IMPROVEMENTS TO UNIT E200-00-00 AND E141-00-00 BASIN E500-10-00 TO WHITE OAK BAYOU HCFCD PROJECT E200-00-00-E003

PROJECT REPORT

April 2009

Presented By:

r.g.miller engineers,inc.
Since 1966

Texas Firm Registration No. F-487

12121 wickchester lane, suite 200 • houston, texas 77079 • 713.461.9600 • fax 713.461.8455

r. g. miller engineers, inc.

PROJECT REPORT

Improvements to Units E200-00-00 and E141-00-00
Basin E500-10-00 to White Oak Bayou
HCFCD Project E200-00-00-E003

DATE: April 7, 2009

TO: Ms. Yeh-Min Maa – Harris County Flood Control District

FROM: Duane Barrett, P.E.

RE: Major Engineering Issues Affecting the Jersey Village Channel Project

Dear Yeh-Min:

This project report provides background information on a number of issues that have had significant effects on the design of the Jersey Village Channel. The following sections of the memorandum describe a number of design decisions made during the duration of the project and the reasoning behind those decisions.

GENERAL PROJECT INFORMATION

The Jersey Village Channel project involves modifications to Harris County Flood Control District Channels E141-00-00 and E200-00-00 upstream of regional detention basin E500-10-00. The proposed modifications to Channel E141-00-00 extend from the northern boundary of Basin E500-10-00 to the confluence of Channel E141-00-00 and Channel E200-00-00, a distance of approximately 3,400 feet. Modifications to Channel E200-00-00 will extend from the confluence with Channel E141-00-00 to the confluence with White Oak Bayou (Channel E100-00-00), a distance of 8,000 feet. The total length of improved channel is approximately 11,400 feet. A general layout of the project area is attached.

The depth of Channel E141-00-00 will be increased to an average of 22 feet. The proposed cross-section for E141-00-00 calls for a bottom width of 20 to 30 feet. A 10-foot-wide shelf will be provided on each side of the channel, approximately halfway up the channel slope. The channel side slope below the shelf will be 3 horizontal to 1 vertical (3:1). Above the shelf, the side slope will be 4:1. The portion of Channel E141-00-00 below the shelf will be lined with rip-rap due to the existence of granular soils and to the intrusion of the proposed channel bottom into the existing water table along the channel alignment.

A portion of Channel E200-00-00 was originally designed to drain westward into White Oak Bayou. The channel was re-graded some time ago, and the entire channel now drains eastward to join Channel E141-00-00 east of Beltway 8. The proposed channel improvement project will cause the channel of E200-00-00 to be widened. The improved channel section east of Beltway 8 will be similar to the improved channel of E141-00-00 as described above, and the lower portion of the entire segment of the E200-00-00 channel east of Beltway 8 (approximately 2,200 feet in length) will be lined with rip-rap. The improved E200-00-00 west of Beltway 8 will consist of a corridor section

with multiple shelves , or benches, and a top width of 180 to 200 feet. The average depth of the channel will be approximately 16 feet. Rip-rap will be used to protect the bottom of the channel for a distance of approximately 2,100 feet due to the existence of granular soils and to the intrusion of the proposed channel bottom into the existing water table.

The proposed improvements to Channels E141-00-00 and E200-00-00 will increase flood flow conveyance capacity in the area and help to reduce flooding along White Oak Bayou upstream of the project by taking some of the flow from that stream. The improved channels are being incorporated into the ongoing White Oak Bayou Federal Study, which is being funded by the HCFCD and the federal government.

HYDROLOGIC & HYDRAULIC STUDIES

The initial hydrologic and hydraulic studies associated with the Jersey Village Channel project were completed by PBS&J in 2003. The initial design information for the project was presented in a report prepared by PBS&J in June 2003 and titled "Design Report, Immediate Proposed Construction Along White Oak Bayou." A copy of that report is attached. Adjustments were made to the design information provided in the June 2003 report via direct in accordance with design decisions made in concert with the HCFCD and PBS&J. Adjustments were made to the initial channel configuration to incorporate slope stability measures and to increase the storage provided in the channel of E200-00-00 west of Beltway 8. Proposed changes to the initial channel profile and configuration were checked by PBS&J to ensure consistency with the goals of the initial design and the White oak Bayou Federal Study. Final hydrologic and hydraulic models were developed by PBS&J, and a final report titled "No Rise Certification for E200-00-00 and E141-00-00 Channel Conveyance Improvements" was prepared by PBS&J in October 2008. The report was signed and sealed by Mr. Brett L. Sachtleben, P.E. A copy of the report is attached.

GEOTECHNICAL REPORT

The final geotechnical report for the project is titled "Final Report, Geotechnical Investigation, Requested Service No. 2, Harris County Purchase Order No. P071629, Proposed Jersey Village Bypass, Final Conveyance Improvements, HCFCD Project ID #E200-00-00-E003, Harris County, Texas, Report No. G163-04." The report was prepared by Aviles Engineering Corporation on August 7, 2007.

CHANNEL CROSS-SECTIONS

The proposed conveyance improvements to units E141-00-00 and E200-00-00 will create channel depths of up to 24 feet. These large channel depths, coupled with the presence of wet sands in the project area, led the design team to recommend channel sections with a shelf on each side of the channel. The shelf lends stability to the channel slope by effectively flattening the side slope, while also providing good access for maintenance vehicles. For the E200-00-00 channel west of Beltway 8, a wide "benched" channel section with two benches, or shelves, on each side of the channel was used to provide the maximum possible volume of in-stream storage.

Three standard cross-sections were developed for three specific segments within the overall project limits. Those segments are described below. A corresponding exhibit is attached.

- Segment 1 extends from Basin E500-10-00 to Mauna Loa Street. The right-of-way width for this segment is 270 feet, and the channel bottom width is 30 feet. A 10-foot shelf is provided on each side of the channel approximately halfway between the top of bank and toe of slope. The channel side slope in this area is 3 horizontal to 1 vertical (3:1) below the shelf and 4 horizontal

to 1 vertical (4:1) above the shelf.

- Segment 2 extends from Mauna Loa Street to Beltway 8. The right-of-way width in this segment is limited to 200 feet, which is sufficient to provide the required channel depth with a bottom width of 20 feet, side slopes of 3:1, and a 10-foot shelf on each side of the channel approximately halfway between the top of bank and toe of slope.

- Segment 3 extends from Beltway 8 westward to White Oak Bayou. The right-of-way in this segment is 250 feet. The channel bottom width is 16 feet, and a shelved, or benched, section is used to provide storage. The benched section consists of two shelves, one 14 feet wide and the other 18-20 feet wide, on each side of the channel.

In segments 1 and 2, the shelves on each side of the channel were set just above the water table as identified in the geotechnical report prepared by Aviles Engineering Corporation. In Segment 3, the upper shelf is set just above the water table. The standard cross-sections developed for the project provide a minimum maintenance berm width of 25 feet on each side of the channel throughout the project limits. A maintenance berm width of 30 feet is provided throughout most of the project limits.

PROVISIONS MADE IN CONNECTION WITH WET SANDS

The geotechnical report prepared by Aviles Engineering Corporation identified problems with sandy soils combined with a water table well above the proposed channel bottom. This condition, which was found to exist from the downstream end of E200-00-00 to a point on E141-00-00 approximately 1,800 feet west of Beltway 8, significantly increases the potential for slope failure in open channels. Copies of the soil profile sheets prepared by Aviles Engineering Corporation are attached to this report. Those profile sheets identify the water table depth and the wet sand zones along the channel alignment.

The problem of wet sands was discussed at length in connection with the project. Based on the geotechnical report and discussions with HCFCD personnel, including in-house geotechnical engineer Ron Langston, P.E., it was determined that sandy soil material coupled with high water table values constituted a potentially unstable channel side slope condition that must be addressed. A number of possible solutions to the problem of potential slope failure were discussed, including concrete lining, articulated concrete blocks, gabions, and rip-rap. It was eventually decided that rip-rap would be adequate for most of the channel, with the rip-rap extending vertically up the channel slopes to elevations above the water table elevations shown on the geotechnical report. This brings the rip-rap roughly to the level of the shelf on each side of the channel, as those shelves were located just above the water table. The rip-rap can be covered and grassed, providing a reinforced earthen section that was preferred above concrete lining. The combination of a woven geotechnical fabric and 18-inch layer of covered and grassed rip-rap will provide slope stability while maintaining a degree of flexibility not provided by concrete.

DROP STRUCTURE DESIGN

Four (4) sloping drop structures were included in the Jersey Village Channel project to accommodate discontinuities in channel bottom elevation. These discontinuities reflect bottom elevation adjustments needed to maintain desired values of longitudinal channel slope and depth as defined in the original hydraulic analyses completed by PBS&J. A number of options were considered for the construction material to be used for the drop structures, including steel sheet piling, rip-rap, concrete slope paving, articulated concrete blocks, and gabions. After visiting the project site with HCFCD personnel and inspecting an existing gabion installation in Ditch E141-00-00 just downstream of Philippine Street, it was determined that gabions will provide stable, erosion-

resistant structures for relatively small vertical drops of 2 to 3 feet. A visit to an installation of gabion drop structures on Ditch J115-00-00 and subsequent evaluation of those structures confirmed that gabion structures should be adequate for conditions anticipated in connection with the Jersey Village Channel project. Accordingly, three of the four drop structures (those located on Ditch E141-00-00 at Philippine, Mauna Loa, and the E200-00-00 confluence) were designed as gabion structures. A combination of 9-inch gabion mattresses and 36" x 36" x 6' gabion baskets were used in the design to provide erosion protection, stability, and resistance to slipping or movement. For the fourth structure, which is located at the confluence of Ditches E200-00-00 and E200-01-00 and involves a drop of approximately 5 feet, the decision was made to use concrete to provide greater stability in light of the relatively high amount of turbulence and greater dynamic forces created by the relatively large total vertical drop of 5 feet.

Checks on flow velocities were completed using the HEC-RAS computer software package. The results obtained using the HEC-RAS program indicated that maximum flow velocities at and upstream of each drop structure were generally within acceptable limits (4 to 5 feet per second in grass-lined channels and 8 to 10 feet per second in channels stabilized with rip-rap or gabions). The only exception to this conclusion was encountered in the channel of Ditch E200-01-00 immediately upstream of the proposed concrete drop structure, where flow velocities in the earthen channel exceeded 5 feet per second, which is the allowable maximum velocity in an earthen channel with sandy soils. A velocity control structure consisting of steel sheet piling across the bottom portion of the E200-01-00 channel was introduced into the design to bring flow velocities in the earthen channel below 5 feet per second. The amount of steel sheet piling extending above the slope paving was minimized to avoid any excessive back-up of storm water that would threaten flooding along Ditch E200-01-00. The sheet piling is designed only to reduce upstream velocities to values below allowable levels during periods when the water level in Ditch E200-00-00 is too low to provide sufficient backwater to control velocities. During periods of high water, the available cross-section of flow above the sheet piling is sufficient to allow 100-year flood flows to enter Ditch E200-00-00 without causing overbank flooding along Ditch E200-01-00.

A copy of a memorandum prepared by RGME to document our analyses of the drop structures is attached.

PROTECTING CHANNEL SIDE SLOPES

Existing storm sewers drain into the channels of E141-00-00 and E200-00-00 at a number of locations. Deepening these channels creates a potential problem with these storm sewers, as each of them must be lowered to satisfy HCFCD criteria for bottom clearance and to avoid discharging storm water down the slopes of earthen channels. Along Ditch E141-00-00, provisions were made to lower storm sewer outfalls to channel elevations 1.0 foot above the channel center-line invert per HCFCD criteria. The same was done for Ditch E200-00-00, but the shelf-type section proposed for that channel does not provide sufficient cover for pipe outfalls. Therefore, a shallow swale was cut through the lower shelf at pipe outfalls along Ditch E200-00-00 to allow the pipes to outfall 1 foot above the channel center-line invert elevation, and the elevation of the upper shelf was increased slightly to provide a minimum of 2 feet of cover above each outfall pipe. Three exceptions were made to this rule. The first involved a 60-inch storm sewer that empties into E200-00-00 at the end of Argentina Street. That outfall pipe was brought into the channel just downstream of the bench section and was treated as a normal outfall with pipe invert 1 foot above channel invert. The second exception to the rule involved a 72-inch storm sewer outfall at project station 88+00 that was too large for cover to be provided. For that outfall, a rip-rap flume was provided to carry storm water safely down the channel side slope to the channel bottom. The flume details are shown on Sheet 66 of the plans. Finally, the invert of a 66-inch pipe connecting E200-00-00 to detention basin E500-07-00 was found to be slightly lower than the proposed channel invert elevation. The 66-inch pipe

invert was left unchanged, and grading on the side slope around the pipe was adjusted to provide adequate cover.

EXISTING BRIDGE STRUCTURES

Existing bridges cross the channel of Ditch E141-00-00 at Philippine Street and Mauna Loa Street. Three bridges (two feeders and main lanes) cross the channel of Ditch E200-00-00 at the Beltway 8 (Sam Houston Toll Way) crossing of Ditch E200-00-00. In order to address questions of structural stability, RGME examined the original construction plans for the Philippine Street and Mauna Loa Street crossings of Ditch E141-00-00 and determined that the channel cross-section proposed on our construction plans is entirely contained within the original channel section. Thus, the length of exposed bridge pier proposed in connection with the current project is less than that provided for in the original design, and the bridge structures should therefore be stable after the current project is completed. At the Beltway 8 crossing of Ditch E200-00-00, all channel excavation is to take place between the two sets of piers under each bridge. Thus, the length of exposed pier will not be changed, and no significant effect on the structural stability of the bridges will occur. In addition, concrete rip-rap will be placed between the piers underneath each of the three bridges, providing added erosion protection around the piers.

Construction plans were provided to the Texas Department of Transportation and the Harris County Toll Road Authority. No significant comments were received from either agency, but each requested that they be kept informed of construction activities in the vicinity of Beltway 8.

UTILITY COORDINATION

R.G. Miller Engineers, Inc. coordinated closely with a number of utilities within the project area. Notices were sent through the Texas One Call system, and utilities with facilities in the area were contacted directly. Construction plans were sent to each of those utilities, and comments were solicited. Information provided by the various utilities was incorporated into the channel improvement plans to show current locations of utility lines. It was determined that action was required in connection with only two existing facilities. One is an 8-inch sanitary sewer force main that crosses E200-00-00 just to the west of E141-00-00. The other is a 12-inch gravity sanitary sewer line that crosses E141-00-00 at Mauna Loa Street. Representatives of the Windfern Forest Utility District, which owns and operates both of these lines, were contacted. The UD agreed to adjust the 8-inch force main downward to avoid conflict with the channel improvement project. With regard to the 12-inch gravity line, the HCFCD and UD agreed that the best alternative is to relocate the line, re-routing it southward along Gessner Drive in order to avoid a conflict with the channel improvements. The Windfern Forest UD and HCFCD agreed to develop an interlocal agreement for the purposes of implementing this plan. As an interim measure, RGME prepared a plan for supporting the 12-inch gravity in place using timber piers until such time as the relocation project can be completed.

Additional coordination with AT&T will be required in the vicinity of the Philippine Street and Mauna Loa Street bridges over Ditch E141-00-00. AT&T has agreed to move an existing pedestal facility and new communications lines in the area, but careful coordination with AT&T is necessary to ensure that those lines and facilities have been moved prior to construction of the proposed channel improvements.

ENVIRONMENTAL PERMITTING

RGME provided information and exhibits to Crouch Environmental Services, Inc. for use in efforts to obtain the necessary environmental permits from the U.S. Army Corps of Engineers. Information provided to Crouch included volume of fill below the existing ordinary high water mark and other basic project information. Exhibits developed for the permitting effort included general project layout exhibits, as well as a set of exhibits on which a graphic representation of the proposed channel improvement project was superimposed over the existing channel with the boundaries of the area within the ordinary high water mark shown for reference. The project will be completed under U.S. Army Corps of Engineers Nationwide Permit #SWG-2008-01033. The Harris County storm water quality permit number for the project is 8-0000168-6.

TREE PROTECTION

In response to a request from the HCFCD, R.G. Miller Engineers, Inc. identified 34 trees within the project area for protection during the construction process. Trips were made to the project site to identify candidate trees, and a review of the construction plans was completed for the purpose of determining which of the candidate trees could be saved without undue complication or effort. The 34 trees identified for protection were clearly indicated on the final construction plans, and a tree protection item was included in the bid documents prepared for the project.

QUANTITY TAKE-OFF AND ENGINEER'S ESTIMATE

A final quantity take-off and engineer's estimate for the project are attached. The quantity take-off provides a detailed breakdown of work and materials required for the project, with quantities for each plan sheet shown separately. Some of the key quantities computed in connection with the project are summarized below.

- Total Excavation = 267,250 cubic yards
- Total Volume of Fill = 40,100 cubic yards
- Total Area of Rip-Rap Coverage = 96,093 square yards
- Total Area Covered by 9-Inch Gabion Mattress = 3,262 square yards
- Total Area of Concrete Slope Paving = 5,649 square yards

The final engineer's estimate dated January 15, 2009 projected a total cost of $6,976,857 for the channel improvements and related work items. A copy of the engineer's estimate is attached.

PROJECT COMPLETION AND BIDDING

Construction plans and the Project Manual were completed in January 2009. A pre-bid meeting was held on January 28, 2009, and bids were received on February 9, 2009. A total of 15 bids were submitted. A summary of the bids received is attached. Bid amounts ranged from $5,272,179.00 to $9,882,761.64. The low bidder was Lindsey Construction, Inc. Final signatures on the plans were obtained from Harris County and the HCFCD in February, 2009, clearing the way for construction permits to be obtained.

CLOSING

Thank you very much for the opportunity to work with you on the important project. Please don't hesitate to contact me if you have any questions or comments regarding this report or the project.

Sincerely,

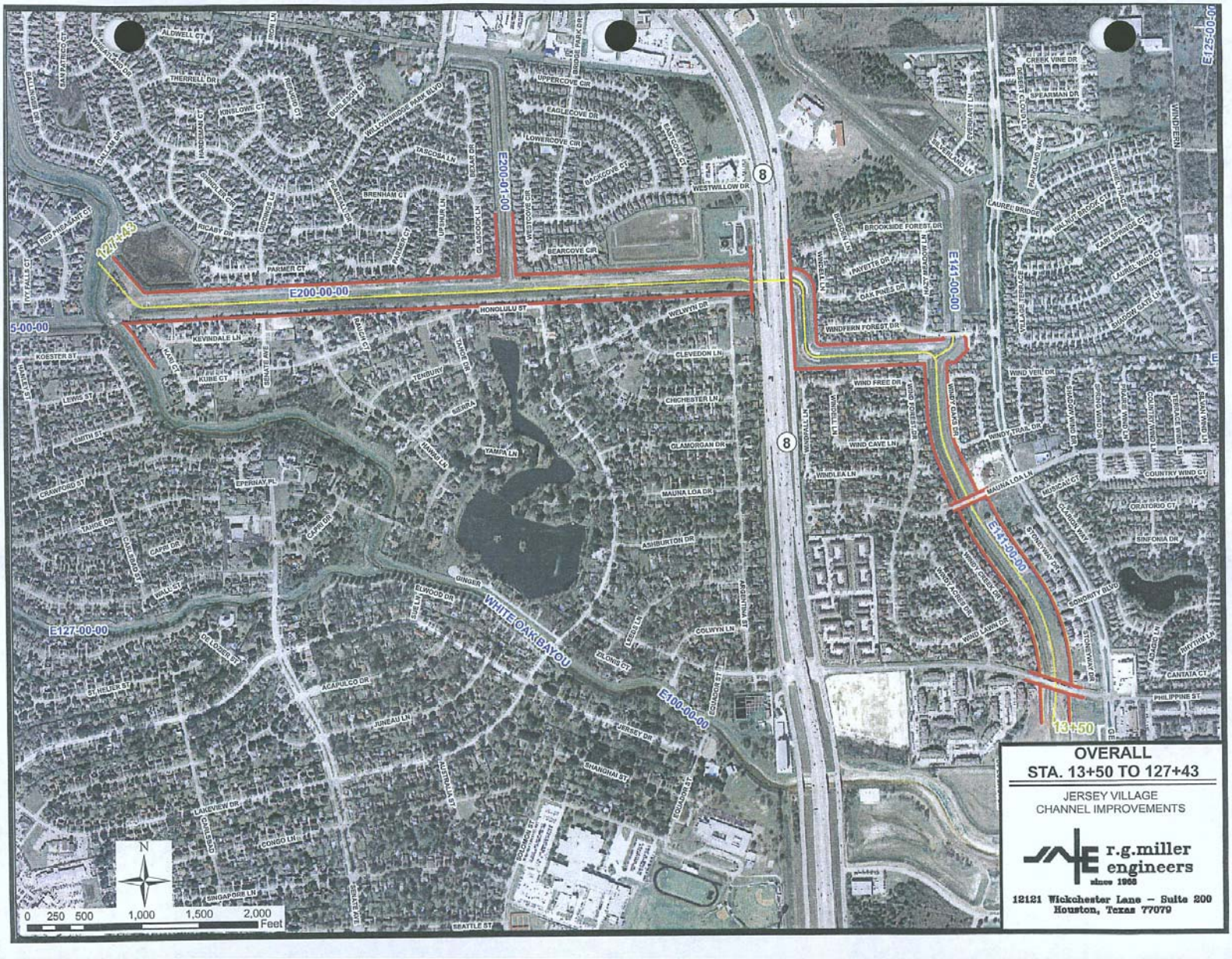
R.G. Miller Engineers, Inc.

Duane Barrett, P.E.
Senior Project Manager

Attachments

1. Project Layout
2. PBS&J Preliminary Report
3. PBS&J Final Report
4. Typical Channel Cross-Sections
5. Soil Profile Sheets from Geotechnical Report
6. Drop Structure Analysis Memo
7. Final Quantity Take-Off
8. Engineer's Cost Estimate
9. Tabulation of Bid Amounts

ATTACHMENT 1
PROJECT LAYOUT



OVERALL
STA. 13+50 TO 127+43

JERSEY VILLAGE
CHANNEL IMPROVEMENTS

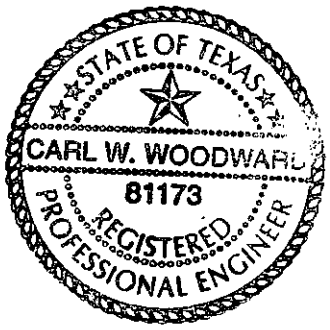
r.g.miller engineers
since 1966
12121 Wickchester Lane – Suite 200
Houston, Texas 77079

ATTACHMENT 2
PBS&J PRELIMINARY REPORT

DESIGN REPORT

IMMEDIATE PROPOSED CONSTRUCTION ALONG WHITE OAK BAYOU

June 2003



6/10/03

Prepared for

Harris County Flood Control District

Prepared by

PBS&J

Immediate Proposed Construction along White Oak Bayou

Introduction

This report documents the design of the construction projects along White Oak Bayou (E100-00-00) suitable for immediate implementation. The proposed projects will cause no adverse impact to the receiving waterways for the 10-year, 25-year, and 100-year events. The proposed projects lower water surface elevations throughout the White Oak Bayou for all these frequencies. The purpose of this report is to document the proposed projects so that necessary permits can be obtained from the Harris County and City of Houston Flood Plain Managers. This report complies with the City of Houston ordinances with respect to no adverse impact.

This report reflects the construction plans being completed by Harris County Flood Control District (HCFCD) design consultants. McDonough Engineering was contracted to complete final construction plans for the Phase 1 projects, which is Harris County Flood Control District Project ID E200-00-00-E002. R. G. Miller was contracted to complete final construction plans for the Phase 2 projects, which is Harris County Flood Control District Project ID E100-00-00-E003.

Sections

This letter-report consists of the following sections.

Supporting Information

Project Area

The project area for this report is the reach of White Oak Bayou (E100-00-00) from the confluence with E122-00-00 to upstream of the Jersey Village Diversion (E200-00-00). Exhibit A shows White Oak Bayou Watershed. Exhibit B shows the immediate proposed construction.

Consideration of the current 211(f) Federal Project

Significant work by the District has gone into developing a National Economic Development (NED) plan for this federal project. The construction proposed in this letter-report is compatible with this work effort.

Criteria for Project Selection

The following criteria were used for selection of the proposed project:

- No increases in water surface elevations along White Oak Bayou due to implementation of project features.
- Utilize detention basin storage recently constructed in the reach of White Oak Bayou (E100-00-00), including E500-01-00, E500-02-00, and E500-03-00.
- Feature compatibility with the 211(f) project.

Modeling Tools, Analysis Frequencies, and Datum

HEC-1 and HEC-2 models were used for analysis.

The 10-, 25-, and 100-year frequencies were analyzed.

All data presented in this letter-report is adjusted to 1973 datum.

Continued on next page

Models Sets

Three model sets are documented in this letter-report. The table below documents the model sets naming convention.

Name	Description
Pre-Project	Models acquired from the 211(f) project. These models are based on the FEMA FIRM models developed in the Klotz LOMR dated February 1995.
Phase 1	Phase 1 of a three-phase project. The project involves regrading JV Bypass and the construction of E500-10-00 detention facility.
Phase 2	Phase 2 of a three-phase project. The project involves construction of side weirs on E500-02 and E500-03, additional excavation at E500-03, channel modifications of E100 from E122 to Beltway 8, and modification of E500-10-00 side weir.

Pre-Project Models

Conditions in the White Oak Bayou watershed have changed relative to the latest FEMA FIRM's. The table below identifies and describes relevant changes included in the pre-project models. Additional field survey needs to be conducted to update the models to present conditions.

Feature	Description
X1 Cards	Reach lengths on X1 cards were updated and the identification field was also updated to reflect this information.
Gessner Bridge	Modeling for this bridge was updated

WARNING

Use of the proposed project details in a CLOMR without consideration of the complete 211(f) project for White Oak Bayou may seriously impact the District's ability to implement the 211(f) project for White Oak Bayou.

Proposed Project – Phase 1

Introduction

Based on the project selection criteria described previously, a project has been recommended for implementation in the White Oak Bayou (E100-00-00) mid-reach. Information used to select this proposed project is contained primarily in three reports:

- PBS&J report (July 2001) Final White Oak Bayou Interim Plan from N. Houston Rosslyn to West Road – Phase 1 Results
- PBS&J report (August 2001) Draft White Oak Bayou Interim Plan from N. Houston Rosslyn to West Road – Phase 2 Results
- Carter and Burgess report (June 1999) titled White Oak Bayou Section 211f Flood Control Project Component Screening Analysis

The elements of the Phase 1 work include the Jersey Village bypass channel (E200-00-00) regrade and the excavation of the E500-10-00 detention facility. The construction plans for these elements were prepared for HCFCD Project ID E200-00-00-E002.

Proposed Jersey Village Channel Regrade

The JV Bypass Channel will be regraded between the upstream confluence with White Oak Bayou to Beltway 8.

- The regrade will change the direction of flow in the existing bypass channel to flow toward Gessner around the Jersey Village area. The distance of the regrade is approximately 3,900 feet at a slope of 0.01 percent.
- No flow will be diverted from White Oak Bayou into the JV Bypass. Only the existing flow from the drainage area to the north will be in the JV Bypass channel.
- All plugs in the existing bypass channel upstream of the confluence of E200-00-00 and E141-00-00 will need to be removed. No control structure is needed at Beltway 8. The TxDOT control structure downstream of Beltway 8 will need to be removed.
- The E141-00-00 control structure 200 feet upstream of the E100-00-00 and E141-00-00 confluence will be moved upstream to Station 1250.
- The template for JV Bypass regrade is a 40 bottom width with 3-to-1 side slopes from Station 6900 to Station 10850.
- All of the features in the construction plans for this portion of the project were incorporated into the models.

Exhibit C1 shows a profile of the JV Bypass regrade.

Continued on next page

Proposed E500-10-00 Detention Basin

The E500-10-00 detention basin will be used to offset the increased flows on White Oak Bayou (E100-00-00) due to the addition of the regrade.

- The E500-10-00 north cell will be completely open to both E100-00-00 and E141-00-00. The existing lift station on the west edge of the detention basin will remain in place.
- The E500-10-00 south cell will be a side weir facility. The proposed excavation for the south cell is approximately 266 acre-feet at elevation 102.0 feet (1973 adjustment). The side weir will be a stepped side weir.
- The E141 drop structure at the confluence with E100-00-00 will be relocated to just upstream approximately 1,500 feet of the confluence of E141 and E100.
- The details of the Phase 1 proposed E500-10-00 detention basin can be found in the E200-00-00-E002 construction plan set. All of the features in the McDonough construction plans for this portion of the project were incorporated into the models.

Exhibit D shows a schematic layout for the E500-10-00 detention basin.

Detention Basin Modeling Methodology

Detention basin analysis uses a spreadsheet in conjunction with HEC-1 hydrologic modeling. This spreadsheet incorporates equations from the work completed by Dr. Ed Holley (University of Texas) for the Harris County Flood Control District. This spreadsheet calculates the effects of the detention basin on the channel hydrograph. This resultant hydrograph is reinserted into the HEC-1 model, and the HEC-2 model is then used to obtain water surface elevations. This process is repeated a limited number of times to converge on a solution for the entire channel.

Note - This cycling is required for the changes in the channel's flow and velocity rating curve (at the detention basin) and channel storage routing relationships due to the detention basin.

Continued on next page

Benefits of the Proposed Project

The benefits of the proposed project are mostly seen in the Jersey Village area; however, benefits are present from 34th Street to upstream of the Jersey Village Diversion. The table below presents the average stage reductions in the project area for the 10-, 25-, and 100-year events.

Tables A through C document in detail the water surface elevations for the 10-, 25-, and 100-year events (Pre-project, Existing, Project). There is no adverse impact to the watershed with this proposed project.

Exhibits K, L, and M document the water surface profiles for the 10-, 25-, and 100-year frequencies.

Exhibits N, O, and P document the comparison between the pre-project and post-project hydrographs at various locations.

Location	Average Stage Reduction (ft)		
	10-Year	25-Year	100-Year
Upstream of Lakeview to Beltway 8	0.44	0.35	0.14
Beltway 8 to Gessner	0.66	0.44	0.07
Gessner to Windfern	0.45	0.25	0.06
Windfern to Fairbanks-North Houston	0.43	0.26	0.06
Fairbanks–North Houston to North Houston-Rosslyn	0.39	0.14	0.13

Proposed Project – Phase 2

Introduction

Two existing detention basins on White Oak Bayou (E100-00-00) are altered in conjunction with the proposed channel modifications in Phase 2 of this project. The two proposed detention basins are E500-02-00 and E500-03-00. The construction plans for these elements were prepared for HCFCD Project ID E100-00-00-E003. No changes to the existing E500-01-00 detention basin are required. Exhibit E shows the E500-00-00 plans developed by Sparks & Barrow dated October 1999. The existing basin effectively matches these plans. The E500-10-00 side weir will be modified in this phase. The JV Bypass will remain unchanged relative to Phase 1.

Proposed E500-02-00 Detention Basin Side Weir Modifications

The E500-02-00 detention basin is at its ultimate capacity. The maximum detention volume is approximately 460 acre-feet at elevation 93 feet (1973 adjustment). Changes to basin inlet structures are primarily designed to work with the proposed project, and secondarily to complement the proposed 211(f) project features.

- E500-02-00 – The existing side weir is to high for effective use. A wide side weir with an invert elevation of 82 feet is proposed to efficiently use this basin. The width of this opening suggests that riprap should be placed to prevent erosion due to velocity considerations.

Exhibit F shows a schematic layout for detention basin E500-02-00 and associated side weir.

Proposed E500-03-00 Detention Basin Side Weir Modifications and Additional Excavation

The existing E500-03-00 detention basin has approximately 280 acre-feet of excavation completed at elevation 90 feet (1973 adjustment). The final detention layout for detention basin E500-03-00 and associated side weir are shown in Exhibit G.

- E500-03-00 – The existing side weir is too high for effective use. A flow-through weir with an invert elevation of 82 feet is proposed to efficiently use this basin.

- E500-03-00 Excavation – An additional detention volume is required for this phase of the project. The hydrologic and hydraulic modeling shows an additional 100 acre-feet is required to offset the small impacts. The construction plans included the 100 acre-feet.

Continued on next page

Proposed Channel Modifications for White Oak Bayou (E100)

The template for White Oak Bayou (E100-00-00) channel modifications has a 30-foot bottom width, 3-to-1 side slopes, and a 0.052 percent grade.

- The transition structure located on White Oak Bayou (E100-00-00) upstream of E122-00-00 is to be removed.
- The channel modifications extend from the E122-00-00 transition structure to Beltway 8 for a distance of approximately 18,350 feet.
- Replace the foot bridge at Woodland Trails West subdivision with a 200-foot span bridge. The low chord of the proposed bridge is at the same elevation as the existing bridge.

Each of the cross-sections in the model was replaced with the closest proposed cross-section in the construction plan set. Furthermore, the cross-sections at each of the bridges within the channel improvement reach in the plan construction set was incorporated into the Phase 2 model. The construction plan set is at a 2000 datum adjustment. This construction plan set needed to be adjusted to the datum of the model that is at 1973. The adjustment factor at E500-03-00 was 3.99 feet, and the adjustment at E500-10-00 was 4.20 feet. A relationship was developed to apply this differential adjustment to the entire Phase 2 channel improvement reach. This methodology properly modeled the proposed Phase 2 relative to the construction plan set.

A representative channel cross-section is shown on Exhibit H.

Proposed E500-10-00 Detention Basin Side Weir Modifications

Due to the fact that the water surface elevations are significantly decreased with the channel modifications in Phase 2, the side weir for the E500-10-00 detention facility will need to be modified. The stepped side weir will need to be lowered. The modified side weir is shown on Exhibit D.

The Phase 1 and Phase 2 project will be constructed concurrently and completed in approximately the same timeframe. Due to the schedule of the Phase 1 and Phase 2 completion, the Phase 2 side weir will be constructed on the E500-10-00 detention facility.

Continued on next page

Benefits of the Proposed Project

The benefits of the proposed project are mostly seen between Beltway 8 and North Houston-Rosslyn; however, benefits are present from 34th Street to upstream of the Jersey Village Diversion. The table below presents the average stage reductions in the project area for the 10-, 25-, and 100-year events.

Table A through C document in detail the water surface elevations for the 10-, 25-, and 100-year events (Pre-project, Existing, Project). There is no adverse impact to the watershed with this proposed project.

Exhibits K, L, and M document the water surface profiles for the 10-, 25-, and 100-year frequencies. As shown on these exhibits, the flow line has some irregularities at four stations. At these locations, the construction plans do not modify or fill the irregularities of the channel bottom. PBS&J used the exact cross-section represented in the construction plan set for the HEC-2 modeling.

Exhibits N, O, and P document the comparison between the pre-project and post-project hydrographs at various locations.

Location	Average Stage Reduction (ft)		
	10-Year	25-Year	100-Year
Upstream of Lakeview to Beltway 8	1.54	1.32	0.86
Beltway 8 to Gessner	3.11	2.44	1.39
Gessner to Windfern	3.30	2.69	1.74
Windfern to Fairbanks-North Houston	3.26	2.78	1.99
Fairbanks-North Houston to North Houston-Rosslyn	2.00	1.50	1.03

Proposed Project – Phase 3

Introduction

The Phase 3 portion of the White Oak Bayou project includes the activation of the JV Bypass includes two elements. The first element is the channel modifications of the bypass itself, and the second element is the construction of the inflow structure. This phase of the White Oak Bayou project will be modeled and designed at a later date. The remainder of this section briefly describes the Phase 3 project and is for informational purposes only. At a later date Harris County Flood Control District will submit a separate report with construction plans to document Phase 3.

Proposed Jersey Village Bypass Activation and Channel Modifications

The following are the elements for the proposed Phase 3 project.

- The JV Bypass channel modifications will deepen and widen the JV Bypass channel to fully utilize the channel right-of-way. The channel modifications will extend from the confluence of the JV Bypass and White Oak upstream of Jersey Village for a distance of approximately 12,000 feet to its confluence with White Oak Bayou at Gessner.

- The Jersey Village inflow structure is a stepped weir. The inflow structure will allow a certain amount of flow from White Oak Bayou to enter the JV Bypass Channel.

Exhibit I is a preliminary JV Bypass channel modification profile.

Exhibit J is a preliminary JV Bypass Site Layout.

Exhibits

Exhibits

The exhibits referenced in this letter report are listed below.

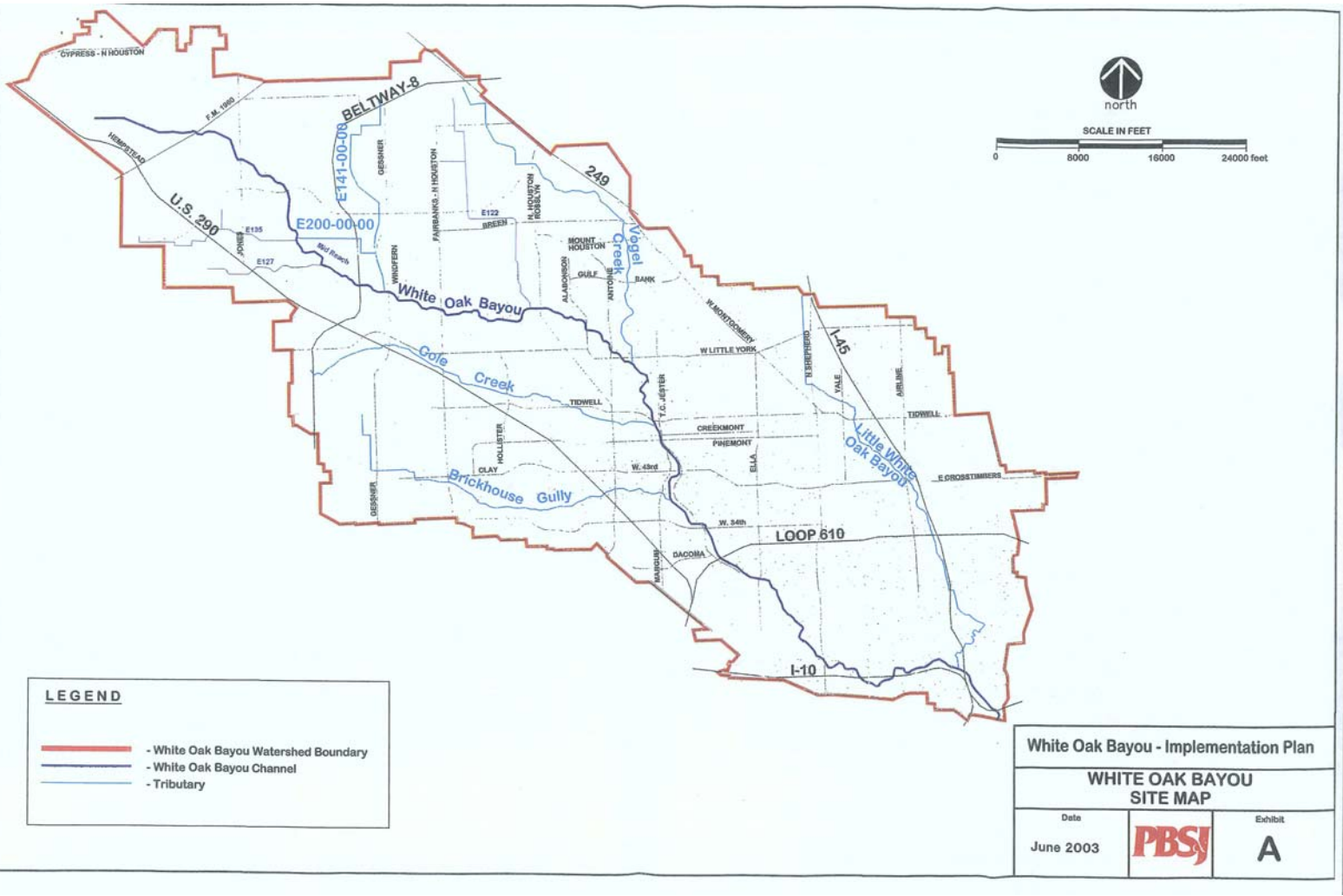
Exhibit	Description
A	General map of the watershed
B	Project area map showing phased proposed construction
C1	Jersey Village Bypass regrade profile (Phase 1)
C2	Jersey Village Bypass regrade profile (Phase 2)
D	E500-10-00 Layout
E	E500-01-00 Layout
F	E500-02-00 Layout
G	E500-03-00 Layout
H	Representative channel cross-section
I	Jersey Village Bypass channel modification profile
J	Jersey Village Bypass site layout
K	Water surface profile for E100-00-00 showing pre- and post-project conditions for the 10-year frequency
L	Water surface profile for E100-00-00 showing pre- and post-project conditions for the 25-year frequency
M	Water surface profile for E100-00-00 showing pre- and post-project conditions for the 100-year frequency
N	Hydrograph Comparison 10-year frequency
O	Hydrograph Comparison 25-year frequency
P	Hydrograph Comparison 100-year frequency

Tables

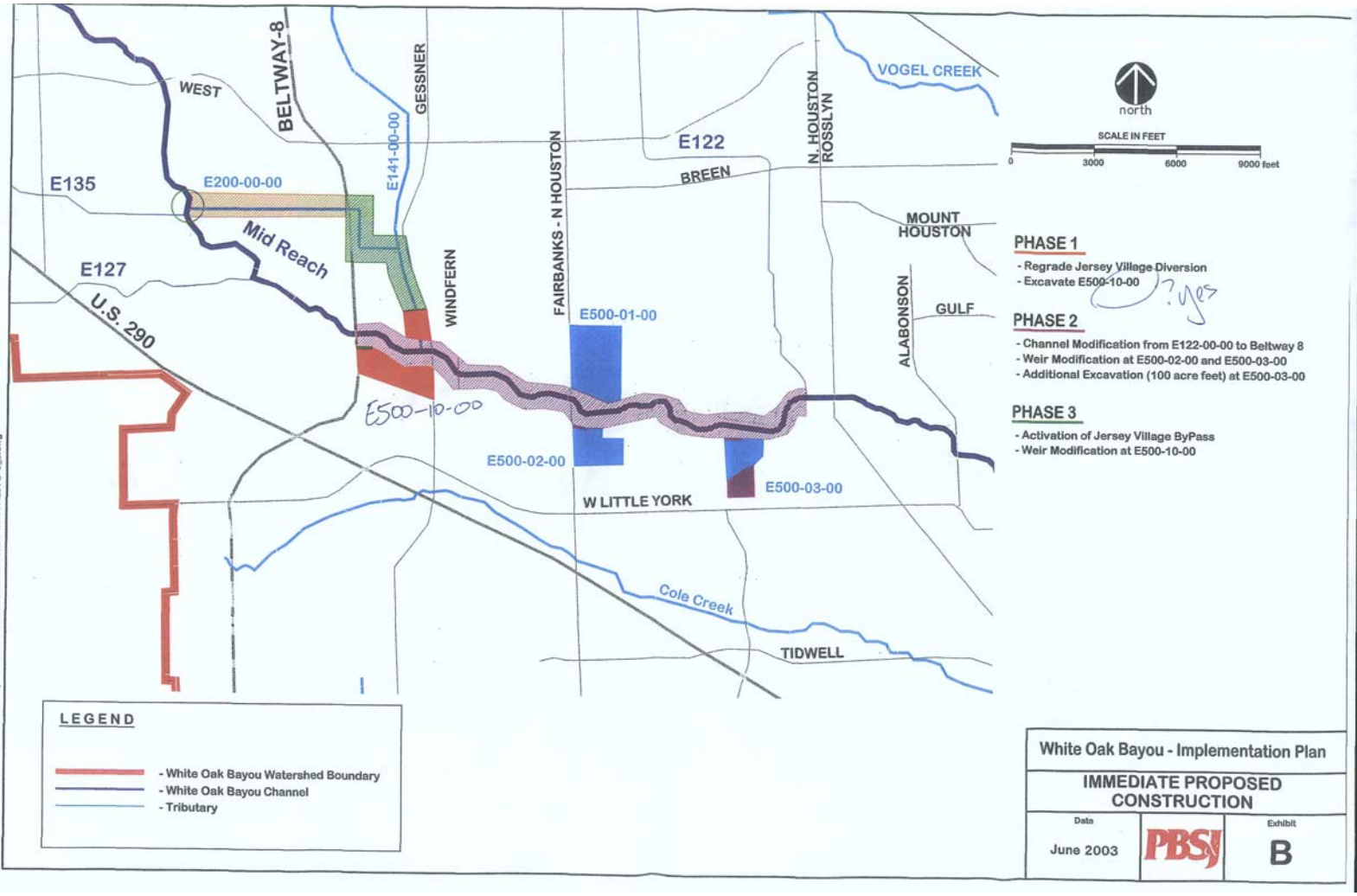
Tables

The tables reference in this letter report are listed below.

Table	Description
A	Water Surface Elevations for 10-year
B	Water Surface Elevations for 25-year
C	Water Surface Elevations for 100-year



Feb 25, 2003 jpm JB16036 D:\Projects\460078.05\Exhibits\Exhibits 7-20-01\ ExA-B-O_8.1"



Feb 25, 2003 - 9:...pm JB16036 D:\Projects\460078.05\Exhibits\Exhibits 7-20-01\ Exh-B-O_a.dwg

Exhibit C_1
Jersey Village Bypass Channel Phase 1 Profile
100-Year Frequency

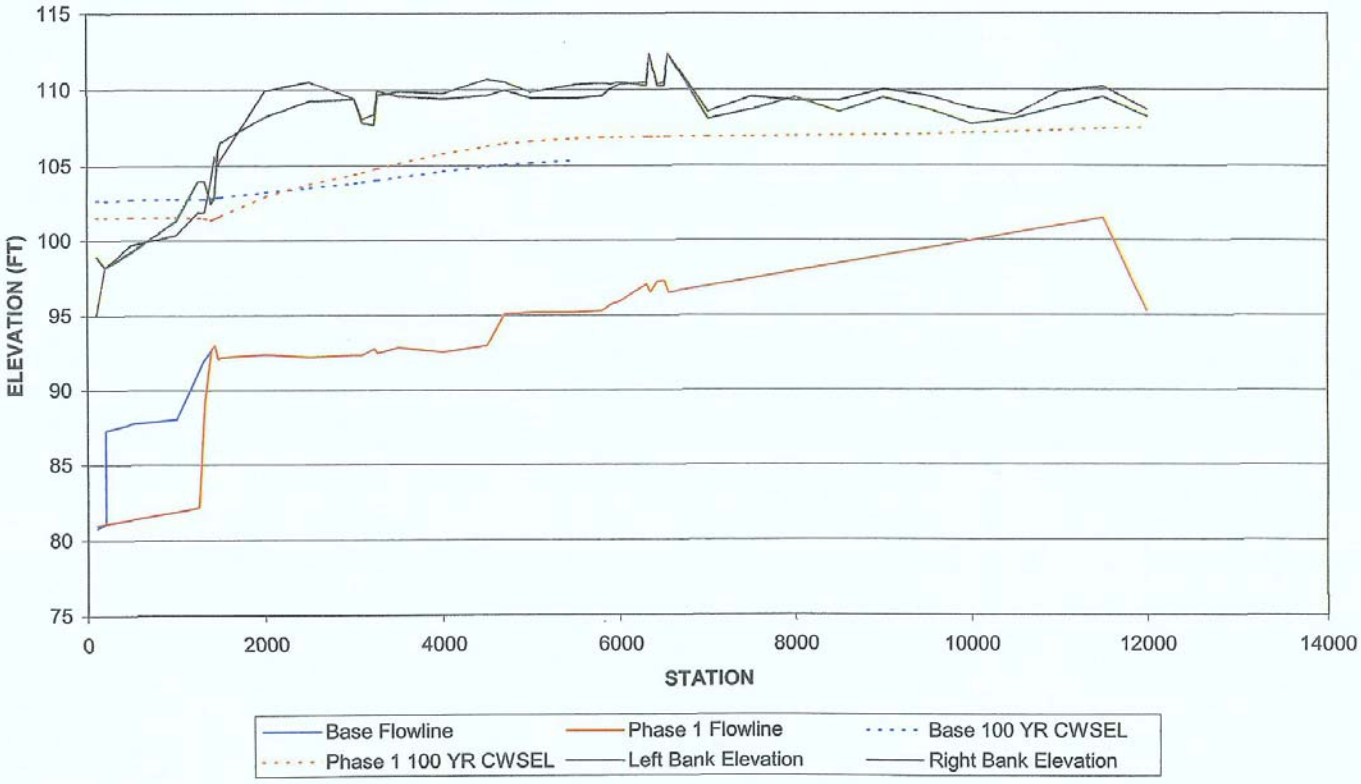
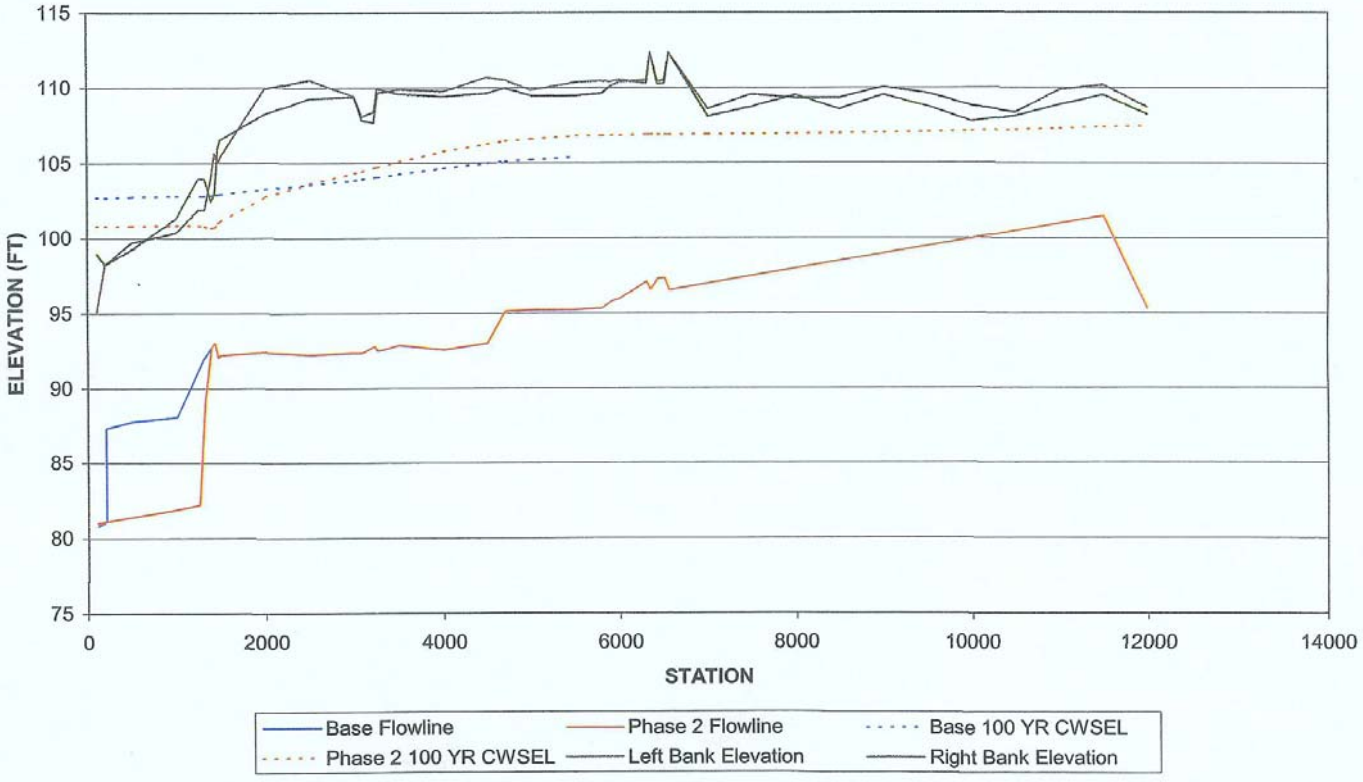
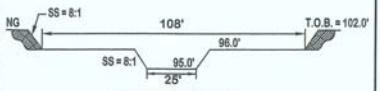


Exhibit C_2
Jersey Village Bypass Channel Phase 2 Profile
100-Year Frequency



north



INLET STRUCTURE DETAIL
(N.T.S.)

Note:
1. North cell flow through facility
2. South cell side weir facility

South Cell
Elevation - Storage Relationship:

Elev. (FT.) (1973 ADJ.)	Storage (AC. FT.)
82.0	0.0
84.0	10.0
87.0	42.0
90.0	85.0
93.0	132.0
96.0	182.0
99.0	235.0
102.0	266.0

LEGEND

PROPOSED CONSTRUCTION
H.C.F.C.D. R.O.W.

SCALE IN FEET
0 400 800 1200

White Oak Bayou - Implementation Plan

Detention Facility
E500-10-00 Site Layout

Date		Exhibit
June 2003	PBS&J	D

Jun 09, 2003 m JB16036 D:\Projects\60078.05\Exhibits\Exhibits 7-20-01\ Exhibit D.dv

north

Note: Flow Through Facility

Elevation - Storage Relationship:

Elev. (FT.) (1973 ADJ.)	Storage (AC. FT.)
82.0	18.6
84.0	69.9
86.0	156.2
88.0	263.0
90.0	372.4
92.0	482.9
94.0	594.6
96.0	629.7
98.0	651.9
100.0	657.1

LEGEND

- DETENTION FACILITY SITE LIMITS
- H.C.F.C.D. R.O.W.
- 500 YEAR FEMA FLOOD PLAIN
- 100 YEAR FEMA FLOOD PLAIN

Note: Layout from HCFCD final construction plans.

SCALE IN FEET

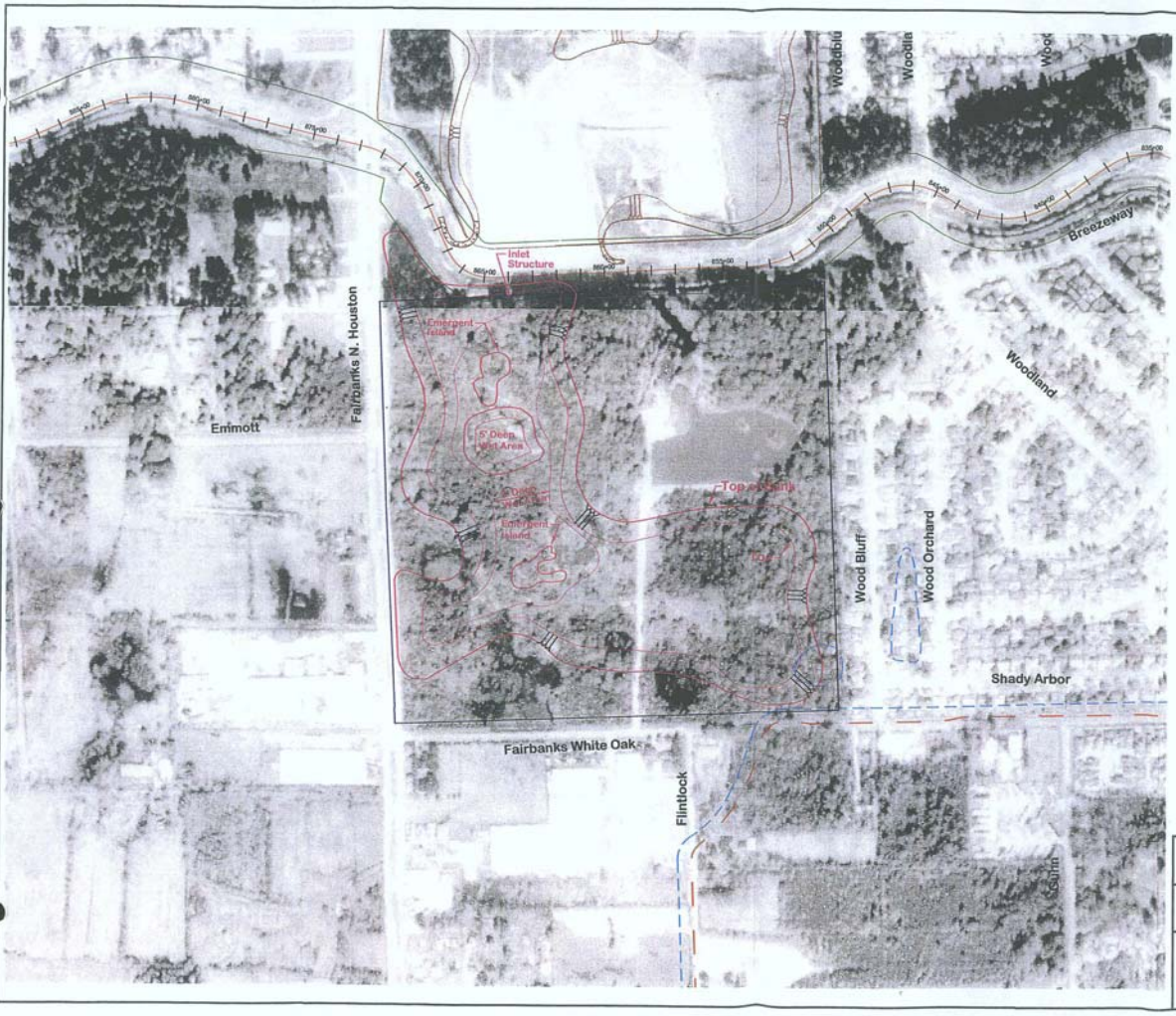
0 400 800 1200

White Oak Bayou - Implementation Plan

Detention Facility E500-01-00
Site Layout

Date		Exhibit
June 2003	PBSJ	E

JAN 02, 2003-4:P... J:\8039 PATH\K-\460078.02 WOB Implementation\Exhibits\Exhibit D.dwg



north

NG SS = 5:1 98' 82.0' T.O.B. = 100.0'

INLET STRUCTURE DETAIL
(N.T.S.)

Elevation - Storage Relationship:

Elev. (FT.) (1973 ADJ.)	Storage (AC. FT.)
78.0	0.0
85.0	151.0
90.0	329.0
93.0	464.0

LEGEND

- DETENTION FACILITY SITE LIMITS
- H.C.F.C.D. R.O.W.
- 500 YEAR FEMA FLOOD PLAIN
- 100 YEAR FEMA FLOOD PLAIN

Note: Layout from HCFCD final construction plans.

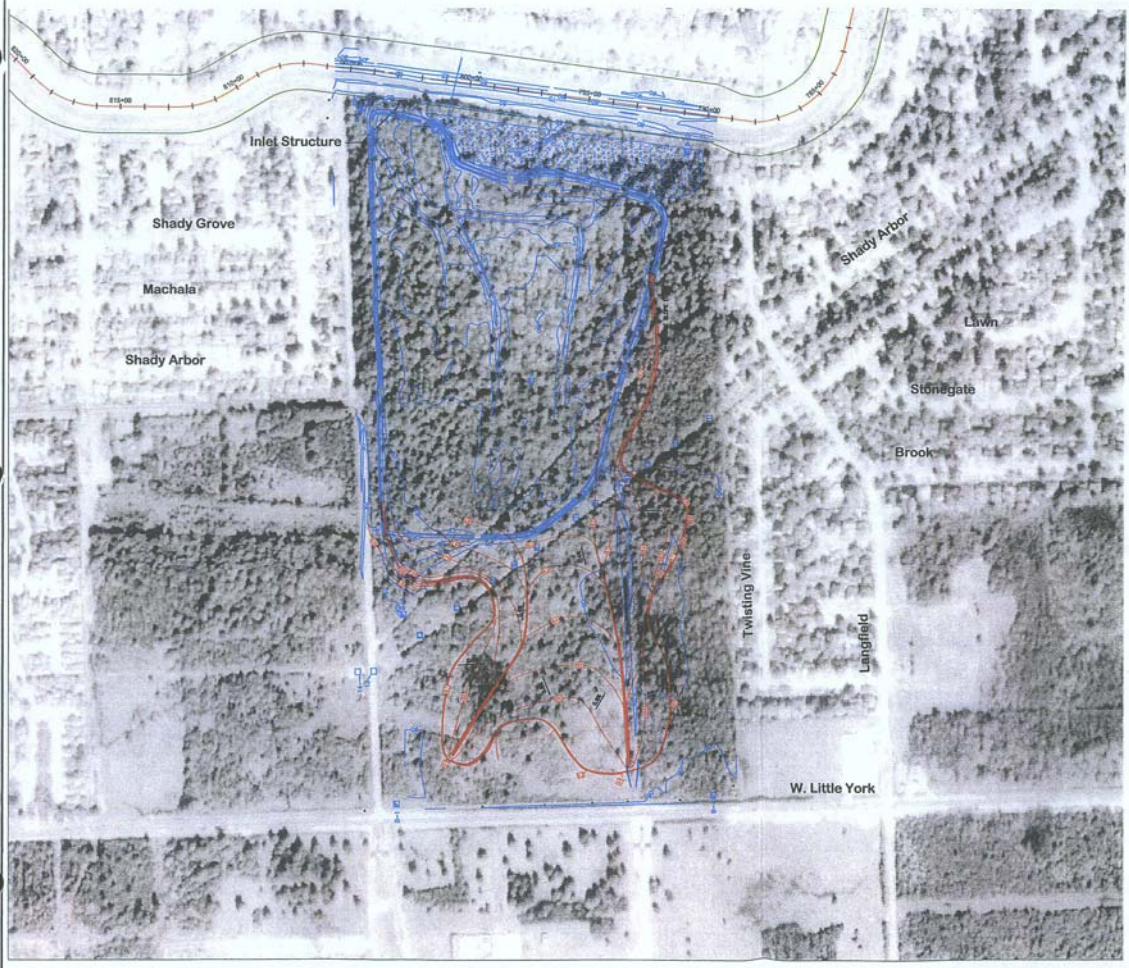
SCALE IN FEET
0 400 800 1200

White Oak Bayou - Implementation Plan

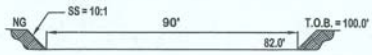
Detention Facility E500-02-00 Site Layout

Date		Exhibit
June 2003	PBSJ	F

Jun 09, 2003 pm JB16036 D:\Projects\460078.05\Exhibits\Exhibits 7-20-01\ Exhibit F.dwg



north



INLET STRUCTURE
DETAIL
(N.T.S.)

Total Excavation
Elevation - Storage Relationship:

Elevation (FT.) (1973 ADJ.)	Final Storage (AC. FT.)
77.0	0.0
79.0	13.0
81.0	41.0
83.0	107.0
85.0	198.0
87.0	309.0
88.0	366.0
90.0	380.0

Note: Existing storage before excavation is 281.0 acre-feet at an elevation of 90.0 ft.

LEGEND

- ORIGINAL (EXISTING) DETENTION DESIGN
- PROPOSED DETENTION DESIGN

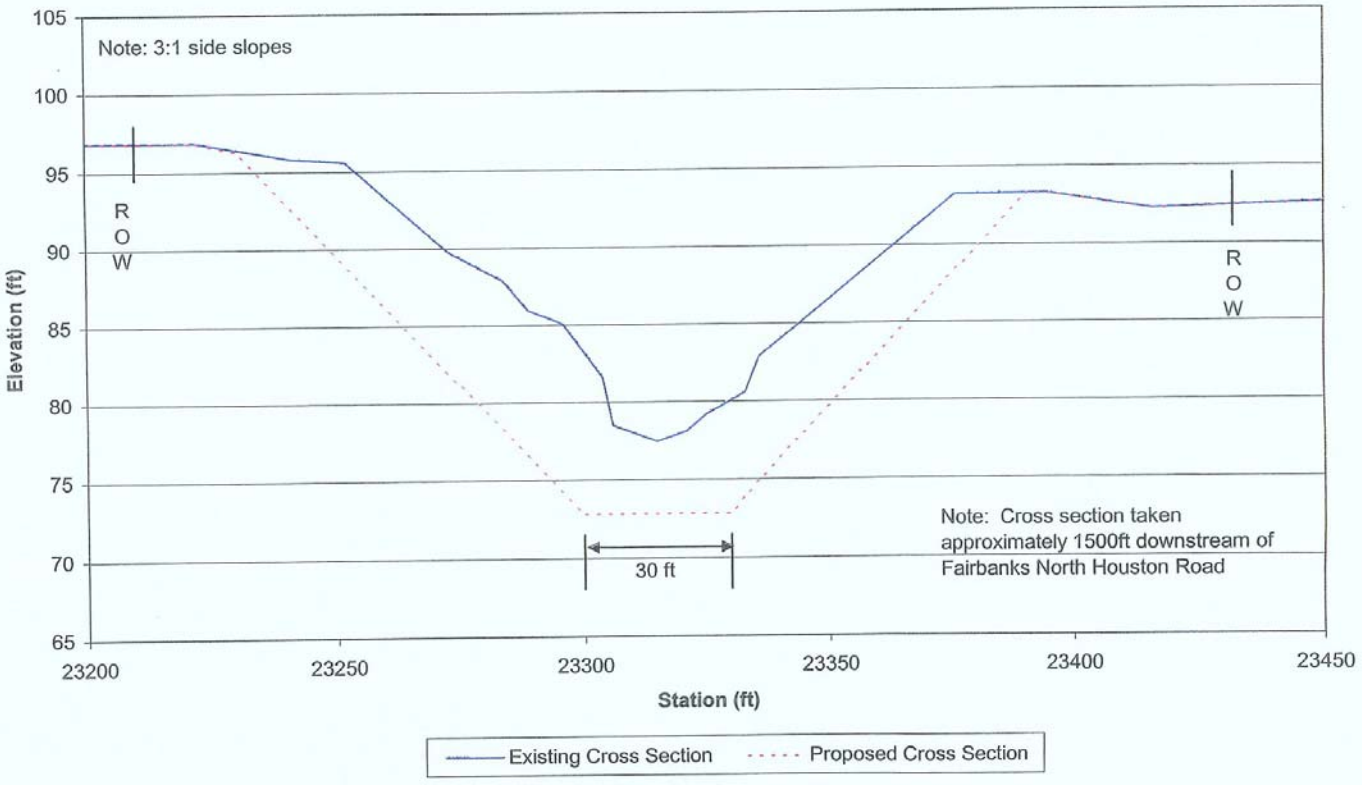
SCALE IN FEET
0 400 800 1200

White Oak Bayou - Implementation Plan

Detention Facility E500-03-00
Site Layout

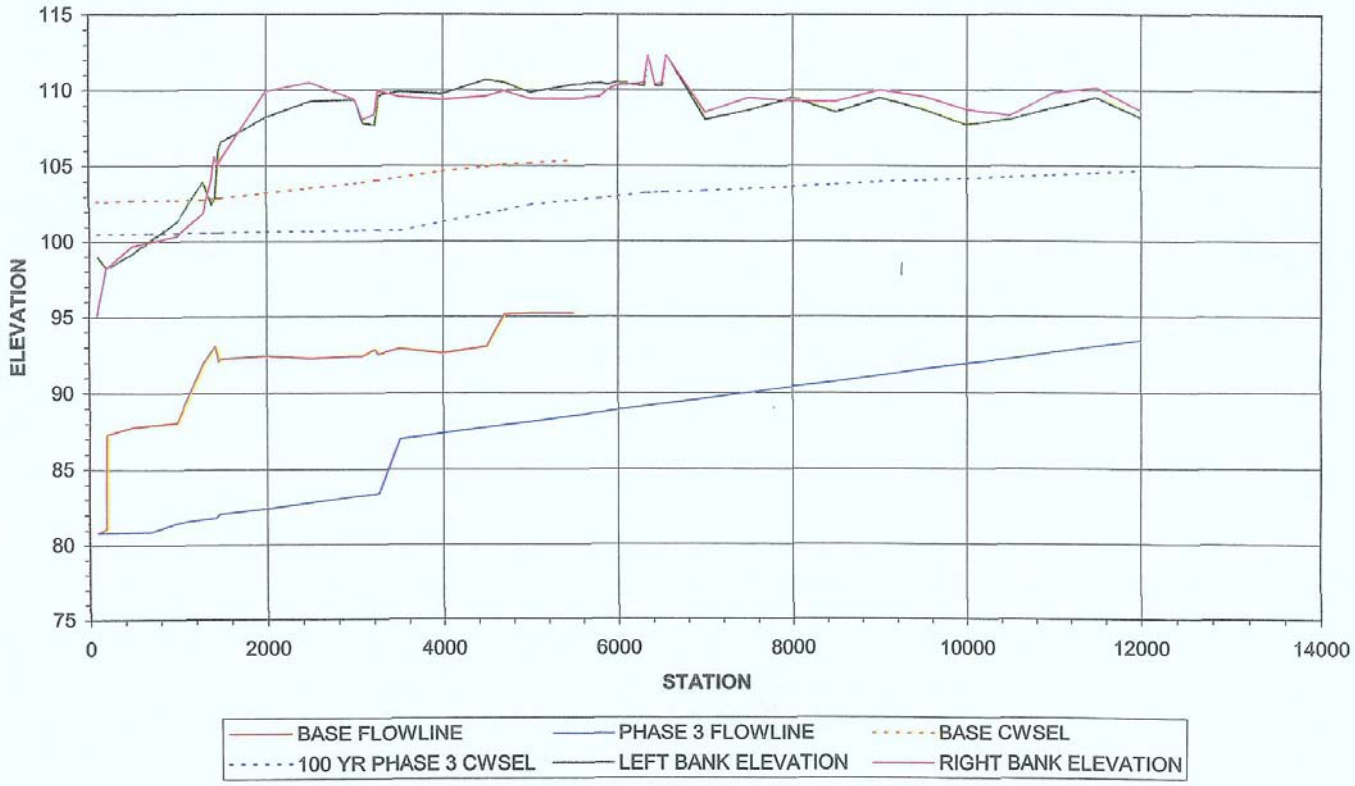
Date		Exhibit
June 2003	PBSJ	G

Exhibit H
Typical Existing and Proposed Cross Section



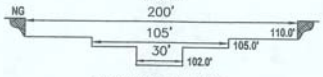
PRELIMINARY

Exhibit I
Jersey Village Bypass Channel Phase 3 Profile
100-Year Frequency



PRELIMINARY

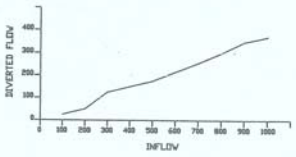
north



INFLOW STRUCTURE DETAIL
(N.T.S.)

SECTION A-A
(N.T.S.)

INFLOW STRUCTURE DIVERSION RATING CURVE



LEGEND

- Centerline of R.O.W.
- H.C.F.C.D. R.O.W.
- CHANNEL H.C.F.C.D. R.O.W.

SCALE IN FEET

0 800 1600 2400 feet

White Oak Bayou - Implementation Plan

PRELIMINARY JERSEY VILLAGE BYPASS CHANNEL SITE LAYOUT

Date		Exhibit
June 2003	PBSJ	J

P:\Z7_2000-12-\139375 PATH:D:\Projects\469078 White Oak Bayou\Exhibits\Exh E-2.dwg

Exhibit K_1
June 2003 Water Surface Elevation Profile
10-Year Frequency

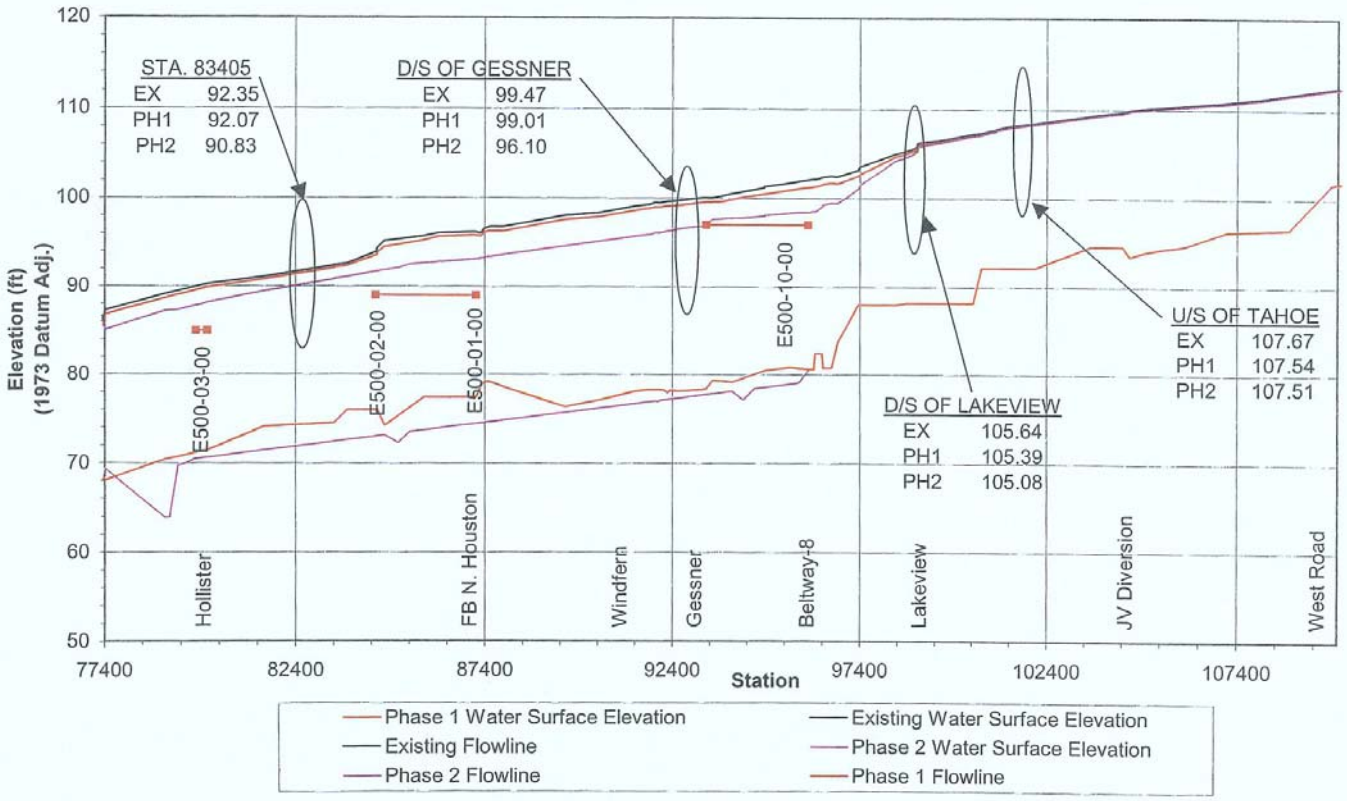


Exhibit K_2
June 2003 Water Surface Elevation Profile
10-Year Frequency

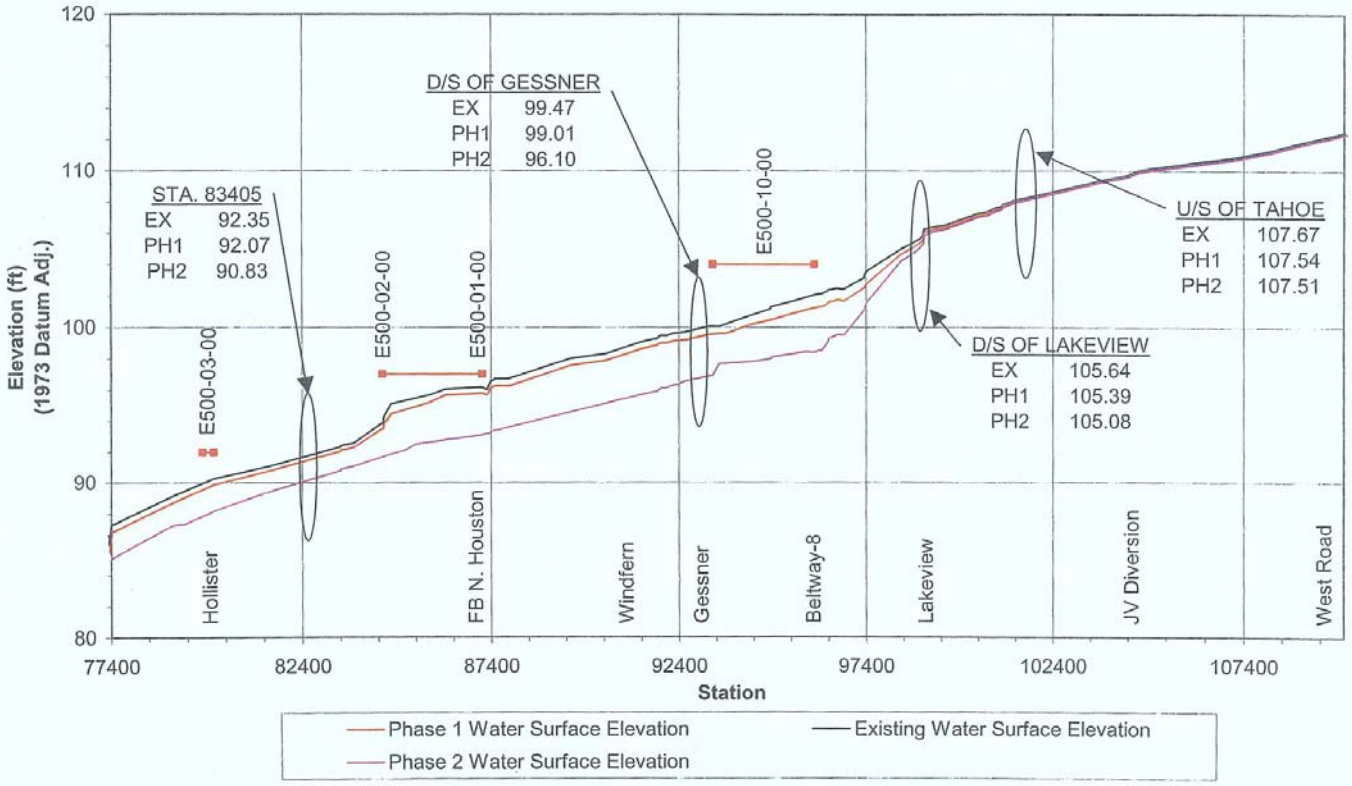


Exhibit L_1
February 2003 Water Surface Elevation Profile
25-Year Frequency

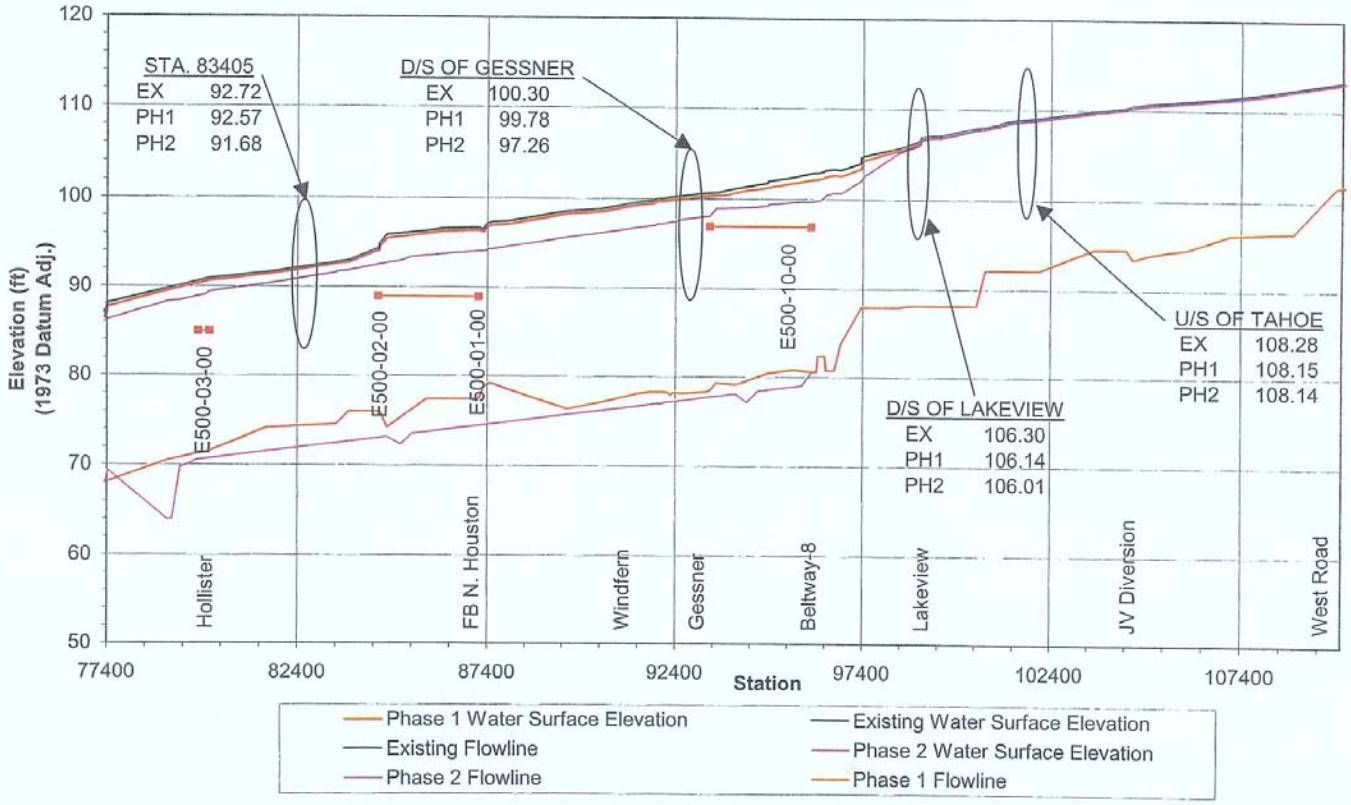


Exhibit L_2
June 2003 Water Surface Elevation Profile
25-Year Frequency

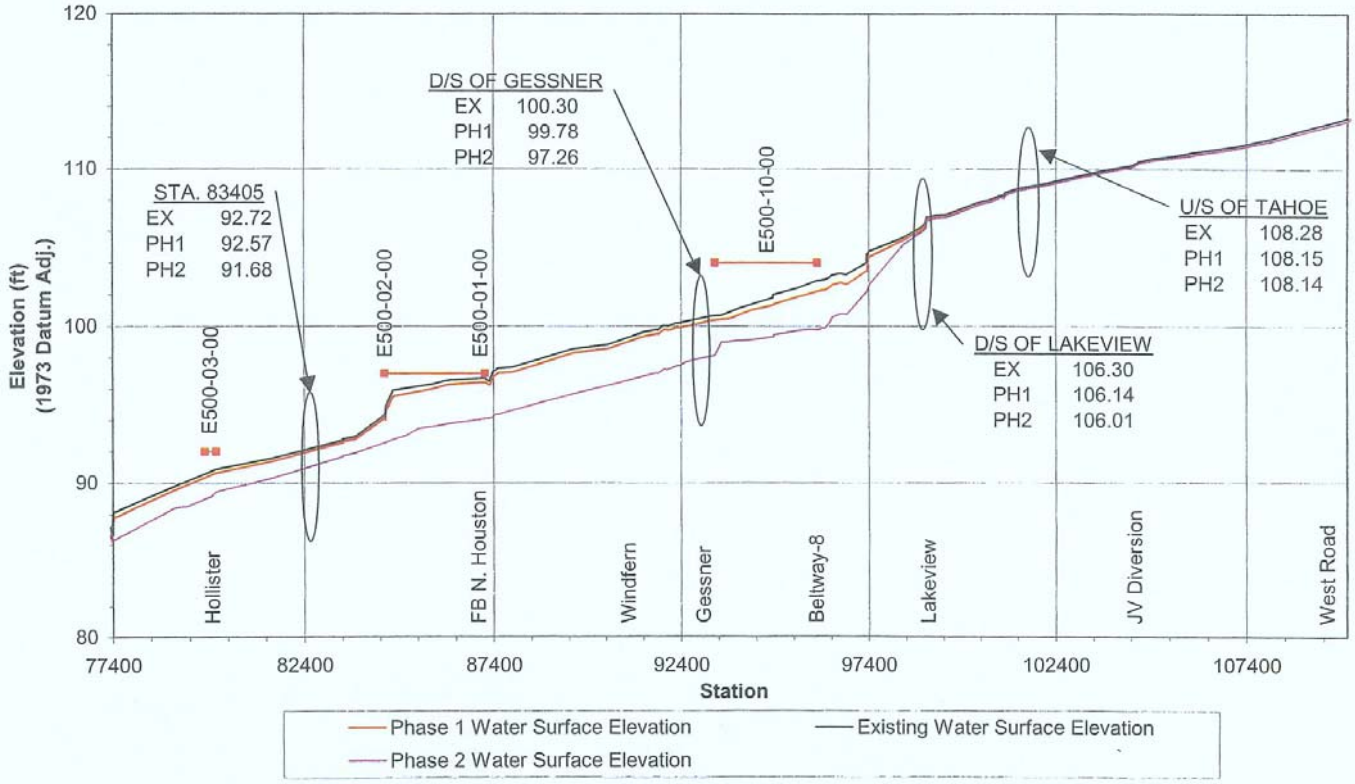


Exhibit M_1
June 2003 Water Surface Elevation Profile
100-Year Frequency

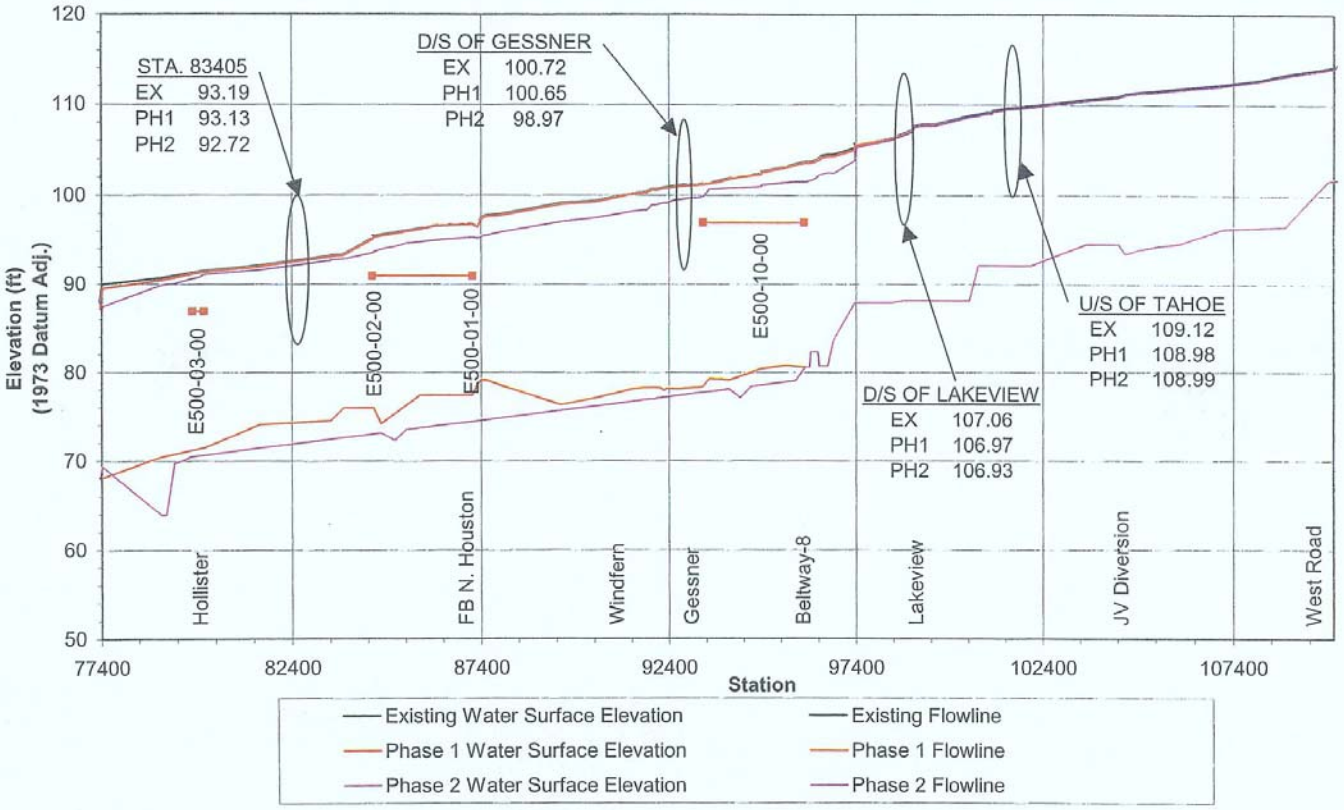


Exhibit M_2
June 2003 Water Surface Elevation Profile
100-Year Frequency

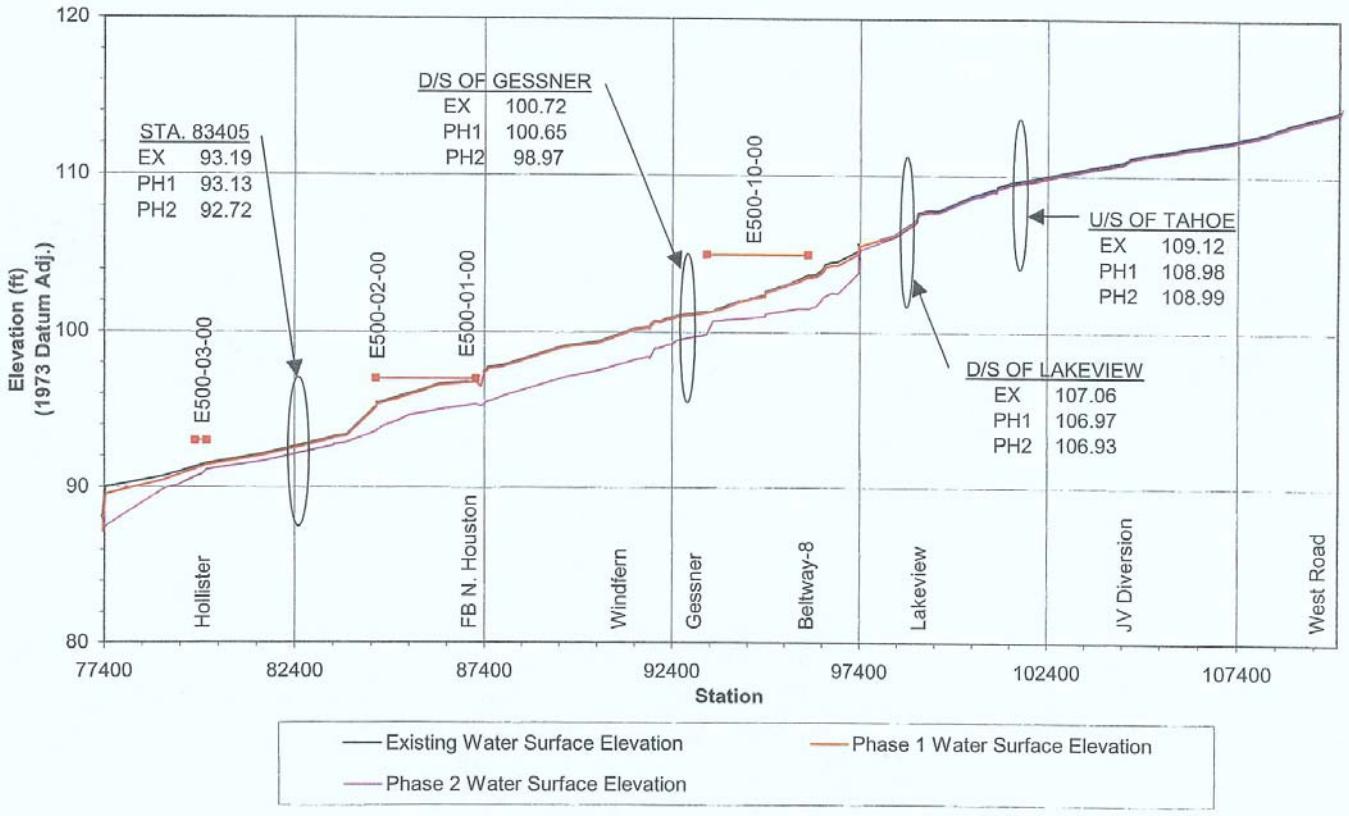


Exhibit N_1
Pre-Project vs Proposed Hydrographs
10-Year Frequency

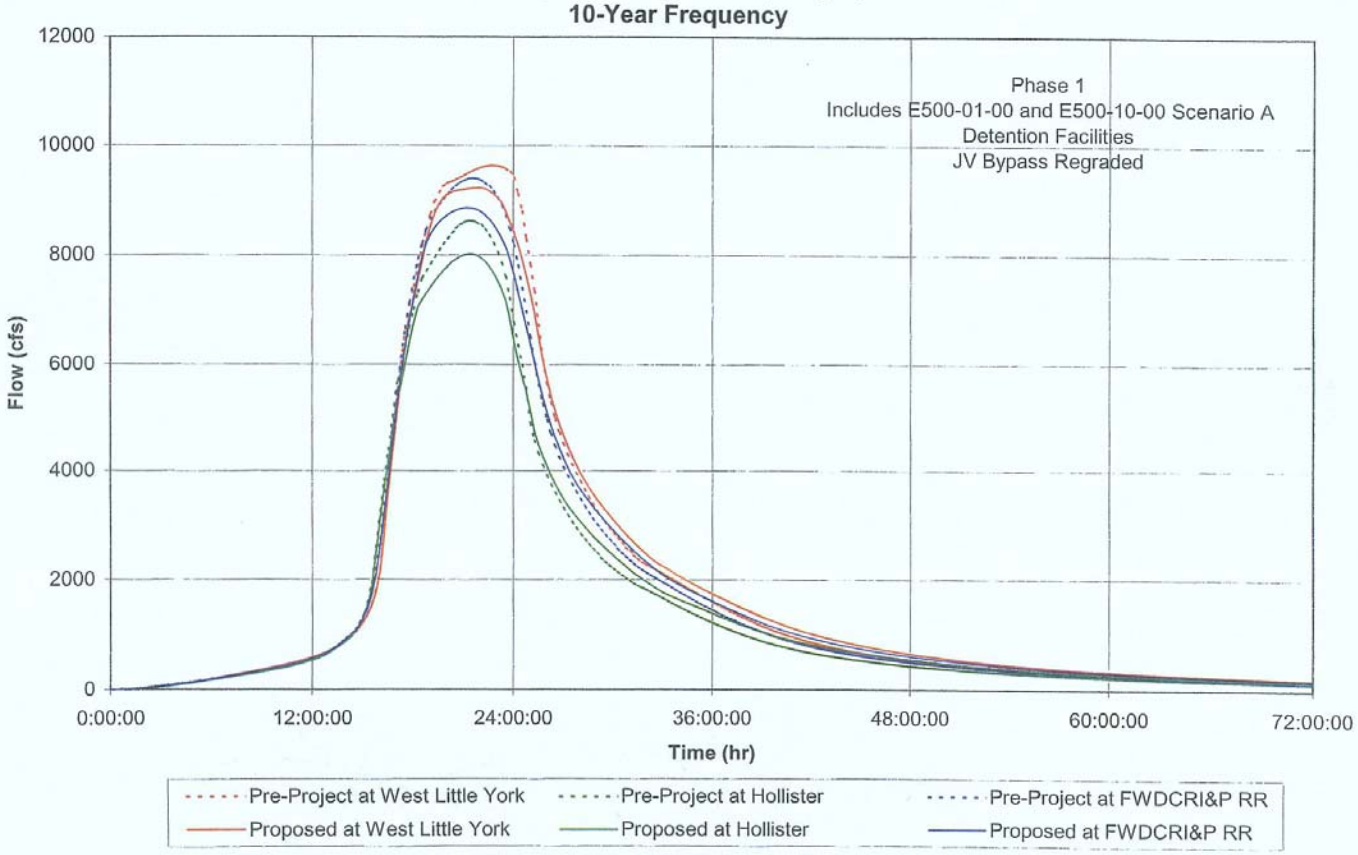


Exhibit N_2
Pre-Project vs Proposed Hydrographs
10-Year Frequency

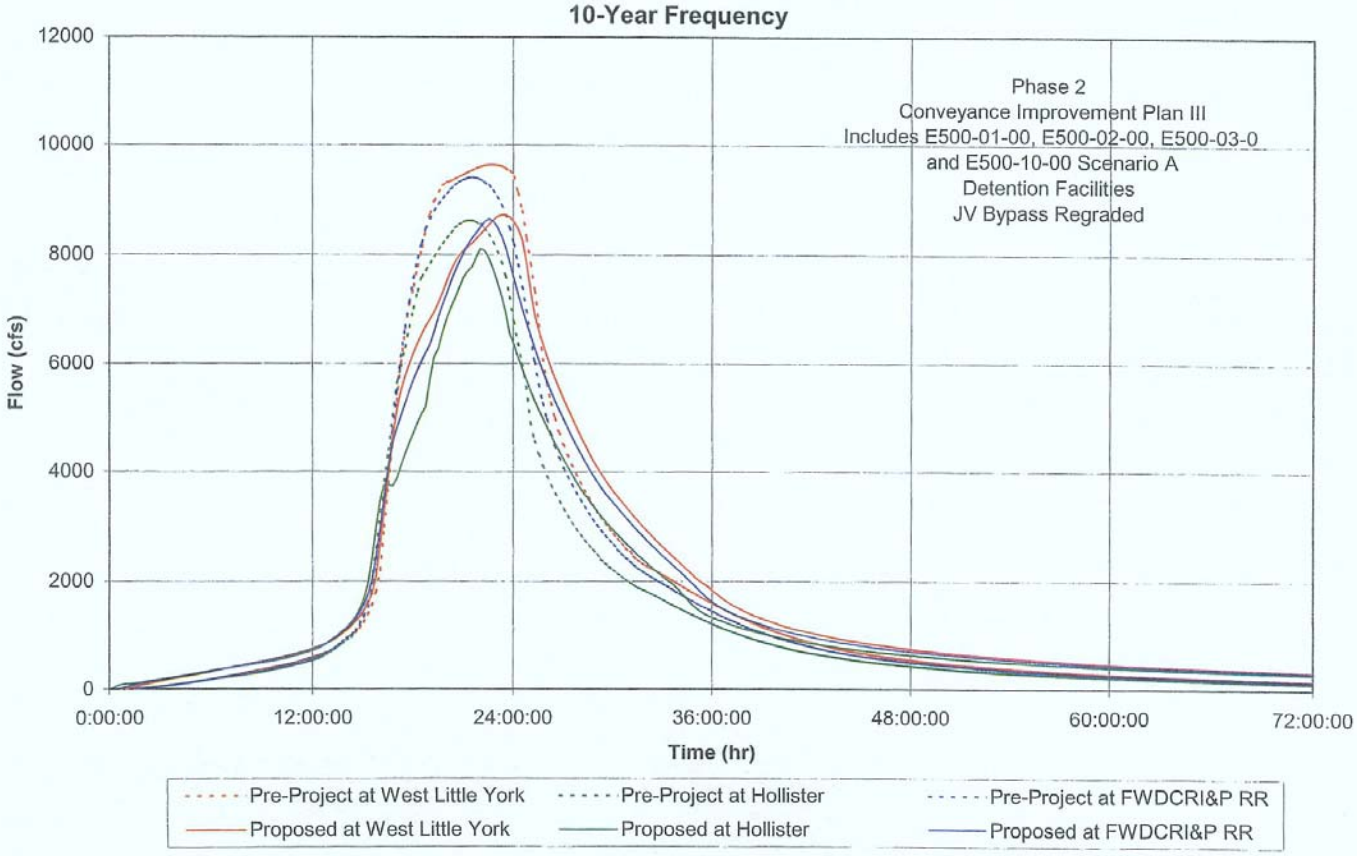


Exhibit O_1
Pre-Project vs Proposed Hydrographs
25-Year Frequency

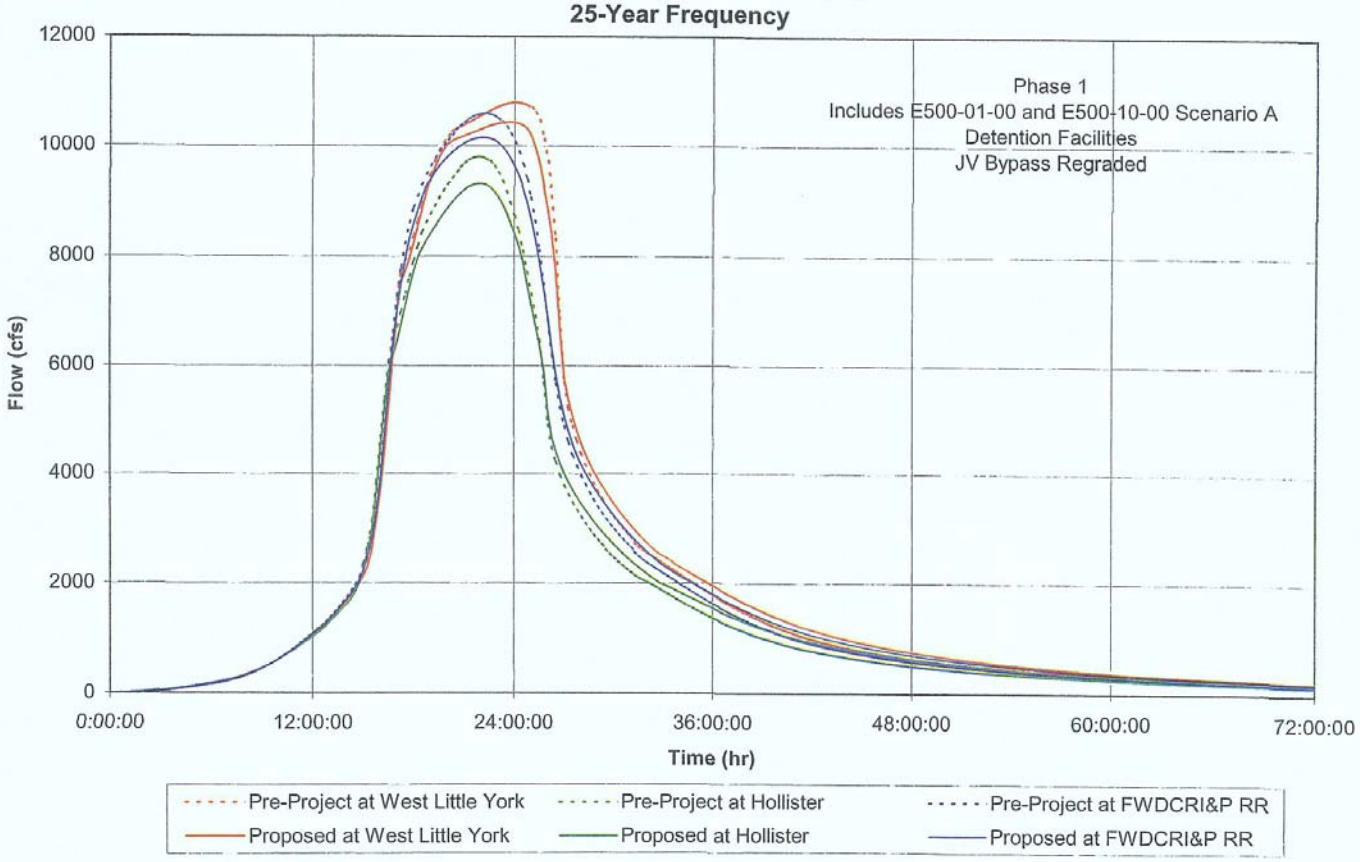


Exhibit O_2
Pre-Project vs Proposed Hydrographs
25-Year Frequency

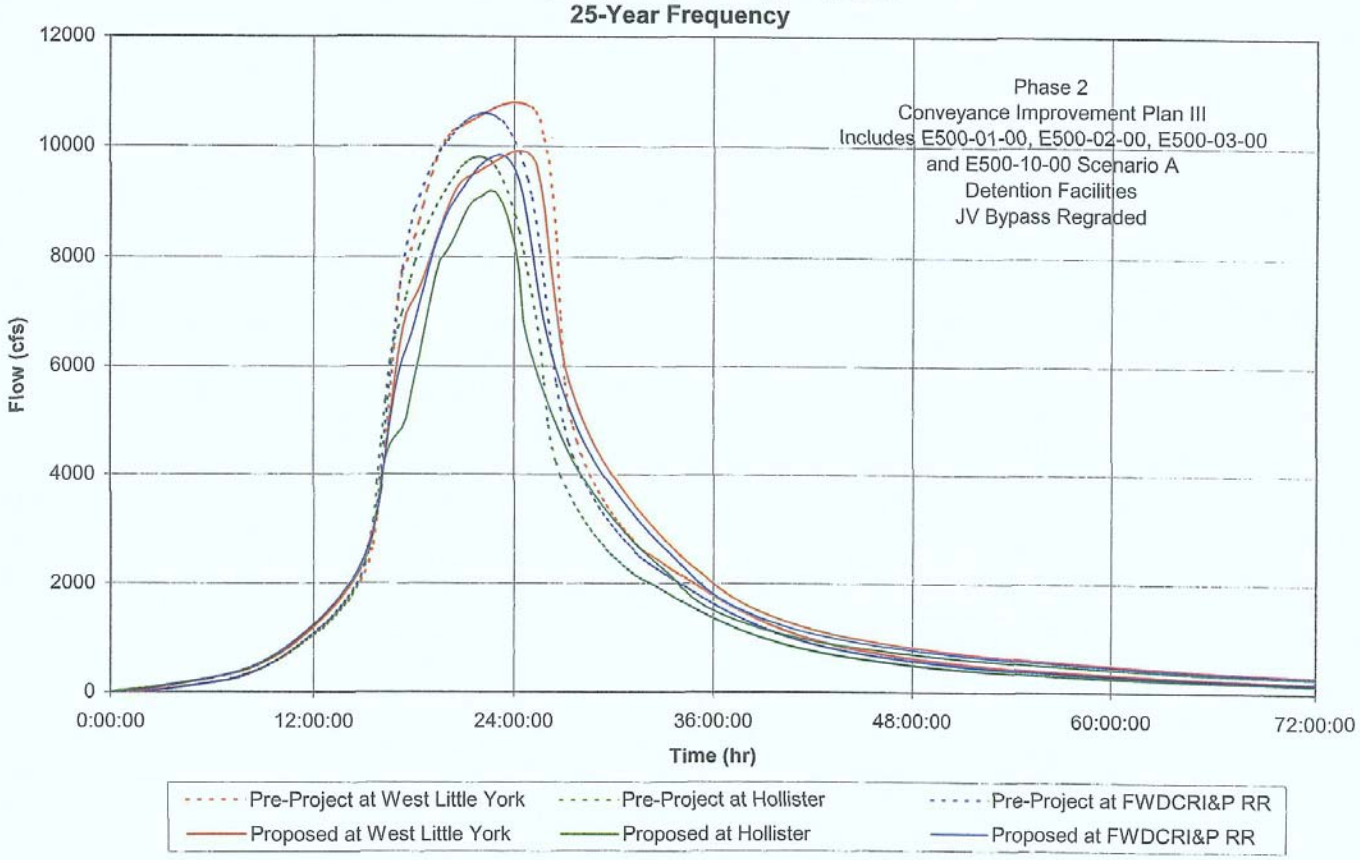


Exhibit P_1
Pre-Project vs Proposed Hydrographs
100-Year Frequency

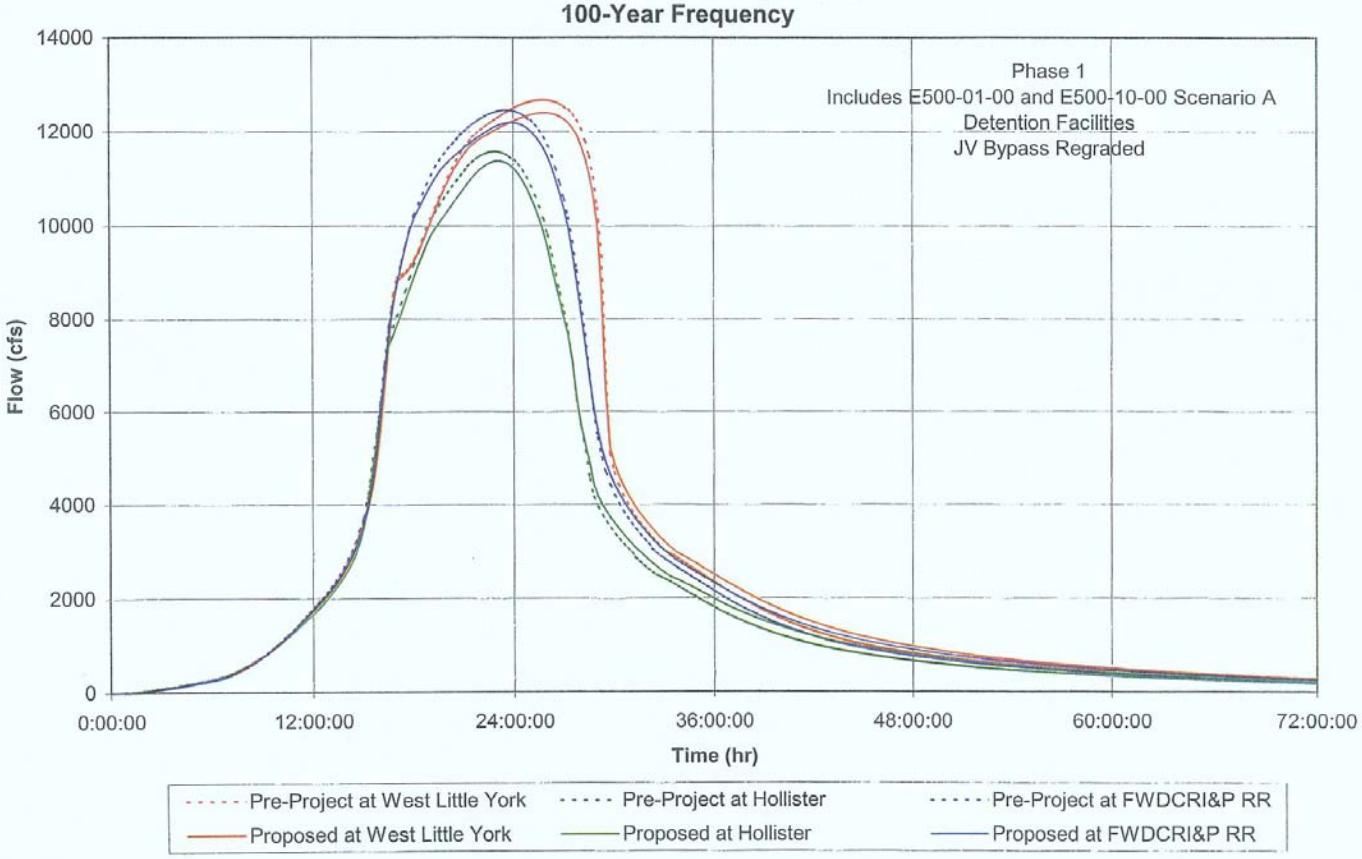


Exhibit P_2
Pre-Project vs Proposed Hydrographs
100-Year Frequency

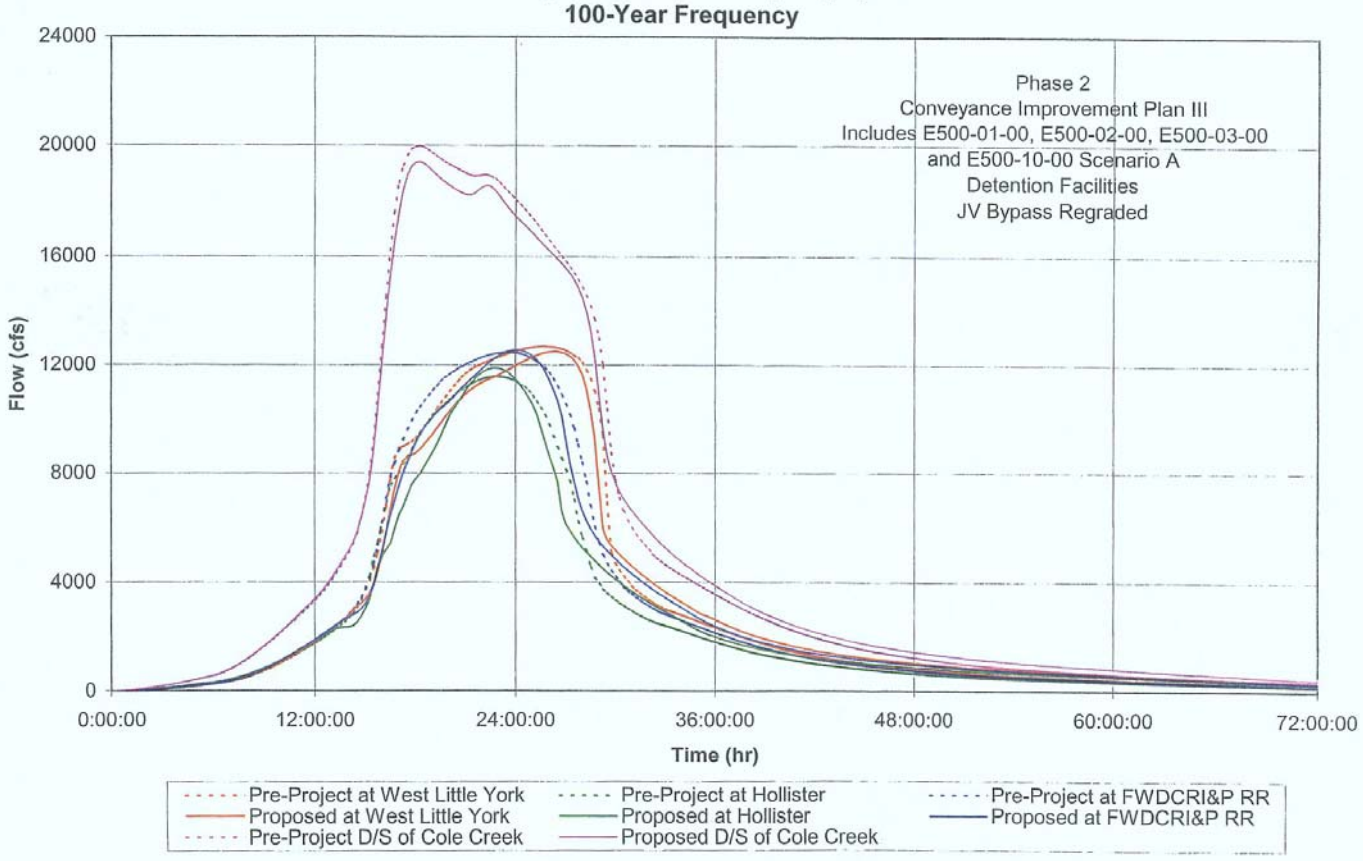


TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

e		Base	Phase 1	Phase 2
Date			Apr-03	Jun-03
el Name		Jbase10	10yrp16	10yrp28
			Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 10-year storm	n/a	n/a
E500-01 Basin Inlet Width			n/a	SW=82'
E500-02 Basin Inlet Elev.			100	100
E500-02 Basin Inlet Width			n/a	SW=82' + 100ach
E500-03 Basin Inlet Elev.			n/a	100
E500-03 Basin Inlet Width				
E122 Transition Structure		existing	existing	removed
Conveyance Improvements through		-	-	95760
Conveyance Improvements size		-	-	Plan III
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass		-	Regraded	Regraded
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
E500-10 Scenario		-	A Sideweir	A Sideweir
Woodlands Trail Bridge		Existing	Existing	Prop (lc=Exist)
Jersey Village Footbridge		Existing	Existing	Existing
Avg Stage Reduct JV Diversion Channel to BW 8		0.00	0.44	1.54
Avg Stage Reduct BW 8 to Gessner		0.00	0.66	3.11
Avg Stage Reduct Gessner to Windfern		0.00	0.45	3.30
Avg State Reduct Windfern to Fairbanks-North Houston		0.00	0.43	3.26
Avg Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.39	2.00
Avg Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.37	1.19
Avg Stage Reduct between Alabonson to West Little York		0.00	0.19	1.21
Avg Stage Reduct between West Little York to Tidwell		0.00	0.18	1.15
Avg Stage Reduct between Tidwell to 34th Street		0.00	0.25	0.77
Min Stage Reduct JV Diversion Channel to BW 8		0.00	0.11	0.11
Min Stage Reduct BW 8 to Gessner		0.00	0.43	2.36
Min Stage Reduct Gessner to Windfern		0.00	0.40	3.12
Min State Reduct Windfern to Fairbanks-North Houston		0.00	0.39	3.08
Min Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.27	1.01
Min Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.21	1.02
Min Stage Reduct between Alabonson to West Little York		0.00	0.18	0.93
Min Stage Reduct between West Little York to Tidwell		0.00	0.16	0.97
Min Stage Reduct between Tidwell to 34th Street		0.00	0.19	0.63
Max Stage Reduct JV Diversion Channel to BW 8		0.00	0.82	3.62
Max Stage Reduct BW 8 to Gessner		0.00	0.83	3.65
Max Stage Reduct Gessner to Windfern		0.00	0.49	3.37
State Reduct Windfern to Fairbanks-North Houston		0.00	0.47	3.37
Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.63	3.27
Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.58	1.40
Max Stage Reduct between Alabonson to West Little York		0.00	0.21	1.47
Max Stage Reduct between West Little York to Tidwell		0.00	0.19	1.22
Max Stage Reduct between Tidwell to 34th Street		0.00	0.35	0.97
		Peak Stage Reduction	Peak Stage Reduction	Peak Stage Reduction
	Station	(ft)	(ft)	(ft)
Confluence of White Oak Bayou with Buffalo Bayou	160	0.00	0.00	0.00
Southern Pacific Railroad	175	0.00	0.00	0.01
	240	0.00	0.00	0.01
	339	0.00	0.00	0.01
	340	0.00	0.01	0.01
Texas and New Orleans Railroad	352	0.00	0.02	0.04
	400	0.00	0.02	0.04
	550	0.00	0.02	0.04
	774	0.00	0.02	0.04
	775	0.00	0.02	0.04
	864	0.00	0.02	0.04
	930	0.00	0.03	0.05
	964	0.00	0.03	0.05
	965	0.00	0.03	0.05
	1105	0.00	0.03	0.06
	1006	0.00	0.04	0.07
	1180	0.00	0.04	0.07
	1224	0.00	0.04	0.07
	1225	0.00	0.03	0.06
	1241	0.00	0.04	0.08
	1242	0.00	0.05	0.09
	1310	0.00	0.04	0.09
	1510	0.00	0.05	0.09
	2160	0.00	0.05	0.10
	3780	0.00	0.05	0.09
	3889	0.00	0.05	0.10
	3890	0.00	0.05	0.10
	3908	0.00	0.05	0.09
	3909	0.00	0.05	0.10
	4010	0.00	0.05	0.10
	4185	0.00	0.05	0.10
	4629	0.00	0.05	0.10
	4630	0.00	0.05	0.10
	4684	0.00	0.05	0.10
	4685	0.00	0.05	0.10
	4795	0.00	0.05	0.10
	4820	0.00	0.05	0.10
	4850	0.00	0.06	0.11
	4869	0.00	0.06	0.11
	4870	0.00	0.05	0.10
	4884	0.00	0.05	0.10

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

ase		Base		Phase 1	Phase 2
iel Date				Apr-03	Jun-03
del Name		Jbase10		10yrp16	10yrp28
				Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 10-year storm		n/a	n/a
E500-01 Basin Inlet Width				n/a	SW=82'
E500-02 Basin Inlet Elev.				100	100
E500-02 Basin Inlet Width				n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.				n/a	100
E500-03 Basin Inlet Width					
		existing		existing	removed
E122 Transition Structure		-		-	95760
Conveyance Improvements through		-		-	Plan III
Conveyance Improvements size		Ex Brg		Ex Brg	Ex Brg
Fairbanks North Houston Bridge		Ex Brg		Ex Brg	Ex Brg
Gessner Bridge		Ex Brg		Ex Brg	Ex Brg
Windfern Bridge		-		Regraded	Regraded
Jersey Village Bypass		-		-	-
JV Div Wier (Elevation/Length)		-		-	-
JV Div Wier (Elevation/Length)		-		-	-
JV Div Wier (Elevation/Length)		-		A Sideweir	A Sideweir
E500-10 Scenario		Existing		Existing	Prop (tc=Exist)
Woodlands Trail Bridge		Existing		Existing	Existing
Jersey Village Footbridge					
	4685	0.00		0.05	0.10
	4926	0.00		0.05	0.10
	5085	0.00		0.05	0.10
	5230	0.00		0.05	0.10
	5395	0.00		0.05	0.10
	5835	0.00		0.05	0.10
	5945	0.00		0.06	0.11
	5979	0.00		0.05	0.10
	5980	0.00		0.06	0.10
	6051	0.00		0.05	0.10
	6052	0.00		0.05	0.10
	6340	0.00		0.05	0.10
	6341	0.00		0.05	0.10
	6365	0.00		0.05	0.10
	6366	0.00		0.06	0.11
	6365	0.00		0.06	0.11
	6440	0.00		0.05	0.11
	6441	0.00		0.05	0.10
	6535	0.00		0.05	0.11
	6236	0.00		0.05	0.11
	6676	0.00		0.06	0.11
	6800	0.00		0.06	0.11
	6801	0.00		0.06	0.11
	6825	0.00		0.05	0.11
	6826	0.00		0.06	0.11
	6850	0.00		0.05	0.11
	6930	0.00		0.06	0.11
	7480	0.00		0.06	0.11
	7481	0.00		0.06	0.10
	7539	0.00		0.05	0.10
	7540	0.00		0.05	0.10
	7780	0.00		0.05	0.11
	10040	0.00		0.06	0.11
	10580	0.00		0.06	0.11
	10734	0.00		0.06	0.12
	10735	0.00		0.06	0.11
	10816	0.00		0.06	0.11
	10817	0.00		0.06	0.12
	10905	0.00		0.06	0.12
	11940	0.00		0.06	0.12
	12820	0.00		0.06	0.12
	12821	0.00		0.06	0.12
	13060	0.00		0.06	0.13
	13117	0.00		0.06	0.12
	13190	0.00		0.06	0.13
	13565	0.00		0.06	0.12
	13568	0.00		0.06	0.12
	13790	0.00		0.06	0.13
	13809	0.00		0.06	0.12
	13810	0.00		0.06	0.12
	13823	0.00		0.06	0.12
	13824	0.00		0.06	0.13
	14860	0.00		0.06	0.13
	14030	0.00		0.06	0.13
	14140	0.00		0.06	0.13
	14141	0.00		0.06	0.13
	14340	0.00		0.06	0.13
	14435	0.00		0.06	0.13
	14469	0.00		0.06	0.13
	14525	0.00		0.06	0.15
	14540	0.00		0.07	0.15
	14760	0.00		0.07	0.16
	14800	0.00		0.06	0.15
	14860	0.00		0.06	0.15
	14920	0.00		0.07	0.15
	14921	0.00		0.07	0.15
	16210	0.00		0.08	0.19
	16211	0.00		0.08	0.19
	17260	0.00		0.07	0.19
	17261	0.00		0.07	0.19
	17500	0.00		0.08	0.20
	17636	0.00		0.10	0.25
	17685	0.00		0.11	0.26
	17880	0.00		0.10	0.26

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

Case		Base		Phase 1		Phase 2
Model Date				Apr-03		Jun-03
Model Name		Jbase10		10yrp16		10yrp28
				Ex. Flowline		Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 10-year storm		n/a		n/a
E500-01 Basin Inlet Width				n/a		SW=82'
E500-02 Basin Inlet Elev.				100		100
E500-02 Basin Inlet Width				n/a		SW=82' + 100acft
E500-03 Basin Inlet Elev.				n/a		100
E500-03 Basin Inlet Width						
E122 Transition Structure		existing		existing		removed
Conveyance Improvements through		-		-		95760
Conveyance Improvements size		-		-		Plan III
Fairbanks North Houston Bridge		Ex Brg		Ex Brg		Ex Brg
Gessner Bridge		Ex Brg		Ex Brg		Ex Brg
Windfern Bridge		Ex Brg		Ex Brg		Ex Brg
Jersey Village Bypass		-		Regraded		Regraded
JV Div Wier (Elevation/Length)		-		-		-
JV Div Wier (Elevation/Length)		-		-		-
JV Div Wier (Elevation/Length)		-		-		-
E500-10 Scenario		-		A Sideweir		A Sideweir
Woodlands Trail Bridge		Existing		Existing		Prop (ic=Exist)
Jersey Village Footbridge		Existing		Existing		Existing
	18567	0.00		0.11		0.26
	17970	0.00		0.11		0.26
	18054	0.00		0.13		0.33
	18089	0.00		0.13		0.33
	18090	0.00		0.13		0.32
	18110	0.00		0.13		0.33
	18111	0.00		0.13		0.33
	18250	0.00		0.14		0.34
	18630	0.00		0.13		0.34
	18770	0.00		0.13		0.34
	18970	0.00		0.13		0.34
	18971	0.00		0.13		0.34
	19565	0.00		0.13		0.33
	19686	0.00		0.13		0.33
	20940	0.00		0.14		0.33
	20941	0.00		0.14		0.33
	22305	0.00		0.13		0.32
	22306	0.00		0.13		0.32
	22555	0.00		0.13		0.32
	22556	0.00		0.13		0.32
	22670	0.00		0.13		0.32
	22723	0.00		0.13		0.32
	22765	0.00		0.13		0.32
	22990	0.00		0.13		0.32
	22991	0.00		0.13		0.32
	23145	0.00		0.13		0.32
	23384	0.00		0.13		0.33
	23385	0.00		0.13		0.33
	23429	0.00		0.13		0.32
	23430	0.00		0.13		0.33
	23575	0.00		0.13		0.33
	23960	0.00		0.13		0.33
	23961	0.00		0.13		0.33
	24649	0.00		0.13		0.33
	24650	0.00		0.13		0.33
	24686	0.00		0.14		0.35
	24687	0.00		0.15		0.38
	24705	0.00		0.15		0.38
	24706	0.00		0.15		0.38
	24935	0.00		0.15		0.38
	26170	0.00		0.15		0.38
	26270	0.00		0.15		0.38
	26337	0.00		0.15		0.38
	26470	0.00		0.14		0.37
	26950	0.00		0.14		0.37
	26951	0.00		0.14		0.37
	27825	0.00		0.14		0.37
	27940	0.00		0.15		0.37
	28015	0.00		0.14		0.37
	28073	0.00		0.17		0.42
	28110	0.00		0.16		0.42
	28315	0.00		0.17		0.42
	28570	0.00		0.17		0.42
	28571	0.00		0.17		0.42
	29050	0.00		0.17		0.42
	29110	0.00		0.16		0.42
	29190	0.00		0.18		0.46
	29320	0.00		0.18		0.46
	29530	0.00		0.18		0.46
	30370	0.00		0.18		0.46
	31840	0.00		0.18		0.46
	32770	0.00		0.18		0.46
	33125	0.00		0.17		0.46
	33126	0.00		0.17		0.46
	33380	0.00		0.18		0.46
	33502	0.00		0.17		0.45
	33560	0.00		0.51		0.79
	33561	0.00		0.51		0.79
	33625	0.00		0.50		0.78
	33825	0.00		0.50		0.78
	34385	0.00		0.49		0.77
	34770	0.00		0.47		0.75
	34800	0.00		0.46		0.74
	34880	0.00		0.50		0.82

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

se			Base		Phase 1	Phase 2
del Date					Apr-03	Jun-03
del Name			Jbase10		10yrp16	10yrp28
					Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 10-year storm		n/a	n/a
E500-01 Basin Inlet Width					n/a	SW=82'
E500-02 Basin Inlet Elev.					100	100
E500-02 Basin Inlet Width					n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.					n/a	100
E500-03 Basin Inlet Width						
			existing		existing	removed
E122 Transition Structure			-		-	95760
Conveyance Improvements through			-		-	Plan III
Conveyance Improvements size			Ex Brg		Ex Brg	Ex Brg
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			-		Regraded	Regraded
Jersey Village Bypass			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		A Sideweir	A Sideweir
E500-10 Scenario			Existing		Existing	Prop (Ic=Exist)
Woodlands Trail Bridge			Existing		Existing	Existing
Jersey Village Footbridge						
	34950	0.00		0.50		0.82
	35130	0.00		0.50		0.82
	35485	0.00		0.50		0.81
	37060	0.00		0.46		0.77
	38050	0.00		0.44		0.76
	38550	0.00		0.41		0.73
	38730	0.00		0.41		0.73
	38910	0.00		0.41		0.73
	38964	0.00		0.40		0.72
	39010	0.00		0.41		0.72
	39190	0.00		0.40		0.72
	39240	0.00		0.40		0.72
	39294	0.00		0.40		0.72
	39340	0.00		0.40		0.72
	41570	0.00		0.36		0.68
	42405	0.00		0.33		0.66
34th Street	42450	0.00		0.32		0.65
	42502	0.00		0.33		0.66
	42570	0.00		0.32		0.65
	42895	0.00		0.32		0.65
	43095	0.00		0.31		0.64
	43160	0.00		0.30		0.63
	43266	0.00		0.35		0.74
	43470	0.00		0.34		0.74
	43371	0.00		0.34		0.74
	43695	0.00		0.34		0.74
T.C. Jester	44030	0.00		0.33		0.73
	44340	0.00		0.33		0.72
	44850	0.00		0.32		0.71
FWDCRI&P Railroad	44864	0.00		0.31		0.71
	44916	0.00		0.31		0.70
	46323	0.00		0.27		0.68
	47885	0.00		0.25		0.67
	49350	0.00		0.24		0.73
	50520	0.00		0.22		0.74
	50640	0.00		0.23		0.74
	50641	0.00		0.23		0.74
	50695	0.00		0.22		0.74
	50801	0.00		0.23		0.75
	50830	0.00		0.23		0.75
	52610	0.00		0.21		0.80
	52805	0.00		0.21		0.81
	53233	0.00		0.20		0.81
Watonga	53300	0.00		0.20		0.81
	53400	0.00		0.21		0.81
	54290	0.00		0.20		0.84
	54410	0.00		0.20		0.83
	54430	0.00		0.20		0.83
	54510	0.00		0.20		0.84
	54560	0.00		0.20		0.84
Pinemont	54860	0.00		0.20		0.86
	54910	0.00		0.19		0.85
	54963	0.00		0.19		0.86
Creekmont	55030	0.00		0.20		0.87
	55590	0.00		0.20		0.89
	55960	0.00		0.19		0.91
	56100	0.00		0.19		0.92
	56200	0.00		0.19		0.95
	56470	0.00		0.19		0.97
Tidwell	56570	0.00		0.18		0.97
	56640	0.00		0.19		0.98
	57520	0.00		0.18		1.03
	57645	0.00		0.18		1.04
	59310	0.00		0.17		1.13
	59311	0.00		0.17		1.13
	59340	0.00		0.18		1.18
E500-05-00	59530	0.00		0.18		1.20
	60180	0.00		0.18		1.19
	60250	0.00		0.18		1.17
	60251	0.00		0.18		1.17
	60300	0.00		0.18		1.18
	60850	0.00		0.18		1.18
	60861	0.00		0.18		1.18
	60960	0.00		0.18		1.16

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

Case		Base		Phase 1	Phase 2
Model Date				Apr-03	Jun-03
Model Name		Jbase10		10yrp16	10yrp28
				Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 10-year storm		n/a	n/a
E500-01 Basin Inlet Width				n/a	SW=82'
E500-02 Basin Inlet Elev.				100	100
E500-02 Basin Inlet Width				n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.				n/a	- 100
E500-03 Basin Inlet Width					
E122 Transition Structure		existing		existing	removed
Conveyance Improvements through		-		-	95760
Conveyance Improvements size		-		-	Plan III
Fairbanks North Houston Bridge		Ex Brg		Ex Brg	Ex Brg
Gessner Bridge		Ex Brg		Ex Brg	Ex Brg
Windfern Bridge		Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass		-		Regraded	Regraded
JV Div Wier (Elevation/Length)		-		-	-
JV Div Wier (Elevation/Length)		-		-	-
JV Div Wier (Elevation/Length)		-		-	-
E500-10 Scenario		-		A Sideweir	A Sideweir
Woodlands Trail Bridge		Existing		Existing	Prop (lc=Exist)
Jersey Village Footbridge		Existing		Existing	Existing
	62040	0.00		0.18	1.20
	62041	0.00		0.18	1.20
	62140	0.00		0.17	1.19
	62900	0.00		0.17	1.22
	64080	0.00		0.16	1.18
	64150	0.00		0.17	1.18
	65160	0.00		0.17	1.15
	65260	0.00		0.16	1.14
West Little York Road	65320	0.00		0.20	1.47
	65450	0.00		0.20	1.45
	66305	0.00		0.20	1.36
	66430	0.00		0.19	1.35
Antoine Drive	66519	0.00		0.19	1.21
	66540	0.00		0.20	1.21
	66640	0.00		0.20	1.20
	66666	0.00		0.20	1.21
	66667	0.00		0.21	1.20
Pipeline crossing	66669	0.00		0.21	1.21
	66670	0.00		0.18	1.25
	66710	0.00		0.18	1.25
	66919	0.00		0.18	1.22
	66920	0.00		0.18	1.22
	67050	0.00		0.17	1.15
Victory	67145	0.00		0.18	1.20
	67280	0.00		0.18	1.20
	67860	0.00		0.19	1.24
	67861	0.00		0.19	1.24
	68255	0.00		0.19	1.15
	68315	0.00		0.19	1.15
Inwood Country Club Bridge	68325	0.00		0.20	1.15
	68380	0.00		0.20	1.14
	69470	0.00		0.18	1.04
	69890	0.00		0.16	0.93
	70105	0.00		0.17	0.93
Alabonson	70165	0.00		0.25	1.34
	70320	0.00		0.25	1.31
	70321	0.00		0.25	1.31
	71490	0.00		0.23	1.21
	72410	0.00		0.21	1.02
	72411	0.00		0.21	1.02
	72550	0.00		0.21	1.02
	72630	0.00		0.21	1.03
	72631	0.00		0.21	1.02
Pipeline crossing	72634	0.00		0.21	1.03
	72635	0.00		0.21	1.03
	72740	0.00		0.58	1.40
	72741	0.00		0.58	1.40
	72800	0.00		0.38	1.27
	72801	0.00		0.37	1.27
FWDCRI&P Railroad	72811	0.00		0.38	1.27
	72812	0.00		0.42	1.30
	72865	0.00		0.41	1.29
	72866	0.00		0.41	1.29
	73160	0.00		0.42	1.26
E500-04-00	73565	0.00		0.42	1.21
	73660	0.00		0.42	1.20
	73760	0.00		0.41	1.18
	73830	0.00		0.41	1.18
	74050	0.00		0.41	1.17
	74250	0.00		0.42	1.18
	74450	0.00		0.42	1.17
	74600	0.00		0.42	1.17
	74820	0.00		0.41	1.16
	74950	0.00		0.41	1.16
	75025	0.00		0.42	1.16
	75090	0.00		0.42	1.16
	75125	0.00		0.42	1.17
	75180	0.00		0.42	1.16
	75215	0.00		0.42	1.16
	75380	0.00		0.42	1.15
	75530	0.00		0.42	1.15
	75779	0.00		0.42	1.13
North Houston Rosslyn	75780	0.00		0.41	1.13
	75877	0.00		0.41	1.13

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

Base		Base		Phase 1		Phase 2
Model Date				Apr-03		Jun-03
Model Name		Jbase10		10yrp16		10yrp28
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 10-year storm		Ex. Flowline		Ult. Flowline
E500-01 Basin Inlet Width				n/a		n/a
E500-02 Basin Inlet Elev.				n/a		SW=82'
E500-02 Basin Inlet Width				100		100
E500-03 Basin Inlet Elev.				n/a		SW=82' + 100acft
E500-03 Basin Inlet Width				n/a		100
E122 Transition Structure		existing		existing		removed
Conveyance Improvements through		-		-		95760
Conveyance Improvements size		-		-		Plan III
Fairbanks North Houston Bridge		Ex Brg		Ex Brg		Ex Brg
Gessner Bridge		Ex Brg		Ex Brg		Ex Brg
Windfern Bridge		Ex Brg		Ex Brg		Ex Brg
Jersey Village Bypass		-		Regraded		Regraded
JV Div Wier (Elevation/Length)		-		-		-
JV Div Wier (Elevation/Length)		-		-		-
JV Div Wier (Elevation/Length)		-		-		-
E500-10 Scenario		-		A Sideweir		A Sideweir
Woodlands Trail Bridge		Existing		Existing		Prop (lc=Exist)
Jersey Village Footbridge		Existing		Existing		Existing

	75878	0.00	0.42	1.13
	75933	0.00	0.42	1.13
	76315	0.00	0.42	1.14
	77285	0.00	0.41	1.01
	77300	0.00	0.42	1.02
	77355	0.00	0.41	1.01
E122-00-00 Transition Structure	77356	0.00	0.39	--
	77405	0.00	0.45	2.19
	77430	0.00	0.45	2.19
	77435	0.00	0.45	2.13
	78980	0.00	0.42	1.87
E500-03-00	80080	0.00	0.37	2.07
	81560	0.00	0.29	1.63
	83405	0.00	0.28	1.52
	83406	0.00	0.28	1.52
	83746	0.00	0.27	1.46
	84521	0.00	0.34	2.19
Woodlands Trail Footbridge	84526	0.00	0.31	2.09
	84534	0.00	0.31	2.14
	84539	0.00	0.44	2.51
	84734	0.00	0.63	3.21
E500-01-00/E500-02-00	85770	0.00	0.45	3.02
	85900	0.00	0.42	3.09
	86185	0.00	0.36	3.22
	86990	0.00	0.37	--
	87150	0.00	0.37	3.04
	87285	0.00	0.32	2.80
	87385	0.00	0.40	3.27
Fairbanks North Houston	87390	0.00	0.39	3.18
	87485	0.00	0.41	3.22
	87489	0.00	0.44	3.30
	87520	0.00	0.44	3.29
	87880	0.00	0.47	3.08
	89506	0.00	0.43	3.36
	90436	0.00	0.41	3.14
	91380	0.00	0.44	3.35
	91700	0.00	0.41	3.35
	91774	0.00	0.42	3.37
Windfern	91779	0.00	0.40	3.34
	91830	0.00	0.41	3.36
	91920	0.00	0.46	3.35
	92000	0.00	0.46	3.37
	92058	0.00	0.45	3.30
	92155	0.00	0.46	3.31
	92255	0.00	0.46	3.29
	92325	0.00	0.47	3.29
	92600	0.00	0.49	3.12
Gessner	93185	0.00	0.50	3.18
	93285	0.00	0.51	3.15
	93460	0.00	0.43	2.36
	93980	0.00	0.60	2.72
	94850	0.00	0.69	3.16
	94855	0.00	0.81	3.19
	94856	0.00	0.82	3.20
	95510	0.00	0.79	3.37
	96030	0.00	0.83	3.65
d/s Beltway-8	96080	0.00	0.82	3.62
	96127	0.00	0.82	3.58
	96148	0.00	0.81	3.56
	96183	0.00	0.82	3.61
	96199	0.00	0.82	3.59
	96204	0.00	0.81	3.59
	96346	0.00	0.79	3.30
	96351	0.00	0.78	3.26
	96367	0.00	0.78	3.24
	96402	0.00	0.76	3.08
	96422	0.00	0.76	3.07
u/s Beltway-8	96469	0.00	0.75	3.04
	96625	0.00	0.74	2.98
	96790	0.00	0.74	2.93
	97344	0.00	0.61	2.04
JV Footbridge	97345	0.00	0.55	1.97
	97348	0.00	0.59	1.97
	97349	0.00	0.64	2.04

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

[illegible]se			Base		Phase 1	Phase 2
[illegible]el Date					Apr-03	Jun-03
[illegible]del Name			Jbase10		10yrp16	10yrp26
					Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 10-year storm		n/a	n/a
E500-01 Basin Inlet Width					n/a	SW=82'
E500-02 Basin Inlet Elev.					100	100
E500-02 Basin Inlet Width					n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.					n/a	100
E500-03 Basin Inlet Width						
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (lc=Exist)
Jersey Village Footbridge			Existing		Existing	Existing

	97399	0.00	0.76	1.96
	98320	0.00	0.30	0.74
	98321	0.00	0.30	0.74
	98625	0.00	0.28	0.66
	98830	0.00	0.25	0.56
	98910	0.00	0.24	0.50
	98942	0.00	0.18	0.37
Lakeview	98990	0.00	0.19	0.37
	99185	0.00	0.17	0.33
	99470	0.00	0.16	0.29
	100410	0.00	0.15	0.23
	100640	0.00	0.14	0.22
	100890	0.00	0.14	0.20
	100980	0.00	0.14	0.20
	101014	0.00	0.13	0.16
	101050	0.00	0.14	0.17
	101375	0.00	0.13	0.15
	101376	0.00	0.13	0.15
	102065	0.00	0.12	0.13
	103540	0.00	0.11	0.11
	103541	0.00	0.11	0.11
	104395	0.00	0.11	0.11
JV Diversion Channel	104396	0.00	0.11	0.11
	104580	0.00	0.11	0.11
	104581	0.00	0.11	0.11
	104965	0.00	0.13	0.12
	105475	0.00	0.13	0.13
	105870	0.00	0.14	0.14
	106020	0.00	0.15	0.15
	107109	0.00	0.15	0.15
	108130	0.00	0.14	0.14
	108230	0.00	0.14	0.14
	108740	0.00	0.14	0.14
West Road	109835	0.00	0.14	0.14
	110020	0.00	0.15	0.14
	110110	0.00	0.14	0.14
	110330	0.00	0.16	0.16
	111205	0.00	0.13	0.13
	111206	0.00	0.13	0.13
	111360	0.00	0.13	0.13
	111395	0.00	0.13	0.13
	111625	0.00	0.13	0.13
	111626	0.00	0.13	0.13
	113250	0.00	0.08	0.08
	113251	0.00	0.08	0.08
	113300	0.00	0.08	0.08
	113310	0.00	0.07	0.07
	113575	0.00	0.07	0.07
	113740	0.00	0.05	0.05
	114060	0.00	0.06	0.06
	114295	0.00	0.05	0.05
	114580	0.00	0.04	0.04
	114625	0.00	0.04	0.04
	114780	0.00	0.04	0.04
	114955	0.00	0.04	0.04
	115125	0.00	0.04	0.04
	115450	0.00	0.03	0.03
	115855	0.00	0.03	0.03
	116015	0.00	0.03	0.03
	116035	0.00	0.02	0.02
	116115	0.00	0.03	0.03
	116220	0.00	0.03	0.03
	116485	0.00	0.03	0.03
	117210	0.00	0.03	0.02
	119290	0.00	0.03	0.03
	120695	0.00	0.03	0.03
	121735	0.00	0.02	0.02
	121830	0.00	0.03	0.03
	121915	0.00	0.03	0.03
	121995	0.00	0.02	0.02
	122100	0.00	0.02	0.02
	122330	0.00	0.03	0.03
	122420	0.00	0.03	0.03
	123990	0.00	0.02	0.02

TABLE A

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
10 Year Frequency

			Base		Phase 1	Phase 2
					Apr-03	Jun-03
Date			Jbase10		10yrp16	10yrp28
el Name						
					Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 10-year storm		n/a	n/a
E500-01 Basin Inlet Width					n/a	SW=82'
E500-02 Basin Inlet Elev.					100	100
E500-02 Basin Inlet Width					n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.					n/a	100
E500-03 Basin Inlet Width						
			existing		existing	removed
E122 Transition Structure			-		-	95760
Conveyance Improvements through			-		-	Plan III
Conveyance Improvements size			Ex Brg		Ex Brg	Ex Brg
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			-		Regraded	Regraded
Jersey Village Bypass			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		A Sideweir	A Sideweir
E500-10 Scenario			Existing		Exlsting	Prop (Ic=Exist)
Woodlands Trail Bridge			Existing		Existing	Existing
Jersey Village Footbridge						
		124340	0.00		0.01	0.01
		124354	0.00		0.02	0.02
		124415	0.00		0.02	0.02
		124810	0.00		0.02	0.02
		124940	0.00		0.02	0.02
		124941	0.00		0.01	0.01
		124955	0.00		0.02	0.02
		124956	0.00		0.02	0.02
		125060	0.00		0.01	0.01
		125587	0.00		0.01	0.01
		126200	0.00		0.02	0.02
		126330	0.00		0.01	0.01
		126331	0.00		0.02	0.02
		126335	0.00		0.01	0.01
		126336	0.00		0.01	0.01
		126410	0.00		0.01	0.01
		127755	0.00		0.01	0.01
		127790	0.00		0.01	0.01
		127780	0.00		0.01	0.01
		127880	0.00		0.01	0.01
	Wortham Blvd	127973	0.00		0.01	0.01
		128065	0.00		0.01	0.01
		128175	0.00		0.01	0.01
		128606	0.00		0.01	0.01
		128690	0.00		0.01	0.01
		128691	0.00		0.00	0.00
		128697	0.00		0.01	0.01
		128698	0.00		0.00	0.00
		128835	0.00		0.01	0.01
		129265	0.00		0.01	0.01
		129385	0.00		0.01	0.01
		129580	0.00		0.00	0.00
		130556	0.00		0.00	0.00
		130815	0.00		0.00	0.00
		132030	0.00		0.00	0.00
		132035	0.00		0.00	0.00
		132080	0.00		0.00	0.00
		132110	0.00		0.00	0.01
		132121	0.00		0.00	0.00
		132209	0.00		0.00	0.00
		132210	0.00		0.00	0.00
		132028	0.00		0.00	0.00
		132029	0.00		0.00	0.00
		132338	0.00		0.00	0.00
		132479	0.00		0.00	0.00

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

[illegible]se		Base	Phase 1	Phase 2
[illegible]el Date			Apr-03	Jun-03
[illegible]del Name		J25base4	25yrp17	25yrp28
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 25-year storm	Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width			n/a	n/a
E500-02 Basin Inlet Elev.			n/a	SW=82'
E500-02 Basin Inlet Width			100	0
E500-03 Basin Inlet Elev.			n/a	SW=82' + 100acft
E500-03 Basin Inlet Width			n/a	100
			0	0
E122 Transition Structure		existing	existing	removed
Conveyance Improvements through		-	-	95760
Conveyance Improvements size		-	-	Plan III
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass		-	Regraded	Regraded
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
E500-10 Scenario		-	A Sideweir	A Sideweir
Woodlands Trail Bridge		Existing	Existing	Prop (lc=Exist)
Jersey Village Footbridge		Existing	Existing	Existing
Avg Stage Reduct JV Diversion Channel to BW 8		0.00	0.35	1.32
Avg Stage Reduct BW 8 to Gessner		0.00	0.44	2.44
Avg Stage Reduct Gessner to Windfern		0.00	0.25	2.69
Avg State Reduct Windfern to Fairbanks-North Houston		0.00	0.26	2.78
Avg Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.22	1.50
Avg Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.14	0.43
Avg Stage Reduct between Alabonson to West Little York		0.00	0.13	0.69
Avg Stage Reduct between West Little York to Tidwell		0.00	0.26	0.94
Avg Stage Reduct between Tidwell to 34th Street		0.00	0.11	0.57
Min Stage Reduct JV Diversion Channel to BW 8		0.00	0.13	0.13
Min Stage Reduct BW 8 to Gessner		0.00	0.23	1.66
Min Stage Reduct Gessner to Windfern		0.00	0.22	2.51
Min State Reduct Windfern to Fairbanks-North Houston		0.00	0.23	2.56
Min Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.15	0.39
Min Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.09	0.23
Min Stage Reduct between Alabonson to West Little York		0.00	0.09	0.50
Min Stage Reduct between West Little York to Tidwell		0.00	0.15	0.84
Min Stage Reduct between Tidwell to 34th Street		0.00	0.09	0.49
Max Stage Reduct JV Diversion Channel to BW 8		0.00	1.08	3.04
Max Stage Reduct BW 8 to Gessner		0.00	0.66	3.10
Max Stage Reduct Gessner to Windfern		0.00	0.28	2.77
[illegible]x State Reduct Windfern to Fairbanks-North Houston		0.00	0.31	2.94
[illegible]ax Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.36	3.12
Max Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.18	0.72
Max Stage Reduct between Alabonson to West Little York		0.00	0.16	0.93
Max Stage Reduct between West Little York to Tidwell		0.00	0.39	0.98
Max Stage Reduct between Tidwell to 34th Street		0.00	0.16	0.69

		Peak Stage Reduction (ft)	Peak Stage Reduction (ft)	Peak Stage Reduction (ft)
	Station			
Confluence of White Oak Bayou with Buffalo Bayou	160	0.00	0.00	0.00
Southern Pacific Railroad	175	0.00	0.00	0.01
	240	0.00	0.01	0.01
	339	0.00	0.01	0.01
	340	0.00	0.00	0.01
Texas and New Orleans Railroad	352	0.00	0.01	0.02
	400	0.00	0.01	0.02
	550	0.00	0.01	0.02
	774	0.00	0.02	0.03
	775	0.00	0.02	0.03
	864	0.00	0.01	0.02
	930	0.00	0.02	0.03
	964	0.00	0.02	0.02
	965	0.00	0.01	0.02
	1105	0.00	0.02	0.03
	1006	0.00	0.02	0.03
	1180	0.00	0.02	0.03
	1224	0.00	0.02	0.04
	1225	0.00	0.03	0.04
	1241	0.00	0.02	0.04
	1242	0.00	0.02	0.03
	1310	0.00	0.02	0.03
	1510	0.00	0.02	0.03
	2160	0.00	0.02	0.03
	3780	0.00	0.03	0.04
	3889	0.00	0.02	0.03
	3890	0.00	0.02	0.03
	3908	0.00	0.02	0.04
	3909	0.00	0.02	0.04
	4019	0.00	0.02	0.03
	4185	0.00	0.02	0.04
	4629	0.00	0.02	0.03
	4630	0.00	0.03	0.04
	4684	0.00	0.02	0.03
	4685	0.00	0.02	0.04
	4795	0.00	0.03	0.04
	4820	0.00	0.02	0.04
	4850	0.00	0.02	0.03
	4869	0.00	0.02	0.04
	4870	0.00	0.02	0.03
	4884	0.00	0.02	0.04

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

		Base	Phase 1	Phase 2
[illegible]e			Apr-03	Jun-03
[illegible]el Date		J25base4	25yrp17	25yrp28
[illegible]del Name				
		Base HEC-2 Model (Existing Conditions) 25-year storm	Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			n/a	n/a
E500-01 Basin Inlet Width			n/a	SW=82'
E500-02 Basin Inlet Elev.			100	0
E500-02 Basin Inlet Width			n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.			n/a	100
E500-03 Basin Inlet Width			0	0
		existing	existing	removed
E122 Transition Structure		-	-	95760
Conveyance Improvements through		-	-	Plan III
Conveyance Improvements size		Ex Brg	Ex Brg	Ex Brg
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		-	Regraded	Regraded
Jersey Village Bypass		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	A Sideweir	A Sideweir
E500-10 Scenario		Existing	Existing	Prop (Ic=Exist)
Woodlands Trail Bridge		Existing	Existing	Existing
Jersey Village Footbridge				

4885	0.00	0.02	0.03
4926	0.00	0.02	0.04
5085	0.00	0.02	0.04
5230	0.00	0.03	0.04
5395	0.00	0.02	0.03
5835	0.00	0.02	0.04
5945	0.00	0.02	0.03
5979	0.00	0.02	0.03
5980	0.00	0.02	0.03
6051	0.00	0.02	0.03
6052	0.00	0.02	0.04
6340	0.00	0.02	0.03
6341	0.00	0.02	0.03
6365	0.00	0.02	0.03
6366	0.00	0.02	0.03
6385	0.00	0.02	0.03
6440	0.00	0.03	0.04
6441	0.00	0.02	0.03
6535	0.00	0.02	0.03
6236	0.00	0.03	0.04
6676	0.00	0.02	0.04
6800	0.00	0.02	0.04
6801	0.00	0.03	0.04
6825	0.00	0.02	0.03
6826	0.00	0.02	0.03
6850	0.00	0.03	0.04
6930	0.00	0.02	0.03
7480	0.00	0.02	0.04
7481	0.00	0.02	0.03
7539	0.00	0.02	0.03
7540	0.00	0.02	0.03
7780	0.00	0.02	0.03
10040	0.00	0.02	0.04
10580	0.00	0.03	0.04
10734	0.00	0.02	0.04
10735	0.00	0.03	0.04
10816	0.00	0.03	0.04
10817	0.00	0.02	0.04
10905	0.00	0.02	0.04
11940	0.00	0.03	0.05
12820	0.00	0.03	0.05
12821	0.00	0.03	0.05
13060	0.00	0.03	0.05
13117	0.00	0.03	0.05
13190	0.00	0.03	0.06
13565	0.00	0.03	0.05
13568	0.00	0.03	0.05
13790	0.00	0.03	0.05
13809	0.00	0.03	0.06
13810	0.00	0.03	0.06
13823	0.00	0.02	0.05
13824	0.00	0.03	0.06
14860	0.00	0.03	0.06
14030	0.00	0.03	0.06
14140	0.00	0.03	0.06
14141	0.00	0.03	0.06
14340	0.00	0.03	0.06
14435	0.00	0.03	0.06
14469	0.00	0.03	0.06
14525	0.00	0.04	0.08
14540	0.00	0.03	0.07
14760	0.00	0.04	0.08
14800	0.00	0.03	0.07
14860	0.00	0.03	0.07
14920	0.00	0.04	0.08
14921	0.00	0.04	0.08
16210	0.00	0.04	0.10
16211	0.00	0.04	0.10
17260	0.00	0.04	0.10
17261	0.00	0.04	0.10
17500	0.00	0.04	0.11
17636	0.00	0.07	0.17
17685	0.00	0.07	0.17
17880	0.00	0.06	0.17

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

		Base	Phase 1	Phase 2
se			Apr-03	Jun-03
el Date		J25base4	25yrp17	25yrp28
odel Name				
			Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 25-year storm	n/a	n/a
E500-01 Basin Inlet Width			n/a	SW=82'
E500-02 Basin Inlet Elev.			100	0
E500-02 Basin Inlet Width			n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.			n/a	100
E500-03 Basin Inlet Width			0	0
		existing	existing	removed
E122 Transition Structure		-	-	95760
Conveyance Improvements through		-	-	Plan III
Conveyance Improvements size		Ex Brg	Ex Brg	Ex Brg
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		-	Regraded	Regraded
Jersey Village Bypass		-	-	-
JV Div Weir (Elevation/Length)		-	-	-
JV Div Weir (Elevation/Length)		-	-	-
JV Div Weir (Elevation/Length)		-	A Sideweir	A Sideweir
E500-10 Scenario		Existing	Existing	Prop (lo=Exist)
Woodlands Trail Bridge		Existing	Existing	Existing
Jersey Village Footbridge				

	18567	0.00	0.06	0.16
	17970	0.00	0.06	0.17
	18054	0.00	0.08	0.22
	18089	0.00	0.09	0.23
	18090	0.00	0.08	0.22
	18110	0.00	0.08	0.23
	18111	0.00	0.10	0.26
	18250	0.00	0.10	0.27
	18630	0.00	0.10	0.27
	18770	0.00	0.10	0.27
	18970	0.00	0.10	0.26
	18971	0.00	0.10	0.26
	19865	0.00	0.10	0.26
	19866	0.00	0.10	0.26
	20940	0.00	0.10	0.26
	20941	0.00	0.10	0.26
	22305	0.00	0.09	0.25
	22306	0.00	0.09	0.25
	22555	0.00	0.10	0.26
	22556	0.00	0.10	0.26
	22670	0.00	0.10	0.26
	22723	0.00	0.10	0.29
	22785	0.00	0.10	0.29
	22990	0.00	0.11	0.29
	22991	0.00	0.11	0.29
	23145	0.00	0.10	0.29
	23384	0.00	0.11	0.30
	23385	0.00	0.10	0.29
	23429	0.00	0.10	0.29
	23430	0.00	0.11	0.30
	23575	0.00	0.10	0.30
	23960	0.00	0.11	0.31
	23961	0.00	0.11	0.31
	24649	0.00	0.11	0.30
	24650	0.00	0.10	0.30
	24686	0.00	0.10	0.31
	24687	0.00	0.11	0.32
	24705	0.00	0.11	0.33
	24706	0.00	0.11	0.33
	24935	0.00	0.12	0.33
	26170	0.00	0.11	0.33
	26270	0.00	0.11	0.33
	26337	0.00	0.13	0.37
	26470	0.00	0.13	0.37
	26950	0.00	0.13	0.37
	26951	0.00	0.13	0.37
	27825	0.00	0.13	0.37
	27940	0.00	0.13	0.37
	28015	0.00	0.12	0.36
	28073	0.00	0.12	0.34
	28110	0.00	0.12	0.34
	28315	0.00	0.11	0.33
	28570	0.00	0.11	0.33
	28571	0.00	0.11	0.33
	29050	0.00	0.11	0.32
	29110	0.00	0.11	0.32
	29190	0.00	0.10	0.29
	29320	0.00	0.10	0.29
	29530	0.00	0.10	0.29
	30370	0.00	0.10	0.30
	31840	0.00	0.10	0.29
	32770	0.00	0.10	0.29
	33125	0.00	0.10	0.29
	33126	0.00	0.10	0.29
	33380	0.00	0.09	0.29
	33502	0.00	0.10	0.29
	33560	0.00	0.11	0.35
	33561	0.00	0.11	0.35
	33625	0.00	0.11	0.35
	33625	0.00	0.12	0.38
	34385	0.00	0.12	0.38
	34770	0.00	0.11	0.36
	34800	0.00	0.11	0.36
	34880	0.00	0.11	0.36

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

ase			Base		Phase 1	Phase 2
el Date					Apr-03	Jun-03
del Name			J25base4		25yrp17	25yrp28
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 25-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					100	0
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100acft
E500-03 Basin Inlet Width					n/a	100
					0	0
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing		Existing	Existing

	34950	0.00	0.11	0.36
	35130	0.00	0.11	0.37
	35485	0.00	0.11	0.36
	37060	0.00	0.11	0.37
	38050	0.00	0.11	0.37
	38550	0.00	0.10	0.37
	38730	0.00	0.11	0.38
	38910	0.00	0.11	0.38
	38964	0.00	0.12	0.44
	39010	0.00	0.13	0.44
	39190	0.00	0.12	0.44
	39240	0.00	0.13	0.45
	39294	0.00	0.14	0.51
	39340	0.00	0.15	0.51
	41570	0.00	0.14	0.51
	42405	0.00	0.13	0.49
34th Street	42450	0.00	0.14	0.50
	42502	0.00	0.18	0.62
	42570	0.00	0.18	0.62
	42885	0.00	0.16	0.64
	43095	0.00	0.16	0.63
	43160	0.00	0.16	0.62
	43266	0.00	0.12	0.51
	43470	0.00	0.12	0.51
	43371	0.00	0.12	0.51
	43695	0.00	0.12	0.51
T.C. Jester	44030	0.00	0.13	0.51
	44340	0.00	0.12	0.50
	44850	0.00	0.12	0.51
FWDCRI&P Railroad	44864	0.00	0.12	0.51
	44916	0.00	0.12	0.51
	46323	0.00	0.12	0.52
	47885	0.00	0.12	0.52
	49350	0.00	0.11	0.50
	50520	0.00	0.11	0.51
	50640	0.00	0.09	0.49
	50641	0.00	0.09	0.49
	50695	0.00	0.10	0.49
	50801	0.00	0.09	0.49
	50830	0.00	0.10	0.50
	52610	0.00	0.09	0.52
	52805	0.00	0.09	0.51
	53233	0.00	0.09	0.52
Watonga	53300	0.00	0.11	0.63
	53400	0.00	0.10	0.63
	54290	0.00	0.11	0.64
	54410	0.00	0.11	0.63
	54430	0.00	0.11	0.63
	54510	0.00	0.10	0.63
	54560	0.00	0.10	0.63
Pinemont	54860	0.00	0.10	0.63
	54910	0.00	0.10	0.63
	54963	0.00	0.10	0.63
Creekmont	55030	0.00	0.10	0.64
	55590	0.00	0.10	0.66
	55960	0.00	0.10	0.66
	56100	0.00	0.09	0.66
	56200	0.00	0.10	0.67
	56470	0.00	0.10	0.69
Tidwell	56570	0.00	0.39	0.98
	56640	0.00	0.39	0.98
	57520	0.00	0.36	0.98
	57645	0.00	0.35	0.97
	59310	0.00	0.29	0.97
	59311	0.00	0.29	0.97
	59340	0.00	0.27	0.97
E500-05-00	59530	0.00	0.27	0.98
	60180	0.00	0.27	0.97
	60250	0.00	0.27	0.98
	60251	0.00	0.27	0.98
	60300	0.00	0.27	0.97
	60860	0.00	0.26	0.96
	60861	0.00	0.26	0.96
	60960	0.00	0.25	0.95

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

se			Base		Phase 1	Phase 2
el Date					Apr-03	Jun-03
del Name			J25base4		25yrp17	25yrp28
E500-01 Basin Inlet Elev.			*Base HEC-2* Model (Existing Conditions) 25-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					100	0
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100acft
E500-03 Basin Inlet Width					n/a	100
					0	0
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sidewelr	A Sidewelr
Woodlands Trail Bridge			Existing		Existing	Prop (lc=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
	62040	0.00		0.23		0.94
	62041	0.00		0.23		0.94
	62140	0.00		0.21		0.94
	62900	0.00		0.18		0.90
	64080	0.00		0.17		0.87
	64150	0.00		0.17		0.87
	65160	0.00		0.15		0.84
	65260	0.00		0.15		0.84
West Little York Road	65320	0.00		0.16		0.92
	65450	0.00		0.16		0.91
	66305	0.00		0.15		0.88
	66430	0.00		0.15		0.88
Antoine Drive	66519	0.00		0.14		0.77
	66540	0.00		0.13		0.76
	66640	0.00		0.13		0.76
	66656	0.00		0.14		0.82
	66667	0.00		0.16		0.93
Pipeline crossing	66669	0.00		0.16		0.93
	66670	0.00		0.10		0.60
	66710	0.00		0.09		0.60
	66919	0.00		0.10		0.59
	66920	0.00		0.10		0.59
	67050	0.00		0.15		0.61
Victory	67145	0.00		0.15		0.64
	67280	0.00		0.15		0.64
	67860	0.00		0.14		0.61
	67861	0.00		0.14		0.61
	68255	0.00		0.14		0.61
	68315	0.00		0.14		0.60
Inwood Country Club Bridge	68325	0.00		0.14		0.59
	68380	0.00		0.13		0.58
	69470	0.00		0.12		0.55
	69880	0.00		0.12		0.50
	70105	0.00		0.11		0.50
Alabonson	70165	0.00		0.15		0.72
	70320	0.00		0.14		0.70
	70321	0.00		0.14		0.70
	71490	0.00		0.13		0.65
	72410	0.00		0.12		0.65
	72411	0.00		0.12		0.65
	72550	0.00		0.11		0.58
	72630	0.00		0.11		0.55
	72631	0.00		0.12		0.68
Pipeline crossing	72634	0.00		0.11		0.68
	72635	0.00		0.11		0.64
	72740	0.00		0.12		0.27
	72741	0.00		0.12		0.27
	72800	0.00		0.09		0.25
	72801	0.00		0.09		0.23
FWDCRI&P Railroad	72811	0.00		0.09		0.23
	72812	0.00		0.13		0.31
	72865	0.00		0.13		0.32
	72866	0.00		0.13		0.32
	73180	0.00		0.15		0.35
E500-04-00	73565	0.00		0.16		0.37
	73660	0.00		0.16		0.37
	73760	0.00		0.16		0.36
	73830	0.00		0.16		0.37
	74050	0.00		0.16		0.37
	74250	0.00		0.16		0.36
	74450	0.00		0.17		0.37
	74600	0.00		0.16		0.37
	74820	0.00		0.16		0.37
	74950	0.00		0.16		0.37
	75025	0.00		0.16		0.37
	75090	0.00		0.16		0.37
	75125	0.00		0.17		0.37
	75180	0.00		0.17		0.36
	75215	0.00		0.17		0.38
	75380	0.00		0.17		0.37
	75530	0.00		0.17		0.37
	75779	0.00		0.18		0.39
North Houston Rosslyn	75780	0.00		0.18		0.39
	75677	0.00		0.19		0.41

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

			Base	Phase 1	Phase 2
ase				Apr-03	Jun-03
odel Date			J25base4	25yrp17	25yrp28
odel Name					
				Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 25-year storm	n/a	n/a
E500-01 Basin Inlet Width				n/a	SW=82'
E500-02 Basin Inlet Elev.				100	0
E500-02 Basin Inlet Width				n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.				n/a	100
E500-03 Basin Inlet Width				0	0
E122 Transition Structure			existing	existing	removed
Conveyance Improvements through			-	-	85760
Conveyance Improvements size			-	-	Plan III
Fairbanks North Houston Bridge			Ex Brg	Ex Brg	Ex Brg
Gessner Bridge			Ex Brg	Ex Brg	Ex Brg
Windfern Bridge			Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass			-	Regraded	Regraded
JV Div Weir (Elevation/Length)			-	-	-
JV Div Weir (Elevation/Length)			-	-	-
JV Div Weir (Elevation/Length)			-	-	-
E500-10 Scenario			-	A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing	Existing	Prop (tc=Exist)
Jersey Village Footbridge			Existing	Existing	Existing

	75878	0.00	0.19	0.41
	75933	0.00	0.19	0.41
	76315	0.00	0.20	0.44
	77265	0.00	0.19	0.40
	77300	0.00	0.19	0.39
	77355	0.00	0.20	0.40
E122-00-00 Transition Structure	77356	0.00	0.15	–
	77405	0.00	0.27	1.73
	77430	0.00	0.31	1.80
	77435	0.00	0.33	1.76
	78980	0.00	0.22	1.39
	80080	0.00	0.21	1.42
E500-03-00	81560	0.00	0.18	1.22
	83405	0.00	0.15	1.04
	83406	0.00	0.15	1.04
	83746	0.00	0.15	1.00
	84521	0.00	0.19	1.76
Woodlands Trail Footbridge	84526	0.00	0.17	1.61
	84534	0.00	0.17	1.67
	84539	0.00	0.27	2.24
	84734	0.00	0.36	3.12
E500-01-00/E500-02-00	85770	0.00	0.29	2.71
	85900	0.00	0.28	2.74
	86185	0.00	0.25	2.78
	86990	0.00	0.24	–
	87150	0.00	0.25	2.59
	87285	0.00	0.22	2.33
	87385	0.00	0.27	2.90
Fairbanks North Houston	87390	0.00	0.27	2.78
	87485	0.00	0.29	2.86
	87489	0.00	0.28	2.94
	87520	0.00	0.29	2.94
	87860	0.00	0.31	2.75
	89506	0.00	0.25	2.81
	90436	0.00	0.24	2.56
	91380	0.00	0.24	2.74
	91700	0.00	0.23	2.70
	91774	0.00	0.23	2.73
Windfern	91779	0.00	0.22	2.67
	91830	0.00	0.23	2.72
	91920	0.00	0.26	2.74
	92000	0.00	0.25	2.77
	92058	0.00	0.25	2.69
	92155	0.00	0.26	2.70
	92255	0.00	0.26	2.69
	92325	0.00	0.27	2.70
	92600	0.00	0.28	2.51
Gessner	93185	0.00	0.26	2.52
	93285	0.00	0.27	2.49
	93460	0.00	0.23	1.66
	93980	0.00	0.38	2.05
	94850	0.00	0.44	2.45
	94855	0.00	0.58	2.49
	94856	0.00	0.59	2.50
	95510	0.00	0.54	2.68
	96030	0.00	0.66	3.10
d/s Beltway-8	96080	0.00	0.63	3.04
	96127	0.00	0.63	3.01
	96148	0.00	0.63	2.99
	96183	0.00	0.63	3.03
	96199	0.00	0.63	3.01
	96204	0.00	0.63	3.01
	96346	0.00	0.61	2.78
	96351	0.00	0.61	2.75
	96367	0.00	0.61	2.73
	96402	0.00	0.60	2.63
	96422	0.00	0.59	2.62
u/s Beltway-8	96469	0.00	0.60	2.60
	96625	0.00	0.58	2.53
	96790	0.00	0.60	2.47
	97344	0.00	0.49	1.78
JV Footbridge	97345	0.00	1.08	2.32
	97348	0.00	0.33	2.28
	97349	0.00	0.37	2.10

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

hase			Base		Phase 1	Phase 2
odel Date					Apr-03	Jun-03
odel Name			J25base4		25yrp17	25yrp28
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 25-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					100	0
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100acft
E500-03 Basin Inlet Width					n/a	100
					0	0
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sidewelr	A Sidewelr
Woodlands Trail Bridge			Existing		Existing	Prop (lc=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
	97399	0.00			0.36	2.09
	98320	0.00			0.16	0.41
	98321	0.00			0.16	0.41
	98625	0.00			0.17	0.35
	98830	0.00			0.16	0.29
	98910	0.00			0.16	0.27
	98942	0.00			0.14	0.21
Lakeview	98990	0.00			0.14	0.21
	99165	0.00			0.14	0.20
	99470	0.00			0.13	0.18
	100410	0.00			0.14	0.15
	100640	0.00			0.14	0.16
	100890	0.00			0.14	0.14
	100980	0.00			0.14	0.15
	101014	0.00			0.13	0.14
	101050	0.00			0.14	0.15
	101375	0.00			0.13	0.14
	101376	0.00			0.13	0.14
	102065	0.00			0.13	0.13
	103540	0.00			0.13	0.13
	103541	0.00			0.13	0.13
	104395	0.00			0.13	0.13
JV Diversion Channel	104396	0.00			0.13	0.13
	104580	0.00			0.13	0.13
	104581	0.00			0.13	0.13
	104965	0.00			0.14	0.13
	105475	0.00			0.14	0.14
	105870	0.00			0.15	0.15
	106020	0.00			0.15	0.15
	107109	0.00			0.16	0.16
	108130	0.00			0.16	0.16
	108230	0.00			0.16	0.16
	108740	0.00			0.16	0.16
West Road	109835	0.00			0.17	0.17
	110020	0.00			0.18	0.18
	110110	0.00			0.21	0.22
	110330	0.00			0.24	0.24
	111205	0.00			0.20	0.20
	111206	0.00			0.20	0.20
	111360	0.00			0.19	0.20
	111395	0.00			0.21	0.22
	111625	0.00			0.21	0.22
	111626	0.00			0.21	0.22
	113250	0.00			0.15	0.16
	113251	0.00			0.15	0.16
	113300	0.00			0.15	0.16
	113310	0.00			0.10	0.11
	113575	0.00			0.09	0.09
	113740	0.00			0.08	0.09
	114060	0.00			0.08	0.08
	114295	0.00			0.08	0.08
	114580	0.00			0.08	0.08
	114625	0.00			0.07	0.08
	114780	0.00			0.08	0.08
	114955	0.00			0.07	0.08
	115125	0.00			0.07	0.08
	115450	0.00			0.07	0.08
	115855	0.00			0.06	0.06
	116015	0.00			0.05	0.05
	116035	0.00			0.06	0.06
	116115	0.00			0.03	0.03
	116220	0.00			0.03	0.03
	116485	0.00			0.03	0.03
	117210	0.00			0.03	0.03
	119290	0.00			0.03	0.03
	120695	0.00			0.02	0.02
	121735	0.00			0.02	0.02
	121830	0.00			0.01	0.02
	121915	0.00			0.02	0.02
	121995	0.00			0.02	0.02
	122100	0.00			0.01	0.01
	122330	0.00			0.01	0.01
	122420	0.00			0.01	0.01
	123990	0.00			0.02	0.02

TABLE B

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
25 Year Frequency

		Base	Phase 1	Phase 2
e			Apr-03	Jun-03
el Date		J25base4	25yrp17	25yrp28
el Name				
			Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 25-year storm	n/a	n/a
E500-01 Basin Inlet Width			n/a	SW=82'
E500-02 Basin Inlet Elev.			100	0
E500-02 Basin Inlet Width			n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.			n/a	100
E500-03 Basin Inlet Width			0	0
		existing	existing	removed
E122 Transition Structure		-	-	95760
Conveyance Improvements through		-	-	Plan III
Conveyance Improvements size		Ex Brg	Ex Brg	Ex Brg
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		-	Regraded	Regraded
Jersey Village Bypass		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	A Sideweir	A Sideweir
E500-10 Scenario		Existing	Existing	Prop (lc=Exist)
Woodlands Trail Bridge		Existing	Existing	Existing
Jersey Village Footbridge				

	124340	0.00	0.01	0.01
	124354	0.00	0.01	0.01
	124415	0.00	0.01	0.01
	124810	0.00	0.02	0.02
	124840	0.00	0.01	0.02
	124941	0.00	0.01	0.01
	124955	0.00	0.02	0.02
	124956	0.00	0.01	0.01
	125060	0.00	0.01	0.01
	125567	0.00	0.01	0.01
	126200	0.00	0.01	0.01
	126330	0.00	0.00	0.00
	126331	0.00	0.00	0.00
	126335	0.00	0.01	0.01
	126336	0.00	0.01	0.01
	126410	0.00	0.01	0.01
	127755	0.00	0.00	0.00
	127790	0.00	0.00	0.00
	127780	0.00	0.01	0.01
	127880	0.00	0.01	0.01
Wortham Blvd	127973	0.00	0.01	0.01
	128065	0.00	0.00	0.00
	128175	0.00	0.01	0.01
	128606	0.00	0.01	0.01
	128690	0.00	0.00	0.00
	128691	0.00	0.01	0.01
	128697	0.00	0.00	0.00
	128698	0.00	0.00	0.00
	128835	0.00	0.00	0.00
	129265	0.00	0.00	0.00
	129385	0.00	0.00	0.00
	129580	0.00	0.00	0.00
	130556	0.00	0.00	0.00
	130815	0.00	0.00	0.00
	132030	0.00	0.00	0.00
	132035	0.00	0.00	0.00
	132080	0.00	0.00	0.00
	132110	0.00	0.00	0.00
	132121	0.00	0.00	0.00
	132209	0.00	0.00	0.00
	132210	0.00	0.00	0.00
	132028	0.00	0.00	0.00
	132029	0.00	0.00	0.00
	132338	0.00	0.00	0.00
	132479	0.00	0.00	0.00

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

se		Base	Phase 1	Phase 2
del Date			Apr-03	Jun-03
lel Name		J100base	100yrp1B	100yrp2B
			Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.		Base HEC-2	n/a	n/a
E500-01 Basin Inlet Width		Model	n/a	SW=82'
E500-02 Basin Inlet Elev.		(Existing	n/a	100
E500-02 Basin Inlet Width		Conditions)	n/a	SW=82' + 100ach
E500-03 Basin Inlet Elev.		100-year	n/a	100
E500-03 Basin Inlet Width		storm		
		existing	existing	removed
E122 Transition Structure		-	-	95760
Conveyance Improvements through		-	-	Plan III
Conveyance Improvements size		Ex Brg	Ex Brg	Ex Brg
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		-	Regraded	Regraded
Jersey Village Bypass		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	A Sideweir	A Sideweir
E500-10 Scenario		Existing	Existing	Prop (Ic=Exist)
Woodlands Trail Bridge		Existing	Existing	Existing
Jersey Village Footbridge				
Avg Stage Reduct JV Diversion Channel to BW 8		0.00	0.14	0.85
Avg Stage Reduct BW 8 to Gessner		0.00	0.07	1.39
Avg Stage Reduct Gessner to Windfern		0.00	0.08	1.74
Avg State Reduct Windfern to Fairbanks-North Houston		0.00	0.06	1.99
Avg Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.13	1.03
Avg Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.09	0.19
Avg Stage Reduct between Alabonson to West Little York		0.00	0.08	0.28
Avg Stage Reduct between West Little York to Tidwell		0.00	0.06	0.33
Avg Stage Reduct between Tidwell to 34th Street		0.00	0.04	0.24
Min Stage Reduct JV Diversion Channel to BW 8		0.00	0.01	0.11
Min Stage Reduct BW 8 to Gessner		0.00	0.00	0.62
Min Stage Reduct Gessner to Windfern		0.00	0.05	1.57
Min State Reduct Windfern to Fairbanks-North Houston		0.00	0.05	1.80
Min Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.03	0.07
Min Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.05	0.12
Min Stage Reduct between Alabonson to West Little York		0.00	0.07	0.21
Min Stage Reduct between West Little York to Tidwell		0.00	0.05	0.32
Min Stage Reduct between Tidwell to 34th Street		0.00	0.03	0.20
Max Stage Reduct JV Diversion Channel to BW 8		0.00	0.33	2.07
Max Stage Reduct BW 8 to Gessner		0.00	0.14	2.18
ax Stage Reduct Gessner to Windfern		0.00	0.07	1.94
ax State Reduct Windfern to Fairbanks-North Houston		0.00	0.07	2.19
ax Stage Reduct between Fairbanks-North Houston to North Houston-Rosslyn		0.00	0.67	2.48
Max Stage Reduct between North Houston-Rosslyn to Alabonson		0.00	0.12	0.28
Max Stage Reduct between Alabonson to West Little York		0.00	0.09	0.35
Max Stage Reduct between West Little York to Tidwell		0.00	0.08	0.35
Max Stage Reduct between Tidwell to 34th Street		0.00	0.05	0.28
		Peak	Peak	Peak
		Stage	Stage	Stage
		Reduction	Reduction	Reduction
	Station	(ft)	(ft)	(ft)
Confluence of White Oak Bayou with Buffalo Bayou	160	0.00	0.00	0.00
Southern Pacific Railroad	175	0.00	0.00	0.01
	240	0.00	0.01	0.02
	339	0.00	0.01	0.02
	340	0.00	0.01	0.02
Texas and New Orleans Railroad	352	0.00	0.01	0.03
	400	0.00	0.02	0.04
	550	0.00	0.02	0.04
	774	0.00	0.02	0.04
	775	0.00	0.02	0.04
	864	0.00	0.03	0.06
	930	0.00	0.03	0.07
	964	0.00	0.03	0.07
	965	0.00	0.03	0.07
	1105	0.00	0.04	0.07
	1006	0.00	0.03	0.07
	1180	0.00	0.03	0.07
	1224	0.00	0.04	0.08
	1225	0.00	0.04	0.08
	1241	0.00	0.04	0.08
	1242	0.00	0.04	0.08
	1310	0.00	0.04	0.08
	1510	0.00	0.04	0.09
	2160	0.00	0.04	0.08
	3780	0.00	0.04	0.08
	3889	0.00	0.04	0.08
	3890	0.00	0.04	0.08
	3908	0.00	0.03	0.08
	3909	0.00	0.04	0.08
	4010	0.00	0.04	0.09
	4185	0.00	0.04	0.08
	4629	0.00	0.04	0.08
	4630	0.00	0.04	0.09
	4684	0.00	0.04	0.09
	4685	0.00	0.04	0.09
	4795	0.00	0.04	0.08
	4820	0.00	0.04	0.08
	4850	0.00	0.04	0.08
	4869	0.00	0.04	0.08
	4870	0.00	0.04	0.09
	4884	0.00	0.04	0.08

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

		Base	Phase 1	Phase 2
ase			Apr-03	Jun-03
el Date		J100base	100yrp18	100yrp28
del Name				
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 100-year storm	Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width			n/a	n/a
E500-02 Basin Inlet Elev.			n/a	SW=82'
E500-02 Basin Inlet Width			n/a	100
E500-03 Basin Inlet Elev.			n/a	SW=82' + 100acft
E500-03 Basin Inlet Width			n/a	100
E122 Transition Structure		existing	existing	removed
Conveyance Improvements through		-	-	95760
Conveyance Improvements size		-	-	Plan III
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass		-	Regraded	Regraded
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
E500-10 Scenario		-	A Sideweir	A Sideweir
Woodlands Trail Bridge		Existing	Existing	Prop (Ic=Exist)
Jersey Village Footbridge		Existing	Existing	Existing
	4885	0.00	0.04	0.08
	4926	0.00	0.04	0.08
	5085	0.00	0.04	0.09
	5230	0.00	0.04	0.08
	5395	0.00	0.03	0.08
	5835	0.00	0.04	0.08
	5945	0.00	0.04	0.08
	5979	0.00	0.04	0.08
	5980	0.00	0.04	0.09
	6051	0.00	0.03	0.08
	6052	0.00	0.04	0.08
	6340	0.00	0.04	0.08
	6341	0.00	0.04	0.08
	6365	0.00	0.04	0.09
	6366	0.00	0.04	0.09
	6385	0.00	0.05	0.09
	6440	0.00	0.04	0.09
	6441	0.00	0.04	0.09
	6535	0.00	0.04	0.09
	6236	0.00	0.04	0.09
	6676	0.00	0.04	0.09
	6800	0.00	0.04	0.09
	6801	0.00	0.04	0.09
	6825	0.00	0.04	0.09
	6826	0.00	0.04	0.09
	6850	0.00	0.04	0.09
	6930	0.00	0.04	0.09
	7480	0.00	0.04	0.09
	7481	0.00	0.05	0.09
	7539	0.00	0.05	0.09
	7540	0.00	0.04	0.08
	7780	0.00	0.05	0.10
	10040	0.00	0.04	0.09
	10580	0.00	0.04	0.09
	10734	0.00	0.04	0.09
	10735	0.00	0.05	0.10
	10816	0.00	0.05	0.10
	10817	0.00	0.04	0.09
	10905	0.00	0.05	0.10
	11940	0.00	0.05	0.10
	12820	0.00	0.04	0.09
	12821	0.00	0.04	0.09
	13060	0.00	0.05	0.10
	13117	0.00	0.03	0.09
	13190	0.00	0.04	0.10
	13565	0.00	0.03	0.09
	13566	0.00	0.03	0.09
	13790	0.00	0.03	0.09
	13809	0.00	0.03	0.09
	13810	0.00	0.03	0.09
	13823	0.00	0.03	0.09
	13824	0.00	0.03	0.10
	14860	0.00	0.04	0.10
	14030	0.00	0.03	0.10
	14140	0.00	0.03	0.09
	14141	0.00	0.03	0.09
	14340	0.00	0.03	0.09
	14435	0.00	0.03	0.09
	14469	0.00	0.05	0.14
	14525	0.00	0.05	0.14
	14540	0.00	0.05	0.14
	14780	0.00	0.05	0.14
	14800	0.00	0.05	0.14
	14860	0.00	0.06	0.17
	14920	0.00	0.06	0.17
	14921	0.00	0.06	0.17
	16210	0.00	0.06	0.19
	16211	0.00	0.06	0.19
	17260	0.00	0.06	0.19
	17251	0.00	0.06	0.19
	17500	0.00	0.06	0.18
	17636	0.00	0.06	0.18
	17685	0.00	0.06	0.18
	17880	0.00	0.06	0.18

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

ase		Base	Phase 1	Phase 2
iel Date			Apr-03	Jun-03
iel Name		J100base	100yrp18	100yrp28
E500-01 Basin Inlet Elev.		Base HEC-2 Model (Existing Conditions) 100-year storm	Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width			n/a	n/a
E500-02 Basin Inlet Elev.			n/a	SW=82'
E500-02 Basin Inlet Width			n/a	100
E500-03 Basin Inlet Elev.			n/a	SW=82' + 100acft
E500-03 Basin Inlet Width			n/a	100
E122 Transition Structure		existing	existing	removed
Conveyance Improvements through		-	-	95760
Conveyance Improvements size		-	-	Plan III
Fairbanks North Houston Bridge		Ex Brg	Ex Brg	Ex Brg
Gessner Bridge		Ex Brg	Ex Brg	Ex Brg
Windfern Bridge		Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass		-	Regraded	Regraded
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
JV Div Wier (Elevation/Length)		-	-	-
E500-10 Scenario		-	A Sideweir	A Sideweir
Woodlands Trail Bridge		Existing	Existing	Prop (Ic=Exist)
Jersey Village Footbridge		Existing	Existing	Existing
	18567	0.00	0.06	0.18
	17970	0.00	0.06	0.18
	18054	0.00	0.06	0.18
	18089	0.00	0.07	0.19
	18090	0.00	0.06	0.18
	18110	0.00	0.06	0.19
	18111	0.00	0.08	0.23
	18250	0.00	0.07	0.22
	18630	0.00	0.07	0.23
	18770	0.00	0.07	0.22
	18970	0.00	0.07	0.23
	18971	0.00	0.07	0.23
	19865	0.00	0.08	0.23
	19866	0.00	0.08	0.23
	20940	0.00	0.07	0.23
	20941	0.00	0.07	0.23
	22305	0.00	0.07	0.23
	22306	0.00	0.07	0.23
	22555	0.00	0.07	0.23
	22556	0.00	0.07	0.23
	22670	0.00	0.07	0.23
	22723	0.00	0.08	0.23
	22785	0.00	0.07	0.23
	22990	0.00	0.07	0.23
	22991	0.00	0.07	0.23
	23145	0.00	0.08	0.23
	23384	0.00	0.07	0.22
	23385	0.00	0.07	0.22
	23429	0.00	0.07	0.22
	23430	0.00	0.08	0.23
	23575	0.00	0.07	0.23
	23960	0.00	0.08	0.23
	23961	0.00	0.08	0.23
	24649	0.00	0.08	0.23
	24650	0.00	0.07	0.23
	24686	0.00	0.08	0.24
	24687	0.00	0.09	0.29
	24705	0.00	0.09	0.28
	24706	0.00	0.09	0.28
	24935	0.00	0.10	0.30
	26170	0.00	0.10	0.30
	26270	0.00	0.10	0.30
	26337	0.00	0.11	0.35
	26470	0.00	0.11	0.36
	26950	0.00	0.11	0.37
	26951	0.00	0.11	0.37
	27825	0.00	0.11	0.37
	27940	0.00	0.11	0.37
	28015	0.00	0.11	0.36
	28073	0.00	0.10	0.34
	28110	0.00	0.09	0.34
	28315	0.00	0.09	0.34
	28570	0.00	0.10	0.34
	28571	0.00	0.10	0.34
	29050	0.00	0.10	0.34
	29110	0.00	0.09	0.33
	29190	0.00	0.09	0.32
	29320	0.00	0.09	0.32
	29530	0.00	0.08	0.31
	30370	0.00	0.08	0.31
	31840	0.00	0.09	0.31
	32770	0.00	0.08	0.29
	33125	0.00	0.09	0.30
	33126	0.00	0.09	0.30
	33380	0.00	0.08	0.29
	33502	0.00	0.08	0.29
	33560	0.00	0.08	0.29
	33561	0.00	0.08	0.29
	33625	0.00	0.08	0.29
	33825	0.00	0.08	0.28
	34385	0.00	0.08	0.28
	34770	0.00	0.08	0.28
	34800	0.00	0.08	0.27
	34880	0.00	0.07	0.26

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

ase			Base		Phase 1	Phase 2
del Date					Apr-03	Jun-03
del Name			J100base		100yrp18	100yrp28
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 100-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					n/a	100
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100actt
E500-03 Basin Inlet Width					n/a	100
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
	34950	0.00			0.07	0.25
	35130	0.00			0.07	0.26
	35485	0.00			0.07	0.25
	37060	0.00			0.07	0.25
	38050	0.00			0.07	0.26
	38550	0.00			0.07	0.25
	38730	0.00			0.07	0.25
	38910	0.00			0.07	0.25
	38964	0.00			0.07	0.25
	39010	0.00			0.06	0.25
	39190	0.00			0.06	0.24
	39240	0.00			0.06	0.25
	39294	0.00			0.05	0.19
	39340	0.00			0.05	0.20
	41570	0.00			0.05	0.21
	42405	0.00			0.05	0.21
34th Street	42450	0.00			0.04	0.20
	42502	0.00			0.05	0.23
	42570	0.00			0.05	0.22
	42895	0.00			0.05	0.23
	43095	0.00			0.05	0.23
	43160	0.00			0.05	0.22
	43268	0.00			0.05	0.22
	43470	0.00			0.05	0.23
	43371	0.00			0.05	0.23
	43695	0.00			0.05	0.23
T.C. Jester	44030	0.00			0.05	0.23
	44340	0.00			0.05	0.22
	44850	0.00			0.05	0.23
FWDCRI&P Railroad	44864	0.00			0.05	0.23
	44916	0.00			0.05	0.24
	46323	0.00			0.05	0.24
	47685	0.00			0.04	0.24
	49350	0.00			0.05	0.24
	50520	0.00			0.04	0.24
	50640	0.00			0.05	0.23
	50641	0.00			0.05	0.23
	50695	0.00			0.04	0.22
	50801	0.00			0.05	0.25
	50830	0.00			0.04	0.25
	52610	0.00			0.04	0.26
	52805	0.00			0.04	0.25
	53233	0.00			0.04	0.26
Watonga	53300	0.00			0.04	0.24
	53400	0.00			0.04	0.24
	54290	0.00			0.04	0.25
	54410	0.00			0.04	0.24
	54430	0.00			0.04	0.24
	54510	0.00			0.03	0.25
	54560	0.00			0.04	0.26
Pinemont	54860	0.00			0.04	0.25
	54910	0.00			0.04	0.25
	54963	0.00			0.04	0.25
Creekmont	55030	0.00			0.03	0.26
	55590	0.00			0.04	0.28
	55960	0.00			0.04	0.25
	56100	0.00			0.03	0.25
	56200	0.00			0.03	0.24
	56470	0.00			0.03	0.25
Tidwell	56570	0.00			0.05	0.33
	56640	0.00			0.05	0.33
	57520	0.00			0.05	0.35
	57645	0.00			0.05	0.35
	59310	0.00			0.05	0.32
	59311	0.00			0.05	0.32
	59340	0.00			0.06	0.33
E500-05-00	59530	0.00			0.05	0.32
	60180	0.00			0.05	0.32
	60250	0.00			0.06	0.33
	60251	0.00			0.06	0.33
	60300	0.00			0.05	0.32
	60860	0.00			0.05	0.33
	60861	0.00			0.05	0.33
	60960	0.00			0.05	0.32

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

ase			Base		Phase 1	Phase 2
del Date					Apr-03	Jun-03
fet Name			J100base		100yrp18	100yrp28
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 100-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					n/a	100
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100acft
E500-03 Basin Inlet Width					n/a	100
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
		62040	0.00		0.05	0.33
		62041	0.00		0.05	0.33
		62140	0.00		0.06	0.34
		62900	0.00		0.06	0.32
		64080	0.00		0.06	0.33
		64150	0.00		0.06	0.33
		65160	0.00		0.08	0.35
		65260	0.00		0.07	0.35
	West Little York Road	65320	0.00		0.08	0.35
		65450	0.00		0.08	0.35
		66305	0.00		0.08	0.33
		66430	0.00		0.08	0.33
	Antoine Drive	66519	0.00		0.08	0.30
		66540	0.00		0.08	0.30
		66640	0.00		0.09	0.30
		66666	0.00		0.08	0.29
		66667	0.00		0.08	0.29
	Pipeline crossing	66669	0.00		0.08	0.29
		66670	0.00		0.08	0.29
		66710	0.00		0.09	0.29
		66919	0.00		0.08	0.28
		66920	0.00		0.08	0.28
		67050	0.00		0.08	0.28
	Victory	67145	0.00		0.07	0.25
		67280	0.00		0.07	0.25
		67860	0.00		0.08	0.25
		67861	0.00		0.08	0.25
		68255	0.00		0.08	0.24
		68315	0.00		0.08	0.25
	Inwood Country Club Bridge	68325	0.00		0.08	0.25
		68380	0.00		0.08	0.24
		69470	0.00		0.08	0.23
		69890	0.00		0.07	0.22
		70105	0.00		0.07	0.21
	Alabonson	70165	0.00		0.08	0.24
		70320	0.00		0.08	0.24
		70321	0.00		0.08	0.24
		71490	0.00		0.08	0.22
		72410	0.00		0.07	0.21
		72411	0.00		0.07	0.21
		72550	0.00		0.08	0.21
		72630	0.00		0.07	0.21
		72631	0.00		0.07	0.20
	Pipeline crossing	72634	0.00		0.07	0.21
		72635	0.00		0.07	0.21
		72740	0.00		0.07	0.21
		72741	0.00		0.07	0.21
		72800	0.00		0.06	0.23
		72801	0.00		0.05	0.20
	FWDCRI&P Railroad	72811	0.00		0.05	0.20
		72812	0.00		0.12	0.28
		72865	0.00		0.12	0.28
		72866	0.00		0.12	0.28
		73180	0.00		0.11	0.23
	E500-04-00	73565	0.00		0.10	0.17
		73660	0.00		0.11	0.17
		73760	0.00		0.10	0.16
		73830	0.00		0.10	0.16
		74050	0.00		0.10	0.15
		74250	0.00		0.10	0.15
		74450	0.00		0.10	0.14
		74600	0.00		0.10	0.14
		74820	0.00		0.10	0.14
		74950	0.00		0.11	0.14
		75025	0.00		0.11	0.14
		75090	0.00		0.10	0.14
		75125	0.00		0.11	0.14
		75180	0.00		0.10	0.14
		75215	0.00		0.11	0.14
		75380	0.00		0.10	0.14
		75530	0.00		0.09	0.13
		75779	0.00		0.10	0.12
	North Houston Rosslyn	75780	0.00		0.11	0.13
		75877	0.00		0.11	0.12

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

			Base	Phase 1	Phase 2
Case				Apr-03	Jun-03
Model Date			J100base	100yrp18	100yrp28
Model Name					
				Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 100-year storm	n/a	n/a
E500-01 Basin Inlet Width				n/a	SW=82'
E500-02 Basin Inlet Elev.				n/a	100
E500-02 Basin Inlet Width				n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.				n/a	100
E500-03 Basin Inlet Width					
E122 Transition Structure			existing	existing	removed
Conveyance Improvements through			-	-	95760
Conveyance Improvements size			-	-	Plan III
Fairbanks North Houston Bridge			Ex Brg	Ex Brg	Ex Brg
Gessner Bridge			Ex Brg	Ex Brg	Ex Brg
Windfern Bridge			Ex Brg	Ex Brg	Ex Brg
Jersey Village Bypass			-	Regraded	Regraded
JV Div Wier (Elevation/Length)			-	-	-
JV Div Wier (Elevation/Length)			-	-	-
JV Div Wier (Elevation/Length)			-	-	-
E500-10 Scenario			-	A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing	Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing	Existing	Existing
	75878	0.00		0.10	0.12
	75933	0.00		0.10	0.11
	76315	0.00		0.14	0.15
	77285	0.00		0.11	0.07
	77300	0.00		0.11	0.08
	77355	0.00		0.11	0.07
E122-00-00 Transition Structure	77356	0.00		0.67	-
	77405	0.00		0.43	2.25
	77430	0.00		0.42	2.48
	77435	0.00		0.42	2.46
	78980	0.00		0.23	0.78
E500-03-00	80080	0.00		0.10	0.37
	81560	0.00		0.09	0.44
	83405	0.00		0.06	0.47
	83406	0.00		0.06	0.47
	83746	0.00		0.05	0.45
	84521	0.00		0.06	1.57
Woodlands Trail Footbridge	84526	0.00		0.06	1.85
	84534	0.00		0.07	1.85
	84539	0.00		0.06	1.70
	84734	0.00		0.06	1.55
E500-01-00/E500-02-00	85770	0.00		0.05	1.44
	85900	0.00		0.04	1.51
	86185	0.00		0.04	1.61
	86990	0.00		0.04	-
	87150	0.00		0.04	1.46
	87285	0.00		0.03	1.25
	87385	0.00		0.06	2.11
Fairbanks North Houston	87390	0.00		0.06	1.97
	87485	0.00		0.07	2.09
	87489	0.00		0.06	2.19
	87520	0.00		0.06	2.17
	87880	0.00		0.07	1.95
	89506	0.00		0.05	1.95
	90436	0.00		0.05	1.80
	91380	0.00		0.05	1.96
	91700	0.00		0.05	1.91
	91774	0.00		0.05	1.93
Windfern	91779	0.00		0.05	1.92
	91830	0.00		0.06	1.94
	91920	0.00		0.06	1.74
	92000	0.00		0.07	1.75
	92058	0.00		0.07	1.65
	92155	0.00		0.06	1.68
	92255	0.00		0.06	1.69
	92325	0.00		0.06	1.70
	92600	0.00		0.07	1.57
Gessner	93185	0.00		0.04	1.44
	93285	0.00		0.04	1.42
	93460	0.00		0.00	0.62
	93980	0.00		0.06	1.01
	94850	0.00		0.10	1.34
	94855	0.00		0.09	1.40
	94856	0.00		0.10	1.41
	95510	0.00		0.03	1.65
	96030	0.00		0.14	2.16
d/s Beltway-8	96080	0.00		0.13	2.07
	96127	0.00		0.14	2.04
	96148	0.00		0.14	2.04
	96183	0.00		0.13	2.04
	96199	0.00		0.14	2.03
	96204	0.00		0.14	2.03
	96348	0.00		0.15	1.89
	96351	0.00		0.15	1.86
	96367	0.00		0.15	1.86
	96402	0.00		0.15	1.80
	96422	0.00		0.16	1.79
u/s Beltway-8	96469	0.00		0.18	2.01
	96625	0.00		0.19	1.94
	96790	0.00		0.23	2.03
	97344	0.00		0.20	1.39
JV Footbridge	97345	0.00		0.16	1.45
	97348	0.00		0.15	0.74
	97349	0.00		0.33	0.89

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

ase			Base		Phase 1	Phase 2
del Date					Apr-03	Jun-03
del Name			J100base		100yrp18	100yrp28
					Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 100-year storm		n/a	n/a
E500-01 Basin Inlet Width					n/a	SW=82'
E500-02 Basin Inlet Elev.					n/a	100
E500-02 Basin Inlet Width					n/a	SW=82' + 100acft
E500-03 Basin Inlet Elev.					n/a	100
E500-03 Basin Inlet Width						
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
JV Div Wier (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
	97399	0.00		0.01		0.25
	98320	0.00		0.05		0.13
	98321	0.00		0.05		0.13
	98625	0.00		0.09		0.14
	98830	0.00		0.09		0.13
	98910	0.00		0.10		0.13
	98942	0.00		0.12		0.13
Lakeview	98990	0.00		0.11		0.13
	99185	0.00		0.12		0.14
	99470	0.00		0.11		0.12
	100410	0.00		0.14		0.14
	100640	0.00		0.15		0.15
	100890	0.00		0.14		0.14
	100980	0.00		0.14		0.14
	101014	0.00		0.14		0.13
	101050	0.00		0.14		0.14
	101375	0.00		0.14		0.14
	101376	0.00		0.14		0.14
	102065	0.00		0.14		0.13
	103540	0.00		0.13		0.12
	103541	0.00		0.13		0.12
	104395	0.00		0.12		0.11
JV Diversion Channel	104396	0.00		0.12		0.11
	104580	0.00		0.12		0.12
	104581	0.00		0.12		0.12
	104965	0.00		0.12		0.12
	105475	0.00		0.13		0.13
	105870	0.00		0.14		0.14
	106020	0.00		0.14		0.14
	107109	0.00		0.15		0.15
	108130	0.00		0.13		0.13
	108230	0.00		0.14		0.14
	108740	0.00		0.15		0.15
West Road	109835	0.00		0.13		0.13
	110020	0.00		0.13		0.13
	110110	0.00		0.16		0.16
	110330	0.00		0.20		0.20
	111205	0.00		0.16		0.16
	111206	0.00		0.16		0.16
	111360	0.00		0.14		0.15
	111395	0.00		0.08		0.08
	111625	0.00		0.08		0.08
	111626	0.00		0.08		0.08
	113250	0.00		0.05		0.05
	113251	0.00		0.05		0.05
	113300	0.00		0.06		0.06
	113310	0.00		0.05		0.05
	113575	0.00		0.04		0.04
	113740	0.00		0.04		0.04
	114060	0.00		0.03		0.03
	114295	0.00		0.03		0.03
	114560	0.00		0.03		0.03
	114625	0.00		0.02		0.02
	114780	0.00		0.02		0.02
	114955	0.00		0.02		0.03
	115125	0.00		0.02		0.02
	115450	0.00		0.02		0.02
	115855	0.00		0.02		0.02
	116015	0.00		0.01		0.01
	116035	0.00		0.02		0.02
	116115	0.00		0.02		0.02
	116220	0.00		0.01		0.01
	116485	0.00		0.01		0.01
	117210	0.00		0.01		0.01
	119290	0.00		0.01		0.01
	120695	0.00		0.01		0.01
	121735	0.00		0.01		0.01
	121830	0.00		0.01		0.01
	121915	0.00		0.01		0.01
	121995	0.00		0.01		0.01
	122100	0.00		0.01		0.01
	122330	0.00		0.01		0.01
	122420	0.00		0.02		0.02
	123990	0.00		0.01		0.01

TABLE C

Summary of Results of Trials
White Oak Bayou HEC-1/HEC-2 Model
100 Year Frequency

Phase			Base		Phase 1	Phase 2
Model Date					Apr-03	Jun-03
Model Name			J100base		100yrp18	100yrp28
E500-01 Basin Inlet Elev.			Base HEC-2 Model (Existing Conditions) 100-year storm		Ex. Flowline	Ult. Flowline
E500-01 Basin Inlet Width					n/a	n/a
E500-02 Basin Inlet Elev.					n/a	SW=82'
E500-02 Basin Inlet Width					n/a	100
E500-03 Basin Inlet Elev.					n/a	SW=82' + 100acft
E500-03 Basin Inlet Width					n/a	100
E122 Transition Structure			existing		existing	removed
Conveyance Improvements through			-		-	95760
Conveyance Improvements size			-		-	Plan III
Fairbanks North Houston Bridge			Ex Brg		Ex Brg	Ex Brg
Gessner Bridge			Ex Brg		Ex Brg	Ex Brg
Windfern Bridge			Ex Brg		Ex Brg	Ex Brg
Jersey Village Bypass			-		Regraded	Regraded
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
JV Div Weir (Elevation/Length)			-		-	-
E500-10 Scenario			-		A Sideweir	A Sideweir
Woodlands Trail Bridge			Existing		Existing	Prop (Ic=Exist)
Jersey Village Footbridge			Existing		Existing	Existing
	124340	0.00		0.02		0.02
	124354	0.00		0.01		0.01
	124415	0.00		0.01		0.01
	124810	0.00		0.01		0.01
	124940	0.00		0.01		0.01
	124941	0.00		0.01		0.01
	124955	0.00		0.01		0.01
	124956	0.00		0.01		0.01
	125060	0.00		0.01		0.01
	125567	0.00		0.00		0.00
	126200	0.00		0.01		0.01
	126330	0.00		0.00		0.00
	126331	0.00		0.01		0.01
	126335	0.00		0.01		0.01
	126336	0.00		0.01		0.01
	126410	0.00		0.01		0.01
	127755	0.00		0.01		0.01
	127790	0.00		0.00		0.00
	127780	0.00		0.00		0.00
	127880	0.00		0.01		0.01
Wortham Blvd	127973	0.00		0.01		0.01
	128065	0.00		0.00		0.00
	128175	0.00		0.01		0.01
	128606	0.00		0.01		0.01
	128690	0.00		0.01		0.01
	128691	0.00		0.00		0.00
	128697	0.00		0.01		0.01
	128698	0.00		0.01		0.01
	128835	0.00		0.01		0.01
	129265	0.00		0.01		0.01
	129385	0.00		0.01		0.01
	129580	0.00		0.01		0.01
	130556	0.00		0.01		0.01
	130815	0.00		0.00		0.00
	132030	0.00		0.00		0.00
	132035	0.00		0.00		0.00
	132080	0.00		0.00		0.00
	132110	0.00		0.00		0.00
	132121	0.00		0.00		0.00
	132209	0.00		0.00		0.00
	132210	0.00		0.00		0.00
	132028	0.00		0.00		0.00
	132029	0.00		0.00		0.00
	132338	0.00		0.00		0.00
	132479	0.00		0.00		0.00

ATTACHMENT 3
PBS&J FINAL REPORT

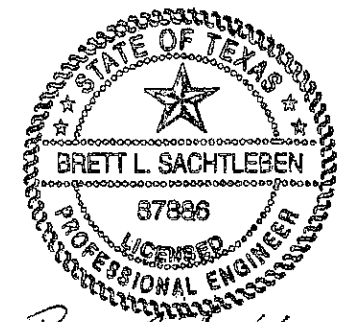
NO RISE CERTIFICATION FOR E200-00-00 AND E141-00-00 CHANNEL CONVEYANCE IMPROVEMENTS

Prepared for:

R.G. Miller Engineers, Inc.
12121 Wickchester Lane
Suite 200
Houston, Texas 77079

Prepared by:

PBS&J
1250 Wood Branch Park Drive, Suite 300
Houston, Texas 77079



10/1/08

October 2008

Contents

Exhibits

Tables

Appendices

1.0 INTRODUCTION

The Harris County Flood Control District ("HCFCD") has requested that PBS&J conduct a No-Rise Certification for the proposed channel conveyance improvements to E141-00-00 and E200-00-00. The No-Rise Certification will be developed so that construction permits can be obtained for R.G. Miller Engineer's ("RGME") conveyance improvement plans for E200-00-00 and E141-00-00 (Project ID# E200-00-00-E003). The proposed channel conveyance improvements are located on E141-00-00 between Philippine Street and E200-00-00 and on E200-00-00 between E141-00-00 and E100-00-00. The proposed channel improvements are located entirely within Harris County and are not located within the City of Houston; thus, only the drainage regulations for Harris County are applicable.

1.1 BACKGROUND

White Oak Bayou, E100-00-00, is one of the 22 major watersheds within Harris County. White Oak Bayou originates in northwest Harris County and outfalls into Buffalo Bayou in downtown Houston near the Houston Ship Channel. As seen in Exhibit 1.1, E141-00-00 is located just east of Beltway 8 and outfalls into White Oak Bayou (E100-00-00) just upstream of Gessner. Under the base condition E200-00-00 is plugged just west of Beltway 8. East of the plug E200-00-000 outfalls into E141-00-00 just downstream of Windfern Forest Drive. West of the plug E200-00-00 outfalls into E100-00-00 just north of the City of Jersey Village. As seen in Exhibit 1.2, E100-00-00 and E141-00-00 are FEMA studied streams, while E200-00-00 is unstudied.

In order to reduce the occurrence of flooding within the White Oak Bayou watershed, HCFCD has planned and constructed numerous channel improvements and regional detention facilities within the watershed. Most recently the benefits of the Phase 3 improvements to the White Oak Bayou watershed were documented by PBS&J in "Phase 3 Recommended Project Design Report-Immediate Proposed Construction Along White Oak Bayou (May 2007)". For the purposes of this no-rise certification this previous report will be identified as the "Phase 3 Analysis". The Phase 3 Analysis, among other drainage improvements, included conveyance improvements to both E141-00-00 and E200-00-00. The analysis concluded that no negative peak flood stage impacts will occur on E100-00-00 or E141-00-00 when the E141-00-00 and E200-00-00 conveyance improvements are constructed in conjunction with the other Phase 3 improvements within the watershed.

The original intent of this current study was to utilize the Phase 3 Analysis modeling results to prove that "No-Rise" in peak flood stages will result because of the construction of the E141-00-00 and E200-00-00 conveyance improvements. However, in the case of the proposed E200-00-00 and E141-00-00 channel conveyance improvements, the Phase 3 Analysis does not match the current RGME design. Therefore, this study will use the proposed conditions from the Phase 3 Analysis, but will update the proposed configuration of E200-00-00 and E141-00-00 to reflect the RGME 90% progress drawings.

1.2 STUDY OBJECTIVE

In order for the proposed conveyance improvements to E141-00-00 and E200-00-00 to be constructed, HCFCD must receive a No-Rise Certificate from the Harris County Permits Department. The No-Rise Certificate stipulates that construction of the proposed improvements will cause no adverse hydrologic or hydraulic impact along E100-00-00 or E141-00-00. The objective of this study is to provide an analysis whose documentation aids HCFCD in obtaining a No-Rise Certificate from the Harris County Permits Department. As per HCFCD criteria, the analysis must prove no adverse impact for both the 100-year (1 percent exceedance probability) and 10-year (10 percent exceedance probability) storm events.

1.3 PROJECTION AND VERTICAL DATUM

All mapping developed as part of this study reference the North American Datum (NAD) 1983 State Plane Coordinate System, Texas South Central Zone – Grid – Feet. All elevations in this report reference the North American Vertical Datum of 1998 (NAVD 88) (2001 adjustment).

2.0 DATA COLLECTION

PBS&J required several data items to complete this study. These include the following:

- Report and models from "Phase 3 Recommended Project Design Report-Immediate Proposed Construction Along White Oak Bayou (May 2007)"
- 90% Progress Drawings – "(Project ID# E200-00-00-E003) Jersey Village Channel Conveyance Improvements from Unit E141-00-00 at Philippine Street to Unit E100-00-00" (by RGME).

PBS&J completed the Phase 3 Analysis; thus, PBS&J was already in possession of all necessary hydraulic and hydrologic models from the Phase 3 effort. The Phase 3 Analysis utilized the unsteady routing-steady state water surface elevation (UR-SWSEL) process. The steady and unsteady-state hydraulic models were developed using HEC-RAS Version 3.1.1. The hydrologic models are in a HEC-HMS Version 2.2.2 format.

RGME provided 90% progress drawings for the E141-00-00 and E200-00-00 channel conveyance improvements. RGME also provided electronic files that defined the location of the channel improvement components.

3.0 ANALYSIS

As with the Phase 3 Analysis, all modeling will utilize the UR-SWSEL process. This process utilizes unsteady-state HEC-RAS to determine peak flow rates and then the peak flow rates are applied to steady state HEC-RAS to determine peak flood stages.

The study approach consisted of the following steps:

(1) Define the Base Condition steady-state HEC-RAS model from the Phase 3 Analysis.

(2) Collect from the Phase 3 Analysis the unsteady-state Phase 3 Condition HEC-RAS (includes all Phase 3 components).

(3) Collect from the Phase 3 Analysis the steady-state Phase 3 Condition HEC-RAS (includes all Phase 3 components).

(4) Update the Phase 3 Condition unsteady-state HEC-RAS with E200-00-00 and E141-00-00 cross sections from the RGME construction plans and run model to determine new 10- and 100-year event peak flows. This updated model will be the Proposed Condition unsteady-state HEC-RAS model for the current analysis.

(5) Update the Phase 3 Condition steady-state HEC-RAS with E200-00-00 and E141-00-00 cross sections from the RGME construction plans and update the model with step (4) peak flows. This updated model will be the Proposed Condition steady-state HEC-RAS model for the current analysis.

(6) Using the updated Phase 3 Condition steady state HEC-RAS model from Step (5), determine 10- and 100-year event peak flood stages for E100-00-00, E141-00-00 and E200-00-00.

(7) Prepare a comparison of peak flood stages between the Base Condition steady-state HEC-RAS model (Step (1)) and the Proposed Condition steady-state HEC-RAS model (Step (6)).

Once these steps were completed, an evaluation was made of the model results to determine if adverse flood stage impacts (i.e., Proposed Condition peak flood stage values exceed Base Condition peak flood stage values) occurred. This section will discuss the above steps.

3.1 BASE CONDITION

The Base Condition model for this analysis was taken directly from the Phase 3 Analysis. As documented in the Phase 3 Analysis, the Base Condition model was created from the September 17, 2004 preliminary TSARP HEC-RAS models. As part of the Phase 3 Analysis, HEC-RAS cross sections were added, HEC-RAS cross sections were modified and bridge modeling approaches were changed from the preliminary TSARP HEC-RAS models. These changes were made in order to allow the HEC-RAS model to function properly when run in an unsteady state, to remove Phase 3 components that may have been reflected in the preliminary TSARP HEC-RAS models or to allow Phase 3 components to be modeled in the Phase 3 Condition hydraulic model. The Base Condition steady-state HEC-RAS output may be found in Appendix A.

3.2 PROPOSED CONDITION

As with the Base Condition, the Phase 3 Condition hydraulic models were taken from the Phase 3 Analysis that was previously completed by PBS&J. The Phase 3 Analysis modeling was completed utilizing RGME's 45% Progress Drawings for the E200-00-00 and E141-00-00 channel improvements. However, in RGME's 90% Progress Drawings the proposed channel configurations of E200-00-00 and E141-00-00 have been slightly modified from RGME's 45% Progress Drawings. The Proposed Condition of this analysis will reflect the E200-00-00 and E141-00-00 channel configuration from RGME's 90% Progress Drawings.

In addition to the E200-00-00 and E141-00-00 channel improvements, the Proposed Condition HEC-RAS models (unsteady and steady-state) include the following Phase 3 components: E100-00-00 channel improvements (from confluence with E122-00-00 to Beltway 8), removal of the E122-00-00 control structure, removal of Woodlands Trail footbridge, E500-01-00 Detention Facility, E500-02-00 Detention Facility, E500-03-00 Detention Facility, E500-10-00 Detention Facility, E500-11-00 Detention Facility and E500-12-00 Detention Facility. These Phase 3 components, which are shown in Exhibit 3.1, were modeled in this current analysis the same as in the Phase 3 Analysis.

The initial step in the Proposed Condition modeling was to update and convert the Phase 3 Analysis hydraulic models to the Proposed Condition hydraulic models for this study. This was done by updating the proposed channel configuration of E200-00-00 and E141-00-00 to reflect RGME's 90% Progress Drawings. The limits of the E200-00-00 and E141-00-00 channel improvements are shown in Exhibit 3.2. The location of HEC-RAS cross sections for E200-00-00 and E141-00-00 may be seen in Exhibit 3.3. The RGME 90% Progress Drawings may be found in Appendix C in an electronic format.

3.2.1 RESULTS VERIFICATION

An unsteady-state simulation was performed on the newly created Proposed Condition HEC-RAS model. The peak flows that were developed from the unsteady simulation were applied to the steady-state Proposed Condition HEC-RAS model using the UR-SWSEL process. In order to verify that the results from the Proposed Condition steady-state model were reasonable, the model's peak flood stages were compared against those of the Phase 3 steady-state model from the Phase 3 Analysis. Since the differences between the two models include only minor changes to the channel cross sections of E200-00-00 and E141-00-00, it was anticipated that differences in peak flood stages would also be minor.

As seen in Table 3.1, only minor peak flood stage differences resulted on E100-00-00 due to the changes to the proposed channel configuration of E200-00-00 and E141-00-00. The Proposed Condition peak flood stage for the 10-year event is a maximum of 0.08 feet higher and a maximum of 0.02 feet lower than the Phase 3 Analysis peak flood stages. The 100-year event peak flood stage for the Proposed Condition is a maximum of 0.06 feet higher and 0.02 feet lower than the Phase 3 Analysis model on

E100-00-00. The differences between the Proposed Condition and Phase 3 Analysis peak flood stages are slightly larger on E141-00-00. The Proposed Condition peak flood stages are a maximum of 0.38 feet and 0.39 feet lower than the Phase 3 Analysis simulation for the 10- and 100-year event, respectively (see Table 3.2). As seen in Table 3.3, the Proposed Condition peak flood stages of E200-00-00 are lower than the Phase 3 Analysis flood stages by a maximum of 0.16 feet and 0.22 feet for the 10- and 100-year event, respectively. The Proposed Condition steady-state output may be found in Appendix B.

3.2.2 RESULTS

After the results of the Proposed Condition steady-state HEC-RAS model were determined to be reasonable, the Proposed Condition peak flood stages were compared against those of the Base Condition steady-state HEC-RAS model to confirm "no-rise". As seen in Table 3.4, the Proposed Condition improvements reduce E100-00-00's 10-year event peak flood stages by a maximum of 4.61 feet just upstream of Equador Drive on E100-00-00. The Proposed Condition improvements result in an E100-00-00 peak 100-year event flood stage that is a maximum of 1.74 feet lower than Base Conditions near Equador Drive. The Proposed Conditions model for E100-00-00 shows that two (2) cross sections for the 10-year event and five (5) cross sections for the 100-year event that have peak flood stages increases over the Base Condition. These cross sections are at the upstream limit of E100-00-00 and well upstream of any channel improvements. Therefore, it can be concluded that the 0.01 impacts are not realistic and are due to limitations in the accuracy of HEC-RAS.

E141-00-00 peak flood stages are also reduced below the Base Condition due to the Proposed Conditions improvements. As seen in Table 3.5, the 10-year event peak flood stage is lower by a maximum of 4.27 feet near Phillippine Street. The 100-year event peak flood stage on E141-00-00 is lowered by a maximum of 3.8 feet near Mauna Loa. 10-year and 100-year event peak flood stages are not increased over Base Conditions at any location on E141-00-00.

Under the Base Condition E200-00-00 is plugged just west of Beltway 8. E200-00-00 outfalls to E100-00-00 west of Beltway 8 and to E141-00-00 east of Beltway 8. E200-00-00 functions primarily as storage areas for E100-00-00 and E141-00-00 and as a result was not modeled as part of TSARP. Therefore, a direct comparison of Base Condition and Proposed Condition peak flood stages on E200-00-00 could not be made. However, it can be concluded that under the Proposed Condition that both the 10- and 100-year event peak flood profiles are contained within the banks of E200-00-00 (see Exhibit 3.4).

4.0 CONCLUSIONS

Based upon the results of this analysis **there is no rise in the 10- and 100-year event peak flood stages downstream of the proposed improvements on E100-00-00 or E141-00-00 when the E141-00-00 and E200-00-00 channel conveyance improvements are constructed with the Phase 3 drainage improvements for the White Oak Bayou watershed.** The proposed drainage improvements result in

peak 10- and 100-year event flood stages that are contained within the banks of E200-00-00. Besides the E141-00-00 and E200-00-00 channel conveyance improvements, the Phase 3 drainage improvements include:

- E100-00-00 Channel Improvements (from confluence with E122-00-00 to Beltway 8)
- Removal of the E122-00-00 control structure
- Removal of Woodlands Trail footbridge
- E500-01-00 Detention Facility
- E500-02-00 Detention Facility
- E500-03-00 Detention Facility
- E500-10-00 Detention Facility
- E500-11-00 Detention Facility
- E500-12-00 Detention Facility

Following the construction of the Phase 3 drainage improvements, which includes the E141-00-00 and E200-00-00 channel improvements, a LOMR will be completed to reflect their flood plain and flood stage reduction benefits. Unlike this analysis, the LOMR will be submitted utilizing the effective FEMA models for E100-00-00 and E141-00-00 as base for the analysis.

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition* 10-Yr Flood Stage (ft-2001 adj.) (1)	*Phase 3 Condition* 100-Yr Flood Stage (ft-2001 adj.) (2)	*Proposed Condition* 10-Yr Flood Stage (ft-2001 adj.) (3)	*Proposed Condition* 100-Yr Flood Stage (ft-2001 adj.) (4)	10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
-3399.7	*- Confluence w/ Buffalo Bayou -*	22.46	29.39	22.49	29.39	0.03	0
-2855.3		22.63	29.57	22.66	29.57	0.03	0
-2814.3		22.8	29.78	22.83	29.78	0.03	0
-1659.7		23.65	30.7	23.68	30.7	0.03	0
-1428.4		23.69	30.71	23.72	30.71	0.03	0
-906.5		23.77	30.82	23.8	30.82	0.03	0
-874.7		24.02	31.07	24.04	31.07	0.02	0
-643.5		24.37	31.18	24.4	31.18	0.03	0
-553.5		24.71	31.78	24.74	31.78	0.03	0
-513		24.94	32.08	24.97	32.08	0.03	0
-508		24.94	32.08	24.97	32.08	0.03	0
-442		25.77	32.92	25.79	32.92	0.02	0
-437		26.1	33.49	26.13	33.49	0.03	0
-284.5		26.1	33.5	26.13	33.5	0.03	0
-132		26.05	33.51	26.08	33.51	0.03	0
20.5		26.07	33.53	26.1	33.53	0.03	0
173	UPRR - D/S Face	26.06	33.46	26.08	33.46	0.02	0
210	UPRR - U/S Face	26.39	33.91	26.42	33.91	0.03	0
365	UPRR - D/S Face	26.68	34.16	26.71	34.16	0.03	0
400	UPRR - U/S Face	26.89	34.49	26.92	34.49	0.03	0
654		27.39	34.9	27.42	34.9	0.03	0
851	Main St. Access - D/S Face	27.23	34.82	27.26	34.82	0.03	0
984	Main St. Access - U/S Face	27.76	35.23	27.79	35.23	0.03	0
1319	UPRR - D/S Face	27.77	35.29	27.8	35.29	0.03	0
1353	UPRR - U/S Face	28.55	35.47	28.59	35.47	0.04	0
1580		29.09	35.77	29.12	35.78	0.03	0.01
2298		29.79	36.03	29.83	36.03	0.04	0
3585		30.26	36.3	30.29	36.3	0.03	0
3681		30.31	36.37	30.34	36.37	0.03	0
3976	UPRR - D/S Face	30.62	36.53	30.65	36.53	0.03	0
4014	UPRR - U/S Face	30.91	36.81	30.94	36.81	0.03	0
4407		30.95	36.82	30.98	36.83	0.03	0.01
4687	Crockett/Hogan - D/S Face	31.3	37.01	31.33	37.01	0.03	0
4812	Crockett/Hogan - U/S Face	31.45	37.11	31.48	37.11	0.03	0
4961	Railroad - D/S Face	31.65	37.24	31.67	37.24	0.02	0
4994	Railroad - U/S Face	31.84	37.32	31.87	37.32	0.03	0
5525		32.06	37.51	32.09	37.51	0.03	0
6068	IH 45 - D/S Face	32.08	37.53	32.11	37.53	0.03	0
6174	IH 45 - U/S Face	32.13	37.57	32.16	37.57	0.03	0
6423	IH 45 North Entr. Ramp - D/S Face	32.19	37.6	32.21	37.6	0.02	0
6473	IH 45 North Entr. Ramp - U/S Face	32.22	37.64	32.25	37.64	0.03	0
6775		32.34	37.7	32.37	37.71	0.03	0.01
6898	IH 10 East Entr. Ramp - D/S Face	32.36	37.72	32.38	37.72	0.02	0
6975	IH 10 East Entr. Ramp - U/S Face	32.38	37.75	32.41	37.75	0.03	0
6980		32.38	37.75	32.41	37.75	0.03	0
7353		32.34	37.72	32.37	37.72	0.03	0
7529		32.35	37.74	32.37	37.74	0.02	0
7546		32.38	37.81	32.41	37.81	0.03	0
7568	Houston - D/S Face	32.37	37.79	32.4	37.79	0.03	0
7649	Houston - U/S Face	32.4	37.81	32.43	37.81	0.03	0
8140		32.7	38.03	32.73	38.03	0.03	0
8532		32.73	38.04	32.76	38.04	0.03	0
9779		32.65	37.97	32.67	37.97	0.02	0
10643		32.56	37.89	32.59	37.89	0.03	0
10804	Taylor - D/S Face	33.1	38.33	33.13	38.33	0.03	0
10908	Taylor - U/S Face	33.24	38.36	33.27	38.36	0.03	0
11021		33.22	38.34	33.25	38.34	0.03	0
11546		33.23	38.35	33.25	38.35	0.02	0
12066		33.27	38.36	33.3	38.36	0.03	0
12698		33.35	38.42	33.38	38.42	0.03	0
13143	Studemont - D/S Face	33.72	38.7	33.75	38.7	0.03	0
13220	Studemont - U/S Face	33.79	38.81	33.82	38.81	0.03	0
13494		33.72	38.74	33.75	38.74	0.03	0

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.)	100-Yr Flood Stage Difference (ft-2001 adj.)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)	(3) - (1)	(4) - (2)
13898	UPRR - D/S Face	33.86	38.84	33.9	38.84	0.02	0
13924	UPRR - U/S Face	34.18	39.12	34.21	39.12	0.03	0
14354		34.69	39.67	34.72	39.67	0.03	0
14532	IH 10 Access Road - D/S Face	34.43	39.4	34.46	39.4	0.03	0
14590	IH 10 Access Road - U/S Face	34.56	39.85	34.59	39.86	0.03	0.01
14897	IH 10 Access Road - D/S Face	35.1	40.34	35.13	40.34	0.03	0
14977	IH 10 Access Road - U/S Face	35.92	40.72	35.95	40.73	0.03	0.01
15278		35.89	40.69	35.92	40.69	0.03	0
15795		36.51	41.26	36.54	41.27	0.03	0.01
16831		36.55	41.32	36.58	41.32	0.03	0
17318		36.48	41.17	36.51	41.18	0.03	0.01
17597	S. Heights - D/S Face	36.89	41.62	36.92	41.63	0.03	0.01
17756	S. Heights - U/S Face	38.14	43.94	38.18	43.95	0.04	0.01
17905		38.23	43.94	38.27	43.95	0.04	0.01
18082	Yale - D/S Face	38.3	43.96	38.34	43.97	0.04	0.01
18176	Yale - U/S Face	39.1	45.7	39.14	45.71	0.04	0.01
18199	UPRR - D/S Face	39.52	45.98	39.56	45.99	0.04	0.01
18234	UPRR - U/S Face	41.16	48.53	41.2	48.55	0.04	0.02
18377		41.04	48.46	41.08	48.47	0.04	0.01
19463		41.5	48.66	41.54	48.67	0.04	0.01
19917		41.75	48.74	41.79	48.76	0.04	0.02
20521		42.16	49.15	42.2	49.17	0.04	0.02
20622		42.24	49.23	42.28	49.25	0.04	0.02
20644		42.34	49.34	42.38	49.36	0.04	0.02
20746		42.35	49.33	42.38	49.34	0.03	0.01
21444		42.82	49.61	42.85	49.62	0.03	0.01
22224		43.67	50.01	43.7	50.02	0.03	0.01
22610		43.61	49.97	43.64	49.98	0.03	0.01
22758	Shepherd - D/S Face	43.62	49.94	43.65	49.95	0.03	0.01
22834	Shepherd - U/S Face	43.84	50.26	43.87	50.28	0.03	0.02
22983		43.99	50.54	44.02	50.55	0.03	0.01
23180		44.31	50.63	44.34	50.64	0.03	0.01
23444	Durham - D/S Face	44.57	50.67	44.6	50.68	0.03	0.01
23550	Durham - U/S Face	44.78	50.8	44.8	50.81	0.02	0.01
23934		44.92	50.91	44.95	50.92	0.03	0.01
24636		45.28	51.19	45.31	51.2	0.03	0.01
24758	UPRR - D/S Face	45.26	51.08	45.28	51.09	0.02	0.01
24817	UPRR - U/S Face	45.81	51.32	45.83	51.33	0.02	0.01
25132		46.23	51.63	46.25	51.64	0.02	0.01
25536		46.4	51.77	46.42	51.78	0.02	0.01
26140		46.69	51.96	46.72	51.97	0.03	0.01
26366	T.C. Jester - D/S Face	46.79	51.94	46.81	51.96	0.02	0.02
26498	T.C. Jester - U/S Face	46.92	52.61	46.94	52.63	0.02	0.02
26598		46.95	52.84	46.98	52.85	0.03	0.01
27429		47.32	53.07	47.34	53.08	0.02	0.01
27982		47.57	53.22	47.59	53.24	0.02	0.02
28113	W. 11th - D/S Face	47.7	53.24	47.73	53.25	0.03	0.01
28190	W. 11th - U/S Face	47.87	53.63	47.89	53.64	0.02	0.01
28330	Bicycle Bridge - D/S Face	47.97	53.92	47.99	53.93	0.02	0.01
28375	Bicycle Bridge - U/S Face	48.08	53.95	48.1	53.96	0.02	0.01
28775		48.56	54.23	48.59	54.24	0.03	0.01
29203	T.C. Jester - D/S Face	48.62	54.18	48.64	54.19	0.02	0.01
29368	T.C. Jester - U/S Face	49.26	54.58	49.28	54.59	0.02	0.01
29659		49.77	55.07	49.8	55.08	0.03	0.01
30779		50.15	55.18	50.17	55.19	0.02	0.01
31583		50.41	55.33	50.44	55.33	0.03	0
32570		50.8	55.47	50.82	55.48	0.02	0.01
33357		51.19	55.74	51.21	55.75	0.02	0.01
33610	W. 18th - D/S Face	51.31	55.77	51.33	55.77	0.02	0
33681	W. 18th - U/S Face	51.46	56.46	51.48	56.47	0.02	0.01
33770		52.11	57.13	52.13	57.14	0.02	0.01
34206		51.98	57.04	52	57.05	0.02	0.01
34645		52.23	57.19	52.25	57.19	0.02	0

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
34895	Ella - D/S Face	52.34	57.22	52.36	57.22	0.02	0
35006	Ella - U/S Face	52.58	57.58	52.6	57.58	0.02	0
35158		52.75	57.67	52.78	57.68	0.03	0.01
35718		52.98	57.71	53.01	57.71	0.03	0
36134		53.41	58.11	53.43	58.11	0.02	0
36296		53.51	58.33	53.54	58.34	0.03	0.01
36318		53.55	58.36	53.57	58.37	0.02	0.01
36505		53.61	58.45	53.63	58.46	0.02	0.01
36870		53.76	58.4	53.78	58.41	0.02	0.01
37857		54.22	58.93	54.24	58.94	0.02	0.01
38877		54.76	59.34	54.78	59.35	0.02	0.01
39017	Loop 610 - D/S Face	54.84	59.38	54.87	59.39	0.03	0.01
39419	Loop 610 - U/S Face	55.34	60.1	55.36	60.1	0.02	0
39567		55.42	60.3	55.44	60.3	0.02	0
40384		56.22	60.81	56.24	60.82	0.02	0.01
41337		56.77	60.94	56.78	60.95	0.01	0.01
42356		57.34	61.26	57.35	61.26	0.01	0
42555	W. 34th - D/S Face	57.39	61.26	57.4	61.27	0.01	0.01
42650	W. 34th - U/S Face	57.63	62.07	57.64	62.07	0.01	0
42932		57.97	62.56	57.99	62.56	0.02	0
43276	T.C. Jester - D/S Face	58.1	62.48	58.12	62.49	0.02	0.01
43420	T.C. Jester - U/S Face	59.85	62.53	59.88	62.53	0.03	0
43626		60.06	62.91	60.08	62.92	0.02	0.01
44372		60.55	63.23	60.57	63.23	0.02	0
44556		60.62	63.27	60.64	63.27	0.02	0
44688		60.68	63.31	60.7	63.31	0.02	0
44711		60.83	63.47	60.85	63.48	0.02	0.01
44945	BNRR - D/S Face	61.01	63.68	61.03	63.68	0.02	0
44983	BNRR - U/S Face	61.35	63.95	61.37	63.95	0.02	0
45120		61.45	64.19	61.47	64.2	0.02	0.01
46096		61.9	64.73	61.92	64.73	0.02	0
46827		62.49	65.28	62.51	65.29	0.02	0.01
47857		62.85	65.62	62.86	65.63	0.01	0.01
48942		63.13	65.78	63.14	65.79	0.01	0.01
49281		63.22	65.92	63.23	65.92	0.01	0
49437		63.35	66.04	63.36	66.04	0.01	0
49457		63.45	66.12	63.47	66.13	0.02	0.01
49564		63.47	66.12	63.49	66.12	0.02	0
49824		63.55	66.19	63.56	66.19	0.01	0
50694		64.08	66.77	64.1	66.77	0.02	0
50808	W. 43rd - D/S Face	63.93	66.54	63.95	66.54	0.02	0
50921	W. 43rd - U/S Face	64.08	67.01	64.1	67.02	0.02	0.01
51021		64.26	67.36	64.28	67.36	0.02	0
51777		64.49	67.5	64.5	67.5	0.01	0
52589		64.69	67.64	64.7	67.65	0.01	0.01
52722	Bicycle Bridge - D/S Face	64.71	67.65	64.72	67.65	0.01	0
52760	Bicycle Bridge - U/S Face	64.75	67.79	64.77	67.79	0.02	0
52833		64.89	67.9	64.9	67.91	0.01	0.01
53116		64.95	67.96	64.96	67.96	0.01	0
53282	Mangum - D/S Face	65	67.94	65.02	67.95	0.02	0.01
53459	Mangum - U/S Face	65.06	68.16	65.08	68.16	0.02	0
53642		65.19	68.28	65.2	68.28	0.01	0
53664		65.28	68.36	65.29	68.37	0.01	0.01
53766		65.32	68.41	65.34	68.42	0.02	0.01
54053		65.44	68.57	65.46	68.57	0.02	0
54398		65.68	68.74	65.69	68.75	0.01	0.01
54545	Pinemont - D/S Face	65.69	68.71	65.71	68.72	0.02	0.01
54667	Pinemont - U/S Face	65.81	69.28	65.82	69.29	0.01	0.01
54895		65.93	69.48	65.94	69.48	0.01	0
55059	Creekmont Dr - D/S Face	65.98	69.46	65.99	69.47	0.01	0.01
55112	Creekmont Dr - U/S Face	66.49	69.68	66.51	69.68	0.02	0
55190		66.55	69.77	66.56	69.77	0.01	0
55757		66.83	70.04	66.85	70.05	0.02	0.01

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.)	100-Yr Flood Stage Difference (ft-2001 adj.)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)	(3) - (1)	(4) - (2)
56231		67.22	70.51	67.23	70.52	0.01	0.01
56239	*- Confluence w/ E117-00-00 -*	67.2	70.5	67.21	70.51	0.01	0.01
56486		67.34	70.66	67.35	70.67	0.01	0.01
56621	Tidwell - D/S Face	67.65	70.82	67.67	70.83	0.02	0.01
56811	Tidwell - U/S Face	67.97	71.48	67.99	71.48	0.02	0
57015		67.95	71.53	67.97	71.53	0.02	0
57918		68.53	71.84	68.54	71.85	0.01	0.01
58797		69.04	72.33	69.05	72.33	0.01	0
59972		68.76	72.07	68.78	72.07	0.02	0
60759		69.65	72.88	69.66	72.88	0.01	0
61936		69.49	72.65	69.5	72.65	0.01	0
62890		69.8	72.93	69.81	72.93	0.01	0
63780		70.1	73.15	70.11	73.15	0.01	0
65068		70.99	73.97	71	73.97	0.01	0
65268		71.19	74.29	71.2	74.29	0.01	0
65401		71.26	74.71	71.27	74.71	0.01	0
65422		71.3	74.95	71.31	74.94	0.01	-0.01
65425	W. Little York - D/S Face	71.61	74.91	71.62	74.91	0.01	0
65504	W. Little York - U/S Face	71.81	75.18	71.83	75.18	0.02	0
65650		71.78	75.34	71.79	75.34	0.01	0
65878		71.85	75.29	71.86	75.28	0.01	-0.01
66480		72.51	75.98	72.52	75.98	0.01	0
66585	Antoine - D/S Face	72.68	76.07	72.69	76.07	0.01	0
66695	Antoine - U/S Face	72.81	76.53	72.83	76.53	0.02	0
66806		72.76	76.59	72.77	76.59	0.01	0
66832		72.81	76.78	72.82	76.78	0.01	0
67095		73	76.95	73.01	76.95	0.01	0
67246	Victory - D/S Face	73.33	77.04	73.35	77.04	0.02	0
67364	Victory - U/S Face	73.5	77.26	73.51	77.26	0.01	0
67624		73.72	77.25	73.74	77.25	0.02	0
68398		74.75	78	74.76	78	0.01	0
68503		74.74	77.92	74.75	77.92	0.01	0
68533		74.96	78.13	74.98	78.13	0.02	0
68633		75.26	78.58	75.27	78.58	0.01	0
69408		75.86	78.8	75.87	78.8	0.01	0
70166		76.29	78.98	76.3	78.98	0.01	0
70266	Alabonson - D/S Face	76.37	79	76.38	79	0.01	0
70347	Alabonson - U/S Face	76.81	79.16	76.82	79.16	0.01	0
70450		76.87	79.22	76.89	79.22	0.02	0
70472		76.92	79.33	76.93	79.33	0.01	0
70642		77.21	79.5	77.22	79.5	0.01	0
71493		77.69	79.71	77.7	79.71	0.01	0
72828		77.93	79.58	77.94	79.58	0.01	0
72908		78.04	79.67	78.05	79.67	0.01	0
72931		78.09	79.77	78.1	79.77	0.01	0
72965	BNRR - D/S Face	78.08	79.75	78.09	79.75	0.01	0
72999	BNRR - U/S Face	78.17	80.13	78.18	80.13	0.01	0
73083		78.17	80.27	78.18	80.27	0.01	0
74115		78.81	81.25	78.82	81.25	0.01	0
75102		78.91	81.36	78.91	81.36	0	0
75698		78.81	80.98	78.81	80.97	0	-0.01
75927	N. Houston Rosslyn - D/S Face	79.22	81.61	79.22	81.61	0	0
76041	N. Houston Rosslyn - U/S Face	80.31	83.47	80.31	83.47	0	0
76222		80.45	83.57	80.46	83.56	0.01	-0.01
77129		81.48	84.94	81.48	84.93	0	-0.01
77333		81.72	85.11	81.72	85.11	0	0
77436		81.72	85.1	81.72	85.09	0	-0.01
77447		81.61	85.03	81.61	85.02	0	-0.01
77625		81.74	85.44	81.74	85.43	0	-0.01
78804		82.73	85.89	82.73	85.89	0	0
79500		83.31	86.51	83.31	86.51	0	0
79748		83.55	86.7	83.55	86.7	0	0
80000		83.74	86.84	83.73	86.84	-0.01	0

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	Phase 3 Condition		Proposed Condition		10-Yr Flood Stage Difference (ft-2001 adj.)	100-Yr Flood Stage Difference (ft-2001 adj.)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)	(3) - (1)	(4) - (2)
80250		83.94	86.98	83.94	86.98	0	0
80547		84.18	86.73	84.18	86.73	0	0
80800		84.38	87.48	84.38	87.48	0	0
81638		85.06	88.26	85.06	88.26	0	0
82633		85.75	88.74	85.74	88.74	-0.01	0
83815		86.56	89.68	86.56	89.68	0	0
84548		87.07	89.94	87.07	89.94	0	0
84692	Golf Cart Bridge - D/S Face	87.18	90.05	87.17	90.05	-0.01	0
84716	Golf Cart Bridge - U/S Face	87.2	90.25	87.2	90.25	0	0
84932		87.37	90.57	87.37	90.57	0	0
85100		87.48	90.86	87.48	90.85	0	-0.01
85400		87.85	91.39	87.85	91.38	0	-0.01
85749		88.11	91.65	88.11	91.65	0	0
85900		88.15	91.69	88.15	91.69	0	0
86185		88.23	91.78	88.23	91.78	0	0
86400		88.34	91.88	88.35	91.87	0.01	-0.01
86621		88.4	91.93	88.4	91.92	0	-0.01
86898		88.46	92	88.47	91.99	0.01	-0.01
87171		88.6	92.07	88.61	92.07	0.01	0
87390	Fairbanks N. Houston - D/S Face	88.81	92.19	88.81	92.18	0	-0.01
87508	Fairbanks N. Houston - U/S Face	88.92	92.58	88.92	92.57	0	-0.01
87610		88.94	92.84	88.95	92.83	0.01	-0.01
88972		89.77	93.65	89.77	93.65	0	0
90490		90.67	94.71	90.67	94.7	0	-0.01
91339		91.16	95.25	91.17	95.25	0.01	0
91823		91.45	95.43	91.45	95.42	0	-0.01
91923	Winfern - D/S Face	91.59	95.46	91.59	95.46	0	0
91972	Winfern - U/S Face	91.7	96.55	91.7	96.54	0	-0.01
92147		91.98	96.59	91.98	96.58	0	-0.01
92244		91.95	96.53	91.95	96.53	0	0
92302		91.99	96.56	91.99	96.56	0	0
92399		92.07	96.59	92.07	96.59	0	0
92499		92.19	96.65	92.19	96.65	0	0
92569		92.19	96.62	92.19	96.62	0	0
92851		92.38	96.84	92.37	96.84	-0.01	0
93320		92.62	97.07	92.62	97.07	0	0
93419	Gessner - D/S Face	92.68	97.09	92.68	97.09	0	0
93534	Gessner - U/S Face	92.87	97.36	92.86	97.35	-0.01	-0.01
93630		93.33	97.98	93.32	97.97	-0.01	-0.01
93700	*- Confluence w/ E141-00-00 -*	93.42	98	93.41	97.99	-0.01	-0.01
93904		93.44	98.02	93.43	98.01	-0.01	-0.01
94068		93.5	98.08	93.5	98.07	0	-0.01
94258		93.51	98.09	93.5	98.08	-0.01	-0.01
94401		93.52	98.09	93.51	98.09	-0.01	0
95013		93.58	98.16	93.57	98.16	-0.01	0
95629		93.64	98.21	93.63	98.2	-0.01	-0.01
95998		93.71	98.29	93.71	98.29	0	0
96077		93.65	98.25	93.65	98.24	0	-0.01
96176	S.H. Tollway NB Feeder - D/S Face	93.7	98.29	93.7	98.28	0	-0.01
96244	S.H. Tollway NB Feeder - U/S Face	94.35	98.92	94.35	98.92	0	0
96298	SH Tollway Mainlanes - D/S Face	94.46	98.99	94.46	99	0	0.01
96459	SH Tollway Mainlanes - U/S Face	94.6	99.12	94.6	99.12	0	0
96514	S.H. Tollway SB Feeder - D/S Face	94.67	99.16	94.68	99.17	0.01	0.01
96586	S.H. Tollway SB Feeder - U/S Face	94.71	99.21	94.72	99.22	0.01	0.01
96688		94.73	99.24	94.74	99.25	0.01	0.01
97054		94.82	99.33	94.82	99.34	0	0.01
97445		95.07	99.62	95.08	99.64	0.01	0.02
97546	Equador Dr. - D/S Face	95.12	99.59	95.13	99.61	0.01	0.02
97571	Equador Dr. - U/S Face	95.42	99.81	95.45	99.82	0.03	0.01
97673		95.6	100.12	95.63	100.14	0.03	0.02
98564		96.97	100.71	97.02	100.74	0.05	0.03
99044		97.56	100.99	97.61	101.02	0.05	0.03
99154	Lakeview - D/S Face	97.94	101.16	97.99	101.19	0.05	0.03

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
99202	Lakeview - U/S Face	98.01	101.28	98.06	101.31	0.05	0.03
99304		98.1	101.34	98.16	101.37	0.06	0.03
99963		98.67	101.72	98.73	101.76	0.06	0.04
100723		99.34	102.2	99.41	102.24	0.07	0.04
101172		99.91	102.78	99.97	102.82	0.06	0.04
101274	Tahoe - D/S Face	99.98	102.8	100.04	102.83	0.06	0.03
101325	Tahoe - U/S Face	100.05	102.91	100.13	102.95	0.08	0.04
101430		100.15	102.94	100.22	102.98	0.07	0.04
102317		100.76	103.32	100.82	103.36	0.06	0.04
103364		101.43	103.8	101.49	103.85	0.06	0.05
104527		102.15	104.36	102.21	104.4	0.06	0.04
104902		102.45	104.68	102.51	104.73	0.06	0.05
104977		102.47	104.7	102.53	104.76	0.06	0.06
105052		102.49	104.73	102.55	104.78	0.06	0.05
105640	*- Confluence w/ E200-00-00 -*	102.66	104.88	102.72	104.94	0.06	0.06
106727		103.6	105.86	103.64	105.9	0.04	0.04
107598		104.4	106.6	104.43	106.63	0.03	0.03
108221		105.22	107.31	105.24	107.33	0.02	0.02
108323		105.38	107.45	105.4	107.47	0.02	0.02
108354		105.46	107.67	105.48	107.7	0.02	0.03
108454		105.79	108.01	105.8	108.03	0.01	0.02
109208		106.65	108.77	106.66	108.78	0.01	0.01
110243		108.26	110.41	108.27	110.41	0.01	0
110346	West Road - D/S Face	108.42	110.49	108.42	110.49	0	0
110454	West Road - U/S Face	108.58	111.02	108.58	111.02	0	0
110549		108.66	111.2	108.66	111.21	0	0.01
110813		108.91	111.4	108.91	111.41	0	0.01
111409		109.43	111.71	109.43	111.72	0	0.01
111699		109.68	111.96	109.68	111.96	0	0
111799	Rio Grande - D/S Face	109.73	111.95	109.73	111.95	0	0
111861	Rio Grande - U/S Face	110.04	112.82	110.04	112.82	0	0
111983		110.14	112.95	110.14	112.95	0	0
112547		110.48	113.2	110.48	113.2	0	0
113080		110.81	113.47	110.82	113.47	0.01	0
113539		111.07	113.75	111.07	113.75	0	0
113632	HL&P Bridge - D/S Face	111.1	113.79	111.1	113.79	0	0
113668	HL&P Bridge - U/S Face	111.21	114.05	111.21	114.05	0	0
113821		111.41	114.28	111.41	114.28	0	0
114246		111.67	114.48	111.66	114.48	-0.01	0
114948		111.69	114.48	111.69	114.48	0	0
115807		111.95	114.8	111.94	114.8	-0.01	0
116374		112.63	115.57	112.62	115.57	-0.01	0
116453		112.73	115.67	112.72	115.67	-0.01	0
116549	Jones Road - D/S Face	112.83	115.73	112.82	115.73	-0.01	0
116659	Jones Road - U/S Face	113.09	116.98	113.08	116.98	-0.01	0
116759		113.21	117.03	113.19	117.03	-0.02	0
117779		114.75	117.78	114.74	117.78	-0.01	0
118660		115.89	118.5	115.88	118.5	-0.01	0
118910		116.16	118.7	116.14	118.7	-0.02	0
119390		116.7	118.93	116.69	118.93	-0.01	0
120253		117.48	119.55	117.48	119.55	0	0
121010		118.24	120.03	118.23	120.04	-0.01	0.01
121745		118.66	120.51	118.66	120.51	0	0
122396		118.84	120.73	118.83	120.73	-0.01	0
122498	FM 1960 - D/S Face	118.86	120.75	118.86	120.75	0	0
122616	FM 1960 - U/S Face	119.09	121.07	119.09	121.06	0	-0.01
122719		119.21	121.21	119.21	121.2	0	-0.01
123541		119.52	121.6	119.51	121.58	-0.01	-0.02
124344		119.73	121.85	119.73	121.84	0	-0.01
124809		119.94	122.11	119.94	122.1	0	-0.01
124931		119.99	122.17	119.99	122.16	0	-0.01
124956		120.04	122.28	120.03	122.28	-0.01	0
125059		120.09	122.35	120.09	122.34	0	-0.01

Table 3.1

E100-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
125237		120.2	122.47	120.2	122.46	0	-0.01
125344	N. Eldridge - D/S Face	120.31	122.58	120.31	122.58	0	0
125461	N. Eldridge - U/S Face	120.4	122.68	120.4	122.68	0	0
125563		120.46	122.75	120.45	122.74	-0.01	-0.01
126183		120.75	123.05	120.74	123.05	-0.01	0
127300		121.31	123.65	121.3	123.65	-0.01	0
128236		121.7	124.07	121.7	124.07	0	0
128540	Wortham - D/S Face	121.82	124.19	121.82	124.2	0	0.01
128646	Wortham - U/S Face	121.89	124.28	121.89	124.28	0	0
128748		122	124.4	122	124.41	0	0.01
129818		122.59	124.93	122.59	124.94	0	0.01
130861		123.28	125.54	123.28	125.55	0	0.01
131331		123.76	125.91	123.76	125.92	0	0.01
131432		123.89	126.01	123.89	126.02	0	0.01
131453		123.94	126.07	123.94	126.08	0	0.01
131721		124.28	126.36	124.28	126.36	0	0
132744		125.1	127.12	125.1	127.13	0	0.01
132844	Huffmeister Road - D/S Face	125.13	127.15	125.13	127.16	0	0.01
132955	Huffmeister Road - U/S Face	125.67	127.68	125.67	127.7	0	0.02
132960		125.71	127.72	125.71	127.74	0	0.02
133191		126.16	127.73	126.16	127.74	0	0.01
133211		126.65	127.92	126.65	127.93	0	0.01
133960		128.8	129.85	128.8	129.84	0	-0.01
135006		129.5	130.56	129.5	130.56	0	0

Maximum Flood Stage Reduction (ft) =	**-0.02**	**-0.02**
Maximum Flood Stage Increase (ft) =	**0.08**	**0.06**

Table 3.2

E141-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Stationing (ft)	Description	Phase 3 Analysis 10-Yr Flood Stage (ft-2001 adj.) (1)	Phase 3 Analysis 100-Yr Flood Stage (ft-2001 adj.) (2)	Proposed Condition 10-Yr Flood Stage (ft-2001 adj.) (3)	Proposed Condition 100-Yr Flood Stage (ft-2001 adj.) (4)	10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
400	*- Confluence w/ E100-00-00 -*	93.42	98.00	93.32	97.62	-0.10	-0.38
412		93.42	98.00	93.32	97.62	-0.10	-0.38
547		93.43	98.01	93.33	97.63	-0.10	-0.38
1189		93.52	98.08	93.42	97.70	-0.10	-0.38
1350		93.55	98.08	93.44	97.70	-0.11	-0.38
1526		93.58	98.12	93.48	97.73	-0.10	-0.39
1579		93.62	98.13	93.48	97.74	-0.14	-0.39
1580		93.62	98.13	93.52	97.79	-0.10	-0.34
1616		93.64	98.14	93.54	97.80	-0.10	-0.34
1652	Phillippine St. - D/S Face	93.67	98.16	93.55	97.80	-0.12	-0.36
1706	Phillippine St. - U/S Face	93.83	98.26	93.67	97.89	-0.16	-0.37
1905		94.00	98.38	93.82	98.00	-0.18	-0.38
2300		94.25	98.52	94.10	98.17	-0.15	-0.35
2649		94.51	98.66	94.36	98.32	-0.15	-0.34
3000		94.77	98.82	94.62	98.49	-0.15	-0.33
3200		94.95	98.92	94.78	98.58	-0.17	-0.34
3296		95.02	98.96	94.83	98.61	-0.19	-0.35
3350		95.04	98.98	94.85	98.62	-0.19	-0.36
3351		95.04	98.98	94.87	98.69	-0.17	-0.29
3400		95.05	98.99	94.81	98.65	-0.24	-0.34
3428		95.15	99.03	94.87	98.68	-0.28	-0.35
3448	Mauna Loa - U/S Face	95.22	99.06	94.96	98.73	-0.26	-0.33
3502	Mauna Loa - U/S Face	95.56	99.25	95.27	98.93	-0.29	-0.32
3587		95.80	99.36	95.42	99.00	-0.38	-0.36
3800		96.33	99.64	96.19	99.36	-0.14	-0.28
4000		96.76	99.90	96.72	99.67	-0.04	-0.23
4193		97.15	100.15	97.15	99.96	0.00	-0.19
4400		97.50	100.35	97.56	100.26	0.06	-0.09
4540		97.76	100.55	97.79	100.43	0.03	-0.12
4611		97.94	100.72	97.89	100.52	-0.05	-0.20
4639		98.44	101.26	98.37	101.06	-0.07	-0.20
4644		98.44	101.26	98.37	101.06	-0.07	-0.20
4655	*- Confluence w/ E200-00-00 -*	98.45	101.27	98.37	101.07	-0.08	-0.20
4850		98.47	101.29	98.44	101.13	-0.03	-0.16
4885.8	Windfern Forest Drive - D/S Face	98.49	101.31	98.44	101.12	-0.05	-0.19
4942.7	Windfern Forest Drive - U/S Face	98.63	101.45	98.59	101.27	-0.04	-0.18
4981.4		98.63	101.45	98.60	101.28	-0.03	-0.17
5929.3		98.91	101.69	98.88	101.54	-0.03	-0.15
6953.2		99.42	102.10	99.39	101.97	-0.03	-0.13
7968.8		99.90	102.50	99.88	102.39	-0.02	-0.11
8336.2		100.08	102.66	100.07	102.56	-0.01	-0.10
8453.4	West Road - D/S Face	100.12	102.69	100.10	102.60	-0.02	-0.09
8567.3	West Road - U/S Face	100.16	102.74	100.15	102.64	-0.01	-0.10
8660.8		100.18	102.76	100.17	102.66	-0.01	-0.10
9502.4		100.36	102.93	100.35	102.84	-0.01	-0.09
10422.8		100.60	103.15	100.59	103.07	-0.01	-0.08
11489.3		100.91	103.39	100.90	103.32	-0.01	-0.07
12594.7		101.27	103.67	101.26	103.61	-0.01	-0.06
13589.6		101.71	103.99	101.70	103.94	-0.01	-0.05
14753.6		102.27	104.43	102.26	104.39	-0.01	-0.04
15147		102.46	104.59	102.45	104.55	-0.01	-0.04
				Maximum Flood Stage Reduction (ft) =		**-0.38**	**-0.39**
				Maximum Flood Stage Increase (ft) =		**0.06**	**N/A**

Note: The cumulative channel reach length between the Proposed Condition and Phase 3 Analysis Condition HEC-RAS models differ slightly. Therefore, the flood stage comparison is presented in terms of the Proposed Conditions HEC-RAS model cross sections using a relationship between the two (2) model's cross sections that was developed based upon bridge locations.

Table 3.3

E200-00-00 Peak Flood Stage Comparison

(Phase 3 Analysis vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Phase 3 Analysis*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
5000	*- Confluence w/ E141-00-00 -*	98.61	101.35	98.5	101.14	-0.11	-0.21
5600		99.12	101.73	99.02	101.54	-0.1	-0.19
5775		99.28	101.85	99.18	101.66	-0.1	-0.19
5900		99.39	101.94	99.29	101.75	-0.1	-0.19
6000		99.48	102.01	99.38	101.82	-0.1	-0.19
6400		99.85	102.29	99.76	102.11	-0.09	-0.18
6500		99.94	102.36	99.85	102.19	-0.09	-0.17
6586	BW 8 SB Frontage - D/S Face	100.11	102.53	100.03	102.36	-0.08	-0.17
6650	BW 8 SB Frontage - U/S Face	100.2	102.61	100.11	102.44	-0.09	-0.17
6662		100.21	102.61	100.12	102.44	-0.09	-0.17
6675	BW 8 Mainlanes - D/S Face	100.2	102.6	100.11	102.43	-0.09	-0.17
6800	BW 8 Mainlanes - U/S Face	100.4	102.79	100.31	102.62	-0.09	-0.17
6815		100.41	102.79	100.32	102.62	-0.09	-0.17
6830	BW 8 SB Frontage - D/S Face	100.44	102.83	100.36	102.66	-0.08	-0.17
6883	BW 8 SB Frontage - U/S Face	100.52	102.9	100.44	102.73	-0.08	-0.17
6950		100.53	102.91	100.46	102.75	-0.07	-0.16
7050		100.63	102.98	100.54	102.82	-0.09	-0.16
7200		100.83	103.17	100.67	102.95	-0.16	-0.22
7800		100.94	103.28	100.8	103.07	-0.14	-0.21
8400		101.08	103.4	100.94	103.2	-0.14	-0.2
9000		101.23	103.54	101.11	103.35	-0.12	-0.19
9600		101.4	103.7	101.29	103.52	-0.11	-0.18
10200		101.55	103.81	101.45	103.64	-0.1	-0.17
10800		101.74	103.95	101.64	103.78	-0.1	-0.17
11400		101.95	104.1	101.87	103.93	-0.08	-0.17
12000		102.19	104.27	102.12	104.11	-0.07	-0.16
12200		102.28	104.33	102.21	104.17	-0.07	-0.16
12400	*- Confluence w/ E100-00-00 -*	-	-	102.3	104.23	-	-

Maximum Flood Stage Reduction (ft) =	**-0.16**	**-0.22**
Maximum Flood Stage Increase (ft) =	**N/A**	**N/A**

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	Base Condition		Proposed Condition		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
-3399.7	*- Confluence w/ Buffalo Bayou -*	22.55	29.42	22.49	29.39	-0.06	-0.03
-2855.3		22.72	29.6	22.66	29.57	-0.06	-0.03
-2814.3		22.89	29.81	22.83	29.78	-0.06	-0.03
-1659.7		23.74	30.73	23.68	30.7	-0.06	-0.03
-1428.4		23.78	30.74	23.72	30.71	-0.06	-0.03
-906.5		23.86	30.85	23.8	30.82	-0.06	-0.03
-874.7		24.11	31.1	24.04	31.07	-0.07	-0.03
-643.5		24.46	31.21	24.4	31.18	-0.06	-0.03
-553.5		24.8	31.81	24.74	31.78	-0.06	-0.03
-513		25.03	32.11	24.97	32.08	-0.06	-0.03
-508		25.03	32.11	24.97	32.08	-0.06	-0.03
-442		25.86	32.95	25.79	32.92	-0.07	-0.03
-437		26.19	33.53	26.13	33.49	-0.06	-0.04
-284.5		26.19	33.54	26.13	33.5	-0.06	-0.04
-132		26.14	33.55	26.08	33.51	-0.06	-0.04
20.5		26.16	33.57	26.1	33.53	-0.06	-0.04
173	UPRR - D/S Face	26.14	33.49	26.08	33.46	-0.06	-0.03
210	UPRR - U/S Face	26.48	33.95	26.42	33.91	-0.06	-0.04
365	UPRR - D/S Face	26.77	34.2	26.71	34.16	-0.06	-0.04
400	UPRR - U/S Face	26.98	34.52	26.92	34.49	-0.06	-0.03
654		27.49	34.94	27.42	34.9	-0.07	-0.04
851	Main St. Access - D/S Face	27.32	34.86	27.26	34.82	-0.06	-0.04
984	Main St. Access - U/S Face	27.85	35.26	27.79	35.23	-0.06	-0.03
1319	UPRR - D/S Face	27.87	35.33	27.8	35.29	-0.07	-0.04
1353	UPRR - U/S Face	28.67	35.5	28.59	35.47	-0.08	-0.03
1580		29.2	35.81	29.12	35.78	-0.08	-0.03
2298		29.91	36.06	29.83	36.03	-0.08	-0.03
3585		30.37	36.33	30.29	36.3	-0.08	-0.03
3681		30.42	36.4	30.34	36.37	-0.08	-0.03
3976	UPRR - D/S Face	30.73	36.56	30.65	36.53	-0.08	-0.03
4014	UPRR - U/S Face	31.02	36.84	30.94	36.81	-0.08	-0.03
4407		31.06	36.86	30.98	36.83	-0.08	-0.03
4687	Crockett/Hogan - D/S Face	31.41	37.04	31.33	37.01	-0.08	-0.03
4812	Crockett/Hogan - U/S Face	31.55	37.14	31.48	37.11	-0.07	-0.03
4961	Railroad - D/S Face	31.75	37.27	31.67	37.24	-0.08	-0.03
4994	Railroad - U/S Face	31.94	37.35	31.87	37.32	-0.07	-0.03
5525		32.16	37.54	32.09	37.51	-0.07	-0.03
6068	IH 45 - D/S Face	32.19	37.56	32.11	37.53	-0.08	-0.03
6174	IH 45 - U/S Face	32.23	37.6	32.16	37.57	-0.07	-0.03
6423	IH 45 North Entr. Ramp - D/S Face	32.29	37.63	32.21	37.6	-0.08	-0.03
6473	IH 45 North Entr. Ramp - U/S Face	32.33	37.66	32.25	37.64	-0.08	-0.02
6775		32.44	37.73	32.37	37.71	-0.07	-0.02
6898	IH 10 East Entr. Ramp - D/S Face	32.46	37.75	32.38	37.72	-0.08	-0.03
6975	IH 10 East Entr. Ramp - U/S Face	32.49	37.78	32.41	37.75	-0.08	-0.03
6980		32.49	37.78	32.41	37.75	-0.08	-0.03
7353		32.44	37.75	32.37	37.72	-0.07	-0.03
7529		32.45	37.77	32.37	37.74	-0.08	-0.03
7546		32.48	37.84	32.41	37.81	-0.07	-0.03
7568	Houston - D/S Face	32.47	37.82	32.4	37.79	-0.07	-0.03
7649	Houston - U/S Face	32.51	37.84	32.43	37.81	-0.08	-0.03
8140		32.81	38.06	32.73	38.03	-0.08	-0.03
8532		32.83	38.07	32.76	38.04	-0.07	-0.03
9779		32.75	38	32.67	37.97	-0.08	-0.03
10643		32.67	37.92	32.59	37.89	-0.08	-0.03
10804	Taylor - D/S Face	33.21	38.37	33.13	38.33	-0.08	-0.04
10908	Taylor - U/S Face	33.35	38.39	33.27	38.36	-0.08	-0.03
11021		33.33	38.37	33.25	38.34	-0.08	-0.03
11546		33.33	38.39	33.25	38.35	-0.08	-0.04
12066		33.38	38.4	33.3	38.36	-0.08	-0.04
12698		33.46	38.46	33.38	38.42	-0.08	-0.04
13143	Studemont - D/S Face	33.83	38.74	33.75	38.7	-0.08	-0.04
13220	Studemont - U/S Face	33.9	38.85	33.82	38.81	-0.08	-0.04
13494		33.83	38.78	33.75	38.74	-0.08	-0.04

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
13898	UPRR - D/S Face	33.98	38.88	33.9	38.84	-0.08	-0.04
13924	UPRR - U/S Face	34.28	39.16	34.21	39.12	-0.07	-0.04
14354		34.79	39.72	34.72	39.67	-0.07	-0.05
14532	IH 10 Access Road - D/S Face	34.53	39.44	34.46	39.4	-0.07	-0.04
14590	IH 10 Access Road - U/S Face	34.66	39.91	34.59	39.86	-0.07	-0.05
14897	IH 10 Access Road - D/S Face	35.2	40.4	35.13	40.34	-0.07	-0.06
14977	IH 10 Access Road - U/S Face	36.02	40.8	35.95	40.73	-0.07	-0.07
15278		35.99	40.76	35.92	40.69	-0.07	-0.07
15795		36.62	41.34	36.54	41.27	-0.08	-0.07
16831		36.66	41.39	36.58	41.32	-0.08	-0.07
17318		36.58	41.25	36.51	41.18	-0.07	-0.07
17597	S. Heights - D/S Face	36.99	41.7	36.92	41.63	-0.07	-0.07
17756	S. Heights - U/S Face	38.28	44.05	38.18	43.95	-0.1	-0.1
17905		38.37	44.05	38.27	43.95	-0.1	-0.1
18082	Yale - D/S Face	38.44	44.06	38.34	43.97	-0.1	-0.09
18176	Yale - U/S Face	39.26	45.83	39.14	45.71	-0.12	-0.12
18199	UPRR - D/S Face	39.68	46.11	39.56	45.99	-0.12	-0.12
18234	UPRR - U/S Face	41.35	48.7	41.2	48.55	-0.15	-0.15
18377		41.23	48.63	41.08	48.47	-0.15	-0.16
19463		41.69	48.83	41.54	48.67	-0.15	-0.16
19917		41.93	48.91	41.79	48.76	-0.14	-0.15
20521		42.34	49.32	42.2	49.17	-0.14	-0.15
20622		42.42	49.4	42.28	49.25	-0.14	-0.15
20644		42.51	49.51	42.38	49.36	-0.13	-0.15
20746		42.51	49.5	42.38	49.34	-0.13	-0.16
21444		42.98	49.77	42.85	49.62	-0.13	-0.15
22224		43.82	50.16	43.7	50.02	-0.12	-0.14
22610		43.77	50.12	43.64	49.98	-0.13	-0.14
22758	Shepherd - D/S Face	43.77	50.09	43.65	49.95	-0.12	-0.14
22834	Shepherd - U/S Face	43.99	50.4	43.87	50.28	-0.12	-0.12
22983		44.15	50.67	44.02	50.55	-0.13	-0.12
23180		44.47	50.76	44.34	50.64	-0.13	-0.12
23444	Durham - D/S Face	44.72	50.8	44.6	50.68	-0.12	-0.12
23550	Durham - U/S Face	44.93	50.93	44.8	50.81	-0.13	-0.12
23934		45.07	51.04	44.95	50.92	-0.12	-0.12
24636		45.43	51.32	45.31	51.2	-0.12	-0.12
24758	UPRR - D/S Face	45.4	51.21	45.28	51.09	-0.12	-0.12
24817	UPRR - U/S Face	45.96	51.45	45.83	51.33	-0.13	-0.12
25132		46.38	51.76	46.25	51.64	-0.13	-0.12
25536		46.54	51.91	46.42	51.78	-0.12	-0.13
26140		46.84	52.1	46.72	51.97	-0.12	-0.13
26366	T.C. Jester - D/S Face	46.94	52.08	46.81	51.96	-0.13	-0.12
26498	T.C. Jester - U/S Face	47.08	52.76	46.94	52.63	-0.14	-0.13
26598		47.11	52.99	46.98	52.85	-0.13	-0.14
27429		47.47	53.22	47.34	53.08	-0.13	-0.14
27982		47.73	53.37	47.59	53.24	-0.14	-0.13
28113	W. 11th - D/S Face	47.86	53.39	47.73	53.25	-0.13	-0.14
28190	W. 11th - U/S Face	48.05	53.74	47.89	53.64	-0.16	-0.1
28330	Bicycle Bridge - D/S Face	48.14	54.03	47.99	53.93	-0.15	-0.1
28375	Bicycle Bridge - U/S Face	48.26	54.06	48.1	53.96	-0.16	-0.1
28775		48.74	54.34	48.59	54.24	-0.15	-0.1
29203	T.C. Jester - D/S Face	48.8	54.28	48.64	54.19	-0.16	-0.09
29368	T.C. Jester - U/S Face	49.48	54.69	49.28	54.59	-0.2	-0.1
29659		50	55.17	49.8	55.08	-0.2	-0.09
30779		50.37	55.27	50.17	55.19	-0.2	-0.08
31583		50.62	55.42	50.44	55.33	-0.18	-0.09
32570		51	55.56	50.82	55.48	-0.18	-0.08
33357		51.39	55.83	51.21	55.75	-0.18	-0.08
33610	W. 18th - D/S Face	51.5	55.85	51.33	55.77	-0.17	-0.08
33681	W. 18th - U/S Face	51.66	56.55	51.48	56.47	-0.18	-0.08
33770		52.3	57.21	52.13	57.14	-0.17	-0.07
34206		52.17	57.12	52	57.05	-0.17	-0.07
34645		52.42	57.27	52.25	57.19	-0.17	-0.08

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition*		*Proposed Condition*		10-Yr Flood Stage *Difference* (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	*100-Yr Flood* Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
34895	Ella - D/S Face	52.53	57.3	52.36	57.22	-0.17	-0.08
35006	Ella - U/S Face	52.81	57.64	52.6	57.58	-0.21	-0.06
35158		52.99	57.74	52.78	57.68	-0.21	-0.06
35718		53.21	57.77	53.01	57.71	-0.2	-0.06
36134		53.64	58.17	53.43	58.11	-0.21	-0.06
36296		53.74	58.4	53.54	58.34	-0.2	-0.06
36318		53.77	58.43	53.57	58.37	-0.2	-0.06
36505		53.83	58.52	53.63	58.46	-0.2	-0.06
36870		53.97	58.47	53.78	58.41	-0.19	-0.06
37857		54.43	58.99	54.24	58.94	-0.19	-0.05
38877		54.96	59.41	54.78	59.35	-0.18	-0.06
39017	Loop 610 - D/S Face	55.05	59.44	54.87	59.39	-0.18	-0.05
39419	Loop 610 - U/S Face	55.53	60.16	55.36	60.1	-0.17	-0.06
39567		55.62	60.36	55.44	60.3	-0.18	-0.06
40384		56.41	60.87	56.24	60.82	-0.17	-0.05
41337		56.92	61	56.78	60.95	-0.14	-0.05
42356		57.48	61.31	57.35	61.26	-0.13	-0.05
42555	W. 34th - D/S Face	57.53	61.32	57.4	61.27	-0.13	-0.05
42650	W. 34th - U/S Face	57.79	62.1	57.64	62.07	-0.15	-0.03
42932		58.15	62.6	57.99	62.56	-0.16	-0.04
43276	T.C. Jester - D/S Face	58.27	62.52	58.12	62.49	-0.15	-0.03
43420	T.C. Jester - U/S Face	60.08	62.57	59.88	62.53	-0.2	-0.04
43626		60.29	62.95	60.08	62.92	-0.21	-0.03
44372		60.76	63.26	60.57	63.23	-0.19	-0.03
44556		60.82	63.3	60.64	63.27	-0.18	-0.03
44688		60.89	63.34	60.7	63.31	-0.19	-0.03
44711		61.03	63.51	60.85	63.48	-0.18	-0.03
44945	BNRR - D/S Face	61.21	63.71	61.03	63.68	-0.18	-0.03
44983	BNRR - U/S Face	61.55	63.99	61.37	63.95	-0.18	-0.04
45120		61.65	64.24	61.47	64.2	-0.18	-0.04
46096		62.09	64.78	61.92	64.73	-0.17	-0.05
46827		62.67	65.32	62.51	65.29	-0.16	-0.03
47857		63.01	65.68	62.86	65.63	-0.15	-0.05
48942		63.28	65.84	63.14	65.79	-0.14	-0.05
49281		63.37	65.98	63.23	65.92	-0.14	-0.06
49437		63.5	66.1	63.36	66.04	-0.14	-0.06
49457		63.62	66.2	63.47	66.13	-0.15	-0.07
49564		63.63	66.19	63.49	66.12	-0.14	-0.07
49824		63.71	66.26	63.56	66.19	-0.15	-0.07
50694		64.23	66.85	64.1	66.77	-0.13	-0.08
50808	W. 43rd - D/S Face	64.08	66.62	63.95	66.54	-0.13	-0.08
50921	W. 43rd - U/S Face	64.23	67.16	64.1	67.02	-0.13	-0.14
51021		64.41	67.53	64.28	67.36	-0.13	-0.17
51777		64.62	67.68	64.5	67.5	-0.12	-0.18
52589		64.82	67.83	64.7	67.65	-0.12	-0.18
52722	Bicycle Bridge - D/S Face	64.83	67.84	64.72	67.65	-0.11	-0.19
52760	Bicycle Bridge - U/S Face	64.87	67.99	64.77	67.79	-0.1	-0.2
52833		65.01	68.11	64.9	67.91	-0.11	-0.2
53116		65.07	68.16	64.96	67.96	-0.11	-0.2
53282	Mangum - D/S Face	65.12	68.15	65.02	67.95	-0.1	-0.2
53459	Mangum - U/S Face	65.18	68.43	65.08	68.16	-0.1	-0.27
53642		65.3	68.54	65.2	68.28	-0.1	-0.26
53664		65.39	68.65	65.29	68.37	-0.1	-0.28
53766		65.43	68.71	65.34	68.42	-0.09	-0.29
54053		65.55	68.86	65.46	68.57	-0.09	-0.29
54398		65.78	69.05	65.69	68.75	-0.09	-0.3
54545	Pinemont - D/S Face	65.79	69.01	65.71	68.72	-0.08	-0.29
54667	Pinemont - U/S Face	65.91	69.64	65.82	69.29	-0.09	-0.35
54895		66.03	69.84	65.94	69.48	-0.09	-0.36
55059	Creekmont Dr - D/S Face	66.08	69.81	65.99	69.47	-0.09	-0.34
55112	Creekmont Dr - U/S Face	66.59	70.03	66.51	69.68	-0.08	-0.35
55190		66.65	70.13	66.56	69.77	-0.09	-0.36
55757		66.93	70.39	66.85	70.05	-0.08	-0.34

Table 3.4
E100-00-00 Peak Flood Stage Comparison
(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition* 10-Yr Flood Stage (ft-2001 adj.) (1)	*Base Condition* 100-Yr Flood Stage (ft-2001 adj.) (2)	*Proposed Condition* 10-Yr Flood Stage (ft-2001 adj.) (3)	*Proposed Condition* 100-Yr Flood Stage (ft-2001 adj.) (4)	10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
56231		67.3	70.92	67.23	70.52	-0.07	-0.4
56239	*- Confluence w/ E117-00-00 -*	67.29	70.91	67.21	70.51	-0.08	-0.4
56486		67.43	71.06	67.35	70.67	-0.08	-0.39
56621	Tidwell - D/S Face	67.74	71.17	67.67	70.83	-0.07	-0.34
56811	Tidwell - U/S Face	68.05	71.8	67.99	71.48	-0.06	-0.32
57015		68.04	71.84	67.97	71.53	-0.07	-0.31
57918		68.6	72.12	68.54	71.85	-0.06	-0.27
58797		69.25	72.73	69.05	72.33	-0.2	-0.4
59972		69.22	72.71	68.78	72.07	-0.44	-0.64
60759		70.23	73.57	69.66	72.88	-0.57	-0.69
61936		70.33	73.62	69.5	72.65	-0.83	-0.97
62890		70.58	73.83	69.81	72.93	-0.77	-0.9
63780		70.83	73.96	70.11	73.15	-0.72	-0.81
65068		71.54	74.57	71	73.97	-0.54	-0.6
65268		71.75	74.86	71.2	74.29	-0.55	-0.57
65401		71.85	75.2	71.27	74.71	-0.58	-0.49
65422		71.87	75.41	71.31	74.94	-0.56	-0.47
65425	W. Little York - D/S Face	72.15	75.37	71.62	74.91	-0.53	-0.46
65504	W. Little York - U/S Face	72.37	75.51	71.83	75.18	-0.54	-0.33
65650		72.34	75.69	71.79	75.34	-0.55	-0.35
65878		72.41	75.68	71.86	75.28	-0.55	-0.4
66480		73.07	76.18	72.52	75.98	-0.55	-0.2
66585	Antoine - D/S Face	73.25	76.23	72.69	76.07	-0.56	-0.16
66695	Antoine - U/S Face	73.44	76.61	72.83	76.53	-0.61	-0.08
66806		73.38	76.69	72.77	76.59	-0.61	-0.1
66832		73.43	76.87	72.82	76.78	-0.61	-0.09
67095		73.63	77.03	73.01	76.95	-0.62	-0.08
67246	Victory - D/S Face	73.96	77.12	73.35	77.04	-0.61	-0.08
67364	Victory - U/S Face	74.33	77.33	73.51	77.26	-0.82	-0.07
67624		74.54	77.32	73.74	77.25	-0.8	-0.07
68398		75.54	78.05	74.76	78	-0.78	-0.05
68503		75.46	77.97	74.75	77.92	-0.71	-0.05
68533		75.69	78.18	74.98	78.13	-0.71	-0.05
68633		76.09	78.63	75.27	78.58	-0.82	-0.05
69408		76.55	78.84	75.87	78.8	-0.68	-0.04
70166		76.87	79.02	76.3	78.98	-0.57	-0.04
70266	Alabonson - D/S Face	76.93	79.04	76.38	79	-0.55	-0.04
70347	Alabonson - U/S Face	77.44	79.2	76.82	79.16	-0.62	-0.04
70450		77.51	79.26	76.89	79.22	-0.62	-0.04
70472		77.53	79.37	76.93	79.33	-0.6	-0.04
70642		77.79	79.54	77.22	79.5	-0.57	-0.04
71493		78.17	79.74	77.7	79.71	-0.47	-0.03
72828		78.32	79.6	77.94	79.58	-0.38	-0.02
72908		78.41	79.71	78.05	79.67	-0.36	-0.04
72931		78.47	79.81	78.1	79.77	-0.37	-0.04
72965	BNRR - D/S Face	78.46	79.78	78.09	79.75	-0.37	-0.03
72999	BNRR - U/S Face	78.56	80.18	78.18	80.13	-0.38	-0.05
73083		78.57	80.33	78.18	80.27	-0.39	-0.06
74115		79.27	81.3	78.82	81.25	-0.45	-0.05
75102		79.37	81.41	78.91	81.36	-0.46	-0.05
75698		79.22	81.02	78.81	80.97	-0.41	-0.05
75927	N. Houston Rosslyn - D/S Face	79.66	81.66	79.22	81.61	-0.44	-0.05
76041	N. Houston Rosslyn - U/S Face	80.85	83.52	80.31	83.47	-0.54	-0.05
76222		81.01	83.61	80.46	83.56	-0.55	-0.05
77129		82.09	84.98	81.48	84.93	-0.61	-0.05
77333		82.26	85.16	81.72	85.11	-0.54	-0.05
77436		82.26	85.16	81.72	85.09	-0.54	-0.07
77447		82.27	85.17	81.61	85.02	-0.66	-0.15
77625		82.27	85.64	81.74	85.43	-0.53	-0.21
78804		84.61	86.12	82.73	85.89	-1.88	-0.23
79500		85.67	86.74	83.31	86.51	-2.36	-0.23
79748		86	86.94	83.55	86.7	-2.45	-0.24
80000		86.23	87.11	83.73	86.84	-2.5	-0.27

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
80250		86.39	87.25	83.94	86.98	-2.45	-0.27
80547		86.28	86.82	84.18	86.73	-2.1	-0.09
80800		86.75	88.08	84.38	87.48	-2.37	-0.6
81638		87.84	88.74	85.06	88.26	-2.78	-0.48
82633		88.47	89.25	85.74	88.74	-2.73	-0.51
83815		89.61	90.12	86.56	89.68	-3.05	-0.44
84548		89.78	90.48	87.07	89.94	-2.71	-0.54
84692	Golf Cart Bridge - D/S Face	90.65	91.01	87.17	90.05	-3.48	-0.96
84716	Golf Cart Bridge - U/S Face	90.74	91.15	87.2	90.25	-3.54	-0.9
84932		90.84	91.28	87.37	90.57	-3.47	-0.71
85100		90.94	91.42	87.48	90.85	-3.46	-0.57
85400		91.51	92.21	87.85	91.38	-3.66	-0.83
85749		91.7	92.46	88.11	91.65	-3.59	-0.81
85900		91.79	92.56	88.15	91.69	-3.64	-0.87
86185		91.93	92.77	88.23	91.78	-3.7	-0.99
86400		92.04	92.86	88.35	91.87	-3.69	-0.99
86621		92.08	92.92	88.4	91.92	-3.68	-1
86898		92.15	93	88.47	91.99	-3.68	-1.01
87171		92.13	93.02	88.61	92.07	-3.52	-0.95
87390	Fairbanks N. Houston - D/S Face	92.22	93.09	88.81	92.18	-3.41	-0.91
87508	Fairbanks N. Houston - U/S Face	92.73	93.58	88.92	92.57	-3.81	-1.01
87610		93.15	94	88.95	92.83	-4.2	-1.17
88972		93.81	94.77	89.77	93.65	-4.04	-1.12
90490		94.63	95.65	90.67	94.7	-3.96	-0.95
91339		95.1	96.1	91.17	95.25	-3.93	-0.85
91823		95.3	96.31	91.45	95.42	-3.85	-0.89
91923	Winfern - D/S Face	95.33	96.31	91.59	95.46	-3.74	-0.85
91972	Winfern - U/S Face	95.91	96.79	91.7	96.54	-4.21	-0.25
92147		95.96	96.82	91.98	96.58	-3.98	-0.24
92244		95.91	96.73	91.95	96.53	-3.96	-0.2
92302		95.91	96.74	91.99	96.56	-3.92	-0.18
92399		95.96	96.81	92.07	96.59	-3.89	-0.22
92499		96.07	96.97	92.19	96.65	-3.88	-0.32
92569		96.06	97	92.19	96.62	-3.87	-0.38
92851		96.22	97.24	92.37	96.84	-3.85	-0.4
93320		96.54	97.73	92.62	97.07	-3.92	-0.66
93419	Gessner - D/S Face	96.67	97.84	92.68	97.09	-3.99	-0.75
93534	Gessner - U/S Face	96.82	98.18	92.86	97.35	-3.96	-0.83
93630		97.06	98.54	93.32	97.97	-3.74	-0.57
93700	*- Confluence w/ E141-00-00 -*	97.09	98.57	93.41	97.99	-3.68	-0.58
93904		97.17	98.65	93.43	98.01	-3.74	-0.64
94068		97.07	98.52	93.5	98.07	-3.57	-0.45
94258		97.27	98.76	93.5	98.08	-3.77	-0.68
94401		97.4	98.91	93.51	98.09	-3.89	-0.82
95013		97.86	99.37	93.57	98.16	-4.29	-1.21
95629		98.03	99.58	93.63	98.2	-4.4	-1.38
95998		98.14	99.73	93.71	98.29	-4.43	-1.44
96077		98.2	99.81	93.65	98.24	-4.55	-1.57
96176	S.H. Tollway NB Feeder - D/S Face	98.24	99.84	93.7	98.28	-4.54	-1.56
96244	S.H. Tollway NB Feeder - U/S Face	98.88	99.93	94.35	98.92	-4.53	-1.01
96298	SH Tollway Mainlanes - D/S Face	98.97	100.07	94.46	99	-4.51	-1.07
96459	SH Tollway Mainlanes - U/S Face	99.11	100.31	94.6	99.12	-4.51	-1.19
96514	S.H. Tollway SB Feeder - D/S Face	99.16	100.39	94.68	99.17	-4.48	-1.22
96586	S.H. Tollway SB Feeder - U/S Face	99.21	100.6	94.72	99.22	-4.49	-1.38
96688		99.25	100.66	94.74	99.25	-4.51	-1.41
97054		99.35	100.92	94.82	99.34	-4.53	-1.58
97445		99.68	101.33	95.08	99.64	-4.6	-1.69
97546	Equador Dr. - D/S Face	99.65	101.31	95.13	99.61	-4.52	-1.7
97571	Equador Dr. - U/S Face	99.87	101.56	95.45	99.82	-4.42	-1.74
97673		100.24	101.77	95.63	100.14	-4.61	-1.63
98564		100.84	102.19	97.02	100.74	-3.82	-1.45
99044		101.14	102.41	97.61	101.02	-3.53	-1.39
99154	Lakeview - D/S Face	101.3	102.54	97.99	101.19	-3.31	-1.35

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
99202	Lakeview - U/S Face	101.42	102.78	98.06	101.31	-3.36	-1.47
99304		101.48	102.83	98.16	101.37	-3.32	-1.46
99963		101.88	103.23	98.73	101.76	-3.15	-1.47
100723		102.38	103.77	99.41	102.24	-2.97	-1.53
101172		102.98	104.35	99.97	102.82	-3.01	-1.53
101274	Tahoe - D/S Face	103	104.35	100.04	102.83	-2.96	-1.52
101325	Tahoe - U/S Face	103.16	104.52	100.13	102.95	-3.03	-1.57
101430		103.19	104.55	100.22	102.98	-2.97	-1.57
102317		103.68	104.92	100.82	103.36	-2.86	-1.56
103364		104.26	105.35	101.49	103.85	-2.77	-1.5
104527		104.84	105.78	102.21	104.4	-2.63	-1.38
104902		105.23	106.36	102.51	104.73	-2.72	-1.63
104977		105.26	106.4	102.53	104.76	-2.73	-1.64
105052		105.3	106.43	102.55	104.78	-2.75	-1.65
105640	*- Confluence w/ E200-00-00 -*	105.58	106.66	102.72	104.94	-2.86	-1.72
106727		106.08	107.21	103.64	105.9	-2.44	-1.31
107598		106.54	107.75	104.43	106.63	-2.11	-1.12
108221		107.02	108.29	105.24	107.33	-1.78	-0.96
108323		107.12	108.39	105.4	107.47	-1.72	-0.92
108354		107.25	108.71	105.48	107.7	-1.77	-1.01
108454		107.52	109.04	105.8	108.03	-1.72	-1.01
109208		108.07	109.54	106.66	108.78	-1.41	-0.76
110243		109.54	110.97	108.27	110.41	-1.27	-0.56
110346	West Road - D/S Face	109.66	111.02	108.42	110.49	-1.24	-0.53
110454	West Road - U/S Face	109.87	111.69	108.58	111.02	-1.29	-0.67
110549		109.94	111.87	108.66	111.21	-1.28	-0.66
110813		110.19	112.01	108.91	111.41	-1.28	-0.6
111409		110.62	112.24	109.43	111.72	-1.19	-0.52
111699		110.86	112.46	109.68	111.96	-1.18	-0.5
111799	Rio Grande - D/S Face	110.9	112.45	109.73	111.95	-1.17	-0.5
111861	Rio Grande - U/S Face	111.42	113.09	110.04	112.82	-1.38	-0.27
111983		111.57	113.22	110.14	112.95	-1.43	-0.27
112547		111.89	113.46	110.48	113.2	-1.41	-0.26
113080		112.2	113.73	110.82	113.47	-1.38	-0.26
113539		112.47	114.01	111.07	113.75	-1.4	-0.26
113632	HL&P Bridge - D/S Face	112.5	114.05	111.1	113.79	-1.4	-0.26
113668	HL&P Bridge - U/S Face	112.86	114.29	111.21	114.05	-1.65	-0.24
113821		113.11	114.48	111.41	114.28	-1.7	-0.2
114246		113.37	114.66	111.66	114.48	-1.71	-0.18
114948		113.39	114.67	111.69	114.48	-1.7	-0.19
115807		113.64	115	111.94	114.8	-1.7	-0.2
116374		114.3	115.78	112.62	115.57	-1.68	-0.21
116453		114.4	115.87	112.72	115.67	-1.68	-0.2
116549	Jones Road - D/S Face	114.48	115.93	112.82	115.73	-1.66	-0.2
116659	Jones Road - U/S Face	115.41	117.2	113.08	116.98	-2.33	-0.22
116759		115.54	117.26	113.19	117.03	-2.35	-0.23
117779		116.37	117.92	114.74	117.78	-1.63	-0.14
118660		117.16	118.61	115.88	118.5	-1.28	-0.11
118910		117.41	118.83	116.14	118.7	-1.27	-0.13
119390		117.67	119.05	116.69	118.93	-0.98	-0.12
120253		118.15	119.65	117.48	119.55	-0.67	-0.1
121010		118.65	120.13	118.23	120.04	-0.42	-0.09
121745		118.98	120.61	118.66	120.51	-0.32	-0.1
122396		119.13	120.82	118.83	120.73	-0.3	-0.09
122498	FM 1960 - D/S Face	119.15	120.84	118.86	120.75	-0.29	-0.09
122616	FM 1960 - U/S Face	119.34	121.15	119.09	121.06	-0.25	-0.09
122719		119.44	121.3	119.21	121.2	-0.23	-0.1
123541		119.71	121.66	119.51	121.58	-0.2	-0.08
124344		119.91	121.91	119.73	121.84	-0.18	-0.07
124809		120.1	122.16	119.94	122.1	-0.16	-0.06
124931		120.14	122.22	119.99	122.16	-0.15	-0.06
124956		120.19	122.33	120.03	122.28	-0.16	-0.05
125059		120.25	122.4	120.09	122.34	-0.16	-0.06

Table 3.4

E100-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Station (ft)	Description	*Base Condition*		*Proposed Condition*		10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
		10-Yr Flood Stage (ft-2001 adj.) (1)	100-Yr Flood Stage (ft-2001 adj.) (2)	10-Yr Flood Stage (ft-2001 adj.) (3)	100-Yr Flood Stage (ft-2001 adj.) (4)		
125237		120.34	122.51	120.2	122.46	-0.14	-0.05
125344	N. Eldridge - D/S Face	120.44	122.62	120.31	122.58	-0.13	-0.04
125461	N. Eldridge - U/S Face	120.53	122.72	120.4	122.68	-0.13	-0.04
125563		120.58	122.78	120.45	122.74	-0.13	-0.04
126183		120.85	123.08	120.74	123.05	-0.11	-0.03
127300		121.38	123.68	121.3	123.65	-0.08	-0.03
128236		121.76	124.08	121.7	124.07	-0.06	-0.01
128540	Wortham - D/S Face	121.88	124.21	121.82	124.2	-0.06	-0.01
128646	Wortham - U/S Face	121.95	124.29	121.89	124.28	-0.06	-0.01
128748		122.05	124.42	122	124.41	-0.05	-0.01
129818		122.62	124.94	122.59	124.94	-0.03	0
130861		123.3	125.55	123.28	125.55	-0.02	0
131331		123.77	125.92	123.76	125.92	-0.01	0
131432		123.9	126.02	123.89	126.02	-0.01	0
131453		123.96	126.08	123.94	126.08	-0.02	0
131721		124.29	126.36	124.28	126.36	-0.01	0
132744		125.1	127.13	125.1	127.13	0	0
132844	Huffmeister Road - D/S Face	125.13	127.15	125.13	127.16	0	0.01
132955	Huffmeister Road - U/S Face	125.68	127.69	125.67	127.7	-0.01	0.01
132960		125.71	127.73	125.71	127.74	0	0.01
133191		126.16	127.73	126.16	127.74	0	0.01
133211		126.65	127.92	126.65	127.93	0	0.01
133960		128.79	129.85	128.8	129.84	0.01	-0.01
135006		129.49	130.56	129.5	130.56	0.01	0
					Maximum Flood Stage Reduction (ft) =	**-4.61**	**-1.74**
					Maximum Flood Stage Increase (ft) =	**0.01**	**0.01**

Table 3.5

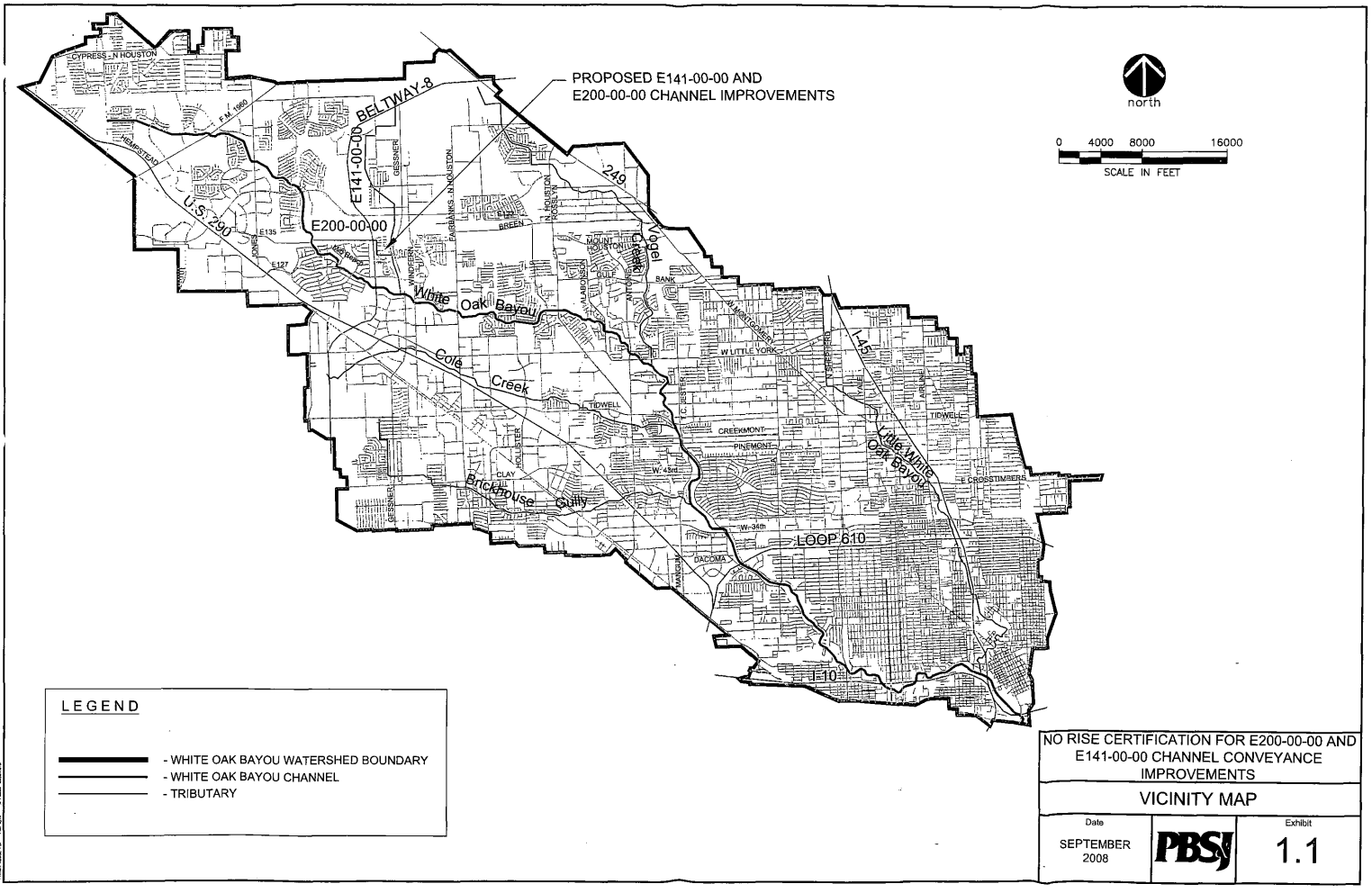
E141-00-00 Peak Flood Stage Comparison

(Base vs. Proposed Condition)

HEC-RAS Stationing (Prop) (ft)	Description	*Base Condition* 10-Yr Flood Stage (ft-2001 adj.) (1)	*Base Condition* 100-Yr Flood Stage (ft-2001 adj.) (2)	*Proposed Condition* 10-Yr Flood Stage (ft-2001 adj.) (3)	*Proposed Condition* 100-Yr Flood Stage (ft-2001 adj.) (4)	10-Yr Flood Stage Difference (ft-2001 adj.) (3) - (1)	100-Yr Flood Stage Difference (ft-2001 adj.) (4) - (2)
400	*- Confluence w/ E100-00-00 -*	95.89	98.59	93.32	97.62	-2.57	-0.95
412		96.24	98.59	93.32	97.62	-2.92	-0.96
547		97.10	98.58	93.33	97.63	-3.77	-0.95
1189		97.10	98.59	93.42	97.7	-3.68	-0.90
1350		97.09	98.54	93.44	97.7	-3.65	-0.85
1526		97.12	98.62	93.48	97.73	-3.64	-0.85
1579		97.01	98.56	93.48	97.74	-3.53	-0.88
1580		97.00	98.55	93.52	97.79	-3.48	-0.86
1616		97.00	98.55	93.54	97.8	-3.46	-1.27
1652	Phillippine St. - D/S Face	97.19	98.67	93.55	97.8	-3.64	-1.69
1706	Phillippine St. - U/S Face	97.85	99.06	93.67	97.89	-4.18	-1.91
1905		98.09	99.50	93.82	98	-4.27	-2.14
2300		98.23	99.77	94.1	98.17	-4.13	-2.02
2649		98.27	99.81	94.36	98.32	-3.91	-2.66
3000		98.34	99.96	94.62	98.49	-3.72	-2.56
3200		98.40	100.05	94.78	98.58	-3.62	-2.83
3296		98.43	100.10	94.83	98.61	-3.60	-3.05
3350		98.45	100.13	94.85	98.62	-3.60	-3.04
3351		98.45	100.13	94.87	98.69	-3.58	-2.99
3400		98.41	100.09	94.81	98.65	-3.60	-3.04
3428		98.41	100.10	94.87	98.68	-3.54	-3.23
3448	Mauna Loa - U/S Face	98.52	100.21	94.96	98.73	-3.56	-3.55
3502	Mauna Loa - U/S Face	99.25	100.96	95.27	98.93	-3.98	-3.72
3587		99.30	101.05	95.42	99	-3.88	-3.80
3800		99.39	101.20	96.19	99.36	-3.20	-3.48
4000		99.47	101.31	96.72	99.67	-2.75	-3.21
4193		99.54	101.41	97.15	99.96	-2.39	-2.94
4400		99.60	101.50	97.56	100.26	-2.04	-2.80
4540		99.64	101.56	97.79	100.43	-1.85	-2.84
4611		99.65	101.58	97.89	100.52	-1.76	-2.98
4639		99.68	101.63	98.37	101.06	-1.31	-2.70
4644		99.68	101.63	98.37	101.06	-1.31	-3.01
4655	*- Confluence w/ E200-00-00 -*	99.69	101.64	98.37	101.07	-1.32	-3.42
4850		99.70	101.66	98.44	101.13	-1.26	-3.51
4885.8	Windfern Forest Drive - D/S Face	99.70	101.66	98.44	101.12	-1.26	-0.54
4942.7	Windfern Forest Drive - U/S Face	99.71	101.68	98.59	101.27	-1.12	-0.41
4981.4		99.71	101.69	98.6	101.28	-1.11	-0.41
5929.3		99.88	101.91	98.88	101.54	-1.00	-0.37
6953.2		100.19	102.28	99.39	101.97	-0.80	-0.31
7968.8		100.52	102.65	99.88	102.39	-0.64	-0.26
8336.2		100.65	102.80	100.07	102.56	-0.58	-0.24
8453.4	West Road - D/S Face	100.68	102.84	100.1	102.6	-0.58	-0.24
8567.3	West Road - U/S Face	100.71	102.88	100.15	102.64	-0.56	-0.24
8660.8		100.73	102.90	100.17	102.66	-0.56	-0.24
9502.4		100.87	103.06	100.35	102.84	-0.52	-0.22
10422.8		101.05	103.27	100.59	103.07	-0.46	-0.20
11489.3		101.29	103.50	100.9	103.32	-0.39	-0.18
12594.7		101.58	103.76	101.26	103.61	-0.32	-0.15
13589.6		101.94	104.07	101.7	103.94	-0.24	-0.13
14753.6		102.42	104.49	102.26	104.39	-0.16	-0.10
15147		102.59	104.64	102.45	104.55	-0.14	-0.09

Maximum Flood Stage Reduction (ft) =	-4.27	-3.80
Maximum Flood Stage Increase (ft) =	N/A	N/A

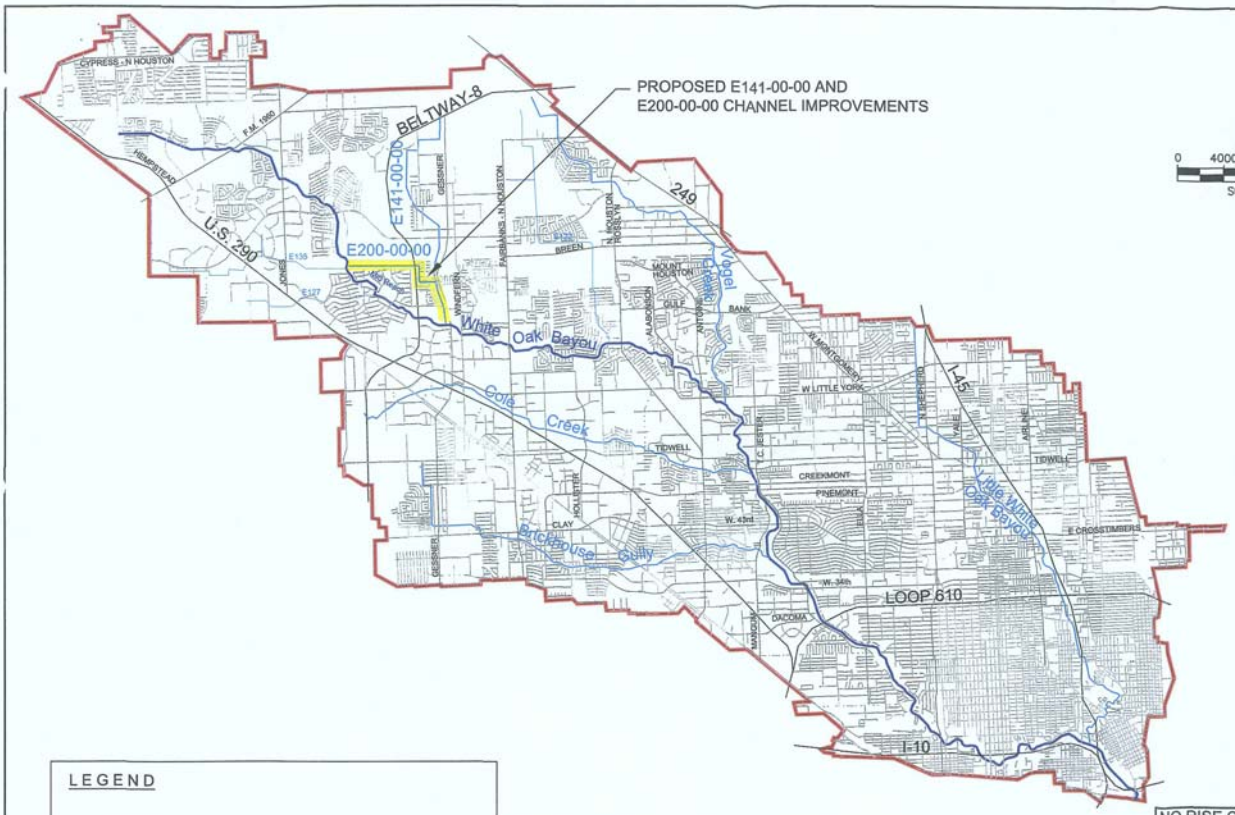
Note: The cumulative channel reach length between the Base Condition and Proposed Condition HEC-RAS models differ slightly due to realignment of E141-00-00 under Proposed Conditions. Therefore, the flood stage comparison is presented in terms of the Proposed Conditions HEC-RAS model cross sections using a relationship between the two (2) model's cross sections that was developed based upon bridge locations.



NO RISE CERTIFICATION FOR E200-00-00 AND E141-00-00 CHANNEL CONVEYANCE IMPROVEMENTS

VICINITY MAP

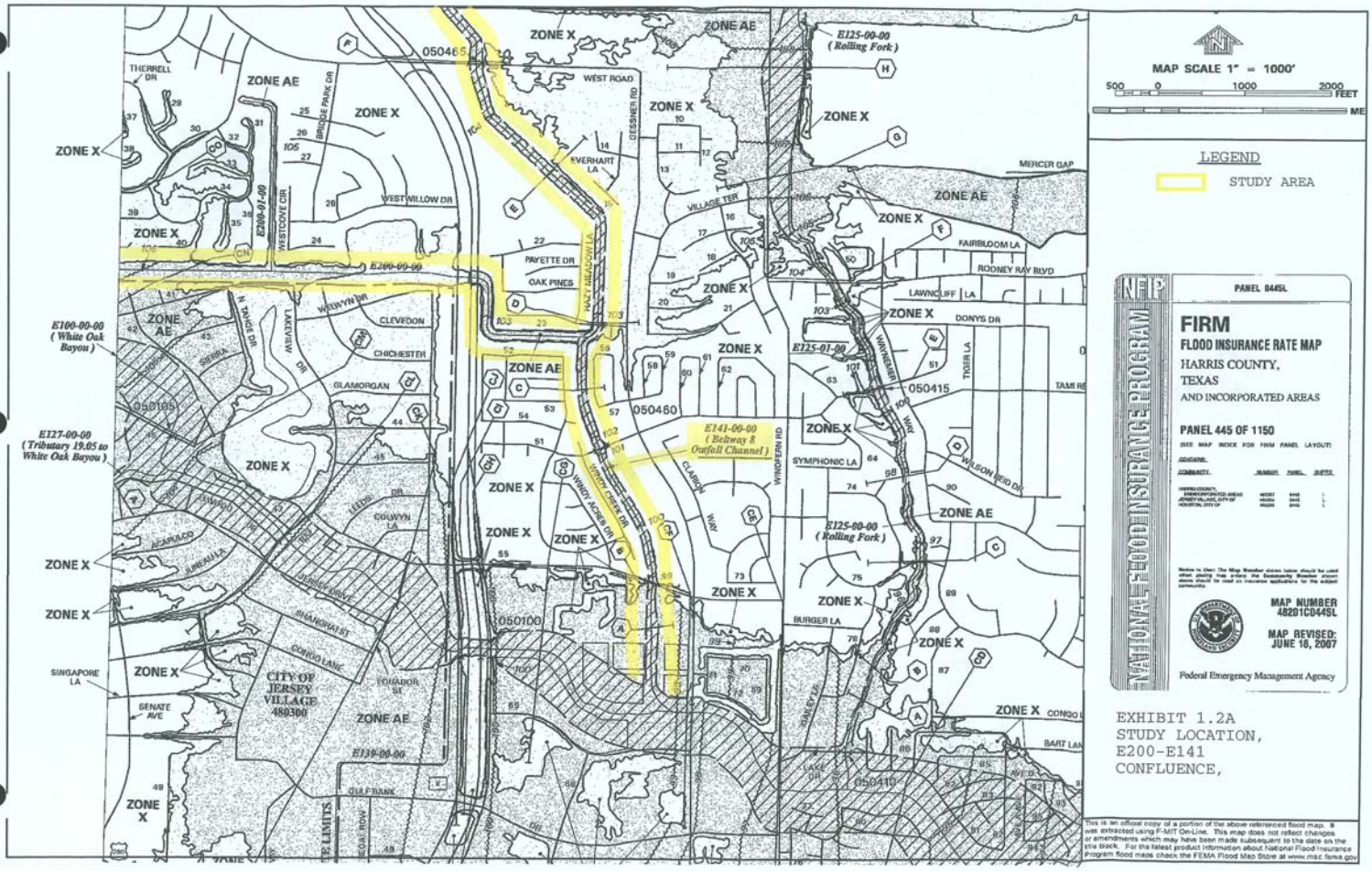
Date		Exhibit
SEPTEMBER 2008	PBSJ	1.1



NO RISE CERTIFICATION FOR E200-00-00 AND E141-00-00 CHANNEL CONVEYANCE IMPROVEMENTS

VICINITY MAP

Date		Exhibit
SEPTEMBER 2008	PBSJ	1.1



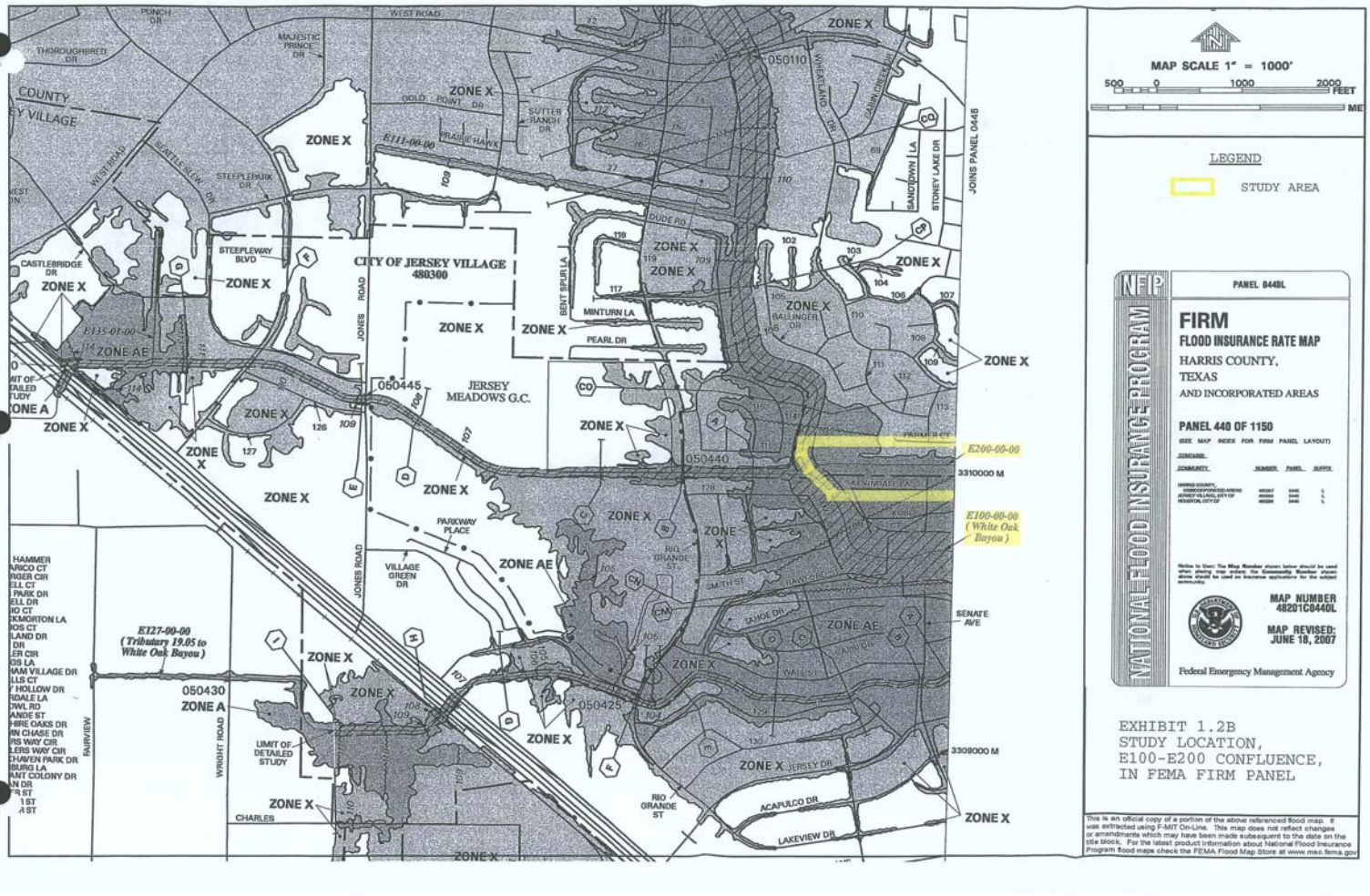
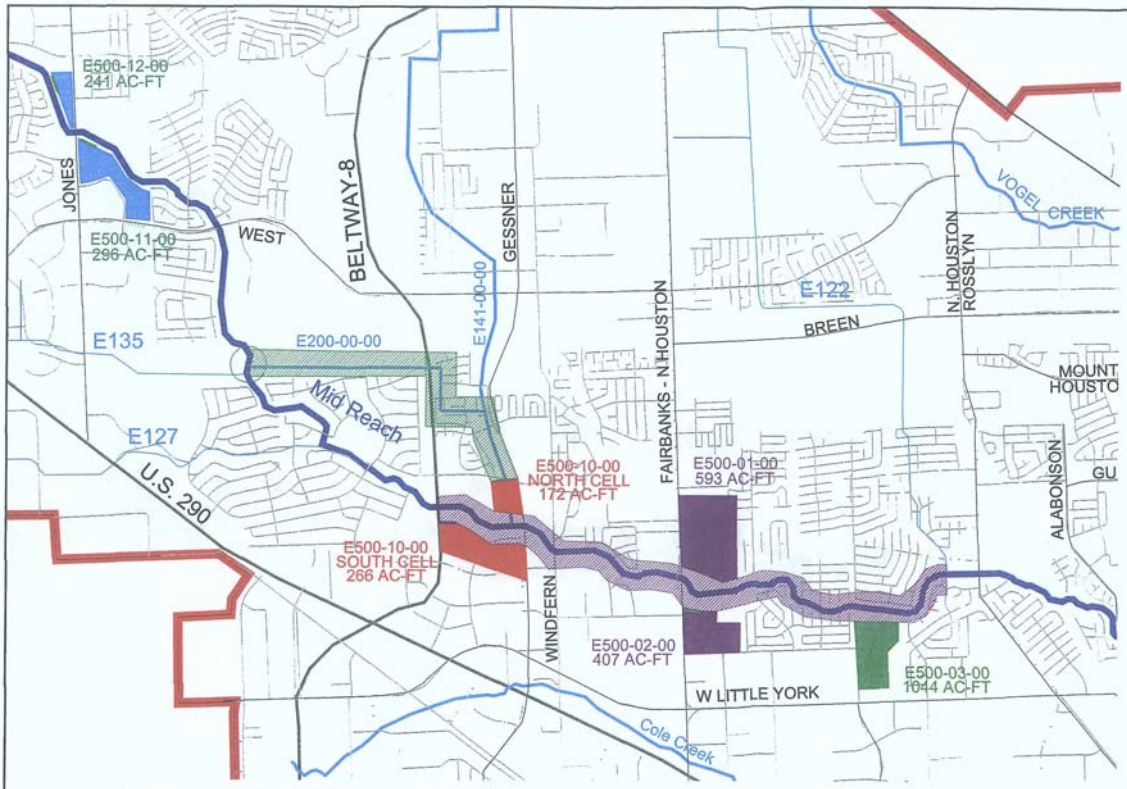


EXHIBIT 1.2B
STUDY LOCATION,
E100-E200 CONFLUENCE,
IN FEMA FIRM PANEL



north

0 1500 3000 6000

SCALE IN FEET

PHASE 2B

- ACTIVATION OF PHASE 1 AND PHASE 2 PROJECTS
- ADDITION OF E500-12-00 DETENTION FACILITY
- ADDITION OF E500-11-00 DETENTION FACILITY

PHASE 3

- ACTIVATION OF PHASE 1, PHASE 2, AND PHASE 2B PROJECTS
- 11,000 FEET OF CHANNEL MODIFICATIONS ALONG E141-00-00 AND E200-00-00
- E500-12-00 SIDE WEIR MODIFICATION
- E500-11-00 SIDE WEIR MODIFICATION
- ADDITIONAL EXCAVATION OF 500 AC-FT TO THE E500-03-00 DETENTION FACILITY
- E500-02-00 SIDE WEIR MODIFICATION
- E500-03-00 SIDE WEIR MODIFICATION

LEGEND

- WHITE OAK BAYOU WATERSHED BOUNDARY
- WHITE OAK BAYOU CHANNEL
- TRIBUTARY
- CHANNEL IMPROVEMENT

NO RISE CERTIFICATION FOR E200-00-00 AND E141-00-00 CHANNEL CONVEYANCE IMPROVEMENTS

PHASE 3 COMPONENTS

Date		Exhibit
SEPTEMBER 2008	PBSJ	3.1

Legend

- HCFCD Channel

RGME 90% Plans Layer

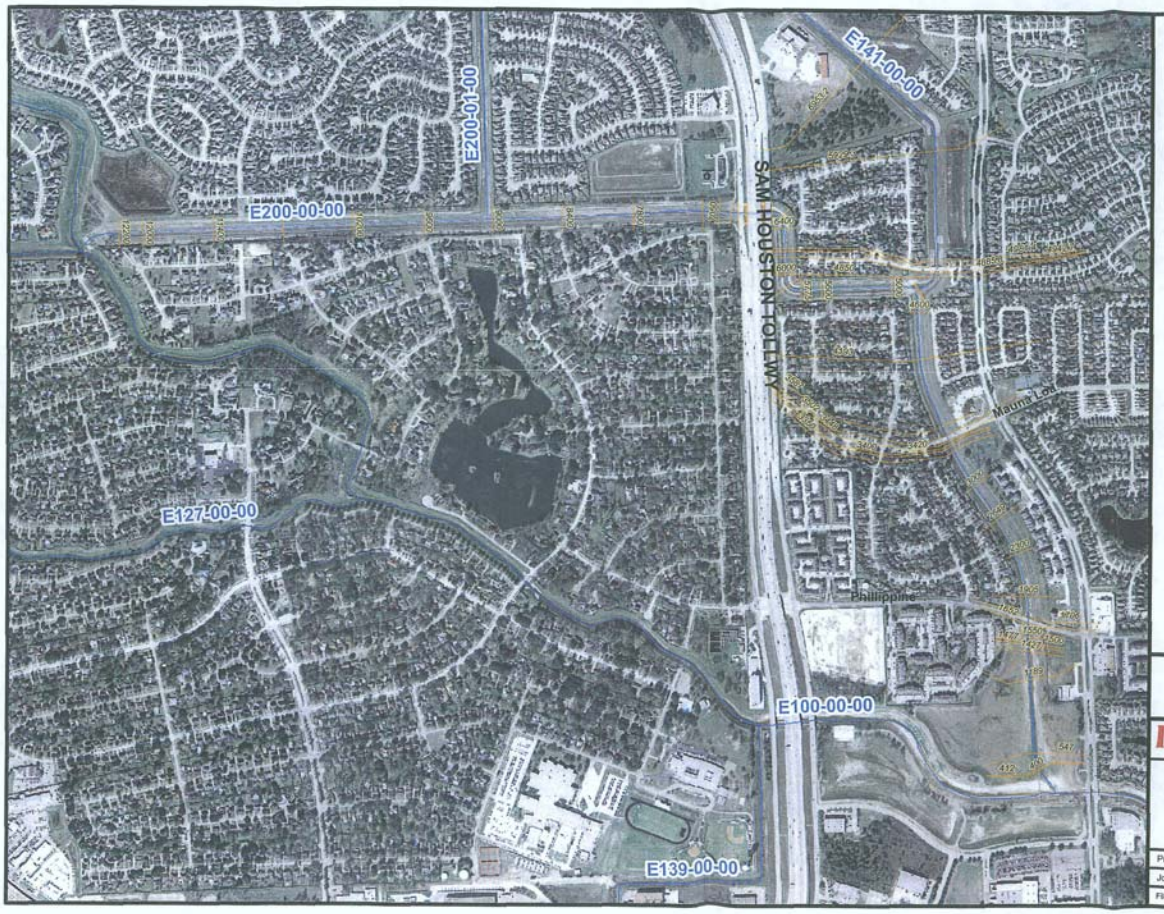
- Proposed Channel CL
- Proposed Channel

1 inch equals 800 feet

PBSJ
1250 Wood Branch Park Drive, Ste 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

Exhibit 3.2
E200-00-00 and E141-00-00
HEC-RAS Channel Improvement Layout

Prepared By: PBSJ/J23473	Date: September 2008
Job No.: 100004498 WOB Phase3 Addl Services	
File: K:\100004498 WOB Phase3 Add Services\WR\GIS\ArcMap Projects	



Legend

- HCFCD Channel
- HEC-RAS Cross Sections

RGME 90% Plans

Layer

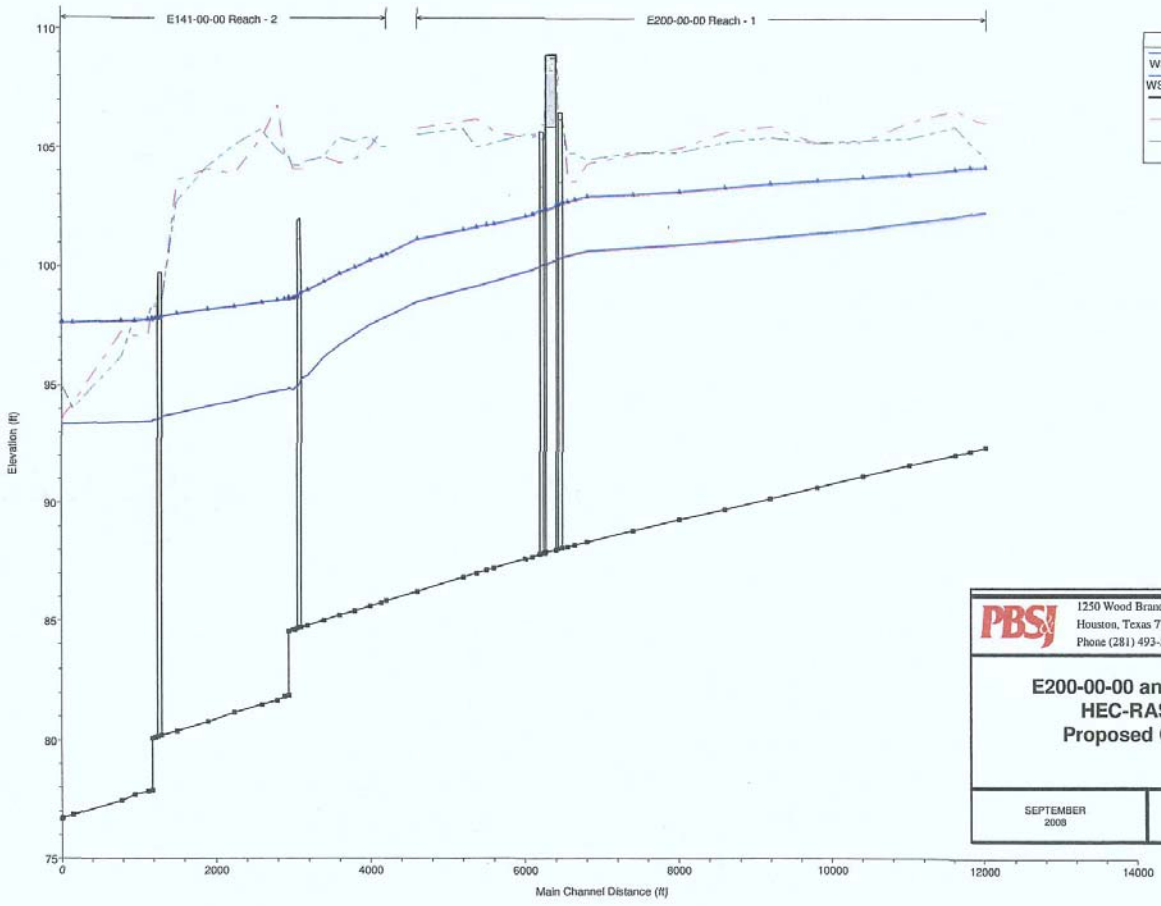
- Proposed Channel CL
- Proposed Channel

1 inch equals 800 feet

PBSJ
1250 Wood Branch Park Drive, Ste 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

Exhibit 3.3
E200-00-00 and E141-00-00
HEC-RAS Cross Section Layout

Prepared By: PBS&J/23473	Date: September 2008
Job No.: 100004498 WOB Phase3 Addl Services	
File: K:\100004498 WOB Phase3 Addl Services\WR\GIS\ArcMap Projects	



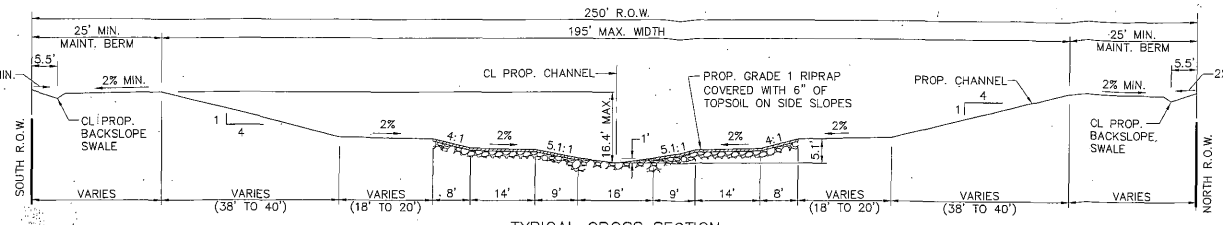
PBSJ
1250 Wood Branch Park Drive, Ste 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

E200-00-00 and E141-00-00
HEC-RAS Profile
Proposed Condition

SEPTEMBER
2008

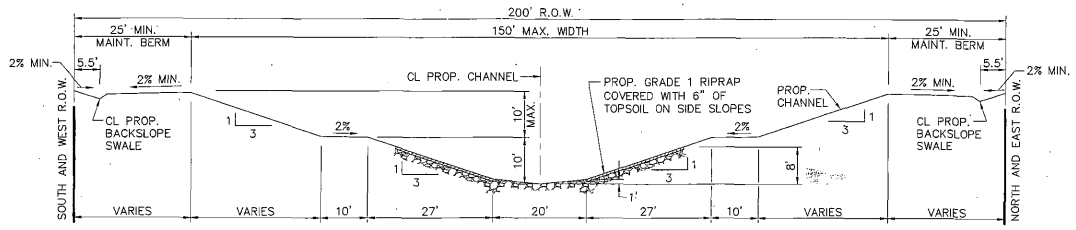
Exhibit
3.4

ATTACHMENT 4
TYPICAL CHANNEL CROSS SECTIONS

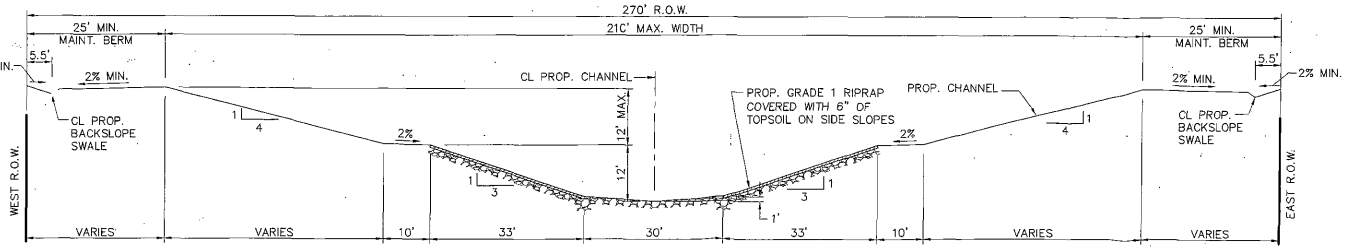


TYPICAL CROSS SECTION
STA. 70+00 TO 124+00 (BELTWAY TO E100-00-00)

NOTE:
RIPRAP NOT REQUIRED FROM STA. 89+35 TO 118+00.



TYPICAL CROSS SECTION
STA. 34+00 TO 67+00 (MAUNA LOA TO BELTWAY)



TYPICAL CROSS SECTION
STA. 17+50 TO 32+00 (BETWEEN PHILIPPINE AND MAUNA LOA)

REV	DESCRIPTION	DATE	APPR

E200-00-00-E003
JERSEY VILLAGE CHANNEL CONVEYANCE IMPROVEMENTS
TYPICAL CROSS SECTIONS

PREPARED: TD
CHECKED: MN
APPROVED: DB

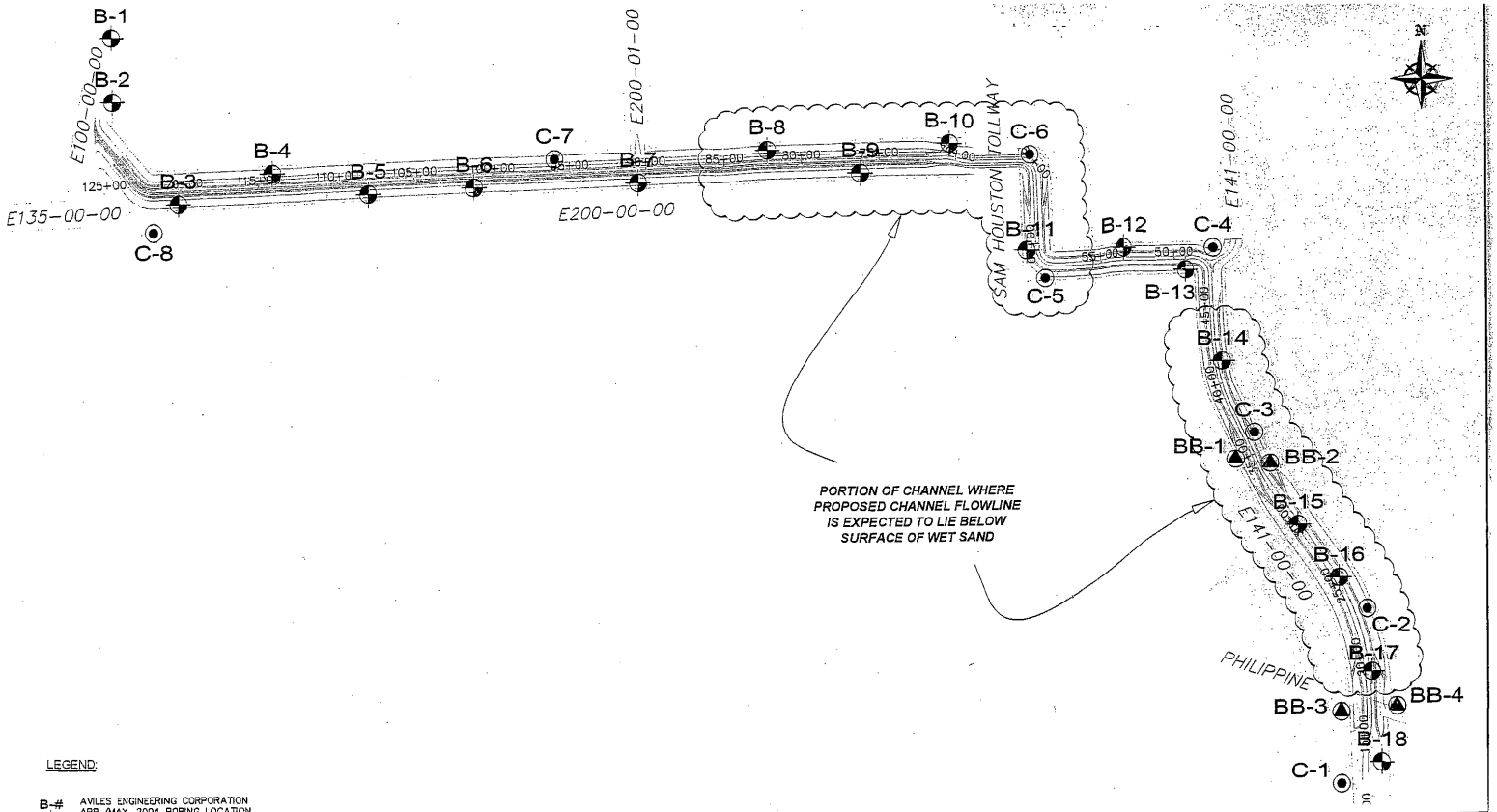
r.g.miller engineers since 1946
12121 Wickchester Lane
Suite 200
Houston, Texas 77079
(713) 461-9600
Texas Firm Registration No. F-687

Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092

DATE: JAN, 2009
SCALE: AS NOTED

SHEET NUMBER
7 OF 68

ATTACHMENT 5
SOIL PROFILE SHEETS



LEGEND:

B-# AVILES ENGINEERING CORPORATION
APR./MAY, 2004 BORING LOCATION
(SEE PLATES A-3 THRU A-20 FOR LOGS OF BORINGS)

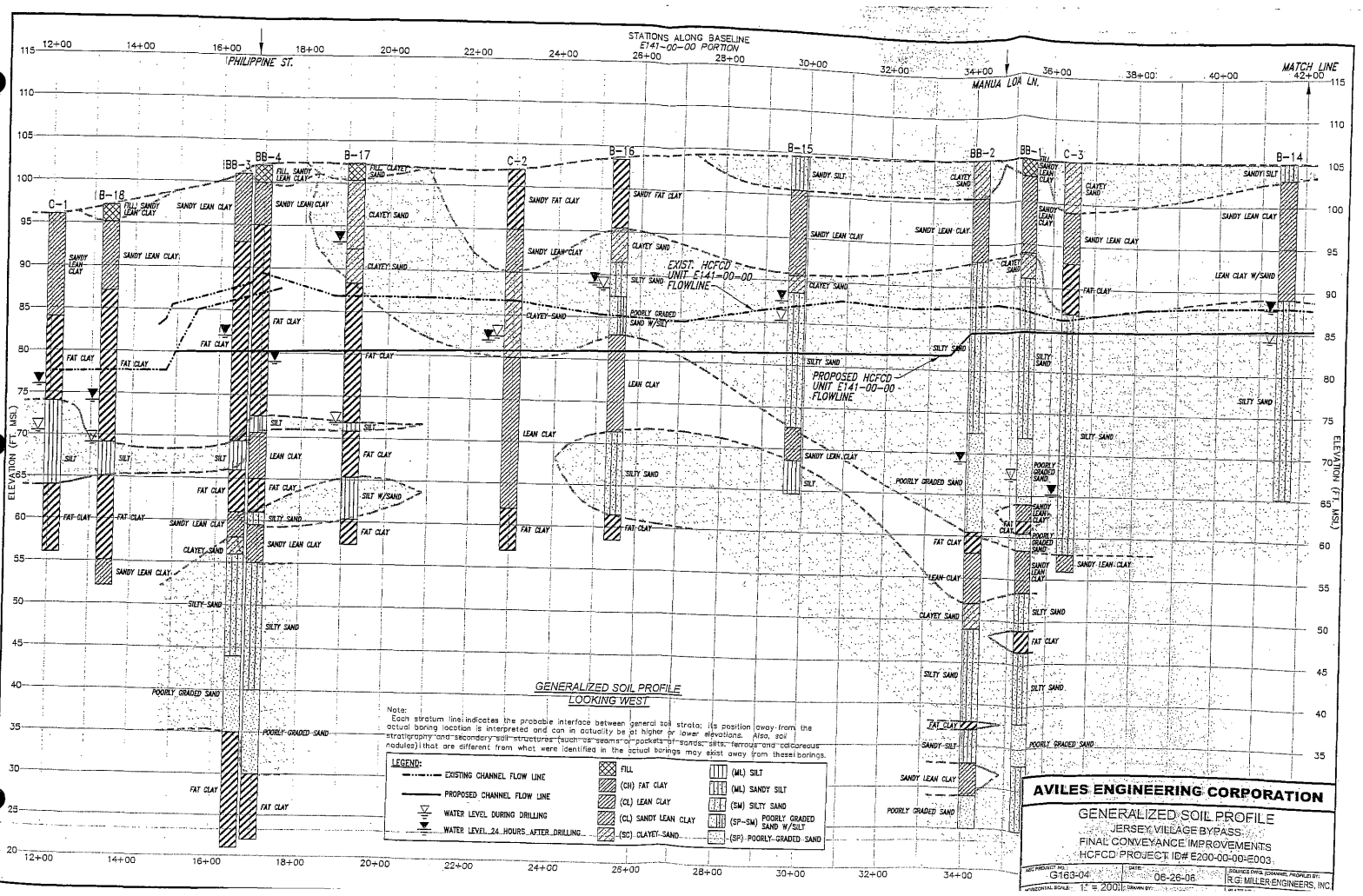
C-# MCBRIDE RATCLIFF AND ASSOCIATES, INC.
AUG., 1986 APPROXIMATE BORING LOCATION
(SEE PLATES A-62 THRU A-69 FOR LOGS OF BORINGS)

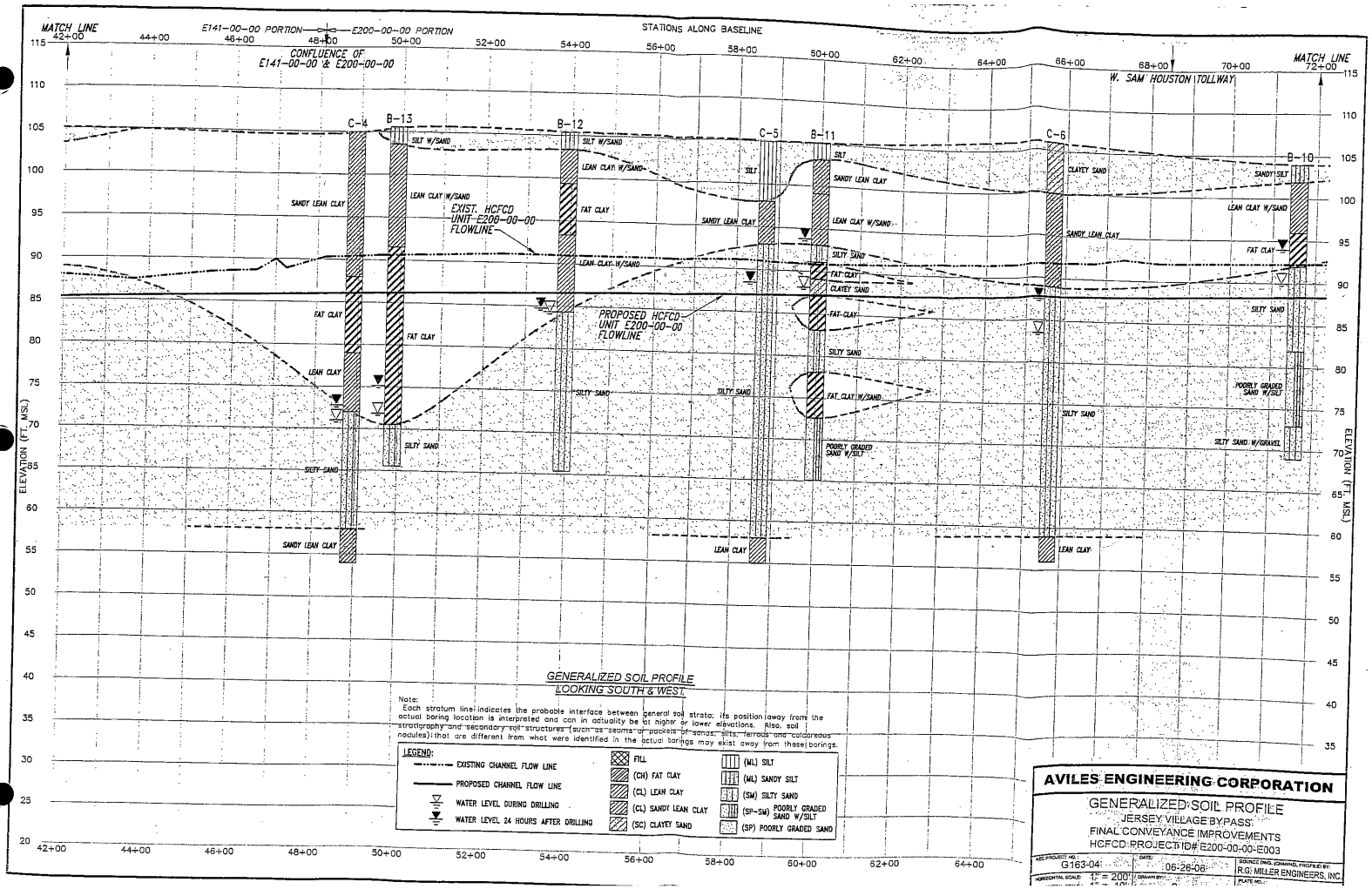
BB-# MCBRIDE RATCLIFF AND ASSOCIATES, INC.
JUL., 1986, APPROXIMATE BORING LOCATION
(SEE PLATES A-58 THRU A-61 FOR LOGS OF BORINGS)

AVILES ENGINEERING CORPORATION

OVERALL BORING LOCATION PLAN
JERSEY VILLAGE BYPASS
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003

ASC PROJECT NO.	DATE	SOURCE DWG. BY:
G163-04	09-20-06	R.G. MILLER ENGINEERS, INC.
SCALE:	DRAWN BY:	PLATE NO.
1" = 600'	B.P.J.	PLATE A-2e


STATIONS ALONG BASELINE
E141-00-00 PORTION
PHILIPPINE ST.
MANUA LOA LN.
MATCH LINE
12+00
14+00
16+00
18+00
20+00
22+00
24+00
26+00
28+00
30+00
32+00
34+00
36+00
38+00
40+00
42+00
ELEVATION (FT. MSL)
C-1
B-18
BB-3
BB-4
B-17
C-2
B-16
B-15
BB-2
BB-1
C-3
B-14
EXIST. HCFCD UNIT E141-00-00 FLOWLINE
PROPOSED HCFCD UNIT E141-00-00 FLOWLINE
FILL: SANDY LEAN CLAY
FILL: CLAYEY SAND
SANDY LEAN CLAY
CLAYEY SAND
SANDY FAT CLAY
FAT CLAY
LEAN CLAY
SILT
SILT W/SAND
SILTY SAND
POORLY GRADED SAND
POORLY GRADED SAND W/SILT
SANDY SILT
CLAYEY SAND
LEAN CLAY W/SAND
GENERALIZED SOIL PROFILE
LOOKING WEST
Note:
Each stratum line indicates the probable interface between general soil strata; its position away from the actual boring location is interpreted and can in actuality be at higher or lower elevations. Also, soil stratigraphy and secondary soil structures (such as seams or pockets of sands, silts, ferrous and calcareous nodules) that are different from what were identified in the actual borings may exist away from these borings.
LEGEND:
EXISTING CHANNEL FLOW LINE
PROPOSED CHANNEL FLOW LINE
WATER LEVEL DURING DRILLING
WATER LEVEL 24 HOURS AFTER DRILLING
FILL
(CH) FAT CLAY
(CL) LEAN CLAY
(CL) SANDY LEAN CLAY
(SC) CLAYEY SAND
(ML) SILT
(ML) SANDY SILT
(SM) SILTY SAND
(SP-SM) POORLY GRADED SAND W/SILT
(SP) POORLY GRADED SAND
AVILES ENGINEERING CORPORATION
GENERALIZED SOIL PROFILE
JERSEY VILLAGE BYPASS
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003
AEC PROJECT NO.
G163-04
DATE:
06-26-06
SOURCE DWG. (CHANNEL PROFILE) BY:
R.G. MILLER ENGINEERS, INC.
HORIZONTAL SCALE: 1" = 200'
DRAWN BY:



GENERALIZED SOIL PROFILE
LOOKING SOUTH & WEST

Note:
Each stratum line indicates the probable interface between general soil strata; its position away from the actual boring location is interpreted and can in actuality be at higher or lower elevations. Also, soil stratigraphy and secondary soil structures (such as seams or pockets of sands, silts, ferrous and calcareous nodules) that are different from what were identified in the actual borings may exist away from these borings.

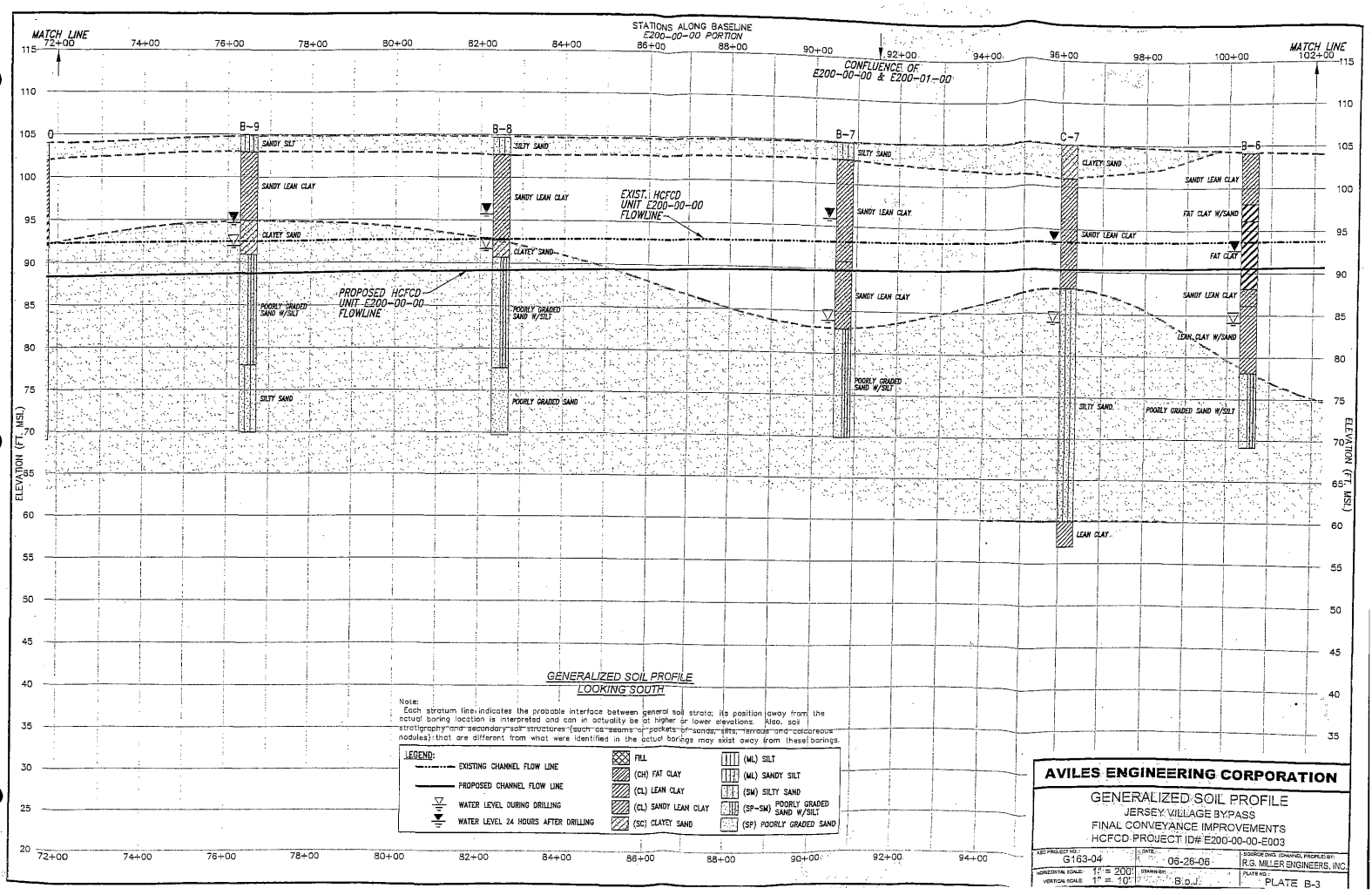
LEGEND:

- EXISTING CHANNEL FLOW LINE
- PROPOSED CHANNEL FLOW LINE
- WATER LEVEL DURING DRILLING
- WATER LEVEL 24 HOURS AFTER DRILLING
- FILL
- (CH) FAT CLAY
- (CL) LEAN CLAY
- (CL) SANDY LEAN CLAY
- (SC) CLAYEY SAND
- (ML) SILT
- (ML) SANDY SILT
- (SM) SILTY SAND
- (SP-SM) POORLY GRADED SAND W/SILT
- (SP) POORLY GRADED SAND

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE
JERSEY VILLAGE BYPASS:
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003

AEC PROJECT NO.	DATE:	SOURCE DWG. (CHANNEL PROFILE) BY:
G163-04	06-26-06	R.G. MILLER ENGINEERS, INC.
HORIZONTAL SCALE: 1" = 200'	DRAWN BY:	PLATE NO.:



GENERALIZED SOIL PROFILE
LOOKING SOUTH

Note:
Each stratum line indicates the probable interface between general soil strata; its position away from the actual boring location is interpreted and can in actuality be at higher or lower elevations. Also, soil stratigraphy and secondary soil structures (such as seams or pockets of sands, silts, fervous and calcareous nodules) that are different from what were identified in the actual borings may exist away from these borings.

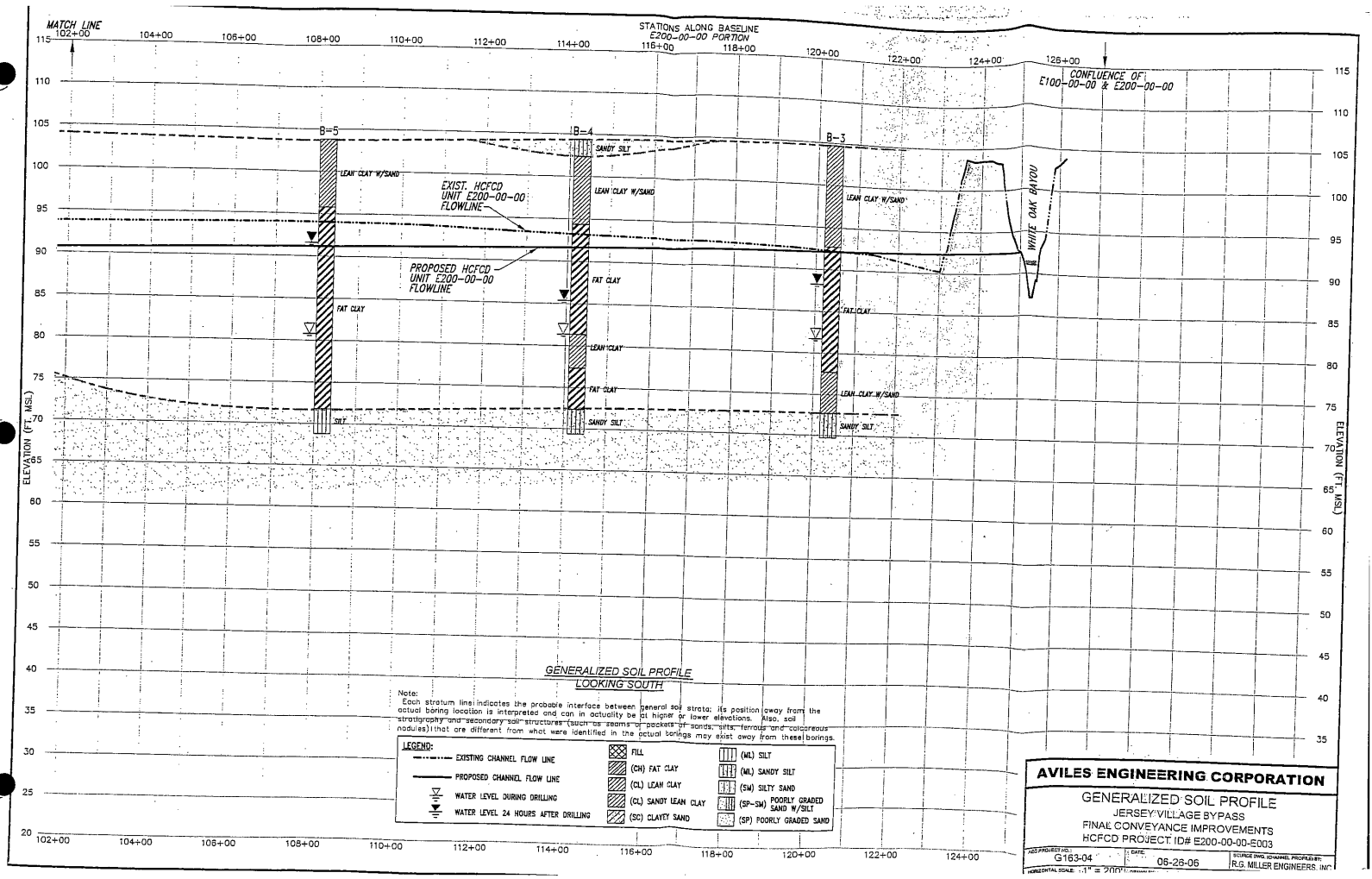
LEGEND:

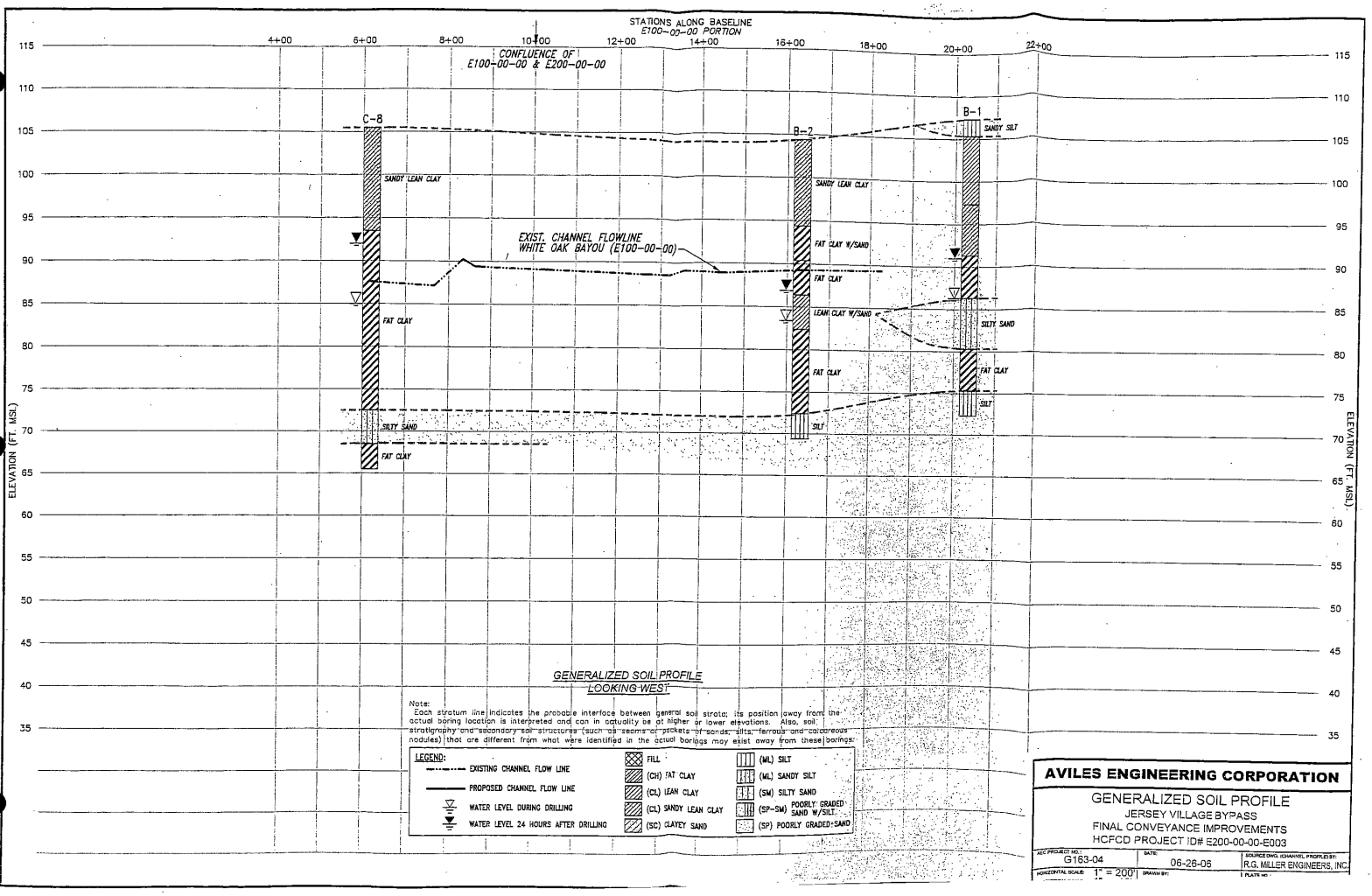
- EXISTING CHANNEL FLOW LINE
- PROPOSED CHANNEL FLOW LINE
- WATER LEVEL DURING DRILLING
- WATER LEVEL 24 HOURS AFTER DRILLING
- FILL
- (CH) FAT CLAY
- (CL) LEAN CLAY
- (CL) SANDY LEAN CLAY
- (SC) CLAYEY SAND
- (ML) SILT
- (ML) SANDY SILT
- (SM) SILTY SAND
- (SP-SM) POORLY GRADED SAND W/SILT
- (SP) POORLY GRADED SAND

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE
JERSEY VILLAGE BYPASS
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003

AEC PROJECT NO.:	DATE:	SOURCE DWG. (CHANNEL PROFILE) BY:
G163-04	06-26-06	R.G. MILLER ENGINEERS, INC.
HORIZONTAL SCALE: 1" = 200'	DRAWN BY:	PLATE NO.:
VERTICAL SCALE: 1" = 10'	B.D.J.	PLATE B-3


MATCH LINE
STATIONS ALONG BASELINE
E200-00-00 PORTION
CONFLUENCE OF
E100-00-00 & E200-00-00
B-5
B-4
B-3
SANDY SILT
LEAN CLAY W/SAND
EXIST. HCFCD
UNIT E200-00-00
FLOWLINE
PROPOSED HCFCD
UNIT E200-00-00
FLOWLINE
FAT CLAY
LEAN CLAY
SILT
WHITE OAK BAYOU
ELEVATION (FT, MSL)
GENERALIZED SOIL PROFILE
LOOKING SOUTH
Note:
Each stratum line indicates the probable interface between general soil strata; its position away from the actual boring location is interpreted and can in actuality be at higher or lower elevations. Also, soil stratigraphy and secondary soil structures (such as seams or pockets of sands, silts, ferrous and calcareous nodules) that are different from what were identified in the actual borings may exist away from these borings.
LEGEND:
EXISTING CHANNEL FLOW LINE
PROPOSED CHANNEL FLOW LINE
WATER LEVEL DURING DRILLING
WATER LEVEL 24 HOURS AFTER DRILLING
FILL
(CH) FAT CLAY
(CL) LEAN CLAY
(CL) SANDY LEAN CLAY
(SC) CLAYEY SAND
(ML) SILT
(ML) SANDY SILT
(SM) SILTY SAND
(SP-SM) POORLY GRADED SAND W/SILT
(SP) POORLY GRADED SAND
AVILES ENGINEERING CORPORATION
GENERALIZED SOIL PROFILE
JERSEY VILLAGE BYPASS
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003
G163-04
06-26-06
R.G. MILLER ENGINEERS, INC



GENERALIZED SOIL PROFILE
LOOKING WEST

Note:
Each stratum line indicates the probable interface between general soil strata; its position away from the actual boring location is interpreted and can in actuality be at higher or lower elevations. Also, soil stratigraphy and secondary soil structures (such as seams or pockets of sands, silts, ferrous and calcareous nodules) that are different from what were identified in the actual borings may exist away from these borings.

LEGEND:

- EXISTING CHANNEL FLOW LINE
- PROPOSED CHANNEL FLOW LINE
- WATER LEVEL DURING DRILLING
- WATER LEVEL 24 HOURS AFTER DRILLING

- FILL
- (CH) FAT CLAY
- (CL) LEAN CLAY
- (CL) SANDY LEAN CLAY
- (SC) CLAYEY SAND
- (ML) SILT
- (ML) SANDY SILT
- (SM) SILTY SAND
- (SP-SM) POORLY GRADED SAND W/SILT
- (SP) POORLY GRADED SAND

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE
JERSEY VILLAGE BYPASS
FINAL CONVEYANCE IMPROVEMENTS
HCFCD PROJECT ID# E200-00-00-E003

AEC PROJECT NO.	DATE:	SOURCE DWG. (CHANNEL PROFILE) BY:
G163-04	06-26-05	R.G. MILLER ENGINEERS, INC.
HORIZONTAL SCALE: 1" = 200'	DRAWN BY:	PLATE NO.

ATTACHMENT 6
DROP STRUCTURE ANALYSIS
MEMO

g. miller engineers, inc.

PROGRESS REPORT

DATE: August 29, 2008

TO: Yeh-Min Maa

FROM: Duane Barrett, Adam Rodriguez

RE: Hydraulic Analysis of Drop Structures for Jersey Village Channel Conveyance Improvements

Yeh Min:

We have completed hydraulic analyses of the four main drop structures that will be built as part of the Jersey Village Channel Conveyance Improvements project. We used the HEC-RAS computer program to model the proposed structures and the channels upstream and downstream of the structures.

Our primary concern during this analysis was flow velocities in the channel. We wanted to ensure that slopes are adequately protected from erosion in high-velocity reaches of the channel. Our intention was to keep channel velocities at or are below 5 feet per second in unprotected portions of the channel and ensure that higher-velocity sections of the channel were lined with rip-rap, gabions or concrete.

HEC-RAS Models

The four structures modeled are labeled "Proposed Drop Structure" in the plan set and are located in Channels E141-00-00 and E200-01-00. HEC-RAS output (including a results table, profile graph, and individual cross sections) has been included for all four structures. The first proposed drop structure is located on the south (downstream) side of Philippine Street at cross section 15+80 on the construction plans. HEC-RAS output for the structure has been included. The second and third drop structures are at plan stations 33+50 and 48+00 and are both included in the HEC-RAS model as the "Station 33+50 & 48+00 Drops" Plan. However, Drop Number 3 at station 48+00 is modeled in the separate "Drop at E200" reach while Drop Number 2 at station 33+50 is in reach "4750-3280."

Drop Structure Number 4 is located in Channel E200-01-00, a short distance upstream of channel E200-00-00. Station numbering for channel E200-01-00 begins at station 3+00 at channel E200-00-00 and continues upstream to the drop structure at station 4+00 before continuing upstream into an unprotected portion of the channel. In the attached HEC-RAS model, the corresponding plan for this drop structure is "2-Notch Weir Stepped Drop" with reach "Drop at E200-00" corresponding to channel E200-01-00 upstream of E200-00-00.

Channel Velocities

Four graphs have been included in this memo. They show the channel velocity at each of the four drop structures plotted against the channel station. The graphs show the portions of the channel experiencing high velocities and the type of protection used to prevent erosion. The first three drop

structures are protected by gabions. The channels upstream and downstream of those three drop structures are protected with rip rap. The fourth drop structure in channel E200-01-00 is protected by concrete slop paving from channel E200-00-00 to a portion of the channel upstream of the drop structure. No slope protection is provided upstream of the slop paving, but our calculations show that flow velocities in that unprotected portion of the channel do not exceed 5 feet per second.

Results

After reviewing the graphs provided for each of the four drop structures associated with this project, we can conclude that the channel is adequately protected from erosion. Gabions are used to protect the drop structures and rip rap is used to protect most of the channel. Flow velocities over the rip rap do not exceed 8 feet per second. The only unprotected portion of the channel (upstream of the drop structure number 4) does not experience flows above 5 feet per second. Therefore, we anticipate that velocities are adequately controlled and the channel is adequately protected from erosion.

We hope that the information provided in this document will prove useful to you. Don't hesitate to contact us if you have any questions or comments regarding the results of the analysis, or if you require any additional information.

Thanks,

R.G. Miller Engineers, Inc.

Duane Barrett, P.E.
Senior Project Engineer

Adam Rodriguez, E.I.T.
Engineering Associate

Attachments

- HEC-RAS Output: Drop Structure Number 1
- HEC-RAS Output: Drop Structure Numbers 2 and 3
- HEC-RAS Output: Drop Structure Number 4
- Channel Velocity Graphs

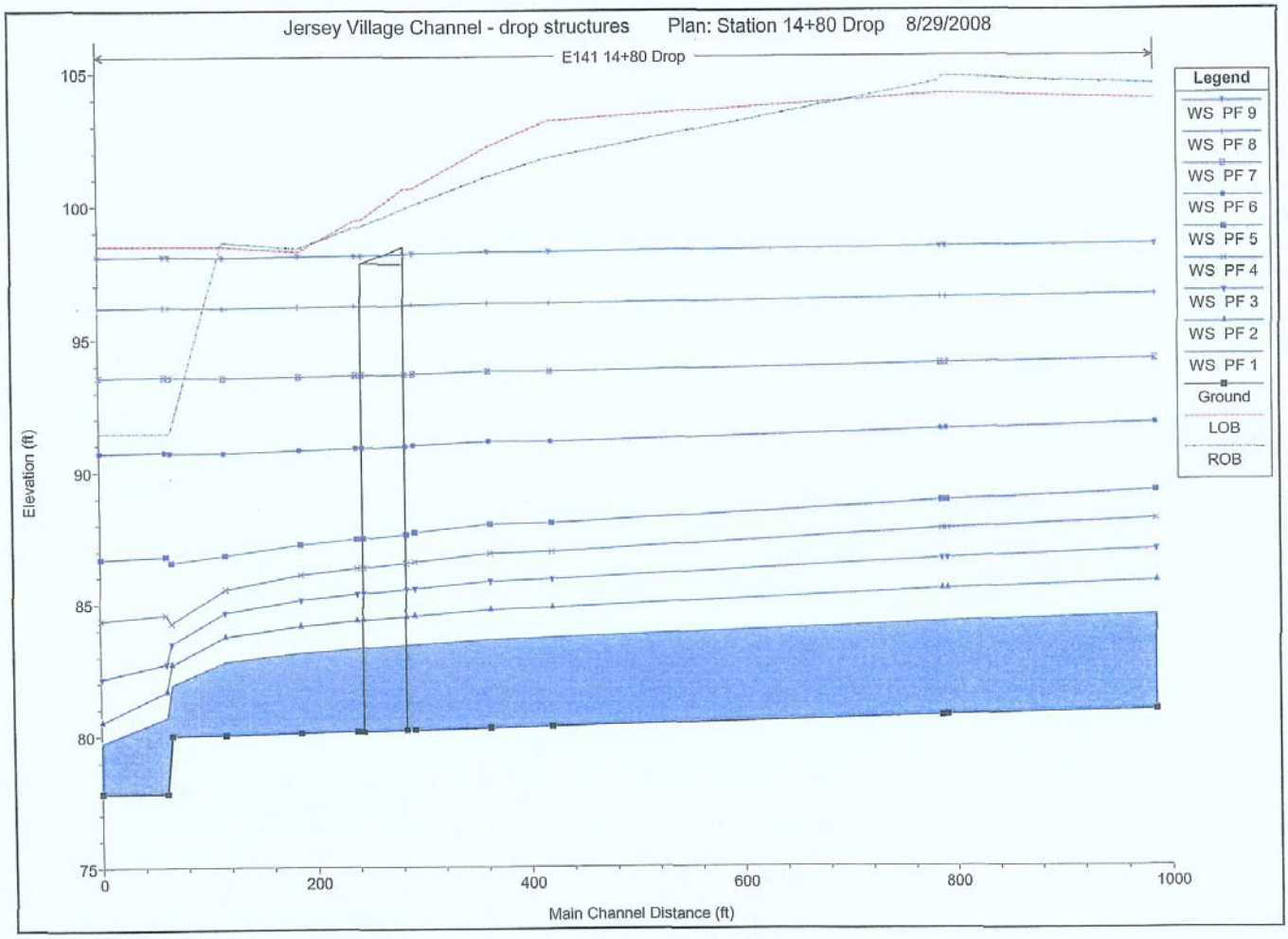
P:\H&H\2973 Jersey Village Bypass\Drop Velocity Check\Summary Memo-080829.doc

ATTACHMENT 1

HEC-RAS Output: Drop Structure Number 1

Jersey Village Channel Conveyance Improvements

Harris County, Texas

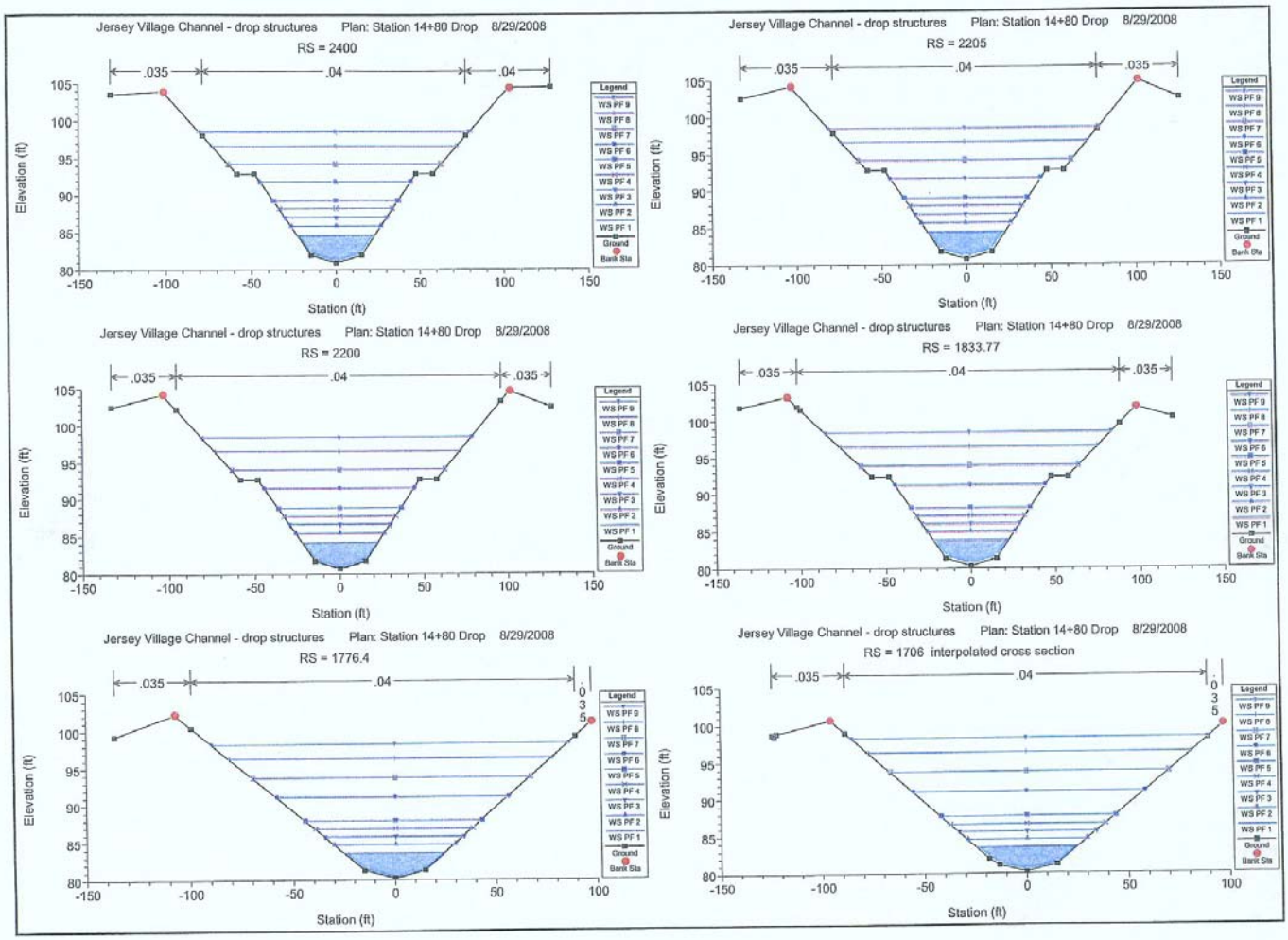

Jersey Village Channel - drop structures
Plan: Station 14+80 Drop 8/29/2008
E141 14+80 Drop
Legend
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
105
100
95
90
85
80
75
0
200
400
600
800
1000
Main Channel Distance (ft)

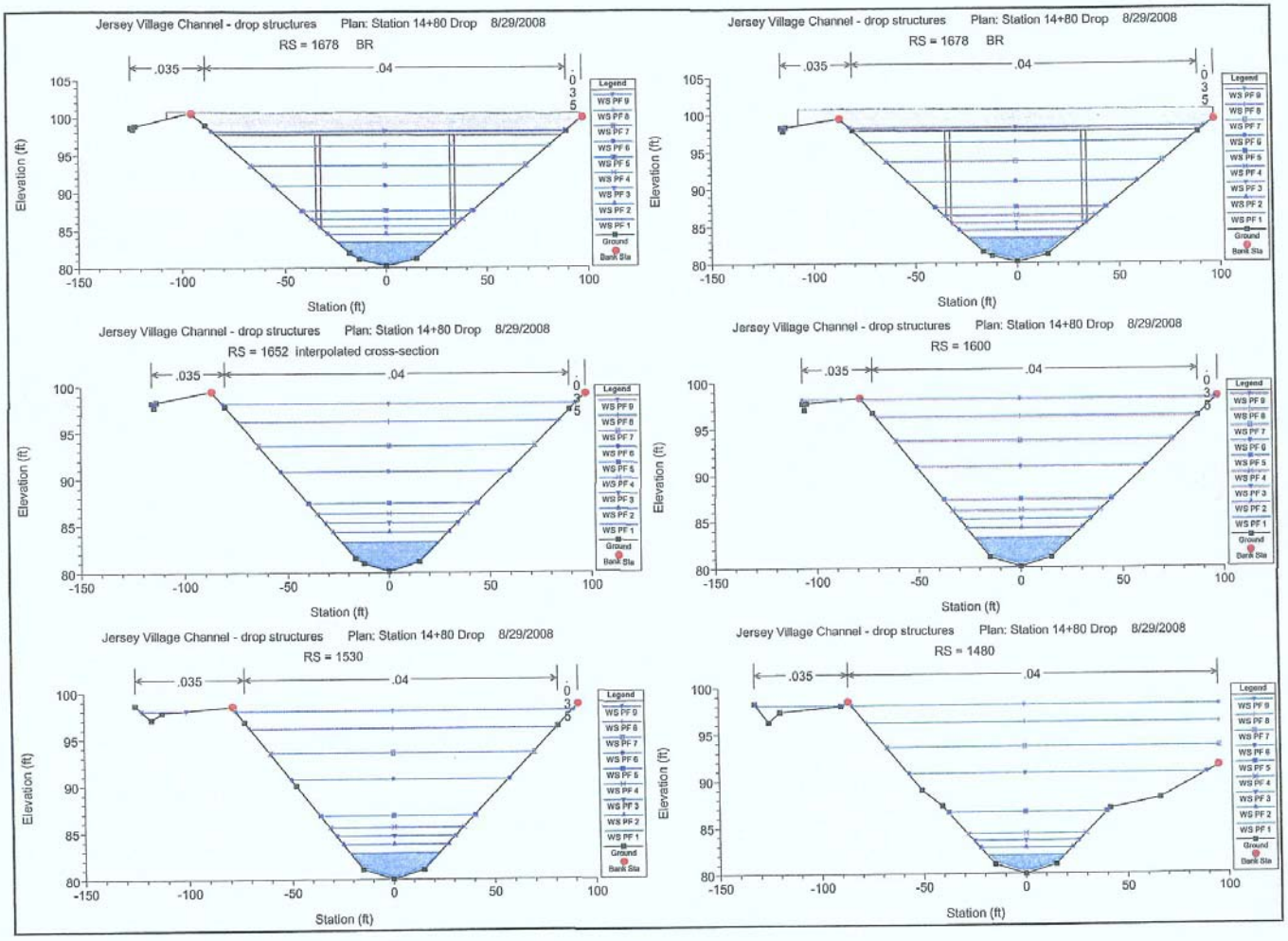
HEC-RAS Plan: 14+80 Drop River: E141 Reach: 14+80 Drop

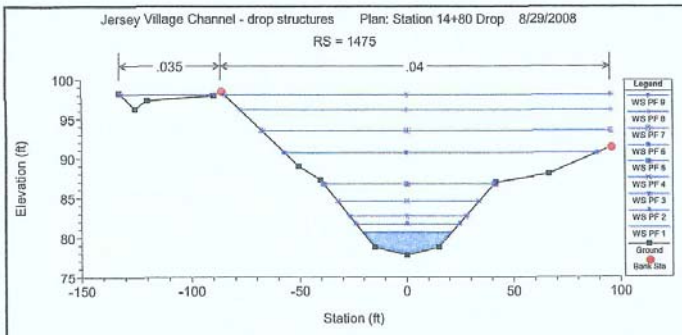
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
14+80 Drop	2400	PF 1	261.00	80.90	84.48		84.57	0.001198	2.32	112.49	45.50	0.26
14+80 Drop	2400	PF 2	522.00	80.90	85.76		85.89	0.001352	2.98	175.29	53.14	0.29
14+80 Drop	2400	PF 3	870.00	80.90	86.96		87.16	0.001492	3.57	243.64	60.36	0.31
14+80 Drop	2400	PF 4	1305.00	80.90	88.12		88.38	0.001611	4.11	317.55	67.31	0.33
14+80 Drop	2400	PF 5	1766.10	80.90	89.19		89.51	0.001637	4.49	393.37	73.76	0.34
14+80 Drop	2400	PF 6	2566.50	80.90	91.75		92.03	0.001085	4.27	601.38	89.09	0.29
14+80 Drop	2400	PF 7	3139.00	80.90	94.18		94.39	0.000768	3.64	862.96	126.00	0.24
14+80 Drop	2400	PF 8	3937.00	80.90	96.59		96.76	0.000499	3.31	1189.47	144.82	0.20
14+80 Drop	2400	PF 9	4929.00	80.90	98.50		98.67	0.000429	3.33	1479.83	159.70	0.19
14+80 Drop	2205	PF 1	261.00	80.71	84.24		84.32	0.001278	2.37	109.99	45.16	0.27
14+80 Drop	2205	PF 2	522.00	80.71	85.47		85.62	0.001465	3.08	170.36	52.58	0.30
14+80 Drop	2205	PF 3	870.00	80.71	86.64		86.85	0.001632	3.69	235.92	59.59	0.33
14+80 Drop	2205	PF 4	1305.00	80.71	87.77		88.05	0.001770	4.25	306.90	66.35	0.35
14+80 Drop	2205	PF 5	1766.10	80.71	88.84		89.17	0.001783	4.63	381.30	72.77	0.36
14+80 Drop	2205	PF 6	2566.50	80.71	91.53		91.82	0.001096	4.28	599.16	88.94	0.29
14+80 Drop	2205	PF 7	3139.00	80.71	94.03		94.24	0.000753	3.62	868.22	125.99	0.24
14+80 Drop	2205	PF 8	3937.00	80.71	96.50		96.67	0.000482	3.28	1201.66	144.59	0.20
14+80 Drop	2205	PF 9	4929.00	80.71	98.42		98.59	0.000414	3.30	1493.21	159.08	0.19
14+80 Drop	2200	PF 1	261.00	80.70	84.23		84.32	0.001273	2.37	110.15	45.19	0.27
14+80 Drop	2200	PF 2	522.00	80.70	85.47		85.61	0.001462	3.06	170.50	52.59	0.30
14+80 Drop	2200	PF 3	870.00	80.70	86.63		86.84	0.001630	3.69	236.03	59.60	0.33
14+80 Drop	2200	PF 4	1305.00	80.70	87.76		88.04	0.001769	4.25	306.98	66.36	0.35
14+80 Drop	2200	PF 5	1766.10	80.70	88.83		89.16	0.001782	4.63	381.37	72.78	0.36
14+80 Drop	2200	PF 6	2566.50	80.70	91.53		91.81	0.001094	4.28	599.56	88.97	0.29
14+80 Drop	2200	PF 7	3139.00	80.70	94.03		94.23	0.000751	3.61	869.08	126.11	0.24
14+80 Drop	2200	PF 8	3937.00	80.70	96.50		96.66	0.000481	3.27	1203.18	144.85	0.20
14+80 Drop	2200	PF 9	4929.00	80.70	98.42		98.59	0.000415	3.30	1495.41	159.45	0.19
14+80 Drop	1833.77	PF 1	261.00	80.33	83.71		83.81	0.001530	2.53	103.36	44.27	0.29
14+80 Drop	1833.77	PF 2	522.00	80.33	84.84		85.01	0.001839	3.32	157.22	51.05	0.33
14+80 Drop	1833.77	PF 3	870.00	80.33	85.91		86.16	0.002107	4.04	215.32	57.47	0.37
14+80 Drop	1833.77	PF 4	1305.00	80.33	86.96		87.30	0.002310	4.68	278.72	63.74	0.39
14+80 Drop	1833.77	PF 5	1766.10	80.33	88.03		88.43	0.002241	5.03	350.86	70.20	0.40
14+80 Drop	1833.77	PF 6	2566.50	80.33	91.12		91.41	0.001111	4.31	596.10	88.71	0.29
14+80 Drop	1833.77	PF 7	3139.00	80.33	93.76		93.96	0.000731	3.56	882.87	128.54	0.24
14+80 Drop	1833.77	PF 8	3937.00	80.33	96.33		96.49	0.000457	3.17	1242.10	151.17	0.19
14+80 Drop	1833.77	PF 9	4929.00	80.33	98.28		98.43	0.000392	3.17	1552.95	168.32	0.18
14+80 Drop	1776.4	PF 1	261.00	80.28	83.63		83.72	0.001492	2.39	109.15	50.14	0.29
14+80 Drop	1776.4	PF 2	522.00	80.28	84.76		84.90	0.001692	3.05	171.10	59.79	0.32
14+80 Drop	1776.4	PF 3	870.00	80.28	85.83		86.04	0.001836	3.62	240.38	69.01	0.34
14+80 Drop	1776.4	PF 4	1305.00	80.28	86.89		87.15	0.001915	4.10	318.25	78.08	0.36
14+80 Drop	1776.4	PF 5	1766.10	80.28	87.99		88.28	0.001765	4.31	409.46	87.52	0.35
14+80 Drop	1776.4	PF 6	2566.50	80.28	91.13		91.33	0.000790	3.53	726.45	114.42	0.25
14+80 Drop	1776.4	PF 7	3139.00	80.28	93.77		93.91	0.000429	2.97	1058.59	137.06	0.19
14+80 Drop	1776.4	PF 8	3937.00	80.28	96.34		96.46	0.000297	2.74	1438.35	159.04	0.16
14+80 Drop	1776.4	PF 9	4929.00	80.28	98.28		98.41	0.000269	2.79	1763.91	175.70	0.16
14+80 Drop	1706	PF 1	300.00	80.21	83.45	82.17	83.58	0.002280	2.89	103.81	49.34	0.35
14+80 Drop	1706	PF 2	600.00	80.21	84.53	82.93	84.75	0.002607	3.70	161.99	58.54	0.39
14+80 Drop	1706	PF 3	1000.00	80.21	85.56	83.71	85.86	0.002849	4.41	226.77	67.31	0.42
14+80 Drop	1706	PF 4	1500.00	80.21	86.58	84.48	86.97	0.002975	5.00	299.86	76.01	0.44
14+80 Drop	1706	PF 5	2030.00	80.21	87.69	85.16	88.12	0.002667	5.21	389.55	85.47	0.43
14+80 Drop	1706	PF 6	2950.00	80.21	90.99	86.17	91.25	0.001076	4.11	717.85	113.59	0.29
14+80 Drop	1706	PF 7	3601.00	80.21	93.69	86.77	93.87	0.000568	3.41	1055.42	136.59	0.22
14+80 Drop	1706	PF 8	4569.00	80.21	96.27	87.57	96.43	0.000400	3.18	1436.08	158.58	0.19
14+80 Drop	1706	PF 9	5656.00	80.21	98.22	88.36	98.38	0.000355	3.21	1761.46	175.19	0.18
14+80 Drop	1678		Bridge									
14+80 Drop	1652	PF 1	300.00	80.15	83.31		83.45	0.002574	3.02	99.37	48.46	0.37
14+80 Drop	1652	PF 2	600.00	80.15	84.36		84.59	0.002939	3.87	155.02	57.39	0.41
14+80 Drop	1652	PF 3	1000.00	80.15	85.37		85.70	0.003191	4.60	217.42	65.97	0.45
14+80 Drop	1652	PF 4	1500.00	80.15	86.35		86.78	0.003385	5.25	285.77	74.24	0.47
14+80 Drop	1652	PF 5	2030.00	80.15	87.45		87.91	0.003002	5.45	372.65	83.59	0.45
14+80 Drop	1652	PF 6	2950.00	80.15	90.89		91.16	0.001103	4.15	710.54	112.79	0.29
14+80 Drop	1652	PF 7	3601.00	80.15	93.63		93.82	0.000572	3.42	1052.00	136.07	0.22
14+80 Drop	1652	PF 8	4569.00	80.15	96.23		96.39	0.000401	3.19	1433.57	158.09	0.19
14+80 Drop	1652	PF 9	5656.00	80.15	98.13		98.29	0.000358	3.23	1750.35	176.00	0.18
14+80 Drop	1600	PF 1	300.00	80.10	83.14		83.30	0.002997	3.19	94.00	47.27	0.40
14+80 Drop	1600	PF 2	600.00	80.10	84.16		84.42	0.003424	4.10	146.51	55.86	0.45
14+80 Drop	1600	PF 3	1000.00	80.10	85.15		85.52	0.003707	4.86	205.62	64.18	0.48
14+80 Drop	1600	PF 4	1500.00	80.10	86.10		86.58	0.003911	5.54	270.70	72.24	0.50
14+80 Drop	1600	PF 5	2030.00	80.10	87.24		87.74	0.003319	5.66	358.66	81.87	0.48
14+80 Drop	1600	PF 6	2950.00	80.10	90.83		91.10	0.001117	4.18	706.34	112.14	0.29
14+80 Drop	1600	PF 7	3601.00	80.10	93.60		93.79	0.000573	3.43	1050.01	135.57	0.22

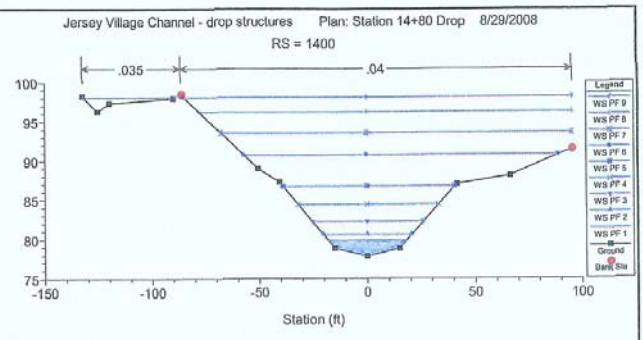
HEC-RAS Plan: 14+80 Drop River: E141 Reach: 14+80 Drop (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
14+80 Drop	1600	PF 8	4569.00	80.10	96.21		96.36	0.000401	3.19	1431.56	157.55	0.19
14+80 Drop	1600	PF 9	5656.00	80.10	98.11		98.28	0.000353	3.24	1751.94	193.05	0.18
14+80 Drop	1530	PF 1	300.00	80.03	82.83		83.04	0.004361	3.66	81.92	44.40	0.48
14+80 Drop	1530	PF 2	600.00	80.03	83.76		84.11	0.005012	4.73	126.88	51.88	0.53
14+80 Drop	1530	PF 3	1000.00	80.03	84.67		85.17	0.005446	5.64	177.36	59.16	0.57
14+80 Drop	1530	PF 4	1500.00	80.03	85.55		86.20	0.005784	6.45	232.53	66.21	0.61
14+80 Drop	1530	PF 5	2030.00	80.03	86.84		87.45	0.004252	6.26	324.19	76.49	0.54
14+80 Drop	1530	PF 6	2950.00	80.03	90.72		91.01	0.001192	4.33	681.81	107.60	0.30
14+80 Drop	1530	PF 7	3601.00	80.03	93.55		93.74	0.000604	3.54	1017.52	130.19	0.22
14+80 Drop	1530	PF 8	4569.00	80.03	96.16		96.33	0.000424	3.30	1385.66	151.13	0.19
14+80 Drop	1530	PF 9	5656.00	80.03	98.07		98.25	0.000376	3.35	1695.51	187.58	0.19
14+80 Drop	1480	PF 1	300.00	80.00	81.94	81.94	82.57	0.022453	6.38	47.00	37.99	1.01
14+80 Drop	1480	PF 2	600.00	80.00	82.72	82.72	83.61	0.019753	7.59	79.01	44.57	1.01
14+80 Drop	1480	PF 3	1000.00	80.00	83.49	83.49	84.64	0.018333	8.61	116.09	51.15	1.01
14+80 Drop	1480	PF 4	1500.00	80.00	84.27	84.27	85.66	0.017288	9.47	158.34	57.74	1.01
14+80 Drop	1480	PF 5	2030.00	80.00	86.56		87.22	0.004814	6.48	313.28	77.23	0.57
14+80 Drop	1480	PF 6	2950.00	80.00	90.72		90.93	0.001070	3.72	793.24	146.08	0.28
14+80 Drop	1480	PF 7	3601.00	80.00	93.57		93.70	0.000424	2.90	1240.01	163.16	0.19
14+80 Drop	1480	PF 8	4569.00	80.00	96.18		96.30	0.000274	2.72	1680.22	173.03	0.15
14+80 Drop	1480	PF 9	5656.00	80.00	98.09		98.22	0.000243	2.80	2042.63	222.75	0.15
14+80 Drop	1475	PF 1	300.00	77.80	80.71	79.74	80.91	0.003791	3.59	83.64	41.93	0.45
14+80 Drop	1475	PF 2	600.00	77.80	81.70	80.54	82.04	0.004387	4.67	128.47	48.15	0.50
14+80 Drop	1475	PF 3	1000.00	77.80	82.75		83.22	0.004517	5.48	182.33	54.69	0.53
14+80 Drop	1475	PF 4	1500.00	77.80	84.59		84.99	0.002700	5.11	293.36	66.17	0.43
14+80 Drop	1475	PF 5	2030.00	77.80	86.79		87.10	0.001489	4.47	454.14	79.93	0.33
14+80 Drop	1475	PF 6	2950.00	77.80	90.75		90.91	0.000658	3.20	921.64	146.51	0.22
14+80 Drop	1475	PF 7	3601.00	77.80	93.58		93.69	0.000311	2.64	1365.67	163.21	0.16
14+80 Drop	1475	PF 8	4569.00	77.80	96.19		96.29	0.000217	2.53	1805.20	173.07	0.14
14+80 Drop	1475	PF 9	5656.00	77.80	98.10		98.21	0.000201	2.63	2167.85	222.87	0.13
14+80 Drop	1400	PF 1	300.00	77.80	79.74	79.74	80.40	0.022231	6.50	46.13	35.90	1.01
14+80 Drop	1400	PF 2	600.00	77.80	80.54	80.54	81.49	0.019570	7.83	76.67	40.87	1.01
14+80 Drop	1400	PF 3	1000.00	77.80	82.18	81.35	82.85	0.007561	6.58	151.92	51.10	0.67
14+80 Drop	1400	PF 4	1500.00	77.80	84.36	82.20	84.81	0.003112	5.38	278.79	64.77	0.46
14+80 Drop	1400	PF 5	2030.00	77.80	86.68	82.93	87.01	0.001567	4.55	445.76	79.27	0.34
14+80 Drop	1400	PF 6	2950.00	77.80	90.71	84.02	90.87	0.000670	3.22	915.40	145.98	0.23
14+80 Drop	1400	PF 7	3601.00	77.80	93.56	84.66	93.67	0.000313	2.64	1362.50	163.14	0.16
14+80 Drop	1400	PF 8	4569.00	77.80	96.18	85.55	96.28	0.000218	2.53	1802.86	173.02	0.14
14+80 Drop	1400	PF 9	5656.00	77.80	98.09	86.41	98.20	0.000201	2.64	2165.05	222.69	0.13


Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 2400
.035
.04
.04
Elevation (ft)
Station (ft)
Legend
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 2205
.035
.04
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 2200
.035
.04
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1833.77
.035
.04
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1776.4
.035
.04
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1706 interpolated cross section
.035
.04
.035
Elevation (ft)
Station (ft)


Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1678 BR
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1678 BR
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1652 interpolated cross-section
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1600
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1530
Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1480


Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1475
.035
.04
Elevation (ft)
Station (ft)
Legend
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta

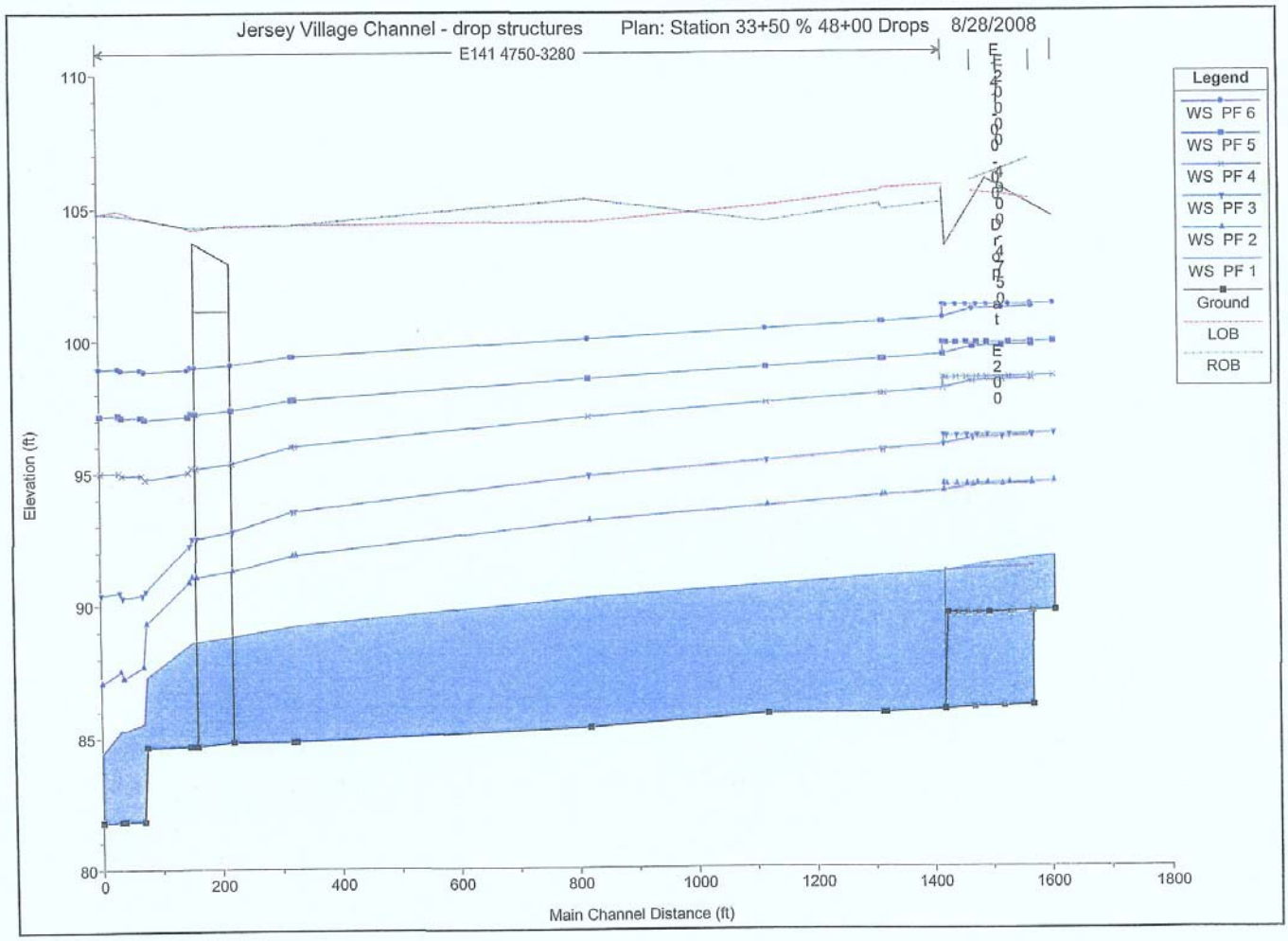

Jersey Village Channel - drop structures Plan: Station 14+80 Drop 8/29/2008
RS = 1400
.035
.04
Elevation (ft)
Station (ft)
Legend
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta

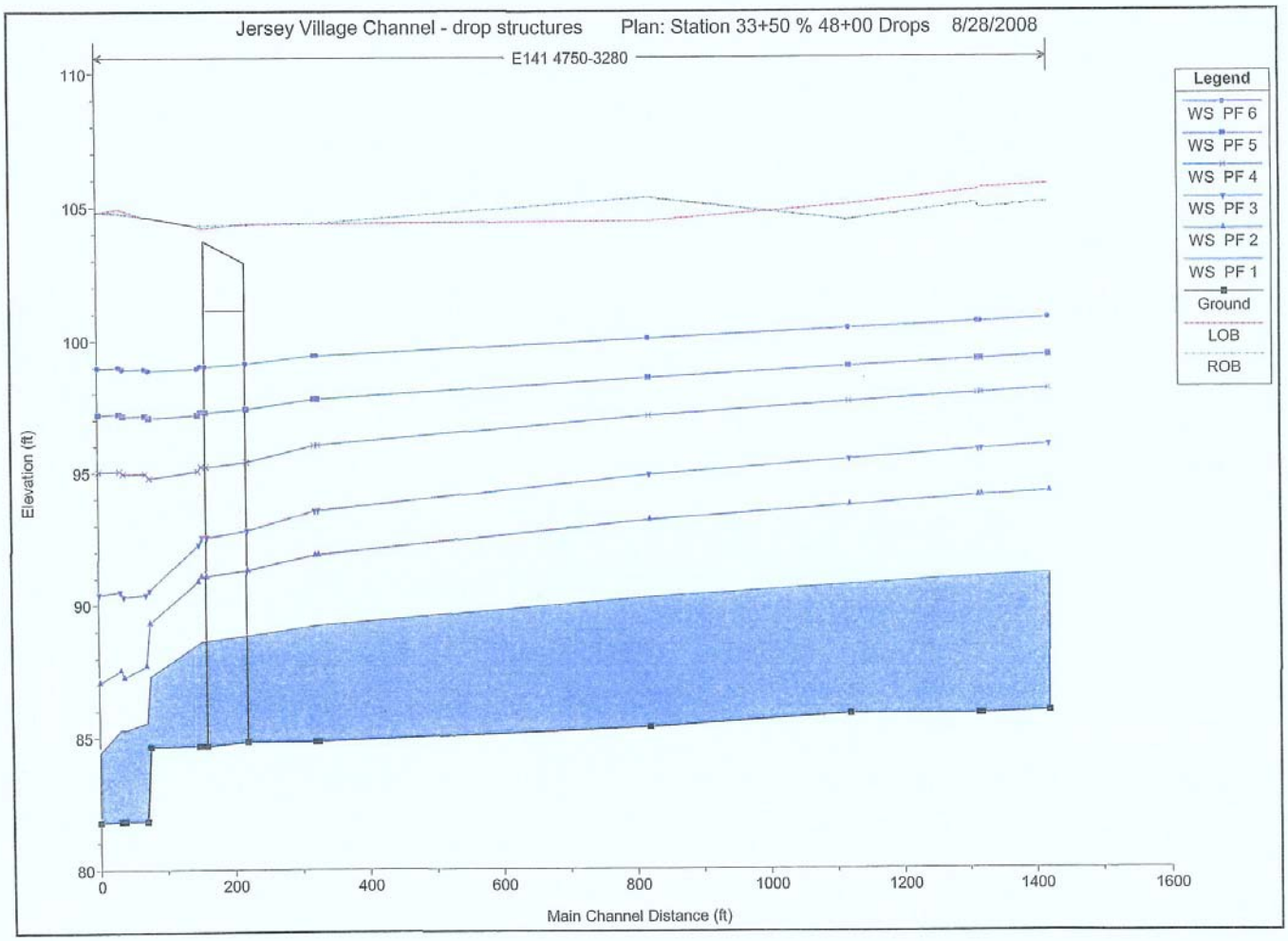
ATTACHMENT 2

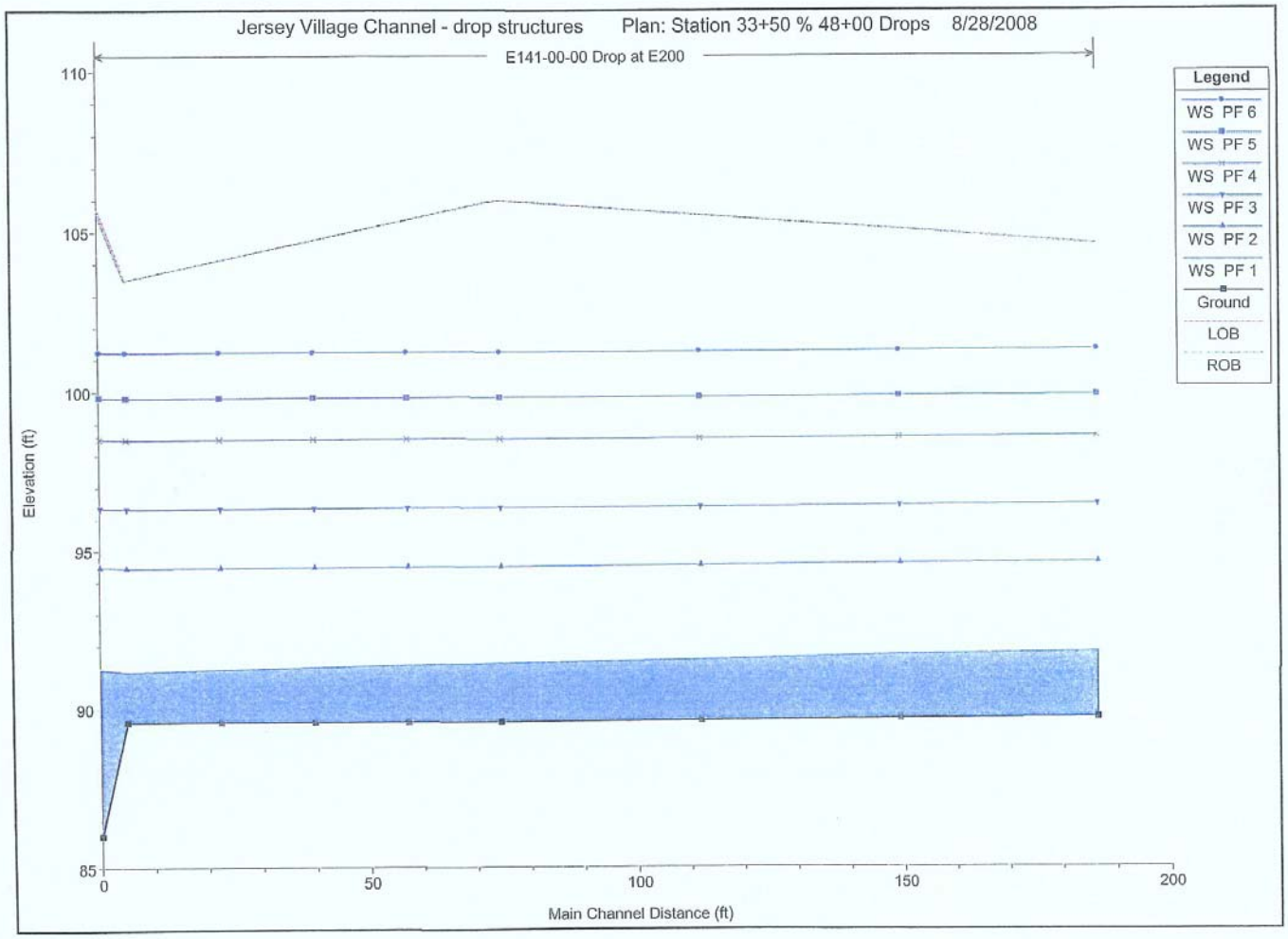
HEC-RAS Output: Drop Structure Numbers 2 and 3

Jersey Village Channel Conveyance Improvements

Harris County, Texas


Jersey Village Channel - drop structures
Plan: Station 33+50 % 48+00 Drops
8/28/2008
E141 4750-3280
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
Main Channel Distance (ft)
110
105
100
95
90
85
80
0
200
400
600
800
1000
1200
1400
1600
1800


Jersey Village Channel - drop structures
Plan: Station 33+50 % 48+00 Drops
8/28/2008
E141 4750-3280
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
110
105
100
95
90
85
80
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (ft)


Jersey Village Channel - drop structures
Plan: Station 33+50 % 48+00 Drops
8/28/2008
E141-00-00 Drop at E200
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
110
105
100
95
90
85
0
50
100
150
200
Main Channel Distance (ft)

HEC-RAS Plan: 3350 & 4800

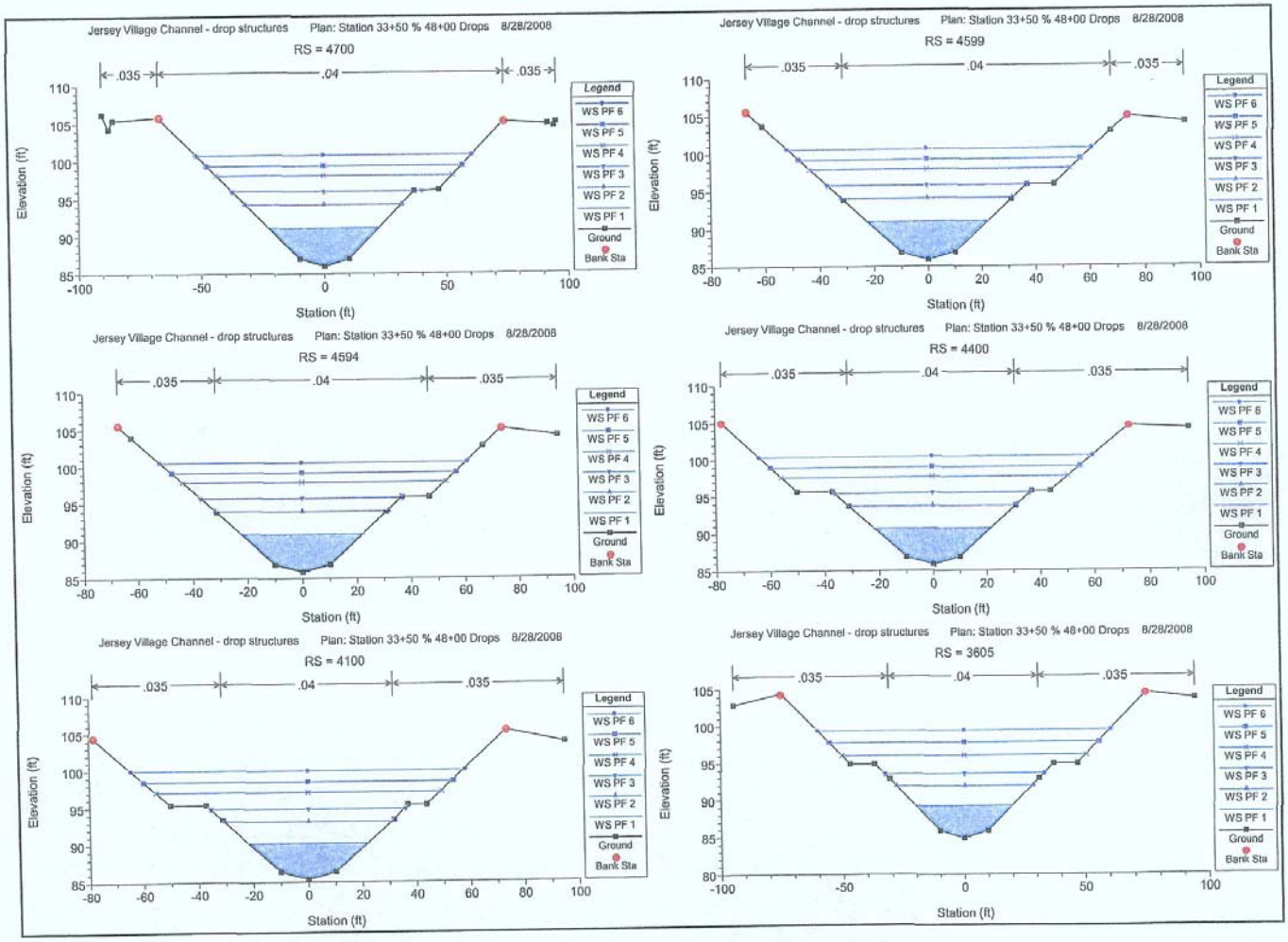
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E20000	4900-4750	4900	PF 1	308.00	86.11	91.33		91.40	0.000669	2.07	148.80	45.60	0.20
E20000	4900-4750	4900	PF 2	949.00	86.11	94.50		94.63	0.000768	2.93	323.36	64.71	0.23
E20000	4900-4750	4900	PF 3	1542.00	86.11	96.34		96.52	0.000945	3.40	453.85	85.37	0.26
E20000	4900-4750	4900	PF 4	2372.00	86.11	98.47		98.68	0.000827	3.64	651.64	99.92	0.25
E20000	4900-4750	4900	PF 5	2939.00	86.11	99.76		99.98	0.000761	3.74	785.71	108.68	0.25
E20000	4900-4750	4900	PF 6	3579.00	86.11	101.17		101.39	0.000681	3.78	946.10	118.31	0.24
E20000	4900-4750	4850.*	PF 1	308.00	86.07	91.30		91.37	0.000668	2.07	148.87	45.58	0.20
E20000	4900-4750	4850.*	PF 2	949.00	86.07	94.46		94.59	0.000770	2.94	323.00	64.64	0.23
E20000	4900-4750	4850.*	PF 3	1542.00	86.07	96.29		96.47	0.000885	3.40	453.00	80.83	0.25
E20000	4900-4750	4850.*	PF 4	2372.00	86.07	98.43		98.64	0.000837	3.66	647.82	99.54	0.25
E20000	4900-4750	4850.*	PF 5	2939.00	86.07	99.72		99.94	0.000768	3.76	781.60	108.04	0.25
E20000	4900-4750	4850.*	PF 6	3579.00	86.07	101.14		101.36	0.000685	3.80	941.33	117.39	0.24
E20000	4900-4750	4800.*	PF 1	308.00	86.03	91.27		91.33	0.000665	2.07	149.07	45.57	0.20
E20000	4900-4750	4800.*	PF 2	949.00	86.03	94.42		94.56	0.000771	2.94	322.73	64.55	0.23
E20000	4900-4750	4800.*	PF 3	1542.00	86.03	96.25		96.43	0.000867	3.41	452.12	79.14	0.25
E20000	4900-4750	4800.*	PF 4	2372.00	86.03	98.39		98.60	0.000841	3.67	645.63	99.01	0.25
E20000	4900-4750	4800.*	PF 5	2939.00	86.03	99.68		99.90	0.000769	3.77	778.92	107.27	0.25
E20000	4900-4750	4800.*	PF 6	3579.00	86.03	101.10		101.33	0.000686	3.82	937.81	116.35	0.24
E141-00-00	Drop at E200	213.5	PF 1	105.00	89.66	91.76		91.79	0.000670	1.42	73.77	40.05	0.18
E141-00-00	Drop at E200	213.5	PF 2	323.00	89.66	94.59		94.63	0.000309	1.58	204.95	52.48	0.14
E141-00-00	Drop at E200	213.5	PF 3	525.00	89.66	96.43		96.47	0.000255	1.70	308.58	60.51	0.13
E141-00-00	Drop at E200	213.5	PF 4	807.00	89.66	98.58		98.63	0.000218	1.79	449.95	72.44	0.13
E141-00-00	Drop at E200	213.5	PF 5	1017.00	89.66	99.88		99.93	0.000208	1.85	550.06	81.75	0.13
E141-00-00	Drop at E200	213.5	PF 6	1386.00	89.66	101.30		101.36	0.000230	2.06	673.27	91.93	0.13
E141-00-00	Drop at E200	176.166*	PF 1	105.00	89.65	91.69		91.75	0.001375	1.90	55.37	33.62	0.26
E141-00-00	Drop at E200	176.166*	PF 2	323.00	89.65	94.56		94.61	0.000469	1.82	177.36	50.39	0.17
E141-00-00	Drop at E200	176.166*	PF 3	525.00	89.65	96.40		96.46	0.000347	1.89	278.39	59.52	0.15
E141-00-00	Drop at E200	176.166*	PF 4	807.00	89.65	98.56		98.62	0.000276	1.92	419.89	73.21	0.14
E141-00-00	Drop at E200	176.166*	PF 5	1017.00	89.65	99.86		99.92	0.000253	1.95	521.88	83.59	0.14
E141-00-00	Drop at E200	176.166*	PF 6	1386.00	89.65	101.28		101.35	0.000271	2.14	648.86	95.45	0.14
E141-00-00	Drop at E200	138.833*	PF 1	105.00	89.61	91.55		91.66	0.003281	2.49	42.16	32.87	0.39
E141-00-00	Drop at E200	138.833*	PF 2	323.00	89.61	94.53		94.59	0.000585	1.97	164.09	49.05	0.19
E141-00-00	Drop at E200	138.833*	PF 3	525.00	89.61	96.38		96.44	0.000409	1.99	264.15	59.17	0.17
E141-00-00	Drop at E200	138.833*	PF 4	807.00	89.61	98.54		98.60	0.000311	1.99	406.36	74.14	0.15
E141-00-00	Drop at E200	138.833*	PF 5	1017.00	89.61	99.85		99.91	0.000282	1.99	510.98	86.58	0.14
E141-00-00	Drop at E200	138.833*	PF 6	1386.00	89.61	101.27		101.34	0.000296	2.15	643.92	101.01	0.15
E141-00-00	Drop at E200	101.5	PF 1	105.00	89.58	91.47		91.55	0.002142	2.25	46.74	30.67	0.32
E141-00-00	Drop at E200	101.5	PF 2	323.00	89.58	94.51		94.57	0.000546	1.94	166.55	48.24	0.18
E141-00-00	Drop at E200	101.5	PF 3	525.00	89.58	96.37		96.43	0.000398	1.97	265.99	58.97	0.16
E141-00-00	Drop at E200	101.5	PF 4	807.00	89.58	98.53		98.59	0.000316	1.97	409.72	76.64	0.15
E141-00-00	Drop at E200	101.5	PF 5	1017.00	89.58	99.84		99.90	0.000286	1.96	519.28	91.23	0.14
E141-00-00	Drop at E200	101.5	PF 6	1386.00	89.58	101.26		101.33	0.000295	2.10	660.20	107.12	0.15
E141-00-00	Drop at E200	84.1*	PF 1	105.00	89.58	91.41		91.51	0.002863	2.46	42.61	30.36	0.37
E141-00-00	Drop at E200	84.1*	PF 2	323.00	89.58	94.50		94.56	0.000583	1.97	164.17	49.01	0.19
E141-00-00	Drop at E200	84.1*	PF 3	525.00	89.58	96.36		96.42	0.000420	1.98	267.48	62.58	0.17
E141-00-00	Drop at E200	84.1*	PF 4	807.00	89.58	98.53		98.59	0.000314	1.91	422.74	83.08	0.15
E141-00-00	Drop at E200	84.1*	PF 5	1017.00	89.58	99.84		99.89	0.000279	1.87	542.94	100.88	0.14
E141-00-00	Drop at E200	84.1*	PF 6	1386.00	89.58	101.26		101.32	0.000280	1.98	700.22	120.25	0.14
E141-00-00	Drop at E200	66.7*	PF 1	105.00	89.58	91.34		91.45	0.003497	2.64	39.75	29.67	0.40
E141-00-00	Drop at E200	66.7*	PF 2	323.00	89.58	94.49		94.55	0.000589	1.99	162.71	48.26	0.19
E141-00-00	Drop at E200	66.7*	PF 3	525.00	89.58	96.35		96.41	0.000436	1.98	264.91	62.89	0.17
E141-00-00	Drop at E200	66.7*	PF 4	807.00	89.58	98.52		98.58	0.000326	1.89	427.27	88.05	0.15
E141-00-00	Drop at E200	66.7*	PF 5	1017.00	89.58	99.83		99.88	0.000285	1.83	556.17	109.23	0.14
E141-00-00	Drop at E200	66.7*	PF 6	1386.00	89.58	101.26		101.31	0.000278	1.90	728.35	132.58	0.14
E141-00-00	Drop at E200	49.3*	PF 1	105.00	89.58	91.28		91.39	0.003619	2.70	38.95	28.89	0.41
E141-00-00	Drop at E200	49.3*	PF 2	323.00	89.58	94.48		94.54	0.000584	1.98	163.09	48.24	0.19
E141-00-00	Drop at E200	49.3*	PF 3	525.00	89.58	96.34		96.40	0.000417	2.00	263.15	59.50	0.17
E141-00-00	Drop at E200	49.3*	PF 4	807.00	89.58	98.52		98.57	0.000349	1.90	423.92	90.92	0.16
E141-00-00	Drop at E200	49.3*	PF 5	1017.00	89.58	99.83		99.88	0.000303	1.82	559.09	116.76	0.15
E141-00-00	Drop at E200	49.3*	PF 6	1386.00	89.58	101.25		101.31	0.000288	1.86	744.05	143.76	0.14
E141-00-00	Drop at E200	31.9	PF 1	105.00	89.58	91.22		91.33	0.003652	2.69	39.04	29.24	0.41
E141-00-00	Drop at E200	31.9	PF 2	323.00	89.58	94.47		94.53	0.000562	1.96	165.05	48.21	0.19
E141-00-00	Drop at E200	31.9	PF 3	525.00	89.58	96.34		96.40	0.000403	1.98	265.21	59.10	0.16
E141-00-00	Drop at E200	31.9	PF 4	807.00	89.58	98.51		98.57	0.000364	1.94	415.99	89.19	0.16
E141-00-00	Drop at E200	31.9	PF 5	1017.00	89.58	99.82		99.87	0.000329	1.84	553.23	119.98	0.15
E141-00-00	Drop at E200	31.9	PF 6	1386.00	89.58	101.25		101.30	0.000308	1.85	748.37	153.46	0.15
E141-00-00	Drop at E200	0	PF 1	105.00	85.99	91.29		91.29	0.000074	0.69	151.61	45.87	0.07
E141-00-00	Drop at E200	0	PF 2	323.00	85.99	94.50		94.51	0.000084	0.98	329.96	65.17	0.08
E141-00-00	Drop at E200	0	PF 3	525.00	85.99	96.36		96.38	0.000095	1.13	463.59	80.94	0.08
E141-00-00	Drop at E200	0	PF 4	807.00	85.99	98.53		98.56	0.000090	1.22	663.43	99.49	0.08
E141-00-00	Drop at E200	0	PF 5	1017.00	85.99	99.84		99.86	0.000085	1.27	798.72	107.59	0.08
E141-00-00	Drop at E200	0	PF 6	1386.00	85.99	101.26		101.29	0.000096	1.45	958.06	116.40	0.09
E141	4750-3280	4700	PF 1	408.00	85.95	91.17		91.28	0.001195	2.76	147.63	45.30	0.27
E141	4750-3280	4700	PF 2	1256.00	85.95	94.25		94.49	0.001431	3.98	315.66	63.79	0.32
E141	4750-3280	4700	PF 3	2040.00	85.95	96.02		96.35	0.001642	4.66	438.03	77.47	0.35

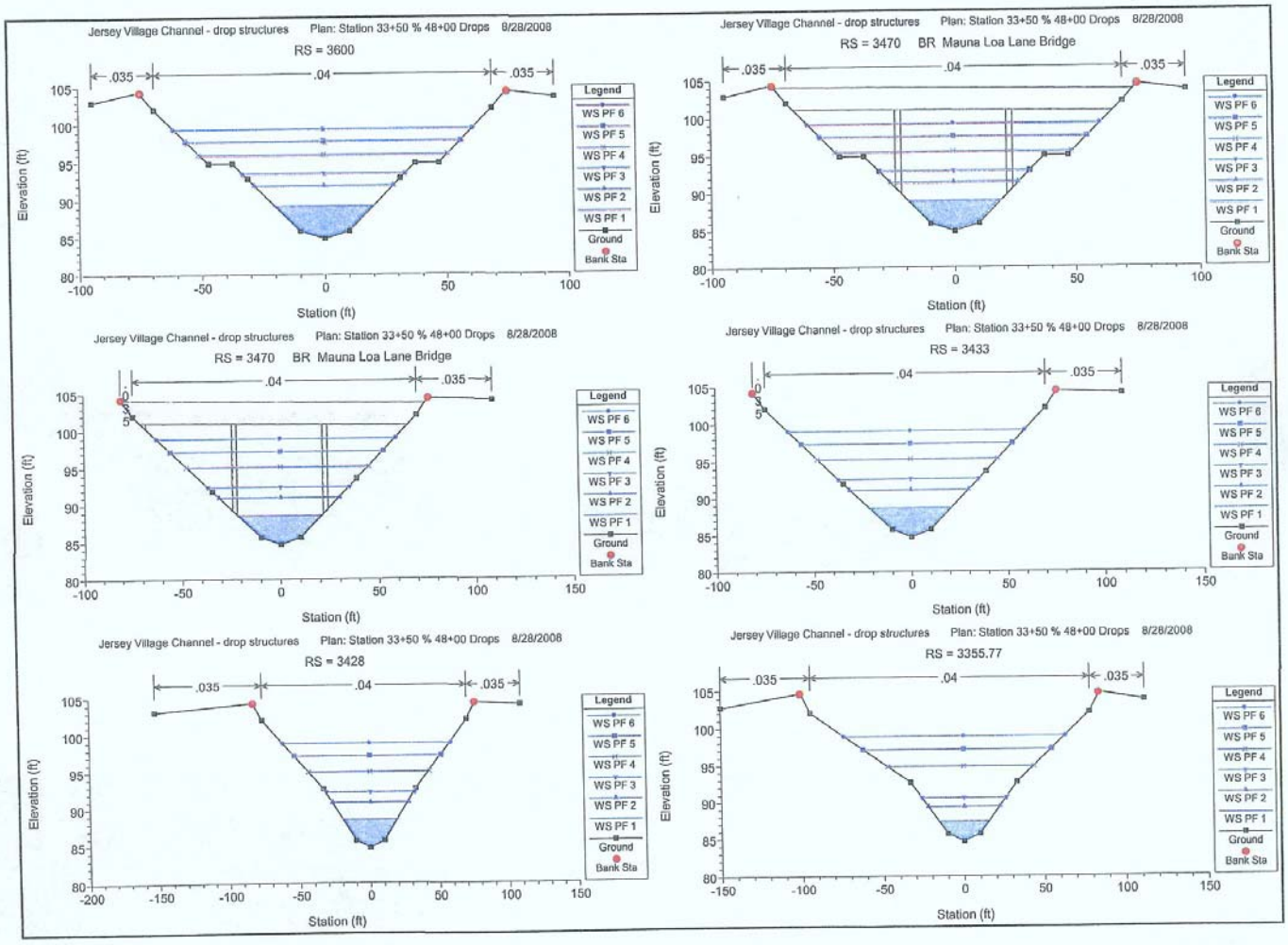
HEC-RAS Plan: 3350 & 4800 (Continued)

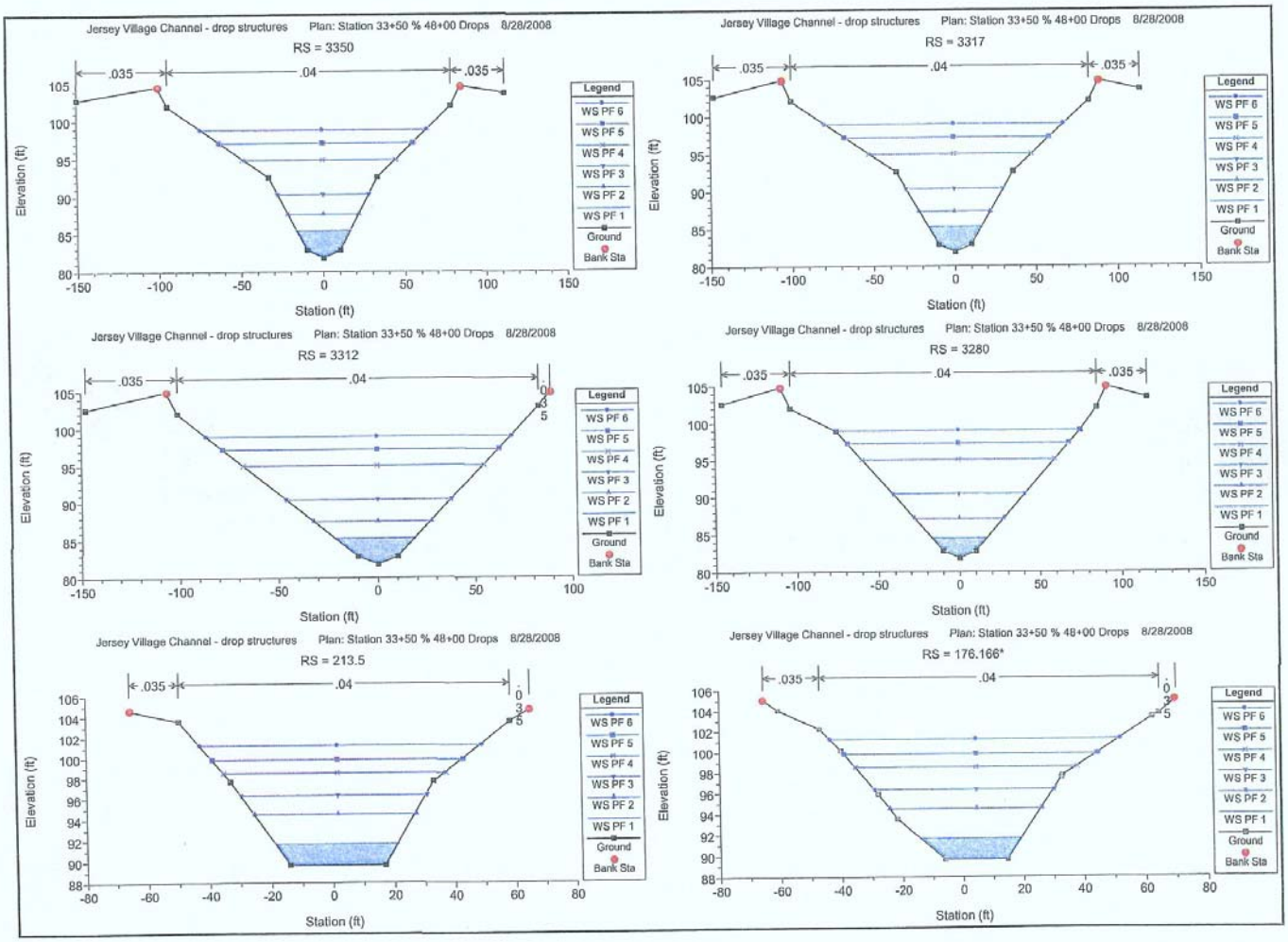
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E141	4750-3280	4700	PF 4	3139.00	85.95	98.13		98.52	0.001563	4.99	628.46	96.52	0.34
E141	4750-3280	4700	PF 5	3937.00	85.95	99.40		99.82	0.001472	5.21	756.10	104.16	0.34
E141	4750-3280	4700	PF 6	4929.00	85.95	100.79		101.26	0.001398	5.44	906.56	112.49	0.34
E141	4750-3280	4599	PF 1	408.00	85.85	91.04		91.16	0.001214	2.78	146.80	45.19	0.27
E141	4750-3280	4599	PF 2	1256.00	85.85	94.09		94.34	0.001464	4.02	312.69	63.51	0.32
E141	4750-3280	4599	PF 3	2040.00	85.85	95.85		96.19	0.001577	4.71	433.11	74.03	0.34
E141	4750-3280	4599	PF 4	3139.00	85.85	97.97		98.36	0.001546	5.02	625.14	96.75	0.35
E141	4750-3280	4599	PF 5	3937.00	85.85	99.26		99.68	0.001432	5.22	754.40	104.45	0.34
E141	4750-3280	4599	PF 6	4929.00	85.85	100.65		101.11	0.001343	5.44	906.38	112.83	0.34
E141	4750-3280	4594	PF 1	408.00	85.85	91.04		91.16	0.001220	2.78	146.58	45.19	0.27
E141	4750-3280	4594	PF 2	1256.00	85.85	94.09		94.34	0.001469	4.02	312.42	63.53	0.32
E141	4750-3280	4594	PF 3	2040.00	85.85	95.84		96.18	0.001581	4.71	432.91	74.12	0.34
E141	4750-3280	4594	PF 4	3139.00	85.85	97.96		98.35	0.001521	5.02	624.98	96.72	0.35
E141	4750-3280	4594	PF 5	3937.00	85.85	99.25		99.67	0.001397	5.22	754.25	104.39	0.34
E141	4750-3280	4594	PF 6	4929.00	85.85	100.65		101.11	0.001299	5.44	906.17	112.74	0.34
E141	4750-3280	4400	PF 1	408.00	85.85	90.75		90.89	0.001556	3.03	134.76	44.06	0.31
E141	4750-3280	4400	PF 2	1256.00	85.85	93.74		94.02	0.001748	4.26	294.51	62.55	0.35
E141	4750-3280	4400	PF 3	2040.00	85.85	95.47		95.85	0.001795	4.96	411.64	72.92	0.37
E141	4750-3280	4400	PF 4	3139.00	85.85	97.66		98.05	0.001612	5.01	626.27	106.45	0.36
E141	4750-3280	4400	PF 5	3937.00	85.85	98.99		99.40	0.001371	5.09	773.83	114.71	0.35
E141	4750-3280	4400	PF 6	4929.00	85.85	100.43		100.85	0.001209	5.22	944.91	123.60	0.33
E141	4750-3280	4100	PF 1	408.00	85.35	90.29		90.43	0.001502	2.99	136.35	44.16	0.30
E141	4750-3280	4100	PF 2	1256.00	85.35	93.20		93.49	0.001804	4.32	290.98	62.02	0.35
E141	4750-3280	4100	PF 3	2040.00	85.35	94.91		95.30	0.001863	5.04	405.05	71.56	0.37
E141	4750-3280	4100	PF 4	3139.00	85.35	97.15		97.56	0.001677	5.09	616.56	104.94	0.37
E141	4750-3280	4100	PF 5	3937.00	85.35	98.58		98.99	0.001367	5.09	772.76	113.61	0.34
E141	4750-3280	4100	PF 6	4929.00	85.35	100.07		100.49	0.001186	5.19	948.90	122.66	0.33
E141	4750-3280	3605	PF 1	408.00	84.86	89.29		89.49	0.002454	3.59	113.71	40.55	0.38
E141	4750-3280	3605	PF 2	1256.00	84.86	91.94		92.36	0.002917	5.18	242.67	56.50	0.44
E141	4750-3280	3605	PF 3	2040.00	84.86	93.60		94.15	0.002931	5.92	344.61	66.49	0.46
E141	4750-3280	3605	PF 4	3139.00	84.86	95.07		95.58	0.002323	5.69	551.33	101.11	0.43
E141	4750-3280	3605	PF 5	3937.00	84.86	97.82		98.26	0.001563	5.35	736.51	111.33	0.37
E141	4750-3280	3605	PF 6	4929.00	84.86	99.44		99.88	0.001264	5.32	926.67	120.86	0.34
E141	4750-3280	3600	PF 1	408.00	84.85	89.27	87.58	89.47	0.002451	3.59	113.59	40.53	0.38
E141	4750-3280	3600	PF 2	1256.00	84.85	91.93	89.60	92.34	0.002929	5.18	242.31	56.46	0.44
E141	4750-3280	3600	PF 3	2040.00	84.85	93.58	90.86	94.13	0.002997	5.93	344.20	66.58	0.46
E141	4750-3280	3600	PF 4	3139.00	84.85	96.06	92.26	96.56	0.002563	5.69	551.65	101.44	0.43
E141	4750-3280	3600	PF 5	3937.00	84.85	97.81	93.10	98.25	0.001748	5.33	738.48	112.20	0.37
E141	4750-3280	3600	PF 6	4929.00	84.85	99.44	94.02	99.88	0.001428	5.30	929.77	122.25	0.34
E141	4750-3280	3470		Bridge									
E141	4750-3280	3433	PF 1	408.00	84.68	88.66		88.90	0.003549	3.94	103.59	42.76	0.45
E141	4750-3280	3433	PF 2	1256.00	84.68	91.10		91.56	0.003816	5.45	230.27	61.34	0.50
E141	4750-3280	3433	PF 3	2040.00	84.68	92.58		93.17	0.003825	6.19	329.57	72.65	0.51
E141	4750-3280	3433	PF 4	3139.00	84.68	95.25		95.76	0.002273	5.69	551.32	93.06	0.41
E141	4750-3280	3433	PF 5	3937.00	84.68	97.32		97.74	0.001513	5.18	759.96	108.83	0.35
E141	4750-3280	3433	PF 6	4929.00	84.68	99.05		99.46	0.001272	5.14	958.98	121.99	0.32
E141	4750-3280	3428	PF 1	408.00	84.68	88.59		88.87	0.004068	4.24	96.14	39.14	0.48
E141	4750-3280	3428	PF 2	1256.00	84.68	90.92		91.50	0.004846	6.13	204.77	54.40	0.56
E141	4750-3280	3428	PF 3	2040.00	84.68	92.31		93.09	0.005124	7.11	286.94	63.56	0.59
E141	4750-3280	3428	PF 4	3139.00	84.68	95.08		95.71	0.002988	6.35	494.45	86.72	0.47
E141	4750-3280	3428	PF 5	3937.00	84.68	97.21		97.71	0.001914	5.63	698.91	105.10	0.39
E141	4750-3280	3428	PF 6	4929.00	84.68	98.96		99.43	0.001568	5.50	895.62	120.16	0.36
E141	4750-3280	3355.77	PF 1	408.00	84.65	87.37	87.37	88.25	0.020371	7.53	54.16	31.36	1.01
E141	4750-3280	3355.77	PF 2	1256.00	84.65	89.35	89.35	90.82	0.017022	9.70	129.42	44.48	1.00
E141	4750-3280	3355.77	PF 3	2040.00	84.65	90.59	90.59	92.39	0.015867	10.77	189.35	52.64	1.00
E141	4750-3280	3355.77	PF 4	3139.00	84.65	94.82		95.47	0.003444	6.60	482.68	91.13	0.50
E141	4750-3280	3355.77	PF 5	3937.00	84.65	97.09		97.56	0.001991	5.47	719.60	117.05	0.39
E141	4750-3280	3355.77	PF 6	4929.00	84.65	98.88		99.30	0.001543	5.20	947.37	137.43	0.35
E141	4750-3280	3350	PF 1	408.00	81.82	85.59		85.96	0.006308	4.90	83.31	33.00	0.54
E141	4750-3280	3350	PF 2	1256.00	81.82	87.75		88.64	0.007361	7.57	165.87	43.18	0.68
E141	4750-3280	3350	PF 3	2040.00	81.82	90.42		91.15	0.003920	6.85	297.79	55.72	0.52
E141	4750-3280	3350	PF 4	3139.00	81.82	94.98		95.38	0.001579	5.06	619.81	93.04	0.35
E141	4750-3280	3350	PF 5	3937.00	81.82	97.18		97.51	0.001175	4.63	851.10	118.00	0.30
E141	4750-3280	3350	PF 6	4929.00	81.82	98.94		99.27	0.001031	4.58	1077.20	138.10	0.29
E141	4750-3280	3317	PF 1	408.00	81.82	85.30		85.75	0.007191	5.36	76.07	33.24	0.62
E141	4750-3280	3317	PF 2	1256.00	81.82	87.32		88.35	0.009549	8.16	154.01	44.00	0.77
E141	4750-3280	3317	PF 3	2040.00	81.82	90.34		91.01	0.003701	6.56	311.04	60.09	0.51
E141	4750-3280	3317	PF 4	3139.00	81.82	94.97		95.32	0.001364	4.72	665.61	100.38	0.32
E141	4750-3280	3317	PF 5	3937.00	81.82	97.17		97.46	0.001003	4.30	914.88	126.34	0.28
E141	4750-3280	3317	PF 6	4929.00	81.82	98.94		99.22	0.000878	4.26	1156.87	147.24	0.27
E141	4750-3280	3312	PF 1	408.00	81.81	85.35	84.50	85.68	0.005869	4.65	87.71	41.26	0.56
E141	4750-3280	3312	PF 2	1256.00	81.81	87.58		88.19	0.005832	6.26	200.62	59.96	0.60
E141	4750-3280	3312	PF 3	2040.00	81.81	90.53		90.90	0.002188	4.93	413.85	84.67	0.39
E141	4750-3280	3312	PF 4	3139.00	81.81	95.07		95.27	0.000675	3.55	885.46	122.77	0.23

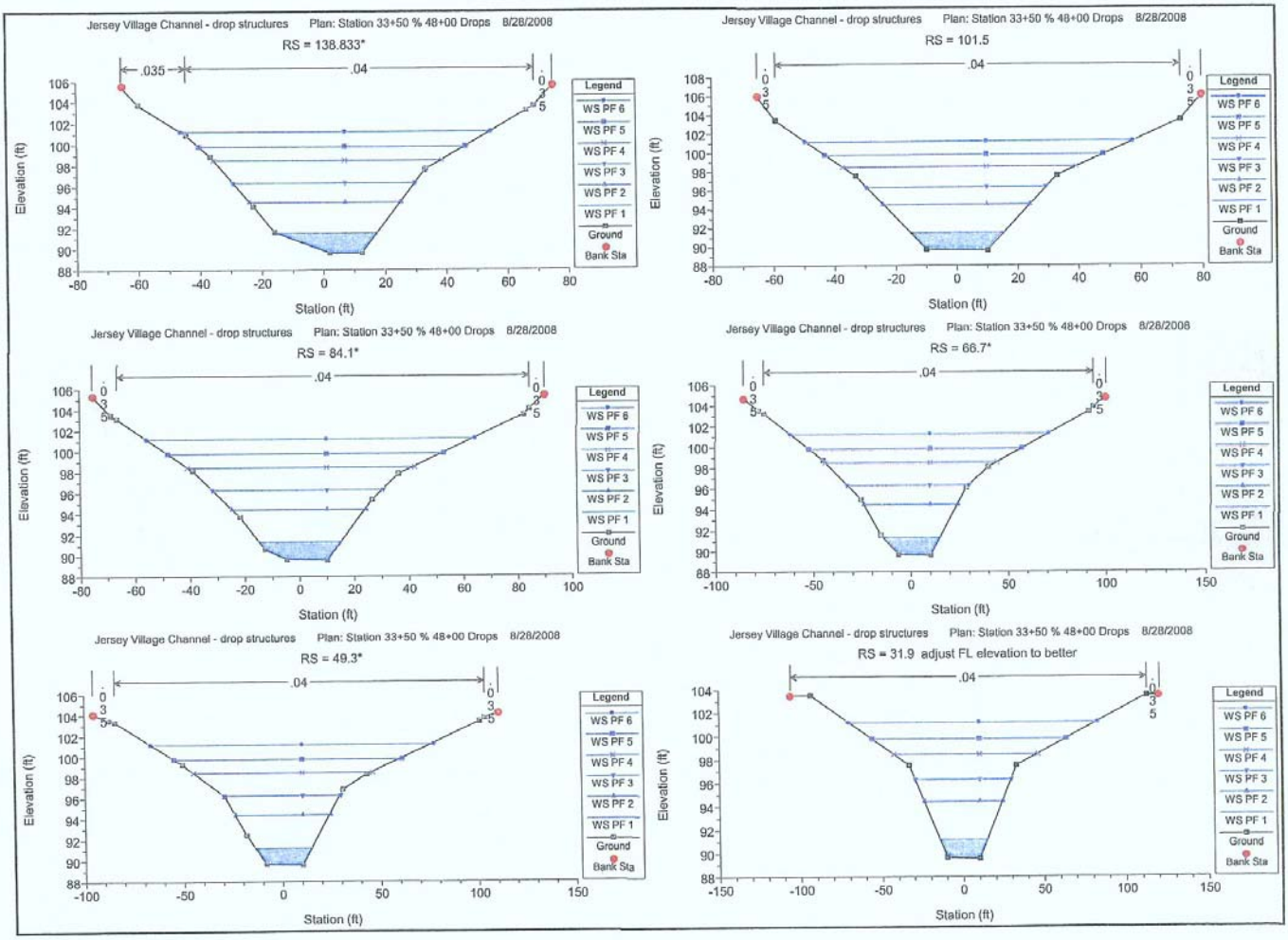
HEC-RAS Plan: 3350 & 4800 (Continued)

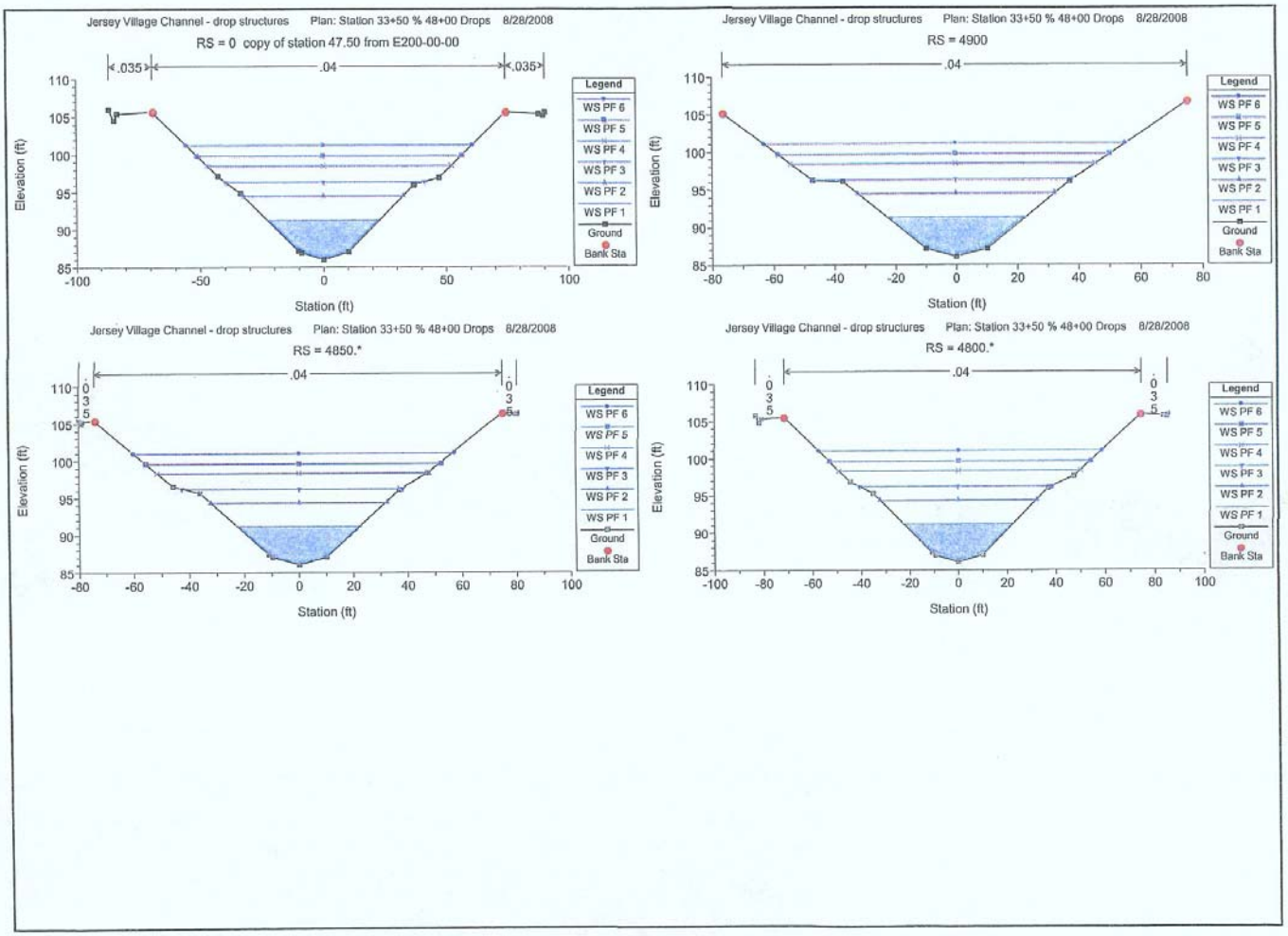
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E141	4750-3280	3312	PF 5	3937.00	81.81	97.25		97.42	0.000502	3.36	1172.12	140.99	0.21
E141	4750-3280	3312	PF 6	4929.00	81.81	99.01		99.19	0.000460	3.44	1433.17	155.74	0.20
E141	4750-3280	3280	PF 1	408.00	81.78	84.47	84.47	85.31	0.020565	7.35	55.48	33.69	1.01
E141	4750-3280	3280	PF 2	1256.00	81.78	87.13	86.38	87.94	0.008494	7.25	173.34	55.14	0.72
E141	4750-3280	3280	PF 3	2040.00	81.78	90.42	87.52	90.83	0.002365	5.11	398.83	81.76	0.41
E141	4750-3280	3280	PF 4	3139.00	81.78	95.04	88.76	95.25	0.000709	3.64	862.57	119.08	0.24
E141	4750-3280	3280	PF 5	3937.00	81.78	97.22	89.53	97.40	0.000527	3.45	1141.38	136.70	0.21
E141	4750-3280	3280	PF 6	4929.00	81.78	98.98	90.35	99.17	0.000485	3.53	1394.49	151.15	0.21


Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4700
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4599
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4594
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4400
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4100
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3605


Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3600
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3470 BR Mauna Loa Lane Bridge
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3470 BR Mauna Loa Lane Bridge
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3433
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3428
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3355.77
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta


Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3350
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3317
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3312
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 3280
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 213.5
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 176.166*


Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 138.833*
.035
.04
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 101.5
.04
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 84.1*
.04
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 66.7*
.04
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 49.3*
.04
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 31.9 adjust FL elevation to better
.04

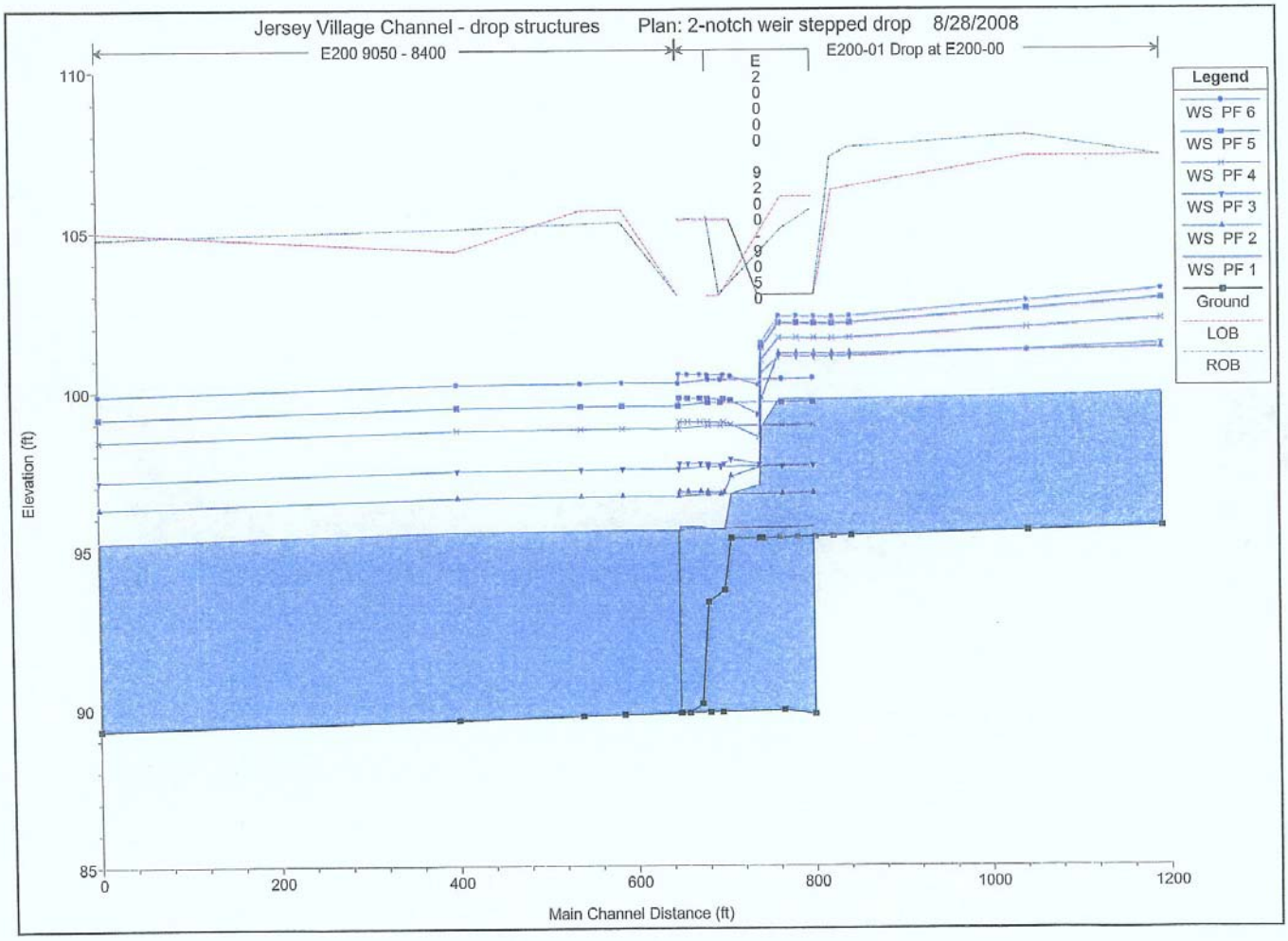

Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 0 copy of station 47.50 from E200-00-00
.035
.04
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4900
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4850.*
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: Station 33+50 % 48+00 Drops 8/28/2008
RS = 4800.*
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta

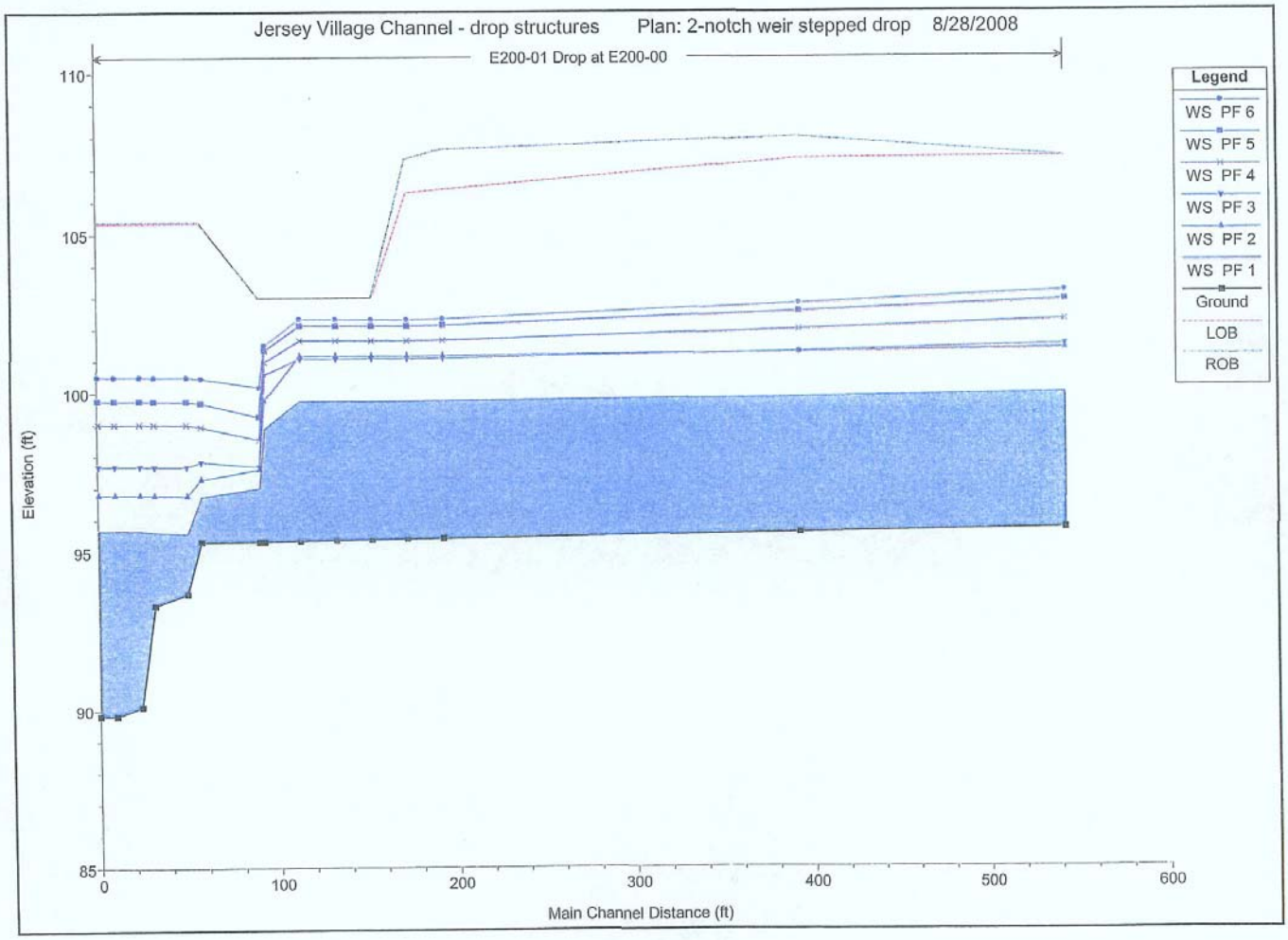
ATTACHMENT 3

HEC-RAS Output: Drop Structure Number 4

Jersey Village Channel Conveyance Improvements

Harris County, Texas


Jersey Village Channel - drop structures
Plan: 2-notch weir stepped drop 8/28/2008
E200 9050 - 8400
E200-01 Drop at E200-00
E 2000000 9200 9050
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
110
105
100
95
90
85
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

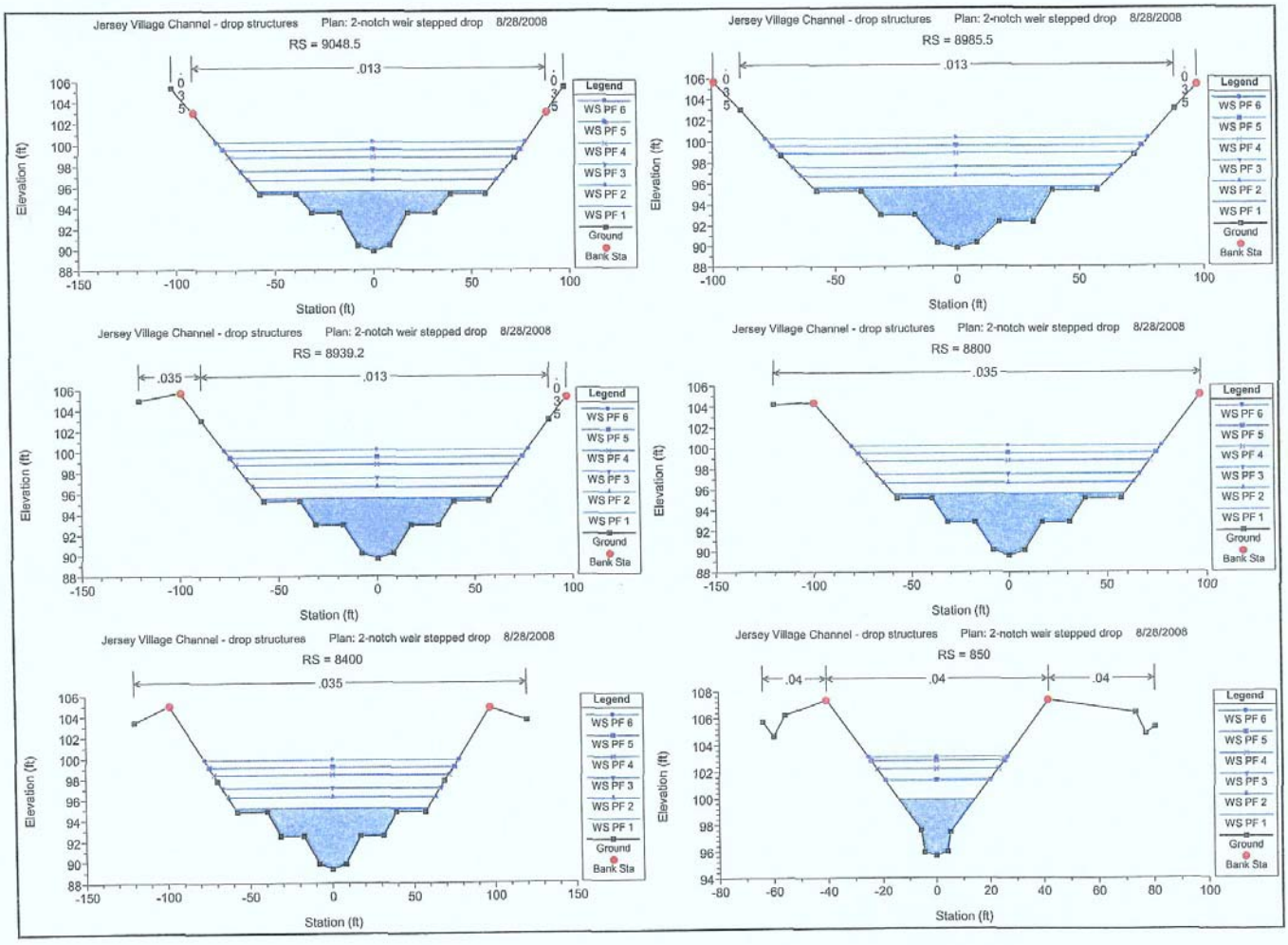

Jersey Village Channel - drop structures
Plan: 2-notch weir stepped drop
8/28/2008
E200-01 Drop at E200-00
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
LOB
ROB
Elevation (ft)
110
105
100
95
90
85
0
100
200
300
400
500
600
Main Channel Distance (ft)

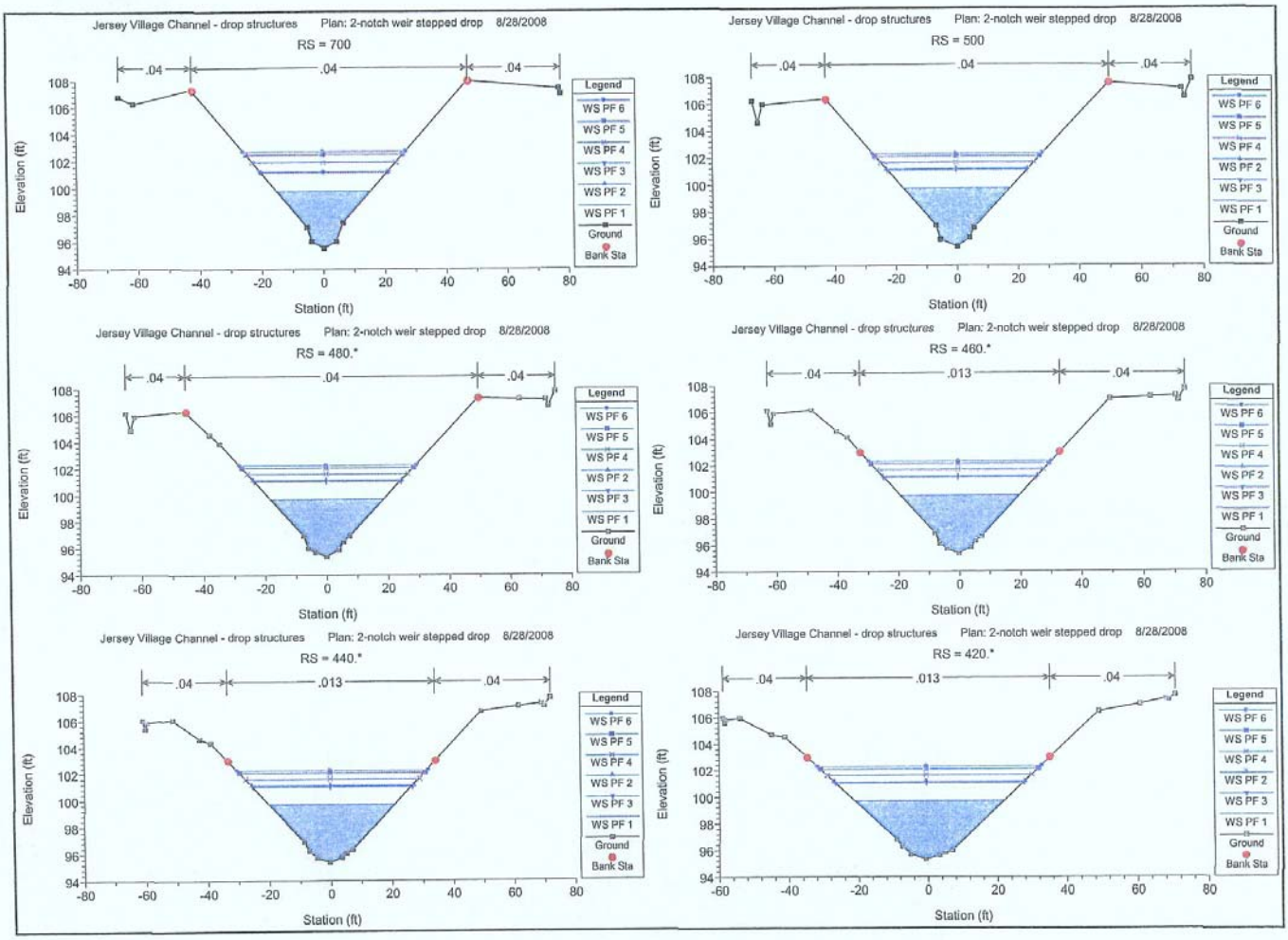
HEC-RAS Plan: 2-notch weir

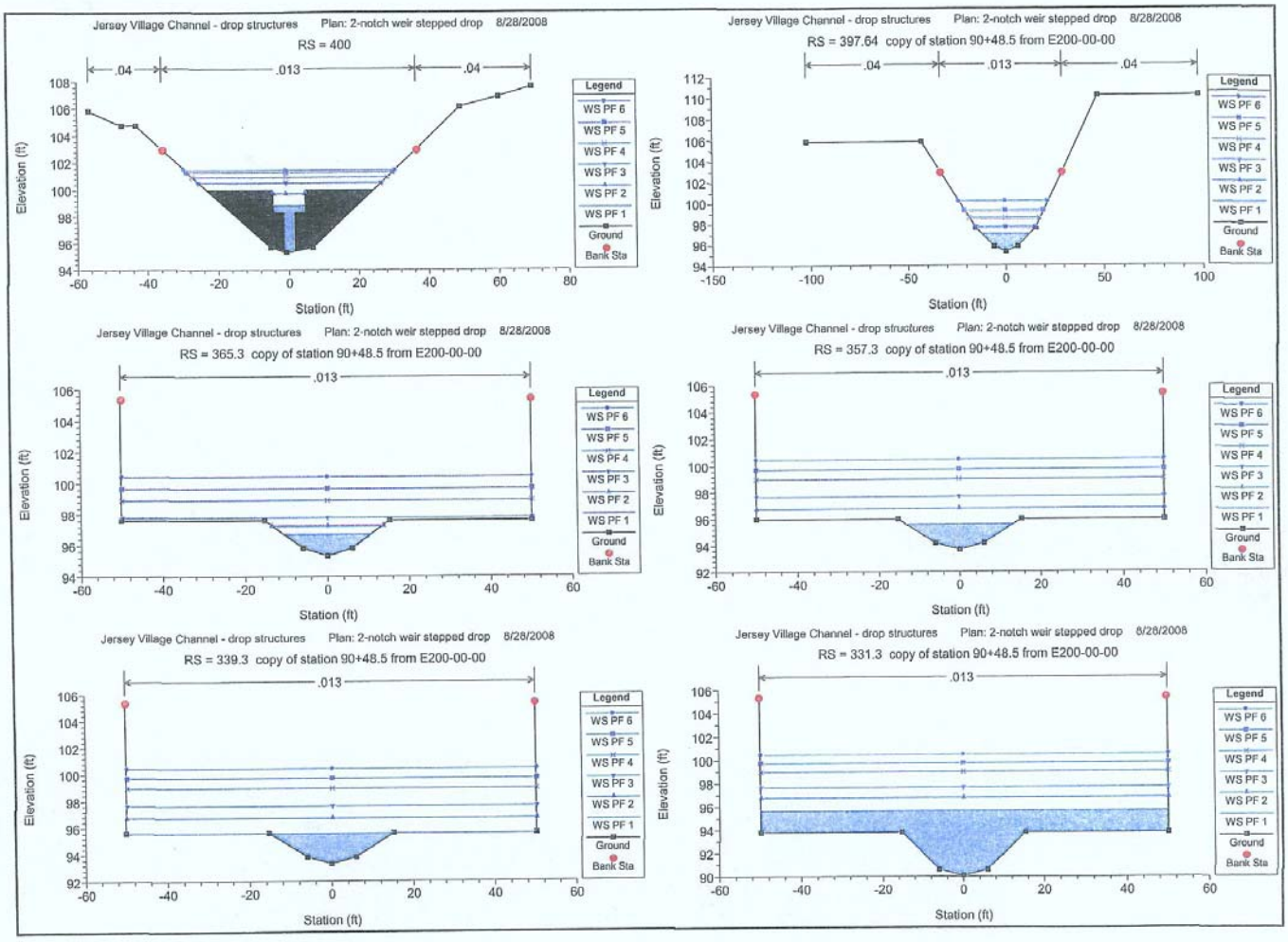
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E20000	9200-9050	9200	PF 1	500.50	89.78	95.68		95.73	0.000663	1.88	266.35	116.52	0.22
E20000	9200-9050	9200	PF 2	900.90	89.78	96.76		96.84	0.000624	2.27	397.36	125.24	0.22
E20000	9200-9050	9200	PF 3	1301.30	89.78	97.65		97.75	0.000606	2.55	511.02	132.34	0.23
E20000	9200-9050	9200	PF 4	2002.00	89.78	98.93		99.07	0.000589	2.91	688.28	142.71	0.23
E20000	9200-9050	9200	PF 5	2419.00	89.78	99.66		99.81	0.000563	3.04	794.54	148.58	0.23
E20000	9200-9050	9200	PF 6	2941.00	89.78	100.39		100.56	0.000568	3.25	905.13	154.45	0.24
E20000	9200-9050	9165.1	PF 1	500.50	89.90	95.65		95.71	0.000698	1.91	262.18	116.51	0.22
E20000	9200-9050	9165.1	PF 2	900.90	89.90	96.74		96.82	0.000645	2.29	393.48	125.40	0.23
E20000	9200-9050	9165.1	PF 3	1301.30	89.90	97.62		97.72	0.000622	2.56	507.45	132.63	0.23
E20000	9200-9050	9165.1	PF 4	2002.00	89.90	98.91		99.04	0.000600	2.92	685.36	143.19	0.24
E20000	9200-9050	9165.1	PF 5	2419.00	89.90	99.64		99.79	0.000571	3.05	792.19	149.18	0.23
E20000	9200-9050	9165.1	PF 6	2941.00	89.90	100.37		100.54	0.000574	3.26	903.26	155.16	0.24
E20000	9200-9050	9095.5	PF 1	500.50	89.85	95.64		95.69	0.000133	1.87	267.03	117.13	0.22
E20000	9200-9050	9095.5	PF 2	900.90	89.85	96.72		96.80	0.000128	2.25	399.71	127.05	0.22
E20000	9200-9050	9095.5	PF 3	1301.30	89.85	97.61		97.71	0.000127	2.52	516.62	135.12	0.23
E20000	9200-9050	9095.5	PF 4	2002.00	89.85	98.90		99.03	0.000125	2.87	697.71	146.90	0.23
E20000	9200-9050	9095.5	PF 5	2419.00	89.85	99.63		99.77	0.000120	2.99	807.71	153.58	0.23
E20000	9200-9050	9095.5	PF 6	2941.00	89.85	100.36		100.52	0.000122	3.19	922.35	160.25	0.23
E20000	9200-9050	9081.5	PF 1	500.50	89.84	95.64		95.69	0.000090	1.87	268.04	117.09	0.22
E20000	9200-9050	9081.5	PF 2	900.90	89.84	96.72		96.80	0.000085	2.25	400.42	126.54	0.22
E20000	9200-9050	9081.5	PF 3	1301.30	89.84	97.61		97.71	0.000083	2.52	516.68	134.23	0.23
E20000	9200-9050	9081.5	PF 4	2002.00	89.84	98.90		99.03	0.000080	2.88	696.18	145.49	0.23
E20000	9200-9050	9081.5	PF 5	2419.00	89.84	99.63		99.77	0.000076	3.00	805.04	152.02	0.23
E20000	9200-9050	9081.5	PF 6	2941.00	89.84	100.36		100.52	0.000077	3.20	918.40	158.53	0.23
E200-01	Drop at E200-00	850	PF 1	100.00	95.67	99.92		99.95	0.000665	1.56	63.97	28.46	0.18
E200-01	Drop at E200-00	850	PF 2	200.00	95.67	101.32		101.37	0.000625	1.80	111.19	38.64	0.19
E200-01	Drop at E200-00	850	PF 3	300.00	95.67	101.44		101.55	0.001261	2.59	115.89	39.51	0.27
E200-01	Drop at E200-00	850	PF 4	500.00	95.67	102.23		102.40	0.001802	3.36	149.01	45.17	0.33
E200-01	Drop at E200-00	850	PF 5	700.00	95.67	102.86		103.09	0.002176	3.91	178.92	49.73	0.36
E200-01	Drop at E200-00	850	PF 6	800.00	95.67	103.14		103.40	0.002323	4.14	193.07	51.76	0.38
E200-01	Drop at E200-00	700	PF 1	100.00	95.55	99.83		99.86	0.000574	1.47	68.21	30.78	0.17
E200-01	Drop at E200-00	700	PF 2	200.00	95.55	101.24		101.29	0.000527	1.68	119.28	41.39	0.17
E200-01	Drop at E200-00	700	PF 3	300.00	95.55	101.27		101.37	0.001158	2.49	120.33	41.58	0.26
E200-01	Drop at E200-00	700	PF 4	500.00	95.55	101.96		102.13	0.001764	3.31	150.99	46.78	0.32
E200-01	Drop at E200-00	700	PF 5	700.00	95.55	102.53		102.77	0.002215	3.92	178.58	51.01	0.37
E200-01	Drop at E200-00	700	PF 6	800.00	95.55	102.78		103.05	0.002400	4.18	191.60	52.89	0.39
E200-01	Drop at E200-00	500	PF 1	100.00	95.40	99.74		99.77	0.000378	1.23	81.21	35.16	0.14
E200-01	Drop at E200-00	500	PF 2	200.00	95.40	101.16		101.20	0.000362	1.44	139.16	46.35	0.15
E200-01	Drop at E200-00	500	PF 3	300.00	95.40	101.08		101.16	0.000877	2.22	135.35	45.69	0.23
E200-01	Drop at E200-00	500	PF 4	500.00	95.40	101.66		101.80	0.001491	3.07	162.83	50.20	0.30
E200-01	Drop at E200-00	500	PF 5	700.00	95.40	102.12		102.34	0.002026	3.75	186.88	53.84	0.35
E200-01	Drop at E200-00	500	PF 6	800.00	95.40	102.32		102.58	0.002266	4.04	198.12	55.46	0.38
E200-01	Drop at E200-00	480.*	PF 1	100.00	95.38	99.74		99.76	0.000312	1.14	87.77	37.18	0.13
E200-01	Drop at E200-00	480.*	PF 2	200.00	95.38	101.16		101.19	0.000307	1.34	148.71	48.49	0.14
E200-01	Drop at E200-00	480.*	PF 3	300.00	95.38	101.07		101.14	0.000746	2.08	144.43	47.78	0.21
E200-01	Drop at E200-00	480.*	PF 4	500.00	95.38	101.64		101.77	0.001285	2.89	172.78	52.29	0.28
E200-01	Drop at E200-00	480.*	PF 5	700.00	95.38	102.10		102.29	0.001764	3.54	197.51	55.92	0.33
E200-01	Drop at E200-00	480.*	PF 6	800.00	95.38	102.30		102.53	0.001980	3.83	209.04	57.53	0.35
E200-01	Drop at E200-00	460.*	PF 1	100.00	95.36	99.74		99.76	0.000027	1.05	95.01	39.32	0.12
E200-01	Drop at E200-00	460.*	PF 2	200.00	95.36	101.16		101.19	0.000027	1.26	159.11	50.78	0.13
E200-01	Drop at E200-00	460.*	PF 3	300.00	95.36	101.08		101.13	0.000068	1.94	154.72	50.08	0.19
E200-01	Drop at E200-00	460.*	PF 4	500.00	95.36	101.64		101.76	0.000115	2.71	184.52	54.66	0.26
E200-01	Drop at E200-00	460.*	PF 5	700.00	95.36	102.10		102.28	0.000159	3.33	210.50	58.36	0.31
E200-01	Drop at E200-00	460.*	PF 6	800.00	95.36	102.31		102.51	0.000179	3.59	222.67	60.01	0.33
E200-01	Drop at E200-00	440.*	PF 1	100.00	95.35	99.74		99.75	0.000023	0.98	102.30	41.25	0.11
E200-01	Drop at E200-00	440.*	PF 2	200.00	95.35	101.16		101.19	0.000023	1.18	169.21	52.76	0.12
E200-01	Drop at E200-00	440.*	PF 3	300.00	95.35	101.08		101.13	0.000057	1.82	164.76	52.08	0.18
E200-01	Drop at E200-00	440.*	PF 4	500.00	95.35	101.65		101.75	0.000099	2.55	195.87	56.70	0.24
E200-01	Drop at E200-00	440.*	PF 5	700.00	95.35	102.11		102.27	0.000137	3.14	222.96	60.45	0.29
E200-01	Drop at E200-00	440.*	PF 6	800.00	95.35	102.32		102.50	0.000154	3.39	235.68	62.13	0.31
E200-01	Drop at E200-00	420.*	PF 1	100.00	95.33	99.74		99.75	0.000019	0.91	110.24	43.32	0.10
E200-01	Drop at E200-00	420.*	PF 2	200.00	95.33	101.16		101.18	0.000020	1.11	180.18	54.93	0.11
E200-01	Drop at E200-00	420.*	PF 3	300.00	95.33	101.08		101.13	0.000048	1.71	176.64	54.26	0.17
E200-01	Drop at E200-00	420.*	PF 4	500.00	95.33	101.66		101.75	0.000085	2.40	208.19	58.95	0.23
E200-01	Drop at E200-00	420.*	PF 5	700.00	95.33	102.12		102.26	0.000118	2.96	236.55	62.75	0.27
E200-01	Drop at E200-00	420.*	PF 6	800.00	95.33	102.33		102.49	0.000133	3.20	249.82	64.46	0.29
E200-01	Drop at E200-00	400	PF 1	100.00	95.31	98.88	98.88	99.67	0.004671	7.15	13.99	9.00	1.01
E200-01	Drop at E200-00	400	PF 2	200.00	95.31	99.76	99.76	101.06	0.004814	9.13	21.91	9.00	1.03
E200-01	Drop at E200-00	400	PF 3	300.00	95.31	100.57	100.57	101.08	0.003121	5.73	52.33	52.17	1.01
E200-01	Drop at E200-00	400	PF 4	500.00	95.31	100.97	100.97	101.68	0.002963	6.78	73.78	55.46	1.04
E200-01	Drop at E200-00	400	PF 5	700.00	95.31	101.34	101.34	102.18	0.002660	7.37	95.04	58.53	1.02
E200-01	Drop at E200-00	400	PF 6	800.00	95.31	101.50	101.50	102.41	0.002598	7.65	104.53	59.85	1.02
E200-01	Drop at E200-00	397.64	PF 1	100.00	95.31	97.01	96.75	97.26	0.001230	4.03	24.83	24.40	0.70
E200-01	Drop at E200-00	397.64	PF 2	200.00	95.31	97.60	97.29	97.97	0.001253	4.89	40.83	30.46	0.74
E200-01	Drop at E200-00	397.64	PF 3	300.00	95.31	97.69	97.69	98.42	0.002296	6.83	43.91	31.09	1.01

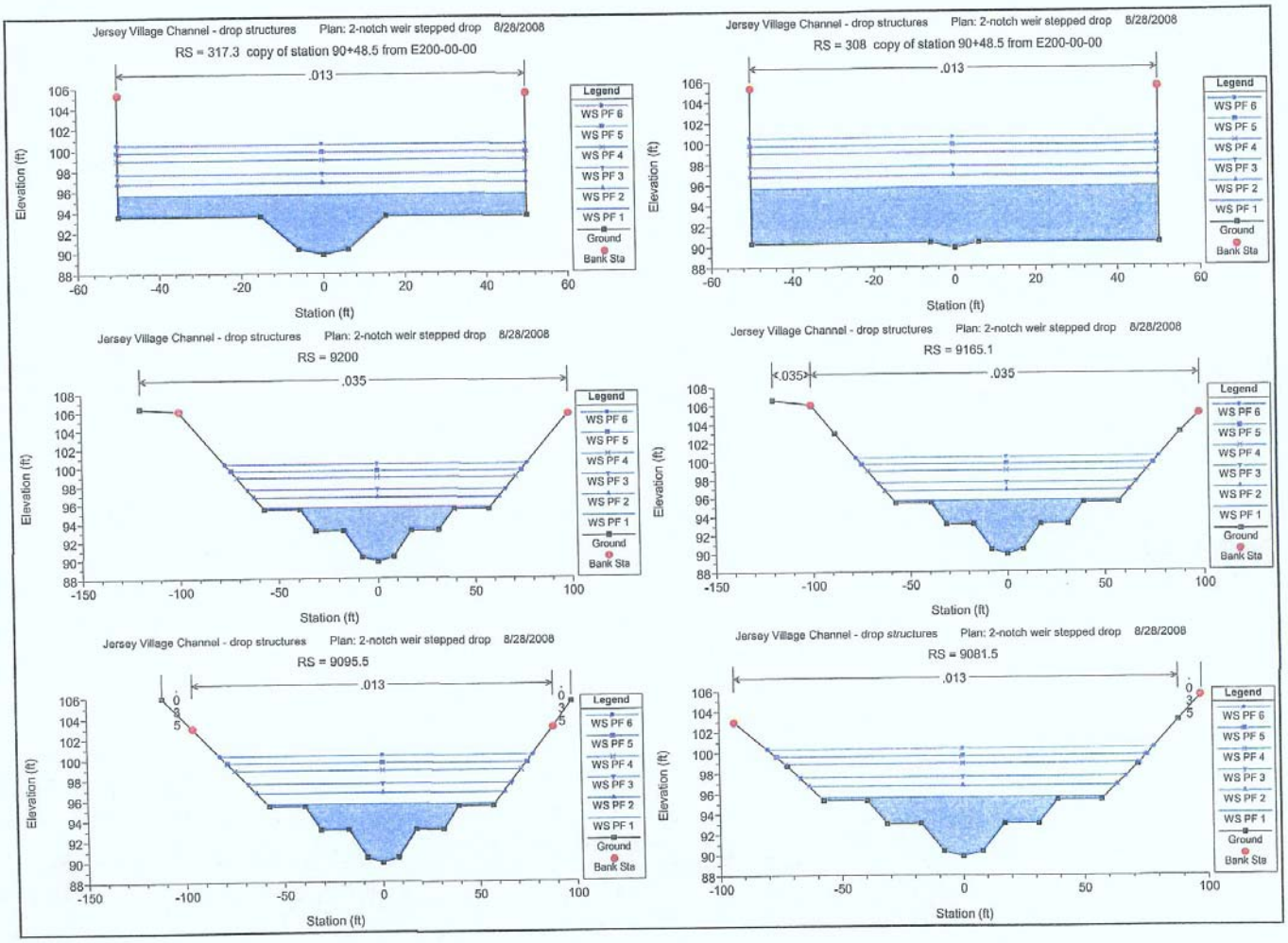
HEC-RAS Plan: 2-notch weir (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E200-01	Drop at E200-00	397.64	PF 4	500.00	95.31	98.53	98.31	99.28	0.001504	6.94	72.01	36.03	0.87
E200-01	Drop at E200-00	397.64	PF 5	700.00	95.31	99.25		100.02	0.001165	7.03	99.64	40.30	0.79
E200-01	Drop at E200-00	397.64	PF 6	800.00	95.31	100.18		100.69	0.000592	5.74	139.37	45.75	0.58
E200-01	Drop at E200-00	365.3	PF 1	100.00	95.31	96.75	96.75	97.19	0.002680	5.34	18.74	21.66	1.01
E200-01	Drop at E200-00	365.3	PF 2	200.00	95.31	97.29	97.29	97.89	0.002416	6.21	32.18	27.33	1.01
E200-01	Drop at E200-00	365.3	PF 3	300.00	95.31	97.84	97.84	98.16	0.002966	4.63	64.75	100.00	1.01
E200-01	Drop at E200-00	365.3	PF 4	500.00	95.31	98.95		99.07	0.000309	2.66	174.90	100.00	0.38
E200-01	Drop at E200-00	365.3	PF 5	700.00	95.31	99.69		99.81	0.000189	2.80	249.58	100.00	0.31
E200-01	Drop at E200-00	365.3	PF 6	800.00	95.31	100.46		100.56	0.000102	2.45	326.67	100.00	0.24
E200-01	Drop at E200-00	357.3	PF 1	100.00	93.67	95.59		95.76	0.000701	3.28	30.48	26.68	0.54
E200-01	Drop at E200-00	357.3	PF 2	200.00	93.67	96.78		96.82	0.000162	1.64	122.07	100.00	0.26
E200-01	Drop at E200-00	357.3	PF 3	300.00	93.67	97.69		97.72	0.000058	1.41	213.35	100.00	0.17
E200-01	Drop at E200-00	357.3	PF 4	500.00	93.67	99.01		99.04	0.000033	1.45	345.43	100.00	0.14
E200-01	Drop at E200-00	357.3	PF 5	700.00	93.67	99.75		99.79	0.000035	1.67	419.04	100.00	0.14
E200-01	Drop at E200-00	357.3	PF 6	800.00	93.67	100.50		100.54	0.000027	1.62	494.28	100.00	0.13
E200-01	Drop at E200-00	339.3	PF 1	100.00	93.31	95.64		95.72	0.001196	2.28	43.91	100.00	0.61
E200-01	Drop at E200-00	339.3	PF 2	200.00	93.31	96.79		96.81	0.000068	1.26	159.09	100.00	0.18
E200-01	Drop at E200-00	339.3	PF 3	300.00	93.31	97.70		97.72	0.000035	1.20	249.85	100.00	0.13
E200-01	Drop at E200-00	339.3	PF 4	500.00	93.31	99.01		99.04	0.000024	1.31	381.80	100.00	0.12
E200-01	Drop at E200-00	339.3	PF 5	700.00	93.31	99.75		99.79	0.000027	1.54	455.46	100.00	0.13
E200-01	Drop at E200-00	339.3	PF 6	800.00	93.31	100.50		100.54	0.000021	1.51	530.61	100.00	0.12
E200-01	Drop at E200-00	331.3	PF 1	100.00	90.10	95.69		95.69	0.000003	0.39	259.30	100.00	0.04
E200-01	Drop at E200-00	331.3	PF 2	200.00	90.10	96.80		96.81	0.000004	0.54	370.51	100.00	0.05
E200-01	Drop at E200-00	331.3	PF 3	300.00	90.10	97.71		97.71	0.000005	0.65	460.98	100.00	0.05
E200-01	Drop at E200-00	331.3	PF 4	500.00	90.10	99.03		99.04	0.000006	0.84	592.91	100.00	0.06
E200-01	Drop at E200-00	331.3	PF 5	700.00	90.10	99.76		99.78	0.000008	1.05	666.84	100.00	0.07
E200-01	Drop at E200-00	331.3	PF 6	800.00	90.10	100.51		100.53	0.000007	1.08	741.84	100.00	0.07
E200-01	Drop at E200-00	317.3	PF 1	100.00	89.82	95.69		95.69	0.000002	0.35	287.32	100.00	0.04
E200-01	Drop at E200-00	317.3	PF 2	200.00	89.82	96.80		96.81	0.000003	0.50	398.55	100.00	0.04
E200-01	Drop at E200-00	317.3	PF 3	300.00	89.82	97.71		97.71	0.000004	0.61	489.03	100.00	0.05
E200-01	Drop at E200-00	317.3	PF 4	500.00	89.82	99.03		99.04	0.000005	0.81	620.97	100.00	0.06
E200-01	Drop at E200-00	317.3	PF 5	700.00	89.82	99.77		99.78	0.000007	1.01	694.93	100.00	0.07
E200-01	Drop at E200-00	317.3	PF 6	800.00	89.82	100.52		100.53	0.000007	1.04	769.92	100.00	0.07
E200-01	Drop at E200-00	308	PF 1	100.00	89.82	95.69		95.69	0.000000	0.19	540.04	100.00	0.01
E200-01	Drop at E200-00	308	PF 2	200.00	89.82	96.80		96.80	0.000001	0.31	651.35	100.00	0.02
E200-01	Drop at E200-00	308	PF 3	300.00	89.82	97.71		97.71	0.000001	0.40	741.89	100.00	0.03
E200-01	Drop at E200-00	308	PF 4	500.00	89.82	99.03		99.03	0.000002	0.57	873.94	100.00	0.03
E200-01	Drop at E200-00	308	PF 5	700.00	89.82	99.77		99.78	0.000003	0.74	948.06	100.00	0.04
E200-01	Drop at E200-00	308	PF 6	800.00	89.82	100.52		100.53	0.000003	0.78	1023.05	100.00	0.04
E200	9050 - 8400	9048.5	PF 1	603.75	89.82	95.58		95.68	0.000184	2.50	241.74	116.84	0.31
E200	9050 - 8400	9048.5	PF 2	1086.75	89.82	96.66		96.79	0.000157	2.92	372.46	126.31	0.30
E200	9050 - 8400	9048.5	PF 3	1569.75	89.82	97.53		97.70	0.000146	3.23	486.21	134.01	0.30
E200	9050 - 8400	9048.5	PF 4	2415.00	89.82	98.81		99.01	0.000136	3.64	664.33	145.19	0.30
E200	9050 - 8400	9048.5	PF 5	2965.00	89.82	99.53		99.76	0.000132	3.85	770.67	151.12	0.30
E200	9050 - 8400	9048.5	PF 6	3573.00	89.82	100.25		100.51	0.000129	4.05	882.21	157.11	0.30
E200	9050 - 8400	8985.5	PF 1	603.75	89.77	95.60		95.66	0.000104	2.10	287.42	117.35	0.24
E200	9050 - 8400	8985.5	PF 2	1086.75	89.77	96.67		96.78	0.000107	2.60	416.63	126.73	0.25
E200	9050 - 8400	8985.5	PF 3	1569.75	89.77	97.54		97.68	0.000108	2.95	532.69	134.36	0.26
E200	9050 - 8400	8985.5	PF 4	2415.00	89.77	98.82		99.00	0.000108	3.40	711.12	145.28	0.27
E200	9050 - 8400	8985.5	PF 5	2965.00	89.77	99.54		99.74	0.000108	3.63	817.28	150.66	0.27
E200	9050 - 8400	8985.5	PF 6	3573.00	89.77	100.26		100.49	0.000108	3.85	928.20	156.09	0.28
E200	9050 - 8400	8939.2	PF 1	603.75	89.73	95.58		95.66	0.000121	2.20	274.78	117.35	0.25
E200	9050 - 8400	8939.2	PF 2	1086.75	89.73	96.66		96.77	0.000118	2.68	405.50	125.94	0.26
E200	9050 - 8400	8939.2	PF 3	1569.75	89.73	97.53		97.67	0.000117	3.03	518.51	132.92	0.27
E200	9050 - 8400	8939.2	PF 4	2415.00	89.73	98.81		98.99	0.000115	3.48	694.33	143.11	0.28
E200	9050 - 8400	8939.2	PF 5	2965.00	89.73	99.52		99.74	0.000115	3.71	798.95	148.84	0.28
E200	9050 - 8400	8939.2	PF 6	3573.00	89.73	100.24		100.48	0.000114	3.93	908.59	154.62	0.29
E200	9050 - 8400	8800	PF 1	603.75	89.62	95.55		95.62	0.000791	2.12	284.18	118.21	0.24
E200	9050 - 8400	8800	PF 2	1086.75	89.62	96.63		96.73	0.000795	2.61	416.31	127.43	0.25
E200	9050 - 8400	8800	PF 3	1569.75	89.62	97.50		97.64	0.000796	2.96	530.95	134.91	0.26
E200	9050 - 8400	8800	PF 4	2415.00	89.62	98.78		98.96	0.000794	3.40	709.97	145.83	0.27
E200	9050 - 8400	8800	PF 5	2965.00	89.62	99.49		99.70	0.000793	3.63	816.82	151.98	0.28
E200	9050 - 8400	8800	PF 6	3573.00	89.62	100.22		100.45	0.000792	3.85	929.03	158.17	0.28
E200	9050 - 8400	8400	PF 1	603.75	89.31	95.23	92.79	95.30	0.000800	2.13	282.94	117.90	0.24
E200	9050 - 8400	8400	PF 2	1086.75	89.31	96.31	93.49	96.41	0.000800	2.62	414.27	126.50	0.26
E200	9050 - 8400	8400	PF 3	1569.75	89.31	97.18	94.06	97.32	0.000801	2.97	527.74	133.48	0.26
E200	9050 - 8400	8400	PF 4	2415.00	89.31	98.46	95.17	98.64	0.000800	3.43	704.40	143.73	0.27
E200	9050 - 8400	8400	PF 5	2965.00	89.31	99.17	95.52	99.38	0.000801	3.66	809.49	149.52	0.28
E200	9050 - 8400	8400	PF 6	3573.00	89.31	99.89	95.88	100.13	0.000800	3.88	919.70	155.35	0.28


Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 9048.5
.013
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 8985.5
.013
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 8939.2
.035
.013
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 8800
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 8400
.035
Elevation (ft)
Station (ft)
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 850
.04
.04
.04
Elevation (ft)
Station (ft)


Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 700
.04
.04
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 500
.04
.04
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 480.*
.04
.04
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 460.*
.04
.013
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 440.*
.04
.013
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 420.*
.04
.013
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 2
WS PF 3
WS PF 1
Ground
Bank Sta


Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 400
.04
.013
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 397.64 copy of station 90+48.5 from E200-00-00
.04
.013
.04
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 365.3 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 357.3 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 339.3 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 331.3 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta


Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 317.3 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 308 copy of station 90+48.5 from E200-00-00
.013
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 9200
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 9165.1
.035
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 9095.5
.013
.035
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta
Jersey Village Channel - drop structures Plan: 2-notch weir stepped drop 8/28/2008
RS = 9081.5
.013
.035
.035
Elevation (ft)
Station (ft)
Legend
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
WS PF 1
Ground
Bank Sta

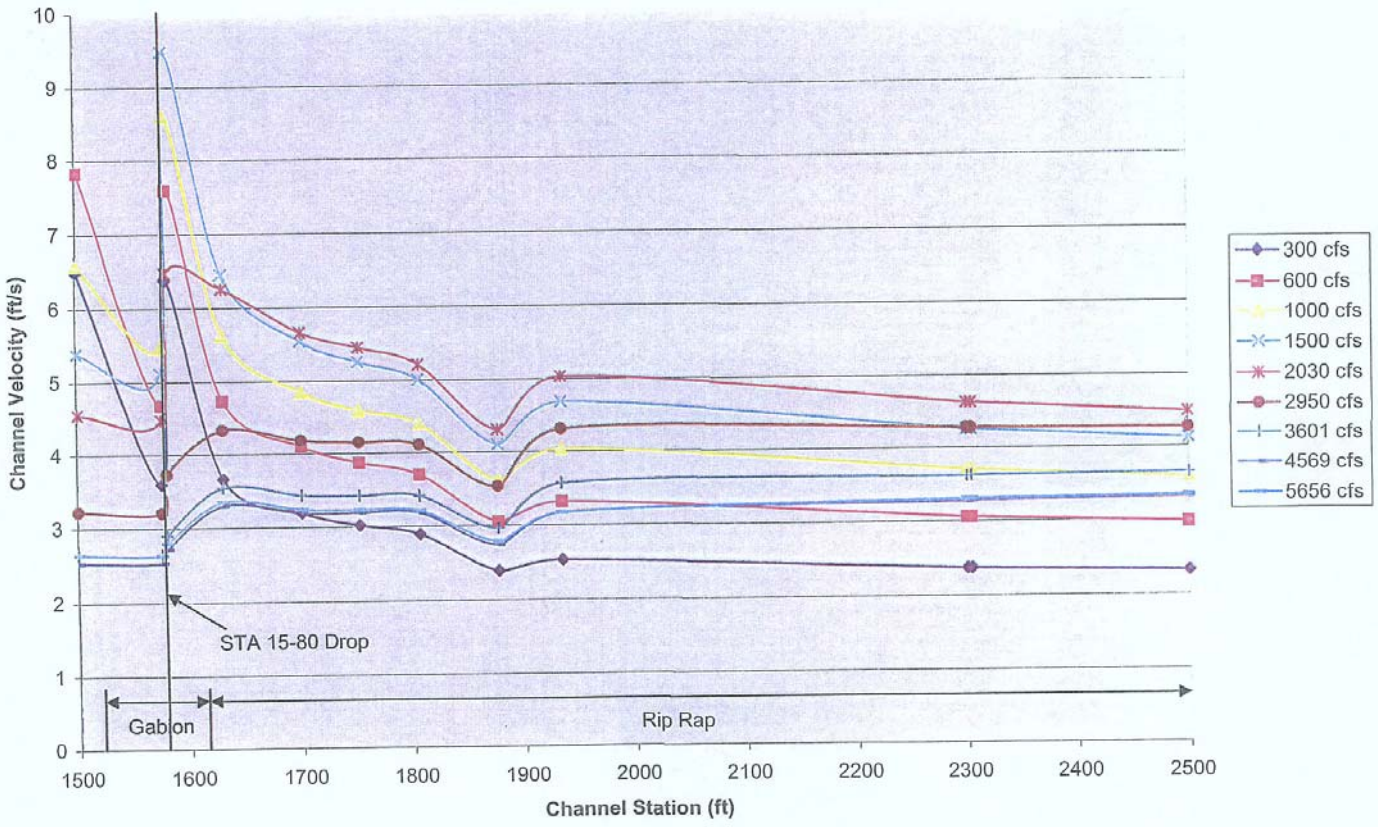
ATTACHMENT 4

Four Channel Velocity Graphs

Jersey Village Channel Conveyance Improvements

Harris County, Texas

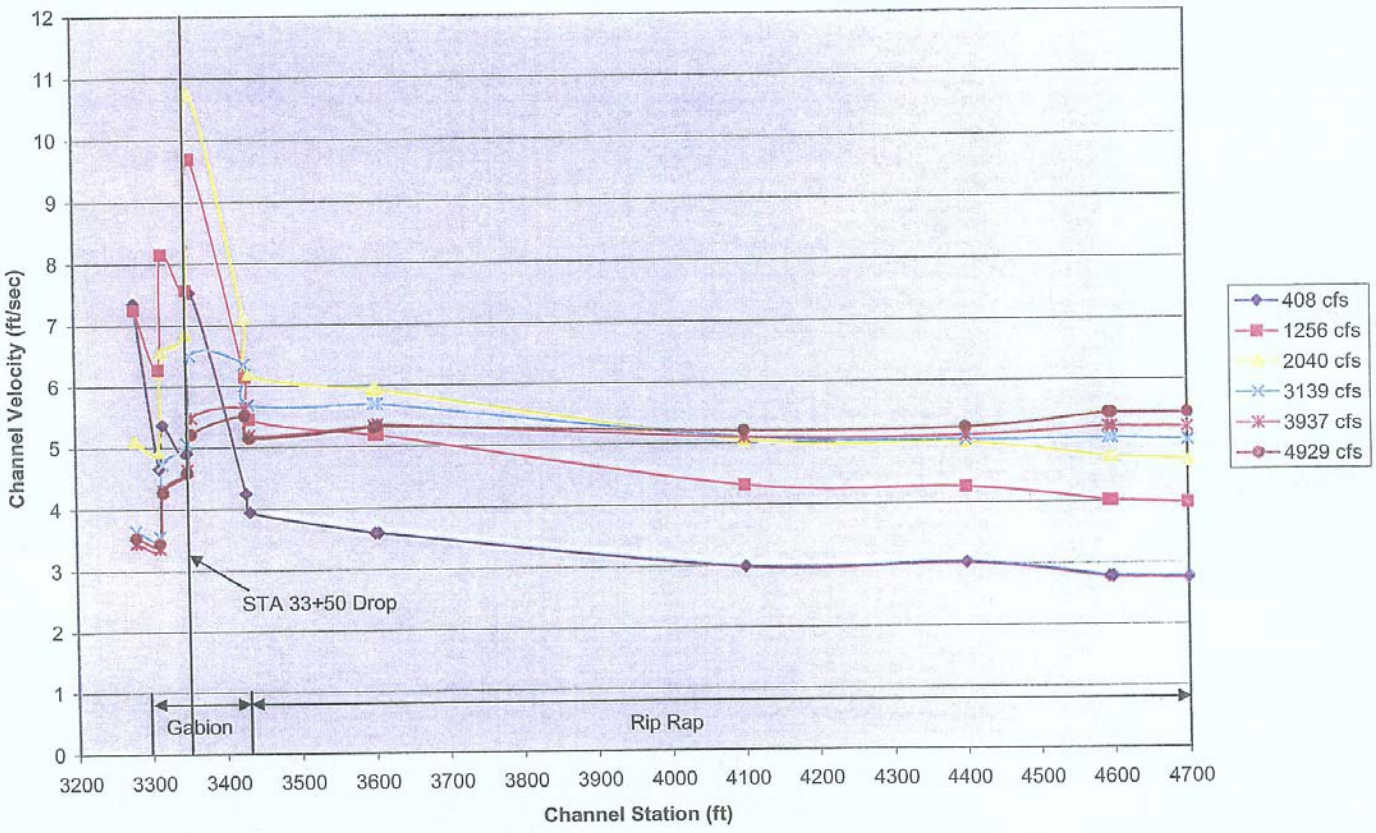
Station 15-80 Drop Channel Velocities



15+80 Chart

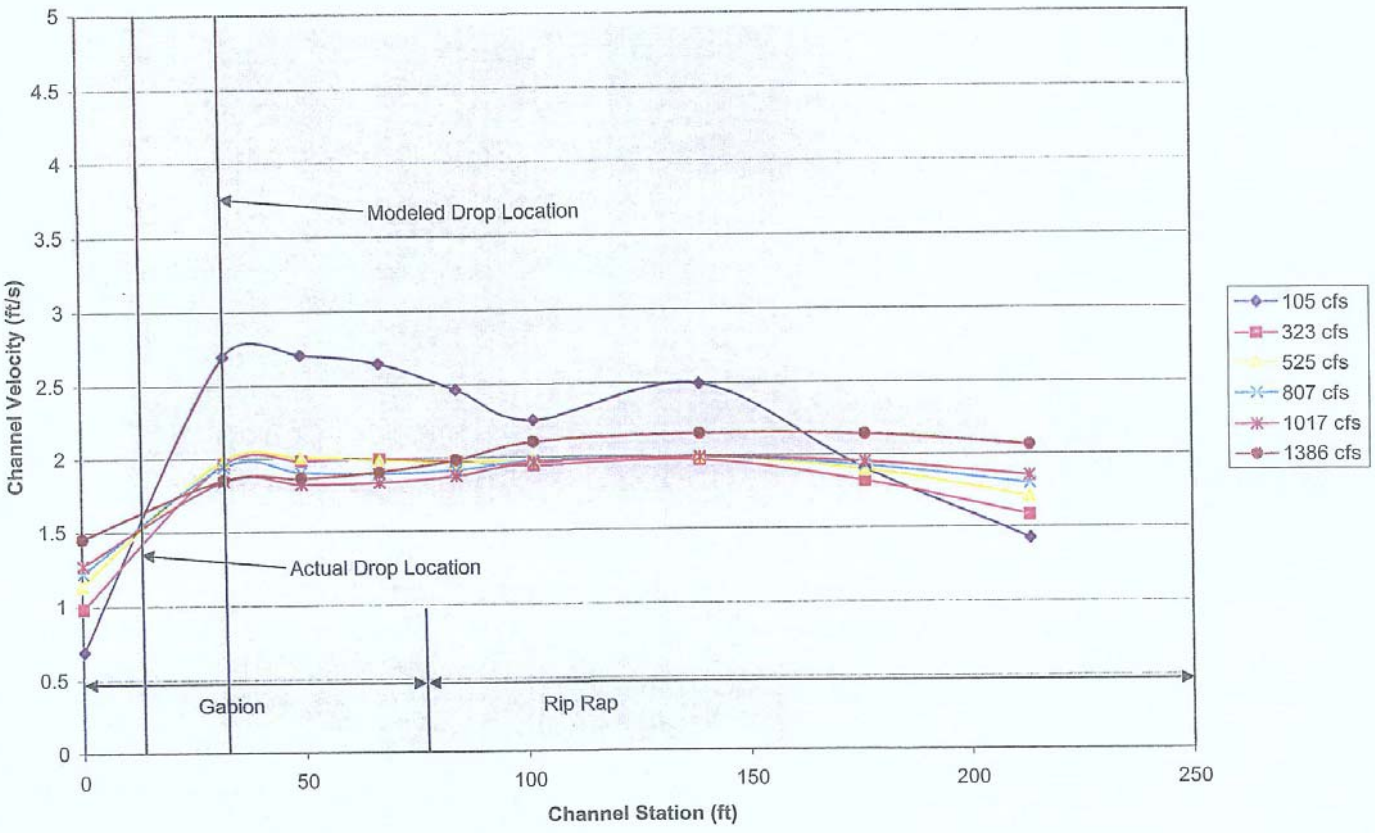
P:\H&H\2973 Jersey Village Bypass\spreadsheets\Velocity vs Station graphs.xls

Station 33+50 Drop Channel Velocities



P:\H&H\2973 Jersey Village Bypass\spreadsheets\Velocity vs Station graphs.xls

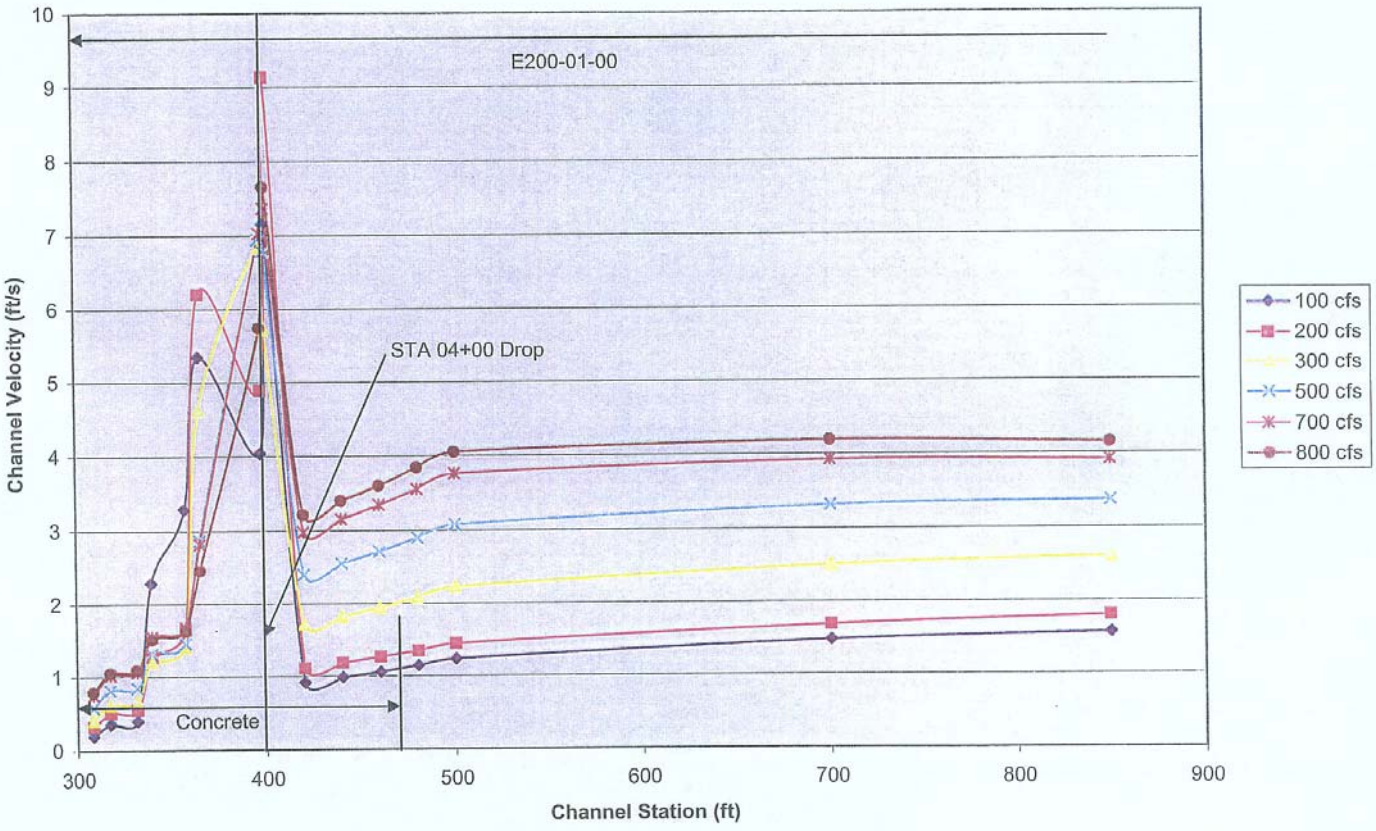
Station 48+00 Drop Channel Velocities



48+00 chart

P:\H&H\2973 Jersey Village Bypass\spreadsheets\Velocity vs Station graphs.xls

Station 04+00 Drop Channel Velocities



04+00 Graph

P:\H&H\2973 Jersey Village Bypass\spreadsheets\Velocity vs Station graphs.xls

ATTACHMENT 7
FREE QUALITY TAKE-OFF

E200-00-00-E003, JERSEY VILLAGE CHANNEL CONVEYANCE IMPROVEMENTS
FROM UNIT E141-00-00 AT PHILIPPINE STREET TO UNIT E100-00-00
100% QUANTITY TAKEOFF REVISED 20090114

ITEM NUMBER	PAYMENT SPEC.	BID ITEM DESCRIPTION	QUANTITY	UNITS
1	2200-08	SITE PREPARATION & RESTORATION, INCLUDING CLEARING AND GRUBBING, CARE AND CONTROL OF WATER AND DEMOLITION (COMPLETE IN PLACE)	1	EA
2	2120-02	DEBRIS AND TRASH REMOVAL AND DISPOSAL IN A LANDFILL	100	CY
3	2120-03	REMOVE AND DISPOSE CONCRETE RUBBLE AND CONCRETE STRUCTURES AND ROCK DAM	200	CY
4	2120-04	REMOVE AND DISPOSE OF ALL PIPE	117	LF
5	2120-05	REMOVE AND DISPOSE OF CONCRETE CHANNEL LINING (COMPLETE IN PLACE)	1,746	SY
6	2120-14	REMOVE AND DISPOSE OF CONCRETE STRUCTURES	66	CY
7	2120-19	REMOVE AND DISPOSE OF 30-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
8	2120-19	REMOVE AND DISPOSE OF 36-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
9	2120-19	REMOVE AND DISPOSE OF 48-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
10	2120-19	REMOVE AND DISPOSE OF 54-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
11	2120-19	REMOVE AND DISPOSE OF 60-INCH MANHOLE (COMPLETE IN PLACE)	2	EA
12	2120-19	REMOVE AND DISPOSE OF 66-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
13	2120-19	REMOVE AND DISPOSE OF 72-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
14	2120-25	REMOVE AND DISPOSE OF 24-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	1,293	LF
15	2120-25	REMOVE AND DISPOSE OF 30-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	130	LF
16	2120-25	REMOVE AND DISPOSE OF 36-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	299	LF
17	2120-25	REMOVE AND DISPOSE OF 48-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	138	LF
18	2120-25	REMOVE AND DISPOSE OF 54-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	0	LF
19	2120-25	REMOVE AND DISPOSE OF 60-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	190	LF
20	2120-25	REMOVE AND DISPOSE OF 66-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	46	LF
21	2120-25	REMOVE AND DISPOSE OF 72-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	235	LF
22	2120-30	REMOVE AND DISPOSE OF TIRES, 13-INCH TO 16-INCH RIM DIAMETER	10	EA
23	2120-31	REMOVE AND DISPOSE OF TIRES, 17-INCH TO 24.5-INCH RIM DIAMETER	10	EA
24	2120-32	REMOVE AND DISPOSE OF TIRES, 25-INCH RIM DIAMETER OR LARGER	10	EA
[illegible]	2120-33	DISCOUNT RIM (IF ATTACHED TO TIRE), ALL DIAMETERS	5	EA
[illegible]	2269-01	TRENCH SHORING SYSTEM, 5 TO 20 FEET	5,684	LF
27	2269-01	TRENCH SHORING SYSTEM, > 20 FEET	0	LF
28	2315-02	EXCAVATION AND HAUL TO OFF-SITE LOCATION (COMPLETE IN PLACE)	267,250	CY
29	2315-03	FILL PLACEMENT AND COMPACTION (COMPLETE IN PLACE) (ON-SITE MATERIAL)	40,100	CY
30	2315-04	IMPORTED FILL		CY
31	2315-06	BACKSLOPE SWALES (COMPLETE IN PLACE)	18,972	LF
32	2321-02	CEMENT STABILIZED SAND, 200 PSI, AS DIRECTED BY THE ENGINEER	10	TON
33	2322-01	FLOWABLE CONCRETE FILL	120	CY
34	2361-01	SILT FENCE (COMPLETE IN PLACE)	0	LF
35	2361-02	REINFORCED SILT FENCE (COMPLETE IN PLACE)	3,880	LF
36	2364-02	ROCK FILTER DAM - TYPE 2 (COMPLETE IN PLACE)	416	LF
37	2365-01	STABILIZED CONSTRUCTION ACCESS	1,083	SY
38	2375-01	GABIONS (COMPLETE IN PLACE)	567	CY
39	2375-03	GABION MATTRESS, 9-INCH THICKNESS (COMPLETE IN PLACE)	3,262	SY
40	2376-03	CONCRETE CHANNEL LINING, 6" NOMINAL THICKNESS	3,970	SY
	2376-03	CONCRETE CHANNEL LINING, 6" NOMINAL THICKNESS (SWALE)	128	SY
41	2376-04	CONCRETE CHANNEL LINING, 8" NOMINAL THICKNESS	840	SY
42	2376-06	CONCRETE BACKSLOPE INTERCEPTOR STRUCTURE (COMPLETE IN PLACE)	522	SY
		CONCRETE AREA UPON COMPLETION OF CONSTRUCTION ACTIVITIES (added 20090105 by MNN for SWQM impervious area calc)	5,705	SY
	2378-01	RIPRAP, GRADIATION NO. 1 (COMPLETE IN PLACE)	97,296	SY
	2378-03	RIPRAP, GRADIATION NO. 2 (COMPLETE IN PLACE)	104	SY
	2378-05	GRANULAR FILL, GRAVEL TO RIPRAP GRADATION NO. 2, AS DIRECTED BY ENGINEER		TON
	2379-01	GEOTEXTILE FOR RIPRAP (COMPLETE IN PLACE)	97,296	SY
	2464-01	HCFCD TIMBER BENT FOR PIPE OUTFALLS	9	EA
	2611-02	24-INCH REINFORCED CONCRETE PIPE	63	LF
	2611-04	36-INCH REINFORCED CONCRETE PIPE	3	LF
	2611-07	54-INCH REINFORCED CONCRETE PIPE	0	LF
	2611-11	78-INCH REINFORCED CONCRETE PIPE	0	LF

E200-00-00-E003, JERSEY VILLAGE CHANNEL CONVEYANCE IMPROVEMENTS
FROM UNIT E141-00-00 AT PHILIPPINE STREET TO UNIT E100-00-00
100% QUANTITY TAKEOFF REVISED 20090114

ITEM NUMBER	PAYMENT SPEC.	BID ITEM DESCRIPTION	QUANTITY	UNITS
	2630-01	TYPE "C" MANHOLE	1	EA
	2630-02	TYPE "C" MANHOLE, 10-FEET DEEP	0	EA
	2630-03	TYPE "C" MANHOLE, 15-FEET DEEP	0	EA
	2630-04	TYPE "C" MANHOLE, 20-FEET DEEP	0	EA
	2630-05	TYPE "C" MANHOLE, >20-FEET DEEP	0	EA
	2630-10	TYPE "C" MANHOLE, 48" TO 72"	0	EA
	2630-05	RECONSTRUCT 30-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
	2630-05	RECONSTRUCT 36-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
	2630-14	RECONSTRUCT 48-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
	2630-14	RECONSTRUCT 54-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
	2630-14	RECONSTRUCT 60-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
	2630-14	RECONSTRUCT 66-INCH MANHOLE (COMPLETE IN PLACE)	0	EA
	2630-14	RECONSTRUCT 72-INCH MANHOLE (COMPLETE IN PLACE)	1	EA
	2630-01	TYPE "A" INLET	0	CY
	2632-10	TYPE "B" INLET W/GRATE TOP	0	EA
	2632-40	TYPE "E" INLET	0	EA
	2632-60	REPAIR MANHOLES AND INLETS		EA
	2642-02	24-INCH CMP PIPE OUTFALL PIPE FOR B.S.I.S. (COMPLETE IN PLACE)	0	LF
	2642-__	RECONSTRUCT 24-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	4,560	LF
	2642-03	RECONSTRUCT 30-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	64	LF
	2642-04	RECONSTRUCT 36-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	428	LF
	2642-06	RECONSTRUCT 48-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	136	LF
	2642-07	RECONSTRUCT 54-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	0	LF
	2642-08	RECONSTRUCT 60-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	207	LF
	2642-09	RECONSTRUCT 66-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	85	LF
	2642-__	RECONSTRUCT 72-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	138	LF
	2642-13	CONCRETE COLLAR	0	EA
	2642-14	18-INCH TO 36-INCH CONCRETE COLLAR	9	EA
	2642-15	42-INCH CONCRETE COLLAR	0	EA
	2642-16	48-INCH CONCRETE COLLAR	1	EA
	2642-17	54-INCH CONCRETE COLLAR	0	EA
	2642-18	60-INCH CONCRETE COLLAR	1	EA
	2642-	66-INCH CONCRETE COLLAR	1	EA
	2642-19	72-INCH CONCRETE COLLAR	1	EA
	2642-54	36-INCH CORRUGATED METAL PIPE, BITUMINOUS COATING	0	LF
	2911-01	IMPORTED TOPSOIL		CY
	2921-13	TURF ESTABLISHMENT - HYDROSEEDING WITH MULCH > 5 ACRES (COMPLETE IN PLACE)	51	AC
	2921-04	TURF ESTABLISHMENT - SODDING	23,803	SY
		TREE PROTECTION	34	EA

E200-00-00-E003, JERSEY VILLAGE CHANNEL CONVEYANCE IMPROVEMENTS
FROM UNIT E141-00-00 AT PHILIPPINE STREET TO UNIT E100-00-00
100% QUANTITY TAKEOFF REVISED 20090114

BID ITEM NUMBER	PAYMENT SPEC.	BID ITEM DESCRIPTION	QUANTITY	UNITS	SHEET 8, 13+00 - 23+00	SHEET 9 23+00 - 33+00	SHEET 10 33+00 - 43+00	SHEET 11 43+00 - 47+40	SHEET 12 47+40 - 58+00	SHEET 13 58+00 - 68+00	SHEET 14 68+00 - 75+00	SHEET 15 75+00 - 87+00	SHEET 16 87+00 - 99+00	SHEET 17 99+00 - 111+00	SHEET 18 111+00 - 121+00	SHEET 19 121+00 - 127+00	SHEET 20 E100-00-00 PGP	SHEET 21 PHILIPPINE BRIDGE	SHEET 22 MAUNA LOA BRIDGE	SHEET 23 WOOD VIEW/ FOREST BR.	SHEET 24 E141-00-00 PGP	SHEET 25 E141-00-00 CROSS SEC	SHEET 26 BELTWAY 8 BRIDGE	SHEET 27 E141-00-00 T 1 CROSS SEC	SHEET 28 E200-01-00 PGP	SHEET 52	SHEET 53	SHEET 54 WEIR STRUC	PPP SHEET 55 13+00 - 33+00	PPP SHEET 56 33+00 - 47+40	PPP SHEET 57 48+40 - 67+00	PPP SHEET 58 67+00 - 87+00	PPP SHEET 59 87+00 - 111+00	PPP SHEET 60 111+00 - 127+00	PPP SHEET 61 E311-00-00	TOTALS
1	2200-08	SITE PREPARATION & RESTORATION, INCLUDING CLEARING AND GRUBBING, CARE AND CONTROL OF WATER AND DEMOLITION (COMPLETE IN PLACE)	1	EA																																
2	2120-02	DEBRIS AND TRASH REMOVAL AND DISPOSAL IN A LANDFILL	100	CY																																
3	2120-03	REMOVE AND DISPOSE CONCRETE RUBBLE AND CONCRETE STRUCTURES AND ROCK DAM	200	CY	DEBRIS AT UPSTREAM E100-00-00 approx 50ft x 10 ft x 10ft																															
4	2120-04	REMOVE AND DISPOSE OF ALL PIPE	117	LF	0	26	0	0	0	26	0	0	0	0	0	0	65	0	0	0	0	0	0	0	0											
5	2120-05	REMOVE AND DISPOSE OF CONCRETE CHANNEL LINING (COMPLETE IN PLACE)	1,746	SY	0	0	67.2	0	53.2	1,362.1	0	0	0	0	0	0	233.7	0	0	0	0	0	0	0	0										
6	2120-14	REMOVE AND DISPOSE OF CONCRETE STRUCTURES	66	CY	3.5	3.5	3.5	3.5	7.0	7.9	7.9	15.3	0	13.6	0	0	0	0	0	0	0	0	0	0	0										
7	2120-15	REMOVE AND DISPOSE OF 30-INCH MANHOLE (COMPLETE IN PLACE)	0	EA														0	0	0	0	0	0	0	0										
8	2120-19	REMOVE AND DISPOSE OF 36-INCH MANHOLE (COMPLETE IN PLACE)	1	EA														1	0	0	0	0	0	0	0										
9	2120-19	REMOVE AND DISPOSE OF 48-INCH MANHOLE (COMPLETE IN PLACE)	1	EA														0	1	0	0	0	0	0	0										
10	2120-19	REMOVE AND DISPOSE OF 54-INCH MANHOLE (COMPLETE IN PLACE)	0	EA														0	0	0	0	0	0	0	0										
11	2120-19	REMOVE AND DISPOSE OF 60-INCH MANHOLE (COMPLETE IN PLACE)	2	EA														0	2	0	0	0	0	0	0										
12	2120-19	REMOVE AND DISPOSE OF 66-INCH MANHOLE (COMPLETE IN PLACE)	0	EA														0	0	0	0	0	0	0	0										
13	2120-19	REMOVE AND DISPOSE OF 72-INCH MANHOLE (COMPLETE IN PLACE)	1	EA														1	0	0	0	0	0	0	0										
14	2120-25	REMOVE AND DISPOSE OF 24-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	1,293	LF	308	46	77	113	140	177	306	121	0	0	0	0	0	0	0	0	0	0	0	0	0										
15	2120-25	REMOVE AND DISPOSE OF 30-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	130	LF	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
16	2120-25	REMOVE AND DISPOSE OF 36-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	299	LF	107	0	0	0	0	0	0	0	131	61	0	0	0	0	0	0	0	0	0	0	0										
17	2120-25	REMOVE AND DISPOSE OF 48-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	138	LF	0	0	118	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
18	2120-25	REMOVE AND DISPOSE OF 54-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	0	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
19	2120-25	REMOVE AND DISPOSE OF 60-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	190	LF	0	0	157	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0										
20	2120-25	REMOVE AND DISPOSE OF 66-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	46	LF	0	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0										
21	2120-25	REMOVE AND DISPOSE OF 72-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	235	LF	172	0	0	0	0	0	0	0	42	0	0	0	20	0	0	0	0	0	0	0	0										
22	2120-30	REMOVE AND DISPOSE OF TIRES, 13-INCH TO 18-INCH RIM DIAMETER	10	EA																																
23	2120-31	REMOVE AND DISPOSE OF TIRES, 17-INCH TO 24.5-INCH RIM DIAMETER	10	EA																																
24	2120-32	REMOVE AND DISPOSE OF TIRES, 25-INCH RIM DIAMETER OR LARGER	10	EA																																
25	2120-33	DISCOUNT RIM (IF ATTACHED TO TIRE) ALL DIAMETERS	5	EA																																
26	2259-01	TRENCH SHORING SYSTEM, 5 TO 20 FEET	5,684	LF																																
27	2259-01	TRENCH SHORING SYSTEM, > 20 FEET	0	LF																																
28	2315-02	EXCAVATION AND HAUL TO OFF-SITE LOCATION (COMPLETE IN PLACE)	267,250	CY	from cross sections excavation summary																															
29	2315-03	FILL PLACEMENT AND COMPACTION (COMPLETE IN PLACE) (ON-SITE MATERIAL)	40,100	CY	from cross sections excavation summary																															
30	2315-04	IMPORTED FILL		CY																																
31	2315-06	BACKSLOPE SWALES (COMPLETE IN PLACE)	18,972	LF	1,097	1,981	1,376	500	1,823	1,547	1,100	1,886	1,410	2,331	1,981	916	0	0	0	0	0	0	0	0	892										
32	2321-02	CEMENT STABILIZED SAND, 200 PSI, AS DIRECTED BY THE ENGINEER	10	TON																																
33	2322-01	FLOWABLE CONCRETE FILL	120	CY													120																			
34	2361-01	SILT FENCE (COMPLETE IN PLACE)	0	LF																											0	0	0	0	0	0	0	0
35	7361-20	REINFORCED SILT FENCE (COMPLETE IN PLACE)	5,660	LF																											0	700	651	73	664	1373.41	0	
36	2364-02	ROCK FILTER DAM - TYPE 2 (COMPLETE IN PLACE)	416	LF																											54	54	54	54	54	96	0	
37	2365-01	STABILIZED CONSTRUCTION ACCESS	1,563	SY																											250	500	63	167	83	0.00	0	
38	2375-01	GABIONS (COMPLETE IN PLACE)	567	CY	156		192.00	219																												
39	2375-03	GABION MATTRESS, 9-INCH THICKNESS (COMPLETE IN PLACE)	3,262	SY	624		1040	1598																												
40	2376-03	CONCRETE CHANNEL LINING, 6" NOMINAL THICKNESS	3,979	SY									3,979																							
	2376-03	CONCRETE CHANNEL LINING, 6" NOMINAL THICKNESS (SWALE)	128	SY							0	0	0	128	0	0																				
41	2376-04	CONCRETE CHANNEL LINING, 8" NOMINAL THICKNESS	840	SY									840																							
42	2376-06	CONCRETE BACKSLOPE INTERCEPTOR STRUCTURE (COMPLETE IN PLACE)	522	SY	44.44	44.44	44.44	11.11	44.44	44.44	22.22	55.56	55.56	66.67	44.44	22.22									22.22											
		CONCRETE AREA UPON COMPLETION OF CONSTRUCTION ACTIVITIES (added 20090105 by MNN for SWPPP footprint (cross areas calc)	5,705	SY	44.44	44.44	44.44	11.11	44.44	44.44	22.22	55.56	4955.57	194.67	44.44	22.22	140.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22											
	2378-01	RIPRAP, GRADATION NO. 1 (COMPLETE IN PLACE)	57,796	SY	11,351.91	11,469.59	7,391.65	8,072.75	6,462.94	8,227.52	12,963.96	10,910.67	2,526.00	539.56	3,759.13	13,814.18									0											
	2378-03	RIPRAP, GRADATION NO. 2 (COMPLETE IN PLACE)	104	SY									104.26																							
	2378-05	GRANULAR FILL, GRAVEL TO RIPRAP GRADATION NO. 2, AS DIRECTED BY ENGINEER		TON																																
	2378-01	GEOTEXTILE FOR RIPRAP (COMPLETE IN PLACE)	97,290	SY	geotextile under gabion is incidental to gabion bid item, removed from line number 2008/0108 sy xxxx																															
	2464-01	HCC/CO TIMBER RENT FOR PIPE OUTFALLS	9	EA	1	0	0	0	0	0	2	0	1	0	0	2	0	0	0	0	1	0	0	0	0											
	2611-02	24-INCH REINFORCED CONCRETE PIPE	63	LF														63																		
	2611-04	36-INCH REINFORCED CONCRETE PIPE	3	LF	3																															
	2611-07	54-INCH REINFORCED CONCRETE PIPE	0	LF																																
	2611-11	78-INCH REINFORCED CONCRETE PIPE	0	LF																																
	2630-01	TYPE "C" MANHOLE	1	EA														1																		
	2630-02	TYPE "C" MANHOLE, 10-FEET DEEP	0	EA																																
	2630-03	TYPE "C" MANHOLE, 15-FEET DEEP	0	EA																																
	2630-04	TYPE "C" MANHOLE, 20-FEET DEEP	0	EA																																
	2630-05	TYPE "C" MANHOLE, >20-FEET DEEP	0	EA																																
	2630-10	TYPE "C" MANHOLE, 48" TO 72"	0	EA																																
	2630-05	RECONSTRUCT 30-INCH MANHOLE (COMPLETE IN PLACE)	0	EA																																
	2630-05	RECONSTRUCT 36-INCH MANHOLE (COMPLETE IN PLACE)	1	EA														1																		
	2630-14	RECONSTRUCT 48-INCH MANHOLE (COMPLETE IN PLACE)	1	EA															1																	
	2630-14	RECONSTRUCT 54-INCH MANHOLE (COMPLETE IN PLACE)	0	EA																																
	2630-14	RECONSTRUCT 60-INCH MANHOLE (COMPLETE IN PLACE)	1	EA															1																	
	2630-14	RECONSTRUCT 66-INCH MANHOLE (COMPLETE IN PLACE)	0	EA																																
	2630-14	RECONSTRUCT 72-INCH MANHOLE (COMPLETE IN PLACE)	1	EA														1																		
	2630-01	TYPE "A" INLET	0	CY																																
	2632-10	TYPE "B" INLET W/GRATE TOP	0	EA																																
	2632-40	TYPE "C" INLET	0	EA																																
	2632-80	REPAIR MANHOLES AND INLETS		EA																																
	2642-02	24-INCH CMP PIPE OUTFALL PIPE FOR B.S.I.S. (COMPLETE IN PLACE)	0	LF																						0	0	0	0	0	0	0	0	0		
	2642-	RECONSTRUCT 24-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	4,560	LF	517	456	545	93	510	510	566	459	455	545	565	564	0	0	0	0	0	0	0	0	120											
	2642-03	RECONSTRUCT 30-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	64	LF	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-04	RECONSTRUCT 36-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	428	LF	191	0	0	0	0	0	0	9	136	92	0	0	0	0	0	0	0	0	0	0	0											
	2642-06	RECONSTRUCT 48-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	136	LF	0	0	105	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0											
	2642-07	RECONSTRUCT 54-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	0	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-08	RECONSTRUCT 60-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	207	LF	0	0	124	0	0	4	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-09	RECONSTRUCT 66-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	85	LF	0	0	0	0	0	0	0	0	0	0	0	85	0	0	0	0	0	0	0	0	0											
	2642-	RECONSTRUCT 72-INCH CMP OUTFALL PIPE (COMPLETE IN PLACE)	138	LF	113	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-13	CONCRETE COLLAR	0	EA																																
	2642-14	18-INCH TO 36-INCH CONCRETE COLLAR	9	EA	0	0	0	0	0	0	3	0	2	1	0	0	0	0	0	0	1	0	0	0	0											
	2642-16	42-INCH CONCRETE COLLAR	0	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-16	48-INCH CONCRETE COLLAR	1	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0											
	2642-17	54-INCH CONCRETE COLLAR	0	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-18	60-INCH CONCRETE COLLAR	1	EA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-	66-INCH CONCRETE COLLAR	1	EA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-19	72-INCH CONCRETE COLLAR	1	EA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2642-54	36-INCH CORRUGATED METAL PIPE, BITUMINOUS COATING	0	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	2911-01	IMPORTED TOPSOIL		CY																																
	2921-13	TURF ESTABLISHMENT - HYDROSEEDING WITH MULCH > 5 ACRES (COMPLETE IN PLACE)	51	AC	4.54	5.53	3.64	3.04	3.74	3.46	3.27	5.46	3.63	6.39	5.39	0.00	4.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
	2921-04	TURF ESTABLISHMENT - SODDING	23,803	SY	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0						704.64	477.78	764.64	666.89	950.58	1063.33	191.11	5,989.26
		TREE PROTECTION	34	EA	0	0	0	0	0	0	0	6	2	0	17	0																				

ATTACHMENT 8
ENGINEER'S COST ESTIMATE

JERSEY VILLAGE CHANNEL

PRELIMINARY ENGINEER'S ESTIMATE
FOR THE CONSTRUCTION OF
IMPROVEMENTS TO CHANNEL E141-00-00 AT PHILIPPINE STREET TO UNIT E100-00-0
January 15, 2009

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1. Protection of Trees; Complete In Place	EA.	34	$200.00	$6,800.00
2. Depris & Trash Removal and Disposal In a Landfill; Complete In Place	C.Y.	200	$29.00	$5,800.00
3. Remove and Dispose Concrete Rubble, Concrete Structures, & Rock Dam; Complete In Place	C.Y.	266	$50.00	$13,300.00
4. Remove and Dispose of All Pipe; Complete In Place	L.F.	2,448	$15.00	$36,720.00
5. Remove and Dispose of Concrete Channel Lining; Complete In Place	S.Y.	1,746	$15.00	$26,190.00
6. Remove and Dispose of All Manhole; Complete In Place	EA.	5	$275.00	$1,375.00
7. Remove and Dispose of Tires, 13" to 25" Rim Diameter; Complete In Place	EA.	30	$10.00	$300.00
8. Discount Rim (If Attached to Tire), All Diameters; Complete In Place	EA.	5	$5.00	$25.00
9. Site Preparation & Restoration; Complete In Place	EA.	1	$100,000.00	$100,000.00
10. Clearing and Grubbing, Complete In Place	AC.	6.41	$3,500.00	$22,435.00
11. Trench Shoring System, 5 to 20 Feet; Complete In Place	L.F.	4,700	$4.50	$21,150.00
12. Excavation and Haul to Off-Site Location Complete In Place	C.Y.	267,250	$4.50	$1,202,625.00
13. Fill Placement and Compaction; Complete In Place	C.Y.	40,100	$3.00	$120,300.00
14. Cement Stabilized Sand, 200 PSI, As Directed By the Engineer; Complete In Place	TON	10	$65.00	$650.00
15. Flowable Concrete Fill; Complete In Place	C.Y.	120	$163.00	$19,560.00

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
16. Reinforced Silt Fence; Complete In Place	L.F.	3,880	$4.00	$15,520.00
17. Concrete Truck Washout Structures; Complete In Place	EA.	1	$500.00	$500.00
18. Filter Dam, Type 2; Complete In Place	L.F.	416	$200.00	$83,200.00
19. Stabilized Construction Access	S.Y.	1,083	$20.00	$21,660.00
20. Gabions; Complete In Place	C.Y.	567	$123.00	$69,741.00
21. Gabion Mattress, 9" PVC Coated Wire; Complete In Place	S.Y.	3,262	$34.00	$110,908.00
22. Concrete Channel Lining, 6" Nominal Thickness; Complete In Place	S.Y.	4,098	$64.00	$262,272.00
23. Concrete Channel Lining, 8" Nominal Thickness; Complete In Place	S.Y.	840	$76.00	$63,840.00
24. Concrete Backslope Interceptor Structure; Complete In Place	S.Y.	522	$110.00	$57,420.00
25. RipRap, Gradation No. 1; Complete In Place	S.Y.	97,296	$40.00	$3,891,840.00
26. RipRap, Gradation No. 2 (Grouted); Complete In Place	S.Y.	104	$80.00	$8,320.00
27. Geotextile For RipRap; Complete In Place	S.Y.	97,400	$2.00	$194,800.00
28. Steel Sheet Piling; Complete In Place	L.F.	436	$200.00	$87,200.00
29. Timber Bent for Pipe Outfalls; Complete In Place	EA.	9	$12,000.00	$108,000.00
30. 24-Inch Reinforced Concrete Pipe; Complete In Place	L.F.	63	$80.00	$5,040.00
31. Type "C" Manhole for 42" and Smaller; Complete In Place	EA.	2	$4,500.00	$9,000.00
32. Type "C" Manhole for 48" to 72"; Complete In Place	EA.	3	$7,000.00	$21,000.00
33. 24-Inch CMP Pipe Outfall for Backslope Interceptor Structure; Complete In Place	L.F.	4,560	$45.00	$205,200.00
34. Reconstruct 30" CMP Outfall Pipe; Complete In Place	L.F.	64	$43.00	$2,752.00

DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
35. Reconstruct 36" CMP Outfall Pipe; Complete In Place	L.F.	428	$70.00	$29,960.00
36. Reconstruct 48" CMP Outfall Pipe; Complete In Place	L.F.	136	$103.00	$14,008.00
37. Reconstruct 60" CMP Outfall Pipe; Complete In Place	L.F.	207	$80.00	$16,560.00
38. Reconstruct 66" CMP Outfall Pipe; Complete In Place	L.F.	85	$100.00	$8,500.00
39. Reconstruct 72" CMP Outfall Pipe; Complete In Place	L.F.	138	$100.00	$13,800.00
40. 18"-36" Concrete Collar; Complete In Place	EA.	9	$845.00	$7,605.00
41. 48" Concrete Collar; Complete In Place	EA.	1	$500.00	$500.00
42. 60" Concrete Collar; Complete In Place	EA.	1	$1,000.00	$1,000.00
43. 66" Concrete Collar; Complete In Place	EA.	1	$1,300.00	$1,300.00
44. 72" Concrete Collar; Complete In Place	EA.	1	$1,300.00	$1,300.00
45. Anchored Sodding; Complete In Place	S.Y.	23,803	$3.65	$86,880.95
Sub-Total				$6,976,856.95
10% Contingencies				$697,685.70
Total				$7,674,542.65

ATTACHMENT 9
TABULATION OF BID

Monday, February 16, 2009
BID TABULATION
JOB NO. 09/0007
E200-00-00-E003

BIDS RECEIVED 2/9/2009

Lindsey Construction, Inc.	$5,272,179.00
Sprint Sand and Clay, L.L.C.	$5,455,131.41
Serco Construction Group, LTD.	$5,995,844.39
Spring Equipment Company, Inc.	$6,180,596.50
SER Construction Partners, Ltd.	$6,196,116.70
W.W. Webber Inc.	$6,388,700.93
L. N. McKean, Inc.	$6,628,985.00
T J & T Enterprises, Inc.	$7,044,330.00
Pace Services, L.P.	$7,233,243.15
Lecon, Inc.	$7,392,964.80
BRH-Garver Construction, LP	$7,632,047.74
Austin Filter Systems, Inc.	$7,874,494.00
C. E. Barker, Ltd.	$8,864,223.45
DCI Contracting	$9,339,513.00
Triple B Services, L.L.P.	$9,882,761.64