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DYSART DRAIN IMPROVEMENT PROJECT

ALTERNATIVES ANALYSIS REPORT

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DYSART DRAIN IMPROVEMENT PROJECT

ALTERNATIVES ANALYSIS REPORT

Prepared For:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
AND
LUKE AIR FORCE BASE

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ARIZONA, U.S.A.

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JANUARY 31, 1994

DYSART DRAIN IMPROVEMENT PROJECT
ALTERNATIVES ANALYSIS REPORT

1.0 INTRODUCTION

This alternatives analysis report is prepared for the Flood Control District of Maricopa County, Arizona and the United States Department of Defense, Luke Air Force Base as part of the design of the Dysart Drain Improvements Project located in Maricopa County, Arizona. The Project Location is shown on **Figure 1**.

Preliminary Design of the Dysart Drain improvements is presented in Dysart Drain Improvement Project, Concept Design Study Selected Alternative, August 4, 1993 and Addendum dated November, 1993, prepared by The WLB Group, Inc. for the Flood Control District of Maricopa County.

The Dysart Drain Improvement Project consists of approximately four miles of concrete lined channel improvements, construction of a 160 acre detention facility with a one half mile collector channel, demolition and replacement of three bridges, box culverts, utility relocations, and related roadway improvements to protect the Luke Air Force Base from flooding for flood events up to the 100-year flood event. The project is designed to accommodate anticipated future subsidence for a 40 year horizon and still provide 100-year flood protection.

As part of the preparation of first draft preliminary plans, bridge alternatives and channel cross-section, profile, and alignment alternatives have been developed and evaluated to refine the preliminary design presented in the Concept Design Study. This report presents the alternatives evaluated along with design recommendations and preliminary costs. This report accompanies the preliminary design plans and cross-sections submitted under separate cover.

Due to changes in the design schedule resulting from an addendum to the design contract and scope of work for the detention basin, the detention basin plans are being submitted separately and at a later date. Therefore, the detention basin design is not addressed in this report. A preliminary design report will be submitted with the detention basin plans.

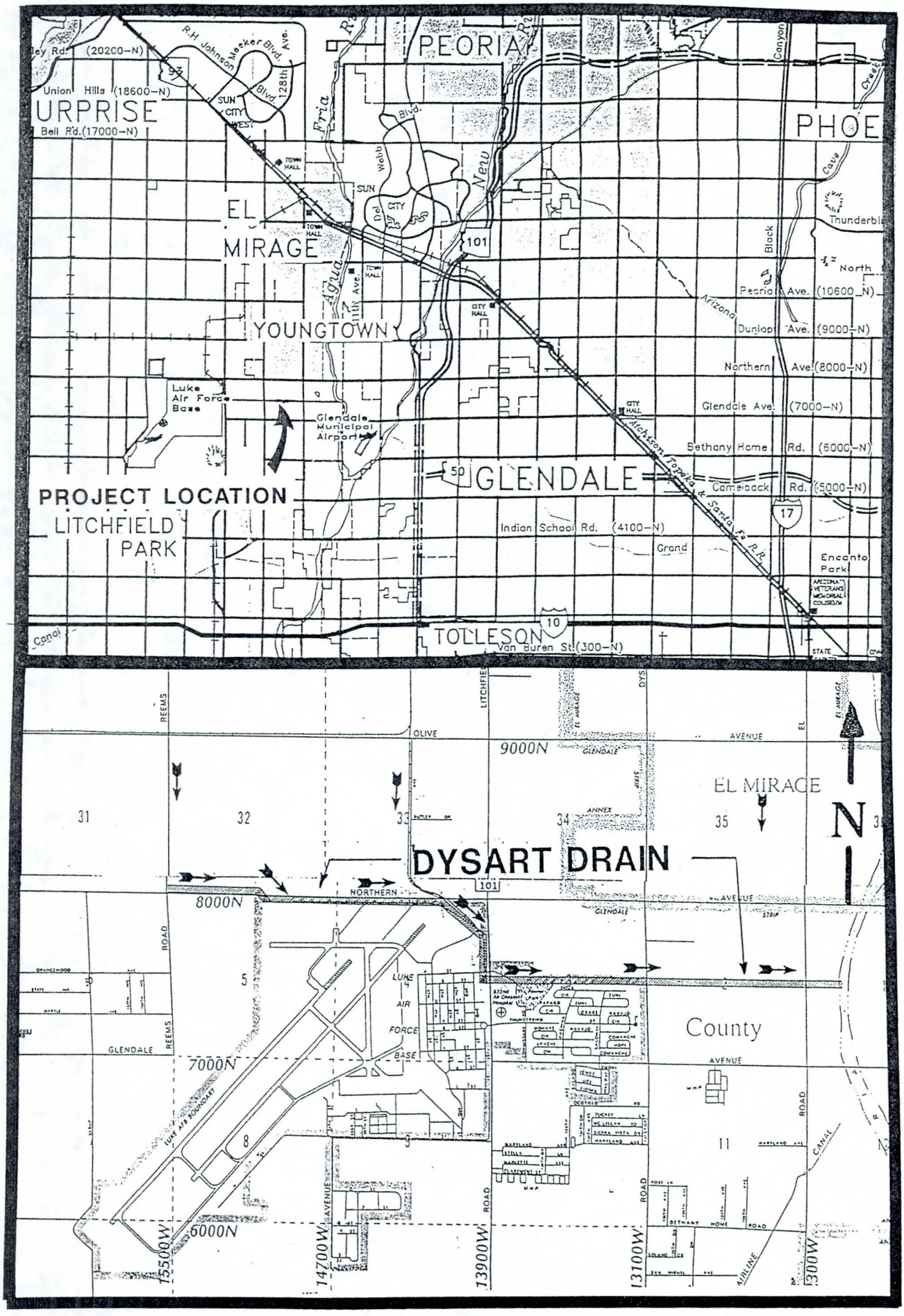

FIGURE 1 - PROJECT LOCATION

2.0 DESIGN CRITERIA

2.1 Hydrology

The hydrology for the project is developed in the Concept Design Study and is taken from the White Tanks/Agua Fria Area Drainage Master Study (ADMS). The hydrologic model is based on existing development conditions in the watershed which is primarily agricultural, modified to include the proposed Dysart Drain Improvements. No modifications were made to account for future developed conditions. Detention basin and channel improvements are based on the computed 100 year peak discharges which have been provided by the Flood Control District of Maricopa County for use in the basin and channel design.

2.2 Hydraulics

Channel design is to be performed in accordance with the "Drainage Design Manual for Maricopa County, Volume II, Hydraulics." The Dysart Drain Improvements are to be designed for the future subsided condition and analyzed for the as constructed condition. The channel design criteria used for the Dysart Drain are summarized as follows:

Flow Conditions - Froude numbers for subcritical channel flow are to be less than or equal to 0.86. Froude numbers for supercritical flow are to be greater than or equal to 1.13 but less than 2.0. A minimum channel velocity of 2.0 feet per second is required to prevent deposition of fine sediments.

Channel Geometry - Changes in horizontal channel alignment are made with curves having a minimum radius of 3.0 times the water surface topwidth. According to the Hydraulics Manual a minimum freeboard of 0.25 times the sum of the flow depth and velocity head is required, or a minimum of 1 foot for subcritical flow and 2 feet for supercritical flow, whichever is greater.

Exceptions to the minimum freeboard requirement have been approved where surface runoff is required to flow into the channel along the north side to prevent upstream ponding. These exceptions occur from a point along Northern Avenue where runoff collected along the west side of the railroad tracks enters the channel to a point east of Litchfield Road in the vicinity of the Kennel. The freeboard requirement is maintained on the south side of the channel to protect Luke Air Force Base and the base housing.

3.0 CHANNEL DESIGN ALTERNATIVES

Four channel design alternatives were considered that include variations in channel cross-section, profile, and alignment. The cross-section alternatives considered were all concrete channel cross-sections. Sideslopes of 2:1 and 1.5:1 were evaluated. The profile alternatives considered were the profile proposed in the Concept Design Study and a new profile alternative developed based on more detailed survey data of the existing channel and a more detailed analysis of the channel hydraulics, specifically, the backwater effects. The channel alignment for each of the four alternatives was adjusted to minimize the required right-of-way acquisition while maintaining desirable hydraulic conditions within the channel. The four alternatives are described as follows:

Alt	SS	Profile*
A	2:1	WLB
B	1.5:1	WLB
C	2:1	NBS
D	1.5:1	NBS

*WLB = Profile from Concept Design Study
NBS = Profile developed by NBS/Lowry

3.1 Alternative A

Alternative A is the channel concept proposed in the Concept Design Study and consists of 2:1 sideslopes and the WLB profile. The WLB profile matches the existing channel at station 113+15 which is shown as the low point in the existing channel invert. From the point of matching the existing channel, the channel slope to the west (upstream) is estimated to be 0.00147 ft/ft. At the time of the survey for the Concept Design Study the channel contained standing water and mud, preventing the surveyors from obtaining channel invert shots. The existing channel profile was therefore estimated from top of channel shots and invert shots at some distance upstream and downstream.

A field survey conducted as part of the design survey revealed that the existing channel profile is basically flat from station 113+15 upstream to station 123+35. Differential subsidence of 0.5 feet is predicted between these two points which would result in an adverse slope condition when subsidence occurs. One thousand feet of flat channel when constructed, and an adverse slope when subsidence occurs is not recommended as part of the design, therefore, alternatives with the WLB slope are not further considered.

3.2 Alternative B

Alternative B consists of 1.5:1 sideslopes with the WLB profile. Preliminary results from the geotechnical investigation indicate that 1.5:1 sideslopes can be safely used for design, therefore, the alternative proposed in the Concept Design Study was modified to utilize 1.5:1 sideslopes. The channel bottom width was increased

to offset the loss of capacity from steepening the sideslopes. Advantages of a 1.5:1 sideslope are a narrower channel topwidth for the same capacity as 2:1 sideslopes and a smaller quantity of concrete and steel for the channel section. Disadvantages are that it is more difficult for a person to climb out of the channel. Because of the existing channel slope condition described in Section 2.1, Alternative B is not further considered.

3.3 Alternative C

Alternative C consists of 2:1 sideslopes as proposed in the Concept Design Study with the NBS Profile. Due to the existing channel slope condition described in Section 2.1 a new profile was developed to provide a positive slope through the flat reach from Station 113+15 to 123+35. The NBS profile ties into the existing channel at Station 123+35. The new profile eliminates the slope problem but results in greater excavation depths downstream, particularly at the Morton Salt facility. As a result of the increased channel depth, the channel and one access road cannot fit within the existing right-of-way at Morton Salt without use of steeper sideslopes or a retaining wall at the top of channel.

3.4 Alternative D

Alternative D consists of 1.5:1 sideslopes and the NBS profile. With 1.5:1 sideslopes and the NBS profile, the existing channel slope problem between station 113+15 and 123+35 is corrected and with the narrower excavated topwidth from a 1.5:1 sideslope the right-of-way problem at Morton Salt is avoided. The geotechnical investigation shows that 1.5:1 sideslopes cannot be maintained east of El Mirage Road, therefore east of the El Mirage Road Bridge the sideslopes transition from 1.5:1 to 2:1 and remain at 2:1 to the Agua Fria River.

3.5 Preliminary Hydraulic Analysis

The alternatives were evaluated using the U.S. Army Corps of Engineers HEC-2 Water Surface Profile computer program. The recommended alternative was analyzed for the as constructed condition and the fully subsided condition. The HEC-2 output for the as constructed and fully subsided conditions is contained in the **Appendix**. The stationing in the output listing corresponds to the channel centerline stationing on the Preliminary Plans.

4.0 BRIDGE DESIGN ALTERNATIVES

4.1 General

This section discusses the recommended structure type and layout for three replacement bridges over the improved Dysart Drain channel. The bridge replacements are necessary to span the widened channel and provide for future ultimate roadway widths. The three bridges are located at Dysart Road, El Mirage Road, and at the Morton Salt Facility. A General Plan, Elevation and Section of the recommended structure types and layouts for these bridges are shown on attached document plans. The length, configuration and type of structure required for these locations have been evaluated to determine the most suitable and economical alternative for final design. The live load design criteria for the evaluation is AASHTO HS 20-44. The design standard used is the AASHTO "Standard Specifications for Highway Bridges", Fifteenth Edition.

4.2 Structure Description

Each of the bridges will be a single span superstructure with a cast-in-place bridge deck and cast-in-place abutments and wingwalls with drilled shaft foundations. The use of drilled shaft foundations is based on preliminary geotechnical recommendations by Thomas Hartig and Associates.

The Dysart Road bridge has a span length of 71'-0" and an 84'-0" deck width with 8'-0" sidewalks (including handrail and barrier) at each side of the bridge. The deck is crowned with a nominal cross slope of 2 percent. Standard approach slabs will be provided at each end of the bridge.

The El Mirage Road bridge has a span length of 71'-0" and an 84'-0" deck width with 8'-0" sidewalks (including handrail and barrier) at each side of the bridge. The deck is crowned with a nominal cross slope of 2 percent. Standard approach slabs will be provided at each end of the bridge.

The Morton Salt Facility bridge has a span length of 71'-0" and a 25'-0" deck width with no sidewalks. A standard concrete barrier 2'-8" high will be used. Approach slabs will not be provided. The Morton Salt staff have also requested several measures be incorporated into the design of the bridge to reduce the damaging effects of the high concentrations of salt on the bridge from facility operations and as otherwise specified. These measures are:

(1) The structure deck is to be sloped to drain properly and prevent ponding of salt laden water.

(2) Powder (fusion bonded) coated rebar will be used in the deck and curb.

(3) Air entrained concrete will be used. The percent of entrained air requested by Morton Salt is 6%. An upper and lower bound also will need to be provided.

(4) The deck thickness and cover over the upper layer of reinforcing will be increased by two inches, for a total cover to reinforcing of 4.5 inches. This request is intended to provide a sacrificial wearing

surface for tracked vehicles crossing the bridge. There will be no additional allowance for future wearing surface, since additional cover is incorporated during initial construction.

(5) Aggregate with no iron content is to be specified. The specification for this will be provided by Morton Salt for inclusion in the Special Provisions.

(6) The design loading will be at least adequate for a two axle vehicle with a gross weight of 45,000 pounds.

4.3 Structure Type Selection and Cost Comparison

The alternative replacement bridge types investigated were standard AASHTO precast prestressed concrete girders composite with a cast-in-place concrete deck, cast-in-place post-tensioned concrete box girder, and steel girders composite with a cast-in-place concrete deck. A comparative cost evaluation of these bridge types is shown in the table below using tabulated bid prices from projects in the Phoenix area.

TABLE 1

Type of Structure	Location	Length Feet	Width Feet	Cost/SF $/SF
Steel Girders	I-10/40th ST	3423	126.83	58.5
	I-10/I-17 T.I.			
	Lane W-N	3940	27.17	56.7
	Lane S-W2	896	39.17	77.2
	Lane W-S	1473	44.27	44.5

Type of Structure	Location	Length Feet	Width Feet	Cost/SF $/SF
Cast-in-Place Post-Tensioned Concrete Box Girder	East Papago/ Hohokam	349	78.74	39.9
	Squaw Peak T.I.			
	Ramp N-E	1833	29.17	40.9
	Ramp W-N	1029	29.17	41.3
	Ramp N-W	339	25.17	40.3
	16th St/I-10	303	104.8	40.4
	Kino Bridge (Tucson)	856	127.16	39.4

Type of Structure	Location	Length Feet	Width Feet	Cost/SF $/SF
Precast AASHTO Concrete Girders	Hohokam/ Salt River	1161	139.09	41.1
	I-10/ Salt River	1083	103.17	40.6
	Sky Harbor/ 24th Street	240	73.33	40.0
	Warner Road/ I-10	267	96.83	42.0

4.4 Recommended Bridge Type

Few steel girder bridges have been constructed in the Phoenix area in recent years due to their typically higher initial and long term maintenance costs, and a regional preference for concrete structures. Both of the concrete alternative types are frequently constructed in this area and qualified contractors are available with experience in each. The concrete bridge alternatives have comparable costs, are constructible replacements at these sites and have few advantages or disadvantages that would significantly favor one alternative over the other. The AASHTO girder alternative is preferred by MCDOT and is therefore recommended for the bridge replacement superstructure type. The lowest structure cost was obtained for the conventional concrete structures at approximately $40 to $41 per square foot. Adding 10% contingencies, a preliminary cost of $45 per square foot is suggested for project estimates. The estimated cost of the precast AASHTO girder bridge option is as follows:

Description	Quantity	Unit Cost	Cost
Replace Dysart Road Bridge (71' X 84')	5964 SF	$45/SF	$268,380
Replace El Mirage Road Bridge (71' X 84')	5964 SF	$45/SF	$268,380
Replace Morton Salt Facility Bridge (71' X 25')	1775 SF	$45/SF	$79,875
		TOTAL BRIDGE COST	**$616,635**

5.0 RECOMMENDATIONS

5.1 Channel Design Recommendations

The channel alternatives developed for this submittal are based on simplified cross-sections utilized in a template to determine approximate cut and fill slope lines for evaluation of right-of-way requirements and for preliminary quantity estimates. Upon approval of a typical channel section and profile, the selected alternative will be developed in detail for preparation of construction plans. The simplified cross-sections are shown on the typical sections in the plans and on the channel cross-section plots. The following recommendations are made for the channel design and refinement of the channel typical section. The proposed channel typical section is shown on **Figure 2**.

1. Channel sideslopes of 1.5 horizontal to 1 vertical are recommended in all areas where the geotechnical report indicates soil conditions will permit. Based on preliminary information received from the Geotechnical subconsultant, 1.5:1 sideslopes are recommended west of El Mirage Road and 2:1 sideslopes east of El Mirage Road.

2. A 4-inch depression in the center of the channel section is shown to direct low flows in the center of the channel. Although the depression is recommended from a hydraulic standpoint, there may be construction and maintenance reasons to maintain a level channel invert section. The depression will likely have a higher construction cost than a flat bottom and cleaning of the channel invert with a bucket may be difficult with a depression.

3. In areas where the channel is in relatively deep cuts it is recommended that a minimum four foot bench be provided at the top of the channel liner. The bench will help relieve hydrostatic pressures from the slopes above the liner, limiting the hydrostatic pressure prism potentially acting on the channel liner to the channel depth. Additionally, with the bench sloping away from the top of channel, it will intercept runoff from the slopes and prevent it from entering behind the channel liner.

4. It is recommended that the maintenance road on the north side of the channel be placed at the top of slope and graded to intercept surface runoff in a swale on the upstream side which will be directed to planned locations where it will be diverted into the channel with a pipe or concrete apron spillway.

It is further recommended that the maintenance road on the south side of the channel be located at the top of the channel liner, not at the top of the slope. This will provide better maintenance access to the channel. Rainfall falling on the south side of the channel will flow away from the slopes eliminating, for the most part, the need to intercept surface runoff at the top of slope on the south side.

5. It is recommended that where possible the slopes above the channel liner not be lined with gunite. Gunite will be susceptible to build-up of hydrostatic pressures and cracking. It is recommended that slopes be graded to 2:1 with no gunite and that surface runoff be intercepted at the top of slope and directed to planned locations to enter the channel. This will limit runoff flowing over the slopes to that caused by rainfall falling directly on the slopes.

   This will not be possible through Morton Salt because of limitations in right-of-way. therefore, gunite and 1.5:1 sideslopes are recommended at Morton Salt. There is room at Morton Salt to provide the recommended bench at the top of liner.

6. It is recommended that surface runoff not be allowed to flow over the edge of the channel lining without special treatment at the top of the liner to prevent undermining of the channel lining. With an untreated top of liner, surface runoff will accumulate and flow longitudinally behind the top of liner eroding the backfill material and promoting seepage into the liner foundation.

   It is recommended that the planned side inflow locations be constructed with a flat (longitudinally) sill that extends a minimum of 5 feet away from the top of liner and includes a 3 foot cutoff wall as shown on **Figure 3**.

5.2 Bridge Design Recommendations

Precast AASHTO concrete girder type bridges are recommended for all three bridge replacements. Precast girder bridges are economical and are preferred by Maricopa County Department of Transportation (MCDOT) which will be responsible for maintenance of the El Mirage and Dysart Road bridges.

5.3 Right-of-way and Easement Recommendations

No additional right-of-way is required west of Litchfield Road because the channel improvements are within the Luke Air Force Base boundaries. Additional channel right-of-way is required on the north side

of the channel from east of the Kennel at Litchfield Road to Dysart Road. No additional right-of-way will be required through the Morton Salt facility. Modifications to the channel typical section have been made to achieve the objective of acquiring no new right-of-way within the Morton Salt reach. Additional right-of-way is required on the north side of the channel from east of Morton Salt to El Mirage Road. Additional right-of-way is required from El Mirage Road to the Agua Fria River on both sides of the channel.

The required new right-of-way shown on the plans is based on 1.5:1 sideslopes west of El Mirage Road and 2:1 sideslopes east of El Mirage Road and is considered the minimum additional right-of-way that will be required. Channel design recommendations from section 5.1, if adopted, will require additional right-of-way in some locations that has not been shown on the plans. It is recommended that following the 30% plans review the selected typical channel section with modifications resulting from the FCDMC and LAFB review be incorporated into the design and a new required right-of-way submittal be made for use in right-of-way acquisition activities.

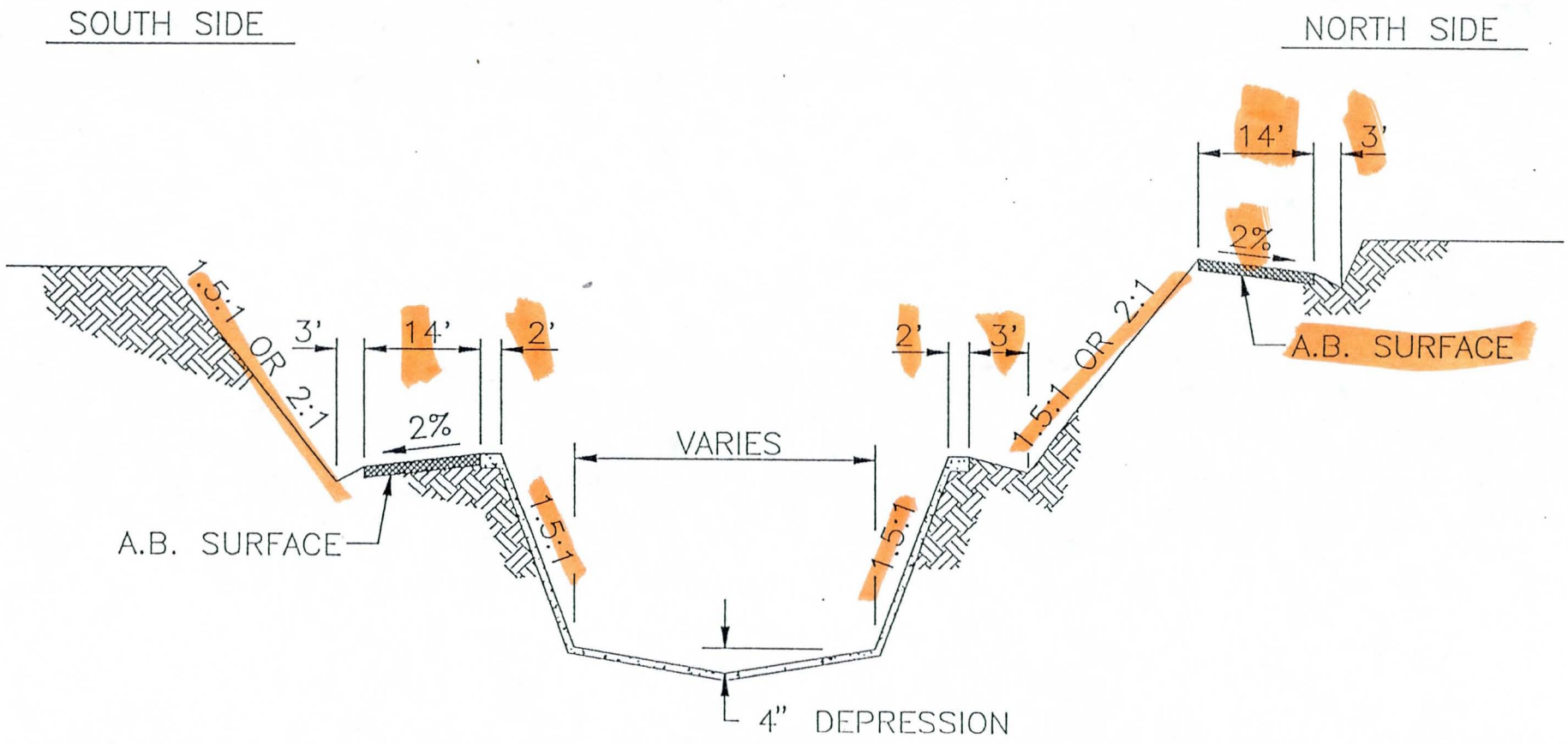

FIGURE 2 - PROPOSED TYPICAL SECTION

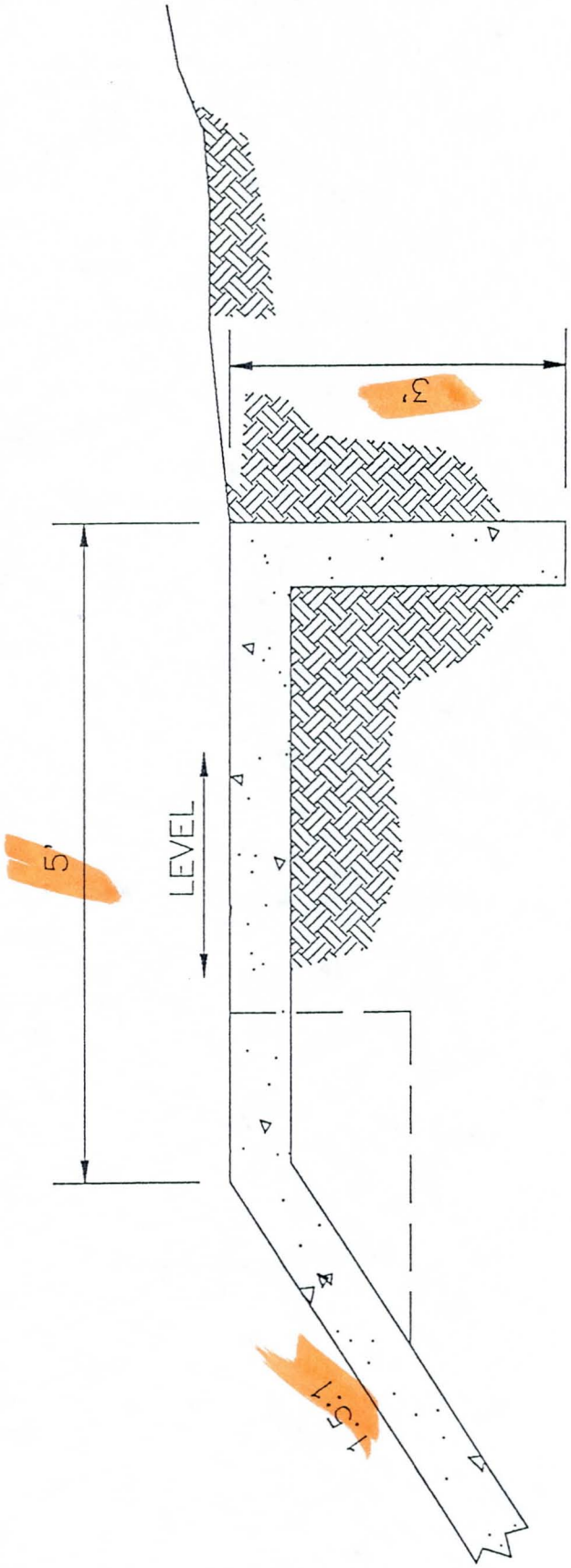

FIGURE 3 - TYPICAL SIDE OVERFLOW DETAIL

6.0 COST ESTIMATES

Cost estimates have been prepared for the channel concept shown on the Preliminary Plans. Unit costs for the estimate are the same as those used in the WLB Concept Design Study for items where unit costs were provided. The estimated construction cost including contingencies of 30% is $11,755,000. The enclosed breakdown of costs includes the detention basin, but not the collector channel authorized in change order #1.

ITEM CODE	ITEM	UNIT	QUANTITY	UNIT PRICE	COST
	- CHANNEL ITEMS -				
100	6" Concrete Channel Liner w/Rebar	S.Y.	133,980	$22.00	$2,947,600
101	4" Shotcrete Erosion Protection	S.Y.	45,290	$12.00	$543,500
102	12'x6' Double Reinforced Concrete Box	L.F.	107	$800.00	$85,600
103	6'x7' Double Reinforced Concrete Box	L.F.	50	$360.00	$18,000
104	Extend 10'x4' Reinforced Concrete Box	L.F.	25	$270.00	$6,800
105	Concrete Retaining Wall w/Rebar	S.F.	1,220	$30.00	$36,600
106	Vertical Cut-off Wall	S.F.	200	$30.00	$6,000
107	Demolish and Remove 10'x5.5' Reinforced Concrete Box	L.F.	63	$60.00	$3,800
108	Demolish and Remove Concrete Lining	S.F.	565,900	$0.75	$424,400
109	3 Strand Barb Wire Fence on 'T' Posts (Includes Gates)	L.F.	23,700	$2.00	$47,400
110	Tie Existing Drain Pipes to Channel	EA.	19	$250.00	$4,800
111	Construct Channel Maintenance Access Road (6" AB)	C.Y.	4,950	$11.00	$54,500
112	Channel Excavation	C.Y.	281,638	$2.00	$563,300
113	Channel Embankment	C.Y.	34,757	$1.00	$34,800
114	Structural Excavation	C.Y.	1,701	$5.00	$8,500
115	Structural Backfill	C.Y.	708	$7.00	$5,000
116	Right of Way Acquisition	S.F.	151,888	$0.15	$22,800
	SUBTOTAL				$4,813,400
	- ROADWAY ITEMS -				
200	Sawcut and Remove Asphalt Concrete Pavement	S.Y.	11,383	$1.00	$11,400
201	Cold Plane Asphalt Concrete Pavement	S.Y.	2,044	$2.00	$4,100
202	Asphalt Concrete Pavement (C-3/4)	Ton	6,971	$25.00	$174,300
203	Aggregate Base	C.Y.	2,989	$11.00	$32,900
204	Soil Cement	C.Y.	4,446	$20.00	$88,900
205	6" Curb and Gutter	L.F.	588	$8.00	$4,700
206	6" Vertical Curb	L.F.	425	$8.00	$3,400
207	Remove and Dispose 48" Corr. Metal Pipe	EA	7	$350.00	$2,500
208	Construct Graded Ditch	L.F.	175	$5.00	$900
209	Roadway Excavation	C.Y.	4,090	$2.00	$8,200
210	Roadway Embankment	C.Y.	551	$1.00	$600
211	16' Driveway Approach	EA	2	$500.00	$1,000
212	Realign Roadway (Just East of Litchfield at Channel Bend)	L.S.	1	$8,000.00	$8,000
	SUBTOTAL				$340,900

ITEM CODE	ITEM	UNIT	QUANTITY	UNIT PRICE	COST
	- BRIDGE ITEMS -				
	-Dysart Road				
300	Demolish and Remove Bridge	L.S.	1	$25,000.00	$25,000
301	Construct Bridge	L.S.	1	$268,400.00	$268,400
	-El Mirage Road				
302	Demolish and Remove Bridge	L.S.	1	$35,000.00	$35,000
303	Construct Bridge	L.S.	1	$268,400.00	$268,400
	-Mortan Salt Road				
304	Demolish and Remove Bridge	L.S.	1	$15,000.00	$15,000
305	Construct Bridge	L.S.	1	$79,900.00	$79,900
	SUBTOTAL				$691,700
	- UTILITY ITEMS -				
	-Detention Basin				
400	12" PVC Waterline	L.F.	1,700	$27.00	$45,900
401	24" CMP	L.F.	16	$60.00	$1,000
402	Irrigation Structure	L.S.	1	$6,000.00	$6,000
403	Irrigation Channel	L.S.	1	$195,000.00	$195,000
404	Subgrade Preparation	S.Y.	2,030	$2.25	$4,600
405	Remove Existing Improvements	L.S.	1	$5,000.00	$5,000
406	Miscellaneous Work	L.S.	1	$4,000.00	$4,000
	-Sumps				
407	18" RCP	L.F.	170	$68.00	$11,600
408	48" Manhole (20-30 Ft)	EA.	2	$7,500.00	$15,000
409	Remove Existing Improvements	L.S.	1	$5,000.00	$5,000
410	Miscellaneous Mechanical Work	L.S.	1	$14,000.00	$14,000
	-Carrier Pipe				
411	24"ID x 5/16" Steel Pipe	L.F.	200	$162.00	$32,400
412	6" Dia x 10.5' Pipe	EA.	4	$200.00	$800
413	Concrete Footing	EA.	8	$1,000.00	$8,000
414	Pipe Straps	EA.	8	$500.00	$4,000
415	Field Welding	L.S.	1	$3,000.00	$3,000
416	Paint Pipe	L.S.	1	$4,000.00	$4,000
417	Remove Existing Improvements	L.S.	1	$6,000.00	$6,000

ITEM CODE	ITEM	UNIT	QUANTITY	UNIT PRICE	COST
	-Irrigation Channel				
418	24" CMP	L.F.	36	$60.00	$2,200
419	Headwalls	EA.	2	$500.00	$1,000
420	Irrigation Channel	L.S.	1	$142,500.00	$142,500
421	Irrigation Structure	L.S.	1	$2,500.00	$2,500
422	Remove Existing Improvements	L.S.	1	$3,800.00	$3,800
	SUBTOTAL				$517,300
	- BASIN ITEMS -				
500	Reinforced Concrete Box at Basin End	C.Y.	86	$250.00	$21,400
501	6'x6' Double Reinforced Concrete Box at Northern Ave.	C.Y.	234	$250.00	$58,600
502	North Collector Channel	S.F	125,000	$2.25	$281,300
503	Reems Road Collector Channel	S.F.	21,580	$2.25	$48,600
504	Channel at Northeast Corner to East Collector Channel	S.F.	15,000	$2.25	$33,800
505	Rip Rap Inlets	C.Y.	600	$55.00	$33,000
506	Nuisance Flow Swales	S.F.	93,000	$1.75	$162,800
507	Excavation	C.Y.	1,200,000	$1.00	$1,200,000
508	Fencing	L.F.	10,400	$3.00	$31,200
509	Right of Way Acquisition	AC.	160	$5,000.00	$800,000
	SUBTOTAL				$2,670,700
	- MISCELLANEOUS ITEMS -				
600	Remove and Replace Railroad Tracks	L.F.	160	$50.00	$8,000
	SUBTOTAL				$8,000
	Contingencies			30%	$2,712,600
	GRAND TOTAL				$11,754,600

APPENDIX

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*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
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 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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T1  FLOOD CONTROL DISTRICT OF MARICOPA COUNTY          CONSULTANT: NBS/LOWRY
T2  FCD 93-01 DYSART DRAIN IMPROVEMENT PROJECT         JOB NO: P81-194-019
T3      DYSART DRAIN - ALT D                           FILE NAME: ALTD.DAT
T4  (NBS slope, 2:1 SS E. of El Mirage, 1.5:1 SS W. of El Mirage,
T5   Trap Section around 575' box)
```

start w/ critical depth

subcritical flow

2nd column on card.

```
J1  ICHECK    INQ     NINV     IDIR     STRT    METRIC   HVINS     Q       WSEL      FQ

     0         2       0        0       -1       0        0        0      56.72      0

J2  NPROF     IPLOT   PRFVS    XSECV    XSECH    FN       ALLDC    IBW     CHNIM     ITRACE

    -1         0      -1                                         6
```

for concrete channel

```
J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38        43        1        8        10       26       68       42       33

NC    .016      .016      .016      .3       .5
    10' BOTTOM WIDTH, 2:1 SS
QT      1      3520
X1    1036       5       965      1035      0        0        0        0      51.17
GR    15.5     965       0.5      995       0     1000       0.5     1005     15.5      1035

X1    1050                                 14       14       14       0      0.0127

X1    1070                                 20       20       20       0      0.0182

X1    1100                                 30       30       30       0      0.0273

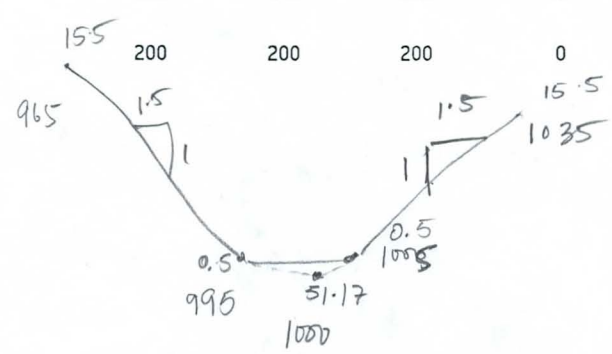
X1    1200                                 100      100      100      0      0.091

X1    1300                                 100      100      100      0      0.091

X1    1500                                 200      200      200      0      0.182

X1    1700                                 200      200      200      0      0.182

X1    1900                                 200      200      200      0      0.182
    15' BOTTOM WIDTH, 1.5:1 SS
```



X1	1950	5	970	1030	50	50	50		52.002	
GR	15.5	970	0.5	992.5	0	1000	0.5	1007.5	15.5	1030
X1	2100				150	150	150	0	0.1365	
X1	2300				200	200	200	0	0.182	
X1	2500				200	200	200	0	0.182	
X1	2700				200	200	200	0	0.182	
X1	2900				200	200	200	0	0.182	
X1	3100				200	200	200	0	0.182	
QT	1	2430								
X1	3200				100	100	100	0	0.091	
X1	3400				200	200	200	0	0.172	
X1	3600				200	200	200	0	0.172	
X1	3800				200	200	200	0	0.172	
X1	4000				200	200	200	0	0.172	
X1	4200				200	200	200	0	0.172	
X1	4400				200	200	200	0	0.172	
X1	4600				200	200	200	0	0.172	
X1	4800				200	200	200	0	0.172	
X1	5000				200	200	200	0	0.172	
X1	5200				200	200	200	0	0.172	
X1	5400				200	200	200	0	0.172	
X1	5600				200	200	200	0	0.172	
X1	5800				200	200	200	0	0.172	
X1	6000				200	200	200	0	0.172	
X1	6200				200	200	200	0	0.172	

X1	6400				200	200	200	0	0.172	
X1	6600				200	200	200	0	0.172	
X1	6800				200	200	200	0	0.172	
X1	7000				200	200	200	0	0.172	
X1	7200				200	200	200	0	0.172	
X1	7300	5	970.75	1029.25	100	100	100		56.67	
GR	15	970.75	0.5	992.5	0	1000	0.5	1007.5	15	1029.25
X1	7400				100	100	100	0	0.19	
X1	7600				200	200	200	0	0.38	
X1	7800				200	200	200	0	0.38	
X1	8000				200	200	200	0	0.38	
X1	8200				200	200	200	0	0.38	
X1	8400				200	200	200	0	0.38	
X1	8600				200	200	200	0	0.38	
X1	8800				200	200	200	0	0.38	
X1	9000				200	200	200	0	0.38	
X1	9200				200	200	200	0	0.38	
X1	9400				200	200	200	0	0.38	
X1	9600				200	200	200	0	0.38	
X1	9800				200	200	200	0	0.38	
X1	10000				200	200	200	0	0.38	
X1	10200				200	200	200	0	0.38	
X1	10400				200	200	200	0	0.38	
X1	10600				200	200	200	0	0.38	
X1	10800				200	200	200	0	0.38	

```
X1    11000                                   200     200     200     0     0.38

X1    11200                                   200     200     200     0     0.38

X1    11315                                   115     115     115           0.2185

X1    11400                                    85      85      85           0.102

X1    11600                                   200     200     200           0.24

X1    11800                                   200     200     200           0.24

X1    12000                                   200     200     200           0.24

X1    12200                                   200     200     200           0.24
   Sta. 122+61, begin Transition to Exist. section

X1    12261                                    61      61      61           0.073
   Sta. 123+11, match exist. channel section

X1    12311     4     977    1023     50      50      50           65.5
GR        9   977       0     995      0    1005       9    1023

X1    12463                                   152     152     152           0.70
   Litchfield Road Bridge - Special Bridge Method

X1    12615                                   152     152     152           0.9
X3       10

SB     1.05   1.6     2.6      42     10     1.5     325       2   68.24    67.5
X1    12742                                   127     127     127            .74
X2                     1    79.4   83.92  TOFB
X3       10                 77.48

X1    12760                                    18      18      18           0.06

X1    12860                                   100     100     100           0.493

X1    12942     4     980    1020     82      82      82
GR     76.4   980    69.1     995   69.1    1005    76.4    1020

X1    13142     4     980    1020    200     200     200
GR     77.5   980   70.01     995  70.01    1005    77.5    1020

X1    13342     4     980    1020    200     200     200
GR     78.6   980   71.01     995  71.01    1005    78.6    1020

X1    13512     4     980    1020    170     170     170
GR     80.9   980    72.1     995    72.1    1005    80.9    1020
```

why BT is not used and why bridge is not skewed!

```
X1    13800      4     980    1020     288     288     288
GR     80.7    980    73.7     995    73.7    1005    80.7    1020

QT        1   2150
X1    13965      4     980    1020     165     165     165
GR     81.8    980    75.2     995    74.9    1005    81.7    1020

X1    14165      4     980    1020     200     200     200
GR     82.7    980   75.86     995   75.83    1005   82.86    1020

X1    14365      4     980    1020     200     200     200
GR     83.6    980    76.6     995    76.6    1005    83.7    1020

X1    14565      4     980    1020     200     200     200
GR    84.99    980   77.52     995   77.51    1005   85.06    1020

X1    14765      4     980    1020     200     200     200
GR    85.99    980   78.49     995   78.46    1005   86.14    1020

X1    14900      4     980    1020     135     135     135
GR    86.82    980   79.22     995   79.24    1005    86.8    1020

X1    14950      4     974    1030      50      50      50              79.57
GR        9    974       0     992       0    1008      11    1030

X1    15036      4     972    1025      86      86      86              80.06
GR        9    972       0     990       0    1025      11    1025
    15067 Is full x-sect with total Q as starting point for culvert analysis

X1    15067      4     972    1040      31      31      31              80.20
GR        9    972       0     990       0    1040      11    1040
    15068 Is effective area for culvert with culvert Q.

QT        1    735
X1    15068      5    1010    1040      .1      .1      .1              80.15
X3       10                   1010
GR        9    972       0     990       0    1010       0    1040      11      1040

SC    2.013    0.2     3.0      25     5.5      10     575     8.1   81.05     80.15
X1    15643      5    1012    1036     575     575     575            81.05
X2                      2
X3       10                   1012
GR        9    974       0     992       0    1012       0    1036      11      1036

QT        1   2150
X1    15644                              .1      .1      .1
    Transition to 24' bottom, 1.5:1 SS, and 0.5' crossfall in invert.
```

Check to see if the W.S.E is higher than top of bridge.

```
X1    15695       4      972    1043.5       51       51       51
GR    90.12     972    81.12       990    81.12     1024    94.12   1043.5

X1    15750       4      972    1032.5       55       55       55
GR    90.17     972    81.17       990    81.17     1013    94.17   1032.5
   24' BOTTOM WIDTH

X1    15800       5      973      1027       50       50       50                81.23
GR     10.5     973      0.5       988        0     1000      0.5    1012     10.5     1027

X1    16000                                 200      200      200                .222

X1    16500                                 500      500      500                .555

X1    17000                                 500      500      500                .555

X1    17500                                 500      500      500                .555

X1    17950                                 450      450      450                  .5

QT        1     655
   10' BOTTOM WIDTH
X1    18000       5      980      1020       50       50       50               83.672
GR     10.5     980      0.5       995        0     1000      0.5    1005     10.5     1020

X1    18500                                 500      500      500                .555

X1    19000                                 500      500      500                .555

X1    19500                                 500      500      500                .555

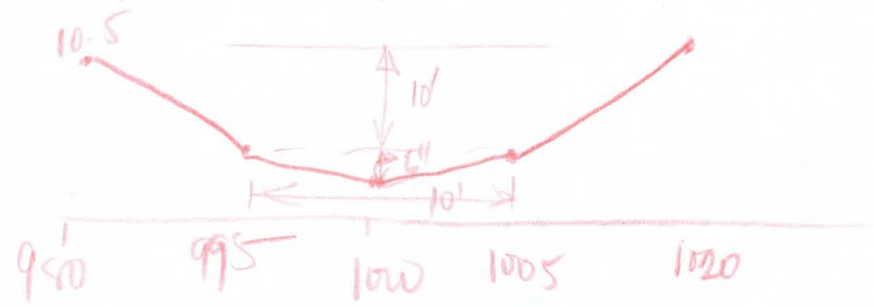
X1    20000                                 500      500      500                .555

X1    20100                                 100      100      100                .111

QT        1     550
X1    20115       4    993.5    1006.5       15       15       15               86.02
X3       10                                                          95          95
GR        9   993.5        0     993.5        0   1006.5        9  1006.5

SC    2.013     0.2      3.0        50        7        6       50     8.1     86.075     86.02
X1    20165       4    993.5    1006.5       50       50       50              86.075
X2                         2                 95
X3       10                                                          95          95
GR        9   993.5        0     993.5        0   1006.5        9  1006.5

X1    20180       5      980      1020       15       15       15              86.092
GR     10.5     980      0.5       995        0     1000      0.5    1005     10.5     1020
```



Column missing

```
X1    20300                                  120     120     120                .133

X1    20500                                  200     200     200                .222

X1    21000                                  500     500     500                .555

X1    21500                                  500     500     500                .555

X1    21850                                  350     350     350                .389

QT        1     2150
X1   -15067        4     972    1040       31      31      31               80.20
GR        9      972       0     990        0    1040      11    1040

QT        1     1415
X1    15068        4     972    1010       .1      .1      .1               80.20
GR        9      972       0     990        0    1010      11    1010

X1    15092                                   24      24      24                0.03
   2 - 12' X 6' X 106' RCBC'S

X1    15121        4     988    1012       29      29      29               80.28
X3       10
GR       11      988       0     988        0    1012      11    1012

SC    2.013      0.2     3.0      25        6      12     106     8.1 ?        80.44
X1    15227                                106     106     106                .16
X2                         2
X3       10

X1    15257        4     974    1026       30      30      30               80.48
GR       11      974       0     996        0    1004      11    1026

X1    15300                                  43      43      43                .06

X1    15500                                 200     200     200                .30

X1    15566                                  66      66      66                .10

X1    15643        4     974    1012       77      77      77               81.05
GR        9      974       0     992        0    1012      11    1012
```

Channel outlet

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

CCHV= .300 CEHV= .500

*SECNO 1036.000

3720 CRITICAL DEPTH ASSUMED

1036.000	9.63	60.80	60.80	56.72	63.63	2.83	.00	.00	66.67
3520.0	.0	3520.0	.0	.0	260.7	.0	.0	.0	66.67
.00	.00	13.50	.00	.000	.016	.000	.000	51.17	976.73
.002393	0.	0.	0.	0	13	0	.00	46.54	1023.27

*SECNO 1050.000

3301 HV CHANGED MORE THAN HVINS

1050.000	11.01	62.19	.00	.00	63.97	1.78	.02	.31	66.68
3520.0	.0	3520.0	.0	.0	328.5	.0	.1	.0	66.68
.00	.00	10.71	.00	.000	.016	.000	.000	51.18	973.98
.001289	14.	14.	14.	9	0	0	.00	52.04	1026.02

*SECNO 1070.000

1070.000	11.03	62.23	.00	.00	64.00	1.77	.03	.00	66.70
3520.0	.0	3520.0	.0	.0	329.4	.0	.2	.0	66.70
.00	.00	10.69	.00	.000	.016	.000	.000	51.20	973.95
.001280	20.	20.	20.	0	0	0	.00	52.11	1026.05

*SECNO 1100.000

1100.000	11.05	62.28	.00	.00	64.04	1.77	.04	.00	66.73
3520.0	.0	3520.0	.0	.0	330.0	.0	.5	.1	66.73
.00	.00	10.67	.00	.000	.016	.000	.000	51.23	973.92
.001274	30.	30.	30.	0	0	0	.00	52.15	1026.08

*SECNO 1200.000

1200.000	11.18	62.50	.00	.00	64.19	1.69	.12	.02	66.82
3520.0	.0	3520.0	.0	.0	337.6	.0	1.2	.2	66.82
.00	.00	10.43	.00	.000	.016	.000	.000	51.32	973.64
.001199	100.	100.	100.	2	0	0	.00	52.73	1026.36

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 1300.000

1300.000	11.26	62.67	.00	.00	64.32	1.65	.12	.01	66.91
3520.0	.0	3520.0	.0	.0	341.8	.0	2.0	.3	66.91
.01	.00	10.30	.00	.000	.016	.000	.000	51.41	973.47
.001160	100.	100.	100.	2	0	0	.00	53.05	1026.53

*SECNO 1500.000

1500.000	11.39	62.98	.00	.00	64.56	1.58	.23	.02	67.09
3520.0	.0	3520.0	.0	.0	348.5	.0	3.6	.6	67.09
.01	.00	10.10	.00	.000	.016	.000	.000	51.59	973.22
.001101	200.	200.	200.	2	0	0	.00	53.55	1026.78

*SECNO 1700.000

1700.000	11.48	63.25	.00	.00	64.79	1.54	.22	.01	67.27
3520.0	.0	3520.0	.0	.0	353.3	.0	5.2	.8	67.27
.02	.00	9.96	.00	.000	.016	.000	.000	51.77	973.04
.001061	200.	200.	200.	2	0	0	.00	53.91	1026.96

*SECNO 1900.000

1900.000	11.55	63.50	.00	.00	65.01	1.51	.21	.01	67.46
3520.0	.0	3520.0	.0	.0	357.0	.0	6.8	1.1	67.46
.02	.00	9.86	.00	.000	.016	.000	.000	51.96	972.91
.001032	200.	200.	200.	2	0	0	.00	54.19	1027.09

*SECNO 1950.000

1950.000	11.53	63.53	.00	.00	65.09	1.56	.05	.02	67.50
3520.0	.0	3520.0	.0	.0	351.6	.0	7.3	1.1	67.50
.03	.00	10.01	.00	.000	.016	.000	.000	52.00	975.96
.000975	50.	50.	50.	2	0	0	.00	48.08	1024.04

*SECNO 2100.000

2100.000	11.54	63.68	.00	.00	65.23	1.55	.15	.00	67.64
3520.0	.0	3520.0	.0	.0	352.2	.0	8.5	1.3	67.64
.03	.00	9.99	.00	.000	.016	.000	.000	52.14	975.94
.000970	150.	150.	150.	0	0	0	.00	48.12	1024.06

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 2300.000

2300.000	11.56	63.88	.00	.00	65.43	1.54	.19	.00	67.82
3520.0	.0	3520.0	.0	.0	353.0	.0	10.1	1.5	67.82
.03	.00	9.97	.00	.000	.016	.000	.000	52.32	975.91
.000964	200.	200.	200.	0	0	0	.00	48.17	1024.09

*SECNO 2500.000

2500.000	11.58	64.09	.00	.00	65.62	1.54	.19	.00	68.00
3520.0	.0	3520.0	.0	.0	353.9	.0	11.7	1.7	68.00
.04	.00	9.95	.00	.000	.016	.000	.000	52.50	975.89
.000957	200.	200.	200.	0	0	0	.00	48.23	1024.11

*SECNO 2700.000

2700.000	11.60	64.29	.00	.00	65.82	1.53	.19	.00	68.18
3520.0	.0	3520.0	.0	.0	354.8	.0	13.3	1.9	68.18
.05	.00	9.92	.00	.000	.016	.000	.000	52.68	975.86
.000951	200.	200.	200.	0	0	0	.00	48.28	1024.14

*SECNO 2900.000

2900.000	11.62	64.49	.00	.00	66.01	1.52	.19	.00	68.37
3520.0	.0	3520.0	.0	.0	355.7	.0	15.0	2.2	68.37
.05	.00	9.90	.00	.000	.016	.000	.000	52.87	975.83
.000945	200.	200.	200.	0	0	0	.00	48.34	1024.17

*SECNO 3100.000

3100.000	11.64	64.68	.00	.00	66.20	1.51	.19	.00	68.55
3520.0	.0	3520.0	.0	.0	356.5	.0	16.6	2.4	68.55
.06	.00	9.88	.00	.000	.016	.000	.000	53.05	975.81
.000939	200.	200.	200.	0	0	0	.00	48.39	1024.19

*SECNO 3200.000

3301 HV CHANGED MORE THAN HVINS

3200.000	12.89	66.03	.00	.00	66.55	.52	.05	.30	68.64
2430.0	.0	2430.0	.0	.0	419.9	.0	17.5	2.5	68.64
.06	.00	5.79	.00	.000	.016	.000	.000	53.14	973.92
.000288	100.	100.	100.	3	0	0	.00	52.17	1026.08

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 3400.000

3400.000	12.77	66.08	.00	.00	66.62	.54	.06	.01	68.81
2430.0	.0	2430.0	.0	.0	413.6	.0	19.4	2.7	68.81
.07	.00	5.88	.00	.000	.016	.000	.000	53.31	974.10
.000300	200.	200.	200.	2	0	0	.00	51.81	1025.90

*SECNO 3600.000

3600.000	12.65	66.13	.00	.00	66.69	.55	.06	.01	68.98
2430.0	.0	2430.0	.0	.0	407.8	.0	21.3	3.0	68.98
.08	.00	5.96	.00	.000	.016	.000	.000	53.48	974.27
.000312	200.	200.	200.	0	0	0	.00	51.47	1025.73

*SECNO 3800.000

3800.000	12.53	66.19	.00	.00	66.76	.57	.06	.01	69.16
2430.0	.0	2430.0	.0	.0	401.8	.0	23.1	3.2	69.16
.09	.00	6.05	.00	.000	.016	.000	.000	53.66	974.44
.000324	200.	200.	200.	0	0	0	.00	51.12	1025.56

*SECNO 4000.000

4000.000	12.42	66.25	.00	.00	66.83	.58	.07	.01	69.33
2430.0	.0	2430.0	.0	.0	396.0	.0	25.0	3.4	69.33
.10	.00	6.14	.00	.000	.016	.000	.000	53.83	974.61
.000337	200.	200.	200.	0	0	0	.00	50.78	1025.39

*SECNO 4200.000

4200.000	12.31	66.31	.00	.00	66.91	.60	.07	.01	69.50
2430.0	.0	2430.0	.0	.0	390.3	.0	26.8	3.7	69.50
.11	.00	6.23	.00	.000	.016	.000	.000	54.00	974.78
.000351	200.	200.	200.	0	0	0	.00	50.44	1025.22

*SECNO 4400.000

4400.000	12.20	66.37	.00	.00	66.99	.62	.07	.01	69.67
2430.0	.0	2430.0	.0	.0	384.8	.0	28.6	3.9	69.67
.12	.00	6.31	.00	.000	.016	.000	.000	54.17	974.94
.000364	200.	200.	200.	0	0	0	.00	50.12	1025.06

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 4600.000									
4600.000	12.09	66.44	.00	.00	67.07	.64	.07	.01	69.84
2430.0	.0	2430.0	.0	.0	379.5	.0	30.3	4.1	69.84
.13	.00	6.40	.00	.000	.016	.000	.000	54.34	975.10
.000378	200.	200.	200.	0	0	0	.00	49.80	1024.90
*SECNO 4800.000									
4800.000	11.99	66.50	.00	.00	67.16	.65	.08	.01	70.02
2430.0	.0	2430.0	.0	.0	374.4	.0	32.0	4.4	70.02
.13	.00	6.49	.00	.000	.016	.000	.000	54.52	975.26
.000392	200.	200.	200.	0	0	0	.00	49.48	1024.74
*SECNO 5000.000									
5000.000	11.89	66.58	.00	.00	67.25	.67	.08	.01	70.19
2430.0	.0	2430.0	.0	.0	369.4	.0	33.8	4.6	70.19
.14	.00	6.58	.00	.000	.016	.000	.000	54.69	975.41
.000407	200.	200.	200.	0	0	0	.00	49.18	1024.59
*SECNO 5200.000									
5200.000	11.79	66.65	.00	.00	67.34	.69	.08	.01	70.36
2430.0	.0	2430.0	.0	.0	364.6	.0	35.4	4.8	70.36
.15	.00	6.67	.00	.000	.016	.000	.000	54.86	975.56
.000421	200.	200.	200.	0	0	0	.00	48.89	1024.44
*SECNO 5400.000									
5400.000	11.69	66.73	.00	.00	67.43	.71	.09	.01	70.53
2430.0	.0	2430.0	.0	.0	359.9	.0	37.1	5.0	70.53
.16	.00	6.75	.00	.000	.016	.000	.000	55.03	975.70
.000436	200.	200.	200.	0	0	0	.00	48.60	1024.30
*SECNO 5600.000									
5600.000	11.60	66.81	.00	.00	67.53	.73	.09	.01	70.70
2430.0	.0	2430.0	.0	.0	355.5	.0	38.7	5.3	70.70
.17	.00	6.84	.00	.000	.016	.000	.000	55.20	975.84
.000451	200.	200.	200.	0	0	0	.00	48.32	1024.16

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
*SECNO 5800.000									
5800.000	11.51	66.89	.00	.00	67.63	.74	.09	.01	70.88
2430.0	.0	2430.0	.0	.0	351.1	.0	40.4	5.5	70.88
.18	.00	6.92	.00	.000	.016	.000	.000	55.38	975.97
.000466	200.	200.	200.	0	0	0	.00	48.06	1024.03
*SECNO 6000.000									
6000.000	11.43	66.97	.00	.00	67.74	.76	.09	.01	71.05
2430.0	.0	2430.0	.0	.0	347.0	.0	42.0	5.7	71.05
.18	.00	7.00	.00	.000	.016	.000	.000	55.55	976.10
.000481	200.	200.	200.	0	0	0	.00	47.80	1023.90
*SECNO 6200.000									
6200.000	11.34	67.06	.00	.00	67.84	.78	.10	.01	71.22
2430.0	.0	2430.0	.0	.0	343.0	.0	43.6	5.9	71.22
.19	.00	7.08	.00	.000	.016	.000	.000	55.72	976.23
.000496	200.	200.	200.	0	0	0	.00	47.55	1023.77
*SECNO 6400.000									
6400.000	11.26	67.15	.00	.00	67.95	.80	.10	.01	71.39
2430.0	.0	2430.0	.0	.0	339.2	.0	45.1	6.1	71.39
.20	.00	7.16	.00	.000	.016	.000	.000	55.89	976.35
.000511	200.	200.	200.	0	0	0	.00	47.31	1023.65
*SECNO 6600.000									
6600.000	11.19	67.25	.00	.00	68.06	.81	.10	.01	71.56
2430.0	.0	2430.0	.0	.0	335.6	.0	46.7	6.4	71.56
.21	.00	7.24	.00	.000	.016	.000	.000	56.06	976.46
.000526	200.	200.	200.	0	0	0	.00	47.08	1023.54
*SECNO 6800.000									
6800.000	11.11	67.35	.00	.00	68.18	.83	.11	.01	71.74
2430.0	.0	2430.0	.0	.0	332.1	.0	48.2	6.6	71.74
.21	.00	7.32	.00	.000	.016	.000	.000	56.24	976.57
.000541	200.	200.	200.	0	0	0	.00	46.85	1023.43

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

*SECNO 7000.000

7000.000	11.04	67.45	.00	.00	68.30	.85	.11	.01	71.91
2430.0	.0	2430.0	.0	.0	328.8	.0	49.7	6.8	71.91
.22	.00	7.39	.00	.000	.016	.000	.000	56.41	976.68
.000556	200.	200.	200.	0	0	0	.00	46.64	1023.32

*SECNO 7200.000

7200.000	10.97	67.55	.00	.00	68.42	.86	.11	.01	72.08
2430.0	.0	2430.0	.0	.0	325.7	.0	51.2	7.0	72.08
.23	.00	7.46	.00	.000	.016	.000	.000	56.58	976.78
.000571	200.	200.	200.	0	0	0	.00	46.44	1023.22

*SECNO 7300.000

7300.000	10.94	67.61	.00	.00	68.48	.87	.06	.00	71.67
2430.0	.0	2430.0	.0	.0	323.8	.0	52.0	7.1	71.67
.23	.00	7.50	.00	.000	.016	.000	.000	56.67	976.84
.000579	100.	100.	100.	0	0	0	.00	46.32	1023.16

*SECNO 7400.000

7400.000	10.79	67.65	.00	.00	68.56	.91	.06	.02	71.86
2430.0	.0	2430.0	.0	.0	317.2	.0	52.7	7.2	71.86
.24	.00	7.66	.00	.000	.016	.000	.000	56.86	977.06
.000613	100.	100.	100.	1	0	0	.00	45.89	1022.94

*SECNO 7600.000

7600.000	10.50	67.74	.00	.00	68.73	1.00	.13	.04	72.24
2430.0	.0	2430.0	.0	.0	303.5	.0	54.1	7.4	72.24
.24	.00	8.01	.00	.000	.016	.000	.000	57.24	977.51
.000690	200.	200.	200.	2	0	0	.00	44.99	1022.49

*SECNO 7800.000

7800.000	10.22	67.84	.00	.00	68.92	1.08	.15	.04	72.62
2430.0	.0	2430.0	.0	.0	291.2	.0	55.5	7.6	72.62
.25	.00	8.35	.00	.000	.016	.000	.000	57.62	977.92
.000772	200.	200.	200.	2	0	0	.00	44.15	1022.08

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 8000.000									
8000.000	9.96	67.96	.00	.00	69.13	1.17	.16	.05	73.00
2430.0	.0	2430.0	.0	.0	279.7	.0	56.8	7.8	73.00
.26	.00	8.69	.00	.000	.016	.000	.000	58.00	978.32
.000861	200.	200.	200.	2	0	0	.00	43.37	1021.68
*SECNO 8200.000									
8200.000	9.71	68.09	.00	.00	69.36	1.27	.18	.05	73.38
2430.0	.0	2430.0	.0	.0	269.1	.0	58.1	8.0	73.38
.26	.00	9.03	.00	.000	.016	.000	.000	58.38	978.68
.000955	200.	200.	200.	2	0	0	.00	42.63	1021.32
*SECNO 8400.000									
8400.000	9.48	68.24	.00	.00	69.60	1.36	.20	.05	73.76
2430.0	.0	2430.0	.0	.0	259.5	.0	59.3	8.2	73.76
.27	.00	9.36	.00	.000	.016	.000	.000	58.76	979.03
.001054	200.	200.	200.	2	0	0	.00	41.95	1020.97
*SECNO 8600.000									
8600.000	9.28	68.42	.00	.00	69.87	1.46	.22	.05	74.14
2430.0	.0	2430.0	.0	.0	250.9	.0	60.5	8.4	74.14
.27	.00	9.68	.00	.000	.016	.000	.000	59.14	979.34
.001155	200.	200.	200.	2	0	0	.00	41.33	1020.66
*SECNO 8800.000									
8800.000	9.09	68.61	.00	.00	70.16	1.55	.24	.05	74.52
2430.0	.0	2430.0	.0	.0	243.3	.0	61.6	8.6	74.52
.28	.00	9.99	.00	.000	.016	.000	.000	59.52	979.61
.001255	200.	200.	200.	2	0	0	.00	40.77	1020.39
*SECNO 9000.000									
9000.000	8.93	68.83	.00	.00	70.46	1.64	.26	.04	74.90
2430.0	.0	2430.0	.0	.0	236.7	.0	62.7	8.8	74.90
.29	.00	10.27	.00	.000	.016	.000	.000	59.90	979.86
.001353	200.	200.	200.	2	0	0	.00	40.28	1020.14

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 9200.000									
9200.000	8.79	69.07	.00	.00	70.78	1.72	.28	.04	75.28
2430.0	.0	2430.0	.0	.0	231.0	.0	63.8	9.0	75.28
.29	.00	10.52	.00	.000	.016	.000	.000	60.28	980.07
.001444	200.	200.	200.	2	0	0	.00	39.86	1019.93
*SECNO 9400.000									
9400.000	8.67	69.33	.00	.00	71.11	1.78	.30	.03	75.66
2430.0	.0	2430.0	.0	.0	226.7	.0	64.8	9.2	75.66
.30	.00	10.72	.00	.000	.016	.000	.000	60.66	980.23
.001519	200.	200.	200.	1	0	0	.00	39.53	1019.77
*SECNO 9600.000									
9600.000	8.57	69.61	.00	.00	71.46	1.85	.31	.03	76.04
2430.0	.0	2430.0	.0	.0	222.8	.0	65.8	9.3	76.04
.30	.00	10.91	.00	.000	.016	.000	.000	61.04	980.38
.001593	200.	200.	200.	1	0	0	.00	39.23	1019.62
*SECNO 9800.000									
9800.000	8.49	69.91	.00	.00	71.81	1.90	.33	.03	76.42
2430.0	.0	2430.0	.0	.0	219.5	.0	66.9	9.5	76.42
.31	.00	11.07	.00	.000	.016	.000	.000	61.42	980.51
.001659	200.	200.	200.	1	0	0	.00	38.98	1019.49
*SECNO 10000.000									
10000.000	8.42	70.22	.00	.00	72.17	1.95	.34	.02	76.80
2430.0	.0	2430.0	.0	.0	217.1	.0	67.9	9.7	76.80
.31	.00	11.19	.00	.000	.016	.000	.000	61.80	980.60
.001710	200.	200.	200.	0	0	0	.00	38.79	1019.40
*SECNO 10200.000									
10200.000	8.37	70.55	.00	.00	72.53	1.98	.35	.02	77.18
2430.0	.0	2430.0	.0	.0	215.0	.0	68.9	9.9	77.18
.32	.00	11.30	.00	.000	.016	.000	.000	62.18	980.68
.001755	200.	200.	200.	0	0	0	.00	38.63	1019.32

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

*SECNO 10400.000

10400.000	8.33	70.89	.00	.00	72.90	2.01	.35	.02	77.56
2430.0	.0	2430.0	.0	.0	213.4	.0	69.8	10.1	77.56
.32	.00	11.39	.00	.000	.016	.000	.000	62.56	980.75
.001792	200.	200.	200.	0	0	0	.00	38.51	1019.25

*SECNO 10600.000

10600.000	8.30	71.24	.00	.00	73.28	2.04	.36	.01	77.94
2430.0	.0	2430.0	.0	.0	212.1	.0	70.8	10.2	77.94
.33	.00	11.46	.00	.000	.016	.000	.000	62.94	980.80
.001821	200.	200.	200.	0	0	0	.00	38.41	1019.20

*SECNO 10800.000

10800.000	8.28	71.60	.00	.00	73.65	2.06	.37	.01	78.32
2430.0	.0	2430.0	.0	.0	211.2	.0	71.8	10.4	78.32
.33	.00	11.51	.00	.000	.016	.000	.000	63.32	980.83
.001843	200.	200.	200.	0	0	0	.00	38.34	1019.17

*SECNO 11000.000

11000.000	8.26	71.96	.00	.00	74.03	2.07	.37	.01	78.70
2430.0	.0	2430.0	.0	.0	210.5	.0	72.8	10.6	78.70
.33	.00	11.54	.00	.000	.016	.000	.000	63.70	980.86
.001859	200.	200.	200.	0	0	0	.00	38.28	1019.14

*SECNO 11200.000

11200.000	8.25	72.33	.00	.00	74.41	2.08	.37	.00	79.08
2430.0	.0	2430.0	.0	.0	210.0	.0	73.7	10.8	79.08
.34	.00	11.57	.00	.000	.016	.000	.000	64.08	980.88
.001870	200.	200.	200.	0	0	0	.00	38.25	1019.12

*SECNO 11315.000

11315.000	8.24	72.54	.00	.00	74.62	2.08	.22	.00	79.30
2430.0	.0	2430.0	.0	.0	209.8	.0	74.3	10.9	79.30
.34	.00	11.58	.00	.000	.016	.000	.000	64.30	980.89
.001876	115.	115.	115.	0	0	0	.00	38.23	1019.11

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 11400.000									
11400.000	8.64	73.04	.00	.00	74.85	1.81	.14	.08	79.40
2430.0	.0	2430.0	.0	.0	225.0	.0	74.7	10.9	79.40
.34	.00	10.80	.00	.000	.016	.000	.000	64.40	980.30
.001551	85.	85.	85.	4	0	0	.00	39.40	1019.70
*SECNO 11600.000									
11600.000	8.89	73.53	.00	.00	75.19	1.65	.29	.05	79.64
2430.0	.0	2430.0	.0	.0	235.4	.0	75.8	11.1	79.64
.35	.00	10.32	.00	.000	.016	.000	.000	64.64	979.91
.001372	200.	200.	200.	2	0	0	.00	40.19	1020.09
*SECNO 11800.000									
11800.000	8.99	73.87	.00	.00	75.47	1.60	.27	.02	79.88
2430.0	.0	2430.0	.0	.0	239.1	.0	76.8	11.3	79.88
.36	.00	10.16	.00	.000	.016	.000	.000	64.88	979.77
.001316	200.	200.	200.	2	0	0	.00	40.46	1020.23
*SECNO 12000.000									
12000.000	9.05	74.17	.00	.00	75.74	1.57	.26	.01	80.12
2430.0	.0	2430.0	.0	.0	241.7	.0	77.9	11.5	80.12
.36	.00	10.05	.00	.000	.016	.000	.000	65.12	979.67
.001278	200.	200.	200.	2	0	0	.00	40.65	1020.33
*SECNO 12200.000									
12200.000	9.08	74.44	.00	.00	76.00	1.56	.25	.00	80.36
2430.0	.0	2430.0	.0	.0	242.5	.0	79.1	11.7	80.36
.37	.00	10.02	.00	.000	.016	.000	.000	65.36	979.65
.001267	200.	200.	200.	0	0	0	.00	40.71	1020.35
*SECNO 12261.000									
12261.000	9.09	74.52	.00	.00	76.08	1.55	.08	.00	80.43
2430.0	.0	2430.0	.0	.0	243.0	.0	79.4	11.7	80.43
.37	.00	10.00	.00	.000	.016	.000	.000	65.43	979.63
.001259	61.	61.	61.	0	0	0	.00	40.75	1020.37

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 12311.000
3280 CROSS SECTION 12311.00 EXTENDED .54 FEET

12311.000	9.54	75.04	.00	.00	76.24	1.20	.05	.11	74.50
2430.0	.0	2430.0	.0	.0	276.7	.0	79.7	11.8	74.50
.37	.00	8.78	.00	.000	.016	.000	.000	65.50	977.00
.000945	50.	50.	50.	3	0	0	.00	46.00	1023.00

*SECNO 12463.000

12463.000	8.85	75.05	.00	.00	76.57	1.53	.17	.16	75.20
2430.0	.0	2430.0	.0	.0	245.0	.0	80.6	11.9	75.20
.37	.00	9.92	.00	.000	.016	.000	.000	66.20	977.30
.001354	152.	152.	152.	2	0	0	.00	45.39	1022.70

*SECNO 12615.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 76.10 ELREA= 76.10

12615.000	7.85	74.95	.00	.00	77.20	2.25	.26	.36	76.10
2430.0	.0	2430.0	.0	.0	201.8	.0	81.4	12.1	76.10
.38	.00	12.04	.00	.000	.016	.000	.000	67.10	979.29
.002279	152.	152.	152.	2	0	0	.00	41.41	1020.71

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 74.29 , NOT 74.95 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	42.00	10.00	1.50	325.00	2.00	68.24	67.50

*SECNO 12742.000
3280 CROSS SECTION 12742.00 EXTENDED .64 FEET

3301 HV CHANGED MORE THAN HVINS

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 = 1.59

CLASS B LOW FLOW

3420 BRIDGE W.S.= 75.84 BRIDGE VELOCITY= 12.47 CALCULATED CHANNEL AREA= 180.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	78.64	.00	0.	2430.	325.	344.	79.40	83.92	0.

12742.000	9.64	77.48	.00	.00	78.64	1.16	1.44	.00	76.84
2430.0	.0	2430.0	.0	.0	281.5	.0	82.1	12.2	76.84
.38	.00	8.63	.00	.000	.016	.000	.000	67.84	977.00
.000898	127.	127.	127.	0	0	0	.00	46.00	1023.00

*SECNO 12760.000
3280 CROSS SECTION 12760.00 EXTENDED .59 FEET

12760.000	9.59	77.49	.00	.00	78.66	1.18	.02	.01	76.90
2430.0	.0	2430.0	.0	.0	279.0	.0	82.2	12.2	76.90
.38	.00	8.71	.00	.000	.016	.000	.000	67.90	977.00
.000923	18.	18.	18.	2	0	0	.00	46.00	1023.00

*SECNO 12860.000
3280 CROSS SECTION 12860.00 EXTENDED .09 FEET

12860.000	9.09	77.48	.00	.00	78.88	1.40	.10	.11	77.39
2430.0	.0	2430.0	.0	.0	256.1	.0	82.8	12.3	77.39
.39	.00	9.49	.00	.000	.016	.000	.000	68.39	977.00
.001196	100.	100.	100.	2	0	0	.00	46.00	1023.00

*SECNO 12942.000
3280 CROSS SECTION 12942.00 EXTENDED .96 FEET

12942.000	8.26	77.36	.00	.00	79.24	1.88	.12	.24	76.40
2430.0	.0	2430.0	.0	.0	220.8	.0	83.3	12.4	76.40
.39	.00	11.00	.00	.000	.016	.000	.000	69.10	980.00
.001697	82.	82.	82.	2	0	0	.00	40.00	1020.00

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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 13142.000
3280 CROSS SECTION  13142.00 EXTENDED       .13 FEET


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13142.000     7.62     77.63     77.63       .00     80.11      2.47       .41       .30     77.50
    2430.0       .0    2430.0       .0       .0     192.5        .0      84.2      12.6     77.50
       .39      .00     12.62       .00      .000      .016      .000      .000     70.01    980.00
   .002565     200.      200.      200.         3        11         0       .00     40.00   1020.00


*SECNO 13342.000
3280 CROSS SECTION  13342.00 EXTENDED       .10 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13342.000     7.69     78.70     78.70       .00     81.14      2.45       .51       .01     78.60
    2430.0       .0    2430.0       .0       .0     193.6        .0      85.1      12.8     78.60
       .40      .00     12.55       .00      .000      .016      .000      .000     71.01    980.00
   .002517     200.      200.      200.         4         5         0       .00     40.00   1020.00


*SECNO 13512.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13512.000     7.98     80.08     80.08       .00     82.66      2.58       .43       .07     80.90
    2430.0       .0    2430.0       .0       .0     188.5        .0      85.9      12.9     80.90
       .40      .00     12.89       .00      .000      .016      .000      .000     72.10    981.39
   .002565     170.      170.      170.        20         8         0       .00     37.22   1018.61


*SECNO 13800.000
3280 CROSS SECTION  13800.00 EXTENDED       .44 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13800.000     7.44     81.14     81.14       .00     83.61      2.47       .74       .03     80.70
    2430.0       .0    2430.0       .0       .0     192.5        .0      87.1      13.2     80.70
       .41      .00     12.62       .00      .000      .016      .000      .000     73.70    980.00
   .002580     288.      288.      288.         2        11         0       .00     40.00   1020.00
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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 13965.000
3280 CROSS SECTION 13965.00 EXTENDED .30 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13965.000	7.10	82.00	82.00	.00	84.28	2.28	.43	.06	81.80
2150.0	.0	2150.0	.0	.0	177.4	.0	87.8	13.3	81.70
.41	.00	12.12	.00	.000	.016	.000	.000	74.90	980.00
.002601	165.	165.	165.	2	11	0	.00	40.00	1020.00

*SECNO 14165.000
3280 CROSS SECTION 14165.00 EXTENDED .18 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14165.000	7.05	82.88	82.88	.00	85.16	2.28	.52	.00	82.70
2150.0	.0	2150.0	.0	.0	177.5	.0	88.6	13.5	82.86
.41	.00	12.11	.00	.000	.016	.000	.000	75.83	980.00
.002590	200.	200.	200.	3	5	0	.00	40.00	1020.00

*SECNO 14365.000
3280 CROSS SECTION 14365.00 EXTENDED .10 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14365.000	7.10	83.70	83.70	.00	85.96	2.26	.51	.01	83.60
2150.0	.0	2150.0	.0	.0	178.4	.0	89.4	13.7	83.70
.42	.00	12.05	.00	.000	.016	.000	.000	76.60	980.00
.002547	200.	200.	200.	2	5	0	.00	40.00	1020.00

*SECNO 14565.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14565.000	7.26	84.77	84.77	.00	87.04	2.28	.51	.01	84.99
2150.0	.0	2150.0	.0	.0	177.6	.0	90.3	13.9	85.06
.42	.00	12.11	.00	.000	.016	.000	.000	77.51	980.45
.002517	200.	200.	200.	4	5	0	.00	38.97	1019.42

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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 14765.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 14765.000     7.27     85.73     85.73       .00     88.03      2.30       .51       .01     85.99
    2150.0       .0    2150.0       .0       .0     176.7        .0     91.1      14.1     86.14
       .43      .00     12.17       .00      .000      .016      .000      .000     78.46    980.51
   .002539     200.      200.      200.         3         5         0       .00     38.69   1019.21


*SECNO 14900.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 14900.000     7.27     86.49     86.49       .00     88.78      2.30       .34       .00     86.82
    2150.0       .0    2150.0       .0       .0     176.7        .0     91.6      14.2     86.80
       .43      .00     12.17       .00      .000      .016      .000      .000     79.22    980.66
   .002540     135.      135.      135.         3         5         0       .00     38.71   1019.38


*SECNO 14950.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.03

 14950.000     8.94     88.51       .00       .00     89.29       .78       .06       .46     88.57
    2150.0       .0    2150.0       .0       .0     303.0        .0     91.9      14.2     90.57
       .43      .00      7.09       .00      .000      .016      .000      .000     79.57    974.11
   .000614      50.       50.       50.         5         0         0       .00     51.77   1025.89


*SECNO 15036.000
 15036.000     8.89     88.95       .00       .00     89.42       .47       .04       .09     89.06
    2150.0       .0    2150.0       .0       .0     390.4        .0     92.6      14.4     91.06
       .44      .00      5.51       .00      .000      .016      .000      .000     80.06    972.21
   .000314      86.       86.       86.         2         0         0       .00     52.79   1025.00


*SECNO 15067.000
3280 CROSS SECTION  15067.00 EXTENDED       .05 FEET
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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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

15067.000	9.04	89.24	.00	.00	89.50	.25	.01	.07	89.20
2150.0	.0	2150.0	.0	.0	534.1	.0	92.9	14.4	91.20
.44	.00	4.03	.00	.000	.016	.000	.000	80.20	972.00
.000148	31.	31.	31.	2	0	0	.00	68.00	1040.00

*SECNO 15068.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

3470 ENCROACHMENT STATIONS= 1010.0 1040.0 TYPE= 1 TARGET= -1010.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 80.15 ELREA= 100000.00

15068.000	9.28	89.43	.00	.00	89.54	.11	.00	.04	80.15
735.0	.0	735.0	.0	.0	278.4	.0	92.9	14.4	100000.00
.44	.00	2.64	.00	.000	.016	.000	.000	80.15	1010.00
.000079	0.	0.	0.	2	0	0	.00	30.00	1040.00

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	25.00	5.50	10.00	575.00	8	1	81.05	80.15

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 15643.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 86.665 EGOC = 91.178 PCWSE= 89.431 ELTRD= **********

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
86.66	91.18	1.64	0.	735.	3.068	110.09999999.00		0.

3470 ENCROACHMENT STATIONS= 1012.0 1036.0 TYPE= 1 TARGET= -1012.000

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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


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       81.05 ELREA=    100000.00

 15643.000      9.98      91.03        .00        .00      91.18        .15       1.64        .00      81.05
     735.0        .0      735.0        .0        .0      239.5        .0       96.3       14.7  100000.00
       .49       .00       3.07       .00       .000       .016       .000       .000      81.05    1012.00
   .000114      575.       575.      575.          2          0          0        .00      24.00    1036.00


*SECNO 15644.000
3280 CROSS SECTION  15644.00 EXTENDED       .93 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.78

 15644.000      9.93      90.98        .00        .00      91.23        .25        .00        .05      81.05
    2150.0    1239.3      910.7         .0      296.3      238.3         .0       96.3       14.7      92.05
       .49      4.18       3.82       .00       .016       .016       .000       .000      81.05     974.00
   .000126        0.         0.         0.          2          0          0        .00      62.00    1036.00


*SECNO 15695.000
3280 CROSS SECTION  15695.00 EXTENDED       .86 FEET

 15695.000      9.85      90.97        .00        .00      91.25        .28        .01        .01      90.12
    2150.0        .0     2150.0         .0        .0      504.5         .0       96.9       14.8      94.12
       .50       .00       4.26       .00       .000       .016       .000       .000      81.12     972.00
   .000159       51.        51.        51.          1          0          0        .00      66.79    1038.79


*SECNO 15750.000
3280 CROSS SECTION  15750.00 EXTENDED       .72 FEET

 15750.000      9.72      90.89        .00        .00      91.36        .48        .01        .10      90.17
    2150.0        .0     2150.0         .0        .0      388.1         .0       97.5       14.9      94.17
       .50       .00       5.54       .00       .000       .016       .000       .000      81.17     972.00
   .000304       55.        55.        55.          2          0          0        .00      55.57    1027.57


*SECNO 15800.000
 15800.000      9.62      90.85        .00        .00      91.43        .59        .02        .06      91.73
    2150.0        .0     2150.0         .0        .0      349.5         .0       97.9       15.0      91.73
       .50       .00       6.15       .00       .000       .016       .000       .000      81.23     974.32
   .000390       50.        50.        50.          2          0          0        .00      51.35    1025.68
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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 16000.000
 16000.000     9.46      90.91       .00        .00      91.53       .61        .08        .01       91.95
    2150.0      .0      2150.0       .0         .0      341.7        .0       99.5       15.2       91.95
       .51     .00        6.29      .00       .000       .016      .000       .000      81.45      974.55
   .000415     200.       200.      200.         0          0         0        .00      50.89     1025.45


*SECNO 16500.000
 16500.000     9.09      91.10       .00        .00      91.79       .69        .22        .04       92.51
    2150.0      .0      2150.0       .0         .0      323.4        .0      103.3       15.8       92.51
       .53     .00        6.65      .00       .000       .016      .000       .000      82.01      975.10
   .000483     500.       500.      500.         1          0         0        .00      49.80     1024.90


*SECNO 17000.000
 17000.000     8.76      91.32       .00        .00      92.09       .76        .26        .04       93.06
    2150.0      .0      2150.0       .0         .0      306.8        .0      106.9       16.3       93.06
       .55     .00        7.01      .00       .000       .016      .000       .000      82.56      975.60
   .000559     500.       500.      500.         0          0         0        .00      48.79     1024.40


*SECNO 17500.000
 17500.000     8.47      91.58       .00        .00      92.42       .84        .30        .04       93.62
    2150.0      .0      2150.0       .0         .0      292.4        .0      110.4       16.9       93.62
       .57     .00        7.35      .00       .000       .016      .000       .000      83.12      976.05
   .000639     500.       500.      500.         0          0         0        .00      47.90     1023.95


*SECNO 17950.000
 17950.000     8.24      91.85       .00        .00      92.76       .91        .30        .03       94.12
    2150.0      .0      2150.0       .0         .0      281.4        .0      113.3       17.4       94.12
       .58     .00        7.64      .00       .000       .016      .000       .000      83.62      976.40
   .000711     450.       450.      450.         0          0         0        .00      47.21     1023.60


*SECNO 18000.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

 18000.000     9.17      92.84       .00        .00      93.00       .16        .02        .22       94.17
     655.0      .0       655.0       .0         .0      201.9        .0      113.6       17.4       94.17
       .59     .00        3.24      .00       .000       .016      .000       .000      83.67      982.00
   .000147      50.        50.       50.         3          0         0        .00      36.00     1018.00
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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 18500.000
 18500.000     8.68      92.91        .00        .00      93.10        .20        .08        .02      94.73
     655.0       .0      655.0        .0        .0      184.7        .0      115.8       17.8      94.73
       .63      .00       3.55        .00       .000       .016       .000       .000      84.23     982.73
   .000187     500.       500.       500.          2          0          0        .00      34.54    1017.27


*SECNO 19000.000
 19000.000     8.21      92.99        .00        .00      93.23        .23        .11        .02      95.28
     655.0       .0      655.0        .0        .0      168.7        .0      117.9       18.2      95.28
       .66      .00       3.88        .00       .000       .016       .000       .000      84.78     983.44
   .000238     500.       500.       500.          0          0          0        .00      33.12    1016.56


*SECNO 19500.000
 19500.000     7.77      93.10        .00        .00      93.38        .28        .13        .02      95.84
     655.0       .0      655.0        .0        .0      154.2        .0      119.7       18.6      95.84
       .70      .00       4.25        .00       .000       .016       .000       .000      85.34     984.11
   .000303     500.       500.       500.          0          0          0        .00      31.78    1015.89


*SECNO 20000.000
 20000.000     7.35      93.25        .00        .00      93.58        .33        .17        .03      96.39
     655.0       .0      655.0        .0        .0      141.3        .0      121.4       19.0      96.39
       .73      .00       4.64        .00       .000       .016       .000       .000      85.89     984.73
   .000384     500.       500.       500.          0          0          0        .00      30.54    1015.27


*SECNO 20100.000
 20100.000     7.28      93.28        .00        .00      93.62        .34        .04        .01      96.50
     655.0       .0      655.0        .0        .0      139.2        .0      121.7       19.0      96.50
       .73      .00       4.71        .00       .000       .016       .000       .000      86.00     984.83
   .000400     100.       100.       100.          0          0          0        .00      30.33    1015.17


*SECNO 20115.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .60


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       95.00 ELREA=       95.00

 20115.000     7.17      93.19        .00        .00      93.73        .54        .01        .10      95.02
     550.0       .0      550.0        .0        .0       93.2        .0      121.8       19.0      95.02
       .73      .00       5.90        .00       .000       .016       .000       .000      86.02     993.50
   .000787      15.        15.        15.          2          0          0        .00      13.00    1006.50
```

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	.20	3.00	50.00	7.00	6.00	50.00	8	1	86.07	86.02

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 20165.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 92.560 EGOC = 94.075 PCWSE= 93.190 ELTRD= 95.000

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
92.56	94.08	.34	0.	550.	5.633	84.0	95.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 95.00 ELREA= 95.00

20165.000	7.51	93.58	.00	.00	94.08	.49	.34	.00	95.07
550.0	.0	550.0	.0	.0	97.6	.0	121.9	19.1	95.07
.74	.00	5.63	.00	.000	.016	.000	.000	86.07	993.50
.000696	50.	50.	50.	2	0	0	.00	13.00	1006.50

*SECNO 20180.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

20180.000	7.89	93.99	.00	.00	94.17	.19	.01	.09	96.59
550.0	.0	550.0	.0	.0	158.5	.0	121.9	19.1	96.59
.74	.00	3.47	.00	.000	.016	.000	.000	86.09	983.91
.000199	15.	15.	15.	2	0	0	.00	32.19	1016.09

*SECNO 20300.000

20300.000	7.78	94.01	.00	.00	94.20	.20	.02	.00	96.73
550.0	.0	550.0	.0	.0	154.8	.0	122.4	19.1	96.73
.75	.00	3.55	.00	.000	.016	.000	.000	86.23	984.08
.000212	120.	120.	120.	2	0	0	.00	31.84	1015.92

*SECNO 20500.000

20500.000	7.60	94.04	.00	.00	94.25	.21	.04	.01	96.95
550.0	.0	550.0	.0	.0	149.1	.0	123.1	19.3	96.95
.76	.00	3.69	.00	.000	.016	.000	.000	86.45	984.35
.000234	200.	200.	200.	0	0	0	.00	31.30	1015.65

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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 21000.000
 21000.000     7.15      94.15        .00        .00      94.41        .26        .13        .02      97.50
     550.0       .0      550.0        .0        .0      135.4         .0      124.7       19.6      97.50
       .80      .00       4.06        .00       .000       .016       .000       .000      87.00     985.02
   .000304     500.       500.       500.          0          0          0        .00      29.95    1014.98


*SECNO 21500.000
 21500.000     6.74      94.30        .00        .00      94.61        .31        .17        .03      98.06
     550.0       .0      550.0        .0        .0      123.2         .0      126.2       20.0      98.06
       .83      .00       4.47        .00       .000       .016       .000       .000      87.56     985.65
   .000392     500.       500.       500.          1          0          0        .00      28.70    1014.35


*SECNO 21850.000
 21850.000     6.48      94.43        .00        .00      94.78        .35        .15        .02      98.45
     550.0       .0      550.0        .0        .0      115.7         .0      127.1       20.2      98.45
       .85      .00       4.75        .00       .000       .016       .000       .000      87.95     986.04
   .000463     350.       350.       350.          0          0          0        .00      27.92    1013.96


*SECNO -15067.000
START TRIB COMP
 -15067.000 15067.000    89.244
3280 CROSS SECTION -15067.00 EXTENDED       .04 FEET

-15067.000     9.04      89.24        .00        .00      89.50        .25        .00        .00      89.20
    2150.0       .0     2150.0        .0        .0      534.0         .0      127.4       20.2      91.20
       .85      .00       4.03        .00       .000       .016       .000       .000      80.20     972.00
   .000148      31.        31.        31.          0          0          0        .00      68.00    1040.00


*SECNO 15068.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .41

 15068.000     8.94      89.14        .00        .00      89.60        .46        .00        .11      89.20
    1415.0       .0     1415.0        .0        .0      258.6         .0      127.4       20.2      91.20
       .85      .00       5.47        .00       .000       .016       .000       .000      80.20     972.12
   .000377       0.         0.         0.          2          0          0        .00      37.88    1010.00
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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 15092.000
 15092.000     8.92     89.15       .00       .00     89.61       .47       .01       .00     89.23
    1415.0       .0    1415.0       .0       .0     257.7       .0     127.5      20.3     91.23
       .85      .00      5.49      .00      .000      .016      .000      .000     80.23    972.17
   .000380      24.       24.      24.         0         0         0       .00     37.83   1010.00


*SECNO 15121.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       91.28 ELREA=       91.28

 15121.000     8.76     89.04       .00       .00     89.74       .70       .01       .12     91.28
    1415.0       .0    1415.0       .0       .0     210.3       .0     127.7      20.3     91.28
       .85      .00      6.73      .00      .000      .016      .000      .000     80.28    988.00
   .000604      29.       29.      29.         2         0         0       .00     24.00   1012.00


SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013      .20      3.00      25.00     6.00      12.00     106.00    8         1         80.44      .00

CHART  8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE  1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 15227.000

SPECIAL CULVERT OUTLET CONTROL
EGIC =     85.522  EGOC =     91.152  PCWSE=     89.041  ELTRD= **********

SPECIAL CULVERT

    EGIC      EGOC       H4     QWEIR     QCULV      VCH     ACULV     ELTRD    WEIRLN
    85.52     91.15     1.41       0.     1415.    5.784    144.09999999.00       0.


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       91.44 ELREA=       91.44

 15227.000    10.19     90.63       .00       .00     91.15       .52      1.41       .00     91.44
    1415.0       .0    1415.0       .0       .0     244.7       .0     128.2      20.3     91.44
       .86      .00      5.78      .00      .000      .016      .000      .000     80.44    988.00
   .000398     106.      106.     106.         2         0         0       .00     24.00   1012.00


*SECNO 15257.000
 15257.000    10.38     90.86       .00       .00     91.21       .35       .01       .05     91.48
    1415.0       .0    1415.0       .0       .0     298.8       .0     128.4      20.4     91.48
       .86      .00      4.74      .00      .000      .016      .000      .000     80.48    975.23
   .000269      30.       30.      30.         2         0         0       .00     49.54   1024.77
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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 15300.000
 15300.000     10.33      90.87        .00        .00      91.23        .35        .01        .00      91.54
    1415.0        .0     1415.0        .0        .0      296.5        .0      128.7       20.4      91.54
       .86       .00       4.77       .00       .000       .016       .000       .000      80.54     975.32
   .000274       43.        43.       43.          0          0          0        .00      49.35    1024.68


*SECNO 15500.000
 15500.000     10.08      90.92        .00        .00      91.30        .39        .06        .02      91.84
    1415.0        .0     1415.0        .0        .0      283.9        .0      130.0       20.6      91.84
       .87       .00       4.98       .00       .000       .016       .000       .000      80.84     975.84
   .000308      200.       200.      200.          1          0          0        .00      48.33    1024.16


*SECNO 15566.000
 15566.000      9.99      90.93        .00        .00      91.33        .40        .02        .01      91.94
    1415.0        .0     1415.0        .0        .0      279.7        .0      130.5       20.7      91.94
       .88       .00       5.06       .00       .000       .016       .000       .000      80.94     976.01
   .000320       66.        66.       66.          0          0          0        .00      47.98    1023.99


*SECNO 15643.000
3280 CROSS SECTION  15643.00 EXTENDED       .96 FEET

 15643.000      9.96      91.01        .00        .00      91.36        .35        .02        .01      90.05
    1415.0        .0     1415.0        .0        .0      297.6        .0      131.0       20.8      92.05
       .88       .00       4.76       .00       .000       .016       .000       .000      81.05     974.00
   .000250       77.        77.       77.          2          0          0        .00      38.00    1012.00
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THIS RUN EXECUTED 28JAN94 14:28:44

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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

DYSART DRAIN - ALT D

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
*	1036.000	3520.00	60.80	9.63	2.83	13.50	1.01	51.17	.00
	1050.000	3520.00	62.19	11.01	1.78	10.71	.75	51.18	.91
	1070.000	3520.00	62.23	11.03	1.77	10.69	.75	51.20	.91
	1100.000	3520.00	62.28	11.05	1.77	10.67	.75	51.23	.91
	1200.000	3520.00	62.50	11.18	1.69	10.43	.73	51.32	.91
	1300.000	3520.00	62.67	11.26	1.65	10.30	.71	51.41	.91
	1500.000	3520.00	62.98	11.39	1.58	10.10	.70	51.59	.91
	1700.000	3520.00	63.25	11.48	1.54	9.96	.69	51.77	.91
	1900.000	3520.00	63.50	11.55	1.51	9.86	.68	51.96	.91
	1950.000	3520.00	63.53	11.53	1.56	10.01	.65	52.00	.92
	2100.000	3520.00	63.68	11.54	1.55	9.99	.65	52.14	.91
	2300.000	3520.00	63.88	11.56	1.54	9.97	.65	52.32	.91
	2500.000	3520.00	64.09	11.58	1.54	9.95	.65	52.50	.91
	2700.000	3520.00	64.29	11.60	1.53	9.92	.64	52.68	.91
	2900.000	3520.00	64.49	11.62	1.52	9.90	.64	52.87	.91
	3100.000	3520.00	64.68	11.64	1.51	9.88	.64	53.05	.91
	3200.000	2430.00	66.03	12.89	.52	5.79	.36	53.14	.91

SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
3400.000	2430.00	66.08	12.77	.54	5.88	.37	53.31	.86
3600.000	2430.00	66.13	12.65	.55	5.96	.37	53.48	.86
3800.000	2430.00	66.19	12.53	.57	6.05	.38	53.66	.86
4000.000	2430.00	66.25	12.42	.58	6.14	.39	53.83	.86
4200.000	2430.00	66.31	12.31	.60	6.23	.39	54.00	.86
4400.000	2430.00	66.37	12.20	.62	6.31	.40	54.17	.86
4600.000	2430.00	66.44	12.09	.64	6.40	.41	54.34	.86
4800.000	2430.00	66.50	11.99	.65	6.49	.42	54.52	.86
5000.000	2430.00	66.58	11.89	.67	6.58	.42	54.69	.86
5200.000	2430.00	66.65	11.79	.69	6.67	.43	54.86	.86
5400.000	2430.00	66.73	11.69	.71	6.75	.44	55.03	.86
5600.000	2430.00	66.81	11.60	.73	6.84	.44	55.20	.86
5800.000	2430.00	66.89	11.51	.74	6.92	.45	55.38	.86
6000.000	2430.00	66.97	11.43	.76	7.00	.46	55.55	.86
6200.000	2430.00	67.06	11.34	.78	7.08	.46	55.72	.86
6400.000	2430.00	67.15	11.26	.80	7.16	.47	55.89	.86
6600.000	2430.00	67.25	11.19	.81	7.24	.48	56.06	.86
6800.000	2430.00	67.35	11.11	.83	7.32	.48	56.24	.86
7000.000	2430.00	67.45	11.04	.85	7.39	.49	56.41	.86
7200.000	2430.00	67.55	10.97	.86	7.46	.50	56.58	.86
7300.000	2430.00	67.61	10.94	.87	7.50	.50	56.67	.90
7400.000	2430.00	67.65	10.79	.91	7.66	.51	56.86	1.90
7600.000	2430.00	67.74	10.50	1.00	8.01	.54	57.24	1.90
7800.000	2430.00	67.84	10.22	1.08	8.35	.57	57.62	1.90
8000.000	2430.00	67.96	9.96	1.17	8.69	.60	58.00	1.90
8200.000	2430.00	68.09	9.71	1.27	9.03	.63	58.38	1.90

SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL	
8400.000	2430.00	68.24	9.48	1.36	9.36	.66	58.76	1.90	
8600.000	2430.00	68.42	9.28	1.46	9.68	.69	59.14	1.90	
8800.000	2430.00	68.61	9.09	1.55	9.99	.72	59.52	1.90	
9000.000	2430.00	68.83	8.93	1.64	10.27	.75	59.90	1.90	
9200.000	2430.00	69.07	8.79	1.72	10.52	.77	60.28	1.90	
9400.000	2430.00	69.33	8.67	1.78	10.72	.79	60.66	1.90	
9600.000	2430.00	69.61	8.57	1.85	10.91	.81	61.04	1.90	
9800.000	2430.00	69.91	8.49	1.90	11.07	.82	61.42	1.90	79.30±
10000.000	2430.00	70.22	8.42	1.95	11.19	.83	61.80	1.90	
10200.000	2430.00	70.55	8.37	1.98	11.30	.84	62.18	1.90	
10400.000	2430.00	70.89	8.33	2.01	11.39	.85	62.56	1.90	
10600.000	2430.00	71.24	8.30	2.04	11.46	.86	62.94	1.90	
10800.000	2430.00	71.60	8.28	2.06	11.51	.86	63.32	1.90	
11000.000	2430.00	71.96	8.26	2.07	11.54	.87	63.70	1.90	
11200.000	2430.00	72.33	8.25	2.08	11.57	.87	64.08	1.90	79.30
11315.000	2430.00	72.54	8.24	2.08	11.58	.87	64.30	1.90	
11400.000	2430.00	73.04	8.64	1.81	10.80	.80	64.40	1.20	
11600.000	2430.00	73.53	8.89	1.65	10.32	.75	64.64	1.20	
11800.000	2430.00	73.87	8.99	1.60	10.16	.74	64.88	1.20	
12000.000	2430.00	74.17	9.05	1.57	10.05	.73	65.12	1.20	
12200.000	2430.00	74.44	9.08	1.56	10.02	.72	65.36	1.20	
12261.000	2430.00	74.52	9.09	1.55	10.00	.72	65.43	1.20	
12311.000	2430.00	75.04	9.54	1.20	8.78	.63	65.50	1.33	79.30±
12463.000	2430.00	75.05	8.85	1.53	9.92	.75	66.20	4.61	79.30±
12615.000	2430.00	74.95	7.85	2.25	12.04	.96	67.10	5.92	79.30±
* 12742.000	2430.00	77.48	9.64	1.16	8.63	.62	67.84	5.83	79.30±

ok

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL	
	12760.000	2430.00	77.49	9.59	1.18	8.71	.62	67.90	3.33	79.30 ±
	12860.000	2430.00	77.48	9.09	1.40	9.49	.71	68.39	4.93	79.30 ±
	12942.000	2430.00	77.36	8.26	1.88	11.00	.83	69.10	8.62	79.30 ±
*	13142.000	2430.00	77.63	7.62	2.47	12.62	1.01	70.01	4.55	79.30 ±
*	13342.000	2430.00	78.70	7.69	2.45	12.55	1.01	71.01	5.00	79.30 ±
*	13512.000	2430.00	80.08	7.98	2.58	12.89	1.01	72.10	6.41	79.30 ±
*	13800.000	2430.00	81.14	7.44	2.47	12.62	1.01	73.70	5.56	80.34 ±
*	13965.000	2150.00	82.00	7.10	2.28	12.12	1.01	74.90	7.27	80.54 ±
*	14165.000	2150.00	82.88	7.05	2.28	12.11	1.01	75.83	4.65	81.46 ±
*	14365.000	2150.00	83.70	7.10	2.26	12.05	1.01	76.60	3.85	83.70 ±
*	14565.000	2150.00	84.77	7.26	2.28	12.11	1.00	77.51	4.55	
*	14765.000	2150.00	85.73	7.27	2.30	12.17	1.00	78.46	4.75	
*	14900.000	2150.00	86.49	7.27	2.30	12.17	1.00	79.22	5.63	
*	14950.000	2150.00	88.51	8.94	.78	7.09	.52	79.57	7.00	84.22
	15036.000	2150.00	88.95	8.89	.47	5.51	.36	80.06	5.70	
*	15067.000	2150.00	89.24	9.04	.25	4.03	.25	80.20	4.52	
*	15068.000	735.00	89.43	9.28	.11	2.64	.15	80.15	-499.95	
	15643.000	735.00	91.03	9.98	.15	3.07	.17	81.05	1.57	86.73
*	15644.000	2150.00	90.98	9.93	.25	3.82	.21	81.05	.00	
	15695.000	2150.00	90.97	9.85	.28	4.26	.27	81.12	1.37	1086.78
	15750.000	2150.00	90.89	9.72	.48	5.54	.37	81.17	.91	
	15800.000	2150.00	90.85	9.62	.59	6.15	.42	81.23	1.20	87.08
	16000.000	2150.00	90.91	9.46	.61	6.29	.43	81.45	1.11	88.78
	16500.000	2150.00	91.10	9.09	.69	6.65	.46	82.01	1.11	89.59
	17000.000	2150.00	91.32	8.76	.76	7.01	.49	82.56	1.11	
	17500.000	2150.00	91.58	8.47	.84	7.35	.52	83.12	1.11	

Worse

At Rail Road

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
	17950.000	2150.00	91.85	8.24	.91	7.64	.55	83.62	1.11
*	18000.000	655.00	92.84	9.17	.16	3.24	.24	83.67	1.10
	18500.000	655.00	92.91	8.68	.20	3.55	.27	84.23	1.11
	19000.000	655.00	92.99	8.21	.23	3.88	.30	84.78	1.11
	19500.000	655.00	93.10	7.77	.28	4.25	.34	85.34	1.11
	20000.000	655.00	93.25	7.35	.33	4.64	.38	85.89	1.11
	20100.000	655.00	93.28	7.28	.34	4.71	.39	86.00	1.11
*	20115.000	550.00	93.19	7.17	.54	5.90	.39	86.02	1.13
	20165.000	550.00	93.58	7.51	.49	5.63	.36	86.07	1.10
*	20180.000	550.00	93.99	7.89	.19	3.47	.28	86.09	1.13
	20300.000	550.00	94.01	7.78	.20	3.55	.28	86.23	1.11
	20500.000	550.00	94.04	7.60	.21	3.69	.30	86.45	1.11
	21000.000	550.00	94.15	7.15	.26	4.06	.34	87.00	1.11
	21500.000	550.00	94.30	6.74	.31	4.47	.38	87.56	1.11
	21850.000	550.00	94.43	6.48	.35	4.75	.41	87.95	1.11
tributary	-15067.000	2150.00	89.24	9.04	.25	4.03	.25	80.20	.00
*	15068.000	1415.00	89.14	8.94	.46	5.47	.37	80.20	.00
	15092.000	1415.00	89.15	8.92	.47	5.49	.37	80.23	1.25
	15121.000	1415.00	89.04	8.76	.70	6.73	.40	80.28	1.72
	15227.000	1415.00	90.63	10.19	.52	5.78	.32	80.44	1.51
	15257.000	1415.00	90.86	10.38	.35	4.74	.34	80.48	1.33
	15300.000	1415.00	90.87	10.33	.35	4.77	.34	80.54	1.40
	15500.000	1415.00	90.92	10.08	.39	4.98	.36	80.84	1.50
	15566.000	1415.00	90.93	9.99	.40	5.06	.37	80.94	1.52
	15643.000	1415.00	91.01	9.96	.35	4.76	.30	81.05	1.43

check w/ 9e-15067

Bullard Ave 1093.3

415
735
2150

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   1036.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=  12742.000  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=  12742.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  13142.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13142.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13342.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13342.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13512.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13512.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  13512.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  13800.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13800.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13965.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13965.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14165.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14165.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14365.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14365.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14565.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14565.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14765.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14765.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14900.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14900.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=  14950.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15067.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15068.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15644.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  18000.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  20115.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  20180.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15068.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    13JAN94    TIME    10:22:18  *
*********************************************
```

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****************************************
*  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
```

THIS RUN EXECUTED 13JAN94 10:22:19

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

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


T1  FLOOD CONTROL DISTRICT OF MARICOPA COUNTY          CONSULTANT: NBS/LOWRY
T2  FCD 93-01 DYSART DRAIN IMPROVEMENT PROJECT         JOB NO: P81-194-019
T3      DYSART DRAIN - ALT D    Subsided Condition     FILE NAME: ALTDSUB.DAT
T4  (NBS slope, 2:1 SS E. of El Mirage, 1.5:1 SS W. of El Mirage,
T5   Trap Section around 575' box)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         2         0         0        -1         0         0         0     56.72         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1         0        -1                                                 6


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         8        10        26        68        42        33

NC    .016      .016      .016        .3        .5
    10' BOTTOM WIDTH, 2:1 SS
QT       1      3520
X1    1040         5       965      1035         0         0         0         0     51.17
GR    15.5       965       0.5       995         0      1000       0.5      1005      15.5      1035

X1    1060                                     20        20        20         0     0.008

X1    1080                                     20        20        20         0     0.008

X1    1100                                     20        20        20         0     0.008

X1    1200                                    100       100       100         0      0.04

X1    1300                                    100       100       100         0      0.04

X1    1500                                    200       200       200         0      0.08

X1    1700                                    200       200       200         0      0.08

X1    1900                                    200       200       200         0      0.08
    15' BOTTOM WIDTH, 1.5:1 SS
```

X1	1950	5	970	1030	50	50	50		51.53	
GR	15.5	970	0.5	992.5	0	1000	0.5	1007.5	15.5	1030
X1	2100				150	150	150	0	0.06	
X1	2300				200	200	200	0	0.08	
X1	2500				200	200	200	0	0.08	
X1	2700				200	200	200	0	0.08	
X1	2900				200	200	200	0	0.08	
X1	3100				200	200	200	0	0.08	
QT	1	2430								
X1	3200				100	100	100	0	0.04	
X1	3400				200	200	200	0	0.08	
X1	3600				200	200	200	0	0.08	
X1	3800				200	200	200	0	0.08	
X1	4000				200	200	200	0	0.08	
X1	4200				200	200	200	0	0.08	
X1	4400				200	200	200	0	0.08	
X1	4600				200	200	200	0	0.08	
X1	4800				200	200	200	0	0.08	
X1	5000				200	200	200	0	0.08	
X1	5200				200	200	200	0	0.08	
X1	5400				200	200	200	0	0.08	
X1	5600				200	200	200	0	0.08	
X1	5800				200	200	200	0	0.08	
X1	6000				200	200	200	0	0.08	
X1	6200				200	200	200	0	0.08	

X1	6400				200	200	200	0	0.08	
X1	6600				200	200	200	0	0.08	
X1	6800				200	200	200	0	0.08	
X1	7000				200	200	200	0	0.08	
X1	7200				200	200	200	0	0.08	
X1	7300	5	970.75	1029.25	100	100	100		53.67	
GR	15	970.75	0.5	992.5	0	1000	0.5	1007.5	15	1029.25
X1	7400				100	100	100	0	0.08	
X1	7600				200	200	200	0	0.16	
X1	7800				200	200	200	0	0.16	
X1	8000				200	200	200	0	0.16	
X1	8200				200	200	200	0	0.16	
X1	8400				200	200	200	0	0.16	
X1	8600				200	200	200	0	0.16	
X1	8800				200	200	200	0	0.16	
X1	9000				200	200	200	0	0.16	
X1	9200				200	200	200	0	0.16	
X1	9400				200	200	200	0	0.16	
X1	9600				200	200	200	0	0.16	
X1	9800				200	200	200	0	0.16	
X1	10000				200	200	200	0	0.16	
X1	10200				200	200	200	0	0.16	
X1	10400				200	200	200	0	0.16	
X1	10600				200	200	200	0	0.16	
X1	10800				200	200	200	0	0.16	

```
X1    11000                                   200       200       200         0       0.16

X1    11200                                   200       200       200         0       0.16

X1    11400                                   200       200       200                 0.16

X1    11600                                   200       200       200                 0.16

X1    11800                                   200       200       200                 0.16

X1    12000                                   200       200       200                 0.16

X1    12200                                   200       200       200                 0.16
   Sta. 122+69, begin Transition to Exist. section

X1    12269                                    69        69        69                0.055
   Sta. 123+19, match exist. channel section

X1    12319        4       977      1023        50        50        50                57.7
GR        9      977         0       995         0      1005         9      1023

X1    12500                                   181       181       181                0.978
   Litchfield Road Bridge - Special Bridge Method

X1    12615                                   115       115       115                0.622
X3       10

SB     1.05      1.6       2.6        42        10       1.5       325         2      60.24      59.55
X1    12742                                   127       127       127                 .685
X2                         1      71.4     75.92
X3       10

X1    12760                                    18        18        18                0.088

X1    12860                                   100       100       100                0.493

X1    12942        4       980      1020        82        82        82               -8.05
GR     76.4      980      69.1       995      69.1      1005      76.4      1020

X1    13142        4       980      1020       200       200       200               -7.97
GR     77.5      980     70.01       995     70.01      1005      77.5      1020

X1    13342        4       980      1020       200       200       200               -7.98
GR     78.6      980     71.01       995     71.01      1005      78.6      1020

X1    13512        4       980      1020       170       170       170               -8.01
GR     80.9      980      72.1       995      72.1      1005      80.9      1020
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X1    13800      4     980    1020     288     288     288              -7.97
GR     80.7    980    73.7     995    73.7    1005    80.7    1020

QT        1   2150
X1    13965      4     980    1020     165     165     165              -8.12
GR     81.8    980    75.2     995    74.9    1005    81.7    1020

X1    14165      4     980    1020     200     200     200              -8.24
GR     82.7    980   75.86     995   75.83    1005   82.86    1020

X1    14365      4     980    1020     200     200     200              -8.19
GR     83.6    980    76.6     995    76.6    1005    83.7    1020

X1    14565      4     980    1020     200     200     200              -8.29
GR    84.99    980   77.52     995   77.51    1005   85.06    1020

X1    14765      4     980    1020     200     200     200              -8.22
GR    85.99    980   78.49     995   78.46    1005   86.14    1020

X1    14900      4     980    1020     135     135     135              -8.28
GR    86.82    980   79.22     995   79.24    1005    86.8    1020

X1    14950      4     974    1030      50      50      50              71.20
GR        9    974       0     992       0    1008      11    1030

X1    15036      4     972    1025      86      86      86              71.64
GR        9    972       0     990       0    1025      11    1025
    15067 Is full x-sect with total Q as starting point for culvert analysis

X1    15067      4     972    1040      31      31      31              71.80
GR        9    972       0     990       0    1040      11    1040
    15068 Is effective area for culvert with culvert Q.

QT        1    735
X1    15068      5    1010    1040      .1      .1      .1              71.80
X3       10                   1010
GR        9    972       0     990       0    1010       0    1040      11    1040

SC    2.013    0.2     3.0      25     5.5      10     575     8.1    72.56
X1    15643      5    1012    1036     575     575     575             72.56
X2                      2
X3       10                   1012
GR        9    974       0     992       0    1012       0    1036      11    1036

QT        1   2150
X1    15644                              .1      .1      .1
    Transition to 24' bottom, 1.5:1 SS, and 0.5' crossfall in invert.
```

```
X1    15695       4     972    1043.5      51      51      51              -8.51
GR    90.12     972   81.12       990   81.12    1024   94.12    1043.5
X1    15750       4     972    1032.5      55      55      55              -8.52
GR    90.17     972   81.17       990   81.17    1013   94.17    1032.5
   24' BOTTOM WIDTH
X1    15800       5     973      1027      50      50      50              72.70
GR     10.5     973     0.5       988       0    1000     0.5     1012      10.5      1027
X1    16000                             200     200     200               .176
X1    16500                             500     500     500               .439
X1    17000                             500     500     500               .439
X1    17500                             500     500     500               .439
X1    17950                             400     400     400               .351
QT        1     655
   10' BOTTOM WIDTH
X1    18000       5     980      1020      50      50      50              74.63
GR     10.5     980     0.5       995       0    1000     0.5     1005      10.5      1020
X1    18500                             500     500     500               .439
X1    19000                             500     500     500               .439
X1    19500                             500     500     500               .439
X1    20000                             500     500     500               .439
X1    20100                             100     100     100               .088
QT        1     550
X1    20115       4   993.5    1006.5      15      15      15              76.498
X3       10                                                        95        95
GR        9   993.5       0     993.5       0  1006.5       9  1006.5
SC    2.013     0.2     3.0        50       7       6      50     8.1      76.54    76.498
X1    20165       4   993.5    1006.5      50      50      50              76.54
X2                        2                95
X3       10                                                        95        95
GR        9   993.5       0     993.5       0  1006.5       9  1006.5
X1    20180       5     980      1020      15      15      15             76.554
GR     10.5     980     0.5       995       0    1000     0.5     1005      10.5      1020
```

```
X1    20300                                    120       120       120                .104

X1    20500                                    200       200       200                .173

X1    21000                                    500       500       500                .433

X1    21500                                    500       500       500                .433

X1    21850                                    350       350       350                .303

QT        1      2150
X1   -15067         4       972      1040       31        31        31               71.80
GR        9       972         0       990        0      1040        11      1040

QT        1      1415
X1    15068         4       972      1010       .1        .1        .1               71.80
GR        9       972         0       990        0      1010        11      1010

X1    15092                                     24        24        24                0.02
   2 - 12' X 6' X 106' RCBC'S

X1    15121         4       988      1012       29        29        29               71.84
X3       10
GR       11       988         0       988        0      1012        11      1012

SC    2.013       0.2       3.0        25        6        12       106       8.1      71.99
X1    15227                                    106       106       106                .145
X2                            2
X3       10

X1    15257         4       974      1026       30        30        30               72.03
GR       11       974         0       996        0      1004        11      1026

X1    15300                                     43        43        43                .059

X1    15500                                    200       200       200                .276

X1    15566                                     66        66        66                .091

X1    15643         4       974      1012       77        77        77               72.56
GR        9       974         0       992        0      1012        11      1012
```

```
   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


CCHV=     .300 CEHV=     .500
*SECNO 1040.000
3720 CRITICAL DEPTH ASSUMED
  1040.000      9.63     60.80     60.80     56.72     63.63      2.83       .00       .00     66.67
    3520.0        .0    3520.0        .0        .0     260.7        .0       .0        .0     66.67
       .00       .00     13.50       .00      .000      .016      .000      .000     51.17    976.73
   .002393        0.        0.        0         0        13         0       .00     46.54   1023.27


*SECNO 1060.000

3301 HV CHANGED MORE THAN HVINS

  1060.000     11.04     62.22       .00       .00     63.99      1.77       .03       .32     66.68
    3520.0        .0    3520.0        .0        .0     329.7        .0        .1        .0     66.68
       .00       .00     10.68       .00      .000      .016      .000      .000     51.18    973.94
   .001277       20.       20.       20.        11         0         0       .00     52.13   1026.06


*SECNO 1080.000
  1080.000     11.12     62.30       .00       .00     64.03      1.72       .03       .01     66.69
    3520.0        .0    3520.0        .0        .0     334.1        .0        .3        .0     66.69
       .00       .00     10.54       .00      .000      .016      .000      .000     51.19    973.77
   .001233       20.       20.       20.         2         0         0       .00     52.47   1026.23


*SECNO 1100.000
  1100.000     11.15     62.34       .00       .00     64.05      1.71       .02       .00     66.69
    3520.0        .0    3520.0        .0        .0     335.3        .0        .4        .1     66.69
       .00       .00     10.50       .00      .000      .016      .000      .000     51.19    973.72
   .001221       20.       20.       20.         1         0         0       .00     52.56   1026.28


*SECNO 1200.000
  1200.000     11.40     62.63       .00       .00     64.21      1.58       .12       .04     66.73
    3520.0        .0    3520.0        .0        .0     349.2        .0       1.2        .2     66.73
       .00       .00     10.08       .00      .000      .016      .000      .000     51.23    973.20
   .001096      100.      100.      100.         2         0         0       .00     53.60   1026.80
```

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 1300.000									
1300.000	11.56	62.84	.00	.00	64.34	1.50	.11	.02	66.77
3520.0	.0	3520.0	.0	.0	358.0	.0	2.0	.3	66.77
.01	.00	9.83	.00	.000	.016	.000	.000	51.27	972.87
.001025	100.	100.	100.	2	0	0	.00	54.26	1027.13
*SECNO 1500.000									
1500.000	11.83	63.18	.00	.00	64.57	1.39	.19	.03	66.85
3520.0	.0	3520.0	.0	.0	372.4	.0	3.7	.6	66.85
.01	.00	9.45	.00	.000	.016	.000	.000	51.35	972.35
.000922	200.	200.	200.	2	0	0	.00	55.31	1027.65
*SECNO 1700.000									
1700.000	12.03	63.46	.00	.00	64.77	1.31	.18	.02	66.93
3520.0	.0	3520.0	.0	.0	383.5	.0	5.5	.8	66.93
.02	.00	9.18	.00	.000	.016	.000	.000	51.43	971.95
.000853	200.	200.	200.	2	0	0	.00	56.11	1028.05
*SECNO 1900.000									
1900.000	12.19	63.70	.00	.00	64.95	1.25	.17	.02	67.01
3520.0	.0	3520.0	.0	.0	392.8	.0	7.2	1.1	67.01
.03	.00	8.96	.00	.000	.016	.000	.000	51.51	971.62
.000800	200.	200.	200.	2	0	0	.00	56.76	1028.38
*SECNO 1950.000									
1950.000	12.18	63.71	.00	.00	65.02	1.31	.04	.03	67.03
3520.0	.0	3520.0	.0	.0	383.8	.0	7.7	1.1	67.03
.03	.00	9.17	.00	.000	.016	.000	.000	51.53	974.97
.000770	50.	50.	50.	2	0	0	.00	50.05	1025.03
*SECNO 2100.000									
2100.000	12.28	63.87	.00	.00	65.14	1.27	.11	.01	67.09
3520.0	.0	3520.0	.0	.0	388.6	.0	9.0	1.3	67.09
.03	.00	9.06	.00	.000	.016	.000	.000	51.59	974.83
.000745	150.	150.	150.	2	0	0	.00	50.34	1025.17

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 2300.000

2300.000	12.39	64.06	.00	.00	65.30	1.24	.15	.01	67.17
3520.0	.0	3520.0	.0	.0	394.3	.0	10.8	1.5	67.17
.04	.00	8.93	.00	.000	.016	.000	.000	51.67	974.66
.000716	200.	200.	200.	2	0	0	.00	50.68	1025.34

*SECNO 2500.000

2500.000	12.50	64.25	.00	.00	65.45	1.21	.14	.01	67.25
3520.0	.0	3520.0	.0	.0	399.5	.0	12.6	1.8	67.25
.04	.00	8.81	.00	.000	.016	.000	.000	51.75	974.51
.000691	200.	200.	200.	2	0	0	.00	50.99	1025.49

*SECNO 2700.000

2700.000	12.59	64.42	.00	.00	65.60	1.18	.14	.01	67.33
3520.0	.0	3520.0	.0	.0	404.3	.0	14.5	2.0	67.33
.05	.00	8.71	.00	.000	.016	.000	.000	51.83	974.37
.000669	200.	200.	200.	2	0	0	.00	51.26	1025.63

*SECNO 2900.000

2900.000	12.67	64.58	.00	.00	65.73	1.15	.13	.01	67.41
3520.0	.0	3520.0	.0	.0	408.6	.0	16.3	2.3	67.41
.06	.00	8.61	.00	.000	.016	.000	.000	51.91	974.24
.000651	200.	200.	200.	2	0	0	.00	51.52	1025.76

*SECNO 3100.000

3100.000	12.75	64.74	.00	.00	65.87	1.13	.13	.01	67.49
3520.0	.0	3520.0	.0	.0	412.6	.0	18.2	2.5	67.49
.06	.00	8.53	.00	.000	.016	.000	.000	51.99	974.13
.000634	200.	200.	200.	2	0	0	.00	51.75	1025.87

*SECNO 3200.000

3301 HV CHANGED MORE THAN HVINS

3200.000	13.66	65.69	.00	.00	66.12	.43	.04	.21	67.53
2430.0	.0	2430.0	.0	.0	460.7	.0	19.2	2.6	67.53
.07	.00	5.27	.00	.000	.016	.000	.000	52.03	972.77
.000225	100.	100.	100.	3	0	0	.00	54.47	1027.23

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

*SECNO 3400.000

3400.000	13.62	65.73	.00	.00	66.17	.44	.05	.00	67.61
2430.0	.0	2430.0	.0	.0	458.7	.0	21.3	2.9	67.61
.08	.00	5.30	.00	.000	.016	.000	.000	52.11	972.82
.000227	200.	200.	200.	2	0	0	.00	54.36	1027.18

*SECNO 3600.000

3600.000	13.58	65.77	.00	.00	66.21	.44	.05	.00	67.69
2430.0	.0	2430.0	.0	.0	456.8	.0	23.4	3.1	67.69
.09	.00	5.32	.00	.000	.016	.000	.000	52.19	972.87
.000230	200.	200.	200.	0	0	0	.00	54.25	1027.13

*SECNO 3800.000

3800.000	13.55	65.82	.00	.00	66.26	.44	.05	.00	67.77
2430.0	.0	2430.0	.0	.0	454.9	.0	25.5	3.4	67.77
.10	.00	5.34	.00	.000	.016	.000	.000	52.27	972.93
.000232	200.	200.	200.	0	0	0	.00	54.15	1027.07

*SECNO 4000.000

4000.000	13.51	65.86	.00	.00	66.31	.45	.05	.00	67.85
2430.0	.0	2430.0	.0	.0	453.0	.0	27.6	3.6	67.85
.11	.00	5.36	.00	.000	.016	.000	.000	52.35	972.98
.000235	200.	200.	200.	0	0	0	.00	54.04	1027.02

*SECNO 4200.000

4200.000	13.48	65.91	.00	.00	66.36	.45	.05	.00	67.93
2430.0	.0	2430.0	.0	.0	451.1	.0	29.7	3.9	67.93
.12	.00	5.39	.00	.000	.016	.000	.000	52.43	973.03
.000238	200.	200.	200.	0	0	0	.00	53.94	1026.97

*SECNO 4400.000

4400.000	13.44	65.95	.00	.00	66.41	.45	.05	.00	68.01
2430.0	.0	2430.0	.0	.0	449.3	.0	31.8	4.1	68.01
.13	.00	5.41	.00	.000	.016	.000	.000	52.51	973.08
.000240	200.	200.	200.	0	0	0	.00	53.84	1026.92

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 4600.000									
4600.000	13.41	66.00	.00	.00	66.46	.46	.05	.00	68.09
2430.0	.0	2430.0	.0	.0	447.5	.0	33.8	4.4	68.09
.14	.00	5.43	.00	.000	.016	.000	.000	52.59	973.13
.000243	200.	200.	200.	0	0	0	.00	53.74	1026.87
*SECNO 4800.000									
4800.000	13.38	66.05	.00	.00	66.51	.46	.05	.00	68.17
2430.0	.0	2430.0	.0	.0	445.7	.0	35.9	4.6	68.17
.15	.00	5.45	.00	.000	.016	.000	.000	52.67	973.18
.000245	200.	200.	200.	0	0	0	.00	53.64	1026.82
*SECNO 5000.000									
5000.000	13.35	66.10	.00	.00	66.56	.47	.05	.00	68.25
2430.0	.0	2430.0	.0	.0	444.0	.0	37.9	4.8	68.25
.16	.00	5.47	.00	.000	.016	.000	.000	52.75	973.23
.000248	200.	200.	200.	0	0	0	.00	53.54	1026.77
*SECNO 5200.000									
5200.000	13.31	66.14	.00	.00	66.61	.47	.05	.00	68.33
2430.0	.0	2430.0	.0	.0	442.3	.0	39.9	5.1	68.33
.17	.00	5.49	.00	.000	.016	.000	.000	52.83	973.28
.000251	200.	200.	200.	0	0	0	.00	53.44	1026.72
*SECNO 5400.000									
5400.000	13.28	66.19	.00	.00	66.66	.47	.05	.00	68.41
2430.0	.0	2430.0	.0	.0	440.6	.0	42.0	5.3	68.41
.18	.00	5.52	.00	.000	.016	.000	.000	52.91	973.33
.000253	200.	200.	200.	0	0	0	.00	53.35	1026.67
*SECNO 5600.000									
5600.000	13.25	66.24	.00	.00	66.72	.48	.05	.00	68.49
2430.0	.0	2430.0	.0	.0	439.0	.0	44.0	5.6	68.49
.19	.00	5.54	.00	.000	.016	.000	.000	52.99	973.37
.000256	200.	200.	200.	0	0	0	.00	53.26	1026.63

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 5800.000									
5800.000	13.22	66.29	.00	.00	66.77	.48	.05	.00	68.57
2430.0	.0	2430.0	.0	.0	437.3	.0	46.0	5.8	68.57
.20	.00	5.56	.00	.000	.016	.000	.000	53.07	973.42
.000258	200.	200.	200.	0	0	0	.00	53.17	1026.58
*SECNO 6000.000									
6000.000	13.19	66.34	.00	.00	66.82	.48	.05	.00	68.65
2430.0	.0	2430.0	.0	.0	435.8	.0	48.0	6.1	68.65
.21	.00	5.58	.00	.000	.016	.000	.000	53.15	973.46
.000261	200.	200.	200.	0	0	0	.00	53.08	1026.54
*SECNO 6200.000									
6200.000	13.16	66.39	.00	.00	66.88	.49	.05	.00	68.73
2430.0	.0	2430.0	.0	.0	434.2	.0	50.0	6.3	68.73
.22	.00	5.60	.00	.000	.016	.000	.000	53.23	973.51
.000263	200.	200.	200.	0	0	0	.00	52.99	1026.49
*SECNO 6400.000									
6400.000	13.13	66.44	.00	.00	66.93	.49	.05	.00	68.81
2430.0	.0	2430.0	.0	.0	432.7	.0	52.0	6.6	68.81
.23	.00	5.62	.00	.000	.016	.000	.000	53.31	973.55
.000266	200.	200.	200.	0	0	0	.00	52.90	1026.45
*SECNO 6600.000									
6600.000	13.10	66.49	.00	.00	66.99	.49	.05	.00	68.89
2430.0	.0	2430.0	.0	.0	431.2	.0	54.0	6.8	68.89
.24	.00	5.64	.00	.000	.016	.000	.000	53.39	973.59
.000268	200.	200.	200.	0	0	0	.00	52.82	1026.41
*SECNO 6800.000									
6800.000	13.08	66.55	.00	.00	67.04	.50	.05	.00	68.97
2430.0	.0	2430.0	.0	.0	429.7	.0	56.0	7.0	68.97
.25	.00	5.65	.00	.000	.016	.000	.000	53.47	973.63
.000271	200.	200.	200.	0	0	0	.00	52.73	1026.37

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 7000.000									
7000.000	13.05	66.60	.00	.00	67.10	.50	.05	.00	69.05
2430.0	.0	2430.0	.0	.0	428.3	.0	57.9	7.3	69.05
.26	.00	5.67	.00	.000	.016	.000	.000	53.55	973.67
.000273	200.	200.	200.	0	0	0	.00	52.65	1026.33
*SECNO 7200.000									
7200.000	13.02	66.65	.00	.00	67.16	.50	.05	.00	69.13
2430.0	.0	2430.0	.0	.0	426.9	.0	59.9	7.5	69.13
.27	.00	5.69	.00	.000	.016	.000	.000	53.63	973.71
.000276	200.	200.	200.	0	0	0	.00	52.57	1026.29
*SECNO 7300.000									
7300.000	13.01	66.68	.00	.00	67.18	.50	.03	.00	68.67
2430.0	.0	2430.0	.0	.0	426.1	.0	60.9	7.6	68.67
.28	.00	5.70	.00	.000	.016	.000	.000	53.67	973.74
.000277	100.	100.	100.	0	0	0	.00	52.53	1026.26
*SECNO 7400.000									
7400.000	12.95	66.70	.00	.00	67.22	.51	.03	.00	68.75
2430.0	.0	2430.0	.0	.0	423.4	.0	61.8	7.8	68.75
.28	.00	5.74	.00	.000	.016	.000	.000	53.75	973.81
.000282	100.	100.	100.	0	0	0	.00	52.37	1026.19
*SECNO 7600.000									
7600.000	12.84	66.75	.00	.00	67.28	.53	.06	.01	68.91
2430.0	.0	2430.0	.0	.0	417.8	.0	63.8	8.0	68.91
.29	.00	5.82	.00	.000	.016	.000	.000	53.91	973.98
.000292	200.	200.	200.	0	0	0	.00	52.05	1026.02
*SECNO 7800.000									
7800.000	12.74	66.81	.00	.00	67.35	.54	.06	.01	69.07
2430.0	.0	2430.0	.0	.0	412.2	.0	65.7	8.2	69.07
.30	.00	5.90	.00	.000	.016	.000	.000	54.07	974.14
.000303	200.	200.	200.	0	0	0	.00	51.73	1025.86

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 8000.000									
8000.000	12.63	66.86	.00	.00	67.42	.55	.06	.01	69.23
2430.0	.0	2430.0	.0	.0	406.7	.0	67.6	8.5	69.23
.31	.00	5.97	.00	.000	.016	.000	.000	54.23	974.30
.000314	200.	200.	200.	0	0	0	.00	51.41	1025.70
*SECNO 8200.000									
8200.000	12.53	66.92	.00	.00	67.49	.57	.06	.01	69.39
2430.0	.0	2430.0	.0	.0	401.4	.0	69.4	8.7	69.39
.32	.00	6.05	.00	.000	.016	.000	.000	54.39	974.45
.000325	200.	200.	200.	0	0	0	.00	51.10	1025.55
*SECNO 8400.000									
8400.000	12.43	66.98	.00	.00	67.56	.58	.07	.01	69.55
2430.0	.0	2430.0	.0	.0	396.3	.0	71.2	8.9	69.55
.33	.00	6.13	.00	.000	.016	.000	.000	54.55	974.60
.000337	200.	200.	200.	0	0	0	.00	50.79	1025.40
*SECNO 8600.000									
8600.000	12.33	67.04	.00	.00	67.64	.60	.07	.01	69.71
2430.0	.0	2430.0	.0	.0	391.2	.0	73.1	9.2	69.71
.34	.00	6.21	.00	.000	.016	.000	.000	54.71	974.75
.000348	200.	200.	200.	0	0	0	.00	50.50	1025.25
*SECNO 8800.000									
8800.000	12.23	67.10	.00	.00	67.71	.61	.07	.01	69.87
2430.0	.0	2430.0	.0	.0	386.4	.0	74.8	9.4	69.87
.34	.00	6.29	.00	.000	.016	.000	.000	54.87	974.90
.000360	200.	200.	200.	0	0	0	.00	50.21	1025.10
*SECNO 9000.000									
9000.000	12.14	67.17	.00	.00	67.80	.63	.07	.01	70.03
2430.0	.0	2430.0	.0	.0	381.7	.0	76.6	9.6	70.03
.35	.00	6.37	.00	.000	.016	.000	.000	55.03	975.04
.000372	200.	200.	200.	0	0	0	.00	49.92	1024.96

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 9200.000									
9200.000	12.04	67.23	.00	.00	67.88	.64	.08	.01	70.19
2430.0	.0	2430.0	.0	.0	377.1	.0	78.3	9.9	70.19
.36	.00	6.44	.00	.000	.016	.000	.000	55.19	975.18
.000385	200.	200.	200.	0	0	0	.00	49.65	1024.82
*SECNO 9400.000									
9400.000	11.95	67.30	.00	.00	67.96	.66	.08	.01	70.35
2430.0	.0	2430.0	.0	.0	372.6	.0	80.1	10.1	70.35
.37	.00	6.52	.00	.000	.016	.000	.000	55.35	975.31
.000397	200.	200.	200.	0	0	0	.00	49.38	1024.69
*SECNO 9600.000									
9600.000	11.87	67.38	.00	.00	68.05	.68	.08	.01	70.51
2430.0	.0	2430.0	.0	.0	368.4	.0	81.8	10.3	70.51
.38	.00	6.60	.00	.000	.016	.000	.000	55.51	975.44
.000410	200.	200.	200.	0	0	0	.00	49.12	1024.56
*SECNO 9800.000									
9800.000	11.78	67.45	.00	.00	68.14	.69	.08	.01	70.67
2430.0	.0	2430.0	.0	.0	364.2	.0	83.4	10.5	70.67
.39	.00	6.67	.00	.000	.016	.000	.000	55.67	975.57
.000422	200.	200.	200.	0	0	0	.00	48.86	1024.43
*SECNO 10000.000									
10000.000	11.70	67.53	.00	.00	68.24	.71	.09	.01	70.83
2430.0	.0	2430.0	.0	.0	360.2	.0	85.1	10.8	70.83
.40	.00	6.75	.00	.000	.016	.000	.000	55.83	975.69
.000435	200.	200.	200.	0	0	0	.00	48.62	1024.31
*SECNO 10200.000									
10200.000	11.62	67.61	.00	.00	68.33	.72	.09	.01	70.99
2430.0	.0	2430.0	.0	.0	356.4	.0	86.8	11.0	70.99
.40	.00	6.82	.00	.000	.016	.000	.000	55.99	975.81
.000448	200.	200.	200.	0	0	0	.00	48.38	1024.19

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
*SECNO 10400.000									
10400.000	11.54	67.69	.00	.00	68.43	.74	.09	.01	71.15
2430.0	.0	2430.0	.0	.0	352.6	.0	88.4	11.2	71.15
.41	.00	6.89	.00	.000	.016	.000	.000	56.15	975.93
.000461	200.	200.	200.	0	0	0	.00	48.15	1024.07
*SECNO 10600.000									
10600.000	11.47	67.78	.00	.00	68.53	.75	.09	.01	71.31
2430.0	.0	2430.0	.0	.0	349.1	.0	90.0	11.4	71.31
.42	.00	6.96	.00	.000	.016	.000	.000	56.31	976.04
.000473	200.	200.	200.	0	0	0	.00	47.93	1023.96
*SECNO 10800.000									
10800.000	11.40	67.87	.00	.00	68.64	.77	.10	.01	71.47
2430.0	.0	2430.0	.0	.0	345.7	.0	91.6	11.7	71.47
.43	.00	7.03	.00	.000	.016	.000	.000	56.47	976.14
.000486	200.	200.	200.	0	0	0	.00	47.71	1023.86
*SECNO 11000.000									
11000.000	11.33	67.96	.00	.00	68.74	.78	.10	.01	71.63
2430.0	.0	2430.0	.0	.0	342.4	.0	93.2	11.9	71.63
.44	.00	7.10	.00	.000	.016	.000	.000	56.63	976.25
.000499	200.	200.	200.	0	0	0	.00	47.51	1023.75
*SECNO 11200.000									
11200.000	11.26	68.05	.00	.00	68.85	.80	.10	.01	71.79
2430.0	.0	2430.0	.0	.0	339.2	.0	94.7	12.1	71.79
.44	.00	7.16	.00	.000	.016	.000	.000	56.79	976.35
.000511	200.	200.	200.	0	0	0	.00	47.31	1023.65
*SECNO 11400.000									
11400.000	11.20	68.15	.00	.00	68.96	.81	.10	.01	71.95
2430.0	.0	2430.0	.0	.0	336.2	.0	96.3	12.3	71.95
.45	.00	7.23	.00	.000	.016	.000	.000	56.95	976.44
.000524	200.	200.	200.	0	0	0	.00	47.11	1023.56

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 11600.000

11600.000	11.14	68.25	.00	.00	69.07	.83	.11	.01	72.11
2430.0	.0	2430.0	.0	.0	333.3	.0	97.8	12.5	72.11
.46	.00	7.29	.00	.000	.016	.000	.000	57.11	976.53
.000536	200.	200.	200.	0	0	0	.00	46.93	1023.47

*SECNO 11800.000

11800.000	11.08	68.35	.00	.00	69.19	.84	.11	.01	72.27
2430.0	.0	2430.0	.0	.0	330.6	.0	99.3	12.7	72.27
.47	.00	7.35	.00	.000	.016	.000	.000	57.27	976.62
.000548	200.	200.	200.	0	0	0	.00	46.76	1023.38

*SECNO 12000.000

12000.000	11.02	68.45	.00	.00	69.31	.85	.11	.01	72.43
2430.0	.0	2430.0	.0	.0	328.0	.0	100.9	13.0	72.43
.47	.00	7.41	.00	.000	.016	.000	.000	57.43	976.71
.000560	200.	200.	200.	0	0	0	.00	46.59	1023.29

*SECNO 12200.000

12200.000	10.97	68.56	.00	.00	69.43	.87	.11	.01	72.59
2430.0	.0	2430.0	.0	.0	325.5	.0	102.4	13.2	72.59
.48	.00	7.47	.00	.000	.016	.000	.000	57.59	976.79
.000572	200.	200.	200.	0	0	0	.00	46.43	1023.21

*SECNO 12269.000

12269.000	10.95	68.60	.00	.00	69.47	.87	.04	.00	72.65
2430.0	.0	2430.0	.0	.0	324.6	.0	102.9	13.2	72.65
.48	.00	7.49	.00	.000	.016	.000	.000	57.64	976.82
.000576	69.	69.	69.	0	0	0	.00	46.37	1023.18

*SECNO 12319.000

3280 CROSS SECTION 12319.00 EXTENDED 2.07 FEET

12319.000	11.07	68.77	.00	.00	69.53	.76	.03	.03	66.70
2430.0	.0	2430.0	.0	.0	347.1	.0	103.3	13.3	66.70
.49	.00	7.00	.00	.000	.016	.000	.000	57.70	977.00
.000480	50.	50.	50.	2	0	0	.00	46.00	1023.00

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 12500.000
3280 CROSS SECTION 12500.00 EXTENDED 1.07 FEET

12500.000	10.07	68.75	.00	.00	69.76	1.01	.11	.12	67.68
2430.0	.0	2430.0	.0	.0	301.3	.0	104.6	13.5	67.68
.49	.00	8.07	.00	.000	.016	.000	.000	58.68	977.00
.000732	181.	181.	181.	2	0	0	.00	46.00	1023.00

*SECNO 12615.000
3280 CROSS SECTION 12615.00 EXTENDED .43 FEET

12615.000	9.43	68.73	.00	.00	69.97	1.24	.10	.12	68.30
2430.0	.0	2430.0	.0	.0	271.8	.0	105.4	13.6	68.30
.50	.00	8.94	.00	.000	.016	.000	.000	59.30	977.00
.000998	115.	115.	115.	2	0	0	.00	46.00	1023.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	42.00	10.00	1.50	325.00	2.00	60.24	59.55

*SECNO 12742.000
CLASS A LOW FLOW

3420 BRIDGE W.S.= 68.66 BRIDGE VELOCITY= 10.66 CALCULATED CHANNEL AREA= 213.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	70.43	.25	0.	2430.	325.	344.	71.40	75.92	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 68.98 ELREA= 68.98

12742.000	8.99	68.98	.00	.00	70.43	1.45	.45	.00	68.98
2430.0	.0	2430.0	.0	.0	251.8	.0	106.1	13.7	68.98
.50	.00	9.65	.00	.000	.016	.000	.000	59.99	977.01
.001259	127.	127.	127.	0	0	0	.00	45.98	1022.99

*SECNO 12760.000

12760.000	8.91	68.98	.00	.00	70.47	1.49	.02	.02	69.07
2430.0	.0	2430.0	.0	.0	248.3	.0	106.2	13.8	69.07
.50	.00	9.79	.00	.000	.016	.000	.000	60.07	977.16
.001306	18.	18.	18.	1	0	0	.00	45.68	1022.84

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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 12860.000
 12860.000      8.41      68.97        .00        .00      70.78       1.80        .15        .16      69.57
    2430.0        .0     2430.0        .0        .0      225.4         .0      106.8       13.9      69.57
       .50       .00      10.78        .00       .000       .016       .000       .000      60.57     978.19
   .001694      100.       100.       100.          2          0          0        .00      43.63    1021.81


*SECNO 12942.000
3280 CROSS SECTION  12942.00 EXTENDED       .61 FEET

 12942.000      7.90      68.95        .00        .00      71.10       2.14        .15        .17      68.35
    2430.0        .0     2430.0        .0        .0      206.8         .0      107.2       13.9      68.35
       .50       .00      11.75        .00       .000       .016       .000       .000      61.05     980.00
   .002070       82.        82.        82.          2          0          0        .00      40.00    1020.00


*SECNO 13142.000
3280 CROSS SECTION  13142.00 EXTENDED       .18 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13142.000      7.67      69.71      69.71        .00      72.13       2.43        .45        .14      69.53
    2430.0        .0     2430.0        .0        .0      194.3         .0      108.1       14.1      69.53
       .51       .00      12.51        .00       .000       .016       .000       .000      62.04     980.00
   .002494      200.       200.       200.          3          8          0        .00      40.00    1020.00


*SECNO 13342.000
3280 CROSS SECTION  13342.00 EXTENDED       .08 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13342.000      7.67      70.70      70.70        .00      73.16       2.46        .50        .01      70.62
    2430.0        .0     2430.0        .0        .0      193.1         .0      109.0       14.3      70.62
       .51       .00      12.58        .00       .000       .016       .000       .000      63.03     980.00
   .002537      200.       200.       200.          4          5          0        .00      40.00    1020.00


*SECNO 13512.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 13512.000      7.98      72.07      72.07        .00      74.65       2.58        .43        .06      72.89
    2430.0        .0     2430.0        .0        .0      188.5         .0      109.7       14.5      72.89
       .52       .00      12.89        .00       .000       .016       .000       .000      64.09     981.39
   .002565      170.       170.       170.         20          8          0        .00      37.22    1018.61
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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 13800.000
3280 CROSS SECTION 13800.00 EXTENDED .44 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13800.000	7.44	73.17	73.17	.00	75.64	2.47	.74	.03	72.73
2430.0	.0	2430.0	.0	.0	192.5	.0	111.0	14.7	72.73
.52	.00	12.62	.00	.000	.016	.000	.000	65.73	980.00
.002580	288.	288.	288.	2	11	0	.00	40.00	1020.00

*SECNO 13965.000
3280 CROSS SECTION 13965.00 EXTENDED .30 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

13965.000	7.10	73.88	73.88	.00	76.16	2.28	.43	.06	73.68
2150.0	.0	2150.0	.0	.0	177.4	.0	111.7	14.9	73.58
.53	.00	12.12	.00	.000	.016	.000	.000	66.78	980.00
.002602	165.	165.	165.	2	11	0	.00	40.00	1020.00

*SECNO 14165.000
3280 CROSS SECTION 14165.00 EXTENDED .18 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14165.000	7.05	74.64	74.64	.00	76.92	2.28	.52	.00	74.46
2150.0	.0	2150.0	.0	.0	177.5	.0	112.5	15.0	74.62
.53	.00	12.11	.00	.000	.016	.000	.000	67.59	980.00
.002590	200.	200.	200.	2	5	0	.00	40.00	1020.00

*SECNO 14365.000
3280 CROSS SECTION 14365.00 EXTENDED .10 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14365.000	7.10	75.51	75.51	.00	77.77	2.26	.51	.01	75.41
2150.0	.0	2150.0	.0	.0	178.4	.0	113.3	15.2	75.51
.54	.00	12.05	.00	.000	.016	.000	.000	68.41	980.00
.002547	200.	200.	200.	2	5	0	.00	40.00	1020.00

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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 14565.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 14565.000      7.26      76.48      76.48        .00      78.75       2.28        .51        .01      76.70
    2150.0        .0     2150.0        .0        .0      177.6         .0      114.1       15.4      76.77
       .54       .00      12.11        .00       .000       .016       .000       .000      69.22     980.45
   .002517      200.       200.       200.          3          5          0        .00      38.97    1019.42


*SECNO 14765.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 14765.000      7.27      77.51      77.51        .00      79.81       2.30        .51        .01      77.77
    2150.0        .0     2150.0        .0        .0      176.7         .0      115.0       15.6      77.92
       .54       .00      12.17        .00       .000       .016       .000       .000      70.24     980.51
   .002539      200.       200.       200.          4          5          0        .00      38.69    1019.21


*SECNO 14900.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 14900.000      7.27      78.21      78.21        .00      80.50       2.30        .34        .00      78.54
    2150.0        .0     2150.0        .0        .0      176.7         .0      115.5       15.7      78.52
       .55       .00      12.17        .00       .000       .016       .000       .000      70.94     980.66
   .002540      135.       135.       135.          3          5          0        .00      38.72    1019.38


*SECNO 14950.000
3280 CROSS SECTION  14950.00 EXTENDED       .07 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.10

 14950.000      9.07      80.27        .00        .00      81.02        .75        .05        .47      80.20
    2150.0        .0     2150.0        .0        .0      309.9         .0      115.8       15.8      82.20
       .55       .00       6.94        .00       .000       .016       .000       .000      71.20     974.00
   .000577       50.        50.        50.          5          0          0        .00      52.15    1026.15
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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 15036.000
3280 CROSS SECTION 15036.00 EXTENDED .06 FEET

15036.000	9.05	80.69	.00	.00	81.15	.45	.03	.09	80.64
2150.0	.0	2150.0	.0	.0	399.0	.0	116.5	15.9	82.64
.55	.00	5.39	.00	.000	.016	.000	.000	71.64	972.00
.000295	86.	86.	86.	2	0	0	.00	53.00	1025.00

*SECNO 15067.000
3280 CROSS SECTION 15067.00 EXTENDED .17 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

15067.000	9.17	80.97	.00	.00	81.21	.24	.01	.06	80.80
2150.0	.0	2150.0	.0	.0	542.6	.0	116.8	15.9	82.80
.56	.00	3.96	.00	.000	.016	.000	.000	71.80	972.00
.000141	31.	31.	31.	2	0	0	.00	68.00	1040.00

*SECNO 15068.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .46

3470 ENCROACHMENT STATIONS= 1010.0 1040.0 TYPE= 1 TARGET= -1010.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 71.80 ELREA= 100000.00

15068.000	9.35	81.15	.00	.00	81.25	.11	.00	.04	71.80
735.0	.0	735.0	.0	.0	280.4	.0	116.8	15.9	100000.00
.56	.00	2.62	.00	.000	.016	.000	.000	71.80	1010.00
.000077	0.	0.	0.	2	0	0	.00	30.00	1040.00

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	25.00	5.50	10.00	575.00	8	1	72.56	.00

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 15643.000

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 = 77.829 EGOC = 82.895 PCWSE= 81.148 ELTRD= **********

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
77.83	82.89	1.64	0.	735.	3.004	110.09	99999999.00	0.

3470 ENCROACHMENT STATIONS= 1012.0 1036.0 TYPE= 1 TARGET= -1012.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 72.56 ELREA= 100000.00

15643.000	10.19	82.75	.00	.00	82.89	.14	1.64	.00	72.56
735.0	.0	735.0	.0	.0	244.7	.0	120.3	16.3	100000.00
.61	.00	3.00	.00	.000	.016	.000	.000	72.56	1012.00
.000107	575.	575.	575.	2	0	0	.00	24.00	1036.00

*SECNO 15644.000
3280 CROSS SECTION 15644.00 EXTENDED 1.14 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.80

15644.000	10.14	82.70	.00	.00	82.94	.24	.00	.05	72.56
2150.0	1244.2	905.8	.0	304.5	243.5	.0	120.3	16.3	83.56
.61	4.09	3.72	.00	.016	.016	.000	.000	72.56	974.00
.000117	0.	0.	0.	2	0	0	.00	62.00	1036.00

*SECNO 15695.000
3280 CROSS SECTION 15695.00 EXTENDED 1.09 FEET

15695.000	10.09	82.70	.00	.00	82.96	.27	.01	.01	81.61
2150.0	.0	2150.0	.0	.0	520.3	.0	120.9	16.3	85.61
.61	.00	4.13	.00	.000	.016	.000	.000	72.61	972.00
.000145	51.	51.	51.	1	0	0	.00	67.14	1039.14

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 15750.000
3280 CROSS SECTION 15750.00 EXTENDED .97 FEET

15750.000	9.97	82.62	.00	.00	83.06	.44	.01	.09	81.65
2150.0	.0	2150.0	.0	.0	402.3	.0	121.5	16.4	85.65
.62	.00	5.34	.00	.000	.016	.000	.000	72.65	972.00
.000274	55.	55.	55.	2	0	0	.00	55.96	1027.96

*SECNO 15800.000

15800.000	9.89	82.59	.00	.00	83.13	.54	.02	.05	83.20
2150.0	.0	2150.0	.0	.0	363.4	.0	121.9	16.5	83.20
.62	.00	5.92	.00	.000	.016	.000	.000	72.70	973.92
.000350	50.	50.	50.	2	0	0	.00	52.16	1026.08

*SECNO 16000.000

16000.000	9.77	82.65	.00	.00	83.21	.56	.07	.01	83.38
2150.0	.0	2150.0	.0	.0	357.5	.0	123.6	16.7	83.38
.63	.00	6.01	.00	.000	.016	.000	.000	72.88	974.09
.000366	200.	200.	200.	0	0	0	.00	51.82	1025.91

*SECNO 16500.000

16500.000	9.50	82.82	.00	.00	83.42	.61	.19	.02	83.82
2150.0	.0	2150.0	.0	.0	344.1	.0	127.6	17.3	83.82
.65	.00	6.25	.00	.000	.016	.000	.000	73.32	974.48
.000407	500.	500.	500.	0	0	0	.00	51.04	1025.52

*SECNO 17000.000

17000.000	9.26	83.01	.00	.00	83.66	.65	.21	.02	84.25
2150.0	.0	2150.0	.0	.0	331.3	.0	131.5	17.9	84.25
.67	.00	6.49	.00	.000	.016	.000	.000	73.75	974.86
.000452	500.	500.	500.	0	0	0	.00	50.27	1025.14

*SECNO 17500.000

17500.000	9.03	83.22	.00	.00	83.92	.70	.24	.02	84.69
2150.0	.0	2150.0	.0	.0	319.9	.0	135.2	18.5	84.69
.69	.00	6.72	.00	.000	.016	.000	.000	74.19	975.20
.000498	500.	500.	500.	0	0	0	.00	49.59	1024.80

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 17950.000

17950.000	8.87	83.41	.00	.00	84.15	.74	.21	.02	85.04
2150.0	.0	2150.0	.0	.0	311.9	.0	138.1	18.9	85.04
.71	.00	6.89	.00	.000	.016	.000	.000	74.54	975.45
.000534	400.	400.	400.	0	0	0	.00	49.11	1024.55

*SECNO 18000.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .64

18000.000	9.57	84.20	.00	.00	84.34	.14	.02	.18	85.13
655.0	.0	655.0	.0	.0	216.9	.0	138.4	19.0	85.13
.71	.00	3.02	.00	.000	.016	.000	.000	74.63	981.38
.000121	50.	50.	50.	2	0	0	.00	37.23	1018.62

*SECNO 18500.000

18500.000	9.19	84.26	.00	.00	84.42	.16	.07	.01	85.57
655.0	.0	655.0	.0	.0	202.7	.0	140.8	19.4	85.57
.76	.00	3.23	.00	.000	.016	.000	.000	75.07	981.97
.000146	500.	500.	500.	2	0	0	.00	36.07	1018.03

*SECNO 19000.000

19000.000	8.82	84.33	.00	.00	84.51	.19	.08	.01	86.01
655.0	.0	655.0	.0	.0	189.4	.0	143.1	19.8	86.01
.80	.00	3.46	.00	.000	.016	.000	.000	75.51	982.52
.000174	500.	500.	500.	0	0	0	.00	34.95	1017.48

*SECNO 19500.000

19500.000	8.46	84.41	.00	.00	84.62	.21	.10	.01	86.45
655.0	.0	655.0	.0	.0	177.1	.0	145.2	20.2	86.45
.83	.00	3.70	.00	.000	.016	.000	.000	75.95	983.06
.000209	500.	500.	500.	0	0	0	.00	33.88	1016.94

*SECNO 20000.000

20000.000	8.12	84.51	.00	.00	84.75	.24	.11	.02	86.89
655.0	.0	655.0	.0	.0	165.7	.0	147.2	20.6	86.89
.87	.00	3.95	.00	.000	.016	.000	.000	76.39	983.57
.000250	500.	500.	500.	0	0	0	.00	32.85	1016.43

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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 20100.000
 20100.000     8.06     84.53       .00       .00     84.78       .25       .03       .00     86.97
     655.0       .0     655.0       .0       .0     163.7       .0     147.5      20.7     86.97
       .88      .00      4.00      .00      .000      .016      .000      .000     76.47    983.67
   .000258     100.      100.     100.         0         0         0       .00     32.67   1016.33


*SECNO 20115.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .55


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=        95.00 ELREA=        95.00

 20115.000     7.94     84.44       .00       .00     84.88       .44       .01       .10     85.50
     550.0       .0     550.0       .0       .0     103.2       .0     147.6      20.7     85.50
       .88      .00      5.33      .00      .000      .016      .000      .000     76.50    993.50
   .000602      15.       15.      15.         2         0         0       .00     13.00   1006.50



SPECIAL CULVERT

SC  CUNO      CUNV      ENTLC     COFQ      RDLEN     RISE      SPAN      CULVLN    CHRT      SCL       ELCHU     ELCHD
     2         .013      .20      3.00      50.00     7.00      6.00      50.00     8         1         76.54     76.50

CHART  8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE  1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 20165.000

SPECIAL CULVERT OUTLET CONTROL
EGIC =     83.026  EGOC =     85.324  PCWSE=     84.439  ELTRD=     95.000

SPECIAL CULVERT

     EGIC      EGOC       H4     QWEIR     QCULV      VCH     ACULV     ELTRD    WEIRLN
     83.03     85.32      .44       0.      550.    5.042      84.0     95.00        0.


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=        95.00 ELREA=        95.00

 20165.000     8.39     84.93       .00       .00     85.32       .39       .44       .00     85.54
     550.0       .0     550.0       .0       .0     109.1       .0     147.7      20.7     85.54
       .88      .00      5.04      .00      .000      .016      .000      .000     76.54    993.50
   .000522      50.       50.      50.         2         0         0       .00     13.00   1006.50
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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 20180.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.01

20180.000	8.72	85.27	.00	.00	85.41	.14	.00	.08	87.05
550.0	.0	550.0	.0	.0	185.9	.0	147.8	20.7	87.05
.88	.00	2.96	.00	.000	.016	.000	.000	76.55	982.67
.000129	15.	15.	15.	2	0	0	.00	34.65	1017.33

*SECNO 20300.000

20300.000	8.63	85.28	.00	.00	85.42	.14	.02	.00	87.16
550.0	.0	550.0	.0	.0	182.8	.0	148.3	20.8	87.16
.89	.00	3.01	.00	.000	.016	.000	.000	76.66	982.81
.000135	120.	120.	120.	2	0	0	.00	34.38	1017.19

*SECNO 20500.000

20500.000	8.48	85.31	.00	.00	85.46	.15	.03	.00	87.33
550.0	.0	550.0	.0	.0	177.8	.0	149.1	20.9	87.33
.91	.00	3.09	.00	.000	.016	.000	.000	76.83	983.03
.000146	200.	200.	200.	0	0	0	.00	33.94	1016.97

*SECNO 21000.000

21000.000	8.11	85.38	.00	.00	85.55	.17	.08	.01	87.76
550.0	.0	550.0	.0	.0	165.6	.0	151.1	21.3	87.76
.95	.00	3.32	.00	.000	.016	.000	.000	77.26	983.58
.000177	500.	500.	500.	0	0	0	.00	32.84	1016.42

*SECNO 21500.000

21500.000	7.76	85.46	.00	.00	85.66	.20	.10	.01	88.20
550.0	.0	550.0	.0	.0	154.1	.0	152.9	21.7	88.20
.99	.00	3.57	.00	.000	.016	.000	.000	77.70	984.11
.000214	500.	500.	500.	0	0	0	.00	31.78	1015.89

*SECNO 21850.000

21850.000	7.53	85.53	.00	.00	85.75	.22	.08	.01	88.50
550.0	.0	550.0	.0	.0	146.9	.0	154.1	21.9	88.50
1.02	.00	3.74	.00	.000	.016	.000	.000	78.00	984.46
.000244	350.	350.	350.	0	0	0	.00	31.08	1015.54

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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 -15067.000
START TRIB COMP
 -15067.000 15067.000    80.970
3280 CROSS SECTION -15067.00 EXTENDED       .17 FEET

-15067.000      9.17     80.97       .00       .00     81.21       .24       .00       .00     80.80
    2150.0        .0    2150.0        .0        .0     542.5        .0     154.4      22.0     82.80
      1.02       .00      3.96       .00      .000      .016      .000      .000     71.80    972.00
   .000141       31.       31.       31.         0         0         0       .00     68.00   1040.00


*SECNO 15068.000
3280 CROSS SECTION  15068.00 EXTENDED       .07 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .41

 15068.000      9.07     80.87       .00       .00     81.32       .45       .00       .10     80.80
    1415.0        .0    1415.0        .0        .0     263.6        .0     154.4      22.0     82.80
      1.02       .00      5.37       .00      .000      .016      .000      .000     71.80    972.00
   .000357        0.        0.        0.         2         0         0       .00     38.00   1010.00


*SECNO 15092.000
3280 CROSS SECTION  15092.00 EXTENDED       .05 FEET

 15092.000      9.06     80.88       .00       .00     81.32       .45       .01       .00     80.82
    1415.0        .0    1415.0        .0        .0     263.0        .0     154.5      22.0     82.82
      1.02       .00      5.38       .00      .000      .016      .000      .000     71.82    972.00
   .000359       24.       24.       24.         0         0         0       .00     38.00   1010.00


*SECNO 15121.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       82.84 ELREA=       82.84

 15121.000      8.94     80.78       .00       .00     81.45       .68       .01       .11     82.84
    1415.0        .0    1415.0        .0        .0     214.4        .0     154.7      22.0     82.84
      1.02       .00      6.60       .00      .000      .016      .000      .000     71.84    988.00
   .000572       29.       29.       29.         2         0         0       .00     24.00   1012.00
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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
	2	.013	.20	3.00	25.00	6.00	12.00	106.00	8	1	71.99	.00

CHART 8 - BOX CULVERT WITH FLARED WINGWALLS; NO INLET TOP EDGE BEVEL
SCALE 1 - WINGWALLS FLARED 30 TO 75 DEGREES

*SECNO 15227.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 77.792 EGOC = 82.885 PCWSE= 80.775 ELTRD= **********

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
77.79	82.89	1.43	0.	1415.	5.667	144.09999999	00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 82.98 ELREA= 82.98

15227.000	10.40	82.39	.00	.00	82.89	.50	1.43	.00	82.98
1415.0	.0	1415.0	.0	.0	249.7	.0	155.2	22.1	82.98
1.03	.00	5.67	.00	.000	.016	.000	.000	71.98	988.00
.000377	106.	106.	106.	2	0	0	.00	24.00	1012.00

*SECNO 15257.000

15257.000	10.59	82.62	.00	.00	82.95	.33	.01	.05	83.03
1415.0	.0	1415.0	.0	.0	309.1	.0	155.4	22.1	83.03
1.03	.00	4.58	.00	.000	.016	.000	.000	72.03	974.82
.000245	30.	30.	30.	2	0	0	.00	50.37	1025.18

*SECNO 15300.000

15300.000	10.54	82.63	.00	.00	82.96	.33	.01	.00	83.09
1415.0	.0	1415.0	.0	.0	306.8	.0	155.7	22.2	83.09
1.03	.00	4.61	.00	.000	.016	.000	.000	72.09	974.91
.000250	43.	43.	43.	0	0	0	.00	50.18	1025.09

*SECNO 15500.000

15500.000	10.30	82.67	.00	.00	83.03	.36	.05	.01	83.36
1415.0	.0	1415.0	.0	.0	295.0	.0	157.1	22.4	83.36
1.04	.00	4.80	.00	.000	.016	.000	.000	72.36	975.38
.000278	200.	200.	200.	1	0	0	.00	49.23	1024.62

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 15566.000

15566.000	10.23	82.68	.00	.00	83.05	.37	.02	.00	83.46
1415.0	.0	1415.0	.0	.0	291.1	.0	157.5	22.5	83.46
1.05	.00	4.86	.00	.000	.016	.000	.000	72.46	975.54
.000288	66.	66.	66.	0	0	0	.00	48.92	1024.46

*SECNO 15643.000

3280 CROSS SECTION 15643.00 EXTENDED 1.19 FEET

15643.000	10.19	82.75	.00	.00	83.08	.33	.02	.01	81.56
1415.0	.0	1415.0	.0	.0	306.1	.0	158.1	22.5	83.56
1.05	.00	4.62	.00	.000	.016	.000	.000	72.56	974.00
.000230	77.	77.	77.	2	0	0	.00	38.00	1012.00

THIS RUN EXECUTED 13JAN94 10:22:31

****
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

DYSART DRAIN - ALT D

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
*	1040.000	3520.00	60.80	9.63	2.83	13.50	1.01	51.17	.00
	1060.000	3520.00	62.22	11.04	1.77	10.68	.75	51.18	.40
	1080.000	3520.00	62.30	11.12	1.72	10.54	.74	51.19	.40
	1100.000	3520.00	62.34	11.15	1.71	10.50	.73	51.19	.40
	1200.000	3520.00	62.63	11.40	1.58	10.08	.70	51.23	.40
	1300.000	3520.00	62.84	11.56	1.50	9.83	.67	51.27	.40
	1500.000	3520.00	63.18	11.83	1.39	9.45	.64	51.35	.40
	1700.000	3520.00	63.46	12.03	1.31	9.18	.62	51.43	.40
	1900.000	3520.00	63.70	12.19	1.25	8.96	.60	51.51	.40
	1950.000	3520.00	63.71	12.18	1.31	9.17	.58	51.53	.32
	2100.000	3520.00	63.87	12.28	1.27	9.06	.57	51.59	.40
	2300.000	3520.00	64.06	12.39	1.24	8.93	.56	51.67	.40
	2500.000	3520.00	64.25	12.50	1.21	8.81	.55	51.75	.40
	2700.000	3520.00	64.42	12.59	1.18	8.71	.55	51.83	.40
	2900.000	3520.00	64.58	12.67	1.15	8.61	.54	51.91	.40
	3100.000	3520.00	64.74	12.75	1.13	8.53	.53	51.99	.40
	3200.000	2430.00	65.69	13.66	.43	5.27	.32	52.03	.40

SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
3400.000	2430.00	65.73	13.62	.44	5.30	.32	52.11	.40
3600.000	2430.00	65.77	13.58	.44	5.32	.32	52.19	.40
3800.000	2430.00	65.82	13.55	.44	5.34	.32	52.27	.40
4000.000	2430.00	65.86	13.51	.45	5.36	.33	52.35	.40
4200.000	2430.00	65.91	13.48	.45	5.39	.33	52.43	.40
4400.000	2430.00	65.95	13.44	.45	5.41	.33	52.51	.40
4600.000	2430.00	66.00	13.41	.46	5.43	.33	52.59	.40
4800.000	2430.00	66.05	13.38	.46	5.45	.33	52.67	.40
5000.000	2430.00	66.10	13.35	.47	5.47	.33	52.75	.40
5200.000	2430.00	66.14	13.31	.47	5.49	.34	52.83	.40
5400.000	2430.00	66.19	13.28	.47	5.52	.34	52.91	.40
5600.000	2430.00	66.24	13.25	.48	5.54	.34	52.99	.40
5800.000	2430.00	66.29	13.22	.48	5.56	.34	53.07	.40
6000.000	2430.00	66.34	13.19	.48	5.58	.34	53.15	.40
6200.000	2430.00	66.39	13.16	.49	5.60	.34	53.23	.40
6400.000	2430.00	66.44	13.13	.49	5.62	.35	53.31	.40
6600.000	2430.00	66.49	13.10	.49	5.64	.35	53.39	.40
6800.000	2430.00	66.55	13.08	.50	5.65	.35	53.47	.40
7000.000	2430.00	66.60	13.05	.50	5.67	.35	53.55	.40
7200.000	2430.00	66.65	13.02	.50	5.69	.35	53.63	.40
7300.000	2430.00	66.68	13.01	.50	5.70	.35	53.67	.40
7400.000	2430.00	66.70	12.95	.51	5.74	.36	53.75	.80
7600.000	2430.00	66.75	12.84	.53	5.82	.36	53.91	.80
7800.000	2430.00	66.81	12.74	.54	5.90	.37	54.07	.80
8000.000	2430.00	66.86	12.63	.55	5.97	.37	54.23	.80
8200.000	2430.00	66.92	12.53	.57	6.05	.38	54.39	.80

SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
8400.000	2430.00	66.98	12.43	.58	6.13	.39	54.55	.80
8600.000	2430.00	67.04	12.33	.60	6.21	.39	54.71	.80
8800.000	2430.00	67.10	12.23	.61	6.29	.40	54.87	.80
9000.000	2430.00	67.17	12.14	.63	6.37	.41	55.03	.80
9200.000	2430.00	67.23	12.04	.64	6.44	.41	55.19	.80
9400.000	2430.00	67.30	11.95	.66	6.52	.42	55.35	.80
9600.000	2430.00	67.38	11.87	.68	6.60	.42	55.51	.80
9800.000	2430.00	67.45	11.78	.69	6.67	.43	55.67	.80
10000.000	2430.00	67.53	11.70	.71	6.75	.44	55.83	.80
10200.000	2430.00	67.61	11.62	.72	6.82	.44	55.99	.80
10400.000	2430.00	67.69	11.54	.74	6.89	.45	56.15	.80
10600.000	2430.00	67.78	11.47	.75	6.96	.45	56.31	.80
10800.000	2430.00	67.87	11.40	.77	7.03	.46	56.47	.80
11000.000	2430.00	67.96	11.33	.78	7.10	.47	56.63	.80
11200.000	2430.00	68.05	11.26	.80	7.16	.47	56.79	.80
11400.000	2430.00	68.15	11.20	.81	7.23	.48	56.95	.80
11600.000	2430.00	68.25	11.14	.83	7.29	.48	57.11	.80
11800.000	2430.00	68.35	11.08	.84	7.35	.49	57.27	.80
12000.000	2430.00	68.45	11.02	.85	7.41	.49	57.43	.80
12200.000	2430.00	68.56	10.97	.87	7.47	.50	57.59	.80
12269.000	2430.00	68.60	10.95	.87	7.49	.50	57.64	.80
12319.000	2430.00	68.77	11.07	.76	7.00	.45	57.70	1.10
12500.000	2430.00	68.75	10.07	1.01	8.07	.56	58.68	5.40
12615.000	2430.00	68.73	9.43	1.24	8.94	.65	59.30	5.41
12742.000	2430.00	68.98	8.99	1.45	9.65	.73	59.99	5.39
12760.000	2430.00	68.98	8.91	1.49	9.79	.74	60.07	4.89

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
	12860.000	2430.00	68.97	8.41	1.80	10.78	.84	60.57	4.93
	12942.000	2430.00	68.95	7.90	2.14	11.75	.91	61.05	5.90
*	13142.000	2430.00	69.71	7.67	2.43	12.51	1.00	62.04	4.95
*	13342.000	2430.00	70.70	7.67	2.46	12.58	1.01	63.03	4.95
*	13512.000	2430.00	72.07	7.98	2.58	12.89	1.01	64.09	6.24
*	13800.000	2430.00	73.17	7.44	2.47	12.62	1.01	65.73	5.69
*	13965.000	2150.00	73.88	7.10	2.28	12.12	1.01	66.78	6.36
*	14165.000	2150.00	74.64	7.05	2.28	12.11	1.01	67.59	4.05
*	14365.000	2150.00	75.51	7.10	2.26	12.05	1.01	68.41	4.10
*	14565.000	2150.00	76.48	7.26	2.28	12.11	1.00	69.22	4.05
*	14765.000	2150.00	77.51	7.27	2.30	12.17	1.00	70.24	5.10
*	14900.000	2150.00	78.21	7.27	2.30	12.17	1.00	70.94	5.19
*	14950.000	2150.00	80.27	9.07	.75	6.94	.50	71.20	5.20
	15036.000	2150.00	80.69	9.05	.45	5.39	.35	71.64	5.12
*	15067.000	2150.00	80.97	9.17	.24	3.96	.25	71.80	5.16
*	15068.000	735.00	81.15	9.35	.11	2.62	.15	71.80	.00
	15643.000	735.00	82.75	10.19	.14	3.00	.17	72.56	1.32
*	15644.000	2150.00	82.70	10.14	.24	3.72	.21	72.56	.00
	15695.000	2150.00	82.70	10.09	.27	4.13	.26	72.61	.98
	15750.000	2150.00	82.62	9.97	.44	5.34	.35	72.65	.73
	15800.000	2150.00	82.59	9.89	.54	5.92	.40	72.70	1.00
	16000.000	2150.00	82.65	9.77	.56	6.01	.40	72.88	.88
	16500.000	2150.00	82.82	9.50	.61	6.25	.42	73.32	.88
	17000.000	2150.00	83.01	9.26	.65	6.49	.45	73.75	.88
	17500.000	2150.00	83.22	9.03	.70	6.72	.47	74.19	.88
	17950.000	2150.00	83.41	8.87	.74	6.89	.48	74.54	.88

	SECNO	Q	CWSEL	DEPTH	HV	VCH	FRCH	ELMIN	K*CHSL
*	18000.000	655.00	84.20	9.57	.14	3.02	.22	74.63	1.72
	18500.000	655.00	84.26	9.19	.16	3.23	.24	75.07	.88
	19000.000	655.00	84.33	8.82	.19	3.46	.26	75.51	.88
	19500.000	655.00	84.41	8.46	.21	3.70	.29	75.95	.88
	20000.000	655.00	84.51	8.12	.24	3.95	.31	76.39	.88
	20100.000	655.00	84.53	8.06	.25	4.00	.31	76.47	.88
*	20115.000	550.00	84.44	7.94	.44	5.33	.33	76.50	1.60
	20165.000	550.00	84.93	8.39	.39	5.04	.31	76.54	.84
*	20180.000	550.00	85.27	8.72	.14	2.96	.23	76.55	.93
	20300.000	550.00	85.28	8.63	.14	3.01	.23	76.66	.87
	20500.000	550.00	85.31	8.48	.15	3.09	.24	76.83	.86
	21000.000	550.00	85.38	8.11	.17	3.32	.26	77.26	.87
	21500.000	550.00	85.46	7.76	.20	3.57	.29	77.70	.87
	21850.000	550.00	85.53	7.53	.22	3.74	.30	78.00	.87
	-15067.000	2150.00	80.97	9.17	.24	3.96	.25	71.80	.00
*	15068.000	1415.00	80.87	9.07	.45	5.37	.36	71.80	.00
	15092.000	1415.00	80.88	9.06	.45	5.38	.36	71.82	.83
	15121.000	1415.00	80.78	8.94	.68	6.60	.39	71.84	.69
	15227.000	1415.00	82.39	10.40	.50	5.67	.31	71.98	1.37
	15257.000	1415.00	82.62	10.59	.33	4.58	.33	72.03	1.50
	15300.000	1415.00	82.63	10.54	.33	4.61	.33	72.09	1.37
	15500.000	1415.00	82.67	10.30	.36	4.80	.35	72.36	1.38
	15566.000	1415.00	82.68	10.23	.37	4.86	.35	72.46	1.38
	15643.000	1415.00	82.75	10.19	.33	4.62	.29	72.56	1.35

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=   1040.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=  13142.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13142.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13342.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13342.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13512.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13512.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  13512.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  13800.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13800.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  13965.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  13965.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14165.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14165.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14365.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14365.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14565.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14565.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14765.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14765.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  14900.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  14900.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=  14950.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15067.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15068.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15644.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  18000.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  20115.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  20180.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=  15068.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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NBS LOWRY

ENGINEERS & PLANNERS

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MINUTES OF MEETING

PROJECT: FCD 93-01 DYSART DRAIN IMPROVEMENT PROJECT

DATE: JANUARY 25, 1994

PLACE: NBS/LOWRY ENGINEERS AND PLANNERS
2600 N. 44TH ST., PHOENIX AZ

PURPOSE: 30% PLANS QA/QC REVIEW (CONSULTANT IN-HOUSE REVIEW)

ATTENDEES:

Name	Office
Dr. Gary Guymon	Irvine
Bo Escobar	San Bernardino
Keith Satermo	Irvine
Brian Fry	Phoenix

RECORDER: BRIAN FRY

An in-house review meeting was held at NBS/Lowry on January 25, 1994. Following are the conclusions and recommendations from that meeting. It is intended that these comments be reviewed as part of the 30% plans review to possibly be incorporated into the project for the 60% plans submittal.

1. Future Subsidence

The rate of subsidence over the life of the existing reinforced concrete channel has been relatively uniform or at least the differential rate of subsidence has varied gradually enough that the existing lining has held up quite well. Based on the performance of the existing channel it is surmised that the structural section with minimal reinforcement used in the existing channel was sufficient to withstand subsidence stresses. The existing channel section consists of 6" thickness with #4 bars @ 12" c.c. both ways on the slopes and 8" thickness with #4 bars transversely and #5 bars longitudinally at 12" c.c. in the invert.

2. Geotechnical considerations

Ken Walsh (Huntingdon Thomas-Hartig) joined the group to provide additional information to interim report of December 15, 1993. Ken informed that most soils are tight soils of moderate to high plasticity which will stand at 1.5:1 slopes west of El Mirage Road and 2:1 slopes east of El Mirage Road. Also, the soils are low in permeability which will help to prevent infiltration of free water to channel lining. Therefore, the following general conclusions can be drawn:

- Hydrostatic pressures will not be a problem. Weepholes are not recommended.
- A subdrainage system is not required.
- Expansive clay soils are encountered at the invert for a portion of the channel alignment. It will be recommended in the geotechnical report that portions of the clay material be overexcavated and replaced with better material. The detention basin is a possible source.

Ken also addressed the issue of fissures and the impact on the channel lining foundation. The areas of fissuring will be identified in the geotechnical report. The fissures are narrow enough that they will not present a problem with channel section design. The soils should be excavated and replaced with compacted granular material as recommended in the interim geotechnical report. The fissures allowing free water to enter and cause a problem with hydrostatic pressures on the side slopes or invert is not likely. Soils will expand and reduce the size of fissures as the soil absorbs water.

3. Typical Channel Section

The channel section design parameters were discussed at length. It was generally concluded that maintenance access roads should be provided at the top of the channel lining where possible. At a minimum, a 4' bench should be provided at the top of the channel lining to allow for construction and to serve as a drainage ditch and to collect soil which will erode from the cut slopes. Additionally, a 4' bench will provide room for a bobcat if necessary for maintenance.

It was recommended that cut slopes above the channel lining be constructed at 2:1 slopes with no gunite protection. Off site drainage which could cause slope erosion will be controlled at the top of the cut slope and directed to planned locations where it will enter the channel. 1.5:1 cut slopes with gunite protection is an alternative but was not favorably recommended. 1.5:1 cut slopes are required through Morton Salt to stay within existing right-of-way.

Offsite drainage from overland flow will be controlled to enter the channel at planned locations with concrete paved aprons and cutoff walls to avoid runoff from undermining the channel foundation.

It is recommended that the access road be at the top of channel liner on the south side of the channel except at Morton Salt where the road will be at the top of cut slope to be at grade at the bridge. The north access road will follow natural terrain at top of slope with a graded ditch on the upstream side to intercept overland flow preventing runoff from flowing over the cut slopes. The collected runoff will be directed to side spillways to be placed at low points in the access road profile.