CLOMR TO LOMR SUPPLEMENTAL DATA

FOR

INDIAN BEND WASH CHANNELIZATION
40TH STREET TO HEARN ROAD

FEMA CASE NO. 98-09-484R

SUBMITTED BY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 WEST DURANGO STREET
PHOENIX, ARIZONA 85009

(602) 506-1501

APRIL 11, 2000

Federal Emergency Management Agency

Washington, D.C. 20472

Property of
Flood Control District of MC Library
Please Return to
2801 W. Durango
Phoenix, AZ 85009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 00-09-617P

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

Community: City of Phoenix, AZ
Community No.: 040051
Panels Affected: 04013C1660 F and 1680 F
Effective Date of This Revision: AUG 22 2000

102-D-A

Dear Mayor Rimsza:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas (the effective FIRM and FIS report for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated April 11, 2000, Mr. Michael W. Duncan, P.E., Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM and FIS report to show the effects of channelization along Indian Bend Wash from 40th Street to Hearn Road, installation of reinforced-concrete arch culverts under State Route 51 and Thunderbird Road and a reinforced-concrete box culvert (RCB) at 36th Street, and modifications to the existing RCBs at Sweetwater Road. This request follows up on a Conditional Letter of Map Revision issued on June 8, 1998.

All data required to complete our review of this request were submitted with letters from Ms. Cindy D. White, P.E., Floodplain Manager, City of Phoenix, and Mr. Duncan.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and FIS report. We have revised the FIRM and FIS report to modify the elevations and floodway boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Indian Bend Wash from 40th Street to approximately 400 feet upstream of Hearn Road. As a result of the modifications, the Base Flood Elevations (BFEs) for Indian Bend Wash and the widths of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, and the regulatory floodway decreased. The base flood is contained in the channel from 40th Street to Hearn Road. The modifications are shown on the enclosed annotated copies of FIRM Panels 04013C1660 F and 04013C1680 F; Profile Panels 216P(a), 217P, and 218P; and affected portions of the Floodway Data Table. Profile Panel 216P was removed from the FIS report as a result of the modifications. This Letter of Map Revision (LOMR) hereby revises the above-referenced panels of the effective FIRM and the affected portions of the FIS report, both dated September 30, 1995.

The modifications are effective as of the date shown above. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

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Phoenix, AZ 85009

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)*	Modified BFE (feet)*
Approximately 1,100 feet upstream of 40th Street	1,392	1,389
Approximately 150 feet upstream of Sweetwater Avenue	1,398	1,397
Approximately 400 feet upstream of State Route 51	1,412	1,406

*Referenced to the National Geodetic Vertical Datum, rounded to the nearest whole foot

Public notification of the modified BFEs will be given in the *Arizona Republic* on or about September 14 and September 21, 2000. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Arizona Republic*, a citizen may request that FEMA reconsider the determination made by this LOMR. Any request for reconsideration must be based on scientific or technical data. All interested parties are on notice that, until the 90-day period elapses, the determination to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local
newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We are processing a revised FIRM and FIS report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the revised FIRM and FIS report were submitted to your community for review on December 23, 1997, and May 29, 1998. Please note that updated road base information for your community has been incorporated into the revised Preliminary FIRM. For display purposes, this updated information is shown on the enclosed annotated copies of FIRM Panels 04013C1660 F and 04013C1680 F. We will incorporate the modifications made by this LOMR into the revised FIRM and FIS report before they become effective.

The floodway is provided to your community as a tool to regulate floodplain development. Therefore, the floodway modifications described in this LOMR, while acceptable to FEMA, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culverts rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

FEMA makes flood insurance available in participating communities; in addition, we encourage communities to develop their own loss reduction and prevention programs. Through the *Project Impact: Building Disaster Resistant Communities* initiative, launched by FEMA Director James Lee Witt in 1997, we seek to focus the energy of businesses, citizens, and communities in the United States on the importance of reducing their susceptibility to the impact of all natural disasters, including floods, hurricanes, severe storms, earthquakes, and wildfires. Natural hazard mitigation is most effective when it is planned for and implemented at the local level, by the entities who are most knowledgeable of local conditions and whose economic stability and safety are at stake. For your information, we are enclosing a copy of a pamphlet describing this nationwide initiative. For additional information on *Project Impact*, please visit our Web site at **www.fema.gov/impact**.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Chief, Community Mitigation Programs Branch, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7184. If you have any questions regarding this LOMR, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: Mr. Ray Dovalina, P.E.
Floodplain Manager
City of Phoenix

Mr. Michael W. Duncan, P.E.
Engineering Division
Flood Control District of Maricopa County

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE CITY OF PHOENIX, MARICOPA COUNTY, ARIZONA, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On September 30, 1995, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the City of Phoenix, Maricopa County, Arizona, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified base flood elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate channelization along Indian Bend Wash from 40th Street to Hearn Road, installation of reinforced-concrete arch culverts under State Route 51 and Thunderbird Road and a reinforced-concrete box culvert (RCB) at 36th Street, and modifications to the existing RCBs at Sweetwater Road. This analysis has resulted in a revised delineation of the regulatory floodway, a decrease in SFHA width, and decreased BFEs for Indian Bend Wash from 40th Street to approximately 400 feet upstream of Hearn Road. The aforementioned channelized portion of Indian Bend Wash contains the base flood. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
Approximately 1,100 feet upstream of 40th Street	1,392	1,389
Approximately 150 feet upstream of Sweetwater Avenue	1,398	1,397
Approximately 400 feet upstream of State Route 51	1,412	1,406

*National Geodetic Vertical Datum, rounded to nearest whole foot

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Directorate reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Directorate's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

National Flood Insurance Program
NFIP
Administered by FEMA

Need Information on Flood Hazard Maps?

A wealth of information is only a click away at: **www.fema.gov/mit/tsd**

Homeowners will find:

- A helpful tutorial: "How to Challenge a Flood Risk Determination"
- Answers to Frequently Asked Questions, including, "Why do I need flood insurance?" "What are the different flood hazard zone designations and what do they mean?" and "What is a base flood elevation?

Insurance Agents and Bankers will find:

- Information on the National Flood Insurance Reform Act of 1994, which affects lenders
- Pages containing information on how to become a "Write Your Own" insurance agent
- Pages containing flood insurance rate information and a listing of map determination companies

Engineers and Surveyors will find:

- A listing of National Flood Insurance Program (NFIP) approved and test version software with links to free downloads
- Forms and fee schedules for requesting a map change or back-up study data
- A link to a listing of training courses and conferences related to emergency management

Floodplain Managers and Community Officials will find:

- The compendium of map change actions and the Guide for Community Officials
- A listing of key contacts at FEMA with direct e-mail links
- Forms necessary to initiate requests for back-up study data

All Four Constituent groups will find:

FEMA MAP ASSISTANCE CENTER
FMAC
1-877-FEMA MAP

- NFIP policies and regulations
- Forms for making map change requests
- The answers to over 80 Frequently Asked Questions
- Access to a database containing the status of recent requests for map changes
- Numerous reports and guidance documents in both Adobe Acrobat .PDF and MS Word formats
- Information on Map Modernization initiatives with direct e-mail links to FEMA Task Leaders
- A subscription service providing free news on the latest developments in flood hazard mapping via e-mail
- E-mail links to Map Specialists at the FEMA Map Assistance Center (1-877-FEMA MAP)

Questions and suggestions? Contact John Magnotti at 202-646-3932, or john.magnotti@fema.gov

Want to talk to a Map Specialist about Flood Hazard Mapping?

If your home or business is located in the floodplain, you will need to purchase and maintain flood insurance. If you have a mortgage, your bank will require it.

FEMA MAP ASSISTANCE CENTER

FMAC

1-877-FEMA MAP

For all your flood hazard map questions, call toll-free:

1-877-FEMA MAP (1-877-336-2627)

or visit our Web Site at www.fema.gov/mit/tsd

FEMA's flood hazard maps— also called Flood Insurance Rate Maps or FIRMs— are used to determine your property's flood risk. Increasing development, severe weather events, and other activities in the floodplain will change the flood risks shown on the maps. FEMA is working hard to update and modernize all of the flood hazard maps. However, with more than 18,000 communities participating in the National Flood Insurance Program (NFIP), this will take time. Meanwhile, the FEMA Map Assistance Center (FMAC) has a staff of trained professionals ready to help

Typical flood hazard map questions we answer:

Property Owner: "My home has never flooded. Why do I need flood insurance?"

Real Estate Agent: "I think the previous owner had an exemption from flood insurance— is there a record of this exemption?"

Developers and Engineers: "What is the status of my request for a map change? How long will it take?"

Community Officials: "How do I request a physical revision to a flood map?"

Lenders: "How can we help our customers whose homes are located in a flood zone?"

Other important National Flood Insurance Program toll-free numbers:

- To purchase flood hazard maps for a nominal fee... **1-800-358-9616**
- For general flood insurance information... **1-800-427-4661**
- To order any current FEMA publication... **1-800-480-2520**
- For lender questions on flood policy coverage and rates... **1-800-611-6125**
- For agent questions on policy coverage and rates... **1-800-720-1093**

National Flood Insurance Program
NFIP
Administered by FEMA

Federal Emergency Management Agency

Office of Emergency Information and Media Affairs, Washington, D.C. 20472 (202) 646-4600

FACT SHEET

PROJECT IMPACT
Building a Disaster Resistant Community

BACKGROUND

PROJECT IMPACT is an initiative developed by FEMA Director James Lee Witt to challenge the country to undertake actions that protect families, businesses and communities by reducing the effects of natural disasters. This initiative includes a national awareness campaign, the selection of pilot communities that demonstrate the benefits of hazard mitigation through a partnership approach, and an outreach effort to businesses and communities using a new guidebook that offers a formula for a community or business to follow to become disaster resistant.

RATIONALE

The increasing number and severity of natural disasters the past decade demands that action be taken to reduce the threat that hurricanes, severe storms, earthquakes, floods and wildfires impose upon the economic stability, economic future and safety of the citizens of the U.S. As the federal agency responsible for emergency management, FEMA is committed to reducing disaster losses by focusing the energy of businesses, citizens, and communities in the U.S. on the importance of reducing their susceptibility to the impact of natural disasters.

There are three primary tenets of the PROJECT IMPACT initiative:

- *Mitigation is a local issue.* It is best addressed by a local partnership that involves government, businesses and private citizens.

- *Private sector participation is essential.* Disasters threaten the economic and commercial growth of our cities, towns, villages and counties. Without the participation of the private sector, comprehensive solutions will not be developed.

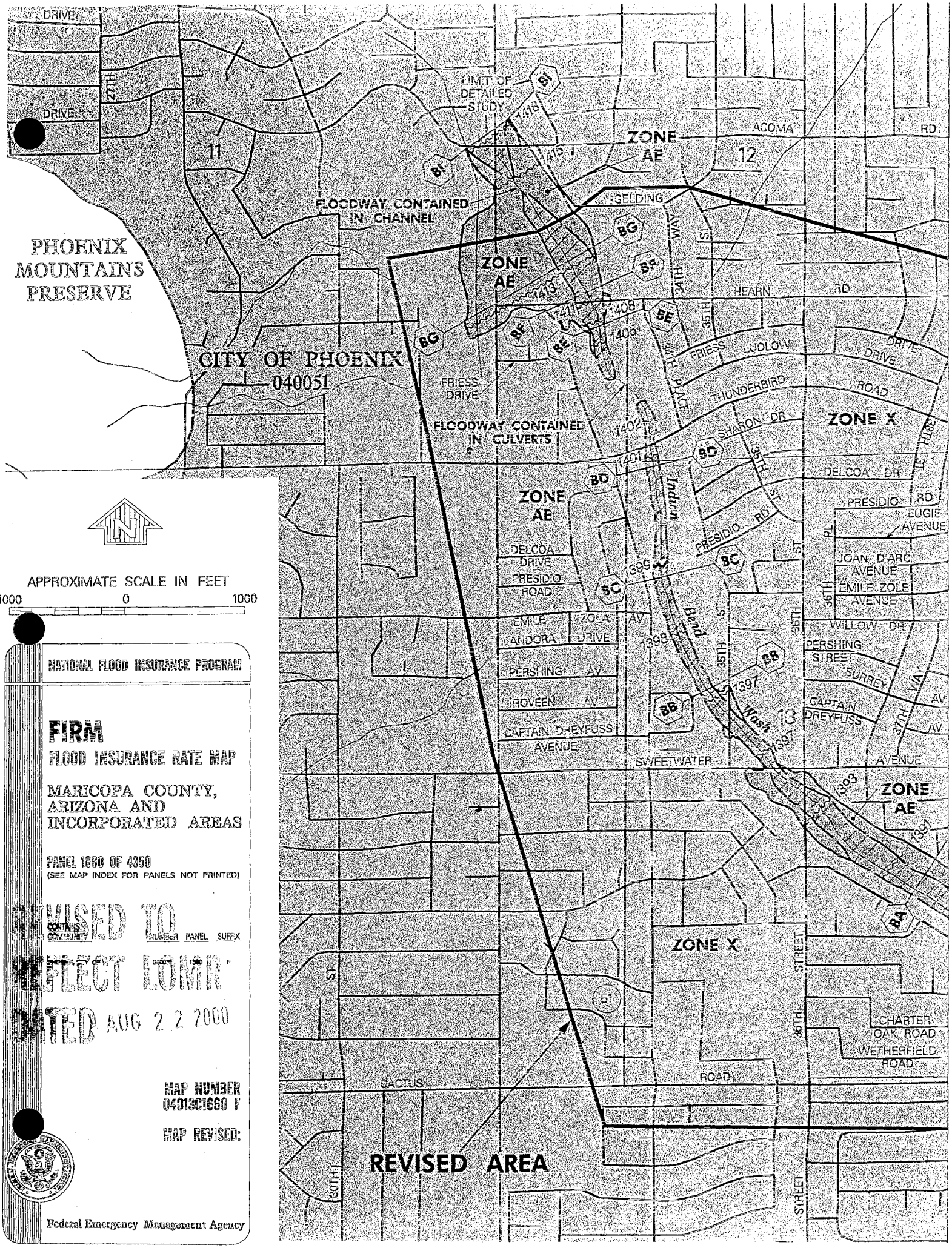
- *Mitigation is a long-term effort that requires long-term investment.* Disaster losses will not be eliminated overnight.

PILOT COMMUNITIES

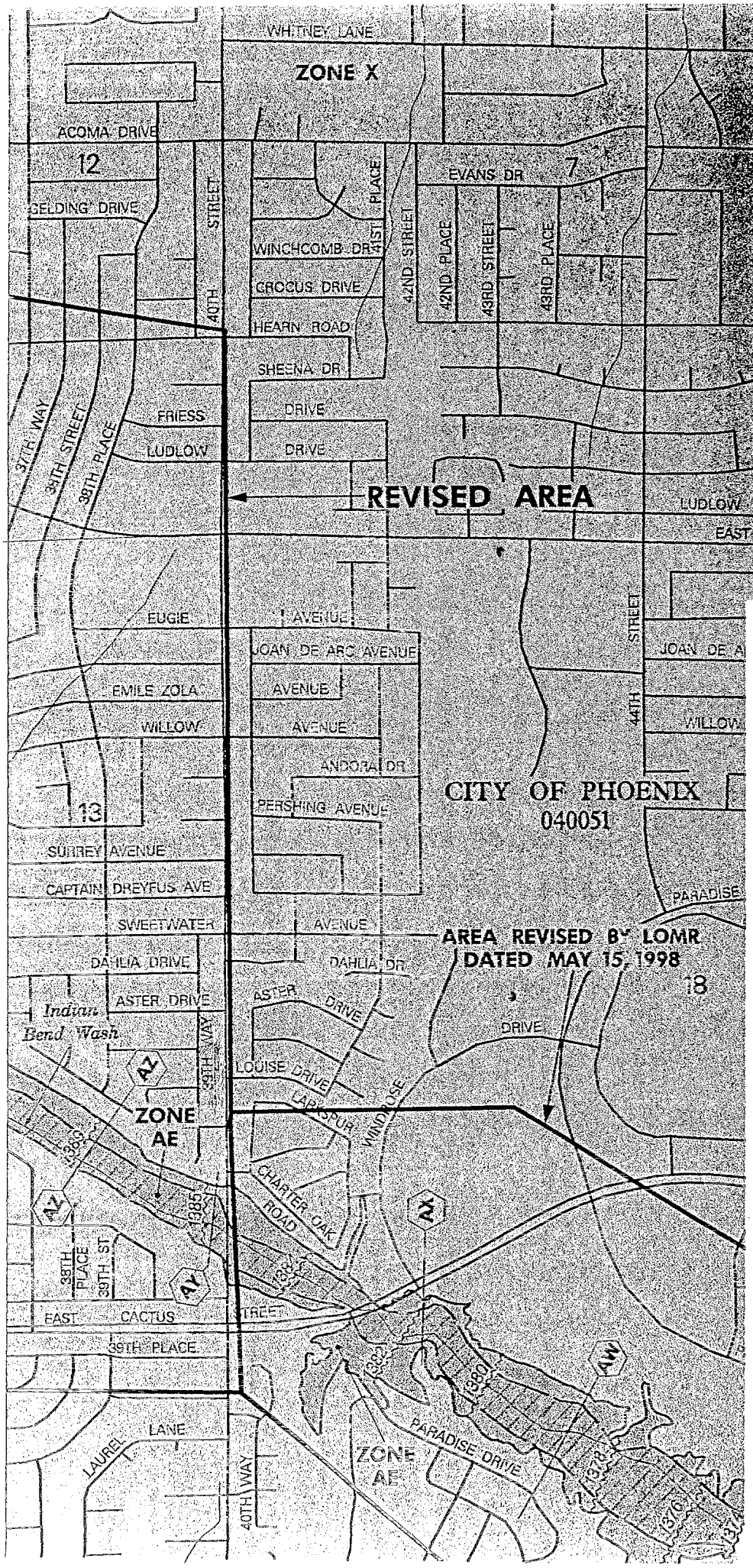
Director Witt and FEMA have worked closely with seven communities throughout the U.S. to develop a PROJECT IMPACT plan that localities, businesses and citizens can follow to build disaster resistant communities where they live and work. Director Witt will participate in events in each of these communities to congratulate them on their foresight, commitment, and contribution to a disaster resistant nation.

PROJECT IMPACT GUIDEBOOK

The guidebook presents that steps a community can take to become disaster resistant. It also provides examples of the actions and resources available to accomplish this goal.


PHOENIX MOUNTAINS PRESERVE
CITY OF PHOENIX
040051
FLOODWAY CONTAINED IN CHANNEL
FLOODWAY CONTAINED IN CULVERTS
LIMIT OF DETAILED STUDY
ZONE AE
ZONE X
REVISED AREA
JOINS PANEL 1680
APPROXIMATE SCALE IN FEET
1000 0 1000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS
PANEL 1660 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)
REVISED TO REFLECT LOMR EFFECTIVE DATE AUG 2 2 2000
MAP NUMBER 04013C1660 F
MAP REVISED:
Federal Emergency Management Agency

JOINS PANEL 1660



APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 1660 OF 4350

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
PARADISE VALLEY, TOWN OF	040040	1660	F
PHOENIX, CITY OF	040051	1660	F
SCOTTSDALE, CITY OF	045012	1660	F

REVISED TO REFLECT LOMR DATED AUG 2 2 2000

MAP NUMBER
04013C1660 F

MAP REVISED:

Federal Emergency Management Agency

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Indian Bend Wash (continued)								
AY	76,000[3]	430	2,042	2.9	1,384.8	1,384.8	1,385.8	1.0
AZ	76,900[3]	215	942	6.4	1,388.6	1,388.6	1,388.6	0.0
BA	77,800[3]	200	1,045	5.7	1,390.7	1,390.7	1,390.7	0.0
BB	80,311[3]	109	586	4.1	1,397.1	1,397.1	1,397.1	0.0
BC	81,433[3]	98	443	5.4	1,398.8	1,398.8	1,398.8	0.0
BD	82,335[3]	90	411	5.8	1,401.0	1,401.0	1,401.0	0.0
BE	83,625[3]	90	500	4.8	1,405.8	1,405.8	1,405.9	0.1
BF	83,936[3]	140	290	8.3	1,410.6	1,410.6	1,410.9	0.3
BG	84,276[3]	140	415	5.8	1,412.7	1,412.7	1,413.5	0.8
BH	1.973[1]	--[2]	538	4.5	1,414.8	1,414.8	1,415.2	0.4
BI	2.060[1]	404	509	4.7	1,418.0	1,418.0	1,418.0	0.0

REVISED DATA

[1] Miles above Cactus Road [2] Coincident with Channel Banks
[3] Feet Above Confluence with Salt River Along Profile Baseline

REVISED TO REFLECT LOMR DATED AUG 2 2 2000

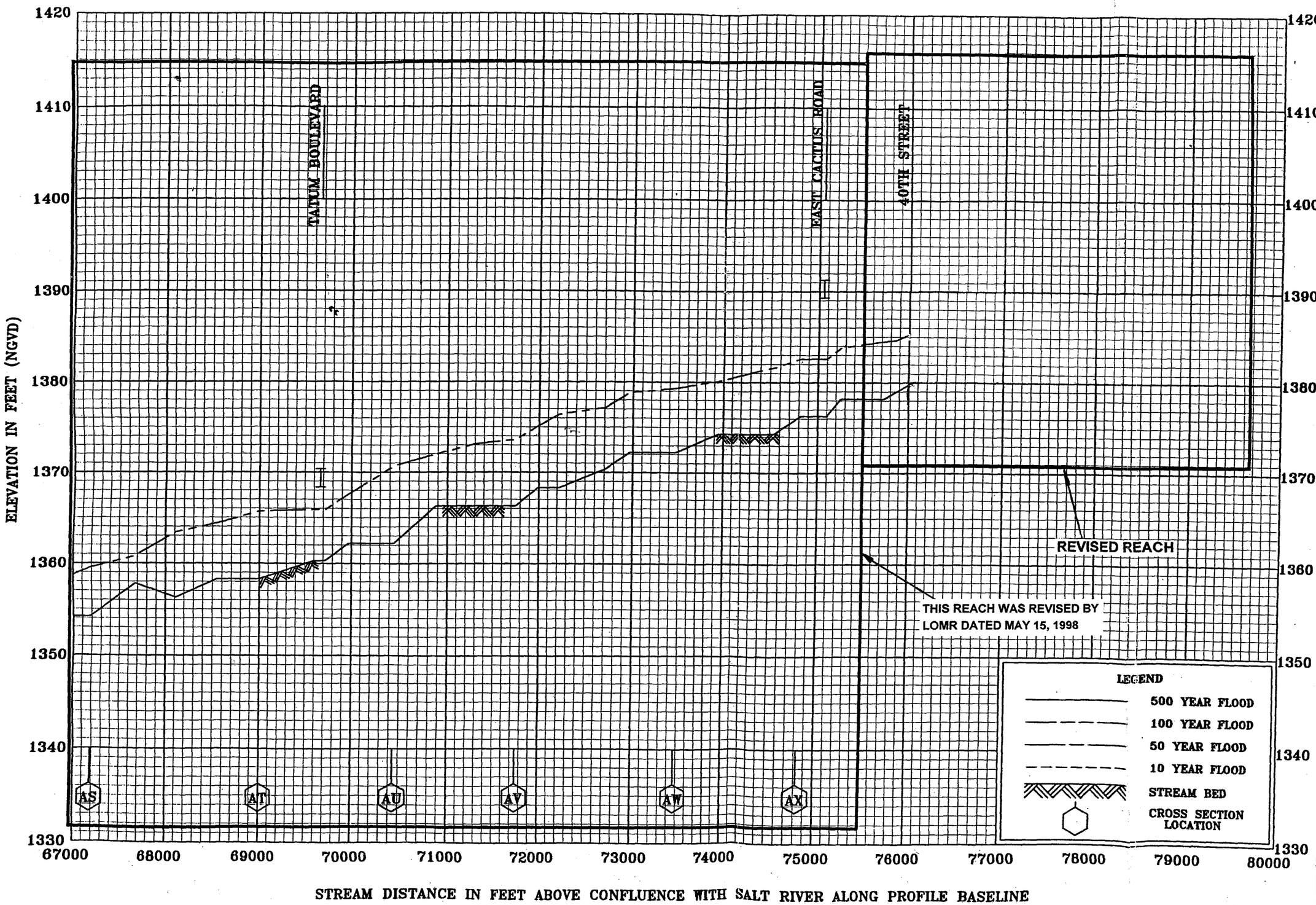
TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

INDIAN BEND WASH



REVISED TO REFLECT LOMR DATED AUG 2 2 2010

FLOOD PROFILES

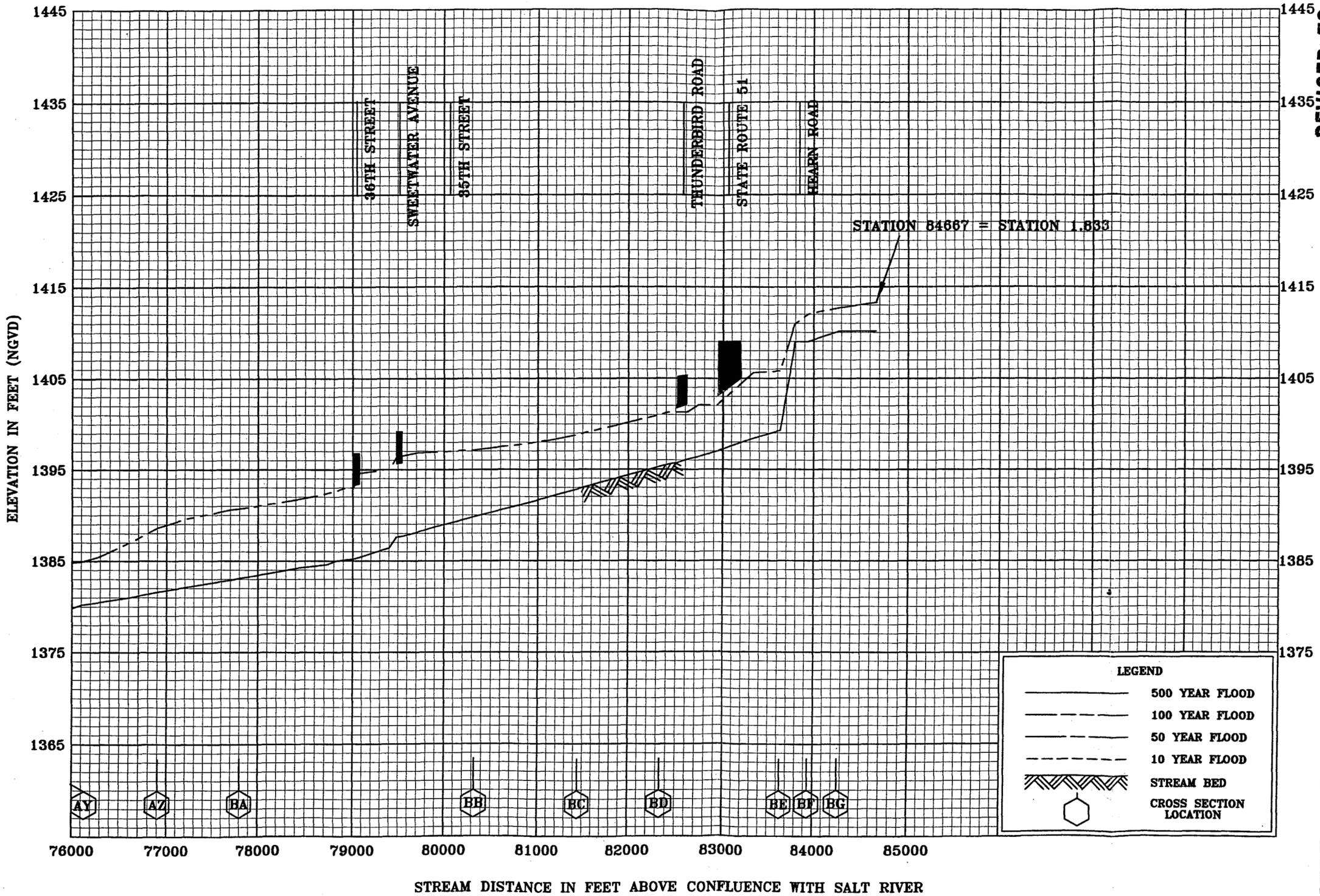
INDIAN BEND WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

216PA



REVISED TO REFLECT LOMR DATED AUG 2 2 2000

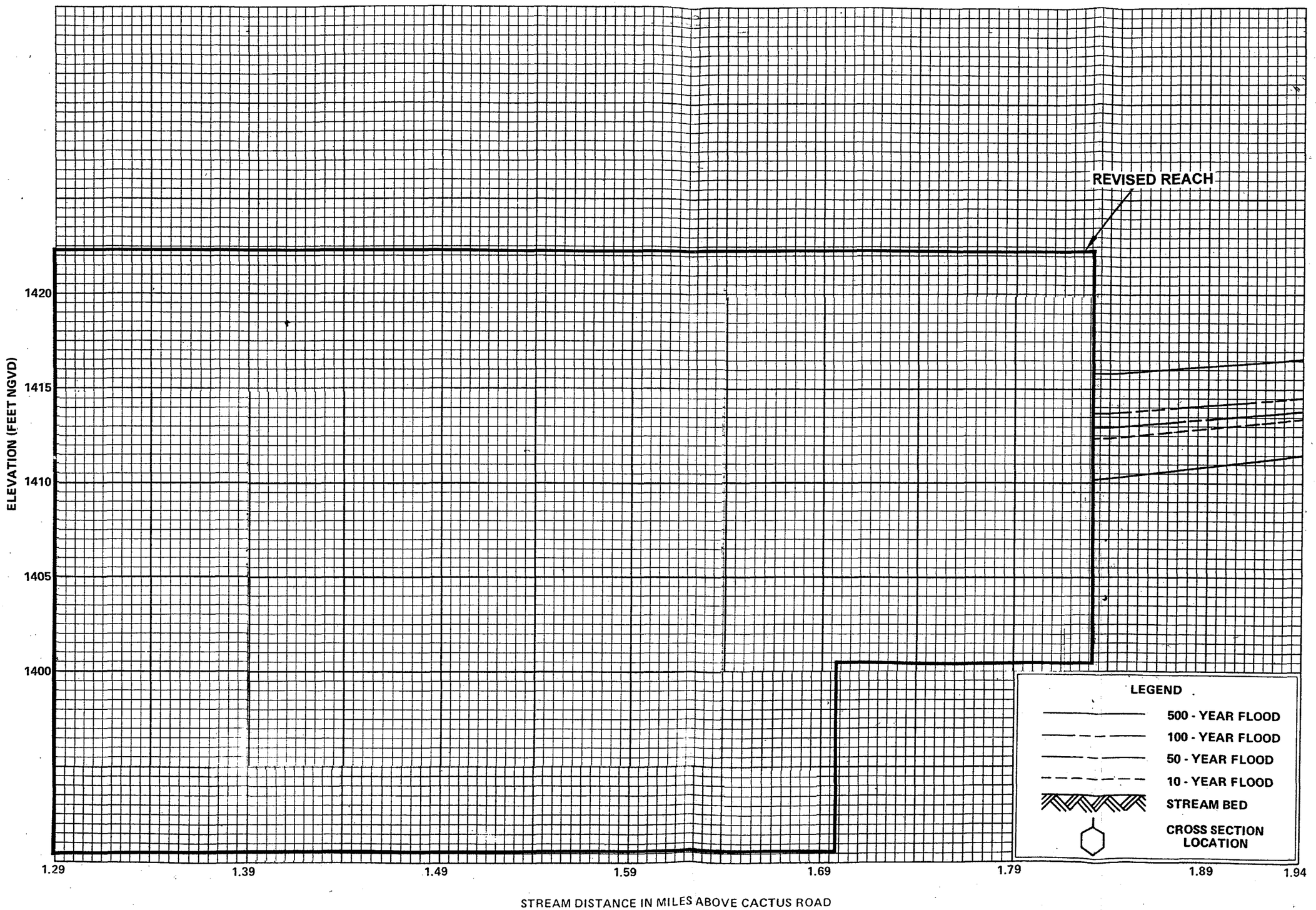
FLOOD PROFILES

INDIAN BEND WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS



REVISED TO REFLECT LOMR DATED AUG 2 2 2000

FLOOD PROFILES

INDIAN BEND WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

Federal Emergency Management Agency

Washington, D.C. 20472

May 23, 2000

Mr. Michael W. Duncan, P.E.
Engineering Division
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

IN REPLY REFER TO:
Case No.: 00-09-617P
Community: City of Phoenix, AZ
Community No.: 040051

316-ACK.FRQ

Dear Mr. Duncan:

This responds to your letter dated May 2, 2000, concerning an April 11, 2000, request that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Indian Bend Wash Channelization from 40th Street to Hearn Road
Flooding Source:	Indian Bend Wash
FIRM Panel(s) Affected:	04013C1660 F and 1680 F

We have completed an inventory of the items that you submitted. We have received the data and the review and processing fee ($3,400) required to begin a detailed technical review of your request. If additional data are required, we will inform you within 30 days of the date of this letter.

Please direct all questions concerning your request to our Mapping Coordination Contractor at the following address:

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Attention: Ms. Pernille Buch-Pedersen
Telephone: (703) 317-6224
Fax: (703) 960-9125

When you write us about your request, you must include the case number referenced above in your letter.

FLOOD CONTROL DISTRICT
RECEIVED
MAY 30, 00

CH & GM	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
ENG	FILE
CONTRACTS	
ROUTING	MWD

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

cc: Mr. Ray Dovalina, P.E.
Floodplain Manager
City of Phoenix

Federal Emergency Management Agency

Washington, D.C. 20472

April 28, 2000

Mr. Michael W. Duncan, P.E.
Engineering Division
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

IN REPLY REFER TO:
Case No.: 00-09-617P
Community: City of Phoenix, AZ
Community No.: 040051

316-FEE

Dear Mr. Duncan:

This responds to your request dated April 11, 2000, that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Indian Bend Wash Channelization form 40th Street to Hearn Road
Flooding Source:	Indian Bend Wash
FIRM Panel(s) Affected:	04013C1660 F and 1680 F

To minimize the financial burden on the policyholders while maintaining the National Flood Insurance Program (NFIP) as self-sustaining, FEMA implemented a procedure to recover costs associated with reviewing and processing requests for modifications to published flood information and maps. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register*, is enclosed for your information. In accordance with this schedule, the fee for your request is $3,400 and must be submitted before we can begin processing your request. Payment of this fee must be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or credit card payment. For identification purposes, the case number referenced above must be included on the check or money order.

If you choose to forward your payment using the U.S. Postal Service, please send it to the following address:

Federal Emergency Management Agency
Fee-Collection System Administrator
P.O. Box 3173
Merrifield, VA 22116-3173

If you choose to forward your payment using an overnight service, please send it to the following address:

Fee-Collection System Administrator
c/o Dewberry & Davis, METS Division
8401 Arlington Boulevard
Fairfax, VA 22031

Upon receipt of the requested payment, we will begin our technical review of your request. When you write

FLOOD CONTROL DISTRICT
RECEIVED
MAY 01 '00
CH & GM | FINANCE
PIO | LANDS
ADMIN | O & M
REC | P & PM
ENG | FILE
CONTRACTS
ROUTING MWD

to us about your request, please include the case number referenced above in your letter. Unless otherwise directed by you in writing, we will keep the submitted data in our files.

If you have any questions concerning the processing of your request, please contact our Mapping Coordination Contractor at the following address: Michael Baker Jr., Inc., 3601 Eisenhower Avenue, Suite 600, Alexandria, Virginia 22304. The Revisions Coordinator for your state, Ms. Pernille Buch-Pedersen, may be reached at (703) 317-6224. If you have any questions regarding FEMA policy or the NFIP in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

FEDERAL EMERGENCY MANAGEMENT AGENCY ANNOUNCES USER FEES FOR FLOOD MITIGATION PRODUCTS

Through a Notice published in the *Federal Register* on January 11, 1999, the Federal Emergency Management Agency (FEMA) announced changes to the fee schedule for several of the products it provides to the public in support of the National Flood Insurance Program (NFIP). These changes, which became effective on March 1, 1999, were made to ensure full reimbursement to FEMA of the funds that are expended in reviewing and processing requests for Conditional and Final Map Revisions. Through a rule change published in the *Federal Register* on September 23, 1999, FEMA revised the exemptions listed under Section 72.5 of the NFIP regulations. Copies of both *Federal Register* publications are attached.

The current fee schedule for requests for Conditional Letters of Map Revision (CLOMRs) and Final Map Revisions—Letters of Map Revision (LOMRs) and Physical Map Revisions (PMRs)—is shown below.

Fee Schedule for CLOMR Requests

Request based on new hydrology, bridge, culvert, channel, or combination thereof	$3,100
Request based on levee, berm, or other structural measure	$4,000

Fee Schedule for LOMR and PMR Requests

Request based on bridge, culvert, channel, or combination thereof	$4,000
Request based on levee, berm, or other structural measure	$4,700
Request based on as-built information submitted as followup to CLOMR	$3,400

Additional copies of both *Federal Register* publications may be obtained electronically from the National Archives and Records Administration site on the World Wide Web at http://www.access.gpo.gov/su_docs/aces/aces140.html. Interested persons who do not have access to the Internet may obtain paper copies of the Notice, free of charge, by calling the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

with FEMA functional and program activities funded under Performance Partnership Agreements with State and local governments.

SUPPLEMENTARY INFORMATION: Cooperative Agreements under Performance Partnership Agreements (PPA), will be the vehicle for achieving the Federal Emergency Management Agency's (FEMA's) Strategic goal of establishing in concert with its partners, a national emergency management system that is comprehensive, risk-based and all hazards in approach. It focuses on integrating and achieving Federal and State goals and objectives for the four broad emergency management functions: Mitigation (risk reduction), preparedness (operational readiness), response (emergency) operations, and recovery operations. The PPA also carries out FEMA initiatives relative to national emergency management goals (e. g., the National Mitigation Strategy) and pulls into a single document all FEMA and State memoranda of understanding and agreements.

Collection of Information

Title: Financial and Technical Assistance Under Performance Partnership Agreements.

Type of Information Collection. Revision of currently approved collection.

OMB Number: 3067–0206.

Form Numbers: SF 424, Application for Federal Assistance; Indirect Cost Agreement; FF 20–20, Budget Information—Nonconstruction; FF 20–22, Narrative Statement; FF 20–15, Budget Information-Construction Projects; FF 20–16, Assurances; FF 76–10a, Obligating Document for Awards/Amendments; FF 20–19, Report of Unobligated Balance of Federal Funds, Drawdowns, and Undrawn funds; FF 20–10, Financial Status Report; FF 20–17, Outlay Report and Request for Reimbursement for Construction Programs; FF 20–18, Report of Government Property; SF–SAC, Data Collection form for Reporting on Audits.

Abstract. The collection of information focuses on Standard and FEMA forms associated with financial and administrative reporting and recordkeeping requirements that enables State and Local governments to request from FEMA federal financial and technical assistance through Performance Partnership Agreements.

Affected Public: State, Local or Tribal Governments.

FEMA/forms and other reporting	No. of respondents (A)	Frequency of response (B)	Hours Per response (C)	Annual Reporting Hours (AxBxC)	Record-keeping burden hours
FF20–10 Financial Status Report	56	20	9.8	10976	11200
FF 20–15 Budget Information Construction Program	56	5	17	4760	4816
FF20–16 Summary Sheet for Assurance and Certification	56	1	1.5	84	95.2
FF 20–17 Outlay Report and Request for Reimburse-ment for Construction	56	15	17	14280	144488
FF 20–18 Report of Government Property	56	2	6	672	694.4
FF20–19 Report of Unobligated Balance of Federal Funds	56	20	2	2240	2464
					2464
FF20–20NC Budget Information Non Construction	56	10	9.8	5488	5600
FF20–22 Narrative Form	56	5	8	2240	2296
FF–20–22NC Performance Report	56	2	8	896	918.4
FF–20–22C Performance Report	56	5	8	2240	2296
FF–20–22NC Narrative Non-Construction	56	2	8	896	918.4
FF–76–10A Obligating the Document for Award	56	2	1.5	168	190.4
SF–424 Application for Federal Assistance	56	1	2	112	123.2
Reading and Understanding	56	1	12	672	683.2
Indirect Cost Agreement	56	2	50	5600	5622.4
Budget Deviations	56	2	5.8	649.4	672
SF-Data Collection	56	2	30	3360	3382.4

Estimated Total Annual Burden and Recordkeeping Hours. 69,277.6.

Estimated Cost. $400,000.00.

Comments

Written comments are solicited to (a) evaluate whether the proposed data collection is necessary for the proper performance of the agency, including whether the information shall have practical utility; (b) evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (c) enhance the quality, utility, and clarity of the information to be collected; and (d) minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses. Comments should be received within 60 days of the date of this notice.

ADDRESSES: Interested persons should submit written comments to Muriel B. Anderson, FEMA Information Collections Officer, Federal Emergency Management Agency, 500 C Street, SW, Room 316, Washington, DC 20472. Telephone number (202) 646–2625. FAX number (202) 646–3524.

FOR FURTHER INFORMATION CONTACT: Contact Charles F. McNulty, Office of Financial Management, Room 350, Washington D.C., Phone No. (202) 646–2976 for additional information. Contact Ms. Anderson at (202) 646–2625 for copies of the proposed collection of information.

Dated: December 23, 1998.

Reginald Trujillo,

Director, Program Services Division, Operations Support Directorate.

[FR Doc. 99–525 Filed 1–8–99; 8:45 am]

BILLING CODE 6718–01–P

FEDERAL EMERGENCY MANAGEMENT AGENCY

Fee Schedule for Processing Requests for Map Changes and for Flood Insurance Study Backup Data

AGENCY: Federal Emergency Management Agency (FEMA).

ACTION: Notice.

SUMMARY: This notice contains the revised fee schedules for processing certain requests that you (the requester) make for changes to National Flood Insurance Program (NFIP) maps and for processing requests for Flood Insurance Study (FIS) backup data. The changes in the fee schedules will allow us (FEMA) to reduce further the expenses to the NFIP by recovering more fully the costs associated with (1) processing conditional and final map change requests and (2) retrieving, reproducing, and distributing technical and administrative support data related to FIS analyses and mapping.

EFFECTIVE DATE: The revised fee schedules are effective for all requests dated March 1, 1999, or later.

FOR FURTHER INFORMATION CONTACT: Matthew B. Miller, P.E., Chief, Hazards Study Branch, Mitigation Directorate, 500 C Street SW., Washington, DC 20472; (202) 646–3461 or by facsimile at (202) 646–4596 (not toll-free calls), or (email) *matthew.miller@fema.gov.*

SUPPLEMENTARY INFORMATION: This notice contains the revised fee schedules for processing certain requests for changes to NFIP maps and for processing requests for FIS backup data. The revised fee schedule for map changes is effective for all requests dated March 1, 1999, or later. It supersedes the current fee schedule, which was established on March 10, 1997.

The revised fee schedule for requests for FIS backup data also is effective for all requests dated March 1, 1999, or later. It supersedes the current fee schedule, which was established on March 10, 1997.

To develop the revised fee schedules, we evaluated the actual costs of reviewing and processing requests for Conditional Letters of Map Amendment (CLOMAs), Conditional Letters of Map Revision Based on Fill (CLOMR–Fs), Conditional Letters of Map Revision (CLOMRs), Letters of Map Revision Based on Fill (LOMR–Fs), Letters of Map Revision (LOMRs), and Physical Map Revisions (PMRs) and requests for FIS backup data.

As we indicated in the **Federal Register** notice published on February 6, 1997, a primary component of the fees is the prevailing private-sector rates charged to us for labor and materials. Because these rates and the actual review and processing costs may vary from year to year, we will evaluate the fees periodically and publish revised fee schedules, when needed, as notices in the **Federal Register**.

Fee Schedule for Requests for Conditional Letters of Map Amendment and Conditional and Final Letters of Map Revision Based on Fill

Based on a review of actual cost data for Fiscal Year 1997, we maintained the following flat user fees, which are to be submitted with all requests:

- Request for single-lot/single-structure CLOMA, CLOMR–F, and LOMR–F—$400.
- Request for single-lot/single-structure LOMR–F based on as-built information (CLOMR–F previously issued by FEMA)—$300.
- Request for multiple-lot/multiple-structure CLOMA—$700.
- Request for multiple-lot/multiple-structure CLOMR–F and LOMR–F—$800.
- Request for multiple-lot/multiple-structure LOMR–F based on as-built information (CLOMR–F previously issued by FEMA)—$700.

Fee Schedule for Requests for Conditional Map Revisions

Unless the request is otherwise exempted under 44 CFR 72.5, you (the requester) must submit the flat user fees shown below with requests for CLOMRs dated March 1, 1999, or later that are not based on structural measures on alluvial fans. These fees are based on a review of actual cost data for Fiscal Year 1997.

- Request based on new hydrology, bridge, culvert, channel, or combination thereof—$3,100.
- Request based on levee, berm, or other structural measure—$4,000.

Fee Schedule for Requests for Map Revisions

Unless the request is otherwise exempted under 44 CFR 72.5, you must submit the flat user fees shown below with requests for LOMRs and PMRs dated March 1, 1999, or later that are not based on structural measures on alluvial fans. These fees are based on a review of actual cost data for Fiscal Year 1997.

- Request based on bridge, culvert, channel, or combination thereof—$4,000.
- Request based on levee, berm, or other structural measure—$4,700.
- Request based on as-built information submitted as followup to CLOMR—$3,400.
- Request based solely on submission of more detailed data—$3,100.

Fees for Conditional and Final Map Revisions Based on Structural Measures on Alluvial Fans

Based on a review of actual cost data for Fiscal Year 1997, we maintained $5,000 as the initial fee for your requests for LOMRs and CLOMRs based on structural measures on alluvial fans. We also will continue to recover the remainder of the review and processing costs by invoicing the requester before issuing a determination letter, consistent with current practice. The prevailing private-sector labor rate charged to we ($50 per hour) will continue to use to calculate the total reimbursable fees.

Fee Schedule for Requests for Flood Insurance Study Backup Data

You must submit the user fees shown below with your requests for FIS backup data dated March 1, 1999, or later. These fees are based on a review of actual cost data for Fiscal Year 1997. They are based on the complete recovery of our costs for retrieving, reproducing, and distributing the data, as well as a pro rata share of the costs for maintaining the data and operating the fee reimbursement system.

As under the previous fee schedule, all entities except the following will be charged for requests for FIS backup data: our Study Contractors; our Technical Evaluation Contractors; the Federal agencies involved in performing studies and restudies for us (i.e., U.S. Army Corps of Engineers, U.S. Geological Survey, Natural Resources Conservation Service, and Tennessee Valley Authority); communities that have supplied the Digital Line Graph base to us and request the Digital Line Graph data (Category 6 below); State NFIP Coordinators if the data have not already been provided on microfiche or CD–ROM or if the State is actively involved in performing a study or restudy that will be used by us to update NFIP maps. The only other exception is that one copy of the FIS backup data will be provided to a community free of charge if the data are requested during the statutory 90-day appeal period for an initial or revised FIS for that community.

We have established seven categories into which we separate requests for FIS backup data. These categories are:

(1) *Category 1*—Paper copies, microfiche, or diskettes of hydrologic and hydraulic backup data for current or historical FISs

(2) *Category 2*—Paper or mylar copies of topographic mapping developed during FIS process

(3) *Category 3*—Paper copies or microfiche of survey notes developed during FIS process

(4) *Category 4*—Paper copies of individual Letters of Map Change

(5) *Category 5*—Paper copies of preliminary Flood Insurance Rate Map

or Flood Boundary and Floodway Map panels

(6) *Category 6*—Computer tapes or CD-ROMs of Digital Line Graph files

(7) *Category 7*—Computer diskettes and user's manuals for our computer programs

You must submit a *non-refundable* fee of $140, to cover the preliminary costs of research and retrieval, to begin requests for data under Categories 1, 2, and 3. The total costs of processing requests in Categories 1, 2, and 3 above will vary based on the complexity of the research involved in retrieving the data and the volume and medium of data to be reproduced and distributed. The initial fee will be applied against the total costs to process the request, and we will invoice you for the balance before the data are provided. No data will be provided to you until all required fees have been paid.

We do not require an initial fee to begin a request for data under Categories 4 through 7. We will notify you by telephone about the availability of materials and the fees associated with requested data. As with requests for data under Categories 1, 2, and 3, we will not provide any data to you until you pay all required fees.

The costs for processing requests under Categories 4 through 7 have not varied. Therefore, the flat user fees for these categories of requests, shown below, will continue to be required.

	Dollars
Request Under Category 4:	
First letter	40
Each additional letter	10
Request Under Category 5:	
First panel	35
Each additional panel	2
Request Under Category 6 (per county)	150
Request Under Category 7 (per copy)	25

Payment Submission Requirements

You must make fee payments before we render services. You must make these payments by check, by money order, or by credit card payment. Make checks and money orders payable, in U.S. funds, to the *National Flood Insurance Program*.

We will deposit the fees we collect in the National Flood Insurance Fund, which is the source of funding for providing these services.

Dated: January 6, 1999.

Michael J. Armstrong,

Associate Director for Mitigation.

[FR Doc. 99-526 Filed 1-8-99; 8:45 am]

BILLING CODE 6718-04-P

FEDERAL MARITIME COMMISSION

Ocean Freight Forwarder License; Applicants

Notice is hereby given that the following applicants have filed with the Federal Maritime Commission applications for licenses as ocean freight forwarders pursuant to section 19 of the Shipping Act of 1984 (46 U.S.C. app. 1718 and 46 CFR part 510).

Persons knowing of any reason why any of the following applicants should not receive a license are requested to contact the Office of Freight Forwarders, Federal Maritime Commission, Washington, DC 20573.

Empire Shipping Company, Inc., Cargo Building 80, JFK International, Airport, Jamaica, NY 11430, Officer: Helen Duffy, President, Richard Locari, Secretary

Dated: January 5, 1999.

Bryant L. VanBrakle,

Secretary.

[FR Doc. 99-486 Filed 1-8-99; 8:45 am]

BILLING CODE 6730-01-M

FEDERAL RESERVE SYSTEM

Change in Bank Control Notices; Acquisitions of Shares of Banks or Bank Holding Companies

The notificants listed below have applied under the Change in Bank Control Act (12 U.S.C. 1817(j)) and § 225.41 of the Board's Regulation Y (12 CFR 225.41) to acquire a bank or bank holding company. The factors that are considered in acting on the notices are set forth in paragraph 7 of the Act (12 U.S.C. 1817(j)(7)).

The notices are available for immediate inspection at the Federal Reserve Bank indicated. The notices also will be available for inspection at the offices of the Board of Governors. Interested persons may express their views in writing to the Reserve Bank indicated for that notice or to the offices of the Board of Governors. Comments must be received not later than January 25, 1999.

A. Federal Reserve Bank of Minneapolis (JoAnne F. Lewellen, Assistant Vice President) 90 Hennepin Avenue, P.O. Box 291, Minneapolis, Minnesota 55480-0291:

1. Fred C. Krahmer Irrevocable Trust, and Fred W. Krahmer, as trustee, both of Fairmont, Minnesota; to acquire voting shares of Truman Bancshares, Inc., Truman, Minnesota, and thereby indirectly acquire voting shares of Peoples State Bank of Truman, Truman, Minnesota.

Board of Governors of the Federal Reserve System, January 5, 1999.

Robert deV. Frierson,

Associate Secretary of the Board.

[FR Doc. 99-471 Filed 1-8-99; 8:45 am]

BILLING CODE 6210-01-F

FEDERAL RESERVE SYSTEM

Formations of, Acquisitions by, and Mergers of Bank Holding Companies

The companies listed in this notice have applied to the Board for approval, pursuant to the Bank Holding Company Act of 1956 (12 U.S.C. 1841 *et seq.*) (BHC Act), Regulation Y (12 CFR Part 225), and all other applicable statutes and regulations to become a bank holding company and/or to acquire the assets or the ownership of, control of, or the power to vote shares of a bank or bank holding company and all of the banks and nonbanking companies owned by the bank holding company, including the companies listed below.

The applications listed below, as well as other related filings required by the Board, are available for immediate inspection at the Federal Reserve Bank indicated. The application also will be available for inspection at the offices of the Board of Governors. Interested persons may express their views in writing on the standards enumerated in the BHC Act (12 U.S.C. 1842(c)). If the proposal also involves the acquisition of a nonbanking company, the review also includes whether the acquisition of the nonbanking company complies with the standards in section 4 of the BHC Act. Unless otherwise noted, nonbanking activities will be conducted throughout the United States.

Unless otherwise noted, comments regarding each of these applications must be received at the Reserve Bank indicated or the offices of the Board of Governors not later than February 4, 1999.

A. Federal Reserve Bank of Kansas City (D. Michael Manies, Assistant Vice President) 925 Grand Avenue, Kansas City, Missouri 64198-0001:

1. Chelsea Bancshares, Inc., Chelsea, Oklahoma; to become a bank holding company by acquiring 100 percent of the voting shares of Bank of Chelsea, Chelsea, Oklahoma.

B. Federal Reserve Bank of Dallas (W. Arthur Tribble, Vice President) 2200 North Pearl Street, Dallas, Texas 75201-2272:

1. State National Bancshares, Inc., Lubbock, Texas; to acquire 100 percent of the voting shares of Valley Bancorp, Inc., El Paso, Texas, and thereby

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Part 72

RIN 3067–AC88

National Flood Insurance Programs; Procedures and Fees for Processing Map Changes

AGENCY: Federal Emergency Management Agency (FEMA).

ACTION: Final rule.

SUMMARY: This final rule revises the National Flood Insurance program (NFIP) regulations concerning the procedures and fees for processing changes to NFIP maps by removing the fee payment requirements for processing certain changes. Under this rule, map change requests based on flood hazard information meant to improve upon that shown on the flood map or within the flood study will be exempt from review and processing fees. Improvements to flood maps or studies, which partially or wholly incorporate man-made modifications within the special flood hazard area, will not be exempt from review and processing fees.

EFFECTIVE DATE: This rule is effective on September 23, 1999.

FOR FURTHER INFORMATION CONTACT: Matthew B. Miller, Chief, Hazards Study Branch, Mitigation Directorate, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20472, by telephone at (202) 646–3461, by facsimile at (202) 646–4596 (not toll-free calls), or by e-mail at matthew.miller@fema.gov.

SUPPLEMENTARY INFORMATION: This final rule revises the NFIP regulation governing fee requirements for processing certain changes to NFIP maps. We established the current fee requirements under a final rule published in the **Federal Register** on February 6, 1997, 62 FR 5734.

Under current standards, request are exempt from submitting review and processing fees for:

(a) Requests for map changes based on mapping or study analysis errors;

(b) Requests for map changes based on the effects of natural changes within Special Flood Hazard Areas (SFHAs);

(c) Request for a Letter of Map Amendment (LOMA);

(d) Requests for map changes based on federally sponsored flood-control projects where 50 percent or more of the project's costs are federally funded;

(e) Requests for map changes based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective Flood Insurance Rate Map (FIRM).

This rule maintains the fee exemptions for map change requests in Items (a) through (e) above, and adds a new exemption in subsection 72.5(f), which exempts requesters from paying review and processing fees when the aim of the request is to improve flood hazard information shown on the flood map or within the flood study. Proposed improvements to the flood hazard information that partially or wholly incorporate man-made modifications within the special flood hazard area will not be exempt from review and processing fees.

These final revisions to the NFIP regulations are a result of our continuing reappraisal of the NFIP in order to achieve greater administrative and fiscal effectiveness and to encourage sound floodplain management.

Administrative Procedure Act Determination.

We are publishing this final rule without opportunity for prior public comment under the Administrative Procedure act, having determined that it is a rule of agency procedure or practice excepted under 5 U.S.C. 553(b)(A). We are further making this rule effective immediately upon publication in the **Federal Register** under 5 U.S.C. 553(d)(1), for substantive rules that grant or recognize an exemption.

National Environmental Policy Act

44 CFR Part 10, Environmental Consideration categorically excludes this final rule from its requirements. We have not prepared an environmental impact assessment.

Regulatory Flexibility Act

As Director, I certify that this final rule does not have a significant economic impact on a substantial number of small entities in accordance with the Regulatory Flexibility Act, 5 U.S.C. *et seq.*, because it is not expected (1) *to* have significant secondary or incidental effects on a substantial number of small entities, nor (2) to create any additional burden on small entities. We have not prepared a regulatory flexibility analysis.

Paperwork Reduction Act.

This rule does not involve any collection of information for the purposes of the Paperwork Reduction Act.

Executive Order 12866, Regulatory Planning and Review

42 U.S.C. 4014(f), Promulgation of this final rule is required by statute, which also specifies the regulatory approach taken in the final rule. To the extent possible under the statutory requirements of 42 U.S.C. 4014(f), this final rule adheres to the principles of regulation as set forth in Executive Order 12866, Regulatory Planning and Review.

Congressional Review of Agency Rulemaking.

We have sent this final rule to the U.S. Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, 5 U.S.C. 801 *et seq.* The rule is not a "major rule" within the meaning of that Act. It does not result in, nor is it likely to result in an annual effect on the economy of $100,000,000 or more. It will not result in a major increase in costs or prices for consumers; individual industries; Federal, State, or local government agencies; or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises.

This final rule is exempt (1) From the requirements of the Regulatory Flexibility Act, as certified previously, and (2) from the Paperwork Reduction Act.

This rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Pub. L. 104–4. The rule does not meet the $100,000,000 threshold of that Act, and any enforceable duties are imposed as a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Part 72

Administrative practice and procedure, Flood insurance, Floodplains, and Reporting and recordkeeping requirements.

Accordingly, we amend Part 72 as follows:

PART 72—PROCEDURES AND FEES FOR PROCESSING MAP CHANGES

1. The authority citation for part 72 continues to read as follows:

Authority: 42 U.S.C. 4001 *et seq.*, Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376.

2. We revise section 72.5 to read as follows:

§ 72.5 Exemptions.

Requesters are exempt from submitting review and processing fees for:

(a) Requests for map changes based on mapping or study analysis errors;

(b) Requests for map changes based on the effects of natural changes within SFHAs;

(c) Requests for a Letter of Map Amendment (LOMA);

(d) Requests for map changes based on federally sponsored flood-control projects where 50 percent or more of the project's costs are federally funded;

(e) Requests for map changes based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; and

(f) Requests for map changes based on flood hazard information meant to improve upon that shown on the flood map or within the flood study will be exempt from review and processing fees. Improvements to flood maps or studies that partially or wholly incorporate man-made modifications within the special flood hazard area will not be exempt from review and processing fees.

Dated: September 9, 1999.

James L. Witt,

Director.

[FR Doc. 99-24559 Filed 9-22-99; 8:45 am]

BILLING CODE 6718-21-M

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 64

[CC Docket No. 97-213; FCC 99-11]

Implementation of the Communications Assistance for Law Enforcement Act

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: This document establishes limited rules to ensure that carriers have policies and procedures in place that require the affirmative intervention by and knowledge of, their employees in effectuating any interception through their switching premises, and that such interception is done lawfully and documented carefully. The decision mandates that this be done by appointment of a designated senior officer or employee by each carrier company who is responsible for maintaining such security procedures. The decision also establishes reporting and recordkeeping requirements for informing law enforcement officials of all acts of unauthorized electronic surveillance that occur on the carriers' premises, as well as any compromises of the carriers' systems security and integrity procedures that involve the execution of electronic surveillance. Finally, the decision adopts filing requirements for large and small carriers. This document contains modified information collections subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13, and has been submitted to the Office of Management and Budget (OMB) for review under the section 3507 of the PRA.

DATES: Effective December 22, 1999 except for §§ 64.2103, 64.2104, and 64.2105, which contain information collection requirements that have not been approved by the Office of Management and Budget. The FCC will publish a document in the **Federal Register** announcing the effective date for those sections. Public comment on the information collections are due November 22, 1999.

FOR FURTHER INFORMATION CONTACT: Thomas Wasilewski, 202-418-1310. For further information concerning the information collections contained in this Report and Order, contact Les Smith, Federal Communications Commission, Room 1A-804, 445 12th Street, S.W., Washington, DC 20054, or via the Internet at lesmith@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Report and Order* (R&O) in CC Docket No. 97-213; FCC 99-11, adopted January 29, 1999, and released March 15, 1999. The complete text of this R&O is available for inspection and copying during normal business hours in the FCC Reference Information Center, Courtyard Level, 445 12th Street, S.W., Washington, DC, and also may be purchased from the Commission's copy contractor, International Transcription Services (ITS, Inc.), CY-B400, 445 12th Street, S.W., Washington, DC.

Synopsis of the Report and Order

1. The Commission adopts a Report and Order (R&O) in CC Docket No. 97-213, regarding implementation of the Communications Assistance for Law Enforcement Act (CALEA).[1] The R&O establishes systems security and integrity regulations that all telecommunications carriers must follow to comply with section 105 of CALEA. The regulations were proposed in the Notice of Proposed Rule Making (NPRM) in this proceeding, which can be found at 62 FR 63302, November 11, 1997. The R&O adopts these regulations pursuant to the authority granted to the Commission under section 105 of CALEA and section 229 of the Communications Act of 1934, as amended. Accordingly, the R&O finds that telecommunications carriers must ensure that "any interception of communications or access to call-identifying information effected within its switching premises can be activated only in accordance with a court order or other lawful authorization and with the affirmative intervention of an individual officer or employee of the carrier"[2] acting in accordance with the regulations adopted in the R&O and sections 229(b) and (c) of the Communications Act.

2. While recognizing that certain carriers currently have existing policies and procedures in place to secure and protect their telecommunications systems in a manner that would comply with section 105 of CALEA and sections 229(b) and (c) of the Communications Act, the R&O finds that the void created by those carriers without such policies and procedures demands adoption of minimum set of requirements that will ensure compliance with section 105 of CALEA and sections 229(b) and (c) of the Communications Act. The R&O declines, however, to adopt specific or detailed policies and procedures that telecommunications carriers must include within their internal operating practices to ensure compliance, because, as the R&O further finds, it is not the Commission's responsibility to "micro-manage" telecommunications carriers' corporate policies. The rules adopted in the R&O are intended to provide carriers with guidance as to the minimum requirements necessary to achieve compliance with section 105 of CALEA and sections 229(b) and (c) of the Communications Act in the least burdensome manner possible.

3. The R&O mandates that carriers, as part of their policies and procedures, must appoint the senior authorized officer(s) or employee(s) whose job function includes being a point of contact for law enforcement on a daily, around-the-clock basis. Carriers must include in their policies and procedures a description of the job functions of such points of contact and a method to enable law enforcement authorities to contact these individuals.

4. Although the Commission declines to adopt a proposal to require carriers to

[1] Public Law 103414, 108 Stat. 4279 (1994).

[2] 47 U.S.C. 1004.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

April 11, 2000

Ms. Pernille Buch-Pederson
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

FEMA Case No.: 98-09-484R
Communities: City of Phoenix
Community Nos.: 040051

Subject: LOMR request for Indian Bend Wash Channelization from 40th Street to Hearn Road Based on CLOMR of June 8, 1998, and enclosed Supplemental Data

Identifier: Indian Bend Wash Channelization from 40th Street to Hearn Road
Flooding Sources: Indian Bend Wash
FIRM Panels Affected: 04013C1660F and 04013C1680F

Dear Ms. Buch-Pedersen:

The channelization project for Indian Bend Wash from 40th Street to Hearn Road has been completed. A LOMR is hereby requested based on As-Built Plans and a Notebook of Supplemental Data that are enclosed in this package. The Notebook contains FEMA application forms and supplemental data. A check for $ 3,400 (for a LOMR with a previously issued CLOMR) has been submitted separately. If you have any questions, please contact me at (602) 506-4732.

Sincerely,

Michael Duncan

Michael Duncan, P.E.
Engineering Division

Enclosures

Copy to: Bill Jenkins, State Coordinator, NFIP
Arizona Department of Water Resources
500 North 3rd Street
Phoenix, Arizona 85004

Ray Dovalina, P.E.
Floodplain Manager
City of Phoenix
200 West Washington Street, 5th Floor
Phoenix, Arizona 85003-1611

COORD: JJT EAR

FILE: FCD 93-05

MAILED MATLS.
ON 4-12-00

COPY OF MATLS. TO
CITY OF PHOENIX ON 4-25-00

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTER AND COMMUNITY OFFICIAL**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

☐ CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).

☒ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: Indian Bend Wash

3. Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

4. FEMA zone designations affected: AE
(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City	AZ	04013C	1660F 1680F	09/30/95 09/30/95

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
☒ Riverine	☒ Channelization
☐ Coastal	☐ Levee/Floodwall
☐ Alluvial fan	☐ Bridge/Culvert
☐ Shallow Flooding (e.g. Zones AO and AH)	☐ Dam
☐ Lakes	☐ Fill
☐ Other (describe)	☐ Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
   ☐ Yes ☒ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☒ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☒ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☒ performing ☐ overseeing compliance with the maintenance and operation plans of the City of Phoenix
(Name)
flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. ☒ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $3,400

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

Signature of Revision Requester

Michael W. Duncan, P.E., Civil Engineer
Printed Name and Title of Revision Requester

Flood Control District Of Maricopa County
Company Name

Telephone No.: 602-506-4732 Date:

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

Signature of Community Official

Ray Dovalina, P.E., Floodplain Manager
Printed Name and Title of Community Official

City of Phoenix, Arizona
Community Name

Telephone No.: 602-262-4026 Date:

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Signature

Michael W. Duncan, Civil Engineer
Printed Name and Title of Revision Requester

Registr No. 24124 Expires (Date) 09/30/2002 State AZ

Type of License/Expertise: Professional Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☒ **Hydraulic** (4)	new or revised water-surface elevations
☐ **Mapping** (5)	floodplain/floodway changes
☒ **Channelization** (6)	channel is modified
☐ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
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☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

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You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: City of Phoenix

Flooding Source: Indian Bend Wash

Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: _____

Upstream Limit: _____

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:	**for areas which do not have detailed flooding:**
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.	Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model ☐ **Natural** **File Name** ____ ☐ **Floodway** **File Name** _____

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☒ **Natural** **File Name** lbw-prof ☒ **Floodway File Name** (same)

The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other – Please attach a sheet describing all other models submitted along with the file names. ☐ **Natural** ☐ **Floodway**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended.
For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritical depth ☐ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☐ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☐ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☐ **Explanation provided on attached printout** ☐

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? ☐ **Yes** ☒ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. **Profile Transition**

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 1140 within 0.00 (feet) Upstream End 9340 within 0.10 (feet)
Cross-Section # *Cross-Section #*

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 1140 within 0.00 (feet) Upstream End 9340 within 0.10 (feet)
Cross-Section # *Cross-Section #*

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End _____ within _____ (feet) Upstream End _____ within _____ (feet)
Cross-Section # *Cross-Section #*

2. **Profile Checklist (check box if information has been provided on profile)**

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☒ Labeled ☒ Low Chord Elevations ☒ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☒ **Yes** ☐ **Not Required**

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: City of Phoenix

Flooding Source: Indian Bend Wash

Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: _____

Upstream Limit: _____

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):

☒ Description of the inlet and outlet

☒ Description of the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)*:

3. ACCESSORY STRUCTURES

The channelization includes:

- ☐ Levees *(Attach Levee/Floodwall System Analysis Form - Form 8)*
- ☐ Drop structures
- ☐ Superelevated sections
- ☐ Transitions in cross sectional geometry
- ☐ Debris basin/detention basin
- ☐ Energy dissipater
- ☐ Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

☒ Channel alignment and locations of inlet, outlet, and accessory structures

☒ Channel lining

☒ Typical cross sections and profiles of channel banks and invert

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry 6,000 and 2,400 (cfs) and/or the 100-year flood.

2. The design elevation in the channel based on:

   ☒ Subcritical flow

   ☐ Critical flow

   ☐ Supercritical flow

   ☐ Energy grade line

3. **If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.**

Inlet to channel?	☐ Yes
Outlet of channel?	☐ Yes
At Drop Structures?	☐ Yes
At Transitions?	☐ Yes
Other locations?	☐ Yes

Explanation Attached? ☐ **Yes** ☐ **No** ☒ **N/A**

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information **(Check the box if provided):**

☐ Estimated sediment load

☐ Method used to estimate sediment transport

☐ Method used to estimate scour and/or deposition

☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

CLOMR TO LOMR SUPPLEMENTAL DATA

FOR

INDIAN BEND WASH CHANNELIZATION
40TH STREET TO HEARN ROAD

FEMA CASE NO. 98-09-484R

SUBMITTED BY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 WEST DURANGO STREET
PHOENIX, ARIZONA 85009

(602) 506-1501

APRIL 11, 2000

FEMA case no. 98-09-484R

CLOMR to LOMR Supplement

Indian Bend Wash Channelization
40th Street to Hearn Road

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2 EVALUATION OF AS-BUILT VARIATIONS

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Due to revised upstream limit

4 MAINTENANCE

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Section 1 FEMA FORMS

MT-2	Form 1	Main
MT-2	Form 4	Hydraulic
MT-2	Form 6	Channelization

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTER AND COMMUNITY OFFICIAL**	O.M.B No. 3067-0148 Expires April 30, 2001

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1. REQUESTED RESPONSE FROM FEMA

This request is for a:

☐ CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).

☒ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: Indian Bend Wash

3. Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

4. FEMA zone designations affected: AE
(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City	AZ	04013C	1660F 1680F	09/30/95 09/30/95

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
☒ Riverine	☒ Channelization
☐ Coastal	☐ Levee/Floodwall
☐ Alluvial fan	☐ Bridge/Culvert
☐ Shallow Flooding (e.g. Zones AO and AH)	☐ Dam
☐ Lakes	☐ Fill
☐ Other (describe)	☐ Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
   ☐ Yes ☒ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☒ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☒ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☒ performing ☐ overseeing compliance with the maintenance and operation plans of the City of Phoenix
(Name)
flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. ☒ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $3,400

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

Michael W. Duncan
Signature of Revision Requester

Michael W. Duncan, P.E., Civil Engineer
Printed Name and Title of Revision Requester

Flood Control District Of Maricopa County
Company Name

Telephone No.: 602-506-4732 Date: 4-12-00

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

Ray Dovalina
Signature of Community Official

Ray Dovalina, P.E., Floodplain Manager
Printed Name and Title of Community Official

City of Phoenix, Arizona
Community Name

Telephone No.: 602-262-4026 Date: 4/12/00

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Michael W. Duncan
Signature

Michael W. Duncan, Civil Engineer
Printed Name and Title of Revision Requester

Registr No. 24124 Expires (Date) 09/30/2002 State AZ

Type of License/Expertise: Professional Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☒ **Hydraulic** (4)	new or revised water-surface elevations
☐ **Mapping** (5)	floodplain/floodway changes
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FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS**	O.M.B No. 3067-0148 Expires April 30, 2001

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Note: Fill out one form for each flooding source studied

Community Name: City of Phoenix

Flooding Source: Indian Bend Wash

Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: _____

Upstream Limit: _____

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:	for areas which do not have detailed flooding:
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.	Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model ☐ **Natural** **File Name** ____ ☐ **Floodway** **File Name** _____

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____

The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☒ **Natural** **File Name** lbw-prof ☒ **Floodway** **File Name** (same)

The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other – Please attach a sheet describing all other models submitted along with the file names. ☐ **Natural** ☐ **Floodway**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended. For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritical depth ☐ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☐ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☐ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☐ **Explanation provided on attached printout** ☐

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? ☐ **Yes** ☒ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. **Profile Transition**

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 1140 within 0.00 (feet) Upstream End 9340 within 0.10 (feet)
Cross-Section # *Cross-Section #*

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 1140 within 0.00 (feet) Upstream End 9340 within 0.10 (feet)
Cross-Section # *Cross-Section #*

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End _____ within _____ (feet) Upstream End _____ within _____ (feet)
Cross-Section # *Cross-Section #*

2. **Profile Checklist (check box if information has been provided on profile)**

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☒ Labeled ☒ Low Chord Elevations ☒ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☒ **Yes** ☐ **Not Required**

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: City of Phoenix

Flooding Source: Indian Bend Wash

Project Name/Identifier: Indian Bend Wash Channelization 40th Street to Hearn Road

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: _____

Upstream Limit: _____

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):

☒ Description of the inlet and outlet

☒ Description of the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)*:

3. ACCESSORY STRUCTURES

The channelization includes:

- ☐ Levees *(Attach Levee/Floodwall System Analysis Form - Form 8)*
- ☐ Drop structures
- ☐ Superelevated sections
- ☐ Transitions in cross sectional geometry
- ☐ Debris basin/detention basin
- ☐ Energy dissipater
- ☐ Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

☒ Channel alignment and locations of inlet, outlet, and accessory structures

☒ Channel lining

☒ Typical cross sections and profiles of channel banks and invert

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry 6,000 and 2,400 (cfs) and/or the 100-year flood.

2. The design elevation in the channel based on:

   ☒ Subcritical flow

   ☐ Critical flow

   ☐ Supercritical flow

   ☐ Energy grade line

3. **If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.**

Inlet to channel?	☐ Yes
Outlet of channel?	☐ Yes
At Drop Structures?	☐ Yes
At Transitions?	☐ Yes
Other locations?	☐ Yes

Explanation Attached? ☐ **Yes** ☐ **No** ☒ **N/A**

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information **(Check the box if provided):**

☐ Estimated sediment load

☐ Method used to estimate sediment transport

☐ Method used to estimate scour and/or deposition

☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

Section 2 EVALUATION OF AS-BUILT VARIATIONS

Variations from Plans

Summary Table of Effects

Revised Hydraulic Model

- Printout
- Diskette

Variations from Plans

After completion of the channelization project for Indian Bend Wash from 40th Street to Hearn Road, the channel was surveyed at 100 to 500 foot intervals. These surveyed cross-sections are plotted with the design cross-sections on full-size plan sheets, which are included with the certified as-built plans that are shipped with this LOMR package.

Inspection of the surveyed cross-sections revealed that only two cross-sections are significantly higher or narrower than the channel design. These are cross-sections 39+00 and 40+00. The corresponding cross-sections (3900 and 4000) of the HEC-2 hydraulic model were revised to match the as-built survey, and the model was re-run. The printout and diskette of this revised model (dated 07 APR 00) are included in this section.

The effects of these two revised cross-sections on the Computed Water Surface Elevations and Top Widths are summarized in Table 1 on the next sheet. The largest increases in water surface elevations are 0.1, 0.2, and 0.2 feet at cross-sections 4000, 4100, and 4190 respectively. The largest increase in top width is 10 feet at cross-section 4100.

With the associated F.I.R.M. scale of 1 inch = 1,000 feet, this 10 feet converts to only 0.01 inch on the F.I.R.M. This is a negligible difference, and the floodplain would remain well within the right-of-way of the channel. **Since the as-built-channel variations from design cause negligible changes in the floodplain, a revision of the CLOMR work maps and profiles are not merited.**

Table 1 -- Summary of Effects of As-Built Channel Variations from Plans

River Station	CLOMR Computed Water Surface Elevation	C.W.S.E. based on As-Builts		Change in C.W.S.E.	
3600	1391.72	1391.72		0.00	
3900	1392.35	1392.39		0.04	+
4000	1392.58	1392.68		0.10	+
4100	1392.75	1392.96		0.21	+
4190	1392.77	1392.97		0.20	+
4256	1394.59	1394.63		0.04	+
4400	1394.78	1394.82		0.04	+

CLOMR Top Width	Top Width based on As-Builts		Change in Top Width		River Station
344.36	344.36		0		3600
346.38	347.21		0.83	+	3900
349.83	353.64		3.81	+	4000
309.84	320.32		10.48	+	4100
245.71	248.48		2.77	+	4190
394.89	398.81		3.92	+	4256
424.50	425.36		0.86	+	4400

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    07APR00    TIME   12:43:35  *
 *******************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

07APR00 12:43:36

THIS RUN EXECUTED 07APR00 12:43:36

```
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
```

THIS IS AN ARCHIVAL RUN ALL DATA AND RESULTS ARE SAVED ON UNIT 96

AC
    1140BEGIN INDIAN BEND WASH IMPROVED CHANNEL, SECTION NUMBERS
    1140MATCH APPROXIMATE R/W STATIONS OF INDIAN BEND WASH
    1140UPSTREAM OF 40TH STREET
    1140A LOW FLOW FJORD
    4190DOWNSTREAM FACE OF 36TH STREET CULVERT
    41906-12'x8' CONCRETE BOX CULVERT
    4190ROADWAY OVERFLOW OCCURS DURING THE 100-YEAR EVENT
    4256UPSTREAM FACE OF 36TH STREET CULVERT
    42566-12'x8' CONCRETE BOX CULVERT
    4256ROADWAY OVERFLOW OCCURS DURING THE 100-YEAR EVENT
    4574DOWNSTREAM FACE OF SWEETWATER AVENUE CULVERT

Mike Duncan 9-7-00

SEE FILE
IB40SWSEL.OUT
ON DISKETTE FOR
REVISED OUTPUT

THE MICHAEL BAKER JR.
REVIEWER

REVISED THE STARTING
WATER SURFACE ELEVATION

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     4574EXISTING 4-10'x8' CBC PLUS 2-10'X8'
     4646UPSTREAM FACE OF SWEETWATER AVENUE CULVERT
     4646EXISTING 4-10'x8' CBC PLUS 2-10'X8'
     6200INDIAN BEND WASH CONFLUENCE AND EMILE ZOLA CHANNEL
     7569DOWNSTREAM FACE OF THUNDERBIRD ROAD CULVERT
     7569START SLA MODIFICATION BY USING THE MOST RECENT TOPO
     75691-28'x7' CONCRETE ARCH PLUS 1-28'x10.32 CONCRETE ARCH
     7569CROWN ELEVATIONS OF ARCHES ARE THE SAME, THE 28'X7' ARCH HAS
     7569FLOW LINE ELEVATIONS OF 1395.74 OUTLET, 1396.12 INLET
     7569THIS HEC-2 MODELS THE TWO ARCHES AS 2-28'x7.63' CONCRETE ARCHES
     7696UPSTREAM FACE OF THUNDERBIRD ROAD CULVERT
     76961-28'x7' CONCRETE ARCH PLUS 1-28'X10.32 CONCRETE ARCH
     7987DOWNSTREAM FACE OF SR 51 CULVERT
     7987THIS HEC-2 MODELS THE 1-28'X7' & 1-16'X10.7' ARCHES FOR THE
     7987WEST SIDE FLOW ONLY.
     7987FLOW LINE ELEVATION OF 16'x10.32' ARCH IS 1-FOOT ABOVE THE FLOW
     7987LINE OF THE 28'x7' ARCH, WHICH IS EQUAL TO CHANNEL FLOW LINE
     8262UPSTREAM FACE OF SR 51 CULVERT
     82621-28'x7' & 1-16'X10.7' CBC FOR THE WEST SIDE FLOW ONLY.
     8262MODELED AS A 2-23'X5.72' CBC
     8850CHANNELIZED SLA SECTION(1 FT DEPTH) TO TRANSITION INTO EXISTING GROUND
T1       INDIAN BEND WASH - CHANNEL IMPROVEMENTS,FILE: IBW-PROF.DAT
T2       40TH STREET TO ACOMA ROAD
T3       FLOWS FROM FIS STUDY

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                         6000   1383.58
1
   07APR00      12:43:36                                                                                PAGE    2


J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                  -1                                                -6


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    110                  150                  200

NC     0.04       0.04      0.035        0.1         0.3
  BEGIN INDIAN BEND WASH IMPROVED CHANNEL, SECTION NUMBERS
  MATCH APPROXIMATE R/W STATIONS OF INDIAN BEND WASH
  UPSTREAM OF 40TH STREET
  A LOW FLOW FJORD
ET                          7.1                                          1765        2195
X1     1140         11      1750       2250
CI   2011.1    1379.87     0.035          4           4          40       0.01
```

GR	1384.3	1750	1381.9	1775.43	1381.4	1839.04	1379.98	1936.6	1380.7	1983.43
GR	1378.8	2000	1380.28	2014.39	1380.54	2051.73	1383.04	2205.7	1387.28	2219.72
GR	1388.9	2250								
ET			7.1				1850	2150		
X1	1300	16	1750	2250	100	100	100			
CI	2080.6	1380.16	0.035	4	4	40	0.01			
GR	1387.8	1750	1388.45	1770.68	1385.55	1786.5	1384.74	1799.46	1383.07	1856.74
GR	1381.8	1887.29	1380.44	1903.17	1381.2	1973.2	1381.14	2016.92	1380.34	2060.34
GR	1381.8	2088.74	1382.49	2118.63	1384.07	2185.07	1385.39	2206.99	1388.56	2228.78
GR	1388.7	2250								
ET			7.1				1930	2150		
X1	1500	17	1750	2250	200	200	200			
CI	2116.3	1380.51	0.035	4	4	40	0.01			
CI	2046	1382.21	0.035	8	8	200	0.01			
GR	1389.2	1750	1389.4	1773.12	1387.72	1799.56	1386.16	1850.89	1383.85	1872.42
GR	1382.0	1895.26	1383.6	1925	1382.32	1962.4	1383.9	2000	1382.72	2069.69
GR	1382.9	2096.32	1384.4	2109.45	1383.25	2126.25	1384.39	2135.22	1387.56	2198.01
GR	1389.5	2220.96	1389.4	2250						
ET			7.1				1960	2160		
X1	1800	13	1750	2250	300	300	300			
CI	2119.6	1381.03	0.035	4	4	40	0.01			
CI	2049.5	1383.49	0.035	8	8	150	0.01			
GR	1389.6	1750	1389.16	1762.53	1389.6	1792.73	1387.38	1832.64	1386	1903.39
GR	1385.9	1955	1385.45	1990.27	1386	2009.13	1385.68	2116.55	1386.53	2127.73
GR	1387.4	2171.71	1389.33	2212.5	1390.8	2250				
ET			7.1				1955	2175		
X1	2100	13	1750	2250	300	300	300			
CI	2122.6	1381.55	0.035	4	4	40	0.01			
CI	2052.5	1384.55	0.035	8	8	150	0.01			
GR	1391.5	1750	1391.48	1787.95	1388.7	1828.31	1387.07	1888.31	1387.06	1966.1
GR	1386.5	1986.12	1386.26	2030.61	1386.9	2049.35	1387.45	2113.79	1388.14	2154.02
GR	1389.3	2188.89	1392.22	2216.69	1391.9	2250				

1

ET			7.1				1960	2180		
X1	2400	13	1750	2250	300	300	300			
CI	2125.5	1382.07	0.035	4	4	40	0.01			
CI	2055.5	1385.07	0.035	8	8	150	0.01			
GR	1392.0	1750	1391.14	1798.58	1390.2	1807.62	1388.41	1859.25	1387.42	1922.94
GR	1387.5	1976.71	1387.13	1998.34	1387.2	2086.8	1387.89	2102.94	1388.52	2143.27
GR	1390.3	2192.62	1391.6	2201.89	1392.5	2250				
ET			7.1				1965	2175		

X1	2700	14	1750	2250	300	300	300			
CI	2124.6	1382.59	0.035	4	4	40	0.01			
CI	2054.4	1385.09	0.035	8	8	150	0.01			
GR	1392.7	1750	1392.94	1793.99	1391.03	1806.34	1388.3	1898.05	1386.87	1986.56
GR	1387.6	2023.99	1387.24	2082.12	1387.77	2091.94	1387.6	2112.76	1387.97	2159.09
GR	1391.0	2185.33	1393.41	2201.07	1392.31	2208.72	1393.3	2250		
ET			7.1				1965	2170		
X1	2900	15	1750	2250	200	200	200			
CI	2122.8	1382.94	0.035	4	4	40	0.01			
CI	2053	1385.94	0.035	8	8	150	0.01			
GR	1393.3	1750	1392.89	1801.03	1389.81	1819.78	1387.87	1863.1	1387.2	1938.92
GR	1387.6	1970.25	1386.89	1981.15	1387.3	2045.98	1387.67	2100.77	1387.8	2139.68
GR	1389.6	2173.15	1393.81	2198.44	1393.03	2208.91	1393.44	2225.17	1393.6	2250
ET			7.1				1965	2165		
X1	3000	18	1750	2250	100	100	100			
CI	2121.8	1383.11	0.035	4	4	40	0.01			
CI	2052	1386.11	0.035	8	8	150	0.01			
GR	1394.1	1750	1393.92	1796.15	1389.4	1823.52	1388.5	1839.9	1387.88	1910.54
GR	1387.1	1941.45	1387.9	1970.6	1387.1	1983.4	1387.85	2016.18	1387.16	2056.63
GR	1387.7	2104.74	1388.31	2115.79	1387.9	2130.95	1388.38	2161.63	1389.74	2175.57
GR	1393.9	2197.15	1393.59	2202.58	1393.5	2250				
ET			7.1				1960	2165		
X1	3300	15	1750	2250	300	300	300			
CI	2119.1	1383.63	0.035	4	4	40	0.01			
CI	2049	1386.63	0.035	8	8	150	0.01			
GR	1394.9	1750	1395.09	1774.57	1394.19	1781.81	1392.69	1806.74	1389.4	1830.93
GR	1388.9	1851.32	1388.79	1913.21	1388.27	1983.55	1388.7	2016.49	1387.9	2084.39
GR	1389.1	2101.96	1388.25	2130.01	1389.81	2169.06	1394.19	2195.37	1394.3	2250
ET			7.1				1955	2170		
X1	3600	16	1750	2250	304	298	300			
CI	2118.3	1384.15	305.035	4	4	40	0.01			
CI	2048.5	1387.15	305.035	8	8	150	0.01			
GR	1394.2	1750	1395.4	1773.9	1394.67	1796.99	1391.76	1823.58	1390.14	1846.54
GR	1389.2	1923.3	1388.98	2023.94	1389.35	2058.77	1389.1	2074.13	1388.47	2095.39
GR	1388.8	2120.82	1389.44	2150.36	1394.64	2189.78	1396.52	2197.03	1394.86	2210.31
GR	1395.2	2250								

1

ET			7.1				1890	2140		
X1	3900	13	1750	2250	305	295	300			
CI	2045.6	1384.60	320.035	4	4	39	0.01			
CI	2000.6	1388.40	320.035	8	8	154	0.01			
GR	1394.0	1750	1394.87	1797.84	1390.7	1836.32	1390.05	1862.53	1390.37	1884.86

```
GR   1389.8    1971.99    1390.19       2000      1389.3     2033.15     1390.12     2044.86     1390.53     2102.09
GR   1391.0    2152.88    1395.62    2202.99      1395.6        2250

ET                           7.1                                          1860        2095
X1     4000         14       1730       2230          95         105         100
CI   2017.4    1385.00    102.035          4           4          45        0.01
CI   1980.4    1388.50    102.035          8           8         140        0.01
GR   1395.8       1730    1395.91    1747.03     1395.12     1783.34      1390.4     1826.66     1389.99      1863.1
GR   1390.0    1952.71    1389.94       1980     1389.26     1992.49      1390.7     2021.85      1391.5     2123.11
GR   1392.7    2160.23    1395.97    2181.02     1394.23     2210.34      1394.2        2230

NC     0.04       0.04       0.03
ET                           7.1                                          1870        2100
X1     4100         13       1750       2250         102          98         100
CI   2002.7    1385.06    100.035          4           4          72        0.01
CI     1929    1388.06    100.035          8           8          62        0.01
GR   1395.6       1750    1395.29    1760.75      1395.3     1803.96     1391.35     1837.06     1390.84     1872.95
GR   1391.6    1951.84    1389.66    1967.24      1389.5     1999.58     1389.75     2031.06     1391.73      2045.3
GR   1392.0     2102.3    1393.97    2188.47      1394.4        2250

NC                                       0.3         0.5
  DOWNSTREAM FACE OF 36TH STREET CULVERT
  6-12'x8'CONCRETE BOX CULVERT
  ROADWAY OVERFLOW OCCURS DURING THE 100-YEAR EVENT
ET                           7.1                                          1880        2100
X1     4190         41    1962.97    2016.12          92          88          90
CI     2000    1385.23     87.035          4           4          76        0.01
CI                                                               0.01        0.01
X3       10
GR   1395.5       1750    1395.43    1765.79     1395.51     1772.58      1395.4     1788.36     1395.41     1794.56
GR   1395.9    1796.56    1395.43    1801.76     1394.25     1810.31     1393.48     1815.32     1392.37     1826.56
GR   1391.2    1838.79    1391.41    1846.56     1391.62     1866.04     1391.63      1880.5     1391.68      1883.8
GR   1391.8    1906.99    1391.87    1931.62     1391.86     1946.17     1391.63     1962.97     1391.34      1973.2
GR   1391.3    1980.49    1391.54    1989.34     1391.92     1991.85     1392.21     1997.87     1392.53     2016.12
GR   1393.1    2066.27    1392.91    2082.04     1392.98     2116.12     1393.06     2130.97     1393.07     2143.46
GR   1393.3    2155.84    1393.44    2159.36     1393.58     2179.75     1394.03     2186.24     1394.47     2193.86
GR   1394.7    2201.87    1394.84    2211.54     1394.68     2221.18      1394.5     2227.31     1394.62      2234.1
GR   1394.7       2250

SC    6.013        0.3       2.63          0           8          12          66        11.4     1385.42     1385.22
  UPSTREAMFACE OF 36TH STREET CULVERT
  6-12'x8'CONCRETE BOX CULVERT
  ROADWAY OVERFLOW OCCURS  DURING THE 100-YEAR EVENT
ET                           7.1                                          1890        2100
1
   07APR00      12:43:36                                                                                  PAGE    5

X1     4256         36    1959.69    2041.79          69          63          66
CI     2000    1385.42     66.025          4           4          76        0.01
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X2                          2                1393.39
X3      10
BT     -10    1819.99    1392.82         0       1820     1393.5          0       1925     1394.5          0
BT             1946.9    1394.67         0       1947    1396.67          0       2000    1396.81          0
BT               2053     1396.6         0     2053.1     1394.6          0       2075     1394.4          0
BT            2147.73    1393.77         0
GR   1396.4      1750    1395.96   1771.49    1395.95    1774.76    1395.52    1787.18    1395.94    1796.05
GR   1394.8   1800.72    1393.55   1808.33    1392.82    1819.99    1392.46    1834.42     1392.1     1855.6
GR   1392.4   1876.29    1392.44   1877.35    1392.28    1897.95     1392.3    1929.39    1392.85    1959.69
GR   1393.2   1987.55    1393.32   1994.42    1393.24    1999.46    1393.37     2003.5    1393.17    2027.24
GR   1393.2   2041.79    1393.09   2052.72    1393.23       2075    1393.44     2095.1    1393.48    2101.75
GR   1393.5   2117.84    1393.56   2125.07    1393.77    2147.73    1394.19    2157.19    1394.17       2162
GR   1393.8   2180.47    1395.01   2195.29    1395.08    2207.47    1394.51    2225.04    1394.76    2237.62
GR   1395.1      2250

ET                          7.1                                       1940       2100
X1     4400        14      1750      2250        149        141        145
CI     2000   1385.86    147.025         4          4         72       0.01
CI     2026   1385.86    147.025         4          4         40       0.01
GR   1395.1      1750    1394.45   1755.97    1394.16    1784.39     1393.8    1839.18    1394.15    1868.69
GR   1394.0   1952.69    1392.42   1975.34    1392.31    2015.92     1393.9    2044.57    1393.99    2073.99
GR   1394.4   2172.58    1396.13   2194.99    1396.45    2220.29     1395.8       2250

NC                                    0.1        0.3
ET                          7.1                                       1965       2115
X1     4500        15      1700      2270        102         98        100
CI     2000   1386.17    100.025         4          4         65       0.01
CI     2056   1386.17    100.025         4          4         56       0.01
GR   1397.2      1700    1395.59   1768.42    1395.45    1852.33    1395.62    1897.79     1396.4    1913.92
GR   1395.6   1950.65    1392.39   1975.16    1392.31    2021.91    1394.21    2050.07     1394.5    2082.25
GR   1394.8   2162.39    1395.38   2181.35    1396.69    2199.14    1396.94    2226.35     1397.1       2270

ET                          7.1                                       1975       2080
X1     4573        44      1750      2250         75         71         73
CI     2000    1386.4     74.035         4          4         65       0.01
CI                                                          0.01       0.01
X3        0                          1967.5                2032.5
GR   1395.8      1750    1395.94   1763.42    1395.87    1793.42     1395.9    1811.82    1395.91     1823.8
GR   1395.8   1828.38    1395.83   1847.89    1395.94    1870.75     1395.9    1882.63    1395.75    1894.46
GR   1395.9   1903.33    1396.46   1925.48    1396.07    1932.16     1396.2    1939.44    1396.54    1959.68
GR   1396.3    1987.5    1397.11   1993.04    1391.79    1996.32     1390.3    1999.02    1391.39    2003.43
GR   1389.9    2007.9    1390.32   2015.63     1391.2    2021.56     1391.9    2027.89    1391.83    2029.35
GR   1393.0   2035.33    1394.34    2044.7    1394.46    2047.14     1394.6    2059.81    1394.63    2068.52
GR   1395.1   2082.63    1395.11   2101.09    1395.29    2117.16     1395.1    2136.65    1395.22     2153.8
GR   1395.3   2163.33     1395.5   2184.28    1395.96    2192.28     1396.4    2201.68    1396.43    2211.06
GR   1396.6    2223.4    1396.52   2226.18    1396.57    2237.49     1396.4       2250
   DOWNSTREAM FACE OF SWEETWATER AVENUE CULVERT
   EXISTING4-10'x8 ' CBC PLUS 2-10'X8'
1
   07APR00      12:43:36                                                                          PAGE    6
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QT        2       2400       2400
ET                            7.1                                          1975        2080
X1     4574         44       1750       2250          1          1          1
CI     2000    1387.55     74.035          4          4         65       0.01
X3       10                           1967.5                  2032.5
GR   1395.8       1750    1395.94    1763.42    1395.87    1793.42     1395.9    1811.82    1395.91     1823.8
GR   1395.8    1828.38    1395.83    1847.89    1395.94    1870.75     1395.9    1882.63    1395.75    1894.46
GR   1395.9    1903.33    1396.46    1925.48    1396.07    1932.16     1396.2    1939.44    1396.54    1959.68
GR   1396.3     1987.5    1397.11    1993.04    1391.79    1996.32     1390.3    1999.02    1391.39    2003.43
GR   1389.9     2007.9    1390.32    2015.63     1391.2    2021.56     1391.9    2027.89    1391.83    2029.35
GR   1393.0    2035.33    1394.34     2044.7    1394.46    2047.14     1394.6    2059.81    1394.63    2068.52
GR   1395.1    2082.63    1395.11    2101.09    1395.29    2117.16     1395.1    2136.65    1395.22     2153.8
GR   1395.3    2163.33     1395.5    2184.28    1395.96    2192.28     1396.4    2201.68    1396.43    2211.06
GR   1396.6     2223.4    1396.52    2226.18    1396.57    2237.49     1396.4       2250

SC    6.013        0.2       2.63        500          8         10         72       11.4    1387.69    1387.55
  UPSTREAMFACE OF SWEETWATER AVENUE CULVERT
  EXISTING4-10'x8 ' CBC PLUS 2-10'X8'
NC     0.04       0.04      0.035
ET                            7.1                                          1980        2035
X1     4646         39       1750       2250         74         70         72
CI     2000    1387.69     74.035          4          4         65       0.01
X2                             2                   1398
X3       10                           1967.5                  2032.5
GR   1395.9       1750    1395.97    1772.27    1396.08     1790.4     1396.1     1843.7    1396.12    1856.75
GR   1395.9    1866.58    1396.02    1869.14    1395.84     1880.5     1395.9    1901.71     1395.9    1921.82
GR   1395.9    1925.66    1395.95     1946.5    1395.31    1966.28     1392.5    1976.44    1391.51    1979.59
GR   1390.9     1992.4     1390.9    1999.72    1397.39     2005.8     1396.8    2010.32    1396.36    2012.87
GR   1396.4    2020.14    1396.46    2041.68    1396.29    2068.85     1396.6    2073.46    1396.69     2080.7
GR   1397.0    2088.77    1395.78    2093.11    1395.97    2103.89       1396    2121.59    1396.11    2144.33
GR   1396.0    2162.46    1396.07    2177.19    1396.64    2188.42     1396.7    2205.23    1396.71    2221.11
GR   1396.8    2223.21    1396.75    2228.66    1396.88    2243.53     1396.8       2250

ET                            7.1                                          1945        2055
X1     4800         17       1750       2250        157        151        154
CI   2000.9    1388.11    152.035          4          4         50       0.01
X3        0                             1927                    2075
GR     1398       1544       1398       1614       1397       1710     1396.6       1750    1396.52    1807.92
GR   1396.2    1865.03    1396.43    1897.93    1396.26    1949.28     1393.4    1965.96    1393.69    1987.18
GR   1393.3    2031.17    1395.98    2044.35     1396.9     2063.9     1397.0    2112.28    1396.23    2200.32
GR   1396.7       2250       1398       2420

NC                                        0.1        0.3
ET                            7.1                                          1945        2055
X1     5000         15       1730       2230        208        192        200
CI   2002.1    1388.66    202.035          4          4         50       0.01
X3        0                             1934                    2070
```

GR	1397.7	1730	1398.07	1757.14	1396.9	1785.16	1397.03	1846.14	1397	1924.43
GR	1394.0	1944.09	1393.8	1973.29	1394.3	2013.33	1398.46	2049.04	1398.7	2098.09
GR	1396.0	2116.97	1395.63	2137.72	1396.76	2178.45	1397.56	2205.96	1397.2	2230

1

ET			7.1				1945	2050		
X1	5300	13	1680	2180	309	291	300			
CI	1999.4	1389.49	306.035	4	4	50	0.01			
X3	0			1941.5		2057.5				
GR	1398.4	1680	1397.81	1715.55	1397.6	1791.13	1397.82	1841.87	1395.45	1880.1
GR	1396.0	1899.79	1395.5	1918.51	1394.6	1962.51	1395.17	2013.02	1397.4	2028.8
GR	1398.1	2067.51	1397.99	2100.77	1398	2180				

ET			7.1				1945	2060		
X1	5400	16	1670	2170	102	98	100			
CI	1999.4	1389.76	102.035	4	4	50	0.01			
X3	0			1941.5		2057.5				
GR	1399.4	1670	1398.98	1707.95	1397.58	1769.63	1397.86	1800.72	1397.18	1848.43
GR	1398	1880.47	1398.49	1939.19	1397.1	1948.98	1395.35	1983.21	1395.56	2037.6
GR	1397.1	2048.74	1398.26	2075.91	1398.06	2120.88	1399.06	2134.9	1398.43	2144.26
GR	1398.3	2170								

ET			7.1				1955	2050		
X1	5700	16	1655	2155	305	295	300			
CI	1999.3	1390.59	306.035	4	4	50	0.01			
X3	0			1941		2057				
GR	1397.9	1655	1397.85	1684.1	1398.29	1732.32	1398.79	1761.79	1401.49	1775.76
GR	1398.6	1784.11	1398.75	1856.28	1400.18	1868.62	1399.46	1904.35	1397.59	1920.98
GR	1396.8	1932.77	1396.12	1997.39	1398.56	2022.4	1399.11	2089.75	1399.32	2121.15
GR	1398.8	2155								

ET			7.1				1950	2050		
X1	6000	16	1645	2145	310	290	300			
CI	2000.8	1391.42	307.035	4	4	50	0.01			
X3	0			1943		2059				
GR	1401.2	1645	1401.15	1675.54	1399.44	1699.45	1399.29	1709.68	1400.24	1720.04
GR	1399.6	1763.67	1399.3	1786.67	1399.81	1845.16	1398.41	1860.53	1397.24	1912.79
GR	1399.5	1956.47	1399.19	1966.98	1400.01	2002.26	1399.5	2025.72	1399.86	2088.49
GR	1399.7	2145								

INDIAN BEND WASH CONFLUENCE AND EMILE ZOLA CHANNEL

ET			7.1				1950	2050		
X1	6200	13	1635	2135	203	197	200			
CI	1996.9	1391.98	203.035	4	4	50	0.01			
X3	0			1936		2058				
GR	1400.5	1635	1400.22	1641.7	1400.2	1729.65	1400.45	1831.28	1399.06	1849.14
GR	1399.3	1904.49	1398.74	1934.25	1398.8	1986.26	1400.64	2022.68	1400.41	2067.73

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GR   1401.0    2079.61    1400.79    2094.85      1400.9        2135

ET                           7.1                                        1950        2050
X1     6500         15       1665       2165         308         292        300
CI   2000.8    1392.82    306.035          4           4          50       0.01
X3        0                             1948                    2054
GR   1402.4       1665     1401.8    1669.99     1401.09     1702.37     1401.04      1778.6      1401.8     1840.48
GR   1400.6     1867.5    1399.17    1899.73     1399.72     1929.38     1399.78     1956.12        1402     1982.73
GR   1402.1    2029.53     1401.2    2080.16      1401.6     2109.68     1400.89     2142.02      1401.8        2165
1
   07APR00      12:43:36                                                                                    PAGE    8


ET                           7.1                                        1950        2050
X1     6700         18       1705       2205         200         200        200
CI   2001.6    1393.37    202.035          4           4          50       0.01
X3        0                             1943                    2060
GR   1404.3       1705    1402.48    1746.94      1403.2     1758.01     1402.49     1767.51     1402.79     1791.25
GR   1403.2    1820.53    1402.77     1842.2      1402.8     1897.94     1401.34     1917.14     1401.32     1952.93
GR   1401.5    2002.75    1402.46    2012.84      1402.6     2078.46     1402.83     2123.04     1401.68     2140.76
GR   1402.9    2146.48    1401.35    2184.17      1402.2        2205

ET                           7.1                                        1955        2045
X1     7000         16       1760       2260         300         300        300
CI     1999    1394.19    300.035          4           4          50       0.01
GR   1405.5       1760    1403.86     1773.2      1403.4     1800.43     1403.14     1833.58      1403.2     1896.62
GR   1403.7    1929.69    1402.14    1956.06     1402.13     2009.95     1402.88     2066.78     1403.27     2083.74
GR   1404.2    2145.35    1403.67    2184.97     1404.13     2199.78     1403.39     2207.45     1402.16     2237.88
GR   1403.3       2260

ET                           7.1                                        1955        2045
X1     7400         15       1815       2315         400         400        400
CI   2000.5    1395.28    400.035          4           4          50       0.01
GR   1406.5       1815    1405.61    1863.39     1404.96     1891.23      1404.9     1955.29      1404.7     1998.94
GR   1403.1    2049.22    1403.43    2101.21     1404.65     2122.18     1405.18     2192.19      1404.9     2241.07
GR   1406.0    2246.99    1404.75    2251.02     1405.69     2256.25     1404.16     2274.59      1404.4        2315

ET                           7.1                                        1950        2060
X1     7500         13       1825       2325         100         100        100
CI   1998.9    1395.55    100.035          4           4          56       0.01
GR   1405.9       1825    1405.46    1866.36      1405.6     1883.11     1405.43     1991.35     1404.16     2025.71
GR   1403.5    2057.51    1404.12    2120.74      1405.9     2134.04     1405.79     2179.72     1404.98     2251.95
GR   1405.6    2269.05    1404.14     2300.5      1404.9        2325

NC     0.04       0.04      0.035        0.3         0.5

   DOWNSTREAM FACE OF THUNDERBIRD ROAD  CULVERT

ET                           7.1                                        1970        2025
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X1	7569	23	1460	3224.85	69	69	69			
CI	1991	1395.74	77.025	4	4	58	0.01			
X3	10			1962		2020				
GR	1407	1460	1407	1715.07	1407	1728.1	1406	1863.49	1405	1983.06
GR	1404	2033.73	1404	2123.07	1405	2276.62	1405	2286.71	1405	2448.38
GR	1406	2627.64	1407	2753	1407	2757.17	1407	2845.37	1407	2867.28
GR	1407	2867.82	1407	2867.95	1407	2870.79	1407	2871.89	1407	2874.19
GR	1408	2912.98	1408	2979.37	1411	3224.85				
SC	2.013	0.3	2.63	150	7.63	28	127	11.4	1394.46	1394.08

UPSTREAM FACE OF THUNDERBIRD ROAD CULVERT

ET			7.1				1495	1565		

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X1	7696	66	650.03	3118.14	128	128	128			
CI	1530	1396.12	110.025	4	4	58	0.01			
X2			2	1402.22	1405.41					
X3	10			1501		1559				
GR	1408	650.03	1407	1110	1406	1408.18	1406	1416.55	1406	1432.02
GR	1406	1466.92	1406	1513.59	1405	1583.82	1404	1631.4	1404	1633.08
GR	1404	1636.15	1404	1639.74	1404	1639.92	1404	1641.59	1405	1685.4
GR	1406	1705.15	1406	1712.36	1406	1712.52	1406	1724.07	1406	1727.28
GR	1407	1729.23	1406	1729.51	1406	1731.46	1406	1731.95	1406	1732.66
GR	1407	1734.57	1406	1734.72	1406	1746.02	1406	1766.04	1406	1819.57
GR	1407	1826.92	1407	1826.97	1407	1835.41	1407	1839.21	1407	1839.41
GR	1407	1839.62	1407	1839.66	1407	1839.68	1407	1840.25	1407	1840.42
GR	1407	1840.73	1407	1841.01	1407	1885.56	1407	1951.21	1406	1966.77
GR	1406	2000.05	1406	2144.24	1406	2149.31	1406	2215.1	1406	2218.3
GR	1407	2423.85	1408	2608.05	1409	2636.71	1409	2689.16	1410	2717.21
GR	1411	2749.75	1411	2780.34	1410	2839.54	1409	2948.81	1409	2961.02
GR	1410	2983.04	1411	2991.19	1412	2999.34	1413	3030.61	1413	3031.1
GR	1412	3118.14								
ET			7.1				1940	2050		
X1	7800	70	864.07	3201.38	104	104	104			
CI	2000	1396.44	113.025	4	4	60	0.01			
GR	1408	864.07	1407	1230	1407	1295.55	1407	1384.65	1407	1417.6
GR	1407	1534.46	1407	1547.78	1407	1554.15	1407	1568.22	1407	1569.74
GR	1406	1691.81	1405	1708.21	1405	1779.76	1406	1812.02	1407	1964.72
GR	1408	2000.96	1408	2055.49	1407	2072.04	1406	2087.02	1406	2104.05
GR	1407	2128.47	1407	2194.27	1407	2195.38	1407	2199.62	1407	2200.1
GR	1407	2209.13	1407	2209.72	1407	2210.02	1407	2210.04	1407	2218.49
GR	1407	2218.96	1407	2236.11	1407	2236.22	1407	2248.89	1407	2250.5
GR	1407	2250.57	1407	2251.85	1407	2251.92	1407	2252.06	1407	2254.36
GR	1407	2254.65	1407	2255.04	1407	2255.06	1407	2257.73	1407	2257.96
GR	1407	2259.67	1407	2259.68	1407	2259.94	1407	2262.61	1407	2263.6

GR	1407	2267.66	1407	2272.53	1407	2273.6	1407	2277.66	1407	2278.63
GR	1407	2430.16	1407	2463.72	1408	2485.7	1408	2553.48	1408	2570.52
GR	1408	2574.48	1408	2618.88	1408	2623.82	1408	2640.43	1408	2757.81
GR	1408	2771.01	1408	2807.13	1409	2877.21	1410	3084.48	1411	3201.38

DOWNSTREAM FACE OF SR51 CULVERT

ET			7.1				1930	2030		
X1	7987	90	608.19	2984.31	197	197	197			
CI	1479	1397.02	200.025	4	4	46	0.01			
X3	10			1456		1502				
GR	1409	608.19	1409	1110	1409	1124.92	1408	1227.14	1407	1245.35
GR	1407	1246.3	1408	1275.7	1408	1397.98	1407	1532.65	1406	1553.3
GR	1406	1636.36	1407	1783.34	1407	1798.67	1408	1825.84	1409	1849.98
GR	1409	1858.59	1408	1913.7	1407	1926.73	1407	1957.16	1408	1972.32
GR	1409	1990.28	1409	2014.39	1409	2014.72	1409	2014.82	1409	2017.75
GR	1408	2041.98	1408	2121.1	1408	2225.63	1408	2269.22	1408	2370.04
GR	1408	2379.67	1409	2403.37	1410	2404.9	1411	2406.56	1411	2555.99
GR	1411	2621.66	1410	2648.43	1410	2648.52	1409	2651.9	1409	2651.93
GR	1409	2652.47	1409	2653.86	1409	2653.93	1409	2653.94	1410	2654.16
GR	1410	2654.34	1409	2654.82	1409	2654.98	1409	2655.96	1409	2656.14

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GR	1409	2656.5	1409	2656.51	1409	2657.37	1409	2657.61	1409	2657.62
GR	1410	2659.55	1410	2659.75	1410	2663.01	1410	2663.67	1410	2676.27
GR	1410	2684.89	1410	2684.97	1410	2685.44	1410	2685.58	1410	2685.78
GR	1410	2687.56	1410	2687.94	1410	2690.3	1410	2690.86	1410	2690.9
GR	1410	2691.09	1410	2691.14	1410	2691.28	1410	2706.97	1410	2709.03
GR	1410	2714.06	1410	2716.3	1410	2716.34	1410	2716.37	1410	2717.28
GR	1410	2718.04	1410	2719.29	1410	2723.4	1410	2729.71	1410	2782.26
GR	1410	2810.17	1410	2844.2	1411	2855.4	1411	2973.49	1411	2984.31
NC	0.025	0.025	0.025							
SC	2.013	0.3	2.63	150	5.72	23	318	11.4	1398.24	1397.28

UPSTREAM FACE OF SR51 CULVERT

ET			7.1				1970	2055		
X1	8262	44	512.92	2649.24	275	275	275			
CI	1488	1397.98	270.025	4	4	46	0.01			
X2			2	1403.08	1409.1					
X3	10			1465		1511				
GR	1411	512.92	1409	1030	1408	1106.32	1408	1130.75	1409	1138.89
GR	1409	1230.46	1408	1384.81	1407	1406.51	1407	1510.06	1408	1534.86
GR	1408	1538.06	1408	1538.85	1408	1545.46	1408	1547.42	1408	1563.13
GR	1408	1605.7	1409	1673.82	1410	1722.35	1410	1728.72	1410	1729.33
GR	1410	1741.22	1409	1786.13	1408	1789.24	1408	1931.41	1409	2081.75

GR	1410	2105.48	1410	2107.34	1409	2172.49	1409	2200.24	1410	2206.82
GR	1411	2216.61	1412	2276.9	1412	2278.96	1412	2281.96	1412	2292
GR	1411	2371.28	1411	2421.75	1411	2449.27	1411	2492.46	1411	2546.63
GR	1411	2557.05	1411	2631.01	1411	2641.92	1412	2649.24		
ET			7.1				1955	2045		
X1	8400	67	856.92	2679.27	130	130	130			
CI	2000	1398.4	130.035	4	4	50	0.01			
GR	1411	856.92	1410	1110	1411	1233.95	1411	1234.34	1411	1245.45
GR	1411	1248.77	1411	1254.92	1411	1256.32	1411	1261.21	1411	1262.1
GR	1411	1262.91	1411	1263.59	1411	1264.28	1411	1279.11	1410	1319.63
GR	1409	1333.17	1409	1354.71	1410	1466.57	1409	1505.27	1408	1630.85
GR	1407	1638.84	1407	1722.75	1408	1745.25	1409	1878.81	1409	1885.4
GR	1409	1921.09	1410	1947.45	1410	2004.86	1409	2014.93	1408	2026.74
GR	1408	2036.58	1409	2116.52	1410	2126.21	1410	2127.76	1410	2129.14
GR	1410	2129.47	1410	2132.07	1410	2132.57	1410	2134.21	1410	2134.28
GR	1410	2134.32	1410	2134.92	1410	2135.33	1410	2138.68	1410	2142.3
GR	1410	2143.89	1410	2147	1410	2147.94	1410	2209.77	1410	2211.84
GR	1410	2213.42	1410	2213.84	1410	2215.75	1410	2215.76	1410	2215.86
GR	1410	2216.06	1410	2216.07	1410	2273.45	1410	2281.58	1409	2393.09
GR	1409	2395.42	1410	2432.15	1411	2546.36	1412	2656.46	1412	2660.77
GR	1412	2676.94	1412	2679.27						
ET			7.1				1955	2045		
X1	8600	90	1133.86	3179.03	200	200	200			
CI	2020	1399	200.025	4	4	50	0.01			
GR	1412	1110	1412	1133.86	1412	1233.13	1412	1241.37	1412	1253.24
GR	1412	1254.97	1412	1258.56	1412	1263.13	1412	1274.23	1412	1281.06
GR	1412	1304.18	1412	1306.13	1412	1318.08	1412	1318.09	1412	1318.51
GR	1412	1319.78	1412	1322.69	1412	1323.71	1412	1326.44	1412	1327.42

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GR	1412	1330.15	1412	1330.22	1412	1330.69	1412	1331	1412	1332.85
GR	1412	1332.86	1412	1333.04	1412	1333.13	1411	1373.31	1411	1414.28
GR	1411	1504.46	1411	1533.14	1411	1613.37	1410	1647.95	1410	1658.97
GR	1411	1670.92	1411	1748.67	1410	1771.49	1410	1774.05	1410	1796.22
GR	1410	1796.5	1410	1908.77	1409	1915.23	1409	1949.99	1409	1953.25
GR	1409	1953.36	1409	1953.37	1409	1953.47	1409	1953.47	1409	1954.25
GR	1410	1954.28	1408	2029.92	1409	2062.65	1409	2146.76	1409	2148.06
GR	1409	2152.41	1409	2156.07	1409	2168.46	1409	2173.63	1409	2181.99
GR	1409	2182.68	1410	2229.65	1410	2308.33	1409	2318.15	1409	2357.34
GR	1410	2375.91	1409	2490.42	1409	2498.84	1409	2499.7	1409	2538.08
GR	1410	2592.52	1411	2723.15	1411	2726.46	1411	2886.31	1412	2950.45
GR	1412	2950.46	1412	2950.74	1412	2950.75	1412	2950.78	1412	2951.06
GR	1412	2953.02	1412	2953.09	1412	2953.35	1412	2956.5	1411	3015.15
GR	1411	3015.46	1412	3105.83	1412	3142.29	1412	3156.35	1413	3179.03
ET			7.1				1955	2045		

X1	8690	90	1080	3203.86	90	90	90			
CI	2000	1399.27	90.025	4	4	50	0.01			
GR	1413	1080	1413	1201.62	1412	1270.57	1411	1381.7	1411	1432.29
GR	1411	1622.83	1411	1772.29	1410	1933.62	1409	1960.23	1409	2053.43
GR	1411	2290.35	1411	2299.96	1410	2319.37	1409	2340.38	1409	2360.47
GR	1410	2382.57	1411	2461.67	1411	2523.2	1411	2524.9	1411	2525.12
GR	1411	2526.36	1411	2526.58	1411	2529.38	1411	2530.2	1411	2530.33
GR	1411	2530.37	1411	2537.17	1411	2539.91	1411	2540.97	1411	2541.15
GR	1411	2542.9	1411	2543.52	1411	2544.12	1411	2544.22	1411	2545.11
GR	1411	2545.55	1411	2546.35	1411	2548.68	1411	2552.96	1411	2560.56
GR	1411	2577.6	1411	2578.41	1411	2580.89	1411	2581.32	1411	2582.75
GR	1411	2583.1	1411	2584.49	1411	2585.46	1411	2589.83	1411	2589.84
GR	1411	2590.97	1411	2591.42	1411	2593.72	1411	2593.88	1411	2594.78
GR	1411	2594.8	1411	2594.91	1411	2595.64	1411	2600.2	1411	2600.27
GR	1411	2602.5	1411	2602.56	1411	2604.35	1411	2604.45	1411	2607.13
GR	1411	2607.3	1411	2611.77	1411	2611.78	1411	2612.45	1411	2612.46
GR	1411	2612.85	1411	2612.85	1411	2613.03	1411	2613.07	1411	2613.63
GR	1411	2613.7	1411	2613.73	1411	2615.7	1411	2616.89	1411	2616.89
GR	1411	2617.19	1411	2617.27	1410	2678.72	1410	2789.04	1412	2990.9
GR	1412	2991.85	1411	3075.65	1411	3077.75	1412	3109.82	1412	3203.86
ET			7.1				1930	2070		
X1	8850	90	1020	3253.96	160	160	160			
CI	2000	1408	160.025	4	4	65	0.01			
GR	1413	1020	1413	1066.06	1414	1157.96	1414	1225.35	1413	1257.01
GR	1412	1403.8	1412	1419.91	1412	1686.97	1411	1873.38	1410	1988.67
GR	1409	1992.76	1409	2005.76	1409	2006.54	1409	2006.97	1409	2007.12
GR	1409	2007.34	1409	2007.34	1409	2007.47	1409	2007.47	1409	2008.6
GR	1409	2009.03	1409	2009.13	1409	2009.14	1409	2010.61	1409	2010.72
GR	1409	2011.33	1409	2011.33	1409	2011.66	1409	2011.68	1409	2011.83
GR	1409	2012.03	1409	2012.04	1409	2012.06	1409	2012.14	1409	2012.24
GR	1409	2012.24	1409	2012.25	1409	2012.58	1409	2012.61	1409	2018.76
GR	1409	2022.36	1409	2022.86	1409	2023.28	1409	2026.03	1409	2028.59
GR	1409	2028.79	1409	2029.01	1409	2030.56	1409	2032.37	1409	2032.38
GR	1409	2032.4	1409	2032.51	1409	2032.66	1409	2034.3	1409	2037.44
GR	1409	2045.64	1409	2049.97	1409	2054.27	1409	2062.15	1410	2140.84
GR	1410	2206.71	1410	2227.78	1410	2233.96	1410	2235.7	1411	2263.13
GR	1411	2353.92	1410	2367.07	1410	2404.23	1411	2418.56	1411	2497.93

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GR	1411	2532.07	1411	2615.26	1411	2618.99	1411	2621.18	1411	2630.08
GR	1411	2634.79	1411	2753.69	1411	2812.11	1411	2840	1412	2875.32
GR	1412	2959.23	1412	2974.51	1412	2986.82	1412	3001.14	1412	3034.53
GR	1412	3061.92	1413	3096.4	1414	3181.83	1414	3248.62	1414	3253.96
ET			7.1				1930	2070		
X1	8851	90	1020	3253.96	1	1	1			
CI						0.01				

GR	1413	1020	1413	1066.06	1414	1157.96	1414	1225.35	1413	1257.01
GR	1412	1403.8	1412	1419.91	1412	1686.97	1411	1873.38	1410	1988.67
GR	1409	1992.76	1409	2005.76	1409	2006.54	1409	2006.97	1409	2007.12
GR	1409	2007.34	1409	2007.34	1409	2007.47	1409	2007.47	1409	2008.6
GR	1409	2009.03	1409	2009.13	1409	2009.14	1409	2010.61	1409	2010.72
GR	1409	2011.33	1409	2011.33	1409	2011.66	1409	2011.68	1409	2011.83
GR	1409	2012.03	1409	2012.04	1409	2012.06	1409	2012.14	1409	2012.24
GR	1409	2012.24	1409	2012.25	1409	2012.58	1409	2012.61	1409	2018.76
GR	1409	2022.36	1409	2022.86	1409	2023.28	1409	2026.03	1409	2028.59
GR	1409	2028.79	1409	2029.01	1409	2030.56	1409	2032.37	1409	2032.38
GR	1409	2032.4	1409	2032.51	1409	2032.66	1409	2034.3	1409	2037.44
GR	1409	2045.64	1409	2049.97	1409	2054.27	1409	2062.15	1410	2140.84
GR	1410	2206.71	1410	2227.78	1410	2233.96	1410	2235.7	1411	2263.13
GR	1411	2353.92	1410	2367.07	1410	2404.23	1411	2418.56	1411	2497.93
GR	1411	2532.07	1411	2615.26	1411	2618.99	1411	2621.18	1411	2630.08
GR	1411	2634.79	1411	2753.69	1411	2812.11	1411	2840	1412	2875.32
GR	1412	2959.23	1412	2974.51	1412	2986.82	1412	3001.14	1412	3034.53
GR	1412	3061.92	1413	3096.4	1414	3181.83	1414	3248.62	1414	3253.96
ET			7.1				1930	2070		
X1	9000	90	950	3172.52	150	150	150			
GR	1414	950	1414	1136.81	1413	1315.28	1413	1501.06	1413	1692.5
GR	1412	1719.17	1412	1750.48	1412	1750.92	1412	1751.69	1412	1752.06
GR	1412	1752.73	1412	1753.22	1412	1754.17	1412	1754.55	1412	1755.32
GR	1412	1759.46	1412	1771.05	1412	1771.42	1412	1773.49	1412	1773.58
GR	1412	1773.87	1412	1774.19	1412	1775.87	1412	1776.79	1412	1778.84
GR	1412	1780.78	1412	1781.45	1412	1782.97	1412	1783.88	1412	1848.08
GR	1411	1902.72	1410	1933.54	1409	1983.96	1409	1984.11	1409	1985.19
GR	1409	1985.26	1409	1985.37	1409	1985.38	1409	1986.05	1409	1986.1
GR	1409	1986.93	1409	1987.01	1409	2001.17	1409	2004.4	1409	2008.97
GR	1409	2011.35	1409	2016.04	1409	2018.72	1410	2054.46	1411	2270.97
GR	1411	2337.3	1411	2383.58	1412	2399.21	1412	2485.56	1411	2534.15
GR	1411	2544.46	1411	2546.14	1411	2548.4	1411	2548.68	1411	2549.64
GR	1411	2550.31	1411	2551.99	1411	2552.61	1411	2553.14	1411	2555.46
GR	1411	2557.01	1411	2557.87	1411	2558.14	1411	2562.73	1411	2566.32
GR	1411	2574.93	1411	2581.44	1412	2656.61	1412	2657.17	1412	2665.6
GR	1412	2665.66	1412	2665.76	1412	2668.87	1412	2792.48	1412	2898.1
GR	1412	2904.48	1412	2923.58	1412	2928.66	1412	2965.87	1411	3035.9
GR	1411	3036	1411	3037.04	1411	3037.04	1412	3058.29	1413	3172.52
ET			7.1				1930	2070		
X1	9340	39	970	3055	365	310	340			
GR	1415	970	1416	990	1416	1005	1415	1160	1415	1215
GR	1416	1315	1416	1340	1415	1385	1414	1480	1413	1680
GR	1413	1690	1414	1695	1414	1697	1413	1700	1413	1710
GR	1413	1810	1412	1860	1411	1870	1410	1910	1410	1960

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GR	1411	2050	1412	2150	1413	2180	1413	2210	1412	2230
GR	1411	2240	1411	2295	1412	2297	1413	2305	1414	2345
GR	1414	2370	1413	2420	1412	2430	1412	2700	1412	2720
GR	1412	2740	1412	2800	1413	2985	1413	3055		
ET			7.1				1970	2110		
X1	9731	90	760	2773.41	390	390	390			
GR	1418	760	1418	922.34	1418	922.4	1418	922.43	1418	922.43
GR	1418	928.22	1418	928.32	1418	929.93	1418	929.94	1418	930.06
GR	1418	930.53	1418	930.54	1418	930.55	1418	930.61	1418	931.15
GR	1418	931.15	1418	931.23	1418	944.85	1418	947.36	1418	950.6
GR	1418	951.25	1418	956.72	1418	958.21	1418	958.21	1418	958.28
GR	1418	958.56	1418	958.63	1418	958.68	1418	958.69	1418	958.77
GR	1418	958.79	1418	964.02	1418	965.06	1418	965.36	1418	965.86
GR	1418	965.95	1418	968.93	1418	969.48	1418	969.73	1418	969.78
GR	1418	970.35	1418	970.45	1418	973.91	1418	974.21	1418	977.24
GR	1418	977.5	1418	977.7	1417	1006.47	1417	1047.64	1417	1050.75
GR	1417	1060.43	1417	1063.48	1417	1068.87	1417	1070.37	1417	1072.21
GR	1417	1074.65	1417	1078.54	1417	1082.36	1417	1089.56	1417	1095.1
GR	1417	1111.87	1417	1112.38	1417	1115.19	1417	1117.85	1417	1136.64
GR	1417	1136.64	1417	1137.18	1417	1137.31	1416	1220.86	1415	1306.6
GR	1415	1321.67	1416	1349.77	1416	1452.86	1415	1776.17	1414	1804.87
GR	1413	1931.54	1412	1948.34	1411	1967.28	1410	1985.74	1410	2059.52
GR	1411	2094.96	1412	2165.75	1413	2563.47	1413	2566.11	1413	2691.1
GR	1413	2773.41	1413	2773.6	1413	2774.13	1413	2774.63	1413	2774.65
ET			7.1				1980	2120		
X1	9930	90	810	2599.07	203	203	203			
GR	1419	810	1419	947.42	1418	1088.3	1418	1251.74	1418	1253.15
GR	1418	1255.5	1418	1258.42	1418	1258.54	1418	1258.84	1418	1259.77
GR	1418	1261.36	1418	1262.77	1418	1266.01	1418	1269.27	1417	1329.2
GR	1416	1356.04	1415	1384.98	1415	1403.54	1416	1413.27	1417	1422.94
GR	1417	1457.51	1417	1458.08	1417	1484.49	1416	1735.65	1415	1870.22
GR	1414	1882.6	1414	1884.75	1414	1920.8	1413	1940.15	1412	1965.06
GR	1411	1985.36	1411	2054.46	1412	2135.63	1413	2174.95	1414	2205.27
GR	1414	2254.2	1414	2254.82	1414	2255.03	1414	2258.78	1414	2260.2
GR	1414	2262.39	1414	2263.11	1414	2263.82	1414	2265.21	1414	2267.2
GR	1414	2269.28	1414	2271.46	1414	2272.12	1414	2272.7	1414	2275.18
GR	1414	2278.3	1414	2278.35	1414	2278.38	1414	2279.18	1414	2280.06
GR	1414	2280.07	1414	2280.07	1414	2280.23	1414	2280.4	1414	2280.4
GR	1414	2280.4	1414	2280.61	1414	2280.83	1414	2281.51	1414	2282.3
GR	1414	2284.42	1414	2287.41	1414	2287.8	1414	2288.44	1414	2289.99
GR	1414	2292.95	1414	2293.08	1414	2293.38	1414	2293.71	1414	2294.46
GR	1414	2294.67	1414	2295.16	1414	2297.89	1414	2306.33	1414	2310.05
GR	1414	2312.76	1414	2316.49	1414	2319.2	1414	2326.43	1414	2327.11
GR	1415	2358.47	1415	2379.63	1414	2428.07	1413	2506.01	1413	2599.07
ET			7.1				1970	2110		
X1	10120	24	1140	2590	193	193	193			
GR	1418	1140	1418	1500	1417	1530	1417	1540	1417	1625

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 GR     1417       1760       1416       1790       1415       1815       1414       1860       1413       1870
 GR     1412       1880       1412       1940       1413       2030       1414       2180       1415       2270
 GR     1415       2290       1414       2300       1413       2380       1412       2390       1412       2410
 GR     1413       2430       1414       2470       1415       2490       1416       2590
1
    07APR00      12:43:36                                                                                  PAGE   14


 ET                           7.1                                          1930       2070
 X1    10600          6       1670       2170        480        480        480
 GR     1418       1670       1417       1740       1417       1830       1416       1920       1417       2170
 GR     1418       2200
1
    07APR00      12:43:36                                                                                  PAGE   15

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *PROF 1
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1140.000
 CHIMP CLSTA=    2011.10 CELCH=    1379.87 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=        9.2SQ-FT     VEXR=        .0K*CU-YD     VEXT=         .0K*CU-YD

   1140.000      4.78   1383.58       .00   1383.58   1384.04       .46       .00       .00   1384.30
     6000.0        .0    6000.0        .0        .0    1096.6        .0        .0        .0   1388.90
        .00       .00      5.47       .00      .000      .035      .000      .000   1378.80   1757.63
    .005068        0.        0.        0.         0         0         0       .00    449.86   2207.49


 *SECNO 1300.000
 CHIMP CLSTA=    2080.60 CELCH=    1380.16 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=       55.0SQ-FT     VEXR=        .1K*CU-YD     VEXT=         .1K*CU-YD

   1300.000      3.86   1384.02       .00       .00   1384.80       .78       .66       .10   1387.80
     6000.0        .0    6000.0        .0        .0     844.3        .0       2.2        .9   1388.70
        .00       .00      7.11       .00      .000      .035      .000      .000   1380.16   1824.23
    .008958      100.      100.      100.         2         0         0       .00    358.65   2182.88


 *SECNO 1500.000
```

```
CHIMP CLSTA=    2116.30 CELCH=    1380.51 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2046.00 CELCH=    1382.21 BW=     200.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     351.6SQ-FT     VEXR=       1.5K*CU-YD     VEXT=        1.6K*CU-YD

  1500.000      4.98   1385.49       .00       .00   1386.07       .58      1.25       .02   1389.20
    6000.0        .0    6000.0        .0        .0     979.0        .0       6.4       2.5   1389.40
       .01       .00      6.13       .00      .000      .035      .000      .000   1380.51   1857.15
   .004613      200.      200.      200.         2         0         0       .00    315.08   2172.23


*SECNO 1800.000
CHIMP CLSTA=    2119.60 CELCH=    1381.03 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2049.50 CELCH=    1383.49 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
1
   07APR00      12:43:36                                                                          PAGE   16


    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


EXCAVATION DATA
AEX=     596.5SQ-FT     VEXR=       5.3K*CU-YD     VEXT=        6.9K*CU-YD

  1800.000      5.98   1387.01       .00       .00   1387.72       .71      1.61       .04   1389.60
    6000.0        .0    6000.0        .0        .0     888.3        .0      12.8       4.6   1390.80
       .03       .00      6.75       .00      .000      .035      .000      .000   1381.03   1851.70
   .006298      300.      300.      300.         3         0         0       .00    311.81   2163.51


*SECNO 2100.000
CHIMP CLSTA=    2122.60 CELCH=    1381.55 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2052.50 CELCH=    1384.55 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     648.5SQ-FT     VEXR=       6.9K*CU-YD     VEXT=       13.8K*CU-YD

  2100.000      7.07   1388.62       .00       .00   1389.06       .44      1.32       .03   1391.50
    6000.0        .0    6000.0        .0        .0    1121.4        .0      19.8       6.9   1391.90
       .04       .00      5.35       .00      .000      .035      .000      .000   1381.55   1830.90
   .003253      300.      300.      300.         1         0         0       .00    340.02   2170.92


*SECNO 2400.000
CHIMP CLSTA=    2125.50 CELCH=    1382.07 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2055.50 CELCH=    1385.07 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     660.0SQ-FT     VEXR=       7.3K*CU-YD     VEXT=       21.1K*CU-YD
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  2400.000      7.47   1389.54       .00       .00   1389.90       .36       .82       .01   1392.00
    6000.0        .0    6000.0        .0        .0    1249.5        .0      27.9       9.2   1392.50
       .06       .00      4.80       .00      .000      .035      .000      .000   1382.07   1826.87
   .002344      300.      300.      300.         2         0         0       .00    348.48   2175.35


*SECNO 2700.000
CHIMP CLSTA=    2124.60 CELCH=    1382.59 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2054.40 CELCH=    1385.09 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     582.0SQ-FT     VEXR=       6.9K*CU-YD     VEXT=       28.0K*CU-YD

  2700.000      7.61   1390.20       .00       .00   1390.50       .30       .60       .01   1392.70
    6000.0        .0    6000.0        .0        .0    1359.5        .0      36.9      11.6   1393.30
       .08       .00      4.41       .00      .000      .035      .000      .000   1382.59   1834.16
   .001740      300.      300.      300.         2         0         0       .00    344.26   2178.42


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   07APR00      12:43:36                                                                                PAGE   17


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 2900.000
CHIMP CLSTA=    2122.80 CELCH=    1382.94 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2053.00 CELCH=    1385.94 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     450.1SQ-FT     VEXR=       3.8K*CU-YD     VEXT=       31.8K*CU-YD

  2900.000      7.63   1390.57       .00       .00   1390.83       .26       .32       .00   1393.30
    6000.0        .0    6000.0        .0        .0    1461.0        .0      43.4      13.3   1393.60
       .09       .00      4.11       .00      .000      .035      .000      .000   1382.94   1815.18
   .001473      200.      200.      200.         2         0         0       .00    363.77   2178.95


*SECNO 3000.000
CHIMP CLSTA=    2121.80 CELCH=    1383.11 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2052.00 CELCH=    1386.11 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     445.3SQ-FT     VEXR=       1.7K*CU-YD     VEXT=       33.5K*CU-YD

  3000.000      7.60   1390.71       .00       .00   1390.98       .26       .15       .00   1394.10
    6000.0        .0    6000.0        .0        .0    1462.5        .0      46.7      14.1   1393.50
       .10       .00      4.10       .00      .000      .035      .000      .000   1383.11   1815.52
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   .001476      100.      100.      100.         1         0         0       .00    365.13   2180.66


 *SECNO 3300.000
 CHIMP CLSTA=    2119.10 CELCH=    1383.63 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2049.00 CELCH=    1386.63 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     506.6SQ-FT     VEXR=       5.3K*CU-YD     VEXT=       38.7K*CU-YD

  3300.000      7.54   1391.17       .00       .00   1391.47       .29       .48       .01   1394.90
    6000.0        .0    6000.0        .0        .0    1376.6        .0      56.5      16.6   1394.30
       .12       .00      4.36       .00      .000      .035      .000      .000   1383.63   1817.95
   .001767      300.      300.      300.         1         0         0       .00    359.25   2177.20


 *SECNO 3600.000
 CHIMP CLSTA=    2118.30 CELCH=    1384.15 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2048.50 CELCH=    1387.15 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     521.3SQ-FT     VEXR=       5.8K*CU-YD     VEXT=       44.6K*CU-YD

  3600.000      7.57   1391.72       .00       .00   1392.03       .32       .56       .01   1394.20
    6000.0        .0    6000.0        .0        .0    1324.1        .0      66.0      19.1   1395.20
       .14       .00      4.53       .00      .000      .035      .000      .000   1384.15   1824.20
   .001902      304.      305.      298.         2         0         0       .00    344.36   2168.56


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   07APR00      12:43:36                                                                          PAGE    18

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 *SECNO 3900.000
 CHIMP CLSTA=    2045.60 CELCH=    1384.60 BW=      39.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2000.60 CELCH=    1388.40 BW=     154.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     475.7SQ-FT     VEXR=       5.9K*CU-YD     VEXT=       50.5K*CU-YD

  3900.000      7.79   1392.39       .00       .00   1392.78       .40       .73       .02   1394.00
    6000.0        .0    6000.0        .0        .0    1188.2        .0      75.2      21.6   1395.60
       .15       .00      5.05       .00      .000      .035      .000      .000   1384.60   1820.73
   .002758      305.      320.      295.         2         0         0       .00    347.21   2167.95


 *SECNO 4000.000
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CHIMP CLSTA=    2017.40 CELCH=    1385.00 BW=      45.00 STCHL=    1730.00 STCHR=    2230.00
CHIMP CLSTA=    1980.40 CELCH=    1388.50 BW=     140.00 STCHL=    1730.00 STCHR=    2230.00
EXCAVATION DATA
AEX=     468.8SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       52.2K*CU-YD

  4000.000      7.68   1392.68       .00       .00   1393.07       .39       .28       .00   1395.80
    6000.0        .0    6000.0        .0        .0    1194.9        .0      78.0      22.4   1394.20
       .16       .00      5.02       .00      .000      .035      .000      .000   1385.00   1805.79
   .002773       95.      102.      105.         2         0         0       .00    353.64   2159.43


*SECNO 4100.000
CHIMP CLSTA=    2002.70 CELCH=    1385.06 BW=      72.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    1929.00 CELCH=    1388.06 BW=      62.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     686.4SQ-FT     VEXR=       2.1K*CU-YD     VEXT=       54.4K*CU-YD

  4100.000      7.90   1392.96       .00       .00   1393.31       .35       .24       .00   1395.60
    6000.0        .0    6000.0        .0        .0    1263.4        .0      80.8      23.2   1394.40
       .16       .00      4.75       .00      .000      .035      .000      .000   1385.06   1823.63
   .002021      102.      100.       98.         0         0         0       .00    320.32   2143.95


CCHV=     .300 CEHV=     .500
*SECNO 4190.000
CHIMP CLSTA=    2000.00 CELCH=    1385.23 BW=      76.00 STCHL=    1935.45 STCHR=    2069.33
EXCAVATION DATA
AEX=     725.1SQ-FT     VEXR=       2.3K*CU-YD     VEXT=       56.7K*CU-YD

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   07APR00      12:43:36                                                                          PAGE   19

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1391.87 ELREA=      1393.06

  4190.000      7.74   1392.97       .00       .00   1393.67       .71       .19       .18   1391.87
    6000.0     304.0    5696.0        .0     142.1     825.5        .0      83.1      23.8   1393.06
       .17      2.14      6.90       .00      .040      .035      .000      .000   1385.23   1820.48
   .002369       92.       87.       88.         2         0         0       .00    248.48   2068.96


SPECIAL CULVERT
```

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	6	.013	.30	2.63	.00	8.00	12.00	66.00	11	4	1385.42	1385.22

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE 4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 4256.000
CHIMP CLSTA= 2000.00 CELCH= 1385.42 BW= 76.00 STCHL= 1934.14 STCHR= 2069.09
EXCAVATION DATA
AEX= 813.4SQ-FT VEXR= 1.9K*CU-YD VEXT= 58.5K*CU-YD

5175, 20 TRIALS OF QELTRD NOT ENOUGH; ASSUMED = 2979.335

SPECIAL CULVERT OUTLET CONTROL + WEIR FLOW EG = 1395.04

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.07

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1394.97	1395.44	1.36	509.	5481.	5.345	576.0	1393.39	222.

4256.000	9.21	1394.63	.00	.00	1395.04	.41	1.36	.00	1392.39
6000.0	417.7	5479.8	102.5	281.9	1025.3	115.6	84.9	24.3	1393.19
.17	1.48	5.34	.89	.040	.025	.040	.000	1385.42	1801.74
.000551	69.	66.	63.	2	0	0	.00	398.81	2231.18

*SECNO 4400.000
CHIMP CLSTA= 2000.00 CELCH= 1385.86 BW= 72.00 STCHL= 1750.00 STCHR= 2250.00
CHIMP CLSTA= 2026.00 CELCH= 1385.86 BW= 40.00 STCHL= 1750.00 STCHR= 2250.00
EXCAVATION DATA
AEX= 821.4SQ-FT VEXR= 4.5K*CU-YD VEXT= 63.0K*CU-YD

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59

  4400.000      8.96   1394.82       .00       .00   1395.18       .36       .13       .01   1395.10
    6000.0        .0    6000.0        .0        .0    1242.2        .0      89.4      25.6   1395.80
       .18       .00      4.83       .00      .000      .025      .000      .000   1385.86   1752.61
   .001591      149.      147.      141.         2         0         0       .00    425.36   2177.97


CCHV=     .100 CEHV=     .300
*SECNO 4500.000
CHIMP CLSTA=    2000.00 CELCH=    1386.17 BW=      65.00 STCHL=    1700.00 STCHR=    2270.00
CHIMP CLSTA=    2056.00 CELCH=    1386.17 BW=      56.00 STCHL=    1700.00 STCHR=    2270.00
EXCAVATION DATA
AEX=    1123.6SQ-FT     VEXR=       3.6K*CU-YD     VEXT=       66.6K*CU-YD


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.69

  4500.000      8.79   1394.96       .00       .00   1395.27       .31       .09       .01   1397.20
    6000.0        .0    6000.0        .0        .0    1344.7        .0      92.3      26.4   1397.10
       .19       .00      4.46       .00      .000      .025      .000      .000   1386.17   1932.33
   .000558      102.      100.       98.         2         0         0       .00    235.37   2167.70


*SECNO 4573.000
CHIMP CLSTA=    2000.00 CELCH=    1386.40 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     764.1SQ-FT     VEXR=       2.6K*CU-YD     VEXT=       69.2K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .24


3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000
  4573.000      6.99   1393.39       .00       .00   1396.10      2.71       .11       .72 100000.00
    6000.0        .0    6000.0        .0        .0     454.4        .0      93.9      26.7 100000.00
       .19       .00     13.20       .00      .000      .035      .000      .000   1386.40   1967.50
   .009380       75.       74.       71.         4         0         0       .00     65.00   2032.50
```

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV

Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
*SECNO 4574.000
CHIMP CLSTA=    2000.00 CELCH=    1387.55 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     611.9SQ-FT     VEXR=       1.9K*CU-YD     VEXT=       71.1K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41


3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  4574.000      8.75   1396.30       .00       .00   1396.57       .28       .23       .24 100000.00
    2400.0        .0    2400.0        .0        .0     568.5        .0      94.7      26.8 100000.00
       .19       .00      4.22       .00      .000      .035      .000      .000   1387.55   1967.50
   .000754        1.       74.        1.         3         0         0       .00     65.00   2032.50


SPECIAL CULVERT

SC  CUNO       CUNV       ENTLC      COFQ       RDLEN      RISE       SPAN       CULVLN     CHRT       SCL        ELCHU      ELCHD
     6          .013       .20       2.63      500.00      8.00      10.00      72.00      11          4        1387.69    1387.55

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 4646.000
CHIMP CLSTA=    2000.00 CELCH=    1387.69 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     692.3SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       72.9K*CU-YD


SPECIAL CULVERT OUTLET CONTROL
EGIC =   1393.516  EGOC =   1396.811  PCWSE=   1396.298  ELTRD=   1398.000

SPECIAL CULVERT

     EGIC       EGOC        H4      QWEIR      QCULV       VCH      ACULV      ELTRD     WEIRLN
   1393.52    1396.81       .24        0.      2400.     4.171      480.0    1398.00        0.
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3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000
1
   07APR00      12:43:36                                                                                  PAGE   22

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  4646.000      8.85   1396.54       .00       .00   1396.81       .27       .24       .00 100000.00
    2400.0        .0    2400.0        .0        .0     575.3        .0      95.7      26.9 100000.00
       .20       .00      4.17       .00      .000      .035      .000      .000   1387.69   1967.50
   .000727       74.       74.       70.         2         0         0       .00     65.00   2032.50


*SECNO 4800.000
CHIMP CLSTA=    2000.90 CELCH=    1388.11 BW=      50.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     449.9SQ-FT     VEXR=       3.2K*CU-YD     VEXT=       76.1K*CU-YD


3470 ENCROACHMENT STATIONS=     1927.0    2075.0  TYPE=      1  TARGET=      148.000
  4800.000      8.65   1396.76       .00       .00   1396.92       .16       .10       .01 100000.00
    2400.0        .0    2400.0        .0        .0     738.6        .0      98.0      27.2 100000.00
       .21       .00      3.25       .00      .000      .035      .000      .000   1388.11   1927.00
   .000616      157.      152.      151.         2         0         0       .00    133.91   2060.91


CCHV=     .100 CEHV=     .300
*SECNO 5000.000
CHIMP CLSTA=    2002.10 CELCH=    1388.66 BW=      50.00 STCHL=    1730.00 STCHR=    2230.00
EXCAVATION DATA
AEX=     503.5SQ-FT     VEXR=       3.6K*CU-YD     VEXT=       79.6K*CU-YD


3470 ENCROACHMENT STATIONS=     1934.0    2070.0  TYPE=      1  TARGET=      136.000
  5000.000      8.22   1396.88       .00       .00   1397.05       .17       .12       .00 100000.00
    2400.0        .0    2400.0        .0        .0     720.8        .0     101.4      27.8 100000.00
       .23       .00      3.33       .00      .000      .035      .000      .000   1388.66   1934.00
   .000621      208.      202.      192.         1         0         0       .00    126.01   2060.01


*SECNO 5300.000
```

```
CHIMP CLSTA=    1999.40 CELCH=    1389.49 BW=      50.00 STCHL=    1680.00 STCHR=    2180.00
EXCAVATION DATA
AEX=     469.6SQ-FT     VEXR=       5.5K*CU-YD     VEXT=       85.1K*CU-YD

3470 ENCROACHMENT STATIONS=     1941.5    2057.5  TYPE=      1  TARGET=      116.000
1
   07APR00      12:43:36                                                                                PAGE   23

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

  5300.000      7.57   1397.06        .00        .00   1397.29        .23        .22        .02 100000.00
    2400.0        .0    2400.0         .0         .0     623.2         .0      106.1       28.7 100000.00
       .25       .00      3.85        .00       .000      .035       .000       .000    1389.49   1941.50
   .000883      309.      306.       291.          0         0          0        .00     113.20   2054.70

*SECNO 5400.000
CHIMP CLSTA=    1999.40 CELCH=    1389.76 BW=      50.00 STCHL=    1670.00 STCHR=    2170.00
EXCAVATION DATA
AEX=     457.7SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       86.9K*CU-YD

3470 ENCROACHMENT STATIONS=     1941.5    2057.5  TYPE=      1  TARGET=      116.000
  5400.000      7.38   1397.14        .00        .00   1397.40        .26        .10        .01 100000.00
    2400.0        .0    2400.0         .0         .0     586.7         .0      107.5       28.9 100000.00
       .26       .00      4.09        .00       .000      .035       .000       .000    1389.76   1944.89
   .001007      102.      102.        98.          0         0          0        .00     109.03   2053.91

*SECNO 5700.000
CHIMP CLSTA=    1999.30 CELCH=    1390.59 BW=      50.00 STCHL=    1655.00 STCHR=    2155.00
EXCAVATION DATA
AEX=     515.9SQ-FT     VEXR=       5.5K*CU-YD     VEXT=       92.4K*CU-YD

3470 ENCROACHMENT STATIONS=     1941.0    2057.0  TYPE=      1  TARGET=      116.000
  5700.000      6.87   1397.46        .00        .00   1397.77        .31        .36        .01 100000.00
    2400.0        .0    2400.0         .0         .0     538.4         .0      111.5       29.7 100000.00
       .28       .00      4.46        .00       .000      .035       .000       .000    1390.59   1941.00
   .001377      305.      306.       295.          2         0          0        .00     110.79   2051.79

*SECNO 6000.000
CHIMP CLSTA=    2000.80 CELCH=    1391.42 BW=      50.00 STCHL=    1645.00 STCHR=    2145.00
```

```
EXCAVATION DATA
AEX=      672.5SQ-FT      VEXR=        6.8K*CU-YD      VEXT=        99.2K*CU-YD


3470 ENCROACHMENT STATIONS=      1943.0     2059.0  TYPE=       1  TARGET=       116.000
  6000.000       6.46   1397.88        .00        .00   1398.25        .37        .46        .02 100000.00
    2400.0         .0    2400.0         .0         .0     490.1         .0      115.1       30.4 100000.00
       .29        .00      4.90        .00       .000      .035       .000       .000    1391.42   1949.95
   .001669       310.      307.       290.          2         0          0        .00     101.69   2051.65


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   07APR00       12:43:36                                                                                    PAGE    24

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 6200.000
CHIMP CLSTA=     1996.90 CELCH=     1391.98 BW=       50.00 STCHL=     1635.00 STCHR=     2135.00
EXCAVATION DATA
AEX=      612.2SQ-FT      VEXR=        4.8K*CU-YD      VEXT=       104.0K*CU-YD


3470 ENCROACHMENT STATIONS=      1936.0     2058.0  TYPE=       1  TARGET=       122.000
  6200.000       6.24   1398.22        .00        .00   1398.63        .41        .36        .01 100000.00
    2400.0         .0    2400.0         .0         .0     467.5         .0      117.3       30.9 100000.00
       .30        .00      5.13        .00       .000      .035       .000       .000    1391.98   1946.95
   .001906       203.      203.       197.          2         0          0        .00      99.90   2046.85


*SECNO 6500.000
CHIMP CLSTA=     2000.80 CELCH=     1392.82 BW=       50.00 STCHL=     1665.00 STCHR=     2165.00
EXCAVATION DATA
AEX=      734.9SQ-FT      VEXR=        7.6K*CU-YD      VEXT=       111.6K*CU-YD


3470 ENCROACHMENT STATIONS=      1948.0     2054.0  TYPE=       1  TARGET=       106.000
  6500.000       5.99   1398.81        .00        .00   1399.27        .46        .63        .01 100000.00
    2400.0         .0    2400.0         .0         .0     443.4         .0      120.5       31.6 100000.00
       .32        .00      5.41        .00       .000      .035       .000       .000    1392.82   1951.83
   .002215       308.      306.       292.          2         0          0        .00      97.95   2049.77


*SECNO 6700.000
CHIMP CLSTA=     2001.60 CELCH=     1393.37 BW=       50.00 STCHL=     1705.00 STCHR=     2205.00
EXCAVATION DATA
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AEX=     718.7SQ-FT     VEXR=       5.4K*CU-YD     VEXT=      117.1K*CU-YD

3470 ENCROACHMENT STATIONS=     1943.0    2060.0  TYPE=      1  TARGET=      117.000
  6700.000      5.89   1399.26       .00       .00   1399.74       .48       .46       .01 100000.00
    2400.0        .0    2400.0        .0        .0     433.3        .0     122.6      32.1 100000.00
       .33       .00      5.54       .00      .000      .035      .000      .000   1393.37   1953.04
   .002363      200.      202.      200.         2         0         0       .00     97.12   2050.16

*SECNO 7000.000
CHIMP CLSTA=    1999.00 CELCH=    1394.19 BW=      50.00 STCHL=    1760.00 STCHR=    2260.00
1
   07APR00      12:43:36                                                                                PAGE   25

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

EXCAVATION DATA
AEX=     671.7SQ-FT     VEXR=       7.7K*CU-YD     VEXT=      124.8K*CU-YD

  7000.000      5.79   1399.98       .00       .00   1400.48       .50       .73       .01   1405.50
    2400.0        .0    2400.0        .0        .0     423.4        .0     125.5      32.7   1403.30
       .34       .00      5.67       .00      .000      .035      .000      .000   1394.19   1950.85
   .002525      300.      300.      300.         2         0         0       .00     96.30   2047.15

*SECNO 7400.000
CHIMP CLSTA=    2000.50 CELCH=    1395.28 BW=      50.00 STCHL=    1815.00 STCHR=    2315.00
EXCAVATION DATA
AEX=     776.8SQ-FT     VEXR=      10.7K*CU-YD     VEXT=      135.5K*CU-YD

  7400.000      5.72   1401.00       .00       .00   1401.51       .51      1.03       .00   1406.50
    2400.0        .0    2400.0        .0        .0     416.8        .0     129.4      33.6   1404.40
       .36       .00      5.76       .00      .000      .035      .000      .000   1395.28   1952.62
   .002640      400.      400.      400.         2         0         0       .00     95.75   2048.38

*SECNO 7500.000
CHIMP CLSTA=    1998.90 CELCH=    1395.55 BW=      56.00 STCHL=    1825.00 STCHR=    2325.00
EXCAVATION DATA
AEX=     864.1SQ-FT     VEXR=       3.0K*CU-YD     VEXT=      138.6K*CU-YD

  7500.000      5.78   1401.33       .00       .00   1401.76       .43       .24       .01   1405.90
    2400.0        .0    2400.0        .0        .0     457.3        .0     130.4      33.8   1404.90
       .37       .00      5.25       .00      .000      .035      .000      .000   1395.55   1947.78
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   .002112      100.      100.      100.         2         0         0       .00    102.24   2050.02


CCHV=      .300 CEHV=      .500
*SECNO 7569.000
CHIMP CLSTA=    1991.00 CELCH=    1395.74 BW=      58.00 STCHL=    1460.00 STCHR=    3224.85
EXCAVATION DATA
AEX=      848.0SQ-FT     VEXR=       2.4K*CU-YD     VEXT=      141.0K*CU-YD


3470 ENCROACHMENT STATIONS=     1962.0    2020.0  TYPE=      1  TARGET=       58.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  7569.000      5.53   1401.27       .00       .00   1402.14       .87       .16       .22 100000.00
    2400.0        .0    2400.0        .0        .0     320.8        .0     131.1      34.0 100000.00
       .37       .00      7.48       .00      .000      .025      .000      .000   1395.74   1962.00
   .002045       69.       77.       69.         2         0         0       .00     58.00   2020.00


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   07APR00      12:43:36                                                                                PAGE   26


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013       .30      2.63    150.00      7.63     28.00    127.00     11         4      1394.46   1394.08

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 7696.000
CHIMP CLSTA=    1530.00 CELCH=    1396.12 BW=      58.00 STCHL=     650.03 STCHR=    3118.14
EXCAVATION DATA
AEX=      914.6SQ-FT     VEXR=       3.6K*CU-YD     VEXT=      144.6K*CU-YD


SPECIAL CULVERT OUTLET CONTROL
EGIC =    1400.560  EGOC =    1401.196  PCWSE=    1401.269  ELTRD=    1405.410

5150, EG OF  1401.20 LESS THAN XEG OF  1402.14
SPECIAL CULVERT
```

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1400.56	1401.20	.00	0.	2400.	8.415	427.3	1405.41	0.

3470 ENCROACHMENT STATIONS= 1501.0 1559.0 TYPE= 1 TARGET= 58.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

7696.000	4.92	1401.04	.00	.00	1402.14	1.10	.00	.00	100000.00
2400.0	.0	2400.0	.0	.0	285.2	.0	131.8	34.1	100000.00
.38	.00	8.41	.00	.000	.025	.000	.000	1396.12	1501.00
.002953	128.	110.	128.	4	0	0	.00	58.00	1559.00

*SECNO 7800.000
CHIMP CLSTA= 2000.00 CELCH= 1396.44 BW= 60.00 STCHL= 864.07 STCHR= 3201.38
EXCAVATION DATA
AEX= 1156.2SQ-FT VEXR= 4.3K*CU-YD VEXT= 148.9K*CU-YD

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.70

7800.000	5.69	1402.13	.00	.00	1402.53	.40	.18	.21	1408.00
2400.0	.0	2400.0	.0	.0	470.3	.0	132.8	34.3	1411.00
.38	.00	5.10	.00	.000	.025	.000	.000	1396.44	1947.26
.001022	104.	113.	104.	3	0	0	.00	105.48	2052.74

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 7987.000
CHIMP CLSTA= 1479.00 CELCH= 1397.02 BW= 46.00 STCHL= 608.19 STCHR= 2984.31
EXCAVATION DATA
AEX= 907.7SQ-FT VEXR= 7.6K*CU-YD VEXT= 156.6K*CU-YD

3301 HV CHANGED MORE THAN HVINS

```
3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .44

3470 ENCROACHMENT STATIONS=     1456.0    1502.0  TYPE=      1  TARGET=       46.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  7987.000      4.78   1401.80       .00       .00   1403.65      1.85       .40       .72 100000.00
    2400.0        .0    2400.0        .0        .0     220.0        .0     134.4      34.7 100000.00
       .39       .00     10.91       .00      .000      .025      .000      .000   1397.02   1456.00
   .005378      197.      200.      197.         3         0         0       .00     46.00   1502.00


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013       .30      2.63    150.00      5.72     23.00    318.00     11         4      1398.24   1397.28

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 8262.000
CHIMP CLSTA=    1488.00 CELCH=    1397.98 BW=      46.00 STCHL=     512.92 STCHR=    2649.24
EXCAVATION DATA
AEX=     767.0SQ-FT     VEXR=       8.4K*CU-YD     VEXT=      164.9K*CU-YD


SPECIAL CULVERT OUTLET CONTROL
EGIC =   1405.252  EGOC =   1405.464  PCWSE=   1401.800  ELTRD=   1409.100


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.59

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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


SPECIAL CULVERT
```

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1405.25	1405.46	1.81	0.	2400.	8.054	263.1	1409.10	0.

3470 ENCROACHMENT STATIONS= 1465.0 1511.0 TYPE= 1 TARGET= 46.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 100000.00

8262.000	6.48	1404.46	.00	.00	1405.46	1.01	1.81	.00	100000.00
2400.0	.0	2400.0	.0	.0	298.0	.0	136.0	35.0	100000.00
.40	.00	8.05	.00	.000	.025	.000	.000	1397.98	1465.00
.002115	275.	270.	275.	3	0	0	.00	46.00	1511.00

*SECNO 8400.000
CHIMP CLSTA= 2000.00 CELCH= 1398.40 BW= 50.00 STCHL= 856.92 STCHR= 2679.27
EXCAVATION DATA
AEX= 1013.1SQ-FT VEXR= 4.3K*CU-YD VEXT= 169.2K*CU-YD

3301 HV CHANGED MORE THAN HVINS

8400.000	7.20	1405.60	.00	.00	1405.88	.28	.19	.22	1411.00
2400.0	.0	2400.0	.0	.0	568.1	.0	137.3	35.2	1412.00
.40	.00	4.22	.00	.000	.035	.000	.000	1398.40	1946.17
.001102	130.	130.	130.	2	0	0	.00	107.65	2053.83

*SECNO 8600.000
CHIMP CLSTA= 2020.00 CELCH= 1399.00 BW= 50.00 STCHL= 1133.86 STCHR= 3179.03
EXCAVATION DATA
AEX= 883.6SQ-FT VEXR= 7.0K*CU-YD VEXT= 176.3K*CU-YD

8600.000	6.75	1405.75	.00	.00	1406.08	.33	.18	.03	1412.00
2400.0	.0	2400.0	.0	.0	519.6	.0	139.8	35.7	1413.00
.42	.00	4.62	.00	.000	.025	.000	.000	1399.00	1968.01
.000722	200.	200.	200.	2	0	0	.00	103.99	2071.99

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
*SECNO 8690.000
CHIMP CLSTA=    2000.00 CELCH=    1399.27 BW=      50.00 STCHL=    1080.00 STCHR=    3203.86
EXCAVATION DATA
AEX=     878.5SQ-FT     VEXR=       2.9K*CU-YD     VEXT=      179.2K*CU-YD

  8690.000      6.53   1405.80       .00       .00   1406.16       .36       .07       .02   1413.00
    2400.0        .0    2400.0        .0        .0     497.3        .0     140.8      35.9   1412.00
       .42       .00      4.83       .00      .000      .025      .000      .000   1399.27   1948.87
   .000817       90.       90.       90.         2         0         0       .00    102.26   2051.13


*SECNO 8850.000
CHIMP CLSTA=    2000.00 CELCH=    1408.00 BW=      65.00 STCHL=    1020.00 STCHR=    3253.96
EXCAVATION DATA
AEX=     102.0SQ-FT     VEXR=       2.9K*CU-YD     VEXT=      182.1K*CU-YD


3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  8850.000      2.57   1410.57   1410.57       .00   1411.12       .55       .31       .10   1413.00
    2400.0        .0    2400.0        .0        .0     402.3        .0     142.5      36.8   1414.00
       .43       .00      5.97       .00      .000      .025      .000      .000   1408.00   1922.99
   .009381      160.      160.      160.        20        19         0       .00    381.15   2412.39


*SECNO 8851.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  8851.000      1.89   1410.89   1410.89       .00   1411.37       .48       .01       .02   1413.00
    2400.0        .0    2400.0        .0        .0     432.5        .0     142.5      36.8   1414.00
       .43       .00      5.55       .00      .000      .025      .000      .000   1409.00   1885.69
   .008816        1.        1.        1.        20        15         0       .00    436.21   2417.03


*SECNO 9000.000
1
   07APR00      12:43:36                                                                          PAGE    30

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
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    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.95

  9000.000      3.01   1412.01       .00        .00   1412.10       .09        .61        .12   1414.00
    2400.0        .0    2400.0        .0         .0    1010.7        .0      145.0       39.9   1413.00
       .45       .00      2.37       .00       .000      .025      .000       .000    1409.00   1718.84
   .002325      150.      150.      150.          2         0         0        .00    1340.84   3059.68


*SECNO 9340.000

3265 DIVIDED FLOW

  9340.000      2.67   1412.67       .00        .00   1412.77       .10        .66        .00   1415.00
    2400.0        .0    2400.0        .0         .0     965.9        .0      152.7       48.7   1413.00
       .48       .00      2.48       .00       .000      .025      .000       .000    1410.00   1826.51
   .001661      365.      340.      310.          4         0         0        .00     929.95   2923.91


*SECNO 9731.000
3280 CROSS SECTION   9731.00 EXTENDED       .30 FEET

  9731.000      3.30   1413.30       .00        .00   1413.40       .10        .63        .00   1418.00
    2400.0        .0    2399.7        .3         .0     956.2        .4      161.3       56.8   1413.00
       .53       .00      2.51       .89       .000      .025      .025       .000    1410.00   1893.53
   .001595      390.      390.      390.          2         0         0        .00     881.12   2774.65


*SECNO 9930.000

3265 DIVIDED FLOW

3280 CROSS SECTION   9930.00 EXTENDED       .66 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  .70

  9930.000      2.66   1413.66       .00        .00   1413.94       .28        .45        .09   1419.00
    2400.0        .0    2400.0        .0         .0     568.5        .0      164.9       59.8   1413.00
       .54       .00      4.22       .00       .000      .025      .000       .000    1411.00   1927.30
   .003297      203.      203.      203.          2         0         0        .00     412.63   2599.07


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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 10120.000

3265 DIVIDED FLOW

 10120.000      2.34   1414.34       .00       .00   1414.54       .20       .58       .02   1418.00
    2400.0        .0    2400.0        .0        .0     673.5        .0     167.6      62.0   1416.00
       .56       .00      3.56       .00      .000      .025      .000      .000   1412.00   1844.51
   .002723      193.      193.      193.         2         0         0       .00    546.80   2476.88

*SECNO 10600.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 10600.000      1.59   1417.59   1417.59       .00   1418.05       .47      2.22       .13   1418.00
    2400.0        .0    2386.8      13.2        .0     434.3       5.2     173.7      67.7   1417.00
       .58       .00      5.50      2.56      .000      .025      .025      .000   1416.00   1698.93
   .009521      480.      480.      480.        20        19         0       .00    488.67   2187.60

T1      INDIAN BEND WASH - CHANNEL IMPROVEMENTS,FILE: IBW_CHI.DAT(100-YEAR HYDRA
T2      40TH STREET TO ACOMA ROAD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                3                                                         6000   1383.78

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15                  -1                                                -6

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   07APR00      12:43:36                                                                          PAGE    32

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2
0
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CCHV=      .100 CEHV=      .300
*SECNO 1140.000
CHIMP CLSTA=    2011.10 CELCH=    1379.87 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=       9.2SQ-FT     VEXR=        .0K*CU-YD     VEXT=         .0K*CU-YD


3470 ENCROACHMENT STATIONS=     1765.0    2195.0  TYPE=      1  TARGET=      430.000
  1140.000      4.98   1383.78       .00   1383.58   1384.19       .41       .00       .00 100000.00
    6000.0        .0    6000.0        .0        .0    1172.9        .0        .0        .0 100000.00
       .00       .00      5.12       .00      .000      .035      .000      .000   1378.80   1765.00
   .003834        0.        0.        0.         0         0         0       .00    430.00   2195.00


*SECNO 1300.000
CHIMP CLSTA=    2080.60 CELCH=    1380.16 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=      55.0SQ-FT     VEXR=        .1K*CU-YD     VEXT=         .1K*CU-YD


3470 ENCROACHMENT STATIONS=     1850.0    2150.0  TYPE=      1  TARGET=      300.000
  1300.000      3.85   1384.01       .00   1384.02   1384.84       .83       .53       .13 100000.00
    6000.0        .0    6000.0        .0        .0     821.3        .0       2.3        .8 100000.00
       .00       .00      7.31       .00      .000      .035      .000      .000   1380.16   1850.00
   .007797      100.      100.      100.         2         0         0       .00    300.00   2150.00


*SECNO 1500.000
CHIMP CLSTA=    2116.30 CELCH=    1380.51 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2046.00 CELCH=    1382.21 BW=     200.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     351.6SQ-FT     VEXR=       1.5K*CU-YD     VEXT=        1.6K*CU-YD


3470 ENCROACHMENT STATIONS=     1930.0    2150.0  TYPE=      1  TARGET=      220.000
  1500.000      4.86   1385.37       .00   1385.49   1386.34       .96      1.45       .04 100000.00
    6000.0        .0    6000.0        .0        .0     761.5        .0       5.9       2.0 100000.00
       .01       .00      7.88       .00      .000      .035      .000      .000   1380.51   1930.00
   .006782      200.      200.      200.         2         0         0       .00    220.00   2150.00


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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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*SECNO 1800.000
CHIMP CLSTA=    2119.60 CELCH=    1381.03 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2049.50 CELCH=    1383.49 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     596.5SQ-FT     VEXR=       5.3K*CU-YD     VEXT=        6.9K*CU-YD


3470 ENCROACHMENT STATIONS=     1960.0    2160.0  TYPE=      1  TARGET=      200.000
  1800.000      6.14   1387.17       .00   1387.01   1387.98       .81      1.63       .02 100000.00
    6000.0        .0    6000.0        .0        .0     831.3        .0      11.4       3.5 100000.00
       .02       .00      7.22       .00      .000      .035      .000      .000   1381.03   1960.00
   .004439      300.      300.      300.         2         0         0       .00    200.00   2160.00


*SECNO 2100.000
CHIMP CLSTA=    2122.60 CELCH=    1381.55 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2052.50 CELCH=    1384.55 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     648.5SQ-FT     VEXR=       6.9K*CU-YD     VEXT=       13.8K*CU-YD


3470 ENCROACHMENT STATIONS=     1955.0    2175.0  TYPE=      1  TARGET=      220.000
  2100.000      6.94   1388.49       .00   1388.62   1389.12       .63      1.13       .02 100000.00
    6000.0        .0    6000.0        .0        .0     940.6        .0      17.5       4.9 100000.00
       .04       .00      6.38       .00      .000      .035      .000      .000   1381.55   1955.00
   .003216      300.      300.      300.         2         0         0       .00    215.33   2170.33


*SECNO 2400.000
CHIMP CLSTA=    2125.50 CELCH=    1382.07 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2055.50 CELCH=    1385.07 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     660.0SQ-FT     VEXR=       7.3K*CU-YD     VEXT=       21.1K*CU-YD


3470 ENCROACHMENT STATIONS=     1960.0    2180.0  TYPE=      1  TARGET=      220.000
  2400.000      7.36   1389.43       .00   1389.54   1389.96       .53       .83       .01 100000.00
    6000.0        .0    6000.0        .0        .0    1029.5        .0      24.3       6.4 100000.00
       .05       .00      5.83       .00      .000      .035      .000      .000   1382.07   1960.00
   .002383      300.      300.      300.         2         0         0       .00    214.95   2174.95


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   07APR00      12:43:36                                                                          PAGE   34

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
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    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *SECNO 2700.000
 CHIMP CLSTA=    2124.60 CELCH=    1382.59 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2054.40 CELCH=    1385.09 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     582.0SQ-FT     VEXR=       6.9K*CU-YD     VEXT=       28.0K*CU-YD

 3470 ENCROACHMENT STATIONS=     1965.0    2175.0  TYPE=      1  TARGET=      210.000
   2700.000      7.54   1390.13       .00   1390.20   1390.58       .45       .61       .01 100000.00
     6000.0        .0    6000.0        .0        .0    1119.6        .0      31.7       7.9 100000.00
        .07       .00      5.36       .00      .000      .035      .000      .000   1382.59   1965.00
    .001763      300.      300.      300.         2         0         0       .00    210.00   2175.00

 *SECNO 2900.000
 CHIMP CLSTA=    2122.80 CELCH=    1382.94 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2053.00 CELCH=    1385.94 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     450.1SQ-FT     VEXR=       3.8K*CU-YD     VEXT=       31.8K*CU-YD

 3470 ENCROACHMENT STATIONS=     1965.0    2170.0  TYPE=      1  TARGET=      205.000
   2900.000      7.54   1390.48       .00   1390.57   1390.99       .51       .39       .02 100000.00
     6000.0        .0    6000.0        .0        .0    1046.8        .0      36.7       8.8 100000.00
        .08       .00      5.73       .00      .000      .035      .000      .000   1382.94   1965.00
    .002144      200.      200.      200.         2         0         0       .00    205.00   2170.00

 *SECNO 3000.000
 CHIMP CLSTA=    2121.80 CELCH=    1383.11 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
 CHIMP CLSTA=    2052.00 CELCH=    1386.11 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     445.3SQ-FT     VEXR=       1.7K*CU-YD     VEXT=       33.5K*CU-YD

 3470 ENCROACHMENT STATIONS=     1965.0    2165.0  TYPE=      1  TARGET=      200.000
   3000.000      7.58   1390.69       .00   1390.71   1391.20       .51       .21       .00 100000.00
     6000.0        .0    6000.0        .0        .0    1045.3        .0      39.1       9.3 100000.00
        .08       .00      5.74       .00      .000      .035      .000      .000   1383.11   1965.00
    .002098      100.      100.      100.         1         0         0       .00    200.00   2165.00

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   07APR00      12:43:36                                                                          PAGE    35

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
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    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 3300.000
CHIMP CLSTA=    2119.10 CELCH=    1383.63 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2049.00 CELCH=    1386.63 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     506.6SQ-FT     VEXR=       5.3K*CU-YD     VEXT=       38.7K*CU-YD

3470 ENCROACHMENT STATIONS=     1960.0    2165.0  TYPE=      1  TARGET=      205.000
  3300.000      7.70   1391.33       .00   1391.17   1391.81       .48       .60       .00 100000.00
    6000.0        .0    6000.0        .0        .0    1082.3        .0      46.4      10.7 100000.00
       .09       .00      5.54       .00      .000      .035      .000      .000   1383.63   1960.00
   .001925      300.      300.      300.         0         0         0       .00    205.00   2165.00

*SECNO 3600.000
CHIMP CLSTA=    2118.30 CELCH=    1384.15 BW=      40.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2048.50 CELCH=    1387.15 BW=     150.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     521.3SQ-FT     VEXR=       5.8K*CU-YD     VEXT=       44.6K*CU-YD

3470 ENCROACHMENT STATIONS=     1955.0    2170.0  TYPE=      1  TARGET=      215.000
  3600.000      7.78   1391.93       .00   1391.72   1392.38       .45       .57       .00 100000.00
    6000.0        .0    6000.0        .0        .0    1115.6        .0      54.1      12.1 100000.00
       .11       .00      5.38       .00      .000      .035      .000      .000   1384.15   1955.00
   .001828      304.      305.      298.         0         0         0       .00    214.44   2169.44

*SECNO 3900.000
CHIMP CLSTA=    2045.60 CELCH=    1384.60 BW=      39.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    2000.60 CELCH=    1388.40 BW=     154.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     475.7SQ-FT     VEXR=       5.9K*CU-YD     VEXT=       50.5K*CU-YD

3470 ENCROACHMENT STATIONS=     1890.0    2140.0  TYPE=      1  TARGET=      250.000
  3900.000      7.99   1392.59       .00   1392.39   1393.06       .48       .68       .01 100000.00
    6000.0        .0    6000.0        .0        .0    1083.9        .0      62.2      13.8 100000.00
       .13       .00      5.54       .00      .000      .035      .000      .000   1384.60   1890.00
   .002472      305.      320.      295.         2         0         0       .00    250.00   2140.00
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 4000.000
CHIMP CLSTA=    2017.40 CELCH=    1385.00 BW=      45.00 STCHL=    1730.00 STCHR=    2230.00
CHIMP CLSTA=    1980.40 CELCH=    1388.50 BW=     140.00 STCHL=    1730.00 STCHR=    2230.00
EXCAVATION DATA
AEX=     468.8SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       52.2K*CU-YD

3470 ENCROACHMENT STATIONS=     1860.0    2095.0  TYPE=      1  TARGET=      235.000
  4000.000      7.83   1392.83       .00   1392.68   1393.32       .49       .25       .00 100000.00
    6000.0        .0    6000.0        .0        .0    1067.5        .0      64.7      14.4 100000.00
       .13       .00      5.62       .00      .000      .035      .000      .000   1385.00   1860.00
   .002403       95.      102.      105.         2         0         0       .00    235.00   2095.00

*SECNO 4100.000
CHIMP CLSTA=    2002.70 CELCH=    1385.06 BW=      72.00 STCHL=    1750.00 STCHR=    2250.00
CHIMP CLSTA=    1929.00 CELCH=    1388.06 BW=      62.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     686.4SQ-FT     VEXR=       2.1K*CU-YD     VEXT=       54.4K*CU-YD

3470 ENCROACHMENT STATIONS=     1870.0    2100.0  TYPE=      1  TARGET=      230.000
  4100.000      8.08   1393.14       .00   1392.96   1393.52       .38       .19       .01 100000.00
    6000.0        .0    6000.0        .0        .0    1212.5        .0      67.3      14.9 100000.00
       .14       .00      4.95       .00      .000      .035      .000      .000   1385.06   1870.00
   .001522      102.      100.       98.         2         0         0       .00    230.00   2100.00

CCHV=      .300 CEHV=      .500
*SECNO 4190.000
CHIMP CLSTA=    2000.00 CELCH=    1385.23 BW=      76.00 STCHL=    1935.45 STCHR=    2069.33
EXCAVATION DATA
AEX=     725.1SQ-FT     VEXR=       2.3K*CU-YD     VEXT=       56.7K*CU-YD

3470 ENCROACHMENT STATIONS=     1880.0    2100.0  TYPE=      1  TARGET=      220.000
  4190.000      7.90   1393.13       .00   1392.97   1393.85       .72       .16       .17   1391.87
    6000.0     160.6    5836.4       3.0      74.5     846.7       5.4      69.4      15.4   1393.06
       .14      2.16      6.89       .56      .040      .035      .040      .000   1385.23   1880.00
   .002294       92.       87.       88.         2         0         0       .00    220.00   2100.00

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	6	.013	.30	2.63	.00	8.00	12.00	66.00	11	4	1385.42	1385.22

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE 4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 4256.000
CHIMP CLSTA= 2000.00 CELCH= 1385.42 BW= 76.00 STCHL= 1934.14 STCHR= 2069.09
EXCAVATION DATA
AEX= 813.4SQ-FT VEXR= 1.9K*CU-YD VEXT= 58.5K*CU-YD

5175, 20 TRIALS OF QELTRD NOT ENOUGH; ASSUMED = 2979.344

SPECIAL CULVERT OUTLET CONTROL + WEIR FLOW EG = 1395.08

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.91

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1394.97	1395.50	1.23	543.	5434.	5.682	576.0	1393.39	222.

3470 ENCROACHMENT STATIONS= 1890.0 2100.0 TYPE= 1 TARGET= 210.000

4256.000	9.17	1394.59	.00	1394.63	1395.08	.49	1.23	.00	1392.39
6000.0	159.6	5798.5	41.9	101.3	1020.4	39.1	71.0	15.7	1393.19
.14	1.57	5.68	1.07	.040	.025	.040	.000	1385.42	1890.00
.000627	69.	66.	63.	2	0	0	.00	210.00	2100.00

*SECNO 4400.000
CHIMP CLSTA= 2000.00 CELCH= 1385.86 BW= 72.00 STCHL= 1750.00 STCHR= 2250.00
CHIMP CLSTA= 2026.00 CELCH= 1385.86 BW= 40.00 STCHL= 1750.00 STCHR= 2250.00
EXCAVATION DATA
AEX= 821.4SQ-FT VEXR= 4.5K*CU-YD VEXT= 63.0K*CU-YD

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3470 ENCROACHMENT STATIONS=     1940.0    2100.0  TYPE=      1  TARGET=      160.000
  4400.000      8.82   1394.68       .00   1394.82   1395.20       .53       .11       .02 100000.00
    6000.0        .0    6000.0        .0        .0    1030.6        .0      74.7      16.3 100000.00
       .15       .00      5.82       .00      .000      .025      .000      .000   1385.86   1940.00
   .000834      149.      147.      141.         2         0         0       .00    160.00   2100.00


CCHV=     .100 CEHV=     .300
*SECNO 4500.000
CHIMP CLSTA=    2000.00 CELCH=    1386.17 BW=      65.00 STCHL=    1700.00 STCHR=    2270.00
1
   07APR00      12:43:36                                                                                PAGE   38


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


CHIMP CLSTA=    2056.00 CELCH=    1386.17 BW=      56.00 STCHL=    1700.00 STCHR=    2270.00
EXCAVATION DATA
AEX=    1123.6SQ-FT     VEXR=       3.6K*CU-YD     VEXT=       66.6K*CU-YD


3470 ENCROACHMENT STATIONS=     1965.0    2115.0  TYPE=      1  TARGET=      150.000
  4500.000      8.71   1394.88       .00   1394.96   1395.28       .40       .06       .01 100000.00
    6000.0        .0    6000.0        .0        .0    1186.1        .0      77.3      16.7 100000.00
       .16       .00      5.06       .00      .000      .025      .000      .000   1386.17   1965.00
   .000501      102.      100.       98.         2         0         0       .00    150.00   2115.00


*SECNO 4573.000
CHIMP CLSTA=    2000.00 CELCH=    1386.40 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
EXCAVATION DATA
AEX=     764.1SQ-FT     VEXR=       2.6K*CU-YD     VEXT=       69.2K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .23


3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000
  4573.000      6.93   1393.33       .00   1393.39   1396.08      2.75       .10       .71 100000.00
    6000.0        .0    6000.0        .0        .0     450.7        .0      78.7      16.9 100000.00
       .16       .00     13.31       .00      .000      .035      .000      .000   1386.40   1967.50
```

```
   .009625       75.       74.       71.         4         0         0       .00     65.00   2032.50

 *SECNO 4574.000
 CHIMP CLSTA=    2000.00 CELCH=    1387.55 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     611.9SQ-FT     VEXR=       1.9K*CU-YD     VEXT=       71.1K*CU-YD

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.43

1
   07APR00      12:43:36                                                                                PAGE   39

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  4574.000      8.74   1396.29       .00   1396.30   1396.57       .28       .24       .25 100000.00
    2400.0        .0    2400.0        .0        .0     568.2        .0      79.5      17.0 100000.00
       .16       .00      4.22       .00      .000      .035      .000      .000   1387.55   1967.50
   .000755        1.       74.        1.         3         0         0       .00     65.00   2032.50


 SPECIAL CULVERT

 SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
      6         .013       .20      2.63    500.00      8.00     10.00     72.00     11         4      1387.69   1387.55

 CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
 SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

 *SECNO 4646.000
 CHIMP CLSTA=    2000.00 CELCH=    1387.69 BW=      65.00 STCHL=    1750.00 STCHR=    2250.00
 EXCAVATION DATA
 AEX=     692.3SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       72.9K*CU-YD
```

```
SPECIAL CULVERT OUTLET CONTROL
EGIC =   1393.516  EGOC =   1396.806  PCWSE=   1396.292  ELTRD=   1398.000

SPECIAL CULVERT

     EGIC      EGOC        H4     QWEIR     QCULV       VCH     ACULV     ELTRD    WEIRLN
   1393.52   1396.81       .24        0.     2400.     4.174     480.0   1398.00        0.


3470 ENCROACHMENT STATIONS=     1967.5    2032.5  TYPE=      1  TARGET=       65.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  4646.000      8.84   1396.53       .00   1396.54   1396.81       .27       .24       .00 100000.00
    2400.0        .0    2400.0        .0        .0     574.9        .0      80.5      17.1 100000.00
       .17       .00      4.17       .00      .000      .035      .000      .000   1387.69   1967.50
   .000728       74.       74.       70.         2         0         0       .00     65.00   2032.50


*SECNO 4800.000
CHIMP CLSTA=    2000.90 CELCH=    1388.11 BW=      50.00 STCHL=    1750.00 STCHR=    2250.00
1
   07APR00      12:43:36                                                                                PAGE   40

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


EXCAVATION DATA
AEX=     449.9SQ-FT     VEXR=       3.2K*CU-YD     VEXT=       76.1K*CU-YD


3470 ENCROACHMENT STATIONS=     1927.0    2075.0  TYPE=      1  TARGET=      148.000
  4800.000      8.64   1396.75       .00   1396.76   1396.92       .16       .10       .01 100000.00
    2400.0        .0    2400.0        .0        .0     737.8        .0      82.8      17.5 100000.00
       .18       .00      3.25       .00      .000      .035      .000      .000   1388.11   1927.00
   .000618      157.      152.      151.         2         0         0       .00    133.78   2060.78


CCHV=     .100 CEHV=     .300
*SECNO 5000.000
CHIMP CLSTA=    2002.10 CELCH=    1388.66 BW=      50.00 STCHL=    1730.00 STCHR=    2230.00
EXCAVATION DATA
AEX=     503.5SQ-FT     VEXR=       3.6K*CU-YD     VEXT=       79.6K*CU-YD
```

```
3470 ENCROACHMENT STATIONS=     1934.0    2070.0  TYPE=      1  TARGET=      136.000
  5000.000      8.21   1396.87       .00   1396.88   1397.05       .17       .13       .00 100000.00
    2400.0        .0    2400.0        .0        .0     720.1        .0      86.2      18.1 100000.00
       .20       .00      3.33       .00      .000      .035      .000      .000   1388.66   1934.00
   .000623      208.      202.      192.         1         0         0       .00    125.98   2059.98

*SECNO 5300.000
CHIMP CLSTA=    1999.40 CELCH=    1389.49 BW=      50.00 STCHL=    1680.00 STCHR=    2180.00
EXCAVATION DATA
AEX=     469.6SQ-FT     VEXR=       5.5K*CU-YD     VEXT=       85.1K*CU-YD

3470 ENCROACHMENT STATIONS=     1941.5    2057.5  TYPE=      1  TARGET=      116.000
  5300.000      7.57   1397.06       .00   1397.06   1397.29       .23       .23       .02 100000.00
    2400.0        .0    2400.0        .0        .0     622.6        .0      90.9      18.9 100000.00
       .22       .00      3.85       .00      .000      .035      .000      .000   1389.49   1941.50
   .000885      309.      306.      291.         0         0         0       .00    113.18   2054.68

*SECNO 5400.000
CHIMP CLSTA=    1999.40 CELCH=    1389.76 BW=      50.00 STCHL=    1670.00 STCHR=    2170.00
EXCAVATION DATA
AEX=     457.7SQ-FT     VEXR=       1.8K*CU-YD     VEXT=       86.9K*CU-YD

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   07APR00      12:43:36                                                                                PAGE   41

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=     1941.5    2057.5  TYPE=      1  TARGET=      116.000
  5400.000      7.37   1397.13       .00   1397.14   1397.39       .26       .10       .01 100000.00
    2400.0        .0    2400.0        .0        .0     586.2        .0      92.3      19.2 100000.00
       .23       .00      4.09       .00      .000      .035      .000      .000   1389.76   1944.91
   .001009      102.      102.       98.         0         0         0       .00    108.99   2053.90

*SECNO 5700.000
CHIMP CLSTA=    1999.30 CELCH=    1390.59 BW=      50.00 STCHL=    1655.00 STCHR=    2155.00
EXCAVATION DATA
AEX=     515.9SQ-FT     VEXR=       5.5K*CU-YD     VEXT=       92.4K*CU-YD

3470 ENCROACHMENT STATIONS=     1941.0    2057.0  TYPE=      1  TARGET=      116.000
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  5700.000      6.87   1397.46       .00   1397.46   1397.77       .31       .36       .01 100000.00
    2400.0        .0    2400.0        .0        .0     538.0        .0      96.2      19.9 100000.00
       .25       .00      4.46       .00      .000      .035      .000      .000   1390.59   1941.00
   .001380      305.      306.      295.         2         0         0       .00    110.77   2051.77


*SECNO 6000.000
CHIMP CLSTA=    2000.80 CELCH=    1391.42 BW=      50.00 STCHL=    1645.00 STCHR=    2145.00
EXCAVATION DATA
AEX=     672.5SQ-FT     VEXR=       6.8K*CU-YD     VEXT=       99.2K*CU-YD


3470 ENCROACHMENT STATIONS=     1943.0    2059.0  TYPE=      1  TARGET=      116.000
  6000.000      6.46   1397.88       .00   1397.88   1398.25       .37       .47       .02 100000.00
    2400.0        .0    2400.0        .0        .0     489.8        .0      99.9      20.7 100000.00
       .26       .00      4.90       .00      .000      .035      .000      .000   1391.42   1949.96
   .001671      310.      307.      290.         2         0         0       .00    101.67   2051.64


*SECNO 6200.000
CHIMP CLSTA=    1996.90 CELCH=    1391.98 BW=      50.00 STCHL=    1635.00 STCHR=    2135.00
EXCAVATION DATA
AEX=     612.2SQ-FT     VEXR=       4.8K*CU-YD     VEXT=      104.0K*CU-YD


3470 ENCROACHMENT STATIONS=     1936.0    2058.0  TYPE=      1  TARGET=      122.000
  6200.000      6.24   1398.22       .00   1398.22   1398.62       .41       .36       .01 100000.00
    2400.0        .0    2400.0        .0        .0     467.3        .0     102.1      21.1 100000.00
       .27       .00      5.14       .00      .000      .035      .000      .000   1391.98   1946.96
   .001909      203.      203.      197.         2         0         0       .00     99.88   2046.84


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   07APR00      12:43:36                                                                          PAGE    42

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 6500.000
CHIMP CLSTA=    2000.80 CELCH=    1392.82 BW=      50.00 STCHL=    1665.00 STCHR=    2165.00
EXCAVATION DATA
AEX=     734.9SQ-FT     VEXR=       7.6K*CU-YD     VEXT=      111.6K*CU-YD


3470 ENCROACHMENT STATIONS=     1948.0    2054.0  TYPE=      1  TARGET=      106.000
  6500.000      5.99   1398.81       .00   1398.81   1399.27       .46       .63       .01 100000.00
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    2400.0        .0    2400.0        .0        .0     443.2        .0     105.3      21.8 100000.00
       .29       .00      5.41       .00      .000      .035      .000      .000   1392.82   1951.83
   .002217      308.      306.      292.         2         0         0       .00     97.94   2049.77


 *SECNO 6700.000
 CHIMP CLSTA=    2001.60 CELCH=    1393.37 BW=      50.00 STCHL=    1705.00 STCHR=    2205.00
 EXCAVATION DATA
 AEX=     718.7SQ-FT     VEXR=       5.4K*CU-YD     VEXT=      117.1K*CU-YD


 3470 ENCROACHMENT STATIONS=     1943.0    2060.0  TYPE=      1  TARGET=      117.000
   6700.000      5.89   1399.26       .00   1399.26   1399.74       .48       .46       .01 100000.00
     2400.0        .0    2400.0        .0        .0     433.2        .0     107.3      22.3 100000.00
        .30       .00      5.54       .00      .000      .035      .000      .000   1393.37   1953.04
   .002365      200.      202.      200.         2         0         0       .00     97.12   2050.16


 *SECNO 7000.000
 CHIMP CLSTA=    1999.00 CELCH=    1394.19 BW=      50.00 STCHL=    1760.00 STCHR=    2260.00
 EXCAVATION DATA
 AEX=     671.7SQ-FT     VEXR=       7.7K*CU-YD     VEXT=      124.8K*CU-YD


 3470 ENCROACHMENT STATIONS=     1955.0    2045.0  TYPE=      1  TARGET=       90.000
   7000.000      5.77   1399.96       .00   1399.98   1400.47       .51       .72       .01 100000.00
     2400.0        .0    2400.0        .0        .0     418.4        .0     110.3      22.9 100000.00
        .31       .00      5.74       .00      .000      .035      .000      .000   1394.19   1955.00
   .002450      300.      300.      300.         1         0         0       .00     90.00   2045.00


 *SECNO 7400.000
 CHIMP CLSTA=    2000.50 CELCH=    1395.28 BW=      50.00 STCHL=    1815.00 STCHR=    2315.00
1
   07APR00      12:43:36                                                                                PAGE   43


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 EXCAVATION DATA
 AEX=     776.8SQ-FT     VEXR=      10.7K*CU-YD     VEXT=      135.5K*CU-YD


 3470 ENCROACHMENT STATIONS=     1955.0    2045.0  TYPE=      1  TARGET=       90.000
   7400.000      5.67   1400.95       .00   1401.00   1401.48       .53      1.01       .01 100000.00
     2400.0        .0    2400.0        .0        .0     410.5        .0     114.1      23.8 100000.00
```

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      .33       .00      5.85       .00      .000      .035      .000      .000   1395.28   1955.00
   .002603      400.      400.      400.         2         0         0       .00     90.00   2045.00


*SECNO 7500.000
CHIMP CLSTA=    1998.90 CELCH=    1395.55 BW=      56.00 STCHL=    1825.00 STCHR=    2325.00
EXCAVATION DATA
AEX=     864.1SQ-FT     VEXR=       3.0K*CU-YD     VEXT=      138.6K*CU-YD


3470 ENCROACHMENT STATIONS=     1950.0    2060.0  TYPE=      1  TARGET=      110.000
  7500.000      5.74   1401.29       .00   1401.33   1401.73       .44       .23       .01 100000.00
    2400.0        .0    2400.0        .0        .0     453.0        .0     115.1      24.0 100000.00
      .34       .00      5.30       .00      .000      .035      .000      .000   1395.55   1950.00
   .002127      100.      100.      100.         2         0         0       .00     99.87   2049.87


CCHV=     .300 CEHV=     .500
*SECNO 7569.000
CHIMP CLSTA=    1991.00 CELCH=    1395.74 BW=      58.00 STCHL=    1460.00 STCHR=    3224.85
EXCAVATION DATA
AEX=     848.0SQ-FT     VEXR=       2.4K*CU-YD     VEXT=      141.0K*CU-YD


3470 ENCROACHMENT STATIONS=     1962.0    2020.0  TYPE=      1  TARGET=       58.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  7569.000      5.49   1401.23       .00   1401.27   1402.11       .88       .16       .22 100000.00
    2400.0        .0    2400.0        .0        .0     318.6        .0     115.7      24.1 100000.00
      .34       .00      7.53       .00      .000      .025      .000      .000   1395.74   1962.00
   .002089       69.       77.       69.         2         0         0       .00     58.00   2020.00


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   07APR00      12:43:36                                                                          PAGE    44

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013       .30      2.63    150.00      7.63     28.00    127.00     11         4      1394.46   1394.08
```

```
CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 7696.000
CHIMP CLSTA=    1530.00 CELCH=    1396.12 BW=      58.00 STCHL=     650.03 STCHR=    3118.14
EXCAVATION DATA
AEX=     914.6SQ-FT     VEXR=       3.6K*CU-YD     VEXT=      144.6K*CU-YD


SPECIAL CULVERT OUTLET CONTROL
EGIC =   1400.560  EGOC =   1401.186  PCWSE=   1401.232  ELTRD=   1405.410

5150, EG OF  1401.19 LESS THAN XEG OF  1402.11
SPECIAL CULVERT

     EGIC      EGOC        H4     QWEIR     QCULV       VCH     ACULV     ELTRD    WEIRLN
   1400.56   1401.19       .00        0.     2400.     8.494     427.3   1405.41        0.


3470 ENCROACHMENT STATIONS=     1501.0    1559.0  TYPE=      1  TARGET=       58.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  7696.000      4.87   1400.99       .00   1401.04   1402.11      1.12       .00       .00 100000.00
    2400.0        .0    2400.0        .0        .0     282.5        .0     116.5      24.3 100000.00
       .35       .00      8.49       .00      .000      .025      .000      .000   1396.12   1501.00
   .003042      128.      110.      128.         4         0         0       .00     58.00   1559.00


*SECNO 7800.000
CHIMP CLSTA=    2000.00 CELCH=    1396.44 BW=      60.00 STCHL=     864.07 STCHR=    3201.38
EXCAVATION DATA
AEX=    1156.2SQ-FT     VEXR=       4.3K*CU-YD     VEXT=      148.9K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.73

1
   07APR00      12:43:36                                                                                PAGE   45

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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3470 ENCROACHMENT STATIONS=     1940.0    2050.0  TYPE=      1  TARGET=      110.000
  7800.000      5.66   1402.10       .00   1402.13   1402.51       .41       .18       .21 100000.00
    2400.0        .0    2400.0        .0        .0     466.7        .0     117.5      24.5 100000.00
       .35       .00      5.14       .00      .000      .025      .000      .000   1396.44   1947.37
   .001019      104.      113.      104.         3         0         0       .00    102.63   2050.00


*SECNO 7987.000
CHIMP CLSTA=    1479.00 CELCH=    1397.02 BW=      46.00 STCHL=     608.19 STCHR=    2984.31
EXCAVATION DATA
AEX=     907.7SQ-FT     VEXR=       7.6K*CU-YD     VEXT=      156.6K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .43


3470 ENCROACHMENT STATIONS=     1456.0    1502.0  TYPE=      1  TARGET=       46.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  7987.000      4.75   1401.77       .00   1401.80   1403.64      1.88       .40       .73 100000.00
    2400.0        .0    2400.0        .0        .0     218.4        .0     119.0      24.8 100000.00
       .36       .00     10.99       .00      .000      .025      .000      .000   1397.02   1456.00
   .005498      197.      200.      197.         3         0         0       .00     46.00   1502.00


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013       .30      2.63    150.00      5.72     23.00    318.00     11         4       1398.24   1397.28

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE  4 - HEADWALL SKEWED 10 TO 45 DEGREES; INLET EDGES BEVELED

*SECNO 8262.000
CHIMP CLSTA=    1488.00 CELCH=    1397.98 BW=      46.00 STCHL=     512.92 STCHR=    2649.24
EXCAVATION DATA
AEX=     767.0SQ-FT     VEXR=       8.4K*CU-YD     VEXT=      164.9K*CU-YD
```


SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV

```
Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


SPECIAL CULVERT OUTLET CONTROL
EGIC =   1405.252  EGOC =   1405.468  PCWSE=   1401.766  ELTRD=   1409.100


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.61

SPECIAL CULVERT

     EGIC       EGOC        H4      QWEIR      QCULV       VCH      ACULV     ELTRD    WEIRLN
   1405.25    1405.47      1.83         0.     2400.     8.046      263.1   1409.10        0.


3470 ENCROACHMENT STATIONS=     1465.0    1511.0  TYPE=      1  TARGET=       46.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  8262.000       6.48   1404.46       .00   1404.46   1405.47       1.01       1.83       .00 100000.00
    2400.0         .0    2400.0        .0        .0     298.3         .0      120.6      25.1 100000.00
       .37        .00      8.05       .00      .000      .025       .000       .000   1397.98   1465.00
   .002109       275.      270.      275.         3         0          0        .00     46.00   1511.00


*SECNO 8400.000
CHIMP CLSTA=    2000.00 CELCH=    1398.40 BW=      50.00 STCHL=     856.92 STCHR=    2679.27
EXCAVATION DATA
AEX=    1013.1SQ-FT     VEXR=       4.3K*CU-YD     VEXT=      169.2K*CU-YD


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.42


3470 ENCROACHMENT STATIONS=     1955.0    2045.0  TYPE=      1  TARGET=       90.000
  8400.000       7.17   1405.57       .00   1405.60   1405.87        .30        .19        .21 100000.00
    2400.0         .0    2400.0        .0        .0     545.5         .0      121.9      25.3 100000.00
       .37        .00      4.40       .00      .000      .035       .000       .000   1398.40   1955.00
   .001053       130.      130.      130.         2         0          0        .00     90.00   2045.00
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 8600.000
CHIMP CLSTA=    2020.00 CELCH=    1399.00 BW=      50.00 STCHL=    1133.86 STCHR=    3179.03
EXCAVATION DATA
AEX=     883.6SQ-FT     VEXR=       7.0K*CU-YD     VEXT=      176.3K*CU-YD


3470 ENCROACHMENT STATIONS=     1955.0    2045.0  TYPE=      1  TARGET=       90.000
  8600.000      6.68   1405.68       .00   1405.75   1406.18       .50       .21       .10 100000.00
    2400.0        .0    2400.0        .0        .0     423.1        .0     124.1      25.7 100000.00
       .38       .00      5.67       .00      .000      .025      .000      .000   1399.00   1968.29
   .001057      200.      200.      200.         2         0         0       .00     76.71   2045.00


*SECNO 8690.000
CHIMP CLSTA=    2000.00 CELCH=    1399.27 BW=      50.00 STCHL=    1080.00 STCHR=    3203.86
EXCAVATION DATA
AEX=     878.5SQ-FT     VEXR=       2.9K*CU-YD     VEXT=      179.2K*CU-YD


3470 ENCROACHMENT STATIONS=     1955.0    2045.0  TYPE=      1  TARGET=       90.000
  8690.000      6.67   1405.94       .00   1405.80   1406.30       .36       .08       .04 100000.00
    2400.0        .0    2400.0        .0        .0     500.4        .0     125.1      25.9 100000.00
       .39       .00      4.80       .00      .000      .025      .000      .000   1399.27   1955.00
   .000706       90.       90.       90.         2         0         0       .00     90.00   2045.00


*SECNO 8850.000
CHIMP CLSTA=    2000.00 CELCH=    1408.00 BW=      65.00 STCHL=    1020.00 STCHR=    3253.96
EXCAVATION DATA
AEX=     102.0SQ-FT     VEXR=       2.9K*CU-YD     VEXT=      182.1K*CU-YD


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1930.0    2070.0  TYPE=      1  TARGET=      140.000
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  8850.000      2.89   1410.89   1410.89   1410.57   1411.95      1.06       .26       .35 100000.00
    2400.0        .0    2400.0        .0        .0     290.3        .0     126.5      26.3 100000.00
       .39       .00      8.27       .00      .000      .025      .000      .000   1408.00   1930.00
   .007488      160.      160.      160.        20        18         0       .00    140.00   2070.00


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   07APR00      12:43:36                                                                          PAGE   48

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *SECNO 8851.000
 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     1930.0    2070.0  TYPE=      1  TARGET=      140.000
  8851.000      2.62   1411.62   1411.62   1410.89   1412.68      1.06       .01       .00 100000.00
    2400.0        .0    2400.0        .0        .0     290.9        .0     126.5      26.3 100000.00
       .39       .00      8.25       .00      .000      .025      .000      .000   1409.00   1930.00
   .007526        1.        1.        1.        20        11         0       .00    140.00   2070.00


 *SECNO 9000.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.32


 3470 ENCROACHMENT STATIONS=     1930.0    2070.0  TYPE=      1  TARGET=      140.000
  9000.000      3.91   1412.91       .00   1412.01   1413.29       .38       .41       .20 100000.00
    2400.0        .0    2400.0        .0        .0     484.5        .0     127.9      26.8 100000.00
       .40       .00      4.95       .00      .000      .025      .000      .000   1409.00   1930.00
   .001398      150.      150.      150.         2         0         0       .00    140.00   2070.00


 *SECNO 9340.000
 3280 CROSS SECTION   9340.00 EXTENDED       .45 FEET


 3470 ENCROACHMENT STATIONS=     1930.0    2070.0  TYPE=      1  TARGET=      140.000
  9340.000      3.45   1413.45       .00   1412.67   1413.96       .52       .60       .07 100000.00
    2400.0        .0    2400.0        .0        .0     415.3        .0     131.4      27.9 100000.00
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      .42       .00      5.78       .00      .000      .025      .000      .000   1410.00   1930.00
   .002337      365.      340.      310.         3         0         0       .00    140.00   2070.00

*SECNO 9731.000
3280 CROSS SECTION   9731.00 EXTENDED      1.27 FEET

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   07APR00      12:43:36                                                                          PAGE   49

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.63


3470 ENCROACHMENT STATIONS=     1970.0    2110.0  TYPE=      1  TARGET=      140.000
  9731.000      4.27   1414.27       .00   1413.30   1414.56       .29       .53       .07 100000.00
    2400.0        .0    2400.0        .0        .0     557.2        .0     135.7      29.1 100000.00
       .44       .00      4.31       .00      .000      .025      .000      .000   1410.00   1970.00
   .000884      390.      390.      390.         2         0         0       .00    140.00   2110.00


*SECNO 9930.000
3280 CROSS SECTION   9930.00 EXTENDED      1.45 FEET


3470 ENCROACHMENT STATIONS=     1980.0    2120.0  TYPE=      1  TARGET=      140.000
  9930.000      3.45   1414.45       .00   1413.66   1414.88       .43       .24       .07 100000.00
    2400.0        .0    2400.0        .0        .0     455.2        .0     138.1      29.8 100000.00
       .46       .00      5.27       .00      .000      .025      .000      .000   1411.00   1980.00
   .001723      203.      203.      203.         2         0         0       .00    140.00   2120.00


*SECNO 10120.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1970.0    2110.0  TYPE=      1  TARGET=      140.000
 10120.000      3.08   1415.08   1415.08   1414.34   1416.14      1.06       .61       .32 100000.00
    2400.0        .0    2400.0        .0        .0     290.1        .0     139.8      30.4 100000.00
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      .46       .00      8.27       .00      .000      .025      .000      .000   1412.00   1970.00
   .007627      193.      193.      193.        20        15         0       .00    140.00   2110.00


*SECNO 10600.000
3280 CROSS SECTION  10600.00 EXTENDED       .53 FEET


3470 ENCROACHMENT STATIONS=     1930.0    2070.0  TYPE=      1  TARGET=      140.000
 10600.000      2.53   1418.53       .00   1417.59   1419.46       .93      3.28       .04 100000.00
    2400.0        .0    2400.0        .0        .0     309.6        .0     143.1      31.9 100000.00
       .48       .00      7.75       .00      .000      .025      .000      .000   1416.00   1930.00
   .006150      480.      480.      480.         2         0         0       .00    140.00   2070.00


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   07APR00      12:43:36                                                                          PAGE   50


                                                                                  THIS RUN EXECUTED 07APR00    12:44:24
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************


NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST


FLOWS FROM FIS STUDY

SUMMARY PRINTOUT TABLE  110

      SECNO      CWSEL     DIFKWS       EG      TOPWID      QLOB       QCH      QROB     PERENC    STENCL     STCHL     STCHR    STENCR

   1140.000   1383.58        .00   1384.04     449.86       .00   6000.00       .00        .00       .00   1750.00   2250.00       .00
   1140.000   1383.78        .20   1384.19     430.00       .00   6000.00       .00     430.00   1765.00   1750.00   2250.00   2195.00

   1300.000   1384.02        .00   1384.80     358.65       .00   6000.00       .00        .00       .00   1750.00   2250.00       .00
   1300.000   1384.01        .00   1384.84     300.00       .00   6000.00       .00     300.00   1850.00   1750.00   2250.00   2150.00

   1500.000   1385.49        .00   1386.07     315.08       .00   6000.00       .00        .00       .00   1750.00   2250.00       .00
   1500.000   1385.37       -.12   1386.34     220.00       .00   6000.00       .00     220.00   1930.00   1750.00   2250.00   2150.00

   1800.000   1387.01        .00   1387.72     311.81       .00   6000.00       .00        .00       .00   1750.00   2250.00       .00
   1800.000   1387.17        .16   1387.98     200.00       .00   6000.00       .00     200.00   1960.00   1750.00   2250.00   2160.00
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2100.000	1388.62	.00	1389.06	340.02	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
2100.000	1388.49	-.13	1389.12	215.33	.00	6000.00	.00	220.00	1955.00	1750.00	2250.00	2175.00
2400.000	1389.54	.00	1389.90	348.48	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
2400.000	1389.43	-.11	1389.96	214.95	.00	6000.00	.00	220.00	1960.00	1750.00	2250.00	2180.00
2700.000	1390.20	.00	1390.50	344.26	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
2700.000	1390.13	-.07	1390.58	210.00	.00	6000.00	.00	210.00	1965.00	1750.00	2250.00	2175.00
2900.000	1390.57	.00	1390.83	363.77	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
2900.000	1390.48	-.09	1390.99	205.00	.00	6000.00	.00	205.00	1965.00	1750.00	2250.00	2170.00
3000.000	1390.71	.00	1390.98	365.13	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
3000.000	1390.69	-.03	1391.20	200.00	.00	6000.00	.00	200.00	1965.00	1750.00	2250.00	2165.00
3300.000	1391.17	.00	1391.47	359.25	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
3300.000	1391.33	.15	1391.81	205.00	.00	6000.00	.00	205.00	1960.00	1750.00	2250.00	2165.00
3600.000	1391.72	.00	1392.03	344.36	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
3600.000	1391.93	.21	1392.38	214.44	.00	6000.00	.00	215.00	1955.00	1750.00	2250.00	2170.00

1

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	3900.000	1392.39	.00	1392.78	347.21	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
	3900.000	1392.59	.20	1393.06	250.00	.00	6000.00	.00	250.00	1890.00	1750.00	2250.00	2140.00
	4000.000	1392.68	.00	1393.07	353.64	.00	6000.00	.00	.00	.00	1730.00	2230.00	.00
	4000.000	1392.83	.15	1393.32	235.00	.00	6000.00	.00	235.00	1860.00	1730.00	2230.00	2095.00
	4100.000	1392.96	.00	1393.31	320.32	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
	4100.000	1393.14	.18	1393.52	230.00	.00	6000.00	.00	230.00	1870.00	1750.00	2250.00	2100.00
	4190.000	1392.97	.00	1393.67	248.48	304.04	5695.96	.00	.00	.00	1935.45	2069.33	.00
	4190.000	1393.13	.16	1393.85	220.00	160.56	5836.39	3.05	220.00	1880.00	1935.45	2069.33	2100.00
*	4256.000	1394.63	.00	1395.04	398.81	417.69	5479.79	102.53	.00	.00	1934.14	2069.09	.00
*	4256.000	1394.59	-.04	1395.08	210.00	159.58	5798.52	41.90	210.00	1890.00	1934.14	2069.09	2100.00
*	4400.000	1394.82	.00	1395.18	425.36	.00	6000.00	.00	.00	.00	1750.00	2250.00	.00
	4400.000	1394.68	-.14	1395.20	160.00	.00	6000.00	.00	160.00	1940.00	1750.00	2250.00	2100.00
*	4500.000	1394.96	.00	1395.27	235.37	.00	6000.00	.00	.00	.00	1700.00	2270.00	.00
	4500.000	1394.88	-.08	1395.28	150.00	.00	6000.00	.00	150.00	1965.00	1700.00	2270.00	2115.00
*	4573.000	1393.39	.00	1396.10	65.00	.00	6000.00	.00	65.00	1967.50	1750.00	2250.00	2032.50

*	4573.000	1393.33	-.06	1396.08	65.00	.00	6000.00	.00	65.00	1967.50	1750.00	2250.00	2032.50
*	4574.000	1396.30	.00	1396.57	65.00	.00	2400.00	.00	65.00	1967.50	1750.00	2250.00	2032.50
*	4574.000	1396.29	-.01	1396.57	65.00	.00	2400.00	.00	65.00	1967.50	1750.00	2250.00	2032.50
	4646.000	1396.54	.00	1396.81	65.00	.00	2400.00	.00	65.00	1967.50	1750.00	2250.00	2032.50
	4646.000	1396.53	-.01	1396.81	65.00	.00	2400.00	.00	65.00	1967.50	1750.00	2250.00	2032.50
	4800.000	1396.76	.00	1396.92	133.91	.00	2400.00	.00	148.00	1927.00	1750.00	2250.00	2075.00
	4800.000	1396.75	-.01	1396.92	133.78	.00	2400.00	.00	148.00	1927.00	1750.00	2250.00	2075.00
	5000.000	1396.88	.00	1397.05	126.01	.00	2400.00	.00	136.00	1934.00	1730.00	2230.00	2070.00
	5000.000	1396.87	-.01	1397.05	125.98	.00	2400.00	.00	136.00	1934.00	1730.00	2230.00	2070.00
	5300.000	1397.06	.00	1397.29	113.20	.00	2400.00	.00	116.00	1941.50	1680.00	2180.00	2057.50
	5300.000	1397.06	.00	1397.29	113.18	.00	2400.00	.00	116.00	1941.50	1680.00	2180.00	2057.50
	5400.000	1397.14	.00	1397.40	109.03	.00	2400.00	.00	116.00	1941.50	1670.00	2170.00	2057.50
	5400.000	1397.13	.00	1397.39	108.99	.00	2400.00	.00	116.00	1941.50	1670.00	2170.00	2057.50
	5700.000	1397.46	.00	1397.77	110.79	.00	2400.00	.00	116.00	1941.00	1655.00	2155.00	2057.00
	5700.000	1397.46	.00	1397.77	110.77	.00	2400.00	.00	116.00	1941.00	1655.00	2155.00	2057.00
	6000.000	1397.88	.00	1398.25	101.69	.00	2400.00	.00	116.00	1943.00	1645.00	2145.00	2059.00
	6000.000	1397.88	.00	1398.25	101.67	.00	2400.00	.00	116.00	1943.00	1645.00	2145.00	2059.00
	6200.000	1398.22	.00	1398.63	99.90	.00	2400.00	.00	122.00	1936.00	1635.00	2135.00	2058.00
	6200.000	1398.22	.00	1398.62	99.88	.00	2400.00	.00	122.00	1936.00	1635.00	2135.00	2058.00

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SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
6500.000	1398.81	.00	1399.27	97.95	.00	2400.00	.00	106.00	1948.00	1665.00	2165.00	2054.00
6500.000	1398.81	.00	1399.27	97.94	.00	2400.00	.00	106.00	1948.00	1665.00	2165.00	2054.00
6700.000	1399.26	.00	1399.74	97.12	.00	2400.00	.00	117.00	1943.00	1705.00	2205.00	2060.00
6700.000	1399.26	.00	1399.74	97.12	.00	2400.00	.00	117.00	1943.00	1705.00	2205.00	2060.00
7000.000	1399.98	.00	1400.48	96.30	.00	2400.00	.00	.00	.00	1760.00	2260.00	.00
7000.000	1399.96	-.02	1400.47	90.00	.00	2400.00	.00	90.00	1955.00	1760.00	2260.00	2045.00
7400.000	1401.00	.00	1401.51	95.75	.00	2400.00	.00	.00	.00	1815.00	2315.00	.00
7400.000	1400.95	-.05	1401.48	90.00	.00	2400.00	.00	90.00	1955.00	1815.00	2315.00	2045.00
7500.000	1401.33	.00	1401.76	102.24	.00	2400.00	.00	.00	.00	1825.00	2325.00	.00
7500.000	1401.29	-.04	1401.73	99.87	.00	2400.00	.00	110.00	1950.00	1825.00	2325.00	2060.00

	7569.000	1401.27	.00	1402.14	58.00	.00	2400.00	.00	58.00	1962.00	1460.00	3224.85	2020.00
	7569.000	1401.23	-.04	1402.11	58.00	.00	2400.00	.00	58.00	1962.00	1460.00	3224.85	2020.00
	7696.000	1401.04	.00	1402.14	58.00	.00	2400.00	.00	58.00	1501.00	650.03	3118.14	1559.00
	7696.000	1400.99	-.05	1402.11	58.00	.00	2400.00	.00	58.00	1501.00	650.03	3118.14	1559.00
*	7800.000	1402.13	.00	1402.53	105.48	.00	2400.00	.00	.00	.00	864.07	3201.38	.00
*	7800.000	1402.10	-.03	1402.51	102.63	.00	2400.00	.00	110.00	1940.00	864.07	3201.38	2050.00
*	7987.000	1401.80	.00	1403.65	46.00	.00	2400.00	.00	46.00	1456.00	608.19	2984.31	1502.00
*	7987.000	1401.77	-.03	1403.64	46.00	.00	2400.00	.00	46.00	1456.00	608.19	2984.31	1502.00
*	8262.000	1404.46	.00	1405.46	46.00	.00	2400.00	.00	46.00	1465.00	512.92	2649.24	1511.00
*	8262.000	1404.46	.01	1405.47	46.00	.00	2400.00	.00	46.00	1465.00	512.92	2649.24	1511.00
	8400.000	1405.60	.00	1405.88	107.65	.00	2400.00	.00	.00	.00	856.92	2679.27	.00
*	8400.000	1405.57	-.03	1405.87	90.00	.00	2400.00	.00	90.00	1955.00	856.92	2679.27	2045.00
	8600.000	1405.75	.00	1406.08	103.99	.00	2400.00	.00	.00	.00	1133.86	3179.03	.00
	8600.000	1405.68	-.07	1406.18	76.71	.00	2400.00	.00	90.00	1955.00	1133.86	3179.03	2045.00
	8690.000	1405.80	.00	1406.16	102.26	.00	2400.00	.00	.00	.00	1080.00	3203.86	.00
	8690.000	1405.94	.14	1406.30	90.00	.00	2400.00	.00	90.00	1955.00	1080.00	3203.86	2045.00
*	8850.000	1410.57	.00	1411.12	381.15	.00	2400.00	.00	.00	.00	1020.00	3253.96	.00
*	8850.000	1410.89	.32	1411.95	140.00	.00	2400.00	.00	140.00	1930.00	1020.00	3253.96	2070.00
*	8851.000	1410.89	.00	1411.37	436.21	.00	2400.00	.00	.00	.00	1020.00	3253.96	.00
*	8851.000	1411.62	.73	1412.68	140.00	.00	2400.00	.00	140.00	1930.00	1020.00	3253.96	2070.00
*	9000.000	1412.01	.00	1412.10	1340.84	.00	2400.00	.00	.00	.00	950.00	3172.52	.00
*	9000.000	1412.91	.90	1413.29	140.00	.00	2400.00	.00	140.00	1930.00	950.00	3172.52	2070.00
	9340.000	1412.67	.00	1412.77	929.95	.00	2400.00	.00	.00	.00	970.00	3055.00	.00
	9340.000	1413.45	.78	1413.96	140.00	.00	2400.00	.00	140.00	1930.00	970.00	3055.00	2070.00

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	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	9731.000	1413.30	.00	1413.40	881.12	.00	2399.67	.33	.00	.00	760.00	2773.41	.00
*	9731.000	1414.27	.97	1414.56	140.00	.00	2400.00	.00	140.00	1970.00	760.00	2773.41	2110.00
*	9930.000	1413.66	.00	1413.94	412.63	.00	2400.00	.00	.00	.00	810.00	2599.07	.00
	9930.000	1414.45	.78	1414.88	140.00	.00	2400.00	.00	140.00	1980.00	810.00	2599.07	2120.00
	10120.000	1414.34	.00	1414.54	546.80	.00	2400.00	.00	.00	.00	1140.00	2590.00	.00
*	10120.000	1415.08	.74	1416.14	140.00	.00	2400.00	.00	140.00	1970.00	1140.00	2590.00	2110.00

*	10600.000	1417.59	.00	1418.05	488.67	.00	2386.78	13.21	.00	.00	1670.00	2170.00	.00
	10600.000	1418.53	.94	1419.46	140.00	.00	2400.00	.00	140.00	1930.00	1670.00	2170.00	2070.00

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FLOWS FROM FIS STUDY

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1140.000	.00	.00	.00	1378.80	6000.00	1383.58	.00	1384.04	50.68	5.47	1096.64	842.84
1140.000	.00	.00	.00	1378.80	6000.00	1383.78	.00	1384.19	38.34	5.12	1172.91	969.03
1300.000	100.00	.00	.00	1380.16	6000.00	1384.02	.00	1384.80	89.58	7.11	844.34	633.94
1300.000	100.00	.00	.00	1380.16	6000.00	1384.01	.00	1384.84	77.97	7.31	821.29	679.52
1500.000	200.00	.00	.00	1380.51	6000.00	1385.49	.00	1386.07	46.13	6.13	978.97	883.39
1500.000	200.00	.00	.00	1380.51	6000.00	1385.37	.00	1386.34	67.82	7.88	761.50	728.59
1800.000	300.00	.00	.00	1381.03	6000.00	1387.01	.00	1387.72	62.98	6.75	888.34	756.07
1800.000	300.00	.00	.00	1381.03	6000.00	1387.17	.00	1387.98	44.39	7.22	831.26	900.58
2100.000	300.00	.00	.00	1381.55	6000.00	1388.62	.00	1389.06	32.53	5.35	1121.37	1051.97
2100.000	300.00	.00	.00	1381.55	6000.00	1388.49	.00	1389.12	32.16	6.38	940.55	1057.95
2400.000	300.00	.00	.00	1382.07	6000.00	1389.54	.00	1389.90	23.44	4.80	1249.50	1239.35
2400.000	300.00	.00	.00	1382.07	6000.00	1389.43	.00	1389.96	23.83	5.83	1029.47	1229.10
2700.000	300.00	.00	.00	1382.59	6000.00	1390.20	.00	1390.50	17.40	4.41	1359.54	1438.41
2700.000	300.00	.00	.00	1382.59	6000.00	1390.13	.00	1390.58	17.63	5.36	1119.64	1428.92
2900.000	200.00	.00	.00	1382.94	6000.00	1390.57	.00	1390.83	14.73	4.11	1461.00	1563.18
2900.000	200.00	.00	.00	1382.94	6000.00	1390.48	.00	1390.99	21.44	5.73	1046.76	1295.88
3000.000	100.00	.00	.00	1383.11	6000.00	1390.71	.00	1390.98	14.76	4.10	1462.45	1561.93
3000.000	100.00	.00	.00	1383.11	6000.00	1390.69	.00	1391.20	20.98	5.74	1045.29	1309.80
3300.000	300.00	.00	.00	1383.63	6000.00	1391.17	.00	1391.47	17.67	4.36	1376.57	1427.35
3300.000	300.00	.00	.00	1383.63	6000.00	1391.33	.00	1391.81	19.25	5.54	1082.26	1367.44
3600.000	305.00	.00	.00	1384.15	6000.00	1391.72	.00	1392.03	19.02	4.53	1324.06	1375.67
3600.000	305.00	.00	.00	1384.15	6000.00	1391.93	.00	1392.38	18.28	5.38	1115.55	1403.39
3900.000	320.00	.00	.00	1384.60	6000.00	1392.39	.00	1392.78	27.58	5.05	1188.19	1142.48
3900.000	320.00	.00	.00	1384.60	6000.00	1392.59	.00	1393.06	24.72	5.54	1083.86	1206.84

	4000.000	102.00	.00	.00	1385.00	6000.00	1392.68	.00	1393.07	27.73	5.02	1194.94	1139.50
	4000.000	102.00	.00	.00	1385.00	6000.00	1392.83	.00	1393.32	24.03	5.62	1067.55	1224.06
	4100.000	100.00	.00	.00	1385.06	6000.00	1392.96	.00	1393.31	20.21	4.75	1263.36	1334.77
	4100.000	100.00	.00	.00	1385.06	6000.00	1393.14	.00	1393.52	15.22	4.95	1212.53	1538.07
	4190.000	87.00	.00	.00	1385.23	6000.00	1392.97	.00	1393.67	23.69	6.90	967.54	1232.68
	4190.000	87.00	.00	.00	1385.23	6000.00	1393.13	.00	1393.85	22.94	6.89	926.57	1252.61
*	4256.000	66.00	1393.39	.00	1385.42	6000.00	1394.63	.00	1395.04	5.51	5.34	1422.87	2556.04
*	4256.000	66.00	1393.39	.00	1385.42	6000.00	1394.59	.00	1395.08	6.27	5.68	1160.87	2396.36

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	4400.000	147.00	.00	.00	1385.86	6000.00	1394.82	.00	1395.18	15.91	4.83	1242.16	1504.08
	4400.000	147.00	.00	.00	1385.86	6000.00	1394.68	.00	1395.20	8.34	5.82	1030.59	2077.10
*	4500.000	100.00	.00	.00	1386.17	6000.00	1394.96	.00	1395.27	5.58	4.46	1344.69	2539.10
	4500.000	100.00	.00	.00	1386.17	6000.00	1394.88	.00	1395.28	5.01	5.06	1186.06	2679.36
*	4573.000	74.00	.00	.00	1386.40	6000.00	1393.39	.00	1396.10	93.80	13.20	454.45	619.51
*	4573.000	74.00	.00	.00	1386.40	6000.00	1393.33	.00	1396.08	96.25	13.31	450.68	611.57
*	4574.000	74.00	.00	.00	1387.55	2400.00	1396.30	.00	1396.57	7.54	4.22	568.54	874.17
*	4574.000	74.00	.00	.00	1387.55	2400.00	1396.29	.00	1396.57	7.55	4.22	568.17	873.29
	4646.000	74.00	1398.00	.00	1387.69	2400.00	1396.54	.00	1396.81	7.27	4.17	575.33	890.14
	4646.000	74.00	1398.00	.00	1387.69	2400.00	1396.53	.00	1396.81	7.28	4.17	574.94	889.20
	4800.000	152.00	.00	.00	1388.11	2400.00	1396.76	.00	1396.92	6.16	3.25	738.59	966.90
	4800.000	152.00	.00	.00	1388.11	2400.00	1396.75	.00	1396.92	6.18	3.25	737.80	965.81
	5000.000	202.00	.00	.00	1388.66	2400.00	1396.88	.00	1397.05	6.21	3.33	720.82	962.99
	5000.000	202.00	.00	.00	1388.66	2400.00	1396.87	.00	1397.05	6.23	3.33	720.13	961.59
	5300.000	306.00	.00	.00	1389.49	2400.00	1397.06	.00	1397.29	8.83	3.85	623.18	807.73
	5300.000	306.00	.00	.00	1389.49	2400.00	1397.06	.00	1397.29	8.85	3.85	622.61	806.62
	5400.000	102.00	.00	.00	1389.76	2400.00	1397.14	.00	1397.40	10.07	4.09	586.68	756.47
	5400.000	102.00	.00	.00	1389.76	2400.00	1397.13	.00	1397.39	10.09	4.09	586.18	755.56
	5700.000	306.00	.00	.00	1390.59	2400.00	1397.46	.00	1397.77	13.77	4.46	538.39	646.72
	5700.000	306.00	.00	.00	1390.59	2400.00	1397.46	.00	1397.77	13.80	4.46	537.97	645.95
	6000.000	307.00	.00	.00	1391.42	2400.00	1397.88	.00	1398.25	16.69	4.90	490.07	587.50

6000.000	307.00	.00	.00	1391.42	2400.00	1397.88	.00	1398.25	16.71	4.90	489.81	587.06
6200.000	203.00	.00	.00	1391.98	2400.00	1398.22	.00	1398.63	19.06	5.13	467.52	549.70
6200.000	203.00	.00	.00	1391.98	2400.00	1398.22	.00	1398.62	19.09	5.14	467.30	549.33
6500.000	306.00	.00	.00	1392.82	2400.00	1398.81	.00	1399.27	22.15	5.41	443.35	509.94
6500.000	306.00	.00	.00	1392.82	2400.00	1398.81	.00	1399.27	22.17	5.41	443.22	509.73
6700.000	202.00	.00	.00	1393.37	2400.00	1399.26	.00	1399.74	23.63	5.54	433.33	493.68
6700.000	202.00	.00	.00	1393.37	2400.00	1399.26	.00	1399.74	23.65	5.54	433.23	493.52
7000.000	300.00	.00	.00	1394.19	2400.00	1399.98	.00	1400.48	25.25	5.67	423.35	477.63
7000.000	300.00	.00	.00	1394.19	2400.00	1399.96	.00	1400.47	24.50	5.74	418.36	484.86
7400.000	400.00	.00	.00	1395.28	2400.00	1401.00	.00	1401.51	26.40	5.76	416.77	467.12
7400.000	400.00	.00	.00	1395.28	2400.00	1400.95	.00	1401.48	26.03	5.85	410.53	470.45
7500.000	100.00	.00	.00	1395.55	2400.00	1401.33	.00	1401.76	21.12	5.25	457.34	522.28
7500.000	100.00	.00	.00	1395.55	2400.00	1401.29	.00	1401.73	21.27	5.30	452.96	520.43

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	7569.000	77.00	.00	.00	1395.74	2400.00	1401.27	.00	1402.14	20.45	7.48	320.77	530.78
	7569.000	77.00	.00	.00	1395.74	2400.00	1401.23	.00	1402.11	20.89	7.53	318.58	525.14
	7696.000	110.00	1405.41	1402.22	1396.12	2400.00	1401.04	.00	1402.14	29.53	8.41	285.22	441.64
	7696.000	110.00	1405.41	1402.22	1396.12	2400.00	1400.99	.00	1402.11	30.42	8.49	282.55	435.16
*	7800.000	113.00	.00	.00	1396.44	2400.00	1402.13	.00	1402.53	10.22	5.10	470.34	750.77
*	7800.000	113.00	.00	.00	1396.44	2400.00	1402.10	.00	1402.51	10.19	5.14	466.73	751.89
*	7987.000	200.00	.00	.00	1397.02	2400.00	1401.80	.00	1403.65	53.78	10.91	219.96	327.27
*	7987.000	200.00	.00	.00	1397.02	2400.00	1401.77	.00	1403.64	54.98	10.99	218.39	323.67
*	8262.000	270.00	1409.10	1403.08	1397.98	2400.00	1404.46	.00	1405.46	21.15	8.05	297.99	521.83
*	8262.000	270.00	1409.10	1403.08	1397.98	2400.00	1404.46	.00	1405.47	21.09	8.05	298.27	522.57
	8400.000	130.00	.00	.00	1398.40	2400.00	1405.60	.00	1405.88	11.02	4.22	568.06	723.06
*	8400.000	130.00	.00	.00	1398.40	2400.00	1405.57	.00	1405.87	10.53	4.40	545.53	739.72
	8600.000	200.00	.00	.00	1399.00	2400.00	1405.75	.00	1406.08	7.22	4.62	519.57	893.40
	8600.000	200.00	.00	.00	1399.00	2400.00	1405.68	.00	1406.18	10.57	5.67	423.14	738.05
	8690.000	90.00	.00	.00	1399.27	2400.00	1405.80	.00	1406.16	8.17	4.83	497.27	839.61
	8690.000	90.00	.00	.00	1399.27	2400.00	1405.94	.00	1406.30	7.06	4.80	500.41	903.18

*	8850.000	160.00	.00	.00	1408.00	2400.00	1410.57	1410.57	1411.12	93.81	5.97	402.34	247.80
*	8850.000	160.00	.00	.00	1408.00	2400.00	1410.89	1410.89	1411.95	74.88	8.27	290.35	277.36
*	8851.000	1.00	.00	.00	1409.00	2400.00	1410.89	1410.89	1411.37	88.16	5.55	432.51	255.60
*	8851.000	1.00	.00	.00	1409.00	2400.00	1411.62	1411.62	1412.68	75.26	8.25	290.86	276.65
*	9000.000	150.00	.00	.00	1409.00	2400.00	1412.01	.00	1412.10	23.25	2.37	1010.73	497.69
*	9000.000	150.00	.00	.00	1409.00	2400.00	1412.91	.00	1413.29	13.98	4.95	484.46	641.82
	9340.000	340.00	.00	.00	1410.00	2400.00	1412.67	.00	1412.77	16.61	2.48	965.91	588.79
	9340.000	340.00	.00	.00	1410.00	2400.00	1413.45	.00	1413.96	23.37	5.78	415.32	496.46
	9731.000	390.00	.00	.00	1410.00	2400.00	1413.30	.00	1413.40	15.95	2.51	956.62	601.01
*	9731.000	390.00	.00	.00	1410.00	2400.00	1414.27	.00	1414.56	8.84	4.31	557.23	807.22
*	9930.000	203.00	.00	.00	1411.00	2400.00	1413.66	.00	1413.94	32.97	4.22	568.48	417.96
	9930.000	203.00	.00	.00	1411.00	2400.00	1414.45	.00	1414.88	17.23	5.27	455.24	578.14
	10120.000	193.00	.00	.00	1412.00	2400.00	1414.34	.00	1414.54	27.23	3.56	673.45	459.93
*	10120.000	193.00	.00	.00	1412.00	2400.00	1415.08	1415.08	1416.14	76.27	8.27	290.15	274.82
*	10600.000	480.00	.00	.00	1416.00	2400.00	1417.59	1417.59	1418.05	95.21	5.50	439.48	245.96
	10600.000	480.00	.00	.00	1416.00	2400.00	1418.53	.00	1419.46	61.50	7.75	309.61	306.05

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FLOWS FROM FIS STUDY

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1140.000	6000.00	1383.58	.00	.00	.00	449.86	.00
1140.000	6000.00	1383.78	.20	.00	.20	430.00	.00
1300.000	6000.00	1384.02	.00	.44	.00	358.65	100.00
1300.000	6000.00	1384.01	.00	.23	.00	300.00	100.00
1500.000	6000.00	1385.49	.00	1.47	.00	315.08	200.00
1500.000	6000.00	1385.37	-.12	1.36	-.12	220.00	200.00
1800.000	6000.00	1387.01	.00	1.52	.00	311.81	300.00
1800.000	6000.00	1387.17	.16	1.80	.16	200.00	300.00
2100.000	6000.00	1388.62	.00	1.61	.00	340.02	300.00
2100.000	6000.00	1388.49	-.13	1.32	-.13	215.33	300.00

2400.000	6000.00	1389.54	.00	.92	.00	348.48	300.00
2400.000	6000.00	1389.43	-.11	.94	-.11	214.95	300.00
2700.000	6000.00	1390.20	.00	.66	.00	344.26	300.00
2700.000	6000.00	1390.13	-.07	.70	-.07	210.00	300.00
2900.000	6000.00	1390.57	.00	.36	.00	363.77	200.00
2900.000	6000.00	1390.48	-.09	.34	-.09	205.00	200.00
3000.000	6000.00	1390.71	.00	.15	.00	365.13	100.00
3000.000	6000.00	1390.69	-.03	.21	-.03	200.00	100.00
3300.000	6000.00	1391.17	.00	.46	.00	359.25	300.00
3300.000	6000.00	1391.33	.15	.64	.15	205.00	300.00
3600.000	6000.00	1391.72	.00	.54	.00	344.36	305.00
3600.000	6000.00	1391.93	.21	.60	.21	214.44	305.00
3900.000	6000.00	1392.39	.00	.67	.00	347.21	320.00
3900.000	6000.00	1392.59	.20	.66	.20	250.00	320.00
4000.000	6000.00	1392.68	.00	.29	.00	353.64	102.00
4000.000	6000.00	1392.83	.15	.24	.15	235.00	102.00
4100.000	6000.00	1392.96	.00	.28	.00	320.32	100.00
4100.000	6000.00	1393.14	.18	.31	.18	230.00	100.00
4190.000	6000.00	1392.97	.00	.01	.00	248.48	87.00
4190.000	6000.00	1393.13	.16	-.01	.16	220.00	87.00
* 4256.000	6000.00	1394.63	.00	1.66	.00	398.81	66.00
* 4256.000	6000.00	1394.59	-.04	1.46	-.04	210.00	66.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
* 4400.000	6000.00	1394.82	.00	.19	.00	425.36	147.00
4400.000	6000.00	1394.68	-.14	.09	-.14	160.00	147.00
* 4500.000	6000.00	1394.96	.00	.15	.00	235.37	100.00
4500.000	6000.00	1394.88	-.08	.21	-.08	150.00	100.00
* 4573.000	6000.00	1393.39	.00	-1.57	.00	65.00	74.00
* 4573.000	6000.00	1393.33	-.06	-1.55	-.06	65.00	74.00
* 4574.000	2400.00	1396.30	.00	2.91	.00	65.00	74.00
* 4574.000	2400.00	1396.29	-.01	2.96	-.01	65.00	74.00

4646.000	2400.00	1396.54	.00	.24	.00	65.00	74.00
4646.000	2400.00	1396.53	-.01	.24	-.01	65.00	74.00
4800.000	2400.00	1396.76	.00	.22	.00	133.91	152.00
4800.000	2400.00	1396.75	-.01	.22	-.01	133.78	152.00
5000.000	2400.00	1396.88	.00	.12	.00	126.01	202.00
5000.000	2400.00	1396.87	-.01	.12	-.01	125.98	202.00
5300.000	2400.00	1397.06	.00	.18	.00	113.20	306.00
5300.000	2400.00	1397.06	.00	.18	.00	113.18	306.00
5400.000	2400.00	1397.14	.00	.08	.00	109.03	102.00
5400.000	2400.00	1397.13	.00	.08	.00	108.99	102.00
5700.000	2400.00	1397.46	.00	.32	.00	110.79	306.00
5700.000	2400.00	1397.46	.00	.32	.00	110.77	306.00
6000.000	2400.00	1397.88	.00	.42	.00	101.69	307.00
6000.000	2400.00	1397.88	.00	.42	.00	101.67	307.00
6200.000	2400.00	1398.22	.00	.34	.00	99.90	203.00
6200.000	2400.00	1398.22	.00	.34	.00	99.88	203.00
6500.000	2400.00	1398.81	.00	.60	.00	97.95	306.00
6500.000	2400.00	1398.81	.00	.60	.00	97.94	306.00
6700.000	2400.00	1399.26	.00	.45	.00	97.12	202.00
6700.000	2400.00	1399.26	.00	.45	.00	97.12	202.00
7000.000	2400.00	1399.98	.00	.72	.00	96.30	300.00
7000.000	2400.00	1399.96	-.02	.70	-.02	90.00	300.00
7400.000	2400.00	1401.00	.00	1.02	.00	95.75	400.00
7400.000	2400.00	1400.95	-.05	1.00	-.05	90.00	400.00
7500.000	2400.00	1401.33	.00	.33	.00	102.24	100.00
7500.000	2400.00	1401.29	-.04	.34	-.04	99.87	100.00

1

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
7569.000	2400.00	1401.27	.00	-.06	.00	58.00	77.00
7569.000	2400.00	1401.23	-.04	-.06	-.04	58.00	77.00
7696.000	2400.00	1401.04	.00	-.23	.00	58.00	110.00

	7696.000	2400.00	1400.99	-.05	-.24	-.05	58.00	110.00
*	7800.000	2400.00	1402.13	.00	1.09	.00	105.48	113.00
*	7800.000	2400.00	1402.10	-.03	1.11	-.03	102.63	113.00
*	7987.000	2400.00	1401.80	.00	-.33	.00	46.00	200.00
*	7987.000	2400.00	1401.77	-.03	-.33	-.03	46.00	200.00
*	8262.000	2400.00	1404.46	.00	2.66	.00	46.00	270.00
*	8262.000	2400.00	1404.46	.01	2.70	.01	46.00	270.00
	8400.000	2400.00	1405.60	.00	1.14	.00	107.65	130.00
*	8400.000	2400.00	1405.57	-.03	1.10	-.03	90.00	130.00
	8600.000	2400.00	1405.75	.00	.15	.00	103.99	200.00
	8600.000	2400.00	1405.68	-.07	.11	-.07	76.71	200.00
	8690.000	2400.00	1405.80	.00	.05	.00	102.26	90.00
	8690.000	2400.00	1405.94	.14	.26	.14	90.00	90.00
*	8850.000	2400.00	1410.57	.00	4.77	.00	381.15	160.00
*	8850.000	2400.00	1410.89	.32	4.95	.32	140.00	160.00
*	8851.000	2400.00	1410.89	.00	.32	.00	436.21	1.00
*	8851.000	2400.00	1411.62	.73	.73	.73	140.00	1.00
*	9000.000	2400.00	1412.01	.00	1.12	.00	1340.84	150.00
*	9000.000	2400.00	1412.91	.90	1.29	.90	140.00	150.00
	9340.000	2400.00	1412.67	.00	.66	.00	929.95	340.00
	9340.000	2400.00	1413.45	.78	.54	.78	140.00	340.00
	9731.000	2400.00	1413.30	.00	.63	.00	881.12	390.00
*	9731.000	2400.00	1414.27	.97	.83	.97	140.00	390.00
*	9930.000	2400.00	1413.66	.00	.36	.00	412.63	203.00
	9930.000	2400.00	1414.45	.78	.17	.78	140.00	203.00
	10120.000	2400.00	1414.34	.00	.68	.00	546.80	193.00
*	10120.000	2400.00	1415.08	.74	.64	.74	140.00	193.00
*	10600.000	2400.00	1417.59	.00	3.24	.00	488.67	480.00
	10600.000	2400.00	1418.53	.94	3.45	.94	140.00	480.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=   4256.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4256.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   4400.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   4500.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   4573.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4573.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   4574.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4574.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   7800.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   7800.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   7987.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   7987.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   8262.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   8262.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   8400.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   8850.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   8850.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   8850.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   8850.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   8850.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   8850.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   8851.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   8851.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   8851.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   8851.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   8851.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   8851.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   9000.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   9000.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9731.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   9930.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  10120.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  10120.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
```

CAUTION SECNO= 10120.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 10600.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 10600.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10600.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODWAY DATA, FLOWS FROM FIS STUDY
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
1140.000	430.	1173.	5.1	1383.8	1383.6	.2
1300.000	300.	821.	7.3	1384.0	1384.0	.0
1500.000	220.	761.	7.9	1385.4	1385.5	-.1
1800.000	200.	831.	7.2	1387.2	1387.0	.2
2100.000	215.	941.	6.4	1388.5	1388.6	-.1
2400.000	215.	1029.	5.8	1389.4	1389.5	-.1
2700.000	210.	1120.	5.4	1390.1	1390.2	-.1
2900.000	205.	1047.	5.7	1390.5	1390.6	-.1
3000.000	200.	1045.	5.7	1390.7	1390.7	.0
3300.000	205.	1082.	5.5	1391.4	1391.2	.2
3600.000	214.	1116.	5.4	1391.9	1391.7	.2
3900.000	250.	1084.	5.5	1392.6	1392.4	.2
4000.000	235.	1068.	5.6	1392.9	1392.7	.2
4100.000	230.	1213.	4.9	1393.2	1393.0	.2
4190.000	220.	927.	6.5	1393.2	1393.0	.2
4256.000	210.	1161.	5.2	1394.6	1394.6	.0
4400.000	160.	1031.	5.8	1394.7	1394.8	-.1
4500.000	150.	1186.	5.1	1394.9	1395.0	-.1
4573.000	65.	451.	13.3	1393.3	1393.4	-.1
4574.000	65.	568.	4.2	1396.3	1396.3	.0
4646.000	65.	575.	4.2	1396.5	1396.5	.0
4800.000	134.	738.	3.3	1396.8	1396.8	.0
5000.000	126.	720.	3.3	1396.9	1396.9	.0
5300.000	113.	623.	3.9	1397.1	1397.1	.0
5400.000	109.	586.	4.1	1397.1	1397.1	.0
5700.000	111.	538.	4.5	1397.5	1397.5	.0

6000.000	102.	490.	4.9	1397.9	1397.9	.0
6200.000	100.	467.	5.1	1398.2	1398.2	.0
6500.000	98.	443.	5.4	1398.8	1398.8	.0
6700.000	97.	433.	5.5	1399.3	1399.3	.0
7000.000	90.	418.	5.7	1400.0	1400.0	.0
7400.000	90.	411.	5.8	1401.0	1401.0	.0
7500.000	100.	453.	5.3	1401.3	1401.3	.0
7569.000	58.	319.	7.5	1401.3	1401.3	.0
7696.000	58.	283.	8.5	1401.0	1401.0	.0
7800.000	103.	467.	5.1	1402.1	1402.1	.0
7987.000	46.	218.	11.0	1401.8	1401.8	.0
8262.000	46.	298.	8.0	1404.5	1404.5	.0
8400.000	90.	546.	4.4	1405.6	1405.6	.0
8600.000	77.	423.	5.7	1405.6	1405.7	-.1
8690.000	90.	500.	4.8	1405.9	1405.8	.1
8850.000	140.	290.	8.3	1410.9	1410.6	.3

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FLOODWAY DATA, FLOWS FROM FIS STUDY
PROFILE NO. 2

STATION	------- FLOODWAY ------- WIDTH	SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
8851.000	140.	291.	8.3	1411.6	1410.9	.7
9000.000	140.	484.	5.0	1412.9	1412.0	.9
9340.000	140.	415.	5.8	1413.5	1412.7	.8
9731.000	140.	557.	4.3	1414.3	1413.3	1.0
9930.000	140.	455.	5.3	1414.5	1413.7	.8
10120.000	140.	290.	8.3	1415.0	1414.3	.7
10600.000	140.	310.	7.8	1418.5	1417.6	.9

Section 3 REVISED SHEETS FOR CLOMR NOTEBOOK

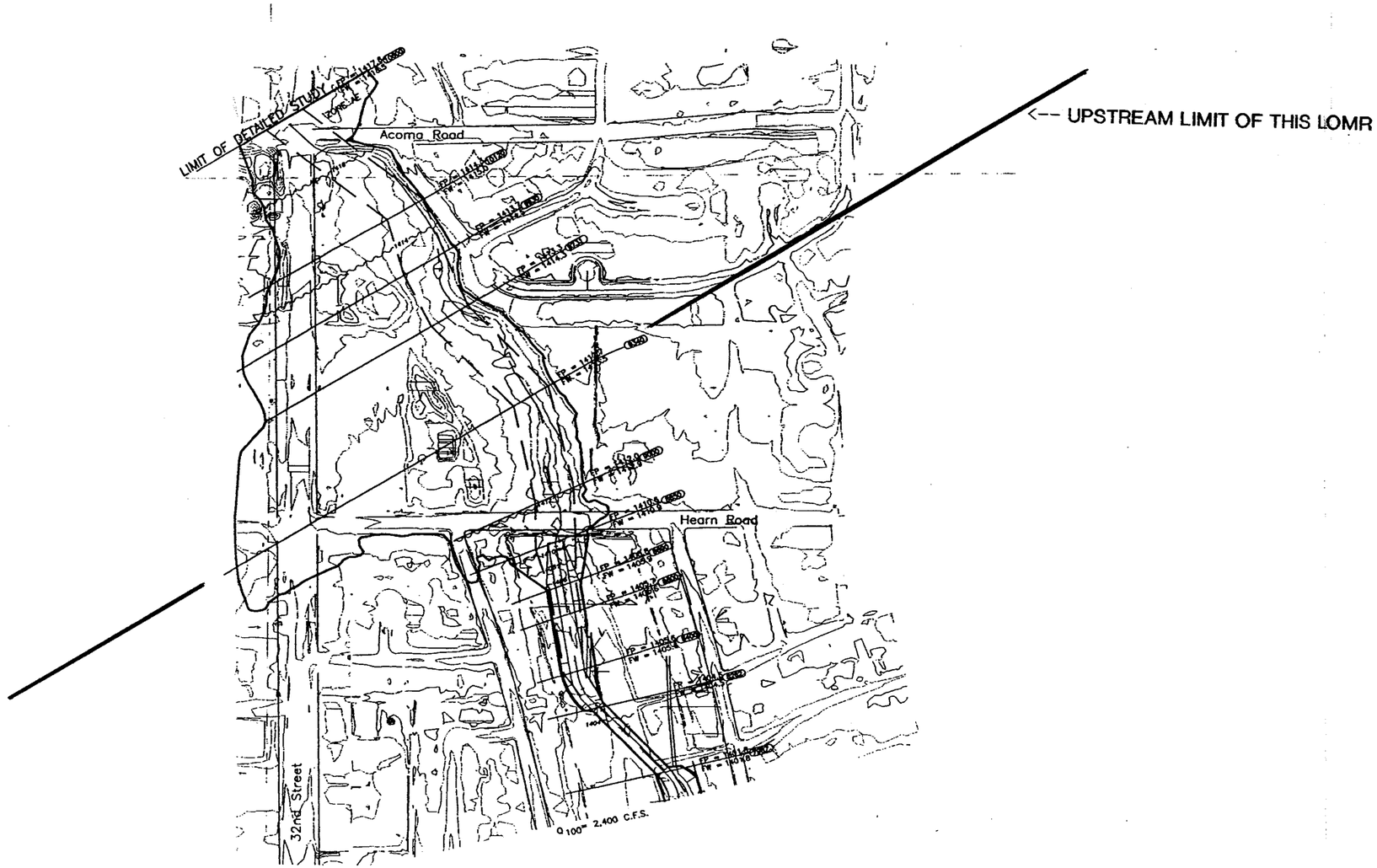
At the upper end of the CLOMR study, there is incomplete cross-section data. This is evidenced by the vertically-extended cross-sections 9731 and 9930 in the proposed-conditions HEC-2 model of the CLOMR submittal. This area of the floodplain includes a city park, and the city has Engineered Plans for some proposed Flood Control features for the park.

Based on this, the upstream limit for this LOMR will be different from that of the associated CLOMR:

The upstream limit for this LOMR is cross-section 9340, which is called BG on the FIRM.

To reflect this change, revised sheets for the CLOMR notebook are included in this section:

page 10	Work Map sheet 3 of 3
page 15 & 17	Water Surface Comparison Tables
page 21	Floodway Data Table
page 23	Annotated FIRM with Proposed Floodplain
page 24	Annotated FIRM with Proposed Floodway
page 27	Flood Profile



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY FOR INDIAN BEND WASH 40th STREET TO 32nd STREET

F.C.D. CONTRACT NO. 93-05

LEGEND

SECTION LINE	
CORPORATE BOUNDARY	
100-YEAR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE	
CROSS-SECTION	FP=FLOODPLAIN WSE FW=FLOODWAY WSE (1,439)
BASE FLOOD ELEVATION	1160
ELEVATION REFERENCE MARK	RM

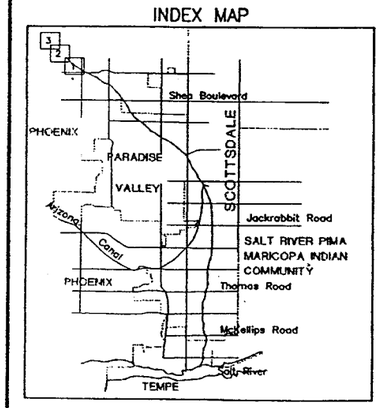
ELEVATION REFERENCE MARKS

RM#	ELEVATION (NAVD '29)	DESCRIPTION
7088	1,409.01	City of Phoenix brass cap in handhole, 32nd Street and Thunderbird Road.
3342-AA	1,394.41	City of Phoenix 3" brass cap in handhole, 36th Street and Sweetwater.

NOTES

1. CROSS-SECTION STATION 2,000 IS THE HYDRAULIC BASELINE EXCEPT WHERE NOTED.

INDEX MAP



200' 0' 200' 400'
SCALE: 1" = 200'
CONTOUR INTERVAL = 1 FOOT

SIMONS, LI & ASSOCIATES, INC.

	BY	DATE	
DESIGN	LX	1/14/98	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	BSB	1/14/98	
PLANS	BAL	1/14/98	RECOMMENDED BY: DATE
PLANS CHK.	BSB	1/14/98	APPROVED BY: DATE
SUBMITTED BY: DATE:			CHIEF ENGINEER AND GENERAL MANAGER
			SHEET 3 OF 3

Figure 3c

5.8 Calibration

The starting water surface at 40th Street was obtained from the pending LOMR request for Indian Bend Wash, Salt River to 40th Street. This elevation was adjusted to the channelization project mapping datum. Since the effective HEC-2 model is not available for Indian Bend Wash, the water-surface elevations resulting from the analysis models were compared to the available effective FIS water-surface information (2). The effective FIS information used included the FIRM and FLOODWAY maps, the profile plots, and the floodway data tables for the study reach.

5.9 Final Results

Table 2 compares the existing conditions floodplain with the effective floodplain, using water-surface elevations taken from the FIS Floodway Data Table, and the proposed post-project floodway. The table demonstrates that the existing conditions floodplain is lower than the effective FIS floodplain and that the proposed floodway is significantly lower than the effective FIS floodplain within the project limits. Upstream of the project limits, the proposed floodway is above the effective FIS floodplain, but not by more than 0.5 feet.

Table 2: Water Surface Elevation Comparison
Existing and Project Conditions vs. FIS

CROSS-SECTION NUMBER	EXISTING CONDITION FLOODPLAIN	F.I.S. FLOODPLAIN	POST PROJECT FLOODWAY	DIFFERENCE (EXIST. F.P.-FIS.F.P.)	DIFFERENCE (FIS F.P.-PROP.F.W.)
1140 (AY)	1383.6	1385.7	1383.8	-2.1	1.9
1500 (AZ)	1385.9	1388.6	1385.4	-2.7	3.2
2100 (BA)	1390.5	1391.5	1388.5	-1.0	3.0
4646 (BB)	1397.5	1398.1	1396.5	-0.6	1.6
5300 (BC)	1399.9	1399.9	1397.1	0.0	2.8
6500 (BD)	1402.6	1404.3	1398.8	-1.7	5.5
7400 (BE)	1405.9	1407.3	1401.0	-1.4	6.3
8690 (BF)	1410.7	1411.9	1405.9	-1.2	6.0
9340 (BG)	1412.6	1413.7	1413.5	-1.1	0.2
~~10120 (BH)~~	~~1414.4~~	~~1414.8~~	~~1415.0~~	~~-0.5~~	~~-0.2~~
~~10600 (BI)~~	~~1417.6~~	~~1418.0~~	~~1418.5~~	~~-0.4~~	~~-0.5~~
(AY) - Effective FIS Cross-section Label					

Table 3: Water Surface Elevation Comparison Existing vs. Project Conditions

CROSS-SECTION NUMBER	EXISTING CONDITION FLOODPLAIN	POST PROJECT FLOODPLAIN	POST PROJECT FLOODWAY	DIFFERENCE (EXIST. F.P.-PROP.F.P.)	DIFFERENCE (PROP. F.W.-PROP.F.P.)
1140	1383.6	1383.6	1383.8	0.0	0.2
1300	1384.3	1384.0	1384.0	0.3	0.0
1500	1385.9	1385.5	1385.4	0.4	-0.1
1800	1388.8	1387.0	1387.2	1.8	0.2
2100	1390.5	1388.6	1388.5	1.9	-0.1
2400	1391.5	1389.5	1389.4	2.0	-0.1
2700	1392.1	1390.2	1390.1	1.9	-0.1
2900	1392.4	1390.6	1390.5	1.8	-0.1
3000	1392.5	1390.7	1390.7	1.8	0.0
3300	1392.8	1391.2	1391.4	1.6	0.2
3600	1393.3	1391.7	1391.9	1.6	0.2
3900	1393.9	1392.3	1392.5	1.6	0.2
4000	1394.2	1392.6	1392.8	1.6	0.2
4100	1394.4	1392.8	1393.0	1.6	0.2
4190	1394.8	1392.8	1392.9	2.0	0.1
4256	1395.5	1394.6	1394.6	0.9	0.0
4400	1396.6	1394.8	1394.7	1.8	-0.1
4500	1397.0	1394.9	1394.8	2.1	-0.1
4573	1396.9	1393.3	1393.2	3.6	-0.1
4574	1396.9	1396.3	1396.3	0.6	0.0
4646	1397.5	1396.5	1396.5	1.0	0.0
4800	1399.6	1396.8	1396.8	2.8	0.0
5000	1399.8	1396.9	1396.9	2.9	0.0
5300	1399.9	1397.1	1397.1	2.8	0.0
5400	1399.9	1397.1	1397.1	2.8	0.0
5700	1400.2	1397.5	1397.5	2.7	0.0
6000	1400.9	1397.9	1397.9	3.0	0.0
6200	1401.5	1398.2	1398.2	3.3	0.0
6500	1402.6	1398.8	1398.8	3.8	0.0
6700	1403.5	1399.3	1399.3	4.2	0.0
7000	1404.7	1400.0	1400.0	4.7	0.0
7400	1405.9	1401.0	1401.0	4.9	0.0
7500	1406.3	1401.3	1401.3	5.0	0.0
7569	1406.7	1401.3	1401.3	5.4	0.0
7696	1406.9	1401.0	1401.0	5.9	0.0
7800	1407.4	1402.1	1402.1	5.3	0.0
7987	1408.4	1401.8	1401.8	6.6	0.0
8262	1409.2	1404.5	1404.5	4.7	0.0
8400	1409.5	1405.6	1405.6	3.9	0.0
8600	1410.3	1405.7	1405.6	4.5	-0.1
8690	1410.7	1405.8	1405.9	4.9	0.1
8850	1411.4	1410.6	1410.9	0.8	0.3
8851	1411.4	1410.9	1411.6	0.5	0.7
9000	1411.8	1412.0	1412.9	-0.2	0.9
9340	1412.6	1412.7	1413.5	-0.1	0.8
~~9731~~	~~1413.3~~	~~1413.3~~	~~1414.3~~	~~0.0~~	~~1.0~~
~~9930~~	~~1413.7~~	~~1413.7~~	~~1414.5~~	~~0.0~~	~~0.8~~
~~10120~~	~~1414.4~~	~~1414.3~~	~~1415.0~~	~~0.0~~	~~0.7~~
~~10600~~	~~1417.6~~	~~1417.6~~	~~1418.5~~	~~0.0~~	~~0.9~~

FLOODING SOURCE		FLOODWAY			WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (ft)	SECTION AREA (sq ft)	MEAN VELOCITY (ft/s)	WITH FLOODWAY (ft)	WITHOUT FLOODWAY (ft)	DIFFERENCE (ft)
BG	1,140	427	1056	5.7	1383.8	1383.6	0.2
BH	1,500	220	757	7.9	1385.4	1385.5	-0.1
BI	2,100	215	940	6.4	1388.5	1388.6	-0.1
BJ	4,190	189	880	6.8	1392.9	1392.8	0.1
BK	4,500	150	1144	5.2	1394.8	1394.9	-0.1
BL	4,646	65	575	4.2	1396.5	1396.5	0.0
BM	5,300	113	622	3.9	1397.1	1397.1	0.0
BN	6,500	98	443	5.4	1398.8	1398.8	0.0
BO	7,400	90	411	5.8	1401.0	1401.0	0.0
BP	8,690	90	500	4.8	1405.9	1405.8	0.1
BQ	8,850	140	290	8.3	1410.9	1410.6	0.3
BR	9,340	140	415	5.8	1413.5	1412.7	0.8
~~BS~~	~~10,120~~	~~140~~	~~290~~	~~8.3~~	~~1415.0~~	~~1414.3~~	~~0.7~~
~~BT~~	~~10,600~~	~~140~~	~~310~~	~~7.8~~	~~1418.5~~	~~1417.6~~	~~0.9~~

[1] Feet above Cactus Road

[2] 1929 Datum

TABLE 6

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SIMONS, LI & ASSOCIATES, INC.

FLOODWAY DATA

INDIAN BEND WASH

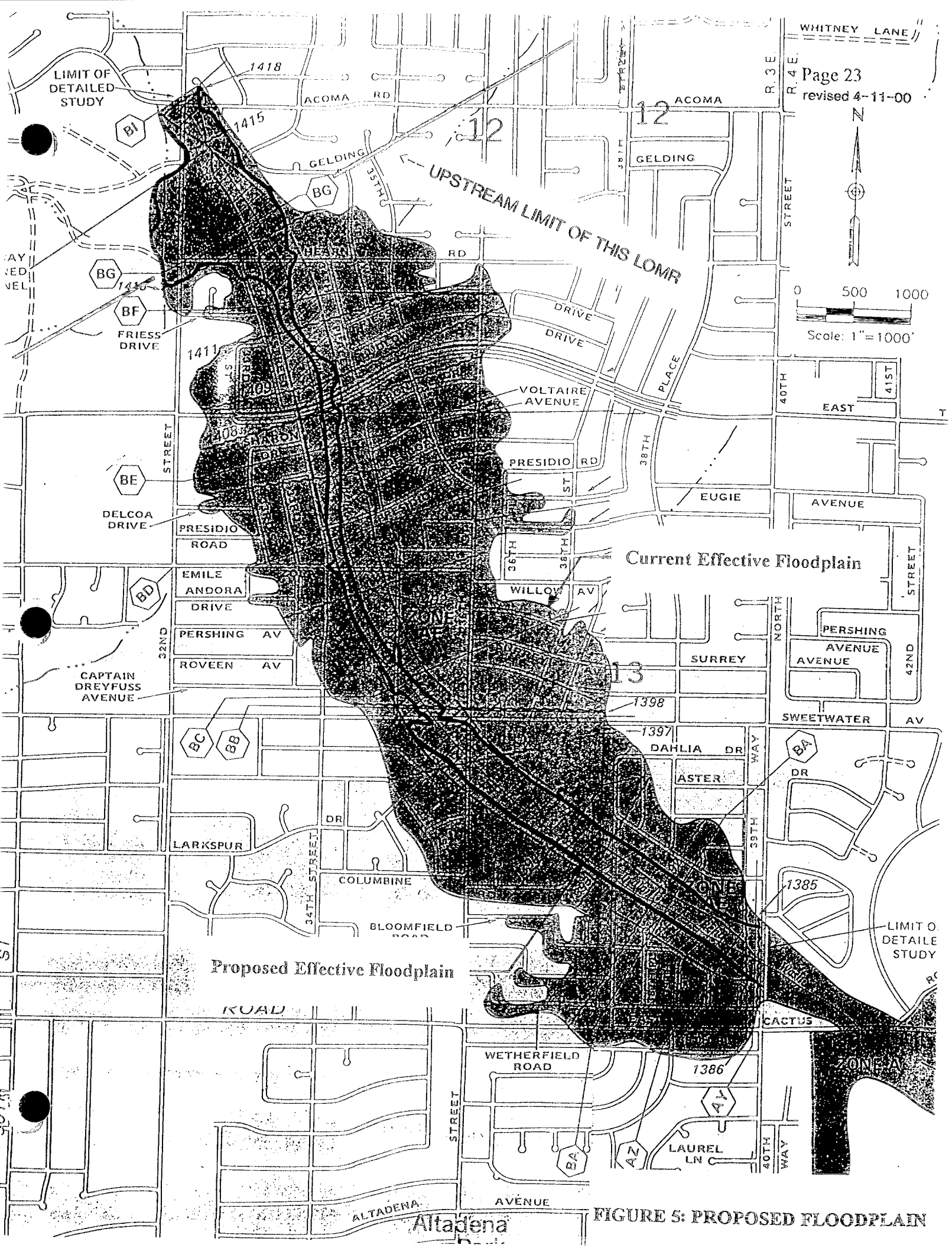


FIGURE 5: PROPOSED FLOODPLAIN

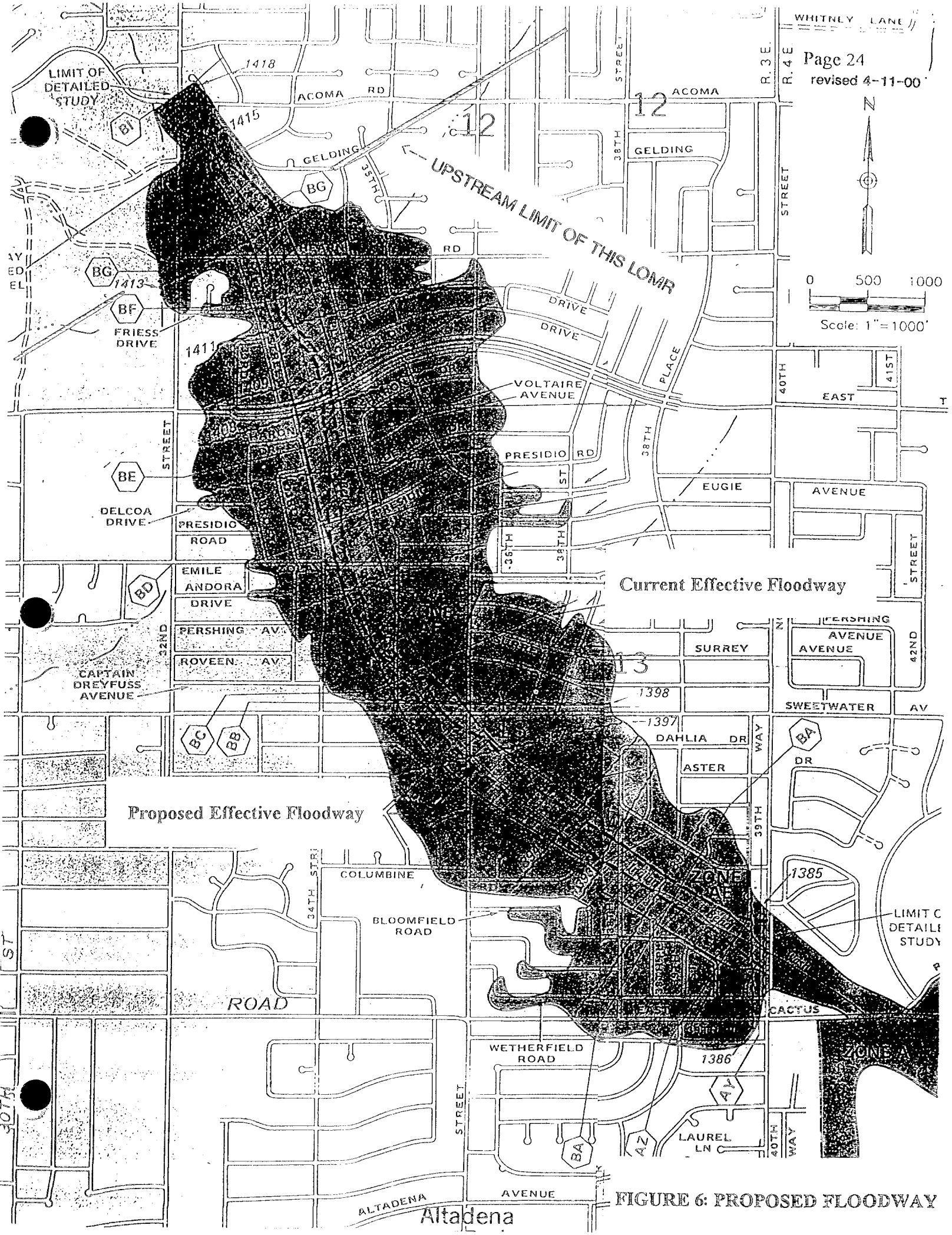
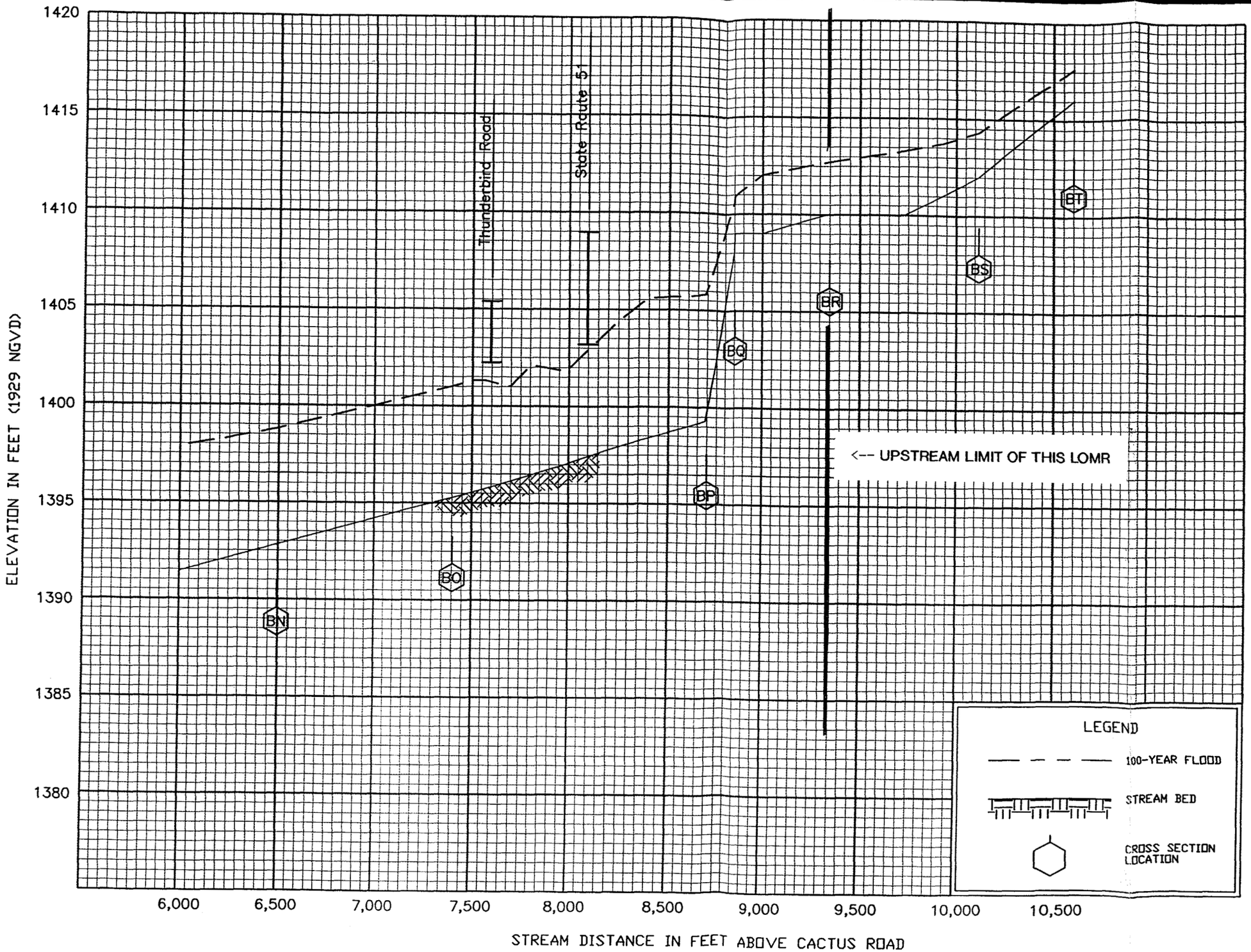


FIGURE 6: PROPOSED FLOODWAY



FLOOD PROFILES

INDIAN BEND WASH
40th STREET TO 32nd STREET

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
(FLOOD CONTROL DISTRICT)

SHEET 2

Section 4 MAINTENANCE

This section contains documents from the City of Phoenix concerning the adoption, enforcement, and maintenance of the revised channel and floodplain.

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

February 4, 2000

FLOOD CONTROL DISTRICT
RECEIVED
FEB 03 2000
CHENG
PIO
ADMIN
FINANCE
O&M
ENGR
REMARKS MWB

Mr. Matthew B. Miller, P.E.
Chief, Hazard Studies Branch
Mitigation Directorate
Federal Emergency Management Agency
500 "C" Street, S.W.
Washington, D.C. 20472

Dear Mr. Miller:

RE: CASE NO. 98-09-484R
FLOODPLAIN DELINEATION FOR INDIAN BEND WASH
40TH STREET TO 32ND STREET
FIRM PANELS 04013C1660F AND 04013C1680F

This is in response to your letter of June 8, 1998 approving a Conditional Letter of Map Revision for the Indian Bend Wash from 40th Street to 32nd Street. Your letter requested that additional data be submitted prior to issuance of a Letter of Map Revision. One item requested was a letter stating that our community will adopt and enforce the modified floodway. This letter serves as the City of Phoenix verification that we will adopt and enforce the modified floodway as it appears on the revised FIRM maps per the Letter of Map Revision.

Another item requested was an officially adopted maintenance and operation plan for the proposed channel. Attached is a copy of the City of Phoenix Policy and Procedure for maintenance of Drainage Facilities. The Street Maintenance Division of the Street Transportation Department is responsible for ensuring that this is accomplished.

200 West Washington Street, Fifth Floor, Phoenix, Arizona 85003-1611 602-262-6284 FAX: 602-495-2016

Recycled Paper

If you have any questions regarding this information, please contact me at 602-262-4026.

Sincerely,

Thomas E. Callow, P.E.
Interim Street Transportation Director

Cindy D White

Cindy D. White, P.E.
Floodplain Manager

TEC/CDW/aff/98-09-484R

Attachment

CITY OF PHOENIX	STREET MAINTENANCE DIVISION POLICY AND PROCEDURE	4.14 1 of 2 NUMBER
	MAINTENANCE OF DRAINAGE FACILITIES SUBJECT	12-02-92 ISSUE DATE

PURPOSE:

To insure all drainage facilities are maintained and kept clear from objects that may impede the flow of storm runoff.

POLICY:

All drainage facilities shall be inspected and cleaned on a maintenance schedule.

PROCEDURE:

1. The Street Maintenance Drainage Foreman shall visually inspect each drainage facility in his/her section once a month.

2. The Drainage Foreman shall schedule the cleaning as needed, but no more than the established service levels, unless it is determined that if allowed to exist could become an obstruction to drainage.

3. The following is the established service levels.

   a) Man-made Drainage Easements: Inspected and cleaned, if needed, once a month.

   b) Dedicated Natural Washes: Inspected monthly and cleaned of debris twice annually.

   c) Un-dedicated Natural Washes: Inspect twice annually and notify adjacent property owner to clean as needed. If the property owner does not remove the debris from the wash, the Foreman shall advise the area Street Maintenance Field Inspector who shall follow through by notifying NIH - Zoning Enforcement.

   d) Man-made Detention Basins: Inspect monthly and clean as needed.

   e) Storm Drainage Inlets: Inspect monthly and clean as needed.

The Street Maintenance Section shall respond to any complaints regarding the clogging of drainage facilities and correct the problem within five days of notification. The above service levels shall be followed for routine maintenance. Extenuating circumstances may require deviation.

DTM:ve

Section 5 AS-BUILT PLANS

The full size, certified as-built plans are packaged separately. The plots of the surveyed-as-built and the design cross-sections of the channel are included with these plans.