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S.R. 51 SQUAW PEAK HIGHWAY
GLENDALE AVENUE TO NORTHERN AVENUE

FINAL DRAINAGE DESIGN REPORT

PREPARED FOR:

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4105 N. 20TH STREET
PHOENIX, ARIZONA 85016

Registered Professional Engineer (Civil)
CERTIFICATE NO.
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ROBERT W.
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ARIZONA, U.S.A.

SEPTEMBER, 1989

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SQUAW PEAK HIGHWAY
ARIZONA STATE ROUTE 51
GLENDALE AVENUE TO NORTHERN AVENUE

ARIZONA PROJECT NO.
RAM-600-2-502

FINAL DRAINAGE DESIGN REPORT

PREPARED FOR
ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
AND
MICHAEL BAKER JR., INC.
(MANAGEMENT CONSULTANT)

SEPTEMBER, 1989

HOWARD NEEDLES TAMMEN & BERGENDOFF
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CHAPTER 1

INTRODUCTION

A. Project Description:

The project consists of the design of the Squaw Peak Highway from approximately north of Glendale Avenue to Northern Avenue. The Project site is shown on Figure 1: Vicinity Map. The proposed design for the new roadway consists of four basic travel lanes traffic in each direction separated by a depressed median and bounded by retaining walls and noise mitigation walls, where necessary. Also included in the design project is the relocation of a portion of the existing equestrian trail that is parallel and adjacent to the new roadway on the east side. The profile grade of the roadway increases uphill from south to north on a generally steady rate.

B. Scope of Work:

The scope of work for this report consists of calculations and designs supporting development of the final design plan.

The drainage assumptions and designs were made based on the refinement of the drainage concepts through a series of coordination meetings with the Management Consultant (MC). The drainage designs are in accordance with Arizona Department of Transportation (ADOT) design standards and guidelines.

The major drainage elements in the project area include (1) Pavement drainage, (2) Glendale Avenue pump station, (3) Myrtle Wash detention basin, (4) Myrtle Wash crossing, (5) Pleasant Drive crossing, (6) Dreamy Draw crossing, (7) Cross pipe drainage and (8) Detour drainage.

The drainage calculations associated with the designs include the following:

1. Hydraulic analysis and calculation by using the HEC-2 computer program leading to the design of a USBR Basin III energy dissipator for use in Myrtle Wash; also the hydraulic analysis relating to Myrtle Wash channelization.

2. Hydraulic analysis and grading calculations supporting the design of Myrtle Wash detention basin.

3. Pavement drainage calculations including flooded width and depth calculations, storm drain network calculations and hydraulic grade line calculations.

4. Hydraulic calculations for pipe culverts and box culverts to accommodate offsite overland flow.

The objectives of the drainage design are as follows:

1. Determine sizes and slopes of stormwater collection systems to intercept the anticipated on-site stormwater flows.

2. Evaluate the impact to the Glendale Avenue Pump Station with the stormwater flows contributing from the area north of Glendale Avenue on the highway.

3. Develop a design for the Myrtle Wash detention basin to accommodate the increase of stormwater flows resulting from the proposed highway construction.

4. Design cross box culverts and pipes based on the given discharges, sizes and general locations from the Final Hydrology Report and Drainage Report provided by the MC.

5. Perform hydraulic analysis to the Myrtle Wash crossing including the energy dissipator, box culvert and channelization. Determine the alignment and sizes of the above drainage structures and develop a drainage plan.

CHAPTER 2

DRAINAGE DESIGN CONCEPT

A. General Drainage:

The project area is located near the western boundary of the Phoenix Mountain Preserve. Overland runoff, in numerous steep washes on the west side of Squaw Peak, concentrates and crosses the highway alignment. The major portion of overland runoff approaching the Squaw Peak Highway is concentrated in Myrtle Wash whose drainage area is 435 acres.

The drainage area north of Myrtle Wash includes approximately 90 acres located on the east side of existing 19th Street. This 90 acre area is divided into nine separate subdrainage areas, each corresponding to an existing culvert crossing under 19th Street, the limits of which are shown on Figure 2: Off-site Drainage Areas. The drainage area is sloped from the northeast to the southwest. The north portion of the drainage area consists primarily of undeveloped hillsides with slopes exceeding ten percent; the south portion of the area is almost completely urbanized with recent single-family residential development. The flows from the urbanized area are contained within the street and sheet flow under existing 19th Street.

The natural waterway course for each drainage area is to the Dreamy Draw East Wash located due west and parallel to existing 19th Street. The two southernmost drainage areas (drainage area Nos. 8 and 9) flow directly to the wash. The adjacent five areas (drainage area Nos. 3-7) flow into a natural ditch which outlets to a detention basin and storm sewer system located at the Pointe development. The two northernmost areas (drainage area Nos. 1 and 2) flow through a natural course to the Dreamy Draw East Wash. The eventual discharge of the Dreamy Draw East Wash is to Myrtle Wash, which will outfall into the future Reach 4 of the Arizona Canal Diversion Channel.

Table 1 presents the design discharges for the culverts obtained from the Final Hydrology Report.

B. Design Concept:

The pavement drainage for Ramp Glen-D and the depressed section of the Squaw Peak Highway from Glendale Avenue to Myrtle Avenue, approximately 1,400 feet of roadway, drains to the Glendale Avenue pump station. This pump station is currently under the City of Phoenix contract for the Squaw Peak Parkway Segment No. 5B roadway construction. Discharges from the pump station and the Cactus Wren/Aurelius storm drain system are carried by storm drains to the south into the future Arizona Canal Divison Channel (ACDC).

Since the proposed highway grade at Myrtle Wash is set approximately at the existing flowline of the wash, a combination drop structure and energy dissipator is designed at the inlet side of the Myrtle Wash box culvert.

The prevailing concern for the drainage design of this project was to detain any additional flows resulting from the construction of the Squaw Peak Highway. The design concept is to allow the flows resulting from the overland runoff to discharge into the natural waterway course; the remaining flows generated by the new northbound roadway, median, and southbound roadway, are collected in catch basins and transported in a collector system to the Myrtle Wash detention basin.

The Myrtle Wash detention basin has been designed to provide detention storage for flows generated from the roadway and median in addition to intercepting flows from drainage area No. 9 and the State Avenue residential sub-basin (the shaded area shown on Figure 2) which presently discharges directly to Myrtle Wash. The design concept is to collect the additional flows resulting from the construction of the new roadway and the flows from State Avenue and drainage area No. 9, then discharge them through an outlet pipe and emergency spillway to Myrtle Wash. The overall effect of utilizing the basin is to maintain the peak flow and volume in Myrtle Wash downstream as the existing condition.

C. Drainage System Description:

The drainage system, including major elements, can be divided into eight (8) distinct parts:

1. Pavement Drainage
2. Glendale Avenue Pump Station
3. Myrtle Wash Detention Basin
4. Myrtle Wash Crossing
5. Pleasant Drive Crossing
6. Dreamy Draw Crossing
7. Cross Pipe Drainage
8. Detour Drainage

1. Pavement Drainage

Pavement drainage includes spread and depth analysis and storm drain network analysis. Pavement drainage from the proposed highway may be further divided into three systems. The pavement drainage from the depressed section and ramps near the Glendale interchange drains into the Glendale Avenue pump station or the existing 24-inch pipe and eventually discharges into the ACDC. The detailed description of this system is provided in Section C.2: Glendale Avenue Pump Station. Storm water from the highway between Myrtle Avenue and Pleasant Drive is carried through a storm drain system and is discharged into the Myrtle Wash detention basin at State Avenue and 20th Street. The storm drain system intercepts the pavement drainage from the highway north of Pleasant Drive and discharges into the Dreamy Draw Wash. There were no detailed drainage design calculations performed for Northern Avenue west of the highway, nor for the areas north of the Northern Avenue bridge (except for catch basin 427).

2. Glendale Avenue Pump Station

The pavement drainage for approximately 1,400 feet north of the Glendale Avenue centerline is collected by catch basins and storm drains. The majority of pavement drainage including the Ramp Glen-D drainage is drained into the pump station and is combined with the Cactus Wren/Aurelius storm drain system and discharged through the existing storm drain into the Arizona Canal. A portion of pavement drainage and the Ramp Glen-C drainage are collected and drained into the existing 24-inch storm drain which outfalls directly to the Ocotillo Road detention basin

adjacent to the Arizona Canal. This new collection system has been designed to carry a maximum allowable storm water and drain by gravity in order to relieve the pump station.

3. Myrtle Wash Detention Basin

To maintain peak discharges downstream from the proposed highway, a detention basin is sized and designed on acreage bounded by Myrtle Wash, 20th Street, State Avenue and the Squaw Peak Highway. This basin provides the 100-year detention storage for highway pavement drainage between Myrtle Avenue and Pleasant Drive as well as the off-site flows from State Avenue and drainage area No. 9.

A storage volume of 6.6 acre-feet (288,000 cubic feet) is determined and designed for a 100-year storm. Due to the space constraints, the detention basin configuration has been revised for side slopes from three-to-one (3H:1V) to two-to-one (2H:1V) in order to accommodate the noise/mitigation berm to the east and the equestrian trail and Myrtle Wash energy dissipator to the south. A minimum depth of 10 feet for the basin is required to provide the adequate storage volume with a minimum of one foot freeboard. Since the proposed highway grade is set approximately 10 feet below the existing ground, an average excavation of 20 feet is required for the construction of the detention basin.

The off-site flows from State Avenue and drainage area No. 9 for Gardenia Avenue will drain into the basin through catch basins and 24-inch pipes, respectively. Discharges from the basin will be drained through a 24-inch pipe directly to the inlet of the Myrtle Wash box culvert. A concrete-lined emergency overflow spillway is designed to prevent the highway from overtopping in case of the outlet pipe clogging or if the flood flow exceeds a 100-year flow. The back slope of 15 percent for the emergency spillway is also designed for maintenance access.

4. Myrtle Wash Crossing

Myrtle Wash drains an area of approximately 435 acres upstream of the proposed highway. The 50 and 100-year discharges of 1,301 cfs and 1,528 cfs have been specified by the MC at the crossing.

The highway grade is proposed approximately at the Myrtle Wash existing flowline. Therefore, a reinforced concrete box culvert with a drop structure for energy dissipation are required to convey the flows under the highway. Furthermore, excavation and downstream channelization will be necessary to tie into the existing flowline. The design scenario is to minimize the disruption to the natural wash by matching the existing channel bottom with a new stabilizing bank in this downstream reach.

An existing equestrian trail will be routed from the new staging area west of the higway at Myrtle Avenue down the new channel lining, through the Myrtle Wash box culvert, and a ten-to-one (10H:1V) slope between the energy dissipator and the detention basin to 20th Street. Due to the space and grade limitations, a 10-foot wide equestrian trail with decomposed granite is proposed for the trail east of the box culvert. Maricopa County Hiking and Riding Trails Committee Standards have been used to design the equestrian crossings.

5. Pleasant Drive Crossing

A 10 foot by 10 foot box culvert at Pleasant Drive is specified by the MC to serve multiple purposes. The culvert size exceeds the drainage needs (a combined flow of 128 cfs for a 100-year flood) and is to provide access for equestrians and bicycles. Since the box culvert is located approximately 180 feet north of the existing culvert and equestrian trail, new alignments of the existing channel are required upstream and downstream of the box culvert and equesterian trails at both ends. A minimum 15-foot wide unpaved equestrian trail is proposed.

6. Dreamy Draw Crossing

A 100-year discharge of 703 cfs is specified by the MC for the Dreamy Draw Crossing. Since the existing Dreamy Draw Park road will be realigned, the proposed box culvert will be strictly sized for drainage requirements.

7. Cross Pipe Drainage

Due to the existing residential and light commercial development in the areas downstream of the proposed highway, cross pipe drainage flows are to be restricted to existing levels. The sizes and locations of the new reinforced concrete pipes are recommended by the MC based on the equivalent flow capacity at each crossing and the Drainage Report except the pipe culverts north of Pleasant Drive. For these pipes (P-508, P-510 and P-512), the discharges were determined by analyzing the capacities of the existing culverts.

8. Detour Drainage

The detour and interim storm drains were designed to meet or slightly exceed the capacity of the existing storm drains except at Myrtle Wash and Dreamy Draw crossings. A reasonable detour drainage design (a 10-year storm) was provided for the interim conditions.

The existing storm drains will be utilized, if possible, during the construction sequence. Special attention will be focused on the construction sequencing for the Myrtle Wash channel lining, the Myrtle Wash box culvert, the Myrtle Wash energy dissipator and the Myrtle Wash detention basin.

CHAPTER 3

DRAINAGE DESIGN PROCEDURE

A. Pavement Drainage

Pavement drainage calculations yield catch basin locations primarily based on ADOT Urban Highway Criteria. HNTB's computer programs HEC12, and T411 were utilized to perform initial sizing the pipes and spacing of the catch basins. The hydraulic grade line (HGL) for the pipes were determined by HNTB's HGL computer program which shows the pipe parameters according to the design plan. No revisions were made to the HEC12 and T411 outputs unless the drainage area or scheme Nos changed. Program outputs were divided into three parts (1) HEC12, (2) T411, and (3) HGL in Appendix D under Pavement Drainage.

The numbering scheme developed for the outfall locations of storm drain pipes for this project is:

100 series pipes to Ocotillo detention basin.

200 series pipes to Glendale Avenue pump station.

300 series pipes to Myrtle Wash detention basin.

400 series pipes for pavement drainage north of Pleasant Drive box culvert. These pipes discharge to existing washes on the west side of the highway.

500 series pipes are pipe culverts conveying offsite overland flow across the highway. These culverts are described in Section G: Cross Pipe Drainage. The reinforced concrete box culverts are identified by name only and have not been assigned a 500 series number.

Pavement drainage to the pump station system and the Ocotillo detention basin system is based on 50-year return period intensity. Pavement drainage to other systems is based on 10-year return period intensity, in accordance with the ADOT Design Procedure Manual. All spread and depth calculations assume a fully paved median section that may be developed into an HOV lane in the future. Consequently, the system is overdesigned for the interim situation.

The storm drain networks are typically designed for the 10-year return period storm; their HGL's are checked against the 50-year storm. If any HGL is less than one foot from the low grate steel in its catch basin, the pipe size is increased to lower the HGL. For the 100 series system, the pipe size is constrained to 24 inches to match into existing pipes discharging to the Ocotillo detention basin. For the 300 series system, some of the downstream pipes were upsized from the 10-year design to meet a target invert elevation in the Myrtle Wash detention basin. The 300 series system was then checked against the 100-year storm since it is an integral component of the Myrtle Wash system which is being designed for the 100-year storm.

There were three 300 series drain systems designed in local streets by using the ADOT standard catch basins. These systems were proposed at Myrtle Avenue, Gardenia Avenue and 20th Street for State Avenue.

For the cross pipe at Northern Avenue (P-500), pipe P-336 was designed to divert an excess flow of 17 cfs from catch basin 500 in order to meet the design criterion that is not to exceed the existing flow.

For 400 series pipes, the majority of the on-site flows were drained into the Dreamy Draw. The pipe system of P-427, P-428 and P-425 was designed for the future on-site drainage. Catch Basin (CB) 427 was designed to intercept 3.2 cfs for a 10-year design flow, while CB-425 was designed to intercept 48 cfs. CB-426 and P-426 were designed only for the interim condition. Hence, a corrupted steel pipe (CSP) has proposed for P-426.

B. Glendale Avenue Pump Station

Pavement drainage contributions to this facility come from approximately Glendale Avenue on the south to 1400 feet north of Glendale Avenue on the north. During the design analysis of the storm drain system (200 series pipes) draining into the pump station, a 50-year design peak flow of 39.2 cfs was determined. This value is higher than the design flow of 29.9 cfs for the pump station under the COP contract. These differences were attributed to two factors: (1) greater rainfall intensity, and (2) paved median assumptions. We have studied the solutions and recommended to

replace 82 feet of the 60-inch pipe with a double 10' x 5' box culvert. However, ADOT decided to retain the 60-inch and not to construct the double 10' x 5' box culverts for in-line storage. See correspondence in Appendix B.

C. Myrtle Wash Detention Basin

The detention basin configuration associated with the mitigation berm, the equestrian trail and the Myrtle Wash energy dissipator was developed and designed. In order to keep the equestrian trail with a ten-to-one (10H:1V) slope and the ten (10) foot mitigation berm with three-to-one (3H:1V) side slopes, a ten (10) foot deep basin with two-to-one (2H:1V) side slopes was adopted by the MC. A continuous retaining wall, extending from the energy dissipator to 20th Street along the equestrian trail, was also recommended to accommodate a ten-to-one (10H:1V) slope on the trail.

Since the detention basin should detain the excess flow as well as the excess volume due to the construction of the highway, the existing flow conditions will need to be investigated. The 50 and 100-year 1-hour floods of 1,301 cfs and 1,528 cfs for Myrtle Wash were adopted by the MC from A-N West's TR-20 hyrdologic model. Consequently, the detention storage volume must be derived from a 100-year 24-hour storm. Based on A-N West's TR-20 model, a total volume of 119.5 acre-feet for the existing Myrtle Wash basin of 435 acres is recorded for a 100-year 24-hour storm event.

A total drainage area of 454 acres for Myrtle Wash is an increase of 19 acres over the existing area due to the proposed highway. For pavement drainage and off-site flows to the detention basin, the Baumgardner method was used to produce the inflow hydrographs with peak discharges generated from the Rational Method. For a 100-year 24-hour storm, a total volume of 126.1 acre-feet was computed for the proposed conditions without any detention. As a result, a 6.6 acre-feet of storage volume was derived for the protection of Myrtle Wash downstream.

Reservoir routing was performed to the detention basin using the HEC-1 computer program with the Modified Puls method. The maximum stage is computed to be at 1,288.8 feet, approximately 8.8 feet deep water in the basin, at 13.8 hours after the storm started. This will provide a minimum freeboard of 1.2 feet. It will take approximately 29.3 hours after the storm started to drain the basin through a 12-inch outlet pipe. Since the minimum size of 24-inch pipe has been proposed, a steel plate is designed at the inlet to provide an equivalent conveyance of a 12-inch pipe through the proposed 24-inch pipe.

D. Myrtle Wash Crossing

The water surface profiles were performed using the HEC-2 computer program for the 50-year and 100-year floods. The HEC-2 models were set up to analyze the proposed conditions in Myrtle Wash for subcritical and supercritical computations. A review of the results indicated that the flow regime from the proposed channelization to the energy dissipator was determined as a subcritical profile, while the flow in the existing Myrtle Wash is a supercritical flow. It should be noted that a breakout will occur near the intersection of 18th Street and Myrtle Avenue, approximately at section 1+50 in the HEC-2 models, due to the insufficient channel capacity to convey a 100-year flood flow. The breakout location is approximately 150 feet downstream from the proposed channelization work.

The HEC-2 channel excavation and improvement option is adopted to perform hydraulic analysis to the channel scheme downstream of Myrtle Wash. Due to the right-of-way constraints at the north side of the wash, side slopes of one-to-one (1H:1V) are used for the proposed concrete-lined channel. The channel bottom widths of 28 feet and 30 feet are proposed based on the maximum available channel flow areas in the right-of-way. However, a HEC-2 model with a constant bottom width of 28 feet was performed under the MC instruction. The results show that a 28 foot channel bottom will provide a minimum freeboard of one (1) foot at the downstream end of the channel lining. Therefore, it was used in the channel lining design.

A 12 foot by 10 foot box culvert was proposed at Myrtle Wash in the initial design phase. However, a headwater of 19.2 feet was calculated for a 100-year flood in the hydraulic analysis using the HEC-2 computer program. Therefore, a 14 foot by 10 foot box culvert is proposed and designed with a headwater of 11.7 feet. A slope of 0.0025 feet per foot for the box is proposed due to the restriction of the proposed Morten Avenue Frontage Road grade.

A series of three straight drop structures were originally recommended by the MC for energy dissipation at the upstream of box culvert. After an extensive investigation, a USBR Basin III energy dissipator was recommended and designed. USBR Basin III operates effectively for Froude numbers ranging from 4.5 to 17 and for discharges up to 200 cfs per foot of basin width as well as for the velocities at the entrance to the basin less than 50 fps. This basin utilized chute blocks, impact baffle blocks, and an end sill to shorten the jump length and to assist in energy dissipation, even with a drowned jump.

The most critical element in the design of Basin III is to provide the sufficient tailwater depths for all discharges instead of the maximum design discharge. Since a chute slope of four-to-one (4H:1V) instead of two-to-one (2H:1V) is proposed for the safety concerns, the chute length is increased substantially, thus the friction losses must be considered in the design calculations.

Tailwater rating curves for a complete range of discharges and incoming flow depths to the basin were obtained from the HEC-2 models for subcritical and supercritical runs, respectively, with a basin width of 32 feet, and 19 foot drop in elevation. The calculations showed that a factor of safety against jump sweep-out ranging from 8-15% is provided for all discharges.

A coarse broom finish to the concrete slab surface was proposed to provide the roughness for ease of equestrian access.

E. Pleasant Drive Crossing

A 10-foot by 10-foot box culvert was designed to provide the drainage and equestrian crossing requirements. Since the proposed culvert was for off-site drainage from drainage area Nos. 1 and 2, a 10-foot wide channel with three-to-one (3H:IV) side slopes was designed to divert flow from drainage area No. 2. A new 15-foot wide equestrian trail was designed east of the highway from the proposed box culvert to the existing trail.

On the west side of the highway, a drainage channel was also designed from the culvert to the existing stream. Two new equestrian trails were designed to tie into the existing trail from the south and the street closure at Pleasant Drive. A coarse broom finish to the concrete slab surface in the box culvert will provide ease for equestrian access. Furthermore, a minimum radius of 50 feet was proposed to the curve reaches for the multiple use equestrian trails.

F. Dreamy Draw Crossing

A double 10-foot by 4-foot box culvert was designed for the off-site drainage. The majority of the 400-series pipes will drain into this box culvert either by inlets or pipe connections. The pipe system consists of P-427, P-428 and P-425, which was designed to discharge into the upstream side of the box culvert for future pavement drainage north of the new Northern Avenue bridge.

CB-427 was located at the northeast end of the new bridge. Due to the superelevation grade, a future catch basin may be added in the median at approximately S.R.51 Sta. 88+90 for the pavement drainage north of the bridge. In order to avoid the disturbance to the bridge foundation materials, pipes P-427 and P-428 were designed to connect to CB-425 instead of CB-414 on Northern Avenue.

Under the MC's instructions, the pavement drainage for Ramp North-C was diverted to Dreamy Draw Wash instead of the existing flow pattern to the West.

A new 48-inch water line was designed and located approximately 30 feet north and parallel to the centerline of the box culvert.

G. Cross Pipe Drainage

Table 2 shows the summary of proposed cross culverts including eight cross pipe culverts. P-512 is an interim pipe and the design discharge was determined based on the existing pipe capacity. P-500 was proposed to tie into the highway right-of-way to the west based on the assumption of the completion of the proposed 48-inch pipe for the new development at the northwest corner of Morten Avenue.

A catch basin at the inlet of each cross pipe except P-512 was proposed. Design calculations were performed and are included in Appendix D. The headwater elevation was determined at each catch basin grate inlet using the weir and orifice flow equations. The computer program "Hydro Conduit's Culvert" was used to calculate the headwater for P-512 and to determine the outlet velocities for all pipes. All the velocities were less than 10 fps except for P-512. An outlet velocity of 12 fps was calculated for P-512. Since this pipe is an interim pipe, outlet protection was not proposed.

H. Detour Drainage

Detour drainage was designed by proposing new CSP pipes or modifying the existing pipes.

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Table 1

Summary of Culvert Discharges

Refer to Figure 2

Drainage Area Numbers	Area (Acres)	Proposed Culvert Station	Existing* Flow,Q(cfs)	Proposed* Flow,Q(cfs)
1	19.2	66+78.61	83	128
2	8.4		37	
3	5.2	58+70	23	17
4	5.7	55+70	26	18
5	6.8	52+56	31	28
6	2.6	45+12	10	9
7	2.5		10	9
8	31.9	37+80	151	134
9 (Gardenia Ave.)	7.2		26	22
Myrtle Wash	435	26+07	1528	1528
Dreamy Draw Wash	--	83+41	703	703
State Avenue	5.1		17	17
Myrtle Avenue	12.8		N/A	32

* Flows from Management Consultant.

Note: Flows greater than 100 cfs represent 100-year flows, those less than 100 cfs represent 50-year flows.

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Table 2

Summary of Proposed Cross Culverts

Location	Station	Design Frequency (Year)	Design Discharges (cfs)	Size & Type of Structure
Myrtle Wash	SR51 Sta.26+07	100	1528	14'x10'RCBC
Pleasant Dr.	SR51 Sta.66+78.61	100	128	10'x10'RCBC
Dreamy Draw	SR51 Sta. 83+41	100	703	2-10'x4'RCBC
P-500	SR51 Sta.37+80	100	134	48" RCP
P-502	SR51 Sta.52+56	50	28	24" RCP
P-504	SR51 Sta.55+70	50	18	30" RCP
P-506	SR51 Sta.58+70	50	17	36" RCP
P-508	SR51 Sta.71+64	50	31	30" RCP
P-510	SR51 Sta.75+00	50	56	36" RCP
P-512	SB 19th St. Connection Sta.93+88	50	90	42" RCP
P-514	SR51 Sta.45+12	50	18	24" RCP

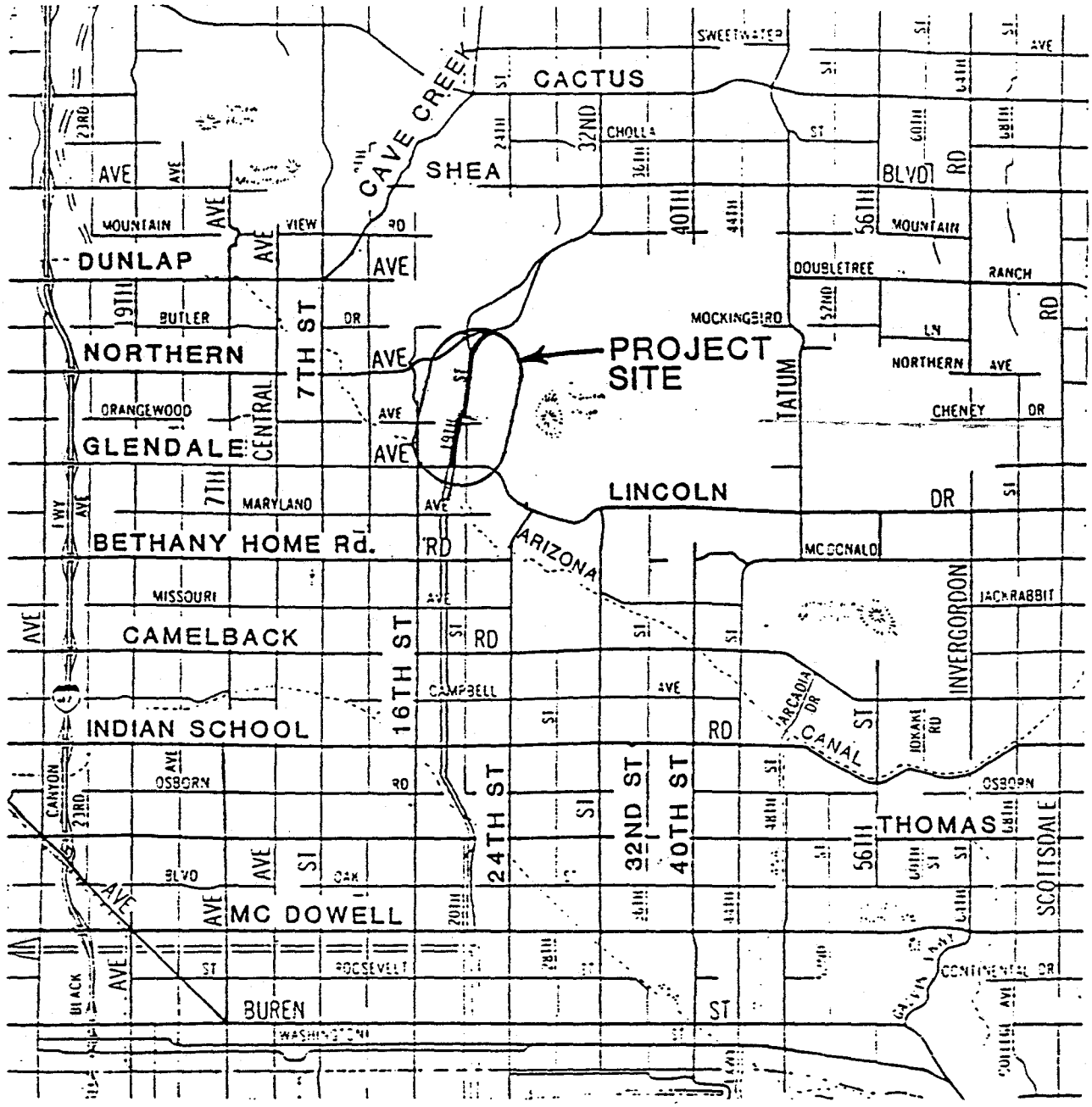


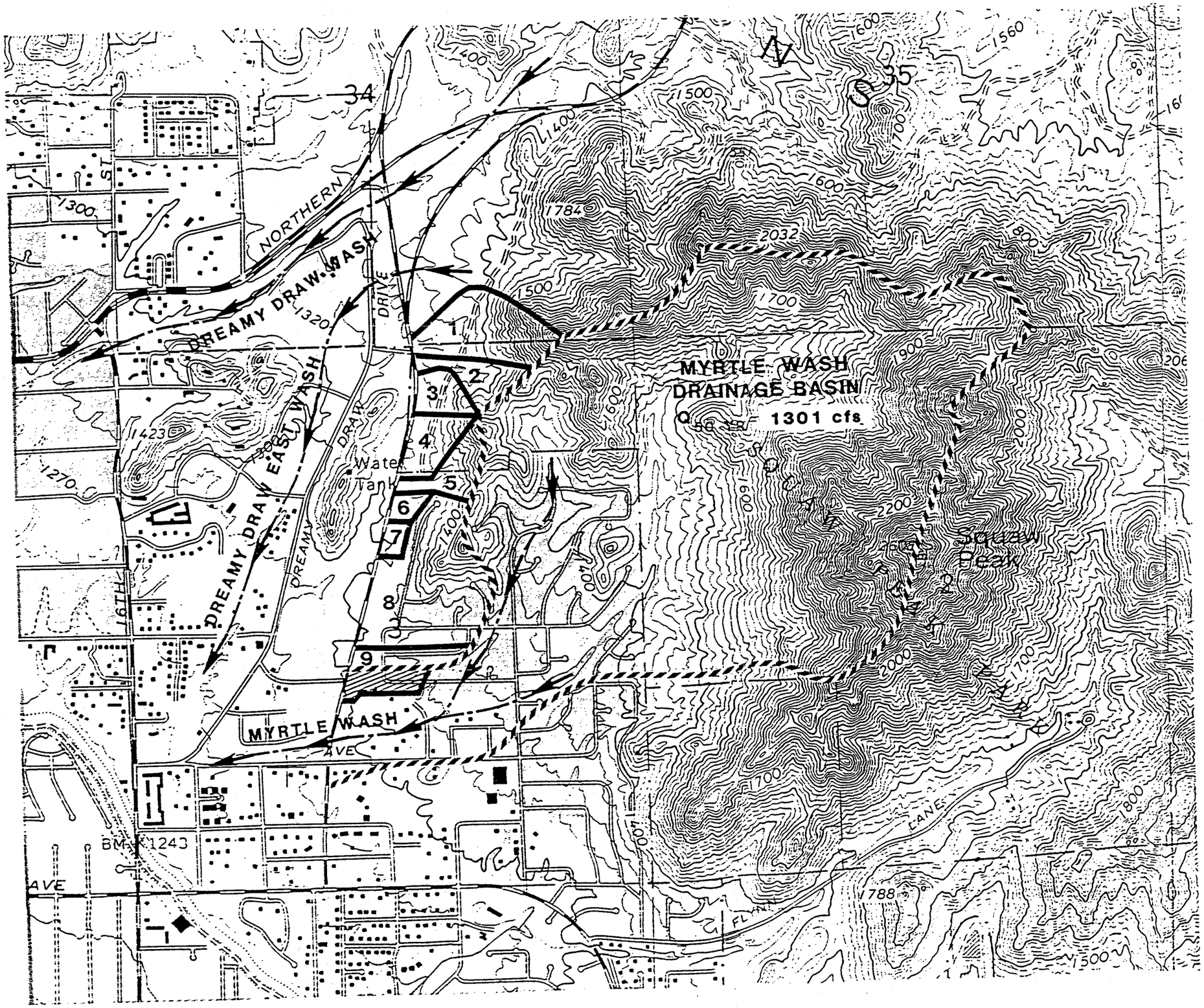
FIGURE 1

VICINITY MAP

NORTH

NTS

HNTB



NORTH

NTS

FIGURE 2

OFF-SITE DRAINAGE AREAS

HNTB

CHAPTER 4
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APPENDICES

APPENDIX A

DRAINAGE DESIGN CRITERIA ADDENDUM

PROJECT NO. RAM-600-2-502

6. ADDENDUM

This Section will serve to state the revisions made to Section 3.7 Drainage Procedures.

In Subsection 3.7.2 Hydrology under item 3. Storm Frequencies revise the following:

Detention Basins	Frequency (years)
Storage Capacity design	100

In Subsection 3.7.2 Hydrology under item 3. Rational Method Parameters add:

Rocky mountain terrain, slopes steeper than 10%	0.8
Rocky mountain terrain, slopes flatter than 10%	0.6
Residential areas, single family homes	0.6

In Subsection 3.7.3 Hydraulic Computation under item 2. Pipe Flow revise the sentence "For head losses ....State of the Art, 1979" to read:

> For head losses at junction structures, manholes or catch basins due to changes in flow direction and the collision and turbulence of flows, refer to Section 5.10.1 and Section 5.10.3 of FHWA's publication "Design of Urban Highway Drainage, the State of the Art, 1979".

In Subsection 3.7.4 Pavement Drainage Design the sentence: "ADOT standard....applicable", shall be revised to read:

> HNTB computer printout may be used. A sample output form for Pavement Drainage (HEC-12) has been included in the Appendix.

In Subsection 3.7.5 Storm Drains the following will be added:

> HNTB computer program and printout for storm sewer design (T411 and HGL) may be used. Sample output format has been included in the Appendix.

In Subsection 3.7.5 Storm Drains under item 2. Pipe size revise the sentence, "Minimum pipe size.....18 inches to read:

> Minimum pipe size shall be 24 inches.

In Subsection 3.7.5 Storm Drains under item 3. Manhole Spacing add the following:

Catch basins may be utilized in lieu of manholes to satisfy spacing requirements.

In Subsection 3.7.5 Storm Drains add another item 5. Minimum Cover:

Minimum cover for storm drains shall be 3 feet measured from normal gutter or grate elevation to the outside top of the pipe.

In Subsection Figures 3.7 add:

Figures 3.7-11 to Figure 3.7-15.2

DII417.14/sc

APPENDIX B

RELATED CORRESPONDENCE

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

Indian School Park
Suite 100
2207 East Camelback Road
Phoenix, Arizona 85016

JOB NO. 13089	COPY TO	INFO	ACTION
FILE	X		
JPM		X	
RWL	X		
SDS	X		
BGS	X		
RFC	X	X	
SWM	X	X	
DATE:		4/18/89	

April 17, 1989

Mr. Thomas A. Ottman, P.E.
Project Coordinator
Michael Baker Jr., Inc.
Squaw Peak Highway Management Consultant
4105 North 20th Street
Phoenix, Arizona 85016

Regarding: S.R. 51 - Squaw Peak Highway
Glendale Avenue to Northern Avenue
ADOT Project RAM 600-2-303
TRACS No. H0836 01 D
HNTB No. 13089

Subject: Myrtle Wash Energy Dissipator

Dear Mr. Ottman:

We have reviewed the Myrtle Wash energy dissipator preliminary calculations and concept drawings that we received April 11, 1989. This letter is divided into three parts: 1) comments on the preliminary calculations and concept drawings, 2) selection of a different energy dissipator, and 3) recommendations.

1. <u>Preliminary Calculations and Drawings</u>

The following comments are offered to a series of three straight drop structures proposed by the Management Consultant.

A. The incoming flow at the uppermost drop is super-critical. To make a critical depth at the brink of the drop, a barrier, approximately 3.5 feet high, was proposed to create a weir flow into the pool.

B. A drop length of approximate 20 feet is determined where the jet strikes the floor and some energy is dissipated. Another 40 feet of pool length is required if the hydraulic jump forms.

Partners
Associates
Offices

C. The hydraulic jump cannot form in the pool of the uppermost drop structure within a reasonable basin length because there is not adequate tailwater.

D. The headwater from the box culvert is most likely to submerge the lowermost drop structure. Hence, the majority of the energy loss must be dissipated in the middle drop structure by forming a stable hydraulic jump.

E. Although the baffle blocks can be installed to dissipate more energy and shorten the basin, the hydraulic performance between three drop structures cannot be predicted using the available experimental knowledge and theoretical approach.

F. It is important to note that the baffle blocks in these basins would collect all types of floating and suspended debris, which would require regular cleaning. This would be a maintenance problem due to the difficulty of the maintenance access and operation.

G. The proposed partial barrier and beams should be hydraulically modeled or analyzed to check performance over the entire range of expected flows.

H. In our opinion, it is not very practical to design a series of three straight drop structures because of the complicated, non-standard configuration and the lack of hydraulic control. Even if a ladder of cascades is proposed, a total basin length of 200 feet or more is needed based on our preliminary calculations.

2. <u>Energy Dissipator Selection</u>

A number of energy dissipators were examined and evaluated based on hydraulic performance, ease of construction and safety. A minimum 19-foot vertical drop in elevation is required to accommodate the box culvert due to the highway grade. The following summary is the evaluation of different types of energy dissipators.

A. USBR Basin I was dropped out because of its excessive basin length and its lack of control, especially the high-velocity jet along the floor.

B. USBR Basin V was not suitable due to the need for a greater tailwater, which will adversely impact the box culvert and highway embankment.

C. A straight drop structure was also evaluated assuming some safety device installed at the crest of the drop. There is a great deal of energy loss, approximately 28 percent of the initial energy, because of the jet striking the basin floor. However, the flow at the brink of the drop structure should be critical. It means that some transition work or weir structure is required to convert the incoming supercritical flow into critical flow. Furthermore, USBR does not recommend straight drops of more than 15 feet unless a model study is conducted.

D. The next energy dissipator considered was USBR Basin IX, baffled apron spillway. The design of this basin is independent of tailwater conditions, i.e., it requires no initial tailwater to be effective. The multiple rows of baffle piers on the chute are used to dissipate the energy in the flow and provide a reasonable terminal velocity. Therefore, the stilling basin is not required in this type of energy dissipator. Two limitations for Basin IX are (1) the maximum unit discharge may be as high as 60 cfs per foot of width, and (2) the entrance velocity should be as low as practical, ideally five (5) fps less than the critical velocity. Basin IX is the design best suited for the conditions where the space is limiting and the tailwater is restricted. However, the required very low entrance velocity is the major drawback for the selection of this energy dissipator.

E. USBR Basin III often is considered for small spillways, outlet works, and small canal structures where the velocities at the entrance to the basin do not exceed 50 fps and for discharges up to 200 cfs per foot of basin width. It operates effectively for Froude numbers ranging from 4.5 to 17. This basin utilizes chute blocks, impact baffle blocks, and an end sill to shorten the jump length and to assist in energy dissipation, even with a drowned jump. Basin III provides a 15 percent or more factor of safety against jump sweep-out due to inadequate tailwater depth. This basin is designed as a short and compact structure, which is more economical than USBR Basins I and II. The most critical element in the design of Basin III is to provide the sufficient tailwater depth for all discharges instead of the maximum design discharge. The relationships of conjugate depth

curves to tailwater rating curves for various basin widths should be established for all discharges in order to determine the configuration of this basin.

3. Recommendations

We recommend the construction of a USBR Basin III energy dissipator at Myrtle Wash. This structure will provide a higher factor of safety from a hydraulic performance standpoint. The proposed design scheme is summarized as follows:

A. A non-standard 14' x 10' reinforced concrete box culvert with 0.25 percent slope will be designed for Myrtle Wash crossing.

B. Tailwater rating curves for a complete range of discharges will be established based on the proposed box culvert for the design of the Basin III energy dissipator.

C. We propose a chute slope of 4:1 instead of 2:1 only because of the safety concerns rather than hydraulic requirements. In addition, we propose a handrail at the brink of the chute. We will provide additional freeboard in the channel upstream of the brink to accommodate a deeper flow in the channel if large debris is collected at the handrail.

D. No weir and barrier will be designed to block and slow down the incoming supercritical flow upstream of the basin. However, a minimum length of concrete-lined channel will be constructed to make smooth transitions from the natural channel to the basin and from the end of basin to the box culvert.

E. Our preliminary calculations indicated that a minimum of 32-foot basin width is required to attain the proper hydraulic performance for all discharges.

Our proposed energy dissipator and channel scheme are shown in Attachment A.

We request written concurrence with our recommendations regarding the design of Myrtle Wash upstream of the box culvert. We will concentrate our design efforts in other areas while we wait for your decision. As you are aware, our schedule is very critical; therefore, we request your prompt attention to this matter.

Please call if you have any questions or comments on this matter.

Very truly yours,

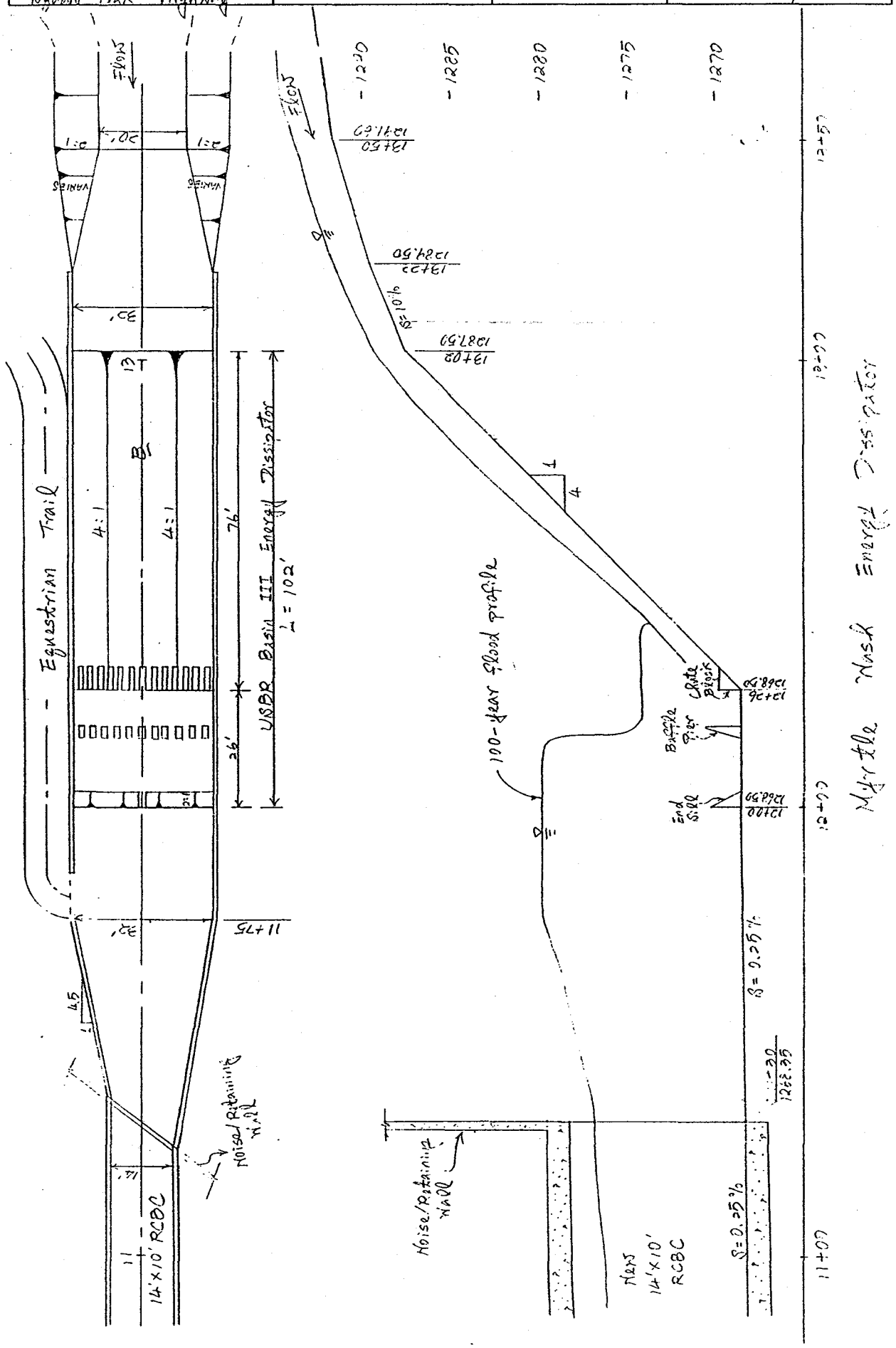
HOWARD NEEDLES TAMMEN & BERGENDOFF

Steven D. Schwab, P.E.
Project Manager

SDS/bgsl/dce
DCII392.64

Attachment A

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BAS	Date 4-18-89	Job Number 13089-21-02
For Squaw Peak Highway	Checked by	Date	Sheet Number 1 of 1
	Backchecked by	Date	



Squaw Peak Highway Project
Arizona State Route 51

Michael Baker Jr. Inc. Consulting Engineers
4105 North 20th Street
Phoenix, Arizona 85016 (602) 957-3686

RECEIVED
APR 24 1989
H. N. T. B.

April 20, 1989

Steven D. Schwab, P.E.
Howard Needles Tammen & Bergendoff
Anchor Centre Two, Suite 400
2207 East Camelback Road
Phoenix, Arizona 85016

Re: Squaw Peak Highway
Project No. RAM-600-2-303
TRACS No. H0836 01 D
Myrtle Wash Energy Dissipator

Dear Mr. Schwab:

We have reviewed your letter dated April 17, 1989 regarding the Myrtle Wash Energy Dissipator.

Baker concurs with the use of the USBR Basin III energy dissipator. We do recommend that the system not retain any water. Therefore, the end sill should have a few openings in the sill in order to drain the basin. We do not recommend the use of pipe through the sill because these become maintenance problems.

There should also be care taken to insure safety of the structure. You recommend a handrail at the brink of the chute, but this would not stop the use of the slope for skateboarding. Other alternatives you might consider is to use a very rough surface with some rocks on the surface or any other alternatives to discourage the use of the chute.

Should you have any questions, please call.

Sincerely,

MICHAEL BAKER, JR., INC.

Timothy E Kelly

Timothy E. Kelly
Engineering Manager

TEK/jlr

Proceed with design.

JOB NO. 13089	COPY TO	INFO	ACTION
FILE	X		
JPH		✓	
SDS	X		
BGS	X		✓
RWL	X	✓	
DATE: 4/24/89			

16684-E140.1-L138

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

Anchor Centre Two
Suite 100
2207 East Camelback Road
Phoenix, Arizona 85016
(602) 954-7420
FAX (602) 468-0070

May 23, 1989

File X
SDS X
BGB X ✓
TFH X ✓
RPB X ✓

Mr. Mark L. Loethen, P.E.
Michael Baker Jr., Inc.
Squaw Peak Highway Mgmt. Consultant
4105 North 20th Street
Phoenix, Arizona 85016

RE: S.R. 51 - ~~Squaw Peak Highway~~
Glendale Avenue to Northern Avenue
ADOT Project RAM 600-2-303
TRACS No. H0836 01 D
HNTB No. 13089

Subject: Myrtle Wash Channel Lining

Dear Mr. Loethen:

In accordance with your request on May 8, 1989, we include the HEC-2 hydraulic analysis for a 12-foot by 10-foot box culvert and our investigation of the various channel bottom widths for the channel lining downstream of the Myrtle Wash box culvert.

The results of hydraulic analysis for the 12-foot by 10-foot box culvert showed that a headwater of 19.2 feet was computed at the upstream of box culvert for a 100-year flood. Appendix A presents the HEC-2 results of subcritical run for the 50- and 100-year discharges for the 12-foot by 10-foot culvert. Table 1 shows the comparison of the results for a 14-foot by 10-foot box culvert and a 12-foot by 10-foot box culvert. Because the headwater elevation created by a 12-foot wide box culvert is higher than the roadway ditch elevation, we recommend a 14-foot by 10-foot box culvert.

TABLE 1

Structure	Inlet Inv. (ft.)	Discharge (cfs)	Roadway Ditch Elev. (ft)	Headwater Elev. (ft)	Headwater (ft)
12'x10' RCBC	1,268.40	Q_{50} = 1,301	1,284.55	1,280.24	11.84
		Q_{100} = 1,528	1,284.55	1,287.64	19.24
14'X10' RCBC	1,268.45	Q_{50} = 1,301	1,284.55	1,278.93	10.48
		Q_{100} = 1,528	1,284.55	1,280.14	11.69

Partners [illegible]
Associates [illegible]
Offices [illegible]

An investigation of the exiting flow characteristics for Myrtle Wash is required prior to the selection of the type of channel improvement. The existing flow in Myrtle Wash downstream from the proposed highway is predominately a supercritical flow. A breakout will occur near Sec. No. 150.00 due to the insufficient channel capacity. A moderate meandering natural channel is presented in the wash. A relatively narrow and shallow channel with unstable banks is located between Section No. 100.00 and Section No. 400.00. Nevertheless, the width of the right-of-way is limited in this reach. Several channel alignments with different cross sections have been considered for the hydraulic efficiency and the cost effectiveness.

The flow in the improvement reach will be a subcritical flow because a flatter slope of 0.0015 feet per foot is created by the new highway grade. A concrete-lined, trapezoidal channel with one-to-one (1H:1V) side slopes is determined to be feasible for this channel improvement. However, a study of the hydraulic performance with various channel bottom widths was undertaken. Three HEC-2 models were performed with channel bottom widths of 20, 24, and 28 feet, respectively (see Appendices B, C, & D). The results are tabulated in Table 2. It should be noted that the critical depth elevation was specified by using the X5 card at Section No. 300.00 for all three runs. This is a valid assumption because the flow regime should be at a critical profile at the downstream end of the channel lining; i.e., at Section No. 300.00 and at a supercritical profile downstream from this section.

A review of the HEC-2 results in Table 2 indicated that the hydraulic performance for the improvement with a bottom width of 28 feet is the best of these three runs regarding water depths and velocities. Furthermore, the channel geometry is feasible for this reach with an optimum grading work. Figure 1 demonstrates the channel grading and excavation work at selected locations with the 100-year water surface elevations. Ideally, the channel slope paving may be ended at the elevation one foot above the highwater elevation and a flatter side slope such as two-to-one (2H:1V) could be used to tie into the existing ground. However, the limits of the right-of-way may alter this design rationale at locations such as Section Nos. 600.00 and 700.00. Also, no grading work should be conducted in the areas with a slopes flatter than one-to-one(1H:1V). At Section No. 300.00, a minimum freeboard of one (1) foot is satisfied for a 28-foot channel bottom from an existing top of bank elevation of 1,272.00 adjacent to Myrtle Avenue.

We recommend a continuous 28-foot channel bottom with one-to-one side slopes and concrete slope paving that ends at least one foot above the highwater elevation, where applicable.

Please feel free to call us should you have any questions.

Very truly yours,

HOWARD NEEDLES TAMMEN & BERGENDOFF

B. Gary Sun, P.E.

cc: J. P. Hribar (w/o appendices)
S. D. Schwab (w/o appendices)

BGS/dce
DCII402.45

TABLE 2

HEC-2 Sec. No.	ELMIN (ft)	WIDTH = 20 ft DEPTH (ft)	WIDTH = 20 ft VCH (fps)	WIDTH = 24 ft DEPTH (ft)	WIDTH = 24 ft VCH (fps)	WIDTH = 28 ft DEPTH (ft)	WIDTH = 28 ft VCH (fps)
100.00	1263.40	6.73	9.3	6.73	9.3	6.73	9.3
150.00	1264.50	6.57	10.7	6.57	10.7	6.57	10.7
200.00	1266.00	6.19	8.2	6.19	8.2	6.19	8.2
250.00	1266.40	6.07	7.8	6.07	7.8	6.07	7.8
		Channel Lining Begins at Sec. No. 300.00					
300.00	1266.75	4.99	10.7	4.68	10.8	4.27	10.9
350.00	1266.83	5.27	11.1	4.70	11.3	4.55	10.3
400.00	1266.90	6.44	7.5	5.69	8.5	4.86	9.6
450.00	1266.98	6.10	9.3	5.34	10.4	4.68	10.6
500.00	1267.05	5.62	11.6	5.37	10.5	4.99	9.9
550.00	1267.13	6.06	10.7	5.57	10.0	5.13	9.6
600.00	1267.20	6.82	8.4	6.12	8.3	5.57	8.2
650.00	1267.28	6.80	8.4	6.11	8.3	5.56	8.2
700.00	1267.35	6.80	8.4	6.11	8.3	5.56	8.2
750.00	1267.43	6.78	8.4	6.09	8.3	5.55	8.2
800.00	1267.50	6.78	8.4	6.09	8.3	5.55	8.2

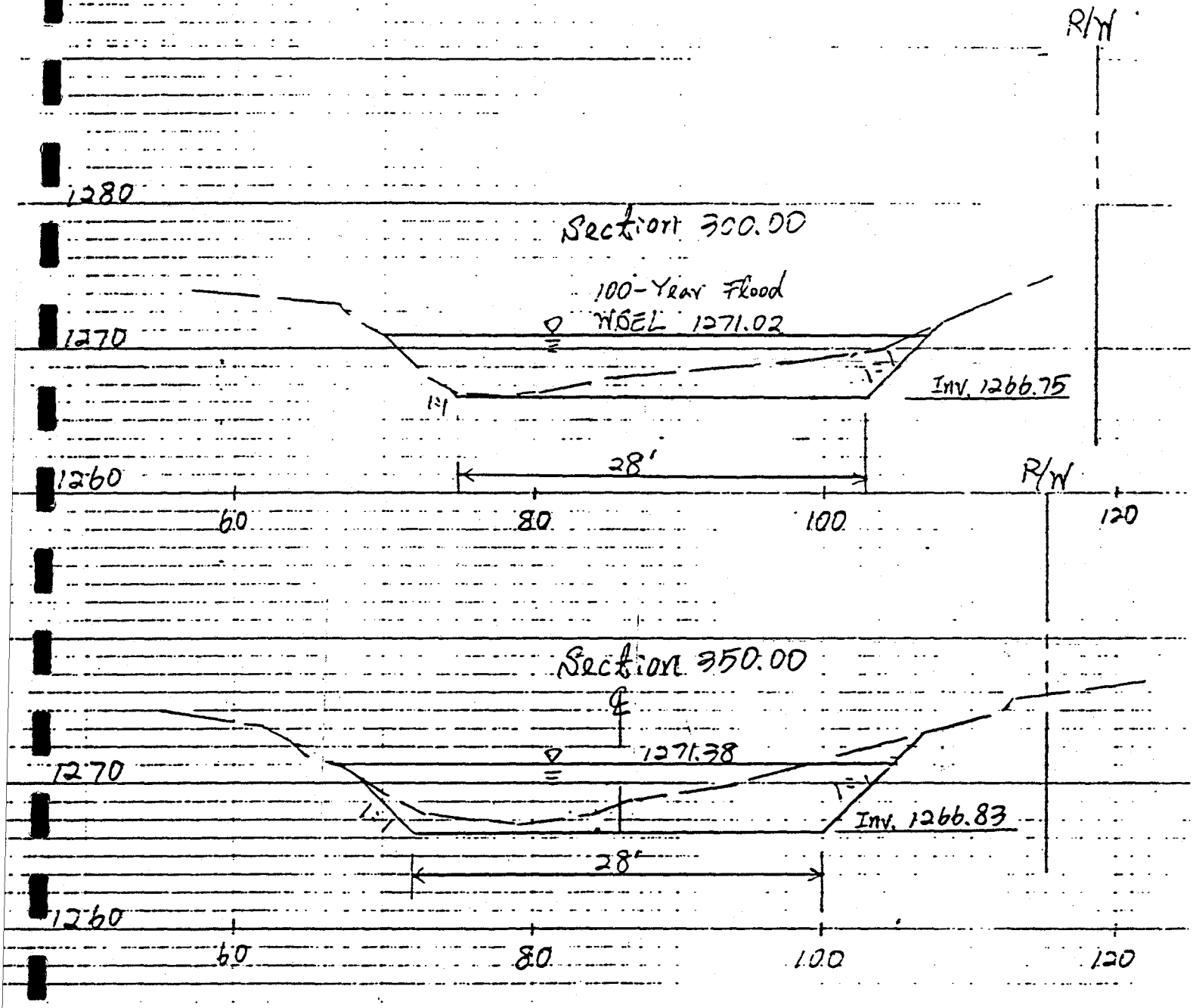


Figure 1

Sheet 1 of 3

HNTB
ARCHITECTS ENGINEERS PLANNERS
HOWARD
NEEDLES
TAMMEN
& BERGENDOFF

ANCHOR CENTRE TWO, SUITE 400
2207 EAST CAMELBACK ROAD

PROJECT NO. 13089-21-23
DATE 5-19-89
DRAWN BY BGS
CHECKED BY
REVISED DATE

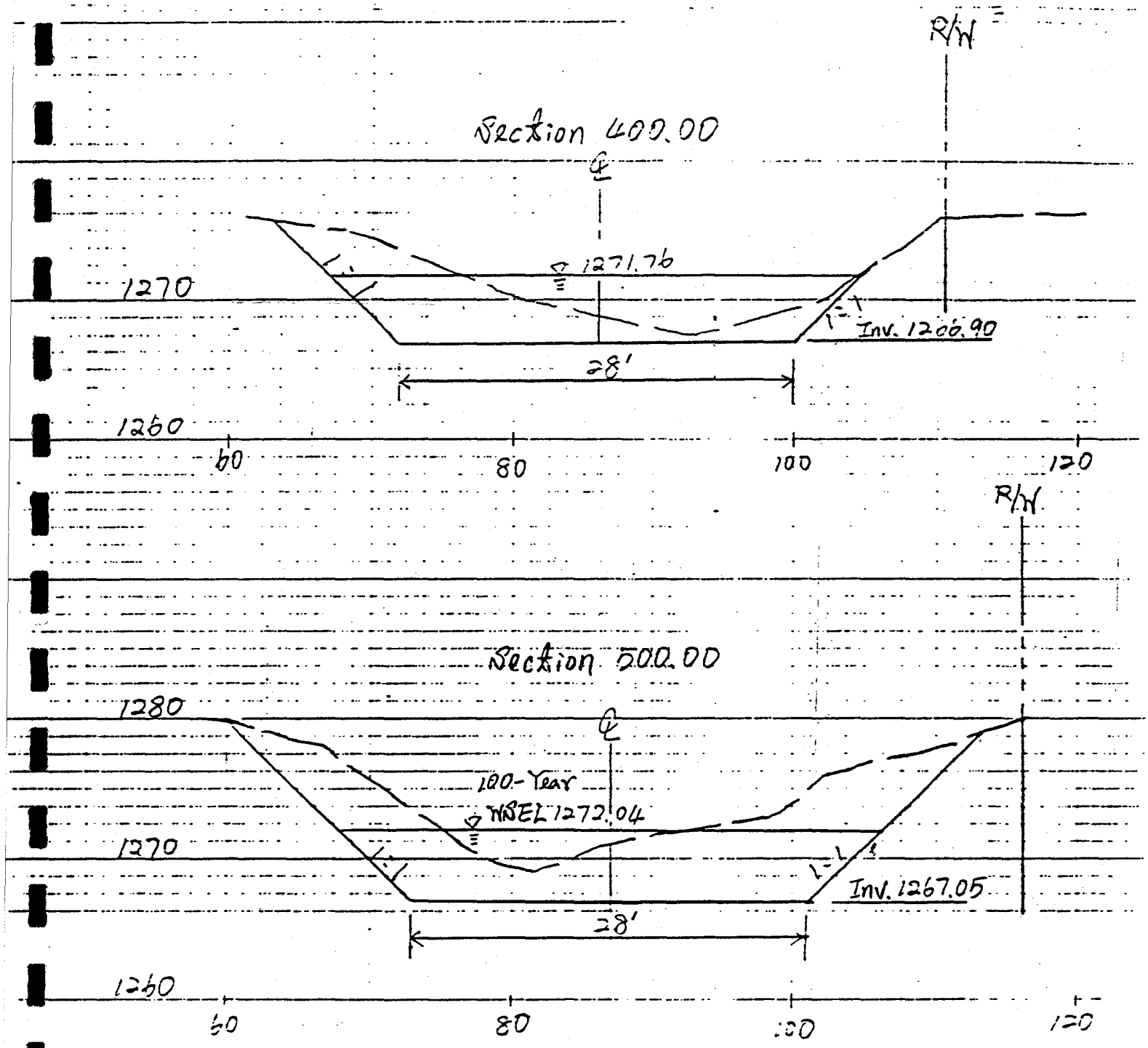


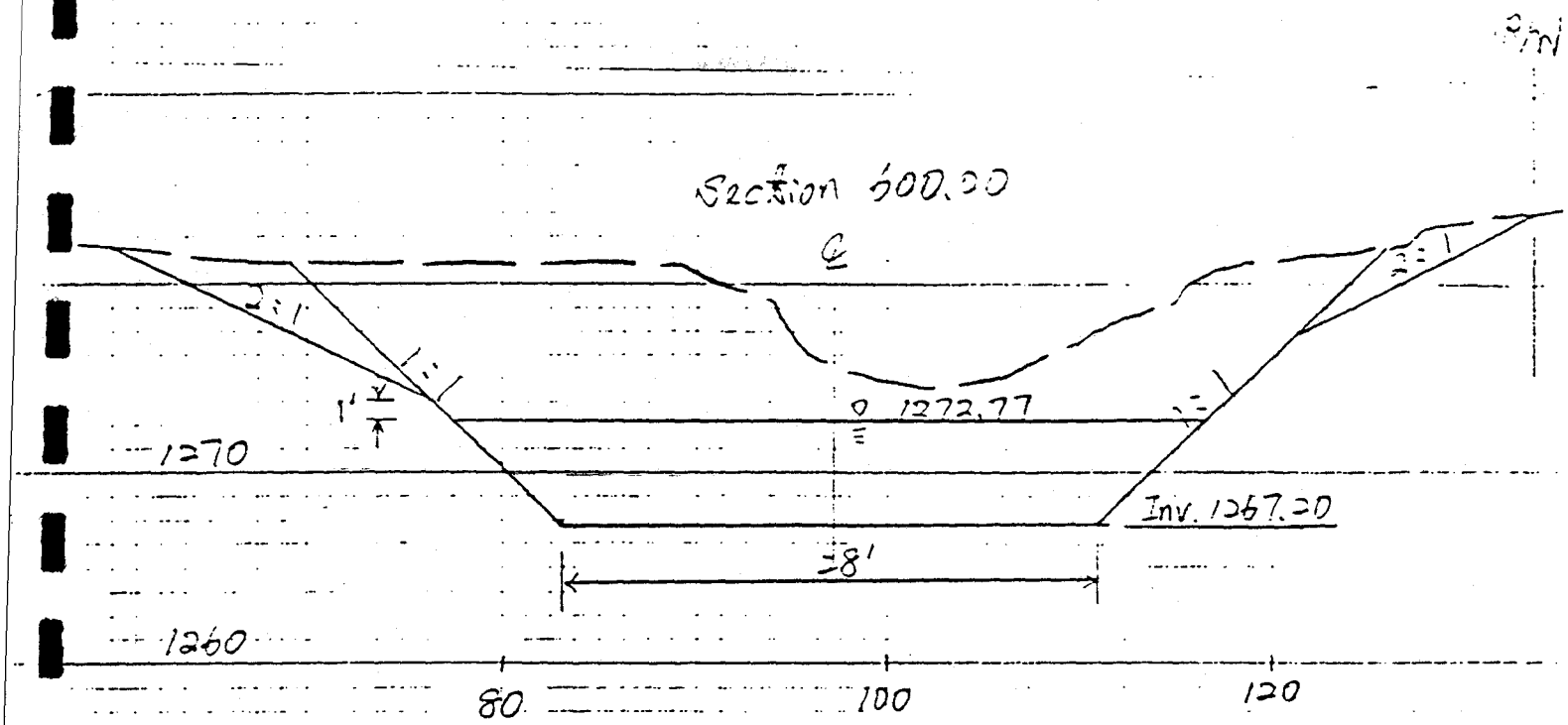
Figure 1

Sheet 2 of 3

HNTB
ARCHITECTS ENGINEERS PLANNERS
HOWARD
NEEDLES
TAMMEN
& BERGENDOFF

ANCHOR CENTRE TWO, SUITE 400
2207 EAST CAMELBACK ROAD

PROJECT NO. 13089-21-03
DATE 5-19-89
DRAWN BY BGS
CHECKED BY
REVISED DATE



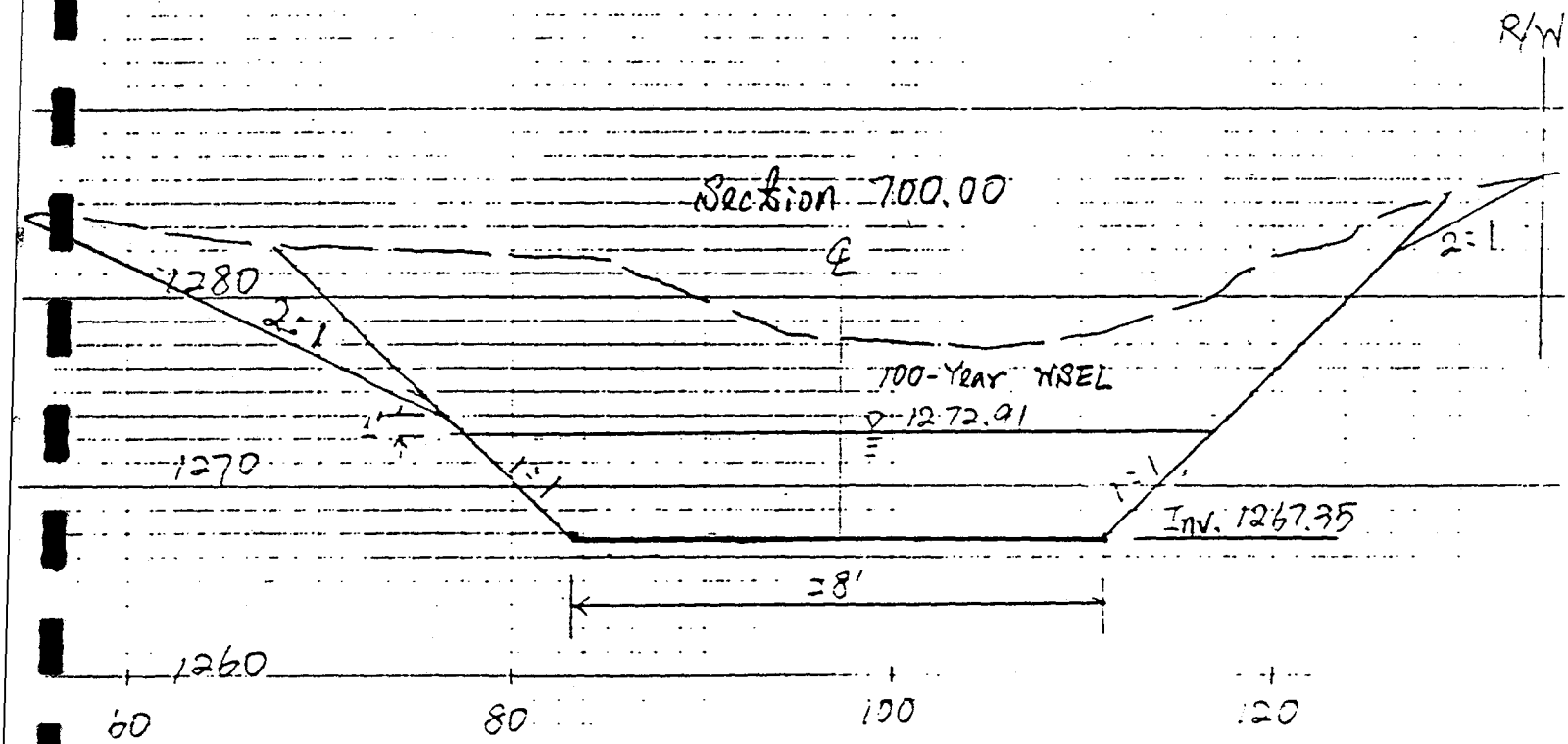


Figure 1

Sheet 3 of 3

HNTB

ARCHITECTS ENGINEERS PLANNERS

HOWARD
NEEDLES
TAMMEN
& BERGENDOFF

ANCHOR CENTRE TWO, SUITE 400
2207 EAST CAMELBACK ROAD

PROJECT NO	30X9-2-13
DATE	5-9-89
DRAWN BY	BGS
CHECKED BY	
REVISED DATE	

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

Anchor Centre Two
Suite 400
2207 East Camelback Road
Phoenix, Arizona 85016
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FAX (602) 468-0704

June 9, 1989

Mr. Thomas A. Ottman, P.E.
Project Coordinator
Michael Baker Jr., Inc.
Squaw Peak Highway Mgmt. Consultant
4105 North 20th Street
Phoenix, Arizona 85016

Re: S.R. 51 - Squaw Peak Highway
Glendale Avenue to Northern Avenue
ADOT Project RAM 600-2-303
TRACS No. H0836 01 D
HNTB No. 13089

Subject: Glendale Avenue Pump Station

Dear Mr. Ottman:

During our analysis of the drainage area north of Glendale Avenue that is served by the Glendale Avenue Pump Station, we identified a discrepancy in our calculated inflow volume and the pump station capacity. We have calculated an inflow design volume of 39 cfs, while the pump station is sized for 30 cfs. These differences are attributed to two factors.

1. Greater rainfall intensity. For the design time of concentration of 11.34 minutes the C.O.P. intensity is 4.77 inches per hour while the ADOT intensity is 5.60 inches per hour.

2. Paved median assumptions. This design project assumed an ultimately paved median, which will result in increased runoff to the pump station.

We have studied the problem and offer the following analysis:

The pump station is currently under contract via C.O.P. project P-856344. The shop drawings for the pumps have been rejected for unrelated reasons. The wet well construction has not begun.

Partners Charles T. Hennigan PE, Daniel L. Spiegel PE, John L. Dotson PE, Francis X. Hall PE, Robert S. Coma PE, Donald A. Dubes PE, William Love FAIA, Robert D. Miller PE, James L. Tuttle Jr PE, Hugh E. Schall PE, Gary D. Goodman AIA, Gordon H. Spivey, Jr PE, Harvey A. Hammond, Jr PE, Stephen G. Goddard PE, John W. Wright, Jr PE, Richard D. Beckman PE
Associates Don R. Ortt PE, Kenneth T. Lincoln CPA, Roberta W. Smithem PE, Harry D. Bertossa PE, Baron E. Robison PE, Cecil P. Counts PE, Stanley L. West PE, Robert W. Anzia PE, Walter Sharpe PE, James D. Russell PE, Ross L. Jensen AIA, Frank T. Lamm PE, Ronald W. Aarons AIA, H. Jerome Butler PE, Blaise M. Carrere PE, Michael P. Ingardia PE, Bernard L. Prince PE, Stephen B. Quinn PE, Saul A. Jacobs PE, Ewing H. Miller FAIA, Douglas C. Wynne PE, Curt J. Mense PE, Daniel F. Becker PE, Richard L. Farnon AIA, Donald P. Keuth PE, Douglas E. Prescott PE, Ronald L. Hartzle PE, Robert W. Luscombe PE, Thomas L. Williams AIA, Dennis E. Donelin PE, John E. Kluke PE, Rodney P. Reid PE, Steven M. Reiss AIA, Robert A. Leick PE, Glenn D. Sedusky PE, Benjamin A. Whisler PE
Offices Alexandria, VA, Atlanta, GA, Houston, TX, Baton Rouge, LA, Boston, MA, Charleston, WV, Chicago, IL, Cleveland, OH, Dallas, TX, Denver, CO, Fairfield, NJ, Hartford, CT, Houston, TX, Indianapolis, IN, Irvine, CA, Kansas City, MO, Lexington, KY, Lexington, MA, Los Angeles, CA, Miami, FL, Milwaukee, WI, Minneapolis, MN, Nashua, NH, Philadelphia, PA, Phoenix, AZ, Raleigh, NC, Seattle, WA, Tampa, FL, Tulsa, OK, Wilmington, DE

One solution would be to issue a change order to P-856344 that would increase the pump capacity and possibly the size of the wet well. This solution would be costly in time and money. We prefer a solution that increases the in-line storage of the entrance facility to the pump station. Currently, the S.R. 51 plans call for a 60-inch inflow pipe. We recommend that we replace approximately 80 feet of this pipe with twin 10' x 5' box culverts.

In order to meet the schedule, we are proceeding with our recommendation. If you have any questions or conerns on this matter, please contact our office.

Very truly yours,

HOWARD NEEDLES TAMMEN & BERGENDOFF

Steven D. Schwab
Project Manager

cc: B.G. Sun
J. Hribar
R. Luscombe
G. Wangelin

DC73.77:SS/kjt

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

Meeting Documentation

Project S.R. 51 - Squaw Peak Highway **Job No.** 13089-21-01

Meeting Location Baker Engineers **Meeting Date** June 15, 1989

Subject Progress Meeting No. 8

Present Baker: Hank Moore, Tom Ottman
HNTB: Steve Schwab

SEGMENT	COPY TO	INFO	ACTION
ATH			✓
MPL			✓
SLA	SLA		✓
Return to			
BGS	6-20		

Discussion **Action/Response**

1. Baker will approach ADOT regarding incentive/penalty clauses.

2. Baker prepares the final bid schedule.

3. The Pleasant Drive berm general plan shows elevation difference of 28' from Dreamy Draw Drive and the top of the berm. — Baker will investigate with Shuler.

4. The general plan for the Pleasant Drive berm will be refined by HNTB to average 8-10' in height. The area taken up by the berm will be decreased from that shown on the general plan. — HNTB will prepare a rough concept for Baker's review.

5. The potential berm between the detention basin and S.R. 51 will not be constructed because there are physical constraints between the 30-foot clear zone and the basin requirements.

6. The roadway is not in a cut section along the detention basin area. The basin needs to have some type of physical protection from errant vehicles. HNTB will extend wall R-2 as a six-foot access control wall to approximately Station 31+00.

7. Slopes in rock areas are to be laid back on 3:1 in all areas that will remain in the R/W.

JOB NO.	COPY TO	INFO	ACTION
DATE:			

Authored By: Steve Schwab **Issue Date:** June 20, 1989

Copy to: Baker
R. Luscombe
J. Hribar

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

Meeting Documentation Cont'd

Project S.R. 51 - Squaw Peak Highway **Job No.** 13089-21-01

Meeting location Baker Engineers **Meeting Date** June 15, 1989

Discussion	Action/Response
8. Baker provided verbal direction to proceed with cobrahead lighting scheme described in concept lighting.	
9. The barrier in front of wall L-3 and beyond to Station 52+00 may possibly move. The barrier past the wall may not be required at all, according to Baker and ADOT.	HNTB will proceed according to the 60% plans. Baker to confer with ADOT and advise HNTB accordingly.
10. ADOT is concerned about the double 10'x5' box culvert for the pump station. ADOT remembers that HNTB was to design that station to ADOT standards and is currently documenting that fact. The proposed solution appears acceptable.	
11. The equestrian trail at Myrtle does not conflict with any utilities.	
12. Item 371 on 60% comments: some striping needs to be shown with one pen size larger.	
13. Sign panels will be removed by the Contractor. Two weeks prior to removal, the Contractor shall notify the engineer so that the City of Phoenix or Mountain Preserve can have the opportunity to remove the signs themselves.	
14. Removals will be shown on the plans.	
15. Will the existing pavement be salvaged and delivered to ADOT for reuse?	Baker/HNTB to investigate.
16. Construction Sequence: New concepts were presented. A typed sequence was provided to HNTB. The following is a list of pertinent facts regarding the sequence of construction.	

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

Meeting Documentation Cont'd

Project S.R. 51 - Squaw Peak Highway **Job No.** 13089-21-01

Meeting location Baker Engineers **Meeting Date** June 15, 1989

Discussion	Action/Response
A. New sequence is only three major phases while the old one was five. Minor traffic shifts occur within single phases in the new sequence.	
B. The new sequence is hinged on weekend closures. The City of Phoenix has not been involved in any discussions or decisions regarding closure of one of their major roads.	
C. The new concepts have not been studied for vertical conflicts.	
D. The new concepts were presented to HNTB for further study and actual workability.	
E. Verbal direction to HNTB was to study the workability of the concepts, present a comprehensive construction sequence plan, and prepare a design change order.	HNTB to work on new construction sequence.

D75.43/sls

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

Meeting Documentation

Project S.R. 51 - Squaw Peak Highway **Job No.** 13089-21-03

Meeting Location Baker Engineers **Meeting Date** June 16, 1989

Subject Grading and Drainage Issues

Present Baker: Tim Kelly, Tom Ottman
HNTB: Mike Khazoom, Gary Sun, Steve Schwab

SEGMENT			
13924			
RJr			✓
MD			✓
SLA SLK			✓
Return to BGS 6-20			

JOB NO.	COPY TO	INFO	ACTION
BGS	✓		

Discussion **Action/Response**

1. Grading behind the wall along Biltmore Highlands for the equestrian trail shows that one drain will be required to drain the trail. HNTB will make sure no additional water will flow onto the Pointe property.

   HNTB to proceed with the equestrian trail design.

2. Offsite flow from Gardenia will be picked up by C.O.P. standard catch basins.

   HNTB to proceed with design.

   NOTE: Baker instructed HNTB on 6/16/89 to use ADOT catch basins.

3. HNTB studied Bakers request to flatten the driveway slope to the bottom of the basin. In order to do this, a 2:1 slope would result between the basin and the equestrian trail. Baker determined that this slope is acceptable.

   HNTB to modify grading to reflect a flatter driveway slope.

4. Interim drainage under the interim grading north of Northern will be handled by a single short pipe at Station 93+50±. Baker agreed with HNTB's suggestion.

   HNTB to proceed with interim drainage design.

5. Drainage in the northwest quadrant of Northern Avenue will be diverted to Dreamy Draw Wash because Baker has had previous problems with easement requirements.

   HNTB will change design and redraw the pipe profiles.

DATE:			

Authored By: Steve Schwab **Issue Date:** June 20. 1989

Copy to: Baker
J. Hribar
R. Luscombe

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

Meeting Documentation Cont'd

Project S.R. 51 - Squaw Peak Highway **Job No.** 13089-21-03

Meeting location Baker Engineers **Meeting Date** June 16, 1989

Discussion	Action/Response
6. HNTB requested the invert of the 48" RCP at the Morten Avenue development. HNTB will not grade a ditch onto the Perrini property. If HNTB does not receive an invert by the end of Friday, June 16, 1989, an invert elevation will be set by HNTB. Invert of 93.10 is not acceptable HNTB suggested an invert of 89.0.	Baker to continue to try to obtain this information.

D75.45/sls

Squaw Peak Highway Project
Arizona State Route 51

Michael Baker Jr. Inc. Consulting Engineers
4105 North 20th Street
Phoenix, Arizona 85016 (602) 957-3686

June 19, 1989

Steven D. Schwab, P.E.
Howard Needles Tammen & Bergendoff
Anchor Centre Two
2207 E. Camelback Rd., Suite 400
Phoenix, Arizona 85016

Subject: Squaw Peak Highway (SR 51) - Section 1
Contract 87-40
Project No. RAM-600-2-302PE
TRACS No. H0835 01 D
ADOT Structure Review Comments

Dear Mr. Schwab:

Attached herewith is an ADOT memorandum quite self explanatory concerning deck drains, approach and anchor slabs, and end treatments at wing walls.

On this project we concur with ADOT's preference and will not construct the approach and anchor slabs for both ends of the bridge (northbound lanes) and the north end of the bridge (southbound lanes). Baker will inform ADOT of this decision.

The attached drawing shows the stationing for the beginning of the pavement anchor slab on the south end of the bridge for the southbound pavement. The development of a special curb detail should only be necessary on the south end of the bridge for the southbound lanes.

If additional information is required, please advise.

Sincerely,

MICHAEL BAKER, JR., INC.

Thomas A. Ottman

Thomas A. Ottman, P.E.
Project Coordinator

TAO/mp

Attachments

cc: Jim Pyne, ADOT Structures

JOB NO. 16684
FILE
DATE

16684-E130 6-1240

ARIZONA DEPARTMENT OF TRANSPORTATION
OFFICE MEMO
BRIDGE DESIGN SERVICES

June 13, 1989

TO: THOMAS A. OTTMAN, Project Coordinator
Baker Engineers

FROM: J. R. PYNE, Bridge Design Engineer-Supervisor
Structures Section

SUBJECT: Squaw Peak Highway, SR 51 - Section 1
Project No. RAM-600-2-502
Northern Avenue Bridge Review Comments

In regards to the review comments contained in your letter dated June 7, 1989, we offer the following comments concerning bridge deck drains. We feel the determination of the need for deck drains, is a roadway drainage design issue. It should be the responsibility of the roadway designer to determine the need for drains. When required, the structural designer will work with the drainage designer to finalize the details. However, for this project, it is anticipated that the water can adequately be picked up before and after the bridge to avoid the need for any bridge deck drains.

From the plans, it appears there is to be no paving of the Southbound Roadway either before or after the bridge. Structures Section's usual preference is not to build approach slabs and anchor slabs until this paving is done to allow as much settlement of the embankments to occur as possible. Please provide direction on whether the southbound anchor and approach slabs should be included in this project or added on a future project.

The end treatment at the end of all four wingwalls will be in accordance with Std. B-21.19. Details need to be shown in the Roadway plans for a special curb to extend from the end of the wingwall to the end of the anchor slab. Since the slabs extend full width of the roadway and do not allow for the usual 2' gutter section.

Attached for your information is a plan view at Northern Avenue showing the beginning and ending stations for the anchor slabs and wingwalls.

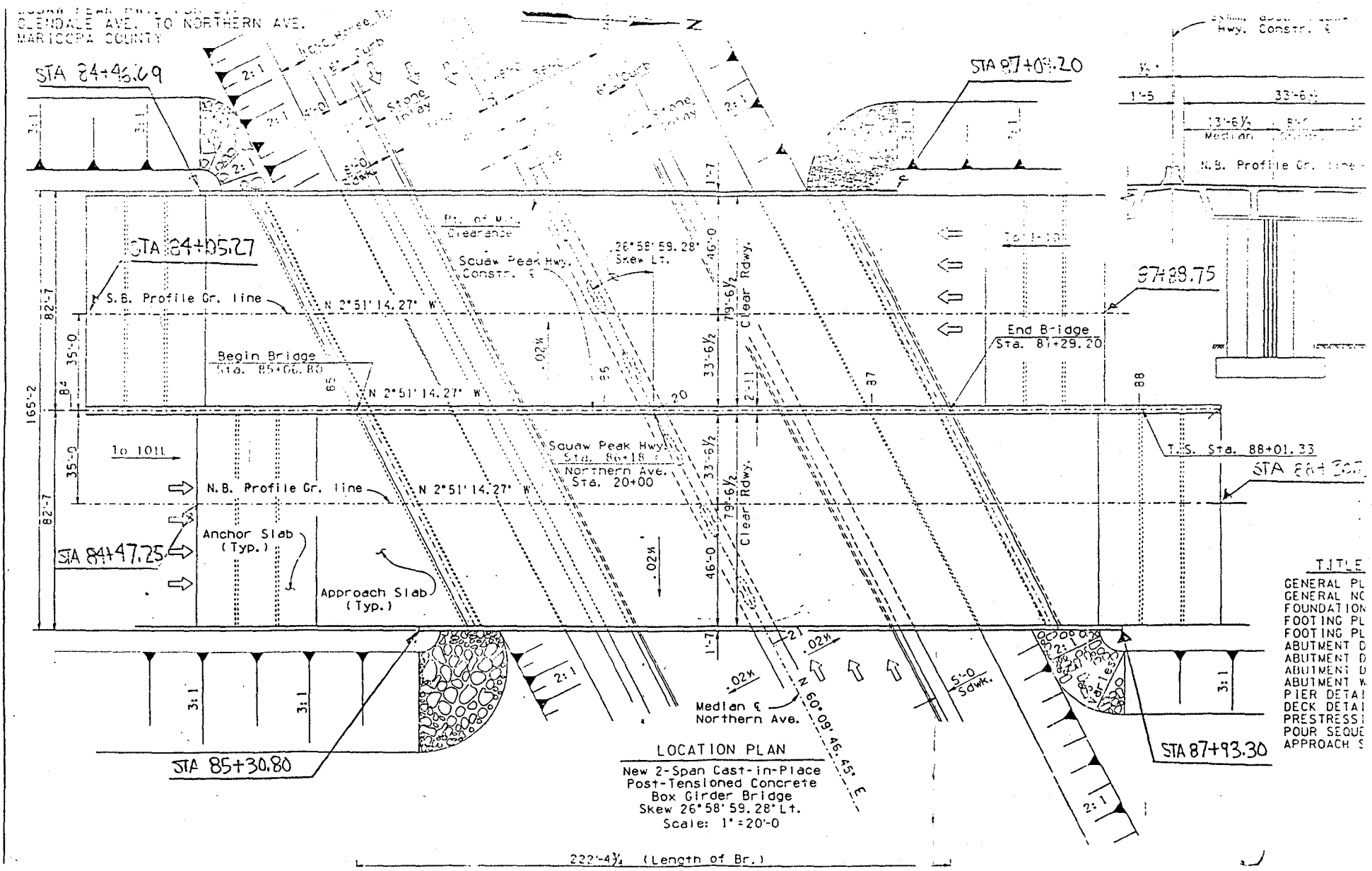
James R. Pyne
J. R. PYNE

CC: THO
HHM
JM

JRP:la

Enclosure

GLENDALE AVE. TO NORTHERN AVE.
MARICOPA COUNTY



LOCATION PLAN

New 2-Span Cast-in-Place
Post-Tensioned Concrete
Box Girder Bridge
Skew 26°58'59.28" Lt.
Scale: 1" = 20'-0

TITLE

GENERAL PL
GENERAL NO
FOUNDATION
FOOTING PL
FOOTING PL
ABUTMENT D
ABUTMENT D
ABUTMENT D
ABUTMENT W
PIER DETAI
DECK DETAI
PRESTRESSI
POUR SEQUE
APPROACH S

Squaw Peak Highway Project
Arizona State Route 51

Michael Baker Jr. Inc. Consulting Engineers
4105 North 20th Street
Phoenix, Arizona 85016 (602) 957-3686

June 21, 1989

Steven D. Schwab
Howard Needles Tammen & Bergendoff
Anchor Centre Two, Suite 400
2207 East Camelback Road
Phoenix, Arizona 85016

Subject: Squaw Peak Highway (SR 51) - Section 1
Contract No. 87-40
Project No. RAM-600-2-302PE
TRACS No. H0835 01 D
Utility Pole in Myrtle Wash

Dear Mr. Schwab:

The following review of the project plans and discussion with ADOT drainage personnel, we have decided that the existing utility pole in Myrtle Wash (approximate Sta. 4+20±) which is in conflict with channel improvements should be allowed to remain.

Construction joints should be placed around the pole so that, if necessary, it may be removed with minimal damage to the channel. The fact that the pole will remain should be appropriately noted in the plans and/or Special Provisions.

We also hereby confirm that a utility pole for temporary overhead utilities during construction can be placed at the construction centerline at Morten Avenue.

Please make the necessary revisions to the project documents for the above items, and advise if you require any further information.

Sincerely,

MICHAEL BAKER, JR., INC.

Thomas A. Ottman

Thomas A. Ottman, P.E.
Project Coordinator

TAO/CAT/mp

cc: H. Shanahan, ADOT
R. Deboer, ADOT
S. Goodman, APS
Su Kane, APS

13C59		
FILE	X	
JPH		✓
SDS	X	
KRG	✓	✓
BLZS	X	✓
TCW	X	✓
PDI	X	✓
DATE	6/21/89	

16684-E150.1-1248

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

Anchor Centre Two
Suite 400
2207 East Camelback Road
Phoenix, Arizona 85016
(602) 95[illegible]
FAX (602) 468-[illegible]

June 9, 1989

Mr. Thomas A. Ottman, P.E.
Project Coordinator
Michael Baker Jr., Inc.
Squaw Peak Highway Mgmt. Consultant
4105 North 20th Street
Phoenix, Arizona 85016

Re: S.R. 51 - Squaw Peak Highway
Glendale Avenue to Northern Avenue
ADOT Project RAM 600-2-303
TRACS No. H0836 01 D
HNTB No. 13089

Subject: Glendale Avenue Pump Station

Dear Mr. Ottman:

During our analysis of the drainage area north of Glendale Avenue that is served by the Glendale Avenue Pump Station, we identified a discrepancy in our calculated inflow volume and the pump station capacity. We have calculated an inflow design volume of 39 cfs, while the pump station is sized for 30 cfs. These differences are attributed to two factors.

1. Greater rainfall intensity. For the design time of concentration of 11.34 minutes the C.O.P. intensity is 4.77 inches per hour while the ADOT intensity is 5.60 inches per hour.

2. Paved median assumptions. This design project assumed an ultimately paved median, which will result in increased runoff to the pump station.

We have studied the problem and offer the following analysis:

The pump station is currently under contract via C.O.P. project P-856344. The shop drawings for the pumps have been rejected for unrelated reasons. The wet well construction has not begun.

Partners Charles T. Hannigan PE, Daniel J. Soldat PE, John L. Dotson PE, Francis A. Hall PE, Robert S. Cama PE, Donald A. Dubies PE, William [illegible] FAIA, Robert D. Miller PE, James L. Tuttle Jr. PE, Hugh E. Schall PE, Carl D. Goodman AIA, Gordon H. Sainey, Jr. PE, Harvey A. Hammond, Jr. PE, Stephen G. Goddard PE, John W. Wright, Jr. PE, Richard D. Beckman PE
Associates Don P. Ort PE, Kenneth T. Lincoln CPA, Roberts N. Smithem PE, Harry D. Bertossa PE, Byron E. Robison PE, Cecil P. Counts PE, Stanley [illegible] West PE, Robert W. Antia PE, Warren Sharko PE, James O. Russell PE, Ross L. Jensen AIA, Frank T. Lamm PE, Ronald W. Aarons AIA, H. Jerome Butler PE, Blaise M. Carrone PE, Michael P. Ingardia PE, Bernard L. Prince PE, Stephen B. Quinn PE, Saul A. Jacobs PE, Ewing H. Miller FAIA, Douglas C. Wynne PE, Carl J. Meiss PE, Daniel F. Becker PE, Richard L. Bangan AIA, Donald P. Keuth PE, Douglas E. Prescott PE, Ronald L. Hartle PE, Robert N. Luscombe PE, Thomas L. Williams AIA, Dennis E. Clinton PE, John E. Kubre PE, Rodney P. Pero PE, Steven M. Reiss AIA, Robert A. Jeck PE, Glenn D. Sadusky PE, Benjamin A. Whisler PE
Offices Alexandria, VA; Atlanta, GA; Austin, TX; Baton Rouge, LA; Boston, MA; Charleston, WV; Chicago, IL; Cleveland, OH; Dallas, TX; Denver, CO; Fairfield, NJ; Hartford, CT; [illegible] TX; Indianapolis, IN; Irvine, CA; Kansas City, MO; Lexington, KY; Lexington, MA; Los Angeles, CA; Miami, FL; Milwaukee, WI; Minneapolis, MN; Nashua, NH; [illegible] Tulsa, OK; Wilmington, DE

One solution would be to issue a change order to P-856344 that would increase the pump capacity and possibly the size of the wet well. This solution would be costly in time and money. We prefer a solution that increases the in-line storage of the entrance facility to the pump station. Currently, the S.R. 51 plans call for a 60-inch inflow pipe. We recommend that we replace approximately 80 feet of this pipe with twin 10' x 5' box culverts.

In order to meet the schedule, we are proceeding with our recommendation. If you have any questions or conerns on this matter, please contact our office.

Very truly yours,

HOWARD NEEDLES TAMMEN & BERGENDOFF

Steven D. Schwab
Project Manager

cc: B.G. Sun
J. Hribar
R. Luscombe
G. Wangelin

DC73.77:SS/kjt

Squaw Peak Highway Project
Arizona State Route 51

RECEIVED
JUL 25 1989 10:30
H.N.T.B.

Letter of Transmittal

Michael Baker Jr. Inc. Consulting Engineers
4105 North 20th Street
Phoenix, Arizona 85016 (602) 957-3686

To: HNTB

S.O. No. 16684-HPH

Project: S.P.H. SR 51 SECTION 1

Date: 7/25/89

Attn. Steve Schwab

We are forwarding the following: ☒ Attached ☐ Under Separate Cover ☐

DWG. NO.	NO. COPIES	TITLE OR DESCRIPTION	COMMENTS
	1	COPY OF LETTER TO ADOT ADDRESSING THE GLENDALE AVE. PUMP STATION.	JOB NO. 13089
			FILE X
			JPH ✓
2 rec'd SDS 7/25		I Kept copy of attach.	SDS X
			BGS X ✓
		Delete Box Replace w/ 60"	FJM X ✓
			DATE 7/25/89

THESE ARE TRANSMITTED as checked below:

- ☐ As requested
- ☐ For review and comment
- ☒ For your information
- ☐ No exception taken
- ☐ Rejected - See remarks
- ☐ Proceed subject to corrections noted
- ☐ Revise and resubmit
- ☐ Submit specified items
- ☐ _____

GENERAL COMMENTS: ADOT AGREES WITH RETAINING THE 60" PIPE AND NOT CONSTRUCTING 2-10'x5' CBC FOR IN LINE STORAGE

Bill Evans Jr. - ADOT

MICHAEL BAKER, JR., INC.

By: Thomas A. Ottman

Title: P.C.

Page 1 of 1

Squaw Peak Highway Project

Arizona State Route 51

FILE COPY

Michael Baker Jr. Inc. Consulting Engineers

4105 North 20th Street

Phoenix, Arizona 85016 (602) 957-3686

July 21, 1989

Arthur V. May, P.E.
Arizona Department of Transportation
Urban Highway Section, Room 216E
205 South 17th Avenue
Phoenix, Arizona 875007

Subject: Squaw Peak Highway (SR 51) - Section 3
Contract No. 87-40
Project No. RAM-600-2-302PE
TRACS No. 51 MA 0835 01D
Glendale Avenue Pump Station

Dear Mr. May:

Attached you will find Baker Engineers' analysis for the Glendale Avenue Pump Station which is being constructed under a City of Phoenix contract.

The pump station was sized using City of Phoenix criteria therefore having some deficiencies under ADOT criteria.

If you have any questions, do not hesitate to call.

Sincerely,

MICHAEL BAKER, JR., INC.

Timothy E. Kelly

Timothy E. Kelly, P.E.
Engineering Manager

TEK/mp

cc: WBMcMullen/File
TAOttman
GJKurgan/JCHayward/CIHoman/CFile

SQUAW PEAK HIGHWAY

GLENDALE AVENUE PUMP STATION

An analysis was conducted on the Glendale Avenue Pump Station. This analysis was conducted based upon the letter dated June 4, 1989 from Mr. Steven D. Schwab, of Howard Needles Tammen and Bergendoff to Michael Baker Jr., Inc. The letter (a copy attached) stated that the pump station was undersized. The reasons listed are:

1. The station was sized under City of Phoenix criteria (i.e. rainfall intensity of 4.77 inches per hour rather than 5.60 inches per hour which is ADOT criteria)

2. The design of Section 1 assumes an ultimate paved median, where the others assumed an unpaved median.

The pump station is under contract via the City of Phoenix.

We have evaluated several alternatives to solve the problem and to ultimately have the pumping capabilities equivalent to meet the ADOT criteria. Alternative evaluated include:

1. Change the pumps to increase pumping capacity
2. Provide additional in-line storage
3. Optimize the pump sequencing
4. Do nothing

The alternative of replacing the pumps was evaluated by looking at specifications for the Flygt Pumps. The pumps selected as designed are at the upper end of the envelope of curves for that size pump. Therefore, to replace the pumps would require going to the next size larger. This would require a revision in the access opening for the removal of the pumps, but would not require a change in the pump or building size. The change will also require a larger generator along with the 3 larger pumps.

In-line storage would only eliminate a portion of the problem. The drainage system south of Glendale is sized by COP criteria and should the intensity be greater than their design standard, some of the water would bypass the inlets and flood the sump at Glendale. By adding inline storage north of Glendale would only lower the volume of water that would flood the sump.

The evaluation of optimizing the pump sequencing is not a viable alternative. By changing the cycling only 2 - 3 cfs of the excess could be handled. Therefore, the sump at Glendale would flood. After looking at these alternatives, we looked at the overall drainage of the Squaw Peak Parkway. From I-10 to Glendale Avenue, the drainage is designed per COP criteria. Therefore, should a rainfall equivalent to the ADOT criteria concur on this portion of the highway, the highway would be flooded at the sump locations such as at Highland Avenue and Bethany Home Road. Because the project was started as a COP project but will now be included in the ADOT Freeway System, there is some point where the criteria is changed. The logical location for this change is at Glendale Avenue.

The cost to replace the pump, revise the access doors and to replace the generation would be approximately $120,000.

The cost of additional inline storage (i.e. replace 80 CF of 60 inch pipe with 2-10'x 5'CBC) would be $60,000.

Neither of these solutions fully solve the problem because the drainage collection system south of Glendale cannot accommodate the flows.

In evaluating the Glendale situation in a realistic manner, the alternative of doing nothing is the most viable.

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

Anchor Centre Two
Suite 400
2207 East Camelback Road
Phoenix, Arizona 85016
(602) 954-7420
FAX (602) 468-6070

August 29, 1989

JOB NO. 13089	COPY TO	INFO	ACTION
FILE	X		
JPH		✓	
SDS	✓		
BGS	✓		
RWL	✓		
DATE:	8/29/89		

Mr. Thomas A. Ottman, P.E.
Project Coordinator
Michael Baker Jr., Inc.
Squaw Peak Highway Mgmt. Consultant
4105 North 20th Street
Phoenix, Arizona 85016

Re: S.R. 51 - Squaw Peak Highway
Glendale Avenue to Northern Avenue
ADOT Project RAM 600-2-303
TRACS No. H0836 01 D
HNTB No. 13089

Subject: Final IA Preliminary Drainage Review Comments

Dear Mr. Ottman:

This letter summarizes our understanding relative to the preliminary drainage review comments received from your staff on August 28, 1989. Per your instructions, we have already begun working on the resolved comments and the associated changes. We understand the comments and have summarized them in this letter.

The two major comments were associated with Myrtle Wash downstream channel lining. First, all channel lining must be kept outside of the City's right-of-way (R/W) for Myrtle Avenue. Second, the north outlet wingwall for the Myrtle Wash box culvert must be shortened to remain inside an existing R/W for drainage maintenance reasons.

1. Since the Myrtle Avenue north R/W is encroaching the existing Myrtle Wash natural channel and bank for the reach between Myrtle Wash Baseline Sta. 3+00 and 5+50, HNTB has tried every possible way to minimize the disruption to the natural wash by matching the existing channel bottom with a new stabilizing bank in this reach. In order to keep the new channel outside the roadway R/W, it will require the relocation of the Myrtle Wash through the above reach. HNTB indicated that the channel relocation of the natural wash might not be a desirable, sound engineering design, but it could be done with caution. As a result, there is at least 200 feet of embankment construction to fill the natural channel and bank.

   a. The new 20-foot channel bottom width with a one-to-one side slope will increase water surface elevation by 1.5 feet and increase velocity to 11.6 fps. The increase of 0.7 foot in water surface elevation at Sta. 3+00 will provide virtually no freeboard for wave protection.

Partners Charles T. Hennigan PE, Daniel J. Spigai PE, John L. Cotton PE, Francis X. Hall PE, Robert S. Coma PE, Donald A. Dugles PE, William Love FAIA, Robert D. Miller PE, James L. Tuttle, Jr. PE, Hugh E. Schell PE, Gary C. Goodman AIA, Gordon H. Sleney, Jr. PE, Harvey K. Hammond, Jr. PE, Stephen G. Goddard PE, John W. Wight, Jr. PE, Richard D. Beckman PE
Associates Don R. Ort PE, Kendall T. Lincoln CPA, Roberta W. Smithem PE, Harry D. Bartosse PE, Ralph E. Robison PE, Cecil P. Counts PE, Stanley I. Mest PE, Robert W. Anzie PE, Walter Sharko PE, James O. Russell PE, Ross L. Jensen AIA, Frank T. Lamm PE, Ronald W. Aarons AIA, H. Jerome Butler PE, Blake M. Carmers PE, Michael P. Ingardia PE, Bernard L. Prince PE, Stephen B. Quinn PE, Saul A. Jacobs PE, Ewing H. Miller FAIA, Douglas C. Mynne PE, Carl J. Melise PE, Daniel F. Becker PE, Richard L. Farmer AIA, Donald P. Keuch PE, Douglas E. Prescott PE, Ronald L. Hartle PE, Robert W. Luscombe PE, Thomas L. Williams AIA, Dennis E. Conklin PE, John E. Kuske PE, Rodney P. Reid PE, Steven M. Reiss AIA, Robert A. Leck PE, Glenn D. Sadulsky PE, Benjamin A. Whisler PE
Offices Alexandria, VA, Atlanta, GA, Austin, TX, Baton Rouge, LA, Boston, MA, Charleston, WV, Chicago, IL, Cleveland, OH, Dallas, TX, Denver, CO, Fairfield, NJ, Hartford, CT, Houston, TX, Indianapolis, IN, Irvine, CA, Kansas City, MO, Lexington, KY, Lexington, MA, Los Angeles, CA, Miami, FL, Milwaukee, WI, Minneapolis, MN, Nashua, NH, [illegible] Phoenix, AZ, Raleigh, NC, Seattle, WA, Tampa, FL, Tulsa, OK, Wilmington, DE

b. Due to the embankment fill construction in the natural channel and bank, it appears that a costly concrete retaining wall or a gabion retaining wall will be required for stability reasons. Moreover, it will require additional grading work to taper from the end of the retaining wall to the existing channel bank. It is obvious that the existing roadway R/W will still be inside the natural wash downstream from Sta. 3+00 with or without the relocation of the new channel.

For the reasons stated above, we do not recommend the relocation of Myrtle Wash to avoid the existing street right-of-way. The City of Phoenix should be contacted for their input.

2. For the shortening of the north wingwall, it was decided that both the north and south outlet retaining walls will be shortened to accommodate an existing maintenance boundary between the City and ADOT.

Other miscellaneous comments are summarized as follows:

1. The heavyline for the half barrier on Morten Avenue Frontage Road will be partially eliminated on Dwg. No. D-1.1 in order to show the proposed new storm drain pipe.

2. New manhole 428 and pipes 427 and 428 will be designed to avoid running through the Northern bridge abutment.

3. The chain link fence proposed along Myrtle Wash on Dwg. No. D-2.1 will remain and will not be replaced by guardrail.

4. The equestrian trail to the west from the outlet of Pleasant Drive box culvert will be designed to tie into the street closure. The contour lines will be revised on Dwg. No. R-2.1 to reflect this proposed equestrian trail.

If you have any questions or comments, please feel free to contact me.

Very truly yours,

HOWARD NEEDLES TAMMEN & BERGENDOFF

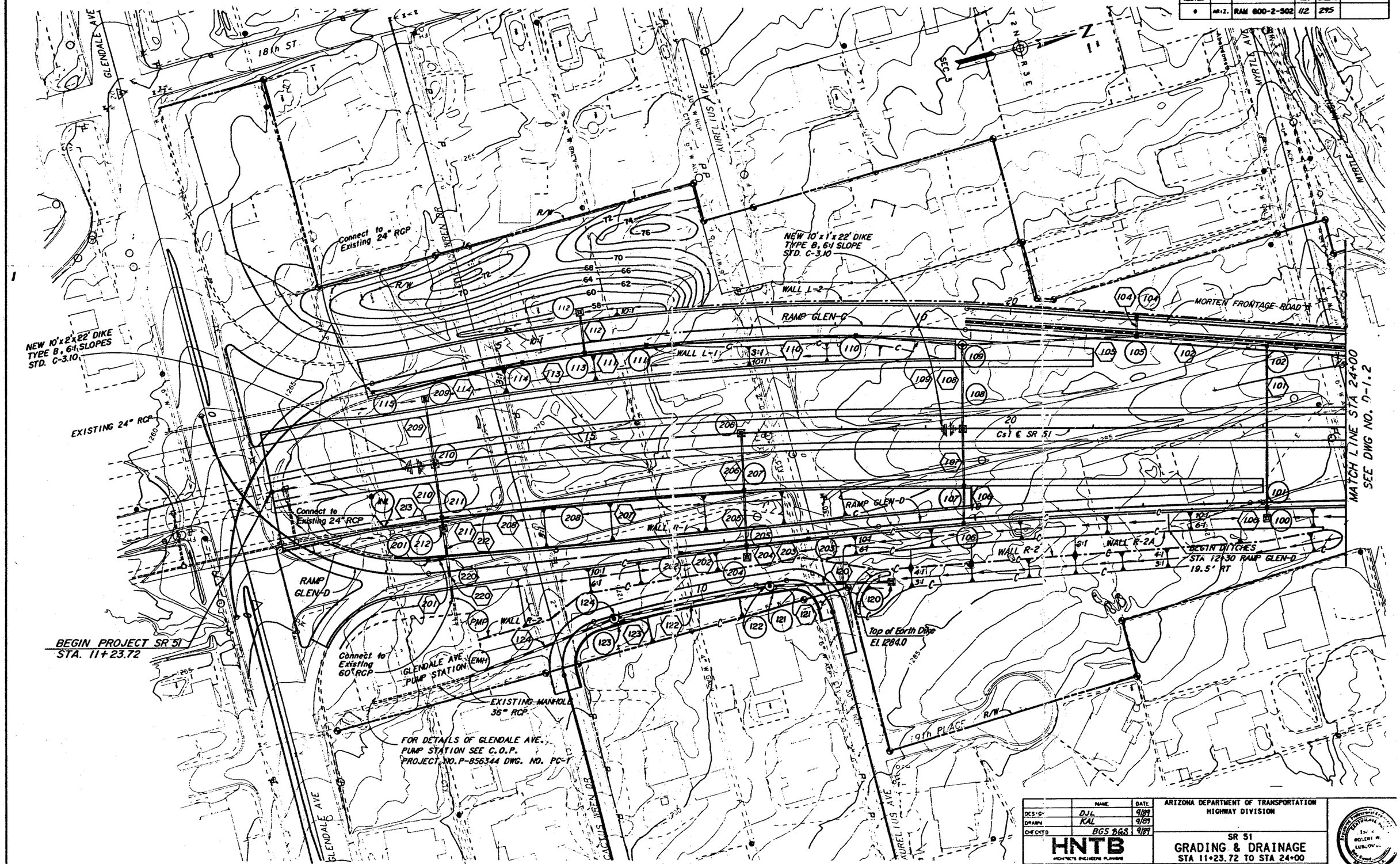
Steven D. Schwab, P.E.
Project Manager

D79.35/SDS/sls

APPENDIX C

DRAINAGE PLANS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	112	295	



	NAME	DATE
DES'GN	DJL	9/89
DRAWN	KAL	9/89
CHECKED	BGS BGS	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 11+23.72 TO STA 24+00

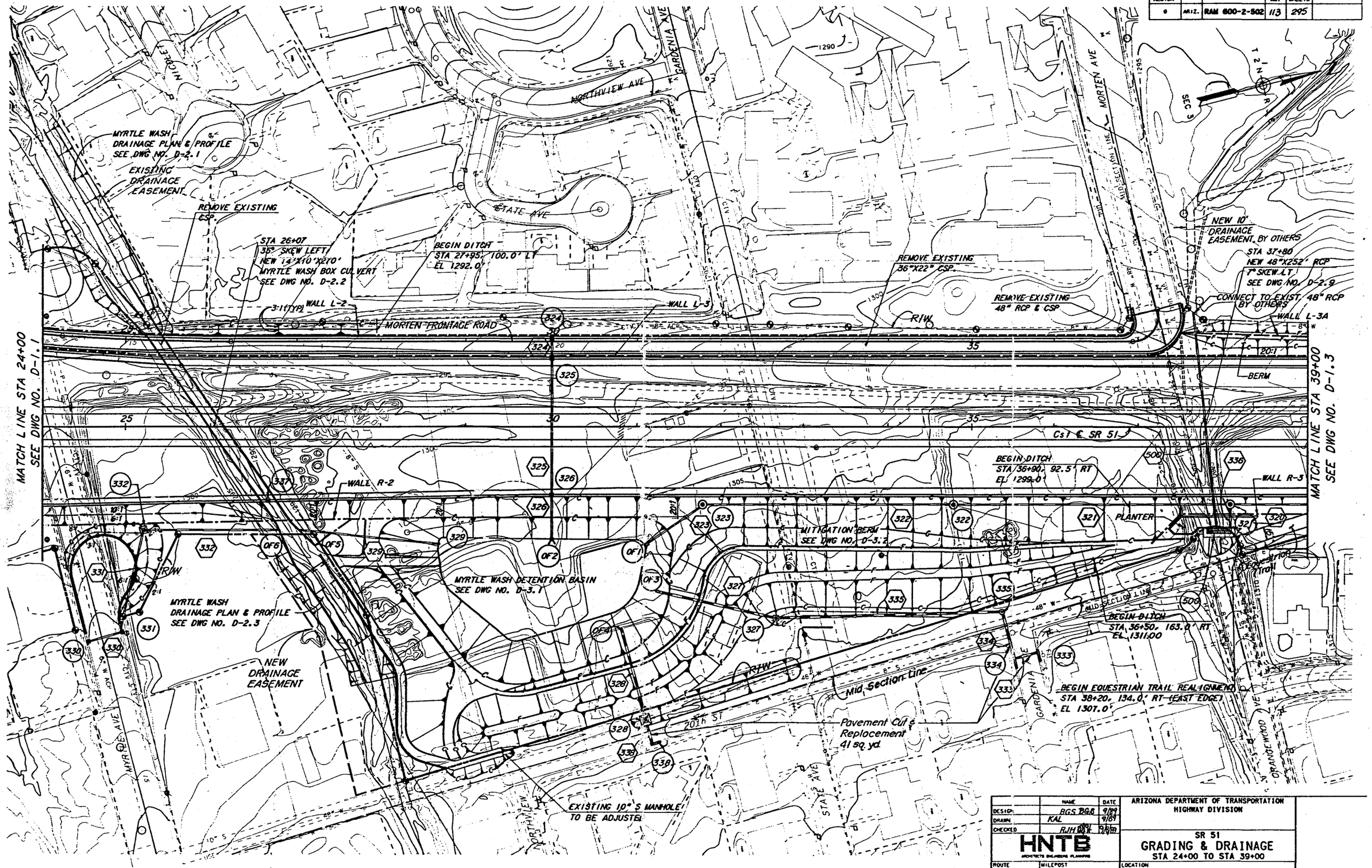
ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-1.1

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	113	295	



	NAME	DATE
DESIGN	BGS BGS	9/89
DRAWN	KAL	9/89
CHECKED	RJH	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 24+00 TO STA 39+00

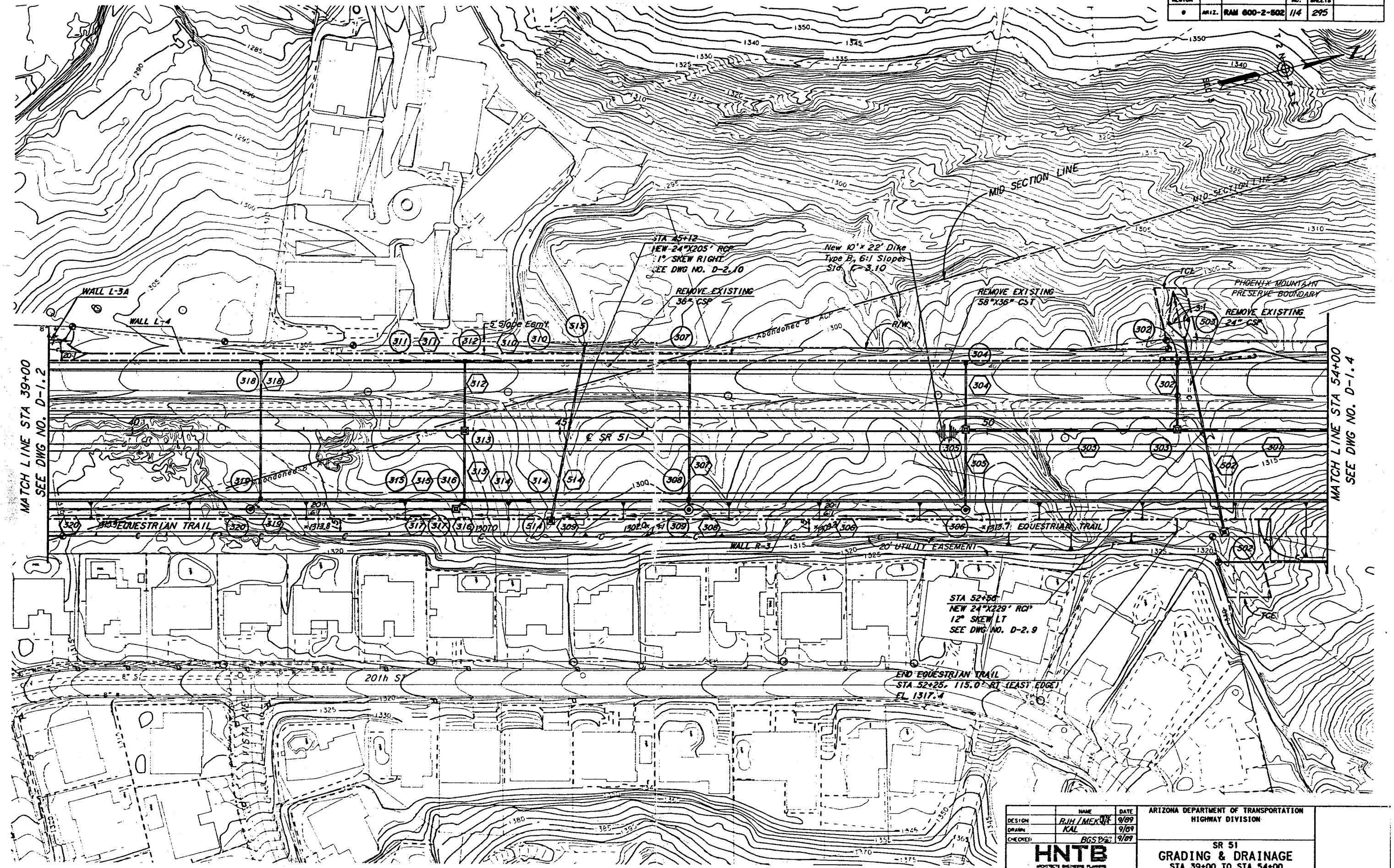
ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-1.2

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	114	295	



	NAME	DATE
DESIGN	RJH/MEK	9/89
DRAWN	KAL	9/89
CHECKED	BGS	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 39+00 TO STA 54+00

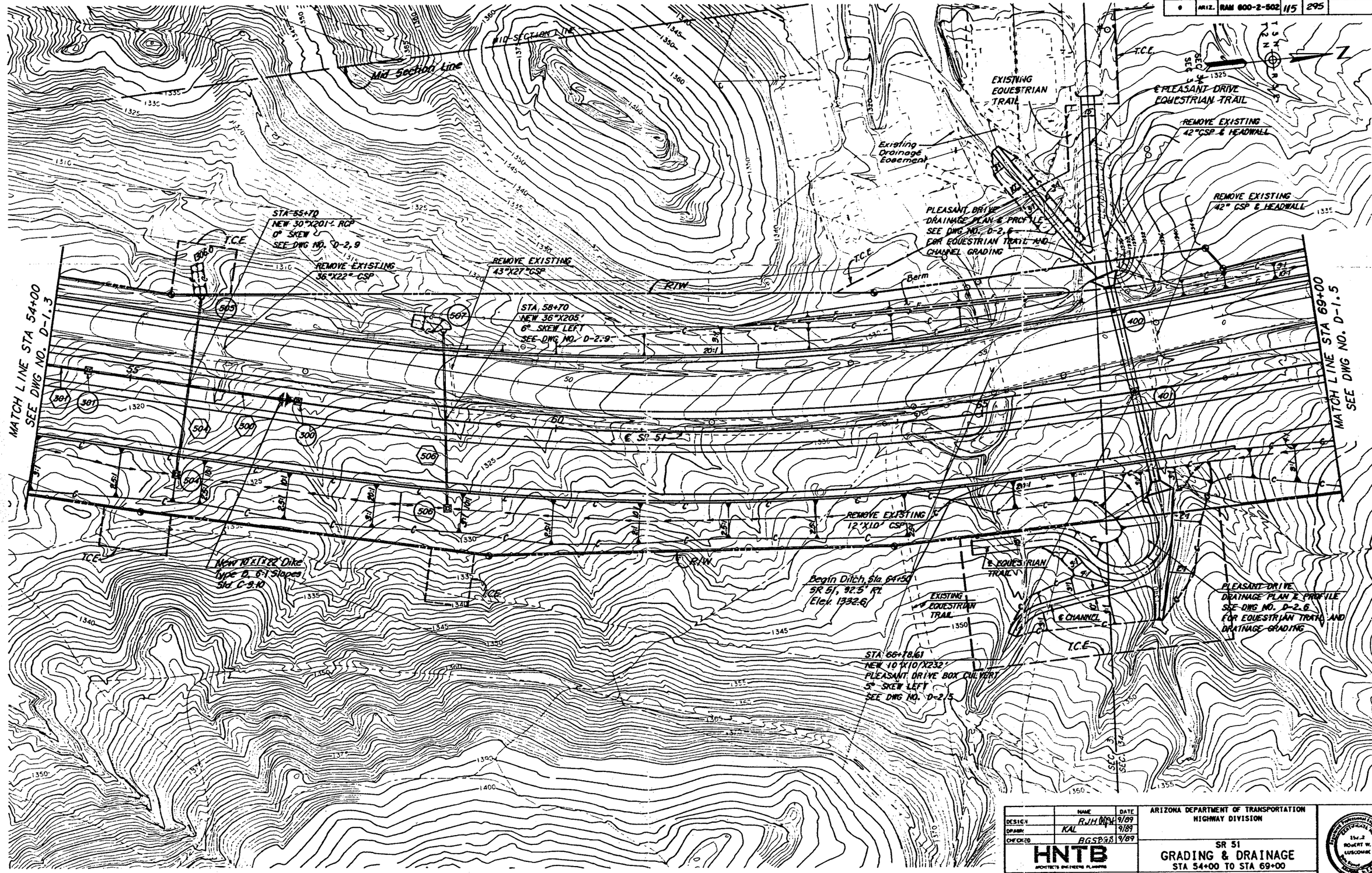
ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-1.3

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	115	295	



	NAME	DATE
DESIGN	RJH	9/89
DRAWN	KAL	9/89
CHECKED	BGSP&S	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 54+00 TO STA 69+00

ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

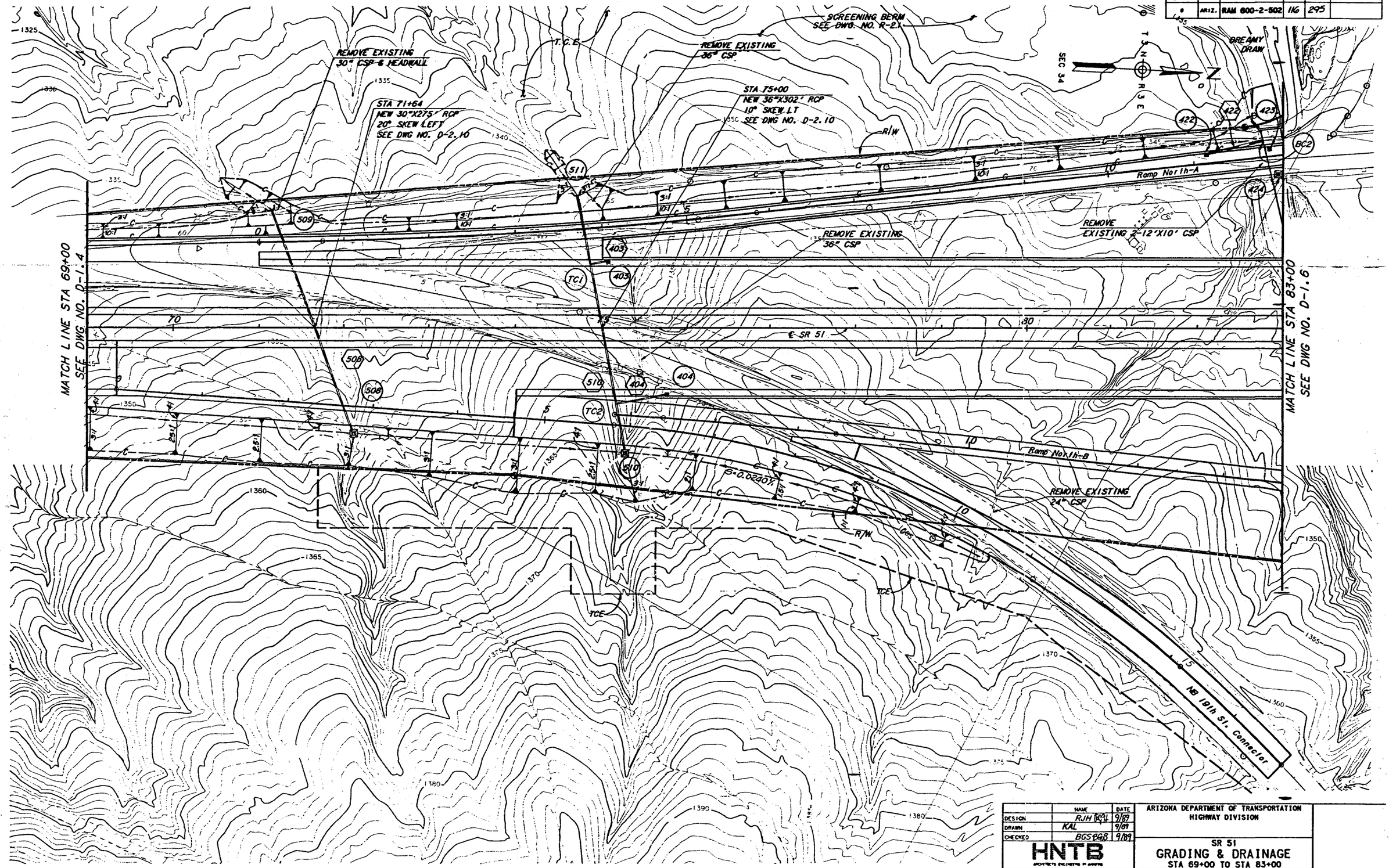
Registered Professional Engineer (Civil) Certificate No. 15612 ROBERT W. LUSCOMBE Expires 6-30-90

DWG. NO. D-1.4

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	116	295	



	NAME	DATE
DESIGN	RJH	9/89
DRAWN	KAL	9/89
CHECKED	BGS BAB	9/89

HNTB
ARCHITECTS ENGINEERS & ASSOCIATES

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 69+00 TO STA 83+00

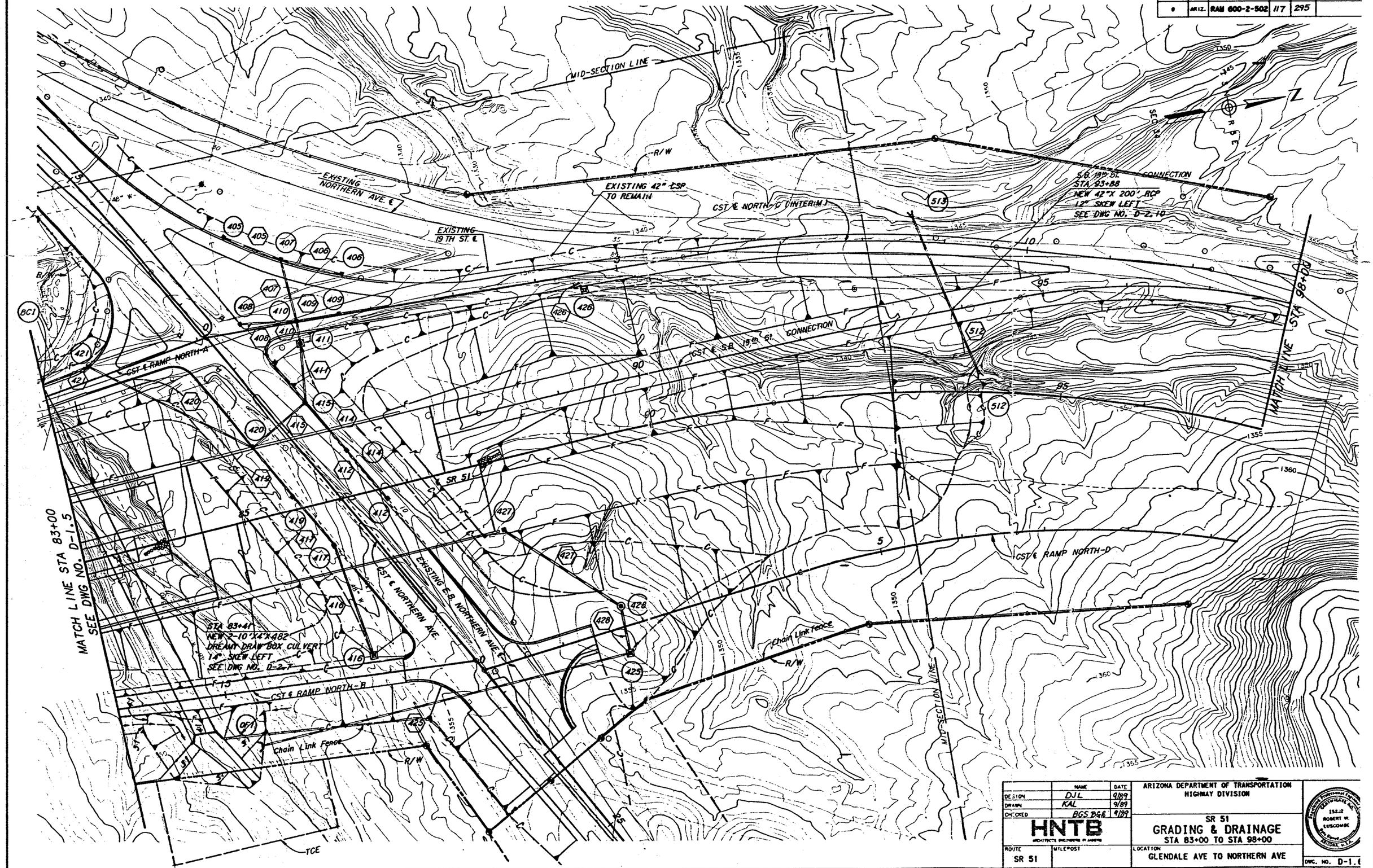
ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-1.5

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	117	295	



	NAME	DATE
DESIGN	DJL	9/89
DRAWN	KAL	9/89
CHECKED	BGS DGB	9/89

HNTB
ARCHITECTS ENGINEERS & ASSOCIATES

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

SR 51
GRADING & DRAINAGE
STA 83+00 TO STA 98+00

ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

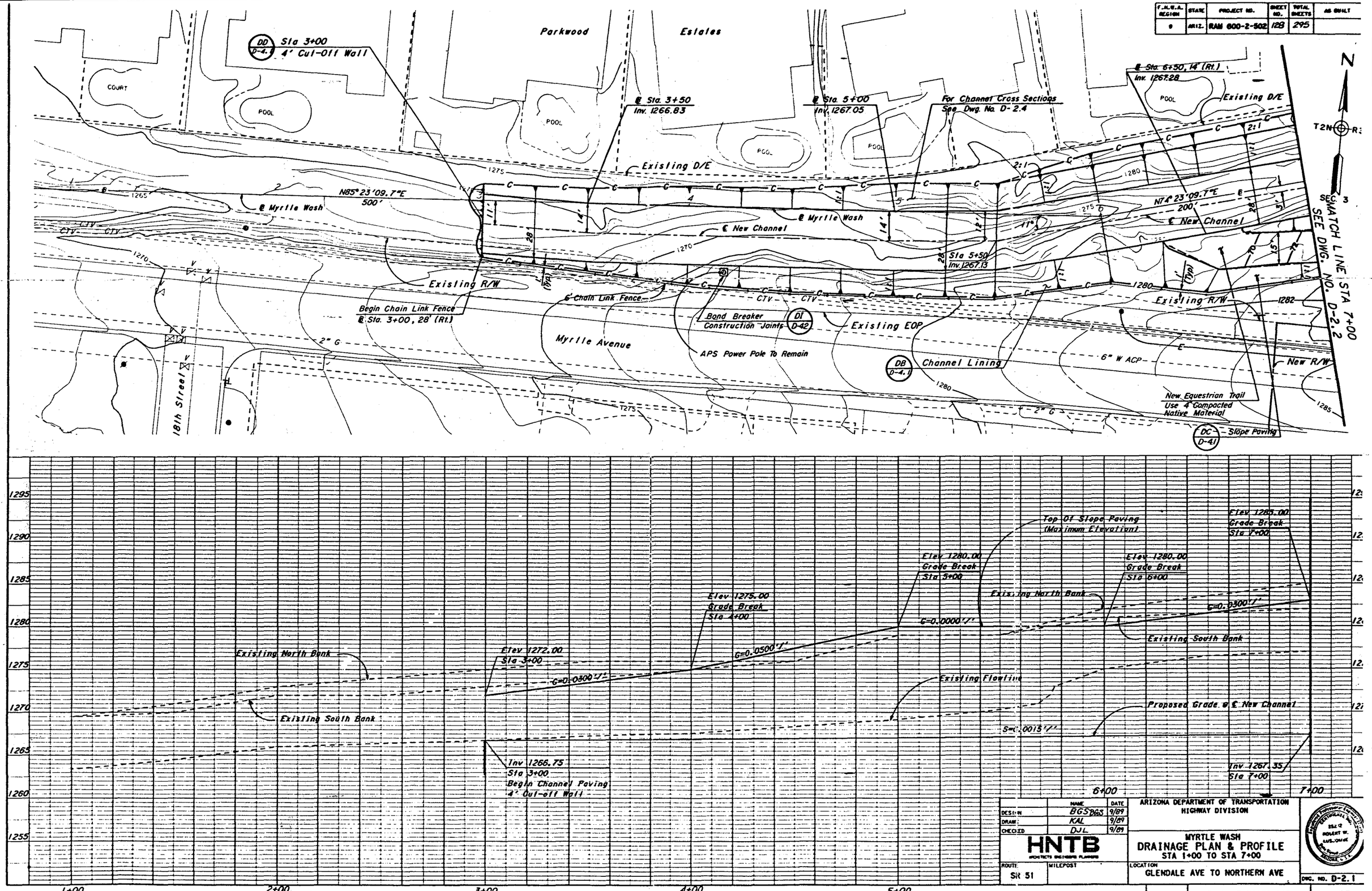
Registered Professional Engineer (Civil) CERTIFICATE NO. 15222 ROBERT W. LUSCOMBE Date Signed ARIZONA, U.S.A.

DWG. NO. D-1.6

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	128	295	



	NAME	DATE
DESIGN	BGS DAS	9/89
DRAWN	KAL	9/89
CHECKED	DJL	9/89

HNTB ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MYRTLE WASH
DRAINAGE PLAN & PROFILE
STA 1+00 TO STA 7+00

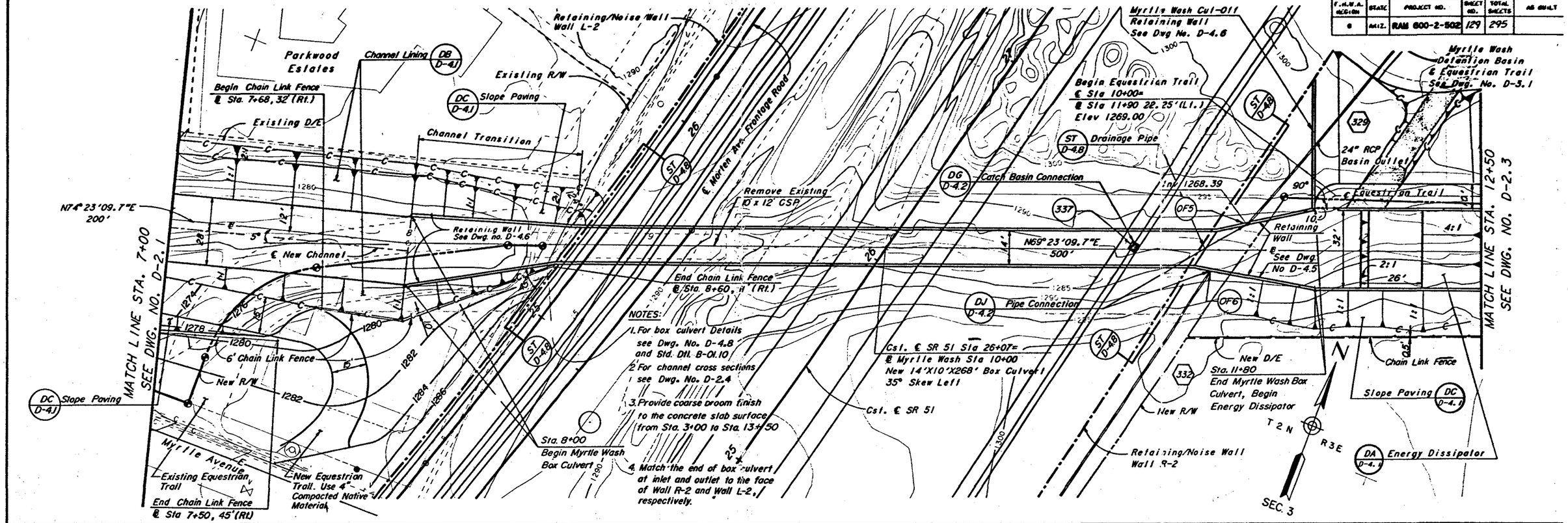
ROUTE: SR 51 | MILEPOST | LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-2.1

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	129	295	



	NAME	DATE
DESIGN	BGS BGS	9/09
DRAWN	KAL	9/09
CHECKED	DJL	9/09

HNTB ARCHITECTS ENGINEERS PLANNERS

ROUTE: SR 51 | MILEPOST:

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MYRTLE WASH
DRAINAGE PLAN & PROFILE
STA 7+00 TO STA 12+50

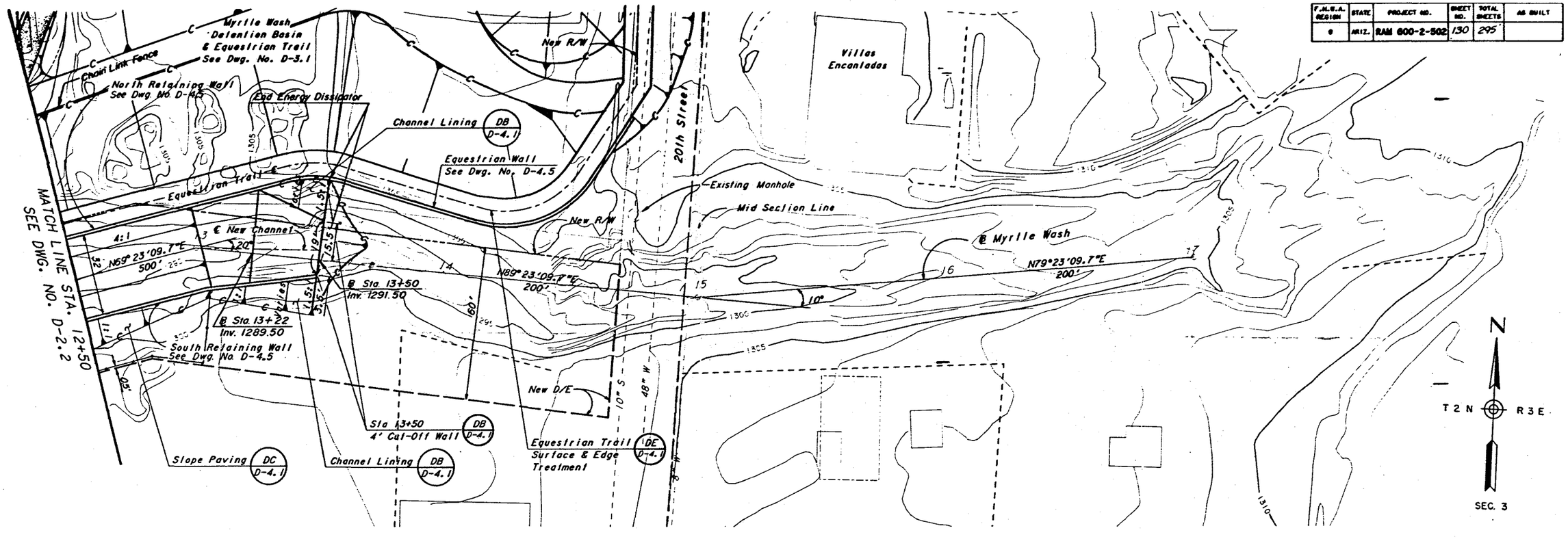
LOCATION: GLENDALE AVE TO NORTHERN AVE

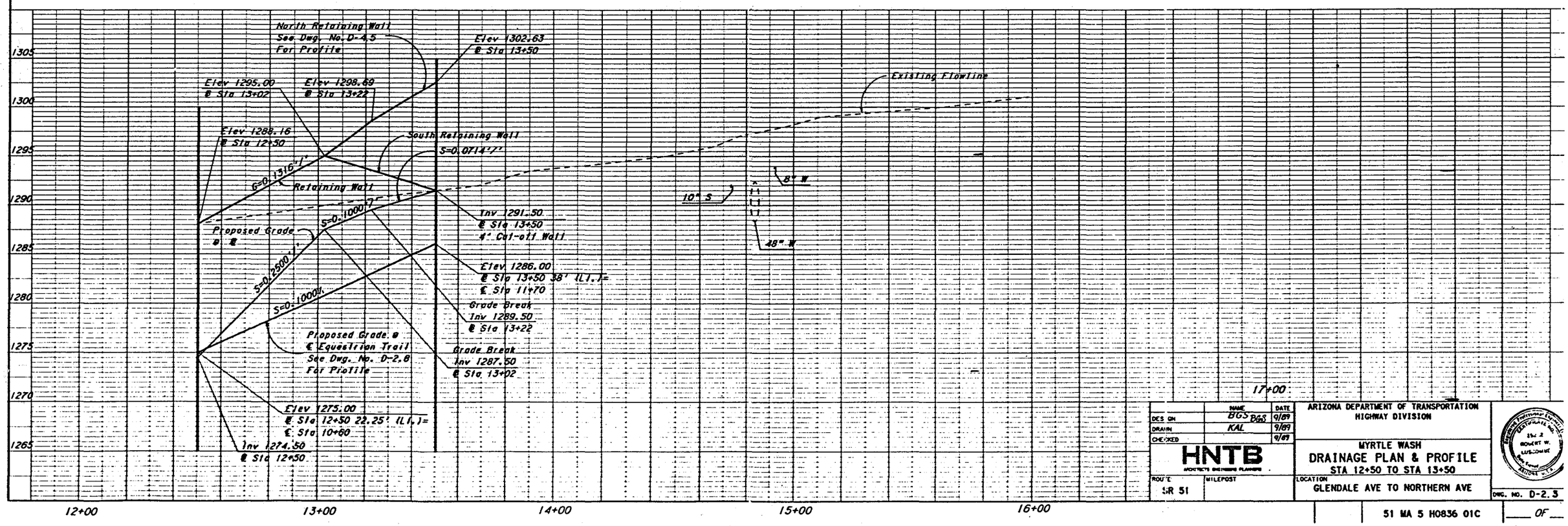
DWG. NO. D-2.2

51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	130	295	





	NAME	DATE
DES GN	BGS	9/89
DRAWN	KAL	9/89
CHECKED		9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ROUTE: SR 51
MILEPOST:

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MYRTLE WASH
DRAINAGE PLAN & PROFILE
STA 12+50 TO STA 13+50

LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-2.3

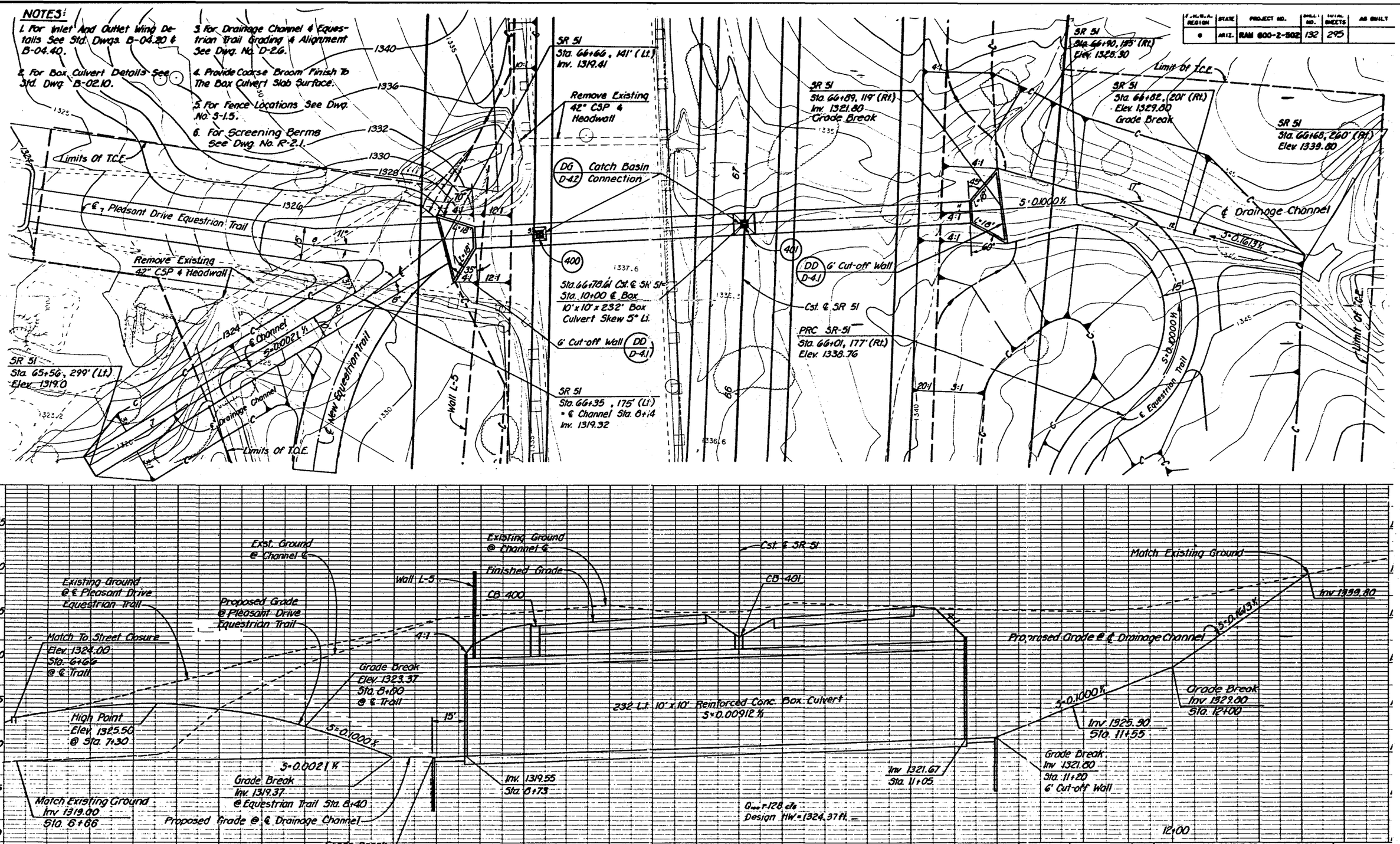
51 MA 5 H0836 01C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	132	295	

NOTES:

1. For Inlet And Outlet Wing Details See Std. Dwgs. B-04.20 & B-04.40.
2. For Box Culvert Details See Std. Dwg. B-02.10.
3. For Drainage Channel & Equestrian Trail Grading & Alignment See Dwg. No. D-2.6.
4. Provide Coarse Broom Finish To The Box Culvert Slab Surface.
5. For Fence Locations See Dwg. No. S-1.5.
6. For Screening Berms See Dwg. No. R-2.1.



	NAME	DATE
DESIGN	RJH	9/8/89
DRAWN	KAL	9/89
CHECKED	BGS	9/89

HNTB ARCHITECTS ENGINEERS PLANNERS

ROUTE: SR 51 | MILEPOST:

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLEASANT DRIVE
DRAINAGE PLAN & PROFILE

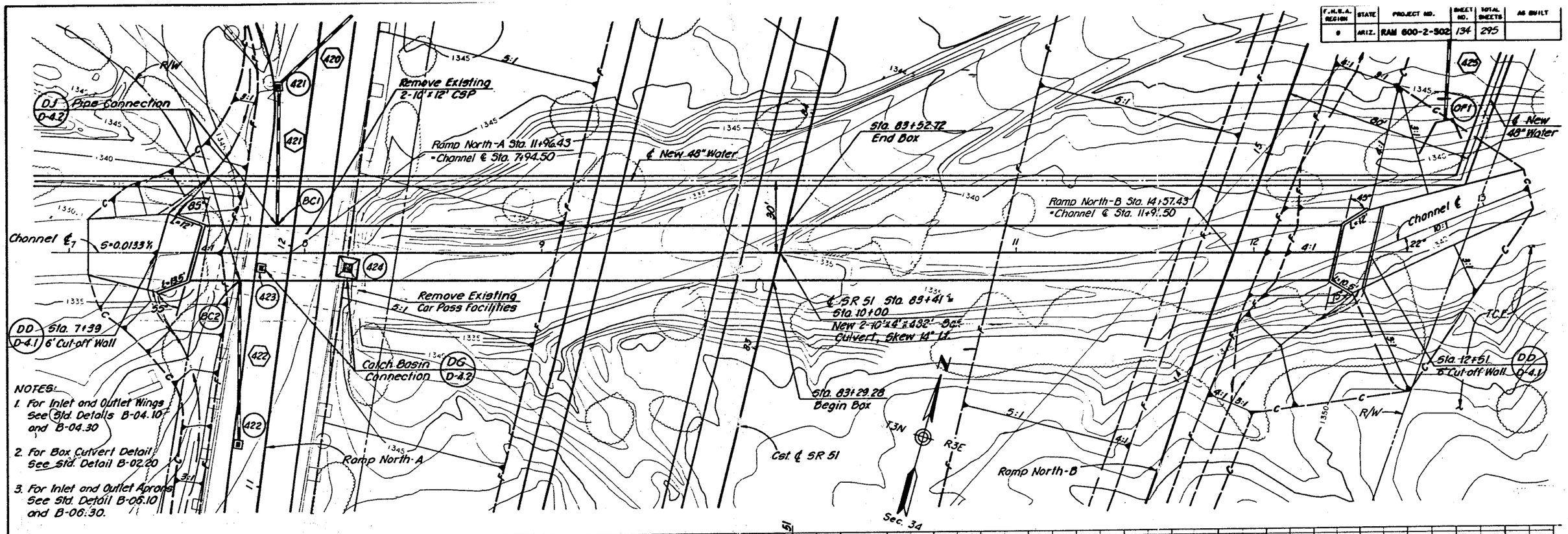
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-2.

51 MA 5 H0836 01 C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	134	295	



DESIGN	NAME	DATE
DESIGN	RJH	9/89
DRAWN	DES KAL	9/89
CHECKED	BGS	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

DREAMY DRAW
DRAINAGE PLAN & PROFILE

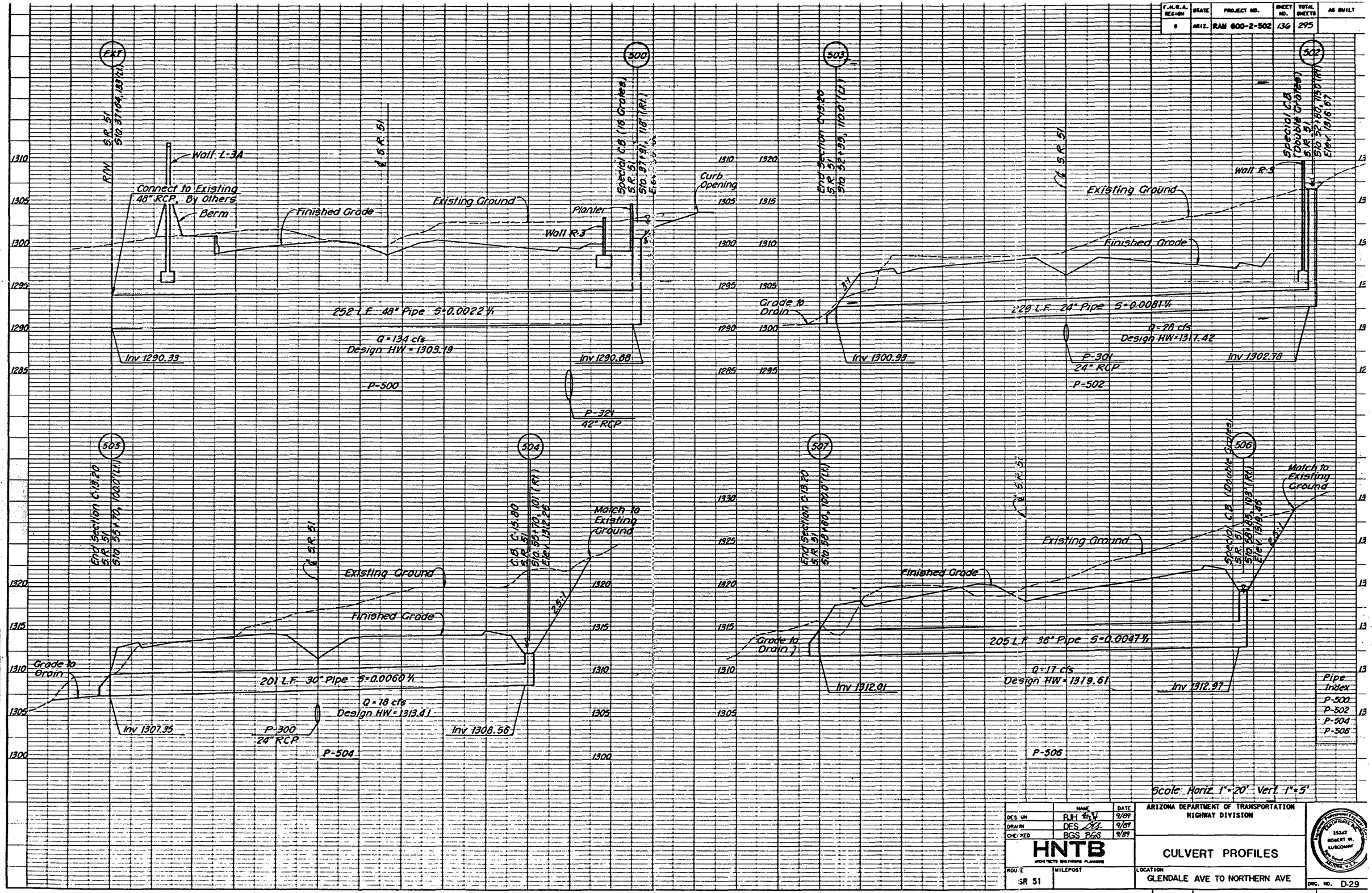
ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

DWG. NO. D-2.

51 MA 5 H0836 01 C

OF

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	136	295	



	NAME	DATE
DES. UN	RJH	9/89
DRAWN	DES	9/89
CHECKED	BGS	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

CULVERT PROFILES

ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

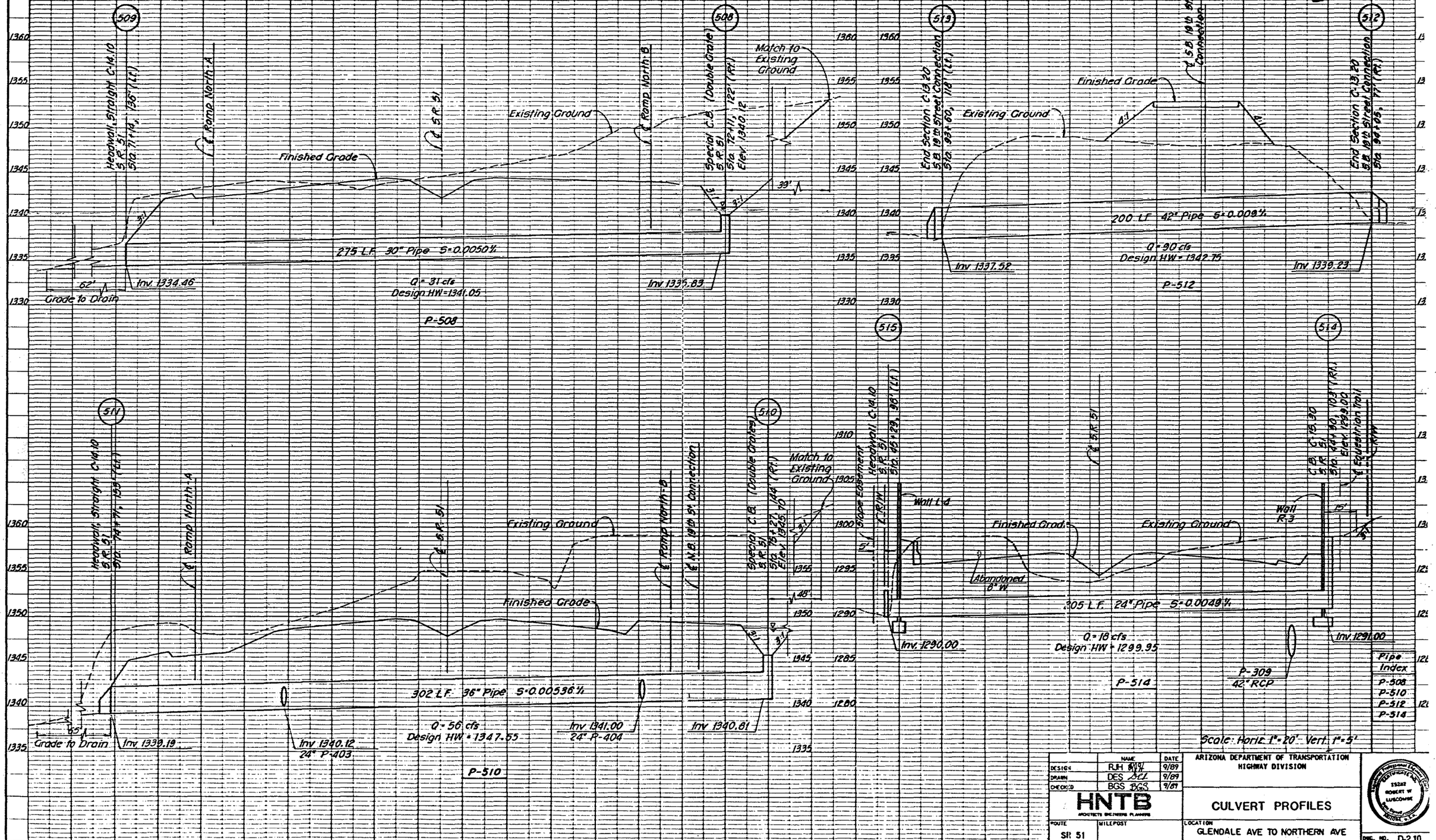
DWG. NO. D-29

51 MA 5 H0836 01 C

____ OF ____

DATE	LOCATION	REVISIONS	FINAL AS BUILT PLANS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	137	295	



	NAME	DATE
DESIGN	RJH	9/89
DRAWN	DES	9/89
CHECKED	BGS	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ROUTE: SR 51
MILEPOST:

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

CULVERT PROFILES

LOCATION: GLENDALE AVE TO NORTHERN AVE

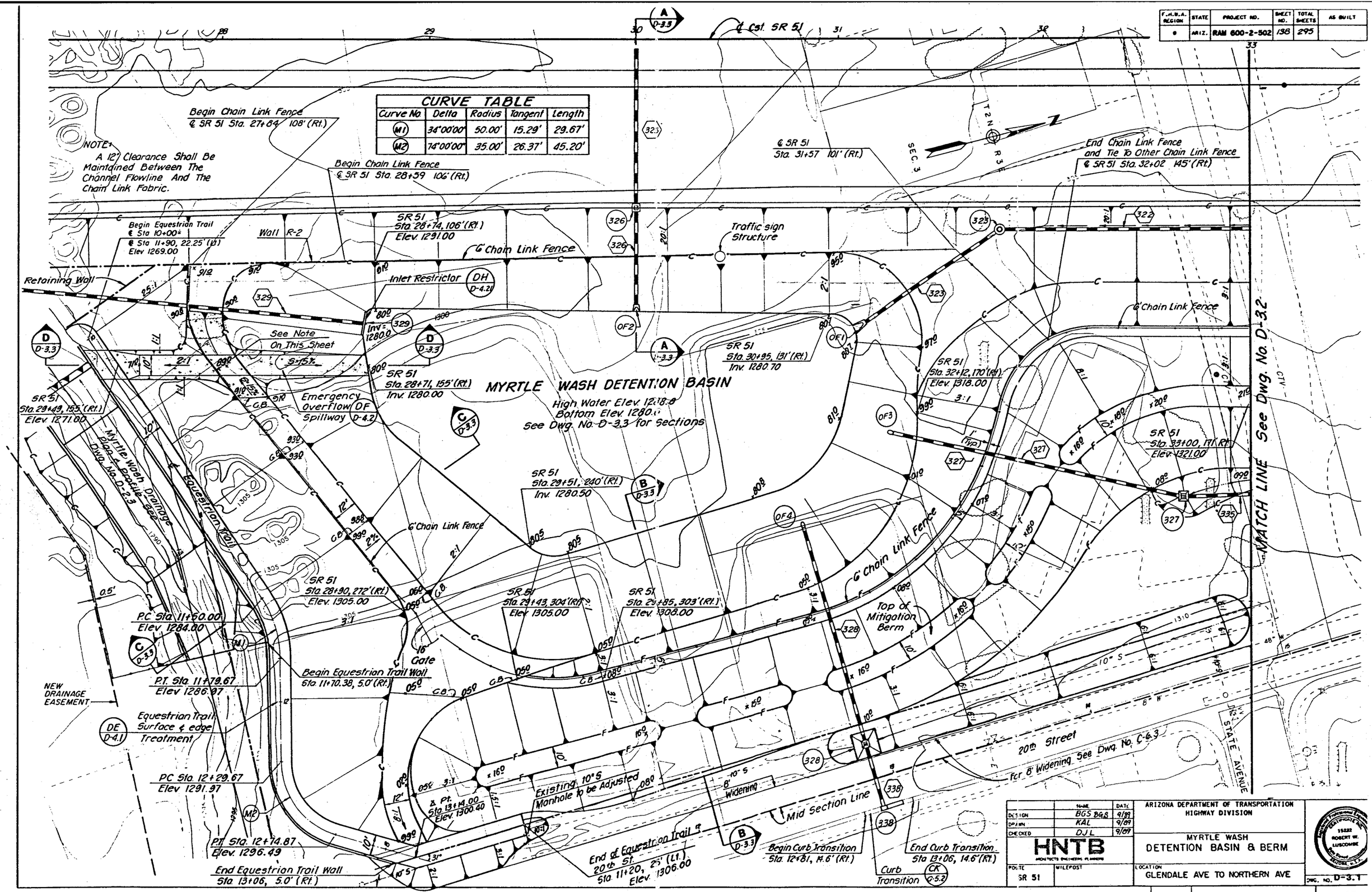
DWG. NO. D-2.10

51 MA 5 H0836 01 C

___ OF ___

DATE	LOCATION	REVISIONS	FINISHED PLANS	DATE	INITIAL

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	138	295	



CURVE TABLE

Curve No.	Delta	Radius	Tangent	Length
M1	34°00'00"	50.00'	15.29'	29.67'
M2	74°00'00"	35.00'	26.37'	45.20'

	NAME	DATE
DESIGN	BGS BGS	9/89
DRAWN	KAL	9/89
CHECKED	DJL	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ROUTE: SR 51
MILEPOST:

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MYRTLE WASH
DETENTION BASIN & BERM

LOCATION: GLENDALE AVE TO NORTHERN AVE

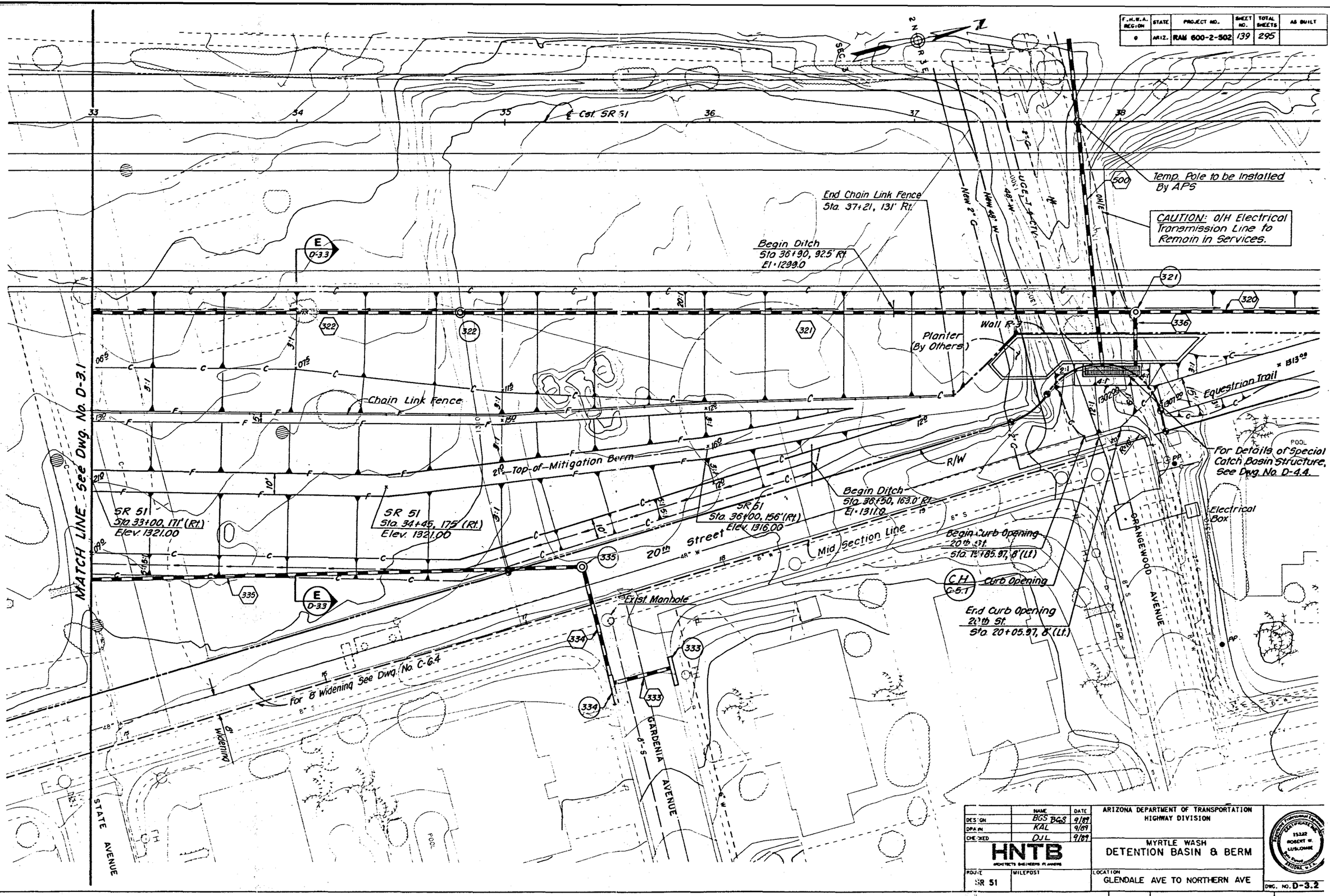
Registered Professional Engineer (Civil) CERTIFICATE NO. 15222 ROBERT W. LUSCOMBE Date Signed 9/29/89 ARIZONA, U.S.A.

DWG. NO. D-3.1

51 MA 5 H0836 01 C

___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM 600-2-502	139	295	



	NAME	DATE
DESIGN	BGS BGS	9/89
DRAWN	KAL	9/89
CHECKED	DJL	9/89

HNTB
ARCHITECTS ENGINEERS PLANNERS

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MYRTLE WASH
DETENTION BASIN & BERM

ROUTE: SR 51
MILEPOST:
LOCATION: GLENDALE AVE TO NORTHERN AVE

15222 ROBERT W. LUBLOMSKI ARIZONA U.S.A.

DWG. NO. D-3.2

51 MA 5 H0836 01 C

___ OF ___

APPENDIX D

DRAINAGE DESIGN CALCULATIONS

Appendix D

Drainage Design Calculations

1. Pavement Drainage

   a. HEC12 Outputs
   b. T411 Outputs
   c. HGL Outputs

2. Myrtle Wash Detention Basin-HEC-1 Output

3. Myrtle Wash Crossing

   a. HEC-2, Output-Subcritical Run
   b. HEC-2, Output-Supercritical Run
   c. Energy Dissipator Design

4. Cross Box Culverts and Pipes

1. PAVEMENT DRAINAGE

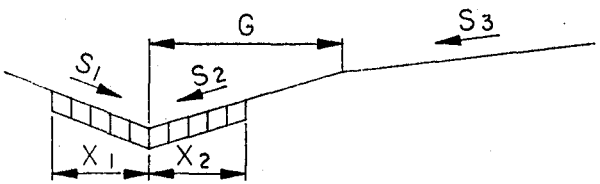
HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF

ROADWAY INLET ANALYSIS
FHWA HEC-12

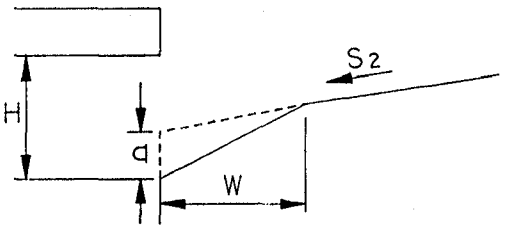
Made by	Date	Sheet No.
Checked by	Date	___ of ___

Prog. Code	Job No.	Max. d-Ft.	I In/hr	n	Description	By
HECI2						

Inlet Id.	Lev.	Type	Sub Type	Areas 1 Ac.	Areas 1 C	Areas 2 Ac.	Areas 2 C	Areas 3 Ac.	Areas 3 C	Qo cfs	So ft/ft	S_1 ft/ft	S_2 ft/ft	G ft	S_3 ft/ft	Depress. a. in.	Depress. W ft.	Opening X_1 ft.	Opening X_2 ft.	Opening L ft.	Opening H in.	Aef $Ft.^2$	Pef L.F.	Location



GRATE INLET



CURB INLET

INPUT INSTRUCTIONS

UNDER "LEV", FILL IN 9 FOR 1st INLET IN EACH LINE
LEAVE BLANK FOR OTHER INLETS

UNDER "TYPE", FILL IN 9 FOR GRATE INLET
FILL IN 8 FOR CURB INLET
FILL IN 7 FOR COMBINATION INLET
FILL IN 6 FOR SLOTTED DRAIN
FILL IN X TO SAVE TOTAL Q

FOR SUBTYPE , SEE INSTRUCTION MANUAL

L = LENGTH OF GRATE OR CURB OPENING

ROADWAY INLET ANALYSIS
HEC-12
INPUT PARAMETERS FOR STANDARD INLETS

INLETS ON GRADE

Id. Location Type Subtype	Level	A1 A2 A3 Qa	C1 C2 C3 Qo	So S1 S2 S3	G a W	X1 X2 L H	Aef Pef
101 UC-01 9 Grate 1 P-1-7/8	9	0.05 0.05 . 	0.95 0.70 . 	0.0030 0.3333 0.0667 0.0200	2.50 0.00 0.00 	1.00 2.00 1.75 	
103 UC-07 9 Grate 1 P-1-7/8	9	0.05 0.05 . 	0.95 0.70 . 	0.0030 . 0.0667 0.0200	2.50 0.00 0.00 	0.00 2.00 1.75 	
105 C-15.30 9 Grate 1 P-1-7/8	9	0.05 0.05 . 	0.95 0.70 . 	0.0030 . 0.0667 0.0200	2.50 0.00 0.00 	0.00 2.10 1.67 	
107 C-15.10 7 Combination 1 P-1-7/8	9	0.05 0.05 . 	0.95 0.70 . 	0.0030 . 0.0667 0.0200	2.50 0.00 0.00 	0.00 1.63 3.34 	
109 UC-02 6 Slotted Drain	9	0.05 0.05 . 	0.95 0.70 . 	0.0030 0.3333 0.0667 0.0200	2.50 	 8.00 0.00	

INLETS AT LOW POINT

Id. Location Type Subtype	Level	A1 A2 A3 Qa	C1 C2 C3 Qo	So S1 S2 S3	G a W	X1 X2 L H	Aef Pef
102 UC-01 9 Grate		0.05 0.05 . 	0.95 0.70 . 	. 0.3333 0.0667 0.0200	2.50 	 	3.3 4.8
104 UC-07 9 Grate		0.05 0.05 . 	0.95 0.70 	. . 0.0667 0.0200	2.50 	 	4.4 3.8
106 C-15.30 9 Grate		0.05 0.05 . 	0.95 0.70 	. . 0.0667 0.0200	2.50 	 	2.4 3.9
108 C-15.10 7 Combination		0.05 0.05 . 	0.95 0.70 	. . 0.0667 0.0200	2.50 	 	4.3 6.9

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/07/89
Input File: USERDISK5:[PHX.3089.HEC12]NORTHCSPURH12.IN;2 Made By: sla
13089 21 01 Northern Ave. Ramp C Spur Page 1
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
406	9	0.02	0.95	0.0064	2.00	0.00									
3+75.00		0.02	0.70	.	0.00	1.63									
7 Combination		.		0.0833	0.00	3.34		0.14	0.14	0.00	0.13	0.00	1.54	1.42	0
1 P-1-7/8				0.0300											
407		0.03	0.95												
3+00.00		0.03	0.70												
X Save Q		.						0.21							
405	9	0.03	0.95	0.0064	2.00	0.00									
2+25.00		0.02	0.70	.	0.00	1.63									
7 Combination		.		0.0833	0.00	3.34		0.18	0.18	0.00	0.14	0.00	1.69	1.52	0
1 P-1-7/8				0.0300											
407		0.03	0.95	.	2.00		4.3				0.08	0.00	0.98	Weir - Grate	
3+00.00		0.05	0.70	.	0.00		6.9				0.16	0.00	1.89	Weir - Curb	
7 Combination		.		0.0833	0.00	3.34		0.48			Orifice condition for curb opening does not apply				
		0.21		0.0300		5.00									

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/07/89
Input File: USERDISK5:[PHX.3089.HEC12]NORTHCH12.IN;4 Made By: sla
13089 21 01 Northern Ave. Ramp C Page 1
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
408	9	0.12	0.95	0.0076		0.00									
17+65.00		0.07	0.70	.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.69	0.53	0.17	0.13	0.00	6.62	1.59	24
1 P-1-7/8				0.0200											
410		0.06	0.95												
1+11.00		0.03	0.70												
X Save Q		.						0.50							
409	9	0.03	0.95	0.0064		0.00									
1+61.00		0.01	0.70	.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.15	0.14	0.01	0.08	0.00	3.86	1.02	8
1 P-1-7/8				0.0200											
410		0.02	0.95	.			4.3				0.10	0.00	5.14	Weir - Grate	
1+11.00		0.03	0.70	.	0.00		6.9				0.20	0.00	9.96	Weir - Curb	
7 Combination		.		.	0.00	3.34		0.68			Orifice condition for curb opening does not apply				
		0.50		0.0200		5.00									

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/07/89
Input File: USERDISK5:[PHX.3089.HEC12]WENRINH12.IN;6 Made By: sla
13089 21 01 West Bound Northern Ave. at SR 51 Underpass Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
415	9	0.08	0.95	0.0072		0.00									
18+86.00		.		.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.44	0.36	0.08	0.11	0.00	5.65	1.39	18
1 P-1-7/8				0.0200											
414		0.03	0.95												
19+61.00		.													
X Save Q		.						0.25							
412		0.13	0.95	0.0075		0.00									
20+36.00		.		.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.80	0.59	0.21	0.14	0.00	7.00	1.63	26
1 P-1-7/8				0.0200											
414		.		.			4.3				0.08	0.00	3.94	Weir - Grate	
19+61.00		.		.	0.00		6.9				0.15	0.00	7.62	Weir - Curb	
7 Combination		.		.	0.00	3.34		0.46			Orifice condition for curb opening does not apply				
		0.25		0.0200		5.00									

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/07/89
Input File: USERDISK5:[PHX.3089.HEC12]EBNRTNH12.IN;8 Made By: sla
13089 21 01 East Bound Northern Ave. at SR 51 Underpass Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
420	9	0.10	0.95	0.0072		0.00									
18+86.00		.		.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.55	0.44	0.12	0.12	0.00	6.14	1.47	21
1 P-1-7/8				0.0200											
419		0.01	0.95												
19+61.00		.													
X Save Q		.						0.17							
417		0.11	0.95	0.0075		0.00									
20+36.00		.		.	0.00	1.63									
7 Combination		.		.	0.00	3.34		0.73	0.54	0.18	0.13	0.00	6.74	1.59	25
1 P-1-7/8				0.0200											
419		.		.			4.3				0.07	0.00	3.31	Weir - Grate	
19+61.00		.		.	0.00		6.9				0.13	0.00	6.41	Weir - Curb	
7 Combination		.		.	0.00	3.34		0.35			Orifice condition for curb opening does not apply				
		0.17		0.0200		5.00									

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/07/89
Input File: USERDISK5:[PHX.3089.HEC12]NORTHAH12.IN;4 Made By: sla
13089 21 01 Ramp North-A Page 1
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
422	9	0.37	0.95	0.0050	2.50	1.00									
11+15.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		1.50	1.21	0.28	0.27	0.80	7.49	1.84	19
1 P-1-7/8				0.0200											
423		0.05	0.95												
11+90.00		.													
X Save Q		.						0.49							
421	9	0.29	0.95	0.0050		0.00									
12+65.00		0.03	0.70	.	0.00	1.63									
7 Combination		.		.	0.00	3.34		1.26	0.88	0.38	0.18	0.00	8.96	1.57	30
1 P-1-7/8				0.0200											
423		0.05	0.95	.	2.50		3.3								
11+90.00		.		0.3333			4.8								
9 Grate		.		0.0668				1.07			0.18	0.53	2.98		
		0.49		0.0200											

Note: Weir Flow

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]SBHEC12.IN;5 Made By: sla
13089 21 01 Southbound S. R. 51 Page 1
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160 Checked By: BGB 8/22/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
FUT 88+93.00 9 Grate 1 P-1-7/8	9	0.65	0.95	0.0184 / . / 0.0668 / 0.0100	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		2.63	1.71	0.92	0.26	0.00	11.70	3.05	35
SD3 75+12.00 6 Slotted Drain		2.57	0.95	0.0141 / 0.3333 / 0.0666 / 0.0400	2.50	16.00 / 0.00		11.32	7.64	3.68	0.46	1.39	9.94	4.75	33
								Note: L= 34.45 Ft. for 100% Interception							
403 75+12.00 9 Grate 1 P-1-7/8				0.0141 / 0.3333 / 0.0666 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		3.68	2.86	0.82	0.31	0.94	6.20	3.68	22
400 66+75.00 9 Grate 1 P-1-7/8		1.84	0.95	0.0184 / 0.3333 / 0.0664 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		8.26	5.43	2.84	0.40	1.19	8.28	4.89	34
302 52+25.00 9 Grate 1 P-1-7/8		2.92	0.95	0.0188 / 0.3333 / 0.0664 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		14.66	8.27	6.39	0.48	1.45	10.42	5.63	44
304 49+75.00 9 Grate 1 P-1-7/8		0.46	0.95	0.0188 / 0.3333 / 0.0664 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		8.25	5.43	2.82	0.40	1.19	8.24	4.92	34
307 46+50.00 9 Grate 1 P-1-7/8		0.60	0.95	0.0101 / . / 0.0668 / 0.0400	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		5.24	3.23	2.02	0.40	0.00	8.29	3.60	38
310 44+62.00 9 Grate 1 P-1-7/8		0.35	0.95	0.0028 / . / 0.0668 / 0.0400	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		3.43	2.21	1.22	0.43	0.00	9.06	1.99	36
312 X Save Q		0.14	0.95					1.79							

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]SBHEC12.IN;5 Made By: sla
13089 21 01 Southbound S. R. 51 Page 2
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
318	9	0.87	0.95	0.0092	2.50	0.00									
41+50.00		.		.	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		3.52	2.41	1.11	0.35	0.00	7.16	3.17	32
1 P-1-7/8				0.0400											
311		0.48	0.95	0.0027	2.50	0.00									
43+12.00		.		.	0.00	2.00									
9 Grate		.		0.0666	0.00	1.75		3.05	2.03	1.02	0.41	0.00	8.71	1.91	34
1 P-1-7/8				0.0400											
312		0.14	0.95	.	2.50		4.4								
43+87.26		.		.			3.8								
9 Grate		.		0.0664				3.38			0.44	0.00	9.46		
		1.79		0.0400											

Note: Weir Flow

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]SBGLENH12.IN;10 Made By: SLA
13089 21 01 Southbound S.R. 51 & Glendale C Ramp Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked By: BGS 8/22/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
325 / 30+00.00 / 9 Grate / 1 P-1-7/8	9	1.27 / . / .	0.95	0.0179 / . / 0.0668 / 0.0400	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		7.02	4.20	2.82	0.40	0.00	8.31	4.79	40
102 / 23+05.00 / 9 Grate / 1 P-1-7/8		1.35 / . / .	0.95	0.0381 / . / 0.0666 / 0.0201	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		10.29	5.07	5.22	0.37	0.00	12.44	6.05	51
105 / 21+50.00 / 9 Grate / 1 P-1-7/8		0.36 / . / .	0.95	0.0268 / . / 0.0666 / 0.0105	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		7.21	3.25	3.96	0.32	0.00	17.11	4.21	55
110 / X Save Q		0.44 / . / .	0.95					6.39							
324 / 30+00.00 / 9 Grate / 1 P-1-7/8	9	0.32 / . / .	0.95	0.0184 / . / 0.0668 / 0.0200	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		1.77	1.45	0.32	0.24	0.00	6.22	3.32	18
104 / 21+50.00 / 9 Grate / 1 P-1-7/8		0.34 / . / .	0.95	0.0377 / . / 0.0668 / 0.0200	2.50 / 0.00 / 0.00	0.00 / 2.00 / 1.75		2.20	1.86	0.34	0.23	0.00	5.70	4.67	15
110 / 9+25.00 / 9 Grate / 1 P-1-7/8		0.08 / . / . / 6.39	0.95	0.0258 / 0.3333 / 0.0664 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		7.17	5.05	2.12	0.36	1.07	7.27	5.39	30
111 / 6+75.00 / 9 Grate / 1 P-1-7/8		0.24 / . / .	0.95	0.0064 / 0.3333 / 0.0668 / 0.0400	2.50 / 0.00 / 0.00	1.00 / 2.00 / 1.75		3.45	2.57	0.88	0.35	1.06	7.15	2.67	26
113 / X Save Q		0.07 / . / .	0.95					1.27							

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]SBGLENH12.IN;10 Made By: SLA
13089 21 01 Southbound S.R. 51 & Glendale C Ramp Page 2
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
115	9	0.20	0.95	0.0219	2.50	0.00									
3+42.00		.		.	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		1.11	1.04	0.06	0.20	0.00	3.46	3.51	6
1 P-1-7/8				0.0372											
114		0.33	0.95	0.0072	2.50	0.00									
5+25.00		.		.	0.00	2.00									
9 Grate		.		0.0664	0.00	1.75		1.89	1.48	0.40	0.30	0.00	5.77	2.52	21
1 P-1-7/8				0.0400											
113		0.07	0.95	.	2.50		4.4								
6+00.00		.		.			3.8								
9 Grate		.		0.0664				2.06			0.32	0.00	6.34		
		1.27		0.0400											

Note: Weir Flow

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]SBUPH12.IN;4 Made By: sla
13089 21 01 Southbound S.R. 51 to Glendale Underpass Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked By: BGR 8/22/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
108	9	0.21	0.95	0.0373		0.00									
19+45.00		.		.	0.00	2.00									
9 Grate		.		.	0.00	1.75		1.16	0.66	0.50	0.10	0.00	7.69	2.96	43
1 P-1-7/8				0.0133											
206		0.48	0.95	0.0390		0.00									
16+80.00		.		.	0.00	2.00									
9 Grate		.		.	0.00	1.75		3.15	2.14	1.01	0.21	0.00	5.95	4.95	32
1 P-1-7/8				0.0360											
210		0.62	0.95	0.0214		0.00									
13+15.00		.		.	0.00	2.00									
9 Grate		.		.	0.00	1.75		4.44	2.60	1.84	0.27	0.00	7.55	4.31	41
1 P-1-7/8				0.0361											

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]NBHEC12.IN;11 Made By: sla
13089 21 01 North Bound S. R. 51 Page 1
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160 Checked By: BGB 8/22/89

Id. Location Type Subtype	Level	A1 A2 A3 Qa	C1 C2 C3 Qo	So S1 S2 S3	G a W	X1 X2 L H	Aef Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
427 88+00.00 9 Grate 1 P-1-7/8	9	0.80	0.95	0.0105 . 0.0668 0.0200	2.50 0.00 0.00	0.00 2.10 1.67		3.24	2.06	1.18	0.32	0.00	9.90	2.87	36
S04 75+75.00 6 Slotted Drain		2.28	0.95	0.0135 0.3333 0.0668 0.0200	2.50	24.00 0.00		10.41	8.69	1.72	0.41	1.24	14.87	3.98	17
								Note: L= 37.95 Ft. for 100% Interception							
404 75+75.00 9 Grate 1 P-1-7/8				0.0135 0.3333 0.0668 0.0200	2.50 0.00 0.00	1.00 2.00 1.75		1.72	1.48	0.24	0.24	0.71	6.06	2.87	14
FUT 72+20.00 8 Curb		0.89	0.95	0.0140 . 0.0668 0.0200	2.50 2.00 2.00	11.20		3.84	3.80	0.04	0.32	0.00	10.03	3.34	1
								Note: L= 12.19 Ft. for 100% Interception							
FTR 69+50.00 9 Grate 1 P-1-7/8		0.55	0.95	0.0135 0.3333 0.0668 0.0197	2.50 0.00 0.00	1.00 2.00 1.75		2.27	1.82	0.45	0.26	0.78	7.22	2.98	20
00S 57+25.00 6 Slotted Drain		2.32	0.95	0.0164 . 0.0200		40.00 0.00		9.84	8.72	1.12	0.31	0.00	15.49	4.10	11
								Note: L= 57.09 Ft. for 100% Interception							
300 57+00.00 9 Grate 1 P-1-7/8		0.04	0.95	0.0164 . 0.0200	0.00 0.00	0.00 2.00 1.75		1.28	0.79	0.49	0.14	0.00	7.22	2.47	38
308 46+50.00 9 Grate 1 P-1-7/8		1.96	0.95	0.0101 0.3333 0.0668 0.0400	2.50 0.00 0.00	1.00 2.00 1.75		8.43	5.22	3.21	0.44	1.33	9.43	3.90	38
314 44+62.00 9 Grate 1 P-1-7/8		0.35	0.95	0.0028 0.3333 0.0668 0.0400	2.50 0.00 0.00	1.00 2.00 1.75		4.63	3.11	1.52	0.45	1.35	9.60	2.07	33

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]NBHEC12.IN;11 Made By: sla
13089 21 01 North Bound S. R. 51 Page 2
Maximum Depth 0.50 Ft. Intensity 4.26 In./hr. Manning's n 0.0160

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
316		0.14	0.96												
X Save Q		. .						2.09							
319	9	0.87	0.95	0.0092	2.50	1.00									
41+50.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		3.52	2.67	0.85	0.33	1.00	6.67	3.08	24
1 P-1-7/8				0.0400											
315		0.48	0.95	0.0027	2.50	1.00									
43+12.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0666	0.00	1.75		2.79	2.09	0.70	0.38	1.14	7.85	1.82	25
1 P-1-7/8				0.0400											
316		0.14	0.96	.	2.50		3.3								
43+87.26		.		0.3333			4.8								
9 Grate		.		0.0664				3.36			0.38	1.14	7.82		
		2.09		0.0400											

Note: Weir Flow

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/06/89
Input File: USERDISK5:[PHX.3089.HEC12]NBGLENH12.IN;11 Made By: sla
13089 21 01 Northbound S.R. 51 & Glendale D Ramp Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
326	9	1.27	0.95	0.0151	2.50	1.00									
30+00.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		7.02	4.44	2.58	0.38	1.13	9.53	4.15	37
1 P-1-7/8				0.0300											
S27		0.73	0.95	0.0284	2.50										
26+25.00		.		0.3333											
6 Slotted Drain		.		0.0668		16.00		6.61	4.34	2.27	0.32	0.97	10.27	4.88	34
				0.0200		0.00									
								Note: L= 35.72 Ft. for 100% Interception							
327		.		0.0284	2.50	1.00									
26+25.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		2.27	1.97	0.30	0.23	0.69	5.71	4.11	13
1 P-1-7/8				0.0200											
101		0.69	0.95	0.0120	2.50	1.00									
23+05.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0293	0.00	1.75		4.11	2.08	2.03	0.25	0.75	11.32	2.93	49
1 P-1-7/8				0.0200											
106		0.20	0.95	0.0264	2.50	0.00									
9+85.00		.		.	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		3.13	2.26	0.88	0.27	0.00	7.77	4.19	28
1 P-1-7/8				0.0199											
203		0.11	0.95	0.0091	2.50	0.00									
8+00.00		.		.	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		1.48	1.18	0.31	0.25	0.00	6.91	2.39	21
1 P-1-7/8				0.0199											
205		0.05	0.95												
X Save Q		.						0.59							
201	9	0.52	0.95	0.0196	2.50	1.00									
3+50.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		2.88	2.13	0.74	0.26	0.77	9.48	3.37	26
1 P-1-7/8				0.0130											
202		0.22	0.95	0.0085	2.50	0.00									
6+50.00		.		.	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		1.96	1.41	0.54	0.28	0.00	8.15	2.42	28
1 P-1-7/8				0.0200											

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/06/89
Input File: USERDISK5:[PHX.3089.HEC12]NBGLENH12.IN;11 Made By: sla
13089 21 01 Northbound S.R. 51 & Glendale D Ramp Page 2
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
205		0.05	0.95	.	2.50		4.4								
7+25.00		.		.			3.8								
9 Grate		.		0.0668				1.40			0.25	0.00	6.53		
		0.59		0.0200											

Note: Weir Flow

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/21/89
Input File: USERDISK5:[PHX.3089.HEC12]NBUPH12.IN;4 Made By: SLA
13089 21 01 North Bound S.R. 51 to Glendale underpass Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked By: BGS 8/22/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
107	9	0.70	0.95	0.0432	2.50	1.00									
19+45.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		3.87	3.12	0.75	0.26	0.77	6.61	5.38	19
1 P-1-7/8				0.0220											
207		0.42	0.95	0.0390	2.50	1.00									
16+80.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		3.07	2.70	0.37	0.25	0.74	4.50	5.28	12
1 P-1-7/8				0.0400											
208		0.36	0.95	0.0292	2.50	1.00									
14+45.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		2.36	2.12	0.24	0.24	0.71	4.25	4.46	10
1 P-1-7/8				0.0400											
211		0.21	0.95	0.0198	2.50	1.00									
13+15.00		.		0.3333	0.00	2.00									
9 Grate		.		0.0668	0.00	1.75		1.40	1.32	0.08	0.21	0.63	3.59	3.44	6
1 P-1-7/8				0.0400											

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/10/89
Input File: USERDISK5:[PHX.3089.HEC12]CWAH12.IN;2 Made By: PDI
11184 21 01 CACTUS WREN & AURELIUS CATCH BASIN SPACING Page 1
Maximum Depth 0.50 Ft. Intensity 5.00 In./hr. Manning's n 0.0150 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
121	9	4.95	0.43	0.0268	1.40										
STA. 10+75		.		.	2.00										
8 Curb		.		0.0417	1.4224.79			10.64	9.32	1.32	0.28	0.00	18.30	4.79	12
				0.0131											
								Note: L= 36.12 Ft. for 100% Interception							
122		.													
STA. 8+90		.													
X Save Q		.						1.32							
122	9	2.71	0.48	.	1.40										
STA. 8+90		.		.	2.00										
8 Curb		.		0.0417	1.4224.79			7.82			0.25	0.00	15.97		
		1.32		0.0131		5.00									
								Note: Weir Flow							

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/10/89
Input File: USERDISK5:[PHX.3089.HEC12]MYRTLEAVE H12.IN;2 Made By: BGS
13089 21 03 MYRTLE AVENUE CATCH BASIN SIZING Page 1
Maximum Depth 0.50 Ft. Intensity 5.00 In./hr. Manning's n 0.0150 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
330	9	6.39	0.47	0.0219	1.40										
STA. 13+30		.		.	2.00										
8 Curb		.		0.0417	1.42	24.79		15.02	13.07	1.95	0.38	0.00	14.70	5.64	13
				0.0245											
								Note: L= 36.53 Ft. for 100% Interception							
332		.													
		.													
X Save Q		.						1.95							
331	9	6.38	0.47	0.0230	1.40										
STA. 13+30		.		.	2.00										
8 Curb		.		0.0417	1.42	24.79		14.99	12.50	2.49	0.36	0.00	16.72	5.43	17
				0.0196											
								Note: L= 39.27 Ft. for 100% Interception							
332		0.23	0.95	.	1.40										
STA. 12+11		0.27	0.45	.	2.00										
8 Curb		.		0.0417	1.42	10.05		6.14			0.36	0.00	13.27		
		1.95		0.0250		5.00									
								Note: Weir Flow							

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 07/10/89
Input File: USERDISK5:[PHX.3089.HEC12]GARDENIA.IN;1 Made By: BJH
13089 21 03 GARDENIA AVE CATCH BASINS Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked by: BGS Date: 7/11/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
333	9	4.02	0.47	0.0400	2.00										
N SIDE GAR		.		.	2.00										
8 Curb		.		0.0833	2.00	16.00		11.00	8.65	2.35	0.38	0.00	12.83	6.21	21
				0.0200											
								Note: L= 27.77 Ft. for 100% Interception							
327		.													
		.													
X Save Q		.						2.35							
334	9	4.02	0.47	0.0400	2.00										
S SIDE GAR		.		.	2.00										
8 Curb		.		0.0833	2.00	16.00		11.00	8.65	2.35	0.38	0.00	12.83	6.21	21
				0.0200											
								Note: L= 27.77 Ft. for 100% Interception							
327		.													
		.													
X Save Q		.						4.69							
		2.35													

HEC12 (March 1984 - Revised 04/15/88) Pavement Drainage Calculations 08/22/89
Input File: USERDISK5:[PHX.3089.HEC12]20THSTH12.IN;4 Made By: sla
13089 21 03 20th Street and State Street Drainage Area Page 1
Maximum Depth 0.50 Ft. Intensity 5.82 In./hr. Manning's n 0.0160 Checked BY BGB 8/22/89

Id. / Location / Type / Subtype	Level	A1 / A2 / A3 / Qa	C1 / C2 / C3 / Qo	So / S1 / S2 / S3	G / a / W	X1 / X2 / L / H	Aef / Pef	* * * Q - cfs * * * Total	Inter.	Bypass	Depth -ft.	Spread - ft. 1	2	Velocity -fps.	% Bypass
338	9	3.08	0.95	0.0080	1.50										
12+89		:		:	3.00										
8 Curb		:		0.0600	2.00	10.87		17.03	9.18	7.85	0.41	0.00	33.27	3.05	46
				0.0100											

Note: L= 31.10 Ft. for 100% Interception

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF

PROGRAM 411
HYDRAULIC DESIGN OF STORM SEWERS

MADE BY	DATE
CHECKED	DATE
PAGE	OF

PROG. CODE	PAGE NO.	LINE NO.	JOB	SEG.	SUB.	REF.	PROJECT IDENTIFICATION	BY	DATE
411		01							

CD CODE	PAGE NO.	LINE NO.	INTENSITY CURVE NO.	CITY NAME	DROP (FT.)	DISALLOWED PIPE SIZE (IN.)	MIN. VELOCITY < 2' DIA.	MIN. VELOCITY 2'-4' DIA.	MIN. VELOCITY > 4' DIA.	MIN. SLOPE 1'-1.5' DIA.	MIN. SLOPE 1.75'-2.25' DIA.	MIN. SLOPE 2.5'-3' DIA.	MIN. SLOPE 3.5'-4.5' DIA.	MIN. SLOPE > 4.5' DIA

CARD CODE	PAGE NO.	LINE NO.	RUN NO.	FROM	TO	END SYSTEM	FREQ. (YRS)	LGTH (FT.)	MIN. DIA (INCH)	TYPE	"N"	ZONE I AREA (ACRE)	ZONE I COEFF.	ZONE II AREA (ACRE)	ZONE II COEFF.	ZONE III AREA (ACRE)	ZONE III COEFF.	CONCEN. TIME (MIN.)	UPPER TOP OF STRUCTURE ELEVATION (FT.)	UPPER MIN. COVER (FT.)	LOWER TOP OF STRUCTURE ELEVATION (FT.)	LOWER MIN. COVER (FT.)	LAST RUN "Z"
3		0.5																					
		1.0																					
		1.5																					
		2.0																					
		2.5																					
		3.0																					
3		3.5																					

CARD CODE	PAGE NO.	LINE NO.	RUN NO.	Q_A (CFS)	MAX. FLOW LINE ELEVATION (UPPER) (FT.)	CROWN CONTROL ELEVATION (FT.)	CROWN CONTROL DIST. (FT.)	FLOW LINE CONTROL ELEVATION (FT.)	FLOW LINE CONTROL DIST. (FT.)	ALTERNATE DESIGN CHECK	ALTERNATE DESIGN FREQ. (YRS)	ALTERNATE DESIGN MIN. DIA (INCH)	ALTERNATE DESIGN TYPE	ALTERNATE DESIGN "N"	ALTERNATE DESIGN Q_A (CFS)	LOCATIONS OR COMMENTS
4		0.5														
		1.0														
		1.5														
		2.0														
		2.5														
		3.0														
4		3.5														

HY113-0577-2M

ADDITIONAL 3 AND 4 CARDS ON OTHER SIDE

CARD CODE	PAGE NO.	LINE NO.	RUN NO.	FROM	TO	END SYSTEM	FREQ. (YRS)	LGTH (FT.)	MIN. DIA (INCH)	TYPE	"N"	ZONE I AREA (ACRE)	ZONE I COEFF.	ZONE II AREA (ACRE)	ZONE II COEFF.	ZONE III AREA (ACRE)	ZONE III COEFF.	CONCEN. TIME (MIN.)	UPPER TOP OF STRUCTURE ELEVATION (FT.)	UPPER MIN. COVER (FT.)	LOWER TOP OF STRUCTURE ELEVATION (FT.)	LOWER MIN. COVER (FT.)	LAST RUN "Z"
1		5	10		15		20	25	30			35	40	45		50	55		60	65	70	75	80
3		4.0																					
		4.5																					
		5.0																					
		5.5																					
		6.0																					
		6.5																					
		7.0																					
		7.5																					
		8.0																					
		8.5																					
3																							

CARD CODE	PAGE NO.	LINE NO.	RUN NO.	Q_A (CFS)	MAX. FLOW LINE ELEVATION (UPPER) (FT.)	CROWN CONTROL ELEVATION (FT.)	CROWN CONTROL DIST. (FT.)	FLOW LINE CONTROL ELEVATION (FT.)	FLOW LINE CONTROL DIST. (FT.)	ALTERNATE DESIGN CHECK	ALTERNATE DESIGN FREQ. (YRS)	ALTERNATE DESIGN MIN. DIA (INCH)	ALTERNATE DESIGN TYPE	ALTERNATE DESIGN "N"	ALTERNATE DESIGN Q_A (CFS)	LOCATIONS OR COMMENTS
1		5	10		15	20	25	30	35	40		45		50	55	60 65 70 75 80
4		4.0														
		4.5														
		5.0														
		5.5														
		6.0														
		6.5														
		7.0														
		7.5														
		8.0														
		8.5														
4																

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-01 Ref. 0001 XSQ PK HWY GLENDALE TI SYSTEM TO OCOTILLA DETEN. PHOENIX 0X By: BJH Date 06/19/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]OCT_95.IN;1 Checked by: BGB Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	05	P-100	100	101	0	10.0	15.	24.	2	.012	0.00	.95	0.18	.70	0.00	.00	10.	1273.87	2.00	1273.87	2.00	
03	01	10	P-101	101	102	0	10.0	192.	24.	2	.012	0.69	.95	0.00	.70	0.00	.00	10.	1273.87	2.00	1273.70	2.00	
03	01	15	P-102	102	105	0	10.0	152.	24.	2	.012	0.40	.95	0.00	.70	0.00	.00	10.	1273.70	2.00	1268.71	2.00	
03	01	25	P-104	104	105	0	10.0	24.	24.	2	.012	0.24	.95	0.00	.70	0.00	.00	10.	1267.94	2.00	1268.71	2.00	
03	01	30	P-105	105	109	0	10.0	206.	24.	2	.012	0.36	.95	0.00	.70	0.00	.00	10.	1268.71	2.00	1263.17	2.00	
03	01	35	P-106	106	107	0	10.0	49.	24.	2	.012	0.20	.95	0.00	.70	0.00	.00	10.	1260.80	2.00	1260.58	2.00	
03	01	40	P-107	107	108	0	10.0	77.	24.	2	.012	0.71	.95	0.00	.70	0.00	.00	10.	1260.58	2.00	1259.51	2.00	
03	01	45	P-108	108	109	0	10.0	96.	24.	2	.012	0.20	.95	0.00	.70	0.00	.00	10.	1259.51	2.00	1263.17	2.00	
03	01	50	P-109	109	110	0	10.0	127.	24.	2	.012	0.00	.95	0.00	.70	0.00	.00	10.	1263.17	2.00	1259.39	2.00	
03	01	55	P-110	110	111	0	10.0	250.	24.	2	.012	0.24	.95	0.00	.70	0.00	.00	10.	1259.39	2.00	1255.61	2.00	
03	01	60	P-111	111	113	0	10.0	75.	24.	2	.012	0.07	.95	0.00	.70	0.00	.00	10.	1255.61	2.00	1255.42	2.00	
03	01	65	P-112	112	113	0	10.0	51.	24.	2	.012	0.00	.95	0.92	.70	0.00	.00	10.	1257.09	2.00	1255.42	2.00	
03	01	70	P-113	113	114	0	10.0	75.	24.	2	.012	0.07	.95	0.00	.70	0.00	.00	10.	1255.42	2.00	1255.67	2.00	
03	01	75	P-114	114	EXT	0	10.0	183.	24.	2	.012	0.53	.95	0.00	.70	0.00	.00	10.	1255.67	3.03	1267.00	14.37	Z

INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]OCT_95.IN;1 Checked by:_____ Date:_____

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	05	P-100	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	10	P-101	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	15	P-102	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	25	P-104	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	30	P-105	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	35	P-106	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	40	P-107	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	45	P-108	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	50	P-109	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	55	P-110	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	60	P-111	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	65	P-112	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	70	P-113	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	75	P-114	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	1249.50	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-01 Ref. 0001 XSQ PK HWY GLENDALE TI SYSTEM TO OCOTILLA DETEN. PHOENIX 0X By: BJH Date 06/19/89
Number of Pipes in system = 14

Input File = USERDISK5:[PHX.3089.T411]OCT_95.IN;1 Checked by:_____ Date:_____

Output data for conversion to PL412: USERDISK5:[PHX.3089.T411]OCT_95.XPL;3

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-100	100	101	15.	0.18	0.13	10.00	4.26	0.54	24	0.241	0.13	12.03	1.93	0.29	1269.62	1269.58	2.00	2.04
P-101	101	102	192.	0.87	0.78	10.13	4.24	3.32	24	0.240	0.98	12.01	3.27	0.72	1269.58	1269.12	2.04	2.33
P-102	102	105	152.	1.27	1.16	11.11	4.11	4.78	24	3.069	0.28	42.95	9.01	0.45	1269.12	1264.46	2.33	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-104	104	105	24.	0.24	0.23	10.00	4.26	0.97	24	0.240	0.17	12.01	2.30	0.38	1263.69	1263.63	2.00	2.83
P-105	105	109	206.	1.87	1.73	11.39	4.08	7.06	24	2.289	0.38	37.09	9.09	0.59	1263.63	1258.92	2.83	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-106	106	107	49.	0.20	0.19	10.00	4.26	0.81	24	0.449	0.30	16.43	2.71	0.30	1256.55	1256.33	2.00	2.00
P-107	107	108	77.	0.91	0.86	10.30	4.22	3.65	24	1.390	0.20	28.90	6.29	0.48	1256.33	1255.26	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-108	108	109	96.	1.11	1.05	10.50	4.19	4.42	24	0.240	0.45	12.01	3.53	0.84	1255.26	1255.03	2.00	5.89
P-109	109	110	127.	2.98	2.79	11.77	4.03	11.22	24	0.241	0.49	12.03	4.35	1.53	1255.03	1254.72	5.89	2.42
P-110	110	111	250.	3.22	3.01	12.25	3.96	11.94	24	1.346	0.48	28.45	8.66	0.90	1254.72	1251.36	2.42	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-111	111	113	75.	3.29	3.08	12.74	3.90	12.01	24	0.253	0.28	12.34	4.47	1.59	1251.36	1251.17	2.00	2.00
P-112	112	113	51.	0.92	0.64	10.00	4.26	2.74	24	3.274	0.11	44.36	7.84	0.34	1252.84	1251.17	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-113	113	114	75.	4.28	3.79	13.02	3.86	14.64	24	0.359	0.23	14.68	5.33	1.63	1251.17	1250.90	2.00	2.52
P-114	114	EXT	183.	4.81	4.29	13.25	3.83	16.45	24	0.452	0.51	16.49	5.98	1.64	1250.39	1249.56	3.03	15.19

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-01 Ref. 0001 XSQ PK HWY GLENDALE TI SYSTEM TO OCOTILLA DETEN. PHOENIX 0X By: BJH Date 06/19/89
Number of Pipes in system = 14

Input File = USERDISK5:[PHX.3089.T411]OCT_95.IN;1 Checked by:_____ Date:_____

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-100	100	101	15.	0.18	0.13	10.00	5.82	0.73	24	0.240	0.12	12.01	2.11	0.34	1269.62	1269.58	2.00	2.04
P-101	101	102	192.	0.87	0.78	10.12	5.80	4.53	24	0.240	0.90	12.01	3.55	0.85	1269.58	1269.12	2.04	2.33
P-102	102	105	152.	1.27	1.16	11.02	5.64	6.55	24	3.069	0.26	42.95	9.88	0.53	1269.12	1264.46	2.33	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-104	104	105	24.	0.24	0.23	10.00	5.82	1.33	24	0.240	0.16	12.01	2.52	0.45	1263.69	1263.63	2.00	2.83
P-105	105	109	206.	1.87	1.73	11.28	5.59	9.68	24	2.289	0.35	37.09	9.93	0.70	1263.63	1258.92	2.83	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-106	106	107	49.	0.20	0.19	10.00	5.82	1.11	24	0.449	0.27	16.43	2.98	0.35	1256.55	1256.33	2.00	2.00
P-107	107	108	77.	0.91	0.86	10.27	5.77	4.99	24	1.390	0.19	28.90	6.89	0.56	1256.33	1255.26	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-108	108	109	96.	1.11	1.05	10.46	5.74	6.05	24	0.240	0.42	12.01	3.83	1.00	1255.26	1255.03	2.00	5.89
P-109	109	110	127.	2.98	2.79	11.62	5.53	15.40	24	0.433	0.36	16.13	5.84	1.56	1255.03	1254.48	5.89	2.66
P-110	110	111	250.	3.22	3.01	11.98	5.46	16.47	24	1.249	0.46	27.40	9.12	1.12	1254.48	1251.36	2.66	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-111	111	113	75.	3.29	3.08	12.44	5.38	16.58	24	0.459	0.21	16.61	6.03	1.64	1251.36	1251.01	2.00	2.16
P-112	112	113	51.	0.92	0.64	10.00	5.82	3.75	24	3.274	0.10	44.36	8.59	0.39	1252.84	1251.17	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-113	113	114	75.	4.28	3.79	12.65	5.34	20.26	30	0.210	0.26	20.35	4.73	2.04	1250.76	1250.61	1.89	2.29
P-114	114	EXT	183.	4.81	4.29	12.91	5.30	22.74	42	0.075	0.89	29.86	3.42	2.29	1248.77	1248.63	3.03	14.50
LOWER INVERT1248.63 BELOW OUTFALL EL.1249.50																		

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-01 Ref. 0002 XSQ PK HWY CACTUS WREN/AURALIUS DRAIN TO EXIST PHOENIX 0X By: BJH Date 04/28/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]CWA.IN;3 Checked by: BGR Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	06	P-120	120	121	0	10.0	120.	24.	2	.012	4.00	.58	0.00	.00	0.00	.00	27.	1282.30	2.00	1277.17	2.00	
03	01	08	P-121	121	122	0	10.0	190.	24.	2	.012	3.30	.58	0.00	.00	0.00	.00	17.	1277.17	2.00	1272.67	2.00	
03	01	09	P-123	123	122	0	10.0	14.	24.	2	.012	2.00	.58	0.00	.00	0.00	.00	17.	1271.67	2.00	1272.67	2.00	
03	01	10	P-122	122	EMH	0	10.0	160.	24.	2	.012	2.71	.58	0.00	.70	0.00	.00	16.	1270.89	2.00	1269.00	2.00	Z

INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]CWA.IN;3 Checked by:_____ Date:_____

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	06	P-120	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	08	P-121	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	09	P-123	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	10	P-122	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	1264.75	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-01 Ref. 0002 XSQ PK HWY CACTUS WREN/AURALIUS DRAIN TO EXIST PHOENIX 0X By: BJH Date 04/28/89
Number of Pipes in system = 4

Input File = USERDISK5:[PHX.3089.T411]CWA.IN;3 Checked by: BAB Date: 9/20/89

Output data for conversion to PL412: USERDISK5:[PHX.3089.T411]CWA.XPL;11

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-120	120	121	120.	4.00	2.32	27.00	2.69	6.23	24	4.275	0.18	50.69	10.95	0.47	1278.05	1272.92	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-121	121	122	190.	7.30	4.23	27.18	2.67	11.32	24	2.368	0.30	37.73	10.50	0.75	1272.92	1268.42	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-123	123	122	14.	2.00	1.16	17.00	3.41	3.95	24	0.240	0.07	12.01	3.43	0.79	1267.42	1267.39	2.00	3.03
P-122	122	EMH	160.	12.01	6.97	27.48	2.66	18.50	24	1.181	0.29	26.65	9.16	1.23	1266.64	1264.75	2.00	2.00

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-01 Ref. 0002 XSQ PK HWY CACTUS WREN/AURALIUS DRAIN TO EXIST PHOENIX 0X By: BJH Date 04/28/89
Number of Pipes in system = 4

Input File = USERDISK5:[PHX.3089.T411]CWA.IN;3 Checked by: BGS Date: 9/20/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-120	120	121	120.	4.00	2.32	27.00	3.67	8.51	24	4.275	0.17	50.69	11.98	0.55	1278.05	1272.92	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-121	121	122	190.	7.30	4.23	27.17	3.65	15.47	24	2.368	0.28	37.73	11.41	0.89	1272.92	1268.42	2.00	2.00
PROJECTED SLOPE BELOW OUTFALL																		
P-123	123	122	14.	2.00	1.16	17.00	4.67	5.42	24	0.240	0.06	12.01	3.72	0.94	1267.42	1267.39	2.00	3.03
P-122	122	EMH	160.	12.01	6.97	27.44	3.63	25.29	24	1.181	0.28	26.65	9.65	1.56	1266.64	1264.75	2.00	2.00

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-01 Ref. 0002 XSQ PK HWY GLENDALE TI SYSTEM TO PUMP STATION PHOENIX OX By: BJH Date 04/28/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]GLEN_95.IN;1 Checked by: BGR Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	08	P-201	201	220	0	50.0	25.	24.	2	.012	0.44	.95	0.00	.00	0.00	.00	10.	1260.68	3.00	1257.49	3.00	
03	01	10	P-202	202	203	0	50.0	75.	24.	2	.012	0.26	.95	0.00	.70	0.00	.00	10.	1257.49	3.00	1257.25	3.00	
03	01	15	P-204	204	203	0	50.0	10.	24.	2	.012	0.00	.95	0.36	.70	0.00	.00	10.	1257.25	3.00	1257.25	3.00	
03	01	20	P-205	205	203	0	50.0	75.	24.	2	.012	0.11	.95	0.00	.70	0.00	.00	10.	1257.57	3.00	1257.25	3.00	
03	01	25	P-203	203	207	0	50.0	75.	24.	2	.012	0.10	.95	0.00	.70	0.00	.00	10.	1257.25	3.00	1249.08	3.00	
03	01	05	P-206	206	207	0	50.0	61.	24.	2	.012	0.50	.95	0.00	.70	0.00	.00	10.	1249.65	3.00	1249.08	3.00	
03	01	30	P-207	207	208	0	50.0	230.	24.	2	.012	0.59	.95	0.00	.70	0.00	.00	10.	1249.08	3.00	1240.54	3.00	
03	01	30	P-208	208	211	0	50.0	130.	24.	2	.012	0.38	.95	0.00	.70	0.00	.00	10.	1240.54	3.00	1237.49	3.00	
03	01	35	P-209	209	210	0	50.0	80.	24.	2	.012	0.00	.95	0.43	.70	0.00	.00	10.	1241.82	3.00	1237.75	3.00	
03	01	40	P-210	210	211	0	50.0	63.	24.	2	.012	0.62	.95	0.00	.70	0.00	.00	10.	1237.75	3.00	1237.33	3.00	
03	01	45	P-211	211	212	0	50.0	10.	24.	2	.012	0.20	.95	0.00	.70	0.00	.00	10.	1237.33	3.00	1237.33	3.00	
03	01	50	P-212	212	220	0	50.0	50.	60.	2	.012	0.00	.95	0.60	.70	0.00	.00	10.	1237.33	3.00	1264.70	32.57	Z

INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]GLEN_95.IN;1 Checked by: BGS Date: 9/20/89

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	08	P-201	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	10	P-202	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	15	P-204	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	20	P-205	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	25	P-203	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	05	P-206	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	30	P-207	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	30	P-208	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	35	P-209	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	40	P-210	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	45	P-211	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	50	P-212	0.	0.00	0.00	0.	0.00	0.	X	10.0	0.	0	.000	0.	0.00	0.	0.00	1226.63	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-01 Ref. 0002 XSQ PK HWY GLENDALE TI SYSTEM TO PUMP STATION PHOENIX 0X By: BJH Date 04/28/89
Number of Pipes in system = 12

Input File = USERDISK5:[PHX.3089.T411]GLEN_95.IN;1 Checked by: BGS Date: 9/20/89

Output data for conversion to PL412: USERDISK5:[PHX.3089.T411]GLEN_95.XPL;3

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-201	201	220	25.	0.44	0.42	10.00	5.82	2.43	24	12.760	0.03	87.57	12.18	0.23	1255.43	1252.24	3.00	3.00
P-202	202	203	75.	0.26	0.25	10.00	5.82	1.44	24	0.321	0.44	13.89	2.86	0.43	1252.24	1252.00	3.00	3.00
P-204	204	203	10.	0.36	0.25	10.00	5.82	1.47	24	0.240	0.06	12.01	2.59	0.47	1252.00	1251.98	3.00	3.02
P-205	205	203	75.	0.11	0.10	10.00	5.82	0.61	24	0.427	0.51	16.01	2.45	0.27	1252.32	1252.00	3.00	3.00
P-203	203	207	75.	0.83	0.70	10.51	5.73	4.00	24	10.862	0.09	80.80	13.36	0.30	1251.98	1243.83	3.02	3.00
PROJECTED SLOPE BELOW OUTFALL																		
P-206	206	207	61.	0.50	0.47	10.00	5.82	2.76	24	0.935	0.20	23.70	5.04	0.46	1244.40	1243.83	3.00	3.00
P-207	207	208	230.	1.92	1.73	10.60	5.71	9.90	24	3.713	0.32	47.24	11.89	0.62	1243.83	1235.29	3.00	3.00
P-208	208	211	130.	2.30	2.10	10.93	5.65	11.84	24	2.346	0.20	37.55	10.59	0.77	1235.29	1232.24	3.00	3.00
P-209	209	210	80.	0.43	0.30	10.00	5.82	1.75	24	5.087	0.17	55.30	8.00	0.24	1236.57	1232.50	3.00	3.00
PROJECTED SLOPE BELOW OUTFALL																		
P-210	210	211	63.	1.05	0.89	10.17	5.79	5.15	24	0.667	0.20	20.02	5.34	0.69	1232.50	1232.08	3.00	3.00
P-211	211	212	10.	3.55	3.18	11.13	5.62	17.83	24	0.531	0.03	17.87	6.48	1.64	1232.08	1232.03	3.00	3.05
P-212	212	220	50.	4.15	3.60	11.16	5.61	20.18	60	4.400	0.06	592.04	14.01	0.63	1228.83	1226.63	3.00	32.57

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-01 Ref. 0002 XSQ PK HWY GLENDALE TI SYSTEM TO PUMP STATION PHOENIX 0X By: BJH Date 04/28/89
Number of Pipes in system = 12

Input File = USERDISK5:[PHX.3089.T411]GLEN_95.IN;1 Checked by: BGS Date: 9/20/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-201	201	220	25.	0.44	0.42	10.00	4.26	1.78	24	12.760	0.04	87.57	11.09	0.20	1255.43	1252.24	3.00	3.00
P-202	202	203	75.	0.26	0.25	10.00	4.26	1.05	24	0.320	0.48	13.87	2.60	0.37	1252.24	1252.00	3.00	3.00
P-204	204	203	10.	0.36	0.25	10.00	4.26	1.07	24	0.240	0.07	12.01	2.36	0.40	1252.00	1251.98	3.00	3.02
P-205	205	203	75.	0.11	0.10	10.00	4.26	0.45	24	0.427	0.56	16.01	2.23	0.23	1252.32	1252.00	3.00	3.00
P-203	203	207	75.	0.83	0.70	10.56	4.19	2.92	24	10.862	0.10	80.80	12.17	0.26	1251.98	1243.83	3.02	3.00
PROJECTED SLOPE BELOW OUTFALL																		
P-206	206	207	61.	0.50	0.47	10.00	4.26	2.02	24	0.935	0.22	23.70	4.60	0.40	1244.40	1243.83	3.00	3.00
P-207	207	208	230.	1.92	1.73	10.66	4.17	7.24	24	3.713	0.35	47.24	10.88	0.53	1243.83	1235.29	3.00	3.00
P-208	208	211	130.	2.30	2.10	11.02	4.13	8.64	24	2.346	0.22	37.55	9.71	0.65	1235.29	1232.24	3.00	3.00
P-209	209	210	80.	0.43	0.30	10.00	4.26	1.28	24	5.087	0.18	55.30	7.29	0.21	1236.57	1232.50	3.00	3.00
PROJECTED SLOPE BELOW OUTFALL																		
P-210	210	211	63.	1.05	0.89	10.18	4.24	3.77	24	0.667	0.21	20.02	4.89	0.59	1232.50	1232.08	3.00	3.00
P-211	211	212	10.	3.55	3.18	11.24	4.10	13.01	24	0.283	0.04	13.05	4.73	1.63	1232.08	1232.05	3.00	3.03
P-212	212	220	50.	4.15	3.60	11.28	4.09	14.71	60	4.400	0.07	592.04	12.74	0.54	1228.83	1226.63	3.00	32.57

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGS Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	02	P-300	300	301	0	10.0	250.	24.	2	.012	2.61	.95	0.00	.00	0.00	.00	10.	1313.99	3.00	1309.47	3.00	
03	01	04	P-301	301	303	0	10.0	225.	24.	2	.012	0.09	.95	0.17	.70	0.00	.00	10.	1309.47	3.00	1305.29	3.00	
03	01	06	P-302	302	303	0	10.0	80.	24.	2	.012	2.92	.95	0.00	.00	0.00	.00	10.	1306.52	3.00	1305.29	3.00	
03	01	08	P-303	303	305	0	10.0	247.	24.	2	.012	0.08	.95	0.16	.70	0.00	.00	10.	1305.29	3.00	1300.59	3.00	
03	01	10	P-304	304	305	0	10.0	80.	24.	2	.012	0.46	.95	0.00	.00	0.00	.00	10.	1301.82	3.00	1300.59	3.00	
03	01	12	P-305	305	306	0	10.0	91.	24.	2	.012	0.09	.95	0.17	.70	0.00	.00	10.	1300.59	3.00	1301.82	3.00	
03	01	14	P-306	306	309	0	10.0	337.	24.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1301.82	3.00	1296.86	3.00	
03	01	16	P-307	307	308	0	10.0	160.	24.	2	.012	0.60	.95	0.00	.00	0.00	.00	10.	1296.86	3.00	1296.86	3.00	
03	01	18	P-308	308	309	0	10.0	15.	24.	2	.012	1.96	.95	0.00	.00	0.00	.00	10.	1296.86	3.00	1296.86	3.00	
03	01	20	P-309	309	317	0	10.0	260.	24.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1296.86	3.00	1295.60	3.00	
03	01	22	P-310	310	312	0	10.0	75.	24.	2	.012	0.35	.95	0.00	.00	0.00	.00	10.	1295.70	3.00	1295.60	3.00	
03	01	24	P-311	311	312	0	10.0	75.	24.	2	.012	0.31	.95	0.00	.00	0.00	.00	10.	1295.73	3.00	1295.60	3.00	
03	01	24	P-312	312	313	0	10.0	80.	24.	2	.012	0.28	.95	0.00	.00	0.00	.00	10.	1295.60	3.00	1294.37	3.00	
03	01	24	P-313	313	316	0	10.0	80.	24.	2	.012	0.47	.95	0.88	.70	0.00	.00	10.	1294.37	3.00	1295.60	3.00	
03	01	24	P-314	314	316	0	10.0	75.	24.	2	.012	0.35	.95	0.00	.00	0.00	.00	10.	1295.71	3.00	1295.60	3.00	
03	01	24	P-315	315	316	0	10.0	75.	24.	2	.012	0.31	.95	0.00	.00	0.00	.00	10.	1295.66	3.00	1295.60	3.00	
03	01	24	P-316	316	317	0	10.0	15.	24.	2	.012	0.28	.95	0.00	.00	0.00	.00	10.	1295.60	3.00	1295.60	3.00	
03	01	24	P-317	317	320	0	10.0	242.	42.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1295.60	3.00	1296.62	3.00	
03	01	24	P-318	318	319	0	10.0	160.	24.	2	.012	0.87	.95	0.00	.00	0.00	.00	10.	1296.62	3.00	1296.62	3.00	
03	01	24	P-319	319	320	0	10.0	15.	24.	2	.012	0.87	.95	0.00	.00	0.00	.00	10.	1296.62	3.00	1296.62	3.00	
03	01	24	P-320	320	321	0	10.0	330.	42.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1296.62	3.00	1299.28	3.00	
03	01	24	P-321	321	322	0	10.0	330.	42.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1299.28	3.00	1298.87	3.00	
03	01	24	P-322	322	323	0	10.0	300.	42.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1298.87	3.00	1296.01	3.00	
03	01	24	P-323	323	OF1	9	10.0	50.	42.	2	.012	0.00	.95	0.00	.00	0.00	.00	10.	1296.01	3.00	1296.01	3.00	
03	01	24	P-324	324	325	0	10.0	24.	24.	2	.012	0.30	.95	0.00	.00	0.00	.00	10.	1292.82	3.00	1293.22	3.00	
03	01	24	P-325	325	326	0	10.0	162.	24.	2	.012	1.27	.95	0.00	.00	0.00	.00	10.	1293.22	3.00	1293.31	3.00	
03	01	24	P-326	326	OF2	9	10.0	67.	24.	2	.012	1.27	.95	0.00	.00	0.00	.00	10.	1293.31	3.00	1296.01	3.00	Z

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 2
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGS Date: 7/11/89

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW CONTROL ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	02	P-300	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	1310.99	130.	3.00	0.00	15.00
04	01	04	P-301	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	1304.88	194.	3.00	0.00	15.00
04	01	06	P-302	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	08	P-303	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	10	P-304	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	12	P-305	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	14	P-306	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	16	P-307	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	18	P-308	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	20	P-309	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	22	P-310	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-311	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-312	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-313	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-314	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-315	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-316	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-317	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-318	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-319	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-320	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-321	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-322	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-323	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-324	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-325	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	24	P-326	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00

- * - DESIGN SUMMARY - * -

HNIB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
Number of Pipes in system = 27

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGS Date: 7/1/89

Output data for conversion to PL412: USERDISK5:[PHX.3089.T411]NVDB.XPL;1

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-300	300	301	250.	2.61	2.48	10.00	4.26	10.56	24	1.267	0.45	27.59	8.20	0.86	1307.39	1304.22	4.35	3.00
P-301	301	303	225.	2.87	2.68	10.45	4.20	11.28	24	0.233	0.39	11.84	4.29	1.56	1300.08	1299.56	7.14	3.48
P-302	302	303	80.	2.92	2.77	10.00	4.26	11.82	24	1.537	0.15	30.40	9.07	0.87	1301.27	1300.04	3.00	3.00
P-303	303	305	247.	6.03	5.65	10.84	4.15	23.43	24	1.708	0.37	32.04	11.13	1.27	1299.56	1295.34	3.48	3.00
P-304	304	305	80.	0.46	0.44	10.00	4.26	1.86	24	1.537	0.25	30.40	5.35	0.34	1296.57	1295.34	3.00	3.00
P-305	305	306	91.	6.75	6.29	11.21	4.10	25.78	24	1.108	0.16	25.81	9.36	1.64	1295.34	1294.33	3.00	5.24
P-306	306	309	337.	6.75	6.29	11.37	4.08	25.65 *	24	1.209	0.58	26.96	9.77	1.57	1294.33	1290.25	5.24	4.36
*PIPE DESIGNED FOR 25.78 CFS																		
P-307	307	308	160.	0.60	0.57	10.00	4.26	2.43	24	0.240	0.89	12.01	2.99	0.61	1291.61	1291.23	3.00	3.38
P-308	308	309	15.	2.56	2.43	10.89	4.14	10.07	24	0.240	0.06	12.01	4.28	1.40	1291.23	1291.19	3.38	3.42
P-309	309	317	260.	9.31	8.72	11.94	4.00	34.91	24	2.029	0.34	34.93	12.67	1.64	1290.25	1284.98	4.36	8.37
P-310	310	312	75.	0.35	0.33	10.00	4.26	1.42	24	0.241	0.49	12.03	2.57	0.46	1290.45	1290.27	3.00	3.08
P-311	311	312	75.	0.31	0.29	10.00	4.26	1.25	24	0.240	0.50	12.01	2.48	0.44	1290.48	1290.30	3.00	3.05
P-312	312	313	80.	0.94	0.89	10.50	4.19	3.74	24	1.438	0.21	29.39	6.42	0.48	1290.27	1289.12	3.08	3.00
P-313	313	316	80.	2.29	1.96	10.71	4.17	8.15	24	0.240	0.32	12.01	4.11	1.21	1289.12	1288.93	3.00	4.42
P-314	314	316	75.	0.35	0.33	10.00	4.26	1.42	24	0.240	0.49	12.01	2.56	0.46	1290.46	1290.28	3.00	3.07
P-315	315	316	75.	0.31	0.29	10.00	4.26	1.25	24	0.240	0.50	12.01	2.48	0.44	1290.41	1290.23	3.00	3.12
P-316	316	317	15.	3.23	2.85	11.04	4.12	11.75	24	0.240	0.06	12.01	4.36	1.60	1288.93	1288.89	4.42	4.46
P-317	317	320	242.	12.54	11.57	12.29	3.96	45.79	42	0.178	0.74	46.05	5.45	2.85	1283.48	1283.05	8.25	9.70
P-318	318	319	160.	0.87	0.83	10.00	4.26	3.52	24	0.240	0.80	12.01	3.32	0.74	1291.37	1290.99	3.00	3.38
P-319	319	320	15.	1.74	1.65	10.80	4.15	6.87	24	0.240	0.06	12.01	3.95	1.08	1290.99	1290.95	3.38	3.42
P-320	320	321	330.	14.28	13.22	13.03	3.86	51.04	42	0.221	0.91	51.27	6.07	2.86	1283.05	1282.32	9.70	13.09
P-321	321	322	330.	14.28	13.22	13.93	3.74	49.46 *	42	0.221	0.91	51.27	6.07	2.86	1282.32	1281.59	13.09	13.41
*PIPE DESIGNED FOR 51.04 CFS																		
P-322	322	323	300.	14.28	13.22	14.84	3.62	47.88 *	42	0.240	0.79	53.37	6.31	2.74	1281.59	1280.87	13.41	11.27
*PIPE DESIGNED FOR 51.04 CFS																		

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
Number of Pipes in system = 27

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGS Date: 7/11/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT UPPER FT	ELEV. LOWER FT	GROUND UPPER FT	COVER LOWER FT
P-323	323	OF1	50.	14.28	13.22	15.63	3.54	46.80 *	42	0.221	0.14	51.27	6.07	2.86	1280.87	1280.76	11.27	11.38
*PIPE DESIGNED FOR 51.04 CFS																		
P-324	324	325	24.	0.30	0.28	10.00	4.26	1.21	24	0.240	0.16	12.01	2.45	0.43	1287.57	1287.51	3.00	3.46
P-325	325	326	162.	1.57	1.49	10.16	4.24	6.32	24	0.240	0.70	12.01	3.87	1.03	1287.51	1287.12	3.46	3.94
P-326	326	OF2	67.	2.84	2.70	10.86	4.15	11.19	24	0.240	0.26	12.01	4.34	1.53	1287.12	1286.96	3.94	6.80

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 6
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
Number of Pipes in system = 27

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGR Date: 7/1/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-300	300	301	250.	2.61	2.48	10.00	5.82	14.43	24	1.267	0.41	27.59	8.88	1.03	1307.39	1304.22	4.35	3.00
P-301	301	303	225.	2.87	2.68	10.41	5.75	15.42	24	0.437	0.36	16.20	5.87	1.56	1300.48	1299.49	6.74	3.55
P-302	302	303	80.	2.92	2.77	10.00	5.82	16.15	24	1.537	0.14	30.40	9.82	1.04	1301.27	1300.04	3.00	3.00
P-303	303	305	247.	6.03	5.65	10.77	5.68	32.08	24	1.884	0.34	33.65	12.19	1.56	1299.49	1294.84	3.55	3.50
P-304	304	305	80.	0.46	0.44	10.00	5.82	2.54	24	1.537	0.23	30.40	5.87	0.39	1296.57	1295.34	3.00	3.00
P-305	305	306	91.	6.75	6.29	11.11	5.62	35.34	24	2.080	0.12	35.36	12.82	1.64	1294.84	1292.95	3.50	6.62
P-306	306	309	337.	6.75	6.29	11.23	5.60	35.21 *	24	2.080	0.44	35.36	12.82	1.64	1292.95	1285.94	6.62	8.67
*PIPE DESIGNED FOR 35.34 CFS																		
P-307	307	308	160.	0.60	0.57	10.00	5.82	3.32	24	0.240	0.82	12.01	3.27	0.72	1291.61	1291.23	3.00	3.38
P-308	308	309	15.	2.56	2.43	10.82	5.67	13.80	24	0.319	0.05	13.84	5.02	1.63	1291.23	1291.18	3.38	3.43
P-309	309	317	260.	9.31	8.72	11.66	5.52	48.14	30	1.175	0.39	48.18	11.18	2.05	1285.44	1282.39	8.63	10.42
P-310	310	312	75.	0.35	0.33	10.00	5.82	1.94	24	0.240	0.45	12.01	2.81	0.54	1290.45	1290.27	3.00	3.08
P-311	311	312	75.	0.31	0.29	10.00	5.82	1.71	24	0.240	0.46	12.01	2.71	0.51	1290.48	1290.30	3.00	3.05
P-312	312	313	80.	0.94	0.89	10.46	5.74	5.12	24	1.438	0.19	29.40	7.02	0.57	1290.27	1289.12	3.08	3.00
P-313	313	316	80.	2.29	1.96	10.65	5.70	11.15	24	0.240	0.31	12.01	4.34	1.52	1289.12	1288.93	3.00	4.42
P-314	314	316	75.	0.35	0.33	10.00	5.82	1.94	24	0.240	0.45	12.01	2.81	0.54	1290.46	1290.28	3.00	3.07
P-315	315	316	75.	0.31	0.29	10.00	5.82	1.71	24	0.240	0.46	12.01	2.71	0.51	1290.41	1290.23	3.00	3.12
P-316	316	317	15.	3.23	2.85	10.96	5.65	16.09	24	0.433	0.04	16.12	5.85	1.64	1288.93	1288.86	4.42	4.49
P-317	317	320	242.	12.54	11.57	12.05	5.45	63.06	42	0.336	0.54	63.24	7.49	2.86	1281.39	1280.57	10.34	12.17
P-318	318	319	160.	0.87	0.83	10.00	5.82	4.81	24	0.240	0.74	12.01	3.61	0.88	1291.37	1290.99	3.00	3.38
P-319	319	320	15.	1.74	1.65	10.74	5.69	9.40	24	0.240	0.06	12.01	4.23	1.33	1290.99	1290.95	3.38	3.42
P-320	320	321	330.	14.28	13.22	12.59	5.35	70.78	42	0.423	0.65	70.95	8.40	2.86	1280.57	1279.17	12.17	16.23
P-321	321	322	330.	14.28	13.22	13.25	5.24	69.23 *	42	0.423	0.65	70.95	8.40	2.86	1279.17	1277.78	16.23	17.22
*PIPE DESIGNED FOR 70.78 CFS																		
P-322	322	323	300.	14.28	13.22	13.90	5.12	67.67 *	42	0.464	0.57	74.26	8.78	2.73	1277.78	1276.38	17.22	15.75
*PIPE DESIGNED FOR 70.78 CFS																		

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 7
Job 3089-21-03 Ref. 1 XNorthveiw Detention Basin System PHOENIX 0X By: sla Date 04/27/89
Number of Pipes in system = 27

Input File = USERDISK5:[PHX.3089.T411]NVDB.IN;17 Checked by: BGS Date: 7/1/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-323	323	OF1	50.	14.28	13.22	14.47	5.02	66.31 *	42	0.423	0.10	70.95	8.40	2.86	1276.38	1276.17	15.75	15.96
*PIPE DESIGNED FOR 70.78 CFS																		
P-324	324	325	24.	0.30	0.28	10.00	5.82	1.66	24	0.240	0.15	12.01	2.68	0.50	1287.57	1287.51	3.00	3.46
P-325	325	326	162.	1.57	1.49	10.15	5.79	8.64	24	0.240	0.65	12.01	4.16	1.26	1287.51	1287.12	3.46	3.94
P-326	326	OF2	67.	2.84	2.70	10.80	5.68	15.32	24	0.392	0.20	15.35	5.57	1.64	1287.12	1286.86	3.94	6.90

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-03 Ref. 0001 PIPE CALCS FOR MYRTLE AVE TURNAROUND TO WASH PHOENIX 0X By: BJH Date 06/22/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]MYRTLE.IN;4 Checked by: BGB Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	ZONE 1 C1	ZONE 2 A2 ACRE	ZONE 2 C2	ZONE 3 A3 ACRE	ZONE 3 C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	UPPER STRUCT M COV FT	LOWER STRUCT TOP EL FT	LOWER STRUCT M COV FT	LR
03	01	05	P-330	330	331	0	10.0	44.	24.	2	.012	6.39	.47	0.00	.00	0.00	.00	10.	1295.00	5.65	1295.00	6.75	
03	01	10	P-331	331	332	0	10.0	115.	24.	2	.012	6.38	.47	0.00	.00	0.00	.00	10.	1295.00	5.67	1299.00	15.05	
03	01	15	P-332	332	MWW	9	10.0	160.	36.	2	.012	0.23	.95	0.27	.45	0.00	.00	10.	1299.00	15.05	1285.00	13.31	Z

Job 3089-21-03 Ref. 0001 PIPE CALCS FOR MYRTLE AVE TURNAROUND TO WASH PHOENIX 0X By: BJH Date 06/22/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]MYRTLE.IN;4 Checked by: BGS Date: 7/1/89

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	05	P-330	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	0.00
04	01	10	P-331	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	0.00
04	01	15	P-332	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	1268.36	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-03 Ref. 0001 PIPE CALCS FOR MYRTLE AVE TURNAROUND TO WASH PHOENIX 0X By: BJH Date 06/22/89
Number of Pipes in system = 3

Input File = USERDISK5:[PHX.3089.T411]MYRTLE.IN;4 Checked by: BGS Date: 7/11/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-330	330	331	44.	6.39	3.00	10.00	4.26	12.80	24	1.265	0.09	27.57	8.61	0.96	1286.56	1286.00	6.19	6.75
P-331	331	332	115.	12.77	6.00	10.09	4.25	25.50	24	1.265	0.19	27.57	9.96	1.52	1283.15	1281.70	9.60	15.05
P-332	332	MWW	160.	13.27	6.34	10.28	4.22	26.79	36	1.658	0.23	93.06	11.38	1.10	1271.01	1268.36	24.66	13.31

LOWER INVERT 1268.36 BELOW OUTFALL EL. 1268.36

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-03 Ref. 0001 PIPE CALCS FOR MYRTLE AVE TURNAROUND TO WASH PHOENIX 0X By: BJH Date 06/22/89
Number of Pipes in system = 3

Input File = USERDISK5:[PHX.3089.T411]MYRTLE.IN;4 Checked by: BGR Date: 7/11/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT UPPER FT	ELEV. LOWER FT	GROUND UPPER FT	COVER LOWER FT
P-330	330	331	44.	6.39	3.00	10.00	5.82	17.48	24	1.265	0.08	27.57	9.29	1.16	1286.56	1286.00	6.19	6.75
P-331	331	332	115.	12.77	6.00	10.08	5.81	34.85	30	0.939	0.20	43.08	9.77	1.71	1282.24	1281.16	9.97	15.05
P-332	332	MWW	160.	13.27	6.34	10.28	5.77	36.60	36	1.658	0.22	93.06	12.37	1.31	1271.01	1268.36	24.66	13.31

LOWER INVERT1268.36 BELOW OUTFALL EL.1268.36

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 10-JUL-89 Page 1
Job 3089-21-03 Ref. 0002 PIPE CALCS FOR GARDENIA AVE TO DETENTION AREA PHOENIX 0X By: BJH Date 06/22/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]GARDENIA.IN;4 Checked by: BGR Date: 7/11/89

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	05	P-333	333	334	0	10.0	31.	24.	2	.012	4.02	.47	0.00	.00	0.00	.00	10.	1313.00	7.85	1313.00	9.57	
03	01	10	P-334	334	M335	0	10.0	52.	24.	2	.012	4.02	.47	0.00	.00	0.00	.00	10.	1313.00	9.57	1311.50	12.35	
03	01	15	P-335	M335	327	0	10.0	282.	24.	2	.012	0.00	.00	0.00	.00	0.00	.00	10.	1311.50	12.35	1307.50	22.17	
03	01	20	P-327	327	OF3	9	10.0	150.	24.	2	.012	0.75	.45	0.00	.00	0.00	.00	10.	1307.50	22.17	1289.00	5.75	Z

Job 3089-21-03 Ref. 0002 PIPE CALCS FOR GARDENIA AVE TO DETENTION AREA PHOENIX 0X By: BJH Date 06/22/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]GARDENIA.IN;4 Checked by: BGS Date: 7/11/89

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	05	P-333	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	0.00
04	01	10	P-334	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	0.00
04	01	15	P-335	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	0.00
04	01	20	P-327	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	1281.00	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 4
Job 3089-21-03 Ref. 0002 PIPE CALCS FOR GARDENIA AVE TO DETENTION AREA PHOENIX 0X By: BJH Date 06/22/89
Number of Pipes in system = 4

Input File = USERDISK5:[PHX.3089.T411]GARDENIA.IN;4 Checked by: BGS Date: 7/1/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-333	333	334	31.	4.02	1.89	10.00	4.26	8.05	24	1.265	0.07	27.57	7.61	0.74	1301.57	1301.18	9.18	9.57
P-334	334	M335	52.	8.04	3.78	10.07	4.25	16.06	24	1.265	0.10	27.57	9.11	1.10	1297.56	1296.90	13.19	12.35
P-335	M335	327	282.	8.04	3.78	10.16	4.24	16.02 *	24	1.265	0.52	27.57	9.11	1.10	1286.65	1283.08	22.60	22.17
*PIPE DESIGNED FOR 16.06 CFS																		
P-327	327	OF3	150.	8.79	4.12	10.68	4.17	17.17	24	1.387	0.26	28.87	9.58	1.11	1283.08	1281.00	22.17	5.75

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 10-JUL-89 Page 5
Job 3089-21-03 Ref. 0002 PIPE CALCS FOR GARDENIA AVE TO DETENTION AREA PHOENIX 0X By: BJH Date 06/22/89
Number of Pipes in system = 4

Input File = USERDISK5:[PHX.3089.T411]GARDENIA.IN;4 Checked by: BGS Date: 7/11/89

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-333	333	334	31.	4.02	1.89	10.00	5.82	11.00	24	1.265	0.06	27.57	8.28	0.88	1301.57	1301.18	9.18	9.57
P-334	334	M335	52.	8.04	3.78	10.06	5.81	21.95	24	1.265	0.09	27.57	9.74	1.35	1297.56	1296.90	13.19	12.35
P-335	M335	327	282.	8.04	3.78	10.15	5.79	21.89 *	24	1.265	0.48	27.57	9.74	1.35	1286.65	1283.08	22.60	22.17
*PIPE DESIGNED FOR 21.95 CFS																		
P-327	327	OF3	150.	8.79	4.12	10.63	5.71	23.49	24	1.387	0.24	28.87	10.24	1.37	1283.08	1281.00	22.17	5.75

BGS 9/11/89

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - INPUT DATA Run Date 11-SEP-89 Page 1
Job 3089-21-01 Ref. 0001 XSq Pk Hwy Northern TI System to Dreamy Draw Wsh PHOENIX 0X By: sla Date 06/07/89
INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]NORTH411.IN;23

CC	PG	LN	RUN NO.	FROM	TO	ES	FREQ YRS	LGTH FT	MIN DIA IN	TP	N	ZONE 1 A1 ACRE	C1	ZONE 2 A2 ACRE	C2	ZONE 3 A3 ACRE	C3	CONC TIME MIN	UPPER STRUCT TOP EL FT	M COV FT	LOWER STRUCT TOP EL FT	M COV FT	LR
03	01	03	P-403	403	TC1	0	10.0	27.	24.	2	.012	2.44	.95	0.00	.70	0.00	.60	10.	1348.46	3.00	1348.56	6.19	
03	01	04	P-404	404	TC2	0	10.0	58.	24.	2	.012	1.10	.95	0.00	.70	0.00	.60	10.	1348.86	3.00	1348.20	4.95	
03	01	05	P-405	405	407	0	10.0	75.	24.	2	.012	0.03	.95	0.02	.70	0.00	.60	10.	1339.02	3.00	1338.81	3.00	
03	01	10	P-406	406	407	0	10.0	75.	24.	2	.012	0.02	.95	0.02	.70	0.00	.60	10.	1339.01	3.00	1338.81	3.00	
03	01	15	P-407	407	410	0	10.0	75.	24.	2	.012	0.06	.95	0.08	.70	0.00	.60	10.	1338.81	3.00	1339.04	0.50	
03	01	20	P-408	408	410	0	10.0	68.	24.	2	.012	0.16	.95	0.07	.70	0.00	.60	10.	1339.53	3.00	1339.04	3.00	
03	01	25	P-409	409	410	0	10.0	50.	24.	2	.012	0.03	.95	0.01	.70	0.00	.60	10.	1339.20	3.00	1339.04	3.00	
03	01	30	P-410	410	411	0	10.0	27.	24.	2	.012	0.04	.95	0.06	.70	0.00	.60	10.	1339.04	3.00	1338.61	3.00	
03	01	35	P-411	411	415	0	10.0	70.	24.	2	.012	0.00	.95	0.38	.70	0.00	.60	10.	1338.61	3.00	1338.25	3.00	
03	01	40	P-427	427	428	0	10.0	63.	24.	2	.012	0.80	.95	0.00	.70	0.00	.60	10.	1362.76	22.35	1339.95	3.00	
03	01	44	P-428	428	412	0	10.0	119.	24.	2	.012	0.00	.95	0.00	.70	0.00	.60	10.	1339.95	3.00	1338.25	3.00	
03	01	46	P-412	412	414	0	10.0	75.	24.	2	.012	0.13	.95	0.00	.70	0.00	.60	10.	1338.25	3.00	1337.97	3.00	
03	01	50	P-414	414	415	0	10.0	75.	24.	2	.012	0.03	.95	0.40	.70	0.00	.60	10.	1337.97	3.00	1338.25	3.00	
03	01	55	P-415	415	420	0	10.0	82.	24.	2	.012	0.08	.95	0.00	.70	0.00	.60	10.	1338.25	3.00	1338.25	3.46	
03	01	60	P-416	416	417	0	10.0	138.	24.	2	.012	0.00	.95	1.50	.70	0.00	.60	10.	1338.95	3.00	1338.25	3.00	
03	01	65	P-417	417	419	0	10.0	75.	24.	2	.012	0.59	.95	0.00	.70	0.00	.60	10.	1338.25	3.00	1337.97	3.00	
03	01	75	P-419	419	420	0	10.0	75.	24.	2	.012	0.01	.95	0.29	.70	0.00	.60	10.	1337.97	3.00	1338.25	3.00	
03	01	80	P-420	420	421	0	10.0	222.	30.	2	.012	0.69	.95	0.00	.70	0.00	.60	10.	1338.25	3.42	1338.87	5.40	
03	01	85	P-421	421	BC1	9	10.0	58.	30.	2	.012	0.29	.95	0.03	.70	0.00	.60	10.	1338.87	3.00	1338.30	5.25	
03	01	90	P-422	422	BC2	9	10.0	66.	24.	2	.012	0.37	.95	0.00	.70	0.00	.60	10.	1338.48	3.00	1338.30	5.00	
03	01	95	P-425	425	OF1	9	10.0	454.	48.	2	.012	0.00	.95	0.00	.70	0.01	.60	10.	1342.56	2.06	1341.31	1.25	
03	01	96	P-426	426	EXT	9	10.0	20.	42.	1	.024	0.38	.95	1.07	.70	0.00	.60	10.	1337.92	1.99	1340.58	4.79	Z

INT. CURVE Z85000 DROP=.00 DPS= 27, 33, 39, 45, MIN VEL= 3.00 3.00 3.00 MIN SLOPE= .00000 .00000 .00000 .00000 .00000

Input File = USERDISK5:[PHX.3089.T411]NORTH411.IN;23

CC	PG	LN	RUN NO.	QA CFS	MAX FL LINE EL FT	CROWN ELEV FT	CONTROL DIST FT	FLOW ELEV FT	CONTROL DIST FT	C	ALTERNATE DESIGN FREQ YRS	MDIA IN	TP	N	QA CFS	GROUND ELEV FT	CONTROL DIST FT	MIN CLEAR FT	OUTFALL ELEV FT	MAX VEL FPS
04	01	03	P-403	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	04	P-404	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	05	P-405	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	10	P-406	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	15	P-407	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	20	P-408	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	25	P-409	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	30	P-410	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	35	P-411	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	40	P-427	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	44	P-428	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	46	P-412	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	50	P-414	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	55	P-415	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	60	P-416	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	65	P-417	2.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	75	P-419	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	80	P-420	2.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	85	P-421	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	90	P-422	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	95	P-425	48.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00
04	01	96	P-426	0.	0.00	0.00	0.	0.00	0.	X	50.0	0.	0	.000	0.	0.00	0.	0.00	0.00	15.00

- * - DESIGN SUMMARY - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 11-SEP-89 Page 4
Job 3089-21-01 Ref. 0001 XSq Pk Hwy Northern TI System to Dreamy Draw Wsh PHOENIX 0X By: sla Date 06/07/89
Number of Pipes in system = 22

Input File = USERDISK5:[PHX.3089.T411]NORTH411.IN;23

Output data for conversion to PL412: USERDISK5:[PHX.3089.T411]NORTH411.XPL;45

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-403	403	TC1	27.	2.44	2.32	10.00	4.26	9.88	24	2.846	0.04	41.36	10.80	0.67	1340.89	1340.12	5.32	6.19
P-404	404	TC2	58.	1.10	1.04	10.00	4.26	4.45	24	4.500	0.10	52.01	10.11	0.40	1343.61	1341.00	3.00	4.95
P-405	405	407	75.	0.05	0.04	10.00	4.26	0.18	24	0.281	0.85	12.99	1.47	0.17	1333.77	1333.56	3.00	3.00
P-406	406	407	75.	0.04	0.03	10.00	4.26	0.14	24	0.267	0.94	12.66	1.33	0.15	1333.76	1333.56	3.00	3.00
P-407	407	410	75.	0.23	0.19	10.94	4.14	0.78	24	0.240	0.58	12.01	2.15	0.35	1333.56	1333.38	3.00	3.41
P-408	408	410	68.	0.23	0.20	10.00	4.26	0.86	24	0.721	0.35	20.81	3.26	0.28	1334.28	1333.79	3.00	3.00
P-409	409	410	50.	0.04	0.04	10.00	4.26	0.15	24	0.320	0.58	13.86	1.45	0.15	1333.95	1333.79	3.00	3.00
P-410	410	411	27.	0.60	0.50	11.52	4.06	2.05	24	0.241	0.16	12.03	2.86	0.56	1333.38	1333.31	3.41	3.05
P-411	411	415	70.	0.98	0.77	11.67	4.04	3.11	24	0.450	0.29	16.44	4.02	0.59	1333.31	1333.00	3.05	3.00
P-427	427	428	63.	0.80	0.76	10.00	4.26	3.24	24	5.492	0.11	57.45	9.87	0.32	1338.16	1334.70	22.35	3.00
P-428	428	412	119.	0.80	0.76	10.11	4.25	3.23 *	24	1.429	0.32	29.30	6.14	0.45	1334.70	1333.00	3.00	3.00
*PIPE DESIGNED FOR 3.24 CFS																		
P-412	412	414	75.	0.93	0.88	10.43	4.20	3.71	24	0.373	0.32	14.98	3.95	0.68	1333.00	1332.72	3.00	3.00
P-414	414	415	75.	1.36	1.19	10.75	4.16	4.96	24	0.240	0.34	12.01	3.64	0.90	1332.72	1332.54	3.00	3.46
P-415	415	420	82.	2.42	2.04	11.96	4.00	8.16	24	0.241	0.33	12.03	4.12	1.21	1332.54	1332.34	3.46	3.66
P-416	416	417	138.	1.50	1.05	10.00	4.26	4.47	24	0.507	0.49	17.46	4.65	0.69	1333.70	1333.00	3.00	3.00
P-417	417	419	75.	2.09	1.61	10.49	4.19	8.66	24	0.373	0.25	14.98	4.94	1.09	1333.00	1332.72	3.00	3.00
P-419	419	420	75.	2.39	1.82	10.75	4.16	9.49	24	0.240	0.30	12.01	4.24	1.34	1332.72	1332.54	3.00	3.46
P-420	420	421	222.	5.50	4.52	12.30	3.96	22.18	30	0.525	0.52	32.22	7.07	1.52	1331.84	1330.68	3.62	5.40
P-421	421	BC1	58.	5.82	4.81	12.82	3.89	23.02	30	0.721	0.12	37.75	8.07	1.41	1330.68	1330.26	5.40	5.25
P-422	422	BC2	66.	0.37	0.35	10.00	4.26	1.50	24	3.303	0.17	44.56	6.56	0.25	1333.23	1331.05	3.00	5.00
P-425	425	OF1	454.	0.01	0.01	10.00	4.26	48.03	48	0.097	1.72	48.46	4.39	3.25	1336.08	1335.64	2.06	1.25
P-426	426	EXT	20.	1.45	1.11	10.00	4.26	4.73	42	0.701	0.11	45.63	3.06	0.76	1332.43	1332.29	1.99	4.79

- * - ALTERNATE DESIGN - * -

HNTB - PROGRAM T411 - * - HYDRAULIC DESIGN OF STORM SEWERS - * - OUTPUT DATA Run Date 11-SEP-89 Page 5
Job 3089-21-01 Ref. 0001 XSq Pk Hwy Northern TI System to Dreamy Draw Wsh PHOENIX 0X By: sla Date 06/07/89
Number of Pipes in system = 22

Input File = USERDISK5:[PHX.3089.T411]NORTH411.IN;23

PIPE NO.	FROM	TO	LENGTH FT	TOTAL A	TOTAL C*A	CONC. TIME MIN	INT. IN/HR	DESIGN FLOW CFS	DIA IN	SLOPE %	TRAVEL TIME MIN	CAPAC. FLOW CFS	VEL. FPS	DEPTH FLOW FT	INVERT ELEV. UPPER FT	INVERT ELEV. LOWER FT	GROUND COVER UPPER FT	GROUND COVER LOWER FT
P-403	403	TC1	27.	2.44	2.32	10.00	5.82	13.49	24	2.846	0.04	41.36	11.77	0.79	1340.89	1340.12	5.32	6.19
P-404	404	TC2	58.	1.10	1.04	10.00	5.82	6.08	24	4.500	0.09	52.01	11.08	0.46	1343.61	1341.00	3.00	4.95
P-405	405	407	75.	0.05	0.04	10.00	5.82	0.25	24	0.280	0.77	12.97	1.61	0.19	1333.77	1333.56	3.00	3.00
P-406	406	407	75.	0.04	0.03	10.00	5.82	0.19	24	0.267	0.85	12.66	1.47	0.17	1333.76	1333.56	3.00	3.00
P-407	407	410	75.	0.23	0.19	10.85	5.67	1.07	24	0.240	0.53	12.01	2.36	0.40	1333.56	1333.38	3.00	3.41
P-408	408	410	68.	0.23	0.20	10.00	5.82	1.17	24	0.721	0.32	20.81	3.57	0.32	1334.28	1333.79	3.00	3.00
P-409	409	410	50.	0.04	0.04	10.00	5.82	0.21	24	0.320	0.52	13.86	1.60	0.17	1333.95	1333.79	3.00	3.00
P-410	410	411	27.	0.60	0.50	11.38	5.57	2.81	24	0.241	0.14	12.03	3.12	0.66	1333.38	1333.31	3.41	3.05
P-411	411	415	70.	0.98	0.77	11.53	5.55	4.28	24	0.451	0.27	16.46	4.40	0.70	1333.31	1333.00	3.05	3.00
P-427	427	428	63.	0.80	0.76	10.00	5.82	4.42	24	5.492	0.10	57.45	10.83	0.38	1338.16	1334.70	22.35	3.00
P-428	428	412	119.	0.80	0.76	10.10	5.80	4.41 *	24	1.429	0.30	29.30	6.72	0.53	1334.70	1333.00	3.00	3.00
*PIPE DESIGNED FOR 4.42 CFS																		
P-412	412	414	75.	0.93	0.88	10.39	5.75	5.08	24	0.373	0.29	14.98	4.31	0.80	1333.00	1332.72	3.00	3.00
P-414	414	415	75.	1.36	1.19	10.68	5.70	6.79	24	0.240	0.32	12.01	3.94	1.08	1332.72	1332.54	3.00	3.46
P-415	415	420	82.	2.42	2.04	11.79	5.50	11.21	24	0.241	0.31	12.03	4.35	1.53	1332.54	1332.34	3.46	3.66
P-416	416	417	138.	1.50	1.05	10.00	5.82	6.11	24	0.507	0.45	17.46	5.06	0.82	1333.70	1333.00	3.00	3.00
P-417	417	419	75.	2.09	1.61	10.45	5.74	11.14	24	0.373	0.24	14.98	5.22	1.29	1333.00	1332.72	3.00	3.00
P-419	419	420	75.	2.39	1.82	10.69	5.70	12.28	24	0.253	0.28	12.33	4.47	1.63	1332.72	1332.53	3.00	3.47
P-420	420	421	222.	5.50	4.52	12.10	5.44	28.88	30	0.525	0.50	32.22	7.42	1.85	1331.84	1330.68	3.62	5.40
P-421	421	BC1	58.	5.82	4.81	12.60	5.35	30.06	30	0.721	0.11	37.75	8.54	1.69	1330.68	1330.26	5.40	5.25
P-422	422	BC2	66.	0.37	0.35	10.00	5.82	2.05	24	3.303	0.15	44.56	7.21	0.29	1333.23	1331.05	3.00	5.00
P-425	425	OF1	454.	0.01	0.01	10.00	5.82	48.03	48	0.097	1.72	48.46	4.39	3.25	1336.08	1335.64	2.06	1.25
P-426	426	EXT	20.	1.45	1.11	10.00	5.82	6.46	42	0.701	0.10	45.63	3.35	0.89	1332.43	1332.29	1.99	4.79

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]OCIHGL_100.INX;3

TW.EL.= 1251.34 SYSTEM: Ocotilla Detention Basin System 8/21/89 CHECKED: SLA 9/15/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-114	22.7	0.0	183.0	1255.67	1249.56	1249.90	2.0	0.012	P-113	2.0		0.0		0.0
P-113	20.3	0.0	75.0	1255.42	1249.90	1250.17	2.0	0.012	P-111	2.0	P-112	90.0		0.0
P-111	16.6	0.0	75.0	1255.61	1250.17	1250.36	2.0	0.012	P-110	3.0		0.0		0.0
P-110	16.5	0.0	250.0	1259.39	1250.36	1253.72	2.0	0.012	P-109	8.0		0.0		0.0
P-109	15.4	0.0	127.0	1263.17	1253.72	1254.03	2.0	0.012	P-105	8.0	P-108	84.0		0.0
P-105	9.7	0.0	206.0	1268.71	1257.92	1262.63	2.0	0.012	P-102	7.0	P-104	84.0		0.0
P-102	6.5	0.0	152.0	1273.70	1263.46	1268.12	2.0	0.012	P-101	86.0		0.0		0.0
P-101	4.5	0.0	191.0	1273.87	1268.12	1268.58	2.0	0.012	P-100	0.0		0.0		0.0
P-100	0.7	0.0	11.0	1273.87	1268.58	1268.62	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1251.34 SYSTEM: Ocotilla Detention Basin System 8/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-114	22.7	183.0	0.012	2.0	1249.56	1249.90	1251.34	1253.13	1.78	2.00	7.69	7.23	1.70	2.00	0.00186	0.00858	0.33	2.21	4	
P-113	20.3	75.0	0.012	2.0	1249.90	1250.17	1253.46	1253.97	2.00	2.00	6.46	6.46	1.62	2.00	0.00360	0.00686	0.43	1.02	5	P-
P-111	16.6	75.0	0.012	2.0	1250.17	1250.36	1254.40	1254.74	2.00	2.00	5.28	5.28	1.47	2.00	0.00253	0.00459	0.01	0.85	5	
P-110	16.5	250.0	0.012	2.0	1250.36	1253.72	1254.76	1255.89	2.00	2.00	5.25	5.25	1.46	1.09	0.01344	0.00453	0.12	3.38	5	
P-109	15.4	127.0	0.012	2.0	1253.72	1254.03	1256.01	1256.51	2.00	2.00	4.90	4.90	1.42	2.00	0.00244	0.00395	0.28	6.38	5	P-
P-105	9.7	206.0	0.012	2.0	1257.92	1262.63	1258.62	1263.74	0.70	1.11	9.93	5.39	1.11	0.70	0.02286	0.00000	0.43	4.54	1	P-
P-102	6.5	152.0	0.012	2.0	1263.46	1268.12	1264.17	1269.02	0.71	0.90	6.50	4.72	0.90	0.53	0.03066	0.00000	0.46	4.21	1	
P-101	4.5	191.0	0.012	2.0	1268.12	1268.58	1269.49	1269.74	1.37	1.16	1.96	2.39	0.75	0.85	0.00241	0.00146	0.16	3.97	3	
P-100	0.7	11.0	0.012	2.0	1268.58	1268.62	1269.90	1269.92	1.32	1.30	0.32	0.32	0.29	0.30	0.00364	0.00181	0.00	3.95	3	

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/15/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1253.97 SYSTEM: Ocotilla Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-112	3.7	0.0	51.0	1257.09	1250.17	1251.84	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/15/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1253.97 SYSTEM: Ocotilla Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-112	3.7	51.0	0.012	2.0	1250.17	1251.84	1253.97	1253.98	2.00	2.00	1.18	1.18	0.67	0.39	0.03275	0.00023	0.03	3.08	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]OCIHGL_100.INX;3

TW.EL.= 1256.51 SYSTEM: Ocotilla Detention Basin System 6/21/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-108	6.1	0.0	96.0	1259.51	1254.03	1254.26	2.0	0.012	P-107	0.0		0.0		0.0
P-107	5.0	0.0	68.0	1260.58	1254.26	1255.33	2.0	0.012	P-106	0.0		0.0		0.0
P-106	1.1	0.0	45.0	1260.80	1255.33	1255.55	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1256.51 SYSTEM: Ocotilla Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-108	6.1	96.0	0.012	2.0	1254.03	1254.26	1256.51	1256.57	2.00	2.00	1.94	1.94	0.87	1.01	0.00240	0.00062	0.04	2.90	5
P-107	5.0	68.0	0.012	2.0	1254.26	1255.33	1256.61	1256.64	2.00	1.31	1.59	2.30	0.79	0.55	0.01574	0.00042	0.15	3.80	5
P-106	1.1	45.0	0.012	2.0	1255.33	1255.55	1256.78	1256.78	1.45	1.23	0.45	0.54	0.36	0.34	0.00489	0.00003	0.01	4.01	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1263.74 SYSTEM: Ocotilla Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-104	1.3	0.0	24.0	1267.94	1262.63	1262.69	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]OCTHGL_100.INX;3

TW.EL.= 1263.74 SYSTEM: Ocotilla Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-104	1.3	24.0	0.012	2.0	1262.63	1262.69	1263.74	1263.77	1.11	1.08	0.73	0.75	0.39	0.44	0.00250	0.00127	0.01	4.16	3

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5 Checked: BGS 9/20/89

TW.EL.= 1267.16 SYSTEM: Cactus, Wren, Aurelius System 8/18/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-124	25.3	0.0	185.0	1272.85	1264.75	1266.64	2.0	0.012	P-122	0.0	P-123	90.0		0.0
P-122	19.7	0.0	187.0	1277.30	1267.42	1271.92	2.0	0.012	P-120	0.0	P-121	9.0		0.0
P-120	8.5	0.0	146.0	1282.30	1271.92	1277.05	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5

TW.EL.= 1267.16 SYSTEM: Cactus, Wren, Aurelius System 8/18/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-124	25.3	185.0	0.012	2.0	1264.75	1266.64	1267.16	1269.13	2.00	2.00	8.05	8.05	1.77	2.00	0.01022	0.01066	0.79	2.93	5	P-
P-122	19.7	187.0	0.012	2.0	1267.42	1271.92	1269.92	1273.51	2.00	1.59	6.27	7.33	1.59	1.02	0.02406	0.00000	0.84	2.95	1	P-
P-120	8.5	146.0	0.012	2.0	1271.92	1277.05	1274.35	1278.09	2.00	1.04	2.71	5.15	1.04	0.58	0.03514	0.00000	0.62	3.59	1	

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5

TW.EL.= 1269.53 SYSTEM: Cactus, Wren, Aurelius System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-123	10.1	0.0	6.0	1272.73	1267.42	1267.52	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5

TW.EL.= 1269.53 SYSTEM: Cactus, Wren, Aurelius System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-123	10.1	6.0	0.012	2.0	1267.42	1267.52	1269.53	1269.54	2.00	2.00	3.21	3.21	1.14	0.78	0.01667	0.00170	0.24	2.95	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5

TW.EL.= 1273.93 SYSTEM: Cactus, Wren, Aurelius System 7/28/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-121	11.7	0.0	6.0	1277.17	1271.92	1272.02	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]CWAHGL_100.INX;5

TW.EL.= 1273.93 SYSTEM: Cactus, Wren, Aurelius System 7/28/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-121	11.7	6.0	0.012	2.0	1271.92	1272.02	1273.93	1273.94	2.00	1.92	3.72	3.77	1.23	0.84	0.01667	0.00228	0.33	2.90	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15 Checked: BGR 9/20/89

TW.EL.= 1232.86 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-220	37.8	0.0	48.0	1261.29	1226.63	1226.82	5.0	0.012	P-212	0.0	P-201	60.0		0.0
P-212	35.8	0.0	34.0	1237.33	1226.82	1226.96	5.0	0.012	P-211	0.0		0.0		0.0
P-211	17.8	0.0	12.0	1237.33	1226.96	1227.01	5.0	0.012	P-208	92.0	P-210	0.0	P-213	90.0
P-208	11.8	0.0	130.0	1240.54	1232.08	1235.29	2.0	0.012	P-207	0.0		0.0		0.0
P-207	9.9	0.0	235.0	1249.08	1235.29	1243.83	2.0	0.012	P-205	91.0	P-206	89.0		0.0
P-205	4.0	0.0	65.0	1257.25	1243.83	1251.98	2.0	0.012	P-204	0.0	P-202	86.0	P-203	94.0
P-204	1.5	0.0	10.0	1257.25	1251.98	1252.00	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.86 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-220	37.8	48.0	0.012	5.0	1226.63	1226.82	1232.86	1232.87	5.00	5.00	1.93	1.93	1.71	1.57	0.00396	0.00018	0.01	28.41	5	P-
P-212	35.8	34.0	0.012	5.0	1226.82	1226.96	1232.88	1232.88	5.00	5.00	1.82	1.82	1.67	1.51	0.00412	0.00016	0.08	4.37	5	
P-211	17.8	12.0	0.012	5.0	1226.96	1227.01	1232.96	1232.96	5.00	5.00	0.91	0.91	1.16	1.06	0.00417	0.00004	0.05	4.32	5	P-
P-208	11.8	130.0	0.012	2.0	1232.08	1235.29	1233.01	1236.52	0.93	1.23	8.23	5.80	1.23	0.76	0.02469	0.00000	0.43	3.59	1	
P-207	9.9	235.0	0.012	2.0	1235.29	1243.83	1236.95	1244.96	1.66	1.13	3.55	5.43	1.13	0.63	0.03634	0.00000	0.67	3.45	1	P-
P-205	4.0	65.0	0.012	2.0	1243.83	1251.98	1245.63	1252.68	1.80	0.70	1.34	4.06	0.70	0.29	0.12538	0.00000	0.33	4.24	1	P-
P-204	1.5	10.0	0.012	2.0	1251.98	1252.00	1253.01	1253.02	1.03	1.02	0.92	0.93	0.42	0.50	0.00200	0.00107	0.02	4.21	3	

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.99 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-210	5.2	0.0	65.0	1237.75	1227.01	1227.27	5.0	0.012	P-209	0.0		0.0		0.0
P-209	1.8	0.0	68.0	1240.98	1232.50	1235.73	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.99 SYSTEM: Glendale Ave Pump Station System 7/26/89

													..... O U T P U T						
PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-210	5.2	65.0	0.012	5.0	1227.01	1227.27	1232.99	1232.99	5.00	5.00	0.26	0.26	0.62	0.59	0.00400	0.00000	0.00	4.76	5
P-209	1.8	68.0	0.012	2.0	1232.50	1235.73	1232.99	1236.19	0.49	0.46	3.01	3.26	0.46	0.25	0.04750	0.00000	0.25	4.54	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1245.30 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-206	2.8	0.0	69.0	1249.65	1243.83	1244.40	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1245.30 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-206	2.8	69.0	0.012	2.0	1243.83	1244.40	1245.30	1245.31	1.47	0.91	1.13	2.01	0.58	0.48	0.00826	0.00016	0.09	4.24	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1252.85 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-202	1.4	0.0	75.0	1257.49	1252.00	1252.24	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1252.85 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-202	1.4	75.0	0.012	2.0	1252.00	1252.24	1252.85	1252.97	0.85	0.73	1.10	1.35	0.41	0.43	0.00320	0.00171	0.04	4.48	3

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1252.85 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-203	0.6	0.0	75.0	1257.57	1252.00	1252.32	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1252.85 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-203	0.6	75.0	0.012	2.0	1252.00	1252.32	1252.85	1253.01	0.85	0.69	0.47	0.63	0.26	0.27	0.00427	0.00212	0.01	4.55	3

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.88 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-201	2.4	0.0	36.0	1261.29	1226.82	1256.00	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.88 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-201	2.4	36.0	0.012	2.0	1226.82	1256.00	1232.88	1256.54	2.00	0.54	0.76	3.52	0.54	0.15	0.81056	0.00000	0.29	4.46	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 1

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.99 SYSTEM: Glendale Ave Pump Station System 7/26/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-213	16.2	0.0	64.0	1237.33	1229.37	1229.66	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:DJL PAGE 2

Input file = USERDISK5:[PHX.3089.T411]GLENHGL_100.INX;15

TW.EL.= 1232.99 SYSTEM: Glendale Ave Pump Station System 7/26/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-213	16.2	64.0	0.012	2.0	1229.37	1229.66	1232.99	1233.27	2.00	2.00	5.16	5.16	1.45	1.61	0.00453	0.00437	0.62	3.44	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4 CHECKED: SLA 9/19/89

TW.EL.= 1288.12 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-323	66.3	0.0	78.0	1296.01	1280.70	1280.87	3.5	0.012	P-322	36.0		0.0		0.0
P-322	67.7	0.0	300.0	1298.87	1280.87	1281.59	3.5	0.012	P-321	0.0		0.0		0.0
P-321	69.2	0.0	330.0	1299.28	1281.59	1282.32	3.5	0.012	P-320	0.0		0.0		0.0
P-320	70.8	0.0	330.0	1296.62	1282.32	1283.05	3.5	0.012	P-317	0.0	P-319	45.0		0.0
P-317	63.1	0.0	242.0	1295.60	1283.05	1283.48	3.5	0.012	P-309	0.0	P-316	45.0		0.0
P-309	48.1	0.0	270.0	1296.86	1283.48	1288.75	3.5	0.012	P-306	0.0	P-308	90.0		0.0
P-306	35.2	0.0	325.0	1301.82	1288.75	1293.33	3.0	0.012	P-305	90.0		0.0		0.0
P-305	35.3	0.0	93.0	1300.59	1293.33	1294.34	3.0	0.012	P-303	90.0	P-304	0.0		0.0
P-303	32.1	0.0	250.0	1305.29	1294.34	1297.12	3.0	0.012	P-301	0.0	P-302	90.0		0.0
P-301	15.4	0.0	225.0	1309.47	1298.12	1299.65	2.0	0.012	P-300	0.0		0.0		0.0
P-300	14.4	0.0	250.0	1313.99	1302.88	1306.06	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1288.12 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-323	66.3	78.0	0.012	3.5	1280.70	1280.87	1288.12	1288.41	3.50	3.50	6.89	6.89	2.55	3.50	0.00218	0.00370	0.23	7.37	5	
P-322	67.7	300.0	0.012	3.5	1280.87	1281.59	1288.64	1289.80	3.50	3.50	7.04	7.04	2.58	3.50	0.00240	0.00386	0.00	9.07	5	
P-321	69.2	330.0	0.012	3.5	1281.59	1282.32	1289.80	1291.13	3.50	3.50	7.19	7.19	2.61	3.50	0.00221	0.00403	0.00	8.15	5	
P-320	70.8	330.0	0.012	3.5	1282.32	1283.05	1291.13	1292.52	3.50	3.50	7.36	7.36	2.64	3.50	0.00221	0.00422	0.28	3.82	5	P-
P-317	63.1	242.0	0.012	3.5	1283.05	1283.48	1292.80	1293.61	3.50	3.50	6.56	6.56	2.49	3.50	0.00178	0.00335	0.48	1.51	5	P-
P-309	48.1	270.0	0.012	3.5	1283.48	1288.75	1294.09	1294.61	3.50	3.50	5.00	5.00	2.17	1.35	0.01952	0.00195	0.24	2.01	5	P-
P-306	35.2	325.0	0.012	3.0	1288.75	1293.33	1294.85	1295.63	3.00	2.30	4.98	6.06	1.93	1.34	0.01409	0.00237	1.03	5.16	5	
P-305	35.3	93.0	0.012	3.0	1293.33	1294.34	1296.66	1296.88	3.00	2.54	4.99	5.54	1.93	1.44	0.01086	0.00239	1.26	2.45	5	P-
P-303	32.1	250.0	0.012	3.0	1294.34	1297.12	1298.14	1298.96	3.00	1.84	4.54	7.07	1.84	1.36	0.01112	0.00000	1.17	5.16	1	P-
P-301	15.4	225.0	0.012	2.0	1298.12	1299.65	1300.13	1301.07	2.00	1.42	4.90	6.48	1.42	1.31	0.00680	0.00000	0.12	8.28	1	
P-300	14.4	250.0	0.012	2.0	1302.88	1306.06	1303.90	1307.43	1.02	1.37	8.89	6.30	1.37	1.02	0.01272	0.00000	0.92	5.64	1	

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1292.80 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-319	9.4	0.0	16.0	1296.62	1290.95	1290.99	2.0	0.012	P-318	45.0		0.0		0.0
P-318	4.8	0.0	162.0	1296.62	1290.99	1291.37	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1292.80 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-319	9.4	16.0	0.012	2.0	1290.95	1290.99	1292.80	1292.83	1.85	1.84	3.10	3.11	1.09	1.31	0.00250	0.00189	0.24	3.55	3
P-318	4.8	162.0	0.012	2.0	1290.99	1291.37	1293.07	1293.13	2.00	1.76	1.53	1.64	0.77	0.88	0.00235	0.00038	0.06	3.42	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1293.85 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-316	16.1	0.0	15.0	1295.60	1287.89	1287.93	3.0	0.012	P-313	45.0	P-314	45.0	P-315	135.0
P-313	11.2	0.0	81.0	1294.37	1287.93	1288.12	3.0	0.012	P-312	0.0		0.0		0.0
P-312	5.1	0.0	81.0	1295.60	1288.12	1289.27	2.5	0.012	P-311	90.0	P-310	90.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1293.85 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-316	16.1	15.0	0.012	3.0	1287.89	1287.93	1293.85	1293.86	3.00	3.00	2.28	2.28	1.28	1.38	0.00267	0.00050	0.11	1.64	5	P-
P-313	11.2	81.0	0.012	3.0	1287.93	1288.12	1293.96	1293.98	3.00	3.00	1.58	1.58	1.06	1.17	0.00235	0.00024	0.06	0.32	5	
P-312	5.1	81.0	0.012	2.5	1288.12	1289.27	1294.05	1294.06	2.50	2.50	1.04	1.04	0.75	0.52	0.01420	0.00013	0.03	1.52	5	P-

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 4 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.17 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-311	1.7	0.0	75.0	1295.73	1289.27	1290.45	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 4 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.17 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-311	1.7	75.0	0.012	2.0	1289.27	1290.45	1294.17	1294.17	2.00	2.00	0.54	0.54	0.45	0.32	0.01573	0.00005	0.01	1.55	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 5 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.17 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-310	1.9	0.0	75.0	1295.70	1289.27	1290.45	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 5 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.17 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-310	1.9	75.0	0.012	2.0	1289.27	1290.45	1294.17	1294.17	2.00	2.00	0.60	0.60	0.48	0.34	0.01573	0.00006	0.01	1.52	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 6 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.07 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-315	1.7	0.0	75.0	1295.66	1290.23	1290.41	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 6 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.07 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-315	1.7	75.0	0.012	2.0	1290.23	1290.41	1294.07	1294.07	2.00	2.00	0.54	0.54	0.45	0.51	0.00240	0.00005	0.01	1.58	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 7 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.07 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-314	1.9	0.0	75.0	1295.71	1290.23	1290.41	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 7 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.07 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-314	1.9	75.0	0.012	2.0	1290.23	1290.41	1294.07	1294.07	2.00	2.00	0.60	0.60	0.48	0.54	0.00240	0.00006	0.01	1.63	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 8 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.89 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-308	13.8	0.0	12.0	1296.86	1288.75	1289.69	3.0	0.012	P-307	0.0		0.0		0.0
P-307	3.3	0.0	162.0	1296.86	1290.69	1291.07	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 8 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1294.89 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-308	13.8	12.0	0.012	3.0	1288.75	1289.69	1294.89	1294.89	3.00	3.00	1.95	1.95	1.18	0.53	0.07833	0.00036	0.14	1.82	5
P-307	3.3	162.0	0.012	2.0	1290.69	1291.07	1295.04	1295.07	2.00	2.00	1.05	1.05	0.64	0.72	0.00235	0.00018	0.03	1.77	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 9 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1298.14 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-304	2.5	0.0	81.0	1301.82	1294.84	1296.57	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 9 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1298.14 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-304	2.5	81.0	0.012	2.0	1294.84	1296.57	1298.14	1298.15	2.00	1.58	0.80	0.94	0.55	0.36	0.02136	0.00010	0.02	3.65	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 10 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1300.13 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-302	16.1	0.0	81.0	1306.52	1298.56	1300.27	3.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 10 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1300.13 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-302	16.1	81.0	0.012	3.0	1298.56	1300.27	1300.13	1301.55	1.57	1.28	4.30	5.59	1.28	0.79	0.02111	0.00000	0.73	4.24	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 11 DATE:09/19/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1288.12 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-326	15.3	0.0	48.0	1293.31	1280.54	1280.65	2.0	0.012	P-325	0.0		0.0		0.0
P-325	8.6	0.0	162.0	1293.22	1287.12	1287.51	2.0	0.012	P-324	0.0		0.0		0.0
P-324	1.7	0.0	24.0	1292.82	1287.51	1287.57	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 11 DATE:09/19/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRTLEHGL_100.INX;4

TW.EL.= 1288.12 SYSTEM: Myrtle Wash Detention Basin System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-326	15.3	48.0	0.012	2.0	1280.54	1280.65	1288.12	1288.31	2.00	2.00	4.87	4.87	1.41	2.00	0.00229	0.00390	0.50	4.50	5
P-325	8.6	162.0	0.012	2.0	1287.12	1287.51	1288.81	1289.08	1.69	1.57	3.04	3.25	1.05	1.25	0.00241	0.00179	0.29	3.85	3
P-324	1.7	24.0	0.012	2.0	1287.51	1287.57	1289.37	1289.40	1.86	1.83	0.56	0.56	0.45	0.50	0.00250	0.00126	0.01	3.41	3

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRAVEHGL_100.INX;1

CHECKED 9/15/89

TW.EL.= 1278.31 SYSTEM: Myrtle Avenue To Myrtle Wash System 6/21

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-332	36.7	0.0	150.0	1291.50	1268.36	1280.62	3.0	0.012	P-331	81.0		0.0		0.0
P-331	34.9	0.0	120.0	1295.00	1280.62	1286.00	3.0	0.012	P-330	114.0		0.0		0.0
P-330	17.5	0.0	44.0	1295.00	1286.00	1287.10	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/15/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]MYRAVEHGL_100.INX;1

TW.EL.= 1278.31 SYSTEM: Myrtle Avenue To Myrtle Wash System 6/21

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-332	36.7	150.0	0.012	3.0	1268.36	1280.62	1278.31	1282.59	3.00	1.97	5.19	7.46	1.97	0.86	0.08173	0.00000	1.28	7.63	1
P-331	34.9	120.0	0.012	3.0	1280.62	1286.00	1283.87	1287.92	3.00	1.92	4.94	7.31	1.92	0.97	0.04483	0.00000	2.31	4.77	1
P-330	17.5	44.0	0.012	2.0	1286.00	1287.10	1290.23	1290.46	2.00	2.00	5.57	5.57	1.51	0.94	0.02500	0.00510	0.72	3.82	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:08/22/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]GARDENIAHGL.INX;2 CHECKED: SLA 8/22/89

TW.EL.= 1288.12 SYSTEM: Gardenia Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-327	23.7	0.0	147.0	1307.50	1294.00	1294.60	2.0	0.012	P-335	12.0		0.0		0.0
P-335	21.9	0.0	270.0	1311.80	1294.60	1295.95	2.0	0.012	P-334	75.0		0.0		0.0
P-334	21.9	0.0	57.0	1313.00	1295.95	1297.30	2.0	0.012	P-333	90.0		0.0		0.0
P-333	11.0	0.0	32.0	1313.00	1297.30	1298.10	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:08/22/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]GARDENIAHGL.INX;2

TW.EL.= 1288.12 SYSTEM: Gardenia Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-327	23.7	147.0	0.012	2.0	1294.00	1294.60	1295.73	1297.37	1.73	2.00	8.22	7.54	1.73	2.00	0.00408	0.00935	0.29	9.83	4
P-335	21.9	270.0	0.012	2.0	1294.60	1295.95	1297.67	1299.82	2.00	2.00	6.97	6.97	1.67	2.00	0.00500	0.00799	1.12	10.86	5
P-334	21.9	57.0	0.012	2.0	1295.95	1297.30	1300.94	1301.40	2.00	2.00	6.97	6.97	1.67	1.09	0.02368	0.00799	1.51	10.09	5
P-333	11.0	32.0	0.012	2.0	1297.30	1298.10	1302.91	1302.97	2.00	2.00	3.50	3.50	1.19	0.73	0.02500	0.00201	0.29	9.74	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:08/22/89 DES:BGS PAGE 1

Input file = PHXV01$DUB0:[PHX.3089.T411]STATEAVEHGL_100.INX;3 CHECKED: SLA 8/22/89

TW.EL.= 1288.12 SYSTEM: Gardenia Avenue System 8/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-328	17.0	0.0	109.0	1307.50	1291.00	1292.00	2.0	0.012	P-338	0.0		0.0		0.0
P-338	17.0	0.0	32.0	1309.60	1292.00	1294.91	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:08/22/89 DES:BGS PAGE 2

Input file = PHXV01$DUB0:[PHX.3089.T411]STATEAVEHGL_100.INX;3

TW.EL.= 1288.12 SYSTEM: Gardenia Avenue System 8/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-328	17.0	109.0	0.012	2.0	1291.00	1292.00	1292.26	1293.49	1.26	1.49	8.14	6.79	1.49	1.26	0.00917	0.00000	0.00	14.01	1
P-338	17.0	32.0	0.012	2.0	1292.00	1294.91	1293.49	1296.40	1.49	1.49	6.79	6.79	1.49	0.65	0.09094	0.00000	1.08	12.13	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

CHECKED: SLA 9/19/89

TW.EL.= 1334.73 SYSTEM: HGL for Northern Avenue System 8/07/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-421	26.0	0.0	58.0	1338.87	1330.26	1330.68	2.5	0.012	P-420	45.0		0.0		0.0
P-420	24.7	0.0	222.0	1338.25	1330.68	1332.04	2.5	0.012	P-415	65.0	P-419	35.0		0.0
P-415	7.0	0.0	84.0	1338.25	1332.04	1332.54	2.0	0.012	P-411	65.0	P-414	90.0		0.0
P-411	4.3	0.0	70.0	1338.61	1333.00	1333.31	2.0	0.012	P-410	5.0		0.0		0.0
P-410	2.8	0.0	28.0	1339.04	1333.31	1333.38	2.0	0.012	P-407	13.0	P-408	95.0	P-409	85.0
P-407	1.1	0.0	77.0	1338.81	1333.38	1333.56	2.0	0.012	P-405	50.0	P-406	120.0		0.0
P-405	0.3	0.0	75.0	1339.02	1333.56	1333.77	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 1 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1334.73 SYSTEM: HGL for Northern Avenue System 8/07/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*	
P-421	26.0	58.0	0.012	2.5	1330.26	1330.68	1334.73	1334.93	2.50	2.50	5.30	5.30	1.74	1.52	0.00724	0.00342	0.32	3.63	5	
P-420	24.7	222.0	0.012	2.5	1330.68	1332.04	1335.24	1335.93	2.50	2.50	5.03	5.03	1.69	1.56	0.00613	0.00309	0.60	1.72	5	P-
P-415	7.0	84.0	0.012	2.0	1332.04	1332.54	1336.53	1336.60	2.00	2.00	2.23	2.23	0.94	0.84	0.00595	0.00082	0.13	1.52	5	P-
P-411	4.3	70.0	0.012	2.0	1333.00	1333.31	1336.73	1336.75	2.00	2.00	1.37	1.37	0.73	0.70	0.00443	0.00031	0.03	1.82	5	
P-410	2.8	28.0	0.012	2.0	1333.31	1333.38	1336.79	1336.79	2.00	2.00	0.89	0.89	0.58	0.65	0.00250	0.00013	0.02	2.23	5	P-
P-407	1.1	77.0	0.012	2.0	1333.38	1333.56	1336.81	1336.81	2.00	2.00	0.35	0.35	0.36	0.41	0.00234	0.00002	0.00	1.99	5	P-
P-405	0.3	75.0	0.012	2.0	1333.56	1333.77	1336.82	1336.82	2.00	2.00	0.10	0.10	0.19	0.21	0.00280	0.00000	0.00	2.20	5	

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.53 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-419	12.3	0.0	75.0	1337.97	1332.54	1332.72	2.0	0.012	P-417	0.0		0.0		0.0
P-417	11.1	0.0	75.0	1338.25	1332.72	1333.00	2.0	0.012	P-416	20.0		0.0		0.0
P-416	6.1	0.0	138.0	1338.95	1333.00	1333.70	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 2 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.53 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-419	12.3	75.0	0.012	2.0	1332.54	1332.72	1336.53	1336.72	2.00	2.00	3.92	3.92	1.26	2.00	0.00240	0.00252	0.09	1.16	5
P-417	11.1	75.0	0.012	2.0	1332.72	1333.00	1336.81	1336.96	2.00	2.00	3.53	3.53	1.19	1.28	0.00373	0.00205	0.28	1.01	5
P-416	6.1	138.0	0.012	2.0	1333.00	1333.70	1337.24	1337.32	2.00	2.00	1.94	1.94	0.87	0.82	0.00507	0.00062	0.09	1.54	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.73 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-414	2.5	0.0	75.0	1337.97	1332.54	1332.72	2.0	0.012	P-412	0.0		0.0		0.0
P-412	0.7	0.0	75.0	1338.25	1332.72	1333.00	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 3 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.73 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-414	2.5	75.0	0.012	2.0	1332.54	1332.72	1336.73	1336.74	2.00	2.00	0.80	0.80	0.55	0.62	0.00240	0.00010	0.02	1.21	5
P-412	0.7	75.0	0.012	2.0	1332.72	1333.00	1336.76	1336.76	2.00	2.00	0.22	0.22	0.29	0.29	0.00373	0.00001	0.00	1.49	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 4 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.81 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-408	1.2	0.0	69.0	1339.53	1333.79	1334.28	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 4 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.81 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-408	1.2	69.0	0.012	2.0	1333.79	1334.28	1336.81	1336.81	2.00	2.00	0.38	0.38	0.38	0.33	0.00710	0.00002	0.00	2.71	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 5 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.81 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-409	0.2	0.0	50.0	1339.20	1333.79	1333.95	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 5 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.81 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-409	0.2	50.0	0.012	2.0	1333.79	1333.95	1336.81	1336.81	2.00	2.00	0.06	0.06	0.15	0.16	0.00320	0.00000	0.00	2.39	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 6 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.82 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-406	0.2	0.0	75.0	1339.01	1333.56	1333.76	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 6 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1336.82 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-406	0.2	75.0	0.012	2.0	1333.56	1333.76	1336.82	1336.82	2.00	2.00	0.06	0.06	0.15	0.17	0.00267	0.00000	0.00	2.19	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=IWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=IWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 7 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1340.68 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-403	13.5	0.0	25.0	1348.46	1340.12	1340.89	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 7 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1340.68 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-403	13.5	25.0	0.012	2.0	1340.12	1340.89	1340.89	1342.21	0.77	1.32	12.12	6.12	1.32	0.77	0.03080	0.00000	0.87	5.37	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 8 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1341.65 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-404	6.1	0.0	58.0	1348.86	1341.00	1343.61	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 8 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1341.65 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-404	6.1	58.0	0.012	2.0	1341.00	1343.61	1341.65	1344.48	0.65	0.87	6.89	4.62	0.87	0.46	0.04500	0.00000	0.50	3.88	1

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 9 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1334.73 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-422	2.0	0.0	68.0	1338.48	1331.05	1333.23	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 9 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1334.73 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-422	2.0	68.0	0.012	2.0	1331.05	1333.23	1334.73	1334.73	2.00	1.50	0.64	0.79	0.49	0.29	0.03206	0.00007	0.01	3.73	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 10 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1335.79 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

									UPSTREAM		LATERAL 3		LATERAL 4	
PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	L1	AN1	L3	AN3	L4	AN4
P-426	6.5	0.0	16.0	1337.92	1332.29	1332.40	3.5	0.024		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 10 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1335.79 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-426	6.5	16.0	0.024	3.5	1332.29	1332.40	1335.79	1335.79	3.50	3.39	0.68	0.68	0.77	0.90	0.00688	0.00014	0.01	2.12	5

* DENOTES HGL FORMULA USED:
(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 11 DATE:09/18/89 DES:BGS PAGE 1

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1335.94 SYSTEM: HGL for Northern Avenue System 6/21/89

********* I N P U T *********

PIPE	Q	QA	L	TS2	FL1	FL2	DIA	N	UPSTREAM L1	UPSTREAM AN1	LATERAL 3 L3	LATERAL 3 AN3	LATERAL 4 L4	LATERAL 4 AN4
P-425	52.4	0.0	454.0	1342.56	1335.64	1336.08	4.0	0.012	P-428	90.0		0.0		0.0
P-428	4.4	0.0	56.0	1343.50	1336.71	1336.83	2.0	0.012	P-427	45.0		0.0		0.0
P-427	4.4	0.0	167.0	1362.76	1336.83	1346.01	2.0	0.012		0.0		0.0		0.0

HYDRAULIC GRADELINE PROFILE JOB:130892103 REF: 11 DATE:09/18/89 DES:BGS PAGE 2

Input file = USERDISK5:[PHX.3089.T411]NORTHHGL_100.INX;24

TW.EL.= 1335.94 SYSTEM: HGL for Northern Avenue System 6/21/89

..... O U T P U T .....

PIPE	Q	L	N	DIA	FL1	FL2	HG1	HG2	D1	D2	V1	V2	DC	DN	SO	S	DY	FB	*
P-425	52.4	454.0	0.012	4.0	1335.64	1336.08	1337.81	1340.15	2.17	4.00	7.51	4.17	2.17	4.00	0.00097	0.00113	0.86	1.54	4
P-428	4.4	56.0	0.012	2.0	1336.71	1336.83	1341.02	1341.04	2.00	2.00	1.40	1.40	0.74	0.87	0.00214	0.00032	0.02	2.45	5
P-427	4.4	167.0	0.012	2.0	1336.83	1346.01	1341.05	1346.75	2.00	0.74	1.40	4.18	0.74	0.37	0.05497	0.00000	0.41	15.60	1

* DENOTES HGL FORMULA USED:

(1) HG2=FL2+DC
(2) HG2=FL2+DN
(3) HG2=TWEL+(SAVG*L)+VH1-VH2
(4) HG2=FL1+H+(SFULL*L)
(5) HG2=TWEL+(SFULL*L)

2. MYRTLE WASH DETENTION BASIN - HEC-1 OUTPUT

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BGS	Date 4-29-89	Job No. 13089-21-03
	Checked by JWW	Date	Sheet No. 1/1
For Squaw Peak Highway Myrtle Wash Hydrology			

Summary of Sheet No. 1 ~ 16

1. Develop TR-20 runs for Existing Condition (TR20EXIST.IN) and Proposed Condition (TR20PROP.IN) for Myrtle Wash for 50- and 100-year W 1- and 24-hour storms by using A-N West hydrologic parameters

2. Use A-N West hydrologic parameters:

   D.A. = 0.68 sq. mi. CN = 93.4 & Tc = 0.385 hrs

3. Adopt A-N West's 1-hr rainfall distribution and City of Phoenix's 24-hr rainfall distribution.

4. The existing total rainfall volume of 119.5 ac-ft was found for a 100-year, 24-hour storm event, while a volume of 126.1 ac-ft was computed for the proposed condition. The additional volume of 6.6 ac-ft must be retained in the Northview Detention Basin and the peak flows for the 50- and 100-year storms must be verified by reservoir routing through the basin.

5. The distributing area to Myrtle Wash is increased by approximately 19 acres for the proposed condition.

6. The 50- and 100-year, 24-hour storms will be used to perform the reservoir routing of Northview Detention Basin.

IE101-0374-20M

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BGB	Date 4-28-89	Job No. 13089-21-03
	Checked by JWW	Date 5-18-89	Sheet No. 1/16

For Squaw Peak Highway Myrtle Wash Hydrology

Myrtle Wash @ 18th St.
Weighted CN = 93.4 & Tc = 0.385 hours

Existing Condition [PHX.3089.HEC2] TR20EXIST.OUT

	Basin Area (sq. mi.)		100-Year 24-hr	100-Year 1-hr	50-Year 24-hr	50-Year 1-hr
Myrtle Wash	0.68 = 435.2 ac	Q_p	1,098.8 cfs	1,528.0 cfs	958.0 cfs	1,301.1 cfs
		Volume	119.5 ac-ft	65.5 ac-ft	103.0 ac-ft	55.6 ac-ft

Proposed Condition [PHX.3089.HEC2] TR20PROP.OUT

	Basin Area		100-Year 24-hr	100-Year 1-hr	50-Year 24-hr	50-Year 1-hr
Myrtle Wash	0.672 sq. mi. = 435.2 - 5.2 (State Ave.) = 430 ac.	Q_p	1,085.9 cfs	1,510.1 cfs	946.7 cfs	1,285.8 cfs
		Vol.	118.1 ac-ft	64.7 ac-ft	101.8 ac-ft	54.9 ac-ft
Northview Detention Basin	1. Pvmt = = 14.28 ac.	Q_p	77.1 cfs		65.3 cfs	
		Vol.	5.2 ac-ft		4.5 ac-ft	
	2. D.A. #9 = 6.31 ac.	Q_p	25.4 cfs		22.2 cfs	
		Vol.	1.6 ac-ft		1.4 ac-ft	
	3. State Ave = 2.99 ac.	Q_p	19.1 cfs		16.5 cfs	
		Vol.	1.2 ac-ft		1.0 ac-ft	

Total D.A. = 453.58 ac. = 0.709 sq. mi.

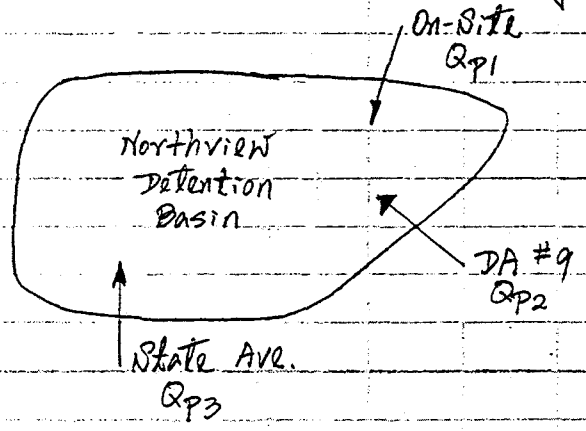
Detention Basin Volume = [118.1 + 5.2 + 1.6 + 1.2] − 119.5 = 6.6 ac-ft ≈ 287,500 ft³

VE101-0374-20M

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BGS	Date 4-26-89	Job No. 13089-21-03
	Checked by JWW	Date 5-1-89	Sheet No. 21b

For Squaw Peak Highway Northview Detention Basin Calc's

Inflow Hydrographs



$i_{50} = 5.82$ in/hr @ $T_c = 10$ min.
$i_{100} = 6.72$ in/hr @ $T_c = 10$ min.
HNTB TR55 Program

$Q_p = q_p \times P \times CA$ (in sq. mi.)
100

q_p from TR-55 Exhibit 5-II

	50-Year Q	Tc	DA	q_p	P	Sources
C = 0.93	Q_{p1} = 65.3 cfs	14.9 min = 0.248 hrs	14.28 ac.	695.2	4.210	[PHX.3089]NVDB.OUT
C = 0.60	Q_{p2} = 22.2 cfs	10.0 min = 0.167 hrs	6.31 ac.	779.5	2.889	Baker's Report
C = 0.95	Q_{p3} = 16.5 cfs	10.0 min = 0.167 hrs	2.99 ac.	779.5	4.531	HNTB's Report

	100-Year Q					
C = 0.93	Q_{p1} = 77.1 cfs	14.5 min = 0.242 hrs	14.28 ac.	707.8	4.882	[PHX.3089]NVDB100.OUT
C = 0.60	Q_{p2} = 25.4 cfs	10.0 min = 0.167 hrs	6.31 ac.	779.5	3.305	Baker's Report
C = 0.95	Q_{p3} = 19.1 cfs	10.0 min = 0.167 hrs	2.99 ac.	779.5	5.245	None of Above

Notes:

1. State Ave. D.A. is reduced from 5.132 ac. to 2.99 ac.
2. D.A. #9 D.A. is reduced from 7.2 ac. to 6.31 ac.

AE101-0374-20M

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            FEBRUARY 1981             *
*          REVISED 31 JAN 85           *
*                                      *
*  RUN DATE      11-M    TIME      11:2 *
*                                      *
****************************************
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****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*  (916) 440-3285 OR (FTS) 448-3285    *
*                                      *
****************************************
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X     X  XXXXXXX  XXXXX          X
X     X  X       X    X        XX
X     X  X       X              X
XXXXXXX  XXXX    X       XXXXX  X
X     X  X       X              X
X     X  X       X    X         X
X     X  XXXXXXX  XXXXX        XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THE VERSION RELEASED 31JAN85 CONTAINS NEW OPTIONS ON RL AND BA RECORDS, AND ADDS THE HL RECORD. SEE JANUARY 1985 INPUT DESCRIPTION FOR NEW DEFINITIONS.

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID        SQUAW PEAK HIGHWAY NORTHVIEW DETENTION BASIN
  2           ID        RESERVOIR ROUTING - MODIFIED PULS METHOD
  3           ID        100-YEAR FLOOD EVENT
  4           ID        12" OUTLET PIPE W/O SPILLWAY
  5           IT       6                    300
  6           IO       1

  7           KK    PF100
  8           KM        PAVEMENT FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)
  9           IN       6
 10           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 11           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 12           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 13           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 14           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 15           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 16           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 17           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 18           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 19           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 21           QI    2.40     2.90     3.40     3.90     4.40     4.90    12.30    19.60    47.00    77.10
 22           QI   70.60    51.30    32.50    22.20    17.10    14.40    12.20    10.00     8.70     8.00
 23           QI    7.50     6.90     6.30     6.00     5.70     5.40     5.20     5.00     4.80     4.60
 24           QI    4.40     4.30     4.10     3.98     3.84     3.70     3.60     3.50     3.40     3.30
 25           QI    3.20     3.14     3.08     3.02     2.96     2.90     2.84     2.78     2.72     2.66
 26           QI    2.60     2.57     2.54     2.51     2.48     2.45     2.42     2.39     2.36     2.33
 27           QI    2.30     2.27     2.24     2.21     2.18     2.15     2.12     2.09     2.06     2.03
 28           QI    2.00     1.98     1.95     1.93     1.90     1.87     1.85     1.82     1.80     1.77
 29           QI    1.75     1.72     1.70     1.67     1.65     1.63     1.60     1.57     1.55     1.52
 30           QI    1.50     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 31           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 32           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 33           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 34           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 35           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 36           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 37           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 38           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 39           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00

 40           KK    AN100
 41           KM        D.A. #9 FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)
 42           IN       6
 43           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 44           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 45           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 46           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 47           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 48           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 49           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 50           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 51           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 52           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 53           QI    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
```

LINE	ID.....1	2	3	4	5	6	7	8	9	10
54	QI 0.80	0.96	1.12	1.28	1.44	1.60	4.70	7.80	21.80	25.40
55	QI 19.10	11.80	7.00	5.10	4.30	3.80	3.20	2.70	2.40	2.30
56	QI 2.20	2.00	1.80	1.73	1.66	1.60	1.50	1.45	1.40	1.35
57	QI 1.30	1.25	1.20	1.15	1.12	1.10	1.05	1.00	0.98	0.94
58	QI 0.90	0.89	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81
59	QI 0.80	0.79	0.78	0.77	0.76	0.75	0.74	0.73	0.72	0.71
60	QI 0.70	0.69	0.68	0.67	0.66	0.65	0.64	0.63	0.62	0.61
61	QI 0.60	0.60	0.59	0.59	0.58	0.58	0.57	0.57	0.56	0.56
62	QI 0.55	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.51	0.51
63	QI 0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	KK SA100									
74	KM STATE AVENUE FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)									
75	IN 6									
76	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	QI 0.60	0.70	0.80	0.90	1.05	1.20	3.50	5.80	16.40	19.10
88	QI 14.40	8.80	5.30	3.90	3.20	2.90	2.40	2.00	1.80	1.70
89	QI 1.60	1.45	1.30	1.28	1.24	1.20	1.16	1.12	1.08	1.04
90	QI 1.00	0.95	0.90	0.85	0.83	0.80	0.78	0.76	0.74	0.72
91	QI 0.70	0.69	0.68	0.67	0.66	0.65	0.64	0.63	0.62	0.61
92	QI 0.60	0.59	0.58	0.57	0.56	0.55	0.54	0.53	0.52	0.51
93	QI 0.50	0.49	0.48	0.47	0.46	0.45	0.44	0.43	0.42	0.41
94	QI 0.40	0.40	0.39	0.39	0.38	0.38	0.37	0.37	0.36	0.36
95	QI 0.35	0.35	0.34	0.34	0.33	0.33	0.32	0.32	0.31	0.31
96	QI 0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	QI 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 106          KK     C 1
 107          KM          COMBINE RUNOFF INTO NORTHVIEW DETENTION BASIN
 108          HC       3

 109          KK   OUT 1 ROUTE FLOWS THROUGH DETENTION BASIN
 110          KM          MODIFIED PULSE METHOD FOR RESERVOIR ROUTING USING 12" RCP
 111          RS       1    ELEV   1280.
 112          SV    0.24    1.26    2.40    3.67    4.35    5.07    5.82    6.61
 113          SE   1281.   1283.   1285.   1287.   1288.   1289.   1290.   1291.
 114          SQ      0.     1.8     3.1     4.1     4.8     5.4     6.0     6.5     7.0     7.5
 115          SQ     7.9     8.3
 116          SE  1280.0   1281.   1282.   1283.   1284.   1285.   1286.   1287.   1288.   1289.
 117          SE   1290.   1291.

 118          KK  MYRTLE
 119          KM        MYRTLE WASH 100-YEAR HYDROGRAPH (TR20PROP.OUT 4-28-89)
 120          IN       6
 121          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 122          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 123          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 124          QI    0.00    0.00    0.04    0.12    0.26    0.42    0.58    0.70    0.80    0.90
 125          QI    1.01    1.11    1.22    1.33    1.44    1.55    1.69    1.91    2.17    2.40
 126          QI    2.60    2.74    2.75    2.71    2.70    2.74    2.86    3.10    3.41    3.68
 127          QI    3.88    3.99    3.95    3.83    3.75    3.75    3.85    4.13    4.49    4.79
 128          QI    5.00    5.10    4.99    4.80    4.67    4.64    4.73    5.04    5.43    5.76
 129          QI    6.02    6.87    9.35   12.57   15.17   16.84   18.10   19.34   20.55   21.56
 130          QI   22.38   22.98   23.23   23.31   23.46   23.80   25.08   28.46   32.78   36.28
 131          QI   38.62   41.62   47.67   55.01   60.87   65.01  112.56  295.74  541.71  743.72
 132          QI  871.73  954.42 1008.45 1044.44 1069.13 1082.69 1026.98  815.39  539.72  333.71
 133          QI  223.78  163.52  125.34   99.69   84.10   75.89   70.10   62.48   55.03   49.87
 134          QI   47.19   45.98   45.97   46.53   47.03   47.29   47.21   46.55   45.67   45.01
 135          QI   44.58   42.46   35.60   26.96   20.62   17.33   15.57   14.64   14.15   13.88
 136          QI   13.76   13.91   14.61   15.55   16.25   16.61   16.58   15.95   15.06   14.39
 137          QI   14.04   14.06   14.72   15.63   16.30   16.65   16.84   16.94   16.99   17.02
 138          QI   17.02   16.81   16.07   15.13   14.43   14.07   14.10   14.74   15.63   16.30
 139          QI   16.65   16.63   15.97   15.07   14.40   14.05   13.86   13.76   13.71   13.68
 140          QI   13.68   13.90   14.63   15.58   16.28   16.64   16.61   15.98   15.08   14.41
 141          QI   14.06   14.08   14.74   15.65   16.33   16.67   16.64   15.99   15.09   14.42
 142          QI   14.08   14.12   14.76   15.65   16.32   16.67   16.63   15.99   15.09   14.42
 143          QI   14.07   13.88   13.78   13.73   13.70   13.69   13.90   14.65   15.60   16.30
 144          QI   16.61   15.66   12.06    7.40    3.92    2.06    1.08    0.56    0.29    0.14
 145          QI    0.07    0.02    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 146          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 147          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 148          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 149          QI    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00

 150          KK     C 2
 151          KM        COMBINE OUTFLOW FROM NORTHVIEW DETENTION BASIN WITH MYRTLE WASH
 152          HC       2
 153          ZZ
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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            FEBRUARY 1981             *
*          REVISED 31 JAN 85           *
*                                      *
*  RUN DATE      11-M    TIME      11:2 *
*                                      *
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*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*  (916) 440-3285 OR (FTS) 448-3285    *
*                                      *
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                         SQUAW PEAK HIGHWAY NORTHVIEW DETENTION BASIN
                         RESERVOIR ROUTING - MODIFIED PULS METHOD
                         100-YEAR FLOOD EVENT
                         12" OUTLET PIPE W/O SPILLWAY

  6 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          6  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME       0554  ENDING TIME

                 COMPUTATION INTERVAL    0.10 HOURS
                      TOTAL TIME BASE   29.90 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  7 KK      *     PF100  *
            *            *
            **************
                         PAVEMENT FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)

  9 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          6  TIME INTERVAL IN MINUTES
                     JXDATE      1   0  STARTING DATE
                     JXTIME          0  STARTING TIME
```

SUBBASIN RUNOFF DATA

0 BA SUBBASIN CHARACTERISTICS
TAREA 0.00 SUBBASIN AREA

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HYDROGRAPH AT STATION PF100

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0730	76	0.	1		1500	151	3.	1		2230	226	0.
1		0006	2	0.	1		0736	77	0.	1		1506	152	3.	1		2236	227	0.
1		0012	3	0.	1		0742	78	0.	1		1512	153	3.	1		2242	228	0.
1		0018	4	0.	1		0748	79	0.	1		1518	154	3.	1		2248	229	0.
1		0024	5	0.	1		0754	80	0.	1		1524	155	3.	1		2254	230	0.
1		0030	6	0.	1		0800	81	0.	1		1530	156	3.	1		2300	231	0.
1		0036	7	0.	1		0806	82	0.	1		1536	157	3.	1		2306	232	0.
1		0042	8	0.	1		0812	83	0.	1		1542	158	3.	1		2312	233	0.
1		0048	9	0.	1		0818	84	0.	1		1548	159	3.	1		2318	234	0.
1		0054	10	0.	1		0824	85	0.	1		1554	160	3.	1		2324	235	0.
1		0100	11	0.	1		0830	86	0.	1		1600	161	3.	1		2330	236	0.
1		0106	12	0.	1		0836	87	0.	1		1606	162	3.	1		2336	237	0.
1		0112	13	0.	1		0842	88	0.	1		1612	163	3.	1		2342	238	0.
1		0118	14	0.	1		0848	89	0.	1		1618	164	3.	1		2348	239	0.
1		0124	15	0.	1		0854	90	0.	1		1624	165	2.	1		2354	240	0.
1		0130	16	0.	1		0900	91	0.	1		1630	166	2.	2		0000	241	0.
1		0136	17	0.	1		0906	92	0.	1		1636	167	2.	2		0006	242	0.
1		0142	18	0.	1		0912	93	0.	1		1642	168	2.	2		0012	243	0.
1		0148	19	0.	1		0918	94	0.	1		1648	169	2.	2		0018	244	0.
1		0154	20	0.	1		0924	95	0.	1		1654	170	2.	2		0024	245	0.
1		0200	21	0.	1		0930	96	0.	1		1700	171	2.	2		0030	246	0.
1		0206	22	0.	1		0936	97	0.	1		1706	172	2.	2		0036	247	0.
1		0212	23	0.	1		0942	98	0.	1		1712	173	2.	2		0042	248	0.
1		0218	24	0.	1		0948	99	0.	1		1718	174	2.	2		0048	249	0.
1		0224	25	0.	1		0954	100	0.	1		1724	175	2.	2		0054	250	0.
1		0230	26	0.	1		1000	101	0.	1		1730	176	2.	2		0100	251	0.
1		0236	27	0.	1		1006	102	0.	1		1736	177	2.	2		0106	252	0.
1		0242	28	0.	1		1012	103	0.	1		1742	178	2.	2		0112	253	0.
1		0248	29	0.	1		1018	104	0.	1		1748	179	2.	2		0118	254	0.
1		0254	30	0.	1		1024	105	0.	1		1754	180	2.	2		0124	255	0.
1		0300	31	0.	1		1030	106	0.	1		1800	181	2.	2		0130	256	0.
1		0306	32	0.	1		1036	107	0.	1		1806	182	2.	2		0136	257	0.
1		0312	33	0.	1		1042	108	0.	1		1812	183	2.	2		0142	258	0.
1		0318	34	0.	1		1048	109	0.	1		1818	184	2.	2		0148	259	0.
1		0324	35	0.	1		1054	110	0.	1		1824	185	2.	2		0154	260	0.
1		0330	36	0.	1		1100	111	2.	1		1830	186	2.	2		0200	261	0.
1		0336	37	0.	1		1106	112	3.	1		1836	187	2.	2		0206	262	0.
1		0342	38	0.	1		1112	113	3.	1		1842	188	2.	2		0212	263	0.
1		0348	39	0.	1		1118	114	4.	1		1848	189	2.	2		0218	264	0.
1		0354	40	0.	1		1124	115	4.	1		1854	190	2.	2		0224	265	0.
1		0400	41	0.	1		1130	116	5.	1		1900	191	2.	2		0230	266	0.
1		0406	42	0.	1		1136	117	12.	1		1906	192	2.	2		0236	267	0.
1		0412	43	0.	1		1142	118	20.	1		1912	193	2.	2		0242	268	0.
1		0418	44	0.	1		1148	119	47.	1		1918	194	2.	2		0248	269	0.

1	0424	45	0.	*	1	1154	120	77.	*	1	1924	195	2.	*	2	0254	270	0.
1	0430	46	0.	*	1	1200	121	71.	*	1	1930	196	2.	*	2	0300	271	0.
1	0436	47	0.	*	1	1206	122	51.	*	1	1936	197	2.	*	2	0306	272	0.
1	0442	48	0.	*	1	1212	123	33.	*	1	1942	198	2.	*	2	0312	273	0.
1	0448	49	0.	*	1	1218	124	22.	*	1	1948	199	2.	*	2	0318	274	0.
1	0454	50	0.	*	1	1224	125	17.	*	1	1954	200	2.	*	2	0324	275	0.
1	0500	51	0.	*	1	1230	126	14.	*	1	2000	201	2.	*	2	0330	276	0.
1	0506	52	0.	*	1	1236	127	12.	*	1	2006	202	0.	*	2	0336	277	0.
1	0512	53	0.	*	1	1242	128	10.	*	1	2012	203	0.	*	2	0342	278	0.
1	0518	54	0.	*	1	1248	129	9.	*	1	2018	204	0.	*	2	0348	279	0.
1	0524	55	0.	*	1	1254	130	8.	*	1	2024	205	0.	*	2	0354	280	0.
1	0530	56	0.	*	1	1300	131	8.	*	1	2030	206	0.	*	2	0400	281	0.
1	0536	57	0.	*	1	1306	132	7.	*	1	2036	207	0.	*	2	0406	282	0.
1	0542	58	0.	*	1	1312	133	6.	*	1	2042	208	0.	*	2	0412	283	0.
1	0548	59	0.	*	1	1318	134	6.	*	1	2048	209	0.	*	2	0418	284	0.
1	0554	60	0.	*	1	1324	135	6.	*	1	2054	210	0.	*	2	0424	285	0.
1	0600	61	0.	*	1	1330	136	5.	*	1	2100	211	0.	*	2	0430	286	0.
1	0606	62	0.	*	1	1336	137	5.	*	1	2106	212	0.	*	2	0436	287	0.
1	0612	63	0.	*	1	1342	138	5.	*	1	2112	213	0.	*	2	0442	288	0.
1	0618	64	0.	*	1	1348	139	5.	*	1	2118	214	0.	*	2	0448	289	0.
1	0624	65	0.	*	1	1354	140	5.	*	1	2124	215	0.	*	2	0454	290	0.
1	0630	66	0.	*	1	1400	141	4.	*	1	2130	216	0.	*	2	0500	291	0.
1	0636	67	0.	*	1	1406	142	4.	*	1	2136	217	0.	*	2	0506	292	0.
1	0642	68	0.	*	1	1412	143	4.	*	1	2142	218	0.	*	2	0512	293	0.
1	0648	69	0.	*	1	1418	144	4.	*	1	2148	219	0.	*	2	0518	294	0.
1	0654	70	0.	*	1	1424	145	4.	*	1	2154	220	0.	*	2	0524	295	0.
1	0700	71	0.	*	1	1430	146	4.	*	1	2200	221	0.	*	2	0530	296	0.
1	0706	72	0.	*	1	1436	147	4.	*	1	2206	222	0.	*	2	0536	297	0.
1	0712	73	0.	*	1	1442	148	4.	*	1	2212	223	0.	*	2	0542	298	0.
1	0718	74	0.	*	1	1448	149	3.	*	1	2218	224	0.	*	2	0548	299	0.
1	0724	75	0.	*	1	1454	150	3.	*	1	2224	225	0.	*	2	0554	300	0.
				*					*					*				

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
77.	11.90	(CFS)	10.	3.	2.	2.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = 0.00 SQ MI

*** ***

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              **************
              *            *
40 KK         *    AN100   *
              *            *
              **************
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D.A. #9 FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)

42 IN TIME DATA FOR INPUT TIME SERIES

JXMIN		6	TIME INTERVAL IN MINUTES
JXDATE	1	0	STARTING DATE
JXTIME		0	STARTING TIME

SUBBASIN RUNOFF DATA

0 BA SUBBASIN CHARACTERISTICS
TAREA 0.00 SUBBASIN AREA

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HYDROGRAPH AT STATION AN100

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0730	76	0.	1		1500	151	1.	1		2230	226	0.
1		0006	2	0.	1		0736	77	0.	1		1506	152	1.	1		2236	227	0.
1		0012	3	0.	1		0742	78	0.	1		1512	153	1.	1		2242	228	0.
1		0018	4	0.	1		0748	79	0.	1		1518	154	1.	1		2248	229	0.
1		0024	5	0.	1		0754	80	0.	1		1524	155	1.	1		2254	230	0.
1		0030	6	0.	1		0800	81	0.	1		1530	156	1.	1		2300	231	0.
1		0036	7	0.	1		0806	82	0.	1		1536	157	1.	1		2306	232	0.
1		0042	8	0.	1		0812	83	0.	1		1542	158	1.	1		2312	233	0.
1		0048	9	0.	1		0818	84	0.	1		1548	159	1.	1		2318	234	0.
1		0054	10	0.	1		0824	85	0.	1		1554	160	1.	1		2324	235	0.
1		0100	11	0.	1		0830	86	0.	1		1600	161	1.	1		2330	236	0.
1		0106	12	0.	1		0836	87	0.	1		1606	162	1.	1		2336	237	0.
1		0112	13	0.	1		0842	88	0.	1		1612	163	1.	1		2342	238	0.
1		0118	14	0.	1		0848	89	0.	1		1618	164	1.	1		2348	239	0.
1		0124	15	0.	1		0854	90	0.	1		1624	165	1.	1		2354	240	0.
1		0130	16	0.	1		0900	91	0.	1		1630	166	1.	2		0000	241	0.
1		0136	17	0.	1		0906	92	0.	1		1636	167	1.	2		0006	242	0.
1		0142	18	0.	1		0912	93	0.	1		1642	168	1.	2		0012	243	0.
1		0148	19	0.	1		0918	94	0.	1		1648	169	1.	2		0018	244	0.
1		0154	20	0.	1		0924	95	0.	1		1654	170	1.	2		0024	245	0.
1		0200	21	0.	1		0930	96	0.	1		1700	171	1.	2		0030	246	0.
1		0206	22	0.	1		0936	97	0.	1		1706	172	1.	2		0036	247	0.
1		0212	23	0.	1		0942	98	0.	1		1712	173	1.	2		0042	248	0.
1		0218	24	0.	1		0948	99	0.	1		1718	174	1.	2		0048	249	0.
1		0224	25	0.	1		0954	100	0.	1		1724	175	1.	2		0054	250	0.
1		0230	26	0.	1		1000	101	0.	1		1730	176	1.	2		0100	251	0.
1		0236	27	0.	1		1006	102	0.	1		1736	177	1.	2		0106	252	0.
1		0242	28	0.	1		1012	103	0.	1		1742	178	1.	2		0112	253	0.
1		0248	29	0.	1		1018	104	0.	1		1748	179	1.	2		0118	254	0.
1		0254	30	0.	1		1024	105	0.	1		1754	180	1.	2		0124	255	0.
1		0300	31	0.	1		1030	106	0.	1		1800	181	1.	2		0130	256	0.
1		0306	32	0.	1		1036	107	0.	1		1806	182	1.	2		0136	257	0.
1		0312	33	0.	1		1042	108	0.	1		1812	183	1.	2		0142	258	0.
1		0318	34	0.	1		1048	109	0.	1		1818	184	1.	2		0148	259	0.
1		0324	35	0.	1		1054	110	0.	1		1824	185	1.	2		0154	260	0.
1		0330	36	0.	1		1100	111	1.	1		1830	186	1.	2		0200	261	0.
1		0336	37	0.	1		1106	112	1.	1		1836	187	1.	2		0206	262	0.
1		0342	38	0.	1		1112	113	1.	1		1842	188	1.	2		0212	263	0.
1		0348	39	0.	1		1118	114	1.	1		1848	189	1.	2		0218	264	0.
1		0354	40	0.	1		1124	115	1.	1		1854	190	1.	2		0224	265	0.
1		0400	41	0.	1		1130	116	2.	1		1900	191	1.	2		0230	266	0.
1		0406	42	0.	1		1136	117	5.	1		1906	192	1.	2		0236	267	0.
1		0412	43	0.	1		1142	118	8.	1		1912	193	1.	2		0242	268	0.
1		0418	44	0.	1		1148	119	22.	1		1918	194	1.	2		0248	269	0.
1		0424	45	0.	1		1154	120	25.	1		1924	195	1.	2		0254	270	0.

1	0430	46	0.	*	1	1200	121	19.	*	1	1930	196	1.	*	2	0300	271	0.
1	0436	47	0.	*	1	1206	122	12.	*	1	1936	197	1.	*	2	0306	272	0.
1	0442	48	0.	*	1	1212	123	7.	*	1	1942	198	1.	*	2	0312	273	0.
1	0448	49	0.	*	1	1218	124	5.	*	1	1948	199	1.	*	2	0318	274	0.
1	0454	50	0.	*	1	1224	125	4.	*	1	1954	200	1.	*	2	0324	275	0.
1	0500	51	0.	*	1	1230	126	4.	*	1	2000	201	1.	*	2	0330	276	0.
1	0506	52	0.	*	1	1236	127	3.	*	1	2006	202	0.	*	2	0336	277	0.
1	0512	53	0.	*	1	1242	128	3.	*	1	2012	203	0.	*	2	0342	278	0.
1	0518	54	0.	*	1	1248	129	2.	*	1	2018	204	0.	*	2	0348	279	0.
1	0524	55	0.	*	1	1254	130	2.	*	1	2024	205	0.	*	2	0354	280	0.
1	0530	56	0.	*	1	1300	131	2.	*	1	2030	206	0.	*	2	0400	281	0.
1	0536	57	0.	*	1	1306	132	2.	*	1	2036	207	0.	*	2	0406	282	0.
1	0542	58	0.	*	1	1312	133	2.	*	1	2042	208	0.	*	2	0412	283	0.
1	0548	59	0.	*	1	1318	134	2.	*	1	2048	209	0.	*	2	0418	284	0.
1	0554	60	0.	*	1	1324	135	2.	*	1	2054	210	0.	*	2	0424	285	0.
1	0600	61	0.	*	1	1330	136	2.	*	1	2100	211	0.	*	2	0430	286	0.
1	0606	62	0.	*	1	1336	137	2.	*	1	2106	212	0.	*	2	0436	287	0.
1	0612	63	0.	*	1	1342	138	1.	*	1	2112	213	0.	*	2	0442	288	0.
1	0618	64	0.	*	1	1348	139	1.	*	1	2118	214	0.	*	2	0448	289	0.
1	0624	65	0.	*	1	1354	140	1.	*	1	2124	215	0.	*	2	0454	290	0.
1	0630	66	0.	*	1	1400	141	1.	*	1	2130	216	0.	*	2	0500	291	0.
1	0636	67	0.	*	1	1406	142	1.	*	1	2136	217	0.	*	2	0506	292	0.
1	0642	68	0.	*	1	1412	143	1.	*	1	2142	218	0.	*	2	0512	293	0.
1	0648	69	0.	*	1	1418	144	1.	*	1	2148	219	0.	*	2	0518	294	0.
1	0654	70	0.	*	1	1424	145	1.	*	1	2154	220	0.	*	2	0524	295	0.
1	0700	71	0.	*	1	1430	146	1.	*	1	2200	221	0.	*	2	0530	296	0.
1	0706	72	0.	*	1	1436	147	1.	*	1	2206	222	0.	*	2	0536	297	0.
1	0712	73	0.	*	1	1442	148	1.	*	1	2212	223	0.	*	2	0542	298	0.
1	0718	74	0.	*	1	1448	149	1.	*	1	2218	224	0.	*	2	0548	299	0.
1	0724	75	0.	*	1	1454	150	1.	*	1	2224	225	0.	*	2	0554	300	0.
				*					*					*				

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
25.	11.90	(CFS)	3.	1.	1.	1.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	1.	2.	2.	2.

CUMULATIVE AREA = 0.00 SQ MI

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          *            *
73 KK     *    SA100   *
          *            *
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STATE AVENUE FLOWS CONTRIBUTING TO DETENTION BASIN (DB100TR55.OUT 4-28)

75 IN TIME DATA FOR INPUT TIME SERIES

JXMIN		6	TIME INTERVAL IN MINUTES
JXDATE	1	0	STARTING DATE
JXTIME		0	STARTING TIME

SUBBASIN RUNOFF DATA

0 BA SUBBASIN CHARACTERISTICS
TAREA 0.00 SUBBASIN AREA

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HYDROGRAPH AT STATION SA100

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0730	76	0.	1		1500	151	1.	1		2230	226	0.
1		0006	2	0.	1		0736	77	0.	1		1506	152	1.	1		2236	227	0.
1		0012	3	0.	1		0742	78	0.	1		1512	153	1.	1		2242	228	0.
1		0018	4	0.	1		0748	79	0.	1		1518	154	1.	1		2248	229	0.
1		0024	5	0.	1		0754	80	0.	1		1524	155	1.	1		2254	230	0.
1		0030	6	0.	1		0800	81	0.	1		1530	156	1.	1		2300	231	0.
1		0036	7	0.	1		0806	82	0.	1		1536	157	1.	1		2306	232	0.
1		0042	8	0.	1		0812	83	0.	1		1542	158	1.	1		2312	233	0.
1		0048	9	0.	1		0818	84	0.	1		1548	159	1.	1		2318	234	0.
1		0054	10	0.	1		0824	85	0.	1		1554	160	1.	1		2324	235	0.
1		0100	11	0.	1		0830	86	0.	1		1600	161	1.	1		2330	236	0.
1		0106	12	0.	1		0836	87	0.	1		1606	162	1.	1		2336	237	0.
1		0112	13	0.	1		0842	88	0.	1		1612	163	1.	1		2342	238	0.
1		0118	14	0.	1		0848	89	0.	1		1618	164	1.	1		2348	239	0.
1		0124	15	0.	1		0854	90	0.	1		1624	165	1.	1		2354	240	0.
1		0130	16	0.	1		0900	91	0.	1		1630	166	1.	2		0000	241	0.
1		0136	17	0.	1		0906	92	0.	1		1636	167	1.	2		0006	242	0.
1		0142	18	0.	1		0912	93	0.	1		1642	168	1.	2		0012	243	0.
1		0148	19	0.	1		0918	94	0.	1		1648	169	1.	2		0018	244	0.
1		0154	20	0.	1		0924	95	0.	1		1654	170	1.	2		0024	245	0.
1		0200	21	0.	1		0930	96	0.	1		1700	171	1.	2		0030	246	0.
1		0206	22	0.	1		0936	97	0.	1		1706	172	0.	2		0036	247	0.
1		0212	23	0.	1		0942	98	0.	1		1712	173	0.	2		0042	248	0.
1		0218	24	0.	1		0948	99	0.	1		1718	174	0.	2		0048	249	0.
1		0224	25	0.	1		0954	100	0.	1		1724	175	0.	2		0054	250	0.
1		0230	26	0.	1		1000	101	0.	1		1730	176	0.	2		0100	251	0.
1		0236	27	0.	1		1006	102	0.	1		1736	177	0.	2		0106	252	0.
1		0242	28	0.	1		1012	103	0.	1		1742	178	0.	2		0112	253	0.
1		0248	29	0.	1		1018	104	0.	1		1748	179	0.	2		0118	254	0.
1		0254	30	0.	1		1024	105	0.	1		1754	180	0.	2		0124	255	0.
1		0300	31	0.	1		1030	106	0.	1		1800	181	0.	2		0130	256	0.
1		0306	32	0.	1		1036	107	0.	1		1806	182	0.	2		0136	257	0.
1		0312	33	0.	1		1042	108	0.	1		1812	183	0.	2		0142	258	0.
1		0318	34	0.	1		1048	109	0.	1		1818	184	0.	2		0148	259	0.
1		0324	35	0.	1		1054	110	0.	1		1824	185	0.	2		0154	260	0.
1		0330	36	0.	1		1100	111	1.	1		1830	186	0.	2		0200	261	0.
1		0336	37	0.	1		1106	112	1.	1		1836	187	0.	2		0206	262	0.
1		0342	38	0.	1		1112	113	1.	1		1842	188	0.	2		0212	263	0.
1		0348	39	0.	1		1118	114	1.	1		1848	189	0.	2		0218	264	0.
1		0354	40	0.	1		1124	115	1.	1		1854	190	0.	2		0224	265	0.
1		0400	41	0.	1		1130	116	1.	1		1900	191	0.	2		0230	266	0.
1		0406	42	0.	1		1136	117	4.	1		1906	192	0.	2		0236	267	0.
1		0412	43	0.	1		1142	118	6.	1		1912	193	0.	2		0242	268	0.
1		0418	44	0.	1		1148	119	16.	1		1918	194	0.	2		0248	269	0.
1		0424	45	0.	1		1154	120	19.	1		1924	195	0.	2		0254	270	0.
1		0430	46	0.	1		1200	121	14.	1		1930	196	0.	2		0300	271	0.

1	0436	47	0.	*	1	1206	122	9.	*	1	1936	197	0.	*	2	0306	272	0.
1	0442	48	0.	*	1	1212	123	5.	*	1	1942	198	0.	*	2	0312	273	0.
1	0448	49	0.	*	1	1218	124	4.	*	1	1948	199	0.	*	2	0318	274	0.
1	0454	50	0.	*	1	1224	125	3.	*	1	1954	200	0.	*	2	0324	275	0.
1	0500	51	0.	*	1	1230	126	3.	*	1	2000	201	0.	*	2	0330	276	0.
1	0506	52	0.	*	1	1236	127	2.	*	1	2006	202	0.	*	2	0336	277	0.
1	0512	53	0.	*	1	1242	128	2.	*	1	2012	203	0.	*	2	0342	278	0.
1	0518	54	0.	*	1	1248	129	2.	*	1	2018	204	0.	*	2	0348	279	0.
1	0524	55	0.	*	1	1254	130	2.	*	1	2024	205	0.	*	2	0354	280	0.
1	0530	56	0.	*	1	1300	131	2.	*	1	2030	206	0.	*	2	0400	281	0.
1	0536	57	0.	*	1	1306	132	1.	*	1	2036	207	0.	*	2	0406	282	0.
1	0542	58	0.	*	1	1312	133	1.	*	1	2042	208	0.	*	2	0412	283	0.
1	0548	59	0.	*	1	1318	134	1.	*	1	2048	209	0.	*	2	0418	284	0.
1	0554	60	0.	*	1	1324	135	1.	*	1	2054	210	0.	*	2	0424	285	0.
1	0600	61	0.	*	1	1330	136	1.	*	1	2100	211	0.	*	2	0430	286	0.
1	0606	62	0.	*	1	1336	137	1.	*	1	2106	212	0.	*	2	0436	287	0.
1	0612	63	0.	*	1	1342	138	1.	*	1	2112	213	0.	*	2	0442	288	0.
1	0618	64	0.	*	1	1348	139	1.	*	1	2118	214	0.	*	2	0448	289	0.
1	0624	65	0.	*	1	1354	140	1.	*	1	2124	215	0.	*	2	0454	290	0.
1	0630	66	0.	*	1	1400	141	1.	*	1	2130	216	0.	*	2	0500	291	0.
1	0636	67	0.	*	1	1406	142	1.	*	1	2136	217	0.	*	2	0506	292	0.
1	0642	68	0.	*	1	1412	143	1.	*	1	2142	218	0.	*	2	0512	293	0.
1	0648	69	0.	*	1	1418	144	1.	*	1	2148	219	0.	*	2	0518	294	0.
1	0654	70	0.	*	1	1424	145	1.	*	1	2154	220	0.	*	2	0524	295	0.
1	0700	71	0.	*	1	1430	146	1.	*	1	2200	221	0.	*	2	0530	296	0.
1	0706	72	0.	*	1	1436	147	1.	*	1	2206	222	0.	*	2	0536	297	0.
1	0712	73	0.	*	1	1442	148	1.	*	1	2212	223	0.	*	2	0542	298	0.
1	0718	74	0.	*	1	1448	149	1.	*	1	2218	224	0.	*	2	0548	299	0.
1	0724	75	0.	*	1	1454	150	1.	*	1	2224	225	0.	*	2	0554	300	0.
				*					*					*				

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
19.	11.90	(CFS)	2.	1.	0.	0.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = 0.00 SQ MI

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          *            *
106 KK    *      C 1   *
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COMBINE RUNOFF INTO NORTHVIEW DETENTION BASIN

108 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION C 1
SUM OF 3 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0730	76	0.	1		1500	151	5.	1		2230	226	0.
1		0006	2	0.	1		0736	77	0.	1		1506	152	5.	1		2236	227	0.
1		0012	3	0.	1		0742	78	0.	1		1512	153	5.	1		2242	228	0.
1		0018	4	0.	1		0748	79	0.	1		1518	154	5.	1		2248	229	0.
1		0024	5	0.	1		0754	80	0.	1		1524	155	4.	1		2254	230	0.
1		0030	6	0.	1		0800	81	0.	1		1530	156	4.	1		2300	231	0.
1		0036	7	0.	1		0806	82	0.	1		1536	157	4.	1		2306	232	0.
1		0042	8	0.	1		0812	83	0.	1		1542	158	4.	1		2312	233	0.
1		0048	9	0.	1		0818	84	0.	1		1548	159	4.	1		2318	234	0.
1		0054	10	0.	1		0824	85	0.	1		1554	160	4.	1		2324	235	0.
1		0100	11	0.	1		0830	86	0.	1		1600	161	4.	1		2330	236	0.
1		0106	12	0.	1		0836	87	0.	1		1606	162	4.	1		2336	237	0.
1		0112	13	0.	1		0842	88	0.	1		1612	163	4.	1		2342	238	0.
1		0118	14	0.	1		0848	89	0.	1		1618	164	4.	1		2348	239	0.
1		0124	15	0.	1		0854	90	0.	1		1624	165	4.	1		2354	240	0.
1		0130	16	0.	1		0900	91	0.	1		1630	166	4.	2		0000	241	0.
1		0136	17	0.	1		0906	92	0.	1		1636	167	4.	2		0006	242	0.
1		0142	18	0.	1		0912	93	0.	1		1642	168	4.	2		0012	243	0.
1		0148	19	0.	1		0918	94	0.	1		1648	169	4.	2		0018	244	0.
1		0154	20	0.	1		0924	95	0.	1		1654	170	4.	2		0024	245	0.
1		0200	21	0.	1		0930	96	0.	1		1700	171	4.	2		0030	246	0.
1		0206	22	0.	1		0936	97	0.	1		1706	172	3.	2		0036	247	0.
1		0212	23	0.	1		0942	98	0.	1		1712	173	3.	2		0042	248	0.
1		0218	24	0.	1		0948	99	0.	1		1718	174	3.	2		0048	249	0.
1		0224	25	0.	1		0954	100	0.	1		1724	175	3.	2		0054	250	0.
1		0230	26	0.	1		1000	101	0.	1		1730	176	3.	2		0100	251	0.
1		0236	27	0.	1		1006	102	0.	1		1736	177	3.	2		0106	252	0.
1		0242	28	0.	1		1012	103	0.	1		1742	178	3.	2		0112	253	0.
1		0248	29	0.	1		1018	104	0.	1		1748	179	3.	2		0118	254	0.
1		0254	30	0.	1		1024	105	0.	1		1754	180	3.	2		0124	255	0.
1		0300	31	0.	1		1030	106	0.	1		1800	181	3.	2		0130	256	0.
1		0306	32	0.	1		1036	107	0.	1		1806	182	3.	2		0136	257	0.
1		0312	33	0.	1		1042	108	0.	1		1812	183	3.	2		0142	258	0.
1		0318	34	0.	1		1048	109	0.	1		1818	184	3.	2		0148	259	0.
1		0324	35	0.	1		1054	110	0.	1		1824	185	3.	2		0154	260	0.
1		0330	36	0.	1		1100	111	4.	1		1830	186	3.	2		0200	261	0.
1		0336	37	0.	1		1106	112	5.	1		1836	187	3.	2		0206	262	0.
1		0342	38	0.	1		1112	113	5.	1		1842	188	3.	2		0212	263	0.
1		0348	39	0.	1		1118	114	6.	1		1848	189	3.	2		0218	264	0.
1		0354	40	0.	1		1124	115	7.	1		1854	190	3.	2		0224	265	0.
1		0400	41	0.	1		1130	116	8.	1		1900	191	3.	2		0230	266	0.
1		0406	42	0.	1		1136	117	21.	1		1906	192	3.	2		0236	267	0.
1		0412	43	0.	1		1142	118	33.	1		1912	193	3.	2		0242	268	0.
1		0418	44	0.	1		1148	119	85.	1		1918	194	3.	2		0248	269	0.
1		0424	45	0.	1		1154	120	122.	1		1924	195	3.	2		0254	270	0.
1		0430	46	0.	1		1200	121	104.	1		1930	196	2.	2		0300	271	0.
1		0436	47	0.	1		1206	122	72.	1		1936	197	2.	2		0306	272	0.
1		0442	48	0.	1		1212	123	45.	1		1942	198	2.	2		0312	273	0.
1		0448	49	0.	1		1218	124	31.	1		1948	199	2.	2		0318	274	0.
1		0454	50	0.	1		1224	125	25.	1		1954	200	2.	2		0324	275	0.
1		0500	51	0.	1		1230	126	21.	1		2000	201	2.	2		0330	276	0.
1		0506	52	0.	1		1236	127	18.	1		2006	202	0.	2		0336	277	0.
1		0512	53	0.	1		1242	128	15.	1		2012	203	0.	2		0342	278	0.

1	0518	54	0.	*	1	1248	129	13.	*	1	2018	204	0.	*	2	0348	279	0.
1	0524	55	0.	*	1	1254	130	12.	*	1	2024	205	0.	*	2	0354	280	0.
1	0530	56	0.	*	1	1300	131	11.	*	1	2030	206	0.	*	2	0400	281	0.
1	0536	57	0.	*	1	1306	132	10.	*	1	2036	207	0.	*	2	0406	282	0.
1	0542	58	0.	*	1	1312	133	9.	*	1	2042	208	0.	*	2	0412	283	0.
1	0548	59	0.	*	1	1318	134	9.	*	1	2048	209	0.	*	2	0418	284	0.
1	0554	60	0.	*	1	1324	135	9.	*	1	2054	210	0.	*	2	0424	285	0.
1	0600	61	0.	*	1	1330	136	8.	*	1	2100	211	0.	*	2	0430	286	0.
1	0606	62	0.	*	1	1336	137	8.	*	1	2106	212	0.	*	2	0436	287	0.
1	0612	63	0.	*	1	1342	138	8.	*	1	2112	213	0.	*	2	0442	288	0.
1	0618	64	0.	*	1	1348	139	7.	*	1	2118	214	0.	*	2	0448	289	0.
1	0624	65	0.	*	1	1354	140	7.	*	1	2124	215	0.	*	2	0454	290	0.
1	0630	66	0.	*	1	1400	141	7.	*	1	2130	216	0.	*	2	0500	291	0.
1	0636	67	0.	*	1	1406	142	7.	*	1	2136	217	0.	*	2	0506	292	0.
1	0642	68	0.	*	1	1412	143	6.	*	1	2142	218	0.	*	2	0512	293	0.
1	0648	69	0.	*	1	1418	144	6.	*	1	2148	219	0.	*	2	0518	294	0.
1	0654	70	0.	*	1	1424	145	6.	*	1	2154	220	0.	*	2	0524	295	0.
1	0700	71	0.	*	1	1430	146	6.	*	1	2200	221	0.	*	2	0530	296	0.
1	0706	72	0.	*	1	1436	147	5.	*	1	2206	222	0.	*	2	0536	297	0.
1	0712	73	0.	*	1	1442	148	5.	*	1	2212	223	0.	*	2	0542	298	0.
1	0718	74	0.	*	1	1448	149	5.	*	1	2218	224	0.	*	2	0548	299	0.
1	0724	75	0.	*	1	1454	150	5.	*	1	2224	225	0.	*	2	0554	300	0.
				*					*					*				

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
122.	11.90	(CFS)	15.	4.	3.	3.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	7.	8.	8.	8.

CUMULATIVE AREA = 0.00 SQ MI

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          **************
          *            *
109 KK    *    OUT 1   *      ROUTE FLOWS THROUGH DETENTION BASIN
          *            *
          **************
                                MODIFIED PULSE METHOD FOR RESERVOIR ROUTING USING 12" RCP
             HYDROGRAPH ROUTING DATA
111 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC    1280.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT
112 SV            STORAGE        0.2       1.3       2.4       3.7       4.3       5.1       5.8       6.6
113 SE          ELEVATION    1281.00   1283.00   1285.00   1287.00   1288.00   1289.00   1290.00   1291.00
114 SQ          DISCHARGE         0.        2.        3.        4.        5.        5.        6.        7.        7.        8.
                                  8.        8.
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116 SE ELEVATION 1280.00 1281.00 1282.00 1283.00 1284.00 1285.00 1286.00 1287.00 1288.00 1289.00
1290.00 1291.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.24	0.24	0.75	1.26	1.83	2.40	3.04	3.67	4.35	5.07
OUTFLOW	0.00	1.80	3.10	4.10	4.80	5.40	6.00	6.50	7.00	7.50
ELEVATION	1280.00	1281.00	1282.00	1283.00	1284.00	1285.00	1286.00	1287.00	1288.00	1289.00

STORAGE	5.82	6.61
OUTFLOW	7.90	8.30
ELEVATION	1290.00	1291.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 2.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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HYDROGRAPH AT STATION OUT 1

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	0.2	1281.0	*	1		1000	101	0.	0.2	1280.0	*	1		2000	201	6.	3.3	1286.5
1		0006	2	2.	0.2	1281.0	*	1		1006	102	0.	0.2	1280.0	*	1		2006	202	6.	3.3	1286.4
1		0012	3	0.	0.2	1280.0	*	1		1012	103	0.	0.2	1280.0	*	1		2012	203	6.	3.3	1286.3
1		0018	4	0.	0.2	1280.0	*	1		1018	104	0.	0.2	1280.0	*	1		2018	204	6.	3.2	1286.3
1		0024	5	0.	0.2	1280.0	*	1		1024	105	0.	0.2	1280.0	*	1		2024	205	6.	3.1	1286.2
1		0030	6	0.	0.2	1280.0	*	1		1030	106	0.	0.2	1280.0	*	1		2030	206	6.	3.1	1286.1
1		0036	7	0.	0.2	1280.0	*	1		1036	107	0.	0.2	1280.0	*	1		2036	207	6.	3.0	1286.0
1		0042	8	0.	0.2	1280.0	*	1		1042	108	0.	0.2	1280.0	*	1		2042	208	6.	3.0	1285.9
1		0048	9	0.	0.2	1280.0	*	1		1048	109	0.	0.2	1280.0	*	1		2048	209	6.	3.0	1285.9
1		0054	10	0.	0.2	1280.0	*	1		1054	110	0.	0.2	1280.0	*	1		2054	210	6.	2.9	1285.8
1		0100	11	0.	0.2	1280.0	*	1		1100	111	2.	0.2	1281.0	*	1		2100	211	6.	2.9	1285.7
1		0106	12	0.	0.2	1280.0	*	1		1106	112	2.	0.3	1281.0	*	1		2106	212	6.	2.8	1285.6
1		0112	13	0.	0.2	1280.0	*	1		1112	113	2.	0.3	1281.1	*	1		2112	213	6.	2.8	1285.6
1		0118	14	0.	0.2	1280.0	*	1		1118	114	2.	0.3	1281.1	*	1		2118	214	6.	2.7	1285.5
1		0124	15	0.	0.2	1280.0	*	1		1124	115	2.	0.4	1281.2	*	1		2124	215	6.	2.7	1285.4
1		0130	16	0.	0.2	1280.0	*	1		1130	116	2.	0.4	1281.3	*	1		2130	216	6.	2.6	1285.3
1		0136	17	0.	0.2	1280.0	*	1		1136	117	2.	0.5	1281.5	*	1		2136	217	6.	2.6	1285.3
1		0142	18	0.	0.2	1280.0	*	1		1142	118	3.	0.7	1281.9	*	1		2142	218	6.	2.5	1285.2
1		0148	19	0.	0.2	1280.0	*	1		1148	119	4.	1.2	1282.8	*	1		2148	219	5.	2.5	1285.1
1		0154	20	0.	0.2	1280.0	*	1		1154	120	5.	2.0	1284.2	*	1		2154	220	5.	2.4	1285.1
1		0200	21	0.	0.2	1280.0	*	1		1200	121	6.	2.9	1285.7	*	1		2200	221	5.	2.4	1285.0
1		0206	22	0.	0.2	1280.0	*	1		1206	122	6.	3.5	1286.8	*	1		2206	222	5.	2.3	1284.9
1		0212	23	0.	0.2	1280.0	*	1		1212	123	7.	4.0	1287.4	*	1		2212	223	5.	2.3	1284.8
1		0218	24	0.	0.2	1280.0	*	1		1218	124	7.	4.2	1287.8	*	1		2218	224	5.	2.3	1284.8
1		0224	25	0.	0.2	1280.0	*	1		1224	125	7.	4.4	1288.1	*	1		2224	225	5.	2.2	1284.7
1		0230	26	0.	0.2	1280.0	*	1		1230	126	7.	4.5	1288.2	*	1		2230	226	5.	2.2	1284.6
1		0236	27	0.	0.2	1280.0	*	1		1236	127	7.	4.6	1288.4	*	1		2236	227	5.	2.1	1284.5
1		0242	28	0.	0.2	1280.0	*	1		1242	128	7.	4.7	1288.5	*	1		2242	228	5.	2.1	1284.5
1		0248	29	0.	0.2	1280.0	*	1		1248	129	7.	4.8	1288.6	*	1		2248	229	5.	2.0	1284.4
1		0254	30	0.	0.2	1280.0	*	1		1254	130	7.	4.8	1288.6	*	1		2254	230	5.	2.0	1284.3
1		0300	31	0.	0.2	1280.0	*	1		1300	131	7.	4.8	1288.7	*	1		2300	231	5.	2.0	1284.2
1		0306	32	0.	0.2	1280.0	*	1		1306	132	7.	4.9	1288.7	*	1		2306	232	5.	1.9	1284.2

1	0312	33	0.	0.2	1280.0	*	1	1312	133	7.	4.9	1288.7	*	1	2312	233	5.	1.9	1284.1
1	0318	34	0.	0.2	1280.0	*	1	1318	134	7.	4.9	1288.8	*	1	2318	234	5.	1.8	1284.0
1	0324	35	0.	0.2	1280.0	*	1	1324	135	7.	4.9	1288.8	*	1	2324	235	5.	1.8	1284.0
1	0330	36	0.	0.2	1280.0	*	1	1330	136	7.	4.9	1288.8	*	1	2330	236	5.	1.8	1283.9
1	0336	37	0.	0.2	1280.0	*	1	1336	137	7.	4.9	1288.8	*	1	2336	237	5.	1.7	1283.8
1	0342	38	0.	0.2	1280.0	*	1	1342	138	7.	4.9	1288.8	*	1	2342	238	5.	1.7	1283.7
1	0348	39	0.	0.2	1280.0	*	1	1348	139	7.	4.9	1288.8	*	1	2348	239	5.	1.6	1283.7
1	0354	40	0.	0.2	1280.0	*	1	1354	140	7.	4.9	1288.8	*	1	2354	240	5.	1.6	1283.6
1	0400	41	0.	0.2	1280.0	*	1	1400	141	7.	4.9	1288.8	*	2	0000	241	4.	1.6	1283.6
1	0406	42	0.	0.2	1280.0	*	1	1406	142	7.	4.9	1288.8	*	2	0006	242	4.	1.5	1283.5
1	0412	43	0.	0.2	1280.0	*	1	1412	143	7.	4.9	1288.8	*	2	0012	243	4.	1.5	1283.4
1	0418	44	0.	0.2	1280.0	*	1	1418	144	7.	4.9	1288.8	*	2	0018	244	4.	1.5	1283.4
1	0424	45	0.	0.2	1280.0	*	1	1424	145	7.	4.9	1288.7	*	2	0024	245	4.	1.4	1283.3
1	0430	46	0.	0.2	1280.0	*	1	1430	146	7.	4.9	1288.7	*	2	0030	246	4.	1.4	1283.2
1	0436	47	0.	0.2	1280.0	*	1	1436	147	7.	4.9	1288.7	*	2	0036	247	4.	1.4	1283.2
1	0442	48	0.	0.2	1280.0	*	1	1442	148	7.	4.8	1288.7	*	2	0042	248	4.	1.3	1283.1
1	0448	49	0.	0.2	1280.0	*	1	1448	149	7.	4.8	1288.7	*	2	0048	249	4.	1.3	1283.1
1	0454	50	0.	0.2	1280.0	*	1	1454	150	7.	4.8	1288.6	*	2	0054	250	4.	1.3	1283.0
1	0500	51	0.	0.2	1280.0	*	1	1500	151	7.	4.8	1288.6	*	2	0100	251	4.	1.2	1282.9
1	0506	52	0.	0.2	1280.0	*	1	1506	152	7.	4.8	1288.6	*	2	0106	252	4.	1.2	1282.9
1	0512	53	0.	0.2	1280.0	*	1	1512	153	7.	4.7	1288.5	*	2	0112	253	4.	1.2	1282.8
1	0518	54	0.	0.2	1280.0	*	1	1518	154	7.	4.7	1288.5	*	2	0118	254	4.	1.1	1282.7
1	0524	55	0.	0.2	1280.0	*	1	1524	155	7.	4.7	1288.5	*	2	0124	255	4.	1.1	1282.7
1	0530	56	0.	0.2	1280.0	*	1	1530	156	7.	4.7	1288.4	*	2	0130	256	4.	1.1	1282.6
1	0536	57	0.	0.2	1280.0	*	1	1536	157	7.	4.6	1288.4	*	2	0136	257	4.	1.0	1282.6
1	0542	58	0.	0.2	1280.0	*	1	1542	158	7.	4.6	1288.4	*	2	0142	258	4.	1.0	1282.5
1	0548	59	0.	0.2	1280.0	*	1	1548	159	7.	4.6	1288.3	*	2	0148	259	4.	1.0	1282.4
1	0554	60	0.	0.2	1280.0	*	1	1554	160	7.	4.6	1288.3	*	2	0154	260	3.	0.9	1282.4
1	0600	61	0.	0.2	1280.0	*	1	1600	161	7.	4.5	1288.3	*	2	0200	261	3.	0.9	1282.3
1	0606	62	0.	0.2	1280.0	*	1	1606	162	7.	4.5	1288.2	*	2	0206	262	3.	0.9	1282.3
1	0612	63	0.	0.2	1280.0	*	1	1612	163	7.	4.5	1288.2	*	2	0212	263	3.	0.9	1282.2
1	0618	64	0.	0.2	1280.0	*	1	1618	164	7.	4.5	1288.2	*	2	0218	264	3.	0.8	1282.2
1	0624	65	0.	0.2	1280.0	*	1	1624	165	7.	4.4	1288.1	*	2	0224	265	3.	0.8	1282.1
1	0630	66	0.	0.2	1280.0	*	1	1630	166	7.	4.4	1288.1	*	2	0230	266	3.	0.8	1282.1
1	0636	67	0.	0.2	1280.0	*	1	1636	167	7.	4.4	1288.1	*	2	0236	267	3.	0.8	1282.0
1	0642	68	0.	0.2	1280.0	*	1	1642	168	7.	4.4	1288.0	*	2	0242	268	3.	0.7	1282.0
1	0648	69	0.	0.2	1280.0	*	1	1648	169	7.	4.3	1288.0	*	2	0248	269	3.	0.7	1281.9
1	0654	70	0.	0.2	1280.0	*	1	1654	170	7.	4.3	1287.9	*	2	0254	270	3.	0.7	1281.9
1	0700	71	0.	0.2	1280.0	*	1	1700	171	7.	4.3	1287.9	*	2	0300	271	3.	0.7	1281.8
1	0706	72	0.	0.2	1280.0	*	1	1706	172	7.	4.2	1287.8	*	2	0306	272	3.	0.6	1281.8
1	0712	73	0.	0.2	1280.0	*	1	1712	173	7.	4.2	1287.8	*	2	0312	273	3.	0.6	1281.7
1	0718	74	0.	0.2	1280.0	*	1	1718	174	7.	4.2	1287.8	*	2	0318	274	3.	0.6	1281.7
1	0724	75	0.	0.2	1280.0	*	1	1724	175	7.	4.2	1287.7	*	2	0324	275	3.	0.6	1281.6
1	0730	76	0.	0.2	1280.0	*	1	1730	176	7.	4.1	1287.7	*	2	0330	276	3.	0.5	1281.6
1	0736	77	0.	0.2	1280.0	*	1	1736	177	7.	4.1	1287.6	*	2	0336	277	3.	0.5	1281.6
1	0742	78	0.	0.2	1280.0	*	1	1742	178	7.	4.1	1287.6	*	2	0342	278	2.	0.5	1281.5
1	0748	79	0.	0.2	1280.0	*	1	1748	179	7.	4.0	1287.5	*	2	0348	279	2.	0.5	1281.5
1	0754	80	0.	0.2	1280.0	*	1	1754	180	7.	4.0	1287.5	*	2	0354	280	2.	0.5	1281.4
1	0800	81	0.	0.2	1280.0	*	1	1800	181	7.	4.0	1287.5	*	2	0400	281	2.	0.4	1281.4
1	0806	82	0.	0.2	1280.0	*	1	1806	182	7.	3.9	1287.4	*	2	0406	282	2.	0.4	1281.4
1	0812	83	0.	0.2	1280.0	*	1	1812	183	7.	3.9	1287.4	*	2	0412	283	2.	0.4	1281.3
1	0818	84	0.	0.2	1280.0	*	1	1818	184	7.	3.9	1287.3	*	2	0418	284	2.	0.4	1281.3
1	0824	85	0.	0.2	1280.0	*	1	1824	185	7.	3.9	1287.3	*	2	0424	285	2.	0.4	1281.3
1	0830	86	0.	0.2	1280.0	*	1	1830	186	7.	3.8	1287.2	*	2	0430	286	2.	0.4	1281.2
1	0836	87	0.	0.2	1280.0	*	1	1836	187	7.	3.8	1287.2	*	2	0436	287	2.	0.3	1281.2
1	0842	88	0.	0.2	1280.0	*	1	1842	188	7.	3.8	1287.1	*	2	0442	288	2.	0.3	1281.2
1	0848	89	0.	0.2	1280.0	*	1	1848	189	7.	3.7	1287.1	*	2	0448	289	2.	0.3	1281.1
1	0854	90	0.	0.2	1280.0	*	1	1854	190	7.	3.7	1287.0	*	2	0454	290	2.	0.3	1281.1
1	0900	91	0.	0.2	1280.0	*	1	1900	191	6.	3.7	1287.0	*	2	0500	291	2.	0.3	1281.1
1	0906	92	0.	0.2	1280.0	*	1	1906	192	6.	3.6	1286.9	*	2	0506	292	2.	0.3	1281.0

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 1     0912  93      0.      0.2  1280.0 *  1     1912 193      6.      3.6  1286.9 *  2     0512 293      1.      0.2  1280.8
 1     0918  94      0.      0.2  1280.0 *  1     1918 194      6.      3.6  1286.8 *  2     0518 294      0.      0.2  1280.0
 1     0924  95      0.      0.2  1280.0 *  1     1924 195      6.      3.5  1286.8 *  2     0524 295      0.      0.2  1280.0
 1     0930  96      0.      0.2  1280.0 *  1     1930 196      6.      3.5  1286.7 *  2     0530 296      0.      0.2  1280.0
 1     0936  97      0.      0.2  1280.0 *  1     1936 197      6.      3.5  1286.7 *  2     0536 297      0.      0.2  1280.0
 1     0942  98      0.      0.2  1280.0 *  1     1942 198      6.      3.4  1286.6 *  2     0542 298      0.      0.2  1280.0
 1     0948  99      0.      0.2  1280.0 *  1     1948 199      6.      3.4  1286.6 *  2     0548 299      0.      0.2  1280.0
 1     0954 100      0.      0.2  1280.0 *  1     1954 200      6.      3.4  1286.5 *  2     0554 300      0.      0.2  1280.0
                                         *                                            *
*****************************************************************************************************************************

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     29.90-HR
      7.      13.70          (CFS)     7.          4.          3.          3.
                         (INCHES)  0.000       0.000       0.000       0.000
                          (AC-FT)     4.          8.          8.          8.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR     29.90-HR
      5.      13.70                    5.          2.          2.          2.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR     29.90-HR
  1288.80      13.80             1288.30     1284.02     1283.23     1283.23

                         CUMULATIVE AREA =    0.00 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 118 KK   *   MYRTLE   *
          *            *
          **************
                                MYRTLE WASH 100-YEAR HYDROGRAPH (TR20PROP.OUT 4-28-89)

 120 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          6  TIME INTERVAL IN MINUTES
                     JXDATE      1   0  STARTING DATE
                     JXTIME          0  STARTING TIME

               SUBBASIN RUNOFF DATA

 108 BA          SUBBASIN CHARACTERISTICS
                      TAREA       0.00  SUBBASIN AREA
                                                          ***
*****************************************************************************************************************************
                                                HYDROGRAPH AT STATION   MYRTLE
*****************************************************************************************************************************
                                 *                                 *                                 *                                 *
   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW
                                 *                                 *                                 *
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1	0000	1	0.	*	1	0730	76	5.	*	1	1500	151	14.	*	1	2230	226	14.
1	0006	2	0.	*	1	0736	77	5.	*	1	1506	152	14.	*	1	2236	227	14.
1	0012	3	0.	*	1	0742	78	5.	*	1	1512	153	15.	*	1	2242	228	15.
1	0018	4	0.	*	1	0748	79	5.	*	1	1518	154	16.	*	1	2248	229	16.
1	0024	5	0.	*	1	0754	80	6.	*	1	1524	155	16.	*	1	2254	230	16.
1	0030	6	0.	*	1	0800	81	6.	*	1	1530	156	17.	*	1	2300	231	17.
1	0036	7	0.	*	1	0806	82	7.	*	1	1536	157	17.	*	1	2306	232	16.
1	0042	8	0.	*	1	0812	83	9.	*	1	1542	158	16.	*	1	2312	233	12.
1	0048	9	0.	*	1	0818	84	13.	*	1	1548	159	15.	*	1	2318	234	7.
1	0054	10	0.	*	1	0824	85	15.	*	1	1554	160	14.	*	1	2324	235	4.
1	0100	11	0.	*	1	0830	86	17.	*	1	1600	161	14.	*	1	2330	236	2.
1	0106	12	0.	*	1	0836	87	18.	*	1	1606	162	14.	*	1	2336	237	1.
1	0112	13	0.	*	1	0842	88	19.	*	1	1612	163	15.	*	1	2342	238	1.
1	0118	14	0.	*	1	0848	89	21.	*	1	1618	164	16.	*	1	2348	239	0.
1	0124	15	0.	*	1	0854	90	22.	*	1	1624	165	16.	*	1	2354	240	0.
1	0130	16	0.	*	1	0900	91	22.	*	1	1630	166	17.	*	2	0000	241	0.
1	0136	17	0.	*	1	0906	92	23.	*	1	1636	167	17.	*	2	0006	242	0.
1	0142	18	0.	*	1	0912	93	23.	*	1	1642	168	17.	*	2	0012	243	0.
1	0148	19	0.	*	1	0918	94	23.	*	1	1648	169	17.	*	2	0018	244	0.
1	0154	20	0.	*	1	0924	95	23.	*	1	1654	170	17.	*	2	0024	245	0.
1	0200	21	0.	*	1	0930	96	24.	*	1	1700	171	17.	*	2	0030	246	0.
1	0206	22	0.	*	1	0936	97	25.	*	1	1706	172	17.	*	2	0036	247	0.
1	0212	23	0.	*	1	0942	98	28.	*	1	1712	173	16.	*	2	0042	248	0.
1	0218	24	0.	*	1	0948	99	33.	*	1	1718	174	15.	*	2	0048	249	0.
1	0224	25	0.	*	1	0954	100	36.	*	1	1724	175	14.	*	2	0054	250	0.
1	0230	26	0.	*	1	1000	101	39.	*	1	1730	176	14.	*	2	0100	251	0.
1	0236	27	0.	*	1	1006	102	42.	*	1	1736	177	14.	*	2	0106	252	0.
1	0242	28	0.	*	1	1012	103	48.	*	1	1742	178	15.	*	2	0112	253	0.
1	0248	29	0.	*	1	1018	104	55.	*	1	1748	179	16.	*	2	0118	254	0.
1	0254	30	0.	*	1	1024	105	61.	*	1	1754	180	16.	*	2	0124	255	0.
1	0300	31	0.	*	1	1030	106	65.	*	1	1800	181	17.	*	2	0130	256	0.
1	0306	32	0.	*	1	1036	107	113.	*	1	1806	182	17.	*	2	0136	257	0.
1	0312	33	0.	*	1	1042	108	296.	*	1	1812	183	16.	*	2	0142	258	0.
1	0318	34	0.	*	1	1048	109	542.	*	1	1818	184	15.	*	2	0148	259	0.
1	0324	35	0.	*	1	1054	110	744.	*	1	1824	185	14.	*	2	0154	260	0.
1	0330	36	0.	*	1	1100	111	872.	*	1	1830	186	14.	*	2	0200	261	0.
1	0336	37	1.	*	1	1106	112	954.	*	1	1836	187	14.	*	2	0206	262	0.
1	0342	38	1.	*	1	1112	113	1008.	*	1	1842	188	14.	*	2	0212	263	0.
1	0348	39	1.	*	1	1118	114	1044.	*	1	1848	189	14.	*	2	0218	264	0.
1	0354	40	1.	*	1	1124	115	1069.	*	1	1854	190	14.	*	2	0224	265	0.
1	0400	41	1.	*	1	1130	116	1083.	*	1	1900	191	14.	*	2	0230	266	0.
1	0406	42	1.	*	1	1136	117	1027.	*	1	1906	192	14.	*	2	0236	267	0.
1	0412	43	1.	*	1	1142	118	815.	*	1	1912	193	15.	*	2	0242	268	0.
1	0418	44	1.	*	1	1148	119	540.	*	1	1918	194	16.	*	2	0248	269	0.
1	0424	45	1.	*	1	1154	120	334.	*	1	1924	195	16.	*	2	0254	270	0.
1	0430	46	2.	*	1	1200	121	224.	*	1	1930	196	17.	*	2	0300	271	0.
1	0436	47	2.	*	1	1206	122	164.	*	1	1936	197	17.	*	2	0306	272	0.
1	0442	48	2.	*	1	1212	123	125.	*	1	1942	198	16.	*	2	0312	273	0.
1	0448	49	2.	*	1	1218	124	100.	*	1	1948	199	15.	*	2	0318	274	0.
1	0454	50	2.	*	1	1224	125	84.	*	1	1954	200	14.	*	2	0324	275	0.
1	0500	51	3.	*	1	1230	126	76.	*	1	2000	201	14.	*	2	0330	276	0.
1	0506	52	3.	*	1	1236	127	70.	*	1	2006	202	14.	*	2	0336	277	0.
1	0512	53	3.	*	1	1242	128	62.	*	1	2012	203	15.	*	2	0342	278	0.
1	0518	54	3.	*	1	1248	129	55.	*	1	2018	204	16.	*	2	0348	279	0.
1	0524	55	3.	*	1	1254	130	50.	*	1	2024	205	16.	*	2	0354	280	0.
1	0530	56	3.	*	1	1300	131	47.	*	1	2030	206	17.	*	2	0400	281	0.
1	0536	57	3.	*	1	1306	132	46.	*	1	2036	207	17.	*	2	0406	282	0.
1	0542	58	3.	*	1	1312	133	46.	*	1	2042	208	16.	*	2	0412	283	0.
1	0548	59	3.	*	1	1318	134	47.	*	1	2048	209	15.	*	2	0418	284	0.
1	0554	60	4.	*	1	1324	135	47.	*	1	2054	210	14.	*	2	0424	285	0.

1	0600	61	4.	*	1	1330	136	47.	*	1	2100	211	14.	*	2	0430	286	0.
1	0606	62	4.	*	1	1336	137	47.	*	1	2106	212	14.	*	2	0436	287	0.
1	0612	63	4.	*	1	1342	138	47.	*	1	2112	213	15.	*	2	0442	288	0.
1	0618	64	4.	*	1	1348	139	46.	*	1	2118	214	16.	*	2	0448	289	0.
1	0624	65	4.	*	1	1354	140	45.	*	1	2124	215	16.	*	2	0454	290	0.
1	0630	66	4.	*	1	1400	141	45.	*	1	2130	216	17.	*	2	0500	291	0.
1	0636	67	4.	*	1	1406	142	42.	*	1	2136	217	17.	*	2	0506	292	0.
1	0642	68	4.	*	1	1412	143	36.	*	1	2142	218	16.	*	2	0512	293	0.
1	0648	69	4.	*	1	1418	144	27.	*	1	2148	219	15.	*	2	0518	294	0.
1	0654	70	5.	*	1	1424	145	21.	*	1	2154	220	14.	*	2	0524	295	0.
1	0700	71	5.	*	1	1430	146	17.	*	1	2200	221	14.	*	2	0530	296	0.
1	0706	72	5.	*	1	1436	147	16.	*	1	2206	222	14.	*	2	0536	297	0.
1	0712	73	5.	*	1	1442	148	15.	*	1	2212	223	14.	*	2	0542	298	0.
1	0718	74	5.	*	1	1448	149	14.	*	1	2218	224	14.	*	2	0548	299	0.
1	0724	75	5.	*	1	1454	150	14.	*	1	2224	225	14.	*	2	0554	300	0.
				*					*					*				

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
1083.	11.50	(CFS)	213.	60.	48.	48.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	105.	118.	118.	118.

CUMULATIVE AREA = 0.00 SQ MI

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          *            *
150 KK    *      C 2   *
          *            *
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COMBINE OUTFLOW FROM NORTHVIEW DETENTION BASIN WITH MYRTLE WASH

152 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION C 2
SUM OF 2 HYDROGRAPHS

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0730	76	5.	*	1		1500	151	21.	*	1		2230	226	19.
1		0006	2	2.	*	1		0736	77	5.	*	1		1506	152	21.	*	1		2236	227	19.
1		0012	3	0.	*	1		0742	78	5.	*	1		1512	153	22.	*	1		2242	228	20.
1		0018	4	0.	*	1		0748	79	5.	*	1		1518	154	23.	*	1		2248	229	21.
1		0024	5	0.	*	1		0754	80	6.	*	1		1524	155	23.	*	1		2254	230	21.
1		0030	6	0.	*	1		0800	81	6.	*	1		1530	156	24.	*	1		2300	231	22.
1		0036	7	0.	*	1		0806	82	7.	*	1		1536	157	24.	*	1		2306	232	21.

1	0042	8	0.	*	1	0812	83	9.	*	1	1542	158	23.	*	1	2312	233	17.
1	0048	9	0.	*	1	0818	84	13.	*	1	1548	159	22.	*	1	2318	234	12.
1	0054	10	0.	*	1	0824	85	15.	*	1	1554	160	22.	*	1	2324	235	9.
1	0100	11	0.	*	1	0830	86	17.	*	1	1600	161	21.	*	1	2330	236	7.
1	0106	12	0.	*	1	0836	87	18.	*	1	1606	162	21.	*	1	2336	237	6.
1	0112	13	0.	*	1	0842	88	19.	*	1	1612	163	22.	*	1	2342	238	5.
1	0118	14	0.	*	1	0848	89	21.	*	1	1618	164	23.	*	1	2348	239	5.
1	0124	15	0.	*	1	0854	90	22.	*	1	1624	165	23.	*	1	2354	240	5.
1	0130	16	0.	*	1	0900	91	22.	*	1	1630	166	24.	*	2	0000	241	5.
1	0136	17	0.	*	1	0906	92	23.	*	1	1636	167	24.	*	2	0006	242	4.
1	0142	18	0.	*	1	0912	93	23.	*	1	1642	168	24.	*	2	0012	243	4.
1	0148	19	0.	*	1	0918	94	23.	*	1	1648	169	24.	*	2	0018	244	4.
1	0154	20	0.	*	1	0924	95	23.	*	1	1654	170	24.	*	2	0024	245	4.
1	0200	21	0.	*	1	0930	96	24.	*	1	1700	171	24.	*	2	0030	246	4.
1	0206	22	0.	*	1	0936	97	25.	*	1	1706	172	24.	*	2	0036	247	4.
1	0212	23	0.	*	1	0942	98	28.	*	1	1712	173	23.	*	2	0042	248	4.
1	0218	24	0.	*	1	0948	99	33.	*	1	1718	174	22.	*	2	0048	249	4.
1	0224	25	0.	*	1	0954	100	36.	*	1	1724	175	21.	*	2	0054	250	4.
1	0230	26	0.	*	1	1000	101	39.	*	1	1730	176	21.	*	2	0100	251	4.
1	0236	27	0.	*	1	1006	102	42.	*	1	1736	177	21.	*	2	0106	252	4.
1	0242	28	0.	*	1	1012	103	48.	*	1	1742	178	22.	*	2	0112	253	4.
1	0248	29	0.	*	1	1018	104	55.	*	1	1748	179	22.	*	2	0118	254	4.
1	0254	30	0.	*	1	1024	105	61.	*	1	1754	180	23.	*	2	0124	255	4.
1	0300	31	0.	*	1	1030	106	65.	*	1	1800	181	23.	*	2	0130	256	4.
1	0306	32	0.	*	1	1036	107	113.	*	1	1806	182	23.	*	2	0136	257	4.
1	0312	33	0.	*	1	1042	108	296.	*	1	1812	183	23.	*	2	0142	258	4.
1	0318	34	0.	*	1	1048	109	542.	*	1	1818	184	22.	*	2	0148	259	4.
1	0324	35	0.	*	1	1054	110	744.	*	1	1824	185	21.	*	2	0154	260	3.
1	0330	36	0.	*	1	1100	111	874.	*	1	1830	186	21.	*	2	0200	261	3.
1	0336	37	1.	*	1	1106	112	956.	*	1	1836	187	20.	*	2	0206	262	3.
1	0342	38	1.	*	1	1112	113	1010.	*	1	1842	188	20.	*	2	0212	263	3.
1	0348	39	1.	*	1	1118	114	1046.	*	1	1848	189	20.	*	2	0218	264	3.
1	0354	40	1.	*	1	1124	115	1071.	*	1	1854	190	20.	*	2	0224	265	3.
1	0400	41	1.	*	1	1130	116	1085.	*	1	1900	191	20.	*	2	0230	266	3.
1	0406	42	1.	*	1	1136	117	1029.	*	1	1906	192	20.	*	2	0236	267	3.
1	0412	43	1.	*	1	1142	118	818.	*	1	1912	193	21.	*	2	0242	268	3.
1	0418	44	1.	*	1	1148	119	544.	*	1	1918	194	22.	*	2	0248	269	3.
1	0424	45	1.	*	1	1154	120	339.	*	1	1924	195	23.	*	2	0254	270	3.
1	0430	46	2.	*	1	1200	121	230.	*	1	1930	196	23.	*	2	0300	271	3.
1	0436	47	2.	*	1	1206	122	170.	*	1	1936	197	23.	*	2	0306	272	3.
1	0442	48	2.	*	1	1212	123	132.	*	1	1942	198	22.	*	2	0312	273	3.
1	0448	49	2.	*	1	1218	124	107.	*	1	1948	199	21.	*	2	0318	274	3.
1	0454	50	2.	*	1	1224	125	91.	*	1	1954	200	21.	*	2	0324	275	3.
1	0500	51	3.	*	1	1230	126	83.	*	1	2000	201	20.	*	2	0330	276	3.
1	0506	52	3.	*	1	1236	127	77.	*	1	2006	202	20.	*	2	0336	277	3.
1	0512	53	3.	*	1	1242	128	70.	*	1	2012	203	21.	*	2	0342	278	2.
1	0518	54	3.	*	1	1248	129	62.	*	1	2018	204	22.	*	2	0348	279	2.
1	0524	55	3.	*	1	1254	130	57.	*	1	2024	205	22.	*	2	0354	280	2.
1	0530	56	3.	*	1	1300	131	55.	*	1	2030	206	23.	*	2	0400	281	2.
1	0536	57	3.	*	1	1306	132	53.	*	1	2036	207	23.	*	2	0406	282	2.
1	0542	58	3.	*	1	1312	133	53.	*	1	2042	208	22.	*	2	0412	283	2.
1	0548	59	3.	*	1	1318	134	54.	*	1	2048	209	21.	*	2	0418	284	2.
1	0554	60	4.	*	1	1324	135	54.	*	1	2054	210	20.	*	2	0424	285	2.
1	0600	61	4.	*	1	1330	136	55.	*	1	2100	211	20.	*	2	0430	286	2.
1	0606	62	4.	*	1	1336	137	55.	*	1	2106	212	20.	*	2	0436	287	2.
1	0612	63	4.	*	1	1342	138	54.	*	1	2112	213	20.	*	2	0442	288	2.
1	0618	64	4.	*	1	1348	139	53.	*	1	2118	214	21.	*	2	0448	289	2.
1	0624	65	4.	*	1	1354	140	52.	*	1	2124	215	22.	*	2	0454	290	2.
1	0630	66	4.	*	1	1400	141	52.	*	1	2130	216	22.	*	2	0500	291	2.
1	0636	67	4.	*	1	1406	142	50.	*	1	2136	217	22.	*	2	0506	292	2.

1	0642	68	4.	*	1	1412	143	43.	*	1	2142	218	22.	*	2	0512	293	1.
1	0648	69	4.	*	1	1418	144	34.	*	1	2148	219	21.	*	2	0518	294	0.
1	0654	70	5.	*	1	1424	145	28.	*	1	2154	220	20.	*	2	0524	295	0.
1	0700	71	5.	*	1	1430	146	25.	*	1	2200	221	19.	*	2	0530	296	0.
1	0706	72	5.	*	1	1436	147	23.	*	1	2206	222	19.	*	2	0536	297	0.
1	0712	73	5.	*	1	1442	148	22.	*	1	2212	223	19.	*	2	0542	298	0.
1	0718	74	5.	*	1	1448	149	21.	*	1	2218	224	19.	*	2	0548	299	0.
1	0724	75	5.	*	1	1454	150	21.	*	1	2224	225	19.	*	2	0554	300	0.
				*					*					*				

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	29.90-HR
1085.	11.50	(CFS)	216.	63.	51.	51.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	107.	126.	126.	126.

CUMULATIVE AREA = 0.00 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	PF100	77.	11.90	10.	3.	2.	0.00		
HYDROGRAPH AT	AN100	25.	11.90	3.	1.	1.	0.00		
HYDROGRAPH AT	SA100	19.	11.90	2.	1.	0.	0.00		
3 COMBINED AT	C 1	122.	11.90	15.	4.	3.	0.00		
ROUTED TO	OUT 1	7.	13.70	7.	4.	3.	0.00	1288.80	13.80
HYDROGRAPH AT	MYRTLE	1083.	11.50	213.	60.	48.	0.00		
2 COMBINED AT	C 2	1085.	11.50	216.	63.	51.	0.00		

*** NORMAL END OF HEC-1 ***

3. MYRTLE WASH CROSSING

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*                                                   *
*  RUN DATE 11-MAY-89  TIME 11:37:02                *
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*  U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616             *
*  (916) 440-2105 (FTS) 448-2105       *
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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
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 HYDRAULIC ANALYSIS OF MYRTLE WASH FOR SQUAW PEAK HIGHWAY(USE 28' CHAN. LINING
T2 100-YEAR Q = 1528 CFS, SUBCRITICAL RUN, 14'X10' RCBC, PRELIM. DESIGN
T3       MYRTLE WASH USBR TYPE III BASIN ENERGY DISSIPATOR (W=32 FT & H=19 FT)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      0.       2.       0.       0.  -1.000000   0.00     0.0      0.      0.000    0.000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
     1.000    0.000   -1.000    0.000    0.000    0.000   -1.000    6.000    0.000    0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   42.000   43.000   26.000    2.000    1.000    8.000   10.000    3.000    5.000

    39.000    4.000   20.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

NC      0.035     0.035     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT      2.000  1528.000  1301.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1    100.000    12.000    78.000   140.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   1270.000    78.000  1269.000    80.000  1265.000    85.000  1264.000    87.000  1263.400    91.000
GR   1264.000    95.000  1265.000    99.000  1266.000   101.000  1267.000   102.000  1268.000   113.000
GR   1269.000   117.000  1270.000   140.000     0.000     0.000     0.000     0.000     0.000     0.000

X1    150.000    13.000    81.000   120.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1270.000    81.000  1269.000    83.000  1268.000    85.000  1267.000    87.000  1266.000    90.000
GR   1265.000    93.000  1264.500    97.000  1265.000   101.000  1266.000   102.000  1269.000   108.000
GR   1270.000   120.000  1271.000   122.000  1272.000   130.000     0.000     0.000     0.000     0.000

X1    200.000    12.000    80.000   118.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1272.000    75.000  1271.000    77.000  1270.000    80.000  1269.000    81.000  1268.000    82.000
GR   1267.000    84.000  1266.000    89.000  1267.000   103.000  1268.000   112.000  1269.000   113.000
GR   1270.000   118.000  1273.000   125.000     0.000     0.000     0.000     0.000     0.000     0.000

X1    250.000    14.000    74.000   114.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1273.000    53.000  1272.000    70.000  1271.000    72.000  1270.000    74.000  1269.000    75.000
GR   1268.000    76.000  1267.000    77.000  1266.400    81.000  1267.000    87.000  1268.000   104.000
GR   1269.000   110.000  1270.000   114.000  1271.000   118.000  1275.000   124.000     0.000     0.000
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X1	300.000	14.000	67.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	89.000	1266.750	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1274.000	57.000	1273.000	67.000	1272.000	68.000	1271.000	70.000	1270.000	71.000
GR	1269.000	72.000	1268.000	73.000	1267.000	75.000	1266.800	77.000	1267.000	80.000
GR	1268.000	85.000	1269.000	97.000	1270.000	104.000	1275.000	115.000	0.000	0.000
X1	350.000	15.000	55.000	112.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.000	1266.830	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1275.000	55.000	1274.000	62.000	1273.000	64.000	1272.000	65.000	1271.000	68.000
GR	1270.000	69.000	1269.000	71.000	1268.000	73.000	1267.300	79.000	1268.000	84.000
GR	1269.000	87.000	1270.000	94.000	1275.000	112.000	1276.000	113.000	1277.000	122.000
X1	400.000	10.000	61.000	110.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.000	1266.900	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1276.000	61.000	1275.000	68.000	1270.000	81.000	1268.000	90.000	1267.600	93.000
GR	1268.000	95.000	1270.000	102.000	1275.000	109.000	1276.000	110.000	1277.000	134.000
X1	450.000	10.000	68.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.500	1266.980	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1278.000	68.000	1277.000	73.000	1276.000	75.000	1275.000	77.000	1270.000	87.000
GR	1268.400	94.000	1270.000	100.000	1275.000	108.000	1276.000	110.000	1277.000	115.000
X1	500.000	17.000	63.000	113.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	87.000	1267.050	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1279.000	63.000	1278.000	67.000	1277.000	68.000	1275.000	71.000	1270.000	78.000
GR	1269.200	81.000	1270.000	84.000	1271.000	86.000	1272.000	91.000	1273.000	98.000
GR	1274.000	100.000	1275.000	101.000	1276.000	102.000	1277.000	105.000	1278.000	110.000
GR	1279.000	113.000	1280.000	116.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	550.000	18.000	70.000	105.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	88.000	1267.130	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1281.000	63.000	1280.000	68.000	1279.000	70.000	1278.000	72.000	1277.000	74.000
GR	1276.000	81.000	1275.000	83.000	1271.000	87.000	1270.300	89.000	1271.000	92.000
GR	1273.000	94.000	1274.000	95.000	1275.000	98.000	1276.000	100.000	1277.000	102.000
GR	1278.000	104.000	1279.000	105.000	1280.000	125.000	0.000	0.000	0.000	0.000
X1	600.000	19.000	89.000	118.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.200	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1282.000	58.000	1281.000	67.000	1281.000	89.000	1280.000	91.000	1279.000	94.000
GR	1277.000	95.000	1276.000	96.000	1275.000	99.000	1274.400	102.000	1275.000	106.000
GR	1276.000	108.000	1277.000	110.000	1278.000	112.000	1279.000	115.000	1280.000	116.000
GR	1281.000	118.000	1282.000	127.000	1283.000	128.000	1284.000	135.000	0.000	0.000
X1	650.000	16.000	82.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.280	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1283.000	53.000	1282.000	66.000	1281.000	82.000	1280.000	83.000	1279.000	86.000
GR	1278.000	88.000	1277.000	92.000	1276.500	98.000	1277.000	104.000	1278.000	108.000
GR	1279.000	111.000	1280.000	112.000	1281.000	115.000	1282.000	117.000	1283.000	123.000
GR	1284.000	137.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	700.000	18.000	65.000	124.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.350	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1285.000	50.000	1284.000	59.000	1283.000	65.000	1282.000	85.000	1281.000	87.000
GR	1280.000	89.000	1279.000	92.000	1278.000	94.000	1277.200	105.000	1278.000	111.000
GR	1279.000	114.000	1280.000	117.000	1281.000	118.000	1282.000	120.000	1283.000	124.000
GR	1284.000	125.000	1285.000	128.000	1285.000	134.000	0.000	0.000	0.000	0.000
X1	750.000	16.000	70.000	129.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.430	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1287.000	60.000	1286.000	68.000	1285.000	70.000	1283.000	73.000	1282.000	76.000
GR	1281.000	92.000	1280.000	95.000	1279.000	99.000	1278.000	107.000	1277.800	110.000
GR	1278.000	114.000	1279.000	116.000	1280.000	118.000	1285.000	129.000	1286.000	131.000
GR	1287.000	133.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	800.000	12.000	77.000	133.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.500	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1288.000	23.000	1287.000	77.000	1286.000	80.000	1285.000	82.000	1280.000	89.000
GR	1279.000	96.000	1278.800	105.000	1279.000	111.000	1280.000	116.000	1285.000	127.000
GR	1286.000	129.000	1287.000	133.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.020	0.020	0.013	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	824.000	4.000	79.000	116.000	24.000	24.000	24.000	0.000	0.000	0.000
CI	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000
GR	1282.000	79.000	1267.500	79.000	1267.500	116.000	1286.000	126.000	0.000	0.000
X1	851.000	4.000	89.000	120.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	1278.500	89.000	1267.500	89.000	1267.500	120.000	1278.500	120.000	0.000	0.000
NC	0.016	0.016	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	866.000	6.000	93.000	107.100	15.000	15.000	15.000	0.000	0.000	0.000
BT	6.000	19.000	1278.700	1278.700	93.000	1281.100	1277.600	93.100	1281.100	1277.600
BT	107.000	1281.500	1277.660	107.100	1281.500	1277.660	170.000	1283.300	1283.300	0.000
GR	1278.700	19.000	1277.660	93.000	1267.660	93.100	1267.660	107.000	1277.660	107.100
GR	1283.300	170.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1135.000	6.000	93.000	107.100	269.000	269.000	269.000	0.000	0.000	0.000
BT	6.000	33.000	1283.800	1283.800	93.000	1285.500	1278.300	93.100	1285.500	1278.300
BT	107.000	1285.900	1278.340	107.100	1285.900	1278.340	133.000	1286.600	1286.600	0.000
GR	1283.800	33.000	1278.340	93.000	1268.340	93.100	1268.340	107.000	1278.340	107.100
GR	1286.600	133.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1180.000	4.000	84.000	116.000	45.000	45.000	45.000	0.000	0.000	0.000
GR	1285.000	84.000	1268.450	84.000	1268.450	116.000	1285.000	116.000	0.000	0.000
NC	0.000	0.000	0.018	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	1200.000	4.000	84.000	116.000	20.000	20.000	20.000	0.000	0.000	0.000
GR	1288.500	84.000	1268.500	84.000	1268.500	116.000	1288.500	116.000	0.000	0.000

X1	1226.000	0.000	0.000	0.000	26.000	26.000	26.000	0.000	1.000	0.000
X1	1230.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	1.000	0.000
X1	1234.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	1.000	0.000
X1	1238.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	1.000	0.000
X1	1242.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	5.000	0.000
X1	1262.000	0.000	0.000	0.000	20.000	20.000	20.000	0.000	10.000	0.000
X1	1302.000	4.000	84.000	116.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	1295.000	84.000	1287.500	84.000	1287.500	116.000	1295.000	116.000	0.000	0.000
NC	0.000	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1322.000	4.000	89.000	121.000	20.000	20.000	20.000	0.000	0.000	0.000
GR	1300.000	89.000	1289.500	89.000	1289.500	121.000	1300.000	121.000	0.000	0.000
X1	1350.000	16.000	84.000	127.000	28.000	28.000	28.000	0.000	0.000	0.000
CI	104.000	-1.000	0.018	1.500	1.500	20.000	0.000	0.000	0.000	0.000
GR	1301.500	65.000	1301.000	82.000	1300.000	84.000	1295.000	92.000	1294.000	94.000
GR	1293.000	97.000	1292.000	99.000	1291.600	105.000	1292.000	112.000	1293.000	117.000
GR	1294.000	119.000	1295.000	120.000	1300.000	127.000	1302.000	130.000	1305.000	136.000
GR	1305.300	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.035	0.035	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	1400.000	11.000	80.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000
GR	1301.500	45.000	1301.000	76.000	1300.000	80.000	1295.000	89.000	1294.000	91.000
GR	1293.500	95.000	1294.000	100.000	1295.000	104.000	1300.000	115.000	1305.000	123.000
GR	1306.500	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1450.000	15.000	66.000	111.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1303.000	66.000	1302.000	71.000	1300.000	72.000	1298.000	75.000	1296.000	78.000
GR	1295.200	80.000	1296.000	85.000	1297.000	95.000	1298.000	96.000	1299.000	98.000
GR	1300.000	100.000	1301.000	107.000	1303.000	111.000	1304.000	114.000	1305.000	124.000
X1	1500.000	12.000	85.000	130.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1305.000	75.000	1304.000	85.000	1300.000	90.000	1299.000	91.000	1298.500	94.000
GR	1299.000	100.000	1300.000	111.000	1301.000	114.000	1302.000	117.000	1303.000	120.000
GR	1304.000	130.000	1305.000	141.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1550.000	14.000	87.000	128.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1306.000	61.000	1305.000	78.000	1304.000	87.000	1303.000	89.000	1301.000	93.000
GR	1300.000	94.000	1299.800	97.000	1300.000	100.000	1301.000	116.000	1302.000	120.000
GR	1303.000	123.000	1304.000	128.000	1305.000	141.000	1306.000	150.000	0.000	0.000

X1	1600.000	13.000	84.000	128.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1307.000	40.000	1306.000	83.000	1305.000	84.000	1304.000	87.000	1303.000	88.000
GR	1302.000	93.000	1301.000	102.000	1302.000	110.000	1303.000	123.000	1304.000	125.000
GR	1305.000	128.000	1306.000	130.000	1307.000	135.000	0.000	0.000	0.000	0.000
X1	1650.000	10.000	87.000	134.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1307.500	60.000	1307.000	87.000	1305.000	89.000	1304.000	92.000	1303.000	96.000
GR	1304.000	111.000	1304.000	124.000	1305.000	128.000	1306.000	131.000	1308.000	134.000
X1	1700.000	12.000	86.000	144.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1309.000	68.000	1308.000	86.000	1307.000	88.000	1306.000	92.000	1305.000	96.000
GR	1304.000	102.000	1304.000	125.000	1305.000	128.000	1306.000	132.000	1307.000	134.000
GR	1308.000	144.000	1309.000	148.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=   0.100 CEHV=   0.300
*SECNO 100.000
2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED
3280 CROSS SECTION    100.00 EXTENDED      0.13 FEET

3720 CRITICAL DEPTH ASSUMED
   100.00      6.73  1270.13  1270.13      0.00  1271.46      1.33      0.00      0.00  1270.00
    1528.        0.     1528.        0.        0.     165.        0.        0.        0.  1270.00
     0.00      0.00      9.27      0.00     0.000     0.030     0.000     0.000   1263.40    78.00
 0.010174        0.        0.        0.         0        13         0      0.00     62.00   140.00

*SECNO 150.000
3280 CROSS SECTION    150.00 EXTENDED      1.07 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   150.00      6.57  1271.07  1271.07      0.00  1272.85      1.78      0.49      0.13  1270.00
    1528.        0.     1525.        3.        0.     142.        1.        0.        0.  1270.00
     0.00      0.00     10.72      2.57     0.000     0.030     0.035     0.000   1264.50    81.00
 0.009310       50.       50.       50.         0         8         0      0.00     41.56   122.56

*SECNO 200.000
3280 CROSS SECTION    200.00 EXTENDED      0.19 FEET

3301 HV CHANGED MORE THAN HVINS

   200.00      6.19  1272.19  1271.09      0.00  1273.20      1.01      0.27      0.08  1270.00
    1528.       20.     1494.       14.        6.     183.        6.        0.        0.  1270.00
     0.00      3.09      8.16      2.54     0.035     0.030     0.035     0.000   1266.00    75.00
 0.003547       50.       50.       50.         4        15         0      0.00     48.10   123.10

*SECNO 250.000
   250.00      6.07  1272.47  1271.33      0.00  1273.38      0.91      0.17      0.01  1270.00
    1528.       20.     1476.       32.        8.     190.        9.        1.        0.  1270.00
     0.00      2.57      7.78      3.39     0.035     0.030     0.035     0.000   1266.40    62.06
 0.003259       50.       50.       50.         2        15         0      0.00     58.14   120.20
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 300.000
CHIMP CLSTA=     89.00 CELCH=   1266.75 BW=     28.00 STCHL=     67.00 STCHR=    115.00
EXCAVATION DATA
AEX=     49.0SQ-FT     VEXR=      0.0K*CU-YD     VEXT=      0.0K*CU-YD

   300.00      5.85  1272.60  1270.97      0.00  1273.47      0.88      0.09      0.00  1273.00
    1528.        0.    1528.        0.        0.     203.        0.        1.        0.  1275.00
     0.01      0.00     7.53      0.00     0.000     0.018     0.000     0.000   1266.75    67.41
 0.001171       50.      50.       50.         2        19         0      0.00     42.30   109.71

*SECNO 350.000
CHIMP CLSTA=     86.00 CELCH=   1266.83 BW=     28.00 STCHL=     55.00 STCHR=    112.00
EXCAVATION DATA
AEX=     77.3SQ-FT     VEXR=      0.1K*CU-YD     VEXT=      0.1K*CU-YD

   350.00      5.79  1272.62  1271.11      0.00  1273.55      0.93      0.06      0.01  1275.00
    1528.        0.    1528.        0.        0.     198.        0.        1.        0.  1275.00
     0.01      0.00     7.73      0.00     0.000     0.018     0.000     0.000   1266.83    64.38
 0.001253       50.      50.       50.         2        15         0      0.00     41.42   105.79

*SECNO 400.000
CHIMP CLSTA=     86.00 CELCH=   1266.90 BW=     28.00 STCHL=     61.00 STCHR=    110.00
EXCAVATION DATA
AEX=    112.8SQ-FT     VEXR=      0.2K*CU-YD     VEXT=      0.3K*CU-YD

   400.00      5.77  1272.67  1271.18      0.00  1273.62      0.95      0.06      0.01  1276.00
    1528.        0.    1528.        0.        0.     195.        0.        1.        0.  1276.00
     0.01      0.00     7.83      0.00     0.000     0.018     0.000     0.000   1266.90    66.22
 0.001248       50.      50.       50.         1        15         0      0.00     39.55   105.78

*SECNO 450.000
CHIMP CLSTA=     86.50 CELCH=   1266.98 BW=     28.00 STCHL=     61.48 STCHR=    115.00
EXCAVATION DATA
AEX=    896.2SQ-FT     VEXR=      0.9K*CU-YD     VEXT=      1.2K*CU-YD

   450.00      5.60  1272.58  1271.34      0.00  1273.76      1.18      0.07      0.07  1278.00
    1528.        0.    1528.        0.        0.     175.        0.        2.        0.  1277.00
     0.01      0.00     8.71      0.00     0.000     0.018     0.000     0.000   1266.98    71.49
 0.001637       50.      50.       50.         2        15         0      0.00     34.61   106.10
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 500.000
CHIMP CLSTA=     87.00 CELCH=   1267.05 BW=     28.00 STCHL=     61.05 STCHR=    113.00
EXCAVATION DATA
AEX=     221.2SQ-FT     VEXR=      1.0K*CU-YD     VEXT=      2.3K*CU-YD

   500.00      5.62  1272.67  1271.41      0.00  1273.84      1.17      0.08      0.00  1279.00
    1528.        0.    1528.       0.        0.     176.        0.        2.        0.  1279.00
     0.01      0.00     8.69      0.00     0.000     0.018     0.000     0.000  1267.05    71.92
 0.001624       50.      50.       50.         1        15         0      0.00     34.69   106.61

*SECNO 550.000
CHIMP CLSTA=     88.00 CELCH=   1267.13 BW=     28.00 STCHL=     60.13 STCHR=    114.34
EXCAVATION DATA
AEX=     425.7SQ-FT     VEXR=      0.6K*CU-YD     VEXT=      2.9K*CU-YD

   550.00      5.63  1272.76  1271.49      0.00  1273.92      1.16      0.08      0.00  1281.00
    1528.        0.    1528.       0.        0.     177.        0.        2.        0.  1279.47
     0.02      0.00     8.64      0.00     0.000     0.018     0.000     0.000  1267.13    72.78
 0.001599       50.      50.       50.         1        15         0      0.00     34.85   107.62

*SECNO 600.000
CHIMP CLSTA=     97.00 CELCH=   1267.20 BW=     28.00 STCHL=     69.20 STCHR=    125.65
EXCAVATION DATA
AEX=     469.1SQ-FT     VEXR=      0.8K*CU-YD     VEXT=      3.7K*CU-YD

   600.00      5.92  1273.12  1271.47      0.00  1274.02      0.90      0.07      0.03  1281.00
    1528.        0.    1528.       0.        0.     201.        0.        2.        0.  1281.85
     0.02      0.00     7.60      0.00     0.000     0.018     0.000     0.000  1267.20    77.07
 0.001143       50.      50.       50.         2        15         0      0.00     39.85   116.93

*SECNO 650.000
CHIMP CLSTA=     97.00 CELCH=   1267.28 BW=     28.00 STCHL=     68.43 STCHR=    127.01
EXCAVATION DATA
AEX=     494.3SQ-FT     VEXR=      0.9K*CU-YD     VEXT=      4.6K*CU-YD

   650.00      5.89  1273.17  1271.56      0.00  1274.08      0.91      0.06      0.00  1281.85
    1528.        0.    1528.       0.        0.     200.        0.        2.        1.  1283.29
     0.02      0.00     7.64      0.00     0.000     0.018     0.000     0.000  1267.28    77.10
 0.001161       50.      50.       50.         1        15         0      0.00     39.80   116.90
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 700.000
CHIMP CLSTA=      97.00 CELCH=   1267.35 BW=     28.00 STCHL=     65.00 STCHR=    128.65
EXCAVATION DATA
AEX=     526.8SQ-FT     VEXR=      0.9K*CU-YD     VEXT=       5.5K*CU-YD

   700.00      5.87  1273.22  1271.63      0.00  1274.14      0.91      0.06      0.00  1283.00
    1528.        0.    1528.       0.        0.     199.        0.        3.        1.  1285.00
     0.02      0.00     7.67     0.00     0.000    0.018     0.000     0.000   1267.35    77.12
 0.001176       50.      50.      50.         0       15         0      0.00     39.76   116.88

*SECNO 750.000
CHIMP CLSTA=      97.00 CELCH=   1267.43 BW=     28.00 STCHL=     63.92 STCHR=    129.00
EXCAVATION DATA
AEX=     550.5SQ-FT     VEXR=      1.0K*CU-YD     VEXT=       6.5K*CU-YD

   750.00      5.85  1273.28  1271.71      0.00  1274.20      0.92      0.06      0.00  1286.51
    1528.        0.    1528.       0.        0.     198.        0.        3.        1.  1285.00
     0.02      0.00     7.71     0.00     0.000    0.018     0.000     0.000   1267.43    77.15
 0.001194       50.      50.      50.         0       15         0      0.00     39.70   116.85

*SECNO 800.000
CHIMP CLSTA=      97.00 CELCH=   1267.50 BW=     28.00 STCHL=     63.25 STCHR=    133.00
EXCAVATION DATA
AEX=     626.9SQ-FT     VEXR=      1.1K*CU-YD     VEXT=       7.6K*CU-YD

   800.00      5.83  1273.33  1271.78      0.00  1274.26      0.93      0.06      0.00  1287.25
    1528.        0.    1528.       0.        0.     197.        0.        3.        1.  1287.00
     0.02      0.00     7.74     0.00     0.000    0.018     0.000     0.000   1267.50    77.16
 0.001205       50.      50.      50.         0       15         0      0.00     39.67   116.84

CCHV=   0.300 CEHV=   0.500
*SECNO 824.000
   824.00      6.19  1273.69  1271.23      0.00  1274.36      0.67      0.01      0.08  1282.00
    1528.        0.    1509.      19.        0.     229.       10.        3.        1.  1267.50
     0.03      0.00     6.58     1.82     0.000    0.013     0.020     0.000   1267.50    79.00
 0.000358       24.      24.      24.         2       14         0      0.00     40.35   119.35

*SECNO 851.000
   851.00      6.02  1273.52  1271.71      0.00  1274.56      1.04      0.01      0.19  1278.50
    1528.        0.    1528.       0.        0.     187.        0.        3.        1.  1278.50
     0.03      0.00     8.19     0.00     0.000    0.013     0.000     0.000   1267.50    89.00
 0.000727       27.      27.      27.         2       14         0      0.00     31.00   120.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 866.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1278.70 MAX ELLC= 1283.30

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   866.00      7.18  1274.84  1274.84      0.00  1278.44      3.60      0.02      1.28  1277.66
    1528.        0.    1528.       0.        0.     100.        0.        3.        1.   1277.66
     0.03      0.00    15.23     0.00     0.000     0.013     0.000     0.000   1267.66     93.03
 0.003276       15.      15.      15.         0        18         0      0.00     14.04    107.07

*SECNO 1135.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1283.80 MAX ELLC= 1286.60

  1135.00      8.61  1276.95  1275.52      0.00  1279.46      2.50      0.68      0.33  1278.34
    1528.        0.    1528.       0.        0.     120.        0.        4.        1.   1278.34
     0.03      0.00    12.70     0.00     0.000     0.013     0.000     0.000   1268.34     93.01
 0.002031      269.     269.     269.        11        15         0      0.00     14.07    107.09

*SECNO 1180.000

3301 HV CHANGED MORE THAN HVINS

  1180.00     11.42  1279.87  1272.58      0.00  1280.14      0.27      0.01      0.67  1285.00
    1528.        0.    1528.       0.        0.     365.        0.        4.        1.   1285.00
     0.04      0.00     4.18     0.00     0.000     0.013     0.000     0.000   1268.45     84.00
 0.000107       45.      45.      45.         3        11         0      0.00     32.00    116.00

CCHV=   0.100 CEHV=   0.300
*SECNO 1200.000
  1200.00     11.37  1279.87  1272.63      0.00  1280.14      0.27      0.00      0.00  1288.50
    1528.        0.    1528.       0.        0.     364.        0.        4.        1.   1288.50
     0.04      0.00     4.20     0.00     0.000     0.018     0.000     0.000   1268.50     84.00
 0.000207       20.      20.      20.         2        18         0      0.00     32.00    116.00
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  SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
  Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
  TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN        SSTA
  SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID       ENDST

*SECNO 1226.000
 1226.00      10.33   1279.83    1273.63       0.00    1280.16       0.33       0.01       0.02    1289.50
   1528.         0.     1528.         0.         0.     331.         0.         5.         1.    1289.50
    0.04       0.00      4.62       0.00      0.000      0.018      0.000      0.000    1269.50      84.00
0.000270        26.       26.        26.          2         18          0       0.00      32.00     116.00

*SECNO 1230.000
 1230.00       9.28   1279.78    1274.62       0.00    1280.19       0.41       0.00       0.02    1290.50
   1528.         0.     1528.         0.         0.     297.         0.         5.         1.    1290.50
    0.04       0.00      5.15       0.00      0.000      0.018      0.000      0.000    1270.50      84.00
0.000367         4.        4.         4.          2         18          0       0.00      32.00     116.00

*SECNO 1234.000
 1234.00       8.20   1279.70    1275.62       0.00    1280.23       0.53       0.00       0.03    1291.50
   1528.         0.     1528.         0.         0.     262.         0.         5.         1.    1291.50
    0.04       0.00      5.82       0.00      0.000      0.018      0.000      0.000    1271.50      84.00
0.000522         4.        4.         4.          2         14          0       0.00      32.00     116.00

*SECNO 1238.000
 1238.00       7.08   1279.58    1276.63       0.00    1280.28       0.71       0.00       0.05    1292.50
   1528.         0.     1528.         0.         0.     226.         0.         5.         1.    1292.50
    0.04       0.00      6.75       0.00      0.000      0.018      0.000      0.000    1272.50      84.00
0.000801         4.        4.         4.          2          8          0       0.00      32.00     116.00

*SECNO 1242.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1242.00       4.14   1281.64    1281.64       0.00    1283.71       2.07       0.01       0.41    1297.50
   1528.         0.     1528.         0.         0.     132.         0.         5.         1.    1297.50
    0.04       0.00     11.55       0.00      0.000      0.018      0.000      0.000    1277.50      84.00
0.004004         4.        4.         4.          0         11          0       0.00      32.00     116.00

*SECNO 1262.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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11-MAY-89 11:37:04

SECNO Q TIME SLOPE	DEPTH QLOB VLOB XLOBL	CWSEL QCH VCH XLCH	CRIWS QROB VROB XLOBR	WSELK ALOB XNL ITRIAL	EG ACH XNCH IDC	HV AROB XNR ICONT	HL VOL WIN CORAR	OLOSS TWA ELMIN TOPWID	BANK ELEV LEFT/RIGHT SSTA ENDST
1262.00	4.12	1291.62	1291.62	0.00	1293.71	2.08	0.08	0.00	1307.50
1528.	0.	1528.	0.	0.	132.	0.	5.	1.	1307.50
0.04	0.00	11.58	0.00	0.000	0.018	0.000	0.000	1287.50	84.00
0.004039	20.	20.	20.	0	5	0	0.00	32.00	116.00

*SECNO 1302.000

3301 HV CHANGED MORE THAN HVINS

1302.00	4.94	1292.44	1291.62	0.00	1293.89	1.45	0.12	0.06	1295.00
1528.	0.	1528.	0.	0.	158.	0.	5.	1.	1295.00
0.04	0.00	9.65	0.00	0.000	0.018	0.000	0.000	1287.50	84.00
0.002322	40.	40.	40.	5	5	0	0.00	32.00	116.00

*SECNO 1322.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1322.00	4.14	1293.64	1293.64	0.00	1295.71	2.07	0.06	0.19	1300.00
1528.	0.	1528.	0.	0.	132.	0.	5.	1.	1300.00
0.04	0.00	11.54	0.00	0.000	0.018	0.000	0.000	1289.50	89.00
0.003997	20.	20.	20.	0	11	0	0.00	32.00	121.00

*SECNO 1350.000
CHIMP CLSTA= 104.00 CELCH= 1291.60 BW= 20.00 STCHL= 79.80 STCHR= 127.00
EXCAVATION DATA
AEX= 36.3SQ-FT VEXR= 0.3K*CU-YD VEXT= 8.0K*CU-YD

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1350.00	4.88	1296.48	1296.48	0.00	1298.41	1.93	0.10	0.01	1301.06
1528.	0.	1528.	0.	0.	137.	0.	5.	1.	1300.00
0.04	0.00	11.16	0.00	0.000	0.018	0.000	0.000	1291.60	86.68
0.003349	28.	28.	28.	0	8	0	0.00	35.39	122.07

CCHV= 0.100 CEHV= 0.300

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

*SECNO 1400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1400.00      6.38    1299.88    1299.88       0.00    1301.87       1.99       0.26       0.02    1300.00
    1528.        0.      1528.         0.         0.     135.         0.         5.         1.    1300.00
     0.04      0.00      11.32       0.00      0.000      0.030      0.000      0.000    1293.50      80.22
 0.009382       50.        50.        50.          0         11          0       0.00      34.51     114.73

*SECNO 1450.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1450.00      6.41    1301.61    1301.61       0.00    1303.51       1.89       0.48       0.01    1303.00
    1528.        0.      1528.         0.         0.     138.         0.         5.         1.    1303.00
     0.04      0.00      11.05       0.00      0.000      0.030      0.000      0.000    1295.20      71.19
 0.009703       50.        50.        50.          0          5          0       0.00      37.04     108.23

*SECNO 1500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1500.00      5.69    1304.19    1304.19       0.00    1305.86       1.67       0.48       0.02    1304.00
    1528.        0.      1528.         0.         0.     147.         0.         6.         1.    1304.00
     0.05      0.88      10.36       0.88      0.035      0.030      0.035      0.000    1298.50      83.06
 0.009644       50.        50.        50.          0         11          0       0.00      49.07     132.13

*SECNO 1550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1550.00      5.22    1305.02    1305.02       0.00    1306.51       1.49       0.42       0.02    1304.00
    1528.       11.      1501.        16.         5.     152.         7.         6.         1.    1304.00
     0.05      2.34       9.87       2.35      0.035      0.030      0.035      0.000    1299.80      77.60
 0.007266       50.        50.        50.          0         11          0       0.00      63.62     141.21

*SECNO 1600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1600.00      4.88    1305.88    1305.88       0.00    1307.47       1.59       0.39       0.03    1305.00
    1528.        1.      1526.         2.         0.     151.         1.         6.         1.    1305.00
     0.05      1.78      10.13       2.09      0.035      0.030      0.035      0.000    1301.00      83.12
 0.008417       50.        50.        50.          0         10          0       0.00      46.63     129.75
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 1650.000
3280 CROSS SECTION   1650.00 EXTENDED      0.14 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1650.00      4.64  1307.64  1307.64      0.00  1309.01      1.37      0.39      0.02  1307.00
     1528.       20.     1508.       0.       10.     159.       0.        6.        1.  1308.00
     0.05      1.93      9.45      0.00     0.035     0.030     0.000     0.000   1303.00    60.00
 0.007424       50.       50.       50.         0         8         0      0.00     73.45   133.45

*SECNO 1700.000
  1700.00      4.03  1308.03  1308.03      0.00  1309.44      1.41      0.42      0.01  1308.00
     1528.        0.     1528.       0.        0.     160.       0.        6.        1.  1308.00
     0.05      0.04      9.53      0.04     0.035     0.030     0.000     0.000   1304.00    85.40
 0.009773       50.       50.       50.         2        15         0      0.00     58.73   144.13
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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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T1 HYDRAULIC ANALYSIS OF MYRTLE WASH FOR SQUAW PEAK HIGHWAY
T2 50-YEAR Q = 1301 CFS, SUBCRITICAL RUN, 14'X10' RCBC, PRELIM. DESIGN
T3 MYRTLE WASH USBR TYPE III BASIN ENERGY DISSIPATOR (W=32 FT & H=19 FT)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	-1.000000	0.00	0.0	0.	0.000	0.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.000	-1.000	0.000	0.000	0.000	-1.000	6.000	0.000	0.000

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

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=   0.100 CEHV=   0.300
*SECNO 100.000
2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED
3720 CRITICAL DEPTH ASSUMED
   100.00      6.39  1269.79  1269.79      0.00  1271.05      1.26      0.00      0.00  1270.00
    1301.        0.     1301.       0.        0.     144.        0.        0.        0.  1270.00
     0.00      0.00      9.02      0.00     0.000     0.030     0.000     0.000   1263.40    78.43
 0.010190        0.        0.        0.         0        16         0      0.00     56.67   135.09

*SECNO 150.000
3280 CROSS SECTION    150.00 EXTENDED      0.64 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   150.00      6.14  1270.64  1270.64      0.00  1272.31      1.67      0.51      0.12  1270.00
    1301.        0.     1300.       1.        0.     126.        0.        0.        0.  1270.00
     0.00      0.00     10.36      1.86     0.000     0.030     0.035     0.000   1264.50    81.00
 0.010125       50.       50.       50.         0        11         0      0.00     40.28   121.28

*SECNO 200.000

3301 HV CHANGED MORE THAN HVINS

   200.00      5.75  1271.75  1270.68      0.00  1272.66      0.91      0.28      0.08  1270.00
    1301.       11.     1282.       8.        4.     166.        4.        0.        0.  1270.00
     0.00      2.63      7.70      2.20     0.035     0.030     0.035     0.000   1266.00    75.51
 0.003589       50.       50.       50.         3        15         0      0.00     46.57   122.08

*SECNO 250.000
   250.00      5.61  1272.01  1270.96      0.00  1272.85      0.83      0.17      0.01  1270.00
    1301.       11.     1270.      20.        4.     171.        7.        1.        0.  1270.00
     0.01      2.62      7.41      2.98     0.035     0.030     0.035     0.000   1266.40    69.80
 0.003377       50.       50.       50.         2        15         0      0.00     49.72   119.52
```

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

*SECNO 300.000
CHIMP CLSTA= 89.00 CELCH= 1266.75 BW= 28.00 STCHL= 67.00 STCHR= 115.00
EXCAVATION DATA
AEX= 49.0SQ-FT VEXR= 0.0K*CU-YD VEXT= 0.0K*CU-YD

300.00	5.43	1272.18	1270.57	0.00	1272.94	0.76	0.09	0.01	1273.00
1301.	0.	1301.	0.	0.	186.	0.	1.	0.	1275.00
0.01	0.00	7.00	0.00	0.000	0.018	0.000	0.000	1266.75	67.81
0.001087	50.	50.	50.	0	14	0	0.00	40.99	108.81

*SECNO 350.000
CHIMP CLSTA= 86.00 CELCH= 1266.83 BW= 28.00 STCHL= 55.00 STCHR= 112.00
EXCAVATION DATA
AEX= 77.3SQ-FT VEXR= 0.1K*CU-YD VEXT= 0.1K*CU-YD

350.00	5.38	1272.21	1270.69	0.00	1273.01	0.80	0.06	0.01	1275.00
1301.	0.	1301.	0.	0.	181.	0.	1.	0.	1275.00
0.01	0.00	7.20	0.00	0.000	0.018	0.000	0.000	1266.83	64.79
0.001185	50.	50.	50.	2	19	0	0.00	40.59	105.38

*SECNO 400.000
CHIMP CLSTA= 86.00 CELCH= 1266.90 BW= 28.00 STCHL= 61.00 STCHR= 110.00
EXCAVATION DATA
AEX= 112.8SQ-FT VEXR= 0.2K*CU-YD VEXT= 0.3K*CU-YD

400.00	5.35	1272.25	1270.77	0.00	1273.08	0.82	0.06	0.00	1276.00
1301.	0.	1301.	0.	0.	179.	0.	1.	0.	1276.00
0.01	0.00	7.27	0.00	0.000	0.018	0.000	0.000	1266.90	66.64
0.001164	50.	50.	50.	0	15	0	0.00	38.73	105.36

*SECNO 450.000
CHIMP CLSTA= 86.50 CELCH= 1266.98 BW= 28.00 STCHL= 61.48 STCHR= 115.00
EXCAVATION DATA
AEX= 896.2SQ-FT VEXR= 0.9K*CU-YD VEXT= 1.2K*CU-YD

450.00	5.21	1272.19	1270.92	0.00	1273.19	1.00	0.07	0.05	1278.00
1301.	0.	1301.	0.	0.	162.	0.	1.	0.	1277.00
0.01	0.00	8.03	0.00	0.000	0.018	0.000	0.000	1266.98	71.56
0.001496	50.	50.	50.	2	15	0	0.00	34.16	105.72

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

*SECNO 500.000
CHIMP CLSTA=      87.00 CELCH=   1267.05 BW=     28.00 STCHL=     61.05 STCHR=    113.00
EXCAVATION DATA
AEX=    221.2SQ-FT     VEXR=      1.0K*CU-YD     VEXT=      2.3K*CU-YD

   500.00      5.22  1272.27  1270.98      0.00  1273.27      1.00      0.07      0.00  1279.00
    1301.        0.    1301.       0.        0.     162.        0.        2.        0.  1279.00
     0.01      0.00     8.03     0.00     0.000     0.018     0.000     0.000   1267.05    71.99
 0.001496       50.      50.      50.         0        15         0      0.00     34.22   106.21

*SECNO 550.000
CHIMP CLSTA=      88.00 CELCH=   1267.13 BW=     28.00 STCHL=     60.13 STCHR=    114.34
EXCAVATION DATA
AEX=    425.7SQ-FT     VEXR=      0.6K*CU-YD     VEXT=      2.9K*CU-YD

   550.00      5.22  1272.35  1271.06      0.00  1273.34      0.99      0.07      0.00  1281.00
    1301.        0.    1301.       0.        0.     163.        0.        2.        0.  1279.47
     0.02      0.00     8.00     0.00     0.000     0.018     0.000     0.000   1267.13    72.87
 0.001484       50.      50.      50.         0        15         0      0.00     34.35   107.21

*SECNO 600.000
CHIMP CLSTA=      97.00 CELCH=   1267.20 BW=     28.00 STCHL=     69.20 STCHR=    125.65
EXCAVATION DATA
AEX=    469.1SQ-FT     VEXR=      0.8K*CU-YD     VEXT=      3.7K*CU-YD

   600.00      5.43  1272.63  1271.06      0.00  1273.43      0.80      0.06      0.02  1281.00
    1301.        0.    1301.       0.        0.     182.        0.        2.        0.  1281.85
     0.02      0.00     7.16     0.00     0.000     0.018     0.000     0.000   1267.20    77.56
 0.001112       50.      50.      50.         2        15         0      0.00     38.87   116.44

*SECNO 650.000
CHIMP CLSTA=      97.00 CELCH=   1267.28 BW=     28.00 STCHL=     68.43 STCHR=    127.01
EXCAVATION DATA
AEX=    494.3SQ-FT     VEXR=      0.9K*CU-YD     VEXT=      4.6K*CU-YD

   650.00      5.40  1272.68  1271.15      0.00  1273.49      0.80      0.06      0.00  1281.85
    1301.        0.    1301.       0.        0.     181.        0.        2.        1.  1283.29
     0.02      0.00     7.20     0.00     0.000     0.018     0.000     0.000   1267.28    77.59
 0.001130       50.      50.      50.         1        15         0      0.00     38.82   116.41
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 700.000
CHIMP CLSTA=     97.00 CELCH=   1267.35 BW=     28.00 STCHL=     65.00 STCHR=    128.65
EXCAVATION DATA
AEX=    526.8SQ-FT     VEXR=      0.9K*CU-YD     VEXT=      5.5K*CU-YD

   700.00      5.39  1272.73  1271.22      0.00  1273.55      0.81      0.06      0.00  1283.00
    1301.        0.    1301.       0.        0.    180.        0.        2.        1.   1285.00
     0.02      0.00     7.23     0.00     0.000    0.018     0.000     0.000   1267.35     77.61
 0.001146       50.      50.      50.         0       15         0      0.00     38.78    116.39

*SECNO 750.000
CHIMP CLSTA=     97.00 CELCH=   1267.43 BW=     28.00 STCHL=     63.92 STCHR=    129.00
EXCAVATION DATA
AEX=    550.5SQ-FT     VEXR=      1.0K*CU-YD     VEXT=      6.5K*CU-YD

   750.00      5.36  1272.79  1271.30      0.00  1273.61      0.82      0.06      0.00  1286.51
    1301.        0.    1301.       0.        0.    179.        0.        3.        1.   1285.00
     0.02      0.00     7.27     0.00     0.000    0.018     0.000     0.000   1267.43     77.64
 0.001166       50.      50.      50.         0       15         0      0.00     38.72    116.36

*SECNO 800.000
CHIMP CLSTA=     97.00 CELCH=   1267.50 BW=     28.00 STCHL=     63.25 STCHR=    133.00
EXCAVATION DATA
AEX=    626.9SQ-FT     VEXR=      1.1K*CU-YD     VEXT=      7.6K*CU-YD

   800.00      5.34  1272.84  1271.37      0.00  1273.67      0.83      0.06      0.00  1287.25
    1301.        0.    1301.       0.        0.    178.        0.        3.        1.   1287.00
     0.03      0.00     7.30     0.00     0.000    0.018     0.000     0.000   1267.50     77.66
 0.001179       50.      50.      50.         0       15         0      0.00     38.69    116.34

CCHV=    0.300 CEHV=    0.500
*SECNO 824.000
   824.00      5.68  1273.18  1270.85      0.00  1273.76      0.57      0.01      0.08  1282.00
    1301.        0.    1286.      15.        0.    210.        9.        3.        1.   1267.50
     0.03      0.00     6.11     1.68     0.000    0.013     0.020     0.000   1267.50     79.00
 0.000340       24.      24.      24.         2       14         0      0.00     40.08    119.08

*SECNO 851.000
   851.00      5.54  1273.04  1271.28      0.00  1273.93      0.89      0.01      0.16  1278.50
    1301.        0.    1301.       0.        0.    172.        0.        3.        1.   1278.50
     0.03      0.00     7.58     0.00     0.000    0.013     0.000     0.000   1267.50     89.00
 0.000674       27.      27.      27.         2       14         0      0.00     31.00    120.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 866.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1278.70 MAX ELLC= 1283.30

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   866.00      6.45   1274.11   1274.11      0.00   1277.35      3.24      0.02      1.18   1277.66
    1301.        0.     1301.        0.        0.      90.        0.        3.        1.   1277.66
     0.03      0.00     14.45      0.00     0.000     0.013     0.000     0.000   1267.66     93.04
 0.003178       15.       15.       15.         0        19         0      0.00     14.03    107.06

*SECNO 1135.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1283.80 MAX ELLC= 1286.60

  1135.00      7.69   1276.03   1274.79      0.00   1278.31      2.28      0.67      0.29   1278.34
    1301.        0.     1301.        0.        0.     107.        0.        4.        1.   1278.34
     0.03      0.00     12.11      0.00     0.000     0.013     0.000     0.000   1268.34     93.02
 0.001982      269.      269.      269.        11        19         0      0.00     14.05    107.08

*SECNO 1180.000

3301 HV CHANGED MORE THAN HVINS

  1180.00     10.23   1278.68   1272.16      0.00   1278.93      0.25      0.01      0.61   1285.00
    1301.        0.     1301.        0.        0.     327.        0.        4.        1.   1285.00
     0.04      0.00      3.97      0.00     0.000     0.013     0.000     0.000   1268.45     84.00
 0.000105       45.       45.       45.         3        11         0      0.00     32.00    116.00

CCHV=   0.100 CEHV=   0.300
*SECNO 1200.000
  1200.00     10.18   1278.68   1272.21      0.00   1278.93      0.25      0.00      0.00   1288.50
    1301.        0.     1301.        0.        0.     326.        0.        4.        1.   1288.50
     0.04      0.00      3.99      0.00     0.000     0.018     0.000     0.000   1268.50     84.00
 0.000204       20.       20.       20.         1        18         0      0.00     32.00    116.00
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

*SECNO 1226.000
  1226.00       9.15  1278.65    1273.21       0.00    1278.96       0.31       0.01       0.02    1289.50
    1301.         0.    1301.         0.         0.     293.         0.         4.         1.    1289.50
     0.04       0.00     4.44       0.00      0.000      0.018      0.000      0.000    1269.50      84.00
 0.000277        26.      26.        26.          2         18          0       0.00      32.00     116.00

*SECNO 1230.000
  1230.00       8.09  1278.59    1274.20       0.00    1278.98       0.39       0.00       0.03    1290.50
    1301.         0.    1301.         0.         0.     259.         0.         4.         1.    1290.50
     0.04       0.00     5.03       0.00      0.000      0.018      0.000      0.000    1270.50      84.00
 0.000394         4.       4.         4.          2         18          0       0.00      32.00     116.00

*SECNO 1234.000
  1234.00       7.00  1278.50    1275.20       0.00    1279.02       0.52       0.00       0.04    1291.50
    1301.         0.    1301.         0.         0.     224.         0.         4.         1.    1291.50
     0.04       0.00     5.81       0.00      0.000      0.018      0.000      0.000    1271.50      84.00
 0.000600         4.       4.         4.          2         14          0       0.00      32.00     116.00

*SECNO 1238.000
  1238.00       5.84  1278.34    1276.20       0.00    1279.10       0.75       0.00       0.07    1292.50
    1301.         0.    1301.         0.         0.     187.         0.         4.         1.    1292.50
     0.04       0.00     6.96       0.00      0.000      0.018      0.000      0.000    1272.50      84.00
 0.001022         4.       4.         4.          2         11          0       0.00      32.00     116.00

*SECNO 1242.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1242.00       3.70  1281.20    1281.20       0.00    1283.07       1.87       0.01       0.34    1297.50
    1301.         0.    1301.         0.         0.     118.         0.         4.         1.    1297.50
     0.04       0.00    10.98       0.00      0.000      0.018      0.000      0.000    1277.50      84.00
 0.004080         4.       4.         4.          0         14          0       0.00      32.00     116.00

*SECNO 1262.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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11-MAY-89 11:37:04

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

 1262.00       3.71  1291.21    1291.21       0.00    1293.07       1.87       0.08       0.00    1307.50
   1301.         0.    1301.         0.         0.      119.         0.         4.         1.    1307.50
    0.04       0.00    10.96       0.00      0.000      0.018      0.000      0.000    1287.50      84.00
0.004058        20.      20.        20.          0          5          0       0.00      32.00     116.00

*SECNO 1302.000

3301 HV CHANGED MORE THAN HVINS

 1302.00       4.47  1291.97    1291.21       0.00    1293.25       1.28       0.12       0.06    1295.00
   1301.         0.    1301.         0.         0.      143.         0.         4.         1.    1295.00
    0.04       0.00     9.10       0.00      0.000      0.018      0.000      0.000    1287.50      84.00
0.002290        40.      40.        40.          5          5          0       0.00      32.00     116.00

*SECNO 1322.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1322.00       3.72  1293.22    1293.22       0.00    1295.07       1.86       0.06       0.17    1300.00
   1301.         0.    1301.         0.         0.      119.         0.         5.         1.    1300.00
    0.04       0.00    10.94       0.00      0.000      0.018      0.000      0.000    1289.50      89.00
0.004025        20.      20.        20.          0         11          0       0.00      32.00     121.00

*SECNO 1350.000
CHIMP CLSTA=     104.00 CELCH=    1291.60 BW=      20.00 STCHL=      79.80 STCHR=     127.00
EXCAVATION DATA
AEX=      36.3SQ-FT      VEXR=      0.3K*CU-YD      VEXT=      8.0K*CU-YD

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1350.00       4.42  1296.02    1296.02       0.00    1297.82       1.80       0.10       0.01    1301.06
   1301.         0.    1301.         0.         0.      121.         0.         5.         1.    1300.00
    0.04       0.00    10.76       0.00      0.000      0.018      0.000      0.000    1291.60      87.38
0.003474        28.      28.        28.          0         11          0       0.00      34.05     121.42

CCHV=    0.100 CEHV=    0.300
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS    BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

*SECNO 1400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1400.00      5.91    1299.41    1299.41       0.00    1301.26       1.85       0.27       0.02    1300.00
    1301.        0.      1301.         0.         0.       119.         0.         5.         1.    1300.00
     0.05       0.00      10.92       0.00      0.000      0.030      0.000      0.000    1293.50      81.07
 0.009531        50.        50.        50.          0         11          0       0.00      32.63     113.69

*SECNO 1450.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1450.00      6.01    1301.21    1301.21       0.00    1302.93       1.72       0.48       0.01    1303.00
    1301.        0.      1301.         0.         0.       124.         0.         5.         1.    1303.00
     0.05       0.00      10.52       0.00      0.000      0.030      0.000      0.000    1295.20      71.39
 0.009779        50.        50.        50.          0          5          0       0.00      36.03     107.42

*SECNO 1500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1500.00      5.32    1303.82    1303.82       0.00    1305.36       1.53       0.49       0.02    1304.00
    1301.        0.      1301.         0.         0.       131.         0.         5.         1.    1304.00
     0.05       0.00       9.93       0.00      0.000      0.030      0.000      0.000    1298.50      85.22
 0.009785        50.        50.        50.          0         15          0       0.00      43.02     128.24

*SECNO 1550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1550.00      4.71    1304.51    1304.51       0.00    1306.03       1.51       0.47       0.00    1304.00
    1301.        2.      1296.         3.         1.       131.         2.         5.         1.    1304.00
     0.05       1.61       9.88       1.61      0.035      0.030      0.035      0.000    1299.80      82.37
 0.008863        50.        50.        50.          0         11          0       0.00      52.33     134.69

*SECNO 1600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1600.00      4.44    1305.44    1305.44       0.00    1306.96       1.52       0.46       0.00    1305.00
    1301.        0.      1301.         0.         0.       131.         0.         5.         1.    1305.00
     0.05       0.04       9.90       1.41      0.035      0.030      0.035      0.000    1301.00      83.56
 0.009636        50.        50.        50.          0         11          0       0.00      45.32     128.88
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN        SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID       ENDST

*SECNO 1650.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1650.00       4.06    1307.06    1307.06       0.00    1308.55       1.48       0.49       0.00    1307.00
     1301.         0.      1301.         0.         0.     133.         0.         5.         1.    1308.00
     0.05       0.42       9.77       0.00      0.035      0.030      0.000      0.000    1303.00      83.60
 0.009809        50.        50.        50.          0          8          0       0.00      49.00     132.59

*SECNO 1700.000
  1700.00       3.89    1307.89    1307.70       0.00    1309.03       1.14       0.45       0.03    1308.00
     1301.         0.      1301.         0.         0.     152.         0.         6.         1.    1308.00
     0.05       0.00       8.55       0.00      0.000      0.030      0.000      0.000    1304.00      86.22
 0.008204        50.        50.        50.          3         11          0       0.00      56.66     142.88
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MYRTLE WASH USBR TYPE I

SUMMARY PRINTOUT

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
*	100.000	1263.40	1528.00	9.27	1270.13	1270.13	6.73	1.33	1271.46	101.74	0.00	62.00	1.00
*	100.000	1263.40	1301.00	9.02	1269.79	1269.79	6.39	1.26	1271.05	101.90	0.00	56.67	1.00
*	150.000	1264.50	1528.00	10.72	1271.07	1271.07	6.57	1.78	1272.85	93.10	50.00	41.56	4097.00
*	150.000	1264.50	1301.00	10.36	1270.64	1270.64	6.14	1.67	1272.31	101.25	50.00	40.28	4097.00
	200.000	1266.00	1528.00	8.16	1271.09	1272.19	6.19	1.01	1273.20	35.47	50.00	48.10	0.00
	200.000	1266.00	1301.00	7.70	1270.68	1271.75	5.75	0.91	1272.66	35.89	50.00	46.57	0.00
	250.000	1266.40	1528.00	7.78	1271.33	1272.47	6.07	0.91	1273.38	32.59	50.00	58.14	0.00
	250.000	1266.40	1301.00	7.41	1270.96	1272.01	5.61	0.83	1272.85	33.77	50.00	49.72	0.00
	300.000	1266.75	1528.00	7.53	1270.97	1272.60	5.85	0.88	1273.47	11.71	50.00	42.30	0.00
	300.000	1266.75	1301.00	7.00	1270.57	1272.18	5.43	0.76	1272.94	10.87	50.00	40.99	0.00
	350.000	1266.83	1528.00	7.73	1271.11	1272.62	5.79	0.93	1273.55	12.53	50.00	41.42	0.00
	350.000	1266.83	1301.00	7.20	1270.69	1272.21	5.38	0.80	1273.01	11.85	50.00	40.59	0.00
	400.000	1266.90	1528.00	7.83	1271.18	1272.67	5.77	0.95	1273.62	12.48	50.00	39.55	0.00
	400.000	1266.90	1301.00	7.27	1270.77	1272.25	5.35	0.82	1273.08	11.64	50.00	38.73	0.00
	450.000	1266.98	1528.00	8.71	1271.34	1272.58	5.60	1.18	1273.76	16.37	50.00	34.61	0.00
	450.000	1266.98	1301.00	8.03	1270.92	1272.19	5.21	1.00	1273.19	14.96	50.00	34.16	0.00
	500.000	1267.05	1528.00	8.69	1271.41	1272.67	5.62	1.17	1273.84	16.24	50.00	34.69	0.00
	500.000	1267.05	1301.00	8.03	1270.98	1272.27	5.22	1.00	1273.27	14.96	50.00	34.22	0.00
	550.000	1267.13	1528.00	8.64	1271.49	1272.76	5.63	1.16	1273.92	15.99	50.00	34.85	0.00
	550.000	1267.13	1301.00	8.00	1271.06	1272.35	5.22	0.99	1273.34	14.84	50.00	34.35	0.00
	600.000	1267.20	1528.00	7.60	1271.47	1273.12	5.92	0.90	1274.02	11.43	50.00	39.85	0.00
	600.000	1267.20	1301.00	7.16	1271.06	1272.63	5.43	0.80	1273.43	11.12	50.00	38.87	0.00

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
	650.000	1267.28	1528.00	7.64	1271.56	1273.17	5.89	0.91	1274.08	11.61	50.00	39.80	0.00
	650.000	1267.28	1301.00	7.20	1271.15	1272.68	5.40	0.80	1273.49	11.30	50.00	38.82	0.00
	700.000	1267.35	1528.00	7.67	1271.63	1273.22	5.87	0.91	1274.14	11.76	50.00	39.76	0.00
	700.000	1267.35	1301.00	7.23	1271.22	1272.73	5.39	0.81	1273.55	11.46	50.00	38.78	0.00
	750.000	1267.43	1528.00	7.71	1271.71	1273.28	5.85	0.92	1274.20	11.94	50.00	39.70	0.00
	750.000	1267.43	1301.00	7.27	1271.30	1272.79	5.36	0.82	1273.61	11.66	50.00	38.72	0.00
	800.000	1267.50	1528.00	7.74	1271.78	1273.33	5.83	0.93	1274.26	12.05	50.00	39.67	0.00
	800.000	1267.50	1301.00	7.30	1271.37	1272.84	5.34	0.83	1273.67	11.79	50.00	38.69	0.00
	824.000	1267.50	1528.00	6.58	1271.23	1273.69	6.19	0.67	1274.36	3.58	24.00	40.35	0.00
	824.000	1267.50	1301.00	6.11	1270.85	1273.18	5.68	0.57	1273.76	3.40	24.00	40.08	0.00
	851.000	1267.50	1528.00	8.19	1271.71	1273.52	6.02	1.04	1274.56	7.27	27.00	31.00	0.00
	851.000	1267.50	1301.00	7.58	1271.28	1273.04	5.54	0.89	1273.93	6.74	27.00	31.00	0.00
*	866.000	1267.66	1528.00	15.23	1274.84	1274.84	7.18	3.60	1278.44	32.76	15.00	14.04	4097.00
*	866.000	1267.66	1301.00	14.45	1274.11	1274.11	6.45	3.24	1277.35	31.78	15.00	14.03	4097.00
	1135.000	1268.34	1528.00	12.70	1275.52	1276.95	8.61	2.50	1279.46	20.31	269.00	14.07	0.00
	1135.000	1268.34	1301.00	12.11	1274.79	1276.03	7.69	2.28	1278.31	19.82	269.00	14.05	0.00
	1180.000	1268.45	1528.00	4.18	1272.58	1279.87	11.42	0.27	1280.14	1.07	45.00	32.00	0.00
	1180.000	1268.45	1301.00	3.97	1272.16	1278.68	10.23	0.25	1278.93	1.05	45.00	32.00	0.00
	1200.000	1268.50	1528.00	4.20	1272.63	1279.87	11.37	0.27	1280.14	2.07	20.00	32.00	0.00
	1200.000	1268.50	1301.00	3.99	1272.21	1278.68	10.18	0.25	1278.93	2.04	20.00	32.00	0.00
	1226.000	1269.50	1528.00	4.62	1273.63	1279.83	10.33	0.33	1280.16	2.70	26.00	32.00	0.00
	1226.000	1269.50	1301.00	4.44	1273.21	1278.65	9.15	0.31	1278.96	2.77	26.00	32.00	0.00
	1230.000	1270.50	1528.00	5.15	1274.62	1279.78	9.28	0.41	1280.19	3.67	4.00	32.00	0.00
	1230.000	1270.50	1301.00	5.03	1274.20	1278.59	8.09	0.39	1278.98	3.94	4.00	32.00	0.00
	1234.000	1271.50	1528.00	5.82	1275.62	1279.70	8.20	0.53	1280.23	5.22	4.00	32.00	0.00
	1234.000	1271.50	1301.00	5.81	1275.20	1278.50	7.00	0.52	1279.02	6.00	4.00	32.00	0.00
	1238.000	1272.50	1528.00	6.75	1276.63	1279.58	7.08	0.71	1280.28	8.01	4.00	32.00	0.00
	1238.000	1272.50	1301.00	6.96	1276.20	1278.34	5.84	0.75	1279.10	10.22	4.00	32.00	0.00
*	1242.000	1277.50	1528.00	11.55	1281.64	1281.64	4.14	2.07	1283.71	40.04	4.00	32.00	4097.00
*	1242.000	1277.50	1301.00	10.98	1281.20	1281.20	3.70	1.87	1283.07	40.80	4.00	32.00	4097.00
*	1262.000	1287.50	1528.00	11.58	1291.62	1291.62	4.12	2.08	1293.71	40.39	20.00	32.00	4097.00
*	1262.000	1287.50	1301.00	10.96	1291.21	1291.21	3.71	1.87	1293.07	40.58	20.00	32.00	4097.00
	1302.000	1287.50	1528.00	9.65	1291.62	1292.44	4.94	1.45	1293.89	23.22	40.00	32.00	0.00
	1302.000	1287.50	1301.00	9.10	1291.21	1291.97	4.47	1.28	1293.25	22.90	40.00	32.00	0.00

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
*	1322.000	1289.50	1528.00	11.54	1293.64	1293.64	4.14	2.07	1295.71	39.97	20.00	32.00	4097.00
*	1322.000	1289.50	1301.00	10.94	1293.22	1293.22	3.72	1.86	1295.07	40.25	20.00	32.00	4097.00
*	1350.000	1291.60	1528.00	11.16	1296.48	1296.48	4.88	1.93	1298.41	33.49	28.00	35.39	4097.00
*	1350.000	1291.60	1301.00	10.76	1296.02	1296.02	4.42	1.80	1297.82	34.74	28.00	34.05	4097.00
*	1400.000	1293.50	1528.00	11.32	1299.88	1299.88	6.38	1.99	1301.87	93.82	50.00	34.51	4097.00
*	1400.000	1293.50	1301.00	10.92	1299.41	1299.41	5.91	1.85	1301.26	95.31	50.00	32.63	4097.00
*	1450.000	1295.20	1528.00	11.05	1301.61	1301.61	6.41	1.89	1303.51	97.03	50.00	37.04	4097.00
*	1450.000	1295.20	1301.00	10.52	1301.21	1301.21	6.01	1.72	1302.93	97.79	50.00	36.03	4097.00
*	1500.000	1298.50	1528.00	10.36	1304.19	1304.19	5.69	1.67	1305.86	96.44	50.00	49.07	4097.00
*	1500.000	1298.50	1301.00	9.93	1303.82	1303.82	5.32	1.53	1305.36	97.85	50.00	43.02	4097.00
*	1550.000	1299.80	1528.00	9.87	1305.02	1305.02	5.22	1.49	1306.51	72.66	50.00	63.62	4097.00
*	1550.000	1299.80	1301.00	9.88	1304.51	1304.51	4.71	1.51	1306.03	88.63	50.00	52.33	4097.00
*	1600.000	1301.00	1528.00	10.13	1305.88	1305.88	4.88	1.59	1307.47	84.17	50.00	46.63	4097.00
*	1600.000	1301.00	1301.00	9.90	1305.44	1305.44	4.44	1.52	1306.96	96.36	50.00	45.32	4097.00
*	1650.000	1303.00	1528.00	9.45	1307.64	1307.64	4.64	1.37	1309.01	74.24	50.00	73.45	4097.00
*	1650.000	1303.00	1301.00	9.77	1307.06	1307.06	4.06	1.48	1308.55	98.09	50.00	49.00	4097.00
	1700.000	1304.00	1528.00	9.53	1308.03	1308.03	4.03	1.41	1309.44	97.73	50.00	58.73	0.00
	1700.000	1304.00	1301.00	8.55	1307.70	1307.89	3.89	1.14	1309.03	82.04	50.00	56.66	0.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION	SECNO= 100.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 100.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 150.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 150.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 150.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 150.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 866.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 866.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 866.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 866.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1242.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1242.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1242.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1242.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1262.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1262.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1262.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1262.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1322.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1322.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1322.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1322.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1350.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1350.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1350.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1350.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1400.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1400.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1400.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1400.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1450.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1450.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1450.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1450.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1500.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1500.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1500.000	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1500.000	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1550.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO= 1550.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO= 1550.000	PROFILE= 2	CRITICAL DEPTH ASSUMED

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CAUTION  SECNO= 1550.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1600.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1600.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1600.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1600.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1650.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1650.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1650.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1650.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*                                                   *
*  RUN DATE 11-MAY-89  TIME 11:25:17                *
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616             *
*  (916) 440-2105 (FTS) 448-2105       *
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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
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1 HYDRAULIC ANALYSIS OF MYRTLE WASH FOR SQUAW PEAK HIGHWAY
T2 100-YEAR Q = 1528 CFS, SUPERCRITICAL RUN, PRELIMINARY DESIGN (60% SUBMITTAL)
T3      USBR TYPE III BASIN ENERGY DISSIPATOR FOR W=32 FT & H=19 FT

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
      0.        2.        0.        1. -1.000000     0.00      0.0       0.      0.000     0.000

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

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    38.000    42.000    43.000    26.000     2.000     1.000     8.000    10.000     3.000     5.000

    39.000     4.000    20.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NC      0.035     0.035     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT      2.000  1528.000  1301.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
X1   1700.000    12.000    86.000   144.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1309.000    68.000  1308.000    86.000  1307.000    88.000  1306.000    92.000  1305.000    96.000
GR   1304.000   102.000  1304.000   125.000  1305.000   128.000  1306.000   132.000  1307.000   134.000
GR   1308.000   144.000  1309.000   148.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   1650.000    10.000    87.000   134.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1307.500    60.000  1307.000    87.000  1305.000    89.000  1304.000    92.000  1303.000    96.000
GR   1304.000   111.000  1304.000   124.000  1305.000   128.000  1306.000   131.000  1308.000   134.000

X1   1600.000    13.000    84.000   128.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1307.000    40.000  1306.000    83.000  1305.000    84.000  1304.000    87.000  1303.000    88.000
GR   1302.000    93.000  1301.000   102.000  1302.000   110.000  1303.000   123.000  1304.000   125.000
GR   1305.000   128.000  1306.000   130.000  1307.000   135.000     0.000     0.000     0.000     0.000

X1   1550.000    14.000    87.000   128.000    50.000    50.000    50.000     0.000     0.000     0.000
GR   1306.000    61.000  1305.000    78.000  1304.000    87.000  1303.000    89.000  1301.000    93.000
GR   1300.000    94.000  1299.800    97.000  1300.000   100.000  1301.000   116.000  1302.000   120.000
GR   1303.000   123.000  1304.000   128.000  1305.000   141.000  1306.000   150.000     0.000     0.000
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X1	1500.000	12.000	85.000	130.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1305.000	75.000	1304.000	85.000	1300.000	90.000	1299.000	91.000	1298.500	94.000
GR	1299.000	100.000	1300.000	111.000	1301.000	114.000	1302.000	117.000	1303.000	120.000
GR	1304.000	130.000	1305.000	141.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1450.000	15.000	66.000	111.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1303.000	66.000	1302.000	71.000	1300.000	72.000	1298.000	75.000	1296.000	78.000
GR	1295.200	80.000	1296.000	85.000	1297.000	95.000	1298.000	96.000	1299.000	98.000
GR	1300.000	100.000	1301.000	107.000	1303.000	111.000	1304.000	114.000	1305.000	124.000
X1	1400.000	11.000	80.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1301.500	45.000	1301.000	76.000	1300.000	80.000	1295.000	89.000	1294.000	91.000
GR	1293.500	95.000	1294.000	100.000	1295.000	104.000	1300.000	115.000	1305.000	123.000
GR	1306.500	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1350.000	16.000	84.000	127.000	28.000	28.000	28.000	0.000	0.000	0.000
CI	104.000	-1.000	0.018	1.500	1.500	20.000	0.000	0.000	0.000	0.000
GR	1301.500	65.000	1301.000	82.000	1300.000	84.000	1295.000	92.000	1294.000	94.000
GR	1293.000	97.000	1292.000	99.000	1291.600	105.000	1292.000	112.000	1293.000	117.000
GR	1294.000	119.000	1295.000	120.000	1300.000	127.000	1302.000	130.000	1305.000	136.000
GR	1305.300	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1322.000	4.000	89.000	121.000	20.000	20.000	20.000	0.000	0.000	0.000
CI	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000
GR	1300.000	89.000	1289.500	89.000	1289.500	121.000	1300.000	121.000	0.000	0.000
X1	1302.000	4.000	84.000	116.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	1295.000	84.000	1287.500	84.000	1287.500	116.000	1295.000	116.000	0.000	0.000
X1	1262.000	0.000	0.000	0.000	20.000	20.000	20.000	0.000	-10.000	0.000
X1	1242.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	-5.000	0.000
X1	1238.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	-1.000	0.000
X1	1234.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	-1.000	0.000
X1	1230.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	-1.000	0.000
X1	1226.000	0.000	0.000	0.000	26.000	26.000	26.000	0.000	-1.000	0.000
X1	1200.000	4.000	84.000	116.000	20.000	20.000	20.000	0.000	0.000	0.000
GR	1288.500	84.000	1268.500	84.000	1268.500	116.000	1288.500	116.000	0.000	0.000
NC	0.000	0.000	0.013	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	1180.000	4.000	84.000	116.000	45.000	45.000	45.000	0.000	0.000	0.000
GR	1285.000	84.000	1268.450	84.000	1268.450	116.000	1285.000	116.000	0.000	0.000

NC	0.016	0.016	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1135.000	6.000	93.000	107.100	269.000	269.000	269.000	0.000	0.000	0.000
BT	6.000	33.000	1283.800	1283.800	93.000	1285.500	1278.300	93.100	1285.500	1278.300
BT	107.000	1285.900	1278.340	107.100	1285.900	1278.340	133.000	1286.600	1286.600	0.000
GR	1283.800	33.000	1278.340	93.000	1268.340	93.100	1268.340	107.000	1278.340	107.100
GR	1286.600	133.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	866.000	6.000	93.000	107.100	15.000	15.000	15.000	0.000	0.000	0.000
BT	6.000	19.000	1278.700	1278.700	93.000	1281.100	1277.600	93.100	1281.100	1277.600
BT	107.000	1281.500	1277.660	107.100	1281.500	1277.660	170.000	1283.300	1283.300	0.000
GR	1278.700	19.000	1277.660	93.000	1267.660	93.100	1267.660	107.000	1277.660	107.100
GR	1283.300	170.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	851.000	4.000	89.000	120.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	1278.500	89.000	1267.500	89.000	1267.500	120.000	1278.500	120.000	0.000	0.000
X1	824.000	4.000	79.000	116.000	24.000	24.000	24.000	0.000	0.000	0.000
GR	1282.000	79.000	1267.500	79.000	1267.500	116.000	1286.000	126.000	0.000	0.000
NC	0.020	0.020	0.018	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	800.000	12.000	77.000	133.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.500	0.018	1.000	1.000	30.000	0.000	0.000	0.000	0.000
GR	1288.000	23.000	1287.000	77.000	1286.000	80.000	1285.000	82.000	1280.000	89.000
GR	1279.000	96.000	1278.800	105.000	1279.000	111.000	1280.000	116.000	1285.000	127.000
GR	1286.000	129.000	1287.000	133.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	750.000	16.000	70.000	129.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.430	0.018	1.000	1.000	30.000	0.000	0.000	0.000	0.000
GR	1287.000	60.000	1286.000	68.000	1285.000	70.000	1283.000	73.000	1282.000	76.000
GR	1281.000	92.000	1280.000	95.000	1279.000	99.000	1278.000	107.000	1277.800	110.000
GR	1278.000	114.000	1279.000	116.000	1280.000	118.000	1285.000	129.000	1286.000	131.000
GR	1287.000	133.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	700.000	18.000	65.000	124.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.350	0.018	1.000	1.000	30.000	0.000	0.000	0.000	0.000
GR	1285.000	50.000	1284.000	59.000	1283.000	65.000	1282.000	85.000	1281.000	87.000
GR	1280.000	89.000	1279.000	92.000	1278.000	94.000	1277.200	105.000	1278.000	111.000
GR	1279.000	114.000	1280.000	117.000	1281.000	118.000	1282.000	120.000	1283.000	124.000
GR	1284.000	125.000	1285.000	128.000	1285.000	134.000	0.000	0.000	0.000	0.000
X1	650.000	16.000	82.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.280	0.018	1.000	1.000	30.000	0.000	0.000	0.000	0.000
GR	1283.000	53.000	1282.000	66.000	1281.000	82.000	1280.000	83.000	1279.000	86.000
GR	1278.000	88.000	1277.000	92.000	1276.500	98.000	1277.000	104.000	1278.000	108.000
GR	1279.000	111.000	1280.000	112.000	1281.000	115.000	1282.000	117.000	1283.000	123.000
GR	1284.000	137.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	600.000	19.000	89.000	118.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	97.000	1267.200	0.018	1.000	1.000	30.000	0.000	0.000	0.000	0.000
GR	1282.000	58.000	1281.000	67.000	1281.000	89.000	1280.000	91.000	1279.000	94.000
GR	1277.000	95.000	1276.000	96.000	1275.000	99.000	1274.400	102.000	1275.000	106.000
GR	1276.000	108.000	1277.000	110.000	1278.000	112.000	1279.000	115.000	1280.000	116.000
GR	1281.000	118.000	1282.000	127.000	1283.000	128.000	1284.000	135.000	0.000	0.000

X1	550.000	18.000	70.000	105.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	88.000	1267.130	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1281.000	63.000	1280.000	68.000	1279.000	70.000	1278.000	72.000	1277.000	74.000
GR	1276.000	81.000	1275.000	83.000	1271.000	87.000	1270.300	89.000	1271.000	92.000
GR	1273.000	94.000	1274.000	95.000	1275.000	98.000	1276.000	100.000	1277.000	102.000
GR	1278.000	104.000	1279.000	105.000	1280.000	125.000	0.000	0.000	0.000	0.000
X1	500.000	17.000	63.000	113.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	87.000	1267.050	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1279.000	63.000	1278.000	67.000	1277.000	68.000	1275.000	71.000	1270.000	78.000
GR	1269.200	81.000	1270.000	84.000	1271.000	86.000	1272.000	91.000	1273.000	98.000
GR	1274.000	100.000	1275.000	101.000	1276.000	102.000	1277.000	105.000	1278.000	110.000
GR	1279.000	113.000	1280.000	116.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	450.000	10.000	68.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.500	1266.980	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1278.000	68.000	1277.000	73.000	1276.000	75.000	1275.000	77.000	1270.000	87.000
GR	1268.400	94.000	1270.000	100.000	1275.000	108.000	1276.000	110.000	1277.000	115.000
X1	400.000	10.000	61.000	110.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.000	1266.900	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1276.000	61.000	1275.000	68.000	1270.000	81.000	1268.000	90.000	1267.600	93.000
GR	1268.000	95.000	1270.000	102.000	1275.000	109.000	1276.000	110.000	1277.000	134.000
X1	350.000	15.000	55.000	112.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	86.000	1266.830	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1275.000	55.000	1274.000	62.000	1273.000	64.000	1272.000	65.000	1271.000	68.000
GR	1270.000	69.000	1269.000	71.000	1268.000	73.000	1267.300	79.000	1268.000	84.000
GR	1269.000	87.000	1270.000	94.000	1275.000	112.000	1276.000	113.000	1277.000	122.000
X1	300.000	14.000	67.000	115.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	89.000	1266.750	0.018	1.000	1.000	28.000	0.000	0.000	0.000	0.000
GR	1274.000	57.000	1273.000	67.000	1272.000	68.000	1271.000	70.000	1270.000	71.000
GR	1269.000	72.000	1268.000	73.000	1267.000	75.000	1266.800	77.000	1267.000	80.000
GR	1268.000	85.000	1269.000	97.000	1270.000	104.000	1275.000	115.000	0.000	0.000
NC	0.035	0.035	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	250.000	14.000	74.000	114.000	50.000	50.000	50.000	0.000	0.000	0.000
CI	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000
GR	1273.000	53.000	1272.000	70.000	1271.000	72.000	1270.000	74.000	1269.000	75.000
GR	1268.000	76.000	1267.000	77.000	1266.400	81.000	1267.000	87.000	1268.000	104.000
GR	1269.000	110.000	1270.000	114.000	1271.000	118.000	1275.000	124.000	0.000	0.000
X1	200.000	12.000	80.000	118.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1272.000	75.000	1271.000	77.000	1270.000	80.000	1269.000	81.000	1268.000	82.000
GR	1267.000	84.000	1266.000	89.000	1267.000	103.000	1268.000	112.000	1269.000	113.000
GR	1270.000	118.000	1273.000	125.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	150.000	13.000	81.000	120.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	1270.000	81.000	1269.000	83.000	1268.000	85.000	1267.000	87.000	1266.000	90.000
GR	1265.000	93.000	1264.500	97.000	1265.000	101.000	1266.000	102.000	1269.000	108.000
GR	1270.000	120.000	1271.000	122.000	1272.000	130.000	0.000	0.000	0.000	0.000
X1	100.000	12.000	78.000	140.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1270.000	78.000	1269.000	80.000	1265.000	85.000	1264.000	87.000	1263.400	91.000
GR	1264.000	95.000	1265.000	99.000	1266.000	101.000	1267.000	102.000	1268.000	113.000
GR	1269.000	117.000	1270.000	140.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=   0.100 CEHV=   0.300
*SECNO 1700.000
2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED
3720 CRITICAL DEPTH ASSUMED
  1700.00      4.03  1308.03  1308.03      0.00  1309.44      1.41      0.00      0.00  1308.00
     1528.        0.     1528.        0.        0.     160.        0.        0.        0.  1308.00
      0.00      0.04      9.54      0.04     0.035     0.030     0.000     0.000   1304.00     85.49
  0.009827        0.        0.        0.         0        13         0      0.00     58.63    144.11

*SECNO 1650.000
3280 CROSS SECTION   1650.00 EXTENDED      0.09 FEET

7185 MINIMUM SPECIFIC ENERGY
  1650.00      4.59  1307.59  1307.64      0.00  1309.01      1.42      0.44      0.00  1307.00
     1528.       17.     1511.        0.        9.     157.        0.        0.        0.  1308.00
      0.00      1.82      9.61      0.00     0.035     0.030     0.000     0.000   1303.00     60.00
  0.007786       50.       50.       50.         0         8         0      0.00     73.38    133.38

*SECNO 1600.000

3301 HV CHANGED MORE THAN HVINS

  1600.00      3.82  1304.82  1305.76      0.00  1308.15      3.33      0.66      0.19  1305.00
     1528.        0.     1528.        0.        0.     104.        0.        0.        0.  1305.00
      0.00      0.00     14.63      0.00     0.000     0.030     0.000     0.000   1301.00     84.52
  0.027678       50.       50.       50.         7         8         0      0.00     42.95    127.48

*SECNO 1550.000

3301 HV CHANGED MORE THAN HVINS

  1550.00      4.33  1304.13  1305.02      0.00  1306.84      2.71      1.13      0.18  1304.00
     1528.        0.     1528.        0.        0.     116.        0.        0.        0.  1304.00
      0.00      0.06     13.21      0.96     0.035     0.030     0.035     0.000   1299.80     85.78
  0.018751       50.       50.       50.         7        11         0      0.00     43.98    129.76
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 1500.000

3301 HV CHANGED MORE THAN HVINS

  1500.00      5.65  1304.15  1304.20      0.00  1305.87      1.72      0.67      0.30  1304.00
    1528.        0.    1528.       0.        0.     145.        0.        1.        0.  1304.00
     0.00      0.73    10.53      0.73     0.035     0.030     0.035     0.000   1298.50    83.58
 0.010173       50.      50.      50.         0        11         0      0.00     47.98   131.56

*SECNO 1450.000

3301 HV CHANGED MORE THAN HVINS

  1450.00      4.95  1300.15  1301.62      0.00  1304.76      4.61      0.82      0.29  1303.00
    1528.        0.    1528.       0.        0.      89.        0.        1.        0.  1303.00
     0.01      0.00    17.23      0.00     0.000     0.030     0.000     0.000   1295.20    71.92
 0.030584       50.      50.      50.         6         8         0      0.00     29.15   101.08

*SECNO 1400.000
  1400.00      4.83  1298.33  1299.87      0.00  1303.18      4.85      1.55      0.02  1300.00
    1528.        0.    1528.       0.        0.      86.        0.        1.        0.  1300.00
     0.01      0.00    17.67      0.00     0.000     0.030     0.000     0.000   1293.50    83.00
 0.031504       50.      50.      50.         6        11         0      0.00     28.33   111.33

*SECNO 1350.000
CHIMP CLSTA=    104.00 CELCH=   1291.60 BW=     20.00 STCHL=     79.80 STCHR=    127.00
EXCAVATION DATA
AEX=     36.3SQ-FT     VEXR=      0.0K*CU-YD     VEXT=       0.0K*CU-YD

3301 HV CHANGED MORE THAN HVINS

  1350.00      2.85  1294.45  1296.47      0.00  1301.62      7.17      1.33      0.23  1301.06
    1528.        0.    1528.       0.        0.      71.        0.        1.        0.  1300.00
     0.01      0.00    21.49      0.00     0.000     0.018     0.000     0.000   1291.60    89.72
 0.022762       50.      50.      50.        10         5         0      0.00     29.73   119.45

*SECNO 1322.000
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

1322.00	1.97	1291.47	1293.63	0.00	1300.59	9.12	0.83	0.20	1300.00
1528.	0.	1528.	0.	0.	63.	0.	1.	0.	1300.00
0.01	0.00	24.23	0.00	0.000	0.018	0.000	0.000	1289.50	89.00
0.040727	28.	28.	28.	12	11	0	0.00	32.00	121.00

*SECNO 1302.000

3301 HV CHANGED MORE THAN HVINS

1302.00	1.87	1289.37	1291.62	0.00	1299.59	10.22	0.89	0.11	1295.00
1528.	0.	1528.	0.	0.	60.	0.	1.	0.	1295.00
0.01	0.00	25.66	0.00	0.000	0.018	0.000	0.000	1287.50	84.00
0.048858	20.	20.	20.	11	17	0	0.00	32.00	116.00

*SECNO 1262.000

3301 HV CHANGED MORE THAN HVINS

1262.00	1.44	1278.94	1281.62	0.00	1296.07	17.13	2.83	0.69	1285.00
1528.	0.	1528.	0.	0.	46.	0.	1.	0.	1285.00
0.01	0.00	33.21	0.00	0.000	0.018	0.000	0.000	1277.50	84.00
0.111858	40.	40.	40.	8	17	0	0.00	32.00	116.00

*SECNO 1242.000

3301 HV CHANGED MORE THAN HVINS

1242.00	1.35	1273.85	1276.62	0.00	1293.35	19.50	2.48	0.24	1280.00
1528.	0.	1528.	0.	0.	43.	0.	1.	0.	1280.00
0.01	0.00	35.44	0.00	0.000	0.018	0.000	0.000	1272.50	84.00
0.137951	20.	20.	20.	12	20	0	0.00	32.00	116.00

*SECNO 1238.000

1238.00	1.33	1272.83	1275.62	0.00	1292.75	19.92	0.56	0.04	1279.00
1528.	0.	1528.	0.	0.	43.	0.	1.	0.	1279.00
0.01	0.00	35.81	0.00	0.000	0.018	0.000	0.000	1271.50	84.00
0.142698	4.	4.	4.	9	20	0	0.00	32.00	116.00

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

*SECNO 1234.000
  1234.00     1.31  1271.81  1274.62      0.00  1292.13     20.32      0.58      0.04  1278.00
    1528.       0.    1528.       0.        0.      42.        0.        1.        0.  1278.00
     0.01     0.00    36.17     0.00     0.000     0.018     0.000     0.000   1270.50    84.00
 0.147355       4.       4.       4.         9        20         0      0.00     32.00   116.00

*SECNO 1230.000
  1230.00     1.31  1270.81  1273.62      0.00  1291.49     20.69      0.60      0.04  1277.00
    1528.       0.    1528.       0.        0.      42.        0.        1.        0.  1277.00
     0.01     0.00    36.50     0.00     0.000     0.018     0.000     0.000   1269.50    84.00
 0.151709       4.       4.       4.        10        20         0      0.00     32.00   116.00

*SECNO 1226.000
  1226.00     1.30  1269.80  1272.62      0.00  1290.84     21.05      0.62      0.04  1276.00
    1528.       0.    1528.       0.        0.      42.        0.        1.        0.  1276.00
     0.01     0.00    36.82     0.00     0.000     0.018     0.000     0.000   1268.50    84.00
 0.155997       4.       4.       4.        10        20         0      0.00     32.00   116.00

*SECNO 1200.000

3301 HV CHANGED MORE THAN HVINS

  1200.00     1.48  1269.98  1272.62      0.00  1286.13     16.15      3.24      1.47  1288.50
    1528.       0.    1528.       0.        0.      47.        0.        1.        0.  1288.50
     0.01     0.00    32.25     0.00     0.000     0.018     0.000     0.000   1268.50    84.00
 0.101786      26.      26.      26.         8        20         0      0.00     32.00   116.00

CCHV=   0.300 CEHV=   0.500
*SECNO 1180.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
  1180.00     1.72  1270.17  1272.59      0.00  1282.18     12.02      1.07      1.81  1285.00
    1528.       0.    1528.       0.        0.      55.        0.        1.        0.  1285.00
     0.01     0.00    27.82     0.00     0.000     0.013     0.000     0.000   1268.45    84.00
 0.033007      20.      20.      20.        20        17         0      0.00     32.00   116.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 1135.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1283.80 MAX ELLC= 1286.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
  1135.00      5.88  1274.22  1275.52      0.00  1279.60      5.38      0.51      3.95  1278.34
     1528.        0.     1528.       0.        0.     82.        0.        1.        1.  1278.34
      0.01      0.00     18.61      0.00     0.000     0.013     0.000     0.000  1268.34    93.04
  0.005622       45.       45.       45.        20        15         0      0.00     14.02   107.06

*SECNO 866.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1278.70 MAX ELLC= 1283.30

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   866.00      7.18  1274.84  1274.84      0.00  1278.44      3.60      1.13      0.62  1277.66
     1528.        0.     1528.       0.        0.    100.        0.        2.        1.  1277.66
      0.01      0.00     15.23      0.00     0.000     0.013     0.000     0.000  1267.66    93.03
  0.003276      269.      269.      269.        20        18         0      0.00     14.04   107.07

*SECNO 851.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
   851.00      4.18  1271.68  1271.73      0.00  1273.84      2.16      0.04      0.12  1278.50
     1528.        0.     1528.       0.        0.    130.        0.        2.        1.  1278.50
      0.01      0.00     11.78      0.00     0.000     0.013     0.000     0.000  1267.50    89.00
  0.002167       15.       15.       15.        20        11         0      0.00     31.00   120.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 824.000

3301 HV CHANGED MORE THAN HVINS

   824.00      2.91  1270.41  1271.23      0.00  1273.48      3.08      0.08      0.28   1282.00
    1528.        0.     1517.      11.        0.     107.        2.        2.        1.   1267.50
     0.02      0.00     14.12     4.63     0.000     0.013     0.016     0.000   1267.50     79.00
 0.004075       27.       27.      27.        12        11         0      0.00     38.57    117.57

CCHV=   0.100 CEHV=   0.300
*SECNO 800.000
CHIMP CLSTA=      97.00 CELCH=   1267.50 BW=      30.00 STCHL=      62.23 STCHR=    133.00
EXCAVATION DATA
AEX=     665.8SQ-FT     VEXR=      0.3K*CU=YD     VEXT=       0.3K*CU-YD

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   800.00      4.11  1271.61  1271.61      0.00  1273.45      1.85      0.09      0.31   1287.27
    1528.        0.     1528.       0.        0.     140.        0.        2.        1.   1287.00
     0.02      0.00     10.90     0.00     0.000     0.018     0.000     0.000   1267.50     77.89
 0.003454       24.       24.      24.        20        11         0      0.00     38.22    116.11

*SECNO 750.000
CHIMP CLSTA=      97.00 CELCH=   1267.43 BW=      30.00 STCHL=      62.78 STCHR=    130.14
EXCAVATION DATA
AEX=     587.3SQ-FT     VEXR=      1.2K*CU=YD     VEXT=       1.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   750.00      4.11  1271.54  1271.54      0.00  1273.38      1.85      0.17      0.15   1286.65
    1528.        0.     1528.       0.        0.     140.        0.        2.        1.   1285.57
     0.02      0.00     10.91     0.00     0.000     0.018     0.000     0.000   1267.43     77.89
 0.003466       50.       50.      50.        20         5         0      0.00     38.21    116.11
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 700.000
CHIMP CLSTA=     97.00 CELCH=   1267.35 BW=     30.00 STCHL=     65.00 STCHR=    129.65
EXCAVATION DATA
AEX=    560.0SQ-FT     VEXR=      1.1K*CU-YD     VEXT=       2.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   700.00      4.11  1271.46  1271.46      0.00  1273.30      1.85      0.17      0.15  1283.00
    1528.        0.    1528.       0.        0.     140.        0.        2.        1.  1285.00
     0.02      0.00    10.91      0.00     0.000     0.018     0.000     0.000   1267.35    77.89
 0.003464       50.      50.       50.        20         5         0      0.00     38.21   116.11

*SECNO 650.000
CHIMP CLSTA=     97.00 CELCH=   1267.28 BW=     30.00 STCHL=     67.37 STCHR=    128.08
EXCAVATION DATA
AEX=    524.9SQ-FT     VEXR=      1.0K*CU-YD     VEXT=       3.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   650.00      4.11  1271.39  1271.39      0.00  1273.23      1.85      0.17      0.15  1281.91
    1528.        0.    1528.       0.        0.     140.        0.        2.        1.  1283.36
     0.02      0.00    10.91      0.00     0.000     0.018     0.000     0.000   1267.28    77.89
 0.003462       50.      50.       50.        20         5         0      0.00     38.21   116.11

*SECNO 600.000
CHIMP CLSTA=     97.00 CELCH=   1267.20 BW=     30.00 STCHL=     68.20 STCHR=    126.78
EXCAVATION DATA
AEX=    497.6SQ-FT     VEXR=      0.9K*CU-YD     VEXT=       4.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   600.00      4.11  1271.31  1271.31      0.00  1273.15      1.85      0.17      0.15  1281.00
    1528.        0.    1528.       0.        0.     140.        0.        3.        1.  1281.98
     0.02      0.00    10.91      0.00     0.000     0.018     0.000     0.000   1267.20    77.89
 0.003460       50.      50.       50.        20         5         0      0.00     38.21   116.11
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 550.000
CHIMP CLSTA=     88.00 CELCH=   1267.13 BW=     28.00 STCHL=     60.13 STCHR=    114.34
EXCAVATION DATA
AEX=    425.7SQ-FT     VEXR=      0.9K*CU=YD     VEXT=      5.3K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   550.00     4.36  1271.49  1271.49     0.00  1273.52     2.03     0.18     0.20  1281.00
    1528.       0.    1528.       0.       0.     134.       0.       3.       1.   1279.47
     0.02     0.00    11.43     0.00    0.000    0.018    0.000    0.000  1267.13    73.05
 0.003664      50.      50.      50.       20        8        0     0.00    33.31   106.36

*SECNO 500.000
CHIMP CLSTA=     87.00 CELCH=   1267.05 BW=     28.00 STCHL=     61.05 STCHR=    113.00
EXCAVATION DATA
AEX=    221.2SQ-FT     VEXR=      0.6K*CU=YD     VEXT=      5.9K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   500.00     4.37  1271.42  1271.42     0.00  1273.45     2.03     0.18     0.16  1279.00
    1528.       0.    1528.       0.       0.     134.       0.       3.       1.   1279.00
     0.02     0.00    11.43     0.00    0.000    0.018    0.000    0.000  1267.05    72.16
 0.003661      50.      50.      50.       20        5        0     0.00    33.21   105.37

*SECNO 450.000
CHIMP CLSTA=     86.50 CELCH=   1266.98 BW=     28.00 STCHL=     61.48 STCHR=    115.00
EXCAVATION DATA
AEX=    896.2SQ-FT     VEXR=      1.0K*CU=YD     VEXT=      7.0K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   450.00     4.37  1271.35  1271.35     0.00  1273.38     2.03     0.18     0.16  1278.00
    1528.       0.    1528.       0.       0.     134.       0.       3.       1.   1277.00
     0.02     0.00    11.44     0.00    0.000    0.018    0.000    0.000  1266.98    71.71
 0.003669      50.      50.      50.       20        5        0     0.00    33.16   104.87
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 400.000
CHIMP CLSTA=     86.00 CELCH=   1266.90 BW=     28.00 STCHL=     61.00 STCHR=    110.00
EXCAVATION DATA
AEX=    112.8SQ-FT     VEXR=      0.9K*CU-YD     VEXT=       7.9K*CU-YD

   400.00      3.90  1270.80  1271.18      0.00  1273.14      2.34      0.21      0.03  1276.00
    1528.        0.    1528.       0.        0.     125.        0.        3.        1.  1276.00
     0.03      0.00    12.27      0.00     0.000     0.018     0.000     0.000  1266.90    68.10
 0.004706       50.      50.       50.         6         8         0      0.00    35.81   103.90

*SECNO 350.000
CHIMP CLSTA=     86.00 CELCH=   1266.83 BW=     28.00 STCHL=     55.00 STCHR=    112.00
EXCAVATION DATA
AEX=     77.3SQ-FT     VEXR=      0.2K*CU-YD     VEXT=       8.1K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   350.00      4.28  1271.11  1271.11      0.00  1273.01      1.90      0.20      1.07  1275.00
    1528.        0.    1528.       0.        0.     138.        0.        3.        1.  1275.00
     0.03      0.00    11.07      0.00     0.000     0.018     0.000     0.000  1266.83    67.68
 0.003462       50.      50.       50.        20         8         0      0.00    36.60   104.28

*SECNO 300.000
CHIMP CLSTA=     89.00 CELCH=   1266.75 BW=     28.00 STCHL=     67.00 STCHR=    115.00
EXCAVATION DATA
AEX=     49.0SQ-FT     VEXR=      0.1K*CU-YD     VEXT=       8.2K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   300.00      4.22  1270.97  1270.97      0.00  1272.86      1.89      0.17      0.12  1273.00
    1528.        0.    1528.       0.        0.     138.        0.        4.        1.  1275.00
     0.03      0.00    11.04      0.00     0.000     0.018     0.000     0.000  1266.75    70.03
 0.003482       50.      50.       50.        20         5         0      0.00    37.18   107.22

CCHV=   0.100 CEHV=   0.300
*SECNO 250.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN        SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID       ENDST

3720 CRITICAL DEPTH ASSUMED
   250.00      4.94    1271.34    1271.34       0.00    1273.02       1.68       0.26       0.02    1270.00
    1528.        6.       1511.        11.         2.     144.         3.         4.         1.    1270.00
     0.03       3.09      10.46       3.32      0.035      0.030      0.035      0.000    1266.40      71.33
 0.008468        50.        50.        50.         20         11          0       0.00      47.18     118.50

*SECNO 200.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   200.00      5.09    1271.09    1271.09       0.00    1272.87       1.78       0.43       0.08    1270.00
    1528.        5.       1520.         3.         2.     142.         1.         4.         1.    1270.00
     0.03       2.68      10.74       2.49      0.035      0.030      0.035      0.000    1266.00      76.82
 0.008653        50.        50.        50.         20          8          0       0.00      43.73     120.55

*SECNO 150.000
3280 CROSS SECTION     150.00 EXTENDED       1.03 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   150.00      6.53    1271.03    1271.03       0.00    1272.85       1.83       0.46       0.49    1270.00
    1528.        0.       1525.         3.         0.     141.         1.         4.         1.    1270.00
     0.03       0.00      10.85       2.52      0.000      0.030      0.035      0.000    1264.50      81.00
 0.009677        50.        50.        50.         20         11          0       0.00      41.21     122.21

*SECNO 100.000

3301 HV CHANGED MORE THAN HVINS

   100.00      5.68    1269.08    1270.06       0.00    1272.05       2.97       0.69       0.11    1270.00
    1528.        0.       1528.         0.         0.     111.         0.         4.         1.    1270.00
     0.03       0.00      13.82       0.00      0.000      0.030      0.000      0.000    1263.40      79.83
 0.021260        50.        50.        50.          8          8          0       0.00      39.08     118.91
```

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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T1 HYDRAULIC ANALYSIS OF MYRTLE WASH FOR SQUAW PEAK HIGHWAY
T2 50-YEAR Q = 1301 CFS, SUPERCRITICAL RUN, PRELIMINARY DESIGN (60% SUBMITTAL)
T3 USBR TYPE III BASIN ENERGY DISSIPATOR FOR W=32 FT & H=19 FT

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	1.	-1.000000	0.00	0.0	0.	0.000	0.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.000	-1.000	0.000	0.000	0.000	-1.000	0.000	0.000	0.000

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

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=   0.100 CEHV=   0.300
*SECNO 1700.000
2096 WSEL NOT GIVEN,AVG OF MAX,MIN USED
3720 CRITICAL DEPTH ASSUMED
  1700.00      3.71  1307.71  1307.71      0.00  1309.01      1.30      0.00      0.00  1308.00
    1301.        0.    1301.       0.        0.     142.        0.        0.        0.  1308.00
     0.00      0.00     9.16      0.00     0.000     0.030     0.000     0.000   1304.00    86.59
 0.009785        0.       0.        0.         0        10         0      0.00     54.48   141.06

*SECNO 1650.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1650.00      4.07  1307.07  1307.07      0.00  1308.55      1.47      0.49      0.04  1307.00
    1301.        0.    1301.       0.        0.     134.        0.        0.        0.  1308.00
     0.00      0.46     9.74      0.00     0.035     0.030     0.000     0.000   1303.00    83.10
 0.009712       50.      50.       50.        20         8         0      0.00     49.50   132.61

*SECNO 1600.000

3301 HV CHANGED MORE THAN HVINS

  1600.00      3.54  1304.54  1305.45      0.00  1307.61      3.07      0.77      0.16  1305.00
    1301.        0.    1301.       0.        0.      93.        0.        0.        0.  1305.00
     0.00      0.00    14.06      0.00     0.000     0.030     0.000     0.000   1301.00    85.37
 0.028413       50.      50.       50.         7         8         0      0.00     41.26   126.63

*SECNO 1550.000

3301 HV CHANGED MORE THAN HVINS

  1550.00      4.05  1303.85  1304.52      0.00  1306.28      2.43      1.14      0.19  1304.00
    1301.        0.    1301.       0.        0.     104.        0.        0.        0.  1304.00
     0.00      0.00    12.51      0.00     0.000     0.030     0.000     0.000   1299.80    87.30
 0.018716       50.      50.       50.         7        11         0      0.00     39.94   127.24
```

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

*SECNO 1500.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
 1500.00      5.27   1303.77   1303.83      0.00   1305.35      1.58      0.67      0.25   1304.00
    1301.       0.     1301.        0.        0.     129.        0.        1.        0.   1304.00
     0.00      0.00     10.10      0.00     0.000     0.030     0.000     0.000   1298.50     85.28
 0.010166       50.       50.       50.         0        11         0      0.00     42.45    127.74

*SECNO 1450.000

3301 HV CHANGED MORE THAN HVINS

 1450.00      4.51   1299.71   1301.20      0.00   1304.22      4.51      0.84      0.29   1303.00
    1301.       0.     1301.        0.        0.      76.        0.        1.        0.   1303.00
     0.01      0.00     17.04      0.00     0.000     0.030     0.000     0.000   1295.20     72.43
 0.032859       50.       50.       50.         6         8         0      0.00     26.99     99.42

*SECNO 1400.000
 1400.00      4.42   1297.92   1299.40      0.00   1302.55      4.63      1.65      0.01   1300.00
    1301.       0.     1301.        0.        0.      75.        0.        1.        0.   1300.00
     0.01      0.00     17.28      0.00     0.000     0.030     0.000     0.000   1293.50     83.73
 0.033331       50.       50.       50.         5        11         0      0.00     26.71    110.44

*SECNO 1350.000
CHIMP CLSTA=     104.00 CELCH=    1291.60 BW=      20.00 STCHL=      79.80 STCHR=     127.00
EXCAVATION DATA
AEX=      36.3SQ-FT      VEXR=      0.0K*CU-YD      VEXT=      0.0K*CU-YD

3301 HV CHANGED MORE THAN HVINS

 1350.00      2.55   1294.15   1296.02      0.00   1300.92      6.76      1.42      0.21   1301.06
    1301.       0.     1301.        0.        0.      62.        0.        1.        0.   1300.00
     0.01      0.00     20.87      0.00     0.000     0.018     0.000     0.000   1291.60     90.17
 0.024566       50.       50.       50.         9         5         0      0.00     28.98    119.15
```

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

*SECNO 1322.000

3301 HV CHANGED MORE THAN HVINS

1322.00	1.73	1291.23	1293.21	0.00	1299.82	8.60	0.91	0.18	1300.00
1301.	0.	1301.	0.	0.	55.	0.	1.	0.	1300.00
0.01	0.00	23.53	0.00	0.000	0.018	0.000	0.000	1289.50	89.00
0.044916	28.	28.	28.	9	11	0	0.00	32.00	121.00

*SECNO 1302.000

3301 HV CHANGED MORE THAN HVINS

1302.00	1.63	1289.13	1291.20	0.00	1298.74	9.61	0.98	0.10	1295.00
1301.	0.	1301.	0.	0.	52.	0.	1.	0.	1295.00
0.01	0.00	24.88	0.00	0.000	0.018	0.000	0.000	1287.50	84.00
0.053739	20.	20.	20.	11	17	0	0.00	32.00	116.00

*SECNO 1262.000

3301 HV CHANGED MORE THAN HVINS

1262.00	1.27	1278.77	1281.20	0.00	1294.95	16.19	3.13	0.66	1285.00
1301.	0.	1301.	0.	0.	40.	0.	1.	0.	1285.00
0.01	0.00	32.29	0.00	0.000	0.018	0.000	0.000	1277.50	84.00
0.124458	40.	40.	40.	7	17	0	0.00	32.00	116.00

*SECNO 1242.000

3301 HV CHANGED MORE THAN HVINS

1242.00	1.19	1273.69	1276.20	0.00	1292.00	18.31	2.74	0.21	1280.00
1301.	0.	1301.	0.	0.	38.	0.	1.	0.	1280.00
0.01	0.00	34.34	0.00	0.000	0.018	0.000	0.000	1272.50	84.00
0.151928	20.	20.	20.	11	20	0	0.00	32.00	116.00

*SECNO 1238.000

1238.00	1.17	1272.67	1275.20	0.00	1291.34	18.67	0.62	0.04	1279.00
1301.	0.	1301.	0.	0.	38.	0.	1.	0.	1279.00
0.01	0.00	34.68	0.00	0.000	0.018	0.000	0.000	1271.50	84.00
0.156801	4.	4.	4.	10	20	0	0.00	32.00	116.00

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

*SECNO 1234.000
  1234.00       1.16  1271.66  1274.20       0.00  1290.67      19.01       0.64       0.03  1278.00
    1301.         0.    1301.       0.         0.      37.         0.         1.         0.  1278.00
     0.01       0.00    34.99     0.00      0.000   0.018      0.000      0.000    1270.50    84.00
 0.161497         4.       4.       4.         10      20          0       0.00      32.00   116.00

*SECNO 1230.000
  1230.00       1.15  1270.65  1273.20       0.00  1289.99      19.33       0.65       0.03  1277.00
    1301.         0.    1301.       0.         0.      37.         0.         1.         0.  1277.00
     0.01       0.00    35.28     0.00      0.000   0.018      0.000      0.000    1269.50    84.00
 0.165922         4.       4.       4.         10      20          0       0.00      32.00   116.00

*SECNO 1226.000
  1226.00       1.15  1269.65  1272.20       0.00  1289.28      19.64       0.67       0.03  1276.00
    1301.         0.    1301.       0.         0.      37.         0.         1.         0.  1276.00
     0.01       0.00    35.56     0.00      0.000   0.018      0.000      0.000    1268.50    84.00
 0.170213         4.       4.       4.         10      20          0       0.00      32.00   116.00

*SECNO 1200.000

3301 HV CHANGED MORE THAN HVINS

  1200.00       1.33  1269.83  1272.20       0.00  1284.33      14.51       3.41       1.54  1288.50
    1301.         0.    1301.       0.         0.      43.         0.         1.         0.  1288.50
     0.01       0.00    30.56     0.00      0.000   0.018      0.000      0.000    1268.50    84.00
 0.104218        26.      26.      26.          7      20          0       0.00      32.00   116.00

CCHV=   0.300 CEHV=   0.500
*SECNO 1180.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
  1180.00       1.50  1269.95  1272.17       0.00  1281.35      11.40       1.16       1.45  1285.00
    1301.         0.    1301.       0.         0.      48.         0.         1.         0.  1285.00
     0.01       0.00    27.09     0.00      0.000   0.013      0.000      0.000    1268.45    84.00
 0.036851        20.      20.      20.         20      17          0       0.00      32.00   116.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 1135.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1283.80 MAX ELLC= 1286.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
  1135.00      5.18  1273.52  1274.79      0.00  1278.56      5.04      0.53      3.78  1278.34
    1301.        0.    1301.       0.        0.     72.        0.        1.        0.  1278.34
     0.01      0.00     18.01     0.00     0.000    0.013     0.000     0.000   1268.34    93.05
 0.005797       45.       45.       45.        20       19         0      0.00     14.00    107.05

*SECNO 866.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD= 1278.70 MAX ELLC= 1283.30

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   866.00      6.45  1274.11  1274.11      0.00  1277.35      3.24      1.13      0.50  1277.66
    1301.        0.    1301.       0.        0.     90.        0.        2.        1.  1277.66
     0.01      0.00     14.45     0.00     0.000    0.013     0.000     0.000   1267.66    93.04
 0.003178      269.      269.      269.        20       19         0      0.00     14.03    107.06

*SECNO 851.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
   851.00      3.76  1271.26  1271.30      0.00  1273.19      1.94      0.04      0.12  1278.50
    1301.        0.    1301.       0.        0.    116.        0.        2.        1.  1278.50
     0.02      0.00     11.17     0.00     0.000    0.013     0.000     0.000   1267.50    89.00
 0.002182       15.       15.       15.        20       11         0      0.00     31.00    120.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 824.000

3301 HV CHANGED MORE THAN HVINS

   824.00      2.62  1270.12  1270.85      0.00  1272.87      2.75      0.08      0.24   1282.00
    1301.        0.    1293.       8.        0.      97.        2.        2.        1.   1267.50
     0.02      0.00    13.35     4.36     0.000     0.013     0.016     0.000   1267.50     79.00
 0.004143       27.      27.      27.        12        11         0      0.00     38.41    117.41

CCHV=   0.100 CEHV=   0.300
*SECNO 800.000
CHIMP CLSTA=     97.00 CELCH=   1267.50 BW=     30.00 STCHL=     62.23 STCHR=    133.00
EXCAVATION DATA
AEX=    665.8SQ-FT     VEXR=     0.3K*CU=YD     VEXT=     0.3K*CU-YD

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   800.00      3.71  1271.21  1271.21      0.00  1272.89      1.68      0.09      0.68   1287.27
    1301.        0.    1301.       0.        0.     125.        0.        2.        1.   1287.00
     0.02      0.00    10.40     0.00     0.000     0.018     0.000     0.000   1267.50     78.29
 0.003529       24.      24.      24.        20        11         0      0.00     37.42    115.71

*SECNO 750.000
CHIMP CLSTA=     97.00 CELCH=   1267.43 BW=     30.00 STCHL=     62.78 STCHR=    130.14
EXCAVATION DATA
AEX=    587.3SQ-FT     VEXR=     1.2K*CU=YD     VEXT=     1.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   750.00      3.70  1271.13  1271.13      0.00  1272.82      1.69      0.18      0.14   1286.65
    1301.        0.    1301.       0.        0.     125.        0.        2.        1.   1285.57
     0.02      0.00    10.42     0.00     0.000     0.018     0.000     0.000   1267.43     78.30
 0.003547       50.      50.      50.        20         5         0      0.00     37.41    115.70
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 700.000
CHIMP CLSTA=     97.00 CELCH=   1267.35 BW=     30.00 STCHL=     65.00 STCHR=    129.65
EXCAVATION DATA
AEX=     560.0SQ-FT     VEXR=      1.1K*CU-YD     VEXT=       2.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   700.00     3.71  1271.06  1271.06     0.00  1272.74     1.68     0.18     0.14  1283.00
    1301.       0.    1301.       0.       0.     125.       0.       2.       1.  1285.00
     0.02     0.00    10.41     0.00    0.000    0.018    0.000    0.000  1267.35    78.29
 0.003543      50.      50.      50.       20        5        0     0.00    37.41   115.71

*SECNO 650.000
CHIMP CLSTA=     97.00 CELCH=   1267.28 BW=     30.00 STCHL=     67.37 STCHR=    128.08
EXCAVATION DATA
AEX=     524.9SQ-FT     VEXR=      1.0K*CU-YD     VEXT=       3.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   650.00     3.71  1270.99  1270.99     0.00  1272.67     1.68     0.18     0.14  1281.91
    1301.       0.    1301.       0.       0.     125.       0.       2.       1.  1283.36
     0.02     0.00    10.42     0.00    0.000    0.018    0.000    0.000  1267.28    78.29
 0.003544      50.      50.      50.       20        5        0     0.00    37.41   115.71

*SECNO 600.000
CHIMP CLSTA=     97.00 CELCH=   1267.20 BW=     30.00 STCHL=     68.20 STCHR=    126.78
EXCAVATION DATA
AEX=     497.6SQ-FT     VEXR=      0.9K*CU-YD     VEXT=       4.5K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   600.00     3.71  1270.91  1270.91     0.00  1272.59     1.68     0.18     0.14  1281.00
    1301.       0.    1301.       0.       0.     125.       0.       2.       1.  1281.98
     0.02     0.00    10.41     0.00    0.000    0.018    0.000    0.000  1267.20    78.29
 0.003541      50.      50.      50.       20        5        0     0.00    37.41   115.71
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 550.000
CHIMP CLSTA=     88.00 CELCH=   1267.13 BW=     28.00 STCHL=     60.13 STCHR=     114.34
EXCAVATION DATA
AEX=     425.7SQ-FT     VEXR=      0.9K*CU=YD     VEXT=      5.3K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   550.00      3.93  1271.06  1271.06      0.00  1272.90      1.84      0.18      0.20  1281.00
    1301.        0.     1301.      0.        0.     119.        0.        2.        1.  1279.47
     0.02      0.00     10.89     0.00     0.000     0.018     0.000     0.000   1267.13    73.15
 0.003726       50.       50.      50.        20         8         0      0.00     32.78   105.93

*SECNO 500.000
CHIMP CLSTA=     87.00 CELCH=   1267.05 BW=     28.00 STCHL=     61.05 STCHR=     113.00
EXCAVATION DATA
AEX=     221.2SQ-FT     VEXR=      0.6K*CU=YD     VEXT=      5.9K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   500.00      3.94  1270.99  1270.99      0.00  1272.83      1.84      0.19      0.15  1279.00
    1301.        0.     1301.      0.        0.     119.        0.        3.        1.  1279.00
     0.02      0.00     10.89     0.00     0.000     0.018     0.000     0.000   1267.05    72.24
 0.003720       50.       50.      50.        20         5         0      0.00     32.70   104.94

*SECNO 450.000
CHIMP CLSTA=     86.50 CELCH=   1266.98 BW=     28.00 STCHL=     61.48 STCHR=     115.00
EXCAVATION DATA
AEX=     896.2SQ-FT     VEXR=      1.0K*CU=YD     VEXT=      7.0K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   450.00      3.94  1270.92  1270.92      0.00  1272.76      1.84      0.19      0.15  1278.00
    1301.        0.     1301.      0.        0.     119.        0.        3.        1.  1277.00
     0.03      0.00     10.90     0.00     0.000     0.018     0.000     0.000   1266.98    71.79
 0.003730       50.       50.      50.        20         5         0      0.00     32.65   104.44
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 400.000
CHIMP CLSTA=     86.00 CELCH=   1266.90 BW=     28.00 STCHL=     61.00 STCHR=    110.00
EXCAVATION DATA
AEX=    112.8SQ-FT     VEXR=      0.9K*CU=YD     VEXT=       7.9K*CU-YD

   400.00      3.61  1270.51  1270.74      0.00  1272.54      2.03      0.20      0.02  1276.00
    1301.        0.    1301.       0.        0.     114.        0.        3.        1.  1276.00
     0.03      0.00    11.42      0.00     0.000     0.018     0.000     0.000   1266.90    68.40
 0.004462       50.      50.       50.         5         5         0      0.00     35.21   103.60

*SECNO 350.000
CHIMP CLSTA=     86.00 CELCH=   1266.83 BW=     28.00 STCHL=     55.00 STCHR=    112.00
EXCAVATION DATA
AEX=     77.3SQ-FT     VEXR=      0.2K*CU=YD     VEXT=       8.1K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   350.00      3.86  1270.69  1270.69      0.00  1272.43      1.74      0.20      0.03  1275.00
    1301.        0.    1301.       0.        0.     123.        0.        3.        1.  1275.00
     0.03      0.00    10.59      0.00     0.000     0.018     0.000     0.000   1266.83    68.14
 0.003548       50.      50.       50.        20         8         0      0.00     35.72   103.86

*SECNO 300.000
CHIMP CLSTA=     89.00 CELCH=   1266.75 BW=     28.00 STCHL=     67.00 STCHR=    115.00
EXCAVATION DATA
AEX=     49.0SQ-FT     VEXR=      0.1K*CU=YD     VEXT=       8.2K*CU-YD

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   300.00      3.81  1270.56  1270.56      0.00  1272.29      1.73      0.18      0.13  1273.00
    1301.        0.    1301.       0.        0.     123.        0.        3.        1.  1275.00
     0.03      0.00    10.54      0.00     0.000     0.018     0.000     0.000   1266.75    70.44
 0.003555       50.      50.       50.        20         5         0      0.00     36.37   106.81

CCHV=   0.100 CEHV=   0.300
*SECNO 250.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS    BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

3720 CRITICAL DEPTH ASSUMED
   250.00      4.56    1270.96    1270.96       0.00    1272.51       1.54       0.27       0.04    1270.00
    1301.        2.       1294.         4.         1.     129.         2.         3.         1.    1270.00
     0.03       2.29      10.00       2.42      0.035      0.030      0.035      0.000    1266.40      72.08
 0.008945        50.        50.        50.         20         11          0       0.00      45.77     117.85

*SECNO 200.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   200.00      4.68    1270.68    1270.68       0.00    1272.33       1.65       0.46       0.07    1270.00
    1301.        1.       1299.         1.         1.     126.         1.         3.         1.    1270.00
     0.03       1.93      10.30       1.89      0.035      0.030      0.035      0.000    1266.00      77.95
 0.009296        50.        50.        50.         20          8          0       0.00      41.65     119.60

*SECNO 150.000
3280 CROSS SECTION     150.00 EXTENDED       0.64 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   150.00      6.14    1270.64    1270.64       0.00    1272.31       1.67       0.49       0.09    1270.00
    1301.        0.       1300.         1.         0.     125.         0.         4.         1.    1270.00
     0.03       0.00      10.38       1.85      0.000      0.030      0.035      0.000    1264.50      81.00
 0.010181        50.        50.        50.         20         11          0       0.00      40.27     121.27

*SECNO 100.000

3301 HV CHANGED MORE THAN HVINS

   100.00      5.32    1268.72    1269.79       0.00    1271.49       2.77       0.70       0.11    1270.00
    1301.        0.       1301.         0.         0.      97.         0.         4.         1.    1270.00
     0.03       0.00      13.35       0.00      0.000      0.030      0.000      0.000    1263.40      80.34
 0.020771        50.        50.        50.         11          8          0       0.00      35.56     115.90
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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

USBR TYPE III BASIN ENER

SUMMARY PRINTOUT

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
*	1700.000	1304.00	1528.00	9.54	1308.03	1308.03	4.03	1.41	1309.44	98.27	0.00	58.63	1.00
*	1700.000	1304.00	1301.00	9.16	1307.71	1307.71	3.71	1.30	1309.01	97.85	0.00	54.48	1.00
*	1650.000	1303.00	1528.00	9.61	1307.64	1307.59	4.59	1.42	1309.01	77.86	50.00	73.38	4096.00
*	1650.000	1303.00	1301.00	9.74	1307.07	1307.07	4.07	1.47	1308.55	97.12	50.00	49.50	11.00
	1600.000	1301.00	1528.00	14.63	1305.76	1304.82	3.82	3.33	1308.15	276.78	50.00	42.95	0.00
	1600.000	1301.00	1301.00	14.06	1305.45	1304.54	3.54	3.07	1307.61	284.13	50.00	41.26	0.00
	1550.000	1299.80	1528.00	13.21	1305.02	1304.13	4.33	2.71	1306.84	187.51	50.00	43.98	0.00
	1550.000	1299.80	1301.00	12.51	1304.52	1303.85	4.05	2.43	1306.28	187.16	50.00	39.94	0.00
	1500.000	1298.50	1528.00	10.53	1304.20	1304.15	5.65	1.72	1305.87	101.73	50.00	47.98	0.00
*	1500.000	1298.50	1301.00	10.10	1303.83	1303.77	5.27	1.58	1305.35	101.66	50.00	42.45	4096.00
	1450.000	1295.20	1528.00	17.23	1301.62	1300.15	4.95	4.61	1304.76	305.84	50.00	29.15	0.00
	1450.000	1295.20	1301.00	17.04	1301.20	1299.71	4.51	4.51	1304.22	328.59	50.00	26.99	0.00
	1400.000	1293.50	1528.00	17.67	1299.87	1298.33	4.83	4.85	1303.18	315.04	50.00	28.33	0.00
	1400.000	1293.50	1301.00	17.28	1299.40	1297.92	4.42	4.63	1302.55	333.31	50.00	26.71	0.00
	1350.000	1291.60	1528.00	21.49	1296.47	1294.45	2.85	7.17	1301.62	227.62	50.00	29.73	0.00
	1350.000	1291.60	1301.00	20.87	1296.02	1294.15	2.55	6.76	1300.92	245.66	50.00	28.98	0.00
	1322.000	1289.50	1528.00	24.23	1293.63	1291.47	1.97	9.12	1300.59	407.27	28.00	32.00	0.00
	1322.000	1289.50	1301.00	23.53	1293.21	1291.23	1.73	8.60	1299.82	449.16	28.00	32.00	0.00
	1302.000	1287.50	1528.00	25.66	1291.62	1289.37	1.87	10.22	1299.59	488.58	20.00	32.00	0.00
	1302.000	1287.50	1301.00	24.88	1291.20	1289.13	1.63	9.61	1298.74	537.39	20.00	32.00	0.00
	1262.000	1277.50	1528.00	33.21	1281.62	1278.94	1.44	17.13	1296.07	1118.58	40.00	32.00	0.00
	1262.000	1277.50	1301.00	32.29	1281.20	1278.77	1.27	16.19	1294.95	1244.58	40.00	32.00	0.00

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
	1242.000	1272.50	1528.00	35.44	1276.62	1273.85	1.35	19.50	1293.35	1379.51	20.00	32.00	0.00
	1242.000	1272.50	1301.00	34.34	1276.20	1273.69	1.19	18.31	1292.00	1519.28	20.00	32.00	0.00
	1238.000	1271.50	1528.00	35.81	1275.62	1272.83	1.33	19.92	1292.75	1426.98	4.00	32.00	0.00
	1238.000	1271.50	1301.00	34.68	1275.20	1272.67	1.17	18.67	1291.34	1568.01	4.00	32.00	0.00
	1234.000	1270.50	1528.00	36.17	1274.62	1271.81	1.31	20.32	1292.13	1473.55	4.00	32.00	0.00
	1234.000	1270.50	1301.00	34.99	1274.20	1271.66	1.16	19.01	1290.67	1614.97	4.00	32.00	0.00
	1230.000	1269.50	1528.00	36.50	1273.62	1270.81	1.31	20.69	1291.49	1517.09	4.00	32.00	0.00
	1230.000	1269.50	1301.00	35.28	1273.20	1270.65	1.15	19.33	1289.99	1659.22	4.00	32.00	0.00
	1226.000	1268.50	1528.00	36.82	1272.62	1269.80	1.30	21.05	1290.84	1559.97	4.00	32.00	0.00
	1226.000	1268.50	1301.00	35.56	1272.20	1269.65	1.15	19.64	1289.28	1702.13	4.00	32.00	0.00
	1200.000	1268.50	1528.00	32.25	1272.62	1269.98	1.48	16.15	1286.13	1017.86	26.00	32.00	0.00
	1200.000	1268.50	1301.00	30.56	1272.20	1269.83	1.33	14.51	1284.33	1042.18	26.00	32.00	0.00
*	1180.000	1268.45	1528.00	27.82	1272.59	1270.17	1.72	12.02	1282.18	330.07	20.00	32.00	12.00
*	1180.000	1268.45	1301.00	27.09	1272.17	1269.95	1.50	11.40	1281.35	368.51	20.00	32.00	12.00
*	1135.000	1268.34	1528.00	18.61	1275.52	1274.22	5.88	5.38	1279.60	56.22	45.00	14.02	12.00
*	1135.000	1268.34	1301.00	18.01	1274.79	1273.52	5.18	5.04	1278.56	57.97	45.00	14.00	12.00
*	866.000	1267.66	1528.00	15.23	1274.84	1274.84	7.18	3.60	1278.44	32.76	269.00	14.04	11.00
*	866.000	1267.66	1301.00	14.45	1274.11	1274.11	6.45	3.24	1277.35	31.78	269.00	14.03	11.00
*	851.000	1267.50	1528.00	11.78	1271.73	1271.68	4.18	2.16	1273.84	21.67	15.00	31.00	12.00
*	851.000	1267.50	1301.00	11.17	1271.30	1271.26	3.76	1.94	1273.19	21.82	15.00	31.00	12.00
	824.000	1267.50	1528.00	14.12	1271.23	1270.41	2.91	3.08	1273.48	40.75	27.00	38.57	0.00
	824.000	1267.50	1301.00	13.35	1270.85	1270.12	2.62	2.75	1272.87	41.43	27.00	38.41	0.00
*	800.000	1267.50	1528.00	10.90	1271.61	1271.61	4.11	1.85	1273.45	34.54	24.00	38.22	11.00
*	800.000	1267.50	1301.00	10.40	1271.21	1271.21	3.71	1.68	1272.89	35.29	24.00	37.42	11.00
*	750.000	1267.43	1528.00	10.91	1271.54	1271.54	4.11	1.85	1273.38	34.66	50.00	38.21	11.00
*	750.000	1267.43	1301.00	10.42	1271.13	1271.13	3.70	1.69	1272.82	35.47	50.00	37.41	11.00
*	700.000	1267.35	1528.00	10.91	1271.46	1271.46	4.11	1.85	1273.30	34.64	50.00	38.21	11.00
*	700.000	1267.35	1301.00	10.41	1271.06	1271.06	3.71	1.68	1272.74	35.43	50.00	37.41	11.00
*	650.000	1267.28	1528.00	10.91	1271.39	1271.39	4.11	1.85	1273.23	34.62	50.00	38.21	11.00
*	650.000	1267.28	1301.00	10.42	1270.99	1270.99	3.71	1.68	1272.67	35.44	50.00	37.41	11.00
*	600.000	1267.20	1528.00	10.91	1271.31	1271.31	4.11	1.85	1273.15	34.60	50.00	38.21	11.00
*	600.000	1267.20	1301.00	10.41	1270.91	1270.91	3.71	1.68	1272.59	35.41	50.00	37.41	11.00
*	550.000	1267.13	1528.00	11.43	1271.49	1271.49	4.36	2.03	1273.52	36.64	50.00	33.31	11.00
*	550.000	1267.13	1301.00	10.89	1271.06	1271.06	3.93	1.84	1272.90	37.26	50.00	32.78	11.00

	SECNO	ELMIN	Q	VCH	CRIWS	CWSEL	DEPTH	HV	EG	10K*S	XLCH	TOPWID	CASE
*	500.000	1267.05	1528.00	11.43	1271.42	1271.42	4.37	2.03	1273.45	36.61	50.00	33.21	11.00
*	500.000	1267.05	1301.00	10.89	1270.99	1270.99	3.94	1.84	1272.83	37.20	50.00	32.70	11.00
*	450.000	1266.98	1528.00	11.44	1271.35	1271.35	4.37	2.03	1273.38	36.69	50.00	33.16	11.00
*	450.000	1266.98	1301.00	10.90	1270.92	1270.92	3.94	1.84	1272.76	37.30	50.00	32.65	11.00
	400.000	1266.90	1528.00	12.27	1271.18	1270.80	3.90	2.34	1273.14	47.06	50.00	35.81	0.00
	400.000	1266.90	1301.00	11.42	1270.74	1270.51	3.61	2.03	1272.54	44.62	50.00	35.21	0.00
*	350.000	1266.83	1528.00	11.07	1271.11	1271.11	4.28	1.90	1273.01	34.62	50.00	36.60	11.00
*	350.000	1266.83	1301.00	10.59	1270.69	1270.69	3.86	1.74	1272.43	35.48	50.00	35.72	11.00
*	300.000	1266.75	1528.00	11.04	1270.97	1270.97	4.22	1.89	1272.86	34.82	50.00	37.18	11.00
*	300.000	1266.75	1301.00	10.54	1270.56	1270.56	3.81	1.73	1272.29	35.55	50.00	36.37	11.00
*	250.000	1266.40	1528.00	10.46	1271.34	1271.34	4.94	1.68	1273.02	84.68	50.00	47.18	11.00
*	250.000	1266.40	1301.00	10.00	1270.96	1270.96	4.56	1.54	1272.51	89.45	50.00	45.77	11.00
*	200.000	1266.00	1528.00	10.74	1271.09	1271.09	5.09	1.78	1272.87	86.53	50.00	43.73	11.00
*	200.000	1266.00	1301.00	10.30	1270.68	1270.68	4.68	1.65	1272.33	92.96	50.00	41.65	11.00
*	150.000	1264.50	1528.00	10.85	1271.03	1271.03	6.53	1.83	1272.85	96.77	50.00	41.21	11.00
*	150.000	1264.50	1301.00	10.38	1270.64	1270.64	6.14	1.67	1272.31	101.81	50.00	40.27	11.00
	100.000	1263.40	1528.00	13.82	1270.06	1269.08	5.68	2.97	1272.05	212.60	50.00	39.08	0.00
	100.000	1263.40	1301.00	13.35	1269.79	1268.72	5.32	2.77	1271.49	207.71	50.00	35.56	0.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO= 1700.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1700.000  PROFILE= 2  CRITICAL DEPTH ASSUMED

CAUTION  SECNO= 1650.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1650.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1650.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1650.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 1500.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1180.000  PROFILE= 1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO= 1180.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 1180.000  PROFILE= 2  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO= 1180.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION  SECNO= 1135.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION  SECNO=  866.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=  800.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=  750.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  750.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=  700.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  700.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  700.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=  700.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  700.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
```

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CAUTION  SECNO=  650.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=  650.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  650.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=  600.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  600.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=  300.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=  250.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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```
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CAUTION  SECNO=  200.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  200.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION  SECNO=  150.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  150.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=  150.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
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HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BGR	Date 5-4-89	Job Number 13089-21-03
For Sequoyah Park Highway	Checked by JWW	Date 5-18-89	Sheet Number
	Backchecked by	Date	

Basin III Design Calc's

Sta. 12+26 PROPRAT.OUT For 60% Submittal

Sta. 12+00 PROPSBRAT.OUT

W = 32 ft R = 19 ft

Q cfs	q cfs/ft	E_0 ft	y_1 ft	V_1 fps	F_1	y_2 ft	Avail. TW ft	Min. TW ft
1528	47.75	11.91	1.30	36.82	5.69	9.83	11.37	
1400	43.75	11.41	1.21	36.14	5.79	9.32	10.71	
1301	40.66	11.00	1.15	35.56	5.84	8.95	10.18	
1100	34.38	10.09	1.01	34.19	6.00	8.07	9.08	
900	28.13	9.07	0.86	32.48	6.17	7.09	7.91	
700	21.88	7.88	0.72	30.25	6.28	6.05	6.66	
500	15.63	6.47	0.58	27.19	6.29	4.88	5.29	
300	9.38	4.74	0.41	22.60	6.22	3.41	3.72	
100	3.13	2.39	0.22	14.54	5.46	1.59	1.71	

1. $\frac{TW}{y_2}$ is between 1.08 ~ 1.15
2. $4.5 < F_1 < 17$
3. $q < 200$ cfs/ft

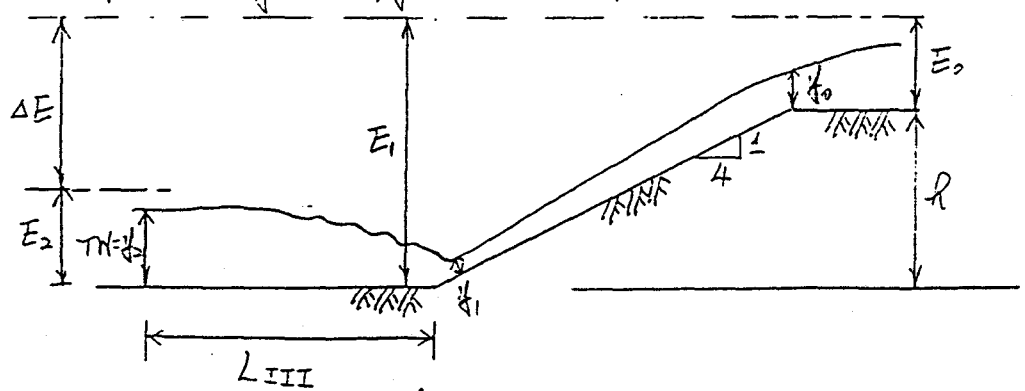
$$E_1 = E_0 + R = y_1 + \frac{q^2}{2gy_1^2} + S_f L$$

Since chute length $L > 30$ ft consider friction loss (See "Design of Small Canal Structures pg. 105)

$$y_2 = \frac{y_1}{2}\left[\sqrt{1+8F_1^2} - 1\right]$$

Use Ref. 1* Fig. 11 pg. 25 to find Min. TW

Use Ref. 1* Fig. 12 pg. 27 to find L_{III}



*Ref. 1. USBR EM No. 25 Hydraulic Design of Stilling Basins & Energy Dissipators

ME101-0488(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BGS	Date 4-18-89	Job Number 13089-21-03
	Checked by JWW	Date 4-19-89	Sheet Number 8/18
For Squaw Peak Highway	Backchecked by	Date	

Myrtle Wash Energy Dissipator
USBR Basin III Design Calculations

$Q_{100} = 1,528$ cfs, $W = 32$ ft, $q = 47.75$ cfs/ft

Incoming flow to the basin floor (from ABRATING.OUT) 12+30

$y_1 = 1.20$ ft, $V_1 = 39.85$ fps, $F_1 = 6.41$

$y_2 = \frac{y_1}{2}[\sqrt{1+8F_1^2} - 1] = 10.30$ ft $<$ TW $= 11.32$ ft

From USBR EM No. 25 Fig. 12 pg. 27

$L_B = 2.52\, y_2 = 25.96$ ft Use 26 ft

$L_T = 4 \times 19 + 26 = 102$ ft

Chute Blocks:

$h_1 = w_1 = w_2 = y_1 = 1.20$ ft Use 1.23 ft or 14.75.

$N_c = W/(2y_1) = 32/2.4 = 13.0$ blocks Use 13 blocks

Space to wall $= 0.5\, y_1 = 0.6$ ft Use 7 in.

Adj. $w_1 = w_2 = W/2N_c = 1.23$ ft Use 15 in.

Baffle Blocks:

From USBR EM No. 25 Fig. 18 pg. 37

$h_3 = 1.7\, y_1 = 2.04$ ft Use 2 ft $= 24$ in

$h_4 = 1.4\, y_1 = 1.68$ ft Use 20 in.

$w_3 = w_4 = 0.75\, h_3 = 1.5$ ft

$N_B = W/(1.5\, h_3) = 10.5$ blocks Use 11 blocks

Adj. $w_3 = w_4 = W/(2N_B) = 1.45$ ft Use 17.5 in

Space at wall $= w_3/2 = 8.7$ in. $0.375\, h_3 = 9.0$"

Length from chute $= 0.8\, y_2 = 8.24$ ft Use 8.25 ft

USBR EM No. 25 6/18

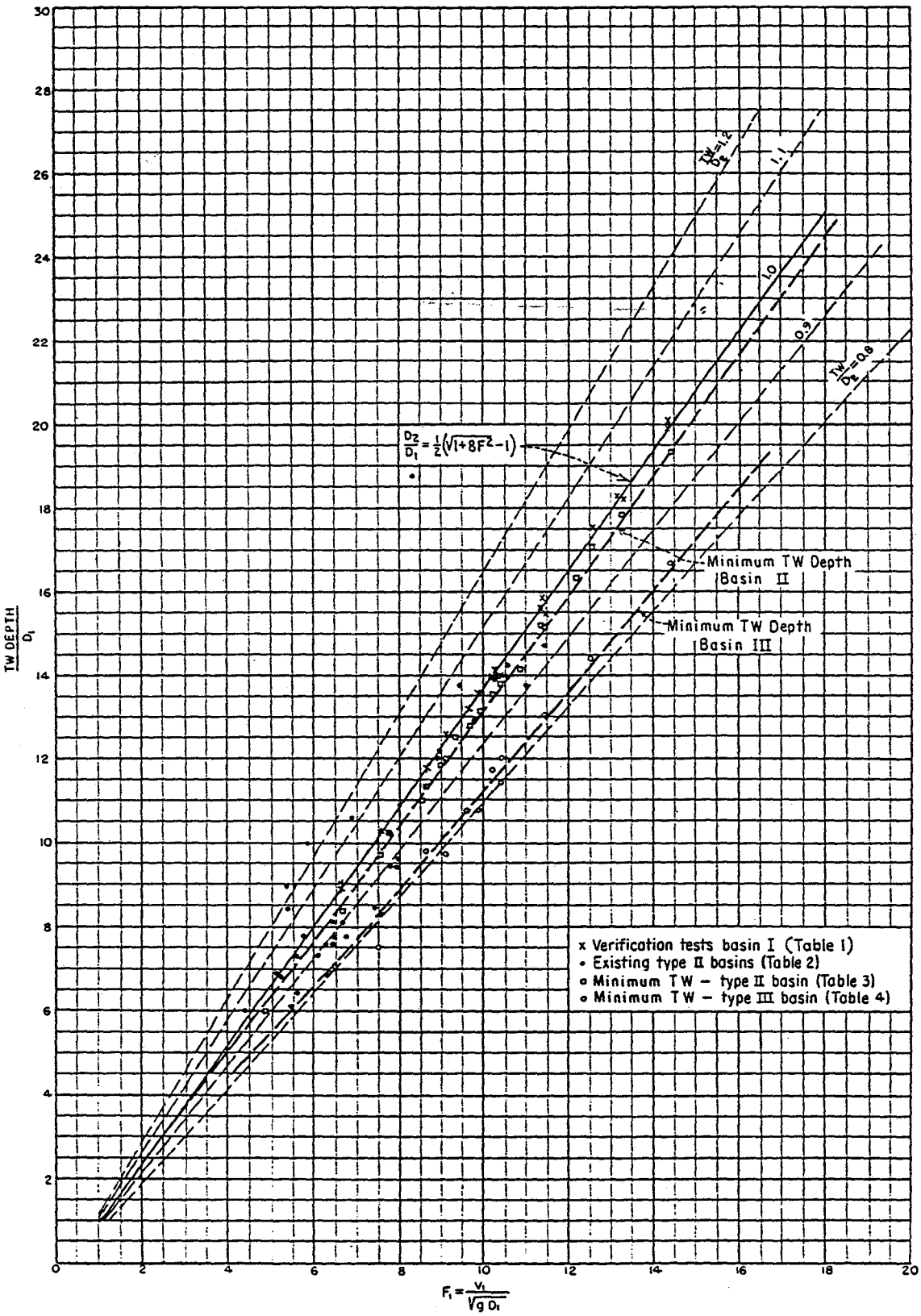


FIGURE 11.—*Minimum tail water depths (Basins I, II, and III).*

USBR EM No. 25

7/18

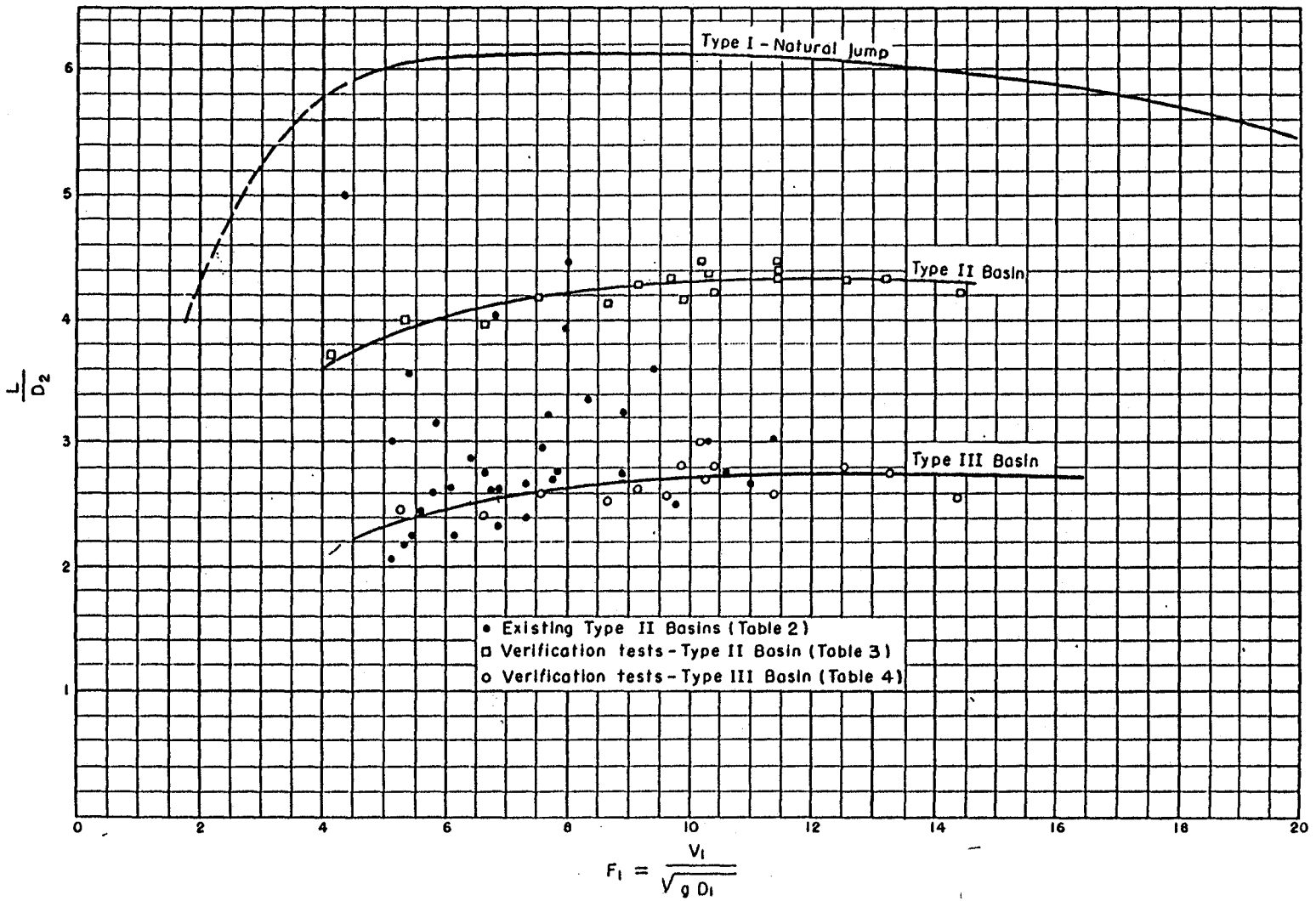


FIGURE 12.—*Length of jump on horizontal floor (Basins I, II, and III).*

4. CROSS BOX CULVERTS AND PIPES

PROJECT: S.R. 51
PLEASANT DRIVE BOX CULVERT

STATION: 66 + 78

SHEET ____ OF ____

CULVERT DESIGN FORM

DESIGNER / DATE: SLA / 6/24/89

REVIEWER / DATE: BGB / 7-10-89

REVISED 9-19-89 SLA

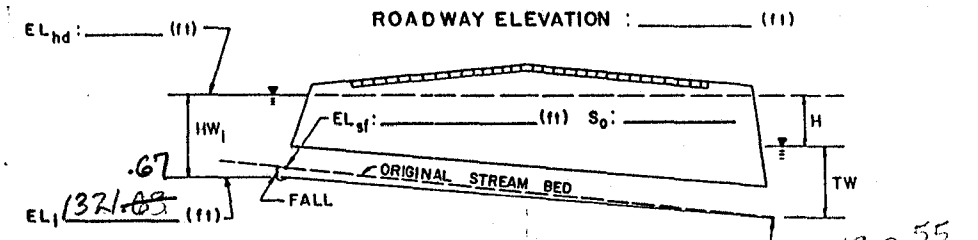
HYDROLOGICAL DATA

SEE ADD'L. SHTS.

- ☐ METHOD: ____
- ☐ DRAINAGE AREA: ____ ☐ STREAM SLOPE: ____
- ☐ CHANNEL SHAPE: ____
- ☐ ROUTING: ____ ☐ OTHER: ____

DESIGN FLOWS/TAILWATER

R.I. (YEARS)	FLOW (cfs)	TW (ft)
50	114	10 (TOP OF BOX)
100	128	10 (TOP OF BOX)



$S \approx S_o - FALL / L_a$

$S =$ ~~0.00095~~ 0.00912

$L_a =$ ~~220~~ 232

Revised 9/19/89

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW Q (cfs)	FLOW PER BARREL Q/N (1)	HEADWATER CALCULATIONS: INLET CONTROL HW_i/D (2)	HW_i	FALL (3)	EL_{hi} (4)	OUTLET CONTROL TW (5)	d_c	$\frac{d_c+D}{2}$	h_o (6)	k_e	H (7)	EL_{ho} (8)	CONTROL HEADWATER ELEVATION	OUTLET VELOCITY	COMMENTS
10' x 10' RCBC	128	128	0.27	2.7	14.5	24.3										CHART 8

TECHNICAL FOOTNOTES:

(1) USE Q/NB FOR BOX CULVERTS

(2) $HW_i/D = HW/D$ OR HW_i/D FROM DESIGN CHARTS

(3) $FALL = HW_i - (EL_{hd} - EL_{sf})$; FALL IS ZERO FOR CULVERTS ON GRADE

(4) $EL_{hi} = HW_i + EL_i$ (INVERT OF INLET CONTROL SECTION)

(5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL.

(6) h_o = TW or $(d_c + D/2)$ (WHICHEVER IS GREATER)

(7) $H = \left[1 + k_e + (29 n^2 L)/R^{1.33}\right] V^2/2g$

(8) $EL_{ho} = EL_o + H + h_o$

SUBSCRIPT DEFINITIONS:

a. APPROXIMATE
f. CULVERT FACE
hd. DESIGN HEADWATER
hi. HEADWATER IN INLET CONTROL
ho. HEADWATER IN OUTLET CONTROL
i. INLET CONTROL SECTION
o. OUTLET
sf. STREAMBED AT CULVERT FACE
tw. TAILWATER

COMMENTS / DISCUSSION:

10 ft. HEIGHT REQUIRED FOR EQUESTRIAN TRAIL, not for drainage reason.

CULVERT BARREL SELECTED:

SIZE: ____

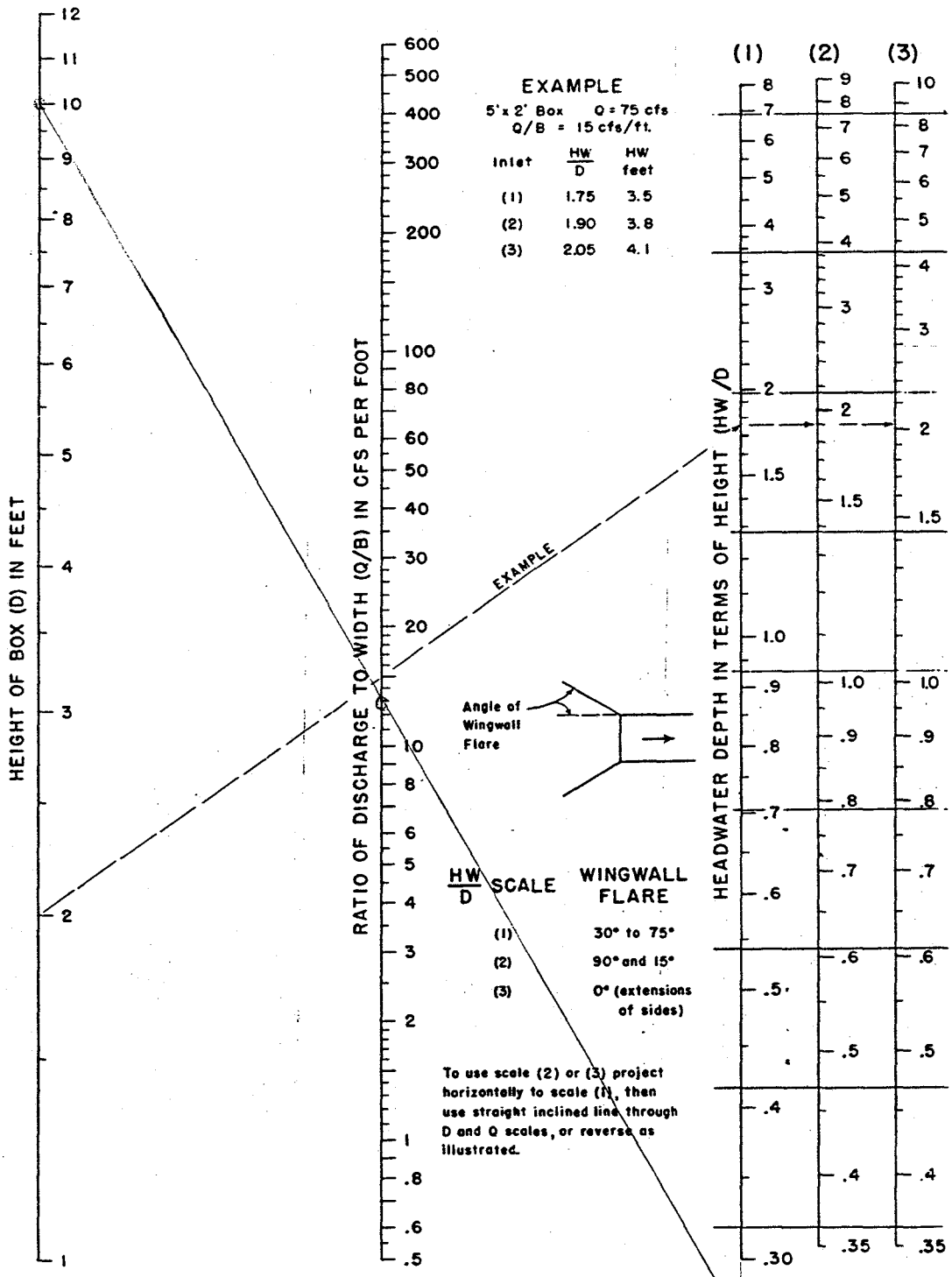
SHAPE: ____

MATERIAL: ____ n: ____

ENTRANCE: ____

PLEASANT DRIVE
BOX CULVERT

CHART 8



$\frac{Q}{B} = \frac{128}{10} = 12.8$

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

PROJECT: S.R. 51
DREAMY DRAW BOX CULVERT

STATION: 83 + 41

SHEET ____ OF ____

CULVERT DESIGN FORM

DESIGNER / DATE: SCA / 3/14/89

REVIEWER / DATE: BGB / 7-10-89

HYDROLOGICAL DATA

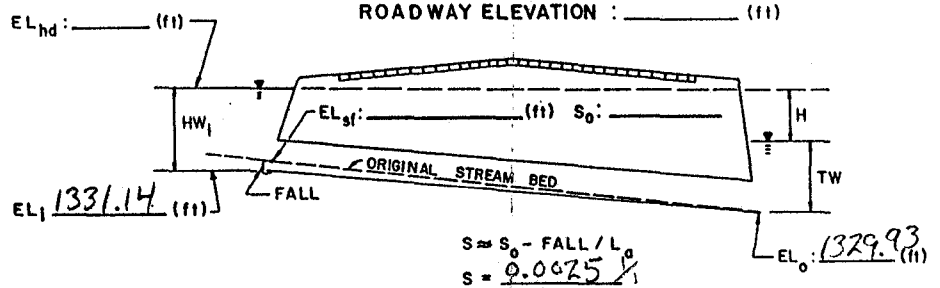
SEE ADD'L SHTS.

- ☐ METHOD: ____
- ☐ DRAINAGE AREA: ____ ☐ STREAM SLOPE: ____
- ☐ CHANNEL SHAPE: ____
- ☐ ROUTING: ____ ☐ OTHER: ____

DESIGN FLOWS/TAILWATER

R.I. (YEARS)	FLOW (cfs)	TW (ft)
50	618	4 (TOP OF BOX)
100	703	4 (TOP OF BOX)

ROADWAY ELEVATION: ____ (ft)



$S \approx S_o - FALL / L_o$

$S = 0.0025$ ft/ft

$L_o = 482$

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW Q (cfs)	FLOW PER BARREL Q/N (1)	HEADWATER CALCULATIONS: INLET CONTROL ✓ HW_i/D (2)	HW_i	FALL (3)	EL_hi (4)	OUTLET CONTROL TW (5)	d_c	(d_c+D)/2	h_o (6)	k_e	H (7)	EL_ho (8)	CONTROL HEADWATER ELEVATION	OUTLET VELOCITY	COMMENTS
2 (10' x 4') RCBC	703	352	1.42	5.68	6.5	36.8										CHART 8
	618	307	1.30	5.20		36.1										

TECHNICAL FOOTNOTES:

(1) USE Q/NB FOR BOX CULVERTS

(2) $HW_i/D = HW/D$ OR HW_i/D FROM DESIGN CHARTS

(3) $FALL = HW_i - (EL_{hd} - EL_{sf})$; FALL IS ZERO FOR CULVERTS ON GRADE

(4) $EL_{hi} = HW_i + EL_i$ (INVERT OF INLET CONTROL SECTION)

(5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL.

(6) h_o = TW or $(d_c + D/2)$ (WHICHEVER IS GREATER)

(7) $H = \left[1 + k_e + (29 n^2 L)/R^{1.33}\right] V^2/2g$

(8) $EL_{ho} = EL_o + H + h_o$

SUBSCRIPT DEFINITIONS:

a. APPROXIMATE
f. CULVERT FACE
hd. DESIGN HEADWATER
hi. HEADWATER IN INLET CONTROL
ho. HEADWATER IN OUTLET CONTROL
i. INLET CONTROL SECTION
o. OUTLET
sf. STREAMBED AT CULVERT FACE
tw. TAILWATER

COMMENTS / DISCUSSION:

CULVERT BARREL SELECTED:

SIZE: ____

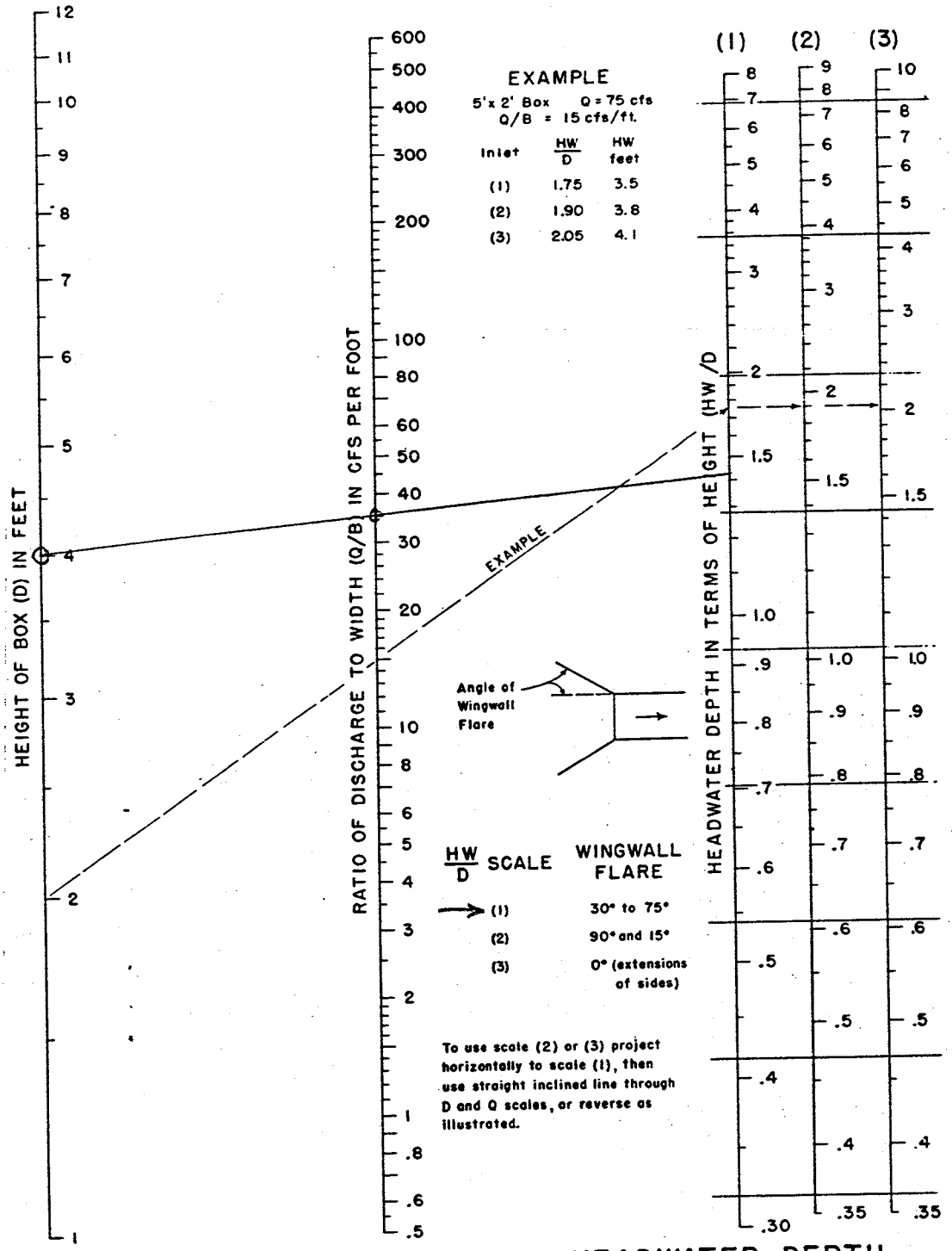
SHAPE: ____

MATERIAL: ____ n: ____

ENTRANCE: ____

DREAMY DRAW BOX CULV.

CHART 8



$\frac{Q}{B} = \frac{352}{10} = 35$

HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

$\frac{310}{10} = 31$

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BJK	Date 6/27/89	Job Number 13089
	Checked by [illegible]	Date 6/30/89	Sheet Number 1/5
For H.W. for pipe culverts	Backchecked by	Date	

* Orifice Flow Conditions

The following pipe culverts have been designed with inlet control, C-15.80 Inlets;

P-502

$Q_{50} = \cancel{18}\ 28$ cfs since drop inlets, assume orifice flow $(V^2 = 2gh)$

A_{eff} of C-15.80 grate $\Rightarrow \left[(2' \times 3') - 7(3')(.052')\right] \frac{1}{2} = 2.45\ ft^2$

(assumed 50% clogging)

$Q = VA \quad V = Q/A = \cancel{18}\ 28 / 2.45 = \cancel{7.3}\ 11.4\ ft/s$

$V = (K)(\sqrt{2gh})$

factor for orifice flow (from HEC-12 manual) $K = .67$

$V = Q/A = \frac{28}{4.9} = 5.7\ ft/s$ for Dbl Grate

check open flow

$h = \frac{V^2}{K(2g)} = \frac{(7.3)^2}{(.67)(2)(32.2)} = \frac{\cancel{1.04}\ 1.84'}{3.03'}$ ** H.W. → $\frac{HW}{D} = 1.32$ H.W. = 2.6'

try double grate (because adjoining wall)

$h = \frac{(5.7)^2}{(.67)(2)(32.2)} = \underline{0.75'}$

P-504

$Q = \cancel{28}\ 18$ cfs $V = Q/A = 28/2.45 = 11.4\ ft/s$

$h = \frac{V^2}{K(2g)} = \frac{(11.4)^2}{(.67)(2)(32.2)} = \frac{\cancel{3.03}\ 3.24'}{1.24}$ ** H.W. → $\frac{H.W.}{D} = 1.2$ H.W. = 3.0'

P-506

$Q = \cancel{35}\ 17$ cfs $V = 35/2.45 = \cancel{14.3}\ 6.9\ ft/s$ $V = \frac{17}{4.9} = 3.47$

$h = \frac{(\cancel{14.3}\ 6.9)^2}{.67(2)(32.2)} = \frac{\cancel{4.7}\ 3.4'}{1.11}$ ** H.W. → $\frac{H.W.}{D} = 1.0$ H.W. = 3.0'

$h = \frac{(3.47)^2}{(.67)(2)(32.2)} = 0.28\ ft$

~~(use double grate)~~

~~$V = 35/4.9 = 7.14$ $\frac{(7.14)^2}{(.67)(2)(32.2)} = 1.18'$ good~~

* helps above grate

** using HDS graph

ME101-0488(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by BSK	Date 8/22/89	Job Number 13089
For	Checked by BGB	Date 9/20/89	Sheet Number 2/5
	Backchecked by	Date	

P-514

$Q = 18$ cfs → $^{*}h = 1.24'$

**H.W. → $\frac{H.W.}{D} = 1.32$ ∴ H.W. = 2.6'

P-508

$Q = 31$ cfs → double grate assume $2(2.45^{\square}) = 4.9$ ft^2

$V = 31/4.9 = 6.3$ ft/s

$h = \frac{(6.3)^2}{(.67)(2)(32.2)} = {}^{*}0.93'$ **H.W. $\frac{HW}{D} = 1.3$ → H.W. = 3.2'

P-510

$Q = 56$ $V = 56/4.9 = 11.4$ ft/s ⇒ $h = {}^{*}3.03'$

**H.W. → $\frac{H.W.}{D} = 1.5$ ∴ H.W. = 4.5'

*heights above grate

P-512 – designed to handle existing flows

existing pipe → 42" x 150' @ 0.0267% CSP (n = .024)

table #37 → assume flowing full [Q = 90 cfs]

proposed slope = .009%, n = .012 Q = 110 cfs ✓

V = 10 ft/s

**H.W. = $3.5' + V^2/2g$

$= 3.5' + 10^2/2(32.2) = 5.05'$

P-500

$Q = 134$ $\frac{HW}{D} = 1.83$ → HDS #1 **H.W. = 7.3'

Inlet A_{eff} ⇒ Tw-1.2 area 3 grates = 4.66 ft^2 16(4.66) = 74.56 ft^2 (.50) = 37.3 ft^2 (assume clogging)

$V = Q/A = 134/37.3 = 3.59$ ft/s → $h = \frac{(3.59)^2}{}$ = $^{*}0.30'$

** Head water from HDS.

ME101-0488(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by JWW	Date 11 June 86	Job Number 13039-21-02
	Checked by	Date	Sheet Number 7 of ~~11~~ 5 5
For Special CR	Backchecked by	Date	

Find perimeter of C-15.50 LW 1.2 grate

net length = 3'-4" - (0'-1") = 3'-3" = 3.25'

net width = 1'-11 5/8" - (9(1/2")) = 1'-7 1/8" = 1.59'

net perimeter	w/o clogging	w/ 50% clogging
1 side - length	3.25 ✓	1.62 ✓
1 side - width	1.59 ✓	0.80 ✓
2 sides - length	6.50 ✓	3.25 ✓
2 sides - width	3.19 ✓	1.59 ✓
2 sides - 1 long 1 wide	4.84 ✓	2.42 ✓
3 sides - 1 long 2 wide	6.44 ✓	3.22 ✓
3 sides - 2 long 1 wide	8.09 ✓	4.05 ✓
4 sides - 2 long 2 wide	~~9.69~~ 12.86	4.84 ✓

ME101-1087-20M

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by SLA	Date 9-19-89	Job Number 13089
	Checked by BGB	Date 9-20-89	Sheet Number 3/5
For HW For Pipe Culvert	Backchecked by	Date	

* Wier Flow Conditions

CALCULATION OF PONDING DEPTH OVER THE GRATES USING WIER FLOW CONDITIONS

$$Q = C_w P d^{1.5} \qquad C_w = 3.0$$

$$d = \left(\frac{Q}{3P}\right)^{2/3}$$

P-502 $Q_{50} = 28$ cfs $P = 2(2.08) + 2(2.66)$ (SPECIAL DOUBLE AGAINST WALL)
$= 9.49$
$P_{eff} = P/2 = 4.75$ ft.

$d = \left(\frac{28}{3(4.75)}\right)^{2/3} = \underline{1.57 \text{ ft.}}$ ✓ ORIFICE CONDITIONS = 0.75 ft ✓ (Control) #

[IF C.B. NOT AGAINST WALL D = 1.17 ft]

P-504 $Q_{50} = 18$ cfs GRATE ⇒ LW 1.2 (C-15.80)
$P_{eff} = 4.84$ ft.

$d = \left(\frac{18}{3(4.84)}\right)^{2/3} = \underline{1.15 \text{ ft.}}$ ✓ # ORIFICE CONDITIONS = 1.24 ft.

P-506 $Q_{50} = 17$ cfs $P = 2(2.08) + 4(2.66)$ (SPECIAL DOUBLE)
$= 14.80$
$P_{eff} = P/2 = 7.40$ ft.

$d = \left(\frac{17}{3(7.40)}\right)^{2/3} = \underline{0.15 \text{ ft.}}$ (control) # ORIFICE CONDITIONS = 0.28 ft

P-508 $Q_{50} = 31$ cfs $P_{eff} = 7.40$ ft. (SPECIAL DOUBLE)

$d = \left(\frac{31}{3(7.40)}\right)^{2/3} = \underline{1.25 \text{ ft.}}$ ORIFICE CONDITIONS = 0.93 ft. #

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by SLA	Date 9-19-89	Job Number 13089
For	Checked by BGB	Date 9-20-89	Sheet Number 4/5
	Backchecked by	Date	

P-510 $Q_{50} = 56$ $P_{eff} = 7.40$ ft (SPECIAL DOUBLE)

$$d = \left(\frac{56}{3(7.4)}\right)^{2/3} = \underline{1.85 \text{ ft.}} \checkmark$$

ORIFICE CONDITIONS = 3.03 ft.

P-514 $q_{50} = 18$ cfs $P_{eff} = (2(1.59) + 3.25)\frac{1}{2} = 6.43$ (C-15.30 AGAINST WALL)

$$d = \left(\frac{18}{3(6.43)}\right)^{2/3} = \underline{0.95 \text{ ft}} \checkmark$$

ORIFICE CONDITION = 1.24 ft

P-500 $Q_{50} = 134$ cfs C.B. - SPECIAL DETAIL IG TW 1.2 GRATES

$$P_{eff} = \frac{1}{2}\left[(8 \times 2.42) + (4 \times 2.08)\right] = 13.76 \text{ ft}$$

$$d = \left(\frac{134}{3(13.76)}\right)^{2/3} = \underline{2.19 \text{ ft.}} \checkmark$$

ORIFICE CONDITION = 0.30 ft

101-0488(REV)

PROJECT S.R. 51: P-500
PROGRAMMER SLA 09-19-1989 Checked: BGS 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 4.000 FT OR 48.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.002200 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 134.0 CU. FT. PER SECOND

DESIGN FLOW IS 134.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 3.486 FEET OR 41.83 INCHES
NORMAL DEPTH IS 4.000 FEET OR 48.00 INCHES
EXIT VELOCITY IS 11.53 FEET PER SECOND
THE HEADWATER IS 7.16 FEET

PROJECT S.R. 51: P-502
PROGRAMMER SLA 09-19-1989 Checked: BGS 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 2.000 FT OR 24.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.008100 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 28.0 CU. FT. PER SECOND

DESIGN FLOW IS 28.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 1.842 FEET OR 22.10 INCHES
NORMAL DEPTH IS 2.000 FEET OR 24.00 INCHES
EXIT VELOCITY IS 9.26 FEET PER SECOND
THE HEADWATER IS 4.48 FEET

PROJECT S.R. 51: P-504
PROGRAMMER SLA 09-19-1989 Checked: BGS 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 2.500 FT OR 30.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.006000 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 18.0 CU. FT. PER SECOND

DESIGN FLOW IS 18.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 1.455 FEET OR 17.46 INCHES
NORMAL DEPTH IS 1.283 FEET OR 15.40 INCHES
EXIT VELOCITY IS 7.09 FEET PER SECOND
THE HEADWATER IS 2.17 FEET

PROJECT S.R. 51: P-506
PROGRAMMER SLA 09-19-1989 Checked: BGS 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 3.000 FT OR 36.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.004700 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 17.0 CU. FT. PER SECOND

DESIGN FLOW IS 17.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 1.335 FEET OR 16.02 INCHES
NORMAL DEPTH IS 1.212 FEET OR 14.54 INCHES
EXIT VELOCITY IS 6.35 FEET PER SECOND
THE HEADWATER IS 1.89 FEET

PROJECT S.R. 51: P-508
PROGRAMMER SLA 09-19-1989

Checked: BGB 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 2.500 FT OR 30.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.005000 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 31.0 CU. FT. PER SECOND

DESIGN FLOW IS 31.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 1.920 FEET OR 23.05 INCHES
NORMAL DEPTH IS 2.021 FEET OR 24.25 INCHES
EXIT VELOCITY IS 7.67 FEET PER SECOND
THE HEADWATER IS 3.26 FEET

PROJECT S.R. 51: P-510
PROGRAMMER SLA 09-19-1989 Checked: BGS 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 3.000 FT OR 36.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.005360 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 56.0 CU. FT. PER SECOND

DESIGN FLOW IS 56.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 2.453 FEET OR 29.43 INCHES
NORMAL DEPTH IS 2.657 FEET OR 31.89 INCHES
EXIT VELOCITY IS 9.05 FEET PER SECOND
THE HEADWATER IS 4.48 FEET

PROJECT S.R. 51: P-512
PROGRAMMER SLA 09-19-1989 Checked: BGB 9-19-89

CONCRETE PIPE WITH A
PREFAB END INLET (THROAT NOT CLOSED)

******* INLET CONTROL ONLY ******

THE DIAMETER IS 3.500 FT OR 42.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.009000 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 90.0 CU. FT. PER SECOND

DESIGN FLOW IS 90.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 2.973 FEET OR 35.68 INCHES
NORMAL DEPTH IS 2.525 FEET OR 30.29 INCHES
EXIT VELOCITY IS 12.11 FEET PER SECOND
THE HEADWATER IS 5.59 FEET

PROJECT S.R. 51: P-514
PROGRAMMER SLA 09-19-1989 Checked: BGB 9-19-89

CONCRETE PIPE WITH A
SQUARE EDGE AND HEADWALL INLET

******* INLET CONTROL ONLY ******

THE DIAMETER IS 2.000 FT OR 24.00 INCHES
SLOPE LINE LENGTH IS 0.0 FEET
THE SLOPE IS 0.004900 FEET/FOOT
MANNING'S 'n' IS 0.01200
FLOW, INLET CONTROL, IS 18.0 CU. FT. PER SECOND

DESIGN FLOW IS 18.0 CU. FT. PER SECOND
CRITICAL DEPTH IS 1.547 FEET OR 18.57 INCHES
NORMAL DEPTH IS 1.749 FEET OR 20.99 INCHES
EXIT VELOCITY IS 6.91 FEET PER SECOND
THE HEADWATER IS 2.65 FEET