LOCATION HYDRAULIC STUDY

Bridge Road Bridge on Santa Paula Creek

Prepared for:

County of Ventura

And

California Department of Transportation

Prepared by:

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BKR JN: 172452

November 2019

REGISTERED CIVIL ENGINEER CERTIFICATION

This Drainage Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

11/8/19

David A. Jaffe, PhD, PE, D.WRE DATE
REGISTERED CIVIL ENGINEER
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1 INTRODUCTION

1.1 Purpose of the report

This report serves as the Location Hydraulics Study and Floodplain Evaluation for the proposed improvements associated with the Bridge Road Bridge located on Santa Paula Creek in the City of Santa Paula. Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. Federal financial assistance and/or issuance of a federal permit(s) are required for a proposed state/local project constitute federal support and/or allowing actions. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply with 23 CFR 650 Subpart A and determine if an encroachment itself is "minimal," or "significant," the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action (to life and property)
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development (inconsistencies with existing watershed and floodplain management programs)
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The purpose of this evaluation is to examine the potential impacts to the mapped Zone AE and Zone X. Special Flood Hazard Areas (SFHA) within Santa Paula Creek at the existing Bridge Road Bridge location and provide scour protection calculations of the existing bridge abutments.

The report describes the method of analysis and results of the hydraulic modeling of the existing conditions in Santa Paula Creek at Bridge Road Bridge. Figure 1 shows the location of the proposed project.

1.2 Definitions

1.2.1 Base Flood

> *The term "base flood" shall mean that flood which has a one percent or greater chance of occurrence in any given year.*
>
> *– Executive Order 11988 Section 6 (b)*

The one percent or greater chance of occurrence flood is commonly referenced as the "100-year" flood.

1.2.2 Floodplain

> *The term "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.*

– Executive Order 11988 Section 6 (c)

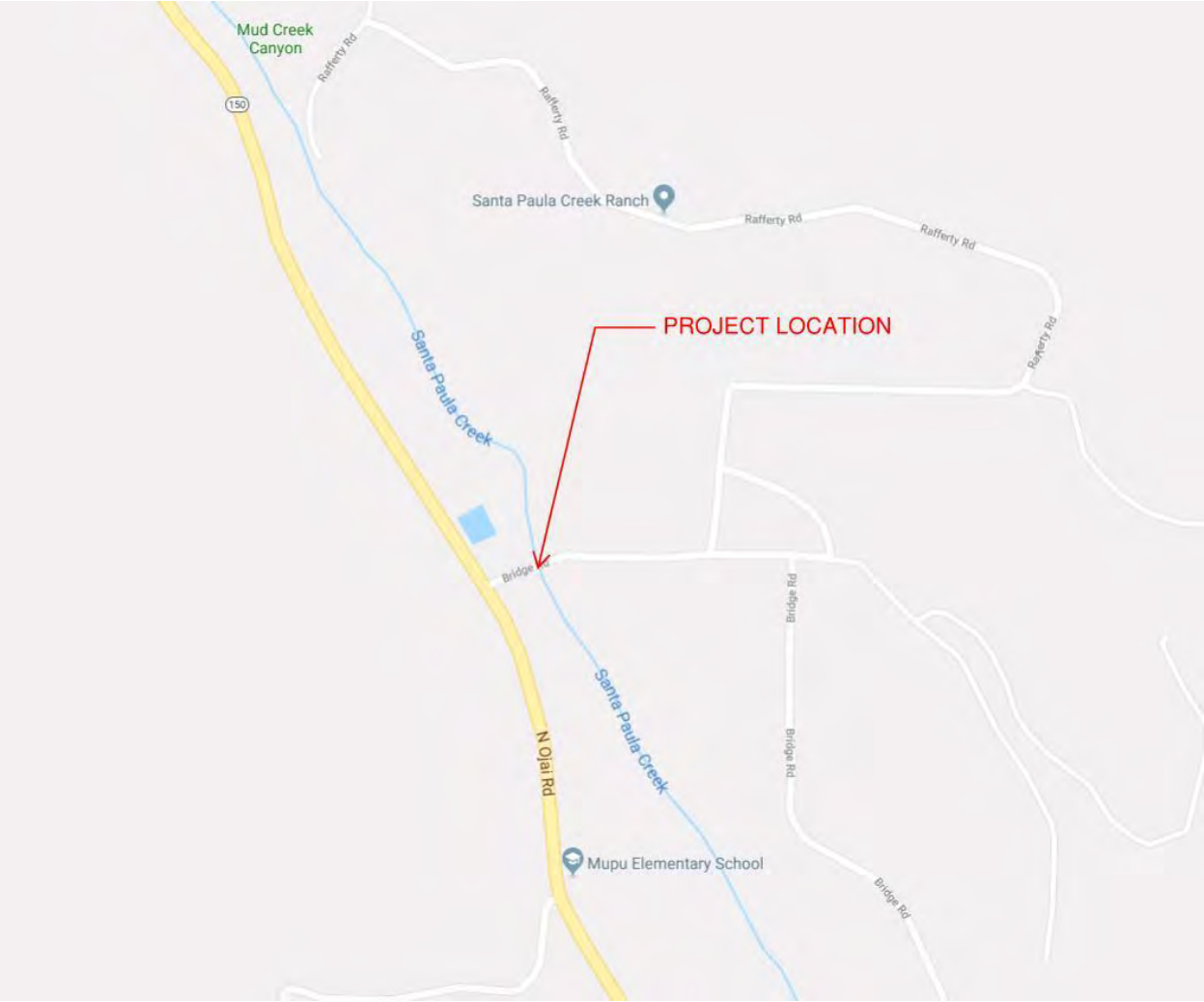
1.2.3 Special Flood Hazard Areas – High Risk

Special Flood Hazard Areas represent the area subject to inundation by the one-percent-annual probability flood. The land area covered by the floodwaters of the 1% annual chance flood is the Special Flood Hazard Areas (SFHA) on National Flood Insurance Program (NFIP) maps. The SFHA is the area where NFIP floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SHFA includes Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-A30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V.

1.3 Project Location and Setting

The Santa Paula Creek watershed is in southwestern Ventura County, and is tributary to the Santa Clara River. The Creek is one of three historic spawning tributaries to the Santa Clara River for the endangered Southern Steelhead (Oncorhynchus mykiss). Bridge Road Bridge is located at the intersection of Ojai Road (SR 150) and Bridge Road. The Project is located within a rural setting with primarily agriculture, open space, and some residential land uses adjacent to the project limits.

Figure 1-1: Project Location



1.4 Purpose and Need for the Project

1.4.1 Purpose

The purpose of the project is to:

- Prepare engineering evaluation of the floodplain hydraulics for the Bridge Road Bridge.
- Calculate the general adjustment, long-term adjustment and local scour at the abutment support locations and propose alternatives to mitigate the potential impacts to the Creek.

1.4.2 Need

Bridge Road is a short county road north of Santa Paula that connects with Highway 150 and runs east for about 400 feet, where it ends at private property. This road crosses a bridge over Santa Paula Creek; the bridge is called Bridge Road Bridge and is a steel truss bridge about 130 feet long. The road leads to approximately twelve properties, with Bridge Road being the only access. Because the bridge is over 20 feet long, Caltrans is responsible for regular inspections and report any issues of concern to the County.

Caltrans performed an inspection of Bridge Road Bridge in 2012 and submitted an inspection report to the County which indicated that Bridge Road Bridge was Structurally Deficient, with a sufficiency rating of 5 out of 100. This report made the bridge eligible for replacement with federal funding under the federal Highway Bridge Replacement and Rehabilitation (HBRR) Program, administered by Caltrans.

The Public Works Agency Transportation Department (PWATD) subsequently applied to Caltrans for funding to replace Bridge Road Bridge and received funding authorization for design and construction. As PWATD began the design of the project, it became apparent that the bridge did not need replacement, but only needed channel scour protection and some minor rehabilitation. As a result, PWATD staff requested a new, detailed inspection by Caltrans, which was done in June 2016. Caltrans' inspection included analysis of the structural steel members using ultrasound for fracture-critical analysis and was more thorough than previous Caltrans inspections. The last routine latest Bridge inspection report is dated 7/25/18 and the information doesn't change the design approach to provide channel protection and minor rehab.

1.5 Proposed Improvements

Three alternatives are being considered for the Bridge Road Bridge bank protection to mitigate the erosion and scour.

1.5.1 Alternative 1

Construct a 3' -6" by 3' -6" cap beam with a top elevation of 570 feet and secant pile wall with a typical elevation of 492 ft. and fill behind the abutment with light weight cellular concrete fill. The abutment would have a 1:12 slope and would fall just under the 25-year water surface elevation.

1.5.2 Alternative 2

Construct a 3’ -6” by 6’ -0” cap beam with a top elevation of 555.5 feet and secant pile wall with a typical elevation of 508 ft. and fill behind the abutment with flowable fill. The abutment would have ground anchors installed.

1.5.3 Alternative 3

Construct a 3’ -6” by 6’ -0” cap beam with a top elevation of 544.0 feet and secant pile wall with a typical elevation of 492 ft. and fill behind the abutment with flowable fill. The proposed abutment will be under the existing ground surface.

1.6 Permits and Approvals Needed

Table 1 lists the agency permits and approvals required for the project.

Table 1: Permits and Approvals

Agency	Permit/Approval	Status
ACOE	Section 404 Nationwide Permit	County to obtain permit
CDFW	Section 1602 Streambed Alteration Agreement	County to obtain permit
LARWQCB	Section 401 Water Quality Certification	County to obtain certification
VCWPD	Encroachment Permit	County to obtain permit
SWRCB	Section 402 NPDES (Construction Activity)	County to file NOI (if needed)

ACOE = US Army Corps of Engineers
CDFW = California Department of Fish and Wildlife
County = County of Ventura
LARWQCB = Los Angeles Regional Water Quality Control Board
VCWPD = Ventura County Watershed Protection District
Caltrans = California Department of Transportation
NOI = Notice of Intent
NPDES = National Pollutant Discharge Elimination System
PS&E = Plans, Specifications, and Estimates
SRWCB = State Water Resources Control Board

2 AFFECTED ENVIRONMENT

2.1 Introduction

The project is located within the Santa Paula Creek watershed in southwestern Ventura County. A review of the FEMA Flood Insurance Rate Map (FIRM) for Ventura County indicates the project area is within FEMA FIRM Panel 06111C0614E. The FIRM Panel is attached in the appendices. The project area has two defined flood zones, described below.

The portion of the project area that is Shaded Zone X. Shaded Zone X areas are characterized as the following:

- areas that have a 0.2% annual chance of flood;
- areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and
- areas protected by levees from 1% annual chance of flood.

Properties in Shaded Zone X are considered at moderate risk of flooding under NFIP.

The portion of the project area that is identified as Zone AE are areas that have a 1% probability of flooding in any given year (also known as the "100-year floodplain"), and where predicted flood water elevations have been established. Properties in Zone AE are considered at high risk of flooding under NFIP.

2.2 General Area Information

2.2.1 Land Use

Primary land use is Agricultural dominated by citrus orchards and avocado fields near the project site with scattered single-family dwellings.

2.2.2 Topography and Regional Hydrology

Bridge Road Bridge is located on Santa Paula Creek within southwestern Ventura County. Santa Paula Creek is a major tributary to the Santa Clara River, draining approximately 44.4 square miles. The headwaters are located along the south-facing slopes of the Topatopa Mountains where the maximum watershed elevation is over 6,500 above mean sea level [MSL]. The downstream limit of the watershed is at the confluence with the Santa Clara River. The major tributaries within the lower Santa Paula Creek watershed include Sisar Creek, Anlauf Canyon, and Mud Creek.

Santa Paula Creek experiences a high degree of annual flow variability, with multi-year droughts and extreme seasonal flooding. Annual precipitation within the watershed ranges from approximately 36 inches within the Topatopa Mountains to approximately 18 inches at the confluence with the Santa Clara River.

Land use within the watershed remains largely undeveloped compared to other Southern California coastal watersheds. Land use/vegetation cover within the watershed includes scrub/chaparral (52.2% of total area), mixed evergreen/deciduous forest (35.5% of total area), agriculture/herbaceous grasslands (10.5% of total area) and developed/residential (0.8% of total area) (NOAA 2002). The northern portion of the watershed is located within the Los Padres National Forest (approximately 65% of total area) and the vegetation cover is entirely

chaparral/scrub and mixed forest. The agricultural/developed areas within the watershed are primarily along the lower Santa Paula Creek downstream of the Sisar Creek confluence, and within Anlauf Canyon and Mud Creek. Agriculture is dominated by citrus orchards and avocado fields (United States Army Corps of Engineers [USACE], 1995).

2.2.3 Local Hydrology

2.2.3.1 Precipitation and Climate

City of Santa Paula climate is mildly warm during summer when temperatures tend to be in the 70s and cool during winter, when temperatures tend to be in the 40s. The warmest month of the year is August with an average maximum temperature of 82 degrees Fahrenheit, while the coldest month of the year is December with an average minimum temperature of 41 degrees Fahrenheit.

Temperature variations between night and day tend to be relatively big during summer with a difference that can reach 26 degrees Fahrenheit, and relatively big during winter with an average difference of 28 degrees Fahrenheit.

The average annual precipitation in the project area is 18.38 inches. Rainfall in is evenly distributed throughout the year. The wettest month of the year is February with an average rainfall of 4.60 inches.

2.2.3.2 Surface Streams

The only surface stream that affects the base floodplain within both the project area and the general area surrounding the project is Santa Paula Creek.

2.2.3.3 Municipal Water Supply

Water is currently supplied for the City of Santa Paula entirely by Santa Paula Groundwater Basin. The City owns and operates five (5) municipal wells that extract groundwater from the Basin

2.2.4 Ground Water Hydrology

The groundwater depth in the City of Santa Paula varies greatly, depending on the specific location within the Basin and hydrogeological conditions. Historically, water levels within the Basin have fluctuated approximately 25 to 50 feet.

2.2.5 Geology/Soils/Soil Erosion Potential

The banks near Bridge Road Bridge have experienced erosion and bend scour near the abutments. The proposed improvements will mitigate bank erosion at the abutments by providing protection to the abutments beyond the bridge deck at the outside bend of the Creek.

2.3 Watershed Characteristics and Beneficial Uses

A beneficial use identifies the ways that water can be used for the benefit of people and/or wildlife. The Water Quality Control Plan for the Los Angeles Region Basin Plan identifies 14 beneficial uses for the Santa Paula Creek Watershed, which are MUN, IND, PROC, AGR,

FRSH, GWR, REC I, REC II, WARM, COLD, WILD, RARE, MIGR, and SPWN. Each beneficial use is described below.

- Municipal and Domestic Supply (**MUN**) waters are used for community, military, municipal or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
- Industrial Service Supply (**IND**) waters are used for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
- Industrial Process Supply (**PROC**) waters are used for industrial activities that depend primarily on water quality. These uses may include, but are not limited to, process water supply and all used of water related to product manufacture or food preparation.
- Agricultural Supply (**AGR**) waters are used for farming, horticulture or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- Freshwater Replenishment (**FRSH**) waters are used for natural or artificial maintenance of surface water quantity or quality.
- Groundwater Recharge (**GWR**) waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality or halting saltwater intrusion into freshwater aquifers.
- Water Contact Recreation (**REC I**) waters are used for recreational activities involving contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing and use of natural hot springs.
- Non-contact Water Recreation (**REC II**) waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting sightseeing and aesthetic enjoyment in conjunction with the above activities.
- Warm Freshwater Habitat (**WARM**) waters support warmwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish and wildlife, including invertebrates.
- Cold Freshwater Habitat (**COLD**) waters support cold water ecosystems that may include, but are not limited to, preservations and enhancement of aquatic habitats, vegetation, fish and wildlife, including invertebrates.
- Wildlife Habitat (**WILD**) waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.
- Rare, Threatened or Endangered Species (**RARE**) waters support the habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as rare, threatened or endangered.
- Migration of Aquatic Organisms (**MIGR**) water are used to support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

- Spawning, Reproduction, and/or Early Development (**SPWN**) waters support high quality aquatic habitats suitable for reproduction and development of fish.

2.4 Support of Incompatible Floodplain Development

The proposed action within the Zone AE and Zone X floodplain is limited to the abutment improvements of the Bridge. There is no floodplain development proposed by this project.

3 HYDRAULIC ANALYSIS

3.1 Introduction

The Special Flood Hazard areas recognized in this report are a result of open channel flow. The floodplain is contained within the boundaries of the channels or basins.

3.2 Hydraulic Analysis

The FIS report for Ventura County was last updated April 4th, 2018 and lists the 1% annual chance discharge of 28,000 cfs for Santa Paula Creek (Downstream of confluence with Mud Creek) near Bridge Road Bridge.

The FIS study used a Manning's value of 0.035 to reflect the channel and overbank roughness for Santa Paula Creek. The same manning's value was used for the HEC-RAS model using the current topographic conditions.

More hydraulic analyses for Santa Paula Creek were prepared in the subsequent years. Per conversations with County of Ventura Staff, a technical agency review report was prepared in June 2011 in support of the Watershed Feasibility Study. This study was submitted to US Army Corps of Engineers. In that study, an HSPF model run yielded a 100-year peak design discharge of 39,400 cfs at the project location near Bridge Road Bridge. This discharge was used for any study analyzing Santa Paula Creek in the vicinity of the Project. This discharge will be used for the proposed design model to calculate the scour for Bridge Road Bridge per the request of Ventura County Watershed Protection District.

The proposed improvements include placement of in-line abutment modifications. The change in water surface elevation using the discharge from the FIS report was assessed to determine if a Conditional Letter of Map Revision (CLOMR) would be required for the alternatives. The table below summarizes the water surface elevation changes for the alternatives. The HEC-RAS results can be found in the appendix.

Table 2: Water Surface Elevations

Cross Section	Existing	Alternative 1	Δ (feet)	Alternative 2	Δ (feet)	Alternative 3	Δ (feet)
1403	552.3	552.3	0.0	552.3	0.0	552.3	0.0
1502	552.9	552.9	0.0	554.0	(1.1)	552.9	0.0
1602	556.0	556.0	0.0	556.3	(0.4)	556.0	0.0
1704	556.4	556.4	0.0	558.4	(2.0)	556.4	0.0
1905	561.5	561.5	0.0	562.8	(1.3)	561.5	0.0
2102	567.7	567.7	0.0	567.7	0.0	567.7	0.0
2219	572.4	572.4	0.0	572.4	0.0	572.4	0.0
2270	573.6	574.9	(1.3)	573.7	(0.2)	573.6	0.0
2365	573.8	575.1	(1.3)	574.0	(0.2)	573.8	0.0
2496	573.6	573.6	0.0	573.6	0.0	573.6	0.0
2575	577.1	577.1	0.0	577.1	0.0	577.1	0.0
2666	578.6	578.6	0.0	578.6	0.0	578.6	0.0
2728	579.6	579.6	0.0	579.6	0.0	579.6	0.0
2825	579.0	579.0	0.0	579.0	0.0	579.0	0.0
2961	576.4	576.4	0.0	579.3	(2.9)	576.4	0.0
3075	582.7	582.7	0.0	582.7	0.0	582.7	0.0

The allowable change in water surface elevation is a cumulative 1-foot rise over the base flood elevation for Zone AE floodplains. The changes to the 100-year Water Surface Elevation based on the current topographical conditions at the bridge increase by more than 1-foot at some cross sections for Alternatives 1 and 2. Alternative 3 is a net zero change in water surface elevation, and, therefore, does not exceed the allowable amount prescribed by FEMA regulations. The project is not anticipated to require a CLMOR during Final Design if Alternative 3 is chosen. If Alternatives 1 or 2 are to be used a CLOMR will be required. A final hydraulics study should be conducted at Final Design and the results used to make the determination of the need for the CLOMR process.

4 RISKS AND IMPACTS

4.1 Potential Risk from Longitudinal Encroachment

The Caltrans Standard Environmental Reference defines a longitudinal encroachment as an encroachment that is parallel to the direction of flow. A transverse encroachment is an encroachment that is perpendicular or skewed to the direction of flow.

The existing Bridge Road bridge crosses the channel transversely; therefore, there is no longitudinal encroachment. The proposed bank protection represents a longitudinal encroachment at the edge of the channel.

4.2 Potential Risk to Life and Property

The risk to life and property is evaluated by a potential impact of the Base Flood on residences, other buildings, crops. The potential risk to life and property remains unchanged because of the proposed project improvements.

4.3 Potential Risk to Natural and Beneficial Floodplain Values

The project is proposing bridge improvements consisting solely of scour protection within the floodplain boundary; therefore, no permanent impacts to beneficial uses are anticipated. The project improvements that occur within Zone AE do not pose potential risks to natural and beneficial floodplain values.

Temporary construction impacts to FRSH, REC I, REC II, WARM, WILD, and RARE will be addressed in the final design phase, using staging for REC I and REC II, and the Biological Monitoring Plan for FRSH, WARM, WILD, and RARE.

4.4 Potential Risk for Support of Incompatible Floodplain Development

The proposed improvements within the Zone AE floodplain is limited to scour protection within the existing stream. There is no development within the floodplain supported by this project. Primary land use near the project is agricultural dominated by citrus orchards and avocado fields with scattered single-family dwellings. Because the County is a participating community in NFIP, the building department administers the NFIP requirements during the building permit process for any development.

4.5 Assessment of Level of Risk

The risk to life and property is Nominal; there is no change to the current risk to life and property because of the proposed action within the SFHA. The proposed risks to natural and beneficial floodplain values are minimal; the impairments to the beneficial uses are temporary due to construction activities. There is no support for further incompatible floodplain development.

Therefore, the combined Assessed Risk Level is LOW RISK.

5 CONCLUSION

The project site is in a mapped Zone AE Floodplain. Alternatives 1 and 2 Water Surface Elevations (WSE) increase by more than a foot; therefore, a CLOMR and LOMR will be required to update the FIRM Panel. Alternative 3 will not require a CLOMR as the proposed changes do not obstruct the channel or change the existing water surface elevation. The work in the floodplain is limited to construction of scour protection measures for the Bridge Road Bridge. An engineering assessment of the project condition improvements indicates that the project does not introduce additional risk for loss of life and property.

The project does not support incompatible floodplain development; the area is sparsely developed and future development in the floodplain and the vicinity is reviewed by the County of Ventura which is the permitting agency and is a participant in the NFIP Community Rating System (CRS).

Depending on the alternative chosen the water surface elevation may need to be documented with FEMA using the CLOMR/LOMR process.

6 SUMMARY OF PREPARER'S EXPERIENCE

This Location Hydraulic Study Report has been prepared under the direction of the following registered civil engineer.

David A. Jaffe, PhD, PE, D.WRE is a Registered Civil Engineer in the State of California, license number C68321. Dr. Jaffe holds a Doctor of Philosophy degree in Civil Engineering from the University of California, Irvine, and has approximately 20 years of experience related to hydrology, hydraulics and scour.

7 REFERENCES

California Department of Transportation (Caltrans). Highway Design Manual, Sixth Edition HDM Change 07/15/16.

Chow, V.T. Open Channel Hydraulics. McGraw-Hill, New York. 1959.

RBF Consulting, Santa Paula Creek Watershed Planning Project: Hydrology and Hydraulic Watershed Assessment, November 2008.

California Department of Transportation Standard Environmental Reference (Caltrans SER).

Flood Insurance Study (FIS), Ventura County, CA. April 4, 2018.

Location Hydraulic Study Report

Bridge Road Bridge @ Ojai Road (SR 150) and Bridge Road in the County of Ventura

Project Limits:

07 - Ventura - 86 – Rte 150, PM 31.456

TECHNICAL APPENDICES

Appendix A

Location Hydraulic Study Form

Location Hydraulic Study Form *

Dist. 07 Co. Ventura Rte. 150 P.M. 31.456
EA Bridge No. 442

Floodplain Description:
The project is located within the Santa Paula Creek watershed in the southwestern Ventura County. A review of the FEMA Flood Insurance Rate Map (FIRM) for Ventura County indicates the project area is within FEMA FIRM Panel 06111C0614E (Effective Date January 20, 2010).

1. Description of Proposal (include any physical barriers, i.e., concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

The proposed project includes improvements to the bridge abutment on outside bend of Santa Paula Creek of Bridge Road bridge to mitigate channel slope erosion and scour.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q_{100}= 28,000 CFS WSE_{100}= 573.6 Exist, 574.9 Alt 1, 573.8 Alt 2, 573.6 Alt 3
The flood of record, if greater than Q_{100}:
Q= 39,400 CFS WSE= 577.7 Exist, 579.2 Alt 1, 577.9 Alt 2, 577.7 Alt 3
Overtopping flood Q= N/A CFS WSE= N/A
Are NFIP maps and studies available? YES x NO

4. Is the highway location alternative within a regulatory floodway?
YES NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO x YES
B. Other Buildings? NO x YES
C. Crops? NO x YES
D. Natural and beneficial
Floodplain values? NO x YES

* Same as Figure 804.7A Technical Information for Location Hydraulic Study located in Chapter 804 of the Highway Design Manual

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO _____	YES __x__
B. Emergency vehicle access?	NO _____	YES __x__
C. Practicable detour available?	NO _____	YES __x__
D. School bus or mail route?	NO _____	YES __x__

7. Estimated duration of traffic interruption for 100-year event hours: ___N/A___

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$___N/A___
B	Property	$___N/A___
	Total	$___N/A___

9. Assessment of Level of Risk Low__x__
Moderate____
High_____

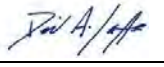
For High Risk projects, during design phase, additional Design Study Risk Analysis May be necessary to determine design alternative.

Signature – Consultant Hydraulic Engineer  Date___11/8/19___
(Item numbers 3,4,5,7,9)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO__x__YES_____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113.

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – Consultant Project Engineer  Date__11/8/19_____
(Item numbers 1,2,6,8)

Appendix B

Summary Floodplain Encroachment Report

Summary Floodplain Encroachment Report *

Dist. 07 Co. Ventura Rte. 150 P.M. 31.456
EA _____ Bridge No. ___

Limits: Bridge Road bridge at Ojai Road (SR 150) and Bridge Road.

Floodplain Description: The project is located within the Santa Paula Creek watershed in the southwestern Ventura County. A review of the FEMA Flood Insurance Rate Map (FIRM) for Ventura County indicates the project area is within FEMA FIRM Panel 06111C0614E (Effective Date January 20, 2010).

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	x	
2.	Are the risks associated with the implementation of the proposed action significant?	x	
3.	Will the proposed action support probable incompatible floodplain development?	x	
4.	Are there any significant impacts on natural and beneficial floodplain values?	x	
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	x	
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?	x	
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.		x

PREPARED BY:

_____ _____ 11/8/19 _____
Signature - Consultant Hydraulic Engineer Date

_____ _____
Signature - Consultant Environmental Specialist Date

_____ _____
Signature - Consultant Project Engineer Date

* Same as Figure 804.7B Floodplain Evaluation Report Summary located in Chapter 804 of the Highway Design Manual

Appendix C

Firm Panel

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

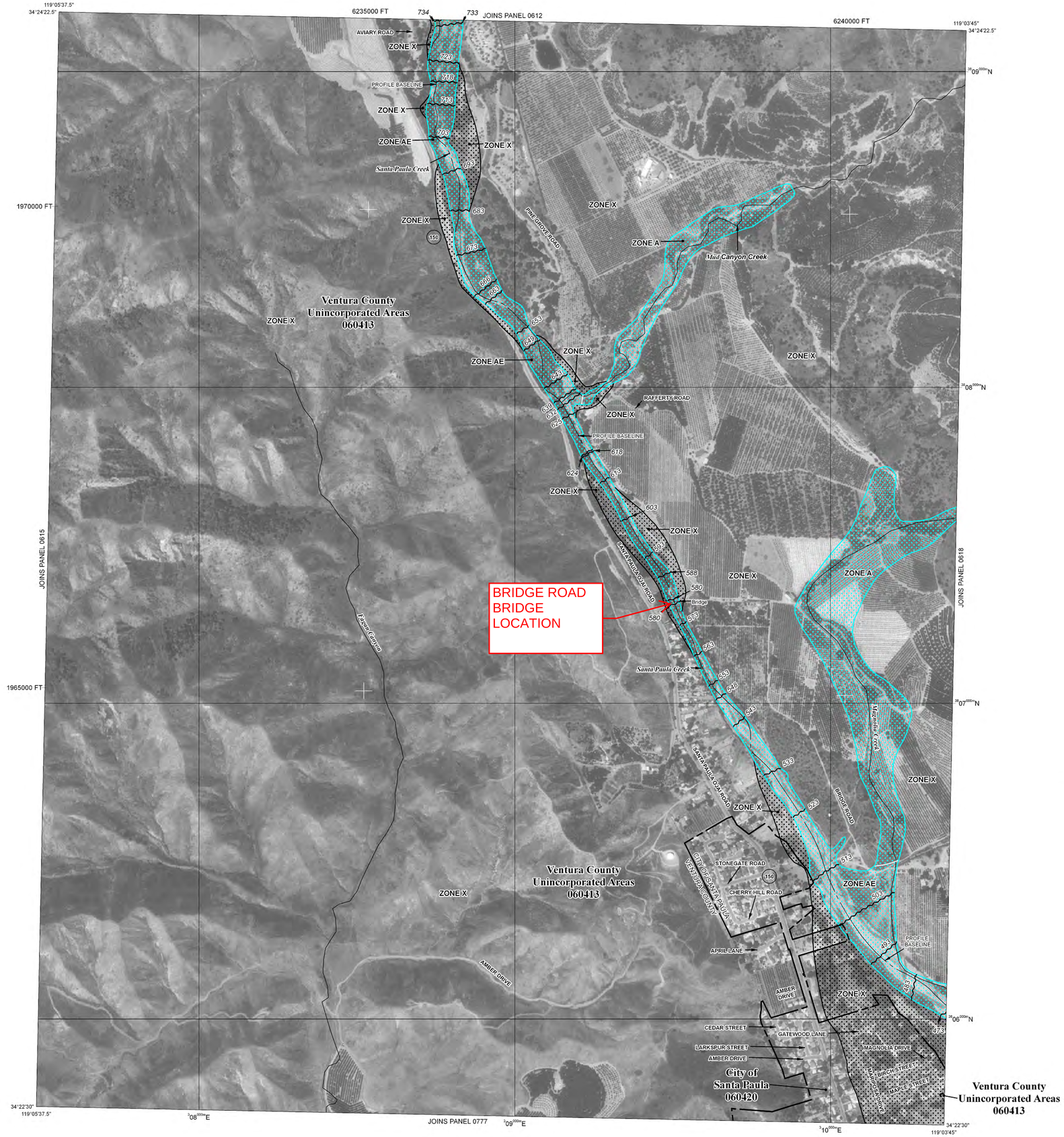
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.mcs.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2°76'000"N — 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
January 20, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0614E

FIRM

FLOOD INSURANCE RATE MAP

VENTURA COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 614 OF 1275

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SANTA PAULA, CITY OF	060420	0614	E
VENTURA COUNTY	060413	0614	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06111C0614E

EFFECTIVE DATE
JANUARY 20, 2010

Federal Emergency Management Agency

Appendix D

Existing HEC-2 Model Results

FEMA Engineering Library
Digitized Data Index

CID:060420

Community:SANTA PAULA, CITY OF

County:VENTURA COUNTY

State:CALIFORNIA

0215603

Box:

Doc:

Case Number/ Study ID:060420-19800415

Effective Date:4/15/1980

Description:1e. Type 19 Restudy

Contents:03. Engineering Analysis: Hydraulics (riverine, stillwater, LDS) 03c. Hydraulic models

Revision Status:

Flooding Source(s):Santa Paula Creek

Notes:Non-Effective

Scanned by:

Scan Date:

QC Staff:

QC Date:

SANTA PAULA CREEK

Received 9/17/79
FHF's Final Run.
Subcritical Run.
PROFILES

```
 *************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
   ERROR CORR -  01,02
   MODIFICATION -  50,51,52,53
 *************************************************

 C
 T1      SANTA PAULA CREEK - SUBCRITICAL - 10 YR.
 T2      VENTURA COUNTY FIS
 T3      BRUCE EISENBISE

 J1  ICHECK     INQ      NINV      IDIR      STRT      METRIC     HVINS      Q        WSEL      FQ
       -0        2        -0        -0      .010000    -0.00      -0.0      -0      482.730   -0.000

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN        ALLDC     IBW      CHNIM     ITRACE
     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000

 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38.000    42.000    39.000    63.000     1.000     2.000    25.000     5.000    10.000    43.000
      4.000    53.000    54.000     8.000    38.000    43.000    50.000    55.000    26.000    56.000
     13.000    14.000    15.000    35.000    27.000    28.000     8.000     0.000   100.000     0.000
    203.000    10.000    72.000   150.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

 J5  LPRNT     NUMSEC           *********REQUESTED SECTION NUMBERS*********
    -10.000   -10.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000
 NC     .035      .035      .035      .100      .300    -0.000    -0.000
 QT    4.000  7000.000 17000.000 24000.000 44000.000    -0.000    -0.000    -0.000    -0.000    -0.000
                                                       -0.000    -0.000    -0.000    -0.000    -0.000

 X1  970.400    16.000   950.000  1050.000  1040.000  1040.000  1040.000    -0.000    -0.000    -0.000
 X3   -0.000   491.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000
 GR  490.000   550.000   480.000   650.000   478.000   700.000   480.000   760.000   475.000   800.000
 GR  470.000   990.000   469.000   900.000   470.300   915.000   472.000   950.000   470.000   970.000
 GR  466.000  1030.000   470.000  1035.000   471.000  1050.000   470.000  1090.000   480.000  1140.000
 GR  490.000  1910.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

 X1  980.900     8.000   870.000  1080.000  1030.000   950.000  1010.000    -0.000    -0.000    -0.000
 X3   -0.000   491.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000
 GR  508.000   550.000   500.000   870.000   490.000   890.000   483.000   970.000   483.000  1020.000
 GR  490.000  1035.000   500.000  1080.000   502.000  1230.000    -0.000    -0.000    -0.000    -0.000

 X1  990.000     9.000   815.000  1080.000  1020.000  1000.000  1010.000    -0.000    -0.000    -0.000
 GR  530.000   510.000   520.000   815.000   510.000   905.000   500.000   960.000   496.000   980.000
 GR  496.000  1020.000   500.000  1030.000   520.000  1080.000   523.000  1150.000    -0.000    -0.000
```

[illegible] = 121.0

Note:
(1) X-sections left to right facing upstream
(2) To match profile stationing subtract 849+4 from river stationing

X1	.200	14.000	939.000	1070.000	960.000	980.000	960.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	550.000	375.000	540.000	570.000	538.000	650.000	539.000	650.000	530.000	930.000
GR	520.000	950.000	514.000	1000.000	514.000	1020.000	540.000	1070.000	546.000	1120.000
GR	540.000	1140.000	536.000	1200.000	540.000	1260.000	550.000	1550.000	-0.000	-0.000
X1	10.750	6.000	930.000	1070.000	1055.000	1055.000	1055.000	-0.000	-0.000	-0.000
GR	560.000	820.000	560.000	930.000	530.000	980.000	530.000	1030.000	540.000	1060.000
GR	560.000	1070.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	20.800	10.000	970.000	1100.000	1030.000	980.000	1005.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	590.000	830.000	560.000	970.000	549.000	1000.000	580.000	1060.000	585.000	1100.000
GR	580.000	1145.000	578.000	1200.000	580.000	1300.000	584.000	1360.000	590.000	1950.000
X1	21.200	10.000	935.000	1065.000	40.000	40.000	40.000	-0.000	-0.000	-0.000
X3	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	600.000	710.000	590.000	935.000	550.000	965.000	550.000	1000.000	550.000	1035.000
GR	590.000	1065.000	580.000	1180.000	578.000	1220.000	580.000	1230.000	590.000	1860.000

BRIDGE ROAD

X1	21.500	10.000	935.000	1065.000	30.000	30.000	30.000	-0.000	-0.000	-0.000
X2	-0.000	-0.000	-0.000	586.000	590.000	-0.000	-0.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	600.000	710.000	590.000	935.000	550.000	965.000	550.000	1000.000	550.000	1035.000
GR	590.000	1065.000	580.000	1180.000	578.000	1220.000	580.000	1230.000	590.000	1860.000
X1	21.900	11.000	920.000	1050.000	40.000	40.000	40.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	600.000	750.000	550.000	800.000	598.000	860.000	580.000	920.000	560.000	960.000
GR	554.000	1000.000	560.000	1010.000	580.000	1050.000	582.000	1230.000	584.000	1310.000
GR	590.000	1830.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	32.000	15.000	800.000	1060.000	970.000	1030.000	1010.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	640.000	750.000	610.000	800.000	603.000	650.000	604.000	940.000	600.000	960.000
GR	590.000	970.000	577.000	1000.000	590.000	1030.000	603.000	1060.000	598.000	1100.000
GR	600.000	1140.000	610.000	1215.000	610.000	1420.000	620.000	1770.000	630.000	1800.000
X1	39.100	11.000	920.000	1060.000	690.000	730.000	710.000	-0.000	-0.000	-0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	630.000	625.000	0.000
GR	670.000	745.000	660.000	760.000	660.000	810.000	630.000	920.000	625.000	960.000
GR	591.000	1300.000	600.000	1030.000	620.000	1060.000	630.000	1660.000	640.000	1850.000
GR	610.000	1950.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	39.600	14.000	905.000	1045.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	625.000	625.000	0.000
GR	650.000	850.000	630.000	880.000	625.000	905.000	615.000	905.000	615.000	955.000
GR	592.000	975.000	592.000	1000.000	592.000	1025.000	615.000	1045.000	625.000	1045.000
GR	630.000	1450.000	636.000	1670.000	640.000	1700.000	650.000	1910.000	-0.000	-0.000

OLD BRIDGE

X1	39.800	17.000	905.000	1145.000	20.000	20.000	20.000	-0.000	-0.000	-0.000
X2	-0.000	-0.000	-0.000	623.000	625.000	-0.000	-0.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	625.000	625.000	-0.000
GR	650.000	850.000	630.000	880.000	625.000	905.000	615.000	905.100	615.000	955.000
GR	623.000	955.100	623.000	957.000	615.000	957.100	592.000	975.000	592.000	1000.000
GR	592.000	1025.000	615.000	1045.000	625.000	1045.100	630.000	1450.000	636.000	1670.000
GR	640.000	1700.000	650.000	1910.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	40.250	13.000	900.000	1100.000	45.000	45.000	45.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	630.000	630.000	-0.000
GR	660.000	795.000	656.000	800.000	656.000	85 [illegible]	630.000	900.000	620.000	950.000
GR	610.000	960.000	593.000	1050.000	610.000	1030. [illegible]	620.000	1050.000	623.000	1100.000
GR	630.000	1250.000	634.000	1600.000	640.000	1080.000	-0.000	-0.000	-0.000	-0.000
X1	43.600	12.000	955.000	1090.000	340.000	330.000	335.000	0.000	0.000	0.000
GR	670.000	845.000	602.000	960.000	602.000	900.000	660.000	910.000	630.000	955.000
GR	599.000	1000.000	610.000	1030.000	620.000	1050.000	630.000	1090.000	640.000	1270.000
GR	650.000	1580.000	660.000	1610.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	44.500	10.000	915.000	1170.000	90.000	110.000	90.000	-0.000	-0.000	-0.000
X3	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	640.000	640.000	-0.000
GR	670.000	860.000	662.000	880.000	662.000	915.000	660.000	930.000	620.000	985.000
GR	601.000	1000.000	610.000	1050.000	630.000	1080.000	635.000	1170.000	640.000	1340.000
QT	4.000	6500.000	16000.000	22000.000	41000.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	45.500	13.000	915.000	1100.000	90.000	140.000	100.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	640.000	640.000	-0.000
GR	680.000	840.000	670.000	855.000	670.000	990.000	660.000	915.000	630.000	950.000
GR	620.000	965.000	602.500	1000.000	610.000	1030.000	620.000	1100.000	630.000	1200.000
GR	640.000	1285.000	650.000	1370.000	650.000	1550.000	-0.000	-0.000	-0.000	-0.000
X1	45.900	11.000	940.000	1090.000	25.000	20.000	30.000	-0.000	-0.000	-0.000
GR	660.000	865.000	660.000	890.000	650.000	910.000	640.000	940.000	603.000	960.000
GR	603.000	1090.000	603.000	1040.000	630.000	1090.000	640.000	1260.000	642.000	1300.000
GR	650.000	1460.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

DROP STRUCTURE

X1	45.900	11.000	940.000	1090.000	10.000	10.000	10.000	-0.000	-0.000	-0.000
GR	660.000	865.000	660.000	890.000	650.000	910.000	640.000	940.000	603.000	960.000
GR	603.000	1090.000	603.000	1040.000	630.000	1090.000	640.000	1260.000	642.000	1300.000
GR	650.000	1460.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	45.950	11.000	940.000	1090.000	5.000	5.000	5.000	0.000	0.000	0.000
GR	660.000	865.000	660.000	890.000	650.000	910.000	640.000	940.000	626.000	960.000
GR	626.000	1090.000	626.000	1040.000	630.000	1090.000	640.000	1260.000	642.000	1300.000
GR	650.000	1460.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	49.200	10.000	890.000	1440.000	200.000	170.000	225.000	0.000	0.000	0.000
GR	660.000	870.000	650.000	890.000	650.000	930.000	640.000	900.000	627.000	1000.000
GR	630.000	1030.000	636.000	1140.000	640.000	1250.000	650.000	1440.000	660.000	1530.000

X1	53.300	12.000	950.000	1040.000	410.000	470.000	510.000	0.000	0.000	0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	670.000	680.000	660.000	710.000	660.000	730.000	640.000	790.000	637.000	850.000
GR	640.000	880.000	643.000	950.000	640.000	990.000	635.000	1000.000	650.000	1040.000
GR	660.000	1045.000	667.000	1100.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	58.100	10.000	875.000	1160.000	400.000	480.000	480.000	0.000	0.000	0.000
GR	670.000	730.000	662.000	800.000	661.000	820.000	661.000	850.000	660.000	875.000
GR	650.000	940.000	644.000	1000.000	650.000	1060.000	660.000	1100.000	670.000	1170.000
X1	61.000	12.000	940.000	1140.000	300.000	240.000	300.000	0.000	0.000	0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	690.000	920.000	670.000	940.000	661.000	950.000	661.000	970.000	650.000	1000.000
GR	660.000	1090.000	662.000	1140.000	660.000	1160.000	655.000	1250.000	660.000	1260.000
GR	680.000	1290.000	685.000	1400.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	64.000	11.000	940.000	1080.000	300.000	230.000	290.000	0.000	0.000	0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	690.000	950.000	680.000	870.000	670.000	890.000	669.000	900.000	669.000	940.000
GR	660.000	950.000	654.000	1000.000	660.000	1030.000	665.000	1080.000	658.000	1130.000
GR	680.000	1180.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	67.600	10.000	940.000	1170.000	370.000	350.000	360.000	0.000	0.000	0.000
GR	700.000	820.000	690.000	840.000	680.000	875.000	678.000	900.000	678.000	930.000
GR	677.000	935.000	676.000	940.000	670.000	970.000	660.000	1000.000	666.000	1050.000
GR	670.000	1140.000	676.000	1170.000	670.000	1200.000	670.000	1230.000	680.000	1270.000
GR	646.000	1300.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	76.030	10.000	860.000	1125.000	800.000	850.000	840.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	690.000	710.000	-0.000
GR	710.000	750.000	700.000	760.000	698.000	770.000	698.000	810.000	690.000	960.000
GR	660.000	865.000	688.000	910.000	684.000	930.000	684.000	980.000	679.000	1000.000
GR	680.000	1015.000	690.000	1025.000	700.000	1070.000	700.000	1125.000	698.000	1170.000
GR	700.000	1220.000	704.000	1400.000	710.000	1410.000	720.000	1420.000	-0.000	-0.000
X1	81.000	10.000	910.000	1030.000	380.000	370.000	500.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	705.000	705.000	-0.000
GR	710.000	870.000	702.000	910.000	700.000	950.000	698.000	1000.000	700.000	1030.000
GR	699.000	1075.000	700.000	1090.000	708.000	1140.000	708.000	1300.000	710.000	1320.000
X1	85.000	11.000	900.000	1090.000	530.000	450.000	500.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	715.000	715.000	-0.000
GR	730.000	770.000	720.000	900.000	710.000	910.000	704.000	1000.000	710.000	1070.000
GR	712.000	1090.000	710.000	1100.000	705.000	1140.000	714.000	1230.000	720.000	1310.000
GR	730.000	1400.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	90.000	9.000	950.000	1050.000	450.000	450.000	560.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	725.000	725.000	-0.000
GR	730.000	810.000	720.000	950.000	715.000	1000.000	720.000	1020.000	722.000	1050.000
GR	720.000	1100.000	716.000	1150.000	720.000	1180.000	730.000	1200.000	-0.000	-0.000
X1	95.000	11.000	930.000	1130.000	410.000	500.000	500.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	740.000	740.000	-0.000

GR	750.000	720.000	747.000	780.000	740.000	820.000	740.000	930.000	730.000	970.000
GR	729.000	1000.000	737.000	1130.000	733.000	1190.000	734.000	1210.000	740.000	1310.000
GR	750.000	1330.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	100.000	7.000	970.000	1170.000	500.000	550.000	500.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	750.000	750.000	-0.000
GR	783.000	750.000	750.000	780.000	742.000	830.000	750.000	970.000	740.000	1000.000
GR	750.000	1170.000	760.000	1350.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	105.000	9.000	860.000	1100.000	500.000	430.000	500.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	770.000	770.000	-0.000
GR	770.000	820.000	760.000	860.000	749.000	1000.000	750.000	1010.000	760.000	1050.000
GR	768.000	1100.000	768.000	1160.000	764.000	1330.000	770.000	1400.000	-0.000	-0.000
X1	110.000	5.000	970.000	1100.000	500.000	420.000	500.000	-0.000	-0.000	-0.000
GR	780.000	870.000	770.000	970.000	760.000	1000.000	770.000	1100.000	780.000	1150.000
X1	115.000	5.000	950.000	1110.000	500.000	460.000	500.000	-0.000	-0.000	-0.000
GR	790.000	950.000	780.000	980.000	772.000	1000.000	780.000	1100.000	790.000	1110.000
X1	116.200	5.000	950.000	1110.000	100.000	140.000	120.000	-0.000	-0.000	-0.000
GR	792.000	950.000	790.000	951.000	774.000	1000.000	760.000	1070.000	800.000	1110.000
X1	116.700	5.000	930.000	1120.000	50.000	50.000	50.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	795.000	795.000	-0.000
GR	799.000	930.000	800.000	970.000	775.000	995.000	775.000	1095.000	800.000	1120.000

STECKEL PARK BRIDGE

X1	117.100	17.000	970.000	1120.000	40.000	40.000	40.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	803.000	803.000	-0.000
BT	15.000	970.000	800.000	700.000	970.100	803.000	792.000	982.500	803.000	793.000
BT	995.000	803.000	792.000	995.100	803.000	700.000	995.500	803.000	700.000	996.600
BT	803.000	788.000	1045.000	803.000	791.000	1093.400	803.000	788.000	1093.500	803.000
BT	700.000	1095.000	803.000	700.000	1095.100	803.000	792.000	1107.500	803.000	793.000
BT	1120.000	803.000	792.000	1120.100	800.000	700.000	-0.000	-0.000	-0.000	-0.000
GR	800.000	930.000	800.000	970.000	787.000	970.100	787.000	982.500	787.000	995.000
GR	775.000	995.100	775.000	996.500	775.000	996.600	775.000	1045.000	775.000	1093.400
GR	775.000	1093.500	775.000	1095.000	787.000	1095.100	787.000	1107.500	787.000	1120.000
GR	800.000	1120.100	800.000	1160.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	117.000	6.000	950.000	1070.000	50.000	50.000	50.000	-0.000	-0.000	-0.000
GR	798.000	930.000	796.000	945.000	790.000	969.000	780.000	950.000	777.000	1000.000
GR	776.000	1030.000	780.000	1070.000	800.000	1100.000	-0.000	-0.000	-0.000	-0.000
X1	118.000	5.000	960.000	1100.000	100.000	100.000	100.000	-0.000	-0.000	-0.000
GR	798.000	900.000	798.000	930.000	790.000	960.000	780.000	930.000	780.000	1000.000
GR	780.000	1020.000	787.000	1090.000	790.000	1100.000	800.000	1110.000	-0.000	-0.000
X1	120.000	5.000	960.000	1100.000	100.000	100.000	100.000	-0.000	-0.000	-0.000
GR	803.200	900.000	803.200	930.000	795.200	960.000	795.200	990.000	785.200	1000.000
GR	795.200	1020.000	787.200	1090.000	795.200	1100.000	805.200	1110.000	-0.000	-0.000

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  HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
  ERROR CODE -  01,02
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

BRUCE EISENBISE

SUMMARY PRINTOUT

	SECNO	ELMIN	XLCH	ELMX	CWSEL	CRIWS	AREA	10K*S	HV	)	TOPWID	SSTA	ENDST
	970.400	481.00	1040.00	490.00	482.93	0.00	1133.70	99.95					
	970.400	481.00	1040.00	490.00	484.15	0.00	2042.15	100.85	.60	7000.00	685.10	628.56	1313.66
	970.400	481.00	1040.00	490.00	484.78	484.70	2574.42	101.96	1.12	17000.00	808.13	615.04	1423.17
*	970.400	481.00	1040.00	490.00	486.26	486.26	3900.46	97.86	1.41	24000.00	872.18	608.00	1480.19
									2.01	44000.00	1022.27	591.51	1613.78
*	980.100	491.00	1010.00	502.00	495.01	495.01	639.71	118.15					
*	980.500	491.00	1010.00	502.00	498.05	498.05	1202.11	100.25	1.86	7000.00	173.97	881.09	1055.06
*	980.900	491.00	1010.00	502.00	499.70	499.70	1534.33	96.06	3.11	17000.00	195.93	874.33	1070.26
*	980.900	491.00	1010.00	502.00	504.31	504.31	3370.65	50.02	3.80	24000.00	207.82	870.67	1078.49
									5.37	44000.00	532.40	697.60	1230.00
	990.000	496.00	1010.00	523.00	504.33	0.00	597.81	76.72					
*	990.400	496.00	1010.00	523.00	508.20	508.20	1062.99	94.24	2.13	7000.00	104.62	936.20	1040.82
*	990.800	496.00	1010.00	523.00	510.54	510.54	1402.28	90.15	3.97	17000.00	135.60	914.90	1050.50
*	990.800	496.00	1010.00	523.00	515.64	515.64	2348.08	82.99	4.55	24000.00	156.18	900.16	1056.34
									5.45	44000.00	214.82	854.27	1069.09
*	.200	514.00	960.00	550.00	522.46	522.46	517.30	104.85					
*	.200	514.00	960.00	550.00	527.16	527.16	989.43	92.78	2.84	7000.00	91.20	945.08	1036.27
*	.200	514.00	960.00	550.00	529.64	529.64	1273.49	89.99	4.58	17000.00	109.64	935.67	1045.32
*	.200	514.00	960.00	550.00	536.61	536.61	2834.95	49.41	5.51	24000.00	119.38	930.71	1050.09
									4.75	44000.00	339.01	724.46	1070.00
*	10.710	530.00	1055.00	560.00	537.47	537.47	503.56	104.94					
*	10.710	530.00	1055.00	560.00	542.34	542.34	955.03	93.87	3.00	7000.00	84.85	967.55	1052.40
*	10.710	530.00	1055.00	560.00	545.00	545.00	1243.51	87.77	4.82	17000.00	101.73	959.44	1061.17
*	10.710	530.00	1055.00	560.00	550.98	550.98	1924.96	83.53	5.78	24000.00	107.50	955.00	1062.50
									8.11	44000.00	120.45	945.04	1065.49
*	20.800	549.00	1005.00	590.00	563.02	563.02	459.48	97.53					
*	20.800	549.00	1005.00	590.00	569.26	569.26	966.23	78.90	3.71	7000.00	66.19	960.94	1027.13
*	20.800	549.00	1005.00	590.00	572.23	572.23	1278.24	76.96	5.13	17000.00	96.97	942.23	1039.20
*	20.800	549.00	1005.00	590.00	576.60	576.60	2090.07	70.94	5.89	24000.00	111.64	933.32	1044.96
									7.37	44000.00	143.10	914.20	1100.00
	21.200	550.00	40.00	590.00	566.72	0.00	1379.98	5.00					
	21.200	550.00	40.00	590.00	573.86	0.00	2096.99	8.91	.40	7000.00	95.08	952.46	1047.54
	21.200	550.00	40.00	590.00	577.17	0.00	2454.98	11.40	1.02	17000.00	105.79	947.11	1052.89
	21.200	550.00	40.00	590.00	584.39	0.00	4280.90	14.51	1.48	24000.00	110.75	944.63	1055.37
									2.21	44000.00	498.52	939.21	1506.47
		BRIDGE ROAD											
	21.100	550.00	30.00	590.00	566.74	0.00	1381.56	4.99					
	21.100	550.00	30.00	590.00	573.69	0.00	2100.53	8.87	.40	7000.00	95.10	952.45	1047.55
	21.100	550.00	30.00	590.00	577.21	0.00	2460.19	11.34	1.02	17000.00	105.84	947.08	1052.92
									1.48	24000.00	110.82	944.59	1055.41

	SECNO	ELMIN	XLCH	ELMX	CWSEL	CRIWS	AREA	10K*S	MV-	Q	TOPWID	SSTA	ENDST
	21.500	550.00	30.00	590.00	583.98	0.00	3244.87	17.67	2.86	44000.00	120.9'	939.51	1065.00
*	21.900	554.00	40.00	590.00	565.33	565.33	473.12	105.40	3.40	7000.00	71.31	949.35	1020.65
	21.900	554.00	40.00	590.00	571.44	0.00	983.83	82.01	4.64	17000.00	95.76	937.12	1032.88
	21.900	554.00	40.00	590.00	574.78	0.00	1325.63	72.42	5.09	24000.00	109.11	933.44	1039.56
	21.900	554.00	40.00	590.00	581.87	580.06	2364.27	56.42	6.03	44000.00	312.54	905.96	1218.50
*	32.000	577.00	1010.00	630.00	591.03	591.03	493.81	108.04	3.69	7000.00	63.42	958.97	1032.39
*	32.000	577.00	1010.00	630.00	597.23	597.23	910.31	93.45	5.42	17000.00	83.92	962.77	1046.69
*	32.000	577.00	1010.00	630.00	600.45	600.45	1197.79	90.14	6.23	24000.00	96.35	957.76	1060.00
*	32.000	577.00	1010.00	630.00	606.32	606.32	2830.24	83.84	3.88	44000.00	361.04	826.32	1187.36
*	39.100	591.00	710.00	650.00	605.00	605.00	439.20	108.51	3.94	7000.00	56.82	980.68	1037.51
*	39.100	591.00	710.00	650.00	611.65	611.65	880.03	95.32	5.79	17000.00	75.94	971.52	1047.47
*	39.100	591.00	710.00	650.00	614.90	614.90	1142.76	93.67	6.85	24000.00	85.33	967.03	1052.36
*	39.100	591.00	710.00	650.00	622.36	622.36	1864.56	85.56	4.69	44000.00	109.53	950.47	1060.00
	39.600	592.00	50.00	650.00	608.74	0.00	1080.16	9.03	.65	7000.00	79.10	960.45	1039.55
	39.600	592.00	50.00	650.00	616.76	0.00	1656.27	18.38	1.30	17000.00	140.00	905.00	1045.00
	39.600	592.00	50.00	650.00	620.95	0.00	2442.18	15.68	1.50	24000.00	140.00	905.00	1045.00
	39.600	592.00	50.00	650.00	630.10	0.00	4844.07	11.86	1.75	44000.00	573.94	879.85	1453.79
		OLD BRIDGE											
	39.600	592.00	20.00	650.00	608.74	0.00	1055.13	9.25	.67	7000.00	77.59	961.97	1039.56
	39.600	592.00	20.00	650.00	616.78	0.00	1630.69	19.31	1.34	17000.00	137.86	905.08	1045.00
	39.600	592.00	20.00	650.00	620.95	0.00	2405.94	17.06	1.55	24000.00	138.01	905.04	1045.00
	39.600	592.00	20.00	650.00	630.26	0.00	4617.05	45.61	1.63	44000.00	580.09	879.60	1459.69
*	40.250	593.00	45.00	640.00	607.75	607.75	447.69	109.06	3.90	7000.00	60.72	965.30	1026.02
	40.250	593.00	45.00	640.00	613.99	613.93	898.54	95.83	5.56	17000.00	81.98	956.01	1037.99
	40.250	593.00	45.00	640.00	618.39	0.00	1288.39	71.12	5.39	24000.00	95.19	951.60	1046.79
	40.250	593.00	45.00	640.00	629.19	625.37	2959.06	36.35	3.43	44000.00	195.94	904.06	1100.00
	43.600	599.00	335.00	660.00	612.14	0.00	784.68	28.19	1.32	7000.00	97.34	857.76	1034.28
	43.600	599.00	335.00	660.00	619.34	0.00	1585.02	22.54	1.95	17000.00	125.01	856.18	1046.67
	43.600	599.00	335.00	660.00	623.01	0.00	2079.22	21.87	2.30	24000.00	145.15	855.37	1062.84
	43.600	599.00	335.00	660.00	630.56	0.00	3343.81	21.05	3.02	44000.00	197.14	853.70	1100.08
*	44.900	601.00	90.00	640.00	613.23	613.23	457.19	111.39	3.64	7000.00	64.64	990.30	1054.93
*	44.900	601.00	90.00	640.00	619.25	619.25	983.05	98.92	5.75	17000.00	78.28	985.59	1063.87
*	44.900	601.00	90.00	640.00	622.52	622.52	1153.53	94.43	6.72	24000.00	87.25	981.53	1068.79
*	44.900	601.00	90.00	640.00	630.68	630.68	1964.18	83.36	7.79	44000.00	121.85	970.32	1092.17
	45.900	602.50	100.00	660.00	616.21	0.00	621.69	56.96	1.70	6500.00	100.89	972.58	1073.47
	45.900	602.50	100.00	660.00	624.42	0.00	1678.74	19.90	1.41	16000.00	141.62	958.38	1100.00
	45.900	602.50	100.00	660.00	628.65	0.00	2292.79	14.23	1.43	22000.00	147.58	952.02	1100.00
	45.900	602.50	100.00	660.00	637.32	0.00	3823.19	12.02	1.99	41000.00	158.54	941.46	1100.00
	45.600	603.00	30.00	650.00	617.76	0.00	1442.53	4.45	.32	6500.00	115.34	952.02	1067.35
	45.600	603.00	30.00	650.00	625.22	0.00	2368.35	6.51	.71	16000.00	133.16	947.99	1081.15
	45.600	603.00	30.00	650.00	629.29	0.00	2930.07	6.76	.88	22000.00	142.90	945.79	1088.69
	45.900	603.00	30.00	650.00	638.10	0.00	4736.76	7.03	1.31	41000.00	286.68	941.03	1227.71

	SECNO	ELMIN	XLOW	TELMX	GWSEL	CRINS	AREA	10K*S	HV	Q	TOPWID	SSTA	ENDST
		DROP STRUCTURE											
	49.900	603.00	10.00	650.01	617.77	0.00	1442.29	4.45	.32	6500.00	115.33	952.02	1067.35
	49.900	603.00	10.00	650.01	625.23	0.00	2369.89	6.49	.71	16000.00	133.19	947.98	1081.17
	49.900	603.00	10.00	650.01	629.30	0.00	2931.44	6.75	.87	22000.00	142.92	945.78	1088.70
	49.900	603.00	10.00	650.01	633.11	0.00	4741.03	7.02	1.30	41000.00	286.82	941.02	1227.84
*	49.950	626.00	5.00	650.01	631.02	631.02	578.87	108.91	2.00	6500.00	154.44	952.83	1107.28
*	49.950	626.00	5.00	650.01	634.44	634.44	1216.45	80.16	2.97	16000.00	217.61	947.94	1165.54
*	49.950	626.00	5.00	650.01	636.03	636.03	1585.70	74.06	3.38	22000.00	246.90	945.67	1192.57
*	49.950	626.00	5.00	650.01	640.13	640.13	2750.38	59.48	4.00	41000.00	322.89	939.62	1262.51
*	48.200	627.00	225.00	660.01	635.44	635.44	568.55	116.45	1.89	6500.00	155.63	974.04	1129.67
*	48.200	627.00	225.00	660.01	638.77	638.77	1262.56	105.43	2.49	16000.00	252.53	963.77	1216.30
*	48.200	627.00	225.00	660.01	640.09	640.09	1622.00	104.92	2.86	22000.00	292.04	959.72	1251.76
*	48.200	627.00	225.00	660.01	643.29	643.29	2656.48	92.63	3.67	41000.00	362.28	950.14	1312.42
*	53.300	635.00	510.00	667.00	643.02	643.02	727.55	85.27	1.87	6500.00	240.42	780.95	1021.37
*	53.300	635.00	510.00	667.00	645.13	645.13	1248.41	101.22	2.58	16000.00	252.40	774.61	1027.01
*	53.300	635.00	510.00	667.00	646.35	646.35	1559.61	96.21	3.12	22000.00	259.29	770.96	1030.26
*	53.300	635.00	510.00	667.00	649.59	649.59	2429.50	84.85	4.46	41000.00	277.65	761.24	1038.90
*	58.100	644.00	480.00	670.00	651.59	651.59	571.14	117.60	2.01	6500.00	146.18	929.69	1075.86
*	58.100	644.00	480.00	670.00	654.98	654.98	1163.06	102.71	2.94	16000.00	202.24	907.60	1109.84
*	58.100	644.00	480.00	670.00	656.55	656.55	1500.22	97.51	3.34	22000.00	228.09	897.42	1125.51
*	58.100	644.00	480.00	670.00	660.15	660.15	2429.16	91.59	4.42	41000.00	289.00	871.15	1160.15
*	61.000	650.00	300.00	685.00	659.39	659.39	517.08	114.45	2.45	6500.00	110.13	974.39	1140.00
*	61.000	650.00	300.00	685.00	662.04	662.04	1380.13	99.81	3.09	16000.00	314.21	948.85	1263.06
*	61.000	650.00	300.00	685.00	662.87	662.87	1643.13	108.11	2.79	22000.00	316.39	947.92	1264.31
*	61.000	650.00	300.00	685.00	665.76	665.76	2569.31	89.21	3.96	41000.00	323.94	944.71	1268.65
*	64.000	654.00	290.00	680.00	662.95	662.95	524.17	112.86	2.39	6500.00	112.76	946.72	1080.00
*	64.000	654.00	290.00	680.00	665.80	665.80	1172.43	99.79	3.00	16000.00	204.18	943.55	1147.73
*	64.000	654.00	290.00	680.00	667.23	667.23	1487.79	93.11	3.59	22000.00	209.02	941.96	1150.98
*	64.000	654.00	290.00	680.00	671.23	671.23	2436.87	72.51	4.69	41000.00	272.54	887.54	1160.07
*	67.000	660.00	350.00	686.00	669.35	669.35	574.49	124.13	1.99	6500.00	153.36	971.96	1125.32
*	67.000	660.00	350.00	686.00	672.57	672.57	1256.67	93.80	2.64	16000.00	248.82	957.15	1205.98
*	67.000	660.00	350.00	686.00	673.91	673.91	1607.41	90.35	3.05	22000.00	274.30	950.45	1245.64
*	67.000	660.00	350.00	686.00	677.00	677.00	2539.54	85.48	4.22	41000.00	322.97	935.01	1257.99
*	76.000	679.00	840.00	710.00	688.47	688.47	536.09	122.62	1.91	6500.00	155.41	863.83	1019.25
*	76.000	679.00	840.00	710.00	691.70	691.70	1115.03	99.86	3.23	16000.00	179.08	849.40	1028.48
*	76.000	679.00	840.00	710.00	693.32	693.32	1419.84	93.43	3.82	22000.00	197.30	839.28	1036.58
*	76.000	679.00	840.00	710.00	697.60	697.60	2367.46	77.21	4.88	41000.00	245.46	812.52	1057.98
*	81.000	690.00	900.00	710.00	701.24	701.24	514.33	109.75	2.48	6500.00	104.75	925.25	1030.00
*	81.000	690.00	900.00	710.00	705.25	705.25	1446.61	50.86	2.03	16000.00	229.02	893.77	1122.79
*	81.000	690.00	900.00	710.00	705.70	705.70	1591.25	78.25	3.36	22000.00	234.10	891.51	1125.61
*	81.000	690.00	900.00	710.00	709.81	709.81	2908.76	55.32	3.96	41000.00	447.22	870.93	1318.14
*	85.000	704.00	900.00	730.00	710.71	710.71	596.97	121.90	1.84	6500.00	167.85	909.29	1090.00
*	85.000	704.00	900.00	730.00	713.66	713.66	1129.35	101.51	3.14	16000.00	183.66	906.34	1090.00
*	85.000	704.00	900.00	730.00	715.22	715.22	2271.94	39.08	1.48	22000.00	341.51	904.78	1246.29
*	85.000	704.00	900.00	730.00	716.28	716.28	2639.87	85.38	3.79	41000.00	356.62	903.72	1260.34

	SECNO	ELMIN	XLCH	TELMX	CWSEL	CRIWS	AREA	10K*S	PV	Q	TOPWID	SSTA	ENDST
*	90.000	715.00	500.00	730.00	723.59	723.59	504.01	108.76	2.59	6500.00	100.00	950.00	1050.00
*	90.000	715.00	500.00	730.00	725.21	725.21	1590.13	57.40	1.68	16000.00	313.34	877.07	1190.42
*	90.000	715.00	500.00	730.00	725.55	725.55	1696.56	89.47	2.60	22000.00	318.73	872.36	1191.09
*	90.000	715.00	500.00	730.00	728.53	728.53	2718.58	77.34	3.83	41000.00	366.46	830.60	1197.06
*	95.000	729.00	500.00	750.00	735.53	735.53	588.99	118.06	1.89	6500.00	150.29	947.87	1130.00
*	95.000	729.00	500.00	750.00	738.55	738.55	1138.51	104.56	3.07	16000.00	194.19	935.81	1130.00
*	95.000	729.00	500.00	750.00	740.06	740.06	2176.47	50.18	1.68	22000.00	380.89	929.22	1310.11
*	95.000	729.00	500.00	750.00	741.59	741.59	2779.51	81.90	3.55	41000.00	405.06	908.12	1313.18
*	100.000	740.00	500.00	753.00	747.61	747.61	579.15	119.13	1.96	6500.00	152.20	977.17	1129.37
*	100.000	740.00	500.00	753.00	750.01	750.01	1763.90	60.81	1.30	16000.00	390.28	779.90	1170.18
*	100.000	740.00	500.00	753.00	750.30	750.30	1879.53	93.36	2.16	22000.00	398.49	776.97	1175.46
*	100.000	740.00	500.00	753.00	752.61	752.61	2874.01	86.56	3.26	41000.00	463.12	753.86	1217.01
*	105.000	749.00	500.00	770.00	756.85	756.85	559.74	116.24	2.09	6500.00	137.34	900.07	1037.41
*	105.000	749.00	500.00	770.00	760.38	760.38	1148.28	100.70	3.01	16000.00	192.40	850.00	1052.40
*	105.000	749.00	500.00	770.00	761.82	761.82	1431.70	97.09	3.67	22000.00	201.39	850.00	1061.39
*	105.000	749.00	500.00	770.00	765.73	765.73	2266.18	85.23	5.08	41000.00	225.81	860.00	1100.00
*	110.000	760.00	500.00	780.00	769.09	769.09	537.50	110.04	2.27	6500.00	118.22	972.72	1090.94
*	110.000	760.00	500.00	780.00	773.00	773.00	1107.96	80.28	3.45	16000.00	175.04	939.97	1115.01
*	110.000	760.00	500.00	780.00	774.90	774.90	1467.61	69.95	3.89	22000.00	203.55	920.96	1124.52
*	110.000	760.00	500.00	780.00	779.32	779.32	2512.16	58.18	4.93	41000.00	269.75	876.83	1146.58
*	115.000	772.00	500.00	790.00	780.46	780.46	535.74	116.00	2.29	6500.00	121.84	978.62	1100.46
*	115.000	772.00	500.00	790.00	784.20	784.20	1019.55	97.78	3.82	16000.00	136.81	967.39	1104.20
*	115.000	772.00	500.00	790.00	786.09	786.09	1284.82	92.57	4.55	22000.00	144.36	961.73	1106.09
*	115.000	772.00	500.00	790.00	790.90	790.90	2024.75	83.25	6.37	41000.00	160.00	950.00	1110.00
*	116.200	774.00	120.00	792.00	782.58	782.58	509.64	107.91	2.53	6500.00	101.42	973.73	1075.15
*	116.200	774.00	120.00	792.00	786.81	786.81	984.93	95.13	4.10	16000.00	122.87	960.75	1083.63
*	116.200	774.00	120.00	792.00	788.91	788.91	1253.18	90.40	4.79	22000.00	133.47	954.35	1087.82
*	116.200	774.00	120.00	792.00	793.89	793.89	1961.40	83.61	6.79	41000.00	147.79	950.00	1097.79
	116.700	775.00	50.00	799.00	784.87	0.00	1004.60	11.52	.56	6500.00	119.74	985.13	1104.87
	116.700	775.00	50.00	799.00	790.03	0.00	1726.51	17.05	1.33	16000.00	130.05	979.97	1110.03
	116.700	775.00	50.00	799.00	792.36	0.00	2038.82	19.78	1.81	22000.00	134.73	977.64	1112.36
	116.700	775.00	50.00	799.00	797.98	0.00	2825.46	26.46	3.27	41000.00	145.95	972.02	1117.98
		DIECKEL PARK BRIDGE											
	117.100	775.00	40.00	800.00	784.61	0.00	950.58	16.34	.73	6500.00	100.06	995.02	1095.08
	117.100	775.00	40.00	800.00	789.31	0.00	1487.66	51.68	1.60	16000.00	149.92	970.08	1120.00
	117.100	775.00	40.00	800.00	791.94	0.00	1646.43	91.29	2.77	22000.00	149.94	970.06	1120.00
	117.100	775.00	40.00	800.00	794.05	790.35	1679.44	374.01	9.25	41000.00	149.95	970.05	1120.00
*	117.600	777.00	50.00	798.00	793.81	783.91	512.93	99.31	2.59	6500.00	103.32	972.39	1075.71
	117.600	777.00	50.00	798.00	798.59	0.00	1060.11	64.13	3.81	16000.00	120.44	962.61	1083.05
	117.600	777.00	50.00	798.00	799.98	0.00	1345.29	59.06	4.51	22000.00	128.95	957.53	1086.48
	117.600	777.00	50.00	798.00	806.34	795.85	2786.32	25.51	3.83	41000.00	160.00	920.00	1100.00
	118.600	780.00	100.00	796.00	785.28	785.27	544.78	113.38	2.21	6500.00	124.64	969.45	1094.09
	118.600	780.00	100.00	798.00	798.74	0.00	1274.77	48.40	2.45	16000.00	143.51	957.23	1100.74
	118.600	780.00	100.00	798.00	793.41	0.00	1674.41	38.50	2.74	22000.00	156.18	947.23	1103.41
	118.600	780.00	100.00	796.00	801.74	0.00	3226.64	19.94	2.76	41000.00	210.00	900.00	1110.00

	SECNC	ELMIN	XLCH	TELMX	CWSEL	CRIMS	AREA	10K**S	HV	Q	TOPWID	SSTA	ENDST
*	120.600	785.20	100.00	803.20	790.48	790.48	544.74	113.37	2.21	6500.00	124.64	969.45	1094.09
*	120.600	785.20	100.00	803.20	794.14	794.14	1023.03	96.70	3.00	16000.00	136.55	962.13	1098.67
*	120.600	785.20	100.00	803.20	795.97	795.97	1278.69	90.60	4.61	22000.00	143.64	957.13	1100.77
*	120.600	785.20	100.00	803.20	800.80	800.80	2041.44	72.99	6.52	41000.00	166.97	938.71	1105.68

BRUCE EISENBISE

SUMMARY PRINTOUT

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	QLOB	QCH	QROB	PERENC	STENCL	STENCR	DEPTH
	970.400	7000.00	0.00	6.49	5.58	5.34	3893.77	1269.43	1836.80	0.00	0.00	0.00	1.93
	970.400	17000.00	1.22	8.97	9.16	7.08	8957.93	2860.54	5161.53	0.00	0.00	0.00	3.15
	970.400	24000.00	.63	10.15	10.40	7.69	12315.52	3932.25	7752.23	0.00	0.00	0.00	3.78
*	970.400	44000.00	1.48	12.29	12.71	9.30	21302.53	6691.04	16006.43	0.00	0.00	0.00	5.26
*	980.500	7000.00	0.00	0.00	10.94	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	4.01
*	980.500	17000.00	3.04	0.00	14.14	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	7.05
*	980.500	24000.00	1.65	0.00	15.64	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	8.70
*	980.500	44000.00	4.61	5.01	15.53	6.60	1660.91	38861.47	3277.61	0.00	0.00	0.00	13.31
	990.600	7000.00	0.00	0.00	11.71	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	8.33
*	990.600	17000.00	3.87	0.00	15.99	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	12.20
*	990.600	24000.00	2.34	0.00	17.11	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	14.54
*	990.600	44000.00	5.10	0.00	18.74	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	19.64
*	.200	7000.00	0.00	0.00	13.53	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	8.46
*	.200	17000.00	4.70	0.00	17.18	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	13.16
*	.200	24000.00	2.48	0.00	18.85	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	15.64
*	.200	44000.00	6.96	0.62	18.32	0.00	4492.80	39507.20	0.00	0.00	0.00	0.00	22.61
*	10.750	7000.00	0.00	0.00	13.90	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	7.47
*	10.750	17000.00	4.87	0.00	17.62	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	12.34
*	10.750	24000.00	2.66	0.00	19.30	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	15.00
*	10.750	44000.00	5.98	0.00	22.86	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	20.98
*	20.800	7000.00	0.00	5.33	15.54	0.00	72.87	6927.13	0.00	0.00	0.00	0.00	14.02
*	20.800	17000.00	6.24	10.11	18.70	0.00	1299.45	15700.55	0.00	0.00	0.00	0.00	20.26
*	20.800	24000.00	2.97	11.95	20.23	0.00	2680.99	21319.01	0.00	0.00	0.00	0.00	23.23
*	20.800	44000.00	6.37	15.26	22.87	0.00	7920.31	36079.70	0.00	0.00	0.00	0.00	29.60
	21.200	7000.00	0.00	0.00	5.07	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	16.72
	21.200	17000.00	7.14	0.00	8.11	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	23.66
	21.200	24000.00	3.31	0.00	9.78	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	27.17
	21.200	44000.00	7.22	0.00	12.36	3.34	0.00	40707.06	3292.94	0.00	0.00	0.00	34.39
		BRIDGE ROAD											
	21.500	7000.00	0.00	0.00	5.07	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	16.74
	21.500	17000.00	7.16	0.00	8.09	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	23.89
	21.500	24000.00	3.32	0.00	9.76	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	27.21
	21.500	44000.00	6.77	0.00	13.56	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	33.98
*	21.900	7000.00	0.50	0.00	14.80	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	11.33
	21.900	17000.00	6.11	0.00	17.28	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	17.44
	21.900	24000.00	3.34	0.00	18.10	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	20.78
	21.900	44000.00	7.18	3.03	19.82	3.05	39.88	43476.77	483.35	0.00	0.00	0.00	27.87
*	32.000	7000.00	0.00	0.00	15.42	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	14.03
*	32.000	17000.00	6.20	0.00	18.67	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	20.23
*	32.000	24000.00	3.22	0.00	20.04	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	23.45
*	32.000	44000.00	5.87	0.00	16.50	12.50	0.00	35563.34	8436.66	0.00	0.00	0.00	29.32

	SECNO	Q	DIFHSP	VLOB	VCH	VROB	QLOB	QCH	QROB	PERENC	STENCL	STENCR	DEPTH
*	39.100	7000.00	0.00	0.00	15.94	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	14.00
*	39.100	17000.00	6.64	0.00	19.32	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	20.65
*	39.100	24000.00	3.26	0.00	21.00	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	23.90
*	39.100	44000.00	7.49	0.00	23.60	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	31.38
	39.600	7000.00	0.00	0.00	6.48	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	16.74
	39.600	17000.00	8.03	0.00	9.16	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	24.76
	39.600	24000.00	4.18	0.00	9.83	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	28.95
	39.600	44000.00	9.15	2.73	10.98	2.77	177.75	40904.84	2917.41	0.00	0.00	0.00	38.10
		OLD BRIDGE											
	39.800	7000.00	0.00	0.00	6.55	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	16.74
	39.800	17000.00	8.03	0.00	9.29	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	24.79
	39.800	24000.00	4.17	0.00	9.98	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	28.95
	39.800	44000.00	9.32	5.57	10.89	5.64	385.24	37292.18	6322.58	0.00	0.00	0.00	38.26
*	40.250	7000.00	0.00	0.00	15.64	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	14.75
	40.250	17000.00	6.24	0.00	18.92	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	20.99
	40.250	24000.00	4.41	0.00	18.63	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	25.39
	40.250	44000.00	10.79	0.00	14.87	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	36.19
	43.600	7000.00	0.00	10.17	7.44	0.00	4328.67	2671.33	0.00	0.00	0.00	0.00	13.14
	43.600	17000.00	7.20	12.67	8.97	0.00	9532.69	7467.31	0.00	0.00	0.00	0.00	20.34
	43.600	24000.00	3.67	14.01	9.56	0.00	12985.18	11014.82	0.00	0.00	0.00	0.00	24.01
	43.600	44000.00	7.54	16.43	11.08	.83	21410.79	22586.86	2.35	0.00	0.00	0.00	31.56
*	44.500	7000.00	0.00	0.00	15.31	0.00	0.00	7000.00	0.00	0.00	0.00	0.00	12.29
*	44.500	17000.00	5.96	0.00	19.25	0.00	0.00	17000.00	0.00	0.00	0.00	0.00	18.25
*	44.500	24000.00	3.27	0.00	20.81	0.00	0.00	24000.00	0.00	0.00	0.00	0.00	21.52
*	44.500	44000.00	8.15	0.00	22.48	0.00	0.00	44000.00	0.00	0.00	0.00	0.00	29.68
	45.500	6500.00	0.00	0.00	10.46	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	13.71
	45.500	16000.00	8.21	0.00	9.53	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	21.92
	45.500	22000.00	4.24	0.00	9.60	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	26.15
	45.500	41000.00	8.67	0.00	11.32	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	34.82
	45.600	6500.00	0.00	0.00	4.51	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	14.76
	45.600	16000.00	7.46	0.00	6.76	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	22.22
	45.600	22000.00	4.07	0.00	7.51	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	26.29
	45.600	41000.00	8.81	0.00	9.34	2.86	0.00	39406.74	1593.26	0.00	0.00	0.00	35.10
		DROP STRUCTURE											
	45.900	6500.00	0.00	0.00	4.51	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	14.77
	45.900	16000.00	7.46	0.00	6.75	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	22.23
	45.900	22000.00	4.07	0.00	7.50	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	26.30
	45.900	41000.00	8.81	0.00	9.33	2.86	0.00	39403.41	1596.59	0.00	0.00	0.00	35.11
*	45.950	6500.00	0.00	0.00	11.36	2.82	0.00	6475.26	24.74	0.00	0.00	0.00	5.82
*	45.950	16000.00	3.43	0.00	14.22	5.47	0.00	14914.88	1085.12	0.00	0.00	0.00	8.44
*	45.950	22000.00	1.59	0.00	15.39	7.62	0.00	19642.09	2357.91	0.00	0.00	0.00	10.03
*	45.950	41000.00	4.05	.00	17.31	9.72	.00	32527.05	8472.95	0.00	0.00	0.00	14.13

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	QLOB	QCH	QROB	PERLNG	STENGL	STENGR	DEPTH
*	48.200	6500.00	0.00	0.01	11.04	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.44
*	48.200	16000.00	3.34	0.01	12.67	0.00	0.00	10000.00	0.00	0.00	0.00	0.00	11.77
*	48.200	22000.00	1.52	0.01	13.56	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	13.09
*	48.200	41000.00	3.19	0.01	15.38	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	16.29
*	53.300	6500.00	0.00	9.41	7.64	0.00	4961.97	1538.03	0.00	0.00	0.00	0.00	8.02
*	53.300	16000.00	2.11	13.31	11.59	0.00	11846.49	4153.51	0.00	0.00	0.00	0.00	10.13
*	53.300	22000.00	1.22	14.61	12.87	0.00	16160.02	5839.98	0.00	0.00	0.00	0.00	11.35
*	53.300	41000.00	3.24	17.43	15.44	0.01	29762.12	11237.87	0.00	0.00	0.00	0.00	14.59
*	58.100	6500.00	0.00	0.00	11.34	0.01	0.00	6500.00	0.00	0.00	0.00	0.00	7.59
*	58.100	16000.00	3.40	0.00	13.76	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	10.98
*	58.100	22000.00	1.57	0.00	14.66	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	12.55
*	58.100	41000.00	3.60	.73	16.88	.04	.22	40999.78	.00	0.00	0.00	0.00	16.15
*	61.000	6500.00	0.00	0.00	12.57	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.39
*	61.000	16000.00	2.65	0.00	11.82	11.17	0.00	10666.93	5333.07	0.00	0.00	0.00	12.04
*	61.000	22000.00	.83	0.00	13.65	12.91	0.00	14505.92	7494.08	0.00	0.00	0.00	12.87
*	61.000	41000.00	2.89	0.00	16.21	15.52	0.00	26306.17	14693.83	0.00	0.00	0.00	15.76
*	64.000	6500.00	0.00	0.00	12.40	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	8.95
*	64.000	16000.00	2.85	0.00	14.54	10.85	0.00	12915.80	3084.20	0.00	0.00	0.00	11.80
*	64.000	22000.00	1.43	0.00	15.89	12.45	0.00	17225.51	4774.48	0.00	0.00	0.00	13.23
*	64.000	41000.00	4.00	5.96	18.26	15.11	644.80	29597	10356.99	0.00	0.00	0.00	17.23
*	67.600	6500.00	0.00	0.00	11.31	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.35
*	67.600	16000.00	3.42	0.00	13.07	6.90	0.00	15263.18	736.82	0.00	0.00	0.00	12.57
*	67.600	22000.00	1.34	0.00	14.35	8.61	0.00	20397.47	1602.53	0.00	0.00	0.00	13.91
*	67.600	41000.00	3.09	2.44	17.04	11.61	6.09	35941.15	5052.80	0.00	0.00	0.00	17.00
*	76.000	6500.00	0.00	0.00	11.09	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.47
*	76.000	16000.00	3.23	3.77	14.44	0.00	33.88	15966.12	0.00	0.00	0.00	0.00	12.70
*	76.000	22000.00	1.62	5.70	15.74	0.00	195.83	21804.17	0.00	0.00	0.00	0.00	14.32
*	76.000	41000.00	4.28	9.41	18.00	0.00	1623.95	39376.05	0.00	0.00	0.00	0.00	18.60
*	81.000	6500.00	0.00	0.00	12.64	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	11.24
*	81.000	16000.00	4.01	4.13	12.18	8.91	108.72	12052.63	3838.65	0.00	0.00	0.00	15.25
*	81.000	22000.00	.45	5.58	15.65	11.55	190.90	16339.38	5469.73	0.00	0.00	0.00	15.70
*	81.000	41000.00	4.12	7.73	17.04	11.19	1180.45	26207.05	13612.50	0.00	0.00	0.00	19.81
*	85.000	6500.00	0.00	0.00	10.89	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	6.71
*	85.000	16000.00	2.95	0.00	14.26	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	9.66
*	85.000	22000.00	1.56	0.00	10.19	8.55	0.00	14402.94	7597.06	0.00	0.00	0.00	11.22
*	85.000	41000.00	1.05	0.00	15.33	14.28	0.00	26287.00	14713.00	0.00	0.00	0.00	12.23
*	90.000	6500.00	0.00	0.00	12.90	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	8.59
*	90.000	16000.00	1.62	6.08	11.32	9.95	1154.59	7535.15	7310.25	0.00	0.00	0.00	10.21
*	90.000	22000.00	.34	7.31	14.60	12.30	1703.60	10213.79	10082.61	0.00	0.00	0.00	10.55
*	90.000	41000.00	2.98	9.30	17.20	15.35	4991.59	17165.21	18843.20	0.00	0.00	0.00	13.53
*	95.000	6500.00	0.00	0.00	11.04	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	6.53
*	95.000	16000.00	3.01	0.00	14.05	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	9.55
*	95.000	22000.00	1.51	.03	11.14	8.10	.00	16001.30	5998.70	0.00	0.00	0.00	11.06
*	95.000	41000.00	1.53	3.29	15.19	12.48	57.[illegible]	28229.63	12713.06	0.00	0.00	0.00	12.59

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	QLOB	QCH	QROB	PERENC	STENCL	STENCR	DEPTH
*	100.000	6500.00	0.00	0.00	11.22	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	7.61
*	100.000	16000.00	2.43	8.33	9.63	.03	6347.98	9652.02	.00	0.00	0.00	0.00	10.01
*	100.000	22000.00	.29	10.92	12.40	1.17	8848.86	13150.18	.96	0.00	0.00	0.00	10.30
*	100.000	41000.00	2.31	13.43	15.19	4.71	17588.57	23122.09	289.39	0.00	0.00	0.00	12.61
*	105.000	6500.00	0.00	0.00	11.61	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	7.65
*	105.000	16000.00	3.51	0.00	13.93	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	11.38
*	105.000	22000.00	1.44	0.00	15.37	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	12.82
*	105.000	41000.00	3.91	0.00	18.09	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	16.73
*	110.000	6500.00	0.00	0.00	12.09	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.09
*	110.000	16000.00	3.91	4.97	15.06	4.92	224.10	15664.94	110.96	0.00	0.00	0.00	13.00
*	110.000	22000.00	1.90	6.43	16.19	6.37	773.16	20844.02	382.83	0.00	0.00	0.00	14.90
*	110.000	41000.00	4.41	9.00	18.89	8.92	3907.35	33157.95	1934.70	0.00	0.00	0.00	19.32
*	115.000	6500.00	0.00	0.00	12.13	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	8.46
*	115.000	16000.00	3.74	0.00	15.69	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	12.20
*	115.000	22000.00	1.84	0.00	17.12	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	14.09
*	115.000	41000.00	4.82	0.00	20.25	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	18.98
*	116.200	6500.00	0.00	0.00	12.75	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	8.58
*	116.200	16000.00	4.24	0.00	16.24	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	12.81
*	116.200	22000.00	2.09	0.00	17.56	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	14.91
*	116.200	41000.00	4.99	0.00	20.90	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	19.89
	116.700	6500.00	0.00	0.00	5.99	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.87
	116.700	16000.00	5.15	0.00	9.26	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	15.03
	116.700	22000.00	2.34	0.00	10.79	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	17.36
	116.700	41000.00	5.61	0.00	14.51	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	22.98
		STECKEL PARK BRIDGE											
	117.100	6500.00	0.00	0.00	6.84	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	9.81
	117.100	16000.00	5.00	0.00	10.75	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	14.81
	117.100	22000.00	2.03	0.00	13.36	0.00	0.00	22000.00	0.00	0.00	0.00	0.00	16.84
	117.100	41000.00	2.21	0.00	24.41	0.00	0.00	41000.00	0.00	0.00	0.00	0.00	19.05
*	117.600	6500.00	0.00	6.03	13.02	5.75	87.40	6350.14	62.46	0.00	0.00	0.00	6.81
	117.600	16000.00	4.88	8.41	15.07	8.01	635.07	14909.33	454.60	0.00	0.00	0.00	11.69
	117.600	22000.00	2.29	9.91	17.63	8.99	1198.18	19988.22	813.60	0.00	0.00	0.00	13.98
	117.600	41000.00	9.36	10.40	16.81	8.97	5006.22	33212.33	2781.46	0.00	0.00	0.00	23.34
	118.600	6500.00	0.00	0.00	11.93	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	5.28
	118.600	16000.00	5.46	1.49	12.96	1.21	1.52	15998.15	.33	0.00	0.00	0.00	10.74
	118.600	22000.00	2.67	3.67	13.30	2.98	79.86	21902.83	17.32	0.00	0.00	0.00	13.41
	118.600	41000.00	6.33	6.27	13.68	4.97	2160.76	38503.89	335.34	0.00	0.00	0.00	21.74
*	120.600	6500.00	0.00	0.00	11.93	0.00	0.00	6500.00	0.00	0.00	0.00	0.00	5.28
*	120.600	16000.00	5.66	0.30	15.64	0.00	0.00	16000.00	0.00	0.00	0.00	0.00	8.94
*	120.600	22000.00	2.83	2.08	17.22	1.69	2.29	21997.21	.50	0.00	0.00	0.00	10.77
*	120.600	41000.00	4.91	7.11	20.60	5.77	429.63	40477.33	93.04	0.00	0.00	0.00	15.69

Santa Paula Creek.

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  HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
  ERROR CORR -  01.02
  MODIFICATION -  50,51,52,53
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T1 SANTA PAULA CREEK BREAKOUT- SUBCRITICAL - 100 YR.
T2 VENTURA COUNTY FIS
T3 BRUCE EISENBISE, TOUPS VENTURA.

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-0	2	-0	-0	.015000	-0.00	-0.0	-0	280.000	-0.000

J2	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	-0.000	-1.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	15.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38.000	42.000	39.000	63.000	1.000	2.000	25.000	5.000	10.000	43.000
4.000	53.000	54.000	0.000	38.000	43.000	50.000	55.000	26.000	56.000
13.000	14.000	15.000	36.000	27.000	28.000	8.000	0.000	100.000	0.350

NC	.060	.060	.060	.100	.300	-0.000	-0.000	-0.000	-0.000	-0.000
DT	2.500	11900.000	19300.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	15.350	11.000	1380.000	2080.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	290.000	400.000	280.000	750.000	278.000	1470.000	278.000	1880.000	272.000	2000.000
GR	278.000	2080.000	284.000	2550.000	282.000	2520.000	284.000	3100.000	286.000	3220.000
GR	288.000	4340.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	22.350	11.000	1400.000	2300.000	460.000	700.000	700.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	288.000	288.000	-0.000
GR	296.000	1200.000	294.000	1400.000	292.000	1610.000	290.000	1800.000	292.000	1970.000
GR	292.100	1995.990	284.300	1996.000	284.000	2004.000	292.100	2004.100	294.000	2300.000
GR	296.000	2415.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
SB	.900	1.500	2.700	-0.000	8.000	-0.000	32.000	-0.000	285.000	284.000
X1	23.310	9.000	1500.000	2260.000	100.000	100.000	100.000	-0.000	-0.000	-0.000
X2	-0.000	-0.000	1.000	289.000	290.800	-0.000	-0.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	290.800	290.800	-0.000
BT	11.000	1200.000	296.000	296.000	1400.000	294.000	294.000	1610.000	292.000	292.000
BT	1800.000	290.800	290.800	1970.000	292.000	292.000	1995.900	292.100	292.100	1996.000
BT	292.100	288.000	2004.000	292.100	286.000	2004.100	292.100	292.100	2300.000	294.000
BT	294.000	2415.000	296.000	296.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	31.25	5.000	1500.000	2070.000	650.000	700.000	790.000	-0.000	-0.000	-0.000
GR	306.000	940.000	302.000	1500.000	302.000	2070.000	304.000	2700.000	307.000	3350.000

X1	79.000	9.000	1600.000	2360.000	540.000	500.000	400.000	-0.000	-0.000	-0.000
GR	330.000	1065.000	320.000	1100.000	320.000	1380.000	316.000	1600.000	314.000	2000.000
GR	316.000	2360.000	318.000	2500.000	320.000	2000.000	320.000	3650.000	-0.000	-0.000
X1	50.000	9.000	1360.000	2210.000	1100.000	1030.000	1100.000	-0.000	-0.000	-0.000
GR	346.000	1230.000	340.000	1265.000	338.000	1360.000	338.000	2210.000	340.000	2700.000
GR	338.000	2835.000	340.000	2940.000	340.000	3000.000	-0.000	-0.000	-0.000	-0.000
X1	61.300	11.000	1950.000	2050.000	1150.000	1200.000	1130.000	-0.000	-0.000	-0.000
GR	364.000	1450.000	360.000	1460.000	359.000	1500.000	360.000	1920.000	362.000	1650.000
GR	362.000	1930.000	360.000	1950.000	359.000	2000.000	360.000	2050.000	362.000	2170.000
GR	364.000	2410.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	70.300	10.000	1920.000	2120.000	930.000	900.000	900.000	-0.000	-0.000	-0.000
GR	396.000	1570.000	380.000	1670.000	377.000	1700.000	379.000	1800.000	377.000	1920.000
GR	379.000	2120.000	377.000	2370.000	378.000	2540.000	380.000	2610.000	382.000	2670.000
DT	2.000	14750.000	27050.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	80.300	16.000	1760.000	2060.000	1060.000	1030.000	1000.000	-0.000	-0.000	-0.000
X3	-0.000	397.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
GR	410.000	1100.000	403.000	1720.000	402.000	1760.000	400.000	1780.000	390.000	1820.000
GR	386.000	1830.000	384.000	1870.000	386.000	1930.000	390.000	1970.000	400.000	2000.000
GR	402.000	2010.000	398.000	2030.000	397.000	2120.000	398.000	2480.000	400.000	2560.000
GR	410.000	2630.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
EJ	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

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  HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
  ERROR CORR -  01.02
  MODIFICATION -  50.51.52.53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

BRUCE EISENBISE, TOUPS V

SUMMARY PRINTOUT
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	SECNO	ELMIN	XLOB	TELMX	CHSEL	CRIWS	AREA	10K*S	HV	Q	TOPWID	SSTA	ENDST
*	19.350	272.00	-0.00	288.00	279.63	279.63	2170.34	145.06	.75	11900.00	1322.41	864.90	2287.31
	19.350	272.00	-0.00	288.00	280.32	0.00	3178.85	149.12	.82	19000.00	1522.92	738.80	2261.73
	22.350	284.00	700.00	296.00	294.12	293.95	1668.86	373.32	.79	11900.00	919.06	1387.90	2306.96
	22.350	284.00	700.00	296.00	294.78	294.68	2223.22	383.01	1.16	19000.00	1009.60	1330.41	2340.01
	23.350	284.00	100.00	296.00	294.81	0.00	2343.69	127.69	.41	11900.00	1028.25	1318.57	2346.82
	23.350	284.00	100.00	296.00	295.62	0.00	3233.21	124.38	.57	19000.00	1156.07	1237.42	2393.49
	31.250	302.00	790.00	307.00	304.55	0.00	2785.38	119.86	.31	11900.00	1647.08	1262.34	2909.43
	31.250	302.00	790.00	307.00	305.18	0.00	3936.71	117.12	.40	19000.00	1952.05	1202.63	3154.68
*	39.000	314.00	400.00	320.00	316.97	316.97	1958.63	402.36	.94	11900.00	881.62	1546.49	2428.11
*	39.000	314.00	400.00	320.00	317.76	317.70	2235.98	341.67	1.19	19000.00	972.93	1506.31	2479.24
	50.000	338.00	1100.00	340.00	340.26	0.00	2876.20	125.17	.29	11900.00	1735.89	1264.11	3000.00
	50.000	338.00	1100.00	340.00	340.73	0.00	3785.16	134.93	.42	19000.00	1738.17	1261.83	3000.00
*	61.300	359.00	1130.00	364.00	363.26	363.26	1627.65	280.77	.95	11900.00	866.14	1455.52	2321.66
*	61.300	359.00	1130.00	364.00	363.99	363.99	2294.40	277.05	1.18	19000.00	959.26	1450.04	2409.30
	70.300	377.00	900.00	382.00	380.45	0.00	2312.45	127.73	.41	11900.00	961.23	1662.42	2623.65
	70.300	377.00	900.00	382.00	381.24	0.00	3088.14	128.67	.59	19000.00	998.18	1649.22	2647.40
	80.300	397.00	1000.00	410.00	400.10	0.00	1871.71	298.37	.97	14750.00	782.61	1778.95	2580.52
	80.300	397.00	1000.00	410.00	401.26	0.00	2741.70	295.16	1.52	27050.00	809.93	1768.03	2585.99

BRUCE EISENPISE, TOUPS V

SUMMARY PRINTOUT

	SECNO	Q	DIFWSP	VLOB	VCH	VROB	QLOB	QCH	QROB	PERENCL	STENCL	STENCR	DEPTH
*	15.350	11900.00	0.00	3.49	8.27	2.60	3981.90	7649.35	268.67	0.00	0.00	0.00	7.63
	15.350	19000.00	.69	4.47	9.21	3.34	8501.46	9794.76	703.78	0.00	0.00	0.00	8.32
	22.350	11900.00	0.00	.71	7.14	.74	.54	11899.15	.31	0.00	0.00	0.00	10.12
	22.350	19000.00	.58	2.40	8.65	2.40	58.05	18908.57	33.38	0.00	0.00	0.00	10.70
	23.350	11900.00	0.00	1.54	5.16	1.54	50.97	11819.73	29.30	0.00	0.00	0.00	10.81
	23.350	19000.00	.81	2.41	6.12	2.41	317.96	18499.23	182.81	0.00	0.00	0.00	11.62
	31.250	11900.00	0.00	3.19	5.06	3.49	963.72	7338.70	3597.58	0.00	0.00	0.00	2.55
	31.250	19000.00	.63	3.66	5.80	4.09	1731.88	10539.97	6728.15	0.00	0.00	0.00	3.18
*	39.000	11900.00	0.00	3.07	7.81	3.07	79.99	11718.20	101.81	0.00	0.00	0.00	2.97
*	39.000	19000.00	.73	4.11	8.88	4.11	328.20	18254.06	417.73	0.00	0.00	0.00	3.70
	50.000	11900.00	0.00	3.13	4.69	3.18	357.83	8780.67	2761.50	0.00	0.00	0.00	2.20
	50.000	19000.00	.52	4.12	5.61	4.08	680.09	13005.75	5314.15	0.00	0.00	0.00	2.73
*	61.300	11900.00	0.00	6.66	10.04	6.09	5884.32	3779.17	2236.51	0.00	0.00	0.00	4.26
*	61.300	19000.00	.73	7.94	11.23	6.79	9896.59	5044.96	4058.44	0.00	0.00	0.00	4.99
	70.300	11900.00	0.00	5.01	5.09	5.23	3008.38	2500.90	6390.72	0.00	0.00	0.00	3.45
	70.300	19000.00	.79	6.03	6.16	6.21	4878.43	3999.75	10121.82	0.00	0.00	0.00	4.24
	80.300	14750.00	0.00	.04	8.14	7.77	.00	4704.60	10045.39	0.00	0.00	0.00	3.10
	80.300	27050.00	1.09	3.01	10.21	9.75	21.58	8353.71	18674.71	0.00	0.00	0.00	4.20

Appendix E

Proposed HEC-RAS Results and Sections for FIS Model

HEC-RAS Plan: Ex_100_FIS River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	28000.00	534.97	552.27	552.28	558.09	0.016479	19.34	1447.45	124.96	1.00
Reach 1	1502	100 Year	28000.00	535.00	552.91	554.06	560.20	0.022906	21.66	1292.73	119.38	1.16
Reach 1	1602	100 Year	28000.00	537.97	555.99	556.33	562.34	0.018158	20.21	1385.58	118.90	1.04
Reach 1	1704	100 Year	28000.00	540.01	556.41	558.42	565.29	0.026419	23.91	1171.21	103.96	1.26
Reach 1	1905	100 Year	28000.00	543.97	561.45	562.77	570.17	0.022126	23.68	1182.41	89.07	1.15
Reach 1	2102	100 Year	28000.00	548.35	567.74	567.74	574.10	0.016045	20.23	1384.32	108.55	1.00
Reach 1	2219	100 Year	28000.00	549.97	572.36		575.45	0.005508	14.11	1984.94	108.87	0.58
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	28000.00	549.84	573.55	566.05	575.75	0.003764	11.90	2352.88	135.10	0.50
Reach 1	2365	100 Year	28000.00	551.00	573.78	567.22	576.23	0.004833	12.57	2228.24	144.30	0.56
Reach 1	2496	100 Year	28000.00	554.67	573.57	573.57	579.87	0.016540	20.13	1391.22	110.64	1.00
Reach 1	2575	100 Year	28000.00	555.00	577.06	573.74	581.04	0.008981	15.99	1750.95	123.87	0.75
Reach 1	2666	100 Year	28000.00	555.97	578.61		581.77	0.005795	14.27	1963.31	118.97	0.62
Reach 1	2728	100 Year	28000.00	556.95	579.64		582.16	0.004691	12.72	2201.14	137.39	0.56
Reach 1	2825	100 Year	28000.00	559.00	579.04	576.52	583.29	0.009006	16.55	1694.78	118.64	0.77
Reach 1	2961	100 Year	28000.00	563.51	576.40	579.30	587.17	0.034409	26.32	1063.66	98.20	1.41
Reach 1	3075	100 Year	28000.00	565.91	582.68	582.68	590.30	0.018284	22.15	1264.18	83.67	1.00

HEC-RAS Plan: ALT1_FIS River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	28000.00	534.97	552.27	552.28	558.09	0.016479	19.34	1447.45	124.96	1.00
Reach 1	1502	100 Year	28000.00	535.00	552.91	554.06	560.20	0.022906	21.66	1292.73	119.38	1.16
Reach 1	1602	100 Year	28000.00	537.97	555.99	556.33	562.34	0.018158	20.21	1385.58	118.90	1.04
Reach 1	1704	100 Year	28000.00	540.01	556.41	558.42	565.29	0.026419	23.91	1171.21	103.96	1.26
Reach 1	1905	100 Year	28000.00	543.97	561.45	562.77	570.17	0.022126	23.68	1182.41	89.07	1.15
Reach 1	2102	100 Year	28000.00	548.35	567.74	567.74	574.10	0.016045	20.23	1384.32	108.55	1.00
Reach 1	2219	100 Year	28000.00	549.97	572.36		575.45	0.005508	14.11	1984.94	108.87	0.58
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	28000.00	549.84	574.86	566.05	576.76	0.003056	11.06	2532.35	138.34	0.46
Reach 1	2365	100 Year	28000.00	551.00	575.06	567.22	577.15	0.003905	11.58	2417.84	150.93	0.51
Reach 1	2496	100 Year	28000.00	554.67	573.57	573.57	579.87	0.016540	20.13	1391.22	110.64	1.00
Reach 1	2575	100 Year	28000.00	555.00	577.07	573.74	581.04	0.008976	15.99	1751.32	123.89	0.75
Reach 1	2666	100 Year	28000.00	555.97	578.61		581.77	0.005794	14.26	1963.48	118.97	0.62
Reach 1	2728	100 Year	28000.00	556.95	579.64		582.16	0.004690	12.72	2201.29	137.39	0.56
Reach 1	2825	100 Year	28000.00	559.00	579.04	576.52	583.29	0.009004	16.55	1694.91	118.64	0.77
Reach 1	2961	100 Year	28000.00	563.51	576.40	579.30	587.17	0.034409	26.32	1063.66	98.20	1.41
Reach 1	3075	100 Year	28000.00	565.91	582.68	582.68	590.30	0.018284	22.15	1264.18	83.67	1.00

HEC-RAS Plan: ALT2_FIS River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	28000.00	534.97	552.27	552.27	558.09	0.016479	19.34	1447.45	124.96	1.00
Reach 1	1502	100 Year	28000.00	535.00	554.00	554.00	560.01	0.017014	19.66	1424.25	120.61	1.01
Reach 1	1602	100 Year	28000.00	537.97	556.34	556.34	562.33	0.016618	19.63	1426.21	119.23	1.00
Reach 1	1704	100 Year	28000.00	540.01	558.40	558.40	564.75	0.016542	20.22	1384.78	110.51	1.01
Reach 1	1905	100 Year	28000.00	543.97	562.78	562.78	569.97	0.016705	21.51	1301.87	90.59	1.00
Reach 1	2102	100 Year	28000.00	548.35	567.74	567.74	574.10	0.016045	20.23	1384.32	108.55	1.00
Reach 1	2219	100 Year	28000.00	549.97	572.36		575.45	0.005508	14.11	1984.94	108.87	0.58
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	28000.00	549.84	573.74	566.05	575.90	0.003648	11.77	2378.87	135.57	0.50
Reach 1	2365	100 Year	28000.00	551.00	573.97		576.36	0.004691	12.41	2255.37	145.48	0.56
Reach 1	2496	100 Year	28000.00	554.67	573.57	573.57	579.87	0.016540	20.13	1391.22	110.64	1.00
Reach 1	2575	100 Year	28000.00	555.00	577.06	573.74	581.04	0.008980	15.99	1750.99	123.87	0.75
Reach 1	2666	100 Year	28000.00	555.97	578.61		581.77	0.005795	14.27	1963.32	118.97	0.62
Reach 1	2728	100 Year	28000.00	556.95	579.64		582.16	0.004691	12.72	2201.14	137.39	0.56
Reach 1	2825	100 Year	28000.00	559.00	579.04		583.29	0.009006	16.55	1694.78	118.64	0.77
Reach 1	2961	100 Year	28000.00	563.51	579.30	579.30	585.93	0.016653	20.65	1356.13	103.38	1.00
Reach 1	3075	100 Year	28000.00	565.91	582.68	582.68	590.30	0.018284	22.15	1264.18	83.67	1.00

HEC-RAS Plan: Ex_100_FIS River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	28000.00	534.97	552.27	552.28	558.09	0.016479	19.34	1447.45	124.96	1.00
Reach 1	1502	100 Year	28000.00	535.00	552.91	554.06	560.20	0.022906	21.66	1292.73	119.38	1.16
Reach 1	1602	100 Year	28000.00	537.97	555.99	556.33	562.34	0.018158	20.21	1385.58	118.90	1.04
Reach 1	1704	100 Year	28000.00	540.01	556.41	558.42	565.29	0.026419	23.91	1171.21	103.96	1.26
Reach 1	1905	100 Year	28000.00	543.97	561.45	562.77	570.17	0.022126	23.68	1182.41	89.07	1.15
Reach 1	2102	100 Year	28000.00	548.35	567.74	567.74	574.10	0.016045	20.23	1384.32	108.55	1.00
Reach 1	2219	100 Year	28000.00	549.97	572.36		575.45	0.005508	14.11	1984.94	108.87	0.58
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	28000.00	549.84	573.55	566.05	575.75	0.003764	11.90	2352.88	135.10	0.50
Reach 1	2365	100 Year	28000.00	551.00	573.78	567.22	576.23	0.004833	12.57	2228.24	144.30	0.56
Reach 1	2496	100 Year	28000.00	554.67	573.57	573.57	579.87	0.016540	20.13	1391.22	110.64	1.00
Reach 1	2575	100 Year	28000.00	555.00	577.06	573.74	581.04	0.008981	15.99	1750.95	123.87	0.75
Reach 1	2666	100 Year	28000.00	555.97	578.61		581.77	0.005795	14.27	1963.31	118.97	0.62
Reach 1	2728	100 Year	28000.00	556.95	579.64		582.16	0.004691	12.72	2201.14	137.39	0.56
Reach 1	2825	100 Year	28000.00	559.00	579.04	576.52	583.29	0.009006	16.55	1694.78	118.64	0.77
Reach 1	2961	100 Year	28000.00	563.51	576.40	579.30	587.17	0.034409	26.32	1063.66	98.20	1.41
Reach 1	3075	100 Year	28000.00	565.91	582.68	582.68	590.30	0.018284	22.15	1264.18	83.67	1.00

HEC-RAS Plan: Existing River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	39000.00	534.97	555.20	555.23	562.35	0.015938	21.44	1819.16	128.40	1.00
Reach 1	1502	100 Year	39000.00	535.00	555.53	557.08	564.65	0.022734	24.23	1609.58	122.35	1.18
Reach 1	1602	100 Year	39000.00	537.97	557.61	559.33	567.09	0.023659	24.71	1578.37	120.45	1.20
Reach 1	1704	100 Year	39000.00	540.01	558.71	561.73	570.44	0.029810	27.47	1419.62	111.05	1.35
Reach 1	1905	100 Year	39000.00	543.97	566.10	566.48	575.23	0.017580	24.24	1609.10	94.45	1.04
Reach 1	2102	100 Year	39000.00	548.35	571.28	571.28	578.66	0.015441	21.79	1789.64	120.90	1.00
Reach 1	2219	100 Year	39000.00	549.97	575.92		580.08	0.006377	16.38	2381.34	114.44	0.63
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	39000.00	549.84	577.72	569.31	580.46	0.003950	13.27	2938.39	147.32	0.52
Reach 1	2365	100 Year	39000.00	551.00	578.05	570.75	580.89	0.004644	13.51	2886.41	162.41	0.57
Reach 1	2496	100 Year	39000.00	554.67	577.07	577.07	584.35	0.015942	21.66	1800.75	123.99	1.00
Reach 1	2575	100 Year	39000.00	555.00	580.96	577.58	585.53	0.008805	17.16	2273.38	144.17	0.76
Reach 1	2666	100 Year	39000.00	555.97	582.03		586.23	0.006022	16.45	2384.54	133.68	0.65
Reach 1	2728	100 Year	39000.00	556.95	583.65		586.67	0.004614	13.98	2834.55	195.55	0.57
Reach 1	2825	100 Year	39000.00	559.00	582.75	579.75	587.91	0.008577	18.24	2147.43	125.68	0.77
Reach 1	2961	100 Year	39000.00	563.51	578.84	582.76	592.65	0.036109	29.80	1308.55	102.52	1.47
Reach 1	3075	100 Year	39000.00	565.91	586.77	586.77	595.84	0.016784	24.17	1620.19	94.19	0.99

HEC-RAS Plan: Alt 1 River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	39000.00	534.97	555.20	555.23	562.35	0.015938	21.44	1819.16	128.40	1.00
Reach 1	1502	100 Year	39000.00	535.00	555.53	557.08	564.65	0.022734	24.23	1609.58	122.35	1.18
Reach 1	1602	100 Year	39000.00	537.97	557.61	559.33	567.09	0.023659	24.71	1578.37	120.45	1.20
Reach 1	1704	100 Year	39000.00	540.01	558.71	561.73	570.44	0.029810	27.47	1419.62	111.05	1.35
Reach 1	1905	100 Year	39000.00	543.97	566.10	566.48	575.23	0.017580	24.24	1609.10	94.45	1.04
Reach 1	2102	100 Year	39000.00	548.35	571.28	571.28	578.66	0.015441	21.79	1789.64	120.90	1.00
Reach 1	2219	100 Year	39000.00	549.97	575.92		580.08	0.006377	16.38	2381.34	114.44	0.63
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	39000.00	549.84	579.18	569.31	581.55	0.003273	12.35	3157.49	153.08	0.48
Reach 1	2365	100 Year	39000.00	551.00	579.47	570.75	581.90	0.003748	12.50	3119.64	167.72	0.51
Reach 1	2496	100 Year	39000.00	554.67	577.04	577.04	584.36	0.016025	21.70	1797.20	123.87	1.00
Reach 1	2575	100 Year	39000.00	555.00	580.97	577.58	585.54	0.008791	17.15	2274.91	144.24	0.76
Reach 1	2666	100 Year	39000.00	555.97	582.03		586.23	0.006016	16.44	2385.25	133.74	0.65
Reach 1	2728	100 Year	39000.00	556.95	583.66		586.68	0.004611	13.97	2835.40	195.63	0.57
Reach 1	2825	100 Year	39000.00	559.00	582.75	579.75	587.91	0.008570	18.24	2148.03	125.69	0.77
Reach 1	2961	100 Year	39000.00	563.51	578.84	582.76	592.65	0.036109	29.80	1308.55	102.52	1.47
Reach 1	3075	100 Year	39000.00	565.91	586.77	586.77	595.84	0.016784	24.17	1620.19	94.19	0.99

HEC-RAS Plan: Alt 2 River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	39000.00	534.97	555.20	555.23	562.35	0.015938	21.44	1819.16	128.40	1.00
Reach 1	1502	100 Year	39000.00	535.00	555.53	557.08	564.65	0.022734	24.23	1609.58	122.35	1.18
Reach 1	1602	100 Year	39000.00	537.97	557.61	559.33	567.09	0.023659	24.71	1578.37	120.45	1.20
Reach 1	1704	100 Year	39000.00	540.01	558.71	561.73	570.44	0.029810	27.47	1419.62	111.05	1.35
Reach 1	1905	100 Year	39000.00	543.97	566.10	566.48	575.23	0.017580	24.24	1609.10	94.45	1.04
Reach 1	2102	100 Year	39000.00	548.35	571.28	571.28	578.66	0.015441	21.79	1789.64	120.90	1.00
Reach 1	2219	100 Year	39000.00	549.97	575.92		580.08	0.006377	16.38	2381.34	114.44	0.63
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	39000.00	549.84	577.94	569.31	580.62	0.003837	13.12	2971.65	148.27	0.52
Reach 1	2365	100 Year	39000.00	551.00	578.27	570.75	581.04	0.004489	13.35	2921.88	163.18	0.56
Reach 1	2496	100 Year	39000.00	554.67	577.07	577.07	584.35	0.015942	21.66	1800.75	123.99	1.00
Reach 1	2575	100 Year	39000.00	555.00	580.96	577.58	585.53	0.008806	17.16	2273.37	144.16	0.76
Reach 1	2666	100 Year	39000.00	555.97	582.03		586.23	0.006022	16.45	2384.53	133.68	0.65
Reach 1	2728	100 Year	39000.00	556.95	583.65		586.67	0.004614	13.98	2834.54	195.54	0.57
Reach 1	2825	100 Year	39000.00	559.00	582.75	579.75	587.91	0.008577	18.24	2147.42	125.68	0.77
Reach 1	2961	100 Year	39000.00	563.51	578.84	582.76	592.65	0.036109	29.80	1308.55	102.52	1.47
Reach 1	3075	100 Year	39000.00	565.91	586.77	586.77	595.84	0.016784	24.17	1620.19	94.19	0.99

HEC-RAS Plan: Alt 3 River: River 1 Reach: Reach 1 Profile: 100 Year

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)	
Reach 1	1403	100 Year	39000.00	534.97	555.20	555.23	562.35	0.015938	21.44	1819.16	128.40	1.00
Reach 1	1502	100 Year	39000.00	535.00	555.53	557.08	564.65	0.022734	24.23	1609.58	122.35	1.18
Reach 1	1602	100 Year	39000.00	537.97	557.61	559.33	567.09	0.023659	24.71	1578.37	120.45	1.20
Reach 1	1704	100 Year	39000.00	540.01	558.71	561.73	570.44	0.029810	27.47	1419.62	111.05	1.35
Reach 1	1905	100 Year	39000.00	543.97	566.10	566.48	575.23	0.017580	24.24	1609.10	94.45	1.04
Reach 1	2102	100 Year	39000.00	548.35	571.28	571.28	578.66	0.015441	21.79	1789.64	120.90	1.00
Reach 1	2219	100 Year	39000.00	549.97	575.92		580.08	0.006377	16.38	2381.34	114.44	0.63
Reach 1	2250		Bridge									
Reach 1	2270	100 Year	39000.00	549.84	577.72	569.31	580.46	0.003950	13.27	2938.39	147.32	0.52
Reach 1	2365	100 Year	39000.00	551.00	578.05	570.75	580.89	0.004644	13.51	2886.41	162.41	0.57
Reach 1	2496	100 Year	39000.00	554.67	577.07	577.07	584.35	0.015942	21.66	1800.75	123.99	1.00
Reach 1	2575	100 Year	39000.00	555.00	580.96	577.58	585.53	0.008805	17.16	2273.38	144.17	0.76
Reach 1	2666	100 Year	39000.00	555.97	582.03		586.23	0.006022	16.45	2384.54	133.68	0.65
Reach 1	2728	100 Year	39000.00	556.95	583.65		586.67	0.004614	13.98	2834.55	195.55	0.57
Reach 1	2825	100 Year	39000.00	559.00	582.75	579.75	587.91	0.008577	18.24	2147.43	125.68	0.77
Reach 1	2961	100 Year	39000.00	563.51	578.84	582.76	592.65	0.036109	29.80	1308.55	102.52	1.47
Reach 1	3075	100 Year	39000.00	565.91	586.77	586.77	595.84	0.016784	24.17	1620.19	94.19	0.99

150’ 75’ 0 150’

GRAPHIC SCALE

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FIGURE 1 - BRIDGE ROAD BRIDGE
HYDRAULICS STUDY
3 JUNE 2019

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150' 75' 0 150'

GRAPHIC SCALE

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FIGURE 2 - BRIDGE ROAD BRIDGE HYDRAULICS STUDY
FIS MODEL Q = 28,000 CFS

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150' 75' 0 150'

GRAPHIC SCALE

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FIGURE 3 - BRIDGE ROAD BRIDGE HYDRAULICS STUDY

DESIGN MODEL Q = 39,400 CFS

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