (breached) conditions is greater than 5 percent (i.e., a 20-year or more frequent flood event would cause damages to properties in urban areas). A determination must be made that in the breached condition, actual physical damages in urbanized areas would be caused by the occurrence of a 5 percent chance flood event.

(3) For Federal and non-Federal agricultural levees, the breaches must be filled to drain crop lands and/or initiate land restoration.

(4) For Federal and non-Federal agricultural levees, the lands are likely to be returned to crop production by the next planting season, and,

(a) The cost of the initial repair is less than $10 per acre; or,

(b) The current risk of substantial flooding to residential, commercial, public, and industrial properties is greater than 10 percent (10-year or more frequent flood event would cause damage to developed properties); or,

(c) The cost of the initial repair is less than $50 per acre protected and the risk of flooding is greater than 20 percent chance (5-year or more frequent flood event would flood croplands.)

b. Compliance. Appropriate environmental compliance and Endangered Species Act procedures must be complied with, when applicable.

c. Completeness of the Action. All breaches in a continuous levee which affect the residual risks and other conditions specified in this paragraph must be filled and the costs included in the justification decision.

d. Economic Analysis. The economic analysis of the future permanent repair will be based on the costs and benefits of the *total repair* as measured by comparing the total cost of restoration (Initial Repairs plus final repair) to the economic benefits attainable had the initial repairs not been undertaken. Districts must include the initial repair costs in the overall economic analysis of the project when final repair costs are determined in the PIR. In deciding whether or not to effect an Initial Repair, the District and the public sponsor must be cognizant of the fact that undertaking an Initial Repair may preclude a permanent repair, if the BCR of the permanent repair is not met.

e. Need for PIR. An abbreviated PIR is used to document the necessity of an Initial Repair. See EP 500-1-1, paragraph 5-14, for the format to be used.

f. Risk of Flooding. As used in this paragraph, the term *risk of flooding* pertains to the risk of actual lands and properties being flooded, and not the level of protection afforded by the breached levee.

5-15. Relief Wells. Relief wells are components of many Active levee projects. Rehabilitation of relief wells, as part of an overall levee rehabilitation project, is necessary to maintain the integrity of the project. However, rehabilitation of relief wells by USACE should not accomplish work that should be the public sponsor's responsibility to perform. Allowable relief well costs for PL 84-99 rehabilitation projects are as follows:

a. Well Replacement and/or Cleanout. Well replacement and/or well cleanout is allowable if (1) the well was inundated, and (2) the damage to the well can be reasonably judged to have been caused by (a) flowing water, (b) floating debris impacting the well components, or (c) other reasonable causes, and *not* by an improperly functioning flap or lack of proper maintenance by the sponsor.

b. Housing. Repair or replacement of the housing is allowable if (1) the housing was inundated, and (2) damage can be reasonably judged to have been caused by the flood event.

c. Foundation and/or Drainage Problems. Repairs to the foundation and/or to correct drainage problems are allowable if (1) the well was inundated, and (2) damage can be reasonably judged to have been caused by the flood event.

d. Well Rehabilitation. Well rehabilitation is allowable if (1) the well was inundated, and (2) damage can be reasonably judged to have been caused by the flood event, and not by an improperly functioning flap.

e. Related Components. Repair or replacement of gaskets, bolts, washers, lids, standpipes, checkvalves, and similar components are a sponsor responsibility and not an allowable charge for Rehabilitation Assistance unless the well is eligible for cleanout (paragraph a. above), and it can be reasonably determined that the component was damaged by the flood.

f. Paint/Painting. Painting costs are not allowable except as incidental to other allowable charges.

g. Piezometer Repair or Replacement. Piezometer repair or replacement is an allowable rehabilitation cost.

Section IV - Nonstructural Alternatives to Structural Levee Rehabilitation

5-16. Authority and Policy. Under PL 84-99, the Chief of Engineers is authorized, when requested by the non-Federal public sponsor, to implement nonstructural alternatives (NSA's) to the rehabilitation, repair, or restoration of flood control works damaged by floods or coastal storms. The option of implementing an NSA project (NSAP) in lieu of a structural repair or restoration is available only to non-Federal public sponsors of FCW's eligible for Rehabilitation Assistance in accordance with this regulation, and only upon the written request of such non-Federal public sponsors.

a. Principal Purposes. The principal purposes of an NSAP are for floodplain restoration, provision or restoration of floodways; and/or reduction of future flood damages and associated FCW repair costs. [NOTE: Habitat restoration is recognized as being a significant benefit that can be achieved with an NSAP, and may be a significant component of an NSAP, but is not considered to be a principal purpose under this authority.]

b. Sponsor Requirement. A sponsor is required for an NSAP. The NSAP sponsor must be either a public sponsor as defined in paragraph 2-3.r. of this regulation, or another Federal

agency. The NSAP sponsor must certify that it has the legal authority and financial capability to provide for the required items of local cooperation.

c. USACE and NSAP Management. The Corps will not be responsible for the operation, maintenance, or management of any NSAP implemented in under authority of PL 84-99.

d. Rejection of NSAP Consideration. The Corps may, in its sole discretion, reject any request for an NSAP which would lead to significantly increased flood protection or flood fighting expenses for public agencies, FCW sponsors, public utilities, or the Federal Government; or, threaten or have a significant adverse impact on the integrity, stability, or level of protection of adjacent or nearby flood control works; or, lead to increased risk of loss of life or property during flood events.

e. Responsibilities of the NSAP Sponsor. The responsibilities of the NSAP non-Federal sponsor are to operate and maintain the NSAP; provide, or arrange for and obtain, all funding required to implement the NSAP in excess of what the Corps provides; and to accept the transfer of ownership of any lands or interests in lands acquired by the Corps and determined by the Corps to be necessary to implement the NSAP.

f. Responsibilities of Other Federal Agencies Acting as NSAP Sponsor. The Corps may participate with one or more Federal agencies in NSAP's. If the Corps is the lead Federal agency, based on mutual agreement of the Federal agencies, then a non-Federal NSAP sponsor is required. If another Federal agency is the lead Federal agency, then Corps participation in the NSAP will be based on the content of this section, with appropriate allowances for effecting an NSAP in accordance with the authority and ultimate goal of the lead Federal agency. A Memorandum of Agreement with the other Federal agency(s) involved is required.

g. Responsibilities of the Requesting FCW Project Public Sponsor. The FCW project sponsor must request that the Corps undertake an NSAP in lieu of rehabilitation of the FCW, in accordance with the public sponsor's applicable laws, ordinances, rules, and regulations. If not also the NSAP sponsor, the FCW project sponsor must divest itself of responsibility to operate and maintain the FCW involved in the NSAP, and provide to the NSAP sponsor such lands or interests in lands as it may have which the Corps determines are necessary to implement the NSAP.

h. Cessation of Corps Participation. Corps participation in development and implementation of an NSAP may cease, at the sole discretion of the Corps, one year after the date of approval of rehabilitation of the damaged FCW or the date of receipt of the FCW public sponsor's request for an NSAP, whichever is earlier, if insufficient progress is being made to develop and implement the NSAP for reasons beyond the control of the Corps. In

such circumstances, the Corps may determine, at its sole discretion, that Rehabilitation Assistance for the damaged flood control project may also be denied.

i. Non-Limitation of USACE Involvement. Nothing in this section shall be construed to limit the participation of other Federal, State, tribal, local, and private agencies in the development, implementation, or future operations and maintenance of an NSAP, subject to the limitations of such participating agency's authorities and regulations.

j. Further USACE PL 84-99 Assistance. After assumption of the NSAP operation and maintenance responsibility to the NSAP sponsor or the lead Federal agency, the Corps will not provide any flood-related assistance anywhere within the formerly protected area of the FCW, except for rescue operations. As an exception, on a case-by-case basis, certain structural flood control works (or elements thereof) repaired or set back as part of the implementation of an NSAP having a non-Federal sponsor may be considered for future flood-related assistance. Normal RIP policies and procedures apply.

k. Environmental Considerations. NSAP's are subject to the same environmental requirements, restrictions, and limitations as are structural rehabilitation projects. See paragraph 5-13.

l. Reimbursement for Acquisition of Land. For the acquisition of land, interests in land, easements, and rights of way for an NSAP, reimbursement may be made to the non-Federal sponsor of the NSAP. Such reimbursements are subject to the normal Corps land acquisition process, funding caps set forth in paragraph 5-17, and availability of appropriations.

m. Combining Land Acquisition Funding. For the acquisition of land, interests in land, easements, and rights-of-way, Corps funding may be combined with the funding of other Federal agencies, absent specific statutory language or principle prohibiting such combinations, under the terms of an MOA with another Federal agency.

5-17. Funding for NSAP's.

a. Cost Share Principle. There is no set percentage for the Federal share or local cost share for an NSAP. The Corps may bear up to 100 percent of the costs for an NSAP, subject to the limitations set forth in paragraph 5-17.b. below.

b. Determination of USACE Cost Cap. Exclusive of the costs of investigation, report preparation, engineering and design work, and related costs, Corps expenditures for implementation of an NSAP are limited to the lesser of (1) the Federal share of rehabilitation construction costs of the project were the FCW to be structurally rehabilitated in accordance with this regulation, or (2) the Federal share of computed benefits which would be derived from

such structural rehabilitation. Exceptions to this cost cap policy may be requested from HQUSACE.

c. Allowable Costs. Allowable costs and expenses for NSAP's are:

(1) Acquisition of land or interests in land.

(2) Removal of structures, including manufactured homes, for salvage and/or reuse purposes.

(3) Demolition and removal of structures, including utility connections and related items.

(4) Debris removal and debris reduction.

(5) Removal, protection, and/or relocation of highways, roads, utilities, cemeteries, and railroads.

(6) Construction to promote, enhance, control, or modify water flows into, out of, through, or around the nonstructural project area.

(7) Nonstructural habitat restoration, to include select planting of native and desirable plant species, native species nesting site enhancements, etc.

(8) Total or partial removal or razing of existing reaches of levee, to include removal of bank protection structures and riprap.

(9) Protection/floodproofing of essential structures and facilities.

(10) Supervision, administrative, and contract administration costs of other allowed expenses.

5-18. NSAP Cooperation Agreement. In order to clearly define the obligations of the Corps and non-Federal interests, a CA (with a non-Federal sponsor) or a Memorandum of Agreement (MOA) (with other Federal agencies) is required for an NSAP. NSAP CA's require HQUSACE approval.

a. Non-Federal Interests. For NSAP's, non-Federal interests shall:

(1) Provide without cost to the United States all borrow and dredged or excavated material disposal areas necessary for the project;

(2) Hold and save the United States free from damages due to the project, except for damages due to the fault or negligence of the United States or its contractor; and

(3) Maintain and operate the NSA project after completion in a manner satisfactory to the Chief of Engineers.

b. Costs. The CA or MOA must address all pertinent costs for the NSAP, and which agency is responsible for each.

c. Other Federal Agency Funding. NSAP CA's shall not prohibit non-Federal interests from accepting funding from other Federal agencies, so long as the provision of such other Federal agency funding is not prohibited by statute.

d. Contributed Funds. Contributed funds may be accepted without further approval by the Chief of Engineers upon execution of the CA by all parties. The required certificate of the district commander will cite 33 USC § 701h as the pertinent authority.

e. Prohibition of Future USACE Assistance. The prohibition of future assistance described in paragraph 5-16.j., above, must be included in the NSAP CA.

f. EO 11988. NSAP CA's shall include acknowledgment of, and a statement of planned adherence to, Executive Order 11988, Floodplain Management, 3 CFR 117 (1977 Compilation), by the NSAP sponsor.

g. Legal Restrictions. The CA must include a statement of legal restrictions placed on formerly protected lands that would preclude future use and/or development of such lands in a fashion incompatible with the purposes of the NSAP.

Section V - Rehabilitation Assistance for Hurricane/Shore Protection Projects

5-19. USACE Common Policy on Non-Federal Responsibilities for OMRR&R for HSPP Projects. HSPP projects are formulated to provide hurricane and storm damage reduction. HSPP projects include hurricane/tsunami protective structures, beach nourishment projects, beach enhancement projects, and other types of projects that protect residential and commercial portions of the coastal shoreline. HSPP projects may be "soft" (i.e., consisting of sacrificial beaches, berms, and/or sand dunes), "hard" (e.g., consisting of a concrete sea wall), or a combination of the two. The non-Federal sponsor must operate, maintain, repair, replace, and rehabilitate the completed project. The unique aspect of beach protection projects is the provision for continuing Federal participation in the periodic nourishment of these projects where sand is placed on the beach, berm, or dune to replenish eroded material. Nourishment is undertaken when necessary to replace storm-induced losses and prevent erosion of the beach design section. Nourishment may be planned for on a recurring schedule, e.g., every five years, or on a complete "as-needed" basis.

5-20. HSPP Projects - General Policies for Rehabilitation.

a. Eligibility. To be eligible for Rehabilitation Assistance, an HSPP must be a completed element of a Federally authorized hurricane or shore protective structure project, and repair/restoration to a pre-storm condition is necessary to allow for adequate functioning of the project. The proposed work must have a benefit to cost ratio greater than 1.0. Recreation benefits will not be used in the BCR calculation.

b. Locally Constructed Portions of an Authorized HSPP. Completed portions of an authorized HSPP that were constructed by non-Federal interests are eligible for Rehabilitation Assistance when approval of such construction was obtained from the Commander, HQUSACE or a designated representative prior to the storm event. An HSPP project or functional element thereof is considered to be complete when it has been formally transferred to the non-Federal public sponsor for OMRR&R.

c. Limit on FCCE-Funded Work. Emergency repair and rehabilitation of HSPP's with FCCE funds will be limited to that necessary to allow for adequate functioning of the project, or restoration to pre-storm condition, whichever is less.

d. The Risk Test. The need for funding under PL 84-99 will be based on an assessment of the risk to life and property, and the need for immediate action. In no case, however, will an HSPP be restored with PL 84-99 funds beyond its pre-storm condition.

e. The Extraordinary Storm. To be eligible for Rehabilitation Assistance, the HSPP must be substantially eroded/damaged by wind, wave, or water action *of an other than ordinary nature*. USACE defines this as an "extraordinary storm". An extraordinary storm

is a storm that, due to length or severity, creates weather conditions that cause significant amounts of damage to a Hurricane/Shore Protection Project.

(1) "Length or severity" refers to a Category 3 or higher hurricane as measured on the Saffir-Simpson scale, or a storm that has an exceedance frequency equal to or greater than the design storm of the project.

(2) "Significant amounts of damage" have occurred when:

(a) the cost of the construction effort to effect repair of the HSPP or separable element thereof (exclusive of dredge mobilization and demobilization costs) exceeds one million dollars and is greater than two percent of the original construction cost (expressed in current day dollars) of the HSPP or separable element thereof; or,

(b) the cost of the construction effort to effect repair of the HSPP or separable element thereof (exclusive of dredge mobilization and demobilization costs) exceeds six million dollars; or,

(c) more than one-third of the planned or historically placed sand for renourishment efforts for the HSPP (or separable element thereof) is lost; or,

(d) when only rehabilitation of hard features is involved, the criteria of paragraph 5-2.q. are met.

f. Extraordinary Storm Justification. The PIR must include justification that substantiates the occurrence of an extraordinary storm. The determination of whether a storm qualifies as extraordinary will be made by the Director of Civil Works, in consultation with the Assistant Secretary of the Army for Civil Works (ASA(CW)) if necessary. PIR justification will include relevant data from the National Weather Service. Saffir-Simpson scale Category I and Category II hurricanes (as measured at the HSPP project) are presumed to be ordinary storms in the absence of a preponderance of evidence that indicates a different conclusion.

g. Uncompleted HSPP's. Rehabilitation Assistance using PL 84-99 funds will not be provided for uncompleted HSPP's eroded by storm events. Uncompleted HSPP eroded by storm events before they are formally transferred to the non-Federal public sponsor will be restored to their design dimensions using Construction, General funds. Costs will be shared by the non-Federal public sponsor as project construction costs under the terms of the PCA.

h. Funding the Restoration Work. In most cases, the non-Federal public sponsor will wish to fully restore the HSPP soft features where only a partial restoration is justified under the provisions of PL 84-99. In other cases, normal scheduled renourishment is required in the near future. In other cases, USACE will require that full restoration must be undertaken as a

condition of receiving HSPP Rehabilitation Assistance. In such cases, the degree of project restoration eligible for rehabilitation funding under PL 84-99 versus the periodic nourishment to be accomplished under the terms of the PCA will be decided on a case-by-case basis by the Director of Civil Works, in conjunction with the ASA(CW) if necessary.

(1) In the PIR preparation, the district will apply the principle that, while an 'average' periodic renourishment cycle is estimated (normally in the PCA or the General Design Memorandum for the original HSPP), the need for periodic renourishment is most often associated with replacement of erosive losses that occurred during ordinary (vice extraordinary) storm events.

(2) Other considerations to be used in making the assessment on degree of restoration required are addressed in EP 500-1-1, Chapter 5, Section V.

i. Sharing Dredge Mobilization/Demobilization Costs. The essentially fixed costs of dredge mobilization and demobilization for a given project will be borne proportionally among contributing sources of funds. These costs will not be borne solely as a cost of rehabilitation under PL 84-99 unless FCCE funds are the only source of funds for the renourishment effort.

j. Scheduling HSPP Rehabilitation Assistance Work. HSPP Rehabilitation Assistance work should be scheduled so that completion will occur before the beginning of the next major storm season (e.g., 1 June for the Atlantic hurricane season.) Inability to do so is normally sufficient justification to disapprove HSPP Rehabilitation Assistance, because it indicates the lack of an emergency situation regarding rehabilitation of the HSPP.

Section VI - Other Provisions of the RIP

5-21. Levee Owner's Manual.

a. Authority. Pursuant to PL 84-99, the Corps will provide a levee owner's manual to the public sponsor of all FCW's in an Active status in the RIP.

b. Policy.

(1) Non-Federal projects. A copy of the Corps-developed levee owner's manual will be provided to sponsors of Active non-Federal projects. The levee owner's manual includes standards that must be met to gain and maintain an Active status in the Rehabilitation and Inspection Program. The levee owner's manual may also be provided, upon request, to the sponsor of an Inactive non-Federal project so that the sponsor may evaluate the project and prepare for an Initial Eligibility Inspection to gain an Active status in the Rehabilitation and Inspection Program.

(2) Federal projects. The Operations and Maintenance Manual specified by Section 208.10(a)(10) of Title 33, Code of Federal Regulations, will fulfill the requirement of providing a levee owner's manual if the Corps has not provided a separate levee owner's manual to the public sponsor of a Federal project.

c. Procedural requirements. Upon initial publication, and when substantive changes are made in the Rehabilitation and Inspection Program, the Corps will provide copies of the Levee Owner's Manual to public sponsors of Active non-Federal flood control works. Other levee sponsors, or owners of private levees who intend to seek sponsorship and Active status in the RIP, will be provided a copy of the Levee Owner's Manual upon request.

5-22. Regional Variances on Vegetation Standards - Policy.

a. Authority and Background. Section 202(g) of WRDA 96 required the U.S. Army Corps of Engineers to undertake a comprehensive review of its levee vegetation policy. The review included examining current policies in view of the varied interests in providing flood control; preserving, protecting, and enhancing natural resources; protecting the rights of Native Americans pursuant to treaty and statute; and other factors as appropriate.

b. Applicability. The policy contained in this paragraph implements the Section 202(g) requirement, and applies to all Active Federal and non-Federal levees, except for Mississippi River and Tributaries (MR&T) levees. This policy also applies to all levees for which the U.S. Army Corps of Engineers has sole responsibility for maintenance and repair activities using Operations and Maintenance, General, (O&M, Gen) funding.

c. Policy - Federal and Non-Federal Levees. The public sponsor of an Active flood control levee may seek a variance from Corps policy (i.e., Appendix A of EP 500-1-1, and ER 1130-2-530) so as to allow additional vegetation to grow on levees, when allowing such vegetation would preserve, protect, and/or enhance natural resources, and/or protect the rights of Native Americans. Such variances will only be granted if:

(1) the safety, structural integrity, and functionality of the levee are retained; and,

(2) accessibility for inspection and flood fighting purposes is retained; and,

(3) the level of protection does not fall below the level necessary for levee certification under the National Flood Insurance Program if the levee is currently so certified; and,

(4) the level of protection does not fall below the minimum permissible for PL 84-99 acceptability (i.e., 5-year level of protection for agricultural levees and 10-year level of protection for urban levees).

d. Policy - O&M, Gen-funded Levees. Districts may apply variances to standing Corps policy regarding levee vegetation on O&M, Gen-funded levees as long as the conditions of paragraph c. above are met.

e. Regional Variance Agreement. The Regional Variance Agreement (RVA) is a memorandum of agreement to which the Corps, and appropriate tribal, state, and local entities, are signatories, that provides regional variances for multiple levees.

f. Approval Authority.

(1) Regional Variance. The approval authority for granting a Regional Variance is the district commander. This authority may not be delegated.

(2) Regional Variance Agreement.

(a) The approval authority for an RVA is the district commander. This authority may not be delegated.

(b) If multiple districts have geographical responsibility for the area covered by an RVA, then the Division Commander may sign the RVA, or the Division Commander may designate a lead district whose commander will manage/sign a multi-district RVA.

g. Procedures.

(1) A separate Regional Variance must be issued for each levee not covered by an RVA.

(2) Procedures and considerations for granting Regional Variances and RVA's are in paragraph 5-8.k. and Appendix D of EP 500-1-1.

5-23. Dams. Federal dams, and non-Federal dams with the principal function of providing flood control and/or flood damage reduction, are eligible for inclusion in the RIP. "Principal function" means that the dam is capable of containing the precipitation of a 200-year return frequency storm prior to use of the spillway.

a. Federal Dam Projects. WRDA 86 authorized the Corps to cost share in the construction of dams, with a public sponsor taking over O&M responsibility upon completion of the dam. Such projects gain an Active status in the RIP upon turnover of responsibility to the public sponsor and upon verification by the appropriate Corps office that the dam's principal function is flood control.

b. Non-Federal Dam Projects. A non-Federal dam can gain an Active status in the RIP. To do so, it must have flood control as its principal function, and it must pass a Corps Initial

Eligibility Inspection in the same manner as a non-Federal levee. Due to the unique aspects of dams and dam construction, it will be a non-Federal expense to compile the necessary data (e.g., ground borings, seismic considerations, as-builts of the structure, etc.) for the Corps to make an "office review" prior to any on-site IEI.

c. Rehabilitation Assistance for Dams. Only those components of the project necessary for flood control are eligible for Rehabilitation Assistance. This includes the dam structure itself, the spillway, outlet works, etc. Other components that are not flood control features (e.g., features for hydropower, recreation use, visitor centers, etc.) are not eligible for Rehabilitation Assistance.

d. Funding. Funding for field investigations, IEI's, CEI's, and rehabilitation for dams will be covered under the same categories as are these actions for other flood control works.

e. Procedures. Refer to EP 500-1-1, paragraph 5-20, for procedural information regarding dams in the RIP.

5-24. Interagency Levee Task Force. By memorandum dated 18 February 1997 with the subject of *Floodplain Management and Procedures for Evaluation and Review of Levee and Associated Restoration Projects*, the Office of Management and Budget (OMB) and the Council on Environmental Quality (CEQ) directed USACE to take the Federal agency lead for Interagency Levee Task Forces (ILTF). In their directive, OMB and CEQ mandated that appropriate Federal agencies fully consider relevant options, including nonstructural alternatives, during evaluation and review of levee repair and rehabilitation projects and associated restoration necessitated by floods or coastal storms. Repair agencies (such as the Corps) are also directed to ensure that relevant Federal and local agencies have the opportunity to comment on the project specifications and suggest appropriate modifications.

a. ILTF Goal. The overall goal of the ILTF process is to achieve a coordinated, rapid, and effective multi-agency response to damaged flood and floodplain management systems, while ensuring a cost effective approach to flood damage mitigation, floodplain management and the protection of important environmental and natural resources inherent to the floodplain. It is not intended to deny access to existing programs for levee repair that are in accord with sound financial and environmental practices, and the policies and procedures of ER 500-1-1 or other Federal agencies' authorities.

b. ILTF Activation. Based on the information available during and after a flood event, activation of an ILTF may be directed by HQUSACE. When an MSC identifies a need for an ILTF, but has not received instructions from HQUSACE to initiate the process, the MSC shall forward its request for ILTF activation to HQUSACE (ATTN: CECW-OE) for action. In either case, HQUSACE, by memorandum, will designate the appropriate MSC commander as the

lead Corps official (LCO) for the ILTF. The MSC commander may delegate LCO authority to the Deputy Division Commander or to a member of the Senior Executive Service on the Division staff. No further delegation is permitted. When multiple states are involved in a flood event, a separate ILTF will be set up for each state. An LCO will be appointed for each ILTF that is activated.

c. Funding.

(1) Generally, the Federal Emergency Management Agency (FEMA) will provide funds for ILTF activities under Emergency Support Function #3 (ESF #3) activities. In addition, FEMA will normally provide space, telecommunications support, mail costs, common user support requirements, and related support for the ILTF in the Disaster Field Office.

(2) Upon activation of an ILTF, and when FEMA (ESF #3) funds are not available for ILTF activities, the responsible MSC will submit a written request for funds to HQUSACE for each ILTF, in accordance with ER 11-1-320. ILTF activities will be funded under Class 370 for costs not covered by FEMA.

(3) Other participating agencies will provide for their own personnel and per diem costs for participation on the ILTF. Class 370 funds may not be used to fund personnel and per diem costs for ILTF participants from other agencies.

(4) All district-level and division-level levee rehabilitation efforts, and specifically division and district coordination with an ILTF, will be appropriately funded under Class 310, 320, or 340. Class 370 funds will be used only for ILTF "organizational" activities.

d. Direction and Control of an ILTF. Once initiated or approved by HQUSACE, the ILTF shall be established to review all proposals for repair and restoration of flood damaged levees and associated systems. The ILTF shall include representatives of each involved Federal agency and appropriate State, Tribal and local agencies.

(1) The LCO will ensure that the ILTF meets regularly to resolve all issues.

(2) Each repair proposal from a Federal agency (e.g., a PL 84-99 rehabilitation by USACE, an Emergency Watershed Program repair under Natural Resources Conservation Service authority, etc.) will be provided to ILTF members for review and comment prior to final action by the responsible Federal agency. A minimum of 24 hours should be provided for this review and comment period, but this time will generally not exceed 72 hours.

(3) In evaluating proposals, each agency shall consider, to the extent appropriate and practicable, nonstructural alternatives and design modifications that will:

(a) Reduce flood damages to the applicant and adjacent upstream and downstream localities.

(b) Lower long term cost to the taxpayer.

(c) Improve the environment or environmental conditions, to include water quality.

(d) Assist public and private landowners in fulfilling their conservation objectives or obligations related to protected species, wetland restoration, and riparian habitat protection.

(e) Address flood damage on a system-wide or watershed basis.

(f) Ensure compatibility with existing local or regional floodplain management and ecosystem plans, approved forest land plans, hazard mitigation plans, and resource management plans.

(g) Allow agencies to use their authorities in implementing repairs that achieve enhanced environmental values. This includes improvement of fish and wildlife habitat, species diversity, and reducing risks of future flood damages.

e. Participating Agencies. The LCO will invite appropriate State, tribal, and local agencies to participate in the ILTF, and will, as a minimum, invite the following Federal agencies:

(1) Department of Agriculture (Natural Resources Conservation Service).

(2) Department of Commerce (National Marine Fisheries Service and the Economic Development Administration).

(3) Department of Housing & Urban Development.

(4) Department of the Interior (US Fish and Wildlife Service, Bureau of Reclamation, Bureau of Land Management, and US Geological Survey).

(5) Department of Transportation.

(6) Environmental Protection Agency.

(7) Federal Emergency Management Agency.

(8) Small Business Administration.

f. ILTF Charter. An ILTF charter format (the Basic Charter) is provided in EP 500-1-1, Figure 5-6. Each ILTF will operate under the guidelines of the Basic Charter until such time as a revised charter is agreed upon by the participating agencies. Significant changes from the Basic Charter will be coordinated with HQUSACE (CECW-OE) prior to distribution of the revised charter for signature among the participating agencies. The LCO will be the Corps signatory of the charter.

CHAPTER 6
EMERGENCY WATER ASSISTANCE

Section I - Emergency Water Assistance Due to Contaminated Water Source

6-1. Policy - Emergency Water Assistance Due to Contaminated Water Source. USACE may provide water to any locality confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality. In addition to the policy of Chapter 2, the following criteria and conditions must be met to provide the assistance.

a. Written Request. A written request for assistance is required from the governor or his/her authorized representative.

b. Determination of Contamination. Contamination, whether it is deliberate, accidental, or natural, will be established by one or more of the following:

(1) The maximum contaminant level *or* treatment technique of any contaminant, as established by the EPA pursuant to the Safe Drinking Water Act, is exceeded.

(2) The water supply has been identified as a source of illness by a state or Federal public health official. The specific contaminant or pathogen does not have to be identified.

(3) An emergency has occurred that has resulted in either one or more contaminants entering the source on a sufficient scale to endanger health, or has made inoperable the equipment necessary to remove known contaminants. Examples of this type of emergency are flooding and chemical spills.

(4) The presence of a contaminant is indicated on the basis of other information available.

c. Scope and Approval of USACE Assistance. USACE assistance may only supplement state and/or local efforts to provide water for human consumption for the benefit of public health and welfare. Assistance may be provided to localities whose publicly or privately owned water and/or distribution system services a community. A CA is required for USACE assistance to be provided. Water will not be provided for livestock.

d. Standard of USACE Assistance. USACE assistance will normally be temporary to meet the immediate threat. Removal of any temporary work will be the responsibility of the local interests. The permanent restoration of safe water supplies is the responsibility of local interests. USACE assistance will not be used to accomplish deferred or deficient maintenance.

e. Limitation on Time for USACE Assistance. USACE assistance is limited to 30 days, or until FEMA undertakes the provision of emergency water under its own authorities (with a reasonable allowance of time to transition from USACE PL 84-99 assistance to FEMA Stafford Act assistance), whichever is earlier. HQUSACE may extend this time limit provided there is adequate justification and explanation why state and local governments cannot provide water within 30 days. Such extension requires a CA (new, or by amending the previous one) between the state and USACE, covering specified services and providing a firm timetable for local interests to provide normal supplies.

f. Multiple Sources of Water. If a locality has multiple sources of water and some are contaminated, no assistance will be provided if the remaining non-contaminated sources, with reasonable conservation measures, can supply the minimum need. However, if the remaining non-contaminated sources cannot provide the minimum need after conservation measures have been instituted, then assistance can be provided to supplement the supply to meet the minimum need.

g. Loss of Water Supply. Loss of supply cases (e.g., a lake level drops below existing water intake levels for the water treatment plant) are not eligible for assistance. However, if supply is lost in some, but not all, of a multiple source system, and part of the remaining source becomes contaminated, then paragraph 6-1.f. above applies. If the loss of supply is due to drought, refer to Section II of this chapter.

h. Water for Businesses. Water will not be furnished to a business or firm for use in its processes, except as incidental to the use of existing distribution systems. This does not prohibit the furnishing of water for drinking by employees and on-site customers.

i. Liability and Legal Action. Cases involving deliberate or accidental contamination will be coordinated with the EPA for determination of liability and possible legal action. However, the primary concern of USACE is protecting the public health and welfare. If necessary, USACE will provide assistance and later seek recovery of costs through legal action.

j. Eligibility for Assistance. A qualified Indian tribe, Alaska Native Corporation, or tribal organization is also eligible for assistance. Assistance will not be provided to military bases and other Federal lands under this authority.

k. Drought Considerations. Contamination due solely to drought would be handled under the drought assistance authorization, Section II of this chapter.

l. Water Quality Testing. Districts shall ensure that the contractor transporting bulk water tests the water at the pickup and delivery points to verify compliance with applicable water quality standards, or that a suitable substitute system is employed.

6-2. Provision of Emergency Water Assistance - Contaminated Water Source. USACE assistance under this authority may include, but is not limited to, purchase of water, transport of water to local water points, delivery of bulk or bottled water to community-level distribution points, temporary connection of a new supply to the existing distribution system, installation of temporary filtration, or use of military units with water purification/storage/distribution capability.

a. Provision of Assistance. District engineers will determine the quantity of water, type (bulk and/or bottled) of water, and the means of distribution needed after considering both the needs of the individual situation and the cost effectiveness of the available options.

b. Sale of Water. Section 6 of the 1944 Flood Control Act (PL 78-534) provides authority to allow the sale of water stored in USACE reservoirs deemed surplus. Procedures for the sale of surplus water are included in ER 1105-2-100, Chapter 4.

c. Cooperation Agreement Requirement. A CA is required in order to obtain USACE emergency water assistance. The format is in EP 500-1-1, Chapter 6, Figure 6-3.

6-3. Funding. ER 11-1-320 prescribes funding procedures for emergency water assistance activities.

6-4. Procedures. Refer to EP 500-1-1, Chapter 6, Section I, for PIR preparation, processing procedures, and CA format.

Section II - Emergency Water Assistance Due to Drought

6-5. Policy - Emergency Water Assistance Due to Drought. USACE may provide temporary emergency water assistance for human consumption/usage to a drought distressed area to meet minimum public health and welfare requirements. USACE assistance is supplemental to state and local efforts. Long term solutions to water supply problems are the responsibility of state and local interests. In addition to the policy of Chapter 2, the following criteria and conditions must be met to provide the assistance.

a. Governor's Request. A written request for assistance is required from the governor or his/her authorized representative. An applicant submitting a request directly to USACE will be referred to the State Emergency Management Agency or equivalent office.

b. Drought Distressed Area. A drought distressed area is one that the Director of Civil Works or the ASA(CW) determines to have an inadequate water supply that is causing, or is likely to cause, a substantial threat to the health and welfare of the inhabitants of the area,

including the threat of damage or loss of property. There must be a definable need in the immediate future that cannot be met totally by state and local actions underway or planned. Where reasonable conservation measures will ensure adequate supplies to meet the need for public health and welfare, there should be no need for a detailed evaluation or assistance by USACE. A credible plan for providing a long-term solution must be developed by the local and state governments and executed expeditiously. If a long-term solution is not expeditiously pursued, USACE assistance is not permitted.

c. Evaluating Potential Drought Distressed Areas. In evaluating a potential "drought distressed" area, consideration must be given to both the measurements used to define the drought and the magnitude of the impacts of the drought on the area under investigation. Therefore, the investigation must indicate that a shortage of water exists, and that the shortage is severely affecting the health and welfare of a major segment of the population in the area proposed for designation as "drought distressed."

d. Limitations of Provision of Water. Water for livestock, irrigation, recreation, or commercial/industrial processing will not be provided under this authority.

e. Non-USACE Expenses. The purchase or acquisition of the water and the storage facility at the terminal point are non-USACE expenses.

f. Permanent Facility. Where the recommended option for transporting water includes a permanent facility, there must be clear justification for such an action. Costs for such a permanent facility will be borne by the public sponsor.

g. Sale of USACE Water. Section 6 of the 1944 Flood Control Act (PL 78-534) provides authority to allow the sale of water stored in USACE reservoirs deemed surplus. When appropriate, this source of water should be considered in providing emergency water assistance. Procedures for the sale of surplus water are included in ER 1105-2-100, Chapter 4.

h. Transportation Costs and Water Testing. Any costs associated with transportation of water will be funded by USACE. Districts will ensure that the contractor transporting bulk water tests the water at the pickup and delivery points to verify compliance with applicable water quality standards.

i. Wells. USACE may construct wells only when commercial or other sources cannot construct it within a reasonable time. Federally owned well drilling equipment can only be used when commercial firms cannot provide comparable service within the time needed to prevent the applicant from suffering increased hardships from the effects of an inadequate water supply.

j. Payment for Wells. Wells constructed by USACE will be paid for by the applicant, and will be the lesser of:

(1) USACE actual cost to construct well(s), exclusive of the cost of transporting equipment used in the construction of wells and the cost of investigation; or,

(2) The cost to a private business to construct such well(s).

k. For wells constructed by USACE, the applicant must enter into an agreement to pay to the United States either:

(1) the reasonable cost of the construction prior to commencement of construction, or,

(2) the reasonable cost of the construction, with interest, over a period of years, not to exceed 30 years, as the Chief of Engineers deems appropriate. The rate of interest charged the applicant will be that rate that would apply if the amount to be repaid was a loan pursuant to Section 7(b)(2) of the Small Business Act, PL 85-536 (15 U.S.C. 636). Eligibility criteria for a loan will be in accordance with the practices of the SBA. Repayment will be in accordance with the established procedures by Finance and Accounting elements.

l. Permits. The applicant is required to obtain all necessary Federal, state, and local permits, and provide all necessary lands, easements, rights-of-way, and rights-of-entry.

m. Stafford Act Mission. A mission under the Stafford Act to address this type of emergency normally obviates the need for PL 84-99 assistance.

6-6. Provision of Emergency Water Assistance - Drought. USACE assistance under this authority may include, but is not limited to, transport of water to local water points, distribution of bottled water, temporary connection of a new supply to the existing distribution system, installation of temporary filtration, or use of military units with water purification/storage/ distribution capability. USACE assistance will be at 100 percent Federal cost.

a. Level of Assistance. Commanders will determine the quantity of water, type (bulk and/or bottled) of water, and the means of distribution needed after considering both the needs of the individual situation and the cost effectiveness of the available options.

b. Cooperation Agreement. A CA is required to obtain USACE assistance. This format is in EP 500-1-1, Chapter 6, Figure 6-6.

6-7. Funding. ER 11-1-320 prescribes funding procedures for emergency water activities.

6-8. Procedures. Refer to EP 500-1-1, Chapter 6, Section II, for PIR preparation, processing procedures, and CA format.

CHAPTER 7
ADVANCE MEASURES

7-1. Policy. USACE may perform Advance Measures prior to flooding or flood fighting activities to protect against loss of life and significant damages to urban areas and/or public facilities due to an imminent threat of unusual flooding. Advance Measures assistance may be taken prior to a flood, a hurricane or coastal storm, or a storm on an inland body of water, or a closed basin flood. In addition to the policy in Chapter 2, the following criteria and conditions must be met to provide Advance Measures assistance.

a. Requirement. An imminent threat of unusual flooding must exist to justify Advance Measures assistance from USACE. The threat must be established either by National Weather Service (NWS) forecasts or by USACE determination of unusual flooding from adverse conditions. The threat must be such that substantial damages will be incurred if preventive/protective action is not taken prior to the forecast event. Prior to beginning an Advance Measures application, other USACE authorities must also be considered. If any other USACE authority is applicable (e.g., a Section 9 of the Flood Control Act of 1946 action when releases from a Corps flood control reservoir project may cause flooding downstream), then Advance Measures may not be undertaken.

(1) Definition of Imminent Threat. A subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that threat is to develop in a given geographical location, and how likely the threat will produce catastrophic consequences to life and improved property, which, when combined, result in a high probability of occurrence. Implicit in the threat aspect can be considerations of time (e.g., a storm front's predicted path), season (e.g., a snowpack that will melt in the coming spring runoff), or known cyclical activities (e.g., rising water levels in the Great Lakes) that occur inside of the normal Corps decision and execution cycle for small project construction.

(2) Definition of Unusual Flooding. A subjective determination that considers potential ability to approach an area's flood of record, a catastrophic level of flooding, or a greater than 50-year level of flooding.

b. USACE Supports State and Local Efforts. Advance Measures assistance will be in support of state and local ongoing or planned efforts. All activities will be coordinated with the State Emergency Management Agency or equivalent. Non-Federal interests must commit available resources (i.e., work force, supplies, equipment, funds, National Guard forces, etc.)

c. Governor's Request. A written request from the Governor is required for USACE assistance. See EP 500-1-1, paragraph 7-4.b. for requirements of the Governor's request.

d. No Assistance for Erosion Damage. Advance Measures assistance solely to prevent erosion damage is not permitted.

e. Channels. Channel clearance and dredging to restore original project design capacity is permitted if predicted flood flows cannot be passed and flooding is likely to occur.

f. Prohibition on Permanent Betterments. Advance Measures assistance will not normally be used to make a permanent modification to FCW to increase the degree of protection or capacity or to provide protection to a larger area.

g. Benefit to Cost Ratio. Projects undertaken must have a favorable BCR (i.e., > 1.0) in accordance with the Principles and Guidelines contained in Chapter 6, ER 1105-2-100, regarding National Economic Development (NED) Benefit Cost Analysis.

h. Nature of USACE Advance Measures Assistance. USACE Advance Measures assistance will be temporary in nature, technically feasible, designed to deal effectively with the specific threat, and capable of construction in time to prevent projected damages. Permanent work may be considered when the permanent project costs less or is significantly more cost effective than the temporary solution.

i. Public Sponsor Requirements. The public sponsor must agree to execute a CA, and, at no cost to USACE, when the operation is over, remove all temporary work constructed by USACE, or agree to upgrade the work to standards acceptable to USACE. In addition, the public sponsor is responsible for providing the traditional a-b-c's at its own expense.

j. Termination of USACE Assistance. USACE Advance Measures assistance will be terminated no later than when the imminent flood threat ends.

k. Assistance for Ice Jams and Ice Jam Blasting. USACE assistance regarding ice jam clearing and ice jam blasting is limited to technical assistance. Under no circumstances will USACE participate in any type of direct assistance involving ice jam blasting activities.

l. Haul Roads. Refer to paragraph 5-2.t. for policy regarding haul roads used during Advance Measures.

m. Cost Sharing. USACE will provide 100 percent of the investigative costs of Advance Measures projects. USACE will provide 100 percent of the engineering and design costs of Advance Measures projects.

(1) Temporary Construction Standard. USACE will provide 100 percent of the costs of Advance Measures projects that use a temporary standard of construction, excluding those costs addressed in paragraph 7-1.i. above.

(2) Permanent Construction Standard. Advance Measures projects using a permanent standard of construction will be cost shared at 75 percent Federal and 25 percent local. Cost sharable items include construction costs, supervision and administration (S&A) costs, costs for preparation of any required Operation and Maintenance manuals, and contingency costs for these items.

n. Project Information Reports for potential Advance Measures projects will be forwarded by the district through the division to HQUSACE (CECW-OE). Approval authority for Advance Measures projects is the Chief, Operations Division (CECW-O).

7-2. Types of Advance Measures Assistance. Advance Measures assistance may be technical and/or direct assistance. Direct assistance may only be provided as part of an approved Advance Measures project.

a. Technical Assistance. Technical assistance consists of providing technical review, advice, and/or recommendations to state and local agencies before an anticipated flood event. The following are examples of technical assistance support:

(1) Providing personnel to inspect existing FCW to identify potential problems and solutions, to evaluate conditions to determine the requirements for additional flood control protection, and to recommend the most expedient construction methods.

(2) Providing hydraulic, hydrologic, and/or geotechnical analysis.

(3) Providing information readily available at USACE districts to local entities for use in the preparation of local evacuation and/or contingency flood plans. Providing assistance in the preparation of flood fight plans.

b. Direct Assistance. Direct assistance is assistance USACE provides to supplement state and local resources, as part of an approved Advance Measures project. Direct Assistance may include supplies, equipment, and/or contracting for the construction of temporary and/or permanent flood control projects. Examples of emergency contracting work include the construction of temporary levees; the repair, strengthening, or temporary raising of levees, or other FCW; shore protection projects; or removal of stream obstructions, to include channel dredging of Federal projects to restore the design flow.

c. Contingency Planning Efforts for Potential Advance Measures Activities. Occasionally weather phenomena occur which produce a much higher than normal probability or threat of flooding which may be predicted several months in advance of occurrence or significant impact, but which may not reach the defined level of "imminent threat" or "unusual flooding". Impacts on specific locations may be unpredictable, but regional impacts may have a high likelihood of occurrence. In such situations, the Corps may provide technical and contingency planning assistance to tribal and state agencies, commensurate with the predicted weather phenomenon, based on requests for assistance from such tribal and State agencies. Based on a state-level request, assistance may also be provided to local agencies. A Governor's request is not required for contingency planning efforts. Potential Advance Measures projects that may emanate from such contingency planning assistance must be addressed as otherwise specified in this chapter and in EP 500-1-1, Chapter 7.

7-3. Eligibility.

a. Federal Projects. Advance Measures may be undertaken on Federal flood damage reduction projects that are in imminent danger of failure/overtopping if the criteria in paragraph 7-1. are met. In those instances where an FCW is in imminent danger of structural failure, Advance Measures can be employed to undertake minimum corrective action to ensure the stability, integrity, and safety of such projects.

(1) Actions under this authority are a last resort.

(2) Actions will be limited to those necessary to prevent imminent failure of a project that meets the following criteria:

(a) A failure poses a significant threat to life and/or improved property; and,

(b) The work on the project is beyond the capability of local interests and the State to perform in a timely manner.

(3) In cases where the corrective action includes work to remedy the results of inadequate maintenance by local interests, the costs for such work are a non-Federal responsibility and shall be assigned as a local cost. Repair work will not be delayed because of difficulties in obtaining funding on the public sponsor's part.

b. Corps FCW. FCW that are operated and maintained by USACE will not be pursued as Advance Measures under PL 84-99.

c. Other Federal Agency FCW's. FCW's constructed by other Federal agencies will not be pursued as Advance Measures under PL 84-99 if the constructing agency has authority to address the flood threat.

d. Non-Federal FCW's. Advance Measures may be undertaken on non-Federal flood damage reduction projects that are in imminent danger of failure/overtopping if the criteria in paragraph 7-1. are met. In those instances where an FCW is in imminent danger of structural failure, Advance Measures can be employed to undertake minimum corrective action to ensure the stability, integrity, and safety of such projects.

e. Other Situations. Construction of temporary flood damage reduction structures (normally levees) may be undertaken.

f. Potential Scenarios within which Advance Measures may apply. See EP 500-1-1, paragraph 7-3.

7-4. Funding. Funding will be in accordance with ER 11-1-320.

7-5. Procedures. Refer to EP 500-1-1, Chapter 7.

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CHAPTER 8
HAZARD MITIGATION

8-1. Policy. USACE will support the Interagency Agreement for Non-Structural Flood Damage Reduction Measures as Applied to Common Flood Disaster Planning and Post Flood Recovery Practices. The primary objective of the agreement is to reduce or avoid Federal expenditures resulting from flood situations through a coordinated interagency and intergovernmental team approach that develops flood hazard mitigation recommendations. The Hazard Mitigation Team (HMT), led by FEMA, is the mechanism by which this is accomplished.

8-2. Implementation. MSC commanders will:

a. Appoint primary and alternate representatives to serve on the HMT.

b. Establish procedures for quick and effective response to the requirements of the HMT in accordance with FEMA's Handbook of Procedures for Flood Hazard Mitigation.

c. Ensure essential information and data necessary to assess mitigation opportunities are available or capable of being obtained quickly.

d. Ensure MSC HMT representatives are trained in flood hazard mitigation concepts and techniques.

e. Provide reports/comments to FEMA and HQUSACE.

8-3. Funding. Funding will be in accordance with ER 11-1-320.

8-4. HMT Concept of Operations. Refer to EP 500-1-1, Chapter 8.

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CHAPTER 9
DEPARTMENT OF THE ARMY ASSISTANCE UNDER AR 500-60

9-1. Policy. In implementation of and compliance with AR 500-60, USACE will support the Commander-in-Chief (CINC), US Joint Forces Command (USJFCOM), the CINC, Southern Command (SOUTHCOM), and the CINC, Pacific Command (PACOM) for disaster relief efforts of DOD. USACE will also provide support during other disasters and emergencies when directed by the Secretary of Defense, the Secretary of the Army, or the Directorate of Military Support.

a. Provision of Assistance. MSC and district commanders may assist civil authorities, recognized relief agencies, and Federal agencies charged with disaster relief. Assistance will be provided as needed (at the discretion of the commander of the activity providing the assistance) or as directed by higher authority. Assistance may be provided:

(1) When the situation is so severe and so widespread that effective response is beyond the capacity of the tribal, State and local governments (including the National Guard).

(2) When support is not immediately available from commercial sources. Support will normally not be furnished if it competes with private enterprise or the civilian labor force, unless so directed by FEMA or HQUSACE.

(3) When direct action is needed immediately to save human life.

(4) By the Commander, Pacific Ocean Division, to PACOM and the U.S. Army, Pacific, to address unique situations present in the PACOM Area of Responsibility.

b. Limitation of USACE Resources. Use of USACE resources in civil emergency relief operations will be limited to those resources that are not immediately required for the execution of the primary USACE mission.

c. Inadequate Communications Ability. When a serious emergency or disaster occurs (e.g., a massive earthquake) that requires immediate response, and waiting for instructions from higher authority would preclude or hamper effective response, and communications with higher authority is difficult or impossible, MSC or district commanders may act to do what is required and justified. This action includes anything necessary to save human life, prevent immediate human suffering, or lessen major property damage or destruction. The commander will report the action taken to HQUSACE as soon as possible. Guidance will be requested from HQUSACE if continued support is necessary or beyond the commander's ability to sustain.

d. Assistance Not to Be Delayed. In situations described in c. above, support will not be delayed or denied pending a commitment of reimbursement from the requestor.

(1) In addition, if needed, the MSC or district may request support from other DOD activities and units. An example of this type of support would be obtaining a helicopter from a nearby Army installation or Navy base.

(2) No emergency contracting is permitted under AR 500-60 unless funds are provided by the requesting (non-USACE) activity.

9-2. DOD Delegation of Authority and Areas of Responsibility.

a. DOD Executive Agent. The Secretary of the Army is designated as the DOD Executive Agent for military support in disasters and emergencies. Responsibilities include the effective use, coordination, and control of military resources employed by the Army, Navy, Air Force, and other DOD components, to include all USACE activities.

b. Director of Military Support. The Director of Military Support (DOMS) acts for the DOD Executive Agent for military support in civil disaster situations. DOMS develops procedures and monitors the employment of DOD resources used in disaster relief. DOMS is also the DOD point of contact with FEMA and other Federal or Departments in all matters related to military assistance, excluding ESF #3 activities, during major disasters or emergencies.

c. Tasking Authority. DOMS principally tasks four commands for executing FRP missions. These four commands are:

(1) USJFCOM. The USJFCOM Area of Responsibility (AOR) is the Continental US (CONUS). The US Army Forces Command (FORSCOM) is USJFCOM's lead operational authority (LOA) for the FRP.

(2) SOUTHCOM. The SOUTHCOM AOR is Puerto Rico and the Virgin Islands.

(3) PACOM. The PACOM AOR is Alaska, Hawaii, US possessions in the Pacific, and the former trust territories in the Pacific.

(4) USACE. USACE is authorized to deal directly with FEMA as the lead DOD agency for ESF 3 planning and execution. For purposes of support to the FRP and execution under PL 84-99, USACE is not a subordinate of a CINC. However, USACE may provide support to ongoing CINC operations upon request or as directed by DOMS.

9-3. Funding. MSC and district use of USACE personnel, equipment and supplies for assistance rendered under authority of AR 500-60 and this chapter is on a non-reimbursable

basis for USACE funds. Costs will be charged to the MSC or district overhead accounts, or other accounts as may be appropriate. However, all appropriate costs and charges will be accounted for, in the event that reimbursement procedures and funding are made available by DOD.

9-4. Army Doctrine - Domestic Support Operations. Field Manual (FM) 100-19, Domestic Support Operations, and FM 100-23-1, Multiservice Procedures For Humanitarian Assistance Operations, should be referenced for Army doctrine on domestic operations as needed. FM 100-19 describes the six principles for the conduct of domestic operations as follows:

a. *Objective - Direct every military operation toward a clearly defined, decisive, and attainable objective.* All commanders and soldiers must understand the objective and integrate their efforts with those of the supported civil authorities to achieve it. The concepts of mission, enemy, troops, terrain, and time available (METT-T) determine intermediate or subordinate objectives that must be accomplished to achieve the primary objective.

b. *Unity of effort - Seek unity of effort toward every objective.* Commanders must seek, establish, and maintain unity of effort. In most crisis situations, they will be in support and under the general direction of civil authorities. They must coordinate closely with these authorities and clearly understand the lines of authority and control. Unity of effort also requires coordination and cooperation among the other federal agencies involved. Almost all domestic support operations will be conducted in a joint and interagency environment. Although unity of *command* may not be possible since command structures vary, the requirement for unity of *effort* remains.

c. *Legitimacy - Sustain the people's willing acceptance of the right of the government to govern or of a group or agency to make and carry out decisions*. Legitimacy derives from the perception that using military force is a legal, effective, and appropriate means of exercising authority for reasonable purposes. However, the issue of legitimacy demands caution and critical judgment. The Army must be aware of the legitimate interests, prerogatives, and authority of the various levels of civil government involved and act accordingly. If the Army aids in the solution of a domestic problem but detracts from the legitimacy of the national or state governments by so doing, its actions will be detrimental to the federal government's long-term strategic objectives.

d. *Perseverance - Prepare for the measured, protracted application of military capabilities in support of strategic aims.* Domestic support operations may require years to achieve desired effects. They may not have a clear beginning or end decisively. For example, the Army's involvement in counterdrug operations, which began in 1981, remains Active.

e. *Restraint - Apply appropriate military capability prudently.* Specific rules of engagement govern the disciplined application of force. In operations other than war, these rules will be more restrictive, detailed, and sensitive to political concerns and may change frequently during operations. Restraints on weaponry, tactics, and levels of force characterize domestic support operations.

d. *Security - Never permit hostile forces to acquire an unexpected advantage.* The Army must never be lulled into believing that the nonhostile intent of a mission involves little or no risk. Individuals or groups may wish to take advantage of a crisis situation for personal gain or to make a political statement. Commanders must be ready to counter activity that could bring harm to their units or jeopardize their mission. Disaster assistance operations focus on alleviating human suffering, but as Army forces involved in 1992 Hurricane Andrew relief discovered, prevention of looting and protection of supplies are also necessary.

CHAPTER 10
NATIONAL OIL AND HAZARDOUS SUBSTANCE POLLUTION CONTINGENCY PLAN

10-1. General. Planning or procedures to respond to releases requiring remedial action under the NCP are governed by 40 CFR Part 300 and ER 200-2-3.

10-2. Policy.

a. Precautions. USACE will take all necessary precautions to prevent discharges of oil and releases of hazardous substances, pollutants or contaminants (discharges and releases) due to USACE activities and to provide for a prompt, coordinated and effective response to contain and clean up discharges or releases that might occur.

b. MSC/District Responsibilities. MSC and District Commands will coordinate and plan for response, participate in RRT activities, and operate the EOC under FCCE authority.

c. USACE Information. MSC's and districts will ensure that regional contingency plans and on-scene coordinator contingency plans for response to discharges and releases include information on USACE resources and facilities that could be used during response and clean up operations.

d. USACE Facilities. USACE will make available any facilities or resources that may be useful in the response and clean up operations. Availability must be consistent with USACE authorities and operational requirements.

e. USACE Projects. USACE project offices that operate and maintain completed USACE projects will develop and maintain a project contingency plan and action plan for responses to discharges and releases, in accordance with ER 200-2-3.

10-3. Authority. USACE has authority to remove sunken vessels or similar obstructions from navigation channels under Sections 15, 19, & 20 of the River and Harbors Act of 1899, as amended.

10-4. Procedures.

a. USACE Projects. Planning, prevention, control and reporting of discharges and releases for project offices that operate and maintain completed USACE projects are subject to the applicable provisions of AR 200-1 and ER 200-2-3.

b. Non-USACE Activities. Planning, preparedness and response assistance to discharges and releases from non-USACE activities are subject to the applicable provisions of AR 500-60.

c. Notification. Notice of an oil discharge or release of a hazardous substance in an amount equal to or greater than the reportable quantity must be made immediately to the National Response Center, HQ USCG, Washington, D.C. telephone (800) 424-8802 or (202) 267-2675. Notification procedures for USACE projects shall be similar to those identified in Chapter 8 of A R 200-1. Information on reportable quantities for oil and hazardous substances is referenced in AR 200-1.

CHAPTER 11
CONTRACTING

11-1. Policy.

a. Contracting Requirements. All applicable contracting regulatory requirements will be met during emergency conditions. Policies, procedures, and forms to be used are prescribed in the Federal Acquisition Regulation (FAR), Defense FAR Supplement (DFAR), Army FAR Supplement (AFARS), Army Federal Acquisition Regulation Supplement Manual No. 2 (Contingency Contracting), and the Engineer FAR Supplement (EFARS).

b. Expeditious Accomplishment of Disaster Operation Requirements. Normal administrative requirements are secondary to expeditious accomplishment of disaster operations when saving time is essential for public health, safety, and the preservation of life and property (i.e., almost all uses of funds from Categories 200 through 500, to specifically include Class 310 and Class 320 levee rehabilitation efforts.) The responsible Contracting Officer will ensure that required documentation is completed at the earliest practical time.

c. Sufficiency of Resources and Support. Contracting offices in each district will provide the full spectrum of specialized acquisition support, contracting resources, contracting methods, and contract types necessary for execution of all FCCE-funded contracts, and to facilitate performance of contracts essential to the performance of the USACE emergency management mission.

d. Applicability. Contingency contracting is applicable to all emergency responses (Categories 200-500) and FEMA Direct Federal Assistance.

e. Other Than Full and Open Competition. Contingency contracting justifies other than full and open competition as allowed by FAR 6.302.

11-2. Contingency Contracting. Contingency contracting will be accomplished using all pertinent emergency and exigency conditions allowed under the FAR, DFAR, AFARS, EFARS, and the Army Federal Acquisition Regulation Supplement Manual No. 2 (Contingency Contracting). Contingency contracting considerations will include, on FEMA-funded missions, the FAR requirement (6.302-5 (b)(5) and FAR Subpart 26.2) for providing preference in awarding contracts to local businesses.

11-3. Policy on Contracting Strategy. All available contracting methods, to include the Advanced Contracting Initiative, Indefinite Delivery Order/Indefinite Quantity contracts, Job Order Contracting, and contingency clauses in routine construction contracts, will be considered, along with all aspects of contingency contracting, when determining the most expeditious method for accomplishing emergency work.

FOR THE COMMANDER:

2 Appendices
(See Table of Contents)

ROBERT CREAR
Colonel, Corps of Engineers
Chief of Staff

Appendix A
REFERENCES

USACE policy on publications states that publications will be kept up to date via the USACE publications home page. The address for the USACE publications home page is www.usace.army.mil/publications.

Section I
Related Public Laws

PL 77-228
Section 5, Flood Control Act of August 18, 1941.

PL 93-288
Robert T. Stafford Disaster Relief and Emergency Assistance Act. (Note: FEMA no longer refers to the Stafford Act as "PL 93-288". The designation is provided as information only.)

40 CFR Part 300
National Oil and Hazardous Substances Pollution Contingency Plan.

Section II
Required Regulations and Manuals

AR 25-400-2
The Modern Army Record Keeping System (MARKS).

AR 200-1
Environmental Protection and Enhancement.

AR 500-60
Disaster Relief.

AR 700-131
Loan or Lease of Army Material

Army Federal Acquisition Regulation Supplement Manual No. 2
Contingency Contracting.

ER 5-1-11
USACE Business Process.

ER 10-1-2
US Army Corps of Engineers Division and District Offices.

ER 11-1-320
Civil Works Emergency Management Programs.

ER 11-2-201
Civil Works Activities - Funding, Work Allowances, & Reprogramming.

ER 37-2-10
Accounting and Reporting, Civil Works Activities.

ER 200-2-2
Procedures for Implementing NEPA.

ER 200-2-3
Environmental Compliance Policies.

ER 500-1-28
Response Planning Guide (Emergency Employment).

ER 700-1-1
USACE Supply Policies and Procedures.

ER 750-1-1
Materiel Maintenance Policies.

ER 1105-2-100
Planning Guidance Notebook.

ER 1130-2-530
Flood Control Operations and Maintenance Policies.

ER 1140-1-211
Support for Others: Reimbursable Work.

ER 1165-2-26
Implementation of Executive Order 11988 on Flood Plain Management.

ER 1165-2-30
Acceptance and Return of Required, Contributed, or Advanced Funds.

ER 1165-2-119
Modifications to Completed Projects.

EFARS
Engineer Federal Acquisition Regulations Supplement.

EP 1165-2-1
Policy Digest.

EP 500-1-1
Civil Emergency Management Program - Procedures.

EM 385-1-1
USACE Safety and Health Requirements Manual.

EM 1110-2-301
Guidelines for Landscape Planting at Flood walls, Levees, and Embankment Dams.

Section III
Related Regulations, Manuals, and Documents

DOD Directive 3025.1
Military Support to Civil Authorities.

DOD Directive 5030.41
Oil and Hazardous Substances Pollution Prevention and Contingency Program.

DOD Manual 3025.1
DOD Manual For Civil Emergencies.

FM 100-19
Domestic Support Operations.

FM 100-23-1
Multiservice Procedures For Humanitarian Assistance Operations.

ER 360-1-1
Public Affairs.

ER 405-1-12
Real Estate Handbook.

ER 690-1-321
Staffing for Civilian Support to Emergency Operations.

ER 1105-2-100
Planning Guidance Notebook.

ER 1110-2-1941
Drought Contingency Plans.

APPENDIX B
PUBLIC LAW 84-99

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33 U.S.C. 701n. Flood emergencies; extraordinary wind, wave, or water damage to federally authorized hurricane or shore protective structures; emergency supplies of water; drought; well construction and water transportation

(a)(1) There is hereby authorized an emergency fund to be expended in preparation for emergency response to any natural disaster, in flood fighting and rescue operations, or in the repair or restoration of any flood control work threatened or destroyed by flood, including the strengthening, raising, extending, or other modification thereof as may be necessary in the discretion of the Chief of Engineers for the adequate functioning of the work for flood control, or in implementation of nonstructural alternatives to the repair or restoration of such flood control work if requested by the non-Federal sponsor; in the emergency protection of federally authorized hurricane or shore protection being threatened when in the discretion of the Chief of Engineers such protection is warranted to protect against imminent and substantial loss to life and property; in the repair and restoration of any federally authorized hurricane or shore protective structure damaged or destroyed by wind, wave, or water action of other than an ordinary nature when in the discretion of the Chief of Engineers such repair and restoration is warranted for the adequate functioning of the structure for hurricane or shore protection. The emergency fund may also be expended for emergency dredging for restoration of authorized project depths for Federal navigable channels and waterways made necessary by flood, drought, earthquake, or other natural disasters. In any case in which the Chief of Engineers is otherwise performing work under this section in an area for which the Governor of the affected State has requested a determination that an emergency exists or a declaration that a major disaster exists under the Disaster Relief and Emergency Assistance Act [42 U.S.C.A. Section 5121 et seq.], the Chief of Engineers is further authorized to perform on public and private lands and waters for a period of ten days following the Governor's request any emergency work made necessary by such emergency or disaster which is essential for the preservation of life and property, including, but not limited to, channel clearance, emergency shore protection, clearance and removal of debris and wreckage endangering public health and safety, and temporary restoration of essential public facilities and services. The Chief of Engineers, in the exercise of his discretion, is further authorized to provide emergency supplies of clean water, on such terms as he determines to be advisable, to any locality which he finds is confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the inhabitants of the locality. The appropriation of such moneys for the initial establishment of this fund and for its replenishment on an annual basis, is hereby authorized: *Provided*, That pending the appropriation of sums to such emergency fund, the Secretary of the Army may allot, from existing flood-control appropriations, such sums as may be necessary for the immediate prosecution of the work herein authorized, such appropriations to be reimbursed from the appropriation herein authorized when made. The Chief of Engineers is authorized, in the prosecution of work in connection with rescue operations, or in conducting other flood emergency work, to acquire on a rental basis such motor vehicles, including passenger cars and buses, as in his discretion are deemed necessary.

(2) In preparing a cost and benefit feasibility assessment for any emergency project described in paragraph (1), the Chief of Engineers shall consider the benefits to be gained by such project for the protection of-

(A) residential establishments;

(B) commercial establishments, including the protection of inventory; and

(C) agricultural establishments, including the protection of crops.

(b)(1) The Secretary, upon a written request for assistance under this paragraph made by any farmer, rancher, or political subdivision within a distressed area, and after a determination by the Secretary that (A) as a result of the drought such farmer, rancher, or political subdivision has an inadequate supply of water, (B) an adequate supply of water can be made available to such farmer, rancher, or political subdivision through the construction of a well, and (C) as a result of the drought such well could not be constructed by a private business, the Secretary, subject to paragraph (3) of this subsection, may enter into an agreement with such farmer, rancher, or political subdivision for the construction of such well.

(2) The Secretary, upon a written request for assistance under this paragraph made by any farmer, rancher, or political subdivision within a distressed area, and after a determination by the Secretary that as a result of the drought such farmer, rancher, or political subdivision has an inadequate supply of water and water cannot be obtained by such farmer, rancher, or political subdivision, the Secretary may transport water to such farmer, rancher, or political subdivision by methods which include, but are not limited to, small-diameter emergency water lines and tank trucks, until such time as the Secretary determines that an adequate supply of water is available to such farmer, rancher, or political subdivision.

(3)(A) Any agreement entered into by the Secretary pursuant to paragraph (1) of this subsection shall require the farmer, rancher, or political subdivision for whom the well is constructed to pay to the United States the reasonable cost of such construction, with interest, over such number of years, not to exceed thirty, as the Secretary deems appropriate. The rate of interest shall be that rate which the Secretary determines would apply if the amount to be repaid was a loan made pursuant to section 7(b)(2) of the Small Business Act [15 USCS 636(b)(2)]

(B) The Secretary shall not construct any well pursuant to this subsection unless the farmer, rancher, or political subdivision for whom the well is being constructed has obtained, prior to construction, all necessary State and local permits.

(4) The Federal share for the transportation of water pursuant to paragraph (2) of this subsection shall be 100 per centum.

(5) For purposes of this subsection-

(A) the term "construction" includes construction, reconstruction, or repair;

(B) the term "distressed area" means an area which the Secretary determines due to drought conditions has an inadequate water supply which is causing, or is likely to cause, a substantial threat to the health and welfare of the inhabitants of the area including threat of damage or loss of property;

(C) the term "political subdivision" means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over the water supply of such public body;

(D) the term "reasonable cost" means the lesser of (i) the cost to the Secretary of constructing a well pursuant to this subsection exclusive of the cost of transporting equipment used in the construction of wells, or (ii) the cost to a private business of constructing such well;

(E) the term 'Secretary' means the Secretary of the Army, acting through the Chief of Engineers; and

(F) the term 'State' means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands.

(c) LEVEE OWNERS MANUAL.-

(1) In general. Not later than one year after the date of the enactment of this subsection, in accordance with chapter 5 of title 5, United States Code, the Secretary of the Army shall prepare a manual describing the maintenance and upkeep responsibilities that the Corps of Engineers requires of a non-Federal interest in order for the non-Federal interest to receive Federal assistance under this section. The Secretary shall provide a copy of the manual at no cost to each non-Federal interest that is eligible to receive Federal assistance under this section.

(2) Authorization of appropriations. - There is authorized to be appropriated $1,000,000 to carry out this subsection.

(3) DEFINITIONS. - In this subsection, the following definitions apply:

(A) MAINTENANCE AND UPKEEP. - The term "maintenance and upkeep" means all maintenance and general upkeep of a levee performed on a regular and consistent basis that is not repair and rehabilitation.

(B) REPAIR AND REHABILITATION. - The term ‘repair and rehabilitation’ -

(i) means the repair or rebuilding of a levee or other flood control structure, after the structure has been damaged by a flood, to the level of protection provided by the structure before the flood; but

(ii) does not include -

(I) any improvement to the structure; or

(II) repair or rebuilding described in clause (i) if, in the normal course of usage, the structure becomes structurally unsound and is no longer fit to provide the level of protection for which the structure was designed.

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Glossary of Acronyms and Terms

Section I. Acronyms.

AAR - After Action Report
ACOM - Atlantic Command. (Obsolete term. See USJFCOM.)
AFARS - Army FAR Supplement
AR - Army Regulation
ASA(CW) - Assistant Secretary of the Army for Civil Works
BCR - Benefit Cost Ratio
BPP - Bank Protection Project
C&P - Cooperation and Participation Agreement. Obsolete term, see *CA*.
CA - Cooperation Agreement
CAT - Crisis Action Team
CEAP - Corps of Engineers Automation Plan
CECW-OE - The HQUSACE Civil Emergency Management Branch
CEI - Continuing Eligibility Inspection
CEQ - Council on Environmental Quality
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CFS - Cubic feet per second.
CG - Commanding General
CONUS - Continental United States (i.e., the contiguous 48 states)
CONUSA - Continental United States Army
CRREL - Cold Regions Research and Engineering Laboratory
CWA - Clean Water Act
CWIS - Civil Works Information System (See also PWI.)
CZM - Coastal Zone Management
dbh - diameter at breast height
DCO - Defense Coordinating Officer
DFAR - Defense FAR Supplement
DFO - Disaster Field Office
DLA - Defense Logistics Agency
DOC - Department of Commerce
DOD - Department of Defense
DOE - Department of Energy
DOI - Department of Interior
DOMS - Directorate of Military Support
DOT - Department of Transportation
DSR - Damage Survey Report

E&D - Engineering and Design
EC - Engineer Circular
ECA - Evaluation and Corrective Action
EDA - Economic Development Administration
EFARS - Engineer FAR Supplement
EM - Engineer Manual, Emergency Manager, Emergency Management
EMHV - Emergency Management High Visibility
EO - Executive Order
EOC - Emergency Operations Center
EP - Engineer Pamphlet
EPA - Environmental Protection Agency
ER - Engineer Regulation
ERDC - Engineer Research and Development Center
ESF - Emergency Support Function
FAD- Funding Authorization Document
FAR - Federal Acquisition Regulation
FCCE - Flood Control and Coastal Emergencies
FCO - Federal Coordinating Officer
FCW - Flood Control Works
FEMA - Federal Emergency Management Agency
FmHA - Farmers Home Administration
FOA - Field Operating Agency
FONSI - Finding of No Significant Impact
FORSCOM - Forces Command
FRP - Federal Response Plan
GIS - Geographic Information Systems
GSA - General Services Administration
HBPP - Hurricane/Beach Protection Project
HFSSB - High Frequency Single Side Band
HHS - Health and Human Services
HMT - Hazard Mitigation Team
HQUSACE - Headquarters, U.S. Army Corps of Engineers
HSPP - Hurricane or Shore Protection Project
HUD - Housing and Urban Development
ICW - Inspection of Completed Works
IEI - Initial Eligibility Inspection
ILTF - Interagency Levee Task Force
JTF - Joint Task Force
LERRD's Lands, easements, rights-of-way, relocations, and borrow and dredged or excavated materials disposal areas.

LOA - Lead Operating Agency
LCO - Lead Corps Official (for ILTF)
LNO - Liaison Officer
MOA - Memorandum of Agreement
MSC - Major Subordinate Command (synonymous with Division)
MSCA - Military Support to Civil Authorities
NCP - National Contingency Plan (National Oil and Hazardous Substance Pollution Contingency Plan)
NED - National Economic Development
NEPA - National Environmental Protection Act
NHPA - National Historic Preservation Act
NRCS - Natural Resources Conservation Service
NRT - National Response Team
NSAP - Nonstructural Alternatives Project
NWP - Nationwide Permit
NWS - National Weather Service
O&M - Operations and Maintenance
OCE-P - Office of the Chief of Engineers, Pentagon
OMB - Office of Management and Budget
OMRR&R - Operation, Maintenance, Repair, Replacement, and Rehabilitation
OSC/RPM - On Scene Coordinator/Remedial Project Manager
PACOM - Pacific Command
PCA - Project Cooperation Agreement.
PDA - Preliminary Damage Assessment
PIR - Project Information Report
PL - Public Law
PWI Project Work Item.
RD - Regional Director
RIP - Rehabilitation and Inspection Program
RS/GIS - Remote Sensing/Geographic Information System
RRT - Regional Response Team
RSC - Readiness Support Center
S&A - Supervision and Administration
S&I - Supervision and Inspection
SAACONS - Standard Army Automated Contracting System
SBA - Small Business Administration
SCS - Soil Conservation Service (See NRCS)
SITREP - Situation Report
SOP - Standard Operating Procedure
SPOTREP - Spot Report

SPS - Standard Procurement System
STU - Secure Telephone Unit
TEECA - Training, Evaluation, Exercise, and Corrective Action
TVA - Tennessee Valley Authority
USACE - U.S. Army Corps of Engineers
USACOM - United States Atlantic Command
USC - United States Code
USCG - United States Coast Guard
USJFCOM - US Joint Forces Command
USDA - United States Department of Agriculture
US&R - Urban Search and Rescue
WPA - Works Progress (later Work Projects) Administration
WRDA - Water Resources Development Act

Section II. Terms.

A-B-C's or a-b-c's. A generic term referring to the items of local cooperation the public sponsor is required (as provided for in the CA) to provide as a condition for receiving Corps assistance. For most types of Corps assistance, the a-b-c's the public sponsor must agree to provided are (a) provide without cost to the United States all lands, easements, rights of way, relocations, and borrow and dredged or excavated material disposal areas necessary for the authorized work; (b) hold and save the United States free from all damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the work, except for damages due to the fault or negligence of the United States or its contractors; and (c) operate, maintain, repair, replace, and rehabilitate the work after its completion. Additional items of local participation may be required, such as the removal of temporary emergency flood damage reduction measures. MSC's and districts are not authorized to change or delete a-b-c requirements, without written permission from HQUSACE.

Active. A status applied to FCW concerning participation in the Rehabilitation and Inspection Program under authority of PL 84-99. An Active project must have met USACE criteria for entry and been entered into the RIP. Only Active projects may receive Rehabilitation Assistance to repair damages caused by a flood event or coastal storm.

Agricultural Levee. A levee that provides at least a 5-year flood protection to predominantly agricultural areas or agribusinesses. May be Federal or non-Federal.

Bank Protection Project. Any project or technique used to prevent erosion of or failure of a streambank.

Beach Nourishment Projects. Projects designed and constructed to build or maintain a beach by placement of material to nourish and stabilize the shoreline. See HSPP.

Betterment. During repair of an FCW, any construction effort that increases the area protected, provides features that did not exist prior to the flood event, or increases the degree or level of protection provided by the FCW. Examples of betterments include increasing the height of a levee, or providing riprap where none previously existed.

Category 100, 200, etc. Feature numbers in the appropriation structure for FCCE under Appropriation 96x3125. For authoritative definitions, refer to ER 11-1-320. For informational purposes, categories are:

(a) Category 100. Disaster Preparedness. MSC and district disaster preparedness programs, to include salaries of emergency management personnel, supplies, training, etc. Also includes EOC facilities, and funding for the Readiness Support Center.

(b) Category 200. Emergency Operations. Includes Emergency Response and Post Flood Response, field investigations during flood events, and preparation of after action reports.

(c) Category 300. Rehabilitation. Rehabilitation Assistance to Federal and non-Federal FCW's and Federally constructed hurricane and shore protection projects, associated investigation costs, etc. Includes inspection of non-Federal FCW, and maintenance of the FCW database.

(d) Category 400. Emergency Water. Assistance to drought distressed regions or localities with a contaminated source of water supply, and costs of associated investigations.

(e) Category 500. Advance Measures. Assistance against an identified, imminent flood threat, and costs of associated investigations.

(f) Category 600. Hazard Mitigation costs of participation in an activated Interagency HMT under the direction of FEMA.

C.F.S. (Cubic Feet per Second). Also **cfs**. The amount of flow passing a given point in a stream channel. One cubic foot per second is equivalent to approximately 7.5 gallons per second.

Channel. A natural or artificial watercourse with definite bed and banks to confine and conduct flowing water.

Channel Capacity. The maximum flow that can pass through a channel without overflowing the banks.

Class. A subdivision of categories in the appropriation structure. For example, category 400 is divided into Classes 410, 420, and 430. See also *Category*.

Contingency Contracting. The necessity for protection or restoration of flood protection projects requires immediate actions. To meet these requirements, justification exists for contracting procedures other than full and open competition (as allowed by FAR 6.302.) These contingency or emergency contracting procedures should comply with FAR 6.302-2.

Cooperation Agreement. An agreement entered into by a District Commander (acting as the agent for the Department of the Army on behalf of the United States Government) and the public sponsor for the purpose of identifying each party's rights and obligations concerning the expenditure of Federal funds under authority of PL 84-99.

Deliberate Levee Cut. A deliberate cut made in a levee, with the intention of either protecting the integrity of the structure (or an adjacent structure) from actual or forecasted river stages, or reducing the overall anticipated damages expected to occur to the existing structure by the current flood event. See also Dewatering Levee Cut.

Dewatering Levee Cut. A deliberate cut in a levee used as an engineering/construction method to dewater the area behind the levee when pumping this contained water is not considered a feasible, timely, or economical alternative. A dewatering levee cut is a type of deliberate levee cut that is never eligible for PL 84-99 assistance.

Dike. In most areas of the United States, a structure (earth, rock, or timber) built part way across a river for the purpose of maintaining a navigation channel. In other areas, the term is used synonymously with levee. Generally constructed of earth, stone, timber, concrete, or similar material.

Division. See Major Subordinate Command.

Drainage Structure. Generally, any feature or system (e.g., culverts) constructed for the purpose of discharging surface water run-off. Such structures are components of interior drainage systems.

Drought Distressed Area. An area that the ASA(CW) has determined to have an inadequate water supply that is causing, or is likely to cause, a substantial threat to the health and welfare of the inhabitants of the area, including a threat of damage or loss of property.

Eligible Levee. A levee categorized as "active" in the RIP, for which USACE can provide assistance under authority of PL 84-99 to repair damage caused by a flood event.

Emergency. A situation involving a natural or technological disaster that would result in an unacceptable hazard to human life, a significant loss of property, or significant economic hardship.

Emergency Assistance. All USACE activities that assist a non-Federal entity that use FCCE funding from Category 200, 300, 400, and/or 500.

Emergency Preparedness. All those activities and measures designed or undertaken to prepare for or minimize the effects of a hazard upon the civilian population, to deal with the immediate emergency conditions that would be created by the hazard, and to effectuate emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by the hazard.

Federally Authorized Projects/Federal Projects. An FCW project built by USACE that was authorized for construction by Congress or by USACE continuing authorities (e.g., Section 205.)

Federal FCW/Federal Levee/Federal Dam. A Federally authorized FCW, levee, levee system, or dam project. FCW constructed by non-Federal interests, or other (non-USACE) Federal agencies, and incorporated into a Federal system by specific Congressional action (i.e., United States law) are also designated as Federal FCW's. Construction by, or previous rehabilitation or reconstruction of a non-Federal FCW by a Federal Agency (to include USACE, FEMA, NRCS, and EDA) does not make the levee a Federal levee. Levees constructed under the authority of the Works Progress Administration are not Federal levees. Section 14 projects constructed under authority of PL 79-526 are not Federal FCW's.

Federal Response Plan (FRP). The FRP is the Federal government's plan to address the consequences of any disaster or emergency situation in which there is a need for Federal response assistance under authorities of the Stafford Act, as amended. The FRP is an interagency document produced under the leadership and direction of the Federal Emergency Management Agency. USACE is the Federal agency responsible for Emergency Support Function #3, Public Works and Engineering. FRP planning and preparedness activities in USACE are funded by the FCCE account under PL 84-99 authority.

Fiscal Completion. Once all expenses have been charged and all financial activities for a specific project are complete, the funding accounts that support the project are closed, and the project is then considered fiscally complete.

Flood. Abnormally high water flows or water level that overtops the natural or artificial confining boundaries of a waterway. A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of river and/or tidal waters and/or the unusual accumulations of waters from any sources.

Flood Control Project. See flood control work.

Flood Control Work(s) (FCW). Structures designed and constructed to have appreciable and dependable effects in preventing damages caused by irregular and unusual rises in water level. FCW may include levees, channels, floodwalls, dams, and Federally authorized and constructed hurricane or shore protective structures. Structures designed and constructed to protect against salt water intrusion or tidal fluctuations, channel alignment, navigation, recreation, fish and wildlife, land reclamation, or to protect against land erosion are not considered to be FCW's. A riprap bank erosion control structure is not considered to be a flood control work.

Flood Fighting. Actions taken immediately before or during a flood to protect human life and to reduce flood damages, such as evacuation, emergency sandbagging and diking, and providing assistance to flood victims.

Flood Plain. Any normally dry land area that is susceptible to being inundated by any natural source, such as a stream, during floods. USACE, as a matter of policy, encourages local governments to zone their flood plains against development and thereby avoid property damage and reduce obstruction to passage of floodwaters.

Flood Stage. The water surface elevation of a river, stream, or body of water, above which flooding and damages normally begin to occur, normally measured with respect to a specific reference gage. Flood stage is normally the level at which a river overflows its banks. Flood stage for any particular geographic area is unique to that geographic area.

Flooding. See Flood.

Floodwall. A type of flood control work usually constructed of stone or reinforced concrete, and which may occasionally have plastic or steel components. Floodwalls are generally constructed in urban areas where insufficient area exists to construct earthen levees.

Floodway. Designated land left essentially clear of development, for the purpose of passing floodwaters. In some areas, floodway is used to designate the 100-year flood plain.

Freeboard. A factor of safety usually expressed in feet above a flood level for purposes of designing flood protection facilities and for floodplain management. Freeboard tends to compensate for the many uncertain factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge obstructions, and the hydrological effect of urbanization of the watershed. Freeboard is being replaced as a technique through risk and uncertainty management.

Haul Road. Any privately owned road used by Corps vehicles or Corps contractor's vehicles to haul rock, earth fill, or other borrow materials to the site of a repair/floodfight/rehabilitation effort, or on which empty vehicles return. This includes haul roads specifically constructed for a repair/rehabilitation effort. Also included are levee crown roads and levee patrol roads that are not public roads, if their principal purpose is for access for maintenance, inspection, and floodfight purposes. All public roads are specifically excluded, to include any public roads that are situated on levees.

Hazard. An emergency or disaster resulting from a natural hazard or an accidental or man-caused event.

Hazard Mitigation. Any activity that permanently eliminates or reduces the long-term vulnerability to life and property from natural and technological hazards. Hazard mitigation refers to the concept of decreasing the severity of the effects of flooding on people and property by reducing the cause, occurrence, exposure, and effects of the flood hazard.

Hazard Mitigation Team. An interagency team assembled under FEMA leadership to investigate and document strategies to reduce or avoid Federal expenditures resulting from flooding situations or other types of natural disasters.

Hundred Year Flood. More accurately referred to as a "one percent chance flood," a flood of a magnitude that, according to historical statistics, has one chance in one hundred of occurring in any given year.

Hurricane/Shore Protection Project. A type of FCW project designed and constructed to prevent damage and flooding caused by a hurricane or tsunami, and their associated storm surges.

Hydraulics. The science of dealing with the mechanical properties of liquids that describes the specific pattern and rate of water movement in the environment.

Hydrology. The science dealing with properties, distribution, and circulation of water on and below the surface of the land and in the atmosphere.

Imminent Threat. A subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that threat is to develop in a given geographical location, and how likely the threat will produce catastrophic consequences to life and improved property. Implicit in the timing aspect can be considerations of time (e.g., a storm front's predicted path) or season (e.g., a snowpack that will melt in the coming spring runoff) or of known cyclical activities (e.g., rising water levels in the Great Lakes), but occurring inside the normal Corps decision and execution cycle for small project construction.

Inactive. A status applied to FCW concerning participation in the RIP. An Inactive project is, simply, any project that is not Active. It includes formerly Active FCW that left Active status in the RIP, either voluntarily or involuntarily, as well as those FCW that have never been Active in the RIP. See also "Active."

Infiltration. That portion of precipitation that is absorbed by the land surface.

Initial Repair. A hastily effected temporary repair of a breached levee that provides a 10- to 25-year level of protection for a short (less than 12 month) period of time until the permanent repair can be designed and executed.

Interior Drainage. Natural or modified outflow of streams within a levee'd area for the conveyance of run-off. Interior drainage systems are not components of flood control works.

Lead Operational Authority. Within military commands, this is a delegated authority to plan and execute missions for a higher headquarters.

Levee. A structure, normally of earth or stone, built generally parallel to a river to protect land from flooding. A levee is a complete unit, designed and intended for flood control. A levee (excluding a ring levee) is always tied to high ground at both ends.

Level of Protection. The degree of protection against flooding provided by an FCW, normally expressed in terms of the cyclical flood-level against which protection is provided.

Local Cost Share. That portion of the cost of undertaking assistance authorized under PL 84-99 (e.g., repairing a damaged Active levee) for which the public sponsor is responsible. The local cost share may be paid either in cash or as work-in-kind, or as a combination of the two.

Local Sponsor. See Public Sponsor.

LERRD's Lands, easements, rights-of-way, relocations, and dredged materials disposal areas.

Major Flood. A flood event determined to be a 100-year event or better, or a series of weather events over a short period of time (normally seven days or less), which causes loss of human life and/or property damage exceeding $1 million.

Major Subordinate Command. The intermediate level USACE headquarters organization, subordinate to HQUSACE, and above the district-level. Also Division.

Military Support to Civil Authorities. Those activities and measures taken by DOD components to foster mutual assistance and support between DOD and any civil government agency in planning or preparedness for, or in the application of resources for response to, the consequences of civil emergencies or attack. See DODD 3025.1.

National Contingency Plan (40 CFR Part 300.) A Federal plan intended to effectuate the powers and responsibilities for responding to nonradiological oil and hazardous substance discharges, releases, or substantial threats of releases as specified in the CERCLA, as amended, and the authorities established by Section 311 of the CWA, as amended.

Natural Disaster. Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, or other catastrophe that causes, or which may cause, substantial damage or injury to civilian property or persons.

Navigation Channel. The channel maintained in a body of water for the purpose of assuring a depth adequate for commercial vessels.

Non-Federal Levee/Non-Federal Project/Non-Federal FCW. A flood control work not authorized by Congress, or under other Federal agency authority. Works Progress Administration (WPA) projects are considered non-Federal FCW for the application of PL 84-99 authority.

Non-Federal Sponsor. See public sponsor.

Nonstructural Alternative Project. A type of project, authorized by an amendment to PL 84-99 contained in WRDA 96, that, in lieu of a structural rehabilitation effort, allows for restoration of floodways, flood plains, and/or the reduction of future flood damages and associated FCW rehabilitation costs.

Political Subdivision. A city, town, borough, township, county, parish, district, association, or other public body created by or pursuant to state law and having jurisdiction over the water supply of such public body.

Project. A generic term used to describe the planned or executed construction of a structure or system.

Project Cooperation Agreement. An agreement entered into by a District Commander (acting as the agent for the Department of the Army on behalf of the United States Government) and the public sponsor for the purpose of identifying each party's rights and obligations concerning the expenditure of Federal funds under USACE authority other than that of PL 84-99. See also Cooperation Agreement.

Public Road. Any road available for general use by the public. Any road for which a public agency or public entity has ongoing and/or statutory maintenance responsibility.

Public Sponsor. A public sponsor must be a public entity that is a legally constituted public body with full authority and capability to perform the terms of its agreement as the non-Federal partner of the Corps for a project, and able to pay damages, if necessary, in the event of its failure to perform. A public sponsor may be a State, county, city, town, Federally recognized Indian Tribe or tribal organization, Alaska Native Corporation, or any political subpart of a State or group of states that has the legal and financial authority and capability to provide the necessary cash contributions and lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas (LERRD's) necessary for the project.

Reach. A section or segment of a levee, which in and of itself does not provide complete protection against a flood. Also, a segment of a river, typically indicated by reference to river mile markers or geographical features.

Rehabilitation and Inspection Program (RIP). A component of the Civil Emergency Management Program concerned with the inspection and rehabilitation of FCW's.

Rehabilitation Assistance. Repair and restoration under authority of PL 84-99 of an Active FCW damaged in a flood event.

Rehabilitation Project. An action or series of actions focused of the repair of an Active flood control work to return the FCW's level of protection to its pre-flood/pre-storm level.

Repair and Rehabilitation. The terms "repair", "rehabilitation", or "repair and rehabilitation" mean the repair or rebuilding of a flood control structure, after the structure has been damaged by a flood, hurricane, or coastal storm, to the level of protection provided by the structure prior to the flood, hurricane, or coastal storm. The terms do not include improvements (betterments) to the structure, nor does "repair and rehabilitation" include any repair, reconstruction, or rehabilitation activities of a flood control structure which, in the normal course of usage, has become structurally unsound and is no longer fit to provide the level of protection for which it was designed.

Riverine. Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Run-off. That portion of precipitation, which is not intercepted by vegetation, absorbed by the land surface or evaporated and thus flows overland into a depression, stream, lake, or ocean.

SAACONS. The Standard Army Automated Contracting System, used for comprehensive management of the contracting process. SAACONS is being replaced by SPS.

Saturation.

(1) Soil Saturation. A condition in soil in which all spaces between the soil particles are filled with water. Such conditions normally occur after prolonged periods of rainfall and/or snowmelt. The result of a saturated condition is that any additional rainfall or snowmelt runs off into streams and rivers instead of soaking into the ground.

(2) Levee saturation. Soil saturation that has occurred in an earthen levee because of floodwaters remaining above flood stage for extremely long periods of time. This condition can lead to catastrophic failure of the levee.

Secondary Levee. A levee that is riverward of the main or principal levee. The level of protection of a secondary levee is always less than the level of protection provided by the main levee.

Stafford Act. The common name for the principal emergency management authority of the Federal Emergency Management Agency. Codified as 42 U.S.C. 5121 et seq.

SPS. The Standard Procurement System, used for comprehensive management of the contracting process. This new system is replacing SAACONS.

Stream. A body of water flowing in a definite natural or manmade course that has the potential to flood. The term stream refers to rivers, streams, creeks, brooks, etc., and includes intermittent streams that are subject to flooding.

Substantial Property Damage. Damage caused by a flood event, the value of which generally exceeds $1 million.

Unusual Flooding. For use with Advance Measures, a subjective determination of the potential level of flooding that considers potential to approach an area's flood of record, a catastrophic level of flooding, or a greater than 50-year level of flooding.

Urban areas. Cities, towns, or other incorporated or unincorporated political subdivisions of States that provide general local government for specific population concentrations, and occupy an essentially continuous area of developed land containing such structures as residences, public and commercial buildings, and industrial sites.

Urban Levee. A levee that provides a high degree of flood protection (10 year or greater) to a predominantly urban area.

Work-in-Kind. That portion of a public sponsor's cost share to rehabilitate a non-Federal FCW that is a non-cash contribution. The work-in-kind may be in the form of labor, equipment, supplies, and/or services. Labor is defined as blue collar-type of work normally paid on an hourly wage basis, comparable to Federal Wage Grade positions.

APPENDIX H – OPERATION & MAINTENANCE MANUAL

Fremont, Nebraska
Fremont, Farmland, and Railroad Levee
OPERATION AND MAINTENANCE MANUAL

PREFACE

Enclosed is the Operation and Maintenance (O&M) Manual for the Fremont, Farmland, and Railroad Flood Risk Reduction Project (FRRP) along the southwest side of Fremont, NE, adjacent to the Platte River. The content in this manual should be used as the most up-to-date information for operation and maintenance purposes. This manual should be updated and amended following any alterations to the levee system.

Rehabilitation assistance for repair of flood damage to the FRRP may be provided through the Public Law 84-99 Rehabilitation and Inspection Program (RIP), which is administered by the USACE.

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SECTION 1 - INTRODUCTION

1.1 PURPOSE AND ORGANIZATIONAL STRUCTURE OF MANUAL

The purpose of this Operation and Maintenance (O&M) manual is to provide detailed information specifically for the operation, maintenance, repair, replacement, and rehabilitation of the Fremont, Farmland, and Railroad Flood Risk Reduction Project (FRRP) in Fremont, Nebraska. It is intended to serve as a practical outline for persons having inspection, maintenance, and/or operation responsibilities under both normal and high-water conditions. Adherence to the inspection procedures and complying with the descriptive materials contained herein will insure conformance with the United States Army Corps of Engineers (USACE) requirements. The Levee Owner's Manual for Non-Federal Flood Control Works, which is provided in Appendix C, is an excellent reference for general operations and maintenance of levee systems and should be reviewed and utilized in concert with the rest of this manual.

The contents included in this manual have been updated to provide a more complete reflection of the flood risk reduction project's existing conditions as of 2020. Below is a summary of the primary elements of this manual:

- Project plates are provided as an appendix to this manual. The project plates provide an overview of the FRRP as surveyed in March 2020 and represent a snapshot of the system as of that time.
- FRRP components and key features are described in Section 2 of this manual. These descriptions generally follow the Project Plates.
- Operation and maintenance of key features during normal, non-emergency conditions is described in this manual. These descriptions are tied to the primary features described in the Project Plates.
- Finally, emergency operations during a high-water event are generally described. This is supported by an Emergency Preparedness Plan (EPP) which describes flood fight procedures specific to the Levee System.

The features of this manual related to key levee system components and non-emergency and emergency operations are intended to be utilized in concert with the project plates. The project plates also include summaries of key system components along with the overview survey. It is intended that the Project Plates can be easily updated with minor updates/changes to the levee system; potential updates to the O&M manual text will need to be reviewed in concert with any changes to the project plates depending on the nature of the plate modification. However, the EPP will require regular review and updates in order to ensure emergency contacts and procedures remain effective.

1.2 AGREEMENTS

1.2.1 AUTHORITY

Insert any existing agreement(s)

1.2.2 FEDERAL REGULATIONS

The requirements by which the Sponsor will be governed in the maintenance and operation of the FRRP are set forth in Part 208 of Title 33 - Code of Federal Regulations, Chapter II, Section 208.10. A copy of this regulation is also provided in Appendix E. All applicable portions of those regulations will apply to this project unless otherwise stated in this manual.

Insert any necessary federal requirements following USACE coordination.

1.2.3 GENERAL RULES AND PROCEDURES

Insert any necessary federal requirements following USACE coordination.

The general rules for maintenance and operation of the FRRP are contained in subparagraph 208.10(a) of the Flood Control Regulations as follows:

1. The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

2. The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of the Army, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the 'Superintendent' (non-federal Sponsor), who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

3. A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

4. No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the right-of-way for the protective facilities.

5. No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination of the District Engineer [District Commander] of the Department of the Army or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of their protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer [District Commander] or, if otherwise obtained, shall be submitted for approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer [District Commander] after completion of the

work. [See Section 1.8] In addition, the area occupied by the river channel and the area between the levee and river has been designated as a floodway for purposes of the National Flood Insurance Program (NFIP). In order to comply with requirements of the NFIP, no fill shall be placed within these areas without prior approval from the local government having jurisdiction for purposes of flood plain regulation.

6. It shall be the duty of the superintendent (non-federal Sponsor) to submit an annual report to the District Engineer [District Commander] covering inspection, maintenance, and operation of the protective works. [see Section 4.7]

7. The District Engineer [District Commander] or his authorized representatives shall have access at all times to all portions of the protective works.

8. Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

9. Appropriate measure shall be taken by local authorities to ensure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's (non-federal Sponsor's) organization during flood periods.

10. The Department of the Army will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under this part.

The Fremont Public Works Director performs the duties of Superintendent as defined. Most of the general duties outlined above are self-explanatory. There are, however, certain features in connection with items 2, 5, 6, and 9 that require further clarification to ensure uniform interpretation. Further instructions for compliance with those requirements are provided in the following sections of this manual.

1.3 LEVEE SYSTEM AND FLOOD EVENT HISTORY

1.3.1 GENERAL

The Fremont, Farmland, and Railroad FRRP includes the levee system along the Platte River at Fremont, NE. The levee extends from 2,000 feet north of W South St to the railroad just west of Union Dyke Rd. The levee was originally designed to control the XX-year flood through Fremont with XX feet of freeboard. The total length of the levee is approximately 2.5 miles.

1.3.2 CONSTRUCTION HISTORY

Insert construction history

1.3.3 SIGNIFICANT FLOOD EVENT HISTORY

Insert flood event history

1.4 KEY REFERENCES

This section provides an overview of key references used in the development of this manual.

1.4.1 REFERENCE

Insert references here

1.4.2 APPLICABLE ENGINEERING REGULATIONS (ER) AND OTHER REFERENCES

The USACE establishes a wide range of technical guidance and regulatory documents related to the engineering design, alteration, management, and operation of flood control levee systems. These documents are subject to periodic update and revision. Therefore, the USACE publications library should be consulted to ensure that the most current version of any guidance or regulation is being utilized.

Pertinent regulations and references can be found by accessing the following link:

http://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/

1.5 SPONSOR RESPONSIBILITIES

The City of Fremont is the non-federal Sponsor for the Levee System. As the non-federal Sponsor, the City is responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the FRRP. These responsibilities include training levee inspectors and maintenance personnel, conducting inspections, preparing for emergencies, reporting, and public education awareness. OMRR&R actions are to conform to the project plates, to this O&M manual, and any relevant USACE agreements or guidance.

The term "Sponsor" will be used throughout this document to represent the City acting in the non-federal Sponsor capacity.

1.6 SPONSOR'S ORGANIZATIONAL STRUCTURE

The organizational structure for the Sponsor's administration of the FRRP and points-of-contact are provided in the EPP. The Sponsor should ensure that there are a sufficient number of primary and alternate personnel responsible for operation of gatewell structures, sand bagging, flood surveillance, and other activities necessary for flood fighting efforts. The EPP including organizational structure, rosters, and points-of-contact must be updated on an annual basis.

1.7 POINTS OF CONTACT AND PLAN HOLDERS LIST

Refer to Appendix A for a listing of points-of-contact for the Sponsor, USACE, and other agencies and organizations. A list of holders of the O&M manual is provided below. All plan holders need to receive any addendums, revisions or updates to the O&M plan.

O&M Manual Holders

- City of Fremont, Nebraska

- Lower Platte North Natural Resources District
- Dodge County Emergency Management Agency
- USACE

Contact information for each O&M manual holder is provided in Appendix A.

1.8 IMPROVEMENTS OR ALTERATIONS

Any proposed improvements or alterations within the project right-of-way or changes to the operation of the FRRP should be reviewed and approved by the USACE, Omaha District prior to implementation as outlined below. Any substantial proposed improvements or alterations within the levee "critical area" should be submitted to the USACE, Omaha District, for technical review prior to implementation. The levee critical area is generally considered to extend from 300-feet riverward to 500-feet landward of a levee's centerline. In some instances, the critical area may extend beyond 500-feet landward if any impact on the levee can be identified. The Sponsor is responsible for construction oversight for any approved alteration within the levee critical area to ensure that it is constructed and implemented in accordance with the reviewed and approved plans and specifications. The Sponsor is also responsible for ensuring that the O&M manual is revised or amended to reflect any alterations or other changes to the FRRP.

Any proposed alteration cannot be injurious to the public interest or impair the usefulness of the FRRP. Public safety is the number one priority and cannot be compromised. The conditions for allowing improvements or alterations are outlined in the Flood Control Regulations. The City needs to fully consider, review and approve any proposed alteration request within the levee critical area and require the requester to submit detailed information for the proposed alteration to the USACE, Omaha District for review and consideration for approval. No improvement or alteration shall be allowed within the FRRP right-of-way without the written approval by the Sponsor with technical review/guidance provided by the USACE or after an appropriate engineering evaluation has been acceptably completed.

As required, the aforementioned submittal to the USACE must include engineering drawings (plans, profiles, cross sections, details, and specifications) that fully illustrate the proposed improvement or alteration and its relationship to the existing levee system. The drawings will be accompanied by a technical write-up, plans, specifications, analysis and other data that describes the proposed improvement or alteration and its impact to the FRRP and any required mitigation measures. The submittal **must** include a signed statement from the engineer-of-record for the proposed alteration that there will be no adverse impact to the project from the proposed alteration.

The party that is proposing any alteration within the FRRP right-of-way needs to consult USACE technical guidance, policy and regulation governing such prior to requesting review of the proposal. USACE guidance on proposed alterations is included in Appendix E. This information is typically available on the USACE websites. Refer to the Applicable Engineering Regulations (ER) and Other References Section for further guidance regarding the availability of this information. The Sponsor's and/or USACE review may result in a determination that the proposed alterations will not be allowed.

1.9 MATERIALS

A reserve supply of materials which may be needed during a flood emergency should be available at all times. These items do not need to be acquired and stored on the project, as long as sufficient advanced arrangements are made to guarantee that sufficient materials will be readily available at the project when needed. Items should include, but not be limited to, sandbags, plastic sheeting, lumber, saws, axes, shovels, portable lights, portable pumps, trucks and earth moving equipment. An annual inventory should be made and submitted with the annual report. That inventory should include the name of item, source and quantity available. Commercial or contractor sources should be verified on a regular basis to ensure there is not a change in the availability of needed items.

1.10 AS-BUILT & ALTERATION DRAWINGS

As-built drawings and available alteration drawings for the Levee System are provided in Appendix F. This information should be consulted prior to any maintenance to the Levee System.

1.11 O&M MANUAL UPDATES, ADDENDUM AND REVISIONS

The Sponsor is responsible for all addendums, updates, and revisions to this O&M manual and for providing all O&M manual holders (See Section 1.7) with the revised sections or document. With respect to updates, the Sponsor should review, and update supplier and contractor lists and emergency notification contacts on an annual basis. Any time there is an alteration to a levee, a facility passed through or under the levee, a change in operation, or any other change in the levee system, an addendum to the O&M manual needs to be prepared for documentation and record purposes. Periodically the entire O&M plan will need to be revised to consolidate all updates, addendums, and other changes to the manual. These complete O&M manual revisions will be performed by the Sponsor on an as-needed basis.

The USACE must review and approve any changes, addendums, or revisions to this O&M manual to ensure that the changes do not adversely impact the operation or integrity of the levee system. Refer to Appendix F for guidance on developing O&M manual addendums.

SECTION 2 - LEVEE SYSTEM AND COMPONENTS

This section provides a description of the Fremont, Farmland, and Railroad Levee and its components.

2.1 LOCATION

The project begins approximately 2,000 feet northwest of the intersection of W South St and Prairie Rd and extends southeasterly to US Hwy 77 just south of Inglewood and then easterly to the railroad just west of Union Dyke Rd.

2.2 FLOOD EVENT CHARACTERISTICS

Ice affected flows, resulting from floating ice and ice jams, have frequently affected the Platte River within Dodge County. Water surface elevations for a specific Platte River discharge can be much higher when flows are affected by ice than when open flow conditions exist.

2.3 HYDROLOGY AND HYDRAULICS

At the time this O&M manual was created, the best available hydrology and hydraulics for the Platte River near Fremont is the current Dodge County Flood Insurance Study (FIS) dated 04 May 2009.

2.4 GENERAL LEVEE SYSTEM DESCRIPTION

The levee component of the Project consists of earthen embankment levee systems that parallel the Platte River within the City of Fremont, NE. The combined length of the levee system is approximately xx miles and provides flood risk reduction mainly to urbanized areas within the City of Fremont. While the original levee and channel design was based on providing 1% annual chance exceedance (100-year) flood risk reduction, currently areas within the City of Fremont are provided flood risk reduction to approximately a 2% annual chance exceedance event level (50-year) based on the current effective flood risk study hydrologic and hydraulic data; this level of flood risk reduction does not necessarily account for geotechnical performance factors under that loading scenario. The levee embankments as constructed between xx and xx consisted of intermittent stretches of new (at the time of construction) levee embankment and reshaped, existing spoil bank levees from channel straightening done in the early and mid-1900's. Levee embankment material utilized in system construction included dispersive clays, which are more erodible than ordinary clays, creating a somewhat unique operation and maintenance challenge.

For more detailed information related to the aforementioned levee system features, reference the Project Plates.

2.5 LEVEE EMBANKMENT, AUTHORIZED CAPACITY, AND CURRENT CAPACITY

The levee embankment provides a barrier necessary to maintain flood risk reduction for the City of Fremont during a flood event on the Platte River. The levee embankment was originally designed to provide protection from the xx-percent annual exceedance flood event on the Platte River with a

2.6 CLOSURE STRUCTURES

2.6.1 SANDBAG CLOSURES

Sandbag closure locations are designated where crossings such as railroads prevent the permanent construction of levee embankment. The crossings leave deficiency gaps in the levee system that require sandbagging when river stages reach a determined level of flood risk.

2.7 MISCELLANEOUS FACILITIES

Pertinent Miscellaneous Facilities for this project are drainage ditches, sanitary sewers, stone spur dikes, stream gage stations, a transmission tower and a sheet pile cutoff wall.

2.7.1 APPROACHES, ACCESS RAMPS, AND TURNOUTS

Approaches and access ramps are built to provide entry to the levee system for operation and maintenance purposes. The turnouts on the levee crest are provided to allow the passing of maintenance and flood fighting equipment.

2.7.2 STREAM GAGES

The nearest stream gage is at North Bend, approximately 15 miles upstream of Fremont.

2.7.3 SURFACING

Surfacing was placed on levee crowns, road ramp crossings, access ramps and turnouts to provide ready access under adverse conditions for flood fighting and operation and maintenance activities.

2.7.4 BAR GATES

Bar gates and fencing have been installed at appropriate locations to help prevent trespassing of unauthorized vehicles.

SECTION 3 - MAINTENANCE AND NON-EMERGENCY OPERATION

This section is intended to cover the maintenance requirements for each component of the levee system. The local Sponsor is responsible for providing the maintenance and inspection required to ensure the levee is functional in the time of need. The following routine maintenance activities should be accomplished on a regular and continual basis. A Maintenance and Inspection Requirements checklist is provided in Section 4 – Inspections Overview. This checklist offers a summary of maintenance and inspection requirements along with the necessary frequency of completion for each requirement. Additional information on general operation and maintenance of the levee system is provided in the Levee Owner's Manual in Appendix C.

3.1 LEVEE EMBANKMENT

Levee embankment includes all earthen embankments and appurtenances that comprise the raise necessary to maintain riverine water levels during a flood event.

3.1.1 MAINTAIN AND PROMOTE GROWTH OF SOD COVER

Reseed as required.

3.1.2 EXTERMINATE BURROWING ANIMALS AND REPAIR DAMAGES

Maximum attention should be given to this item as such activities may not be readily detected without a thorough inspection. Habitats and underground pathways created by gophers, muskrats, or other burrowing animals can and have led to rapid levee failures. Inspections to detect the possible presence of activities is generally most effective immediately following mowing of the levee.

3.1.3 MOWING

All project areas which depend on a sod cover for erosion protection should be mowed at least once annually. The time of year mowing is accomplished is to be adjusted to accommodate conservation of desirable wildlife, e.g. bird nesting season and to control undesirable vegetation. Mowing should not be accomplished before July 10.

3.1.4 REMOVAL OF DRIFT AND DEBRIS DEPOSITS

Any accumulations of drift, debris or similar objectionable materials found to be deposited along the levee crown and side slopes should be removed and disposed of at suitable locations.

3.1.5 REPAIR DAMAGED OR DISPLACED RIPRAP

This may require the addition of suitable durable riprap materials to bring the condition of damaged areas to an acceptable level of protection. Riprap sizing, quantity and placement needs will be assessed for each specific application.

3.1.6 MAINTAIN ACCESS

All access ramps, turnouts and the levee crown should be inspected to assure the Sponsor that they are in a suitable condition to support needed travel during wet periods. They may require the addition of surfacing material which has been lost or displaced due to any cause. Bar gates and fencing have been provided to help control unauthorized travel on the project. The Sponsor shall take whatever additional measures are needed to prevent damage due to such travel.

3.1.7 CONTROL OF TREES, BRUSH AND WEEDS

There are certain areas of the project where power mowing is impractical. Such areas (i.e., riprap areas, outlet ditches, etc.) are subject to developing detrimental and unwanted vegetative growth. Such growth can be controlled by hand cutting. Herbicides can also be beneficial in controlling such growth. Use of herbicides should conform to all applicable local, state and federal regulations current at the time of use.

3.1.8 REPAIR OF LEVEE

Repair to areas of the levee which have settled, lost section, eroded or in any way require earthwork to restore the project to the original constructed condition, should be accomplished as soon as possible after such conditions develop.

3.1.9 RESTRICTIONS

Cultivation, casual burning of vegetative cover, or unauthorized fencing shall not be permitted within the permanent right-of-way limits of the project.

3.1.10 GRAZING

Grazing by domestic animals shall not be permitted on the levee due to the probable damage to and loss of the protective sod cover.

3.1.11 EXCAVATIONS

Removal of impervious blanket materials or berms may endanger the levee because of increased chances of excessive underseepage problems developing. Any excavation, which may be proposed in the vicinity of the levee, should be reviewed by the USACE Omaha District before it is allowed. That review may result in disallowing the proposed excavation or may impose certain restrictions which should be adhered to when allowing those activities. The areas to be monitored for excavation activities extends within 500 feet and 300 feet of the levee embankment on the landward and the riverward toe, respectively. Unauthorized excavations within those areas should not be permitted.

For more detailed information related to existing encroachments within the levee system, reference the Project Plates.

3.2 CHANNELS AND FLOODWAYS

The maintenance requirements for channels and floodways are outlined under subparagraph 208.1(G) 1) of the regulations.

3.2.1 FLOODWAY

The Platte River floodway shall be maintained and monitored to prevent obstructions that may cause increased flood elevations. In particular, the US HWY 77 bridge shall be kept free of debris and ice accumulation.

3.3 MISCELLANEOUS FACILITIES

3.3.1 MISCELLANEOUS

SECTION 4 - INSPECTIONS OVERVIEW

4.1 GENERAL

The Code of Federal Regulations forms the basis for the O&M requirements outlined in this manual.

4.2 INSPECTIONS

The Sponsor is required to conduct inspections at various specified intervals and after high water events as described below in Section 4.5. The Sponsor is required to document all inspections in writing unless otherwise stated.

4.3 INSPECTIONS SCOPE

Any inspection of the levee system should include all features and components of the system within the defined levee project right-of-way including, but not limited to the levee embankment, channels and floodways, drainage structures, underseepage management features, closure structures, embankment protection, etc. The Sponsor also needs to carefully monitor the levee tie-offs (e.g., the railroad embankment) and review them as part of any inspection to ensure that they continue to provide a suitable tie-off for the levee system. Access to the levee should also be assessed during inspections.

4.4 INSPECTION AND CHECKLISTS

Comprehensive checklists covering the maintenance and operation of the levee system are included in Appendix D and should be utilized as detailed in Section 4.5. Proper use of these checklists will help ensure that all pertinent project features are being monitored, maintained and operated appropriately. As noted in Section 1, the Levee Owner's Manual for Non-Federal Flood Control Works is provided in Appendix C. This document provides guidance on how to inspect levees and identify deficiencies.

4.5 SCHEDULED INSPECTIONS

Inspections shall be conducted at intervals as specified below and or as scheduled by the City Public Works Director.

a. Routine Maintenance Inspections

The Sponsor is required to perform routine maintenance inspections. These inspections are cursory or general type inspections and will be performed at the times specified below:

- Immediately prior to the beginning of the flood season
- Immediately following each major high-water period
- In the absence of high water, at intervals not exceeding 90 days
- At intermediate times as necessary

The summary inspection form provided in Appendix D should be completed to document these inspections. The separate inspection checklists also provided in Appendix D do not need to be

completed, but should be used as guidance for this type of routine maintenance inspection. Should there be any notable observations; the relevant sections of the checklist should be completed to further document the observations. Items requiring corrective action shall have a plan of action defined to ensure maintenance or repairs are completed by the next scheduled inspection. If maintenance or repairs cannot be completed prior to the next scheduled inspection, a timeline for completion should be in place. Any items requiring maintenance or other corrective action will be documented at that time and then included in the annual inspection report.

Completion of an annual inspection, periodic inspection, or post-flood inspection and performance assessment can count as a routine maintenance inspection.

The following Maintenance and Inspection Requirements checklist offers a summary of maintenance and inspection requirements along with the necessary frequency of completion for each requirement. Adherence to the requirements in this checklist will aid the Sponsor in fulfilling their operation and maintenance responsibilities.

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SHEET INTENTIONALLY LEFT BLANK – INSERT MAINTENANCE AND INSPECTION REQUIREMENTS TABLE

b. Annual Inspections

The USACE and the Sponsor will jointly perform an inspection of the levee system under the lead of the USACE. Inspections will be performed at a regular interval per the PL 84-99 Rehabilitation Program. The USACE will assess the levee system at this time to confirm that the Sponsor is maintaining and operating the project in accordance with the regulations set forth in the Code of Federal Regulations, requirements set forth in this manual, and other applicable guidance and requirements. Required maintenance such as mowing shall be completed in preparation for annual inspections. In the event that the USACE cannot participate in the annual inspection, the Sponsor is required to perform the annual inspection independently. If this is the case, the Sponsor should complete the inspection checklists provided in Appendix D.

c. Post-Flood Inspections and Performance Assessment

An inspection shall be conducted immediately following a flood event to identify any damages that may have occurred and to document and assess the performance of the levee system. This inspection shall be conducted by the Sponsor utilizing any necessary assistance from the USACE or other professional engineers. The inspection checklists provided in Appendix D should be completed. Any items requiring maintenance or other corrective action will be documented at that time and then included in the annual inspection report. In addition, the report should include discussions regarding flood warning effectiveness, flood fight surveillance activities, flood fight efforts, operation of closure structures, any operational issues, areas of concern, and lessons learned. Any areas of seepage, boils, sliding, erosion, low areas, or other problems that were observed should be documented by project stationing, pictures, drawings, etc.

d. Special Inspections

An inspection shall be conducted immediately following any other event or activity, such as construction within the critical area of the levee that has the potential to adversely impact the levee. The inspection checklists provided in Appendix D should be used to aid inspection and completed where relevant. Any items requiring maintenance or other corrective action will be documented at that time and then included in the annual inspection report. If a special inspection is conducted following an improvement or alteration to the levee, the inspection should include ensuring that all documentation outlined in Section 1 has been completed.

4.6 USACE INSPECTIONS

As outlined above, the USACE will participate in inspections and/or may conduct special inspections to review the condition of the levee system if it is in active status in the PL84-99 RIP. The USACE will prepare an inspection report for any such inspection. The USACE inspection report will govern with respect to the condition assessment and ratings of the levee system and/or components thereof. The USACE inspection reports and results will be utilized to determine continued eligibility in the PL84-99 RIP. The USACE preparation of inspection reports does not eliminate the Sponsor's responsibility to complete and submit an annual report, as outlined below, or to provide supporting information or documentation for inspections or other needs.

4.7 SPONSOR REPORTING REQUIREMENTS

Insert any necessary reporting requirements following USACE coordination.

The Sponsor shall submit an annual report to the USACE that documents the inspections that were conducted, maintenance efforts and costs, and other operation of the levee over the previous year. This is a reduction in the reporting requirements called for in the Flood Control Regulations for federally constructed projects. The annual reports should be furnished no later than the end of each calendar year and should include all logs of operations, dated copies of all inspection checklists, cover any permanent repairs made during the reporting period, include log of amendments made to the O&M during the reporting period, and any other pertinent information. The annual reports will be sent to the USACE point-of-contact as listed in Appendix A and will also be placed in the Sponsor's permanent records.

4.8 CORRECTING DEFICIENCES

Immediate steps shall be undertaken by the Sponsor to correct any dangerous or deficient conditions disclosed by the levee inspections. Repairs to the levee shall be accomplished by methods acceptable in standard engineering and construction practice and in conformance with the original design. Any repairs shall be coordinated with the USACE as outlined in Section 1.

4.9 MODIFICATION REVIEWS

The Sponsor shall maintain a log of all modifications to be made available to USACE inspectors during routine inspections. Visual site inspections can then be performed at the modification locations to identify any obvious non-conformance with standard levee construction practices.

SECTION 5 - GLOSSARY OF TERMS & ABBREVIATIONS

5.1 GLOSSARY OF TERMS

1% Annual Exceedance Probability Flood — The flood that has a 1% probability of being equaled or exceeded in any given year. (1 percent annual exceedance probability flood is an alternative form of the expression '100 year' flood event).

0.2% Annual Exceedance Probability Flood — The flood that has a 0.2% probability of being equaled or exceeded in any given year. (0.2 percent annual exceedance probability flood is an alternative form of the expression '500 year' flood event).

Accredited Levee — A levee that the Federal Emergency Management Agency (FEMA) has shown on the Flood Insurance Rate Map as providing protection from the 1% or greater annual exceedance probability flood. This determination is based on the submittal of data and documentation as required by Section 65.10 of the National Flood Insurance Program regulations. FEMA will accredit a levee that has been certified by federal agencies with levee design and construction competence, such as U.S. Army Corps of Engineers (USACE), or by a registered professional engineer.

Appurtenance/ Appurtenant Feature — The associated works of a levee other than the embankment, such as inlet and outlet works; gatewell structures, flap gates, etc.

As-Built Drawings — Plans or drawings portraying the actual dimension and conditions of a dam, dike, or levee as it was built. Field conditions and material availability during construction often require changes from the original design drawings.

Bank and Channel Stabilization — The process of preventing bank erosion and channel degradation.

Basin — Drainage area of a lake or stream.

Base Flood Elevation (BFE) — The water surface elevation of the 1% annual exceedance probability flood.

Boil — A disturbance in the surface layer caused by water escaping under pressure from behind a water retaining structure such as a dam or a levee. The boil may be accompanied by deposition of soil particles (usually sand) in the form of a conical shaped mound (miniature volcano) around the area where the water escapes.

Borrow Area The area from which material for a constructed embankment is excavated.

Cavitation: Water on hydraulic structures where a high hydraulic gradient is present. Cavitation is caused by the abrupt change in direction and velocity of the water so the pressure at some points is reduced to the vapor pressure and a vapor pocket is created. The pockets collapse with great impact when they enter areas of higher pressure, producing very high impact pressures over small areas, which eventually cause pits and holes in the surface. Noises and vibrations may be evident during high flows.

Channel A general term for any natural or artificial facility for conveying water.

Clay (Clay Soil) Fine-graded portion of soil that can be made to exhibit plasticity (putty-like properties) within a range of water contents, and which exhibits considerable strength when air-dry. The term has been used to designate the percentage finer than 0.002 mm (0.005 mm in some cases).

Community Any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or Alaska Native village, or authorized native organization that has the authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Compaction The densification of a soil by means of mechanical manipulation.

Conduit A closed channel to convey the discharge through, around, or under a levee.

Corrosion The chemical attack on a metal by its environment. Corrosion is a reaction in which metal is oxidized.

Creep Slow movement of rock debris or soil usual imperceptible except to observations of long duration.

Critical Area Generally considered to extend from 300-feet riverward to 500-feet landward of a levee's centerline. In some instances, the critical area may extend beyond 500-feet landward if any impact on the levee can be identified.

C.F.S. (Cubic Feet per Second)	Also cfs. The amount of flow passing a given point in a stream channel. One cubic foot per second is equivalent to approximately 7.5 gallons per second.
Digital Flood Insurance Rate Map (DFIRM)	A Flood Insurance Rate Map (FIRM) that has been prepared as a digital product. Linkages are built into an associated database to allow users options to access the engineering backup material used to develop the DFIRM, such as hydrologic and hydraulic models, flood profiles, data tables, digital elevation models (DEMs), and structure-specific data, such as digital elevation certificates and digital photographs of bridges and culverts.
Discharge	Volume of a fluid that passes a given point within a defined period of time.
Dispersive Clay	Clays with an imbalance in the electrochemical forces between particles. This imbalance causes the minute soil particles to be repulsed rather than attracted to one another. Consequently, dispersive clay particles tend to react as single-grained particles and not as an aggregated mass of particles. Dispersive clays are most easily eroded by water that is low in ion concentration, such as rain water.
Eligible Levee	A levee categorized as "active" in the RIP, for which USACE can provide assistance under authority of PL 84-99 to repair damage caused by a flood event.
Emergency	A situation involving a natural or technological disaster that would result in an unacceptable hazard to human life, a significant loss of property, or significant economic hardship.
Failure	An incident resulting from the uncontrolled release of water from a levee, floodwall, or closure structure.
Federal Emergency Management Agency (FEMA)	The agency within the Emergency Preparedness and Response Directorate of the U.S. Department of Homeland Security. FEMA oversees the administration of the National Flood Insurance Program.
Fines	Portion of soil finer than a No. 200 United States standard sieve.
Five Hundred-Year Flood (for FEMA certification)	A median peak flood discharge having a 0.2% annual probability of being equaled or exceeded in any given year.

Flap Gate	Gate used to control flow automatically. When the water level on the back side of the gate (within the discharge pipe) rises above that on the face (riverside), the gate opens automatically to allow discharge. When water on the face of the gate rises above that on the back, the gate closes automatically to prevent backflows.
Flood Control Work(s) (FCW)	Structures designed and constructed to have appreciable and dependable effects in preventing damages caused by irregular and unusual rises in water level. FCW may include levees, channels, floodwalls, dams, and Federally authorized and constructed hurricane shore protective structures.
Flood Crest	The highest or peak elevation of the water level during a flood.
Flood Damage Reduction Measures	Structural and non-structural measures taken to reduce flood damage. These may include implementation of reservoirs, detention storage, channels, diversions, levees and floodwalls, interior systems, flood-proofing, raising, relocation, and flood warning and preparedness actions.
Floodway	The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
Invert Elevation	The lowest point of the interior of a conduit, pipe or tunnel.
Flood-Frequency Curve	A graph showing the relationship of the flood variable of interest (peak flow, peak stage, 3-hour volume, etc.) to the probability of the variable being equaled or exceeded in any given year.
Flood Insurance Rate Map (FIRM)	The insurance and floodplain management map produced by FEMA that identifies, based on detailed or approximate analyses, the areas subject to flooding during a 1% annual exceedance probability (100-year) flood event in a community. Flood insurance risk zones, which are used to compute actuarial flood insurance rates, also are shown. In areas studied by detailed analyses, the FIRM shows Base Flood Elevations (BFEs) to reflect the elevations of the 1% annual exceedance probability flood. For many communities, when detailed analyses are performed, the FIRM also may show areas inundated by 0.2% annual exceedance probability (500-year) flood and regulatory floodway areas.

Flood Map Modernization (Map Mod) Program	The multiyear program undertaken by FEMA to perform flood hazard assessments and produce new or updated DFIRMs and Flood Insurance Study (FIS) reports for flood-prone communities throughout the United States.
Flood Plain	A plain bordering a river subject to flooding.
Flood Stage	The water surface elevation of a river, stream, or body of water, above which flooding and damages normally measured with respect to a specific reference gauge. Flood stage is normally the level at which a river overflows its banks. Flood stage for any particular geographic area is unique to that geographic area.
Freeboard	The increment of levee height added to the design flood height to increase the likelihood of the design event being contained without the levee overtopping.
Gravity Drainage Outlets	(1) Outlets for gravity drains such as tiles, perforated conduits, etc., servicing an agricultural area and discharging into a drainage ditch. (2) Pipe, culvert, etc., used for dewatering ponded water by gravity.
Head	Differential of pressure causing flow in a fluid system.
Headwaters	(1) The upper reaches of a stream near its source. (2) The region where groundwater emerges to for a surface team. (3) The reach of water upstream from a structure.
Left or Right Bank of River	The left-hand or right-hand bank of a stream when the observer faces downstream.
Levee	An embankment, generally constructed close to the banks of a stream, river, lake, or other body of water, intended to protect the landside from inundation or to confine the stream flow to its regular channel.
Levee Certification	Levee certification is a technical finding that, for the floodplain in question; there is reasonable certainty that the levee system will contain the 1% annual exceedance probability flood (or FEMA BFE).
Levee Certification Determination	This determination is a technical finding that, for the floodplain in question, <u>there is, or is not</u>, a reasonable certainty that the levee system will contain the 1% annual exceedance probability flood. A 'there is' answer leads to certification, and 'is not' answer means certification is not supported.

Levee De-accreditation	The withdrawal of a levee certification statement, indicating that a levee previously certified is found to be no longer capable of containing the 1% annual exceedance probability flood (BFE).
Levee Safety Officer	The non-federal Sponsor responsible for the development and maintenance of all structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States. The Levee Safety Officer is also referred to as the Superintendent. The CITY General Manager's role includes the duties of Superintendent as defined.
Levee System	A levee system comprises one or more components which collectively provide flood damage reduction to a defined area. Failure of one component within a system constitutes failure of the entire system. The levee system is inclusive of all components that are interconnected and necessary to ensure protection of the associated separable floodplain – levee and floodwall sections, closure structures, pumping stations, culverts, and interior drainage works.
Level-of-Protection	The recurrence interval of the flood event beyond which the protection system capacity exceedance or failure results.
Life Risk	The threat to loss of life from failure of a flood protection system or feature. Life risk is often expressed as an annual probability vs. lives lost function or expected value of that function (annual lives lost), sometimes referred to as 'annual statistical lives lost.'
Megger Test	Test using an insulation resistance meter in order to verify condition of electrical insulation. These tests are used to test the insulation of electrical components of pump stations.
Mean Sea Level (m.s.l.)	The elevation of any object, relative to the average sea level datum.
Monte Carlo Analysis	A method that produces a statistical estimate of a variable of interest by drawing many random samples from a set of variables with associated uncertainty or relationships of interest with their associated uncertainty. The method is typically used when values for variables are uncertain and best described by appropriate probability distributions.
Mouth of River	The exit or point of discharge of a stream into another stream, lake, or ocean.

National Flood Insurance Program (NFIP)	Federal program under which flood-prone areas are identified and flood insurance is made available to the owners of the property in participating communities.
Non-structural Measures	Non-structural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from non-structural measures is accomplished by changing the use made of the floodplains, or by accommodating existing uses to the flood hazard. Examples are flood proofing, relocation of structures, flood warning and preparedness systems (including associated emergency measures), and regulation of floodplain uses.
One Hundred-Year Flood (for FEMA certification)	A median peak flood discharge having a 1% annual probability of being equaled or exceeded in any given year.
Overtopping	A condition that occurs when the elevation of the still-water level and/or associated waves exceeds the top of the levee or system.
Piping	Progressive erosion and removal of soil by concentrated seepage flows through a dam, dike, or levee, its foundation, or its abutments. As material is eroded, the area of the pipe increases and the quantity and velocity of flow increase; these changes in turn result in the erosion of more material. The process continues at a progressively faster rate.
Ponding Area	An area reserved for collecting excess runoff preparatory to being discharged whether by gravity or by pumping.
Public Safety	Public safety involves the prevention of and protection from events that could endanger the safety of the general public from significant danger, injury/harm, or damage, such as natural and man-made disasters.
Pump	Fluid machinery that converts mechanical energy to fluid energy. This creates flow where gravity flow of a fluid is impractical.
Pump Characteristic Curve	Plot of a pump's head versus capacity.
Pump Station	Remove stormwater from areas where gravity drainage becomes impractical.

Reach	A levee reach is a portion of a levee system (usually a length of levee) that may be considered as a unit taken for analysis purposes to have uniform representative properties. A levee reach will be the unique entity having properties different than other reaches of the levee system and is used to determine the risk assessment of the levee system. No maximum length is associated with a reach.
Rehabilitation and Inspection Program (RIP)	A component of the Civil Emergency Management Program concerned with the inspection and rehabilitation of FCW's.
Rehabilitation Project	An action or series of actions focused on the repair of an active flood control work to return the FCW's level of protection to its pre-flood/pre-storm level.
Relief Well	Shallow penetrating vertical wells. Principal parts include a well screen section surrounded by a gravel filter pack which extends from the well bottom to approximately the top of the underlying pervious stratum. A solid riser pipe connects the screened section to the ground surface. A collector system or discharge pipes are provided on some wells. The remainder of the wells will overflow at ground surface or into collector ditches during high stream stages. Relief wells provide protection by reducing the water pressure of the pervious zones of the foundation. This pressure reduction reduces the possibility of sandboils and more safely manages excessive underseepage.
Repair and Rehabilitation	The terms "repair", "rehabilitation", or "repair and rehabilitation" mean the repair or rebuilding of a flood control structure, after the structure has been damaged by a flood, hurricane, or coastal storm, to the level of protection provided by the structure prior to the flood, hurricane, or coastal storm. The terms do not include improvements (betterments) to the structure, nor does "repair and rehabilitation" include any repair, reconstruction, or rehabilitation activities of a flood control structure, which, in the normal course of usage, has become structurally unsound and is no longer fit to provide the level of protection for which it was designed.
Residual Risk	The flood risk (probability of capacity exceedance or failure and the associated consequences) that remains after the flood damage reduction project is implemented.
Return Period	The average time interval, usually expressed in years, between occurrences of a hydrological event of a given or greater magnitude. It can be expressed by the reciprocal of the annual chance exceedance.

Revetment	A facing of stone, concrete, sandbags, etc., to protect a bank of ear from erosion.
Riprap	A layer, facing, or protective mound of randomly placed stones to prevent erosion, scour, or sloughing of a structure or embankment. The stone used for this purpose is also called riprap.
River Basin	A water resource basin in a portion of a water resource region defined by a hydrological boundary, which is usually the drainage area of one of the lesser streams in the region.
Risk	Measure of the probability and severity of an adverse effect to life, health, property, or the environment.
Risk Analysis	An approach to evaluation and decision making that is based on the probability of undesirable consequences. Often depicted conceptually as including risk assessment, risk management, and risk communications.
Sand Boil	The ejection of sand and water resulting from piping.
Seepage	The slow percolation of water through the levee embankment, its foundation, or the abutment. A small amount of seepage will normally occur for any levee that retains water.
Seepage Berm (Blanket)	Engineered fill material installed to provide downward weight to counteract the upward force of seepage pressure within the foundation material adjacent to the levee, which is where the pressure is highest. The engineered fill material also serves to lengthen the seepage path, which increases the flow resistance and decreases the seepage pressure in the area beyond the berm.
Sediment/Silt	Soil particles and debris in an impoundment.
Separable Floodplain	The portion of a floodplain that may be protected by its associated levee system that is unaffected by the performance or failure of adjacent levee systems.
Shoaling	A submerged mound or ridge of sediment in a body of shallow water.
Slide	The movement of a mass of earth or tailings down a slope.

Slide Gate	Also known as sluice gates; used to regulate flow through a drainage structure manually. Slide gates are either operated manually using a crank or wheel or operated with the aid of a motor such as a tractor power take off. Slide gates are normally used as a secondary or backup system to flap gates in the event that the flap gate would become lodged in an open position or damaged or broken off by ice or debris. Slide gates are used as a primary system if sufficient warning time is available to allow closure.
Slope Protection	The protection of the embankment slope against wave action and erosion.
Slough	The separation from the surrounding material and downhill movement of a small portion of the slope. Usually a slough refers to a shallow earth slide.
Spalling	Breaking (or erosion) of small fragments from the surface of concrete, masonry, or stone, under the action of weather, or abrasive forces.
Special Flood Hazard Area (SFHA)	The area delineated on a National Flood Insurance Program map as being subject to inundation by the FEMA BFE.
Stage	Water height measured as the vertical distance in feet (meters) above or below a local or national elevation datum.
Stage-Discharge Function (alternatively 'Rating Curve')	A tabular or graphical relationship that yields the stage for a given discharge at a specific location on a stream or river.
Stage-Discharge Functions with Uncertainty	Relationship of the water surface stage and discharge. Uncertainty is the distribution of the errors of stage estimates about a specific discharge.
Structural Measures	Those water resources project measures designed to modify the flow of flood waters.
Subgrade	The soil prepared and compacted to support a structure or a pavement system.

Superintendent	The non-federal Sponsor responsible for the development and maintenance of all structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States. The Superintendent is also referred to as the Levee Safety Officer. The CITY General Manager's role includes the duties of Superintendent as defined.
Total Dynamic Head	Sum of the total static head and the friction and minor losses.
Trash Rack	A structure of metal or reinforced concrete bars located at the intake of a conduit inlet or waterway to prevent entrance of floating or submerged debris of a certain minimum size and larger.
Tributary	A stream or other body of water that contributes its water to another stream or body of water.
Watershed	The whole surface drainage area that contributes water to a collecting river or lake.

5.2 ABBREVIATIONS

3H:1V	3 Horizontal to 1 Vertical
4H:1V	4 Horizontal to 1 Vertical
AEP	Annual Exceedance Probability
CEI	Continuing Eligibility Inspection
CMP	Corrugated Metal Pipe
CNP	Conditional Non-Exceedance Probability
CFR	Code of Federal Regulation
Corps	US Army Corps of Engineers
DFIRM	Digital Flood Insurance Rate Map
EC	Engineer Circular
EM	Engineer Manual
EP	Engineer Pamphlet
ER	Engineer Regulation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FPMS	Floodplain Management Services (Program)
FRMP	Flood Risk Management Program
HEC	Hydrologic Engineering Center
HEC-FDA	Hydrologic Engineering Center – Flood Damage Reduction Analysis
IPET	Interagency Performance Evaluation Team
ITR	Independent Technical Review
LB	Left Bank
LCR	Levee Certification Report
LIDAR	Light Detection and Ranging
LSO	Levee Safety Officer
Map Mod	FEMA Flood Map Modernization Program
MSL	Mean Surface Level

NFIP	National Flood Insurance Program
NWS	National Weather Service
O&M	Operations and Maintenance
PI	Periodic Inspection
PL	Public Law
QA/QC	Quality assurance/quality control
RCP	Reinforced Concrete Pipe
RIP	Rehabilitation and Inspection Program
RB	Right Bank
USACE	United States Army Corps of Engineers
USC	United States Code
USGS	United States Geological Survey

APPENDIX I – NDOT BYPASS PROJECT INFORMATION

ROADWAY DESIGN DIVISION.

INDEX OF SHEETS

PROJECT NO.	SHEET NO.
S-77-3(1036)	A1
◣ CONTROL NO. 22722	
▲ CONTROL NO.	
■ CONTROL NO.	

STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION
PLANS FOR CONSTRUCTION

FREMONT SOUTHEAST BELTWAY
DODGE COUNTY

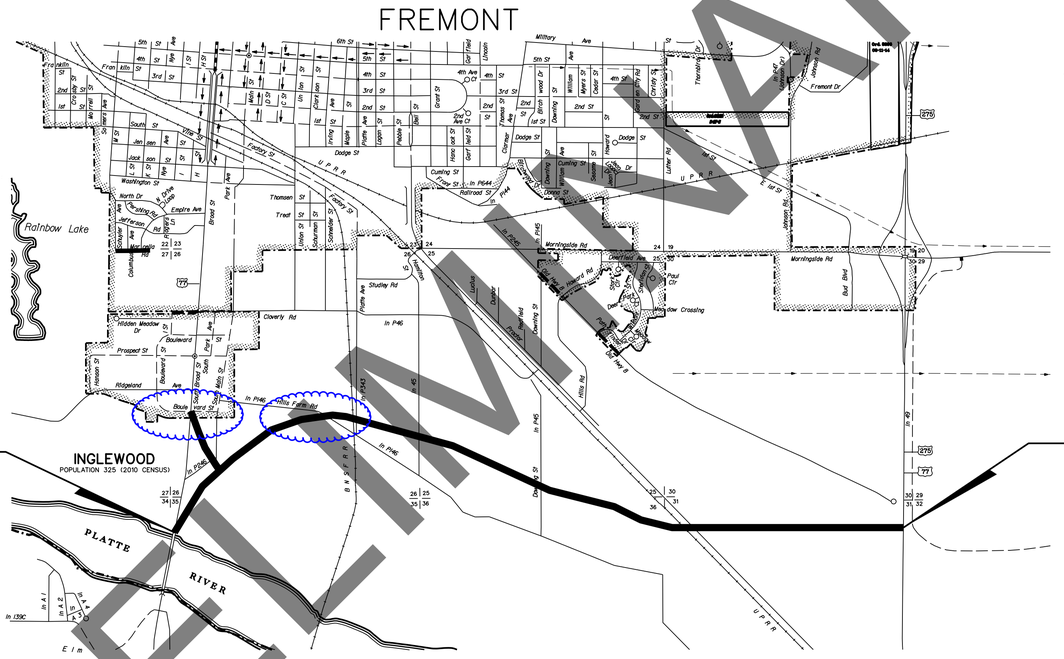
THE 2017 EDITION OF THE NEBRASKA STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS APPLY TO THIS PROJECT.

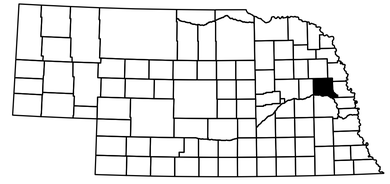
THE WORK ON THIS PROJECT CONSISTS OF GROUPS
1-GRADING, 3-PAVEMENT, 4-CULVERTS,
5-SEEDING, 6-BRIDGE, 7-GUARDRAIL,
8-SPECIALTY, 9-BITUMINOUS & 10-GENERAL

◣ GROUPS 1, 3, 4, 5, 6, 7, 8, 9 & 10 ARE INCLUDED IN THE LETTING OF FEBRUARY 27, 2020

▲ GROUPS _____ ARE INCLUDED IN THE LETTING OF _____

■ GROUPS _____ ARE INCLUDED IN THE LETTING OF _____





Project Raw Materials (Tons)
111,478
Post Consumer Recycle Content in Project Raw Materials (Tons)
7,925
Post Consumer Recycle Content
7%
Estimated Value of Post Consumer Content Recycled
$941,613

CONVENTIONAL SIGNS

- FENCE R.O.W. OR WIRE
- GUARDRAIL
- TRAVELED WAY
- DIKE
- CULVERT
- POWER POLE
- TELEPHONE POLE
- MAILBOX
- RAILROAD TRACKS
- MARSH
- TREE - CONIFEROUS
- TREE - DECIDUOUS

R.O.W. LEGEND

- NEW CONTROLLED ACCESS
- PREVIOUS CONTROLLED ACCESS
- LIMITS OF CONSTRUCTION
- PREVIOUS R.O.W.
- NEW R.O.W.
- EXISTING PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXCESS TAKING
- PERMANENT EASEMENT
- EXISTING RAILROAD EASEMENT
- NEW RAILROAD PERMANENT EASEMENT
- NEW RAILROAD TEMPORARY EASEMENT

REFERENCE POST NO. _____ TO REFERENCE POST NO. _____

EXCEPTIONS: FROM STA. _____ TO STA. _____

TOTAL NET LENGTH OF PROJECT: _____ FEET _____ MILES

COORDINATING PROFESSIONAL

File: 227220_NDOT_Title_Sheet.dgn Date: 12-DEC-2019 10:35 Computer: NDOTDESIGN217

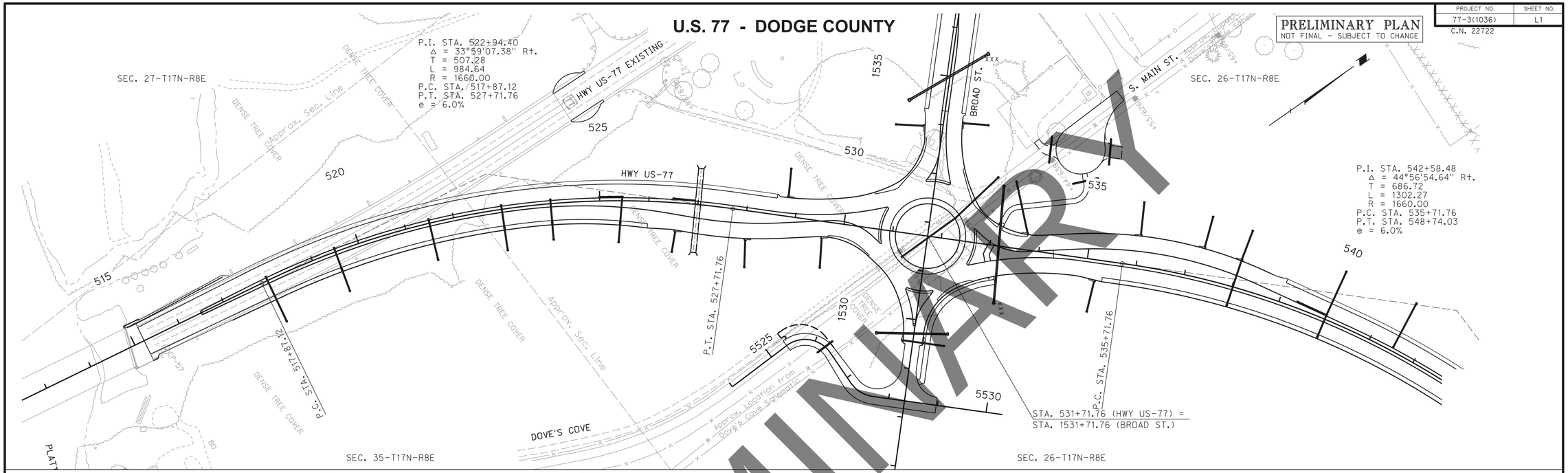
ROADWAY DESIGN DIVISION.

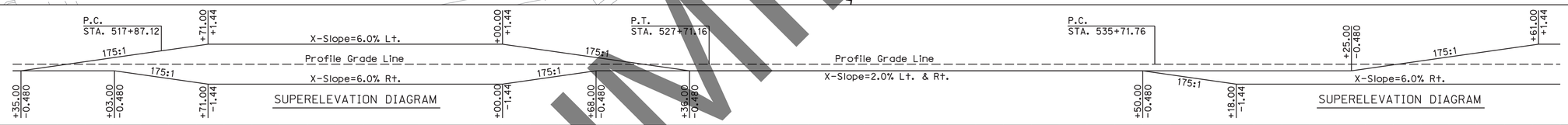
U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(10036)	L1

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



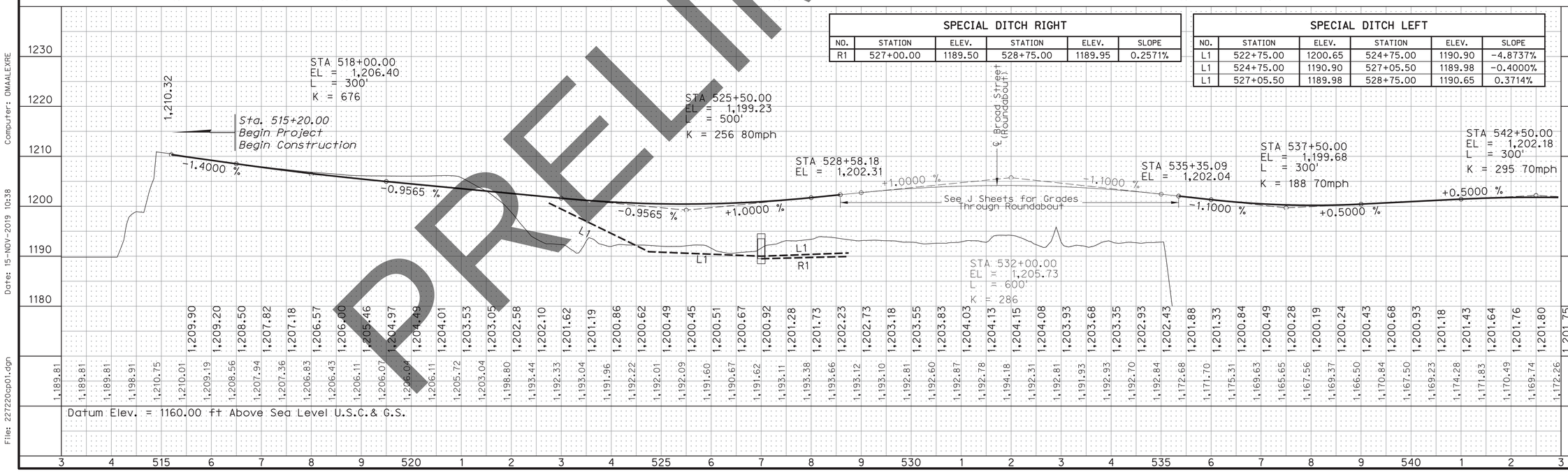


SPECIAL DITCH RIGHT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	527+00.00	1189.50	528+75.00	1189.95	0.2571%

SPECIAL DITCH LEFT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	522+75.00	1200.65	524+75.00	1190.90	-4.8737%
L1	524+75.00	1190.90	527+05.50	1189.98	-0.4000%
L1	527+05.50	1189.98	528+75.00	1190.65	0.3714%



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File: 227220cp01.dgn

PROJECT NO.	SHEET NO.
77-3(10036)	L2

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

U.S. 77 - DODGE COUNTY

SEC. 26-T17N-R8E

HILLS FARM RD.

S. PLATTE AVE.

HWY US-77

BNSF RR

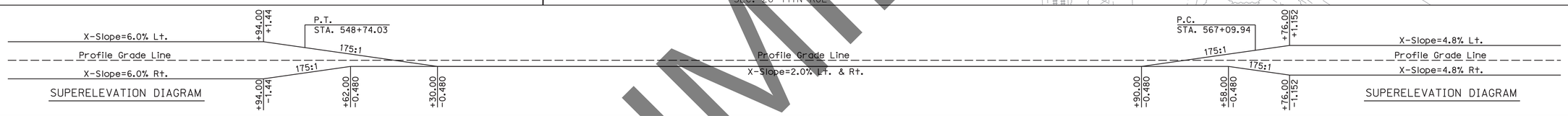
P.T. STA. 548+74.03

STA. 553+50.00 (HWY US-77) =
STA. 2553+50.00 (DRIVES @ 535+50)

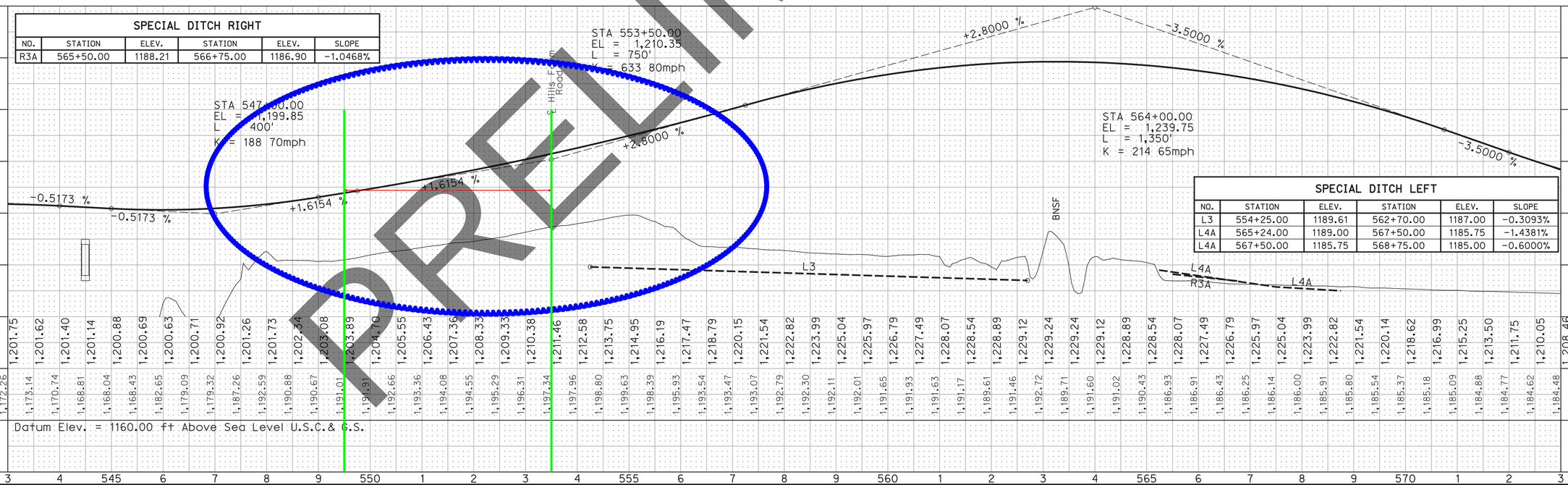
P.C. STA. 567+09.94

JEO Sta. 16+00 and Sta. 9+50

SEC. 26-T17N-R8E



SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R3A	565+50.00	1188.21	566+75.00	1186.90	-1.0468%



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L3	554+25.00	1189.61	562+70.00	1187.00	-0.3093%
L4A	565+24.00	1189.00	567+50.00	1185.75	-1.4381%
L4A	567+50.00	1185.75	568+75.00	1185.00	-0.6000%

ROADWAY DESIGN DIVISION.

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Date: 15-NOV-2019 10:38

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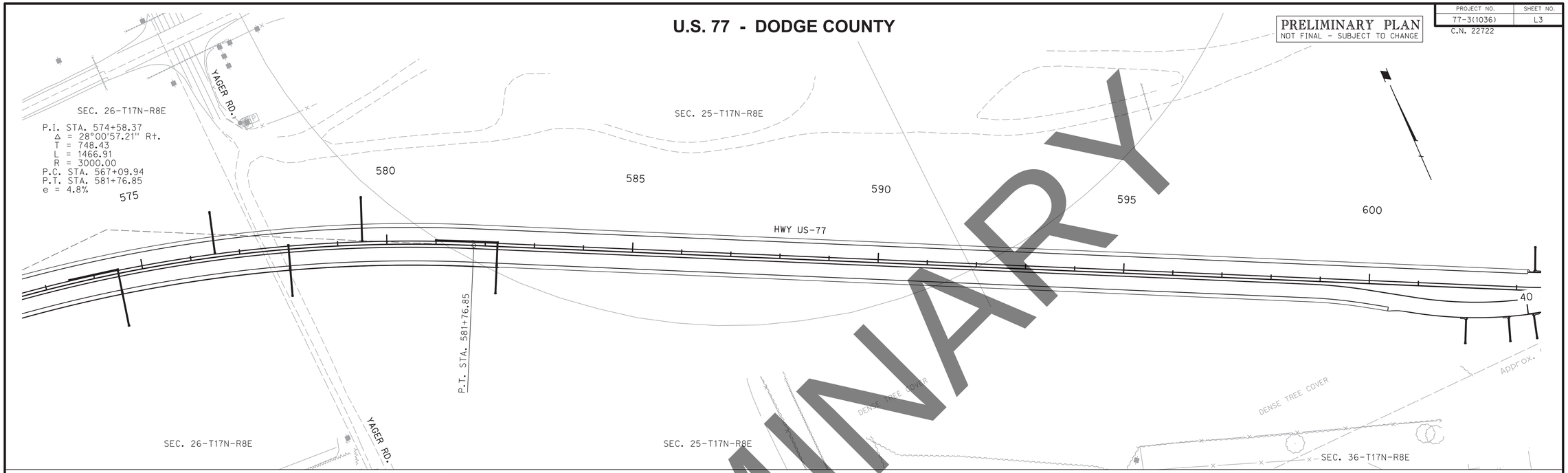
U.S. 77 - DODGE COUNTY

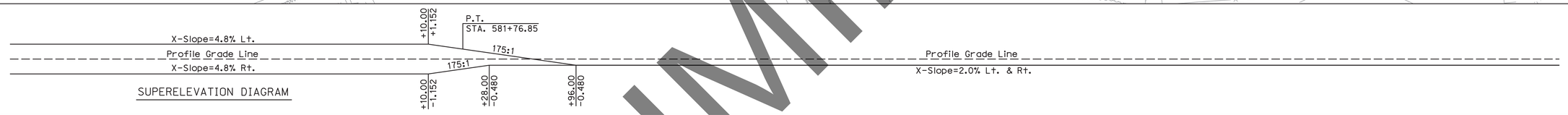
PROJECT NO.	SHEET NO.
77-3(1036)	L3

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

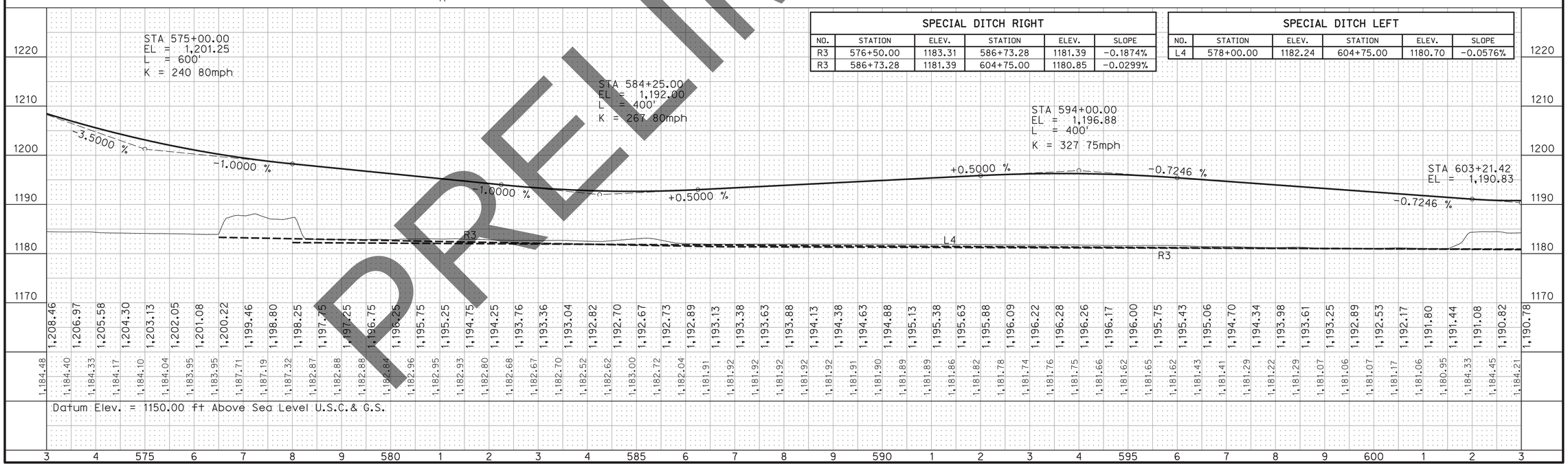




SUPERELEVATION DIAGRAM

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R3	576+50.00	1183.31	586+73.28	1181.39	-0.1874%
R3	586+73.28	1181.39	604+75.00	1180.85	-0.0299%

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L4	578+00.00	1182.24	604+75.00	1180.70	-0.0576%



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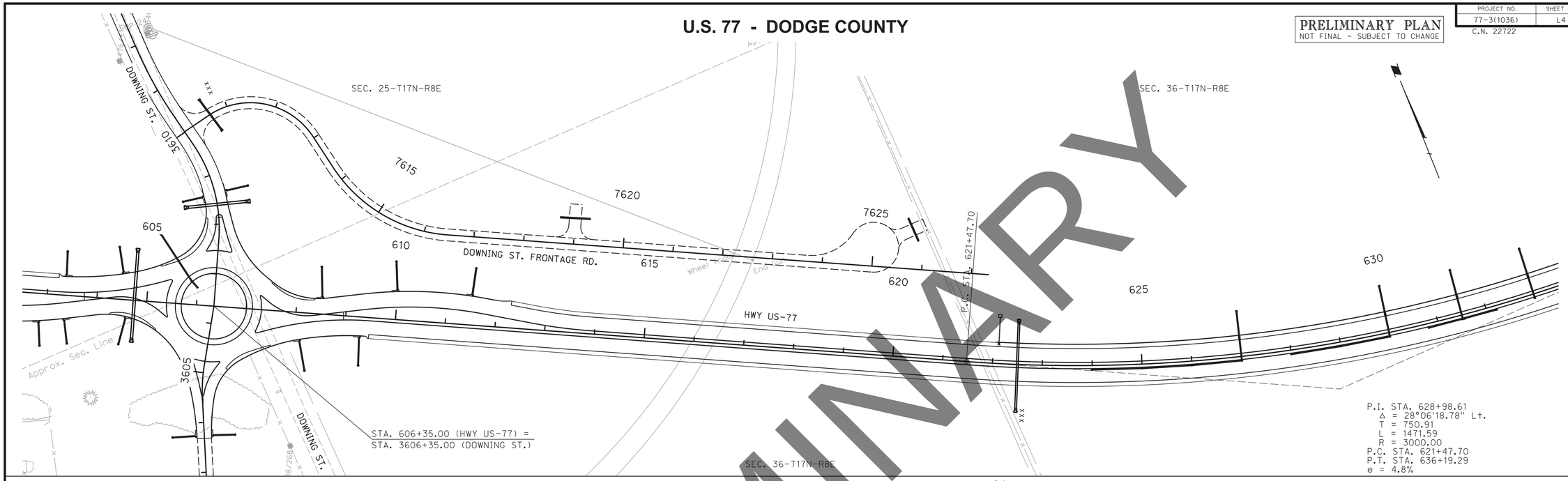
U.S. 77 - DODGE COUNTY

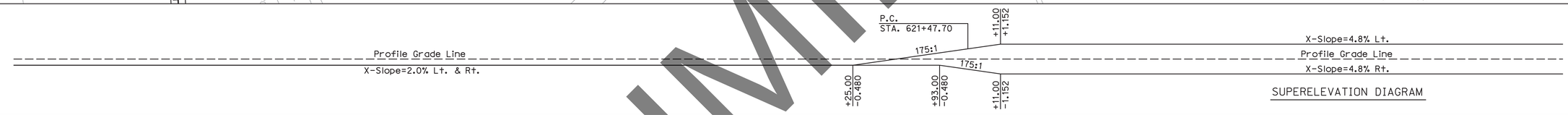
PROJECT NO.	SHEET NO.
77-3(10036)	L4

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

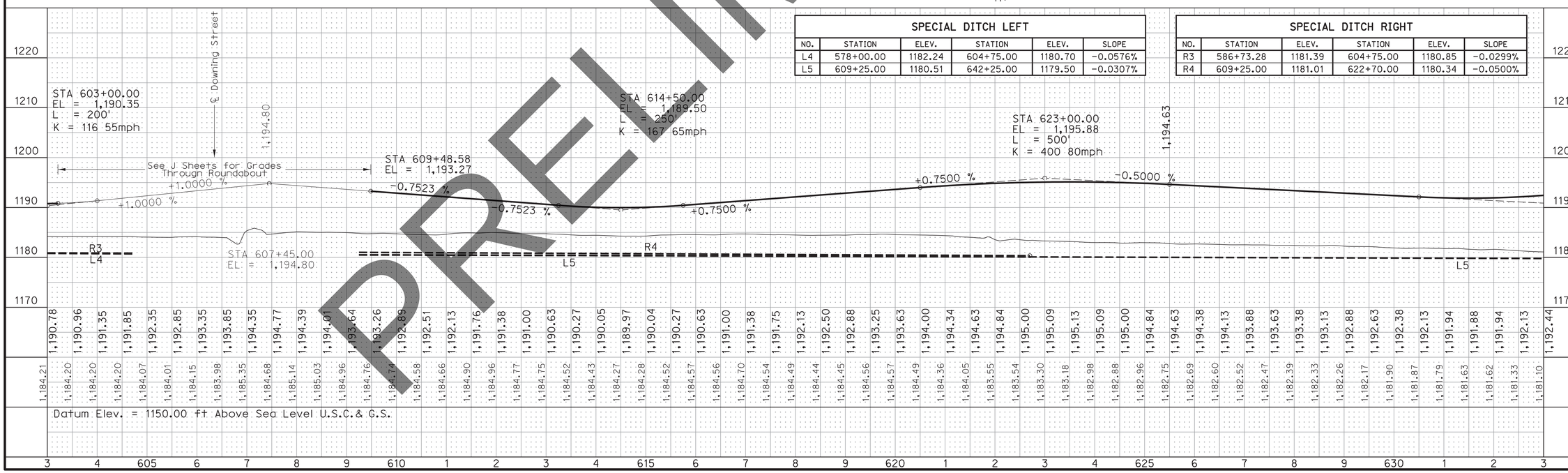




SUPERELEVATION DIAGRAM

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L4	578+00.00	1182.24	604+75.00	1180.70	-0.0576%
L5	609+25.00	1180.51	642+25.00	1179.50	-0.0307%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R3	586+73.28	1181.39	604+75.00	1180.85	-0.0299%
R4	609+25.00	1181.01	622+70.00	1180.34	-0.0500%



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U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(1036)	L5

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

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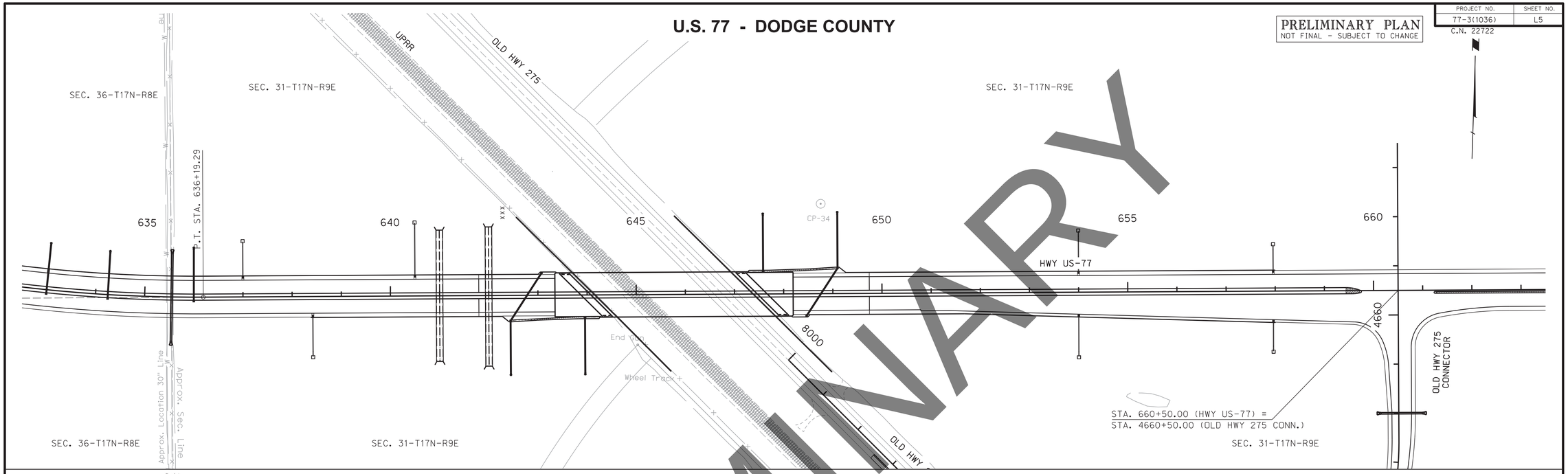
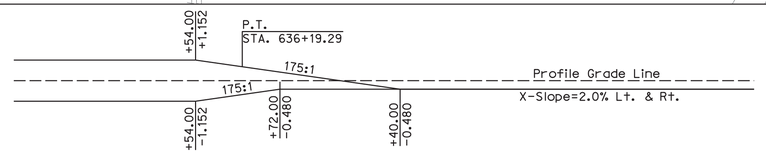
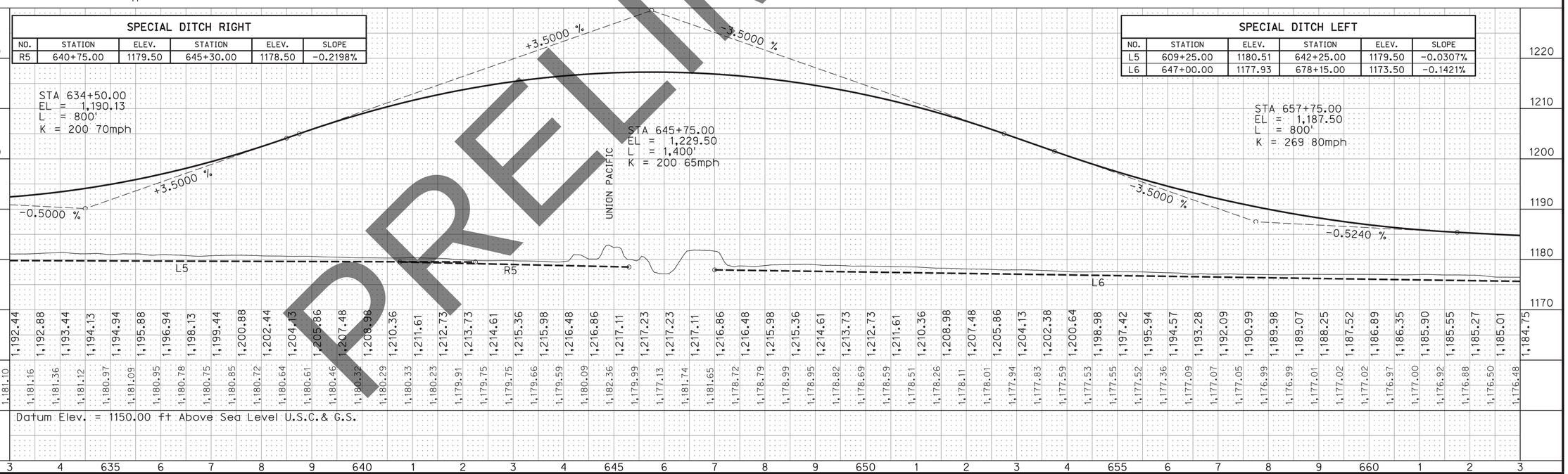




SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R5	640+75.00	1179.50	645+30.00	1178.50	-0.2198%

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L5	609+25.00	1180.51	642+25.00	1179.50	-0.0307%
L6	647+00.00	1177.93	678+15.00	1173.50	-0.1421%

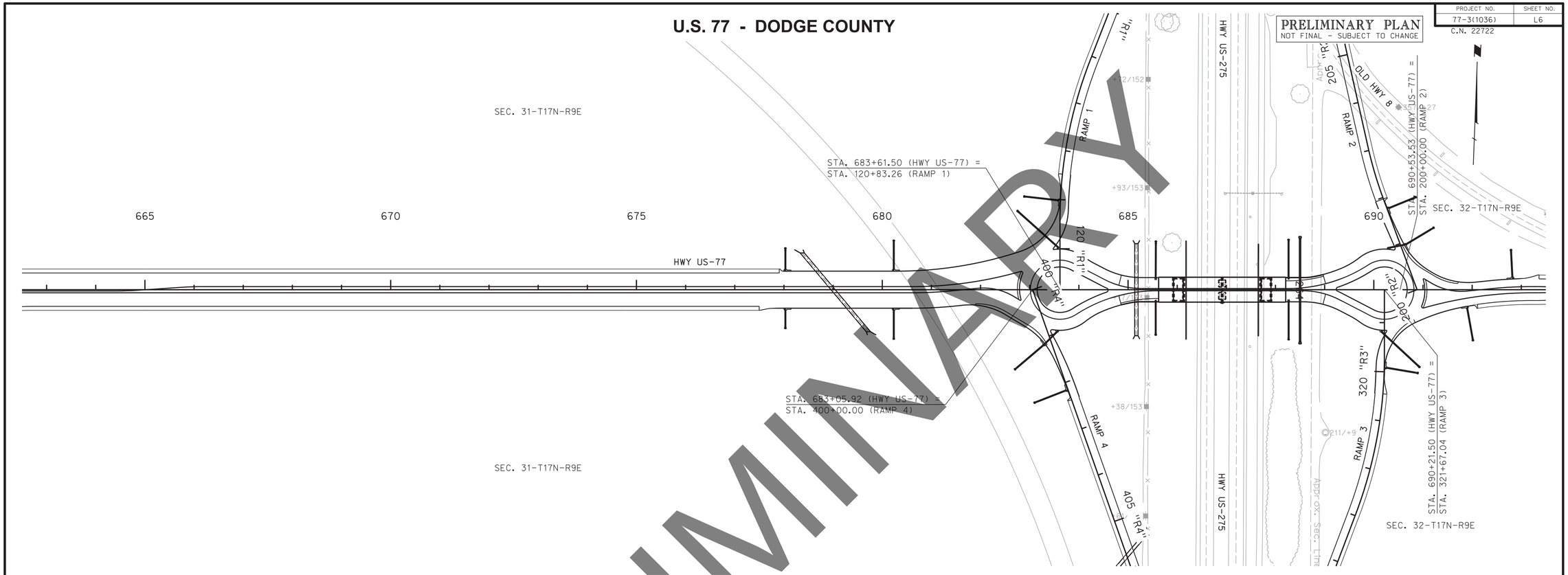


U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(10036)	L6

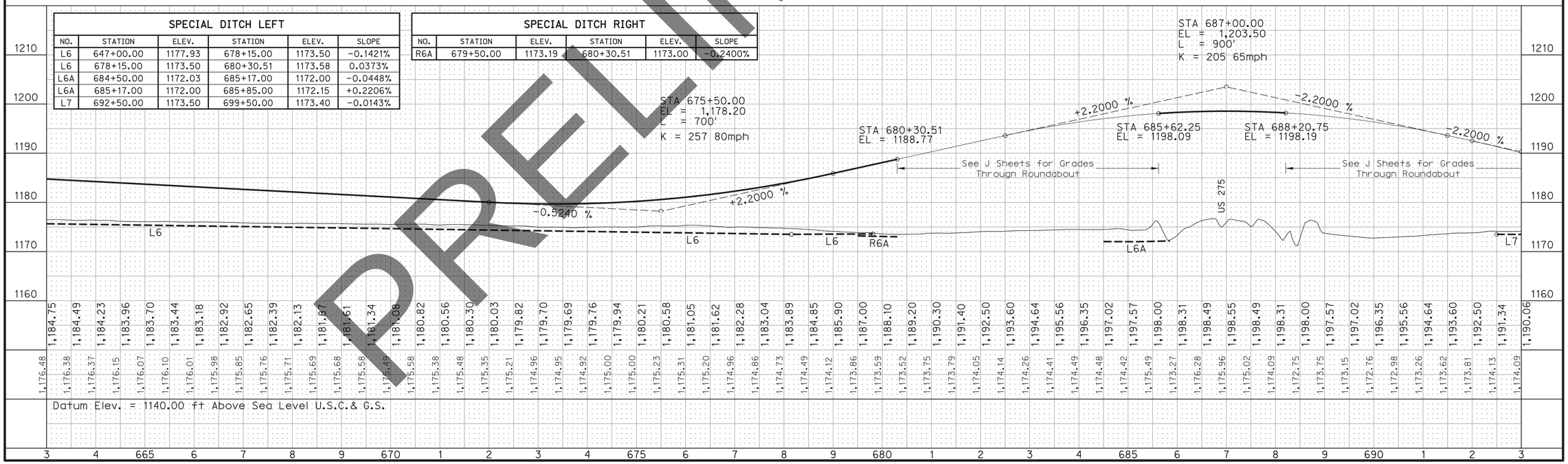
C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L6	647+00.00	1177.93	678+15.00	1173.50	-0.1421%
L6	678+15.00	1173.50	680+30.51	1173.58	0.0373%
L6A	684+50.00	1172.03	685+17.00	1172.00	-0.0448%
L6A	685+17.00	1172.00	685+85.00	1172.15	+0.2206%
L7	692+50.00	1173.50	699+50.00	1173.40	-0.0143%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R6A	679+50.00	1173.19	680+30.51	1173.00	-0.2400%



ROADWAY DESIGN DIVISION.

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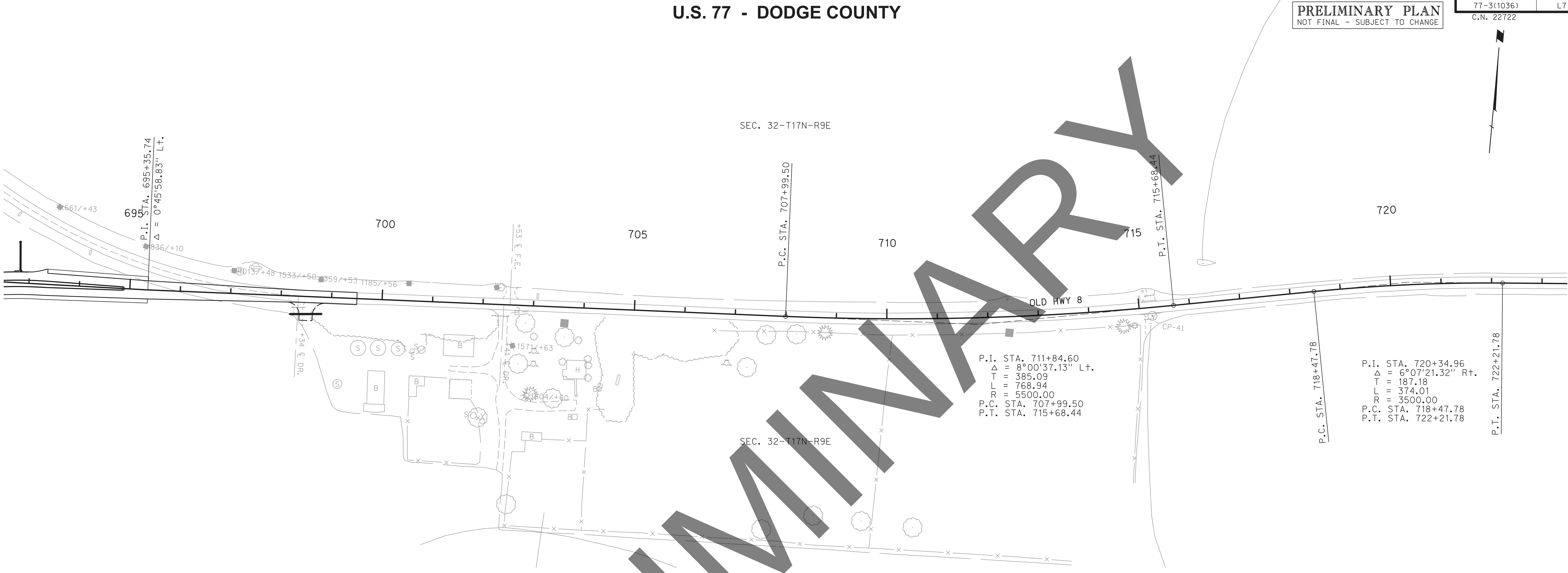
PROJECT NO.	SHEET NO.
77-3(1036)	L7

C.N. 22722

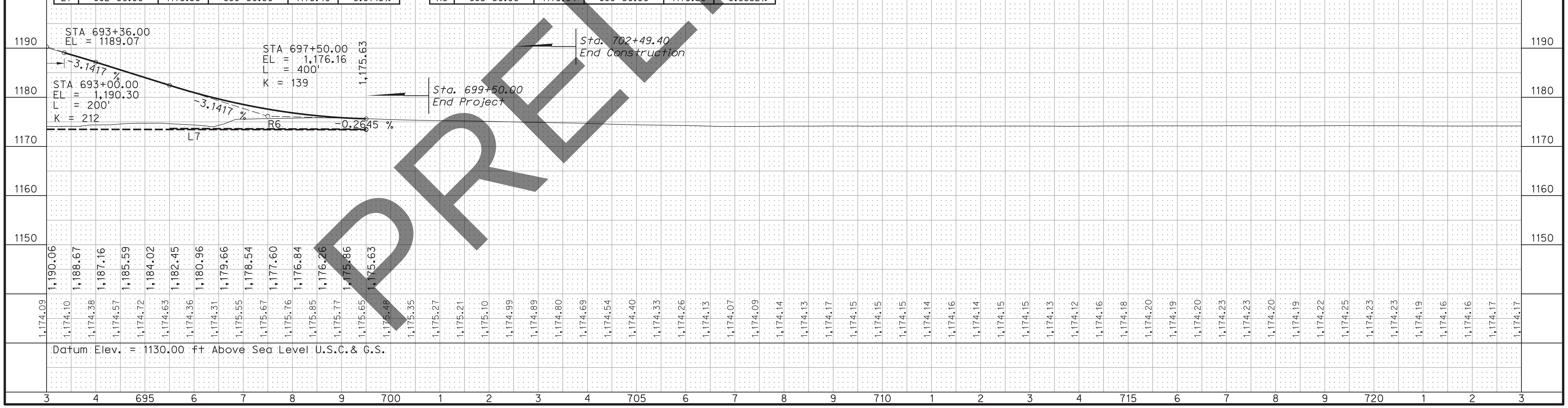
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

U.S. 77 - DODGE COUNTY



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L7	692+50.00	1173.50	699+50.00	1173.40	-0.0143%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R6	695+50.00	1173.64	699+50.00	1173.50	-0.0352%



U.S. 77 - DODGE COUNTY

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

PROJECT NO.	SHEET NO.
77-3(10036)	L8

C.N. 22722

JEO Sta. 35+00

ROADWAY DESIGN DIVISION.

SEC. 35-T17N-R8E

DOVE'S COVE

Approx. Location from Dove's Cove Schematic

P.O.T. STA. 1526+50.00

STA. 1528+33.57 (BROAD ST.) =
STA. 5528+33.57 (S. MAIN ST.)

STA. 1531+71.76 (BROAD ST.) =
STA. 531+71.76 (HWY US-77)

SEC. 26-T17N-R8E

HWY US-77

DENSE TREE COVER

BROAD ST.

P.C. STA. 1536+44.96

P.I. STA. 1540+08.49
Δ = 48°52'27.50" Rt.
T = 363.52
L = 682.41
R = 800.00
P.C. STA. 1536+44.96
P.I. STA. 1543+27.38

P.T. STA. 1543+27.38

S. MAIN ST.

SEC. 26-T17N-R8E

P.O.T. STA. 1549+61.16

BROAD STREET

PRELIMINARY

STA 1530+61.76
EL = 1,204.75

STA 1532+81.76
EL = 1,204.79

STA 1537+00.00
EL = 1,198.52
L = 750'

STA 1542+50.00
EL = 1,201.27
L = 323'

Sta. 1527+90.18
Resume Construction

1,192.77

+33.33 %

+4.0000 %

+2.0000 %

-1.5000 %

STA 1529+50.00
EL = 1,202.51
L = 100'

+0.5000 %

-0.5241 %

1,200.31

Sta. 1544+33.00
Stop Construction

R1

R1

STA 1528+01.59
EL = 1,196.57

STA 1530+93.76
EL = 1,205.39

STA 1532+49.76
EL = 1,205.43

SPECIAL DITCH RIGHT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	1534+28.57	1191.54	1542+00.00	1194.00	0.3188%
R1	1542+00.00	1194.00	1542+75.00	1195.55	2.0667%

1220 1210 1200 1190 1180 1170

1,190.98 1,191.29 1,191.89 1,193.00 1,193.96 1,196.04 1,198.51 1,200.51 1,191.91 1,191.06 1,202.26 1,190.92 1,203.51 1,192.01 1,204.51 1,192.68 1,205.39 1,194.11 1,205.40 1,193.21 1,205.42 1,194.18 1,205.43 1,195.06 1,204.52 1,195.75 1,203.77 1,195.50 1,203.09 1,193.57 1,202.47 1,193.23 1,201.92 1,193.16 1,201.44 1,193.59 1,201.02 1,194.02 1,200.67 1,193.41 1,200.39 1,194.40 1,200.17 1,197.04 1,200.02 1,197.79 1,199.94 1,197.30 1,199.92 1,191.43 1,199.97 1,194.09 1,200.09 1,198.91 1,200.27 1,200.55 1,200.51 1,200.70 1,200.71 1,200.73 1,200.82 1,200.69 1,200.85 1,200.69 1,200.81 1,200.60 1,200.68 1,200.38 1,200.48 1,200.26 1,199.97 1,199.73 1,199.46 1,199.15 1,198.79 1,198.39 1,197.96 1,197.52 1,197.12 1,196.72

Datum Elev. = 1150.00 ft Above Sea Level U.S.C.& G.S.

7 8 9 1530 1 2 3 4 1535 6 7 8 9 1540 1 2 3 4 1545 6 7 8 9

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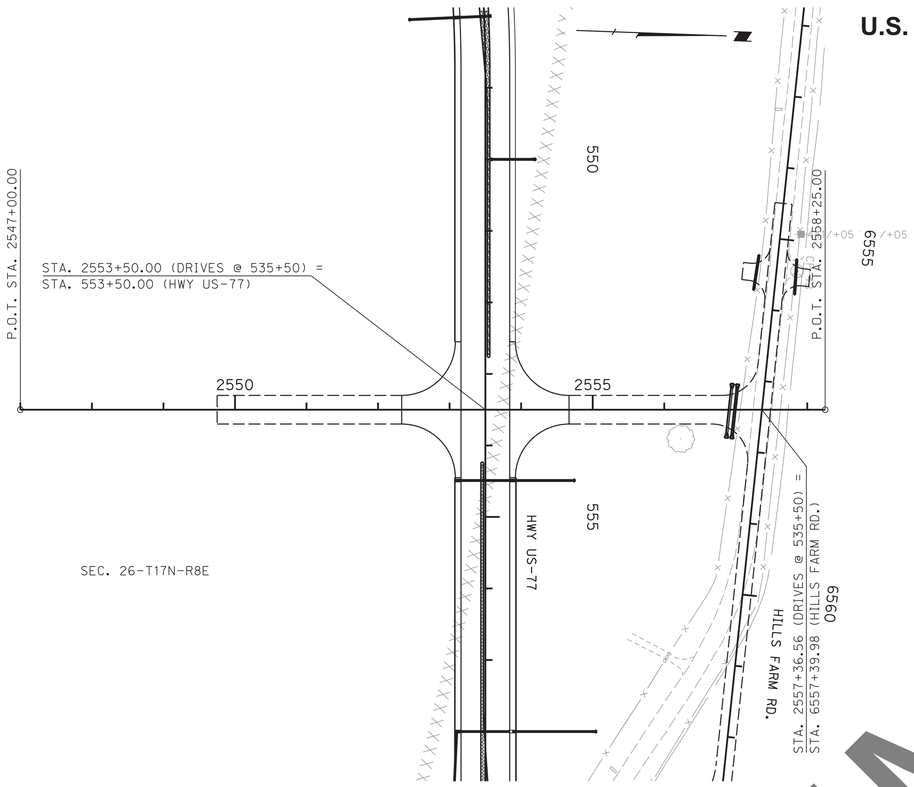
ROADWAY DESIGN DIVISION.

U.S. 77 - DODGE COUNTY

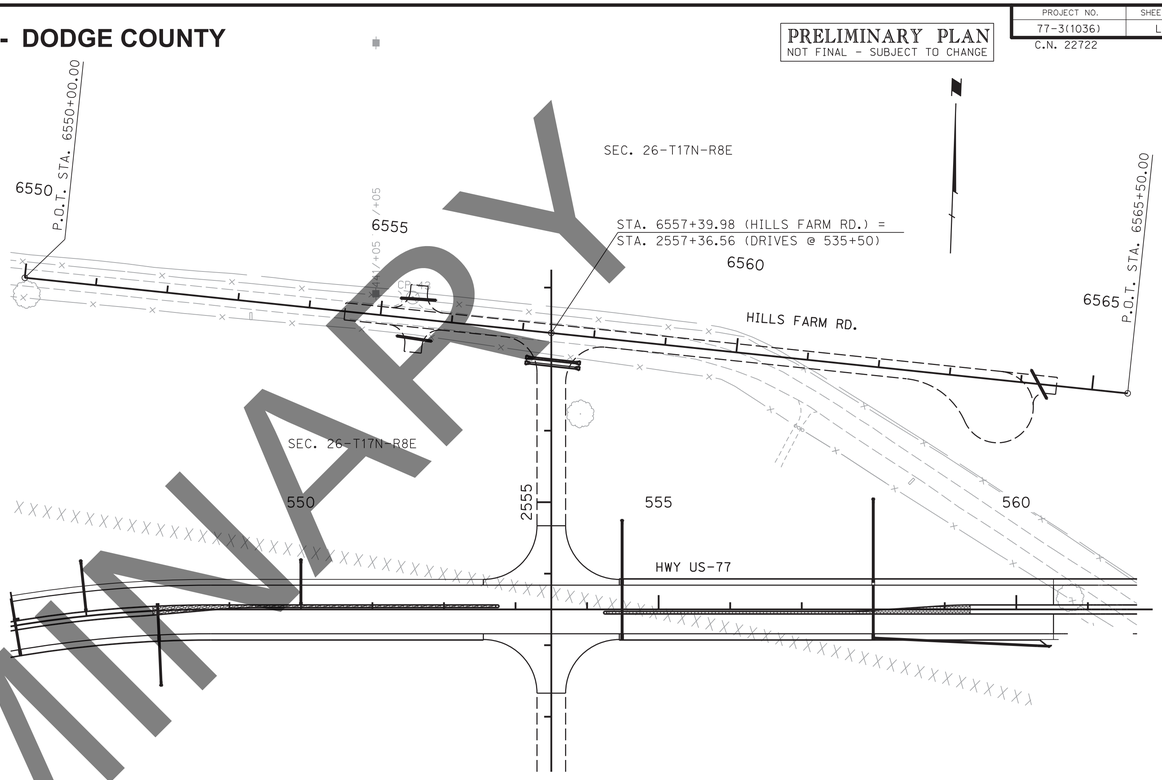
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

PROJECT NO.	SHEET NO.
77-3(1036)	L9

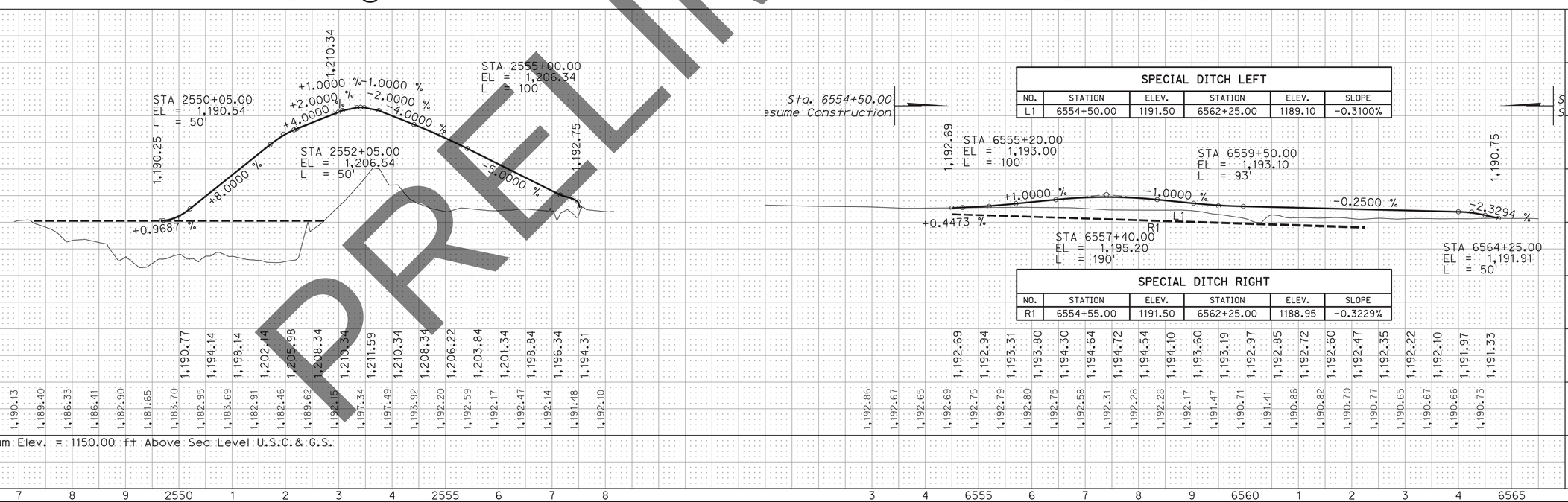
C.N. 22722



DRIVES @ 535+50



HILLS FARM ROAD



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	6554+50.00	1191.50	6562+25.00	1189.10	-0.3100%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	6554+55.00	1191.50	6562+25.00	1188.95	-0.3229%

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ROADWAY DESIGN DIVISION.

PROJECT NO.	SHEET NO.
77-3(10036)	L10

C.N. 22722

PRELIMINARY
NOT FINAL - SUBJECT TO CHANGE

U.S. 77 - DODGE COUNTY

SEC. 36-T17N-R8E

SEC. 25-T17N-R8E

P.O.T. STA. 3598+50.00

STA. 3606+35.00 (DOWNING ST.) =
STA. 606+35.00 (HWY US-77)

Approx. Sec. Line

HWY US-77

P.I. STA. 3608+73.42
Δ = 38°27'01.65" Lt.
T = 104.62
L = 201.33
R = 300.00
P.C. STA. 3607+68.80
P.T. STA. 3609+70.13

P.C. STA. 3607+68.80

P.T. STA. 3609+70.13

STA. 3610+01.11 (DOWNING ST.) =
STA. 7610+01.11 (DOWNING ST. FRONTAGE RD.)

P.O.T. STA. 3616+08.26

3600 3605 3610 3615

DOWNING ST.

P.C. STA. 3604+49.36
P.T. STA. 3605+12.57

P.I. STA. 3606+35.00
Δ = 50°00'00.00" Lt.

P.C. STA. 3610+42.11

P.T. STA. 3611+89.32

P.I. STA. 3604+81.09
Δ = 12°04'19.64" Rt.
T = 31.72
L = 63.21
R = 300.00
P.C. STA. 3604+49.36
P.T. STA. 3605+12.57

P.I. STA. 3611+15.92
Δ = 10°32'34.03" Rt.
T = 73.81
L = 147.21
R = 800.00
P.C. STA. 3610+42.11
P.T. STA. 3611+89.32

HILLS FARM RD.

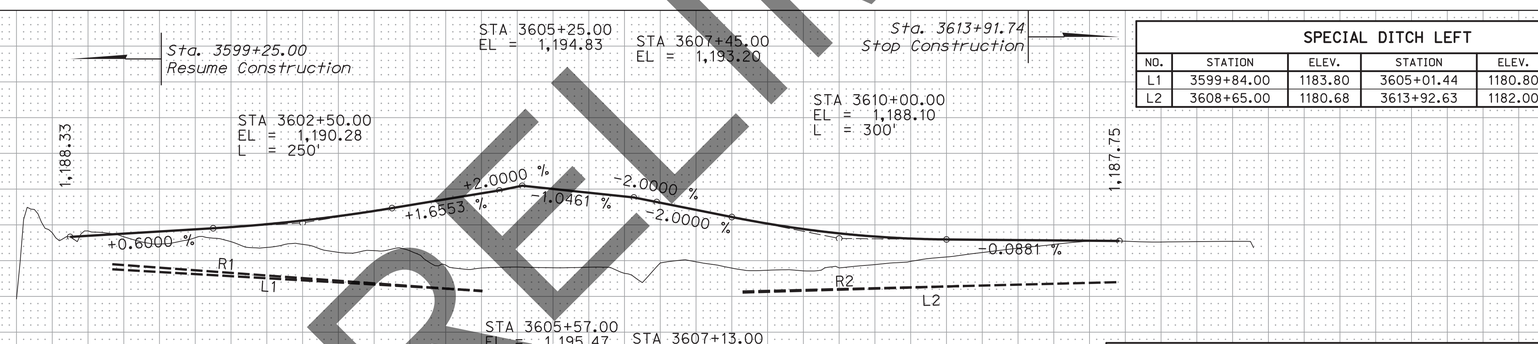
CP-25

HWY US-77

SEC. 36-T17N-R8E

SEC. 25-T17N-R8E

DOWNING STREET



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	3599+84.00	1183.80	3605+01.44	1180.80	-0.5798%
L2	3608+65.00	1180.68	3613+92.63	1182.00	0.2502%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	3599+84.00	1184.50	3605+01.44	1180.72	-0.7305%
R2	3608+64.97	1180.55	3611+75.00	1181.46	0.2929%

1,188.48 1,188.78 1,189.08 1,189.38 1,189.69 1,190.10 1,190.61 1,191.23 1,191.95 1,192.76 1,193.59 1,194.42 1,195.33 1,195.02 1,194.50 1,193.98 1,193.10 1,192.10 1,191.10 1,190.18 1,189.42 1,188.82 1,188.37 1,188.09 1,187.97 1,187.92 1,187.88 1,187.84 1,187.79

1,179.62 1,188.91 1,189.16 1,188.34 1,187.33 1,188.22 1,187.66 1,186.86 1,187.28 1,186.15 1,186.40 1,186.38 1,184.40 1,183.97 1,184.11 1,184.01 1,184.08 1,183.23 1,184.69 1,184.84 1,183.96 1,183.66 1,183.58 1,183.98 1,184.45 1,184.91 1,185.52 1,186.15 1,186.76 1,187.26 1,187.73 1,187.72 1,187.61 1,187.66 1,187.70

Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

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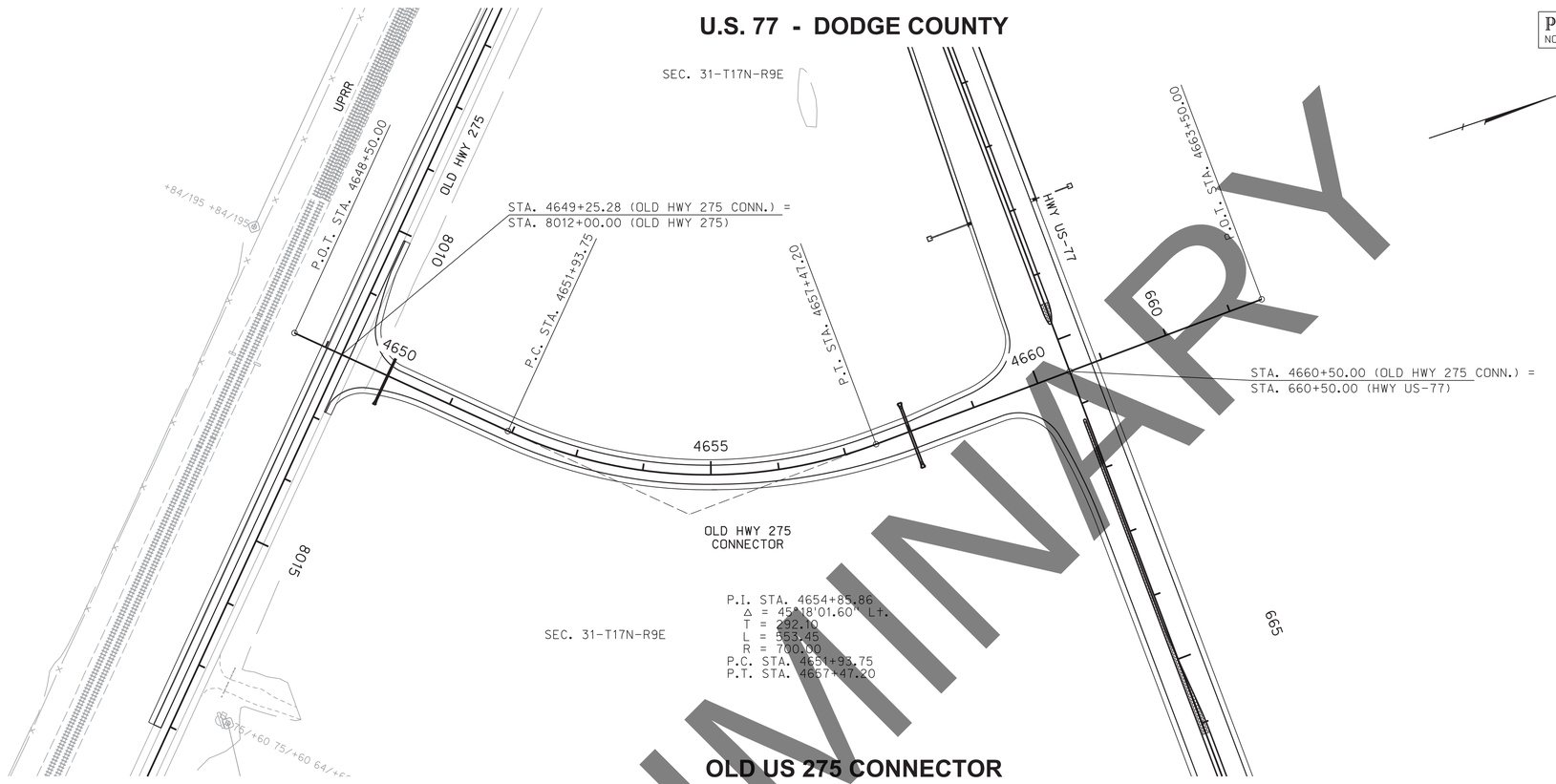
ROADWAY DESIGN DIVISION.

PROJECT NO.	SHEET NO.
77-3(1036)	L11

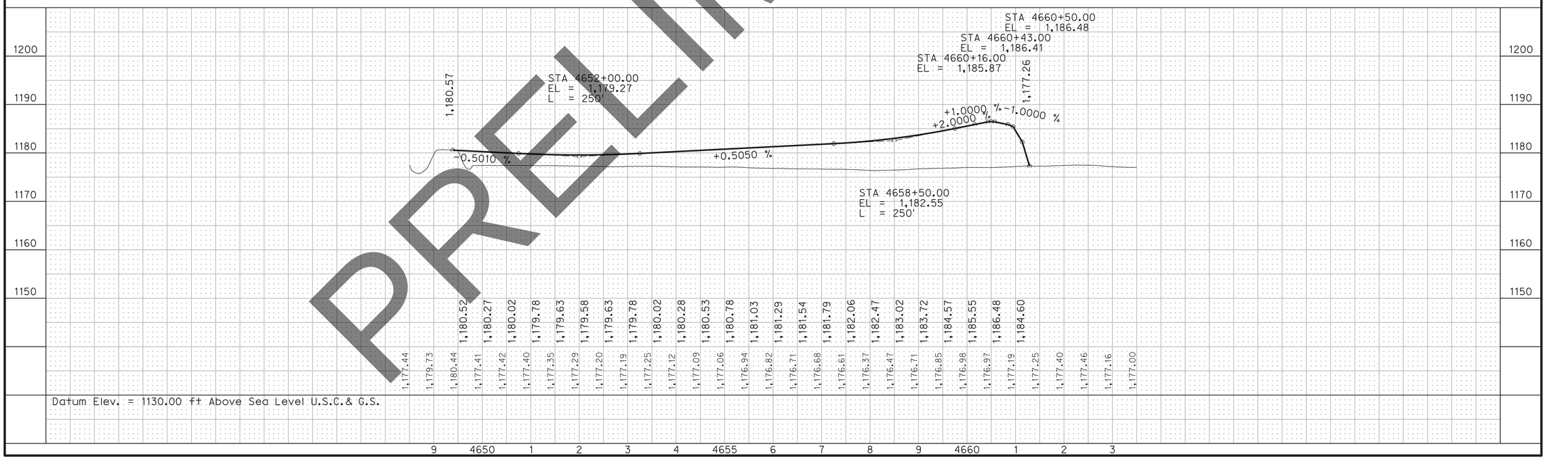
C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

U.S. 77 - DODGE COUNTY



OLD US 275 CONNECTOR



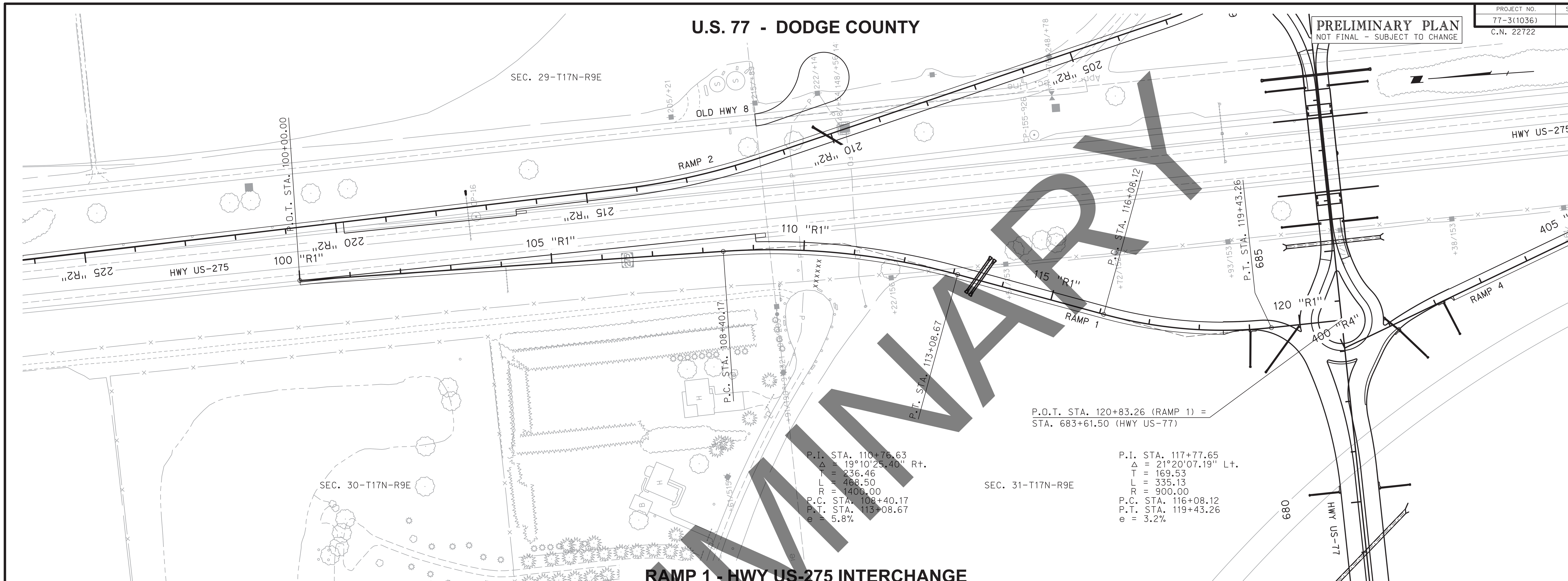
Computer: DMAALEXRE
Date: 15-NOV-2019 10:39
File: 227220cp11.dgn

PROJECT NO.	SHEET NO.
77-3(1036)	L12

C.N. 22722

U.S. 77 - DODGE COUNTY

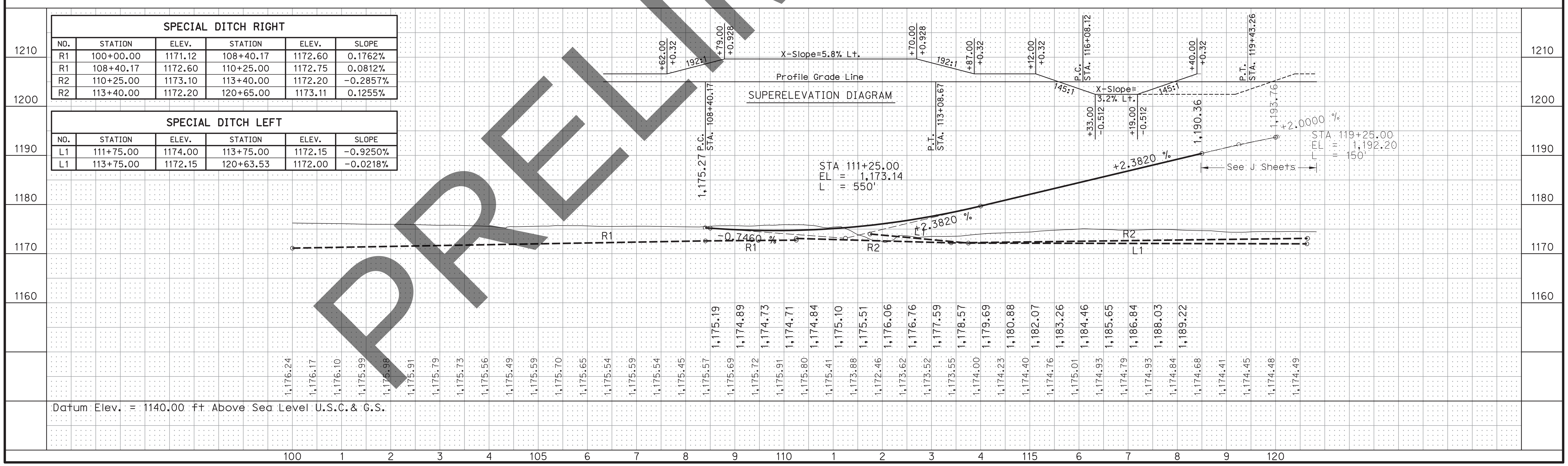
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



RAMP 1 - HWY US-275 INTERCHANGE

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	100+00.00	1171.12	108+40.17	1172.60	0.1762%
R1	108+40.17	1172.60	110+25.00	1172.75	0.0812%
R2	110+25.00	1173.10	113+40.00	1172.20	-0.2857%
R2	113+40.00	1172.20	120+65.00	1173.11	0.1255%

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	111+75.00	1174.00	113+75.00	1172.15	-0.9250%
L1	113+75.00	1172.15	120+63.53	1172.00	-0.0218%



PRELIMINARY

ROADWAY DESIGN DIVISION.
Computer: OMAALEXRE
Date: 15-NOV-2019 10:39
File: 227220cp12.dgn

U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(10036)	L13
C.N. 22722	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

HWY US-275

SEC. 30-T17N-R9E

RAMP 1

110 "R1"

105 "R1"

100 "R1"

HWY US-275

220 "R2"

225 "R2"

215 "R2"

210 "R2"

205 "R2"

RAMP 2

OLD HWY 8

320 "R3"

RAMP 3

200 "R2"

690

695

HWY US-77

P.O.T. STA. 200+00.00 (RAMP 2) =
STA. 690+53.53 (HWY US-77)

P.C. STA. 201+97.11

P.T. STA. 203+04.86

P.I. STA. 202+51.07
Δ = 7°43'00.68" Rt.
T = 53.96
L = 107.75
R = 800.00
P.C. STA. 201+97.11
P.T. STA. 203+04.86

SEC. 32-T17N-R9E

P.C. STA. 211+39.80

P.T. STA. 214+32.29

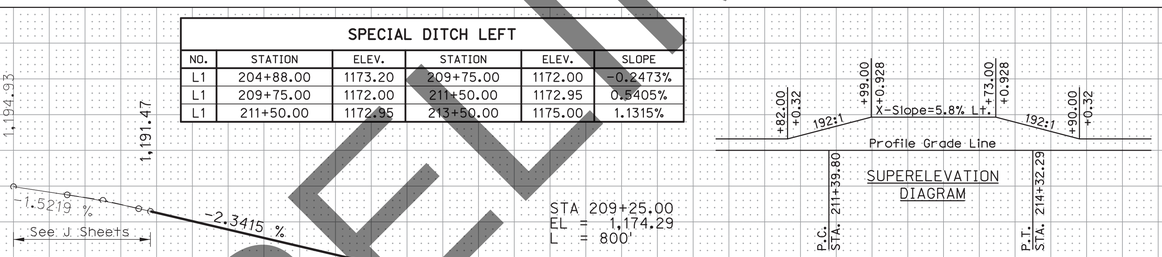
P.I. STA. 212+86.58
Δ = 11°58'12.99" Rt.
T = 146.78
L = 292.49
R = 1400.00
P.C. STA. 211+39.80
P.T. STA. 214+32.29
e = 5.8%

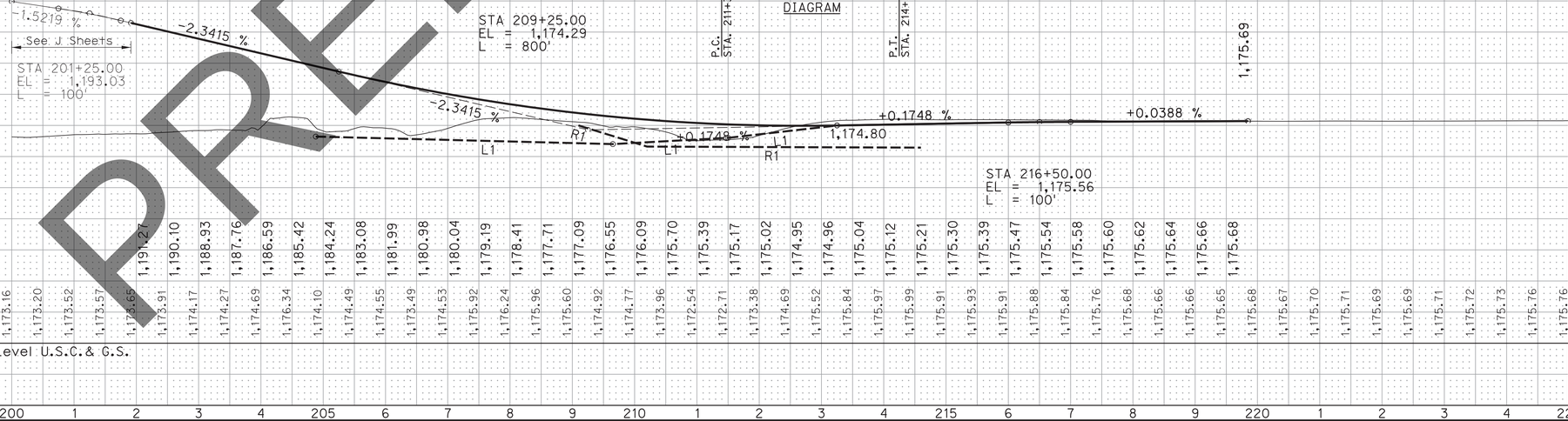
SEC. 29-T17N-R9E

RAMP 2 - HWY US-275 INTERCHANGE

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	204+88.00	1173.20	209+75.00	1172.00	-0.2473%
L1	209+75.00	1172.00	211+50.00	1172.95	0.5405%
L1	211+50.00	1172.95	213+50.00	1175.00	1.1315%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	209+10.00	1175.00	210+20.00	1171.60	-3.0823%
R1	210+20.00	1171.60	214+60.00	1171.43	-0.0392%





Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

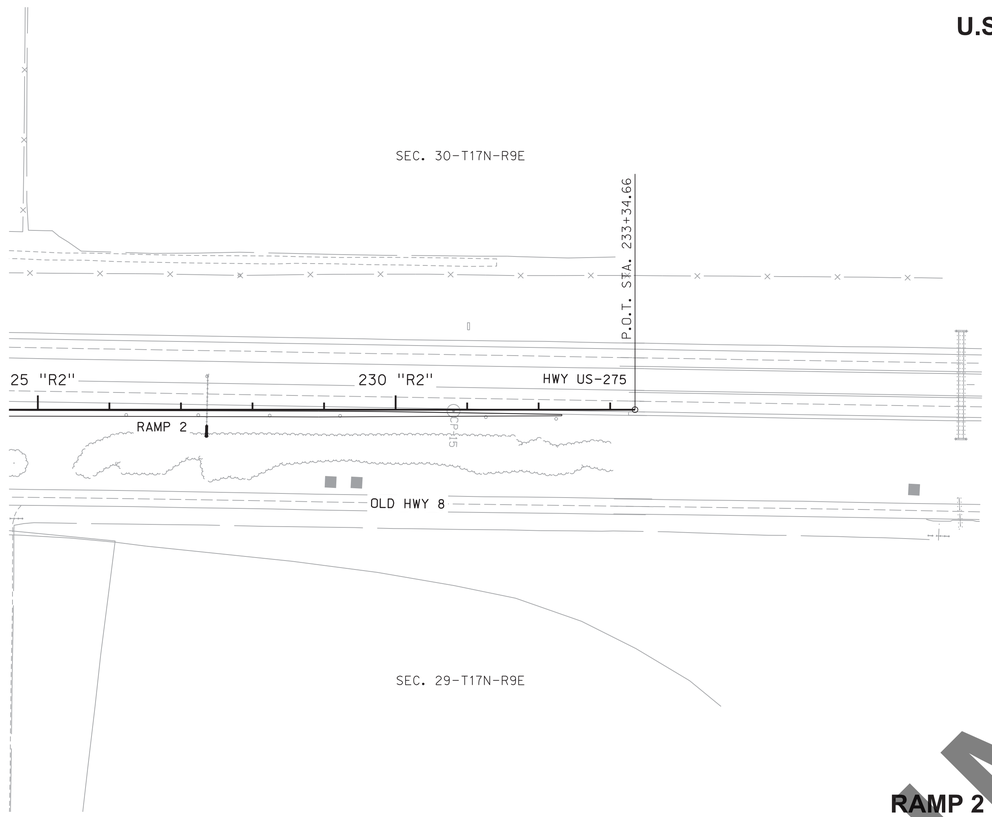
Computer: DMAALEXRE
Date: 15-NOV-2019 10:39
File: 227220cp13.dgn

U.S. 77 - DODGE COUNTY

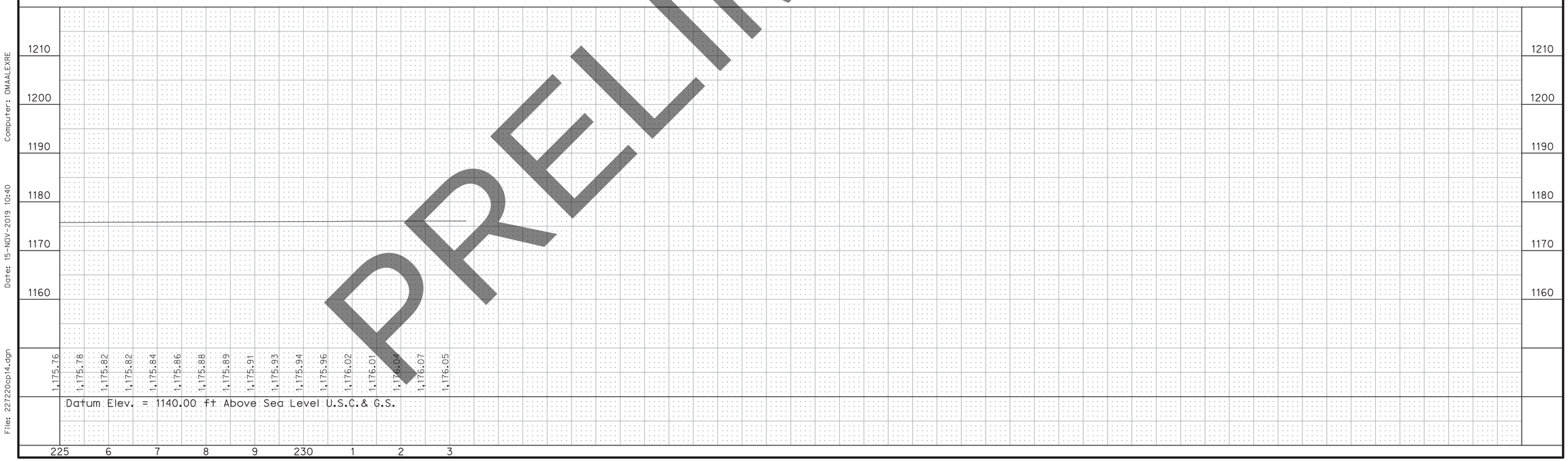
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

PROJECT NO.	SHEET NO.
77-3(10036)	L14

C.N. 22722



RAMP 2 - HWY US-275 INTERCHANGE



ROADWAY DESIGN DIVISION.

Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp14.dgn

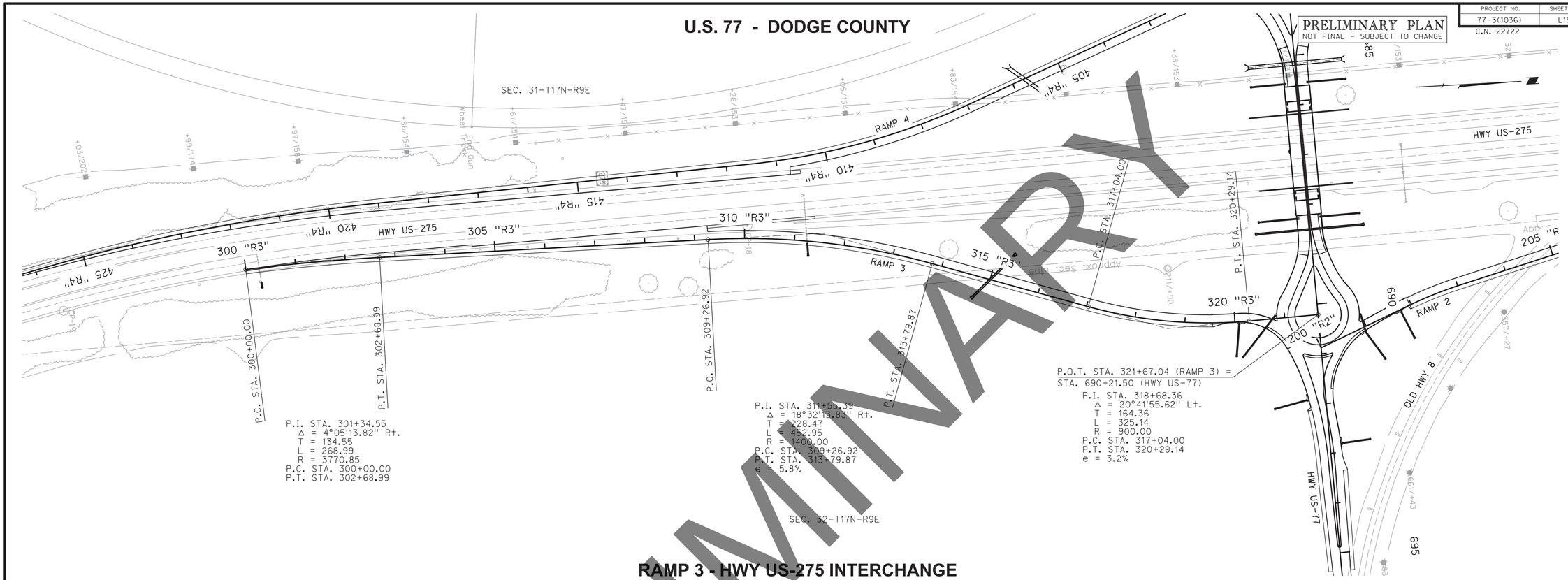
ROADWAY DESIGN DIVISION.

PROJECT NO.	SHEET NO.
77-3(10036)	L15

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

U.S. 77 - DODGE COUNTY



P.I. STA. 301+34.55
Δ = 4°05'13.82" Rt.
T = 134.55
L = 268.99
R = 3770.85
P.C. STA. 300+00.00
P.T. STA. 302+68.99

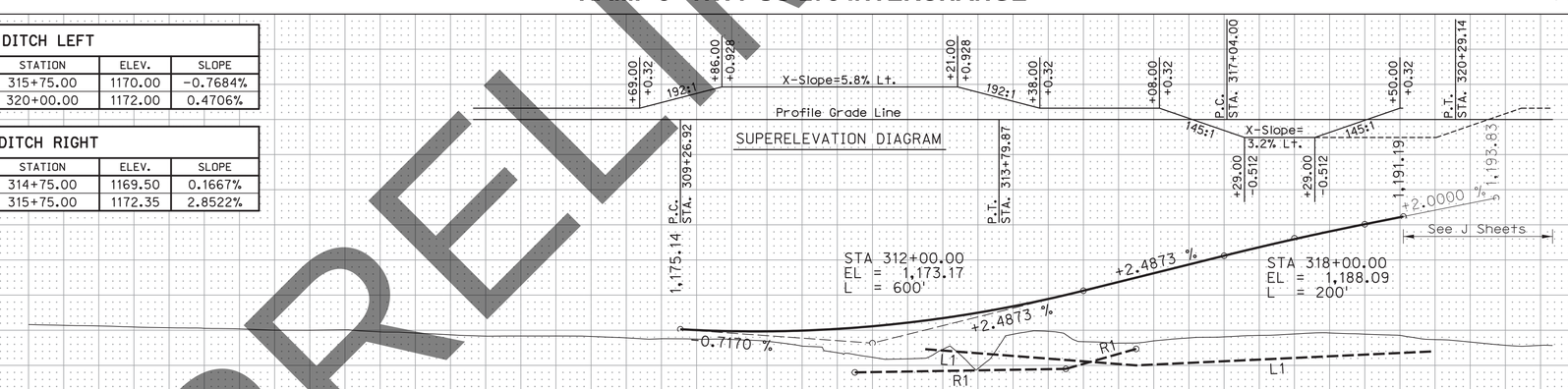
P.I. STA. 311+55.39
Δ = 18°32'13.83" Rt.
T = 228.47
L = 452.95
R = 1400.00
P.C. STA. 309+26.92
P.T. STA. 313+79.87
e = 5.8%

P.I. STA. 318+68.36
Δ = 20°41'55.62" Lt.
T = 164.36
L = 325.14
R = 900.00
P.C. STA. 317+04.00
P.T. STA. 320+29.14
e = 3.2%

RAMP 3 - HWY US-275 INTERCHANGE

SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	312+75.00	1172.31	315+75.00	1170.00	-0.7684%
L1	315+75.00	1170.00	320+00.00	1172.00	0.4706%

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	311+75.00	1169.00	314+75.00	1169.50	0.1667%
R1	314+75.00	1169.50	315+75.00	1172.35	2.8522%



Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

	300	1	2	3	4	305	6	7	8	9	310	1	2	3	4	315	6	7	8	9	320	1
1175.81																						
1175.70																						
1175.62																						
1175.46																						
1175.35																						
1175.28																						
1175.19																						
1175.02																						
1175.00																						
1175.07																						
1174.77																						
1174.61																						
1174.35																						
1174.17																						
1174.18																						
1174.18																						
1174.12																						
1173.92																						
1173.79																						
1173.74	1175.03	1174.87	1174.84	1174.95	1175.19	1175.57	1176.08	1176.72	1177.50	1178.41	1179.45	1180.63	1181.87	1183.12	1184.36	1185.60	1186.82	1187.97	1189.06	1190.09		
1173.70	1173.43	1172.75	1171.81	1171.15	1170.93	1172.28	1169.53	1174.43	1174.84	1173.38	1173.17	1173.50	1173.91	1174.05	1174.26	1174.47	1174.61	1174.44	1174.27	1173.67	1173.32	1172.87	1172.85

Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp15.dgn

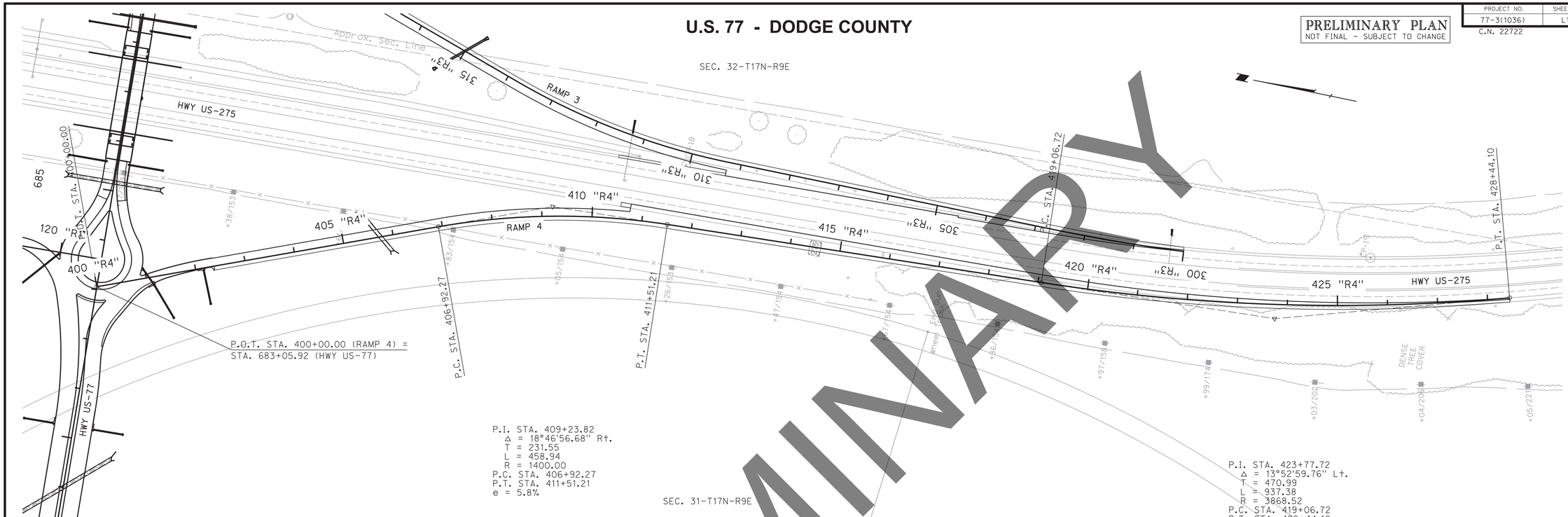
ROADWAY DESIGN DIVISION.

PROJECT NO.	SHEET NO.
77-3(10036)	L16

C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

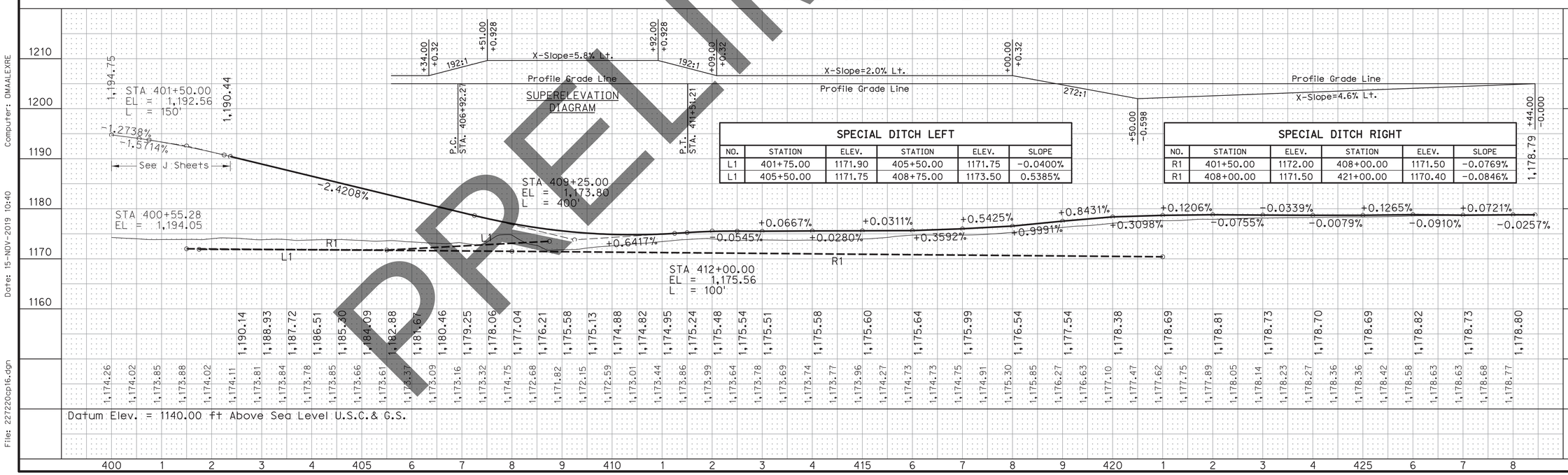
U.S. 77 - DODGE COUNTY



P.I. STA. 409+23.82
Δ = 18°46'56.68" Rt.
T = 231.55
L = 458.94
R = 1400.00
P.C. STA. 406+92.27
P.T. STA. 411+51.21
e = 5.8%

P.I. STA. 423+77.72
Δ = 13°52'59.76" Lt.
T = 470.99
L = 937.38
R = 3868.52
P.C. STA. 419+06.72
P.T. STA. 428+44.10

RAMP 4 - HWY US-275 INTERCHANGE



SPECIAL DITCH LEFT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	401+75.00	1171.90	405+50.00	1171.75	-0.0400%
L1	405+50.00	1171.75	408+75.00	1173.50	0.5385%

SPECIAL DITCH RIGHT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	401+50.00	1172.00	408+00.00	1171.50	-0.0769%
R1	408+00.00	1171.50	421+00.00	1170.40	-0.0846%

1,190.14 1,188.93 1,187.72 1,186.51 1,185.30 1,184.09 1,182.88 1,181.67 1,180.46 1,179.25 1,178.06 1,177.04 1,176.21 1,175.58 1,175.13 1,174.88 1,174.82 1,174.95 1,175.24 1,175.48 1,175.54 1,175.51 1,175.58 1,175.60 1,175.64 1,175.99 1,176.54 1,177.54 1,178.38 1,178.69 1,178.81 1,178.73 1,178.70 1,178.69 1,178.82 1,178.73 1,178.80

1,174.26 1,174.02 1,173.85 1,173.88 1,174.02 1,174.11 1,173.81 1,173.84 1,173.78 1,173.85 1,173.66 1,173.61 1,173.37 1,173.09 1,173.16 1,173.32 1,174.75 1,172.68 1,171.82 1,172.15 1,172.59 1,173.01 1,173.44 1,173.86 1,173.99 1,173.64 1,173.78 1,173.69 1,173.74 1,173.77 1,173.96 1,174.27 1,174.73 1,174.73 1,174.75 1,174.91 1,175.30 1,175.85 1,176.27 1,176.63 1,177.10 1,177.47 1,177.62 1,177.75 1,177.89 1,178.05 1,178.14 1,178.23 1,178.27 1,178.36 1,178.36 1,178.42 1,178.58 1,178.63 1,178.63 1,178.68 1,178.77

Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp16.dgn

ROADWAY DESIGN DIVISION.

Computer: DMAALEXRE

Date: 15-NOV-2019 10:40

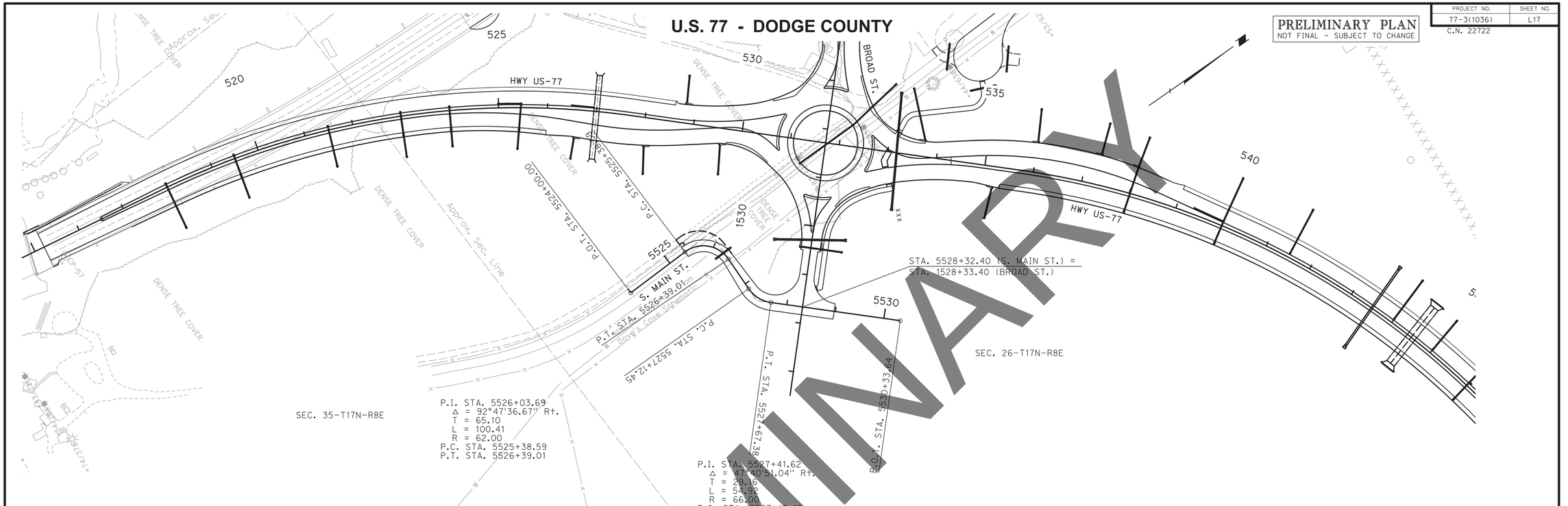
File: 227220cp17.dgn

U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(10036)	L17

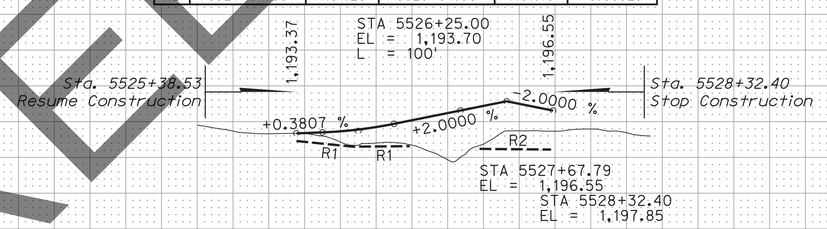
C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



S. MAIN ST.

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	5525+38.00	1192.30	5526+16.50	1191.50	-1.0168%
R1	5526+16.50	1191.50	5526+96.60	1191.58	-0.0928%
R2	5527+94.00	1191.20	5528+94.00	1191.10	-0.0952%



4	5525	6	7	8	9	5530
1,194.52	1,193.68	1,193.30	1,193.36	1,192.16	1,192.01	1,191.72
			1,193.41	1,193.65	1,194.25	1,195.20
1,189.69	1,191.86	1,193.72	1,193.67	1,193.97	1,193.46	
			1,196.20	1,197.20	1,197.49	

Datum Elev. = 1150.00 ft Above Sea Level U.S.C.& G.S.

U.S. 77 - DODGE COUNTY

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

PROJECT NO.	SHEET NO.
77-3(1036)	L18

C.N. 22722

ROADWAY DESIGN DIVISION.

SEC. 25-T17N-R8E

P.I. STA. 7612+11.52
Δ = 91°07'57.79" Rt.
T = 153.00
L = 238.58
R = 150.00
P.C. STA. 7610+58.52
P.T. STA. 7612+97.11

P.I. STA. 7615+19.39
Δ = 52°40'56.15" Lt.
T = 148.54
L = 275.84
R = 300.00
P.C. STA. 7613+70.85
P.T. STA. 7616+46.69

SEC. 36-T17N-R8E

STA. 7610+01.11 (DOWNING ST. FR. RD.) =
STA. 3610+01.11 (DOWNING ST.)

P.O.T. STA. 7627+35.17

DOWNING ST. FRONTAGE RD.

HWY US-77

DOWNING ST.

Approx. Sec. Line

SEC. 36-T17N-R8E

DOWNING ST. FRONTAGE RD.

SPECIAL DITCH LEFT

NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	7610+40.00	1181.20	7623+70.35	1180.41	-0.0591%

STA 7610+19.11
EL = 1,187.58

STA 7610+75.00
EL = 1,186.51
L = 100'

STA 7618+00.00
EL = 1,187.23
L = 200'

Sta. 7610+01.11
Resume Construction

Sta. 7625+00.00
Stop Construction

-2.0000 %
-1.9145 %
+0.5224 %
+0.5224 %
-0.5000 %
-0.5000 %
+0.5000 %
+0.5000 %
-0.2500 %

L1

STA 7615+00.00
EL = 1,188.73
L = 200'

STA 7621+00.00
EL = 1,188.73
L = 200'

1,187.94 1,187.06 1,186.72 1,186.90 1,187.16 1,187.42 1,187.69 1,187.95 1,188.21 1,188.40 1,188.47 1,188.42 1,188.23 1,187.98 1,187.73 1,187.54 1,187.48 1,187.54 1,187.73 1,187.98 1,188.23 1,188.43 1,188.54 1,188.56 1,188.48 1,188.36 1,188.23 1,188.11 1,187.98 1,187.86 1,187.73 1,187.73

1,184.46 1,184.49 1,184.26 1,184.19 1,184.34 1,184.26 1,184.29 1,184.18 1,184.09 1,184.21 1,184.25 1,184.40 1,184.36 1,184.53 1,184.41 1,184.01 1,183.93 1,183.90 1,183.94 1,184.05 1,184.08 1,184.07 1,184.15 1,184.22 1,184.10 1,183.88 1,183.98 1,184.04 1,183.92 1,183.92 1,183.79 1,183.57 1,183.55 1,183.23

Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp18.dgn

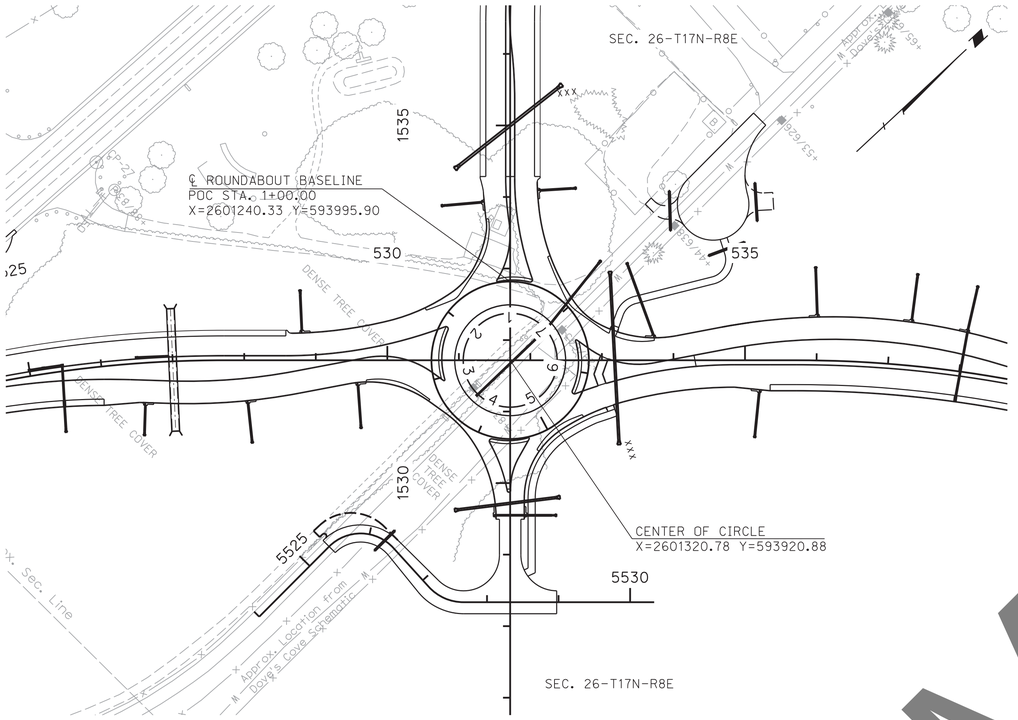
ROADWAY DESIGN DIVISION.

U.S. 77 - DODGE COUNTY

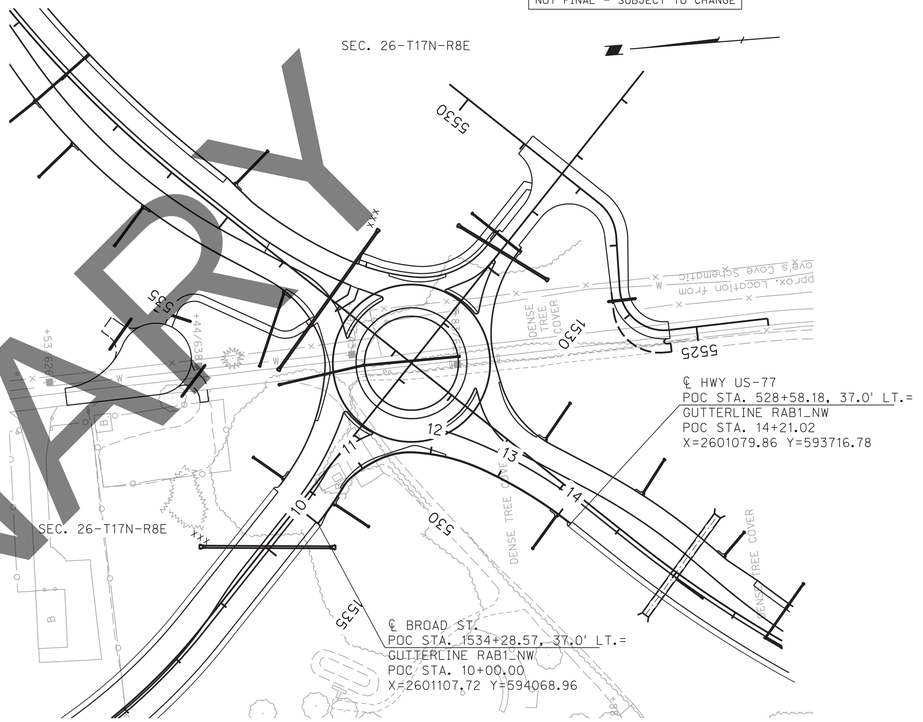
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

PROJECT NO.	SHEET NO.
77-3(10036)	L19

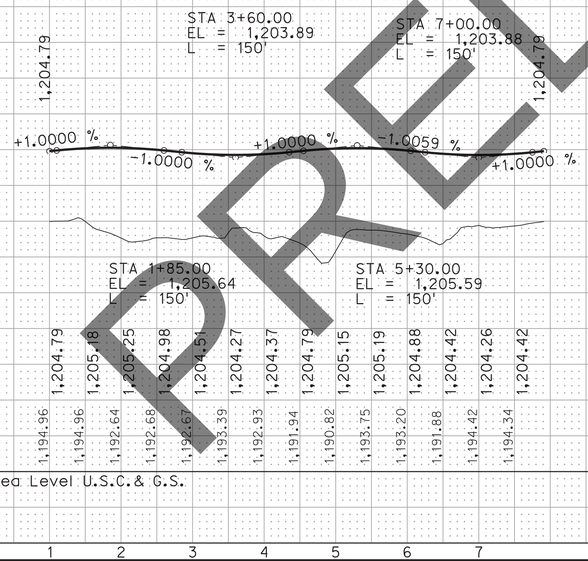
C.N. 22722

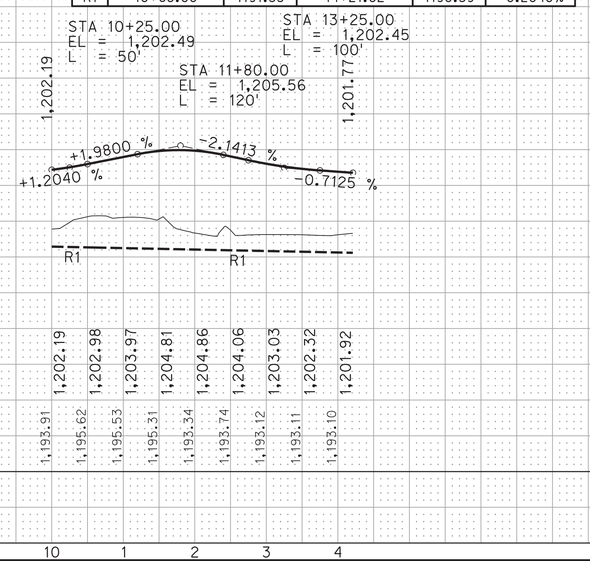


ROUNDABOUT INSCRIBED CIRCLE (ICD-220 FT) (RAB1_ICD)



ROUNDABOUT NORTHWEST (RAB1_NW)





SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	10+00.00	1191.45	10+60.00	1191.33	-0.2052%
R1	10+60.00	1191.33	14+21.02	1190.59	-0.2040%

Datum Elev. = 1160.00 ft Above Sea Level U.S.C.& G.S.

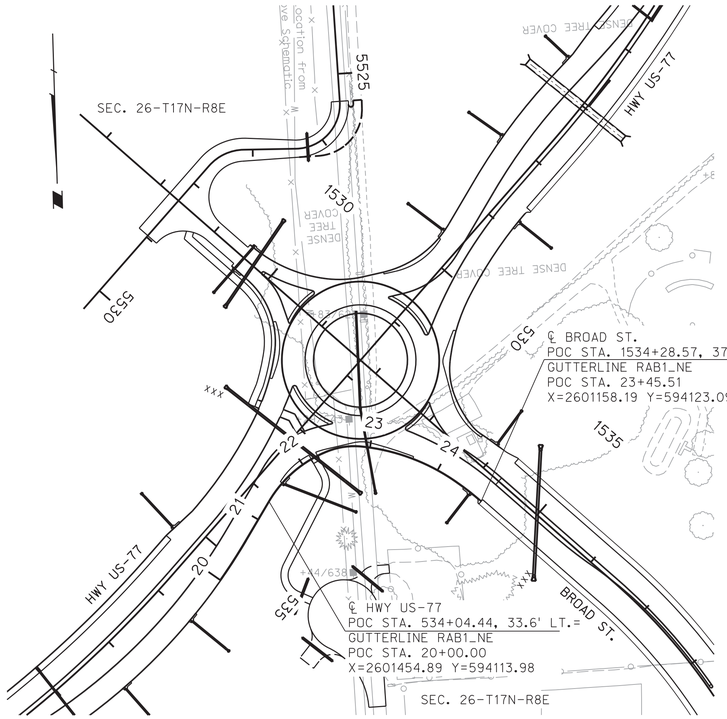
Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp19A.dgn

U.S. 77 - DODGE COUNTY

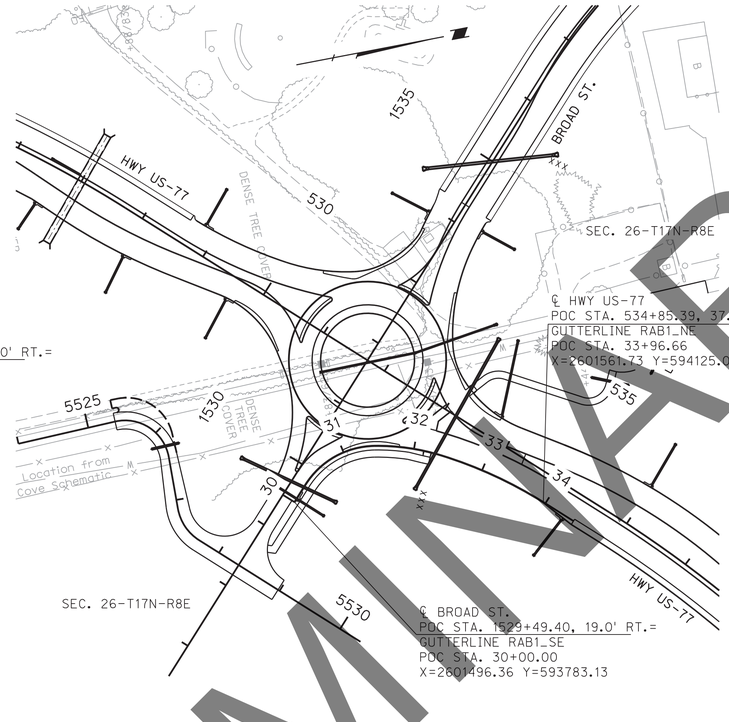
PROJECT NO.	SHEET NO.
77-3(10036)	L20

C.N. 22722

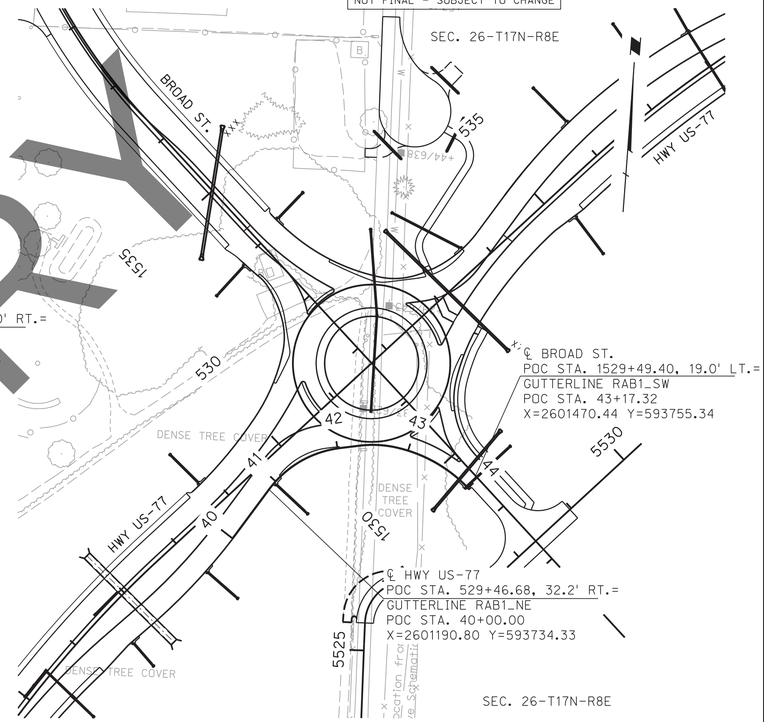
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



ROUNDABOUT NORTHEAST (RAB1_NE)

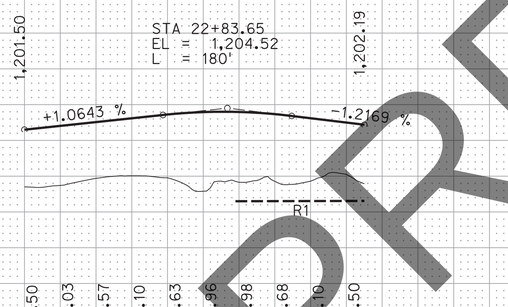


ROUNDABOUT SOUTHEAST (RAB1_SE)



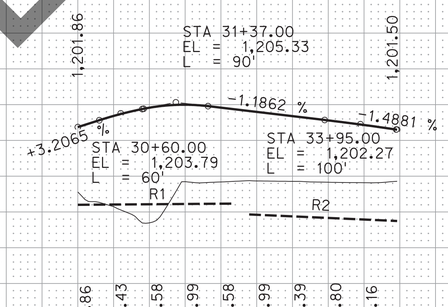
ROUNDABOUT SOUTHWEST (RAB1_SW)

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	22+95.00	1191.50	24+75.10	1191.54	+0.0225%



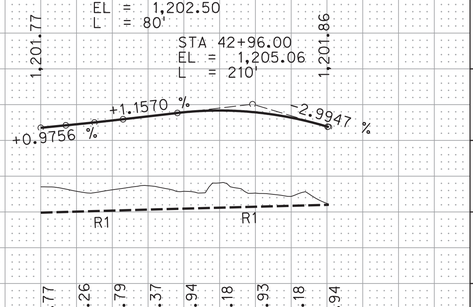
1,201.50	1,202.03	1,202.57	1,203.10	1,203.63	1,203.96	1,203.98	1,203.68	1,203.10	1,202.50
1,193.52	1,193.70	1,194.69	1,195.06	1,194.77	1,192.89	1,194.14	1,194.28	1,194.30	1,195.25

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	30+00.00	1191.00	32+17.00	1191.17	+0.0782%
R2	32+39.50	1189.65	34+46.36	1188.73	-0.4431%



1,201.86	1,203.43	1,204.58	1,204.99	1,204.58	1,203.99	1,203.39	1,202.80	1,202.16
1,192.80	1,190.75	1,188.48	1,194.23	1,194.19	1,194.34	1,194.28	1,194.16	1,194.09

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	40+00.00	1189.91	44+66.55	1190.38	+0.2833%
R1	41+66.55	1190.38	44+02.71	1191.00	+0.2631%



1,201.77	1,202.26	1,202.79	1,203.37	1,203.94	1,204.18	1,203.93	1,203.18	1,201.94
1,193.52	1,192.89	1,193.10	1,193.67	1,192.89	1,194.06	1,192.63	1,192.16	1,191.20

Datum Elev. = 1160.00 ft Above Sea Level U.S.C.& G.S.

ROADWAY DESIGN DIVISION.

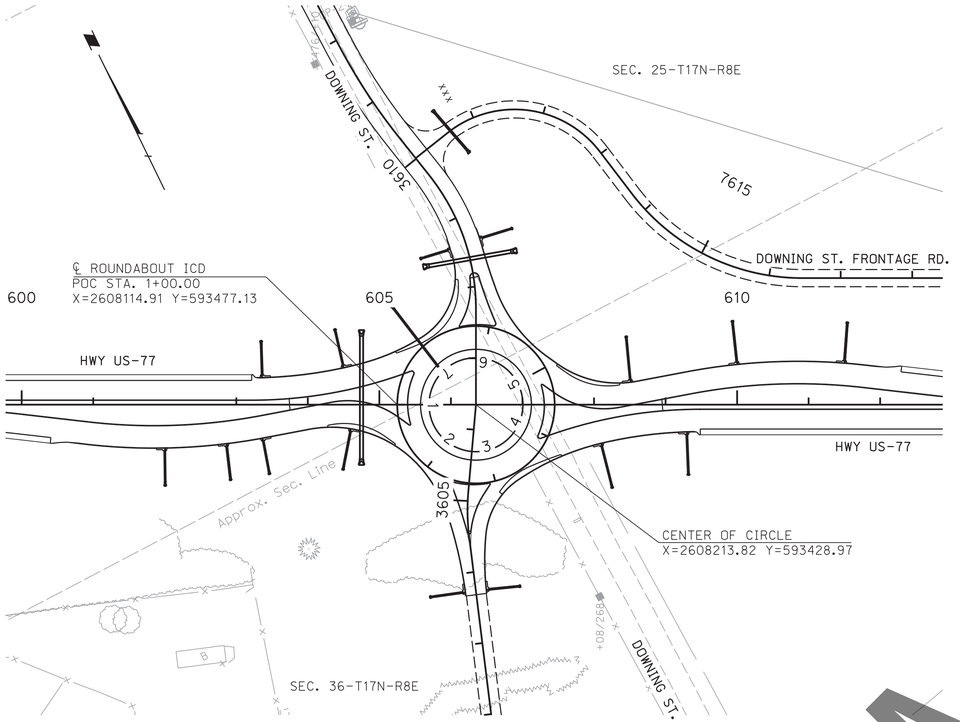
Computer: DMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp19B.dgn

U.S. 77 - DODGE COUNTY

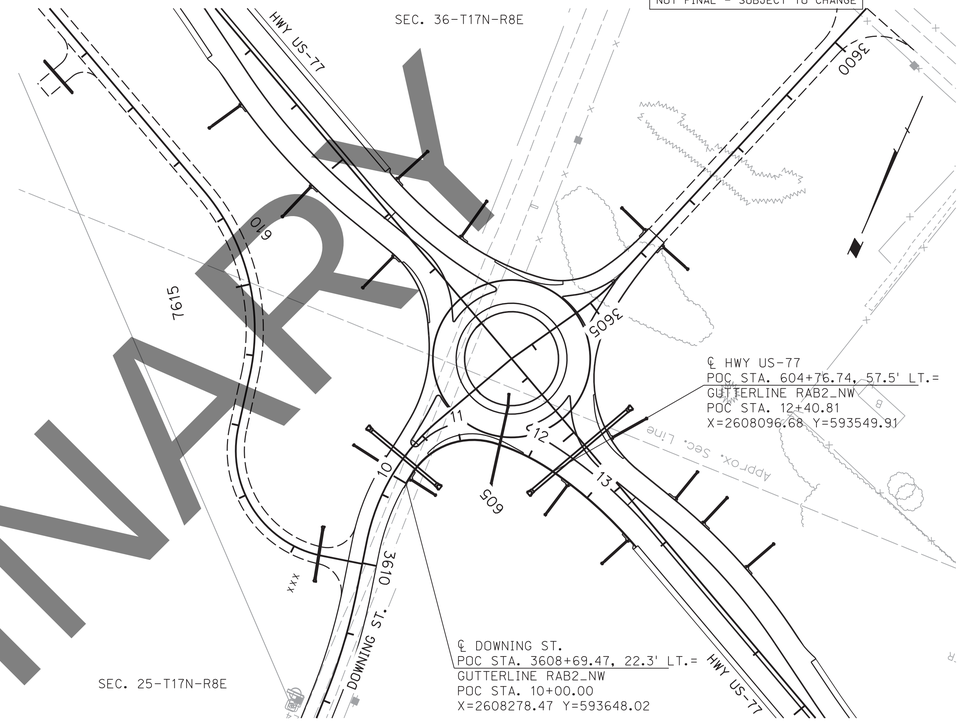
PROJECT NO.	SHEET NO.
77-3(10036)	L21

C.N. 22722

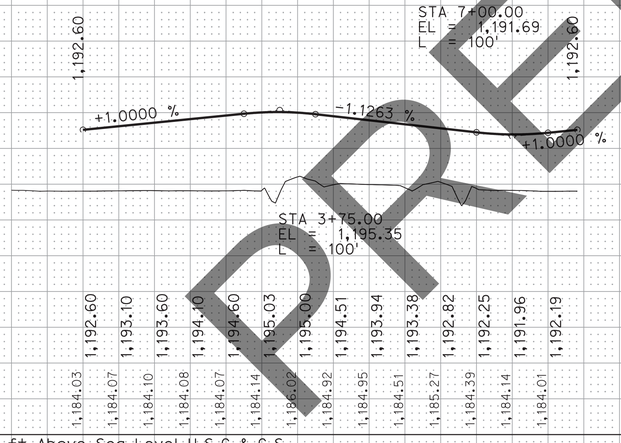
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



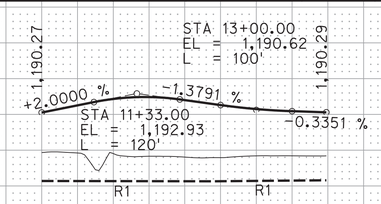
ROUNDABOUT INSCRIBED CIRCLE (ICD-220 FT) (RAB2_ICD)



ROUNDABOUT NORTHWEST (RAB2_NW)



SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	10+00.00	1180.69	12+40.00	1180.65	+0.0160%
R1	12+40.00	1180.65	13+99.01	1180.79	+0.0880%



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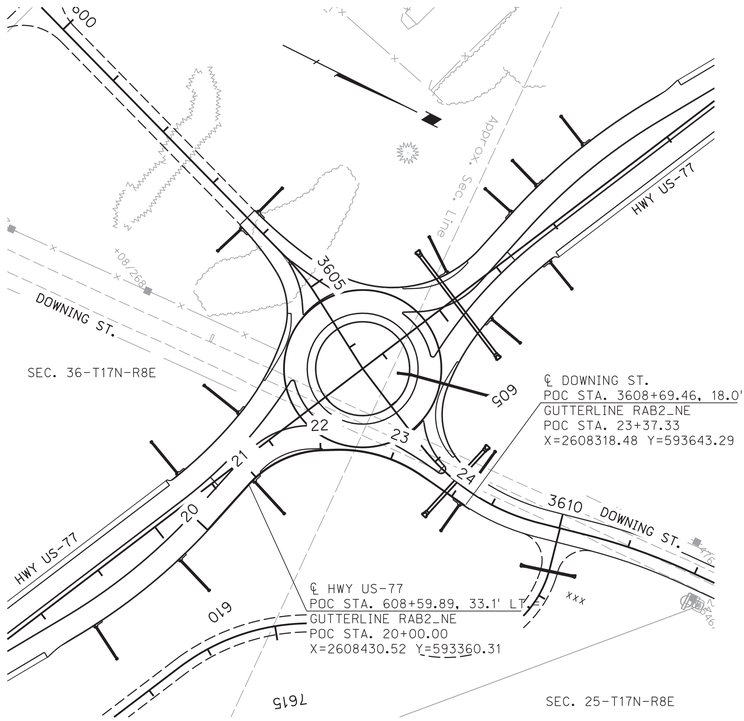
Date: 15-NOV-2019 10:40
File: 227220cp20A.dgn

U.S. 77 - DODGE COUNTY

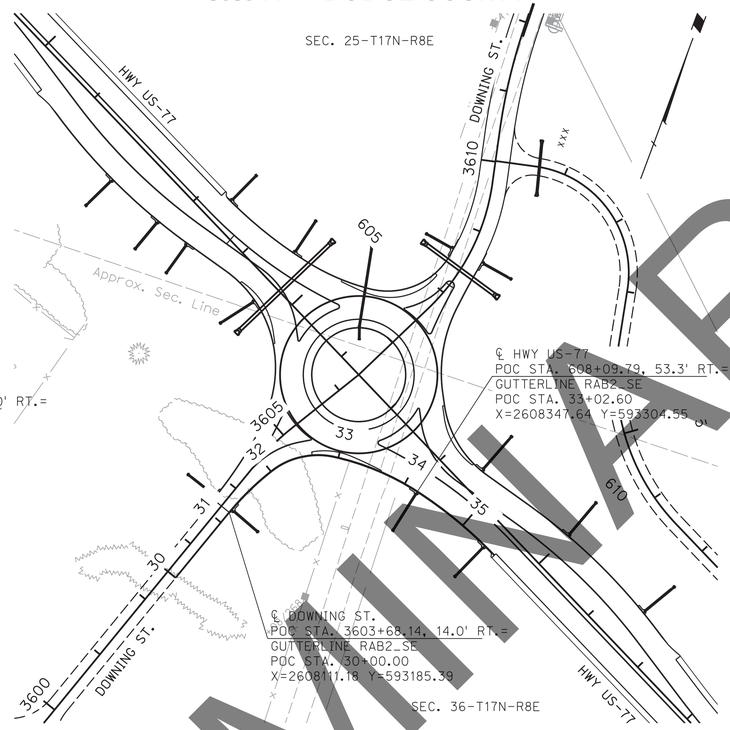
PROJECT NO.	SHEET NO.
77-3(10136)	L22

C.N. 22722

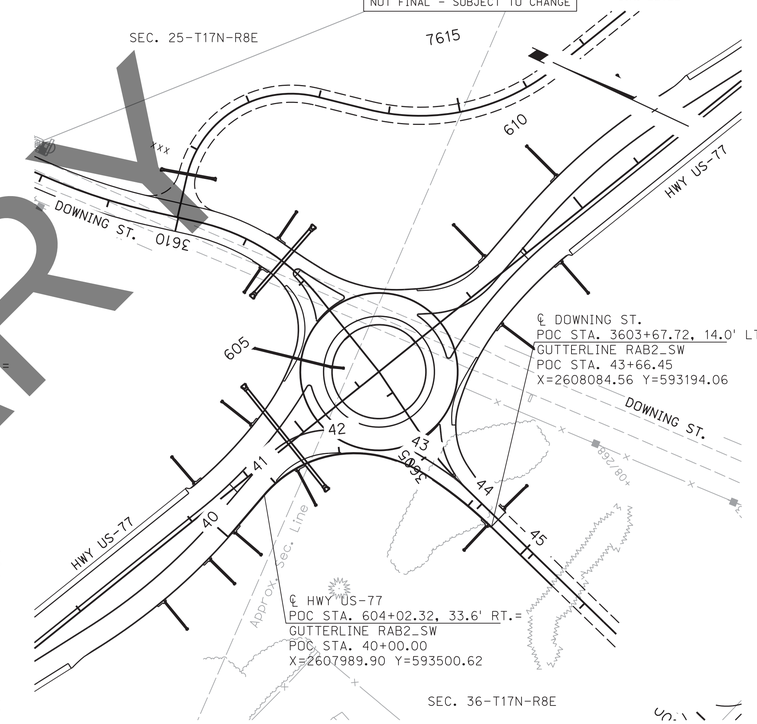
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



ROUNDABOUT NORTHEAST (RAB2_NE)

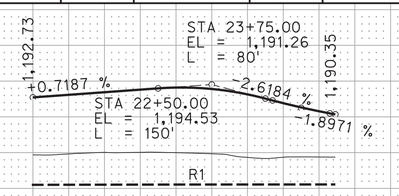


ROUNDABOUT SOUTHEAST (RAB2_SE)

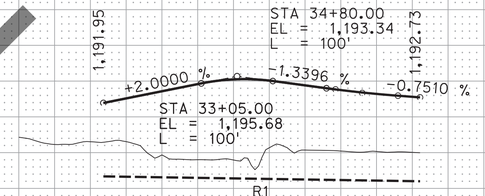


ROUNDABOUT SOUTHWEST (RAB2_SW)

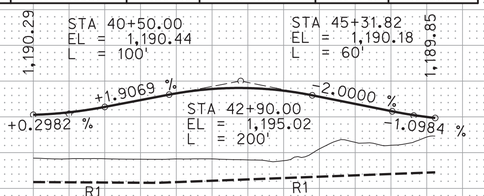
SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	20+00.00	1180.50	22+05.00	1180.54	+0.0173%
R1	22+05.00	1180.54	24+22.68	1180.56	+0.0106%



SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	31+18.14	1,181.69	35+60.79	1,181.00	-0.1559%



SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	40+00.00	1180.90	41+75.00	1180.78	-0.0682%
R1	41+75.00	1180.78	46+61.82	1182.26	+0.3831%



Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

ROADWAY DESIGN DIVISION.

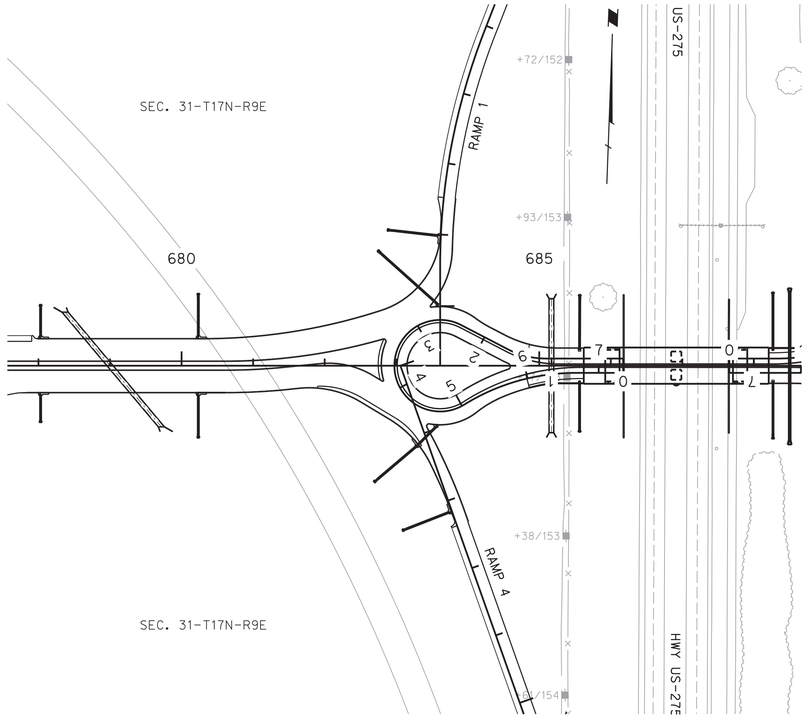
Computer: GMAALEXRE
Date: 15-NOV-2019 10:40
File: 227220cp208.dgn

U.S. 77 - DODGE COUNTY

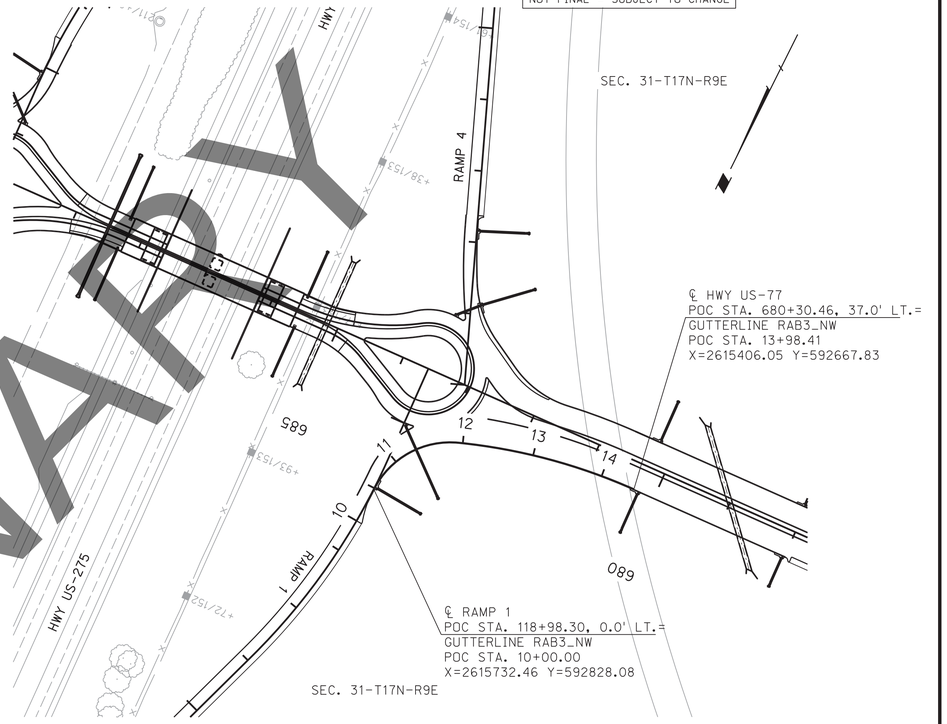
PROJECT NO.	SHEET NO.
77-3(1036)	L23

C.N. 22722

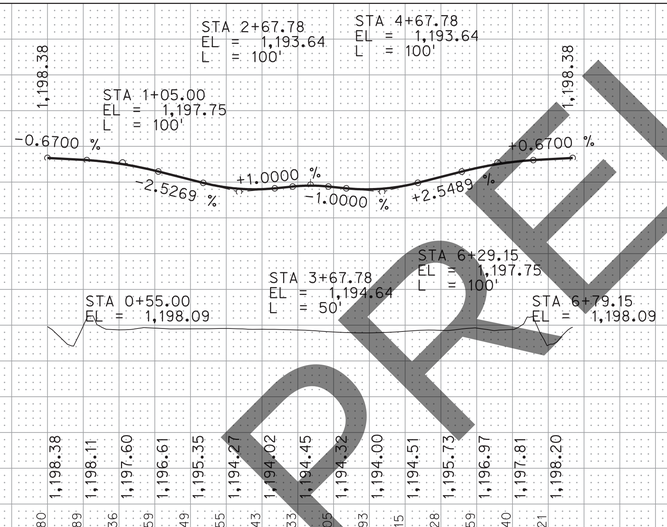
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



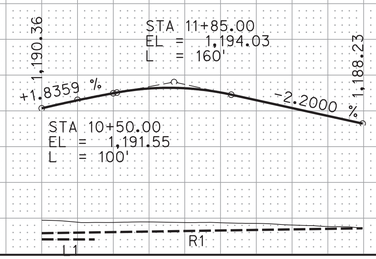
ROUNDABOUT BASELINE (RAB3)



ROUNDABOUT NORTHWEST (RAB3_NW)



SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	10+00.00	1172.90	14+48.67	1173.58	+0.1517%



SPECIAL DITCH LEFT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
L1	10+00.00	1172.05	10+74.03	1172.03	+0.0162%

ROADWAY DESIGN DIVISION.

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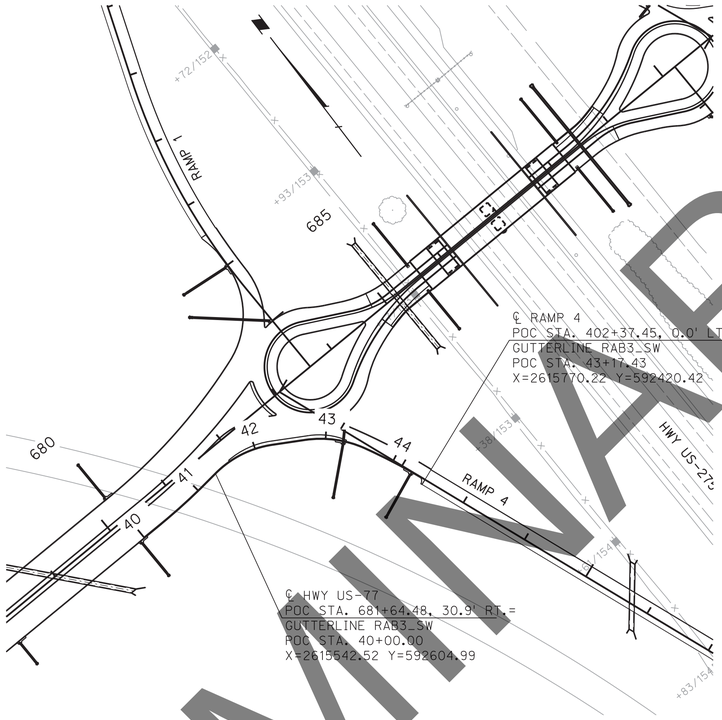
File: 227220cp21A.dgn

U.S. 77 - DODGE COUNTY

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

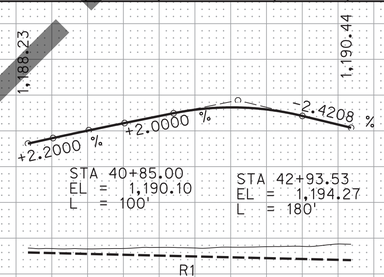
PROJECT NO.	SHEET NO.
77-3(1036)	L24

C.N. 22722



ROUNDABOUT SOUTHWEST (RAB3_SW)

SPECIAL DITCH RIGHT					
NO.	STATION	ELEV.	STATION	ELEV.	SLOPE
R1	40+00.00	1173.00	44+51.64	1171.93	-0.2363%



1,188.23	1,189.33	1,190.39	1,191.40	1,192.40	1,193.14	1,193.26	1,192.77	1,191.69	1,190.48
1,173.63	1,173.50	1,173.53	1,173.64	1,173.71	1,173.61	1,173.74	1,173.83	1,173.86	1,174.15

Datum Elev. = 1140.00 ft Above Sea Level U.S.C.& G.S.

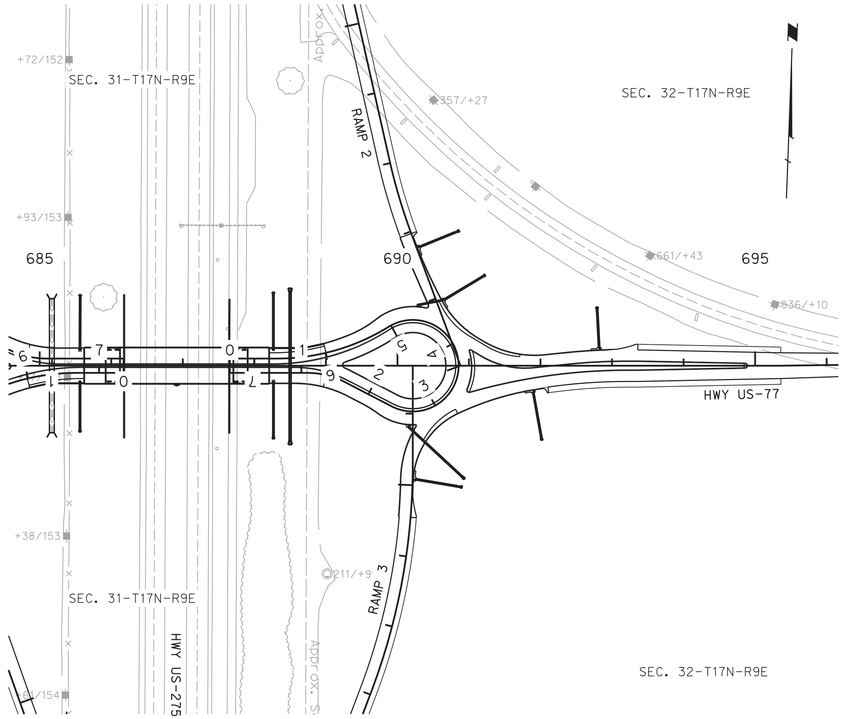
Computer: DMAALEXRE
Date: 15-NOV-2019 10:41
File: 227220cp21B.dgn

U.S. 77 - DODGE COUNTY

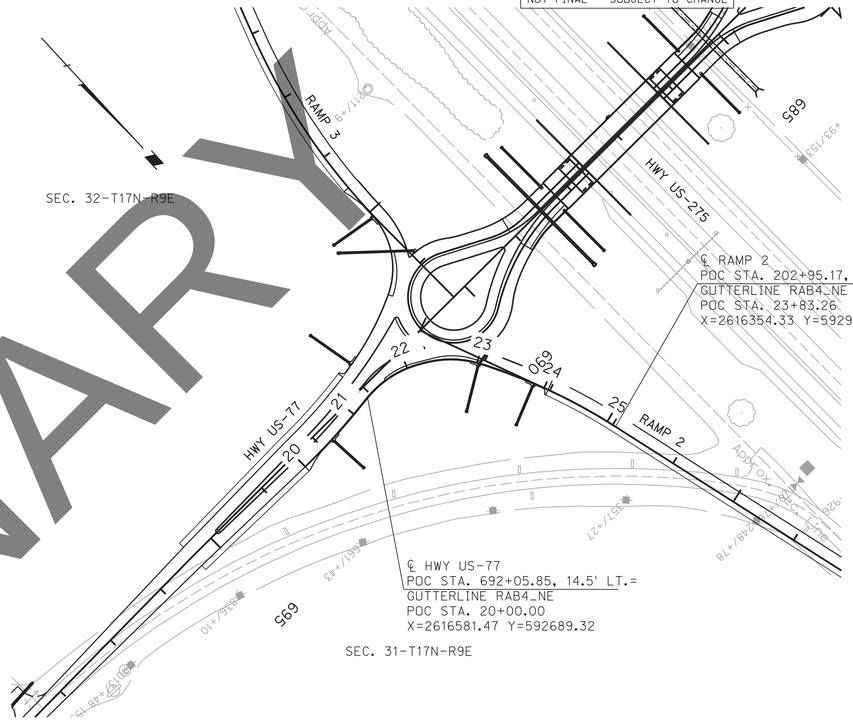
PROJECT NO.	SHEET NO.
77-3(1036)	L25

C.N. 22722

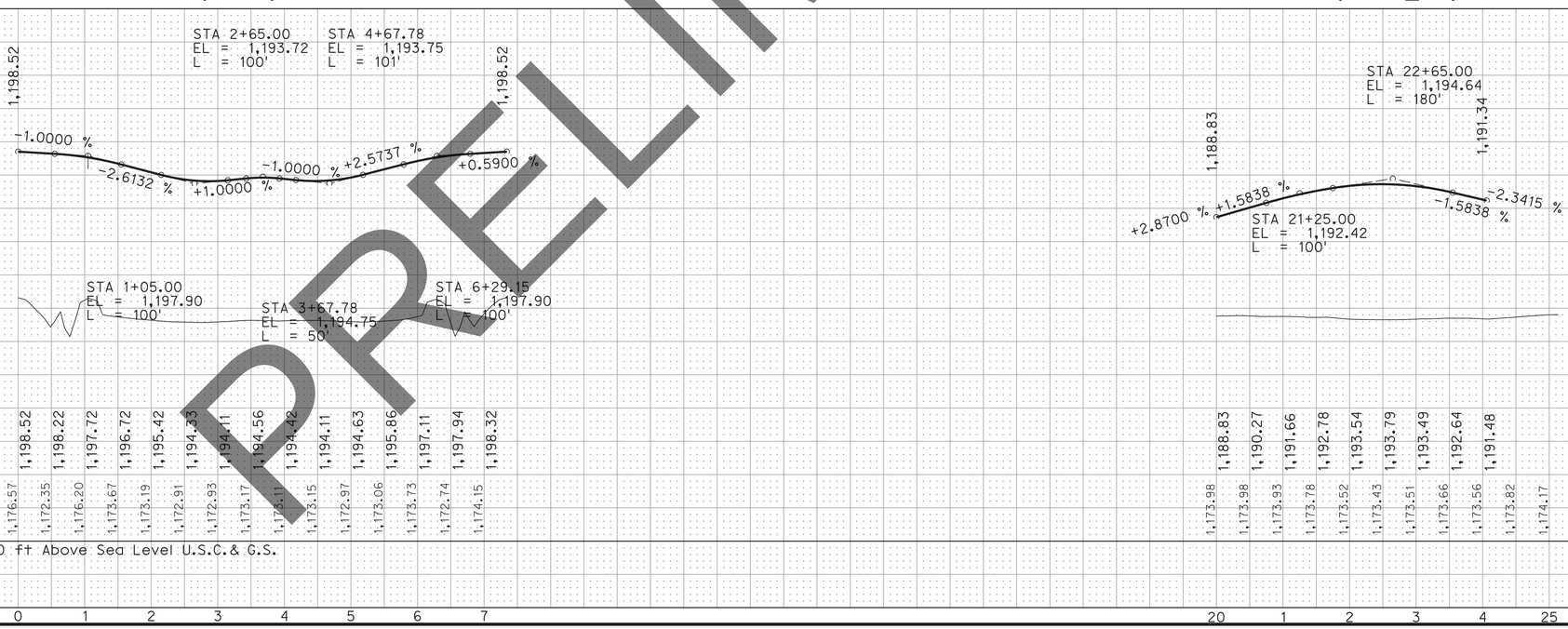
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



ROUNDABOUT BASELINE (RAB4)



ROUNDABOUT NORTHEAST (RAB4_NE)



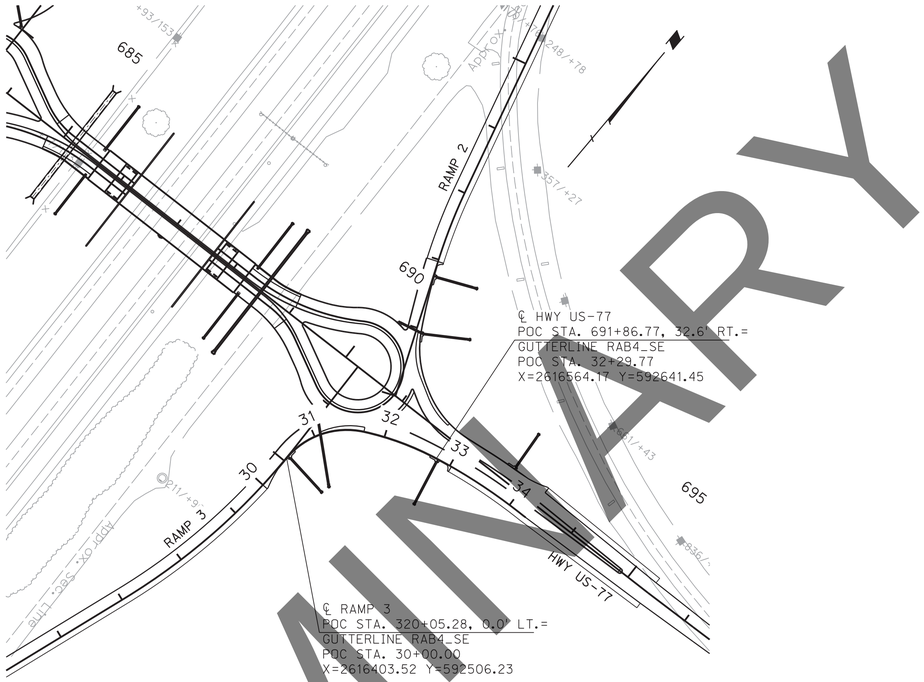
ROADWAY DESIGN DIVISION.

Computer: DMAALEXRE
Date: 15-NOV-2019 10:41
File: 227220cp22A.dgn

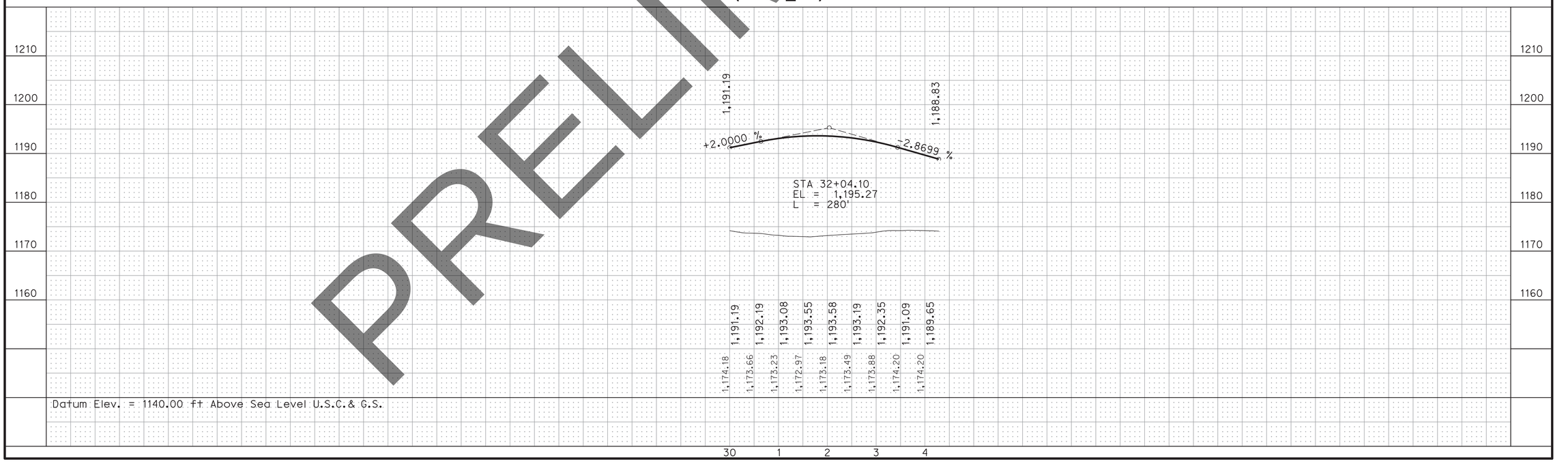
U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(1036)	L26

C.N. 22722



ROUNDABOUT SOUTHEAST (RAB4_SE)



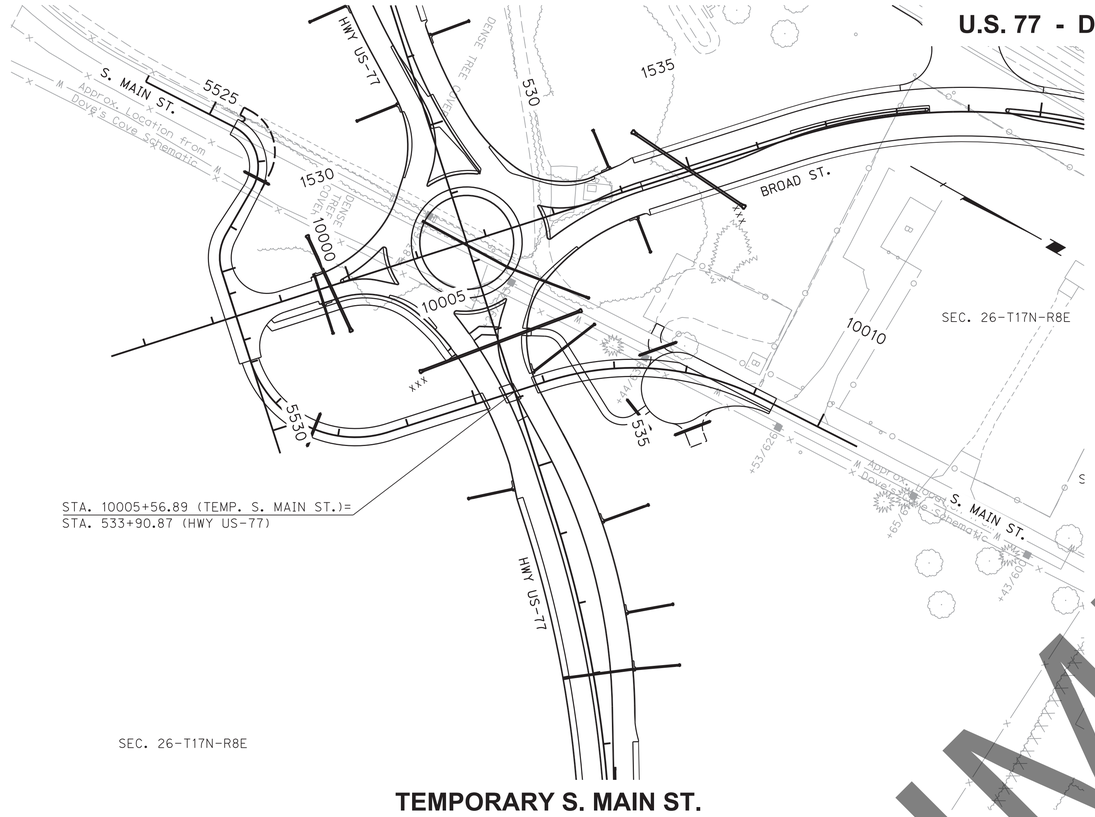
U.S. 77 - DODGE COUNTY

PROJECT NO.	SHEET NO.
77-3(10036)	L27

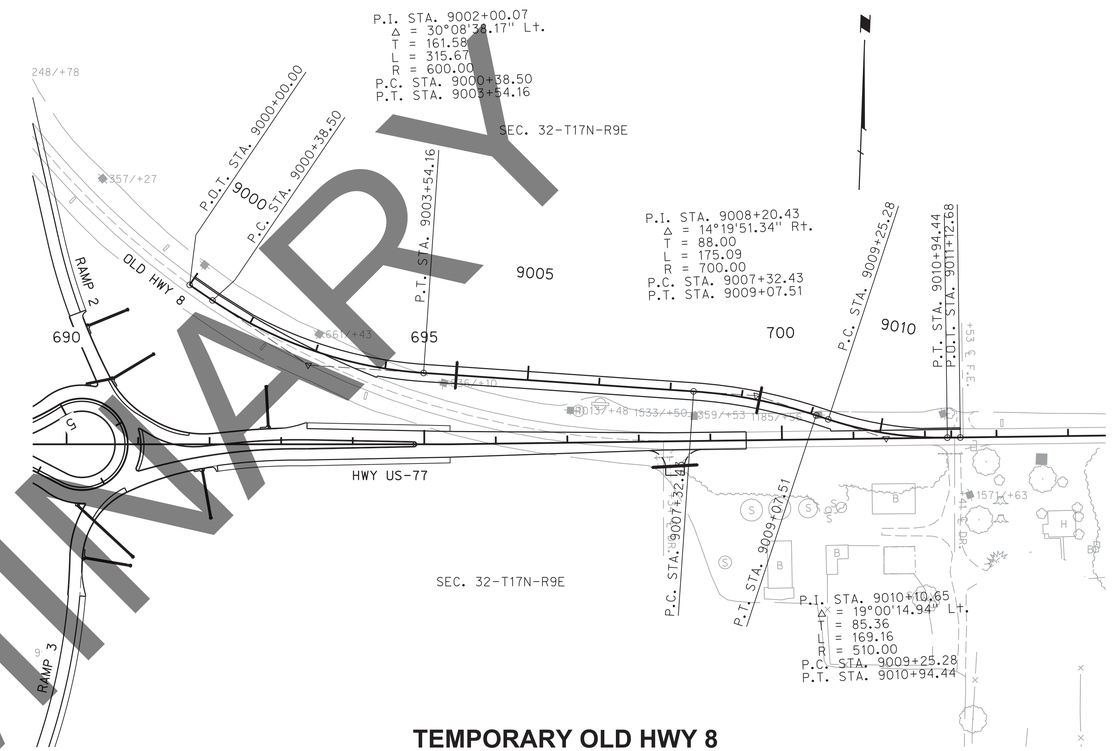
C.N. 22722

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

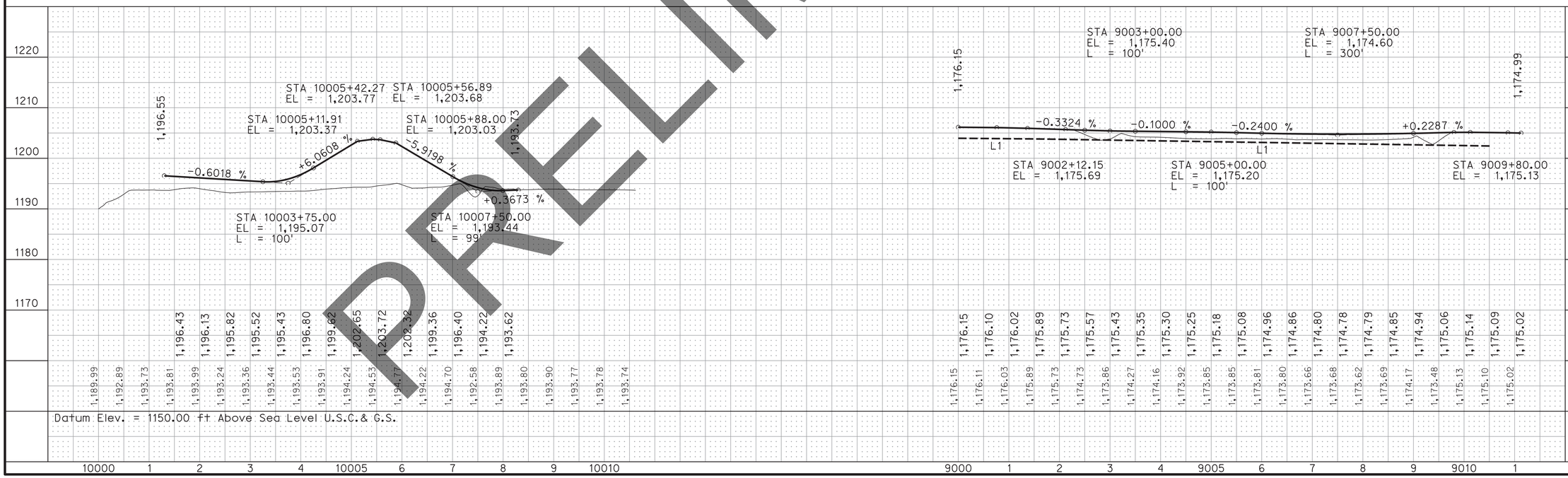
ROADWAY DESIGN DIVISION.



TEMPORARY S. MAIN ST.



TEMPORARY OLD HWY 8



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File: 227220cp23.dgn