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# SQUAW PEAK PARKWAY DRAINAGE REPORT

**PREPARED FOR THE CITY OF PHOENIX**

**APRIL 1988**

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# SQUAW PEAK PARKWAY
# SEGMENT NO. 5B
# DRAINAGE REPORT

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APRIL, 1988

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SQUAW PEAK PARKWAY

DRAINAGE REPORT

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CHAPTER 1

# INTRODUCTION

# CHAPTER 1

## INTRODUCTION

### Purpose

The purpose of this report is to present the results of the evaluation and design of stormwater facilities to serve Segment 5B of the proposed Squaw Peak Parkway. This report will also evaluate the impact of the adjacent drainage basins on the Parkway and the proposed stormwater collection system.

### Background

In July 1986, HNTB entered into an agreement with the City of Phoenix to provide engineering design services for Segment 5B of the proposed Squaw Peak Parkway. This segment consists of approximately 8,000 lineal feet of divided parkway extending from Bethany Home Road North to near Myrtle Avenue (Orangewood Avenue) along 18th and 19th Streets. The design of this project was administrated through the Squaw Peak Coordination Office under the direction of Mr. Peter Johnson. This drainage report was prepared as a part of the overall design.

### Objectives

The objectives of this drainage report are as follows:

- Identify individual drainage basins and determine anticipated flows from each basin.

- Determine sizes and slopes of a stormwater collection system to intercept the anticipated flows.

- Determine an alignment for the proposed system to discharge into an existing stormwater main near Bethany Home Road and 18th Street for the collection system South of the Arizona Canal, and to discharge into the Arizona Canal Diversion Channel (ACDC) for that portion of the collection system North of the Arizona Canal.

- Develop a design for a temporary detention facility to accommodate the anticipated stormwater flows for the parkway North of the Arizona Canal. This detention facility will be used until the ACDC is constructed.

- Evaluate the impact of stormwater flows from the Ocotillo Road drainage basin on the parkway and develop a means of conveying this flow.

- Evaluate the proposed stormwater conveyance structure at Myrtle Wash both hydraulically and as an equestrian crossing under the parkway.

## Findings and Conclusions

Existing Conditions:

- The drainage area tributary to the proposed parkway South of the Arizona Canal consists primarily of fully developed, flood-irrigated, residential lots.

- The drainage area tributary to the proposed parkway North of the Arizona Canal consists of three major drainage basins: 1) The Myrtle Wash drainage basin, 2) The Glendale Area drainage basin, and 3) The Ocotillo Road drainage basin.

- The Myrtle Wash drainage basin consists of approximately 426 acres with a maximum elevation difference of 1100-feet.

- The existing stormwater runoff from the Myrtle Wash drainage basin currently flows westerly underneath 19th Street (the proposed Squaw Peak Parkway alignment) via an existing 144-inch CMP. The existing Myrtle Wash culvert also serves as an equestrian crossing under 19th Street.

- The Glendale Area drainage basin consists of approximately 42 acres of residential development with an elevation difference of 66-feet. This drainage basin was divided into five subbasins for analysis and design.

- The Ocotillo Road drainage basin consists of approximately 626 acres with an elevation difference of 1360-feet. This drainage basin currently discharges directly into the Arizona Canal near the intersection of Ocotillo Road and 19th Street.

Design Procedures:

- The projected runoff from each of the subbasins South of the Arizona Canal was determined based upon the rational method using the City of Phoenix "Storm Drain Design Manual - Storm Drains with Paving of Major Streets" for a two-year design storm.

- The 18th Street storm drain lateral was sized based upon the calculated stormwater volumes from the Greiner Engineering report entitled "Squaw Peak Parkway Task 12

Technical Memorandum: Drainage Study of the Squaw Peak Corridor Between 16th Street and 24th Street, November, 1983", as per the instruction of the City of Phoenix Hydraulic Section.

- The storm drain mains North of the Arizona Canal were designed using the HNTB 411 - "Hydraulic Design of Storm Sewers" computer program.

- This project utilizes two types of City of Phoenix standard inlets. The P-1569 Type "M" inlet is used in areas with vertical curb and gutter. The P-1570 Type "N" inlet is used in areas with rolled curb and gutter and with the parkway's mountable curb and gutter.

- The maximum distance between inlets was set at 600-feet.

- Connector pipes were designed with a minimum full flow velocity of five feet-per-second and a minimum diameter of 15-inches.

- The projected runoff from each off-site drainage basin North of the Arizona Canal was determined based upon the TR-20 computer program.

Proposed Drainage system South of Arizona Canal:

- The proposed stormwater collection system South of the Arizona Canal consists of a lateral located in 18th Street with connector pipes extending West to the Squaw Peak Parkway and East to the individual side streets.

- The 18th Street Storm Drain will connect to a storm drain stub to be installed to approximately 240-feet North of

Bethany Home Road. This stub will be constructed as part of the Squaw Peak Parkway Segment 5A stormwater collection system (ST-842211).

Proposed Drainage System North of the Arizona Canal:

- The Myrtle Wash crossing of the Squaw Peak Parkway was designed to serve both as a stormwater crossing and as an equestrian crossing of the Parkway.

- The proposed Myrtle Wash crossing consists of a 10 x 10 reinforced concrete box culvert with a 10:1 sloped inlet incorporating a drop of approximately 18 feet.

- The existing flow conditions beyond the limits of the proposed channel improvements will not be significantly impacted by either increased velocity or depth of flow.

- All areas of increased velocity within the project limits occur within reinforced concrete structures or within concrete lined channels.

- Maximum velocities through the proposed inlet structure are in the range of 35 ft/sec to 40 ft/sec.

- The slope of proposed channel beyond the inlet structure is designed to maintain supercritical flow conditions for all storms of 10-year flow or larger.

- The proposed stormwater collection system North of the Arizona Canal consists of two separate systems: a lower system which collects stormwater from the depressed section of the Parkway under Glendale Avenue and drains

to a stormwater pump station, and an upper system which accepts the stormwater from this pump station plus collecting the off-site stormwater runoff from the Glendale Area drainage basins.

- The upper stormwater collection system will ultimately discharge directly into the proposed Arizona Canal Diversion Channel (ACDC). This system will temporaily discharge into a detention basin to be constructed within the proposed ACDC right-of-way.

- The proposed ACDC will ultimately directly accept the stormwater flows from the Ocotillo Road Drainage Basin.

- All portions of the upper system which would otherwise be tributary to the depressed portion of the parkway have been designed to intercept the 50-year storm in order to avoid major flows impacting the Glendale Pump Station.

- Until the ACDC is constructed, the stormwater flows from the Ocotillo Road Drainage Basin will be diverted through the detention basin located within the ACDC right-of-way and will outlet into the Arizona Canal through a concrete spillway.

- The temporary Ocotillo Road Detention Basin is designed to contain the stormwater runoff for a 10-year, 2-hour storm over the entire area tributary to the collection system.

- The spillway of the proposed detention basin is designed to pass the flow from the 50-year, 1-hour design storm over the Ocotillo Road Drainage Basin.

- The proposed spillway elevation is set at 1241.0 which is approximately the same elevation as the existing spillway into the Arizona Canal at the west end of Ocotillo Road.

CHAPTER 2

# EXISTING CONDITIONS

# CHAPTER 2

## EXISTING CONDITIONS

### Site Location and Characteristics

Segment 5B of the proposed Squaw Peak Parkway extends from Bethany Home Road North to near Orangewood Avenue along 18th and 19th Streets as shown on Figure 1. The general slope of the land is from northeast to southwest with the Arizona Canal intercepting all of the flow north of the canal. The existing site characteristics along this alignment differ considerably between the portions North and South of the Arizona Canal. The remainder of this report evaluates both the existing and proposed drainage systems separately for the portions of the parkway located North and South of the Arizona Canal.

### Existing Drainage South of the Arizona Canal

The drainage area tributary to the proposed parkway South of the Arizona Canal is bounded by the Arizona Canal on the North, 20th Street on the East, and Bethany Home Road on the South. This drainage basin generally slopes from the northeast to the southwest and consists primarily of fully developed, flood-irrigated, residential lots. These lots are designed to retain irrigation water and will also effectively retain the majority of the stormwater impacting this area. The remaining contributing area consists primarily of asphalt streets which drain West to 18th Street and then South to Bethany Home Road.

The proposed stormwater collection system will consist of a lateral in 18th Street with connector pipes extending West to the Squaw Peak Parkway and East to the individual side streets in order to collect the stormwater from each

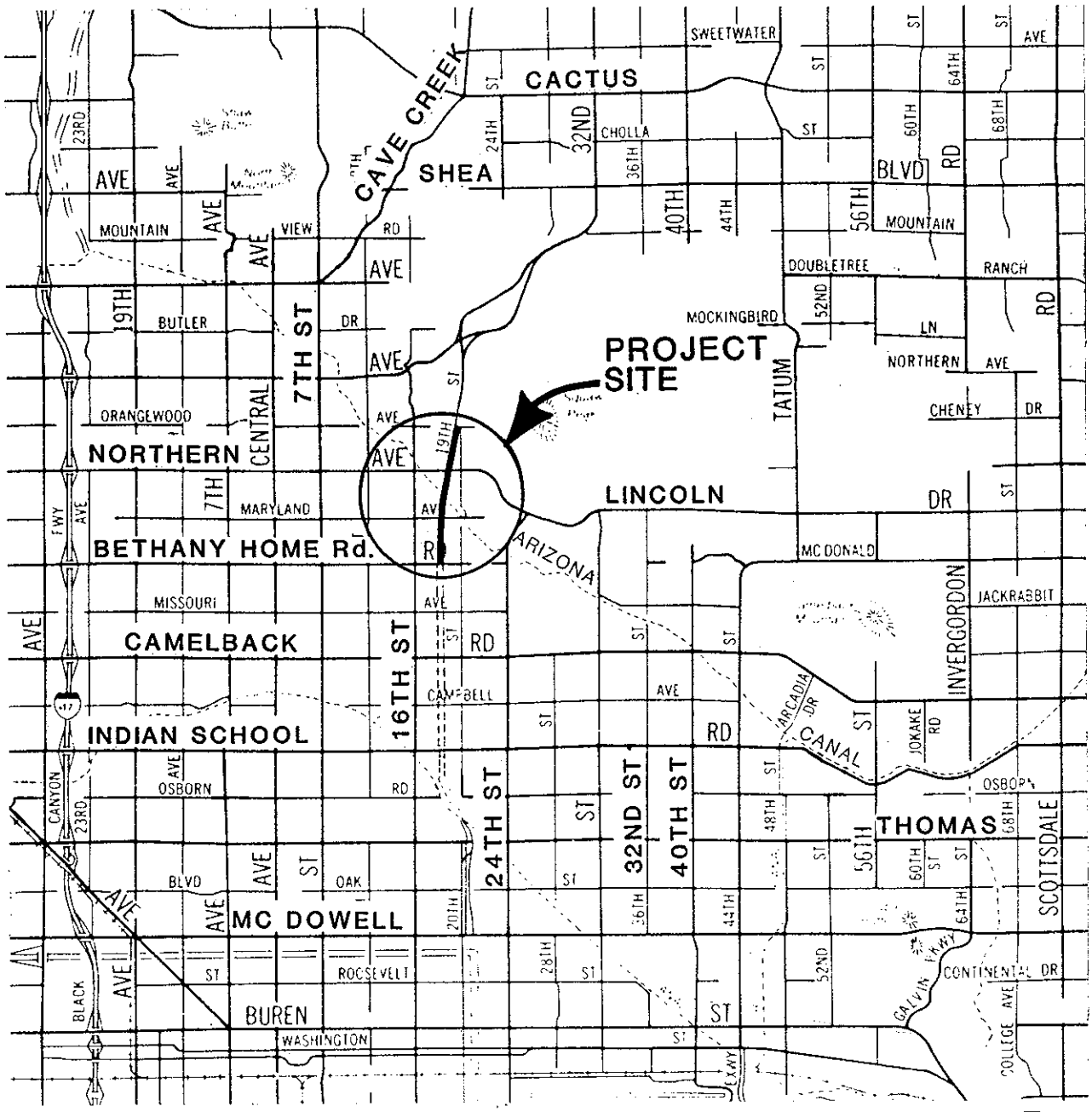


FIGURE 1
VICINITY MAP
NO SCALE

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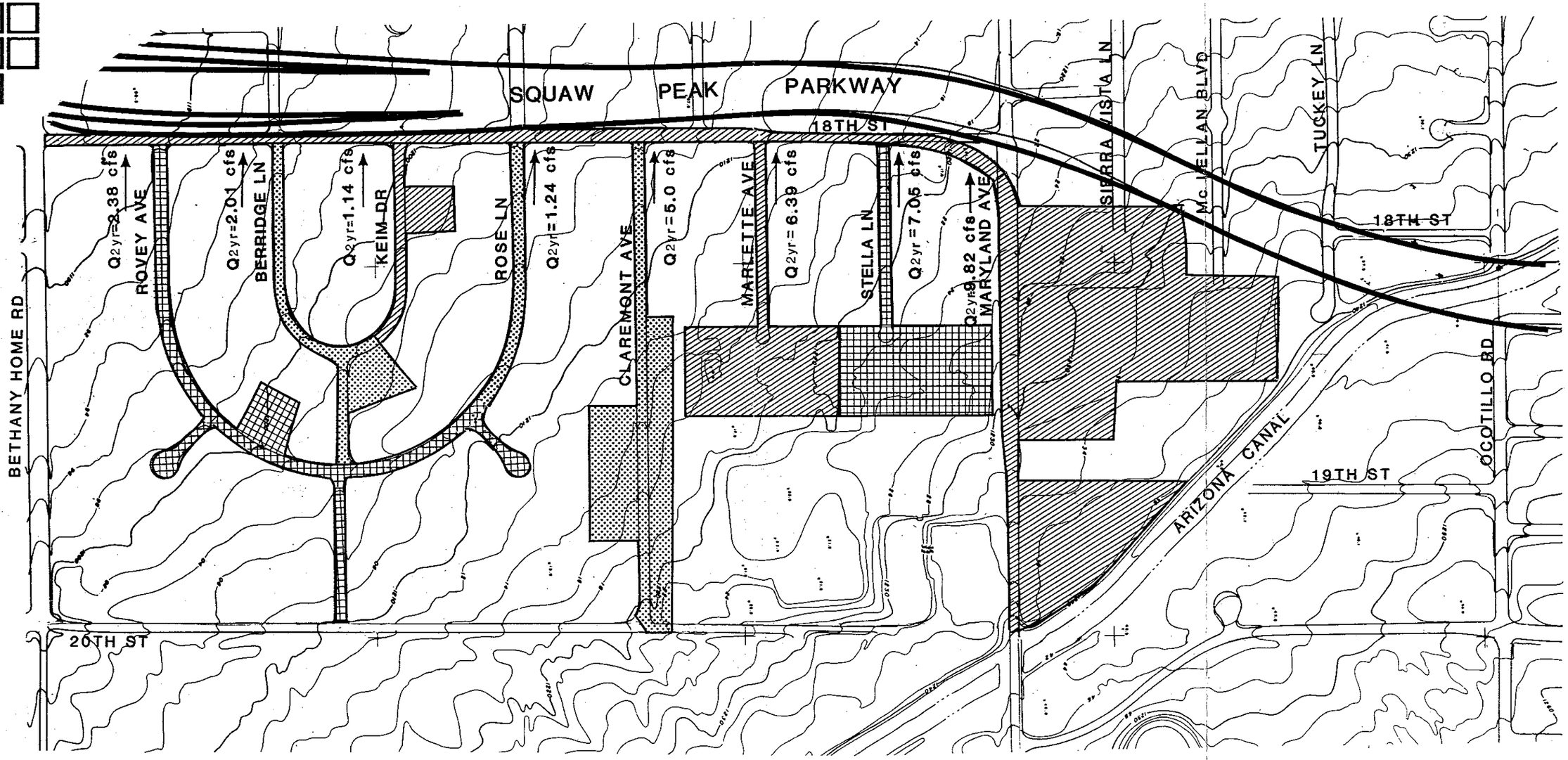


FIGURE 2

OFF-SITE DRAINAGE BASINS

18TH STREET COLLECTION SYSTEM

NOT TO SCALE

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subbasin. Each of the subbasins for the 18th Street collection system are shown in Figure 2.

## Existing Drainage North of the Arizona Canal

The drainage area tributary to the proposed parkway North of the Arizona Canal consists of three major drainage basins as shown on Figure 3. These basins consist of the Myrtle Wash drainage basin, which will cross the proposed parkway through the Myrtle Wash drainage structure; the Glendale Area drainage basin; and the Ocotillo Road drainage basin, which is tributary to the Arizona Canal at 18th Place.

The Myrtle Wash drainage basin consists of approximately 426 acres with a maximum elevation difference of 1100-feet. This drainage basin is approximately two thirds undeveloped land with the remainder being primarily residential development. The existing stormwater runoff from this basin currently crosses under 19th Street (the proposed Squaw Peak Parkway alignment) via an existing 144-inch CMP. This culvert also serves as an equestrian crossing under 19th Street. This equestrian crossing is to be maintained under the proposed Squaw Peak Parkway.

The Glendale Area drainage basin consists of approximately 42 acres of residential development with an elevation difference of 66-feet. The stormwater flows generated from this drainage basin are of particular concern as they directly impact the Squaw Peak Parkway and must be collected by the proposed parkway's stormwater collection system. The Glendale Area drainage basin has been further divided into five subbasins as shown on Figure 4. Each of these subbasins was analyzed individually in the design of the proposed stormwater collection system.

The Ocotillo Road drainage basin consists of approximately 626 acres with a maximum elevation difference of 1360-feet.

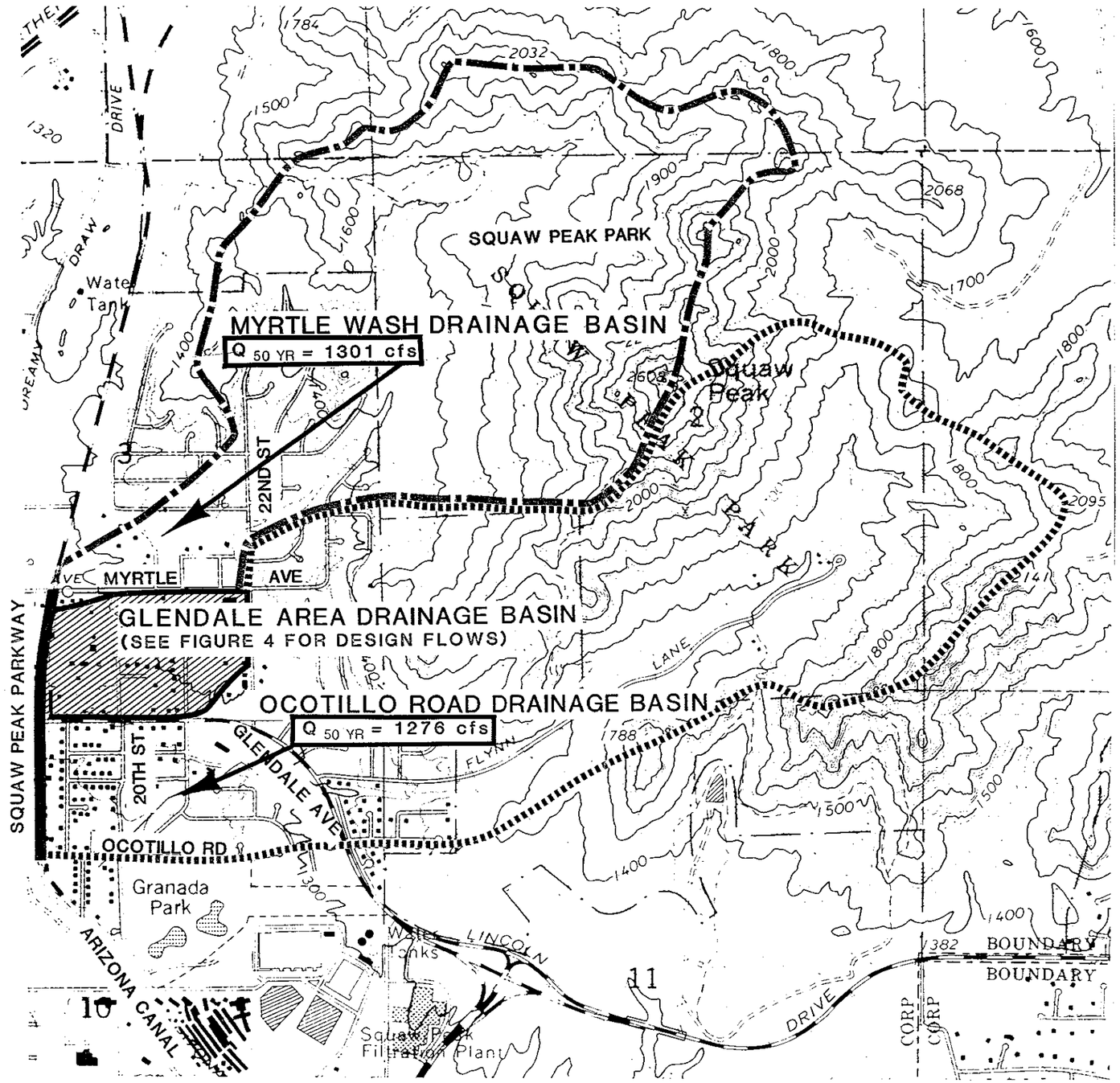


FIGURE 3

OFF-SITE DRAINAGE BASINS NORTH OF ARIZONA CANAL

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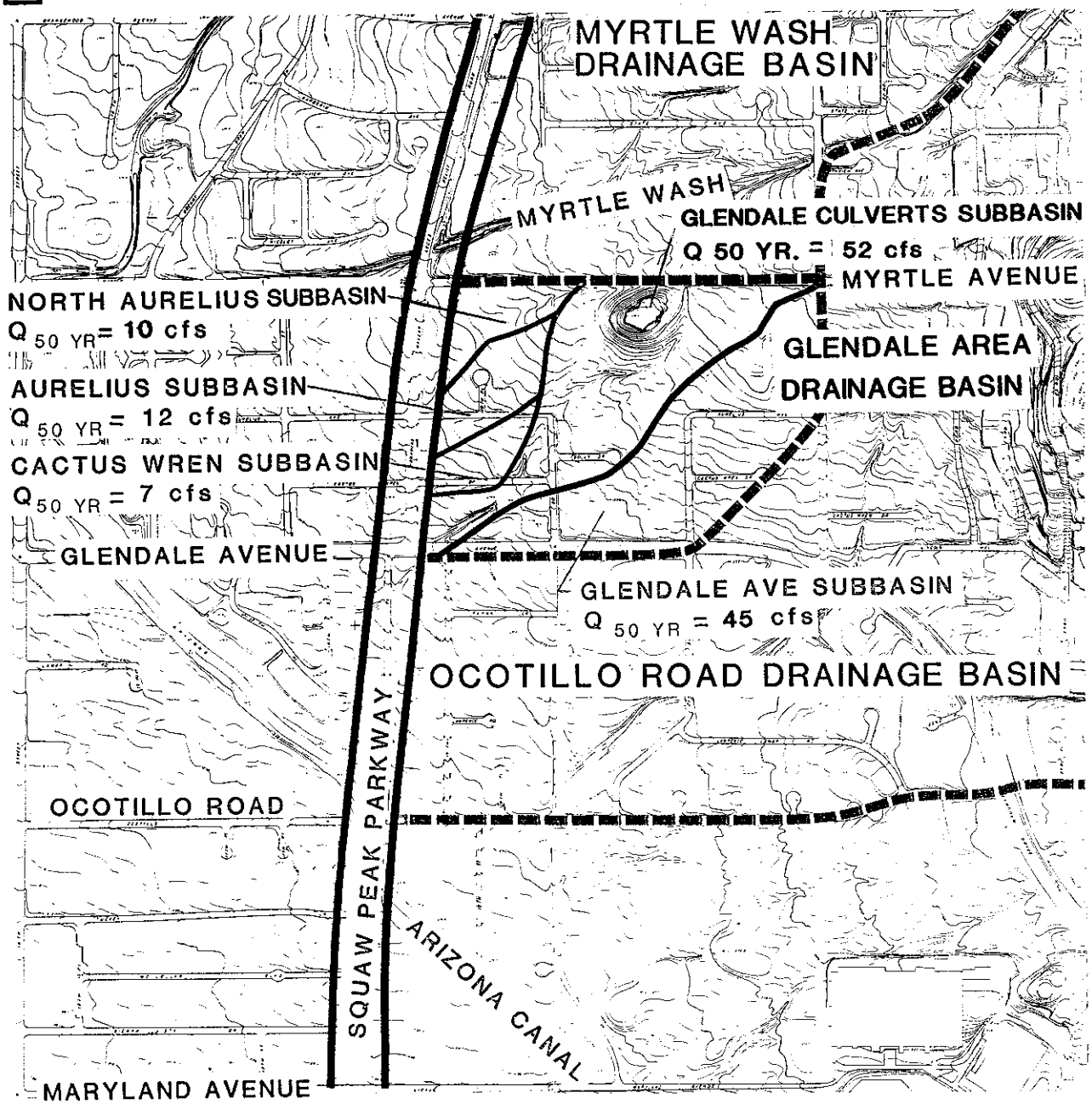

FIGURE 4

GLENDALE AREA SUBBASINS

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drainage basin is approximately one half undeveloped land with the remainder being primarily residential development. The stormwater flows generated from this basin currently discharge directly into the Arizona Canal near the intersection of Ocotillo Road and 18th Place.

CHAPTER 3

# DESIGN PROCEDURE SOUTH OF ARIZONA CANAL

# CHAPTER 3

## DESIGN PROCEDURE SOUTH OF ARIZONA CANAL

### Drainage Basin Analysis

The existing drainage basin South of the Arizona Canal was divided into eight individual subbasins based upon a detailed analysis of existing topographic maps in addition to field surveys identifing existing retention areas and drainage basin boundarys. Each of these drainage subbasins are presented on Figure 2.

The projected runoff from the resulting subbasins was determined based upon the rational method using the City of Phoenix "Storm Drain Design Manual - Storm Drains with Paving of Major Streets" for a two-year design storm.

### Storm Sewer Main Sizing

The 18th Street storm sewer main was sized based upon the calculated stormwater volumes from the Greiner Engineering report entitled "Squaw Peak Parkway Task 12 Technical Memorandum: Drainage Study of the Squaw Peak Corridor Between 16th Street and 24th Street, November, 1983." The stormwater volumes in this report were determined by the TR-20 stormwater modeling method.

HNTB was instructed to use the stormwater volumes from the Greiner report to size the 18th Street storm sewer following the April 28, 1987 meeting with the City of Phoenix Drainage Department staff. A summary of this meeting is included in the appendix of this report.

The 18th Street storm sewer main was designed using the predetermined assumed stormwater volumes with a Mannings' equation assuming a roughness coefficient, N of 0.012 and a minimum full flow velocity of five feet-per-second.

## Inlet Design

Two types of inlets will be used within the project area. The P-1569 Type "M" is a curb inlet catch basin which is to be installed in areas where vertical curb and gutter will be constructed. The P-1570 Type "N" is a gutter inlet which is to be installed on the parkway adjacent to the mountable curb and in other areas where rolled curb and gutter will be installed.

The maximum distance between inlets was set at 600-feet. Inlets were also placed where needed at sections with 1.5% - 2% pavement cross-slopes in areas of superelevation transition. This placement was done in order to prevent excessive amounts of runoff from crossing the pavement in the transition areas.

Inlet design was based upon the City of Phoenix design manual, page 4-5. The stormwater flow in the gutter, flow intercepted by each inlet, and the flow-by stormwater volume was computed for each inlet using the "HEC-12" computer program which was developed to utilize the City of Phoenix manual methods.

## Catch Basin Depth and Connector Pipe Design

The procedure and charts contained in the City of Phoenix "Storm Drain Design Manual - Storm Drains with paving of Major Streets" were used in the determination of catch basin depths and connector pipe design. Connector pipes were designed with a minimum full flow velocity of five feet-per-second and a minimum diameter of 15-inches.

CHAPTER 4

# DESIGN PROCEDURE NORTH OF ARIZONA CANAL

# CHAPTER 4

## DESIGN PROCEDURE NORTH OF THE ARIZONA CANAL

### Drainage Basin Analysis

The limits of the three major drainage basins North of the Arizona Canal were identified based upon an analysis of existing topographic maps. These drainage basins are presented on Figure 3. The Glendale Area drainage basin, which contains all of the off-site area tributary to the stormwater collection system, was further subdivided into five subbasins based on the results of a field survey to identify drainage basin boundries. These subbasins are presented on Figure 4.

The projected runoff generated from each of these basins was determined based upon the Soil Conservation Service TR-20 computer program. The proposed Myrtle Wash drainage box culvert and inlet structure was modeled using a HEC-2 computer analysis for the 100, 50, and 10-year design storms. The existing condition of the Myrtle Wash drainage channel was also modeled for the 100-year design storm for comparison. The output from each of these analyses is included in the appendix of this report.

The projected runoff from the Myrtle Wash Drainage Basin was correlated with a value from a previously conducted study by the U.S. Army Corp of Engineers. This value was further correlated with a value obtained by a study conducted by AN West Inc., Consulting Engineers, Phoenix, Arizona. Following

a meeting of February 25, 1987, a decision was made by Mr. Art May of the Arizona Department of Transportation, District 1 Office, to use the more conservative of the values for the 100-year and the 50-year peak discharges. These values were used in the design and analysis of the Myrtle Wash culvert crossing. Copies of the letters submitted to Mr. Art May by both AN West and HNTB are included in the appendix of this report.

The Ocotillo Road Drainage basin will discharge into the Arizona Canal through a temporary detention basin until it's ultimate outfall into the proposed Arizona Canal Diversion Channel (ACDC) is constructed. This flow through the temporary detention basin and into the Arizona Canal was modeled using a HEC-2 computer analysis for the 50-year design storm. The output from this analysis is included in the appendix of this report.

The projected runoff from the Ocotillo Road Drainage basin was also compared with a value from a previously conducted study by the U.S. Army Corp of Engineers. The more conservative of these values was used in the design of the spillway facility into the Arizona Canal.

Each of the five subbasins comprising the Glendale Area Drainage Basin was analyzed based upon the Soil Conservation Service TR-20 computer program for the 50-year design storm.

## Storm Sewer Main Sizing

The storm sewer mains North of the Arizona Canal were designed using the HNTB 411 - "Hydraulic Design of Storm Sewers" computer program. This program utilizes Manning's

equation to design for a storm sewer capacity equal to 100 to 105 percent of the design discharge. The storm sewer mains were designed assuming a roughness coefficient of N = 0.012 and a minimum full flow velocity of five feet-per-second.

## Inlet Design

Two types of inlets will be used within the project area. The P-1569 Type "M" is a curb inlet catch basin which is to be installed in areas where vertical curb and gutter will be constructed. The P-1570 Type "N" is a gutter inlet which is to be installed on the parkway and in other areas where rolled or mountable curb and gutter will be installed.

The maximum distance between inlets was set at 600-feet. Inlets were also placed where needed at sections with 1.5% - 2% pavement cross-slopes in areas of super elevation transition. This placement was done in order to prevent excessive amounts of runoff from crossing the pavement at the transition areas.

Inlet design was based upon the City of Phoenix design manual, page 4-5. The stormwater flow in the gutter, flow intercepted by each inlet, and the flow-by stormwater volume was computed for each inlet using the "HEC-12" computer program which was developed to utilize the City of Phoenix manual methods.

## Catch Basin Depth and Connector Pipe Design

The procedure and charts contained in the City of Phoenix "Storm Drain Design Manual - Storm Drains with paving of Major Streets" were used in the determination of catch basin

depths and connector pipe design. Connector pipes were designed with a minimum full flow velocity of five feet-per-second and a minimum diameter of 15-inches for that portion of the parkway south of Glendale Avenue, and a minimum diameter of 18-inches for that portion of the parkway north of Glendale.

# CHAPTER 5
# PROPOSED DRAINAGE SYSTEM SOUTH OF ARIZONA CANAL

# CHAPTER 5

## PROPOSED DRAINAGE SYSTEM SOUTH OF THE ARIZONA CANAL

### Stormwater Collection System

The proposed stormwater collection system South of the Arizona Canal consists of a stormwater lateral located in 18th Street with connectors extending both East and West to collect stormwater generated from the proposed Squaw Peak Parkway and from the side street subbasins located East of 18th Street. This lateral will connect to a storm drain stub which will be installed to approximately 240-feet North of Bethany Home Road. This storm sewer stub will be constructed as part of the Squaw Peak Parkway Section 5A stormwater collection system.

The 18th Street stormwater lateral was sized based upon the calculated stormwater volumes from the Greiner Engineering report entitled Squaw Peak Parkway Task 12 Technical Memorandum: Drainage Study of the Squaw Peak Corridor Between 16th Street and 24th Street, November, 1983. This report is a comprehensive drainage study of the Squaw Peak Parkway corridor and was also used in the design of the stormwater collection system for Segment 5A. The connector pipe extending from the main were designed using the rational method to compute design flow.

The proposed stormwater collection system South of the Arizona Canal is presented on Figure 5.

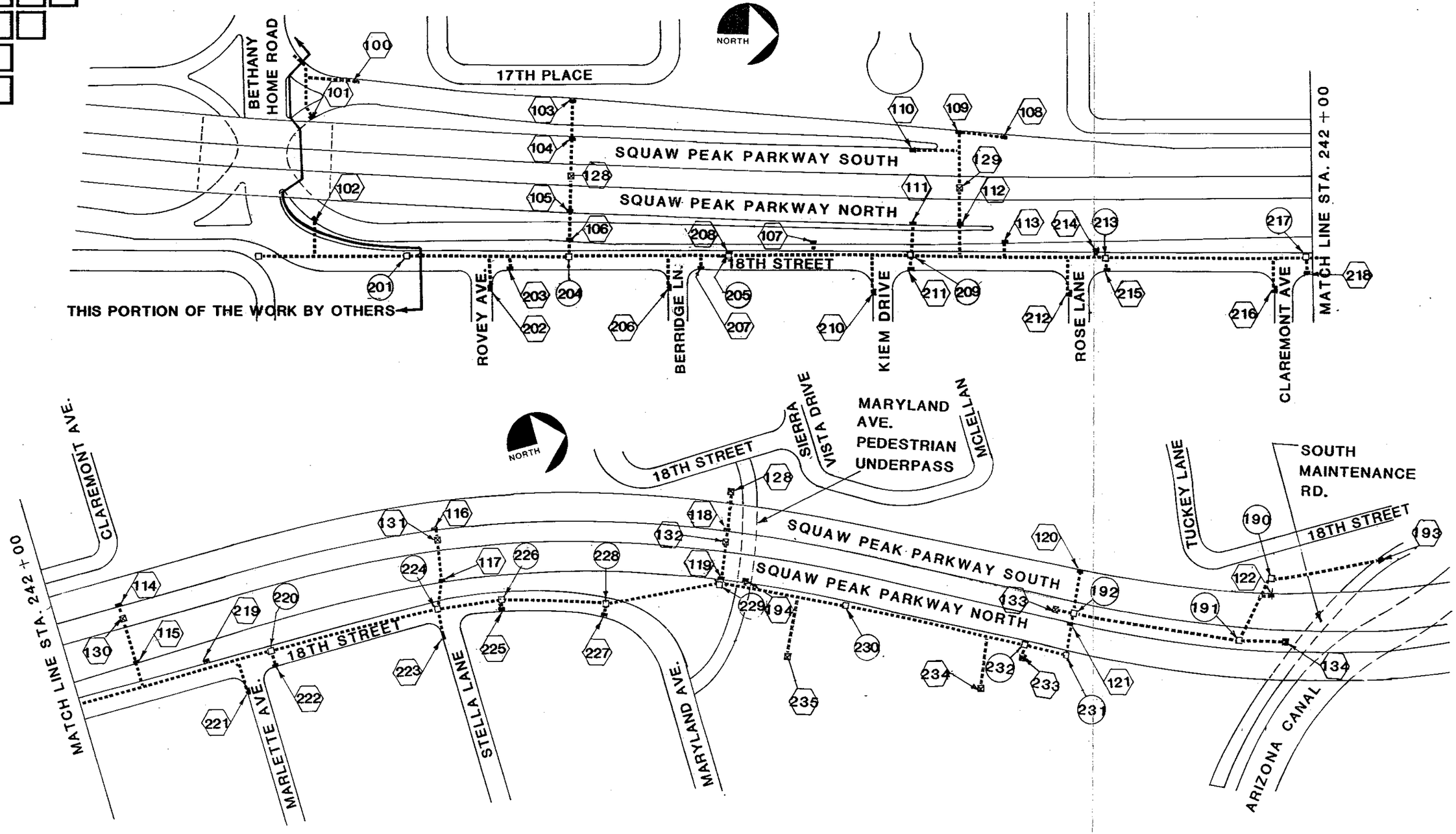


FIGURE 5
STORMWATER COLLECTION SYSTEM
SOUTH OF ARIZONA CANAL

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The 100-year storm water flow from the area North of Bethany Home Road will travel southerly on 18th Street and will cross the Squaw Peak Parkway at Bethany Home Road. The Maryland Avenue pedestrian underpass has been designed above the 100-year water level at Maryland Avenue and will not function as a stormwater crossing under the Squaw Peak Parkway. Major drainage structures, such as inverted siphons for 100-year storm flows, have not been utilized in the design of the proposed drainage system south of the Arizona Canal since the resulting drainage course following the construction of the Squaw Peak Parkway is quite similar to the existing conditions. Additionally, the drainage area tributary to the parkway north of Bethany Home Road and south of the Arizona Canal consists primarily of fully developed, flood-irrigated residential lots. These lots are bermed to retain irrigation waster and will effectively retain stormwater for very large storm events.

CHAPTER 6

# PROPOSED DRAINAGE SYSTEM NORTH OF THE ARIZONA CANAL

## CHAPTER 6

## PROPOSED DRAINAGE SYSTEM NORTH OF ARIZONA CANAL

As discussed in Chapter 2 of this report, the existing drainage area which impacts the proposed parkway North of the Arizona Canal is divided into three major basins. Each of these three basins was analyzed separately in the design of the proposed stormwater drainage system.

### Myrtle Wash Drainage Basin

The Myrtle Wash crossing of the Squaw Peak Parkway was designed to serve both as a stormwater conduit and as an equestrian crossing of the Parkway.

The proposed culvert design consists of a 10 x 10 reinforced concrete box culvert under the parkway. Concrete slope paving will be used for slope stabilization for approximately 525-feet beyond the outlet of the box culvert.

The inlet of the proposed culvert will be a sloped-tapered design which will incorporate a rise of approximately 18-feet from the invert of the proposed box to the existing channel bottom of Myrtle Wash. This inlet is designed so that horses using the equestrian crossing will enter the culvert through the throat and proceed down the inlet to the box culvert on an approximate slope of 10%.

The overall design of the Myrtle Wash drainage basin improvements is such that existing flow conditions beyond the limits of the proposed channel improvements will not be significantly impacted by either increased velocity or increased depth of flow. All areas of increased velocity within the project limits occur within reinforced concrete structures or within concrete lined channels.

Plan and Profile sheets of the proposed Myrtle Wash crossing are presented as Figures 6A - 6B.

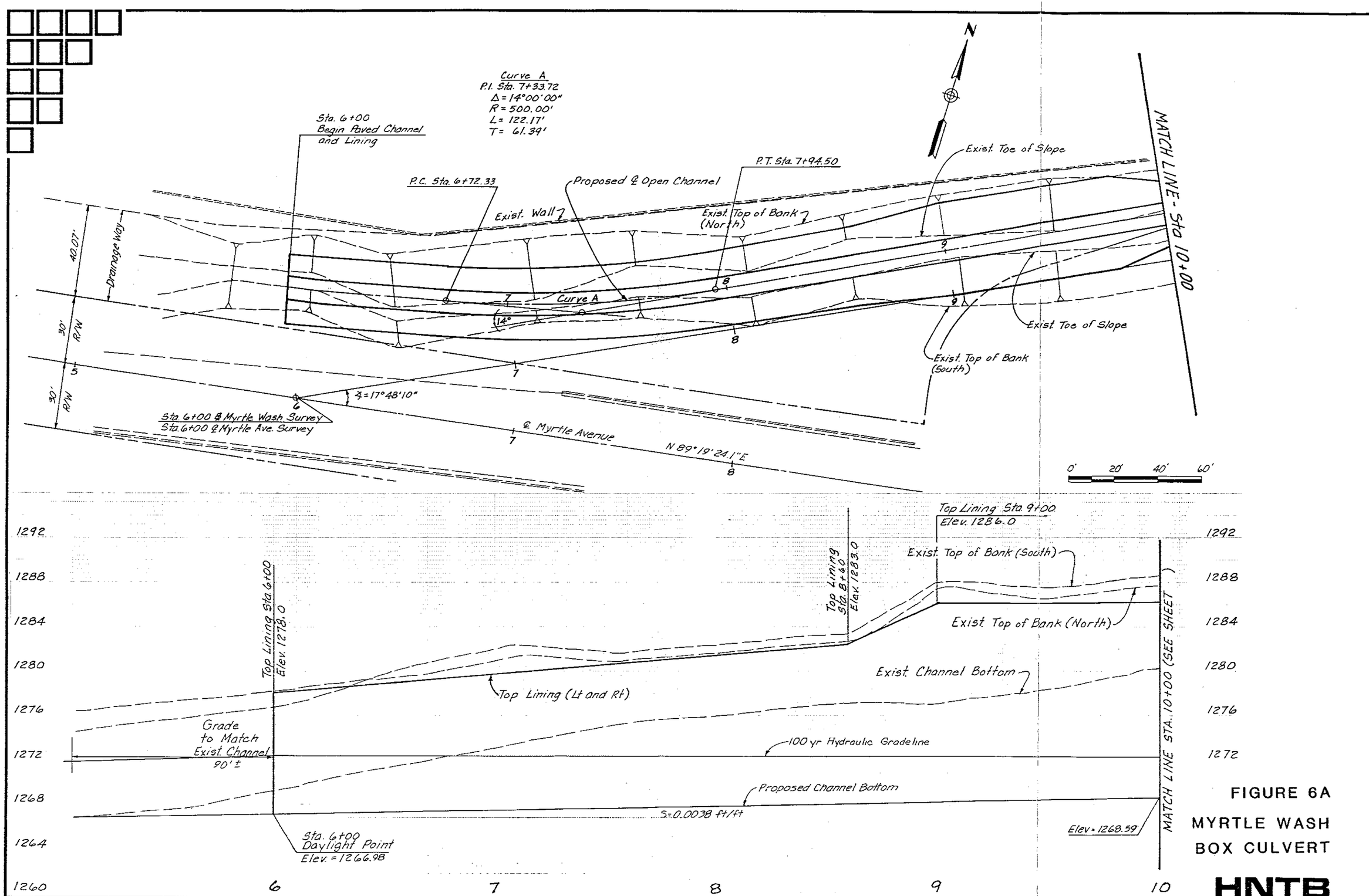


FIGURE 6A

MYRTLE WASH

BOX CULVERT

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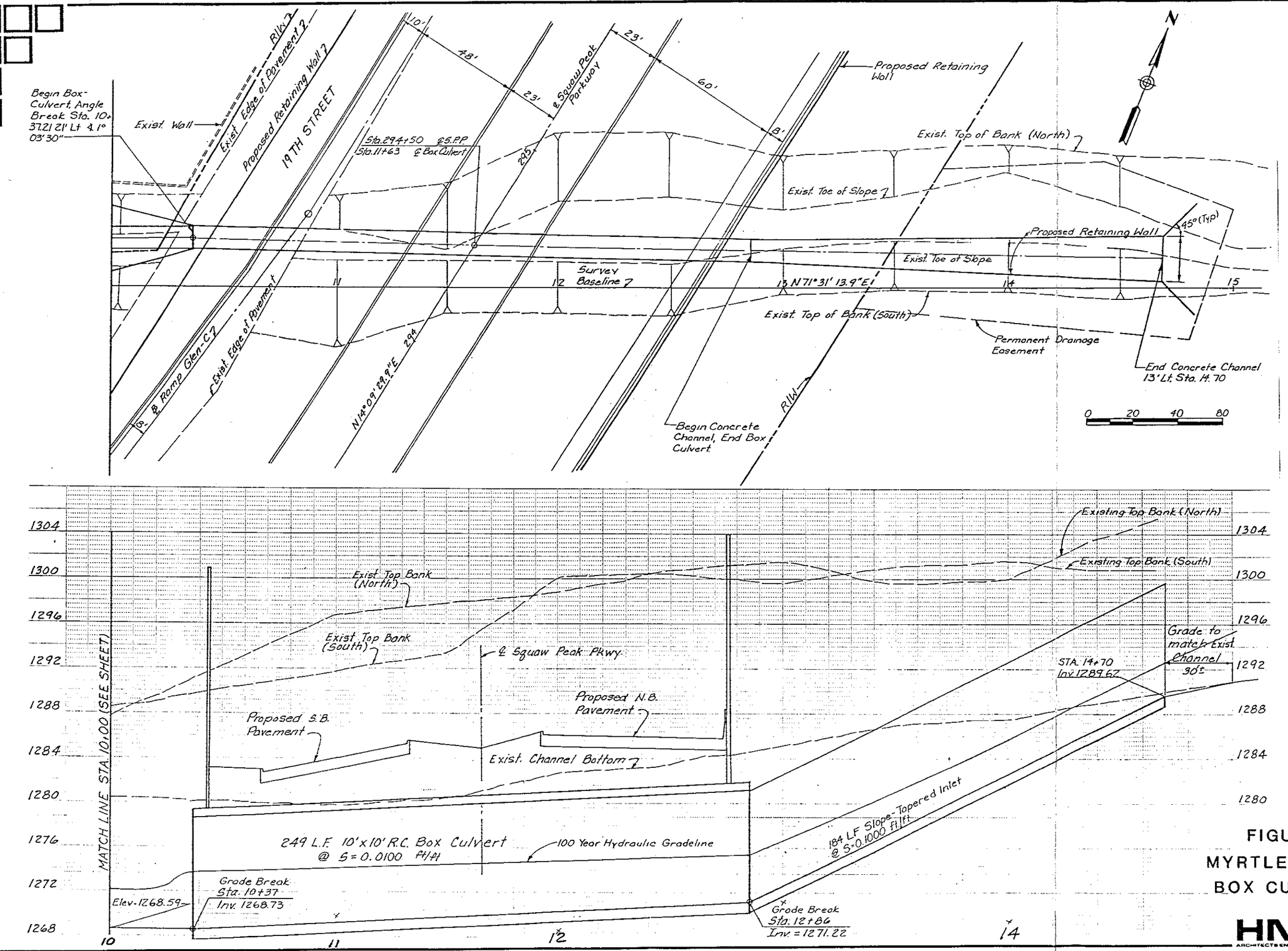


FIGURE 6B
MYRTLE WASH
BOX CULVERT

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The existing channel is on a slope averaging 2%, which is significantly steeper than critical slope, therefore there is supercritical slope throughout the reach the existing channel. — Do this all the way to ACDC.

Because the Squaw Peak Parkway is depressed at Myrtle Wash the flowline of the new box culvert is approximately 13' below the existing flowline. This drop occurs within a 184 foot long concrete inlet channel which tapers from 20 feet wide at the upstream end to 10 feet wide at the entrance of the box culvert. Due to the increased channel slope, the velocities through the proposed inlet structure are quite high. Maximum velocities, as calculated by a HEC-2 computer analysis are in the range of 35 ft/sec to 40 ft/sec throughout the inlet structure.

To slow the velocities would require baffles, a shilling pool (with a drywell to drain standing water) or a conventional drop structure seperate from the equestrian crossing. All alternates are quite expansive and would require extensive hydraulic study which is not within the scope of this project.

The drop downstream of the inlet structure would require a flatter than existing slope in order to match the existing flowline within a practical distance. However too flat a slope would cause a change from supercritical to subcritical flow and would cause a hydraulic jump to occur. If all slopes throughout the project could be maintained at steeper than critical slopes no hydraulic jump would occur. The

box — supercritical
paved channel — supercritical for > 10yr
downstream — ?

slope of the proposed channel beyond the inlet structure was therefore designed in such a way as to maintain supercritical flow for all major storm events.

The box culvert under the Squaw Peak Parkway has almost 5' freeboard in order to allow for unobstructed structure flow. The slope of the box culvert was set at a 1% slope in order to assure supercritical flow for virtually all flow conditions. The slope in the paved channel downstream of the culvert was set on a slope of 0.0038 ft/ft which will assure supercritical flow for 10-year flows and larger. — what about downstream of the paved channel?

This slope would cause hydraulic jumps to occur for flows smaller than the 10 year storms. This condition was not analyzed. Calculations which show critical slopes for the various storm return period flows are included in the appendix of this report.

## Stormwater Collection System

The stormwater collection system serving the section of the proposed parkway North of the Arizona Canal contains two separate systems as shown on Figure 7. This collection system has been designed to minimize the area which must be drained to the pump station. The vertical alignment of the parkway North of the Arizona Canal becomes depressed inorder to cross under Glendale Avenue. This vertical alignment creates a local sump condition which cannot be drained by gravity. The stormwater pump station is used to provide a means of draining the Squaw Peak Parkway through this depressed section. This stormwater pump station will be

located at the northeast corner of Glendale and the Squaw Peak Parkway and will discharge into the upper system where the stormwater will continue by gravity.

The upper stormwater collection system will accept the stormwater from this pump station plus collecting the offsite stormwater runoff from the Glendale Area drainage basins. All portions of the upper system which would otherwise be tributary to the depressed portion of the parkway have been designed to intercept the 50-year storm in order to avoid major flows impacting the Glendale Pump Station. The upper system will ultimately outlet directly into the proposed Arizona Canal Diversion Channel (ACDC) which will be located immediately North of the Arizona Canal. Since the Squaw Peak Parkway is scheduled to be constructed prior to the construction of the ACDC, the upper stormwater collection

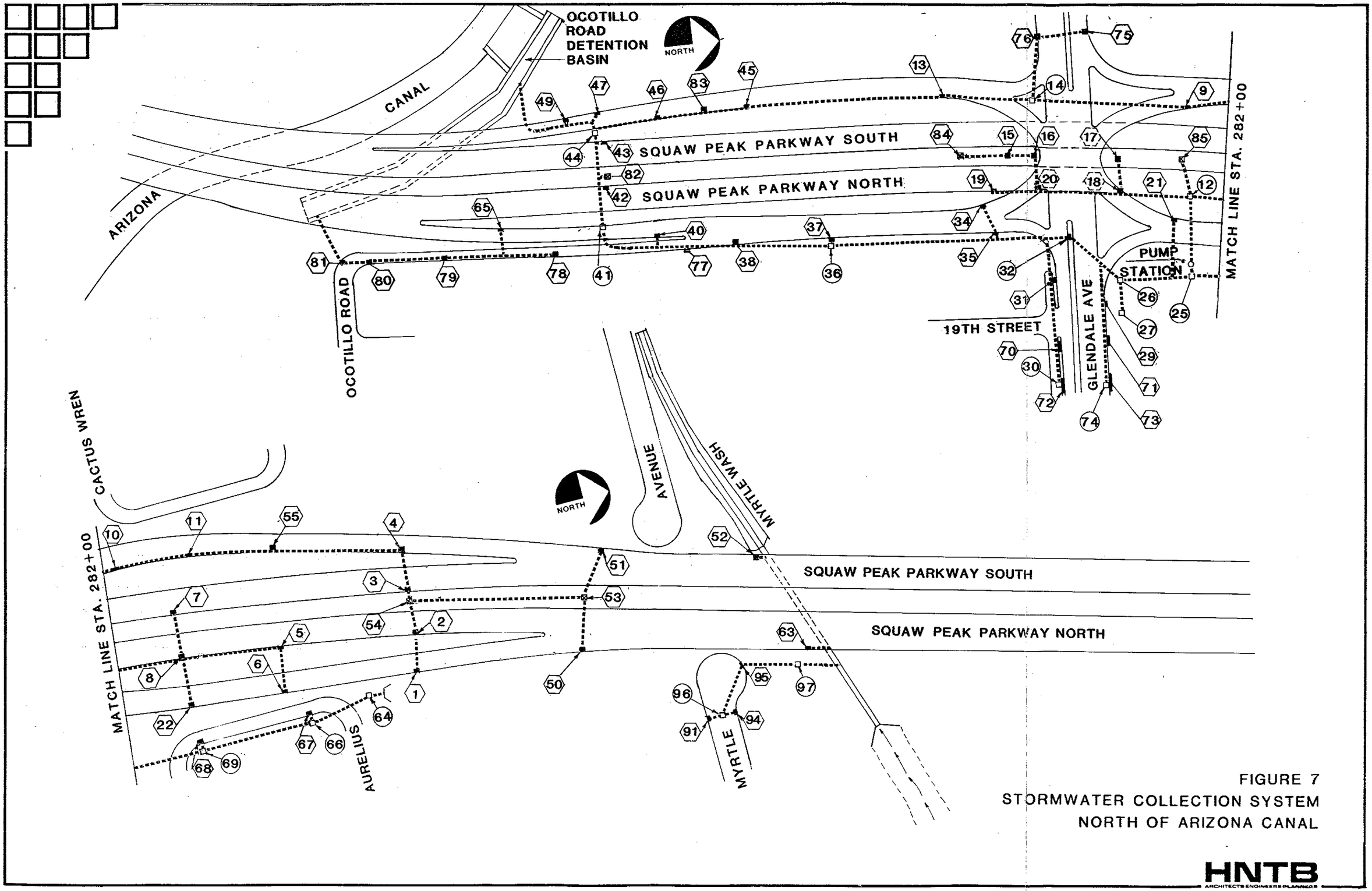


FIGURE 7
STORMWATER COLLECTION SYSTEM
NORTH OF ARIZONA CANAL

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system will temporarily discharge into a detention basin to be constructed within the proposed ACDC right-of-way.

This temporary detention basin is designed to contain the stormwater runoff which would be contributed from the stormwater collection system for a 10-year, 2-hour storm over the entire area tributary to the collection system. The detention basin will discharge through a small pump station at a controlled rate into the existing Arizona Canal. This detention basin is presented in Figure 8.

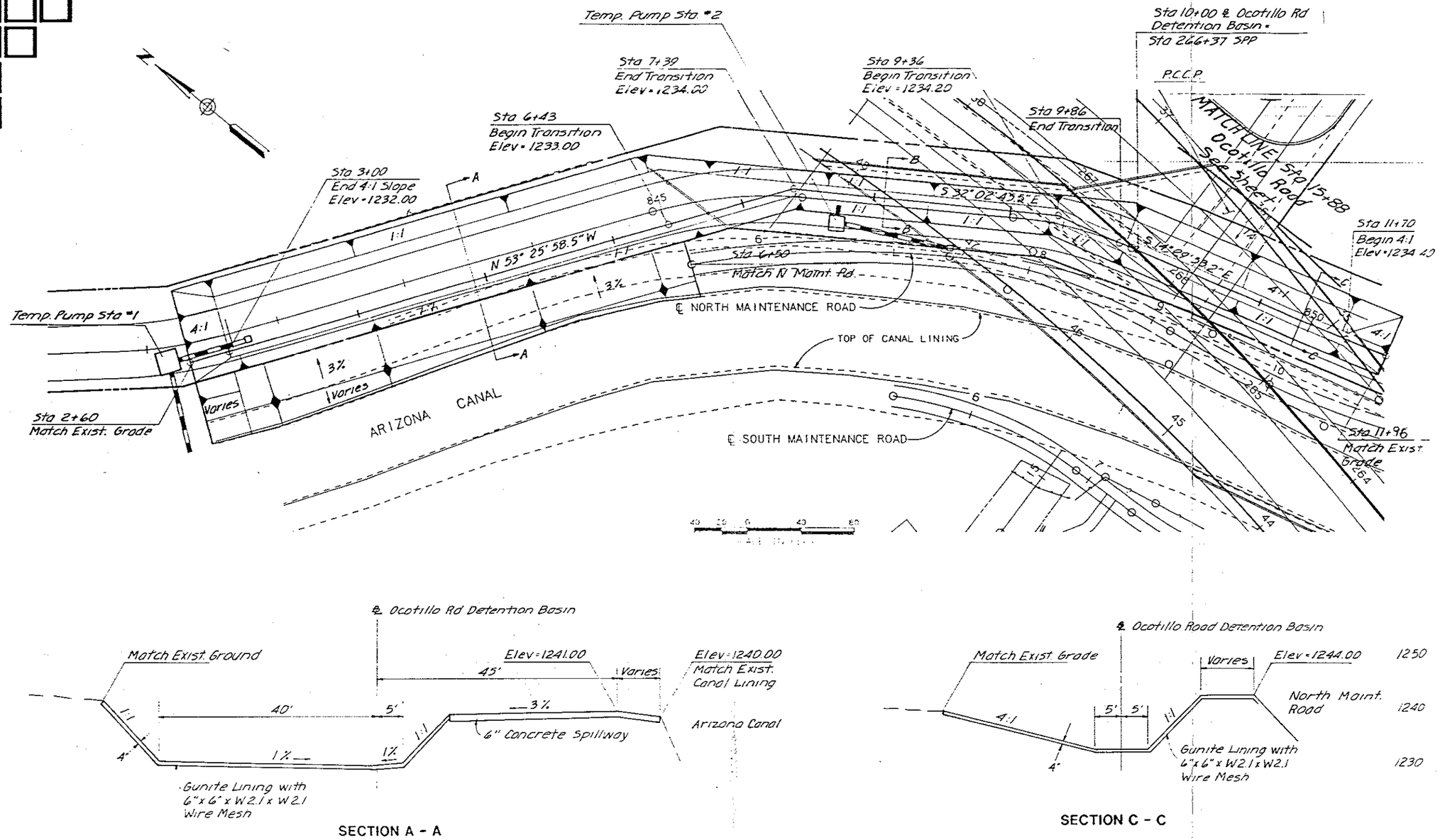
## Ocotillo Road Drainage Basin

The Ocotillo Road drainage basin currently discharges directly into the Arizona Canal near the intersection of Ocotillo Road and 18th Place. The construction of the proposed Squaw Peak Parkway will require that an outfall into the Arizona Canal be maintained until the proposed Arizona Canal Diversion Channel (ACDC) is constructed. The ACDC will ultimately intercept all of the flow currently impacting the Arizona Canal.

Until the ACDC is constructed, the stormwater flows from the Ocotillo Road drainage basin will be diverted through a temporary detention basin to be constructed within the ACDC right-of-way, and will outlet into the Arizona Canal through a concrete spillway located near the West end of the detention pond. The spillway will be designed to pass the flow from the 50-year, 1-hour design storm over the Ocotillo Road Drainage Basin.

The proposed spillway elevation is set at 1241.0 which is approximately the same elevation as the existing spillway into the Arizona Canal at the west end of Ocotillo Road.

The conveyance of the 50-year flow from the Ocotillo Road Drainage Basin through the proposed detention basin and spillway was modeled with a HEC-2 computer analysis. This analysis showed that the spillway will pass the 50-year design flow of 1,300 cfs at a depth of 0.75 feet over the crest of the spillway. The velocity through the detention basin caused by the conveyance of 1,300 cfs ranges from 2.5 cfs to 12.3 cfs. The output from this analysis is included in the appendix of this report.



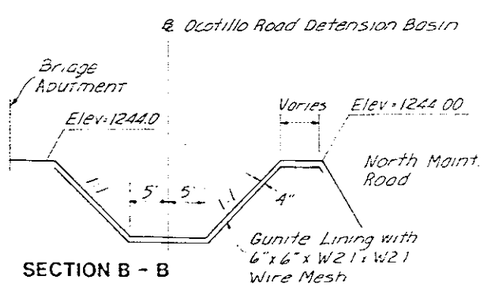




SECTION A - A




SECTION C - C




SECTION B - B

FIGURE 8

OCOTILLO ROAD

DETENTION BASIN

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