PRELIMINARY DRAINAGE REPORT

Optima McDowell Mountain Village
Scottsdale Road and Mayo Boulevard
Scottsdale, Arizona

Prepared For:

DCH Development, Inc.
7157 E. Rancho Vista Drive
Scottsdale, Arizona 85251

Registered Professional Engineer (Civil)
CERTIFICATE NO.
30886
MICHAEL L.
DELMARTER
Date Signed 09/02/22
ARIZONA, U.S.A.
EXP: 12/31/2023

Prepared By:

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Project No. 191007010
September 2022

List of Appendices

1.0 Introduction

1.1 Project Description

The applicant is proposing to construct a multi-family development on a 15.637+/- net acre parcel located at the northeast corner of Scottsdale Road and Mayo Boulevard. The project, Optima McDowell Mountain Village, is anticipated to consist of apartment and condominium buildings and amenities constructed over an underground parking garage which will have access to both Scottsdale Road and Mayo Boulevard.

1.2 Site Location

The proposed development encompasses approximately 15.637± net acres in a portion of the Southwest Quarter of Section 26, Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian in Maricopa County, Arizona. More specifically, the parcel is bounded by the Loop 101 Freeway to the north, vacant State Land to the east, a car dealership to the south, and Scottsdale Road to the west. See **Appendix A** for the site location map and legal description. See **Appendix E** for a Context Aerial Map.

1.3 Purpose

This Preliminary Drainage Report is intended to satisfy City of Scottsdale requirements and demonstrate conformance to the regional drainage planning solutions implemented by other projects immediately south of the project. This report provides a description of the current storm water drainage patterns and systems and a description of the required and proposed drainage improvements.

1.4 Objectives

This report provides a drainage plan for the site that is intended to meet the drainage standards and guidelines of the City of Scottsdale and the Flood Control District of Maricopa County (FCDMC). In particular, this report will demonstrate the following:

1. Off-site flows are diverted around the site via the ADOT Freeway improvements, and the downstream City of Scottsdale box culverts and channel system located along the eastern side of the property.

2. The site drainage patterns will remain consistent with the existing hydrology patterns.

3. Permanent drainage facilities will have a positive outfall for flows exceeding storage capacity and any detained storm water will be disposed of within 36 hours via drywells and or bleed pipes.

4. Drainage facilities will be designed to retain pre vs post development flows. All runoff in excess of the retained storage capacity will be discharged into an adjacent channel which is already sized to handle existing conditions in the area.

2.0 Description of Existing Drainage Conditions and Characteristics

2.1 Existing On-Site Drainage Conditions

The site currently consists of vacant, undeveloped land with sparse desert vegetation throughout the site. The site is bounded by the Loop 101 Freeway to the north, vacant State Land to the east, a car dealership to the south, and Scottsdale Road to the west.

The site generally slopes from the north to the south at approximately 1.5%. The Crossroads East planning area lies immediately east of the site on the eastern side of the regional drainage channel that passes offsite flows around the eastern side of the site. **Appendix I**, includes the Scottsdale Road Drainage Report which discusses the Crossroads East planning and shows how the storm water from the site ultimately outfalls to Reach 11 (Dike 2) in the City of Phoenix.

In 2003, as part of a City of Scottsdale improvement project, 2 sets of double 6’x4’ box culverts were installed in a 30’ wide parcel of City owned land along the northern property line to intercept offsite flows from under the Loop 101 freeway. These box culverts discharge into a drainage channel that runs along the eastern property line which turns westerly near the southern property line before entering a triple 8’x3’ box culvert that flows under Mayo Boulevard and enters the Bell Lexus site. **Appendix K** contains the as-built drawings for the Lund Channel design through the property.

The remainder of the existing site currently discharges as sheet flow onto Mayo Boulevard where flows are picked up in existing catch basins and conveyed to the aforementioned box culvert in Mayo Boulevard.

Refer to **Appendix F** for the Existing Conditions Topography Exhibit.

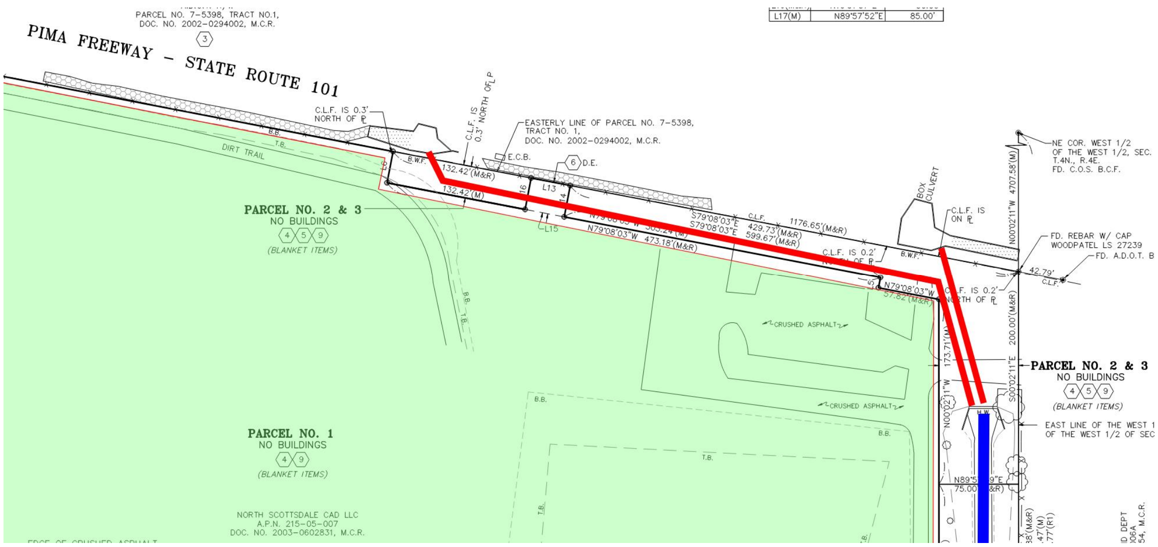
2.2 Existing Off-Site Drainage Conditions

Upstream improvements, north of the freeway, were installed in 2007 as part of the One Scottsdale project. This project installed culverts and retention basins which reduced flows tributary to the original ADOT box culverts. See **Appendix L** One Scottsdale South Drainage Basin Improvement Plans for details.

An interim drainage channel was constructed immediately downstream of the project in 2009 that conveyed flows leaving the southern end of the Lund Channel Box Culvert under Mayo Boulevard to a double 8’x3’ box culvert located just north of Princess Boulevard. See **Appendix M** Scottsdale Road Interim Drainage Channel.

The double 8’x3’ box culvert under Scottsdale Road was also designed in 2009 as part of Segment 2 of Scottsdale Road improvements by the City of Scottsdale. Note: the Scottsdale Road improvements immediately adjacent to the site were constructed as Segment 1 construction. This double box culvert ultimately discharges west of Scottsdale Road and south of Princess Drive into Reach 11.

Subsequent extensions of the Lund Channel system were made across the "Bell Lexus" site immediately downstream of Mayo Boulevard and across the other downstream projects ultimately connecting to the existing 2 – 8'x3' box culverts under Scottsdale Road that discharge to Reach 11.



Existing drainage from Scottsdale Road is collected via catch basins which tie into the 36" diameter storm drain in Scottsdale Road that also eventually discharges to Reach 11. Mayo Boulevard drainage is also collected in catch basins that tie back into the existing "Lund Channel" box culverts under Mayo Boulevard which also discharge to Reach 11.

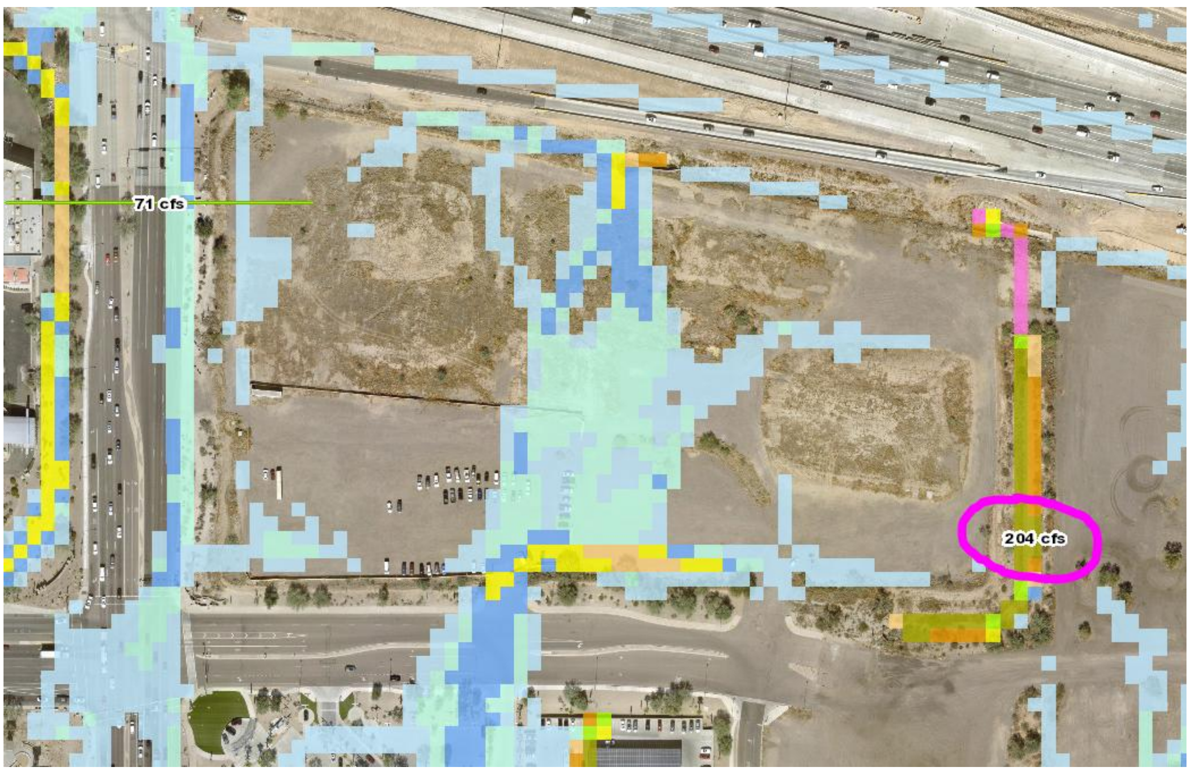
The original design for the ADOT Box culverts anticipated that a total of 600 cfs would be conveyed through the boxes and the "Lund Channel" adjacent to the subject property.

Updated Offsite Hydrology was included in the Final Drainage Report for the Interim Regional Drainage Channel prepared by Wood Patel in October 2008 **(see Appendix O)** and was utilized to design the downstream improvements based on flows that are significantly less than the original ADOT design flow rates. This hydrology is described in the report as follows:

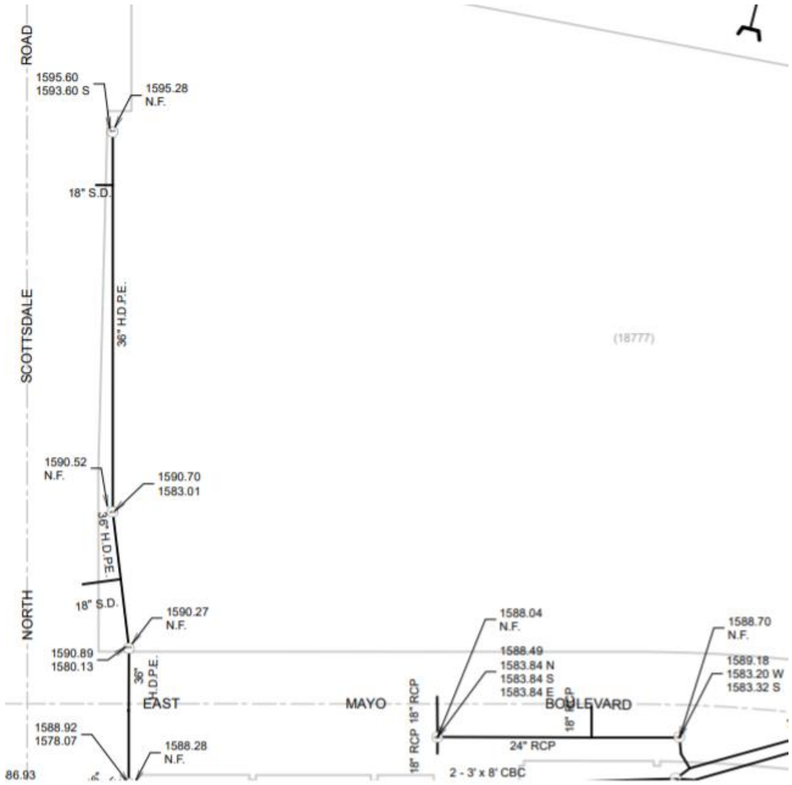
"The 100 year design flow for the Interim Regional Drainage Channel is 300 cfs. This is based on a 100 year 6 hour design storm utilizing HEC-1. Results of this model are included in Appendix A (of the WP Report)… The included HEC-1 model is an expansion of the hydrology model completed for the One Scottsdale Master Drainage Plan by Wood Patel and Associates. The One Scottsdale development lies upstream of the project site to the north of the Loop 101 Freeway. The model was revised to expand to the south to include the proposed improvements. Flow from the Loop 101 Freeway culverts is now routed through the Interim Regional Drainage Channel (R33E.1). Runoff from the Adjacent State Land Parcel (ASLD) joins at the outfall culvert under Scottsdale Road

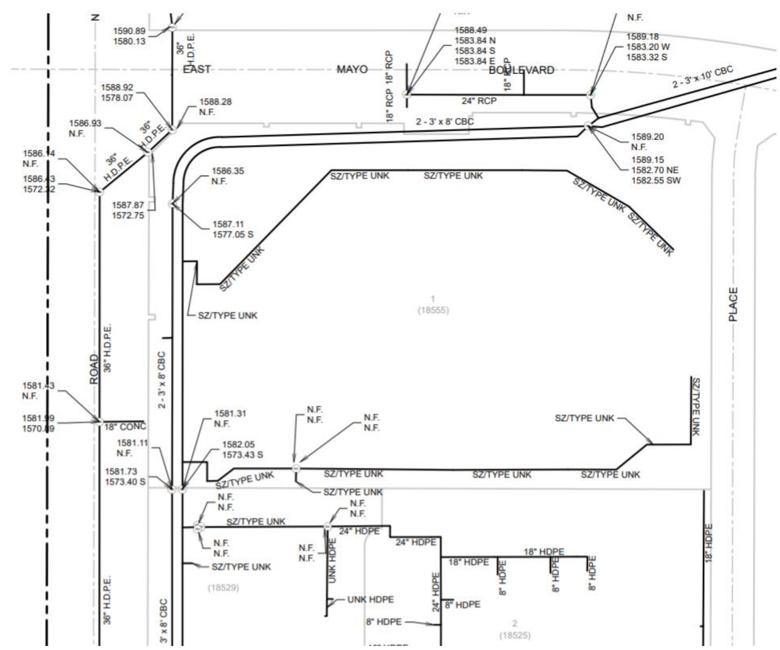
near Princess (CPPRIN). This downstream flow was used as the design flow from the entire channel." The conclusions from the WP report determined that the "Lund Channel" conveys 256 cfs and after inclusion of the other downstream tributary State Land area, the culverts under Scottsdale Road are subject to 300 cfs.

FLO-2D modeling has recently been prepared by the Maricopa County Flood Control District as part of the Pinnacle Peak West – Lower Rawhide analysis and indicate that the 100-year flows in the "Lund Channel" are 204 cfs with another 64 cfs reaching the site from the western ADOT culverts. These flows will actually combine for approximately 268 cfs as the model does not recognize that the 2 box culverts under the freeway combine. While FLO-2D is utilized as a planning tool, these results are consistent with the hydrology presented in the Wood Patel Report. This methodology and analysis have been accepted by the City of Scottsdale and will be used for the purposes of future site design considerations. The following figure is a snip of the FLO 2D results.



The below images are clipped from the City of Scottsdale Quarter Section maps showing storm drain infrastructure in the adjacent streets and also downstream through the Bell Lexus site.





A copy of the Crossroads East Planning Unit IV Drainage Report that provides more detail about the downstream box culverts and proposed developments is included in **Appendix C**.

Refer to **Appendix F** for the Existing Conditions Exhibit.

2.3 Context Relative to Adjacent Projects and Improvements

The site is located between the Loop 101 and Mayo Boulevard on the east side of Scottsdale Road. The Bell Lexus development lies immediately south. See **Appendix E** for Context Aerial of the site.

2.4 FEMA Flood Hazard Areas

The site is located in Flood Zone "AO" according to the Flood Insurance Rate Map 04013C1320L, dated October 16, 2013. Zone "AO" is designated by FEMA as "areas of flood depths of 1 foot (usually sheet flow on sloping terrain) average depths determined for areas of alluvial fan flooding, velocities also determined." Refer to Appendix B for the FEMA FIRMette map for the site. Efforts are currently underway to change the Flood Zone designation to Zone X similar to LOMR's recently approved immediately upstream of the Loop 101 freeway. This process will take up to 12 months, but planning and preliminary engineering is premised on the assumption that this effort will be completed by the end of 2022. Refer to **Appendix B** for current FEMA Flood Map.

The LOMR application has been approved by the City and was submitted to FEMA on June 29, 2022. FEMA comments are anticipated within 90 days.

3.0 Proposed Drainage Plan

3.1 General Description

In the analysis of the proposed drainage conditions the following items are considered:

- Area Types (concrete pavement, building, and desert landscaping)
- Magnitude of areas
- Slopes
- Storm Drain
- Detention Basins

3.2 Proposed Site Conditions

As previously discussed, the existing eastern channel and downstream conveyance system was originally designed for the 100-year discharge of 600 cfs while the current Maricopa County Flood Control FLO 2D study and the 2009 Wood Patel report indicates that the revised flows in the eastern channel are actually 256-268 cfs. The interim regional drainage channel downstream of the property was conservatively designed for 300 cfs including the predeveloped conditions from the subject property. It is therefore proposed that this site be designed for the greater of pre vs post or first flush flows as it has been shown that runoff can be safely delivered to the Reach 11.

Site-generated storm water in excess of existing conditions storage requirement is proposed to be discharged to the regional drainage channel from the underground detention basin.

Most of the 15.637 +/- net acre property will be covered by an underground parking garage with the surface level of the garage set at elevation 1596.0. The fire loop road around the northern and eastern sides of the property is also at 1596.0. This elevation is above the top of bank elevation of the northern end of the existing channel on the east side of the property and 3.5 feet above the top of bank (1592.5) at the southern end of the channel.

With the proposed discharge point located at the southeast corner of the project, the onsite collection system will also serve to provide pre vs post storage and convey excess flows to the outfall location. This storage and conveyance tank is proposed to be a standalone tank located along the southern edge of the garage with the outlet pipe inverts to be located 3.5 feet below the finished floor elevation at 1592.5 Based on a single point of discharge, the overflow pipes will be designed for the 100-year flow which is calculated to be 37.6 cfs with 3 – 24” pipes extending to the bottom of the channel. Supporting calculations are located in **Appendix D** and **Appendix H.**

A new fire access road crossing of the channel is proposed to occur at the southern end of the channel. This crossing will require the installation of a triple 4'x8' box culvert that will be sized to match the existing culverts under Mayo Boulevard immediately downstream of the site. Note: The existing culverts were designed to convey the original 600 cfs assumed by ADOT. These box culverts may be reduced in size with final engineering design to match the capacity of the downstream conveyance system based on the 2009 hydrology discussed above.

3.3 Proposed Off-Site Conditions

Regional off-site storm water runoff from north of the Loop 101 onto Planning Unit IV is proposed to be handled in accordance with the Crossroads East Planning Unit IV Master Drainage Report located in **Appendix I**. Off-site storm water impacts beyond those discussed above are not anticipated due to the built-out condition of the upstream areas adjacent to the site.

3.4 Future Conditions

No future drainage impacts are anticipated for the site due to the previous development of areas upstream of the subject parcel. It is anticipated that undeveloped areas adjacent to the site will be developed in accordance with the Planning Unit IV Master Drainage Report and City of Scottsdale standards.

3.5 Storage Requirements

As previously noted, the site is submitting the documentation for a Stormwater Storage Waiver. Pre vs Post Detention will be provided based on the difference in C-values for the onsite tributary area. A C coefficient of 0.9 is assumed for the post developed conditions and 0.45 is utilized for the existing cleared desert conditions.

Table 1: Pre- vs. Post Detention Volume Requirement

Basin	Land Use	Delta Runoff Coefficient	Drainage Area (ft^2)	Rainfall	Required Volume (ft^3)
Basin A	Garage Footprint	0.9-0.45 =0.45	681,146	2.3"	58,749

Volume Provided = 59,400 cf

3.6 Proposed Drainage Structures or Special Drainage Facilities

An underground retention vault will be constructed in the southeast corner of the site adjacent to the garage footprint to store the pre- vs post development volume. Based on preliminary calcs, it is assumed that the vault will extend to the bottom floor of the garage which is 16.5 feet below the outlet elevation. The cast in place vault is anticipated to be approximately 15' wide by 240 feet long resulted in a storage volume of 59,400 cf which exceeds the required 58,749 cf volume indicated in Table 1 above. While the basin is designed to scalp the flow from the 100-year storm, the overflow outlet will be designed based on a ration method calculation based on the delta C values. Therefore, the overflow 100-year storm will discharge 37.6 cfs into the adjacent Lund Channel.

The invert of the outlet pipes to the basin will be set at 3.5 feet below the first-floor elevation of 1592.5, and is located above the top of bank of the adjacent regional drainage channel. The pipes will extend to bottom of the channel and outlet immediately upstream of the box culvert under Mayo Boulevard. All pipes will be equipped with a grate.

Dry Wells are designed to drain the tank in less than 36 hours at an initial rate of 0.1 cfs. Based on this rate, each drywell can drain 0.1 cf/sec x 36 hrs x60 min/hr x 60 sec/minute = 12,960 cf per drywell. A total of 5 dry wells are required to drain the tanks. These drywells will be installed in the bottom of the tanks at 50 foot intervals with one drywell located outside of the tank. As the dry wells are constructed, each dry well will be tested to determine actual infiltration rate and the number of required drywells may be reduced accordingly.

3.7 ADEQ AZPDES requirements

Prior to construction an executed Notice of Intent (NOI) shall be submitted to Arizona Department of Environmental Quality (ADEQ) in conformance with the Arizona Pollution Discharge Elimination System Permit (AZPDES) permit. The NOI and associated storm water management best management practices will remain active on the site until construction is complete and a Notice of Termination is filed with ADEQ in conformance with AZPDES permit.

3.8 Project Phasing

This project will be constructed in multiple phases. The retention vault will be constructed with Phase 1 but sized for the entire site.

4.0 Special Conditions

4.1 404 Discussion

No existing U.S. Army Corp of Engineers 404 jurisdictional washes are present on site that would be impacted by the proposed improvements.

4.2 Preservation of existing channel

No proposed disturbance to the “Lund Channel” located on the eastern edge of the property is proposed except for the proposed overflow pipe connection and the installation of the triple box culvert discussed in Section 3.2 above. Per City of Scottsdale requirements, contributing off-site upstream flows must be maintained in the post-development condition.

5.0 Data Analysis Methods

5.1 Hydrologic Procedures, Parameter Selection, and Assumptions

All roof drains from the proposed residential buildings and area drains from the landscaped areas located on top of the garage footprint will be sized by the MEP per building code requirements and will tie directly to the concrete detention vault which will be located within the underground garage. Courtyard inlets are designed to be placed on 30 feet placed grid lines. Refer to **Appendix G**, for the Preliminary Grading and Drainage Plans.

Hydrologic calculations for the site were performed using the rational equation in the FCDMC Drainage Design Manual Volume I, which is limited to drainage areas of up to 160 acres. A weighted runoff coefficient was used for the site based upon the large amount of landscaping located adjacent to perimeters of the site. The completed calculations for the Rational Method are included in **Appendix D.**

5.2 Hydraulic Procedures, Methods, Parameter Selection, and Assumptions

All flows for proposed conditions will be determined using the rational method as outlined by the Drainage Design Manual by Maricopa County Flood Control District. Since all pipe inlets and roof drains will be discharging to the cast in place vault descried above, a minimum time of concentration of 10 minutes has been used. All drainage basins will assume a runoff coefficient of 0.95 to account for the current land description. The delineated water shed used in calculation can be found in **Appendix J.**

The following criteria will be used to size the proposed pipes for on-site storm water conveyance:

- A maximum allowable 100-year ponding depth of six inches above the catch basin grate.
- A minimum of 12 inches of freeboard between the 100-year ponding depth and the building finish floor elevation.
- The tailwater condition for the 100-year event will be assumed to be the hydraulic grade line at the pipe connection location.
- The 10-year tailwater condition will be assumed to be free outfall.

StormCAD analysis for the 10-year and 100-year events will be provided with the final drainage report.

5.3 Storm Water Storage Calculation Methods and Assumptions

As stated above, the difference in pre vs post development runoff volumes will be stored in the retention tank. The standard formula for determining the required first flush storage volumes is as follows:

$$V_R = CPA/12$$

Where: V_R = storage volume required (cubic feet)

C = weighted runoff coefficient = 1.0

P = precipitation depth for First Flush = 0.50 inches

A = contributing drainage area to basin (square feet)

6.0 Conclusion

Based on the results of this final drainage report, the following can be concluded:

- An underground storage retention vault will be constructed adjacent to the garage footprint to store pre vs post development retention volume.
- Discharge from the underground vault will be via 3- 24" pipes into the Lund Channel
- Onsite Storm drainage systems consisting of area drain and roof drains will tie directly into the detention basin located adjacent to the garage footprint.
- The building finish floor elevations have been designed to be at least fourteen inches above the ultimate site outfall elevation.
- Off-site storm water from areas upstream of the site are currently and will remain routed around the site, in the existing Lund Channel and discharged at their historical flow path.
- A new box culvert will be installed at the southeast corner of the site across the Lund Channel to provide Fire Department access to the east side of the site.
- A separate LOMR effort is currently being submitted to FEMA by Kimley-Horn to remove the property from FEMA Zone "AO". All design is being performed assuming the site is reclassified as Zone X.
- All runoff generated in Scottsdale Road and Mayo Blvd are collected in existing catch basins and are not stored on-site and do not impact the site.

This drainage report is intended to provide a level of assurance that the site will adhere to all appropriate reviewing agency guidelines with respect to drainage and flood protection.

7.0 References

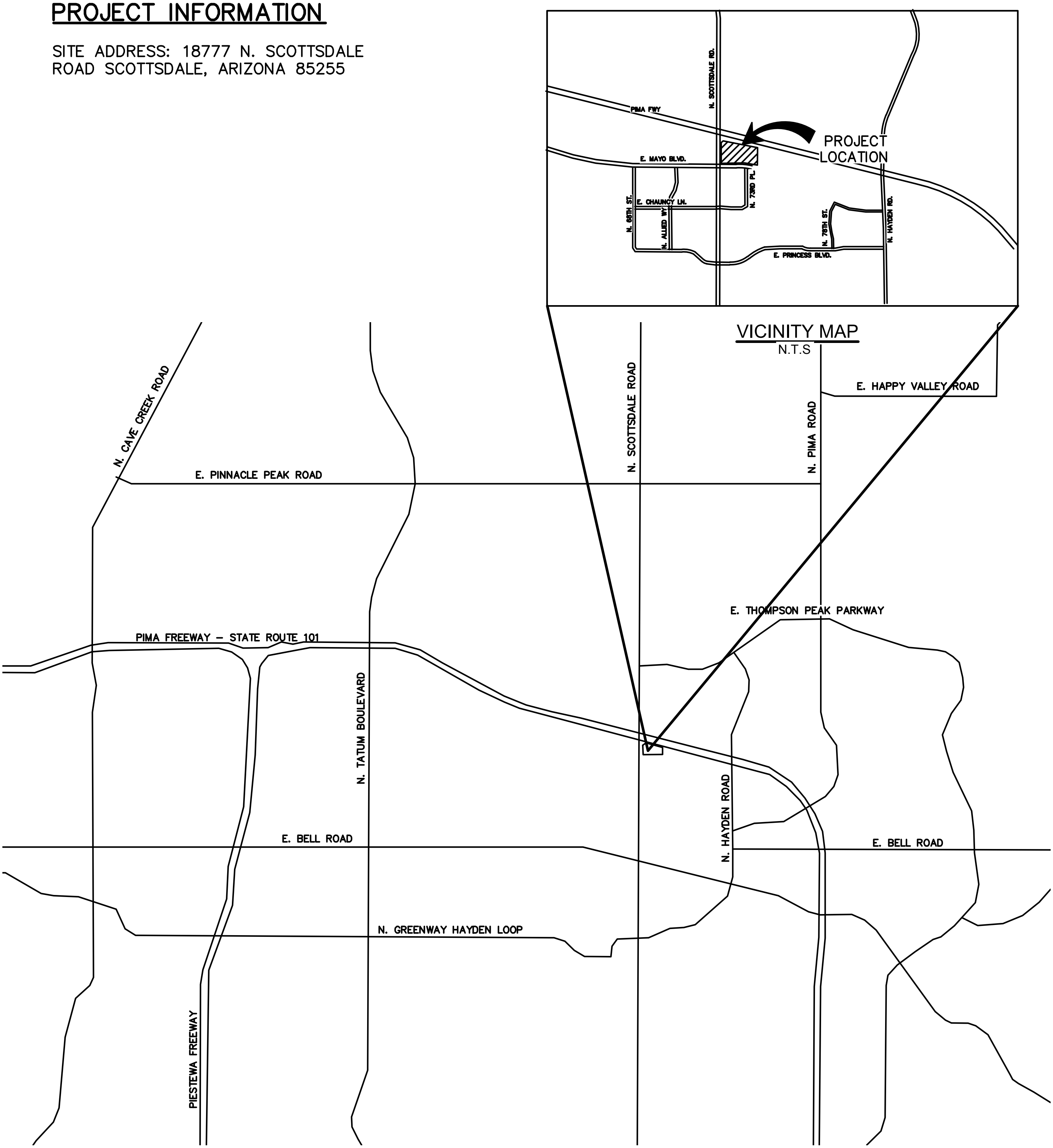
1. City of Scottsdale, *Design Standards and Policies Manual*, *Chapter 4: Grading and Drainage*, January 2010.
2. Federal Emergency Management Agency (FEMA), *Flood Insurance Rate Map (FIRM) of Maricopa County, Arizona and Incorporated Areas, Panel 1320 of 4425, Map Number 0413C1320L*, October 16, 2013.
3. Flood Control District of Maricopa County (FCDMC), *Drainage Design Manual for Maricopa County, Hydrology Volume, February* 2008.
4. Flood Control District of Maricopa County (FCDMC), *Drainage Design Manual for Maricopa County, Hydraulics Volume,* January 1996.
5. Kimley-Horn and Associates, Inc, *Final Drainage Report for Improvement Plans for Scottsdale Road and Chauncey Lane, Crossroads East Planning Unit IV*, August 2012.
6. City of Phoenix, *Storm Water Policies and Standards,* December 2013.
7. Kimley-Horn and Associates, Inc., *Final Drainage Report for Bell Lexus of North Scottsdale*, Scottsdale, Arizona, 2012.
8. Wood Patel and Associates, Final Drainage Report for the Interim Regional Drainage Channel October 2008

Appendix A

Site Location Map and Legal Descriptions

PROJECT INFORMATION

SITE ADDRESS: 18777 N. SCOTTSDALE ROAD SCOTTSDALE, ARIZONA 85255



Kimley»Horn

OPTIMA **SITE LOCATION MAP**

MCDOWELL MOUNTAIN VILLAGE

February 23, 2022

NORTH

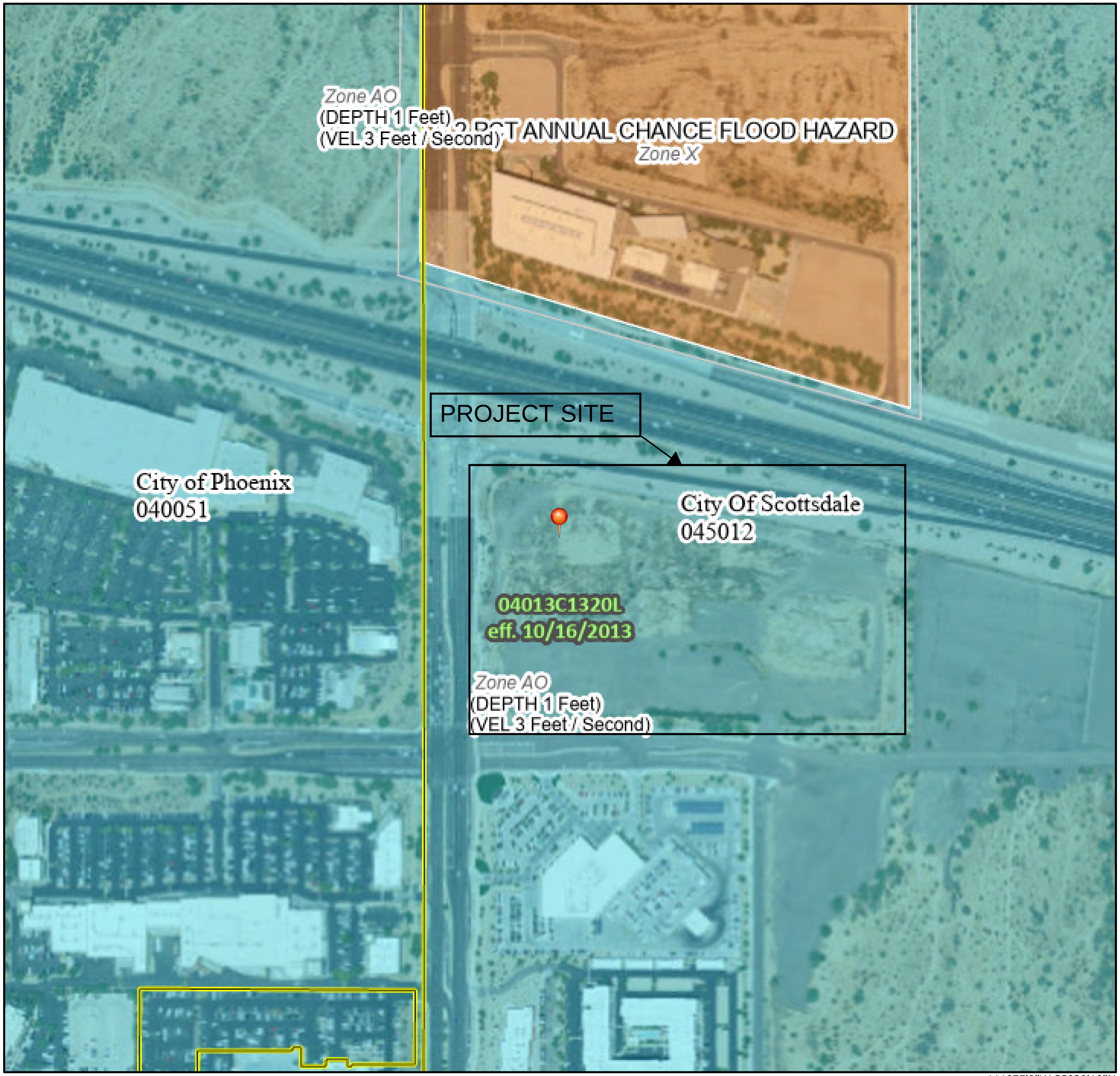
Appendix B

FEMA Flood Insurance Rate Map (FIRM)

National Flood Hazard Layer FIRMette

FEMA

111°55'46"W 33°39'40"N



111°55'9"W 33°39'10"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/22/2021 at 1:30 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C

Crossroads East Final Drainage Report

FINAL DRAINAGE REPORT

Improvement plans for Scottsdale Road and Chauncey Lane; and

Crossroads East Planning Unit IV

Scottsdale, Arizona

Plan check # 2519-2, 1442-12

Plan # 1442-12
Case #
Q-S #
[X] Accepted
[ ] Corrections
M. Rahmann 8-14-12
Reviewed By Date

Prepared For:

Diversified Partners, LLC

191235025
August 2012

Kimley-Horn
and Associates, Inc.

FINAL DRAINAGE REPORT

Improvement plans for Scottsdale Road and Chauncey Lane; and

Crossroads East Planning Unit IV

Scottsdale, Arizona
Plan check # 2519-2, 1442-12

Prepared For:

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
37059
STEPHEN E.
HANEY
Date Signed 8/9/12
ARIZONA, U.S.A.
Exp. 12/31/13

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191235025
August 2012

List of Tables

List of Figures in Appendix (Exhibits)

List of Appendices

1.0 Introduction

1.1 Project Description

Diversified Partners, LLC is proposing development of a portion of Crossroads East Planning Unit IV (Planning Unit IV) at the southeast corner of Scottsdale Road and Mayo Boulevard for commercial use. The project is anticipated to consist of perimeter roadway and utility infrastructure for future multiple buildings with associated parking improvements.

1.2 Site Location

Proposed development, hereinafter referred to as the "sale parcel", encompasses approximately 29.4± gross acres in a portion of the Northwest Quarter of Section 33, Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian in Maricopa County, Arizona. The sale parcel is a portion of Crossroads East Planning Unit IV (138± acres), and is zoned PCD. More specifically, the sale parcel is bounded by Mayo Boulevard and vacant undeveloped desert zoned PCD(C-4) to the north, vacant undeveloped desert zoned PCD to the east, vacant undeveloped desert and the Princess Resort zoned PCD to the south, and Scottsdale Road to the west. See *Appendix A* for the site location map and legal description; and, Figure 1 and 2 in Appendix E for a Context Aerial map and Grading and Drainage Plan.

1.3 Purpose

This Final Drainage Report for the Planning Unit IV is intended to satisfy the storm drainage master planning stipulation number 2.5 for Zoning Case 19-ZN-2002 with regards to Planning Unit IV, as well as more specific guidelines for the aforementioned commercial development infrastructure (sale parcel) in accordance with the City of Scottsdale drainage guidelines and standards. This report provides a description of the current storm water drainage patterns and systems, a description of required and proposed drainage off-site improvements, and outlines anticipated phasing for Planning Unit IV and the sale parcel.

1.4 *Objectives*

This final report provides a drainage plan for Planning Unit IV and the sale parcel that is intended to meet the drainage standards and guidelines of the City of Scottsdale and the Flood Control District of Maricopa County (FCDMC). In particular, the report will demonstrate the following:

1. Off-site storm water from the north being routed around the sale parcel development and discharging to the box culvert under Scottsdale Road at Princess Drive; consistent with current drainage patterns.

2. A delineation of land east and west of the natural drainage divide (hydrologic divide) that bisects Planning Unit IV; and, how drainage will be handled on each side.

3. Sale parcel development designating on and off-site drainage facilities, including temporary and permanent detention basins, for the 100-year, 2-hour storm event.

4. Temporary and permanent drainage facilities having positive outfall; and, any detained storm water being disposed of within 36 hours.

5. Drainage facilities being designed such that the 100-year, 2-hour post-development flow is collected and conveyed in such a manner as to not cause damage to buildings and property.

6. Future drainage requirements for the remainder of Planning Unit IV.

2.0 Description of Existing Drainage Conditions and Characteristics

2.1 General Description

Planning Unit IV's existing drainage conditions and characteristics have been classified into two areas, the sale parcel and the remainder of Planning Unit IV (or simply "remainder"), per the following descriptions:

<u>Sale Parcel</u>

This area consists of 29.4 gross acres of commercial development from the Chauncey Lane alignment to Mayo Boulevard, and from Scottsdale Road to the 73rd Place alignment.

<u>Remainder of Planning Unit IV</u>

This area consists of the remainder of acreage of Planning Unit IV from the sale parcel limits to Loop 101 and the Miller Road alignment, south to Princess Road and east to Scottsdale Road.

2.2 Existing Sale Parcel Drainage Conditions

The sale parcel currently consists of vacant desert and a seasonal use facility with an asphalt and gravel parking area. The sale parcel is bounded on the west by Scottsdale Road, on the north by Mayo Boulevard, on the east by the proposed east right-of-way of 73rd Place, and on the south by the proposed south right-of-way of Chauncey Lane.

The general topography of the sale parcel area is mildly sloping terrain at approximately 2%. A hydrologic divide bisects the sale parcel directing drainage to two separate facilities – Reach 11 (Dike 2) in the City of Phoenix and the TPC (Dike 3) in the City of Scottsdale (see Figure 3 of *Appendix E*). Storm water from land west of the hydrologic divide flows southwest toward the intersection of Scottsdale Road and Chauncey Lane, it then proceeds south along the east side Scottsdale Road in a swale to a box culvert under Scottsdale Road at Princess Boulevard where it is conveyed to Reach 11. An existing double-barrel 10'x3' arch culvert discharges off-site storm water onto the sale parcel at its northeast corner, west of the hydrologic divide (See photos 1 and 2 below). Storm water from this culvert proceeds south to a temporary detention basin at the center of the sale parcel, where it connects to "West Wash" identified on Figure 4 in *Appendix E*. "West Wash" flows southwest toward the intersection of Scottsdale Road and Chauncey Lane to the previously noted roadside swale that connects to the existing box culvert under Scottsdale Road at Princess Boulevard.

Photo 1: Downstream outlet from 10'x3' arch culvert.

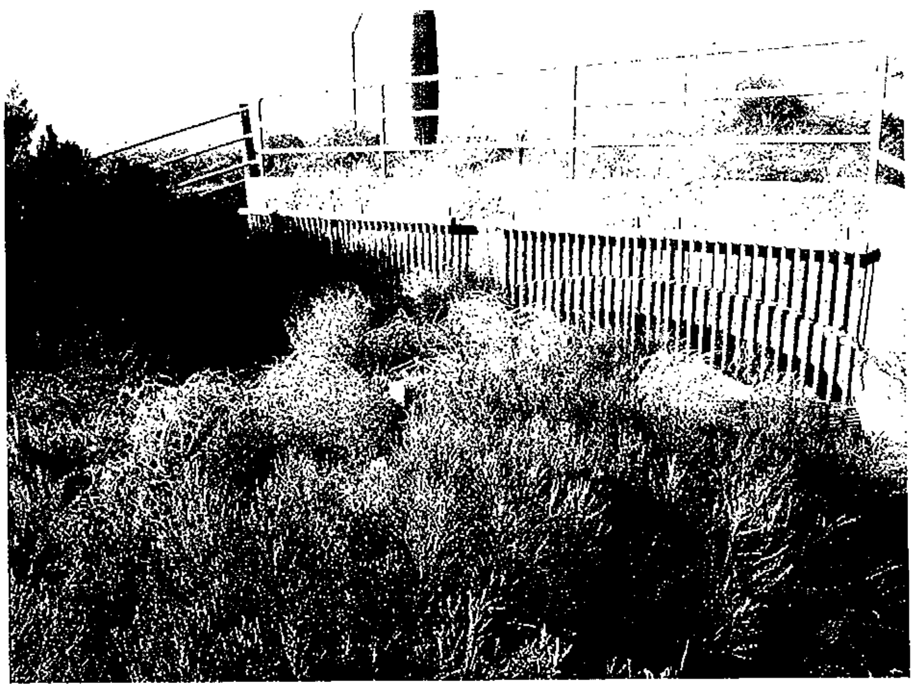


Photo 2: Upstream Inlet from 10'x3' arch culvert.

Storm water from land east of the hydrologic divide flows south/southeast toward "East Wash" identified on Figure 4 in *Appendix E*. "East Wash" flows south and intersects with an existing channel along the north side of Princess Boulevard, continuing on to the TPC via a box culvert under Princess Boulevard.

2.3 Existing Remainder of Planning Unit IV Drainage Conditions

The remainder of Planning Unit IV currently consists of vacant desert and a gravel parking area along the Loop 101. The remainder is bounded on the west by Scottsdale Road and the sale parcel, on the north by Loop 101, on the east by the proposed Miller Road alignment, and the south by Princess Boulevard.

The general topography of the remainder is mildly sloping terrain at approximately 2%. A hydrologic divide bisects a portion of the remainder directing drainage to two separate facilities – Reach 11 (Dike 2) in the City of Phoenix and the TPC (Dike 3) in the City of Scottsdale (see Figure 3 of *Appendix E*). Storm water from land west of the hydrologic divide flows southwest toward a box culvert under Scottsdale Road at Princess Boulevard where it is conveyed to Reach 11.

Storm water from land east of the hydrologic divide flows south/southeast toward "East Wash" identified on Figure 4 in *Appendix E*. "East Wash" flows south and intersects with an existing channel along the north side of Princess Boulevard, continuing on to the TPC via a box culvert under Princess Boulevard. Two existing culverts under Loop 101 discharge off-site storm water onto the remainder along its north boundary, east of the hydrologic divide. Storm water from these culverts proceeds south in "East Wash" identified on Figure 4 in *Appendix E*. "East Wash" flows south toward Princess Boulevard to the previously noted roadside channel that connects to the existing box culvert under Princess Boulevard.

2.4 Existing Off-site Drainage Conditions

Four box culverts under the Loop 101 exist north of Planning Unit IV. The two western most box culverts (See Figure 4) discharge to arch culverts that combine to an open channel that is routed around property that is not part of Planning Unit IV; bringing flow south under Mayo Boulevard onto the sale parcel. The two eastern most box culverts (See Figure 4) discharge directly onto the gravel parking area on the remainder of Planning Unit IV. Off-site flows proceed through Planning Unit IV as described in Sections 2.2 and 2.3.

2.5 Context Relative to Adjacent Projects and Improvements

The proposed sale parcel is located south of Mayo Boulevard, east of Scottsdale Road, North of the proposed alignment of Chauncey Lane, and west of the proposed 73rd Street alignment. See Figure 1 in Appendix E for Context Aerial of the site.

2.6 FEMA Flood Hazard Areas

The sale parcel site is located in Flood Zone "A" according to the Flood Insurance Rate Map 04013C1245H, dated September 30, 2005. Zone "AO" is designated by FEMA as "areas of flood depths of 1 foot (usually sheet flow on sloping terrain) average depths determined for areas of alluvial fan flooding, velocities also determined." Refer to Appendix B for the FEMA FIRMette map for the site. An elevation certificate will be required for any building to be constructed in this flood hazard designation.

3.0 Proposed Drainage Plan

3.1 General Description

Planning Unit IV's proposed drainage conditions and characteristics remain classified into two areas, the sale parcel area and the remainder of Planning Unit IV (or simply "remainder"), per the following descriptions:

<u>Sale Parcel</u>

This area consists of 29.4 gross acres of commercial development from the Chauncey Lane alignment to Mayo Boulevard and from Scottsdale Road to the 73rd Place alignment.

<u>Remainder of Planning Unit IV</u>

This area consists of the remainder of acreage of Planning Unit IV from the sale parcel limits to Loop 101 and the Miller Road alignment, south to Princess Road and west to Scottsdale Road.

In the analysis of the proposed drainage conditions the following items were considered:

- Area Types (asphaltic pavement, building, and desert landscaping)
- Magnitude of areas
- Slopes
- Storm Drain
- Detention Basins

3.2 Proposed Sale Parcel Conditions

The sale parcel proposes a combination of in-kind contribution and detention for the 100-year, 2-hour storm event. In-kind contribution, in the form of a regional drainage channel, will be used to convey off-site flows around the sale parcel and for direct drainage of land west of the hydrologic divide. Detention will be used for land east of the hydrologic divide. To accommodate the off-site roadway drainage design of 73rd Place, the hydrologic divide was modified along the western boundary of 73rd place with an equivalent land area exchange between the land east and west of the hydrologic divide to maintain respective drainage areas and flows. See Figure 5 (Site Basin Delineation) for adjusted hydrologic divide location in relation to the Sale Parcel and Planning Unit IV.

West of Hydrologic Divide

Sale Parcel land west of the hydrologic divide is proposed to be captured in a channel/box culvert along Scottsdale Road. No permanent site surface or underground retention is required for this area due to the in-kind contribution and construction of a regional drainage channel/culvert along Scottsdale Road. The regional drainage channel's construction is planned to coincide with development of the sale parcel. It is the sale parcel developer's preference to utilize a box culvert to convey storm water around the site from Mayo Boulevard to Chauncey versus an open channel. South of Chauncey, the box culvert discharges to an open channel. If the development preferences for the sale parcel change from a box to an open channel, an amended drainage study will be provided to reflect that change.

Interim stormwater run-off from the site, prior to full development, will be captured in two temporary basins that will drain via catch basins connected to the proposed box culvert with 30" RCP. The temporary basins will collect the 100-year 2-hour storm water runoff from the sale parcel and bleed off the storm water through the aforementioned storm drain connections. Upon full development of the sale parcel, the temporary basins will be removed, the existing storm drain connections can be extended through the site. Additional storm drain connections to the box culvert may be added to accommodate the fully-developed 100 year peak flow. Locations and sizes of additional storm drain connections will be determined based upon the individual site development drainage plans.

Sale Parcel land west of the hydrologic divide is identified as basin ASLD1 in Figure 5 (*Appendix* E) with a concentration point of ASLDCT. Based upon the previously prepared Wood Patel HEC-1 model, with modifications outlined in section 5.1, the associated flows from the ASLD1 basin and the combined 100yr peak flow (on-site and off-site) at this concentration point are calculated to be 114 and 317 cfs, respectively. See Figure 5 (*Appendix E*) for the Site Basin Delineation Map Exhibit.

East of Hydrologic Divide

Drainage from the 100-year, 2-hour storm for land east of the hydrologic divide will be detained in a multiple surface detention basins located on the west side of the proposed 73rd Place alignment. These detention basins will drain to one another via storm drain pipes with orifice plates to restrict disposal rates ultimately out-falling to the southeast to the "East Wash", consistent with the current drainage pattern. The east side of 73rd Place and the south side of Chauncey Lane will drain to a roadside swale, discharging to the "East Wash" as an interim condition. The combined peak flow of the interim roadside swale and the bleed off basins is less than the undeveloped peak flow for the area discharging to the "East Wash," see Appendix D for calculations. Flows will continue on their current path to the box culvert that crosses south under Princess Boulevard and outfalls into the TPC golf course. See Figure 5 (*Appendix E*) for Site Basin Delineation Map Exhibit.

Future development along the east side of 73rd Place and south side of Chauncey Lane will be responsible for detaining the 100-year 2-hour storm for their adjacent half streets, unless a master drainage solution for the east of the hydrologic divide has been developed

3.3 Proposed Remainder of Planning Unit IV Conditions

The remainder of Planning Unit IV proposes a combination of in-kind contribution and future detention for the 100-year, 2-hour storm event. In-kind contribution, in the form of a regional drainage channel, will be used for drainage from land west of the hydrologic divide. Drainage from land east of the hydrologic divide will continue to on its historic path until future development occurs.

West of Hydrologic Divide

Remainder land west of the hydrologic divide is proposed to be captured in a channel along the east side of Scottsdale Road. No permanent site surface or underground retention will be provided for this area due to the in-kind contribution and construction of a regional drainage channel/culvert along Scottsdale Road. The regional drainage channels construction is planned to coincide with development of the sale parcel. Interim storm water runoff from the remainder parcel shall sheet flow into the open channel along Scottsdale Road. Future development of the remainder parcel may add storm drain connections to the drainage channel to accommodate proposed site development.

Remainder land west of the hydrologic divide is identified as basin ASLD2 in Figure 5 (*Appendix* E) with a concentration point of CPPRIN. Based upon the previously prepared Wood-Patel HEC-1 model, with modifications outlined in section 5.1, the associated flows from the ASLD2 basin and the combined 100 yr peak flow (on-site and off-site) at this concentration point are calculated to be 84 and 351 cfs, respectively. See Figure 5 (*Appendix* E) for Site Basin Delineation Exhibit.

East of Hydrologic Divide

The future development of this area will detain the 100-year, 2-hour storm in multiple surface detention basins as warranted by proposed improvements. The detention basins should be designed to discharge to an existing wash or drainage conveyance channel that ultimately connects to the existing drainage channel along the north side of Princess Boulevard, consistent with the current drainage patterns.

3.4 Proposed Off-site Conditions

Off-site storm water runoff from north of the 101 onto Planning Unit IV is proposed to be handled in the following manner.

Western two box culverts – Sale Parcel

The western two box culverts that convey storm water from north of the Loop 101 onto Planning Unit IV currently discharge onto the proposed sale parcel, west of the hydrologic divide. With the development of the sale parcel, per the preference of the sale parcel owner, off-site storm water will be routed to the east side of Scottsdale Road and then south to Chauncey Lane via two 8'x3' box culverts (see *Appendix D* for calculations). South of Chauncey Lane, along the east side of Scottsdale Road, off-site storm water will be conveyed in an interim trapezoidal open channel with grade control structures to the existing box culvert under Scottsdale Road that connects to the Reach 11 (Dike 2). The flows in the box culvert and the interim open channel have been sized to accommodate the future fully-developed portions of ASLD1 and ALSD2 drainage basins. See Figure 5 (*Appendix* E) for site basin delineation map.

Eastern two box culverts - Remainder

Future development of this area will dictate how off-site flows are managed and routed to the existing channel on the north side of Princess Boulevard, consistent with the current drainage patterns.

It should be noted that discussions with the City of Scottsdale have revealed the channel north of Princess Boulevard is currently experiencing notable erosion and sediment transport. Drainage studies in conjunction with future development should explore channel armoring options.

3.5 Future Conditions

No future drainage impacts are anticipated for the sale parcel due to the proposed installation of the regional drainage channel/box culvert along the east side of Scottsdale Road from Mayo Boulevard to Princess Drive. The channel/box culvert adjacent to the sale parcel from Mayo Boulevard to Chauncey Lane will be constructed in its final configuration in accordance with the City of Scottsdale scenic corridor guidelines. The channel south of Chauncey Lane to the culvert under Scottsdale Road at Princess Boulevard will be an interim channel that may be modified for the needs of the adjacent future development. Individual future parcels of remainder Planning Unit IV will be responsible for their respective 100-year 2-hour detention depending upon their location in relation to the hydrologic divide.

3.6 Storm Water Storage Requirements

Sale Parcel surface detention basins have been designed to detain the on-site runoff volume associated with the 100-year, 2-hour storm for land east of the hydrologic divide. No permanent storm water storage will be provided for land west of the hydrologic divide due to the approved in-kind contribution to build a regional drainage channel along the east side of Scottsdale Road. Two interim storm water detention basins are proposed along Scottsdale Road next to the box culvert to allow for capturing of site generated storm water into the box culvert prior to full development.

Detention volume will be provided by multiple surface retention basins along the proposed 73rd Place and Chauncey Road alignments. The side slopes for the retention basin are a maximum of 4:1 with a maximum depth of 3 feet.

Future development within the remainder of Planning Unit IV will be required to provide at least one foot of freeboard from the basin overflow elevation to the finished floor elevation of any proposed buildings, in accordance with the City of Scottsdale design standards and policy manual.

The following Table summarizes proposed detention to be constructed as part of the sale parcel development by basin name, type, total contributing area to the basin, runoff coefficient for the contributing area, and the required and provided detention volume for the sale parcel and impacted areas of remainder land.

Table 1: On-site Detention Volume

Basin	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft³)	Provided Volume (ft³)	Surplus (ft³)
A	Landscaping	0.45	3,703	350		
	Pavement	0.95	11,890	2,371		
			15,593	2,721	3,142	421

Basin	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft³)	Provided Volume (ft³)	Surplus (ft³)
B	Landscaping	0.45	5,220	493		
	Pavement	0.95	32,641	6,509		
			37,861	7,002	7,588	586

Basin	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft³)	Provided Volume (ft³)	Surplus (ft³)
C	Landscaping	0.45	13,164	1,244		
	Pavement	0.95	66,572	13,276		
			79,736	14,519	17,843	3,323

Basin	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft³)	Provided Volume (ft³)	Surplus (ft³)
D	Landscaping	0.45	449,197	42,432		
(Temp Basin)	Pavement	0.95	0	0		
			449,197	42,432	44,212	1,780

Basin	Land Use	Runoff Coefficient	Drainage Area (ft²)	Required Volume (ft³)	Provided Volume (ft³)	Surplus (ft³)
E	Landscaping	0.45	396,700	37,473		
(Temp Basin)	Pavement	0.95	0	0		
			396,700	37,473	39,762	2,289

The detention basins are designed such that the 100-year, 2-hour runoff volume is disposed of via pipe flow and overland flow, See Figure 5 in *Appendix E* for Basin Delineation.

3.7 Pre- and Post-Development Runoff Characteristics at Concentration Points

The existing site consists primarily of vacant undeveloped desert. Current topography shows the site draining from northeast to southwest. Upon site development, Sale Parcel storm water west of the hydrologic divide will sheet flow to catch basins and then be conveyed through underground storm drain to the regional channel/box culvert along the east side Scottsdale Road. Sale Parcel storm water east of the hydrologic divide will sheet flow to curb openings/scuppers and then be conveyed through underground storm drain to a series of connected detention basins that will allow the water to sheet flow south to the existing channel along the north side of Princess Boulevard, consistent with the current drainage patterns.

3.8 Proposed Drainage Structures or Special Drainage Facilities

Aesthetics and site access needs dictate that a portion of the regional drainage channel be proposed as a double-barrel box culvert. This box culvert is anticipated to connect to the existing culvert under Mayo Boulevard and extend around the perimeter of the Sale Parcel to the south side of the proposed Chauncey Lane alignment. The box culvert has been designed to accommodate the 100-year storm peak flow as a dry box. The final design will include a drainage easement, dedicated to the City of Scottsdale.

3.9 Project Phasing

This project will be constructed in a multiple phases as follows:

1. Regional Drainage Channel, 73rd Place, Chauncey Lane, and rough grading the remaining Sale Parcel area for site development.

2. Sale Parcel on-site development/improvement. Site development may occur in multiple sub-phases (A, B, C, etc) as market conditions warrant.

3. Remainder portions of Planning Unit IV. Development may occur in multiple sub-phases (A, B, C, etc) as market conditions warrant.

4.0 Special Conditions

4.1 404 Discussion

Per correspondence with the U.S. Army Corp of Engineers 404 jurisdictional washes are impacted by the proposed Regional Channel improvements, roadway improvements, and temporary drainage basins. A Nationwide permit with the Corp of Engineers has been obtained for the disturbance of the existing 404 jurisdictional wash on-site. See Appendix H for Corp of Engineers Certificate of Compliance with Department of the Army Nationwide Permit.

5.0 Data Analysis Methods

5.1 Hydrologic Procedures, Parameter Selection, and Assumptions

West of Hydrologic Divide

Hydrologic calculations for land west of the hydrologic divide were performed using the computer program HEC-1 as outlined for FCDMC Drainage Design Manual Volume I. The previously prepared HEC-1 model for *Interim Regional Drainage Channel* prepared by Wood-Patel and Associates, Inc., was modified to maintain the previous NOAA 2 rainfall data with a change to the sale parcel hydrologic characteristics to reflect the fully developed condition of Planning Unit IV west of the hydrologic divide. In addition the HEC-1 model was modified to reflect the routing of off-site storm water through a box culvert, instead of an open channel to Chauncey Lane (per sale parcel owner's preference for box culvert versus channel), and the subdivision of the previous study's ASLD basin into a north basin, ASLD1, and a south basin, ASLD2.

The NOAA 2 rainfall data used in the previous study was unchanged from the previous approved HEC-1 model. The fully developed condition for land west of the hydrologic divide was achieved by increasing the impervious value of the of sub basin ASLD1 and ASLD2 to 95%. The results of the revised HEC-1 model are located in *Appendix C*. Figure 5, which identifies the drainage sub-basins and concentration points associated with the HEC-1 model, is located in *Appendix E*.

To accommodate the roadway alignment and grading of 73rd Place through the northern end of the hydrologic divide, a land swap between the east and west was utilized. The portion of land located east of the western right of way line of 73rd Place to the hydrologic divide line was exchanged for the equal land area located along the southern portion of the sale parcel See Figure 5, Site Basin Delineation, for the land swap area locations. Since the land area exchange is the same, the flow quantity and magnitudes east and west of the hydrologic divide should remain unchanged.

East of Hydrologic Divide

Hydrologic calculations for land east of the hydrologic divide were performed using the rational equation in the FCDMC Drainage Design Manual Volume I, which is limited to drainage areas of up to 160 acres using NOAA 14 rainfall data. A weighted runoff coefficient was used for the site for the large amount of desert landscaping located adjacent to 73rd Place and Chauncey Lane in the required landscape setbacks. All other drainage sub basins were modeled using a fully developed pavement runoff coefficient to account for future developments.

For analysis of the sale parcel east of the hydrologic divide, the site was sub-divided into sixteen sub-basins (ten sub-basins for the sale parcel, west half street of 73rd Place, and north half street of Chauncey Lane; six sub-basins for the remaining half streets) consisting of the pavement, landscaping, and future commercial. For each sub-basin, the rational equation was used to calculate the peak flow at each concentration point for each basin. The results of the rational method are located in Appendix C. Figure 7, which identifies the drainage sub-basins, is located in *Appendix E.*

5.2 Hydraulic Procedures, Methods, Parameter Selection, and Assumptions

West of Hydrologic Divide

The regional drainage channel along the east side of Scottsdale Road was evaluated using the computer programs StormCAD, by Bentley, for the box culvert routing, and HEC-RAS for the open channel routing and backwater analysis.

Using StormCAD the proposed box culvert from north of Mayo Boulevard to south of Chauncey Lane was analyzed for the 100-year peak flow of 317 cfs at the outlet (peak flow calculated at culvert outfall from modified HEC-1) with a total of 8 cfs being captured between inlets CB-50 and CB-55 and 309 cfs entering the upstream culvert entrance (conservative model due to future connections and flows at each connection). Headlosses at the bends/junctions of the box culverts were individually calculated and included in the analysis as a user defined values.

Using HEC-RAS, the interim channel south of Chauncey Lane to the existing box culvert that crosses Scottsdale Road at Princess Boulevard was analyzed for the peak flow of 351 cfs (peak flow calculated at Box culvert under Scottsdale Road from modified HEC-1 model). Cross sections were taken at the upstream and downstream of each grade control structure (See Figure 6: HEC-RAS Cross Section Locations). The upstream boundary condition was set to match the water surface elevation calculated at the outfall of the double 8'x3' box culvert. The downstream boundary condition was set at the water elevation that would match the calculated head for the dry crossing at the culvert entrance per the *Scottsdale Road Drainage Report* prepared by Dibble and Associates, Inc., in March 2009. Rip rap and grade control structures are proposed to maintain velocities below 6 feet per second in the main channel areas. Manning's n values for the channel were selected from the *Maricopa County Flood Control District Hydraulics Manual.*

East of Hydrologic Divide

The sale parcel site east of the hydrologic divide is divided into sixteen sub-basins that drain into an on-site detention basin. As described in Section 5.1, ten of the sub-basins include the sale parcel land and adjacent half street right-of-ways, and the other six include the remaining half street right-of-ways and the impacted remainder land. See Figure 7 in Appendix F for enlarged sub-basin boundaries.

All flows for proposed conditions were determined using the rational method as outlined by the *Drainage Design Manual by Maricopa County Flood Control District.* Due to the small nature of the watersheds for the individual sub-basins, a minimum time of concentration of five minutes was assumed. All of the drainage basins assume a runoff coefficients of 0.95 (100-year) and 0.85 (10-year) with the exception of the landscape sub-basins. Due to the relatively large amount of landscaping in these areas, a weighted runoff coefficient was used for future landscape areas only (all other basins used a fully developed runoff coefficient). Per the *City of Scottsdale Design Standards and Policy Manual* (January 2010), the runoff coefficient for desert landscaping (no impervious weed barrier) is 0.45 for Hydrologic Soil Group B. The peak flows at the sub-basin concentration points were calculated using the rational method using NOAA 14 rainfall data (see *Appendix C* for hydrologic results).

The following criteria were used to size the proposed pipes and drainage inlets for on-site storm water conveyance and disposal:

- A maximum allowable 100-year ponding depth of 8 inches above the drainage inlet for roadway and contained within the road right-of-way.
- One dry lane in each direction for the 10-year spread in Chauncey Lane (Collector street classification).
- Stormwater contained within the curbs for the 10-year spread in 73rd Place (Local street classification).
- A maximum allowable 10-year ponding depth of 6 inches to contain all storm water runoff within the roadway. (6" depth max).
- Only negligible amount of flow is allowed to bypass the scuppers located at the hydrologic divide (less than 0.30 cfs)

Storm drain calculations and inlet calculations are included in Appendix D.

5.3 Storm Water Storage Calculation Methods and Assumptions

Storm water storage requirements were calculated per City of Scottsdale and Flood Control District of Maricopa County design standards. The standard formula for determining the required storage volumes for the 100-year, 2-hour storm is as follows:

Equation 2: Standard Formula for On-Site Storage Requirement

$$V_R = CPA/12$$

Where:

V_R = storage volume required (acre-feet)

C = weighted runoff coefficient

P = precipitation depth for 100-year, 2-hour event = 2.29 inches

A = contributing drainage area to basin (acres)

6.0 Conclusion

6.1 Overall Project

Based on the results of this final drainage report, the following can be concluded:

- Off-site storm water west of the hydrologic divide will be channelized (Regional Drainage Channel) and directed around the sale parcel.
- Off-site storm water east of the hydrologic divide will continue on its historic path.
- Sale Parcel drainage west of the hydrologic divide will be directed to the Regional Drainage Channel as part of the in-kind contribution.
- Storm drainage systems consisting of catch basins and storm drain pipe will be provided to collect and convey drainage to the Regional Drainage Channel.
- Surface detention will be provided to detain the post-development 100-year, 2-hour storm water for sale parcel land east of the hydrologic divide. Permanent basins for sale parcel site development and site development half-streets (west half of 73rd Place and north half of Chauncey Lane) will be provided on-site. Storm water for the east half of 73rd Place and the south half of Chauncey Lane will discharge into roadway swales with outfall to a natural wash.
- Surface detention basins east of the hydrologic divide will outfall/drain via pipe and overland flow toward the channel along Princess Boulevard.
- Storm drainage systems consisting of curb cuts, storm drain pipe, headwalls, and orifice plates will be provided to collect and convey drainage to the detention basins.
- Remainder site generated storm drainage will continue to flow in its current drainage pattern.
- Future building finish floor elevations will be designed at least fourteen inches above the ultimate site outfall elevation and at least 2 foot above the highest adjacent natural grade to provide one foot of clearance/freeboard from the depth of sheet flow.
- Based on the current Flood Insurance Rate Map (FRIM), the sale parcel is located in the Zone "AO". Any buildings in this Flood Zone will be designed above the depth of flow as indicated on the FIRM map with one foot of clearance/freeboard.
- Drainage easements are provided for the permanent and temporary surface detention basins and final Regional Drainage Channel/Culvert.

This final drainage report is intended to provide a level of assurance that the sale parcel and remainder of Planning Unit IV will adhere to all appropriate reviewing agency guidelines with respect to drainage and flood protection.

7.0 References

1. City of Scottsdale, *Design Standards and Policies Manual, Chapter 4: Grading and Drainage,* January 2010.

2. Dibble Engineering, Inc, *Drainage Report for Scottsdale Road Frank Lloyd Wright Blvd to Thompson Peak Parkway Segment 2,* March 2009.

3. Federal Emergency Management Agency (FEMA), *Flood Insurance Rate Map (FIRM) of Maricopa County, Arizona and Incorporated Areas, Panel 2160 of 4350, Map Number 04013C2160F,* September 30, 2005.

4. Flood Control District of Maricopa County (FCDMC), *Drainage Design Manual for Maricopa County, Hydrology Volume, February,* 2008.

5. Flood Control District of Maricopa County (FCDMC), *Drainage Design Manual for Maricopa County, Hydraulics Volume,* January, 1996.

6. Wood Patel and Associates, Inc, *Final Drainage Report for Interim Regional Drainage Channel,* October 2008.

Appendix A

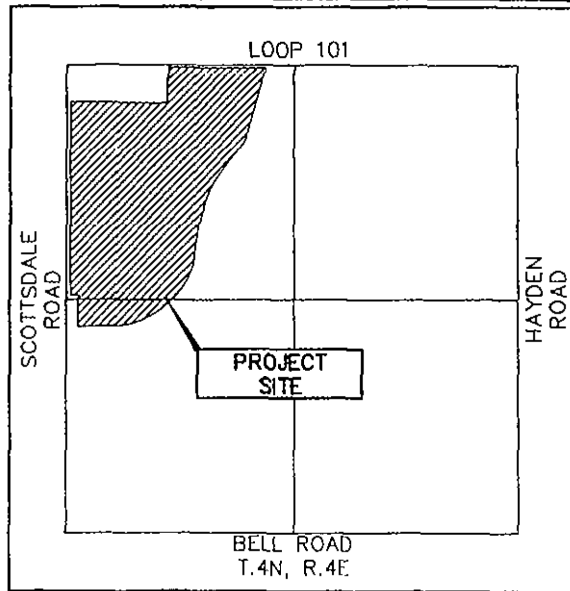
Site Location Map and Legal Descriptions

LEGAL DESCRIPTION:

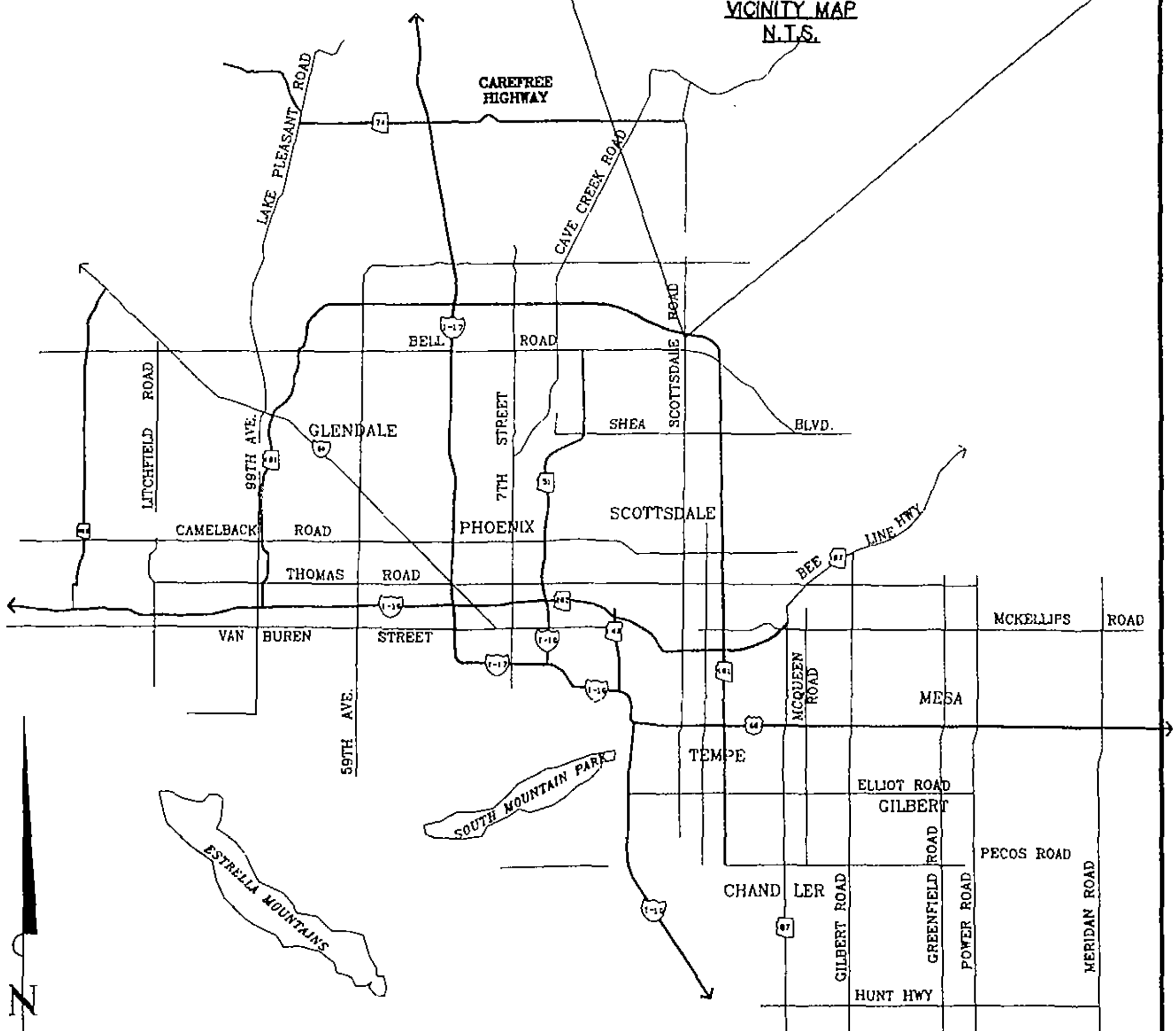
TRACT 3A, STATE PLAT NO. 16, SOUTH CORE, ACCORDING TO BOOK 324 OF MAPS, PAGE 50, RECORDS OF MARICOPA COUNTY, ARIZONA.

PROJECT INFORMATION

SITE ADDRESS: 18555 N. SCOTTSDALE ROAD
SCOTTSDALE, AZ 85255



VICINITY MAP
N.T.S.



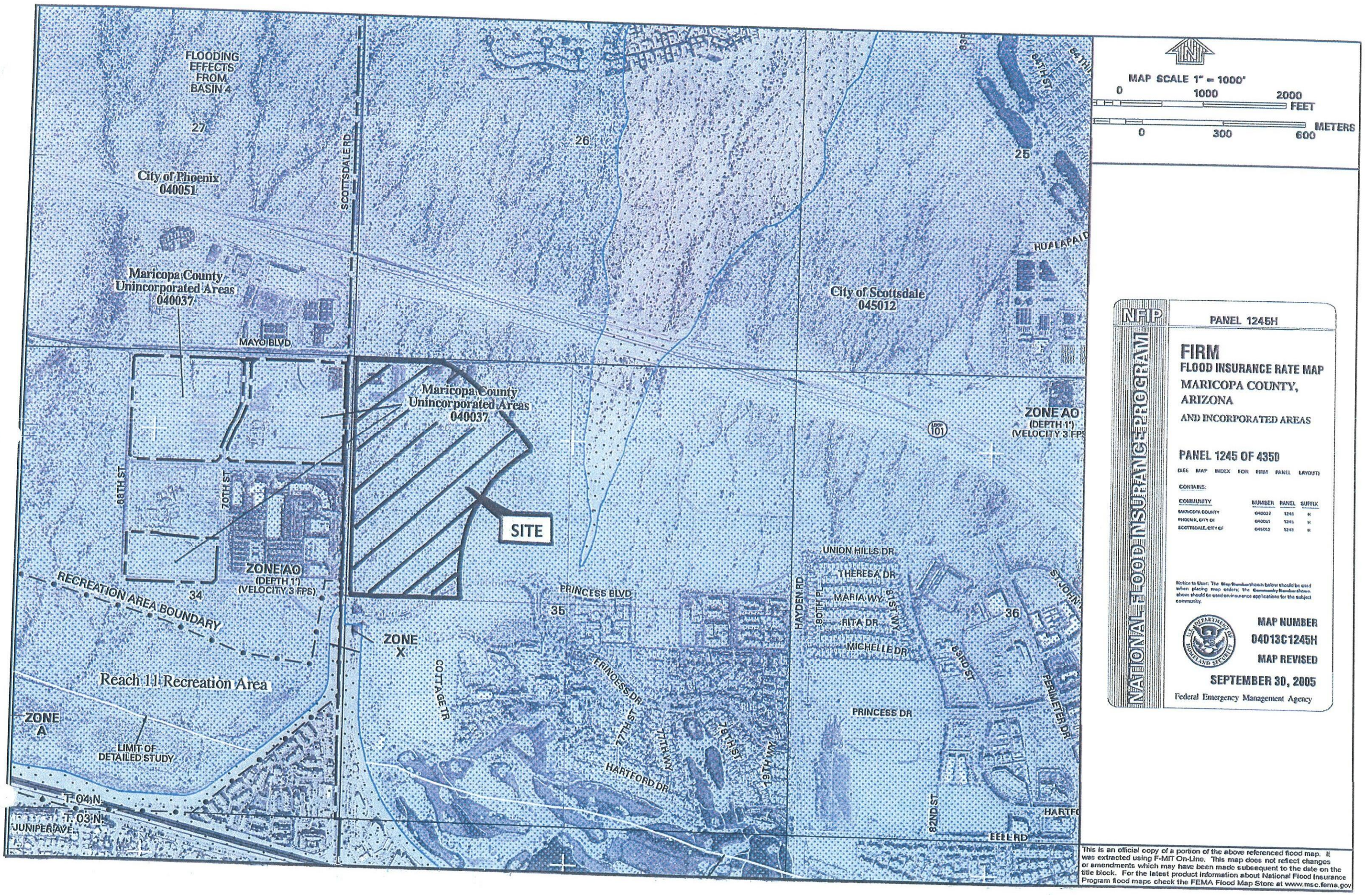
(N.T.S.)

SITE LOCATION MAP

Kimley-Horn and Associates, Inc.

Appendix B

FEMA Flood Insurance Rate Map (FIRM)



MAP SCALE 1" = 1000'
0 1000 2000 FEET
0 300 600 METERS
FLOODING EFFECTS FROM BASIN 4
27
26
25
City of Phoenix 040051
SCOTTSDALE RD
Maricopa County Unincorporated Areas 040037
City of Scottsdale 045012
HUALAPAI
MAYO BLVD
Maricopa County Unincorporated Areas 040037
ZONE AO (DEPTH 1') (VELOCITY 3 FPS)
101
68TH ST
70TH ST
SITE
ZONE AO (DEPTH 1') (VELOCITY 3 FPS)
34
RECREATION AREA BOUNDARY
ZONE X
PRINCESS BLVD
35
UNION HILLS DR
THERESA DR
MARIA WY
RITA DR
MICHELLE DR
HAYDEN RD
80TH PL
81ST WY
36
PERIMETER DR
Reach 11 Recreation Area
COTTAGE TR
PRINCESS DR
77TH ST
77TH WY
78TH ST
79TH WY
PRINCESS DR
ZONE A
LIMIT OF DETAILED STUDY
HARTFORD DR
92ND ST
T. 04 N.
T. 03 N.
JUNIPER AVE
EEL RD
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 1245H
FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS
PANEL 1245 OF 4350
MAP NUMBER 04013C1245H
MAP REVISED
SEPTEMBER 30, 2005
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix C

Hydrologic Calculations

HEC-1 Calculations

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1**************************************                    ***************************************
*                                    *                    *                                     *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1) *                    *  U.S. ARMY CORPS OF ENGINEERS       *
*            JUN   1998              *                    *  HYDROLOGIC ENGINEERING CENTER      *
*          VERSION 4.1               *                    *       609 SECOND STREET             *
*                                    *                    *     DAVIS, CALIFORNIA 95616         *
* RUN DATE   08AUG12  TIME  16:57:57 *                    *        (916) 756-1104               *
*                                    *                    *                                     *
**************************************                    ***************************************


                    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


      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. THIS IS THE FORTRAN77 VERSION
      NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
      DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
      KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


1                                          HEC-1 INPUT                                                PAGE  1

       LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

         1       ID    ONE SCOTTSDALE (STACKED 40S) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
         2       ID    OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA GOVERNED BY PRE-POST CRITERIA
         3       ID    OPTION A - ASLD CHANNEL
         4       ID    FILE:  100YR-N2.DAT
         5       ID           OPTION B - 34.1 ACRES OF ASLD PARCEL
         6       ID
         7       ID    BASED ON MODELS PREPARED BY: ROBERT L. WARD, P.E., CONSULTING ENGINEER
         8       ID
         9       ID                     PR5W-100.6I
        10       ID                     C1.6I       (CENTER DRIVE PROJECT)
        11       ID                     S40EX100.6I (STACKED 40S EXISTING CONDITION)
        12       ID
        13       ID    ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 13, 2002
        14       ID    100-YEAR, 6-HOUR HYPOTHETICAL STORM
        15       ID
        16       ID    AREAL RAINFALL REDUCTION IS BASED ON A 14 SQUARE MILE STORM.
        17       ID
                 *DIAGRAM
        18       IT       5                 300
        19       IO       5
                 *
                 *      BEGIN GRAYHAWK - VILLAGE 1 DRAINAGE PLAN
                 *      PREPARED BY:  GILBERTSON ASSOCIATES, INC., HEC-1 FILE: UDPLAN.DAT.
                 *      THIS GILBERTSON MODEL USES SCS UNIT HYDROGRAPH METHODOLOGY.
                 *      THE ORIGINAL MODEL WAS BASED ON A 1-MINUTE COMPUTATION INTERVAL.
                 *

        20       KK     1A1
        21       KM         EXCESS RUNOFF FROM SUBAREA 1A1
        22       KM         RAINFALL REGION 3
        23       BA    .0188
        24       PH             14     0.76     1.50     2.54     2.81     2.99     3.33
        25       LS             77       36
        26       UD    0.08

        27       KK  DET1A1
        28       KM         DETENTION BASIN FOR SUBAREA 1A1
        29       RS       1    STOR       0
        30       SV       0    1.76
        31       SQ       0      20
        32       SE       0     3.0
        33       ST     3.0      15      2.8      1.5

        34       KK  RA1-C4
        35       KM         ROUTE OUTFLOW FROM DET1A1 TO CP1C4
        36       KM         TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
        37       KM                        SIDE SLOPE = 3:1 (H:V)
        38       KM                        MAX DEPTH  = 1.35 FT.
        39       RS       1    FLOW      -1
        40       RC   0.025   0.025   0.025      670   0.0179
        41       RX       0     0.5     1.0     5.04     5.05      9.1      9.5       10
        42       RY    1.37    1.36    1.35        0        0     1.35     1.36     1.37
1                                          HEC-1 INPUT                                                PAGE  2

       LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


        43       KK     1C4
        44       KM         EXCESS RUNOFF FROM SUBAREA 1C4
        45       BA     .005
        46       LS              77        5
        47       UD     .08
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 48       KK   CP1C4
 49       KM        COMBINE HYDROGRAPHS FROM RA1 C4 AND 1C4
 50       HC        2

 51       KK  RC4-C3
 52       KM        ROUTE OUTFLOW FROM CP1C4 TO CP1C3I
 53       KM        TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E 95)
 54       KM                       SIDE SLOPE = 3:1 (H:V)
 55       KM                       MAX DEPTH  = 1.5 FT.
 56       RS      1    FLOW      -1
 57       RC   0.025   0.025   0.025     400   0.020
 58       RX      0      0.5     1.0    4.49     4.5       9     9.5      10
 59       RY   1.52     1.51     1.5       0       0     1.5    1.51    1.52

 60       KK    1Da3
 61       KM        EXCESS RUNOFF FROM SUBAREA 1Da3
 62       BA   .0148
 63       LS              77      34
 64       UD     .06

 65       KK  DE1Da3
 66       KM        DETENTION FOR SUBAREA 1Da3
 67       KM        OUTLET IS A 18" RGRCP WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
 68       RS      1    STOR       0
 69       SV      0    1.27
 70       SQ      0       4
 71       SE      0     3.0
 72       ST    3.0      15     2.8     1.5

 73       KK    1Da4
 74       KM        EXCESS RUNOFF FROM SUBAREA 1Da4
 75       BA     .01
 76       LS              77      38
 77       UD     .05

 78       KK  CP1Da4
 79       KM        COMBINE HYDROGRAPHS FROM 1Da4 AND DE1Da3
 80       HC        2

 81       KK  DE1Da4
 82       KM        DETENTION FOR SUBAREA 1Da4
 83       KM        OUTLET IS A 18" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
 84       RS      1    STOR       0
 85       SV      0    0.76
 86       SQ      0       4
 87       SE      0     3.0
 88       ST    3.0      15     2.8     1.5
1                                        HEC-1 INPUT                                            PAGE  3

LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 89       KK    1Da5
 90       KM        EXCESS RUNOFF FROM SUBAREA 1Da5
 91       BA    .004
 92       LS              77       5
 93       UD     .08

 94       KK  CP1C3I
 95       KM        COMBINE HYDROGRAHS FROM RC4-C3, 1Da5 AND DE1Da4
 96       HC        3

 97       KK  RC3-C3
 98       KM        ROUTE OUTFLOW FROM CP1C3I TO DET1C3
 99       KM        TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
100       KM                       SIDE SLOPE = 3:1 (H:V)
101       KM                       MAX DEPTH  = 2.35 FT.
102       RS      1    FLOW      -1
103       RC   0.025   0.025   0.025     850   0.005
104       RX      0      0.5     1.0    8.04    8.05    15.1    15.5      16
105       RY   2.37     2.36    2.35       0       0    2.35    2.36    2.37
          *    *************************************************************
          *    *START AT OFF-SITE BASIN ON THE NORTHEAST CORNER OF VILLAGE 1*
          *    *************************************************************

106       KK  Off-1A
107       KM        OFF-SITE CONTRIBUTING AREA LOCATED ON CITY'S LAND
108       BA    .012
109       LS              77
110       UD     .06

111       KK     1A2
112       KM        EXCESS RUNOFF FROM SUBAREA 1A2
113       BA    .004
114       LS              77      44
115       UD     .06

116       KK     1A3
117       KM        EXCESS RUNOFF FROM SUBAREA 1A3
118       BA    .006
119       LS              77      40
120       UD     .05

121       KK    CPA3
122       KM        COMBINE HYDROGRAPHS FROM 1A1, Off-1A AND 1A3
123       HC        3

124       KK  DET1A3
125       KM        DETENTION BASIN FOR SUBAREA 1A3
126       RS      1    STOR       0
127       SV      0    0.38
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SQ      0      22
SE      0     2.5
ST    2.5      15     2.8     1.5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              KK  RA3-A6
              KM        ROUTE OUTFLOW HYDROGRAPH FROM DET1A3 TO DET1A6
              KM                      TRAPEZOIDAL CHANNEL (ASSUMED)
              KM                           SIDE SLOPE = 5:1 (H:V)
              KM                           MAX DEPTH  = 1.0 FT.
              KM                           BOT.WIDTH  = 10.0 FT.
              RS      1    FLOW      -1
              RC  0.025   0.025   0.025     550  0.0145
              RX      0     0.5     1.0       6      16      21    21.5    22.0
              RY   1.02    1.01     1.0       0       0     1.0    1.01    1.02

              KK    1A6
              KM        EXCESS RUNOFF FROM SUBAREA 1A6
              BA   .004
              LS             77      44
              UD    .05

              KK  CP1A6
              KM        COMBINE HYDROGRAPHS FROM RA3-A6 AND 1A6
              HC      2

              KK DET1A6
              KM        DETENTION BASIN FOR SUBAREA 1A6
              RS      1    STOR       0
              SV      0    0.28
              SQ      0      22
              SE      0     2.5
              ST    2.5      15     2.8     1.5

              KK    1A5
              KM        EXCESS RUNOFF FROM SUBAREA 1A5
              BA   .016
              LS             77      46
              UD    .07

              KK  CP1A5
              KM        COMBINE HYDROGRAPHS FROM DET1A6 AND 1A5
              HC      2

              KK DET1A5
              KM        DETENTION BASIN FOR SUBAREA 1A5
              RS      1    STOR       0
              SV      0    0.65
              SQ      0      34
              SE      0     2.5
              ST    2.5      15     2.8     1.5

              KK    1A4
              KM        EXCESS RUNOFF FROM SUBAREA 1A4
              BA   .010
              LS             77      48
              UD    .07
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              KK  RA4-A7
              KM        ROUTE OUTFLOW FROM DET1A4 TO DET1A7
              KM                      TRAPEZOIDAL CHANNEL (ASSUMED)
              KM                           SIDE SLOPE = 10:1 (H:V)
              KM                           MAX DEPTH  = 1.0 FT.
              KM                           BOT.WIDTH  = 10.0 FT.
              RS      1    FLOW      -1
              RC  0.030   0.030   0.030     800  0.0175
              RX      0     0.5     1.0      11      21      31    31.5    32.0
              RY   1.02    1.01     1.0       0       0     1.0    1.01    1.02

              KK DET1A4
              KM        DETENTION BASIN FOR SUBAREA 1A4
              RS      1    STOR       0
              SV      0    0.37
              SQ      0      11
              SE      0     2.5
              ST    2.5      15     2.8     1.5

              KK    1A7
              KM        EXCESS RUNOFF FROM SUBAREA 1A7
              BA   .008
              LS             77      27
              UD    .05

              KK  CP1A7
              KM        COMBINE HYDROGRAPHS FROM DET1A5, DET1A4, AND 1A7
              HC      3

              KK DET1A7
              KM        DETENTION BASIN FOR SUBAREA 1A7
              RS      1    STOR       0
              SV      0    0.93
              SQ      0      11
              SE      0     2.5
              ST    2.5      15     2.8     1.5
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KK     1C1
KM        EXCESS RUNOFF FROM SUBAREA 1C1
BA    .024
LS              77       38
UD     .09

KK   CP1C1
KM        COMBINE HYDROGRAPHS FROM DET1A7, AND 1C1
HC       2

KK  DET1C1
KM        DETENTION BASIN FOR SUBAREA 1C1
KM        STORAGE VOLUME PER PLANS (405-E-95)
KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
RS       1    STOR        0
SV       0     1.5
SQ       0      14
1                                    HEC-1 INPUT                                          PAGE  6

LINE    ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

SE       0     3.6
ST     3.6      15     2.8     1.5

KK     1C2
KM        EXCESS RUNOFF FROM SUBAREA 1C2
BA    .024
LS              77       32
UD     .08

KK   CP1C2
KM        COMBINE HYDROGRAPHS FROM DET1C1 AND 1C2
HC       2

KK  DE1C2A
KM        DETENTION BASIN FOR SUBAREA 1C2
KM        STORAGE VOLUME PER PLANS (405-E-95)
KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
RS       1    STOR        0
SV       0    0.39
SQ       0      14
SE       0     3.6
ST     3.6      15     2.8     1.5

KK  DE1C2B
KM        DETENTION BASIN FOR SUBAREAS 1C2
KM        STORAGE VOLUME PER PLANS (405-E-95)
KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
RS       1    STOR        0
SV       0    0.92
SQ       0      14
SE       0     3.6
ST     3.6      15     2.8     1.5

KK  DE1C2C
KM        DETENTION BASIN FOR SUBAREAS 1C2
KM        STORAGE VOLUME PER PLANS (405-E-95)
KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
RS       1    STOR        0
SV       0    0.54
SQ       0      14
SE       0     3.6
ST     3.6      15     2.8     1.5

KK     1C3
KM        EXCESS RUNOFF FROM SUBAREA 1C3
BA    .026
LS              77       35
UD     .06

KK   CP1C3
KM        COMBINE HYDROGRAPHS FROM RC2-C3, DET1C2C, AND 1C3
HC       3
1                                    HEC-1 INPUT                                          PAGE  7

LINE    ID.......1.......2.......3.......4.......5.......6.......7. .....8.......9......10


KK  DET1C3
KM        DETENTION BASIN FOR SUBAREAS 1C3
KM        STORAGE VOLUME PER PLANS (405-E-95)
KM        OUTLET IS A 6'W x 3'H CBC PER PLANS (1132-E-94 AND 190-E-95)
RS       1    STOR        0
SV       0     1.4
SQ       0     150
SE       0     3.5
ST     3.5      15     2.8     1.5

KK  RC3COM
KM        ROUTE OUTFLOW FROM DET1C3 TO WHERE DETCOM OUTFLOWS
RS       1    FLOW       -1
RC   0.030   0.030   0.030     1000   0.016
RX       0       5      10       20      30      40      45      50
RY    12.0   11.75    11.5     10.0    10.0    11.5   11.75    12.0

KK    COMM
KM        EXCESS RUNOFF FROM SUBAREA COMMERCIAL
BA     .03
LS              77       90
UD     .07
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288    KK  DETCOM
289    KM        DETENTION FOR SUBAREA COMMERCIAL
290    RS      1    STOR      0
291    SV      0     4.1
292    SQ      0      13
293    SE      0       3
294    ST      3      15     2.8     1.5

295    KK   CPCOM
296    KM        COMBINE HYDROGRAPHS FROM Rc3COM AND COMM
297    HC      2

298    KK  COMOF1
299    KM        ROUTE CPCOM TO CPOFF1
300    RS      1    FLOW     -1
301    RC  0.030   0.030   0.030     900  0.0155
302    RX      0       5      10      20      30      40      45      50
303    RY   12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

304    KK    OFF1
305    KM        EXCESS RUNOFF FROM SUBAREA OFF1
306    BA    .02
307    LS             77      90
308    UD    .05

309    KK  DEOFF1
310    KM        DETENTION FOR SUBAREA OFF1
311    RS      1    STOR      0
312    SV      0     2.4
313    SQ      0      13
314    SE      0       3
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315    ST      3      15     2.8     1.5

316    KK  CPOFF1
317    KM        COMBINE HYDROGRAPHS FROM COMOFF AND DEOFF1
318    HC      2

319    KK  OF1OF3
320    KM        ROUTE CPOFF1 TO CPOFF3
321    RS      1    FLOW     -1
322    RC  0.030   0.030   0.030     600   0.013
323    RX      0       5      10      20      30      40      45      50
324    RY   12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

325    KK    OFF3
326    KM        EXCESS RUNOFF FROM SUBAREA OFF3
327    BA   .016
328    LS             77      90
329    UD    .07

330    KK  DEOFF3
331    KM        DETENTION FOR SUBAREA OFF3
332    RS      1    STOR      0
333    SV      0    2.24
334    SQ      0      13
335    SE      0       3
336    ST      3      15     2.8     1.5

337    KK  CPOFF3
338    KM        COMBINE HYDROGRAPHS FROM DEOFF3 AND OF1OF3
339    HC      2
       *
       *      START WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
       *

340    KK    33A1      CP
341    KM         ROUTE CPOFF3 THROUGH SUB 33A
342    RK   1960   .0161    .045            TRAP      20       3
       *

343    KK     33A     SUB
344    KM         RUNOFF FROM SUB 33A, INCLUDES WEST SIDE OF CENTER DRIVE
345    BA   .054
346    LS             77      85
347    UK    300   0.020     .05     100
348    RK   2325    .012    .015            TRAP      20       3
       *

349    KK    33A3      CP
350    KO      1
351    KM         COMBINE SUB 33A, CP 33A1
352    HC      2
       *
       *      END WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
       *
       *
       *      BEGIN GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 1
       *      START AT NORTHEAST CORNER OF PARCEL 1Db AND GO SOUTHWEST THROUGH
       *      PROPOSED PARK SITE.
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353    KK     1Db
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KM        EXCESS RUNOFF FROM SUBAREA 1Db
BA      .04
LS                 77        35
UD       .06

KK   DE1Db
KM        DETENTION FOR SUBAREA 1Db
RS         1    STOR        0
SV         0      2.7
SQ         0       13
SE         0      3.0
ST       3.0       15      2.8       1.5

KK    1Da1
KM        EXCESS RUNOFF FROM SUBAREA 1Da1
BA     .0089
LS                 77        35
UD       .05

KK  DE1Da1
KM        DETENTION FOR SUBAREA 1Da1
KM        OUTLET IS A 18" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
RS         1    STOR        0
SV         0   0.548
SQ         0        4
SE         0      3.0
ST       3.0       15      2.8       1.5

KK    1Da2
KM        EXCESS RUNOFF FROM SUBAREA 1Da2
BA      .003
LS                 77
UD       .08

KK  CP1Dab
KM        COMBINE HYDROGRAPHS FROM 1Da2, DE1Db AND DE1Da1
HC         3

KK  RDabE2
KM        ROUTE OTFLOW FROM CP1Dab TO CP1Ea2
KM        TRAPEZOIDAL CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
KM                          SIDE SLOPE = 4:1 (H:V)
KM                          MAX DEPTH  = 1.0 FT.
KM                          BOT.WIDTH  = 3.0 FT.
RS         1    FLOW       -1
RC     0.030   0.030   0.030     1400  0.0171
RX         0     0.5     1.0        5        8       12     12.5       13
RY       1.2     1.1     1.0        0        0      1.0      1.1      1.2
1                                     HEC-1 INPUT                                                      PAGE 10

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


KK    1Ea1
KM        EXCESS RUNOFF FROM SUBAREA 1Ea1
BA      .019
LS                 77        37
UD       .08

KK  DE1Ea1
KM        DETENTION FOR SUBAREA 1Ea1
KM        OUTLET IS A 8" PVC CONNECTED TO AN 18" RGRCP (407-E-95)
RS         1    STOR        0
SV         0     1.54
SQ         0        4
SE         0        3
ST         3       15      2.8       1.5

KK    1Ea2
KM        EXCESS RUNOFF FROM SUBAREA 1Ea2
BA      .024
LS                 77        39
UD       .06

KK  CP1Ea2
KM        COMBINE HYDROGRAPHS FROM DE1Ea1 AND 1Ea2
HC         2

KK  DE1Ea2
KM        DETENTION FOR SUBAREA 1Ea2
RS         1    STOR        0
SV         0      1.5
SQ         0       10
SE         0        3
ST         3       15      2.8       1.5

KK  CP1Ea2
KM        COMBINE HYDROGRAPHS FROM DE1Ea2 AND RDabE2
HC         2

KK    PARK
KM        EXCESS RUNOFF FROM PROPOSED CITY'S PARK SITE
BA      .021
LS                 77
UD       .06

KK  SCHOOL
KM        EXCESS RUNOFF FROM PROPOSED SCHOOL SITE
BA      .015
LS                 77        80
UD       .05
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LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 437            KK  DETSCH
 438            KM       DETENTION FOR SUBAREA SCHOOL
 439            RS       1    STOR       0
 440            SV       0     1.3
 441            SQ       0      13
 442            SE       0       3
 443            ST       3      15     2.8     1.5

 444            KK   SCH12
 445            KM       ROUTE OUTFLOW FROM DETSCH TO CP1Ec
 446            RS       1    FLOW      -1
 447            RC   0.030   0.030   0.030     500   0.009
 448            RX       0     2.5       5      10      20      25    27.5      30
 449            RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

 450            KK     1Ec
 451            KM       EXCESS RUNOFF FROM SUBAREA 1Ec
 452            BA   .0089
 453            LS              77      80
 454            UD     .06

 455            KK   DE1Ec
 456            KM       DETENTION FOR SUBAREA 1Ec
 457            RS       1    STOR       0
 458            SV       0     0.8
 459            SQ       0      11
 460            SE       0       3
 461            ST       3      15     2.8     1.5

 462            KK   CP1Ec
 463            KM       COMBINE HYDROGRAPHS FROM SCH12 AND DE1Ec
 464            HC       2

 465            KK  1EcEa2
 466            KM       ROUTE OUTFLOW FROM CP1Ec TO CP1Ea2
 467            RS       1    FLOW      -1
 468            RC   0.030   0.030   0.030     500   0.009
 469            RX       0     2.5       5      10      20      25    27.5      30
 470            RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

 471            KK   CP1Ea
 472            KM       COMBINE HYDROGRAPHS FROM CP1Ea2, 1EcEa2 AND PARK
 473            HC       3

 474            KK  REaTPP
 475            KM       ROUTE CP1Ea TO THOMPSON PEAK PARKWAY
 476            RS       1    FLOW      -1
 477            RC   0.030   0.030   0.030     750  0.0186
 478            RX       0     2.5       5      10      20      25    27.5      30
 479            RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0
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LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 480            KK     1Eb
 481            KM       EXCESS RUNOFF FROM SUBAREA 1Eb
 482            BA   .0576
 483            LS              77      52
 484            UD     .08

 485            KK  DET1Eb
 486            KM       DETENTION FOR PARCEL 1Eb
 487            RS       1    STOR       0
 488            SV       0     4.9
 489            SQ       0      52
 490            SE       0       3
 491            ST       3      15     2.8     1.5

 492            KK    OFF2
 493            KM       EXCESS RUNOFF FROM SUBAREA OFF2. PUMPED HOSPITAL FLOWS.
 494            BA    .033
 495            LS              77      90
 496            UD     .07

 497            KK  DEOFF2
 498            KM       DETENTION FOR SUBAREA OFF2. PUMPED HOSPITAL FLOWS.
 499            RS       1    STOR       0
 500            SV       0     4.5
 501            SQ       0      13
 502            SE       0       3
 503            ST       3      15     2.8     1.5

 504            KK  CPOFF2
 505            KM       COMBINE HYDROGRAHPS REaTPP, DET1Eb AND DEOFF2
 506            HC       3
                *
                *      END GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 1
                *
                *
                *      START EAST SIDE OF STACKED 40 DESIGN
                *
                *

 507            KK   1Kr.1   ROUTE
 508            KM       ROUTE CPOFF2 THROUGH SUB 1Kr
```

```
 509          RK    840   .0135    .045              TRAP      10       2
              *

 510          KK     1Kr     SUB
 511          KM        R/O FROM SUB 1Kr
 512          KM        DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1K
 513          BA    .0515
 514          LS              77       55
 515          UD     0.15
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 516          KK    DET1K
 517          KM        DETENTION FOR SUBAREA 1Kr
 518          RS      1     STOR       0
 519          SV      0      4.6
 520          SQ      0       20
 521          SE      0        3
 522          ST      3       15     2.8     1.5
              *

 523          KK    1Kr.2 COMBINE
 524          KM        COMBINE DET1K & 1Kr.1
 525          HC      2
              *

 526          KK    1Mr.1   ROUTE
 527          KM        ROUTE 1Kr.2 THROUGH SUB 1Mr
 528          RK    1200   .0149    .045              TRAP      10       2
              *

 529          KK     1Mr     SUB
 530          KM        R/O FROM SUB 1Mr
 531          KM        DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1M
 532          BA    .0537
 533          LS              77       64
 534          UD      .08
              *

 535          KK    DET1M     DAM
 536          KM        ROUTE SUB 1M THROUGH DETENTION BASIN
 537          RS      1     STOR       0
 538          SV      0      3.3
 539          SQ      0       20
 540          SE      0        3
 541          ST      3       15     2.8     1.5
              *

 542          KK    1Mr.2 COMBINE
 543          KM        COMBINE DET1M & 1Mr.1
 544          HC      2
              *
              *         STACKED 40 BASIN 33E.1 NORTH OF CENTER DR
              *
              *

 545          KK     33E     SUB
 546          KM        R/O FROM SUB 33E
 547          BA    .0395
 548          LS              77       84
 549          UK     100    0.02   0.050     100
 550          RK    2130   0.015   0.035              TRAP      20       3
              *
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 551          KK    33BE     SUB
 552          KM        RUNOFF FROM SUB 33BE. EAST SIDE OF CENTER DRIVE.
 553          BA    .0011
 554          LS              77       78
 555          UK     300   0.020    .035     100
 556          RK    2325    .012    .015              TRAP      20       3
              *

 557          KK    33E.2 COMBINE
 558          KM        COMBINE 1Mr.2 & 33E & 33BE. FLOW INTO CULVERT AND SD SYSTEM
 559          KM        UNDER CENTER DRIVE.
 560          HC      3
              *

 561          KK  R33E.2   ROUTE
 562          KM        ROUTE 33E.2 ALONG EAST SIDE OF STACK 40 PARCEL TO FRONTAGE ROAD
 563          KM        2-54" PIPES. DIAMETER PROVIDED IN ROUTING IS EQUIVALENT DIA OF
 564          KM        BOTH PIPES.
 565          RK    2250   .0147    .015              CIRC     6.3
              *
              *         INSERT EXISTING CONDITION SUBBASIN 33D
              *

 566          KK     33D     SUB
 567          KM        RUNOFF FROM SUB 33D
 568          KO      5
 569          BA    .0403
 570          LS              77
 571          UK      89   .0213     .10     100
 572          RK    2250   .0149    .045              TRAP      20       3
```

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                  *

 573              KK   S40ET      SUB
 574              KM        SUB SOUTH OF CENTER DRIVE, EASTERN SIDE OF PROPERTY, FLOWS TO
 575              KM        EASTERN DIVERSION STRUCTURE.
 576              BA    .0183
 577              LS               77       86
 578              UK     175    .0075     .05      100
 579              RK    2000     .008    .015               CIRC        5
                  *
                  *

 580              KK  CT13.0 COMBINE
 581              KO       1
 582              KM  COMBINE R33E.2, SUB 33D, S40ET, & S40CN. FLOWS INTO JUNCTION STRUCTURE
 583              HC       3
                  *

 584              KK  D_ADOT
 585              KM  DIVERT FLOW FROM BASIN DIRECTLY TO ADOT CULVERT 6
 586              KM  FLOW TO ADOT CULVERT 6 OF 223 CFS
 587              DT  P_ADOT
 588              DI       0      2.7     10.4     22.6     38.7     58.4     80.8    105.4    143.3    191.9
 589              DI   246.9    306.5    361.9    419.9
```



```
LINE              ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 590              DQ       0      2.7     10.4     22.6     38.7     58.4     80.8    105.4    131.6    158.6
 591              DQ   185.7    212.3    230.2    246.9
                  *

 592              KK     33C      SUB
 593              KM  SUBBASIN 33C SOUTH OF CENTER DRIVE WEST SIDE OF PROPERTY
 594              KM  MODIFIED AREA TO ACCOUNT FOR NEW SITE PLAN AND SUBS 04-27-06 - ADDED SOUTHWEST
 595              BA  0.0296
 596              LS               77       87
 597              UK     200    .0068     .05      100
 598              RK    1750     .017    .015               CIRC        5
                  *

 599              KK   S40CN      SUB
 600              KM  SUB SOUTH OF CENTER DRIVE, CENTRAL BASIN FLOWING DIRECTLY INTO DET/RET
 601              KM  INCLUDES DETENTION BASIN
 602              BA   .0448
 603              LS               77       87
 604              UK     250    .0075     .05      100
 605              RK    1500     .009    .015               CIRC      4.5
                  *
                  *

 606              KK  CT13.1 COMBINE
 607              KM  COMBINE CT13.0, 33C FLOWS (Total Flow at the BASIN)
 608              HC       3
                  *
                  *

 609              KK   D_BAS
 610              KM  BY-PASS FLOW THROUGH d=2' PIPE (MAX q = 30 CFS) BASIN OUTLETS PROVIDE
 611              KM  EQUIVALENT AMOUNT OF DISCHARGE
 612              DT  P-PIPE
 613              DI       0      1.0     10.0     30.0       30    100.0    300.0    500.0    800.0
 614              DQ       0      1.0     10.0     30.0       30       30       30       30       30
                  *

 615              KK  D_BAS1
 616              KM  DIVERT THE FIRST 1 AC-FT INTO THE SURFACE STORAGE
 617              DT  D-BAS2      1.0
 618              DI       0      1.0     10.0     40.0     70.0    100.0    300.0    500.0    800.0
 619              DQ       0      1.0     10.0     40.0     70.0    100.0    300.0    500.0    800.0
                  *

 620              KK  D_SURF
 621              KM  DIVERT FLOW INTO SUB_SURFACE STORAGE
 622              KM  (1110', 10' DIAMETER PIPE, VOL = 2.0 Ac-Ft)
 623              KO       1
 624              DT  D-SUBF       2
 625              DI       0      1.0     10.0     40.0     70.0    100.0    300.0    500.0    800.0
 626              DQ       0      1.0     10.0     40.0     70.0    100.0    300.0    500.0    800.0
                  *
```



```
LINE              ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 627              KK  B_PIPE
 628              KM  RETRIEVE DIVERTED PIPE FLOW
 629              DR  P-PIPE
                  *

 630              KK  B_SURF
 631              KM  RETRIEVE DIVERTED SURFACE FLOW
 632              DR  D-BAS2
                  *

 633              KK   CS40B COMBINE
 634              KO       1
 635              KM  COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW
 636              HC       3
                  *
```

```
637            KK  S40BAS
638            KO      1
639            KM  ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
640            KM  ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
641            KM  24" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'
642            RS      1    STOR      -1
643            SV      0    .001     .14     .87    1.84    3.04    4.49    5.16    5.49    5.82
644            SV   6.15
645            SE      0      .8       1       2       3       4       5     5.4     5.6     5.8
646            SE      6
647            SL      1    3.14    0.62     0.5
648            SS    3.8      20     2.8     1.5
               *

649            KK  P33E.1
650            KO      1
651            KM  DIVIDE THE FLOW INTO TWO ADOT CULVERTS
652            DT  D33C.2
653            DI      0     100     200     400     600
654            DQ      0      68     136     272     408
               *
               *

655            KK  R_ADOT
656            KM  RETRIEVE DIVERTED ADOT CULVERT FLOW
657            DR  P_ADOT
               *

658            KK   33E.1 COMBINE
659            KO      1                               21
660            KM  COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6
661            HC      2
               *
1                                         HEC-1 INPUT                                               PAGE 17

LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


662            KK  R33E.1   ROUTE
663            KO      1                               21
664            KM  ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND TO
665            KM  UNION HILLS DRIVE (MAYO) AND 73RD PLACE.
666            KM  ROUTE L=1600', TRAP SECTION BW=19' Z=5, TWmax=39'
667            KM  ASSUME GRASS LINED CHANNEL N=.030 UP=1592.5 DWN=1582.66
668            RK   1600  0.0088    0.03            TRAP      19       5
               *

669            KK  ASLDR1   ROUTE
670            KO      1                               21
671            KM  ROUTE FLOWS FROM CHANNEL THROUGH BOX CULVERT ALONG UNION
672            KM  HILLS DRIVE (MAYO) TO SCOTTSDALE ROAD, SOUTH TO CHAUNCEY.
673            KM  ROUTE L=1830', BOX SECTION W=8' H=3'
674            KM  ASSUME CONCRTE LINED CHANNEL N=.013 UP=1582.55 DWN=1566.32
675            RK   1830  0.0089    .013            TRAP      16       0
               *

676            KK    ASLD1     SUB
677            KO      1                               21
678            KM  ASLD NORTH PARCEL EAST OF SCOTTSDALE ROAD AND NORTH OF CHAUNCEY LANE
679            BA  0.0315
680            LS             77      83
681            UK    345   0.001   0.015     100
682            RK   1400   .0131    .015            TRAP      17       4
               *

683            KK   ASLDCT COMBINE
684            KO      1                               21
685            KM  COMBINED DISCHARGE AT ASLDR1 AND ASLD1 SUB BASIN
686            HC      2
               *

687            KK  ASLDR2   ROUTE
688            KO      1                               21
689            KM  ROUTE ASLDR1 AND ASLD1 SUB TO SCOTTSDALE ROAD
690            KM  AND PRINCESS DRIVE
691            KM  ROUTE L=1000', TRAP SECTION BW=17' Z=4, TWmax=41'
692            KM  ASSUME GRASS LINED CHANNEL N=.030 UP=1570.15 DWN=1548.60
693            RK   1000  0.0075    0.03            TRAP      17       4
               *

694            KK    ASLD2     SUB
695            KO      1                               21
696            KM  ASLD SOUTH PARCEL EAST OF SCOTTSDALE ROAD AND NORTH OF CHAUNCEY LANE
697            BA  0.0193
698            LS             77      78
699            UK    269   .0022   0.015     100
700            RK    600   .0139    .015            TRAP      17       4
               *
1                                         HEC-1 INPUT                                               PAGE 18

LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


701            KK  CPPRIN COMBINE
702            KO      1                               21
703            KM  COMBINE ROUTED ROUTED ASLDCHNL WITH ASLD2
704            HC      2
               *
               *

705            KK  R33C.2
```

```
          706            KO       1
          707            KM  RETRIEVE DIVERTED PIPE FLOW
          708            DR  D33C.2
                         *

          709            KK   S40WT     SUB
          710            KO       1
          711            KM  SUB EAST OF SCOTTSDALE RD. FLOWING DIRECTLY INTO SCOTTSDALE RD
          712            KM  CULVERT, TAKES SCOTTS RD HALF ST AND SCENIC CORRIDOR
          713            BA  0.0063
          714            LS               77      89
          715            UK      50     .01     .05     100
          716            RK     600     .01    .015             CIRC     4.5
                         *
                         *

          717            KK   33C.2 COMBINE
          718            KO       1
          719            KM  COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT
          720            HC       2
                         *
                         *
          721            ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   20         1A1
                V
                V
   27      DET1A1
                V
                V
   34      RA1-C4
                .
                .
   43           .        1C4
                .          .
                .          .
   48       CP1C4...........
                V
                V
   51      RC4-C3
                .
                .
   60           .       1Da3
                .          V
                .          V
   65           .     DE1Da3
                .          .
                .          .
   73           .          .         1Da4
                .          .            .
                .          .            .
   78           .     CP1Da4............
                .          V
                .          V
   81           .     DE1Da4
                .          .
                .          .
   89           .          .         1Da5
                .          .            .
                .          .            .
   94      CP1C3I.......................
                V
                V
   97      RC3-C3
                .
                .
  106           .     Off-1A
                .          .
                .          .
  111           .          .          1A2
                .          .            .
                .          .            .
  116           .          .            .          1A3
                .          .            .            .
                .          .            .            .
  121           .       CPA3.......................
                .          V
                .          V
  124           .     DET1A3
                .          V
                .          V
  131           .     RA3-A6
                .          .
                .          .
  141           .          .          1A6
                .          .            .
                .          .            .
  146           .      CP1A6............
                .          V
                .          V
  149           .     DET1A6
                .          .
                .          .
  156           .          .          1A5
                .          .            .
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                      .           .           .
161                   .       CP1A5............
                      .           V
                      .           V
164                   .      DET1A5
                      .           .
                      .           .
171                   .           .         1A4
                      .           .           V
                      .           .           V
176                   .           .      RA4-A7
                      .           .           V
                      .           .           V
186                   .           .      DET1A4
                      .           .           .
                      .           .           .
193                   .           .           .         1A7
                      .           .           .           .
                      .           .           .           .
198                   .       CP1A7........................
                      .           V
                      .           V
201                   .      DET1A7
                      .           .
                      .           .
208                   .           .         1C1
                      .           .           .
                      .           .           .
213                   .       CP1C1............
                      .           V
                      .           V
216                   .      DET1C1
                      .           .
                      .           .
225                   .           .         1C2
                      .           .           .
                      .           .           .
230                   .       CP1C2............
                      .           V
                      .           V
233                   .      DE1C2A
                      .           V
                      .           V
242                   .      DE1C2B
                      .           V
                      .           V
251                   .      DE1C2C
                      .           .
                      .           .
260                   .           .         1C3
                      .           .           .
                      .           .           .
265               CP1C3........................
                      V
                      V
268              DET1C3
                      V
                      V
277              RC3COM
                      .
                      .
283                   .        COMM
                      .           V
                      .           V
288                   .      DETCOM
                      .           .
                      .           .
295               CPCOM............
                      V
                      V
298              COMOF1
                      .
                      .
304                   .        OFF1
                      .           V
                      .           V
309                   .      DEOFF1
                      .           .
                      .           .
316              CPOFF1............
                      V
                      V
319              OF1OF3
                      .
                      .
325                   .        OFF3
                      .           V
                      .           V
330                   .      DEOFF3
                      .           .
                      .           .
337              CPOFF3............
                      V
                      V
340                33A1
                      .
                      .
343                   .         33A
                      .           .
                      .           .
349                33A3............
```

```
                .
353             .          1Db
                .            V
                .            V
358             .        DE1Db
                .            .
                .            .
365             .            .         1Da1
                .            .            V
                .            .            V
370             .            .       DE1Da1
                .            .            .
                .            .            .
378             .            .            .        1Da2
                .            .            .           .
                .            .            .           .
383             .       CP1Dab.......................
                .            V
                .            V
386             .       RDabE2
                .            .
                .            .
396             .            .         1Ea1
                .            .            V
                .            .            V
401             .            .       DE1Ea1
                .            .            .
                .            .            .
409             .            .            .        1Ea2
                .            .            .           .
                .            .            .           .
414             .            .       CP1Ea2............
                .            .            V
                .            .            V
417             .            .       DE1Ea2
                .            .            .
                .            .            .
424             .       CP1Ea2............
                .            .
                .            .
427             .            .         PARK
                .            .            .
                .            .            .
432             .            .            .      SCHOOL
                .            .            .           V
                .            .            .           V
437             .            .            .      DETSCH
                .            .            .           V
                .            .            .           V
444             .            .            .       SCH12
                .            .            .           .
                .            .            .           .
450             .            .            .           .          1Ec
                .            .            .           .            V
                .            .            .           .            V
455             .            .            .           .        DE1Ec
                .            .            .           .            .
                .            .            .           .            .
462             .            .            .       CP1Ec............
                .            .            .           V
                .            .            .           V
465             .            .            .     1EcEa2
                .            .            .           .
                .            .            .           .
471             .         CP1Ea.......................
                .            V
                .            V
474             .       REaTPP
                .            .
                .            .
480             .            .          1Eb
                .            .            V
                .            .            V
485             .            .       DET1Eb
                .            .            .
                .            .            .
492             .            .            .        OFF2
                .            .            .           V
                .            .            .           V
497             .            .            .     DEOFF2
                .            .            .           .
                .            .            .           .
504             .       CPOFF2.......................
                .            V
                .            V
507             .        1Kr.1
                .            .
                .            .
510             .            .          1Kr
                .            .            V
                .            .            V
516             .            .        DET1K
                .            .            .
                .            .            .
523             .        1Kr.2............
                .            V
                .            V
526             .        1Mr.1
                .            .
                .            .
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```
529        .          .          1Mr
           .          .            V
           .          .            V
535        .          .         DET1M
           .          .            .
           .          .            .
542        .      1Mr.2............
           .          .
           .          .
545        .          .          33E
           .          .            .
           .          .            .
551        .          .            .            33BE
           .          .            .               .
           .          .            .               .
557        .      33E.2.........................
           .          V
           .          V
561        .     R33E.2
           .          .
           .          .
566        .          .          33D
           .          .            .
           .          .            .
573        .          .            .           S40ET
           .          .            .               .
           .          .            .               .
580        .     CT13.0.........................
           .          .
           .          .
587        .          .-------->  P_ADOT
584        .     D_ADOT
           .          .
           .          .
592        .          .          33C
           .          .            .
           .          .            .
599        .          .            .           S40CN
           .          .            .               .
           .          .            .               .
606        .     CT13.1.........................
           .          .
           .          .
612        .          .-------->  P-PIPE
609        .      D_BAS
           .          .
           .          .
617        .          .-------->  D-BAS2
615        .     D_BAS1
           .          .
           .          .
624        .          .-------->  D-SURF
620        .     D_SURF
           .          .
           .          .
629        .          .            .<--------  P-PIPE
627        .          .       B_PIPE
           .          .            .
           .          .            .
632        .          .            .               .<--------  D-BAS2
630        .          .            .         B_SURF
           .          .            .               .
           .          .            .               .
633        .      CS40B.........................
           .          V
           .          V
637        .     S40BAS
           .          .
           .          .
652        .          .-------->  D33C.2
649        .     P33C.1
           .          .
           .          .
657        .          .            .<--------  P_ADOT
655        .          .       R_ADOT
           .          .            .
           .          .            .
658        .      33E.1............
           .          V
           .          V
662        .     R33E.1
           .          V
           .          V
669        .     ASLDR1
           .          .
           .          .
676        .          .        ASLD
           .          .            .
           .          .            .
683        .      ASLDC............
           .          V
           .          V
687        .     ASLDR2
           .          .
           .          .
694        .          .        ASLD
           .          .            .
           .          .            .
701        .     CPPRIN............
                      .
           .          .
```

```
708              .            .            .<-------  D33C.2
705              .            .        R33C.2
                 .            .            .
                 .            .            .
709              .            .            .        S40WT
                 .            .            .            .
                 .            .            .            .
717              .            .         33C.2...........

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1**************************************                    **************************************
*                                     *                    *                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1) *                    *   U.S. ARMY CORPS OF ENGINEERS     *
*              JUN   1998             *                    *   HYDROLOGIC ENGINEERING CENTER    *
*             VERSION 4.1             *                    *         609 SECOND STREET          *
*                                     *                    *      DAVIS, CALIFORNIA 95616       *
* RUN DATE  09AUG12  TIME  16:57:57   *                    *          (916) 756-1104            *
*                                     *                    *                                    *
***************************************                    **************************************


                     ONE SCOTTSDALE (STACKED 40S) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
                     OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA GOVERNED BY PRE-POST CRITERIA
                     OPTION A - ASLD CHANNEL
                     FILE:  100YR-N2.DAT
                            OPTION B - 34.1 ACRES OF ASLD PARCEL

                     BASED ON MODELS PREPARED BY: ROBERT L. WARD, P.E., CONSULTING ENGINEER

                                        PR5W-100.6I
                                        C1.6I        (CENTER DRIVE PROJECT)
                                        S40EX100.6I (STACKED 40S EXISTING CONDITION)

                     ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 13, 2002
                     100-YEAR, 6-HOUR HYPOTHETICAL STORM

                     AREAL RAINFALL REDUCTION IS BASED ON A 14 SQUARE MILE STORM.


 19 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                     NMIN           5  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        0055  ENDING TIME
                    ICENT          19  CENTURY MARK

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE   24.92 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


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
349 KK      *    33A3    *          CP
            *            *
            **************

350 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                          COMBINE SUB 33A, CP 33A1

352 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

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                                         HYDROGRAPH AT STATION      33A3
                                            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   0615   76    41.   *   1   1230  151      5.  *   1    1845  226         1
   1   0005    2          0.     *   1   0620   77    40.   *   1   1235  152      4.  *   1    1850  227         1.
```

1	0010	3	0.	1	0625	78	39.	1	1240	153	4.	1	1855	228	1.
1	0015	4	0.	1	0630	79	37.	1	1245	154	4.	1	1900	229	1.
1	0020	5	0.	1	0635	80	36.	1	1250	155	4.	1	1905	230	1.
1	0025	6	0.	1	0640	81	35.	1	1255	156	4.	1	1910	231	1.
1	0030	7	1.	1	0645	82	34.	1	1300	157	4.	1	1915	232	1.
1	0035	8	1.	1	0650	83	33.	1	1305	158	4.	1	1920	233	1.
1	0040	9	2.	1	0655	84	32.	1	1310	159	4.	1	1925	234	1.
1	0045	10	3.	1	0700	85	31.	1	1315	160	3.	1	1930	235	1.
1	0050	11	3.	1	0705	86	31.	1	1320	161	3.	1	1935	236	1.
1	0055	12	4.	1	0710	87	30.	1	1325	162	3.	1	1940	237	1.
1	0100	13	4.	1	0715	88	30.	1	1330	163	3.	1	1945	238	0.
1	0105	14	4.	1	0720	89	29.	1	1335	164	3.	1	1950	239	0.
1	0110	15	5.	1	0725	90	28.	1	1340	165	3.	1	1955	240	0.
1	0115	16	5.	1	0730	91	28.	1	1345	166	3.	1	2000	241	0.
1	0120	17	5.	1	0735	92	27.	1	1350	167	3.	1	2005	242	0.
1	0125	18	6.	1	0740	93	26.	1	1355	168	3.	1	2010	243	0.
1	0130	19	6.	1	0745	94	26.	1	1400	169	3.	1	2015	244	0.
1	0135	20	7.	1	0750	95	25.	1	1405	170	3.	1	2020	245	0.
1	0140	21	7.	1	0755	96	24.	1	1410	171	3.	1	2025	246	0.
1	0145	22	8.	1	0800	97	24.	1	1415	172	2.	1	2030	247	0.
1	0150	23	8.	1	0805	98	23.	1	1420	173	2.	1	2035	248	0.
1	0155	24	9.	1	0810	99	22.	1	1425	174	2.	1	2040	249	0.
1	0200	25	9.	1	0815	100	22.	1	1430	175	2.	1	2045	250	0.
1	0205	26	10.	1	0820	101	21.	1	1435	176	2.	1	2050	251	0.
1	0210	27	11.	1	0825	102	21.	1	1440	177	2.	1	2055	252	0.
1	0215	28	11.	1	0830	103	20.	1	1445	178	2.	1	2100	253	0.
1	0220	29	12.	1	0835	104	19.	1	1450	179	2.	1	2105	254	0.
1	0225	30	13.	1	0840	105	19.	1	1455	180	2.	1	2110	255	0.
1	0230	31	15.	1	0845	106	18.	1	1500	181	2.	1	2115	256	0.
1	0235	32	18.	1	0850	107	18.	1	1505	182	2.	1	2120	257	0.
1	0240	33	25.	1	0855	108	17.	1	1510	183	2.	1	2125	258	0.
1	0245	34	34.	1	0900	109	17.	1	1515	184	2.	1	2130	259	0.
1	0250	35	45.	1	0905	110	16.	1	1520	185	2.	1	2135	260	0.
1	0255	36	60.	1	0910	111	16.	1	1525	186	2.	1	2140	261	0.
1	0300	37	109.	1	0915	112	15.	1	1530	187	2.	1	2145	262	0.
1	0305	38	232.	1	0920	113	15.	1	1535	188	2.	1	2150	263	0.
1	0310	39	198.	1	0925	114	15.	1	1540	189	2.	1	2155	264	0.
1	0315	40	150.	1	0930	115	14.	1	1545	190	2.	1	2200	265	0.
1	0320	41	143.	1	0935	116	14.	1	1550	191	1.	1	2205	266	0.
1	0325	42	141.	1	0940	117	13.	1	1555	192	1.	1	2210	267	0.
1	0330	43	135.	1	0945	118	13.	1	1600	193	1.	1	2215	268	0.
1	0335	44	132.	1	0950	119	12.	1	1605	194	1.	1	2220	269	0.
1	0340	45	138.	1	0955	120	12.	1	1610	195	1.	1	2225	270	0.
1	0345	46	149.	1	1000	121	12.	1	1615	196	1.	1	2230	271	0.
1	0350	47	151.	1	1005	122	11.	1	1620	197	1.	1	2235	272	0.
1	0355	48	144.	1	1010	123	11.	1	1625	198	1.	1	2240	273	0.
1	0400	49	133.	1	1015	124	11.	1	1630	199	1.	1	2245	274	0.
1	0405	50	123.	1	1020	125	10.	1	1635	200	1.	1	2250	275	0.
1	0410	51	114.	1	1025	126	10.	1	1640	201	1.	1	2255	276	0.
1	0415	52	107.	1	1030	127	10.	1	1645	202	1.	1	2300	277	0.
1	0420	53	99.	1	1035	128	9.	1	1650	203	1.	1	2305	278	0.
1	0425	54	93.	1	1040	129	9.	1	1655	204	1.	1	2310	279	0.
1	0430	55	88.	1	1045	130	9.	1	1700	205	1.	1	2315	280	0.
1	0435	56	83.	1	1050	131	9.	1	1705	206	1.	1	2320	281	0.
1	0440	57	78.	1	1055	132	8.	1	1710	207	1.	1	2325	282	0.
1	0445	58	74.	1	1100	133	8.	1	1715	208	1.	1	2330	283	0.
1	0450	59	70.	1	1105	134	8.	1	1720	209	1.	1	2335	284	0.
1	0455	60	67.	1	1110	135	8.	1	1725	210	1.	1	2340	285	0.
1	0500	61	64.	1	1115	136	7.	1	1730	211	1.	1	2345	286	0.
1	0505	62	61.	1	1120	137	7.	1	1735	212	1.	1	2350	287	0.
1	0510	63	59.	1	1125	138	7.	1	1740	213	1.	1	2355	288	0.
1	0515	64	56.	1	1130	139	7.	1	1745	214	1.	2	0000	289	0.
1	0520	65	54.	1	1135	140	6.	1	1750	215	1.	2	0005	290	0.
1	0525	66	53.	1	1140	141	6.	1	1755	216	1.	2	0010	291	0.
1	0530	67	51.	1	1145	142	6.	1	1800	217	1.	2	0015	292	0.
1	0535	68	50.	1	1150	143	6.	1	1805	218	1.	2	0020	293	0.
1	0540	69	49.	1	1155	144	6.	1	1810	219	1.	2	0025	294	0.
1	0545	70	48.	1	1200	145	5.	1	1815	220	1.	2	0030	295	0.
1	0550	71	47.	1	1205	146	5.	1	1820	221	1.	2	0035	296	0.
1	0555	72	46.	1	1210	147	5.	1	1825	222	1.	2	0040	297	0.
1	0600	73	45.	1	1215	148	5.	1	1830	223	1.	2	0045	298	0.
1	0605	74	44.	1	1220	149	5.	1	1835	224	1.	2	0050	299	0.
1	0610	75	42.	1	1225	150	5.	1	1840	225	1.	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 232.	3.08		65.	19.	19.	19.
		(INCHES)	1.984	2.334	2.334	2.334
		(AC-FT)	32.	38.	38.	38.

CUMULATIVE AREA = .31 SQ MI

568 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

580 KK CT13.0 COMBINE

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591 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

COMBINE R33E.2, SUB 33D, S40ET, & S40CN. FLOWS INTO JUNCTION STRUCTURE

593 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION CT13.0

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	0615	76	58.	1	1230	151	5.	1	1845	226	1.
1	0005	2	0.	1	0620	77	55.	1	1235	152	5.	1	1850	227	1.
1	0010	3	0.	1	0625	78	53.	1	1240	153	5.	1	1855	228	1.
1	0015	4	0.	1	0630	79	50.	1	1245	154	5.	1	1900	229	1.
1	0020	5	0.	1	0635	80	48.	1	1250	155	5.	1	1905	230	1.
1	0025	6	1.	1	0640	81	46.	1	1255	156	5.	1	1910	231	1.
1	0030	7	1.	1	0645	82	44.	1	1300	157	5.	1	1915	232	1.
1	0035	8	2.	1	0650	83	42.	1	1305	158	5.	1	1920	233	1.
1	0040	9	3.	1	0655	84	41.	1	1310	159	4.	1	1925	234	1.
1	0045	10	4.	1	0700	85	39.	1	1315	160	4.	1	1930	235	1.
1	0050	11	5.	1	0705	86	38.	1	1320	161	4.	1	1935	236	1.
1	0055	12	6.	1	0710	87	36.	1	1325	162	4.	1	1940	237	1.
1	0100	13	6.	1	0715	88	35.	1	1330	163	4.	1	1945	238	1.
1	0105	14	7.	1	0720	89	34.	1	1335	164	4.	1	1950	239	1.
1	0110	15	7.	1	0725	90	32.	1	1340	165	4.	1	1955	240	1.
1	0115	16	8.	1	0730	91	31.	1	1345	166	4.	1	2000	241	1.
1	0120	17	9.	1	0735	92	30.	1	1350	167	4.	1	2005	242	1.
1	0125	18	9.	1	0740	93	29.	1	1355	168	4.	1	2010	243	1.
1	0130	19	10.	1	0745	94	28.	1	1400	169	3.	1	2015	244	1.
1	0135	20	10.	1	0750	95	27.	1	1405	170	3.	1	2020	245	1.
1	0140	21	11.	1	0755	96	26.	1	1410	171	3.	1	2025	246	1.
1	0145	22	12.	1	0800	97	25.	1	1415	172	3.	1	2030	247	1.
1	0150	23	12.	1	0805	98	25.	1	1420	173	3.	1	2035	248	1.
1	0155	24	13.	1	0810	99	24.	1	1425	174	3.	1	2040	249	1.
1	0200	25	14.	1	0815	100	23.	1	1430	175	3.	1	2045	250	1.
1	0205	26	15.	1	0820	101	22.	1	1435	176	3.	1	2050	251	1.
1	0210	27	16.	1	0825	102	22.	1	1440	177	3.	1	2055	252	1.
1	0215	28	17.	1	0830	103	21.	1	1445	178	3.	1	2100	253	1.
1	0220	29	18.	1	0835	104	20.	1	1450	179	3.	1	2105	254	1.
1	0225	30	20.	1	0840	105	20.	1	1455	180	3.	1	2110	255	1.
1	0230	31	21.	1	0845	106	19.	1	1500	181	3.	1	2115	256	1.
1	0235	32	25.	1	0850	107	18.	1	1505	182	3.	1	2120	257	1.
1	0240	33	33.	1	0855	108	18.	1	1510	183	2.	1	2125	258	0.
1	0245	34	44.	1	0900	109	17.	1	1515	184	2.	1	2130	259	0.
1	0250	35	58.	1	0905	110	17.	1	1520	185	2.	1	2135	260	0.
1	0255	36	77.	1	0910	111	16.	1	1525	186	2.	1	2140	261	0.
1	0300	37	134.	1	0915	112	16.	1	1530	187	2.	1	2145	262	0.
1	0305	38	295.	1	0920	113	15.	1	1535	188	2.	1	2150	263	0.
1	0310	39	340.	1	0925	114	15.	1	1540	189	2.	1	2155	264	0.
1	0315	40	303.	1	0930	115	14.	1	1545	190	2.	1	2200	265	0.
1	0320	41	275.	1	0935	116	14.	1	1550	191	2.	1	2205	266	0.
1	0325	42	257.	1	0940	117	14.	1	1555	192	2.	1	2210	267	0.
1	0330	43	243.	1	0945	118	13.	1	1600	193	2.	1	2215	268	0.
1	0335	44	226.	1	0950	119	13.	1	1605	194	2.	1	2220	269	0.
1	0340	45	204.	1	0955	120	12.	1	1610	195	2.	1	2225	270	0.
1	0345	46	184.	1	1000	121	12.	1	1615	196	2.	1	2230	271	0.
1	0350	47	168.	1	1005	122	12.	1	1620	197	2.	1	2235	272	0.
1	0355	48	156.	1	1010	123	11.	1	1625	198	2.	1	2240	273	0.
1	0400	49	147.	1	1015	124	11.	1	1630	199	2.	1	2245	274	0.
1	0405	50	140.	1	1020	125	11.	1	1635	200	2.	1	2250	275	0.
1	0410	51	134.	1	1025	126	10.	1	1640	201	2.	1	2255	276	0.
1	0415	52	129.	1	1030	127	10.	1	1645	202	2.	1	2300	277	0.
1	0420	53	125.	1	1035	128	10.	1	1650	203	2.	1	2305	278	0.
1	0425	54	120.	1	1040	129	10.	1	1655	204	2.	1	2310	279	0.
1	0430	55	116.	1	1045	130	9.	1	1700	205	2.	1	2315	280	0.
1	0435	56	112.	1	1050	131	9	1	1705	206	1.	1	2320	281	0.
1	0440	57	108.	1	1055	132	9.	1	1710	207	1.	1	2325	282	0.
1	0445	58	105.	1	1100	133	9.	1	1715	208	1.	1	2330	283	0.
1	0450	59	101.	1	1105	134	8.	1	1720	209	1.	1	2335	284	0.
1	0455	60	98.	1	1110	135	8.	1	1725	210	1.	1	2340	285	0.
1	0500	61	95.	1	1115	136	8.	1	1730	211	1.	1	2345	286	0.
1	0505	62	92.	1	1120	137	8.	1	1735	212	1.	1	2350	287	0.
1	0510	63	89.	1	1125	138	8.	1	1740	213	1.	1	2355	288	0.
1	0515	64	86.	1	1130	139	7.	1	1745	214	1.	2	0000	289	0.
1	0520	65	83.	1	1135	140	7.	1	1750	215	1.	2	0005	290	0.
1	0525	66	81.	1	1140	141	7.	1	1755	216	1.	2	0010	291	0.
1	0530	67	78.	1	1145	142	7.	1	1800	217	1.	2	0015	292	0.
1	0535	68	76.	1	1150	143	7.	1	1805	218	1.	2	0020	293	0.
1	0540	69	74.	1	1155	144	6.	1	1810	219	1.	2	0025	294	0.
1	0545	70	72.	1	1200	145	6.	1	1815	220	1.	2	0030	295	0
1	0550	71	70.	1	1205	146	6.	1	1820	221	1.	2	0035	296	0.
1	0555	72	68.	1	1210	147	6.	1	1825	222	1.	2	0040	297	0.
1	0600	73	66.	1	1215	148	6.	1	1830	223	1.	2	0045	298	0.
1	0605	74	64.	1	1220	149	6.	1	1835	224	1.	2	0050	299	0.
1	0610	75	61.	1	1225	150	6.	1	1840	225	1.	2	0055	300	0.

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 340.	3.17		92.	26.	25.	25.
		(INCHES)	1.960	2.259	2.259	2.259
		(AC-FT)	45.	52.	52.	52.

CUMULATIVE AREA = .43 SQ MI

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              *            *
620 KK        *   D_SURF   *
              *            *
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623 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

DT DIVERSION

ISTAD	D-SUBF	DIVERSION HYDROGRAPH IDENTIFICATION
DSTRMX	2.00	MAXIMUM VOLUME TO BE DIVERTED

DI	INFLOW	.00	1.00	10.00	40.00	70.00	100.00	300.00	500.00	800.00
DQ	DIVERTED FLOW	.00	1.00	10.00	40.00	70.00	100.00	300.00	500.00	800.00

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DIVERSION HYDROGRAPH D-SUBF

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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	0615	76	0.	1	1230	151	0.	1	1845	226	0.
1	0005	2	0.	1	0620	77	0.	1	1235	152	0.	1	1850	227	0.
1	0010	3	0.	1	0625	78	0.	1	1240	153	0.	1	1855	228	0.
1	0015	4	0.	1	0630	79	0.	1	1245	154	0.	1	1900	229	0.
1	0020	5	0.	1	0635	80	0.	1	1250	155	0.	1	1905	230	0.
1	0025	6	0.	1	0640	81	0.	1	1255	156	0.	1	1910	231	0.
1	0030	7	0.	1	0645	82	0.	1	1300	157	0.	1	1915	232	0.
1	0035	8	0.	1	0650	83	0.	1	1305	158	0.	1	1920	233	0.
1	0040	9	0.	1	0655	84	0.	1	1310	159	0.	1	1925	234	0.
1	0045	10	0.	1	0700	85	0.	1	1315	160	0.	1	1930	235	0.
1	0050	11	0.	1	0705	86	0.	1	1320	161	0.	1	1935	236	0.
1	0055	12	0.	1	0710	87	0.	1	1325	162	0.	1	1940	237	0.
1	0100	13	0.	1	0715	88	0.	1	1330	163	0.	1	1945	238	0.
1	0105	14	0.	1	0720	89	0.	1	1335	164	0.	1	1950	239	0.
1	0110	15	0.	1	0725	90	0.	1	1340	165	0.	1	1955	240	0.
1	0115	16	0.	1	0730	91	0.	1	1345	166	0.	1	2000	241	0.
1	0120	17	0.	1	0735	92	0.	1	1350	167	0.	1	2005	242	0.
1	0125	18	0.	1	0740	93	0.	1	1355	168	0.	1	2010	243	0.
1	0130	19	0.	1	0745	94	0.	1	1400	169	0.	1	2015	244	0.
1	0135	20	0.	1	0750	95	0.	1	1405	170	0.	1	2020	245	0.
1	0140	21	0.	1	0755	96	0.	1	1410	171	0.	1	2025	246	0.
1	0145	22	0.	1	0800	97	0.	1	1415	172	0.	1	2030	247	0.
1	0150	23	0.	1	0805	98	0.	1	1420	173	0.	1	2035	248	0.
1	0155	24	0.	1	0810	99	0.	1	1425	174	0.	1	2040	249	0.
1	0200	25	0.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	0.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	0.	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	0.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	0.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	0.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0.
1	0230	31	0.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	0.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	0.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.
1	0245	34	0.	1	0900	109	0.	1	1515	184	0.	1	2130	259	0.
1	0250	35	0.	1	0905	110	0.	1	1520	185	0.	1	2135	260	0.
1	0255	36	0.	1	0910	111	0.	1	1525	186	0.	1	2140	261	0.
1	0300	37	53.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0.
1	0305	38	237.	1	0920	113	0.	1	1535	188	0.	1	2150	263	0.
1	0310	39	0.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	0.	1	0930	115	0.	1	1545	190	0.	1	2200	265	0.
1	0320	41	0.	1	0935	116	0.	1	1550	191	0.	1	2205	266	0.
1	0325	42	0.	1	0940	117	0.	1	1555	192	0.	1	2210	267	0.
1	0330	43	0.	1	0945	118	0.	1	1600	193	0.	1	2215	268	0.
1	0335	44	0.	1	0950	119	0.	1	1605	194	0.	1	2220	269	0.
1	0340	45	0.	1	0955	120	0.	1	1610	195	0.	1	2225	270	0.
1	0345	46	0.	1	1000	121	0.	1	1615	196	0.	1	2230	271	0.
1	0350	47	0.	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	0.	1	1010	123	0.	1	1625	198	0.	1	2240	273	0.
1	0400	49	0.	1	1015	124	0.	1	1630	199	0.	1	2245	274	0.
1	0405	50	0.	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	0.	1	1025	126	0.	1	1640	201	0.	1	2255	276	0.
1	0415	52	0.	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	0.	1	1035	128	0.	1	1650	203	0.	1	2305	278	0.
1	0425	54	0.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0.
1	0430	55	0.	1	1045	130	0.	1	1700	205	0.	1	2315	280	0.
1	0435	56	0.	1	1050	131	0.	1	1705	206	0.	1	2320	281	0.
1	0440	57	0.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.

DA	MON HRMN	ORD	FLOW	DA	MON HRMN	ORD	FLOW	DA	MON HRMN	ORD	FLOW	DA	MON HRMN	ORD	FLOW
1	0445	58	0.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	0.	1	1105	134	0.	1	1720	209	0.	1	2335	284	0.
1	0455	60	0.	1	1110	135	0.	1	1725	210	0.	1	2340	285	0.
1	0500	61	0.	1	1115	136	0.	1	1730	211	0.	1	2345	286	0.
1	0505	62	0.	1	1120	137	0.	1	1735	212	0.	1	2350	287	0.
1	0510	63	0.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	0.	1	1130	139	0.	1	1745	214	0.	2	0000	289	0.
1	0520	65	0.	1	1135	140	0.	1	1750	215	0.	2	0005	290	0.
1	0525	66	0.	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	0.	1	1145	142	0.	1	1800	217	0.	2	0015	292	0.
1	0535	68	0.	1	1150	143	0.	1	1805	218	0.	2	0020	293	0.
1	0540	69	0.	1	1155	144	0.	1	1810	219	0.	2	0025	294	0.
1	0545	70	0.	1	1200	145	0.	1	1815	220	0.	2	0030	295	0.
1	0550	71	0.	1	1205	146	0.	1	1820	221	0.	2	0035	296	0.
1	0555	72	0.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0.
1	0600	73	0.	1	1215	148	0.	1	1830	223	0.	2	0045	298	0.
1	0605	74	0.	1	1220	149	0.	1	1835	224	0.	2	0050	299	0.
1	0610	75	0.	1	1225	150	0.	1	1840	225	0.	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 237.	3.08		4.	1.	1.	1.
		(INCHES)	.074	.074	.074	.074
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .51 SQ MI

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HYDROGRAPH AT STATION D_SURF

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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	0615	76	0.	1	1230	151	0.	1	1845	226	0.
1	0005	2	0.	1	0620	77	0.	1	1235	152	0.	1	1850	227	0.
1	0010	3	0.	1	0625	78	0.	1	1240	153	0.	1	1855	228	0.
1	0015	4	0.	1	0630	79	0.	1	1245	154	0.	1	1900	229	0.
1	0020	5	0.	1	0635	80	0.	1	1250	155	0.	1	1905	230	0.
1	0025	6	0.	1	0640	81	0.	1	1255	156	0.	1	1910	231	0.
1	0030	7	0.	1	0645	82	0.	1	1300	157	0.	1	1915	232	0.
1	0035	8	0.	1	0650	83	0.	1	1305	158	0.	1	1920	233	0.
1	0040	9	0.	1	0655	84	0.	1	1310	159	0.	1	1925	234	0.
1	0045	10	0.	1	0700	85	0.	1	1315	160	0.	1	1930	235	0.
1	0050	11	0.	1	0705	86	0.	1	1320	161	0.	1	1935	236	0.
1	0055	12	0.	1	0710	87	0.	1	1325	162	0.	1	1940	237	0.
1	0100	13	0.	1	0715	88	0.	1	1330	163	0.	1	1945	238	0.
1	0105	14	0.	1	0720	89	0.	1	1335	164	0.	1	1950	239	0.
1	0110	15	0.	1	0725	90	0.	1	1340	165	0.	1	1955	240	0.
1	0115	16	0.	1	0730	91	0.	1	1345	166	0.	1	2000	241	0.
1	0120	17	0.	1	0735	92	0.	1	1350	167	0.	1	2005	242	0.
1	0125	18	0.	1	0740	93	0.	1	1355	168	0.	1	2010	243	0.
1	0130	19	0.	1	0745	94	0.	1	1400	169	0.	1	2015	244	0.
1	0135	20	0.	1	0750	95	0.	1	1405	170	0.	1	2020	245	0.
1	0140	21	0.	1	0755	96	0.	1	1410	171	0.	1	2025	246	0.
1	0145	22	0.	1	0800	97	0.	1	1415	172	0.	1	2030	247	0.
1	0150	23	0.	1	0805	98	0.	1	1420	173	0.	1	2035	248	0.
1	0155	24	0.	1	0810	99	0.	1	1425	174	0.	1	2040	249	0.
1	0200	25	0.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	0.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	0.	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	0.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	0.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	0.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0.
1	0230	31	0.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	0.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	0.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.
1	0245	34	0.	1	0900	109	0.	1	1515	184	0.	1	2130	259	0.
1	0250	35	0.	1	0905	110	0.	1	1520	185	0.	1	2135	260	0.
1	0255	36	0.	1	0910	111	0.	1	1525	186	0.	1	2140	261	0.
1	0300	37	0.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0.
1	0305	38	126.	1	0920	113	0.	1	1535	188	0.	1	2150	263	0.
1	0310	39	309.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	189.	1	0930	115	0.	1	1545	190	0.	1	2200	265	0.
1	0320	41	131.	1	0935	116	0.	1	1550	191	0.	1	2205	266	0.
1	0325	42	101.	1	0940	117	0.	1	1555	192	0.	1	2210	267	0.
1	0330	43	82.	1	0945	118	0.	1	1600	193	0.	1	2215	268	0.
1	0335	44	60.	1	0950	119	0.	1	1605	194	0.	1	2220	269	0.
1	0340	45	38.	1	0955	120	0.	1	1610	195	0.	1	2225	270	0.
1	0345	46	21.	1	1000	121	0.	1	1615	196	0.	1	2230	271	0.
1	0350	47	10.	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	3.	1	1010	123	0.	1	1625	198	0.	1	2240	273	0.
1	0400	49	0.	1	1015	124	0.	1	1630	199	0.	1	2245	274	0.
1	0405	50	0.	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	0.	1	1025	126	0.	1	1640	201	0.	1	2255	276	0.
1	0415	52	0.	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	0.	1	1035	128	0.	1	1650	203	0.	1	2305	278	0.
1	0425	54	0.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0.
1	0430	55	0.	1	1045	130	0.	1	1700	205	0.	1	2315	280	0.
1	0435	56	0.	1	1050	131	0.	1	1705	206	0.	1	2320	281	0.
1	0440	57	0.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	0.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	0.	1	1105	134	0.	1	1720	209	0.	1	2335	284	0.
1	0455	60	0.	1	1110	135	0.	1	1725	210	0.	1	2340	285	0.
1	0500	61	0	1	1115	136	0.	1	1730	211	0.	1	2345	286	0.

1	0505	62	0.	1	1120	137	0.	1	1735	212	0.	1	2350	287	0.
1	0510	63	0.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	0.	1	1130	139	0.	1	1745	214	0.	2	0000	289	0.
1	0520	65	0.	1	1135	140	0.	1	1750	215	0.	2	0005	290	0.
1	0525	66	0.	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	0.	1	1145	142	0.	1	1800	217	0.	2	0015	292	0.
1	0535	68	0.	1	1150	143	0.	1	1805	218	0.	2	0020	293	0.
1	0540	69	0.	1	1155	144	0.	1	1810	219	0.	2	0025	294	0.
1	0545	70	0.	1	1200	145	0.	1	1815	220	0.	2	0030	295	0.
1	0550	71	0.	1	1205	146	0.	1	1820	221	0.	2	0035	296	0.
1	0555	72	0.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0.
1	0600	73	0.	1	1215	148	0.	1	1830	223	0.	2	0045	298	0.
1	0605	74	0.	1	1220	149	0.	1	1835	224	0.	2	0050	299	0.
1	0610	75	0.	1	1225	150	0.	1	1840	225	0.	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 309.	3.17		15.	4.	4.	4.
		(INCHES)	.271	.271	.271	.271
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .51 SQ MI

633 KK CS40B COMBINE

634 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW

636 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION CS40B
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		0615	76	3.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1.	1		1245	154	0.	1		1900	229	0.
1		0020	5	1.	1		0635	80	1.	1		1250	155	0.	1		1905	230	0.
1		0025	6	1.	1		0640	81	1.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	1.	1		1300	157	0.	1		1915	232	0.
1		0035	8	2.	1		0650	83	1.	1		1305	158	0.	1		1920	233	0.
1		0040	9	3.	1		0655	84	1.	1		1310	159	0.	1		1925	234	0.
1		0045	10	4.	1		0700	85	0.	1		1315	160	0.	1		1930	235	0.
1		0050	11	4.	1		0705	86	0.	1		1320	161	0.	1		1935	236	0.
1		0055	12	4.	1		0710	87	0.	1		1325	162	0.	1		1940	237	0.
1		0100	13	5.	1		0715	88	0.	1		1330	163	0.	1		1945	238	0.
1		0105	14	5.	1		0720	89	0.	1		1335	164	0.	1		1950	239	0.
1		0110	15	5.	1		0725	90	0.	1		1340	165	0.	1		1955	240	0.
1		0115	16	5.	1		0730	91	0.	1		1345	166	0.	1		2000	241	0.
1		0120	17	5.	1		0735	92	0.	1		1350	167	0.	1		2005	242	0.
1		0125	18	6.	1		0740	93	0.	1		1355	168	0.	1		2010	243	0.
1		0130	19	6.	1		0745	94	0.	1		1400	169	0.	1		2015	244	0.
1		0135	20	6.	1		0750	95	0.	1		1405	170	0.	1		2020	245	0.
1		0140	21	6.	1		0755	96	0.	1		1410	171	0.	1		2025	246	0.
1		0145	22	7.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	7.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	7.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	8.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	8.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	9.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	10.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	10.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	11.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	13.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	19.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	28.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	39.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	53.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	74.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	99.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	156.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	339.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	219.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	161.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	131.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.

1	0330	43	112.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	90.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	68.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	51.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	40.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	33.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	27.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	23.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	20.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	18.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	16.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	14.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	11.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	9.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	8.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	7.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	7.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	5.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	5.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	5.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	5.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	5.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	5.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	4.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

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	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	339.	3.17		30.	7.	7.	7.
			(INCHES)	.540	.544	.544	.544
			(AC-FT)	15.	15.	15.	15.

CUMULATIVE AREA = .51 SQ MI

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              **************
              *            *
637 KK        *   S40BAS   *
              *            *
              **************

638 KO     OUTPUT CONTROL VARIABLES
                 IPRNT          1  PRINT CONTROL
                 IPLOT          0  PLOT CONTROL
                 QSCAL         0.  HYDROGRAPH PLOT SCALE
                    ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
                    ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
                    24" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'

           HYDROGRAPH ROUTING DATA

642 RS     STORAGE ROUTING
                 NSTPS          1  NUMBER OF SUBREACHES
                  ITYP       STOR  TYPE OF INITIAL CONDITION
                RSVRIC      -1.00  INITIAL CONDITION
                     X        .00 WORKING R AND D COEFFICIENT

643 SV       STORAGE        .0       .0      .1      .9     1.8     3.0     4.5     5.2     5.5     5.8
                           6.2

645 SE     ELEVATION       .00      .80    1.00    2.00    3.00    4.00    5.00    5.40    5.60    5.80
                          6.00

647 SL     LOW-LEVEL OUTLET
                 ELEVL       1.00  ELEVATION AT CENTER OF OUTLET
                 CAREA       3.14  CROSS-SECTIONAL AREA
                  COQL        .62  COEFFICIENT
                  EXPL        .50  EXPONENT OF HEAD

648 SS     SPILLWAY
                  CREL       3.80  SPILLWAY CREST ELEVATION
                 SPWID      20.00  SPILLWAY WIDTH
                  COQW       2.80  WEIR COEFFICIENT
                  EXPW       1.50  EXPONENT OF HEAD
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COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	15.21	16.18	17.27	18.53	19.99	21.68	23.70	26.13
ELEVATION	.00	1.00	1.95	2.07	2.22	2.41	2.64	2.93	3.30	3.80
OUTFLOW	26.75	28.89	33.54	41.63	54.26	72.26	96.63	128.34	168.36	217.65
ELEVATION	3.84	3.92	4.03	4.19	4.39	4.63	4.91	5.23	5.60	6.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.00	.14	.83	.87	.94	1.09	1.27	1.49	1.77
OUTFLOW	.00	.00	.00	15.21	15.61	16.18	17.27	18.53	19.98	21.68
ELEVATION	.00	.80	1.00	1.95	2.00	2.07	2.22	2.41	2.64	2.93
STORAGE	1.84	2.20	2.80	2.85	2.94	3.04	3.09	3.32	3.61	3.96
OUTFLOW	22.08	23.70	26.13	26.75	28.89	32.05	33.54	41.68	54.26	72.26
ELEVATION	3.00	3.30	3.80	3.84	3.92	4.00	4.03	4.19	4.39	4.63
STORAGE	4.36	4.49	4.88	5.16	5.48	5.82	6.15			
OUTFLOW	96.63	104.84	128.34	146.09	168.36	192.60	217.65			
ELEVATION	4.91	5.00	5.23	5.40	5.60	5.80	6.00			

HYDROGRAPH AT STATION S40BAS

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	.8	1		0820	101	1.	.2	1.0	1		1640	201	0.	.1	1.0
1		0005	2	0.	.0	.8	1		0825	102	0.	.2	1.0	1		1645	202	0.	.1	1.0
1		0010	3	0.	.0	.8	1		0830	103	0.	.2	1.0	1		1650	203	0.	.1	1.0
1		0015	4	0.	.0	.8	1		0835	104	0.	.2	1.0	1		1655	204	0.	.1	1.0
1		0020	5	0.	.0	.8	1		0840	105	0.	.2	1.0	1		1700	205	0.	.1	1.0
1		0025	6	0.	.0	.8	1		0845	106	0.	.2	1.0	1		1705	206	0.	.1	1.0
1		0030	7	0.	.0	.8	1		0850	107	0.	.2	1.0	1		1710	207	0.	.1	1.0
1		0035	8	0.	.0	.9	1		0855	108	0.	.2	1.0	1		1715	208	0.	.1	1.0
1		0040	9	0.	.1	.9	1		0900	109	0.	.1	1.0	1		1720	209	0.	.1	1.0
1		0045	10	0.	.1	.9	1		0905	110	0.	.1	1.0	1		1725	210	0.	.1	1.0
1		0050	11	0.	.1	.9	1		0910	111	0.	.1	1.0	1		1730	211	0.	.1	1.0
1		0055	12	0.	.1	1.0	1		0915	112	0.	.1	1.0	1		1735	212	0.	.1	1.0
1		0100	13	0.	.2	1.0	1		0920	113	0.	.1	1.0	1		1740	213	0.	.1	1.0
1		0105	14	1.	.2	1.1	1		0925	114	0.	.1	1.0	1		1745	214	0.	.1	1.0
1		0110	15	2.	.2	1.1	1		0930	115	0.	.1	1.0	1		1750	215	0.	.1	1.0
1		0115	16	2.	.2	1.1	1		0935	116	0.	.1	1.0	1		1755	216	0.	.1	1.0
1		0120	17	3.	.3	1.2	1		0940	117	0.	.1	1.0	1		1800	217	0.	.1	1.0
1		0125	18	3.	.3	1.2	1		0945	118	0.	.1	1.0	1		1805	218	0.	.1	1.0
1		0130	19	3.	.3	1.2	1		0950	119	0.	.1	1.0	1		1810	219	0.	.1	1.0
1		0135	20	4.	.3	1.2	1		0955	120	0.	.1	1.0	1		1815	220	0.	.1	1.0
1		0140	21	4.	.3	1.3	1		1000	121	0.	.1	1.0	1		1820	221	0.	.1	1.0
1		0145	22	4.	.3	1.3	1		1005	122	0.	.1	1.0	1		1825	222	0.	.1	1.0
1		0150	23	5.	.4	1.3	1		1010	123	0.	.1	1.0	1		1830	223	0.	.1	1.0
1		0155	24	5.	.4	1.3	1		1015	124	0.	.1	1.0	1		1835	224	0.	.1	1.0
1		0200	25	5.	.4	1.3	1		1020	125	0.	.1	1.0	1		1840	225	0.	.1	1.0
1		0205	26	6.	.4	1.4	1		1025	126	0.	.1	1.0	1		1845	226	0.	.1	1.0
1		0210	27	6.	.4	1.4	1		1030	127	0.	.1	1.0	1		1850	227	0.	.1	1.0
1		0215	28	7.	.4	1.4	1		1035	128	0.	.1	1.0	1		1855	228	0.	.1	1.0
1		0220	29	7.	.5	1.4	1		1040	129	0.	.1	1.0	1		1900	229	0.	.1	1.0
1		0225	30	8.	.5	1.5	1		1045	130	0.	.1	1.0	1		1905	230	0.	.1	1.0
1		0230	31	8.	.5	1.5	1		1050	131	0.	.1	1.0	1		1910	231	0.	.1	1.0
1		0235	32	9.	.6	1.6	1		1055	132	0.	.1	1.0	1		1915	232	0.	.1	1.0
1		0240	33	11.	.7	1.7	1		1100	133	0.	.1	1.0	1		1920	233	0.	.1	1.0
1		0245	34	14.	.8	1.9	1		1105	134	0.	.1	1.0	1		1925	234	0.	.1	1.0
1		0250	35	17.	1.0	2.1	1		1110	135	0.	.1	1.0	1		1930	235	0.	.1	1.0
1		0255	36	19.	1.3	2.5	1		1115	136	0.	.1	1.0	1		1935	236	0.	.1	1.0
1		0300	37	22.	1.8	2.9	1		1120	137	0.	.1	1.0	1		1940	237	0.	.1	1.0
1		0305	38	25.	2.5	3.5	1		1125	138	0.	.1	1.0	1		1945	238	0.	.1	1.0
1		0310	39	68.	3.9	4.6	1		1130	139	0.	.1	1.0	1		1950	239	0.	.1	1.0
1		0315	40	141.	5.1	5.4	1		1135	140	0.	.1	1.0	1		1955	240	0.	.1	1.0
1		0320	41	159.	5.4	5.5	1		1140	141	0.	.1	1.0	1		2000	241	0.	.1	1.0
1		0325	42	154.	5.3	5.5	1		1145	142	0.	.1	1.0	1		2005	242	0.	.1	1.0
1		0330	43	142.	5.1	5.4	1		1150	143	0.	.1	1.0	1		2010	243	0.	.1	1.0
1		0335	44	127.	4.9	5.2	1		1155	144	0.	.1	1.0	1		2015	244	0.	.1	1.0
1		0340	45	111.	4.6	5.1	1		1200	145	0.	.1	1.0	1		2020	245	0.	.1	1.0
1		0345	46	93.	4.3	4.9	1		1205	146	0.	.1	1.0	1		2025	246	0.	.1	1.0
1		0350	47	77.	4.0	4.7	1		1210	147	0.	.1	1.0	1		2030	247	0.	.1	1.0
1		0355	48	64.	3.8	4.5	1		1215	148	0.	.1	1.0	1		2035	248	0.	.1	1.0
1		0400	49	54.	3.6	4.4	1		1220	149	0.	.1	1.0	1		2040	249	0.	.1	1.0
1		0405	50	46.	3.4	4.3	1		1225	150	0.	.1	1.0	1		2045	250	0.	.1	1.0
1		0410	51	40.	3.3	4.2	1		1230	151	0.	.1	1.0	1		2050	251	0.	.1	1.0
1		0415	52	36.	3.1	4.1	1		1235	152	0.	.1	1.0	1		2055	252	0.	.1	1.0
1		0420	53	32.	3.0	4.0	1		1240	153	0.	.1	1.0	1		2100	253	0.	.1	1.0
1		0425	54	29.	2.9	3.9	1		1245	154	0.	.1	1.0	1		2105	254	0.	.1	1.0
1		0430	55	27.	2.8	3.8	1		1250	155	0.	.1	1.0	1		2110	255	0.	.1	1.0
1		0435	56	26.	2.7	3.7	1		1255	156	0.	.1	1.0	1		2115	256	0.	.1	1.0
1		0440	57	25.	2.6	3.7	1		1300	157	0.	.1	1.0	1		2120	257	0.	.1	1.0
1		0445	58	25.	2.5	3.6	1		1305	158	0.	.1	1.0	1		2125	258	0.	.1	1.0
1		0450	59	24.	2.4	3.5	1		1310	159	0.	.1	1.0	1		2130	259	0.	.1	1.0
1		0455	60	24.	2.3	3.4	1		1315	160	0.	.1	1.0	1		2135	260	0.	.1	1.0
1		0500	61	23.	2.2	3.3	1		1320	161	0.	.1	1.0	1		2140	261	0.	.1	1.0
1		0505	62	23.	2.0	3.2	1		1325	162	0.	.1	1.0	1		2145	262	0.	.1	1.0
1		0510	63	22.	1.9	3.1	1		1330	163	0.	.1	1.0	1		2150	263	0.	.1	1.0
1		0515	64	22.	1.8	3.0	1		1335	164	0.	.1	1.0	1		2155	264	0.	.1	1.0
1		0520	65	21.	1.7	2.9	1		1340	165	0.	.1	1.0	1		2200	265	0.	.1	1.0
1		0525	66	21.	1.6	2.8	1		1345	166	0.	.1	1.0	1		2205	266	0.	.1	1.0
1		0530	67	20.	1.5	2.7	1		1350	167	0.	.1	1.0	1		2210	267	0.	.1	1.0
1		0535	68	19.	1.4	2.6	1		1355	168	0	.1	1.0	1		2215	268	0.	.1	1.0
1		0540	69	19.	1.3	2.5	1		1400	169	0.	.1	1.0	1		2220	269	0.	.1	1.0
1		0545	70	18.	1.2	2.4	1		1405	170	0.	.1	1.0	1		2225	270	0.	.1	1.0
1		0550	71	18.	1.1	2.3	1		1410	171	0.	.1	1.0	1		2230	271	0	.1	1.0
1		0555	72	17.	1.0	2.2	1		1415	172	0.	.1	1.0	1		2235	272	0.	.1	1.0
1		0600	73	16.	1.0	2.1	1		1420	173	0.	.1	1.0	1		2240	273	0.	.1	1.0
1		0605	74	16.	.9	2.0	1		1425	174	0.	.1	1.0	1		2245	274	0.	.1	1.0
1		0610	75	15.	.8	1.9	1		1430	175	0.	.1	1.0	1		2250	275	0.	.1	1.0
1		0615	76	13.	.7	1.8	1		1435	176	0.	.1	1.0	1		2255	276	0.	.1	1.0
1		0620	77	11.	.7	1.7	1		1440	177	0.	.1	1.0	1		2300	277	0.	.1	1.0

1	0625	78	10.	.6	1.6	*	1	1445	178	0.	.1	1.0	*	1	2305	278	0	.1	1.0
1	0630	79	9.	.5	1.6	*	1	1450	179	0.	.1	1.0	*	1	2310	279	0.	.1	1.0
1	0635	80	8.	.5	1.5	*	1	1455	180	0.	.1	1.0	*	1	2315	280	0.	.1	1.0
1	0640	81	7.	.5	1.4	*	1	1500	181	0.	.1	1.0	*	1	2320	281	0.	.1	1.0
1	0645	82	6.	.4	1.4	*	1	1505	182	0.	.1	1.0	*	1	2325	282	0.	.1	1.0
1	0650	83	5.	.4	1.3	*	1	1510	183	0.	.1	1.0	*	1	2330	283	0.	.1	1.0
1	0655	84	5.	.4	1.3	*	1	1515	184	0.	.1	1.0	*	1	2335	284	0.	.1	1.0
1	0700	85	4.	.3	1.3	*	1	1520	185	0.	.1	1.0	*	1	2340	285	0.	.1	1.0
1	0705	86	4.	.3	1.2	*	1	1525	186	0.	.1	1.0	*	1	2345	286	0.	.1	1.0
1	0710	87	3.	.3	1.2	*	1	1530	187	0.	.1	1.0	*	1	2350	287	0.	.1	1.0
1	0715	88	3.	.3	1.2	*	1	1535	188	0.	.1	1.0	*	1	2355	288	0.	.1	1.0
1	0720	89	2.	.2	1.1	*	1	1540	189	0.	.1	1.0	*	2	0000	289	0.	.1	1.0
1	0725	90	2.	.2	1.1	*	1	1545	190	0.	.1	1.0	*	2	0005	290	0.	.1	1.0
1	0730	91	2.	.2	1.1	*	1	1550	191	0.	.1	1.0	*	2	0010	291	0.	.1	1.0
1	0735	92	2.	.2	1.1	*	1	1555	192	0.	.1	1.0	*	2	0015	292	0.	.1	1.0
1	0740	93	1.	.2	1.1	*	1	1600	193	0.	.1	1.0	*	2	0020	293	0.	.1	1.0
1	0745	94	1.	.2	1.1	*	1	1605	194	0.	.1	1.0	*	2	0025	294	0.	.1	1.0
1	0750	95	1.	.2	1.1	*	1	1610	195	0.	.1	1.0	*	2	0030	295	0.	.1	1.0
1	0755	96	1.	.2	1.1	*	1	1615	196	0.	.1	1.0	*	2	0035	296	0.	.1	1.0
1	0800	97	1.	.2	1.1	*	1	1620	197	0.	.1	1.0	*	2	0040	297	0.	.1	1.0
1	0805	98	1.	.2	1.0	*	1	1625	198	0.	.1	1.0	*	2	0045	298	0.	.1	1.0
1	0810	99	1.	.2	1.0	*	1	1630	199	0.	.1	1.0	*	2	0050	299	0.	.1	1.0
1	0815	100	1.	.2	1.0	*	1	1635	200	0.	.1	1.0	*	2	0055	300	0.	.1	1.0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 159.	3.33		29.	7.	7.	7.
		(INCHES)	.532	.539	.539	.539
		(AC-FT)	14.	15.	15.	15.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
5.	3.33		2.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
5.52	3.33		2.64	1.42	1.40	1.40

CUMULATIVE AREA = .51 SQ MI

649 KK * P33E.1 *

650 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

DIVIDE THE FLOW INTO TWO ADOT CULVERTS

DT DIVERSION
ISTAD D33C.2 DIVERSION HYDROGRAPH IDENTIFICATION

DI	INFLOW	.00	100.00	200.00	400.00	600.00
DQ	DIVERTED FLOW	.00	68.00	136.00	272.00	408.00

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DIVERSION HYDROGRAPH D33C.2

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 0615	76	9.	*	1 1230	151	0.	*	1 1845	226	0.
1 0005	2	0.	*	1 0620	77	8.	*	1 1235	152	0.	*	1 1850	227	0.
1 0010	3	0.	*	1 0625	78	7.	*	1 1240	153	0.	*	1 1855	228	0.
1 0015	4	0.	*	1 0630	79	6.	*	1 1245	154	0.	*	1 1900	229	0.
1 0020	5	0.	*	1 0635	80	5.	*	1 1250	155	0.	*	1 1905	230	0.
1 0025	6	0.	*	1 0640	81	5.	*	1 1255	156	0.	*	1 1910	231	0.
1 0030	7	0	*	1 0645	82	4.	*	1 1300	157	0.	*	1 1915	232	0.
1 0035	8	0.	*	1 0650	83	4.	*	1 1305	158	0.	*	1 1920	233	0.
1 0040	9	0.	*	1 0655	84	3.	*	1 1310	159	0.	*	1 1925	234	0.
1 0045	10	0.	*	1 0700	85	3.	*	1 1315	160	0.	*	1 1930	235	0.
1 0050	11	0.	*	1 0705	86	2.	*	1 1320	161	0.	*	1 1935	236	0.
1 0055	12	0.	*	1 0710	87	2.	*	1 1325	162	0.	*	1 1940	237	0.
1 0100	13	0	*	1 0715	88	2.	*	1 1330	163	0.	*	1 1945	238	0.
1 0105	14	1.	*	1 0720	89	2.	*	1 1335	164	0.	*	1 1950	239	0.
1 0110	15	1.	*	1 0725	90	1.	*	1 1340	165	0.	*	1 1955	240	0.
1 0115	16	1.	*	1 0730	91	1.	*	1 1345	166	0.	*	1 2000	241	0.
1 0120	17	2.	*	1 0735	92	1.	*	1 1350	167	0.	*	1 2005	242	0.
1 0125	18	2.	*	1 0740	93	1.	*	1 1355	168	0.	*	1 2010	243	0.
1 0130	19	2.	*	1 0745	94	1.	*	1 1400	169	0.	*	1 2015	244	0.
1 0135	20	3.	*	1 0750	95	1.	*	1 1405	170	0.	*	1 2020	245	0.

1		0140	21	3.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	3.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	3.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	4.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	4.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	4.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	5.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	5.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	5.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	6.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	6.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	8.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	10.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	11.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	13.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	15.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	17.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	46.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	96.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	108.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	105.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	96.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	86.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	75.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	63.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	52.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	44.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	37.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	31.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	27.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	24.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	22.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	19.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	18.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	18.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	17.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	17.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	17.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	16.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	16.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	16.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	15.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	15.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	14.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	14.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	14.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	13.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	13.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	12.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	12.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	12.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	11.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	11.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	10.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 108.	3.33		20.	5.	5.	5.
		(INCHES)	.362	.366	.366	.366
		(AC-FT)	10.	10.	10.	10.

CUMULATIVE AREA = .51 SQ MI

HYDROGRAPH AT STATION P33E.1

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		0615	76	4.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	4.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	3.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1.	1		1335	164	0.	1		1950	239	0.
1		0110	15	1.	1		0725	90	1.	1		1340	165	0.	1		1955	240	0.
1		0115	16	1.	1		0730	91	1.	1		1345	166	0.	1		2000	241	0.
1		0120	17	1.	1		0735	92	1.	1		1350	167	0.	1		2005	242	0.
1		0125	18	1.	1		0740	93	0.	1		1355	168	0.	1		2010	243	0.
1		0130	19	1.	1		0745	94	0.	1		1400	169	0.	1		2015	244	0.
1		0135	20	1.	1		0750	95	0.	1		1405	170	0.	1		2020	245	0.
1		0140	21	1.	1		0755	96	0.	1		1410	171	0.	1		2025	246	0.
1		0145	22	1.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	2.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	2.	1		0810	99	0	1		1425	174	0.	1		2040	249	0.

1	0200	25	2.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	2.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	2.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	2.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	2.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	2.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	3.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	3.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	4.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	5.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	5.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	6.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	7.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	8.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	22.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	45.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	51.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	49.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	45.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	41.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	35.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	30.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	25.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	20.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	17.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	15.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	13.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	11.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	10.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	9.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	8.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	8.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	8.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	8.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	8.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	8.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	7.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	7.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	7.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	7.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	5.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 51.	3.33		9.	2.	2.	2.
		(INCHES)	.170	.172	.172	.172
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .51 SQ MI

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            **************
            *            *
658 KK      *   33E.1    *     COMBINE
            *            *
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659 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6

661 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION 33E.1

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	0615	76	62	*	1	1230	151	5.	*	1	1845	226	1.
1	0005	2	0.	*	1	0620	77	59.	*	1	1235	152	5.	*	1	1850	227	1.
1	0010	3	0.	*	1	0625	78	56.	*	1	1240	153	5.	*	1	1855	228	1.
1	0015	4	0.	*	1	0630	79	53.	*	1	1245	154	5.	*	1	1900	229	1.
1	0020	5	0.	*	1	0635	80	51.	*	1	1250	155	5.	*	1	1905	230	1.
1	0025	6	1.	*	1	0640	81	48.	*	1	1255	156	5.	*	1	1910	231	1.
1	0030	7	1.	*	1	0645	82	46.	*	1	1300	157	5.	*	1	1915	232	1.
1	0035	8	2.	*	1	0650	83	44.	*	1	1305	158	5.	*	1	1920	233	1.
1	0040	9	3.	*	1	0655	84	42.	*	1	1310	159	4.	*	1	1925	234	1.
1	0045	10	4.	*	1	0700	85	40.	*	1	1315	160	4.	*	1	1930	235	1.
1	0050	11	5.	*	1	0705	86	39.	*	1	1320	161	4.	*	1	1935	236	1.
1	0055	12	6.	*	1	0710	87	37.	*	1	1325	162	4.	*	1	1940	237	1.
1	0100	13	7.	*	1	0715	88	36.	*	1	1330	163	4.	*	1	1945	238	1.
1	0105	14	7.	*	1	0720	89	34.	*	1	1335	164	4.	*	1	1950	239	1.
1	0110	15	8.	*	1	0725	90	33.	*	1	1340	165	4.	*	1	1955	240	1.
1	0115	16	9.	*	1	0730	91	32.	*	1	1345	166	4.	*	1	2000	241	1.
1	0120	17	9.	*	1	0735	92	31.	*	1	1350	167	4.	*	1	2005	242	1.
1	0125	18	10.	*	1	0740	93	30.	*	1	1355	168	4.	*	1	2010	243	1.
1	0130	19	11.	*	1	0745	94	29.	*	1	1400	169	3.	*	1	2015	244	1.
1	0135	20	12.	*	1	0750	95	28.	*	1	1405	170	3.	*	1	2020	245	1.
1	0140	21	12.	*	1	0755	96	27.	*	1	1410	171	3.	*	1	2025	246	1.
1	0145	22	13.	*	1	0800	97	26.	*	1	1415	172	3.	*	1	2030	247	1.
1	0150	23	14.	*	1	0805	98	25.	*	1	1420	173	3.	*	1	2035	248	1.
1	0155	24	15.	*	1	0810	99	24.	*	1	1425	174	3.	*	1	2040	249	1.
1	0200	25	16.	*	1	0815	100	23.	*	1	1430	175	3.	*	1	2045	250	1.
1	0205	26	17.	*	1	0820	101	22.	*	1	1435	176	3.	*	1	2050	251	1.
1	0210	27	18.	*	1	0825	102	22.	*	1	1440	177	3.	*	1	2055	252	1.
1	0215	28	19.	*	1	0830	103	21.	*	1	1445	178	3.	*	1	2100	253	1.
1	0220	29	21.	*	1	0835	104	20.	*	1	1450	179	3.	*	1	2105	254	1.
1	0225	30	22.	*	1	0840	105	20.	*	1	1455	180	3.	*	1	2110	255	1.
1	0230	31	24.	*	1	0845	106	19.	*	1	1500	181	3.	*	1	2115	256	1.
1	0235	32	28.	*	1	0850	107	18.	*	1	1505	182	3.	*	1	2120	257	1.
1	0240	33	37.	*	1	0855	108	18.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	49.	*	1	0900	109	17.	*	1	1515	184	2.	*	1	2130	259	0.
1	0250	35	63.	*	1	0905	110	17.	*	1	1520	185	2.	*	1	2135	260	0.
1	0255	36	83.	*	1	0910	111	16.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	132.	*	1	0915	112	16.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	215.	*	1	0920	113	15.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	245.	*	1	0925	114	15.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	256.	*	1	0930	115	14.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	249.	*	1	0935	116	14.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	240.	*	1	0940	117	14.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	229.	*	1	0945	118	13.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	216.	*	1	0950	119	13.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	200.	*	1	0955	120	12.	*	1	1610	195	2.	*	1	2225	270	0.
1	0345	46	184.	*	1	1000	121	12.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	170.	*	1	1005	122	12.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	159.	*	1	1010	123	11.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	151.	*	1	1015	124	11.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	144.	*	1	1020	125	11.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	138.	*	1	1025	126	10.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	133.	*	1	1030	127	10.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	129.	*	1	1035	128	10.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	125.	*	1	1040	129	10.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	121.	*	1	1045	130	9.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	118.	*	1	1050	131	9.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	116.	*	1	1055	132	9.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	113.	*	1	1100	133	9.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	109.	*	1	1105	134	8.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	106.	*	1	1110	135	8.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	102.	*	1	1115	136	8.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	99.	*	1	1120	137	8.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	96.	*	1	1125	138	8.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	93.	*	1	1130	139	7.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	90.	*	1	1135	140	7.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	87.	*	1	1140	141	7.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	85.	*	1	1145	142	7.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	82.	*	1	1150	143	7.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	80.	*	1	1155	144	6.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	78.	*	1	1200	145	6.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	75.	*	1	1205	146	6.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	73.	*	1	1210	147	6.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	71.	*	1	1215	148	6.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	69.	*	1	1220	149	6.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	66.	*	1	1225	150	6.	*	1	1840	225	1.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 256.	3.25		91.	26.	25.	25.
		(INCHES)	1.655	1.917	1.918	1.918
		(AC-FT)	45.	52.	52.	52.

CUMULATIVE AREA = .51 SQ MI

662 KK * R33E.1 * ROUTE

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663 KO          OUTPUT CONTROL VARIABLES
                         IPRNT           1  PRINT CONTROL
                         IPLOT           0  PLOT CONTROL
                         QSCAL          0.  HYDROGRAPH PLOT SCALE
                         IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                          IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                         ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                         ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                        TIMINT        .083  TIME INTERVAL IN HOURS

                            ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND TO
                            UNION HILLS DRIVE (MAYO) AND 73RD PLACE.
                            ROUTE L=1600', TRAP SECTION BW=19' Z=5, TWmax=39'
                            ASSUME GRASS LINED CHANNEL N=.030 UP=1592.5 DWN=1582.66

              HYDROGRAPH ROUTING DATA

669 RK          KINEMATIC WAVE STREAM ROUTING
                             L        1600.  CHANNEL LENGTH
                             S        .0088  SLOPE
                             N         .030  CHANNEL ROUGHNESS COEFFICIENT
                            CA          .00  CONTRIBUTING AREA
                         SHAPE         TRAP  CHANNEL SHAPE
                            WD        19.00  BOTTOM WIDTH OR DIAMETER
                             Z         5.00  SIDE SLOPE
                        NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS

                                                  ***
                                   COMPUTED KINEMATIC PARAMETERS
                                        VARIABLE TIME STEP
                                      (DT SHOWN IS A MINIMUM)
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ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.98	1.43	1.31	533.33	255.46	197.67	1.92	7.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5208E+02 EXCESS= .0000E+00 OUTFLOW= .5208E+02 BASIN STORAGE= .7950E-02 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME
MAIN	.98	1.43	5.00		252.31	200.00	1.92

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HYDROGRAPH AT STATION R33E.1

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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	0615	76	65.	*	1	1230	151	6.	*	1	1845	226	1.
1	0005	2	0.	*	1	0620	77	62.	*	1	1235	152	5.	*	1	1850	227	1.
1	0010	3	0.	*	1	0625	78	58.	*	1	1240	153	5.	*	1	1855	228	1.
1	0015	4	0.	*	1	0630	79	55.	*	1	1245	154	5.	*	1	1900	229	1.
1	0020	5	0.	*	1	0635	80	53.	*	1	1250	155	5.	*	1	1905	230	1.
1	0025	6	0.	*	1	0640	81	50.	*	1	1255	156	5.	*	1	1910	231	1.
1	0030	7	0.	*	1	0645	82	48.	*	1	1300	157	5.	*	1	1915	232	1.
1	0035	8	0.	*	1	0650	83	46.	*	1	1305	158	5.	*	1	1920	233	1.
1	0040	9	1.	*	1	0655	84	44.	*	1	1310	159	5.	*	1	1925	234	1.
1	0045	10	2.	*	1	0700	85	42.	*	1	1315	160	4.	*	1	1930	235	1.
1	0050	11	3.	*	1	0705	86	40.	*	1	1320	161	4.	*	1	1935	236	1.
1	0055	12	5.	*	1	0710	87	39.	*	1	1325	162	4.	*	1	1940	237	1.
1	0100	13	6.	*	1	0715	88	37.	*	1	1330	163	4.	*	1	1945	238	1.
1	0105	14	6.	*	1	0720	89	36.	*	1	1335	164	4.	*	1	1950	239	1.
1	0110	15	7.	*	1	0725	90	34.	*	1	1340	165	4.	*	1	1955	240	1.
1	0115	16	8.	*	1	0730	91	33.	*	1	1345	166	4.	*	1	2000	241	1.
1	0120	17	8.	*	1	0735	92	32.	*	1	1350	167	4.	*	1	2005	242	1.
1	0125	18	9.	*	1	0740	93	31.	*	1	1355	168	4.	*	1	2010	243	1.
1	0130	19	10.	*	1	0745	94	30.	*	1	1400	169	4.	*	1	2015	244	1.
1	0135	20	11.	*	1	0750	95	29.	*	1	1405	170	4.	*	1	2020	245	1.
1	0140	21	11.	*	1	0755	96	28.	*	1	1410	171	3.	*	1	2025	246	1.
1	0145	22	12.	*	1	0800	97	27.	*	1	1415	172	3.	*	1	2030	247	1.
1	0150	23	13.	*	1	0805	98	26.	*	1	1420	173	3.	*	1	2035	248	1.
1	0155	24	14.	*	1	0810	99	25.	*	1	1425	174	3.	*	1	2040	249	1.
1	0200	25	15.	*	1	0815	100	24.	*	1	1430	175	3.	*	1	2045	250	1.
1	0205	26	16.	*	1	0820	101	23.	*	1	1435	176	3.	*	1	2050	251	1.
1	0210	27	17.	*	1	0825	102	22.	*	1	1440	177	3.	*	1	2055	252	1.
1	0215	28	18.	*	1	0830	103	22.	*	1	1445	178	3.	*	1	2100	253	1.
1	0220	29	19.	*	1	0835	104	21.	*	1	1450	179	3.	*	1	2105	254	1.
1	0225	30	21.	*	1	0840	105	20.	*	1	1455	180	3.	*	1	2110	255	1.
1	0230	31	22.	*	1	0845	106	20.	*	1	1500	181	3.	*	1	2115	256	1.
1	0235	32	24.	*	1	0850	107	19.	*	1	1505	182	3.	*	1	2120	257	1.
1	0240	33	29.	*	1	0855	108	18.	*	1	1510	183	3.	*	1	2125	258	1.
1	0245	34	39.	*	1	0900	109	18.	*	1	1515	184	3.	*	1	2130	259	1.
1	0250	35	52.	*	1	0905	110	17.	*	1	1520	185	2.	*	1	2135	260	1.
1	0255	36	69.	*	1	0910	111	17.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	101.	*	1	0915	112	16.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	170.	*	1	0920	113	16.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	230.	*	1	0925	114	15.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	251.	*	1	0930	115	15.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	252.	*	1	0935	116	14.	*	1	1550	191	2.	*	1	2205	266	0
1	0325	42	244.	*	1	0940	117	14.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	234.	*	1	0945	118	14.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	223.	*	1	0950	119	13.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	208.	*	1	0955	120	13.	*	1	1610	195	2	*	1	2225	270	0.
1	0345	46	192.	*	1	1000	121	13.	*	1	1615	196	2.	*	1	2230	271	0.

1	0350	47	177.	*	1	1005	122	12.	*	1	1620	197	2.	*	1	2235	272	0
1	0355	48	165.	*	1	1010	123	12.	*	1	1625	198	2	*	1	2240	273	0.
1	0400	49	155.	*	1	1015	124	11.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	148.	*	1	1020	125	11.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	141.	*	1	1025	126	11.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	136.	*	1	1030	127	11.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	132.	*	1	1035	128	10.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	127.	*	1	1040	129	10.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	123.	*	1	1045	130	10.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	120.	*	1	1050	131	9.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	117.	*	1	1055	132	9.	*	1	1710	207	2.	*	1	2325	282	0.
1	0445	58	114.	*	1	1100	133	9.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	111.	*	1	1105	134	9.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	108.	*	1	1110	135	8.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	104.	*	1	1115	136	8.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	101.	*	1	1120	137	8.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	98.	*	1	1125	138	8.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	95.	*	1	1130	139	8.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	92.	*	1	1135	140	7.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	89.	*	1	1140	141	7.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	87.	*	1	1145	142	7.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	84.	*	1	1150	143	7.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	82.	*	1	1155	144	7.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	79.	*	1	1200	145	7.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	77.	*	1	1205	146	6.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	75.	*	1	1210	147	6.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	73.	*	1	1215	148	6.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	70.	*	1	1220	149	6.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	68.	*	1	1225	150	6.	*	1	1840	225	1.	*	2	0055	300	0.

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 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR         24-HR        72-HR       24.92-HR
+   (CFS)        (HR)
                           (CFS)
+     252.       3.33                  91.           26.          25.           25.
                         (INCHES)    1.655         1.917        1.917         1.917
                          (AC-FT)      45.           52.          52.           52.

                         CUMULATIVE AREA =      .51 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
 669 KK       *   ASLDR1   *        ROUTE
              *            *
              **************

 670 KO            OUTPUT CONTROL VARIABLES
                         IPRNT          1  PRINT CONTROL
                         IPLOT          0  PLOT CONTROL
                         QSCAL         0.  HYDROGRAPH PLOT SCALE
                         IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                          IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                         ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                         ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                        TIMINT       .083  TIME INTERVAL IN HOURS

                           ROUTE FLOWS FROM CHANNEL THROUGH BOX CULVERT ALONG UNION
                           HILLS DRIVE (MAYO) TO SCOTTSDALE ROAD, SOUTH TO CHAUNCEY.
                           ROUTE L=1830', BOX SECTION W=8' H=3'
                           ASSUME CONCRTE LINED CHANNEL N=.013 UP=1582.55 DWN=1566.32

               HYDROGRAPH ROUTING DATA

 675 RK             KINEMATIC WAVE STREAM ROUTING
                             L        1830.  CHANNEL LENGTH
                             S        .0089  SLOPE
                             N         .013  CHANNEL ROUGHNESS COEFFICIENT
                            CA          .00  CONTRIBUTING AREA
                         SHAPE         TRAP  CHANNEL SHAPE
                            WD        16.00  BOTTOM WIDTH OR DIAMETER
                             Z          .00  SIDE SLOPE
                        NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS

                                                       ***
                                         COMPUTED KINEMATIC PARAMETERS
                                               VARIABLE TIME STEP
                                             (DT SHOWN IS A MINIMUM)

                    ELEMENT    ALPHA      M        DT        DX       PEAK    TIME TO    VOLUME    MAXIMUM
                                                                                PEAK               CELERITY
                                                  (MIN)     (FT)      (CFS)    (MIN)      (IN)      (FPS)

                    MAIN        1.70     1.67       .56    610.00    252.12    200.80     1.92      20.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5206E+02  EXCESS= .0000E+00 OUTFLOW= .5205E+02 BASIN STORAGE= .8142E-02 PERCENT ERROR=     .0

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        1.70     1.67      5.00              251.98    200.00     1.92
```

HYDROGRAPH AT STATION ASLDR1

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		0615	76	66.	1		1230	151	6.	1		1845	226	1.
1		0005	2	0.	1		0620	77	63.	1		1235	152	6.	1		1850	227	1.
1		0010	3	0.	1		0625	78	59.	1		1240	153	5.	1		1855	228	1.
1		0015	4	0.	1		0630	79	56.	1		1245	154	5.	1		1900	229	1.
1		0020	5	0.	1		0635	80	54.	1		1250	155	5.	1		1905	230	1.
1		0025	6	0.	1		0640	81	51.	1		1255	156	5.	1		1910	231	1.
1		0030	7	0.	1		0645	82	49.	1		1300	157	5.	1		1915	232	1.
1		0035	8	0.	1		0650	83	47.	1		1305	158	5.	1		1920	233	1.
1		0040	9	0.	1		0655	84	45.	1		1310	159	5.	1		1925	234	1.
1		0045	10	0.	1		0700	85	43.	1		1315	160	5.	1		1930	235	1.
1		0050	11	1.	1		0705	86	41.	1		1320	161	4.	1		1935	236	1.
1		0055	12	3.	1		0710	87	39.	1		1325	162	4.	1		1940	237	1.
1		0100	13	5.	1		0715	88	38.	1		1330	163	4.	1		1945	238	1.
1		0105	14	6.	1		0720	89	36.	1		1335	164	4.	1		1950	239	1.
1		0110	15	6.	1		0725	90	35.	1		1340	165	4.	1		1955	240	1.
1		0115	16	7.	1		0730	91	34.	1		1345	166	4.	1		2000	241	1.
1		0120	17	8.	1		0735	92	32.	1		1350	167	4.	1		2005	242	1.
1		0125	18	9.	1		0740	93	31.	1		1355	168	4.	1		2010	243	1.
1		0130	19	9.	1		0745	94	30.	1		1400	169	4.	1		2015	244	1.
1		0135	20	10.	1		0750	95	29.	1		1405	170	4.	1		2020	245	1.
1		0140	21	11.	1		0755	96	28.	1		1410	171	4.	1		2025	246	1.
1		0145	22	12.	1		0800	97	27.	1		1415	172	3.	1		2030	247	1.
1		0150	23	12.	1		0805	98	26.	1		1420	173	3.	1		2035	248	1.
1		0155	24	13.	1		0810	99	25.	1		1425	174	3.	1		2040	249	1.
1		0200	25	14.	1		0815	100	24.	1		1430	175	3.	1		2045	250	1.
1		0205	26	15.	1		0820	101	24.	1		1435	176	3.	1		2050	251	1.
1		0210	27	16.	1		0825	102	23.	1		1440	177	3.	1		2055	252	1.
1		0215	28	17.	1		0830	103	22.	1		1445	178	3.	1		2100	253	1.
1		0220	29	19.	1		0835	104	21.	1		1450	179	3.	1		2105	254	1.
1		0225	30	20.	1		0840	105	21.	1		1455	180	3.	1		2110	255	1.
1		0230	31	21.	1		0845	106	20.	1		1500	181	3.	1		2115	256	1.
1		0235	32	23.	1		0850	107	19.	1		1505	182	3.	1		2120	257	1.
1		0240	33	27.	1		0855	108	19.	1		1510	183	3.	1		2125	258	1.
1		0245	34	35.	1		0900	109	18.	1		1515	184	3.	1		2130	259	1.
1		0250	35	47.	1		0905	110	18.	1		1520	185	3.	1		2135	260	1.
1		0255	36	63.	1		0910	111	17.	1		1525	186	3.	1		2140	261	1.
1		0300	37	92.	1		0915	112	17.	1		1530	187	2.	1		2145	262	1.
1		0305	38	154.	1		0920	113	16.	1		1535	188	2.	1		2150	263	0.
1		0310	39	218.	1		0925	114	16.	1		1540	189	2.	1		2155	264	0.
1		0315	40	247.	1		0930	115	15.	1		1545	190	2.	1		2200	265	0.
1		0320	41	252.	1		0935	116	15.	1		1550	191	2.	1		2205	266	0.
1		0325	42	246.	1		0940	117	14.	1		1555	192	2.	1		2210	267	0.
1		0330	43	236.	1		0945	118	14.	1		1600	193	2.	1		2215	268	0.
1		0335	44	225.	1		0950	119	14.	1		1605	194	2.	1		2220	269	0.
1		0340	45	211.	1		0955	120	13.	1		1610	195	2.	1		2225	270	0.
1		0345	46	196.	1		1000	121	13.	1		1615	196	2.	1		2230	271	0.
1		0350	47	180.	1		1005	122	12.	1		1620	197	2.	1		2235	272	0.
1		0355	48	168.	1		1010	123	12.	1		1625	198	2.	1		2240	273	0.
1		0400	49	158.	1		1015	124	12.	1		1630	199	2.	1		2245	274	0.
1		0405	50	150.	1		1020	125	11.	1		1635	200	2.	1		2250	275	0.
1		0410	51	143.	1		1025	126	11.	1		1640	201	2.	1		2255	276	0.
1		0415	52	137.	1		1030	127	11.	1		1645	202	2.	1		2300	277	0.
1		0420	53	133.	1		1035	128	10.	1		1650	203	2.	1		2305	278	0.
1		0425	54	128.	1		1040	129	10.	1		1655	204	2.	1		2310	279	0.
1		0430	55	124.	1		1045	130	10.	1		1700	205	2.	1		2315	280	0.
1		0435	56	121.	1		1050	131	10.	1		1705	206	2.	1		2320	281	0.
1		0440	57	118.	1		1055	132	9.	1		1710	207	2.	1		2325	282	0.
1		0445	58	115.	1		1100	133	9.	1		1715	208	2.	1		2330	283	0.
1		0450	59	112.	1		1105	134	9.	1		1720	209	2.	1		2335	284	0.
1		0455	60	109.	1		1110	135	9.	1		1725	210	1.	1		2340	285	0.
1		0500	61	105.	1		1115	136	8.	1		1730	211	1.	1		2345	286	0.
1		0505	62	102.	1		1120	137	8.	1		1735	212	1.	1		2350	287	0.
1		0510	63	99.	1		1125	138	8.	1		1740	213	1.	1		2355	288	0.
1		0515	64	96.	1		1130	139	8.	1		1745	214	1.	2		0000	289	0.
1		0520	65	93.	1		1135	140	8.	1		1750	215	1.	2		0005	290	0.
1		0525	66	90.	1		1140	141	7.	1		1755	216	1.	2		0010	291	0.
1		0530	67	87.	1		1145	142	7.	1		1800	217	1.	2		0015	292	0.
1		0535	68	85.	1		1150	143	7.	1		1805	218	1.	2		0020	293	0.
1		0540	69	82.	1		1155	144	7.	1		1810	219	1.	2		0025	294	0.
1		0545	70	80.	1		1200	145	7.	1		1815	220	1.	2		0030	295	0.
1		0550	71	78.	1		1205	146	6.	1		1820	221	1.	2		0035	296	0.
1		0555	72	75.	1		1210	147	6.	1		1825	222	1.	2		0040	297	0.
1		0600	73	73.	1		1215	148	6.	1		1830	223	1.	2		0045	298	0.
1		0605	74	71.	1		1220	149	6.	1		1835	224	1.	2		0050	299	0.
1		0610	75	69.	1		1225	150	6.	1		1840	225	1.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
252.	3.33		91.	26.	25.	25.
		(INCHES)	1.056	1.917	1.917	1.917
		(AC-FT)	45.	52.	52.	52.

CUMULATIVE AREA = .51 SQ MI

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              **************
              *            *
676 KK        *    ASLD    *     1      SUB
              *            *
              **************

677 KO             OUTPUT CONTROL VARIABLES
                         IPRNT            1  PRINT CONTROL
                         IPLOT            0  PLOT CONTROL
                         QSCAL           0.  HYDROGRAPH PLOT SCALE
                         IPNCH            0  PUNCH COMPUTED HYDROGRAPH
                          IOUT           21  SAVE HYDROGRAPH ON THIS UNIT
                         ISAV1            1  FIRST ORDINATE PUNCHED OR SAVED
                         ISAV2          300  LAST ORDINATE PUNCHED OR SAVED
                        TIMINT         .083  TIME INTERVAL IN HOURS

                        ASLD NORTH PARCEL EAST OF SCOTTSDALE ROAD AND NORTH OF CHAUNCEY LANE

                  SUBBASIN RUNOFF DATA

679 BA             SUBBASIN CHARACTERISTICS
                         TAREA          .03  SUBBASIN AREA

                   PRECIPITATION DATA

 24 PH                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                   ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                   5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                     .76    1.50    2.54    2.81    2.99    3.33     .00     .00     .00     .00     .00     .00

                                                  STORM AREA =    14.00

680 LS             SCS LOSS RATE
                         STRTL          .60  INITIAL ABSTRACTION
                        CRVNBR        77.00  CURVE NUMBER
                         RTIMP        83.00  PERCENT IMPERVIOUS AREA

                   KINEMATIC WAVE
681 UK               OVERLAND-FLOW ELEMENT NO. 1
                             L         345.  OVERLAND FLOW LENGTH
                             S        .0010  SLOPE
                             N         .015  ROUGHNESS COEFFICIENT
                            PA        100.0  PERCENT OF SUBBASIN
                         DXMIN            5  MINIMUM NUMBER OF DX INTERVALS

                   KINEMATIC WAVE
682 RK               MAIN CHANNEL
                             L        1400.  CHANNEL LENGTH
                             S        .0131  SLOPE
                             N         .015  CHANNEL ROUGHNESS COEFFICIENT
                            CA          .03  CONTRIBUTING AREA
                         SHAPE         TRAP  CHANNEL SHAPE
                            WD        17.00  BOTTOM WIDTH OR DIAMETER
                             Z         4.00  SIDE SLOPE
                        NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                        RUPSTQ           NO  ROUTE UPSTREAM HYDROGRAPH

                                                                 ***
                                           COMPUTED KINEMATIC PARAMETERS
                                                VARIABLE TIME STEP
                                              (DT SHOWN IS A MINIMUM)

                     ELEMENT    ALPHA        M         DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                     PEAK                CELERITY
                                                     (MIN)      (FT)     (CFS)     (MIN)       (IN)      (FPS)

                    PLANE1       3.14      1.67      1.19     69.00     128.15    185.47       2.88      1.06
                    MAIN         2.48      1.44       .64    466.67     123.54    186.54       2.89     12.81

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00  EXCESS= .4844E+01 OUTFLOW= .4845E+01 BASIN STORAGE= .3741E-03 PERCENT ERROR=    .0

                                            INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN         2.48      1.44      5.00               114.18    185.00       2.89

***************************************************************************************************************************

                                                   HYDROGRAPH AT STATION      ASLD

***************************************************************************************************************************
                                                                  *
      DA MON HRMN  ORD     RAIN    LOSS  EXCESS      COMP Q       *       DA MON HRMN  ORD     RAIN    LOSS  EXCESS      COMP Q
                                                                  *
       1     0000    1      .00     .00     .00          0.       *        1     1230  151      .00     .00     .00          0.
       1     0005    2      .01     .00     .01          0.       *        1     1235  152      .00     .00     .00          0.
       1     0010    3      .01     .00     .01          0.       *        1     1240  153      .00     .00     .00          0.
       1     0015    4      .01     .00     .01          0.       *        1     1245  154      .00     .00     .00          0.
       1     0020    5      .01     .00     .01          0.       *        1     1250  155      .00     .00     .00          0.
       1     0025    6      .01     .00     .01          0.       *        1     1255  156      .00     .00     .00          0.
       1     0030    7      .01     .00     .01          0.       *        1     1300  157      .00     .00     .00          0.
       1     0035    8      .01     .00     .01          1.       *        1     1305  158      .00     .00     .00          0
       1     0040    9      .01     .00     .01          1.       *        1     1310  159      .00     .00     .00          0.
       1     0045   10      .01     .00     .01          1.       *        1     1315  160      .00     .00     .00          0.
       1     0050   11      .01     .00     .01          1.       *        1     1320  161      .00     .00     .00          0.
       1     0055   12      .01     .00     .01          2.       *        1     1325  162      .00      00     .00          0.
       1     0100   13      .01     .00     .01          2.       *        1     1330  163      .00     .00     .00          0
       1     0105   14      .01     .00      01          2.       *        1     1335  164      .00     .00     .00          0.
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1	0110	15	.01	.00	.01	2.	*	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.00	.01	2.	*	1	1345	166	.00	.00	.00	0.
1	0120	17	.01	.00	.01	2.	*	1	1350	167	.00	.00	.00	0.
1	0125	18	.01	.00	.01	2.	*	1	1355	168	.00	.00	.00	0.
1	0130	19	.01	.00	.01	2.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.01	.00	.01	2.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.01	.00	.01	2.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.00	.01	3.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.02	.00	.01	3.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.02	.00	.01	3.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.02	.00	.02	3.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.02	.00	.02	3.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.02	.00	.02	3.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.02	.00	.02	4.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.02	.00	.02	4.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.03	.00	.02	4.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.03	.01	.03	5.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.08	.01	.06	6.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.09	.01	.07	10.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.10	.02	.08	13.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.14	.02	.11	19.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.18	.02	.15	27.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.40	.05	.35	52.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.69	.06	.63	114.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.28	.02	.26	99.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.15	.01	.14	59.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.11	.01	.10	39.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.09	.01	.09	29.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.08	.00	.08	23.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.03	.00	.03	16.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.03	.00	.03	13.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.03	.00	.02	10.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	8.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.02	.00	.02	7.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.02	.00	.02	6.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.02	6.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.02	.00	.02	5.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	5.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.01	4.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.02	.00	.01	4.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.01	.00	.01	4.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.01	.00	.01	4.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.01	.00	.01	4.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.01	.00	.01	3.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.01	.00	.01	3.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.01	.00	.01	3.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.01	.00	.01	3.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	3.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	3.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	3.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.01	.00	.01	3.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	2.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.01	.00	.01	2.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.01	.00	.01	2.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.01	.00	.01	2.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	2.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.01	.00	.01	2.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.01	.00	.01	2.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.01	.00	.01	2.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	2.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	2.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	1.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	1.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	1.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	1.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	1.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	1.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0	*	1	2200	265	.00	.00	.00	0.

1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.22, TOTAL LOSS = .34, TOTAL EXCESS = 2.88

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 114.	3.08		10.	2.	2.	2.
		(INCHES)	2.860	2.888	2.888	2.888
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .03 SQ MI

683 KK * ASLDC * T COMBINE

684 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

COMBINED DISCHARGE AT ASLDR1 AND ASLD1 SUB BASIN

686 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION ASLDC
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	0615	76	67.	*	1	1230	151	6.	*	1	1845	226	1.
1	0005	2	0.	*	1	0620	77	64.	*	1	1235	152	6.	*	1	1850	227	1.
1	0010	3	0.	*	1	0625	78	60.	*	1	1240	153	5.	*	1	1855	228	1.
1	0015	4	0.	*	1	0630	79	57.	*	1	1245	154	5.	*	1	1900	229	1.
1	0020	5	0.	*	1	0635	80	54.	*	1	1250	155	5.	*	1	1905	230	1.
1	0025	6	0.	*	1	0640	81	52.	*	1	1255	156	5.	*	1	1910	231	1.
1	0030	7	0.	*	1	0645	82	49.	*	1	1300	157	5.	*	1	1915	232	1.
1	0035	8	1.	*	1	0650	83	47.	*	1	1305	158	5.	*	1	1920	233	1.
1	0040	9	1.	*	1	0655	84	45.	*	1	1310	159	5.	*	1	1925	234	1.
1	0045	10	1.	*	1	0700	85	43.	*	1	1315	160	5.	*	1	1930	235	1.
1	0050	11	2.	*	1	0705	86	41.	*	1	1320	161	4.	*	1	1935	236	1.
1	0055	12	5.	*	1	0710	87	39.	*	1	1325	162	4.	*	1	1940	237	1.
1	0100	13	6.	*	1	0715	88	38.	*	1	1330	163	4.	*	1	1945	238	1.

1	0105	14	7.	*	1	0720	89	36.	*	1	1335	164	4.	*	1	1950	239	1.
1	0110	15	8.	*	1	0725	90	35.	*	1	1340	165	4.	*	1	1955	240	1.
1	0115	16	9.	*	1	0730	91	34.	*	1	1345	166	4.	*	1	2000	241	1.
1	0120	17	10.	*	1	0735	92	32.	*	1	1350	167	4.	*	1	2005	242	1.
1	0125	18	11.	*	1	0740	93	31.	*	1	1355	168	4.	*	1	2010	243	1.
1	0130	19	12	*	1	0745	94	30.	*	1	1400	169	4.	*	1	2015	244	1.
1	0135	20	13.	*	1	0750	95	29.	*	1	1405	170	4.	*	1	2020	245	1.
1	0140	21	13.	*	1	0755	96	28.	*	1	1410	171	4.	*	1	2025	246	1.
1	0145	22	14.	*	1	0800	97	27.	*	1	1415	172	3.	*	1	2030	247	1.
1	0150	23	15.	*	1	0805	98	26.	*	1	1420	173	3.	*	1	2035	248	1.
1	0155	24	16.	*	1	0810	99	25.	*	1	1425	174	3.	*	1	2040	249	1.
1	0200	25	17.	*	1	0815	100	24.	*	1	1430	175	3.	*	1	2045	250	1.
1	0205	26	18.	*	1	0820	101	24.	*	1	1435	176	3.	*	1	2050	251	1.
1	0210	27	20.	*	1	0825	102	23.	*	1	1440	177	3.	*	1	2055	252	1.
1	0215	28	21.	*	1	0830	103	22.	*	1	1445	178	3.	*	1	2100	253	1.
1	0220	29	23.	*	1	0835	104	21.	*	1	1450	179	3.	*	1	2105	254	1.
1	0225	30	24.	*	1	0840	105	21.	*	1	1455	180	3.	*	1	2110	255	1.
1	0230	31	26.	*	1	0845	106	20.	*	1	1500	181	3.	*	1	2115	256	1.
1	0235	32	30.	*	1	0850	107	19.	*	1	1505	182	3.	*	1	2120	257	1.
1	0240	33	37.	*	1	0855	108	19.	*	1	1510	183	3.	*	1	2125	258	1.
1	0245	34	49.	*	1	0900	109	18.	*	1	1515	184	3.	*	1	2130	259	1.
1	0250	35	67.	*	1	0905	110	18.	*	1	1520	185	3.	*	1	2135	260	1.
1	0255	36	91.	*	1	0910	111	17.	*	1	1525	186	3.	*	1	2140	261	1.
1	0300	37	144.	*	1	0915	112	17.	*	1	1530	187	2.	*	1	2145	262	1.
1	0305	38	268.	*	1	0920	113	16.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	317.	*	1	0925	114	16.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	305.	*	1	0930	115	15.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	291.	*	1	0935	116	15.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	275.	*	1	0940	117	14.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	260.	*	1	0945	118	14.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	243.	*	1	0950	119	14.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	225.	*	1	0955	120	13.	*	1	1610	195	2.	*	1	2225	270	0.
1	0345	46	206.	*	1	1000	121	13.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	189.	*	1	1005	122	12.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	175.	*	1	1010	123	12.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	164.	*	1	1015	124	12.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	155.	*	1	1020	125	11.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	148.	*	1	1025	126	11.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	142.	*	1	1030	127	11.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	137.	*	1	1035	128	10.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	133.	*	1	1040	129	10.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	128.	*	1	1045	130	10.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	125.	*	1	1050	131	10.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	122.	*	1	1055	132	9.	*	1	1710	207	2.	*	1	2325	282	0.
1	0445	58	119.	*	1	1100	133	9.	*	1	1715	208	2.	*	1	2330	283	0.
1	0450	59	115.	*	1	1105	134	9.	*	1	1720	209	2.	*	1	2335	284	0.
1	0455	60	112.	*	1	1110	135	9.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	108.	*	1	1115	136	8.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	105.	*	1	1120	137	8.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	102.	*	1	1125	138	8.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	98.	*	1	1130	139	8.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	95.	*	1	1135	140	8.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	93.	*	1	1140	141	7.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	90.	*	1	1145	142	7.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	87.	*	1	1150	143	7.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	85.	*	1	1155	144	7.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	82.	*	1	1200	145	7.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	80.	*	1	1205	146	6.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	77.	*	1	1210	147	6.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	75.	*	1	1215	148	6.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	73.	*	1	1220	149	6.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	70.	*	1	1225	150	6.	*	1	1840	225	1.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 317.	3.17		100.	29.	28.	29.
		(INCHES)	1.714	1.973	1.974	1.974
		(AC-FT)	49.	57.	57.	57.

CUMULATIVE AREA = .54 SQ MI

687 KK * ASLDR2 * ROUTE

688 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

ROUTE ASLDR1 AND ASLD1 SUB TO SCOTTSDALE ROAD
AND PRINCESS DRIVE
ROUTE L=1000', TRAP SECTION BW=17' Z=4, TWmax=41'
ASSUME GRASS LINED CHANNEL N=.030 UP=1570.15 DWN=1548.60

HYDROGRAPH ROUTING DATA

693 RK KINEMATIC WAVE STREAM ROUTING

L	1000.	CHANNEL LENGTH
S	.0075	SLOPE
N	.030	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	17.00	BOTTOM WIDTH OR DIAMETER
Z	4.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

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COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.94	1.44	.72	333.33	316.25	191.53	1.97	7.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5692E+02 EXCESS= .0000E+00 OUTFLOW= .5692E+02 BASIN STORAGE= .5511E-02 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.94	1.44	5.00		308.60	195.00	1.97	

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HYDROGRAPH AT STATION ASLDR2

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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		0615	76	69.	1		1230	151	6.	1		1845	226	1.
1		0005	2	0.	1		0620	77	65.	1		1235	152	6.	1		1850	227	1.
1		0010	3	0.	1		0625	78	62.	1		1240	153	6.	1		1855	228	1.
1		0015	4	0.	1		0630	79	59.	1		1245	154	5.	1		1900	229	1.
1		0020	5	0.	1		0635	80	56.	1		1250	155	5.	1		1905	230	1.
1		0025	6	0.	1		0640	81	53.	1		1255	156	5.	1		1910	231	1.
1		0030	7	0.	1		0645	82	50.	1		1300	157	5.	1		1915	232	1.
1		0035	8	0.	1		0650	83	48.	1		1305	158	5.	1		1920	233	1.
1		0040	9	0.	1		0655	84	46.	1		1310	159	5.	1		1925	234	1.
1		0045	10	1.	1		0700	85	44.	1		1315	160	5.	1		1930	235	1.
1		0050	11	1.	1		0705	86	42.	1		1320	161	5.	1		1935	236	1.
1		0055	12	2.	1		0710	87	40.	1		1325	162	4.	1		1940	237	1.
1		0100	13	4.	1		0715	88	39.	1		1330	163	4.	1		1945	238	1.
1		0105	14	6.	1		0720	89	37.	1		1335	164	4.	1		1950	239	1.
1		0110	15	8.	1		0725	90	36.	1		1340	165	4.	1		1955	240	1.
1		0115	16	9.	1		0730	91	34.	1		1345	166	4.	1		2000	241	1.
1		0120	17	9.	1		0735	92	33.	1		1350	167	4.	1		2005	242	1.
1		0125	18	10.	1		0740	93	32.	1		1355	168	4.	1		2010	243	1.
1		0130	19	11.	1		0745	94	31.	1		1400	169	4.	1		2015	244	1.
1		0135	20	12.	1		0750	95	30.	1		1405	170	4.	1		2020	245	1.
1		0140	21	13.	1		0755	96	29.	1		1410	171	4.	1		2025	246	1.
1		0145	22	14.	1		0800	97	28.	1		1415	172	4.	1		2030	247	1.
1		0150	23	15.	1		0805	98	27.	1		1420	173	3.	1		2035	248	1.
1		0155	24	16.	1		0810	99	26.	1		1425	174	3.	1		2040	249	1.
1		0200	25	17.	1		0815	100	25.	1		1430	175	3.	1		2045	250	1.
1		0205	26	18.	1		0820	101	24.	1		1435	176	3.	1		2050	251	1.
1		0210	27	19.	1		0825	102	23.	1		1440	177	3.	1		2055	252	1.
1		0215	28	20.	1		0830	103	23.	1		1445	178	3.	1		2100	253	1.
1		0220	29	22.	1		0835	104	22.	1		1450	179	3.	1		2105	254	1.
1		0225	30	23.	1		0840	105	21.	1		1455	180	3.	1		2110	255	1.
1		0230	31	25.	1		0845	106	21.	1		1500	181	3.	1		2115	256	1.
1		0235	32	28.	1		0850	107	20.	1		1505	182	3.	1		2120	257	1.
1		0240	33	33.	1		0855	108	19.	1		1510	183	3.	1		2125	258	1.
1		0245	34	43.	1		0900	109	19.	1		1515	184	3.	1		2130	259	1.
1		0250	35	58.	1		0905	110	18.	1		1520	185	3.	1		2135	260	1.
1		0255	36	81.	1		0910	111	18.	1		1525	186	3.	1		2140	261	1.
1		0300	37	124.	1		0915	112	17.	1		1530	187	3.	1		2145	262	1.
1		0305	38	230.	1		0920	113	16.	1		1535	188	2.	1		2150	263	1.
1		0310	39	303.	1		0925	114	16.	1		1540	189	2.	1		2155	264	1.
1		0315	40	309.	1		0930	115	16.	1		1545	190	2.	1		2200	265	0.
1		0320	41	295.	1		0935	116	15.	1		1550	191	2.	1		2205	266	0.
1		0325	42	279.	1		0940	117	15.	1		1555	192	2.	1		2210	267	0.
1		0330	43	264.	1		0945	118	14.	1		1600	193	2.	1		2215	268	0.
1		0335	44	248.	1		0950	119	14.	1		1605	194	2.	1		2220	269	0.
1		0340	45	230.	1		0955	120	13.	1		1610	195	2.	1		2225	270	0.
1		0345	46	212.	1		1000	121	13.	1		1615	196	2.	1		2230	271	0.
1		0350	47	194.	1		1005	122	13.	1		1620	197	2.	1		2235	272	0.
1		0355	48	179.	1		1010	123	12.	1		1625	198	2.	1		2240	273	0.
1		0400	49	167.	1		1015	124	12.	1		1630	199	2.	1		2245	274	0.
1		0405	50	158.	1		1020	125	12.	1		1635	200	2.	1		2250	275	0.
1		0410	51	151.	1		1025	126	11.	1		1640	201	2.	1		2255	276	0.
1		0415	52	144.	1		1030	127	11.	1		1645	202	2.	1		2300	277	0.
1		0420	53	139.	1		1035	128	11.	1		1650	203	2.	1		2305	278	0.
1		0425	54	134.	1		1040	129	10.	1		1655	204	2.	1		2310	279	0.
1		0430	55	130.	1		1045	130	10.	1		1700	205	2.	1		2315	280	0.
1		0435	56	126.	1		1050	131	10.	1		1705	206	2.	1		2320	281	0.
1		0440	57	123.	1		1055	132	10.	1		1710	207	2.	1		2325	282	0.
1		0445	58	120.	1		1100	133	9.	1		1715	208	2.	1		2330	283	0.
1		0450	59	117.	1		1105	134	9.	1		1720	209	2.	1		2335	284	0.
1		0455	60	113.	1		1110	135	9.	1		1725	210	2.	1		2340	285	0.

1	0500	61	110.	1	1115	136	9.	1	1730	211	1.	1	2345	286	0.
1	0505	62	106.	1	1120	137	8.	1	1735	212	1.	1	2350	287	0.
1	0510	63	103.	1	1125	138	8.	1	1740	213	1.	1	2355	288	0.
1	0515	64	100.	1	1130	139	8.	1	1745	214	1.	2	0000	289	0.
1	0520	65	97.	1	1135	140	8.	1	1750	215	1.	2	0005	290	0.
1	0525	66	94.	1	1140	141	8.	1	1755	216	1.	2	0010	291	0.
1	0530	67	91.	1	1145	142	7.	1	1800	217	1.	2	0015	292	0.
1	0535	68	88.	1	1150	143	7.	1	1805	218	1.	2	0020	293	0.
1	0540	69	86.	1	1155	144	7.	1	1810	219	1.	2	0025	294	0.
1	0545	70	83.	1	1200	145	7.	1	1815	220	1.	2	0030	295	0.
1	0550	71	81.	1	1205	146	7.	1	1820	221	1.	2	0035	296	0.
1	0555	72	78.	1	1210	147	6.	1	1825	222	1.	2	0040	297	0.
1	0600	73	76.	1	1215	148	6.	1	1830	223	1.	2	0045	298	0.
1	0605	74	74.	1	1220	149	6.	1	1835	224	1.	2	0050	299	0.
1	0610	75	71.	1	1225	150	6.	1	1840	225	1.	2	0055	300	0.

```
 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR      24.92-HR
+  (CFS)       (HR)
                         (CFS)
+     309.     3.25                  100.          29.         28.         28.
                       (INCHES)     1.715        1.974       1.974       1.974
                        (AC-FT)       49.          57.         57.         57.

                       CUMULATIVE AREA =     .54 SQ MI
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            **************
            *            *
 694 KK     *    ASLD    *     2     SUB
            *            *
            **************

 695 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS

                        ASLD SOUTH PARCEL EAST OF SCOTTSDALE ROAD AND NORTH OF CHAUNCEY LANE

              SUBBASIN RUNOFF DATA

 697 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .02  SUBBASIN AREA

                 PRECIPITATION DATA

  24 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 ......    ............... TP-40 ...............   ........... TP-49 ..........
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   .76    1.50    2.54    2.81    2.99    3.33     .00     .00     .00     .00     .00     .00

                                                  STORM AREA =    14.00

 698 LS          SCS LOSS RATE
                      STRTL         .60  INITIAL ABSTRACTION
                     CRVNBR       77.00  CURVE NUMBER
                      RTIMP       78.00  PERCENT IMPERVIOUS AREA

                 KINEMATIC WAVE
 699 UK            OVERLAND-FLOW ELEMENT NO. 1
                          L        269.  OVERLAND FLOW LENGTH
                          S       .0022  SLOPE
                          N        .015  ROUGHNESS COEFFICIENT
                         PA       100.0  PERCENT OF SUBBASIN
                      DXMIN           5  MINIMUM NUMBER OF DX INTERVALS

                 KINEMATIC WAVE
 700 RK            MAIN CHANNEL
                          L        600.  CHANNEL LENGTH
                          S       .0139  SLOPE
                          N        .015  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .02  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       17.00  BOTTOM WIDTH OR DIAMETER
                          Z        4.00  SIDE SLOPE
                     NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ          NO  ROUTE UPSTREAM HYDROGRAPH

                                                     ***
                                        COMPUTED KINEMATIC PARAMETERS
                                             VARIABLE TIME STEP
                                           (DT SHOWN IS A MINIMUM)

                 ELEMENT    ALPHA        M          DT         DX        PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                   PEAK                 CELERITY
                                                  (MIN)       (FT)       (CFS)     (MIN)        (IN)      (FPS)

                 PLANE1      4.66      1.67         .70      53.80      87.24    185.04        2.78       1.27
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MAIN 2.56 1.44 .36 200.00 84.72 185.20 2.78 11.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2865E+01 OUTFLOW= .2863E+01 BASIN STORAGE= .7801E-04 PERCENT ERROR= .1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN 2.56 1.44 5.00 84.18 185.00 2.80

****

HYDROGRAPH AT STATION ASLD

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.
1		0005	2	.01	.00	.01	0.
1		0010	3	.01	.00	.01	0.
1		0015	4	.01	.00	.01	0.
1		0020	5	.01	.00	.01	0.
1		0025	6	.01	.00	.01	0.
1		0030	7	.01	.00	.01	1.
1		0035	8	.01	.00	.01	1.
1		0040	9	.01	.00	.01	1.
1		0045	10	.01	.00	.01	1.
1		0050	11	.01	.00	.01	1.
1		0055	12	.01	.00	.01	1.
1		0100	13	.01	.00	.01	1.
1		0105	14	.01	.00	.01	1.
1		0110	15	.01	.00	.01	1.
1		0115	16	.01	.00	.01	1.
1		0120	17	.01	.00	.01	1.
1		0125	18	.01	.00	.01	1.
1		0130	19	.01	.00	.01	1.
1		0135	20	.01	.00	.01	1.
1		0140	21	.01	.00	.01	2.
1		0145	22	.02	.00	.01	2.
1		0150	23	.02	.00	.01	2.
1		0155	24	.02	.00	.01	2.
1		0200	25	.02	.00	.01	2.
1		0205	26	.02	.00	.02	2.
1		0210	27	.02	.00	.02	2.
1		0215	28	.02	.00	.02	2.
1		0220	29	.02	.01	.02	3.
1		0225	30	.03	.01	.02	3.
1		0230	31	.03	.01	.02	3.
1		0235	32	.08	.02	.06	5.
1		0240	33	.09	.02	.07	8.
1		0245	34	.10	.02	.08	10.
1		0250	35	.14	.03	.11	13.
1		0255	36	.18	.03	.14	19.
1		0300	37	.40	.06	.34	40.
1		0305	38	.69	.08	.61	84.
1		0310	39	.28	.03	.25	48.
1		0315	40	.15	.01	.14	27.
1		0320	41	.11	.01	.10	19.
1		0325	42	.09	.01	.09	15.
1		0330	43	.08	.01	.07	12.
1		0335	44	.03	.00	.03	9.
1		0340	45	.03	.00	.03	6.
1		0345	46	.03	.00	.02	5.
1		0350	47	.02	.00	.02	4.
1		0355	48	.02	.00	.02	4.
1		0400	49	.02	.00	.02	3.
1		0405	50	.02	.00	.02	3.
1		0410	51	.02	.00	.02	3.
1		0415	52	.02	.00	.02	3.
1		0420	53	.02	.00	.01	2.
1		0425	54	.02	.00	.01	2.
1		0430	55	.01	.00	.01	2.
1		0435	56	.01	.00	.01	2.
1		0440	57	.01	.00	.01	2.
1		0445	58	.01	.00	.01	2.
1		0450	59	.01	.00	.01	2.
1		0455	60	.01	.00	.01	2.
1		0500	61	.01	.00	.01	2.
1		0505	62	.01	.00	.01	2.
1		0510	63	.01	.00	.01	2.
1		0515	64	.01	.00	.01	1.
1		0520	65	.01	.00	.01	1.
1		0525	66	.01	.00	.01	1.
1		0530	67	.01	.00	.01	1.
1		0535	68	.01	.00	.01	1.
1		0540	69	.01	.00	.01	1.
1		0545	70	.01	.00	.01	1.
1		0550	71	.01	.00	.01	1.
1		0555	72	.01	.00	.01	1.
1		0600	73	.01	.00	.01	1.
1		0605	74	.00	.00	.00	1.
1		0610	75	.00	.00	.00	1.
1		0615	76	.00	.00	.00	1.
1		0620	77	.00	.00	.00	0.
1		0625	78	.00	.00	.00	0.
1		0630	79	.00	.00	.00	0.
1		0635	80	.00	.00	.00	0.
1		0640	81	.00	.00	.00	0.
1		0645	82	.00	.00	.00	0.
1		1230	151	.00	.00	.00	0.
1		1235	152	.00	.00	.00	0.
1		1240	153	.00	.00	.00	0.
1		1245	154	.00	.00	.00	0.
1		1250	155	.00	.00	.00	0.
1		1255	156	.00	.00	.00	0.
1		1300	157	.00	.00	.00	0.
1		1305	158	.00	.00	.00	0.
1		1310	159	.00	.00	.00	0.
1		1315	160	.00	.00	.00	0.
1		1320	161	.00	.00	.00	0.
1		1325	162	.00	.00	.00	0.
1		1330	163	.00	.00	.00	0.
1		1335	164	.00	.00	.00	0.
1		1340	165	.00	.00	.00	0.
1		1345	166	.00	.00	.00	0.
1		1350	167	.00	.00	.00	0.
1		1355	168	.00	.00	.00	0.
1		1400	169	.00	.00	.00	0.
1		1405	170	.00	.00	.00	0.
1		1410	171	.00	.00	.00	0.
1		1415	172	.00	.00	.00	0.
1		1420	173	.00	.00	.00	0.
1		1425	174	.00	.00	.00	0.
1		1430	175	.00	.00	.00	0.
1		1435	176	.00	.00	.00	0.
1		1440	177	.00	.00	.00	0.
1		1445	178	.00	.00	.00	0.
1		1450	179	.00	.00	.00	0.
1		1455	180	.00	.00	.00	0.
1		1500	181	.00	.00	.00	0.
1		1505	182	.00	.00	.00	0.
1		1510	183	.00	.00	.00	0.
1		1515	184	.00	.00	.00	0.
1		1520	185	.00	.00	.00	0.
1		1525	186	.00	.00	.00	0.
1		1530	187	.00	.00	.00	0.
1		1535	188	.00	.00	.00	0.
1		1540	189	.00	.00	.00	0.
1		1545	190	.00	.00	.00	0.
1		1550	191	.00	.00	.00	0.
1		1555	192	.00	.00	.00	0.
1		1600	193	.00	.00	.00	0.
1		1605	194	.00	.00	.00	0.
1		1610	195	.00	.00	.00	0.
1		1615	196	.00	.00	.00	0.
1		1620	197	.00	.00	.00	0.
1		1625	198	.00	.00	.00	0.
1		1630	199	.00	.00	.00	0.
1		1635	200	.00	.00	.00	0.
1		1640	201	.00	.00	.00	0.
1		1645	202	.00	.00	.00	0.
1		1650	203	.00	.00	.00	0.
1		1655	204	.00	.00	.00	0.
1		1700	205	.00	.00	.00	0.
1		1705	206	.00	.00	.00	0.
1		1710	207	.00	.00	.00	0.
1		1715	208	.00	.00	.00	0.
1		1720	209	.00	.00	.00	0.
1		1725	210	.00	.00	.00	0.
1		1730	211	.00	.00	.00	0.
1		1735	212	.00	.00	.00	0.
1		1740	213	.00	.00	.00	0.
1		1745	214	.00	.00	.00	0.
1		1750	215	.00	.00	.00	0.
1		1755	216	.00	.00	.00	0.
1		1800	217	.00	.00	.00	0.
1		1805	218	.00	.00	.00	0.
1		1810	219	.00	.00	.00	0.
1		1815	220	.00	.00	.00	0.
1		1820	221	.00	.00	.00	0.
1		1825	222	.00	.00	.00	0.
1		1830	223	.00	.00	.00	0.
1		1835	224	.00	.00	.00	0.
1		1840	225	.00	.00	.00	0.
1		1845	226	.00	.00	.00	0.
1		1850	227	.00	.00	.00	0.
1		1855	228	.00	.00	.00	0.
1		1900	229	.00	.00	.00	0.
1		1905	230	.00	.00	.00	0.
1		1910	231	.00	.00	.00	0.
1		1915	232	.00	.00	.00	0.

1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.22, TOTAL LOSS = .44, TOTAL EXCESS = 2.78

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 84.	3.08		6.	1.	1.	1.
		(INCHES)	2.777	2.795	2.795	2.795
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .02 SQ MI

701 KK * CPPRIN * COMBINE

702 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT

ISAV1 1 FIRST ORDINATE PUNCHED OR SAVED
ISAV2 300 LAST ORDINATE PUNCHED OR SAVED
TIMINT .083 TIME INTERVAL IN HOURS

COMBINE ROUTED ROUTED ASLDCHNL WITH ASLD2

704 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION CPPRIN
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	0615	76	69.	1	1230	151	6.	1	1845	226	1.
1	0005	2	0.	1	0620	77	66.	1	1235	152	6.	1	1850	227	1.
1	0010	3	0.	1	0625	78	62.	1	1240	153	6.	1	1855	228	1.
1	0015	4	0.	1	0630	79	59.	1	1245	154	5.	1	1900	229	1.
1	0020	5	0.	1	0635	80	56.	1	1250	155	5.	1	1905	230	1.
1	0025	6	0.	1	0640	81	53.	1	1255	156	5.	1	1910	231	1.
1	0030	7	1.	1	0645	82	51.	1	1300	157	5.	1	1915	232	1.
1	0035	8	1.	1	0650	83	48.	1	1305	158	5.	1	1920	233	1.
1	0040	9	1.	1	0655	84	46.	1	1310	159	5.	1	1925	234	1.
1	0045	10	2.	1	0700	85	44.	1	1315	160	5.	1	1930	235	1.
1	0050	11	2.	1	0705	86	42.	1	1320	161	5.	1	1935	236	1.
1	0055	12	3.	1	0710	87	40.	1	1325	162	4.	1	1940	237	1.
1	0100	13	5.	1	0715	88	39.	1	1330	163	4.	1	1945	238	1.
1	0105	14	8.	1	0720	89	37.	1	1335	164	4.	1	1950	239	1.
1	0110	15	9.	1	0725	90	36.	1	1340	165	4.	1	1955	240	1.
1	0115	16	10.	1	0730	91	34.	1	1345	166	4.	1	2000	241	1.
1	0120	17	11.	1	0735	92	33.	1	1350	167	4.	1	2005	242	1.
1	0125	18	12.	1	0740	93	32.	1	1355	168	4.	1	2010	243	1.
1	0130	19	12.	1	0745	94	31.	1	1400	169	4.	1	2015	244	1.
1	0135	20	13.	1	0750	95	30.	1	1405	170	4.	1	2020	245	1.
1	0140	21	14.	1	0755	96	29.	1	1410	171	4.	1	2025	246	1.
1	0145	22	15.	1	0800	97	28.	1	1415	172	4.	1	2030	247	1.
1	0150	23	16.	1	0805	98	27.	1	1420	173	3.	1	2035	248	1.
1	0155	24	17.	1	0810	99	26.	1	1425	174	3.	1	2040	249	1.
1	0200	25	19.	1	0815	100	25.	1	1430	175	3.	1	2045	250	1.
1	0205	26	20.	1	0820	101	24.	1	1435	176	3.	1	2050	251	1.
1	0210	27	21.	1	0925	102	23.	1	1440	177	3.	1	2055	252	1.
1	0215	28	23.	1	0830	103	23.	1	1445	178	3.	1	2100	253	1.
1	0220	29	24.	1	0835	104	22.	1	1450	179	3.	1	2105	254	1.
1	0225	30	26.	1	0840	105	21.	1	1455	180	3.	1	2110	255	1.
1	0230	31	28.	1	0845	106	21.	1	1500	181	3.	1	2115	256	1.
1	0235	32	32.	1	0850	107	20.	1	1505	182	3.	1	2120	257	1.
1	0240	33	40.	1	0855	108	19.	1	1510	183	3.	1	2125	258	1.
1	0245	34	53.	1	0900	109	19.	1	1515	184	3.	1	2130	259	1.
1	0250	35	72.	1	0905	110	18.	1	1520	185	3.	1	2135	260	1.
1	0255	36	100.	1	0910	111	18.	1	1525	186	3.	1	2140	261	1.
1	0300	37	164.	1	0915	112	17.	1	1530	187	3.	1	2145	262	1.
1	0305	38	314.	1	0920	113	17.	1	1535	188	2.	1	2150	263	1.
1	0310	39	357.	1	0925	114	16.	1	1540	189	2.	1	2155	264	1.
1	0315	40	336.	1	0930	115	16.	1	1545	190	2.	1	2200	265	0.
1	0320	41	314.	1	0935	116	15.	1	1550	191	2.	1	2205	266	0.
1	0325	42	294.	1	0940	117	15.	1	1555	192	2.	1	2210	267	0.
1	0330	43	277.	1	0945	118	14.	1	1600	193	2.	1	2215	268	0.
1	0335	44	257.	1	0950	119	14.	1	1605	194	2.	1	2220	269	0.
1	0340	45	236.	1	0955	120	13.	1	1610	195	2.	1	2225	270	0.
1	0345	46	217.	1	1000	121	13.	1	1615	196	2.	1	2230	271	0.
1	0350	47	198.	1	1005	122	13.	1	1620	197	2.	1	2235	272	0.
1	0355	48	183.	1	1010	123	12.	1	1625	198	2.	1	2240	273	0.
1	0400	49	171.	1	1015	124	12.	1	1630	199	2	1	2245	274	0.
1	0405	50	161.	1	1020	125	12.	1	1635	200	2.	1	2250	275	0.
1	0410	51	153.	1	1025	126	11.	1	1640	201	2.	1	2255	276	0
1	0415	52	147.	1	1030	127	11.	1	1645	202	2.	1	2300	277	0.
1	0420	53	141.	1	1035	128	11.	1	1650	203	2.	1	2305	278	0.
1	0425	54	137.	1	1040	129	10.	1	1655	204	2.	1	2310	279	0.
1	0430	55	132.	1	1045	130	10.	1	1700	205	2.	1	2315	280	0.
1	0435	56	128.	1	1050	131	10.	1	1705	206	2.	1	2320	281	0.
1	0440	57	125.	1	1055	132	10.	1	1710	207	2.	1	2325	282	0.
1	0445	58	122.	1	1100	133	9.	1	1715	208	2.	1	2330	283	0.
1	0450	59	118.	1	1105	134	9.	1	1720	209	2.	1	2335	284	0.
1	0455	60	115.	1	1110	135	9.	1	1725	210	2.	1	2340	285	0.
1	0500	61	111.	1	1115	136	9.	1	1730	211	1.	1	2345	286	0.
1	0505	62	108.	1	1120	137	8.	1	1735	212	1.	1	2350	287	0.
1	0510	63	104.	1	1125	138	8.	1	1740	213	1.	1	2355	288	0.
1	0515	64	101.	1	1130	139	8.	1	1745	214	1.	2	0000	289	0.
1	0520	65	98.	1	1135	140	8.	1	1750	215	1.	2	0005	290	0.
1	0525	66	95.	1	1140	141	8.	1	1755	216	1.	2	0010	291	0.
1	0530	67	92.	1	1145	142	7.	1	1800	217	1.	2	0015	292	0.
1	0535	68	90.	1	1150	143	7.	1	1805	218	1.	2	0020	293	0.
1	0540	69	87.	1	1155	144	7.	1	1810	219	1.	2	0025	294	0.
1	0545	70	84.	1	1200	145	7.	1	1815	220	1.	2	0030	295	0.
1	0550	71	82.	1	1205	146	7.	1	1820	221	1.	2	0035	296	0.
1	0555	72	80.	1	1210	147	6.	1	1825	222	1.	2	0040	297	0.
1	0600	73	77.	1	1215	148	6.	1	1830	223	1.	2	0045	298	0.
1	0605	74	75.	1	1220	149	6.	1	1835	224	1.	2	0050	299	0.
1	0610	75	72.	1	1225	150	6.	1	1840	225	1.	2	0055	300	0.

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
(CFS) (HR)

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                         (CFS)
+     351.      3.17                 105.          30.          29.          29.
                         (INCHES)    1.744        2.002        2.003        2.003
                          (AC-FT)      52.          60.          60.          60.

                         CUMULATIVE AREA =      .56 SQ MI
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           *            *
 705 KK    *   R33C.2   *
           *            *
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 706 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                        RETRIEVE DIVERTED PIPE FLOW

 708 DR          RETRIEVE DIVERSION HYDROGRAPH
                      ISTAD       D33C.2  DIVERSION HYDROGRAPH IDENTIFICATION
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HYDROGRAPH AT STATION R33C.2

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		0615	76	9.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	8.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	7.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2.	1		1330	163	0.	1		1945	238	0.
1		0105	14	1.	1		0720	89	2.	1		1335	164	0.	1		1950	239	0.
1		0110	15	1.	1		0725	90	1.	1		1340	165	0.	1		1955	240	0.
1		0115	16	1.	1		0730	91	1.	1		1345	166	0.	1		2000	241	0.
1		0120	17	2.	1		0735	92	1.	1		1350	167	0.	1		2005	242	0.
1		0125	18	2.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	2.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	3.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	3.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	3.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	3.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	4.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	4.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	4.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	5.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	5.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	5.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	6.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	6.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	8.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	10.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	11.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	13.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	15.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	17.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	46.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	96.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	108.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	105.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	96.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	86.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	75.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	63.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	52.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	44.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	37.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	31.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	27.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	24.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	22.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	19.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0
1		0430	55	18.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	18.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	17.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	17.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	17.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	16.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	16.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	16.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	15.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.

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 1   0515   64     15.   *   1   1130  139     0.   *   1   1745  214     0.   *   2   0000  289     0.
 1   0520   65     14.   *   1   1135  140     0.   *   1   1750  215     0.   *   2   0005  290     0.
 1   0525   66     14.   *   1   1140  141     0.   *   1   1755  216     0.   *   2   0010  291     0.
 1   0530   67     14    *   1   1145  142     0.   *   1   1800  217     0.   *   2   0015  292     0.
 1   0535   68     13.   *   1   1150  143     0.   *   1   1805  218     0.   *   2   0020  293     0.
 1   0540   69     13.   *   1   1155  144     0.   *   1   1810  219     0.   *   2   0025  294     0.
 1   0545   70     12.   *   1   1200  145     0.   *   1   1815  220     0.   *   2   0030  295     0.
 1   0550   71     12.   *   1   1205  146     0.   *   1   1820  221     0.   *   2   0035  296     0.
 1   0555   72     12.   *   1   1210  147     0.   *   1   1825  222     0.   *   2   0040  297     0.
 1   0600   73     11.   *   1   1215  148     0.   *   1   1830  223     0.   *   2   0045  298     0.
 1   0605   74     11.   *   1   1220  149     0.   *   1   1835  224     0.   *   2   0050  299     0.
 1   0610   75     10.   *   1   1225  150     0.   *   1   1840  225     0.   *   2   0055  300     0.
                         *                          *                          *
*****************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR      24.92-HR
+   (CFS)        (HR)
                           (CFS)
+     106.       3.33                  20.           5.          5.          5.
                        (INCHES)      .329         .333        .333        .333
                         (AC-FT)       10.          10.         10.         10.

                        CUMULATIVE AREA =     .00 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
  709 KK     *   S40WT    *           SUB
             *            *
             **************

  710 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           1  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                           SUB EAST OF SCOTTSDALE RD, FLOWING DIRECTLY INTO SCOTTSDALE RD
                           CULVERT, TAKES SCOTTS RD HALF ST AND SCENIC CORRIDOR

                SUBBASIN RUNOFF DATA

  713 BA          SUBBASIN CHARACTERISTICS
                        TAREA          .01  SUBBASIN AREA

                  PRECIPITATION DATA

   24 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......    ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
                    .76    1.50    2.54     2.81     2.99     3.33      .00      .00      .00      .00      .00      .00

                                                     STORM AREA =     14.00

  714 LS          SCS LOSS RATE
                        STRTL          .60  INITIAL ABSTRACTION
                       CRVNBR        77.00  CURVE NUMBER
                        RTIMP        39.00  PERCENT IMPERVIOUS AREA

                  KINEMATIC WAVE
  715 UK            OVERLAND-FLOW ELEMENT NO. 1
                            L           50.  OVERLAND FLOW LENGTH
                            S        .0100  SLOPE
                            N         .050  ROUGHNESS COEFFICIENT
                           PA        100.0  PERCENT OF SUBBASIN
                        DXMIN            5  MINIMUM NUMBER OF DX INTERVALS

                  KINEMATIC WAVE
  716 RK            MAIN CHANNEL
                            L         600.  CHANNEL LENGTH
                            S        .0100  SLOPE
                            N         .015  CHANNEL ROUGHNESS COEFFICIENT
                           CA          .01  CONTRIBUTING AREA
                        SHAPE         CIRC  CHANNEL SHAPE
                           WD         4.50  BOTTOM WIDTH OR DIAMETER
                            Z          .00  SIDE SLOPE
                       NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                       RUPSTQ           NO  ROUTE UPSTREAM HYDROGRAPH

                                                 ***
                                      COMPUTED KINEMATIC PARAMETERS
                                            VARIABLE TIME STEP
                                          (DT SHOWN IS A MINIMUM)

                   ELEMENT     ALPHA        M         DT        DX       PEAK    TIME TO    VOLUME    MAXIMUM
                                                                                  PEAK                CELERITY
                                                     (MIN)      (FT)     (CFS)    (MIN)      (IN)      (FPS)

                   PLANE1       2.98      1.67        .43     10.00     11.73    184.84      3.00        .54
                   MAIN         6.89      1.25        .33    200.00     11.72    184.75      3.00      12.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00  EXCESS= .1009E+01 OUTFLOW= .1008E+01 BASIN STORAGE= .4454E-05 PERCENT ERROR=     .1

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL
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MAIN 6.89 1.25 5.00 31.47 185.00 3.01

HYDROGRAPH AT STATION S40WT

DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	0000	1	.00	.00	.00	0.	1	1230	151	.00	.00	.00	0.
1	0005	2	.01	.00	.01	0.	1	1235	152	.00	.00	.00	0.
1	0010	3	.01	.00	.01	0.	1	1240	153	.00	.00	.00	0.
1	0015	4	.01	.00	.01	0.	1	1245	154	.00	.00	.00	0.
1	0020	5	.01	.00	.01	0.	1	1250	155	.00	.00	.00	0.
1	0025	6	.01	.00	.01	0.	1	1255	156	.00	.00	.00	0.
1	0030	7	.01	.00	.01	0.	1	1300	157	.00	.00	.00	0.
1	0035	8	.01	.00	.01	0.	1	1305	158	.00	.00	.00	0.
1	0040	9	.01	.00	.01	0.	1	1310	159	.00	.00	.00	0.
1	0045	10	.01	.00	.01	0.	1	1315	160	.00	.00	.00	0.
1	0050	11	.01	.00	.01	0.	1	1320	161	.00	.00	.00	0.
1	0055	12	.01	.00	.01	0.	1	1325	162	.00	.00	.00	0.
1	0100	13	.01	.00	.01	0.	1	1330	163	.00	.00	.00	0.
1	0105	14	.01	.00	.01	0.	1	1335	164	.00	.00	.00	0.
1	0110	15	.01	.00	.01	0.	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.00	.01	0.	1	1345	166	.00	.00	.00	0.
1	0120	17	.01	.00	.01	1.	1	1350	167	.00	.00	.00	0.
1	0125	18	.01	.00	.01	1.	1	1355	168	.00	.00	.00	0.
1	0130	19	.01	.00	.01	1.	1	1400	169	.00	.00	.00	0.
1	0135	20	.01	.00	.01	1.	1	1405	170	.00	.00	.00	0.
1	0140	21	.01	.00	.01	1.	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.00	.01	1.	1	1415	172	.00	.00	.00	0.
1	0150	23	.02	.00	.01	1.	1	1420	173	.00	.00	.00	0.
1	0155	24	.02	.00	.02	1.	1	1425	174	.00	.00	.00	0.
1	0200	25	.02	.00	.02	1.	1	1430	175	.00	.00	.00	0.
1	0205	26	.02	.00	.02	1.	1	1435	176	.00	.00	.00	0.
1	0210	27	.02	.00	.02	1.	1	1440	177	.00	.00	.00	0.
1	0215	28	.02	.00	.02	1.	1	1445	178	.00	.00	.00	0.
1	0220	29	.02	.00	.02	1.	1	1450	179	.00	.00	.00	0.
1	0225	30	.03	.00	.02	1.	1	1455	180	.00	.00	.00	0.
1	0230	31	.03	.00	.03	1.	1	1500	181	.00	.00	.00	0.
1	0235	32	.08	.01	.07	3.	1	1505	182	.00	.00	.00	0.
1	0240	33	.09	.01	.08	4.	1	1510	183	.00	.00	.00	0.
1	0245	34	.10	.01	.09	4.	1	1515	184	.00	.00	.00	0.
1	0250	35	.14	.01	.12	6.	1	1520	185	.00	.00	.00	0.
1	0255	36	.18	.02	.16	8.	1	1525	186	.00	.00	.00	0.
1	0300	37	.40	.03	.37	18.	1	1530	187	.00	.00	.00	0.
1	0305	38	.69	.04	.65	31.	1	1535	188	.00	.00	.00	0.
1	0310	39	.28	.01	.26	13.	1	1540	189	.00	.00	.00	0.
1	0315	40	.15	.01	.15	7.	1	1545	190	.00	.00	.00	0.
1	0320	41	.11	.00	.10	5.	1	1550	191	.00	.00	.00	0.
1	0325	42	.09	.00	.09	4.	1	1555	192	.00	.00	.00	0.
1	0330	43	.08	.00	.08	4.	1	1600	193	.00	.00	.00	0.
1	0335	44	.03	.00	.03	2.	1	1605	194	.00	.00	.00	0.
1	0340	45	.03	.00	.03	1.	1	1610	195	.00	.00	.00	0.
1	0345	46	.03	.00	.03	1.	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	1.	1	1620	197	.00	.00	.00	0.
1	0355	48	.02	.00	.02	1.	1	1625	198	.00	.00	.00	0.
1	0400	49	.02	.00	.02	1.	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.02	1.	1	1635	200	.00	.00	.00	0.
1	0410	51	.02	.00	.02	1.	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	1.	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	1.	1	1650	203	.00	.00	.00	0.
1	0425	54	.02	.00	.01	1.	1	1655	204	.00	.00	.00	0.
1	0430	55	.01	.00	.01	1.	1	1700	205	.00	.00	.00	0.
1	0435	56	.01	.00	.01	1.	1	1705	206	.00	.00	.00	0.
1	0440	57	.01	.00	.01	1.	1	1710	207	.00	.00	.00	0.
1	0445	58	.01	.00	.01	1.	1	1715	208	.00	.00	.00	0.
1	0450	59	.01	.00	.01	1.	1	1720	209	.00	.00	.00	0.
1	0455	60	.01	.00	.01	1.	1	1725	210	.00	.00	.00	0.
1	0500	61	.01	.00	.01	1.	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	1.	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	0.	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	0.	1	1745	214	.00	.00	.00	0.
1	0520	65	.01	.00	.01	0.	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	0.	1	1755	216	.00	.00	.00	0.
1	0530	67	.01	.00	.01	0.	1	1800	217	.00	.00	.00	0.
1	0535	68	.01	.00	.01	0.	1	1805	218	.00	.00	.00	0.
1	0540	69	.01	.00	.01	0.	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	0.	1	1815	220	.00	.00	.00	0.
1	0550	71	.01	.00	.01	0.	1	1820	221	.00	.00	.00	0.
1	0555	72	.01	.00	.01	0.	1	1825	222	.00	00	.00	0.
1	0600	73	.01	.00	.01	0.	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	0.	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	0.	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	0.	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	0.	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	1	1935	236	.00	00	.00	0.
1	0710	87	.00	.00	.00	0.	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	1	1945	238	.00	.00	.00	0.
1	0720	89	00	.00	.00	0.	1	1950	239	.00	.00	.00	0.
1	0725	90	00	.00	.00	0.	1	1955	240	.00	.00	.00	0.

1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

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TOTAL RAINFALL =    3.22, TOTAL LOSS =     .22, TOTAL EXCESS =    3.00

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR       24.92-HR
+   (CFS)       (HR)
                           (CFS)
+     31.       3.08                    2.           1.           0.           0.
                         (INCHES)   3.004        3.013        3.013        3.013
                          (AC-FT)      1.           1.           1.           1.

                         CUMULATIVE AREA =      .01 SQ MI
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          *************
          *           *
 717 KK   *   33C.2   *      COMBINE
          *           *
          *************

 718 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            1  PRINT CONTROL
                      IPLOT            0  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE
                         COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT

 720 HC          HYDROGRAPH COMBINATION
                      ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 33C.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	0615	76	9.	1	1230	151	0.	1	1845	226	0.
1	0005	2	0.	1	0620	77	8.	1	1235	152	0.	1	1850	227	0.
1	0010	3	0.	1	0625	78	7.	1	1240	153	0.	1	1855	228	0.
1	0015	4	0.	1	0630	79	6.	1	1245	154	0.	1	1900	229	0.
1	0020	5	0.	1	0635	80	5.	1	1250	155	0.	1	1905	230	0.
1	0025	6	0.	1	0640	81	5.	1	1255	156	0.	1	1910	231	0.
1	0030	7	0.	1	0645	82	4.	1	1300	157	0.	1	1915	232	0.
1	0035	8	0.	1	0650	83	4.	1	1305	158	0.	1	1920	233	0.
1	0040	9	0.	1	0655	84	3.	1	1310	159	0.	1	1925	234	0.
1	0045	10	0.	1	0700	85	2.	1	1315	160	0.	1	1930	235	0.
1	0050	11	0.	1	0705	86	2.	1	1320	161	0.	1	1935	236	0.
1	0055	12	0.	1	0710	87	2.	1	1325	162	0.	1	1940	237	0.
1	0100	13	1.	1	0715	88	2.	1	1330	163	0.	1	1945	238	0.
1	0105	14	1.	1	0720	89	2.	1	1335	164	0.	1	1950	239	0.
1	0110	15	2.	1	0725	90	1.	1	1340	165	0.	1	1955	240	0.
1	0115	16	2.	1	0730	91	1.	1	1345	166	0.	1	2000	241	0.
1	0120	17	2.	1	0735	92	1.	1	1350	167	0.	1	2005	242	0.
1	0125	18	3.	1	0740	93	1.	1	1355	168	0.	1	2010	243	0.
1	0130	19	3.	1	0745	94	1.	1	1400	169	0.	1	2015	244	0.
1	0135	20	3.	1	0750	95	1.	1	1405	170	0.	1	2020	245	0.
1	0140	21	3.	1	0755	96	1.	1	1410	171	0.	1	2025	246	0.
1	0145	22	4.	1	0800	97	1.	1	1415	172	0.	1	2030	247	0.
1	0150	23	4.	1	0805	98	1.	1	1420	173	0.	1	2035	248	0.
1	0155	24	4.	1	0810	99	0.	1	1425	174	0.	1	2040	249	0.
1	0200	25	5.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	5.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	5.	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	6.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	6.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	6.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0.
1	0230	31	7.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	9.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	11.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.
1	0245	34	14.	1	0900	109	0.	1	1515	184	0.	1	2130	259	0.
1	0250	35	17.	1	0905	110	0.	1	1520	185	0.	1	2135	260	0.
1	0255	36	21.	1	0910	111	0.	1	1525	186	0.	1	2140	261	0.
1	0300	37	33.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0.
1	0305	38	48.	1	0920	113	0.	1	1535	188	0.	1	2150	263	0.
1	0310	39	59.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	103.	1	0930	115	0.	1	1545	190	0.	1	2200	265	0.
1	0320	41	114.	1	0935	116	0.	1	1550	191	0.	1	2205	266	0.
1	0325	42	109.	1	0940	117	0.	1	1555	192	0.	1	2210	267	0.
1	0330	43	100.	1	0945	118	0.	1	1600	193	0.	1	2215	268	0.
1	0335	44	89.	1	0950	119	0.	1	1605	194	0.	1	2220	269	0.
1	0340	45	77.	1	0955	120	0.	1	1610	195	0.	1	2225	270	0.
1	0345	46	64.	1	1000	121	0.	1	1615	196	0.	1	2230	271	0.
1	0350	47	53.	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	45.	1	1010	123	0.	1	1625	198	0.	1	2240	273	0.
1	0400	49	38.	1	1015	124	0.	1	1630	199	0.	1	2245	274	0.
1	0405	50	32.	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	28.	1	1025	126	0.	1	1640	201	0.	1	2255	276	0.
1	0415	52	25.	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	22.	1	1035	128	0.	1	1650	203	0.	1	2305	278	0.
1	0425	54	20.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0.
1	0430	55	19.	1	1045	130	0.	1	1700	205	0.	1	2315	280	0.
1	0435	56	18.	1	1050	131	0.	1	1705	206	0.	1	2320	281	0.
1	0440	57	18.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	18.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	17.	1	1105	134	0.	1	1720	209	0.	1	2335	284	0.
1	0455	60	17.	1	1110	135	0.	1	1725	210	0.	1	2340	285	0.
1	0500	61	16.	1	1115	136	0.	1	1730	211	0.	1	2345	286	0.
1	0505	62	16.	1	1120	137	0.	1	1735	212	0.	1	2350	287	0.
1	0510	63	16.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	15.	1	1130	139	0.	1	1745	214	0.	2	0000	289	0.
1	0520	65	15.	1	1135	140	0.	1	1750	215	0.	2	0005	290	0.
1	0525	66	15.	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	14.	1	1145	142	0.	1	1800	217	0.	2	0015	292	0.
1	0535	68	14.	1	1150	143	0.	1	1805	218	0.	2	0020	293	0.
1	0540	69	13.	1	1155	144	0.	1	1810	219	0.	2	0025	294	0.
1	0545	70	13.	1	1200	145	0.	1	1815	220	0.	2	0030	295	0.
1	0550	71	12.	1	1205	146	0.	1	1820	221	0.	2	0035	296	0.
1	0555	72	12.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0.
1	0600	73	11.	1	1215	148	0.	1	1830	223	0.	2	0045	299	0.
1	0605	74	11.	1	1220	149	0.	1	1835	224	0.	2	0050	299	0.
1	0610	75	10.	1	1225	150	0.	1	1840	225	0.	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 114.	3.33		22.	6.	5.	5.
		(INCHES)	32.144	32.619	32.619	32.619
		(AC-FT)	11.	11.	11.	11.

CUMULATIVE AREA = .01 SQ MI

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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	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE

				6-HOUR	24-HOUR	72-HOUR			
HYDROGRAPH AT	1A1	44.	3.17	4.	1.	1.	.02		
ROUTED TO	DET1A1	12.	3.50	4.	1.	1.	.02	1.73	3.50
ROUTED TO	RA1-C4	11.	3.50	4.	1.	1.	.02	.91	3.50
HYDROGRAPH AT	1C4	9.	3.17	1.	0.	0.	.00		
2 COMBINED AT	CP1C4	15.	3.17	4.	1.	1.	.02		
ROUTED TO	RC4-C3	15.	3.25	4.	1.	1.	.02	1.05	3.25
HYDROGRAPH AT	1Da3	38.	3.08	3.	1.	1.	.01		
ROUTED TO	DE1Da3	3.	3.67	2.	1.	1.	.01	2.51	3.67
HYDROGRAPH AT	1Da4	29.	3.08	2.	1.	1.	.01		
2 COMBINED AT	CP1Da4	30.	3.08	4.	1.	1.	.02		
ROUTED TO	DE1Da4	6.	3.58	4.	1.	1.	.02	3.14	3.58
HYDROGRAPH AT	1Da5	7.	3.17	1.	0.	0.	.00		
3 COMBINED AT	CP1C3I	25.	3.17	9.	3.	3.	.05		
ROUTED TO	RC3-C3	24.	3.25	9.	3.	3.	.05	1.52	3.25
HYDROGRAPH AT	Off-1A	21.	3.08	2.	0.	0.	.01		
HYDROGRAPH AT	1A2	11.	3.08	1.	0.	0.	.00		
HYDROGRAPH AT	1A3	18.	3.08	1.	0.	0.	.01		
3 COMBINED AT	CPA3	50.	3.08	4.	1.	1.	.02		
ROUTED TO	DET1A3	33.	3.17	4.	1.	1.	.02	2.84	3.17
ROUTED TO	RA3-A6	35.	3.25	4.	1.	1.	.02	.60	3.25
HYDROGRAPH AT	1A6	12.	3.08	1.	0.	0.	.00		
2 COMBINED AT	CP1A6	40.	3.25	5.	1.	1.	.03		
ROUTED TO	DET1A6	35.	3.33	5.	1.	1.	.03	2.87	3.33
HYDROGRAPH AT	1A5	42.	3.08	4.	1.	1.	.02		
2 COMBINED AT	CP1A5	59.	3.25	8.	2.	2.	.04		
ROUTED TO	DET1A5	53.	3.33	8.	2.	2.	.04	2.96	3.33
HYDROGRAPH AT	1A4	27.	3.08	2.	1.	1.	.01		
ROUTED TO	RA4-A7	25.	3.17	2.	1.	1.	.01	.50	3.17
ROUTED TO	DET1A4	14.	3.33	2.	1.	1.	.01	2.65	3.33

HYDROGRAPH AT	1A7	21.	3.08	2.	0.	0.	.01		
3 COMBINED AT	CP1A7	74.	3.33	12.	3.	3.	.06		
ROUTED TO	DET1A7	66.	3.42	12.	3.	3.	.06	3.62	3.42
HYDROGRAPH AT	1C1	57.	3.17	5.	1.	1.	.02		
2 COMBINED AT	CP1C1	85.	3.33	17.	4.	4.	.08		
ROUTED TO	DET1C1	78.	3.50	16.	4.	4.	.08	4.86	3.50
HYDROGRAPH AT	1C2	54.	3.17	5.	1.	1.	.02		
2 COMBINED AT	CP1C2	92.	3.50	21.	6.	5.	.11		
ROUTED TO	DE1C2A	93.	3.50	21.	6.	5.	.11	5.05	3.50
ROUTED TO	DE1C2B	90.	3.50	21.	6.	5.	.11	5.02	3.50
ROUTED TO	DE1C2C	92.	3.50	21.	6.	5.	.11	5.04	3.50
HYDROGRAPH AT	1C3	68.	3.08	5.	1.	1.	.03		
3 COMBINED AT	CP1C3	128.	3.50	33.	10.	9.	.19		
ROUTED TO	DET1C3	109.	3.67	33.	10.	9.	.19	2.55	3.67
ROUTED TO	RC3COM	108.	3.67	33.	10.	9.	.19	11.14	3.67
HYDROGRAPH AT	COMM	110.	3.08	10.	2.	2.	.03		
ROUTED TO	DETCOM	11.	3.67	7.	2.	2.	.03	2.55	3.67
2 COMBINED AT	CPCOM	119.	3.67	41.	12.	12.	.22		
ROUTED TO	COMOF1	119.	3.75	41.	12.	12.	.22	11.20	3.75
HYDROGRAPH AT	OFF1	84.	3.08	6.	2.	2.	.02		
ROUTED TO	DEOFF1	11.	3.50	6.	2.	2.	.02	2.61	3.50
2 COMBINED AT	CPOFF1	130.	3.75	46.	14.	13.	.24		
ROUTED TO	OF1OF3	129.	3.75	46.	14.	13.	.24	11.31	3.75
HYDROGRAPH AT	OFF3	58.	3.08	5.	1.	1.	.02		
ROUTED TO	DEOFF3	10.	3.50	5.	1.	1.	.02	2.20	3.50
2 COMBINED AT	CPOFF3	138.	3.75	51	15.	14.	.25		
ROUTED TO	33A1	137.	3.83	51.	15.	14.	.25		
HYDROGRAPH AT	33A	213.	3.08	17.	4.	4.	.05		
2 COMBINED AT	33A3	232.	3.08	65.	19.	19.	.31		
HYDROGRAPH AT	1Db	104.	3.08	8.	2.	2.	.04		

ROUTED TO	DE1Db	13.	3.58	7.	2.	2.	.04	2.99	3.58
HYDROGRAPH AT	1Da1	25.	3.08	2.	0.	0.	.01		
ROUTED TO	DE1Da1	4.	3.50	2.	0.	0.	.01	2.95	3.50
HYDROGRAPH AT	1Da2	5.	3.17	0.	0.	0.	.00		
3 COMBINED AT	CP1Dab	18.	3.50	9.	3.	3.	.05		
ROUTED TO	RDabE2	18.	3.50	9.	3.	3.	.05	.75	3.50
HYDROGRAPH AT	1Ea1	44.	3.17	4.	1.	1.	.02		
ROUTED TO	DE1Ea1	4.	3.75	3.	1.	1.	.02	2.81	3.75
HYDROGRAPH AT	1Ea2	65.	3.08	5.	1.	1.	.02		
2 COMBINED AT	CP1Ea2	66.	3.08	7.	2.	2.	.04		
ROUTED TO	DE1Ea2	16.	3.50	7.	2.	2.	.04	3.25	3.50
2 COMBINED AT	CP1Ea2	34.	3.50	16.	5.	5.	.09		
HYDROGRAPH AT	PARK	37.	3.08	3.	1.	1.	.02		
HYDROGRAPH AT	SCHOOL	59.	3.08	5.	1.	1.	.01		
ROUTED TO	DETSCH	12.	3.42	4.	1.	1.	.01	2.84	3.42
ROUTED TO	SCH12	12.	3.42	4.	1.	1.	.01	10.43	3.42
HYDROGRAPH AT	1Ec	33.	3.08	3.	1.	1.	.01		
ROUTED TO	DE1Ec	9.	3.33	3.	1.	1.	.01	2.47	3.33
2 COMBINED AT	CP1Ec	21.	3.42	7.	2.	2.	.02		
ROUTED TO	1EcEa2	21.	3.42	7.	2.	2.	.02	10.59	3.42
3 COMBINED AT	CP1Ea	67.	3.17	26.	7.	7.	.14		
ROUTED TO	REaTPP	67.	3.17	26.	7.	7.	.14	10.92	3.17
HYDROGRAPH AT	1Eb	151.	3.17	14.	4.	3.	.06		
ROUTED TO	DET1Eb	39.	3.50	13.	4.	3.	.06	2.26	3.50
HYDROGRAPH AT	OFF2	121.	3.08	11.	3.	3.	.03		
ROUTED TO	DEOFF2	11.	3.67	8.	3.	3.	.03	2.59	3.67
3 COMBINED AT	CPOFF2	115.	3.50	46.	14.	13.	.23		
ROUTED TO	1Kr.1	115.	3.50	46.	14.	13.	.23		
HYDROGRAPH AT	1Kr	118.	3.17	13.	3.	3.	.05		
ROUTED TO									

+		DET1K	18.	3.75	11.	3.	3.	.05	2.77	3.75
+	2 COMBINED AT	1Kr.2	132.	3.50	57.	17.	16.	.28		
+	ROUTED TO	1Mr.1	132.	3.50	57.	17.	16.	.28		
+	HYDROGRAPH AT	1Mr	152.	3.17	14.	4.	3.	.05		
+	ROUTED TO	DET1M	49.	3.42	13.	4.	3.	.05	3.70	3.42
+	2 COMBINED AT	1Mr.2	178.	3.50	70.	20.	20.	.34		
+	HYDROGRAPH AT	33E	160.	3.08	12.	3.	3.	.04		
+	HYDROGRAPH AT	33DE	3.	3.17	0.	0.	0.	.00		
+	3 COMBINED AT	33E.2	225.	3.17	81.	24.	23.	.38		
+	ROUTED TO	R33E.2	224.	3.17	81.	24.	23.	.38		
+	HYDROGRAPH AT	33D	61.	3.17	5.	1.	1.	.04		
+	HYDROGRAPH AT	S40ET	76.	3.08	6.	1.	1.	.02		
+	3 COMBINED AT	CT13.0	340.	3.17	92.	26.	25.	.43		
+	DIVERSION TO	P_ADOT	223.	3.17	82.	24.	23.	.43		
+	HYDROGRAPH AT	D_ADOT	117.	3.17	10.	3.	2.	.43		
+	HYDROGRAPH AT	33C	126.	3.08	9.	2.	2.	.03		
+	HYDROGRAPH AT	S40CN	180.	3.08	14.	4.	3.	.04		
+	3 COMBINED AT	CT13.1	393.	3.08	34.	8.	8.	.51		
+	DIVERSION TO	P-PIPE	30.	3.08	13.	3.	3.	.51		
+	HYDROGRAPH AT	D_BAS	363.	3.08	21.	5.	5.	.51		
+	DIVERSION TO	D-BAS2	69.	3.08	2.	1.	0.	.51		
+	HYDROGRAPH AT	D_BAS1	363.	3.08	19.	5.	5.	.51		
+	DIVERSION TO	D-SUBF	237.	3.17	4.	1.	1.	.51		
+	HYDROGRAPH AT	D_SURF	309.	3.17	15.	4.	4.	.51		
+	HYDROGRAPH AT	B_PIPE	30.	2.75	13.	3.	3.	.00		
+	HYDROGRAPH AT	B_SURF	69.	3.00	2.	1.	0.	.00		
+	3 COMBINED AT	CS40B	339.	3.17	30.	7.	7.	.51		
+	ROUTED TO	S40BAS	159.	3.33	29.	7.	7.	.51	5.52	3.33
+	DIVERSION TO	D33C.2	108.	3.33	20.	5.	5.	.51		
+	HYDROGRAPH AT	P33E.1	51.	3.33	9.	2.	2.	.51		
+	HYDROGRAPH AT	R_ADOT	223.	3.17	82.	24.	23.	.00		
+	2 COMBINED AT	33E.1	256.	3.25	91.	26.	25.	.51		
+	ROUTED TO	R33E.1	252	3.33	91.	26.	25.	.51		

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         ROUTED TO
+                         ASLDR1      252.    3.33          91.        26.        25.        .51

         HYDROGRAPH AT
+                         ASLD        114.    3.08          10.         2          2.        .03

         2 COMBINED AT
+                         ASLDC       317.    3.17         100.        29.        28.        .54

         ROUTED TO
+                         ASLDR2      309.    3.25         100.        29.        28.        .54

         HYDROGRAPH AT
+                         ASLD         84.    3.08           6.         1.         1.        .02

         2 COMBINED AT
+                         CPPRIN      351.    3.17         105.        30.        29.        .56

         HYDROGRAPH AT
+                         R33C.2      108.    3.33          20.         5.         5.        .00

         HYDROGRAPH AT
+                         S40WT        31.    3.08           2.         1.         0.        .01

         2 COMBINED AT
+                         33C.2       114.    3.33          22.         6.         5.        .01
1
                             SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                 (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                        INTERPOLATED TO
                                                                     COMPUTATION INTERVAL
          ISTAQ    ELEMENT       DT        PEAK      TIME TO      VOLUME       DT       PEAK     TIME TO      VOLUME
                                                      PEAK                                        PEAK

                                (MIN)      (CFS)      (MIN)        (IN)       (MIN)     (CFS)     (MIN)        (IN)

             33A1  MANE          1.88     138.05     228.99        2.21        5.00    137.32    230.00        2.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2975E+02 EXCESS= .0000E+00 OUTFLOW= .2974E+02 BASIN STORAGE= .7425E-02 PERCENT ERROR=     .0

              33A  MANE           .94     229.59     186.25        2.93        5.00    213.27    185.00        2.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8419E+01 OUTFLOW= .8424E+01 BASIN STORAGE= .3781E-03 PERCENT ERROR=    -.1

            1Kr.1  MANE           .88     115.21     210.94        2.20        5.00    115.14    210.00        2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2702E+02 EXCESS= .0000E+00 OUTFLOW= .2702E+02 BASIN STORAGE= .3402E-02 PERCENT ERROR=     .0

            1Mr.1  MANE          1.04     132.38     212.01        2.22        5.00    131.65    210.00        2.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3341E+02 EXCESS= .0000E+00 OUTFLOW= .3341E+02 BASIN STORAGE= .5096E-02 PERCENT ERROR=     .0

              33E  MANE          1.58     168.66     186.51        2.90        5.00    159.64    185.00        2.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6117E+01 OUTFLOW= .6111E+01 BASIN STORAGE= .8650E-04 PERCENT ERROR=     .1

             33BE  MANE          3.45       3.22     190.32        2.78        5.00      3.18    190.00        2.78

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1633E+00 OUTFLOW= .1630E+00 BASIN STORAGE= .1193E-04 PERCENT ERROR=     .2

           R33E.2  MANE           .67     224.58     190.57        2.34        5.00    224.30    190.00        2.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4687E+02 EXCESS= .0000E+00 OUTFLOW= .4687E+02 BASIN STORAGE= .1478E-02 PERCENT ERROR=     .0

              33D  MANE          2.02      64.29     192.41        1.22        5.00     61.02    190.00        1.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2639E+01 OUTFLOW= .2627E+01 BASIN STORAGE= .1883E-03 PERCENT ERROR=     .5

            S40ET  MANE           .85      79.65     186.49        2.94        5.00     76.00    185.00        2.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2873E+01 OUTFLOW= .2871E+01 BASIN STORAGE= .1120E-03 PERCENT ERROR=     .0

              33C  MANE           .51     129.46     185.80        2.96        5.00    125.66    185.00        2.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4678E+01 OUTFLOW= .4675E+01 BASIN STORAGE= .1952E-03 PERCENT ERROR=     .1

            S40CN  MANE           .57     187.23     186.05        2.96        5.00    179.92    185.00        2.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7080E+01 OUTFLOW= .7077E+01 BASIN STORAGE= .4086E-03 PERCENT ERROR=     .0
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          R33E.1  MANE       1.31    255.46    197.67      1.92      5.00    252.31    200.00        1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5206E+02 EXCESS- .0000E+00 OUTFLOW- .5208E+02 BASIN STORAGE- .7950E-02 PERCENT ERROR-    .0

          ASLDR1  MANE        .56    252.12    200.80      1.92      5.00    251.98    200.00        1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5206E+02 EXCESS= .0000E+00 OUTFLOW= .5205E+02 BASIN STORAGE= .9142E-02 PERCENT ERROR=    .0

            ASLD  MANE        .64    123.54    186.54      2.38      5.00    114.18    185.00        2.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4844E+01 OUTFLOW= .4845F+01 BASIN STORAGE= .3741E-03 PERCENT ERROR=    .0

          ASLDR2  MANE        .72    316.25    191 53      1.97      5.00    308.60    195.00        1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5692E+02 EXCESS= .0000E+00 OUTFLOW= .5692E+02 BASIN STORAGE= .5511E-02 PERCENT ERROR=    .0

            ASLD  MANE        .36     84.72    185.20      2.78      5.00     84.16    185.00        2.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .2365E+01 OUTFLOW= .2863E+01 BASIN STORAGE- 7801E-04 PERCENT ERROR=    .1

           S40WT  MANE        .33     31.72    184.75      3.00      5.00     31.47    185.00        3.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1009E+01 OUTFLOW= .1008E+01 BASIN STORAGE= .4454E-05 PERCENT ERROR=    .1

1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DET1A1
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1 ..............                   INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                              ELEVATION           .00               3.00              3.00
                              STORAGE              0.                 2.                2.
                              OUTFLOW              0.                20.               20.

                 RATIO      MAXIMUM       MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF      TIME OF
                   OF      RESERVOIR       DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW    FAILURE
                  PMF      W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

                 1 00        1.73          .00          1.         12.         .00         3.50          .00
1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DE1Da3
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1 ..............                   INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                              ELEVATION           .00               3.00              3.00
                              STORAGE              0.                 1.                1.
                              OUTFLOW              0.                 4.                4.

                 RATIO      MAXIMUM       MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF      TIME OF
                   OF      RESERVOIR       DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW    FAILURE
                  PMF      W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

                 1.00        2.51          .00          1.          3.         .00         3.67          .00
1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DE1Da4
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1 ..............                   INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                              ELEVATION           .00               3.00              3.00
                              STORAGE              0.                 1.                1.
                              OUTFLOW              0.                 4.                4.

                 RATIO      MAXIMUM       MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF      TIME OF
                   OF      RESERVOIR       DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW    FAILURE
                  PMF      W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

                 1.00        3.14          .14          1.          6.        1.42         3.58          .00
1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DET1A3
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1 ..............                   INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                              ELEVATION           .00               2.50              2.50
                              STORAGE              0                  0.                0.
                              OUTFLOW              0.                22.               22.

                 RATIO      MAXIMUM       MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF      TIME OF
                   OF      RESERVOIR       DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW    FAILURE
                  PMF      W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

                 1.00        2.84          .34          0.         33.         .25         3.17          .00
1                                  SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DET1A6
                              (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)
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PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              2.50            2.50
                        STORAGE                0                 0.              0.
                        OUTFLOW                0.               22.             22.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        2.87         .37          0.         35.        .33         3.33         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DET1A5
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              2.50            2.50
                        STORAGE                0.                1.              1.
                        OUTFLOW                0.               34.             34.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        2.96         .46          1.         53.        .33         3.33         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DET1A4
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              2.50            2.50
                        STORAGE                0.                0.              0.
                        OUTFLOW                0.               11.             11.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        2.65         .15          0.         14.        .17         3.33         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DET1A7
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              2.50            2.50
                        STORAGE                0.                1.              1.
                        OUTFLOW                0.               11.             11.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        3.62        1.12          1.         66.       1.50         3.42         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DET1C1
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              3.60            3.60
                        STORAGE                0.                2.              2.
                        OUTFLOW                0.               14.             14.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        4.86        1.26          2.         78.       1.83         3.50         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DE1C2A
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              3.60            3.60
                        STORAGE                0.                0.              0.
                        OUTFLOW                0.               14.             14.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        5.05        1.45          1.         93.       2.75         3.50         .00
1                         SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION    DE1C2B
                     (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

PLAN  1 ..............                INITIAL VALUE     SPILLWAY CREST     TOP OF DAM
                        ELEVATION              .00              3.60            3.60
                        STORAGE                0.                1.              1.
                        OUTFLOW                0.               14.             14.

              RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM    DURATION     TIME OF     TIME OF
                OF     RESERVOIR      DEPTH      STORAGE     OUTFLOW    OVER TOP   MAX OUTFLOW   FAILURE
               PMF     W.S.ELEV     OVER DAM      AC-FT        CFS        HOURS       HOURS       HOURS

              1.00        5.02        1.42          1.         90.       2.92         3.50         .00
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1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2C
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.60	3.60
STORAGE	0	1.	1.
OUTFLOW	0.	14.	14.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	5.04	1.44	1.	92.	3.00	3.50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DET1C3
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.50	3.50
STORAGE	0.	1.	1.
OUTFLOW	0.	150.	150.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.55	.00	1.	109.	.00	3.67	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETCOM
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	4.	4.
OUTFLOW	0.	13.	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.55	.00	3.	11.	.00	3.67	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	2.	2.
OUTFLOW	0.	13.	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.61	.00	2.	11.	.00	3.50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF3
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	2.	2.
OUTFLOW	0.	13.	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.20	.00	2.	10.	.00	3.50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Db
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	3.	3.
OUTFLOW	0.	13.	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.99	.00	3.	13.	.00	3.58	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Da1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	1.	1.
OUTFLOW	0.	4.	4.

RATIO	MAXIMUM	MAXIMUM	MAXIMUM	MAXIMUM	DURATION	TIME OF	TIME OF

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                OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.95         .00          1.          4.         .00         3.50          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DE1Ea1
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ... ..........                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                2.                2.
                         OUTFLOW                 0.                4.                4.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.81         .00          1.          4.         .00         3.75          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DE1Ea2
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                2.                2.
                         OUTFLOW                 0.               10.               10.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        3.25         .25          2.         16.         .67         3.50          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DETSCH
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                1.                1.
                         OUTFLOW                 0.               13.               13.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.84         .00          1.         12.         .00         3.42          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DE1Ec
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                1.                1.
                         OUTFLOW                 0.               11.               11.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.47         .00          1.          9.         .00         3.33          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DET1Eb
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                5.                5.
                         OUTFLOW                 0.               52.               52.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.26         .00          4.         39.         .00         3.50          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DEOFF2
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                5.                5.
                         OUTFLOW                 0.               13.               13.


             RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
               OF      RESERVOIR     DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
               PMF      W.S.ELEV    OVER DAM      AC-FT        CFS        HOURS        HOURS        HOURS

              1.00        2.59         .00          4.         11.         .00         3.67          .00
1                           SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DET1K
                        (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)


  PLAN  1 ..............                   INITIAL VALUE    SPILLWAY CREST     TOP OF DAM
                         ELEVATION              .00              3.00              3.00
                         STORAGE                 0.                5.                5.
```

OUTFLOW	0.	20.	20.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.77	.00	4.	18.	.00	3.75	.00

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DET1M
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3.00	3.00
STORAGE	0.	3.	3.
OUTFLOW	0.	20.	20.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	3.70	.70	4.	49.	.83	3.42	.00

*** NORMAL END OF HEC-1 ***

Appendix D

Hydraulic/Hydrology Calculations

CP	Sub-basins	A	Cw	L	HP	LP	S	Kb-cls	m	b	Kb	Init Tc	Cw1	Tc,clc1	Tc,tot1	i1	Q1	Cw2	Tc,clc2	Tc,tot2	i2	Q2
		Hide/Unhide as applicable	------->				<----												Hide/Unhide as applic		-------->	

Peak Flow Calculations Using The Rational Method

Project:	Optima McDowell Mountain Village
Proj #:	
Date:	2/23/22
Prep by:	DJH
Check by:	MLD

Base Sheet Prepared By GA, Version 2

Source of Rainfall Data --->NOAA Atlas 14

Rainfall Depth-Duration-Frequency (D-D-F), (inch)					
Storm Fequency	Time				
	5 min	10 min	15 min	30 min	60 min
10-Yr	0.42	0.63	0.78	1.05	1.30
100-Yr	0.65	0.99	1.23	1.66	2.05
Derived Rainfall Intensity-Duration-Frequency (I-D-F), (in/hr)					
10-Yr	4.98	3.79	3.13	2.10	1.30
100-Yr	7.81	5.95	4.92	3.32	2.05

Attach source and supporting data for rainfall depths

AF for Cw per $Cw_{10\text{-}Yr}$		
Freq.	Typical	Applic.
2-Yr	1.00	1.00
5-Yr	1.00	1.00
10-Yr	1.00	1.00
25-Yr	1.10	1.00
50-Yr	1.20	1.00
100-Yr	1.25	1.00

AF=Frequency Adjustment Factor

Drainage Area ID: -----							Tc,calc method: 1=Papadakis and Kazan, 2=Avg Veloc.						10-Yr					100-Yr				
							1	Tc,calc=11.4*L^0.5*Kb^0.52*S^-0.31*i^-0.38					Cw for each frequency is adjusted as a function of the 100-year value per the table above									
Concent.	Contributing	Total	Base	Flow	Approx	Approx	Average	K_b	m	b	K_b	Initial/lot	Minim allowed Tc,tot =			10.0	Q	Minim allowed Tc,tot =			10.0	Q
Point	Sub-basins	Area	Cw	Path, L	High pt	Low pt	Slope	Class				Tc	Cw	Tc,calc	Tc,tot	i	10-Yr	Cw	Tc,calc	Tc,tot	i	100-Yr
#		(ac)	(2-10 yr)	(ft)	(ft)	(ft)	ft/ft	A-->D				(min)	AF=1.00	(min)	(min)	(in/hr)	(cfs)	AF=1.00	(min)	(min)	(in/hr)	(cfs)
v	v	v	v	v	v	v	v	v				v										
Pre v Post	1	15.64	0.50	1306.2	1600.00	1593.0	0.0150	A	-0.00625	0.04	0.0325	10	0.50	8.5	18.5	2.92	22.9	0.50	6.9	16.9	4.81	37.6
100-Yr 2-Hr	1	15.64	0.95	1306	1600	1593	0.0150	A	-0.00625	0.04	0.0325	10	0.95	8.5	18.5	2.92	43.4	0.95	6.9	16.9	4.81	71.5
								A	-0.00625	0.04	#NUM!	0		#####	#NUM!	#NUM!	######		#####	#####	#NUM!	######
								A	-0.00625	0.04	#NUM!	0		#####	#NUM!	#NUM!	######		#####	#####	#NUM!	######
								A	-0.00625	0.04	#NUM!	0		#####	#NUM!	#NUM!	######		#####	#####	#NUM!	######
								A	-0.00625	0.04	#NUM!	0		#####	#NUM!	#NUM!	######		#####	#####	#NUM!	######

Point precipitation frequency estimates (inches)
NOAA Atlas 14 Volume 1 Version 5
Data type: Precipitation depth
Time series type: Partial duration
Project area: Southwest
Location n: Arizona USA
Station Name: -
Latitude: 33.6562°
Longitude: -111.9232°
Elevation (USGS): 1594.27 ft

PRECIPITATION FREQUENCY ESTIMATES

by duratio	1	2	5	10	25	50	100	200	500
5-min:	0.196	0.256	0.346	0.415	0.507	0.578	0.651	0.724	0.822
10-min:	0.299	0.39	0.526	0.631	0.772	0.88	0.991	1.1	1.25
15-min:	0.37	0.483	0.652	0.782	0.957	1.09	1.23	1.37	1.55
30-min:	0.498	0.651	0.878	1.05	1.29	1.47	1.66	1.84	2.09
60-min:	0.617	0.805	1.09	1.3	1.6	1.82	2.05	2.28	2.59
2-hr:	0.72	0.931	1.24	1.48	1.8	2.04	2.3	2.55	2.89
3-hr:	0.794	1.02	1.33	1.58	1.92	2.2	2.48	2.78	3.19
6-hr:	0.956	1.21	1.54	1.81	2.17	2.45	2.74	3.04	3.45
12-hr:	1.08	1.36	1.72	1.99	2.37	2.66	2.96	3.26	3.66
24-hr:	1.26	1.6	2.07	2.44	2.96	3.37	3.8	4.25	4.88
2-day:	1.37	1.74	2.28	2.71	3.31	3.78	4.29	4.81	5.54
4-day:	1.57	2	2.66	3.18	3.94	4.55	5.21	5.92	6.92
7-day:	1.77	2.27	3.01	3.61	4.48	5.18	5.93	6.74	7.88
10-day:	1.92	2.46	3.26	3.91	4.83	5.57	6.37	7.21	8.41
20-day:	2.39	3.07	4.06	4.82	5.85	6.65	7.48	8.32	9.47
30-day:	2.8	3.61	4.77	5.66	6.86	7.78	8.74	9.72	11
45-day:	3.27	4.22	5.58	6.59	7.95	8.97	10	11.1	12.5
60-day:	3.63	4.7	6.19	7.29	8.73	9.81	10.9	12	13.4

Date/time (GMT): Wed Feb 23 23:39:34 2022
pyRunTime: 0.0254480838776

Appendix E

Contextual Aerial Plan

K:\PHX_Civil\191007011 - Optima Mayo\CADD\Exhibits\Context Aerial.dwg Feb 22, 2022 DRanda.Hooks
XREFS:
THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

LEGEND

PROJECT SITE PARCEL

CROSSROADS EAST PLANNING UNIT IV

GRAPHIC SCALE

500 0 250 500 1000

(IN FEET)

N

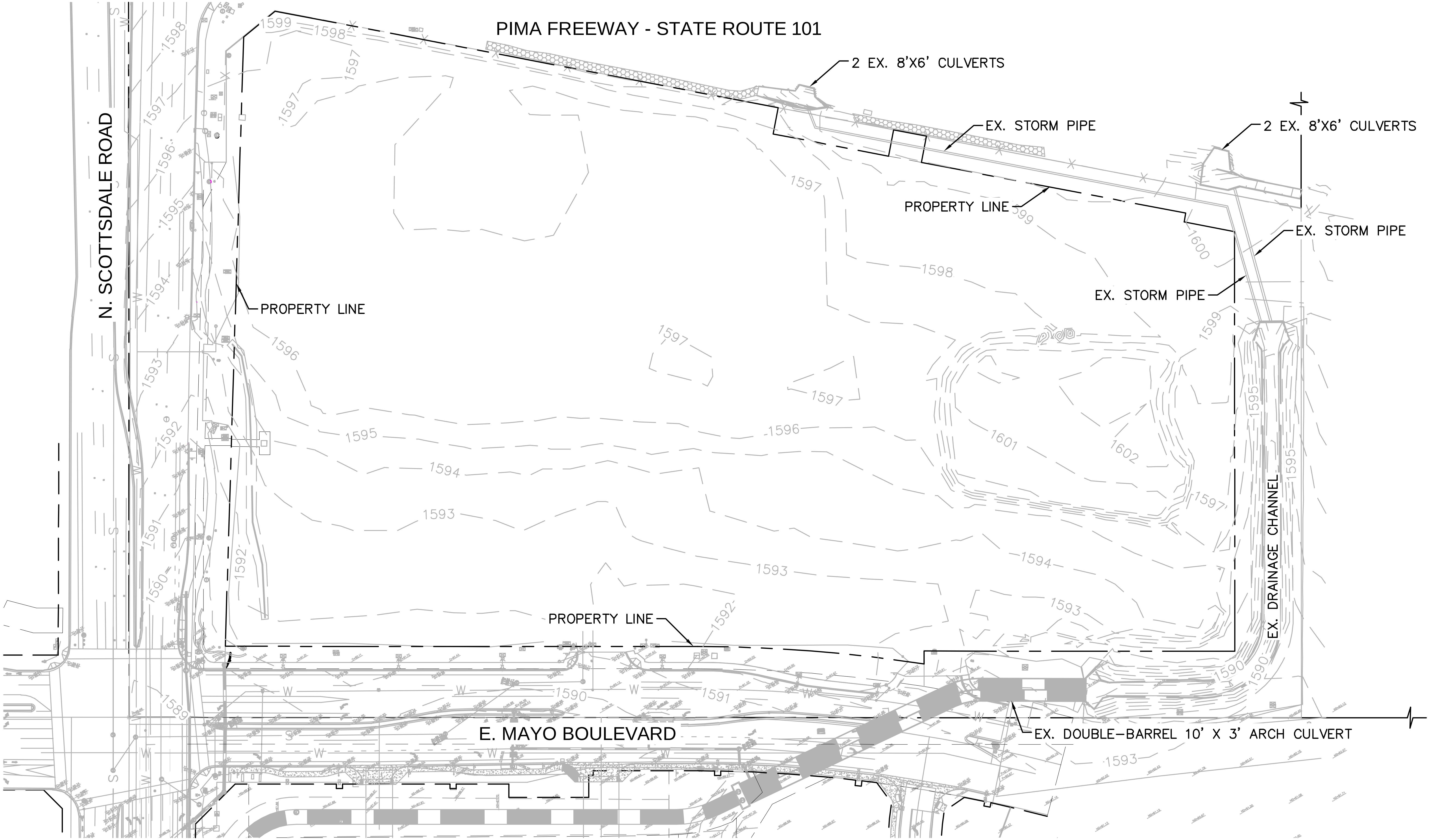
Kimley-Horn and Associates, Inc.

7878 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

FIGURE 1. CONTEXT AERIAL PLAN

Appendix F

Existing Conditions Topographic Map



Optima McDowell Mountain Village

Exisitng Conditons Topographic Map

February 24, 2022

0 50 100 200

NORTH

Appendix G

Preliminary Grading and Drainage Plan

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
7740 N. 16TH STREET, SUITE 300
PHOENIX, AZ 85020
PH: (602) 944-5500
CONTACT: MIKE DELMARTER, PE

LAND SURVEYOR
ATWELL
4700 E. SOUTHERN AVE.
MESA, AZ 85206
PH: (480) 218-8831
CONTACT: J. RICHARDSON

ARCHITECT
OPTIMA
7157 E. RANCHO VISTA DRIVE #109
SCOTTSDALE, AZ 85251
PH: (480) 874-9900
CONTACT: TJ LENICK

GENERAL NOTES

1. ADD 0.5 TO PAVEMENT ELEVATIONS FOR TOP OF CURB ELEVATION, UNLESS OTHERWISE NOTED.
2. ALL SPOT ELEVATIONS ARE FINISHED GRADE PAVEMENT (P), GUTTER/GRADE (G), OR SIDEWALK (SW) ELEVATIONS UNLESS OTHERWISE NOTED.
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5. CONTRACTOR TO COORDINATE LANDSCAPE SLEEVE LOCATIONS, TYPE, ETC. WITH LANDSCAPE ARCHITECT PRIOR TO PAVEMENT/CONCRETE CONSTRUCTION.
6. CONTRACTOR TO COORDINATE LIGHTING CONDUIT LOCATIONS, TYPE, ETC. WITH LANDSCAPE ARCHITECT/ELECTRICIAN PRIOR TO SITE GRADING AND PAVEMENT/CONCRETE CONSTRUCTION.

PRELIMINARY GRADING AND DRAINAGE NOTES

(1) PROPOSED AREA DRAIN, CONNECT TO GARAGE SYSTEM BELOW.
(2) PROPOSED CATCH BASIN.

Optima McDowell Mountain Village - Pre vs Post

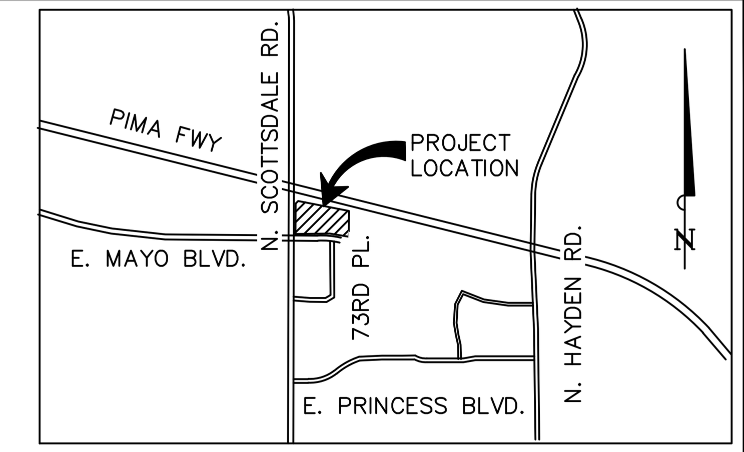
Drainage Area	Land Use	Area [A]		Runoff Coefficient [C]	Precipitation Depth [P]	Required Storage (V_{REQ} = CPA/12)		Retention Basin
		sf	ac		in	cf	ac-ft	
Building Footprint	Building	681,146	15.637	0.45	2.30	58,749	1.349	1
TOTAL	-	**681,146**	**15.637**	-	-	**58,749**	**1.349**	-

Underground Retention Summary

Scenario	Required Volume	Provided Storage	As-Built Volume
	cf	cf	cf
Pre vs Post	58,749	59,400	

Drywell Summary

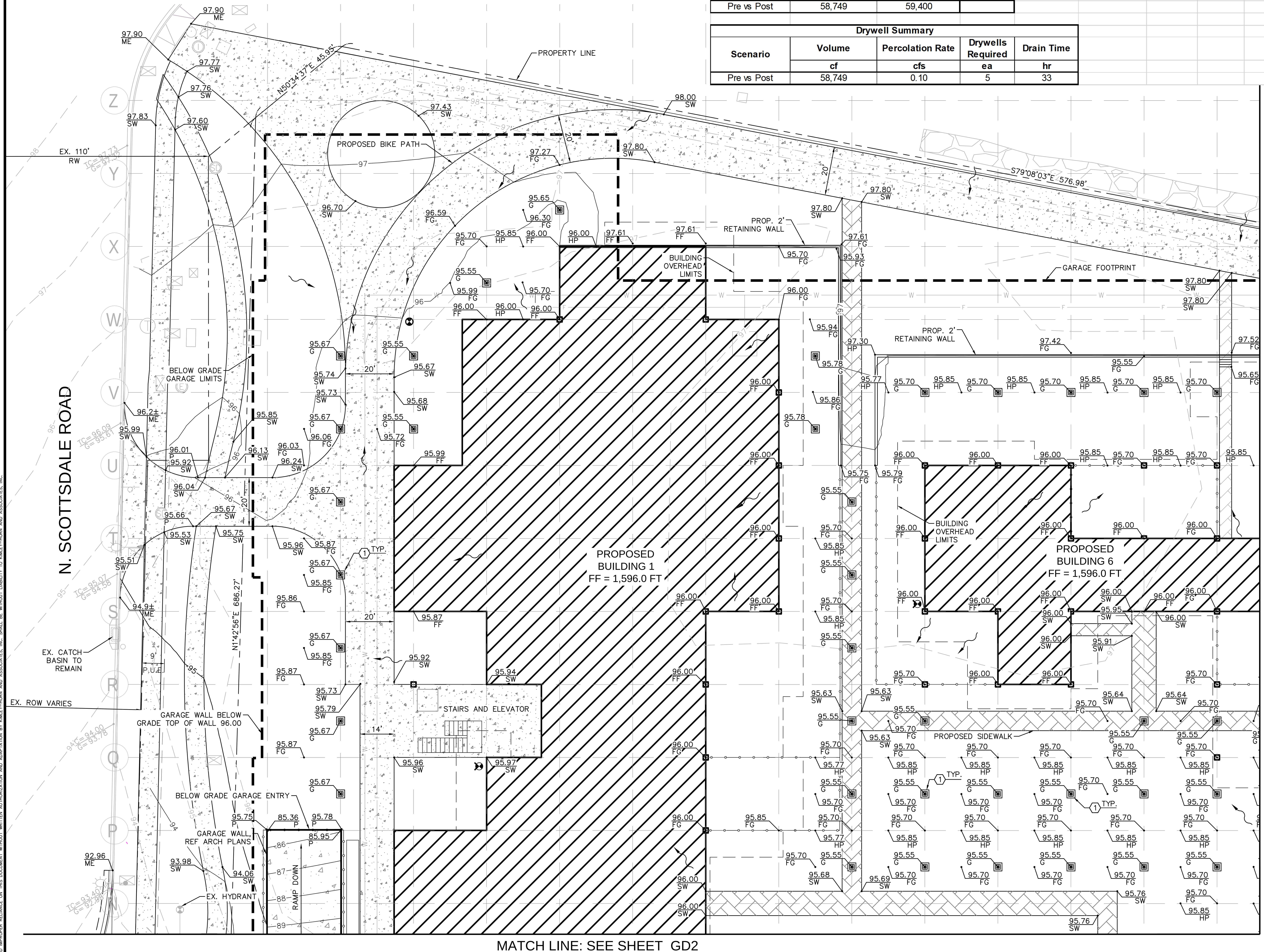
Scenario	Volume	Percolation Rate	Drywells Required	Drain Time
	cf	cfs	ea	hr
Pre vs Post	58,749	0.10	5	33



VICINITY MAP
N.T.S.

LEGEND

PROPERTY LINE
RIGHT OF WAY LINE
STREET CENTERLINE
EASEMENT LINE
EXISTING SEWER MAIN
EXISTING PUBLIC WATER MAIN
PROPOSED WATER MAIN
PROPOSED SEWER MAIN
EXISTING STORM DRAIN
PROPOSED CONTOUR
EXISTING CONTOURS
50.00 FG — PROPOSED PAVEMENT SPOT ELEVATION
EXISTING SPOT ELEVATION
EXISTING SANITARY SEWER MANHOLE
EXISTING FIRE HYDRANT
PROPOSED CATCH BASIN
SURFACE FLOW DIRECTION
EXISTING STORM DRAIN MANHOLE
PROPOSED CONCRETE BIKE PATH
PROPOSED PAVER WALKWAY
PROPOSED GRID LINE



FLOOD INFORMATION

ACCORDING TO THE FLOOD INSURANCE RATE MAP #04013C1320 L, DATED OCTOBER 16, 2013, THIS PROPERTY IS LOCATED IN FLOOD ZONE "AO". AREAS SUBJECT TO INUNDATION BY 1-PERCENT-ANNUAL-CHANCE SHALLOW FLOODING (USUALLY SHEET FLOOD ON SLOPING TERRAIN) WHERE AVERAGE DEPTHS ARE BETWEEN ONE AND THREE FEET. AVERAGE FLOOD DEPTHS DERIVED FROM DETAILED HYDRAULIC ANALYSES ARE SHOWN IN THIS ZONE. MANDATORY FLOOD INSURANCE PURCHASE REQUIREMENTS AND FLOODPLAIN MANAGEMENT STANDARDS APPLY.

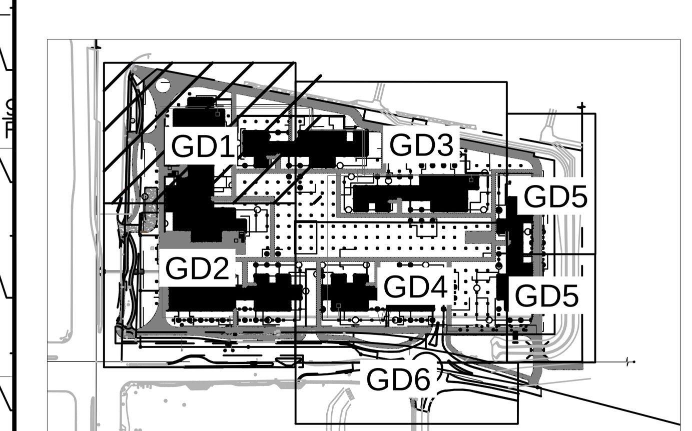
SOME ZONE "AO" HAVE BEEN DESIGNATED IN AREAS WITH HIGH FLOOD VELOCITIES SUCH AS ALLUVIAL FANS AND WASHES. COMMUNITIES ARE ENCOURAGED TO ADOPT MORE RESTRICTIVE REQUIREMENTS FOR THESE AREAS.

DRAINAGE STATEMENT

THE EXISTING SITE CONSISTS OF DESERT VEGETATION THAT GENERALLY FLOWS FROM NORTH TO SOUTH. THE PROPOSED LOT IS VACANT AND OCCASIONALLY USED FOR EXTENDED PARKING.

THE PROPOSED DESIGN CAPTURES STORM WATER GENERATED ON SITE WITH STORM DRAINS AT THE SURFACE LEVEL OF THE BUILDING AND DROPS THE DRAINAGE DIRECTLY DOWN TO THE GARAGE LEVEL WHERE IT IS CONVEYED TO THE PROPOSED RETENTION TANK AT THE SOUTHEASTER CORNER OF THE GARAGE LOWER LEVEL. PRE VS POST RETENTION IS PROVIDED IN THE TANK WHICH THEN OUTLETS AT AN ELEVATION OF 1592.5± AT THE SOUTHEAST CORNER OF THE GARAGE INTO THE EXISTING CHANNEL. THE TANK IS THEN DRAINED VIA DRYWELLS IN LESS THAN 36 HOURS.

THIS SITE IS CURRENTLY LOCATED IN FLOOD ZONE 'AO' BUT IS CURRENTLY GOING THROUGH AN APPROVAL WITH FEMA TO BE REMOVED FROM THE FLOODPLAIN COMPLETELY. 600 CFS OF OFF-SITE FLOWS PASS THROUGH THE SITE ON THE EASTERN BOUNDARY IN AN EXISTING DRAINAGE CHANNEL. THE ULTIMATE SITE OUTFALL IS LOCATED AT THE SOUTH EAST EDGE OF THE SITE AT AN ELEVATION OF 1586.0±.



KEY MAP
N.T.S.

Q.S.#: 39-45

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

OPTIMA MCDOWELL MOUNTAIN VILLAGE
PRELIMINARY GRADING AND DRAINAGE PLAN
SCOTTSDALE, ARIZONA 85255

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

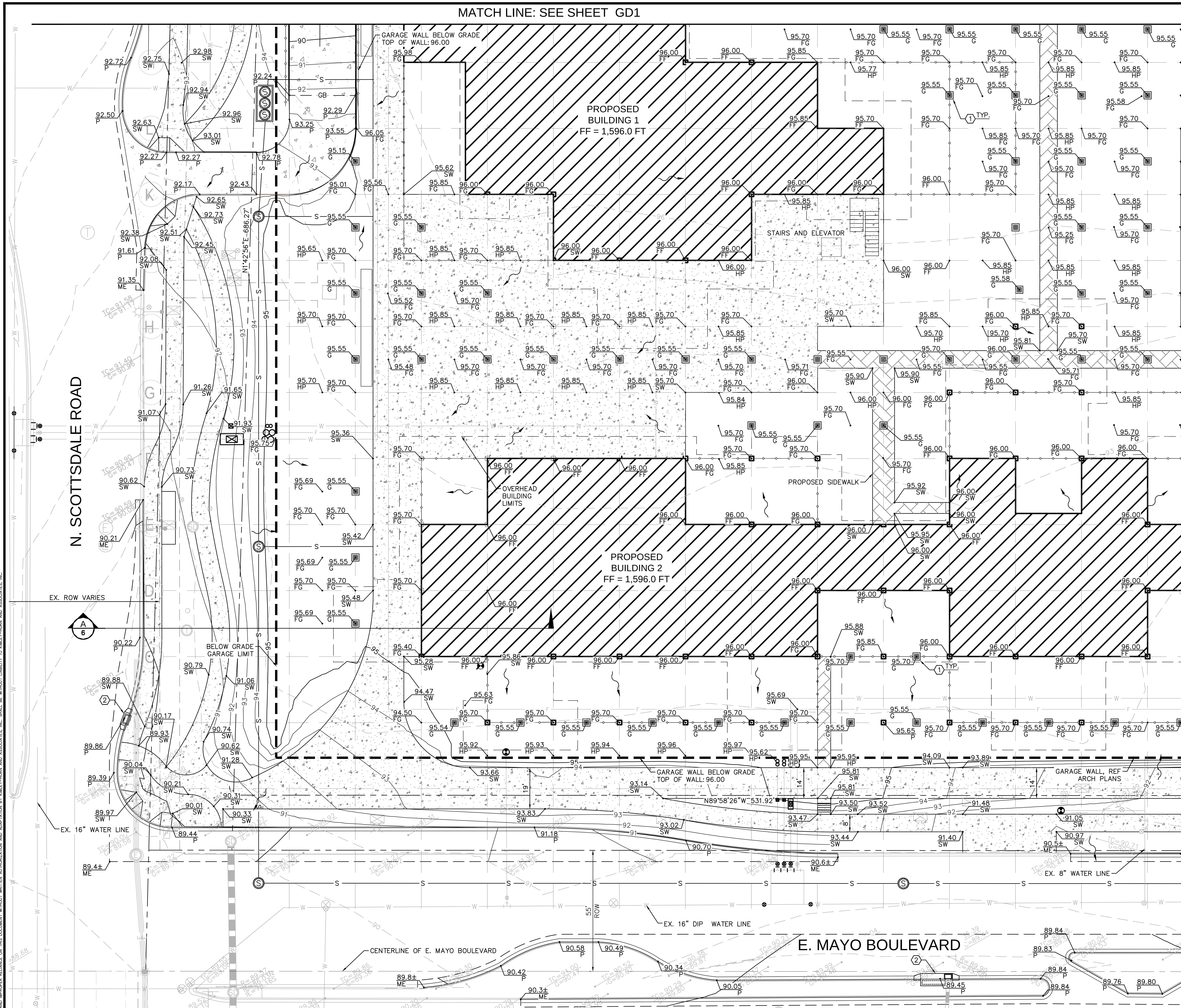
SCALE (H): 1"=20'
SCALE (V): NONE
DESIGNED BY: DJH
DRAWN BY: DJH
CHECKED BY: MLD
DATE: SEP 2022

NO.	REVISION	DATE	BY	APPR.

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION PURPOSES
Kimley»Horn
ENGINEER MIKE DELMARTER
P.E. NO. 30886 DATE 09/02/22

PROJECT NO.
191007011

DRAWING NAME
GD1



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT LINE
- EXISTING SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- EXSTING STORM DRAIN
- PROPOSED CONTOUR
- EXISTING CONTOURS
- 50.00 FG — PROPOSED PAVEMENT SPOT ELEVATION
- TC=49.88 G=49.38 — EXISTING SPOT ELEVATION
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED CATCH BASIN
- SURFACE FLOW DIRECTION
- EXISTING STORM DRAIN MANHOLE
- PROPOSED CONCRETE BIKE PATH
- PROPOSED PAVER WALKWAY
- PROPOSED GRID LINE

GENERAL NOTES

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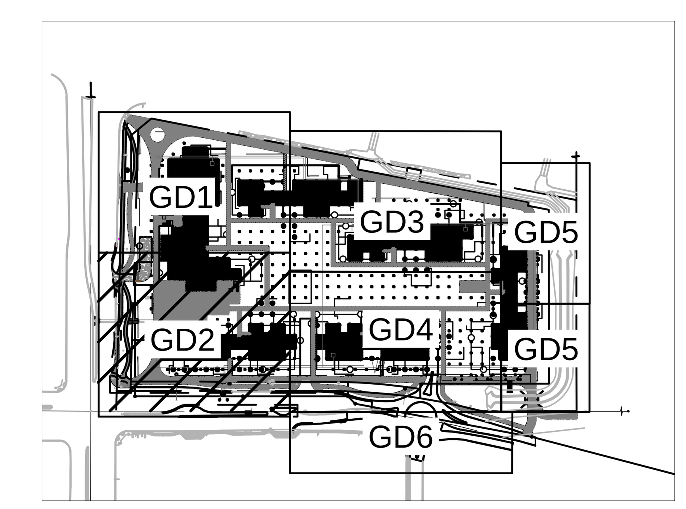
1. PROPOSED AREA DRAIN, CONNECT TO GARAGE SYSTEM BELOW.
2. PROPOSED CATCH BASIN.



KEY MAP
N.T.S.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Q.S.#: 39-45

NO.	REVISION	DATE	BY	APPR.

Kimley»Horn

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

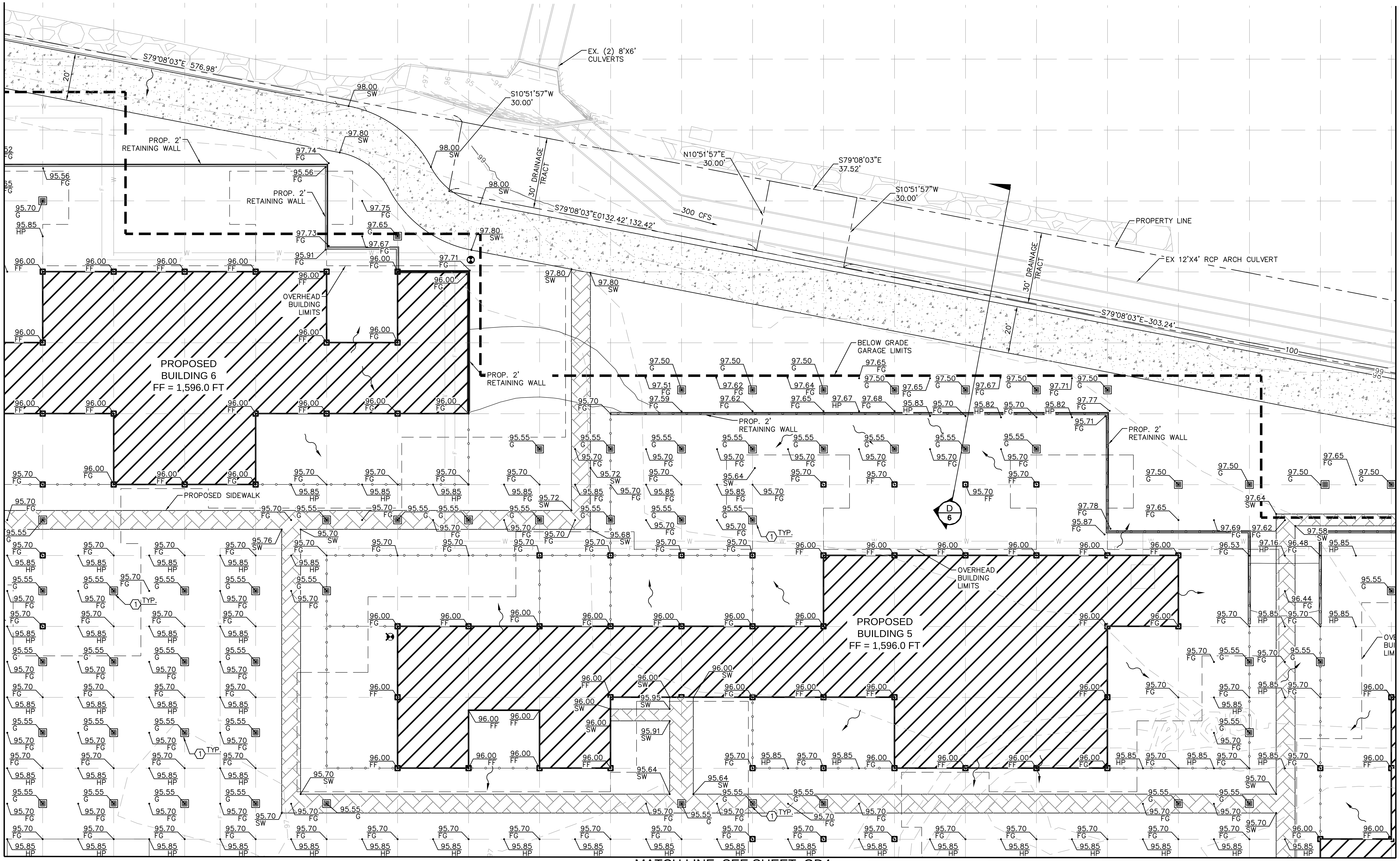
SCALE (H): 1"=20'
SCALE (V): NONE
DESIGNED BY: DJH
DRAWN BY: DJH
CHECKED BY: MLD
DATE: SEP 2022

OPTIMA MCDOWELL MOUNTAIN VILLAGE
PRELIMINARY GRADING AND DRAINAGE PLAN
SCOTTSDALE, ARIZONA 85255

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION PURPOSES
Kimley»Horn
ENGINEER MIKE DELMARTER
PE NO. 30886 DATE 09/02/22

PROJECT NO.
191007011

DRAWING NAME
GD2



LEGEND

	PROPERTY LINE
	RIGHT OF WAY LINE
	STREET CENTERLINE
	EASEMENT LINE
	EXISTING SEWER MAIN
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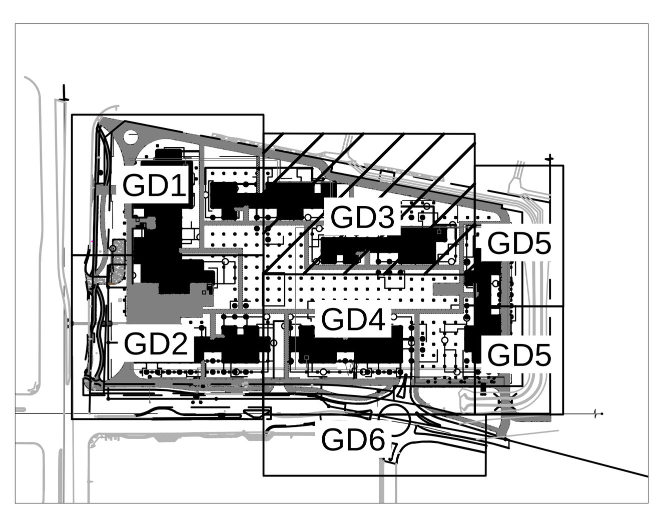
	PROPOSED GRID LINE



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0 10 20 40

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Q.S.#: 39-45

NO.	REVISION	DATE	BY	APPR.

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

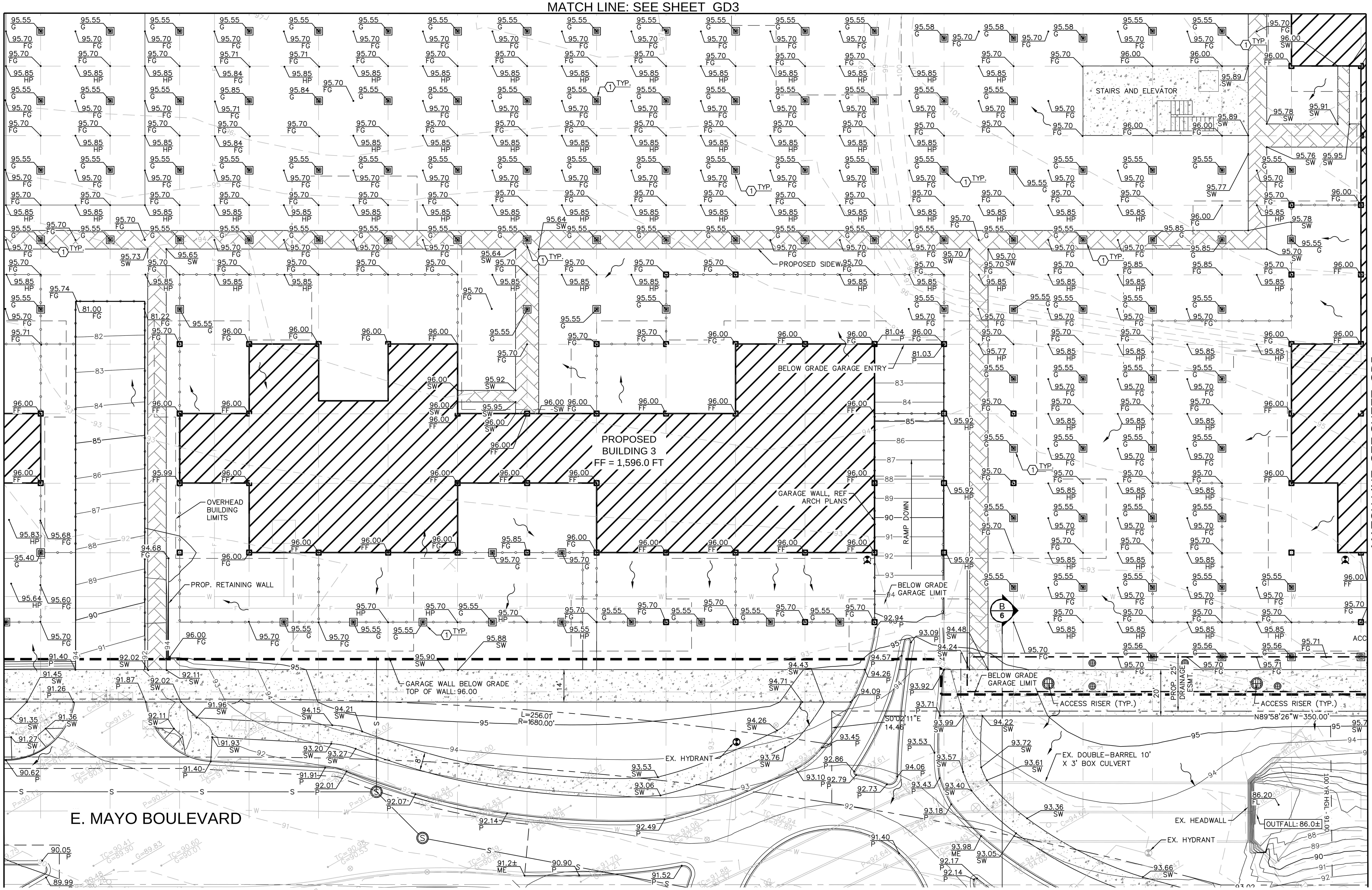
SCALE (H): 1"=20'
SCALE (V): NONE
DESIGNED BY: DJH
DRAWN BY: DJH
CHECKED BY: MLD
DATE: SEP 2022

OPTIMA MCDOWELL MOUNTAIN VILLAGE
PRELIMINARY GRADING AND DRAINAGE PLAN
SCOTTSDALE, ARIZONA 85255

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION PURPOSES
Kimley»Horn
ENGINEER MIKE DELMARTER
PE NO. 30886 DATE 09/02/22

PROJECT NO.
191007011

DRAWING NAME
GD3



LEGEND

PROPERTY LINE
RIGHT OF WAY LINE
STREET CENTERLINE
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EXISTING SEWER MAIN
EXISTING PUBLIC WATER MAIN
PROPOSED WATER MAIN
PROPOSED SEWER MAIN
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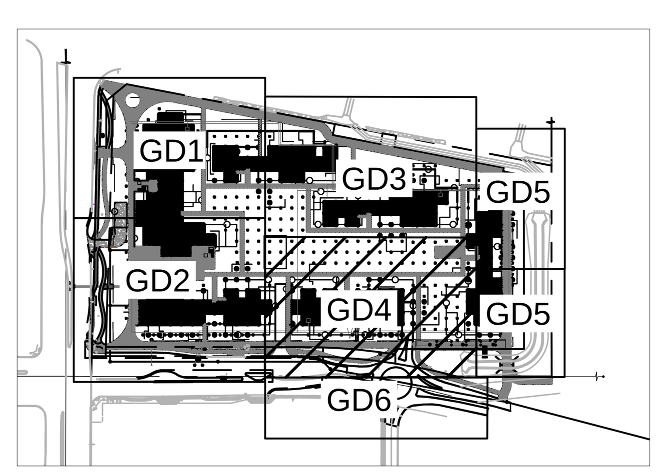

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5. CONTRACTOR TO COORDINATE LANDSCAPE SLEEVE LOCATIONS, TYPE, ETC. WITH LANDSCAPE ARCHITECT PRIOR TO PAVEMENT/CONCRETE CONSTRUCTION.
6. CONTRACTOR TO COORDINATE LIGHTING CONDUIT LOCATIONS, TYPE, ETC. WITH LANDSCAPE ARCHITECT/ELECTRICIAN PRIOR TO SITE GRADING AND PAVEMENT/CONCRETE CONSTRUCTION.

PRELIMINARY GRADING AND DRAINAGE NOTES

1 PROPOSED AREA DRAIN, CONNECT TO GARAGE SYSTEM BELOW.

Q.S.#: 39–45

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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SCALE (V): NONE
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DRAWN BY: DJH
CHECKED BY: MLD
DATE: SEP 2022

OPTIMA MCDOWELL MOUNTAIN VILLAGE
PRELIMINARY GRADING AND DRAINAGE PLAN
SCOTTSDALE, ARIZONA 85255

PRELIMINARY
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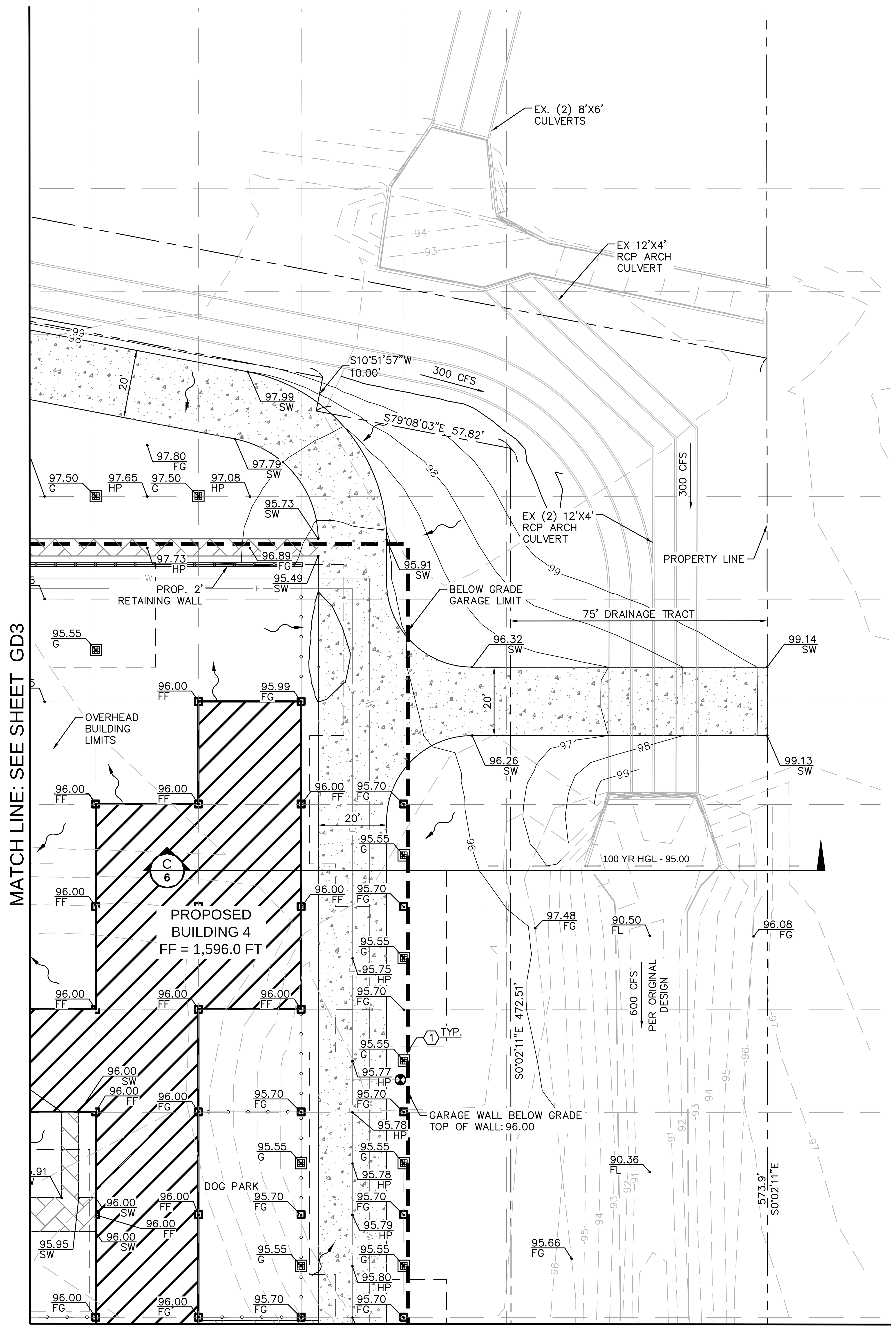
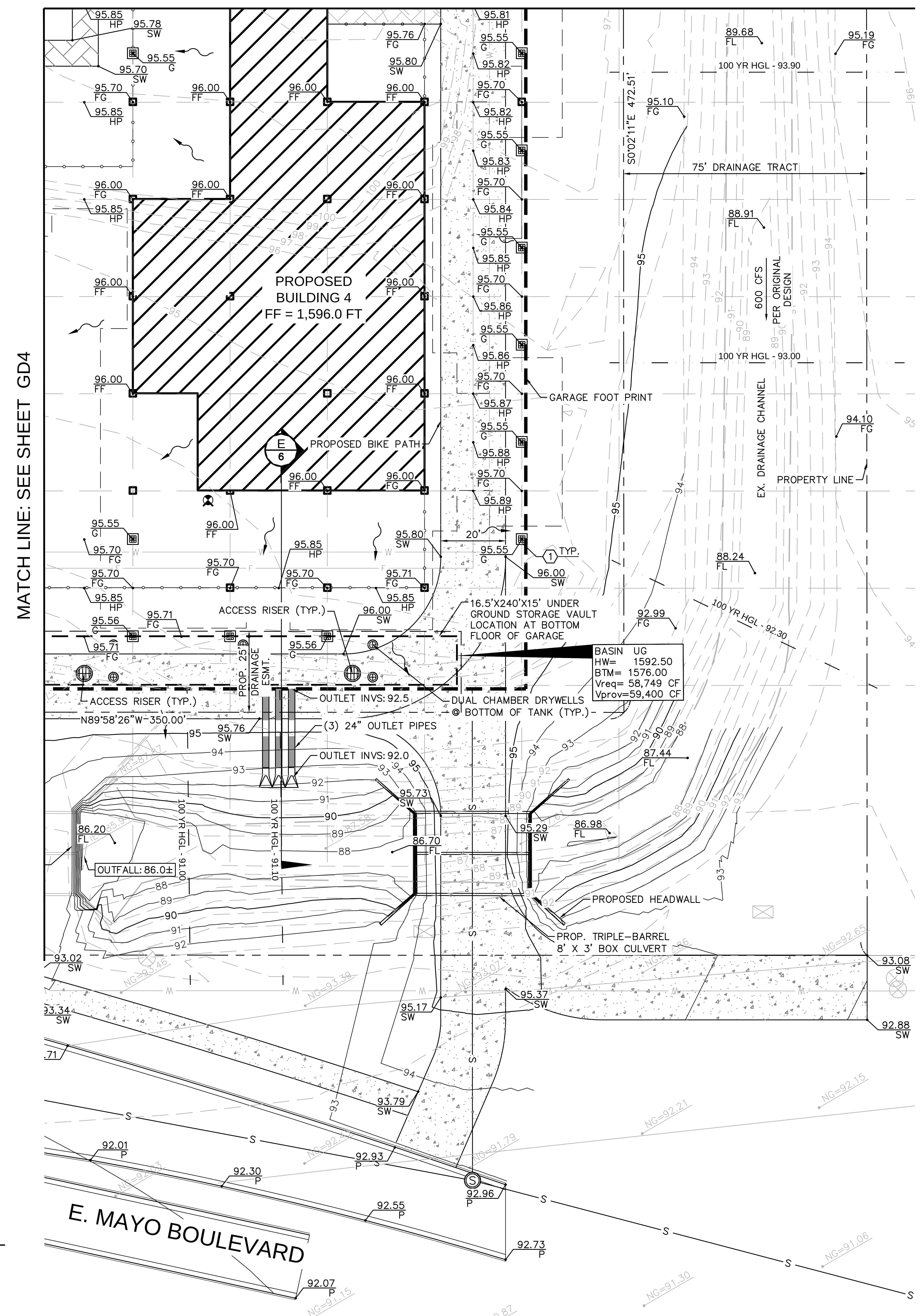
ENGINEER MIKE DELMARTER
PE NO. 30886 DATE 09/02/22

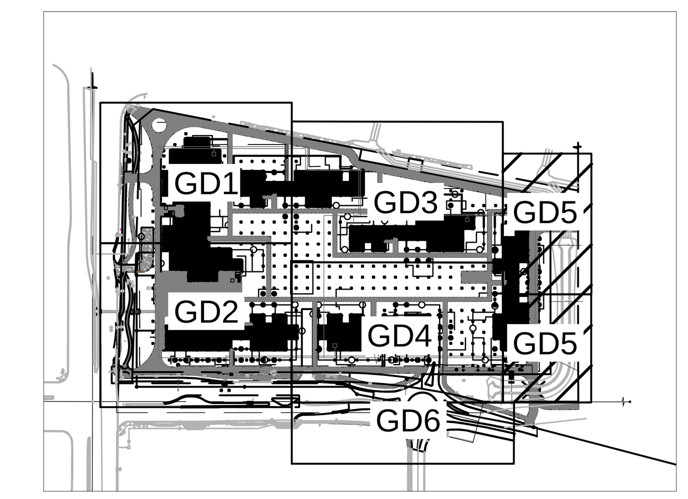
PROJECT NO.
191007011

DRAWING NAME
GD4

MATCH LINE: SEE SHEET GD5







KEY MAP
N.T.S.

LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- STREET CENTERLINE
- EASEMENT LINE
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- EXISTING STORM DRAIN
- 12 PROPOSED CONTOUR
- 2 EXISTING CONTOURS
- 50.00 FG PROPOSED PAVEMENT SPOT ELEVATION
- TC=49.88 G=49.38 EXISTING SPOT ELEVATION
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED CATCH BASIN
- SURFACE FLOW DIRECTION
- EXISTING STORM DRAIN MANHOLE
- PROPOSED CONCRETE BIKE PATH
- PROPOSED PAVER WALKWAY
- PROPOSED GRID LINE

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

MATCH LINE: SEE SHEET GD5

GENERAL NOTES

1. ADD 0.5 TO PAVEMENT ELEVATIONS FOR TOP OF CURB ELEVATION, UNLESS OTHERWISE NOTED.
2. ALL SPOT ELEVATIONS ARE FINISHED GRADE PAVEMENT (P), GUTTER/GRADE (G), OR SIDEWALK (SW) ELEVATIONS UNLESS OTHERWISE NOTED.
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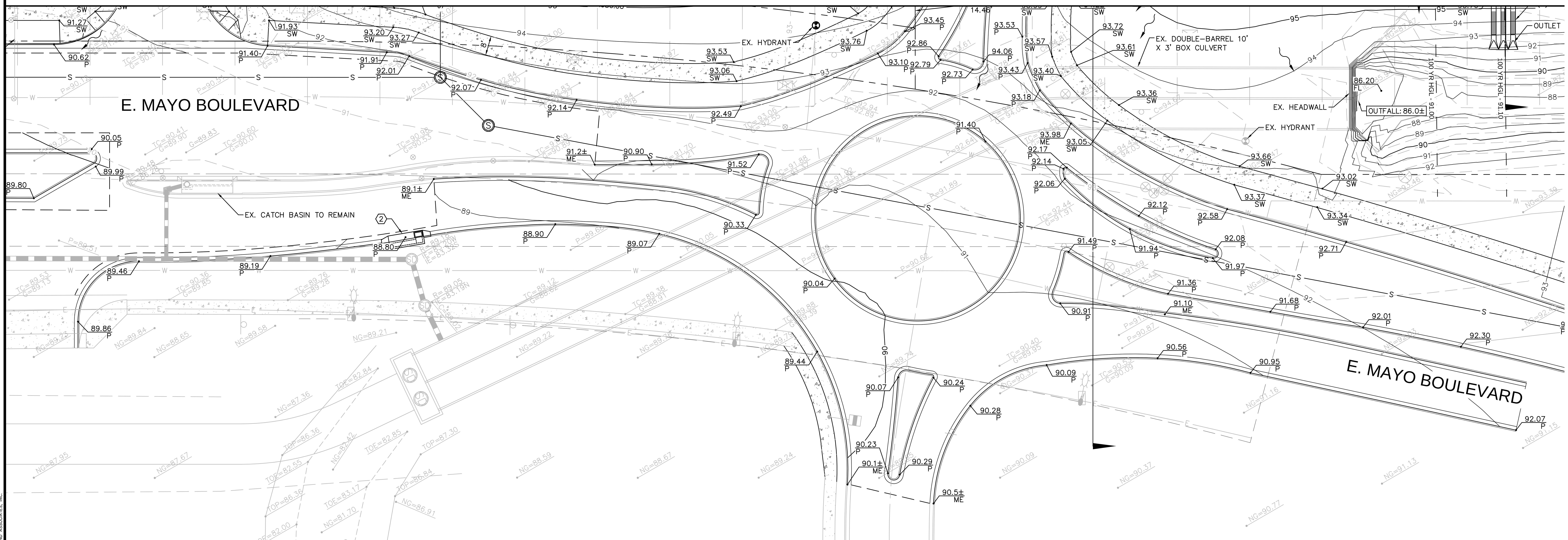

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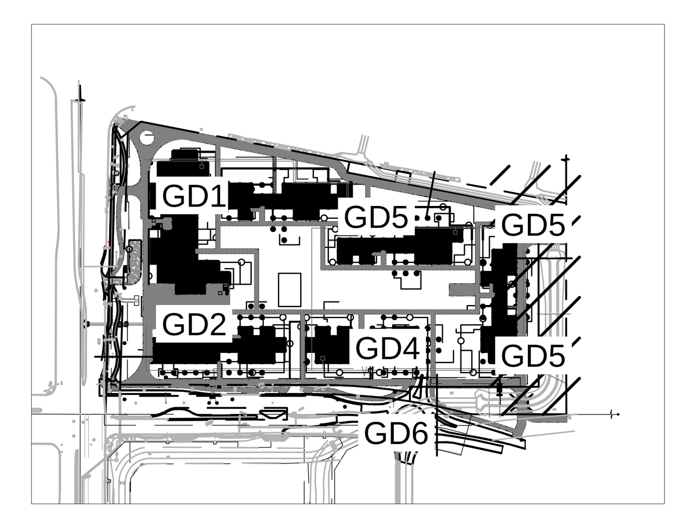
PRELIMINARY GRADING AND DRAINAGE NOTES

(1) PROPOSED AREA DRAIN, CONNECT TO GARAGE SYSTEM BELOW.

(2) PROPOSED CATCH BASIN.

LEGEND

PROPERTY LINE
RIGHT OF WAY LINE
STREET CENTERLINE
EASEMENT LINE
EXISTING SEWER MAIN
EXISTING PUBLIC WATER MAIN
PROPOSED WATER MAIN
PROPOSED SEWER MAIN
EXSTING STORM DRAIN
PROPOSED CONTOUR
EXISTING CONTOURS
50.00 FG — PROPOSED PAVEMENT SPOT ELEVATION
TC=49.88 G=49.38 — EXISTING SPOT ELEVATION
EXISTING SANITARY SEWER MANHOLE
EXISTING FIRE HYDRANT
PROPOSED CATCH BASIN
SURFACE FLOW DIRECTION
EXISTING STORM DRAIN MANHOLE
PROPOSED CONCRETE BIKE PATH
PROPOSED PAVER WALKWAY
PROPOSED GRID LINE



KEY MAP
N.T.S.

NORTH

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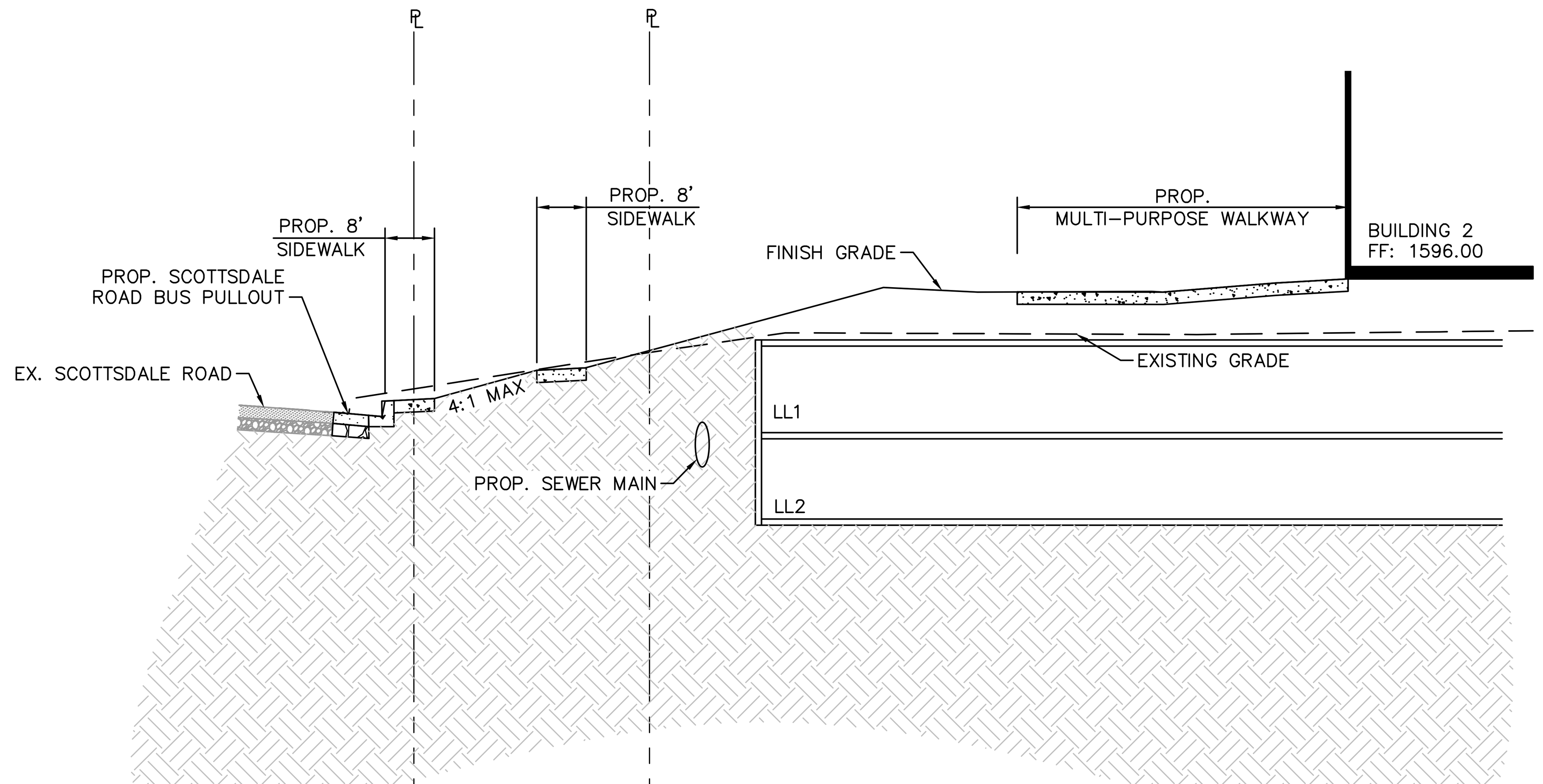
6 OF 7



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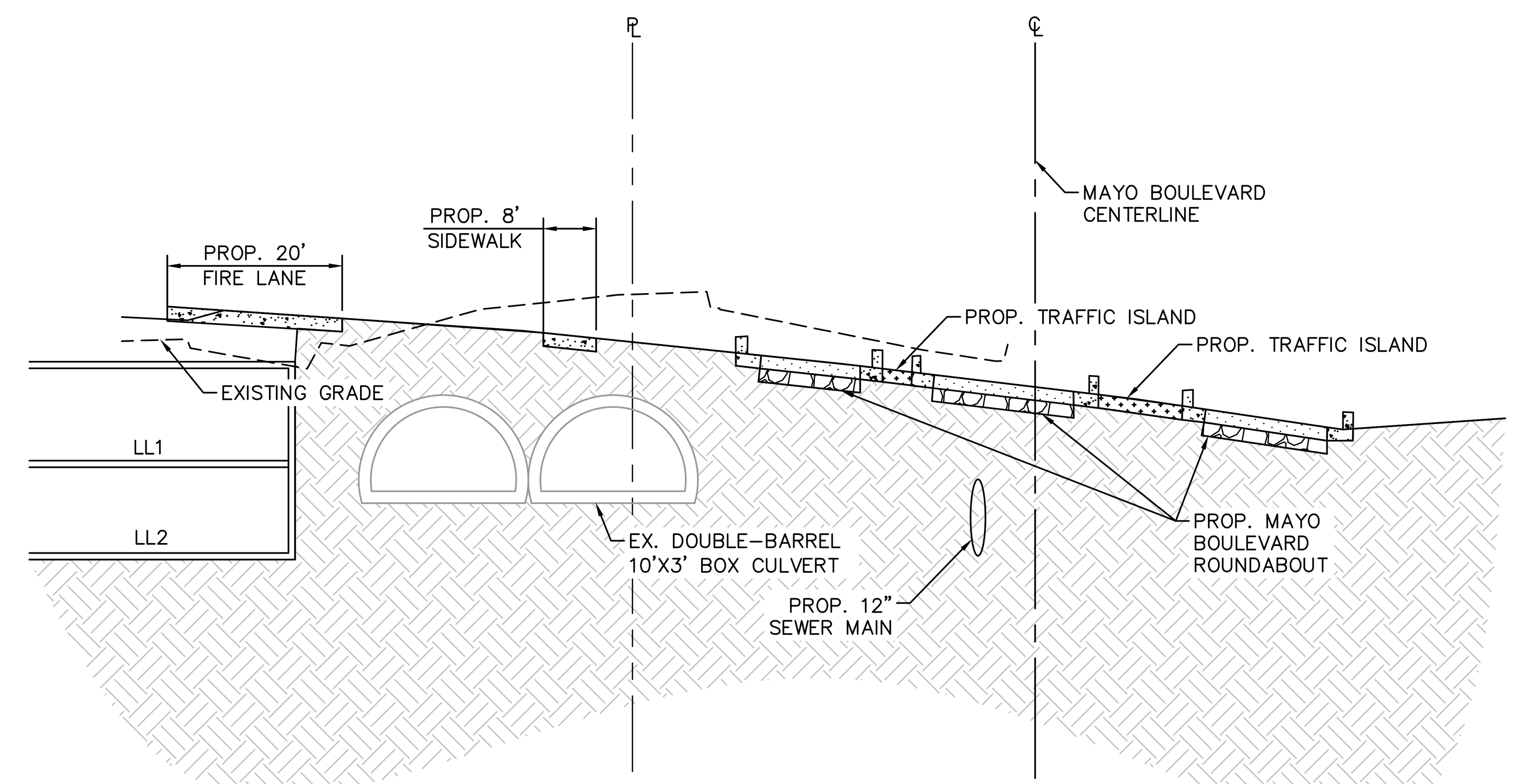

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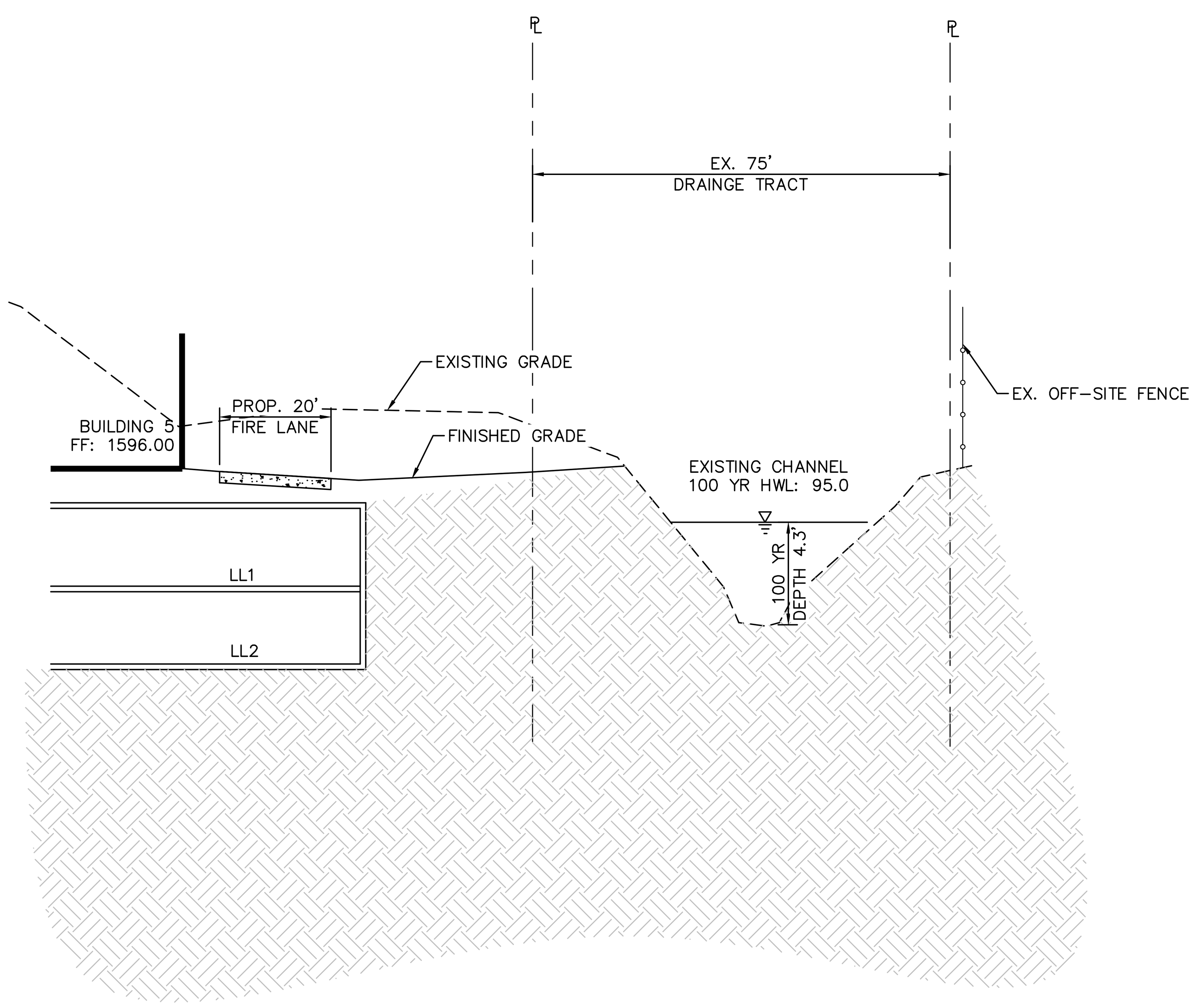

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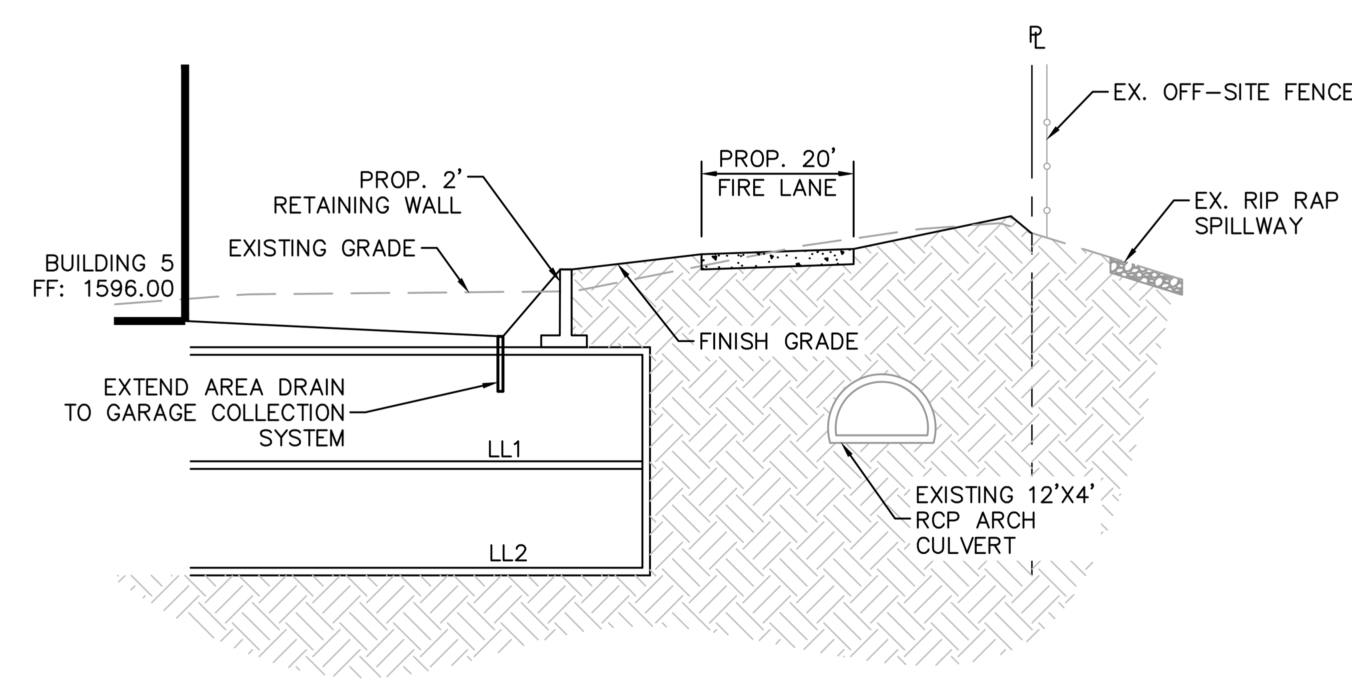

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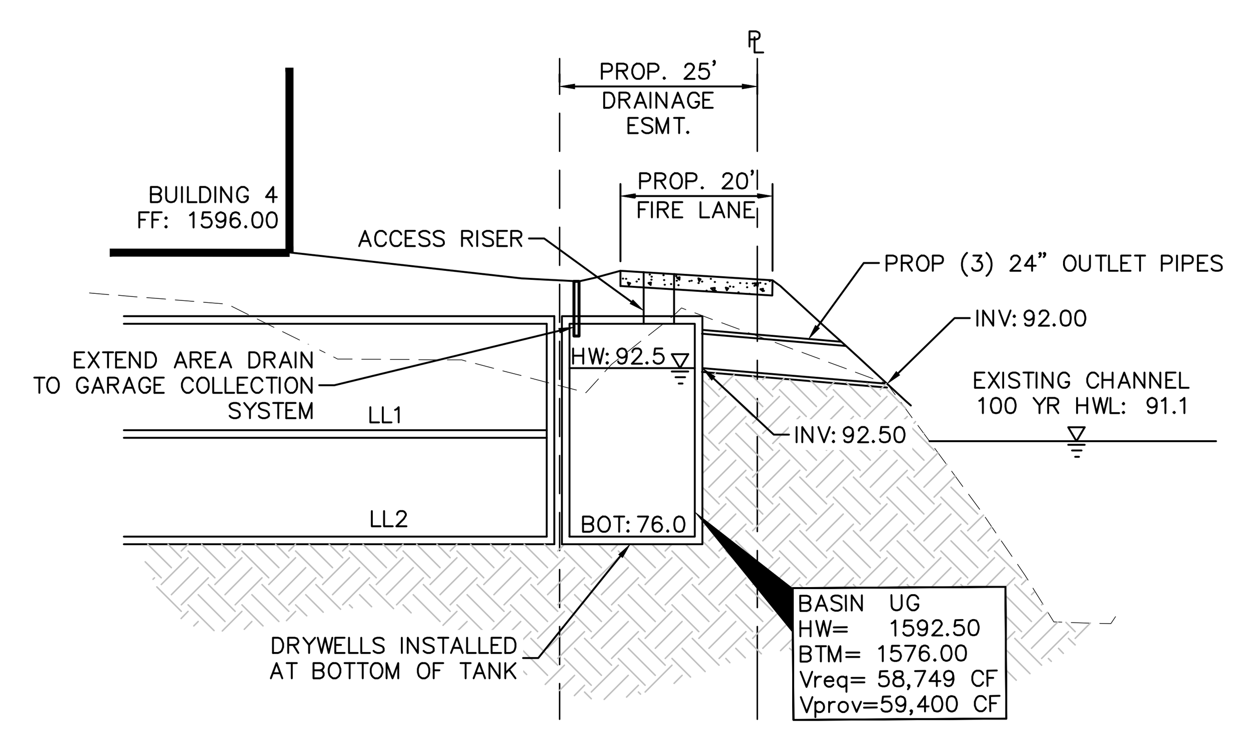

SECTION E
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ENGINEER MIKE DELMARTER
PE NO. 30886 DATE 09/02/22

PROJECT NO.
191007011
DRAWING NAME
GD7

Appendix H

Basin Outlet Calculations

24" Outlet Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.020 ft/ft
Normal Depth	24.0 in
Diameter	24.0 in

Results

Discharge	31.99 cfs
Flow Area	3.1 ft²
Wetted Perimeter	6.3 ft
Hydraulic Radius	6.0 in
Top Width	0.00 ft
Critical Depth	22.7 in
Percent Full	100.0 %
Critical Slope	0.017 ft/ft
Velocity	10.18 ft/s
Velocity Head	1.61 ft
Specific Energy	3.61 ft
Froude Number	(N/A)
Maximum Discharge	34.41 cfs
Discharge Full	31.99 cfs
Slope Full	0.020 ft/ft
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	24.0 in
Critical Depth	22.7 in
Channel Slope	0.020 ft/ft
Critical Slope	0.017 ft/ft

Appendix I

Scottsdale Road Drainage Report

DRAINAGE REPORT

SCOTTSDALE ROAD

FRANK LLOYD WRIGHT BLVD to THOMPSON PEAK PARKWAY

SEGMENT 2

March 2009

Prepared For:

CITY OF SCOTTSDALE
ARIZONA

City of Scottsdale
Capital Project Management
Transportation Capital Improvement
Program - Major Streets

By:

Dibble Engineering
7500 North Dreamy Draw Drive, Suite 200
Phoenix, Arizona 85020

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37878
JOSHUA E.
PAPWORTH
Date Signed 3.9.09
ARIZONA, U.S.A.
Expires 09/30/11

DRAINAGE REPORT

PROJ. #S7005

SCOTTSDALE ROAD – FRANK LLOYD WRIGHT BLVD TO THOMPSON PEAK PKWY

SEGMENT 2

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37878
JOSHUA E.
PAPWORTH
Date Signed 3.9.09
ARIZONA, U.S.A.
Expires 09/30/11

FINAL DRAINAGE REPORT
PROJ. #S7005
SCOTTSDALE ROAD – FRANK LLOYD WRIGHT BLVD TO THOMPSON PEAK PKWY
SEGMENT 2

I. INTRODUCTION

A. *General*

This drainage report is prepared for the City of Scottsdale as part of the Segment 2 roadway improvements design of Scottsdale Road from Frank Lloyd Wright Boulevard to Thompson Peak Parkway in Scottsdale, Arizona. The drainage portions of the project include on-site roadway drainage design, as well as design to accommodate off-site runoff crossing the project corridor. This report presents the project background, drainage analysis, and results for the project. The ~~project location is shown on **Figure 1** on the following page.~~

The improvements to Scottsdale Road are being constructed in two separate segments. **Segment 1** extends from Scottsdale Road centerline station 148+00, just south of Union Hills Boulevard, to the Loop 101, Pima Freeway. Also included in this segment are (1) improvements to Union Hills Boulevard extending from Scottsdale Road, Union Hills centerline station 10+00, to Union Hills centerline station 19+82.37 (EOP) and (2) the offsite flow conveyance system for the Lund Cadillac development at the intersection of Union Hills Boulevard and Scottsdale Road. **Segment 2** extends from Frank Lloyd Wright Boulevard to Scottsdale Road centerline station 148+00, just south of Union Hills Boulevard, and from the Loop 101 , Pima Freeway to Thompson Peak Parkway. This report documents the design of Segment 2. At the time of the writing of this report, construction of Segment 1 is complete. For documentation of Segment 1 of this project refer to *Drainage Report, Frank Lloyd Wright Blvd to Thompson Peak Parkway – Segment 1 100%*, by Dibble Engineering.

The improvements proposed for Scottsdale Road consist of widening the roadway to provide three 12-foot driving lanes in each direction, with a 4-foot bike lane and a 24-foot median, and the addition of concrete curb, gutter, and sidewalk. Where it is necessary, culverts will be added underneath the roadway to allow off-site flow to pass through the corridor unobstructed and at their historic locations.

B. *Study Area*

Existing drainage patterns along the project alignment are generally from the northeast to the southwest. The U.S. Bureau of Reclamation (BOR) has constructed large storm water storage embankments along the upstream (north) side of the CAP Canal that impound all runoff generated north of the canal. The Powerline Channel bisects the contributing

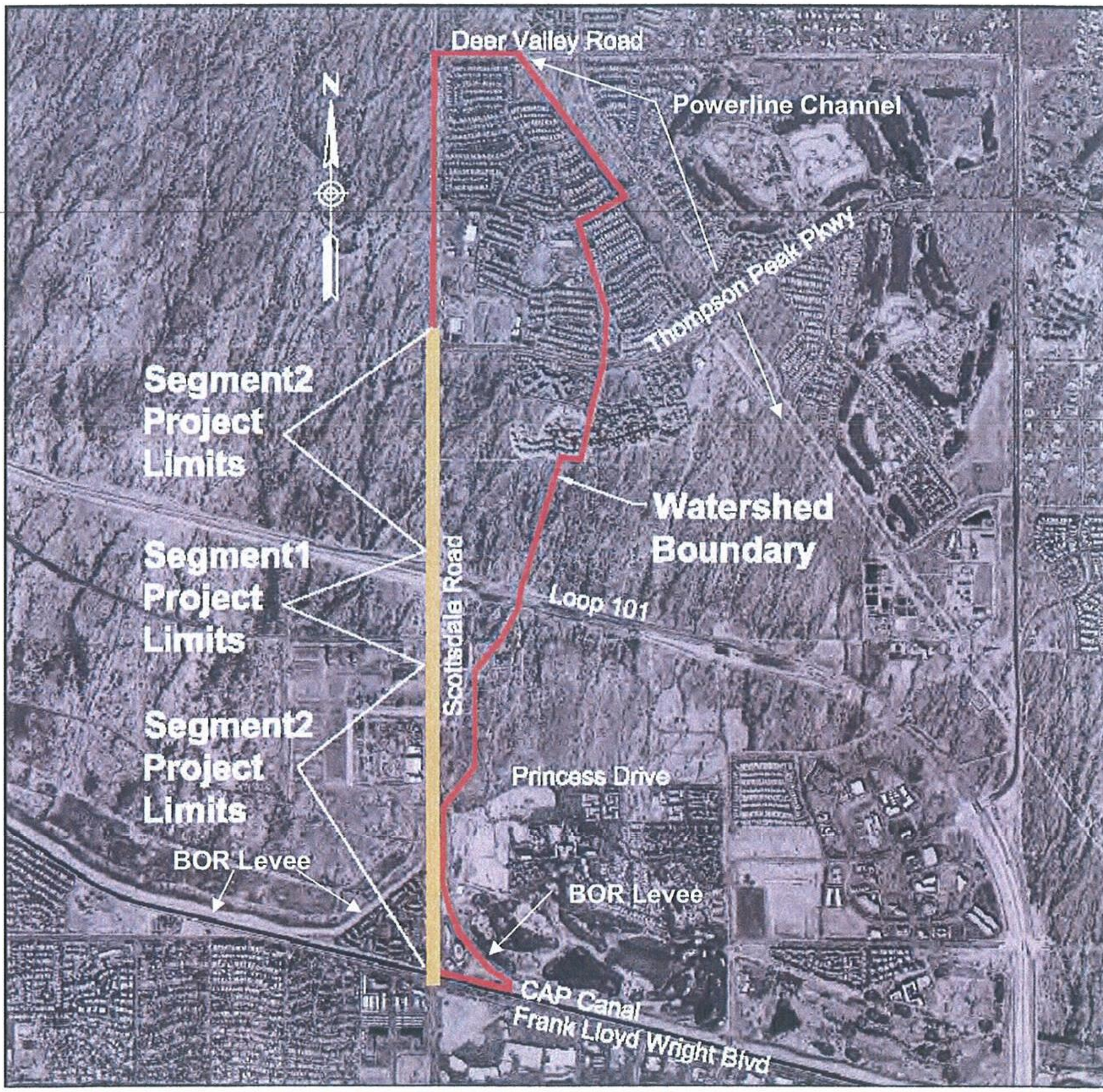


Figure 1 – Project Limits

watershed area and diverts runoff away from the project reducing the peak discharges reaching the roadway. The resulting watershed contributing to drainage across the project corridor has been delineated and is shown on **Figure 1**. The project is located within FEMA flood zone AO consisting of shallow sheet flow flooding conditions on sloping terrain. Within the project limits, the FEMA maps indicate average flooding depths of 1 foot with velocities in the range of 3 to 4 feet-per-second. The sheet flow flooding conditions are being modified as development takes place within the watershed. The developments are providing on-site retention and providing channelization to control the flow and fix its location. Development is rapidly occurring adjacent to the existing roadway resulting in a mix of fully improved roadway sections with full curb and gutter and older roadway sections with no curb and gutter and dip crossings at existing washes. The existing roadway drainage is described by reach as follows:

Frank Lloyd Wright Blvd. to Princess Drive

The BOR embankments wrap to the north on both sides of Scottsdale Road to contain runoff and allow the roadway profile to drop down to the CAP Canal bridge elevation. The embankments extend northerly to near Princess Drive. Due to the lower elevation, runoff generated south of the embankment terminus cannot be drained by gravity into the impoundment area. Off-site runoff generated within this area is currently contained in retention areas constructed with the developments on both sides of the road. The retention areas currently have no outfall to drain the basins. Pavement runoff generated in this area either drains into the retention basins or drains to the CAP canal service road. The CAP does not accept offsite runoff into the canal right-of-way, so this project will need to identify an alternate means of disposing of the runoff.

Princess Drive to Mayo Boulevard

There is a dip crossing at Chauncey Lane that conveys the runoff from a natural wash on the east side of the road into an improved, landscaped channel constructed as part of the Automotive Group Realty automall. The improved channel drains southerly along the west side of Scottsdale Road to the south side of the automall development where it ends. Runoff reaching the southerly limit of the channel fills the channel and spills out into the roadway shoulder area and continues south to a point where it drains into a small natural wash that drains into culverts under Princess Drive and into the BOR impoundment area. A second dip section just north of Princess Drive directs runoff accumulating along the east side of Scottsdale Road into the small natural wash into an existing culvert beneath Princess Drive and into the impoundment area.

Loop 101 to Thompson Peak Parkway

The land adjacent to Scottsdale Road is currently unimproved between Loop 101 and Thompson Peak Parkway. Runoff currently crosses the roadway in dip sections at three locations. The crossings are at approximate stations 183+00, 189+00, and 200+00.

There is an existing dip crossing about 400 feet north of Thompson Peak parkway near station 211+00. The Discount Tire corporate offices have been constructed on the northeast corner of Scottsdale Road and Thompson Peak Parkway. This development diverts offsite flow from the north and northeast across Scottsdale Road prior to Thompson Peak Parkway. On-site retention and landscaping has been completed outside the City ROW. The on-site retention basins drain through 3-36 inch pipes under Thompson Peak Parkway into an existing wash that continues to the south. The 3-36 inch pipes also convey Thompson Peak Parkway roadway drainage.

C. *Existing Drainage Studies*

All areas of the Scottsdale Road project corridor are planned for development in the coming years. A number of drainage reports exist for these developments, and are being investigated for use in the design of the current improvements. The following projects are currently planned or are completed for the Scottsdale Road project corridor.

- Final Drainage Report, Pima Freeway 9A, Part II, reference #10
- Drainage Study, Core North/Core South, reference #15
- Interim Regional Drainage Channel, reference #18
- Master Drainage Report for North Scottsdale Gateway, reference #4
- Palisene-Paradise Ridge Conceptual Drainage Plan Report, reference #6

D. *Corps of Engineers 404 Permit*

The U.S. Army Corps of Engineers (COE) has determined that the One Scottsdale (formerly the Stacked 40's) development north of Union Hills Boulevard does not contain jurisdictional washes. Existing jurisdictional washes upstream of the One Scottsdale have been rerouted due to upstream development, cutting off natural wash flow to the area. As there are no significant crossings of Scottsdale Road that do not originate on the One Scottsdale property, there are no jurisdictional waters in the project area and a 404 permit is not required. The delineation determination letter from the COE is contained in **Appendix E**. The Arizona State Land Department (ASLD) has obtained a 404 permit for the entire Paradise Ridge development. The special conditions from that permit will apply to any property obtained from the ASLD within the permitted area.

II. DESIGN CRITERIA

The City of Scottsdale's drainage requirements as stated in the *City of Scottsdale, Arizona Design Standards and Policies Manual* (DSPM), August 2007, Chapter 4, as well as the *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology*, January 1, 1995, (Hydrology Manual), and *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics*, January 28, 1996, (Hydraulics Manual), will be used as the basis for design. Discussions of specific design criteria are in the sections that follow.

A. *Rainfall*

As mentioned in *Section I.C.*, a number of drainage studies have already been prepared along the Scottsdale Road corridor to support the design of various developments and the Loop 101, Pima Freeway. A significant portion of the offsite flow design of this project will be based on the rainfall runoff results provided within these previous studies. These projects are listed in *section I.C.* **Figure 2** displays the portions of the project watershed studied within these existing drainage studies, along with proposed offsite drainage features. It can be seen in **Figure 2** that the entire project watershed has been studied within the previous studies, and drainage features will be designed based on the results of the corresponding study.

For pavement runoff, and where previous studies of off-site flows require supplementation, rainfall values are obtained from the DSPM isopluvials (for volume calculations) and city-wide IDF curves presented as DSPM *Figure 4.1-3* (maximum discharge calculations).

Figure 2 - Contributing Existing Drainage Studies Map

Exhibit of the areas of the project watershed analyzed by previous drainage studies.

Existing Drainage Studies

- (A) Paradise Ridge (Reference #6)
- (B) Pima Freeway 9A, Part II (Reference #10)
- (C) Interim Regional Drainage Channel (Reference #18)
- (D) North Scottsdale Gateway (Reference #4)

B. *Roadway Inundation*

Runoff is allowed to collect in the two right-most driving lanes and bicycle lane for a maximum allowable spread of 29.5 feet from the face of vertical curb. Pavement drainage is collected in curb opening catch basins and MAG scuppers. The following criteria apply to the on-site drainage:

- A Manning's n value of 0.015 (normal asphalt) will be used for street flow.
- Streets will be designed to carry runoff from a 10-year peak storm. Arterial streets and major collectors will be designed to maintain a single 12-foot dry driving lane in each direction. The peak flows from a 100-year storm will be carried within the cross-section between the right-of-way lines, will be below finished floor of adjacent buildings, and will not produce a depth above the street greater than 8 inches.
- In cases where the peak flows from the design storm exceed the street capacity, underground pipes of sufficient size to carry the excess will be installed.
- Roadside ditches are to be sized to prevent the 10-year storm runoff from saturating the pavement sub-grade.

In addition to the above City of Scottsdale requirements, the following criteria from the Hydraulics Manual have also been adopted for roadway drainage.

- Trapezoidal channel bottoms are a minimum of 4 feet wide for maintenance purposes.
- V-shaped channels are allowed in lieu of a 4-foot trapezoidal channel.

C. *Catch Basins & Scuppers*

Catch basins are placed as necessary to meet the roadway inundation criteria and at intersections to prevent cross street flow. Curb opening catch basins will be City of Phoenix Standard P1569-1. Area inlet catch basins will be MAG Standard 537, type 'G'. Scuppers will be MAG Standard 206. The interception capacity of catch basins and scuppers is reduced to account for plugging by debris. Grated catch basin capacity is reduced by 50% in sump conditions and by 40% in continuous grade conditions. Curb opening catch basin and scupper capacity is reduced by 20% in both continuous grade and sump conditions.

D. *Storm Drains*

If a storm drain system is deemed necessary, it will be sized for 10-year inlet flows and will limit the hydraulic grade line to a minimum of 6 inches below the inlet structures using a Manning's n value of 0.013 for precast concrete pipe and 0.011 for smooth walled HDPE pipe.

- The minimum pipe size is 24 inch for mainline storm drains in the pavement and 15 inch for catch basin connector pipes.
- Pipes will be deep enough to not project into the pavement structural section.
- Maximum spacing of manholes is 300 ft for pipes up to 30 in diameter, 400 ft for pipes larger than 30 in and smaller than 48 in, and 500 ft for pipes 48 in and larger.

Pipes will be designed to accommodate inlets with 100% capture efficiency. Minimum flowing full velocities of 3 ft/s and maximum flowing full velocity of 10 ft/s will be maintained unless restricted by minimum pipe size requirements. The design will, if possible, avoid the interception of an off-site natural wash with the intent of collecting it and putting it into a pipe *or underground storm sewer system. If there is no alternative to the routing of an open* channel into a piped system, water will be first routed into a sediment or debris basin. The capacity of the conduit should be 100 percent of the design discharge plus 30 percent to accommodate any sediment and debris.

E. *Open Channels*

- Regional channels will be designed to convey the 100-year planned-to-date conditions peak discharge within the channel banks.
- The design channel depth is the normal flow depth plus freeboard. Required freeboard is 0.25 times the sum of flow depth plus velocity head with a minimum of 1 foot.
- Froude numbers for channel design are to be less than or equal to 0.86 for sub-critical flow. Super-critical flow will be avoided whenever possible.
- If possible, the minimum channel bend radius will be 3-times the channel top width at the depth of flow.
- Longitudinal channel slopes may be set as steeply as possible within the limitations of the channel material design allowable tractive shear and the limitation on Froude number.
- Surface runoff entering the channel from the side will be directed to enter the channel at planned locations with side spillways. This will limit the possibility of rill erosion for earth channels. Where the top of channel projects above the adjacent existing ground (fill situations), a parallel channel or swale will be used to convey

runoff to a planned channel inflow point. Additional right-of-way may be required in these areas. The parallel auxiliary drainage channel should generally be a v-shaped swale.

F. *Off-site Runoff Cross-Road Drainage*

It will be necessary to construct a number of culverts beneath Scottsdale Road. The location of these culverts and offsite conveyance channels can be seen in **Figure 2**. As stated in the DSPM, cross road culverts for major collector and arterial streets will be designed to convey the 50-year storm underneath the roadway, with no overtopping; and 100-year storm flows over and above the 50 year values will be conveyed over the roadway with a depth not to exceed 6 inches. However, the proposed profile for Scottsdale Road along the project corridor consists of a nearly continuous grade from north to south, with dip sections at natural wash locations removed. If runoff generated by the 100-year storm were to overtop the curb and gutter, it would be directed down the street, not directly over it. Therefore, culverts will be designed to convey the 100- year storm with no roadway overtopping.

- Box Culverts will have a minimum height of 4 feet for maintenance purposes, unless physical constraints make a 3 foot box necessary.
- Culverts constructed with channels will be designed to the same 100-year design discharge as used for the channel.

III. HYDROLOGY

A. *Introduction*

The vast majority of the hydrology for the area has been developed as part of a number of drainage studies for new developments fronting Scottsdale Road and the Loop 101 – Pima Freeway. These studies are listed here and are described in more detail in *Section B. Offsite Methodology*.

- Final Drainage Report, Pima Freeway 9A, Part II, reference #10
- Interim Regional Drainage Channel, reference #18
- Hydrology Analysis, Paradise Ridge, reference #6
- Master Drainage Report for North Scottsdale Gateway, reference #4

In areas where existing studies require supplementation, and in the design of the pavement drainage, the Rational Method has been employed.

B. *Offsite Methodology*

Figure 2 displays the portions of the project watershed studied within previous drainage studies, along with proposed offsite drainage features.

B.1 Final Drainage Report, Pima Freeway 9A, Part II

This hydrology study was performed by HDR Engineering Inc. for ADOT to aid in the design of SR101 from Scottsdale Road to Pima Road, resulting in a total watershed area of 15.71 square miles. The study is a combination of portions of several different models that have been prepared for the area by various consultants since 1992. Hydrologic analysis was performed using the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package, Version 4.0.3E. The results of this study were used to size pass-through culverts beneath the freeway. In Segment 1 of this project, the results are used to design the Lund Cadillac culvert and channel system. A conservative measure, given that the study has since been revised, and flow rates reduced, within the *Core North/Core South* study.

B.2 Interim Regional Drainage Channel

In 2008 the City contracted with Wood, Patel & Associates to design an interim drainage channel to connect the Lund Channel System to a proposed box culvert approximately 150' north of Princess Drive. Hydrology was done for this channel that incorporated changes made to the watershed due to the **One Scottsdale** development area north of the Loop 101, i.e. the *series of parcels fronting* Scottsdale Road *on the east side from* Loop *101* to Thompson Peak Parkway. One Scottsdale was formerly known as the Stacked 40's. The resulting 100-year peak runoff for the channel is 300 cfs.

B.3 Hydrology Analysis, Paradise Ridge

This hydrology study was performed by Bob Ward, P.E., as a subconsultant to Entranco Biological Resource Group. Paradise Ridge is a proposed subdivision development on the western edge of Scottsdale Road, extending from Mayo Boulevard to Deer Valley Road. The purpose of the study was to assist in the development of jurisdictional "404" washes and to prepare a Master Drainage Plan for Paradise Ridge. The study pieces together a number of previous studies to establish off-site flow patterns impacting the Paradise Ridge property. Minor modifications were made to these models to provide connections to jurisdictional wash inflow points along the east boundary of Paradise Ridge. As part of the development of a Master Drainage Plan a post development runoff model was developed, with anticipated regional drainage features in place on the Paradise Ridge property. Hydrologic analysis was performed using the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package, Version 4.0.3E. In the current project, the results of the Paradise Ridge study are used to design Scottsdale Road offsite drainage elements north of Loop 101 and south of Deer Valley Road. The study does not incorporate proposed improvements to **One Scottsdale.** As One Scottsdale is developed they will need to incorporate any improvements made to Scottsdale Road in the current project based on the results of the Paradise Ridge study.

B.4 Master Drainage Report for North Scottsdale Gateway

This hydrology study was performed by Development Coordination Group, Ltd for Byxbee Development Partners, LLC. North Scottsdale Gateway (NSG) is a triangular shaped site located on the east side of Scottsdale Road, adjacent to and north of the Central Arizona Project Canal (CAP). The site is roughly 18 total acres in size. The site is of particular interest because it is the downstream boundary of flow along Scottsdale Road, before reaching the CAP canal. The site is almost completely protected from offsite flows by the Bureau of Reclamation Levee and basin system, the only exception being runoff from Scottsdale road and right-of-way south of Princess Drive, and the levee bank itself. The site receives runoff from the entire roadway right-of-way section, except at the downstream end, where roadway runoff is allowed to drain directly onto the CAP canal service road and canal. Hydrologic analysis for the study was performed using the Rational Method. In the current project, the city has been instructed that the CAP canal is not an allowable depository of storm runoff, and runoff presently reaching the service road and the canal must be diverted to an alternative outfall. Also, the NSG property has no acceptable outfall to drain their basins except by evaporation and percolation. A prior commitment was made by the city to connect to the NSG basin system and provide a bleed-off outfall as part of this Scottsdale Road improvement project. The results of the North Scottsdale Gateway study are modified to account for the improved roadway. These results are used to improve North Scottsdale Gateway retention basins for the increased Scottsdale Road runoff and to design a site outfall for the North Scottsdale Gateway Property.

B.6 Powerline Corridor Channel

The Powerline Corridor Channel currently ends about 1,500-feet southeast of Thompson Peak Parkway, capturing and diverting regional flows to the southeast. The *Core North/Core South* hydrology model is structured to include this channel at its current level of construction. Plans are underway to extend the Powerline Corridor Channel southeast to the COS Water Campus. This construction will not impact the portion of the existing studies used for the current project, design flows would remain unchanged with the new channel in place.

C. *Onsite Methodology*

The rational method is used for runoff calculations for roadway drainage design using a site specific Intensity-Duration-Frequency relationship, checked against the curves presented as *Figure 4.1-3* in the DSPM to ensure the higher intensity is used. This I-D-F relation is also shown in **Appendix A.** The Papadakis and Kazan time of concentration equation from the Hydrology Manual is used to calculate the inlet time (overland flow time) for each inlet. The overland flow time for all inlets is 5 minutes. This value is input into *Hydraflow*. Tc for the system is calculated by *Hydraflow*: travel time in the storm drain pipe is computed based on the pipe flowing full velocity and added to the surface runoff times of concentration to obtain the totaled time of concentration for storm drain design.

D. *Design Assumptions*

The hydrology for this project models the 100-year event (10-year for roadway runoff design) for watershed and land-use conditions as planned by the above referenced developments.

IV. HYDRAULICS

A. Roadway Drainage

A.1 Methodology

The current project represents the full build out of the roadway with complete curb and gutter. Pavement and inlet hydraulic calculations are based on procedures contained in the Federal Highway Administration Hydraulic Engineering Circular No. 12 *Drainage of Highway Pavements*, 1996 and are performed within *Hydraflow v.10.0.0.6* design software.

Storm drain hydraulic grade line calculations are performed by *Hydraflow*, and are made using an iterative procedure that applies Bernoulli's energy equation between downstream and upstream ends of each line in the system. Manning's equation is used to determine head losses due to pipe friction. *Hydraflow* estimates junction losses by using the City of Los Angeles Thompson equation. Manhole losses are computed as K times the velocity head. The values of K are input manually into *Hydraflow* based on criteria adapted from FHWA Hydraulic Engineering Circular No. 12.

A.2 Assumptions

The following assumptions are made in performing the pavement drainage analysis:

1. A minimum time of concentration of five minutes is used.
2. The 10-year design discharge used for inlet sizing is based on the runoff generated within the proposed right-of-way.
3. The C factor for runoff generated within the right-of-way is is 0.95..
4. The gutter flow reduction factor for parked vehicles is 1.0, since parking will not be allowed along Scottsdale Road.

B. Channels

B.1 Methodology

Channels are sized using Manning's equation for developed conditions 100-year peak discharges with freeboard using velocity and tractive shear as the primary design parameter. To minimize the overall channel width, the channel cross-section and slope in each channel reach is set to meet an acceptable design velocity.

B.2 Channel Lining

Due to the natural steepness of the ground slope of the area, some channels have a tractive shear value requiring a rip-rap lining to eliminate scour and head cutting. The Manning roughness coefficient, n, is a measure of the flow resistance or relative roughness of a channel. The flow resistance is affected by many factors including bed material, cross section irregularities, depth of flow, vegetation, channel alignment, channel shape, obstructions, suspended material and bed-load. The Arizona Department of Water Resources *Manual for Engineering Analysis of Fluvial Systems* provides an equation for calculating an n-value based on the size of bed material. The base Manning's n-value for 6" dumped rip-rap material is calculated from the following equation;

$$n_b = 0.0395 \times D_{50}^{(1/6)}$$

Where D_{50} = Diameter, in feet, in which 50% of the particles (by weight) are smaller.

This equation yields a base Manning's n-value of 0.034 for the 6" dumped rip-rap.

B.3 Channel Cross Section

Channels are a trapezoidal section with 3 to 1 to 4 to 1 sideslopes. Where a riprap lining is used, a 3 to 1 sideslope is allowable. In an effort to keep velocities low, roadside channels are generally wide and shallow—less than 3 feet in depth.

C. Culverts

New culverts are sized using standard culvert design methodology considering inlet or outlet control as presented in Federal Highway Administration, Hydraulic Design Series No. 5, *Hydraulic Design of Highway Culverts*, September 1985. The calculations check for inlet control, pipe barrel (friction), or tail water control. The condition resulting in the highest computed headwater elevation governs.

V. RESULTS & RECOMMENDATIONS

A. Pavement Drainage Design

The roadway pavement drainage design uses a combination of scuppers with roadside drainage ditches and storm drain. This portion of Scottsdale Road contains few sumps in the roadway profile. Therefore, management of inlet flow-by of gutter flow at intersections governed the selection of spacing and sizing for scuppers and curb inlets along Scottsdale Road. Gutter spread is kept within the design criteria at the design spacing. Gutter depths do not exceed six inches. Hydraflow surface drainage calculations and drainage area calculations can be found in **Appendix B**; Hydraflow surface drainage models provided are described below:

File Name	*Description*
SurfaceCalcs_West.stm	Surface runoff model for the west halfstreet of Scottsdale Road between Frank Lloyd Wright Blvd and Thompson Peak Pkwy.
SurfaceCalcs_Seg1_East.stm	Surface runoff model for the east halfstreet of Scottsdale Road between Stations 141+93 & 168+04.
SurfaceCalcs_East_N_101.stm	Surface runoff model for east halfstreet of Scottsdale Road between the Loop 101 and Thompson Peak Parkway.
SurfaceCalcs_East_S_Chauncey.stm	Surface runoff model for east halfstreet of Scottsdale Road between Frank Lloyd Wright and Chauncey Lane.

Scuppers are MAG Standard 206, modified to remove the concrete spillway and sidewalk; in order to accommodate the future construction of detached concrete sidewalks along the roadway corridor riprap spillways will be used. Inlet lengths vary from 12 feet to 16 feet. Catch basins are COP Standard P1569-1 M1 or M2.

Two underground storm drain systems exist on the project. The first is located at the northwest corner of Scottsdale Road and Princess Drive. This short 10-year system conveys Scottsdale Road and Princess Drive runoff to an existing culvert beneath Princess Drive. This model is provided in **Appendix B**, filename *Princess_Stormdrain.stm*. A second underground storm drain is designed to provide an outfall for retention basins fronting the North Scottsdale Gateway property. This system is described in more detail in **Section V.D.**

B. Offsite Hydrology

Offsite hydrology results are summarized in the following table and **Figure 3**.

Table 1 – Offsite Design Flow Summary

Hydraulic Structure	Location	Source Drainage Report	100-year Flow
Culvert #1	0.37 mi. South of Thompson Peak Parkway	Paradise Ridge, Bob Ward	224 cfs
Culvert #2	150 ft North of Princess Drive	Interim Regional Drainage Channel, Wood Patel	300 cfs
Culvert #3	2-36" Pipes Automall Frontage (Connects to Culvert #2)	Current Study	76 cfs
Channel #1	0.37 mi. South of Thompson Peak Parkway	Paradise Ridge, Bob Ward	224 cfs
Channel #2	Chauncey to Culvert #2	Interim Regional Drainage Channel, Wood Patel	300 cfs

C. Offsite Drainage Design

There are three offsite drainage features being constructed as part of the Scottsdale Road Segment 2 improvements. Flow rates for each drainage element are presented in **Table 1** and **Figure 3**.

Channel#1/Culvert#1 is located 0.37 miles south of Thompson Peak Parkway, approximate Scottsdale Road centerline station 188+25. Culvert #1 is a single barrel 10'x3' concrete box culvert (CBC). It crosses the intersection of Scottsdale Road and Center Street from Northeast to Southwest at a 48 degree angle. Channel #1 is designed to accept runoff from existing washes and concentrate runoff at the culvert inlet. It is a shallow trapezoidal channel, with a 10 ft. bottom width, 3:1 sideslopes, and a depth of 3 feet. The relatively short channel is riprap lined due to a steep design slope, chosen to match existing grades. Also, an additional segment of Channel #1 has been designed downstream of Culvert #1 to return the runoff to its historic location. Culvert and channel calculations can be found in **Appendix C.**

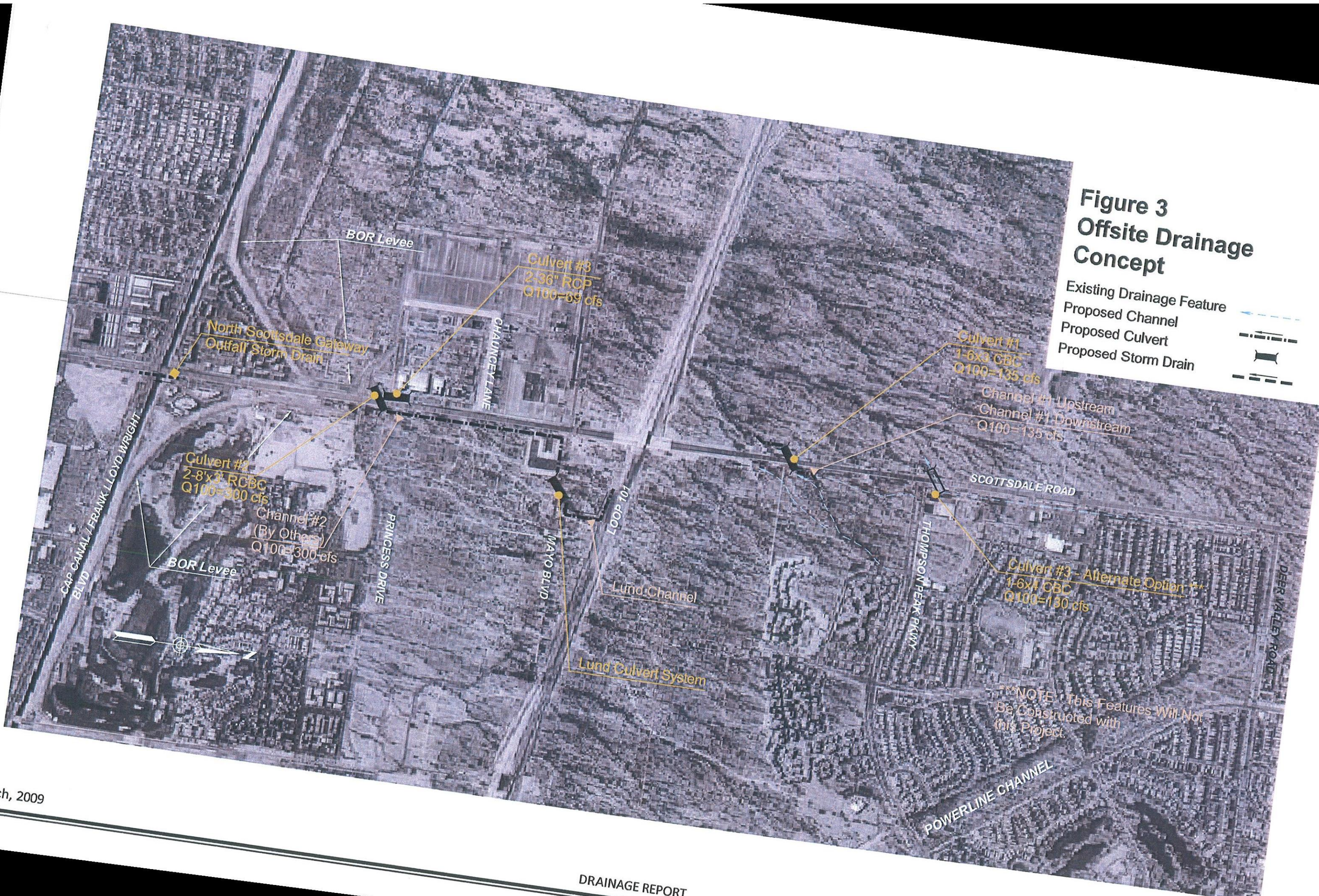


Figure 3
Offsite Drainage
Concept
Existing Drainage Feature
Proposed Channel
Proposed Culvert
Proposed Storm Drain
BOR Levee
Culvert #3
2-36" RCP
Q100=69 cfs
North Scottsdale Gateway
Outfall Storm Drain
CHAUNCEY LANE
Culvert #1
1-6x3 CBC
Q100=135 cfs
Channel #1 Upstream
Channel #1 Downstream
Q100=135 cfs
SCOTTSDALE ROAD
Culvert #2
2-8'x3' RCBC
Q100=300 cfs
Channel #2
(By Others)
Q100=300 cfs
PRINCESS DRIVE
MAYO BLVD
LOOP 101
BOR Levee
CAP CANAL / FRANK LLOYD WRIGHT BLVD
Lund Channel
Lund Culvert System
THOMPSON PEAK PKWY
Culvert #3 - Alternate Option **
1-6x4 CBC
Q100=130 cfs
DEER VALLEY ROAD
**NOTE: This Features Will Not
Be Constructed with
this Project
POWERLINE CHANNEL

One Scottsdale (formerly known as the Stack 40's) are a series of parcels planned for commercial development in the coming years. They front Scottsdale Road on the eastern side from Union Hills Drive to Thompson Peak Parkway, and they are being designed concurrently with this project. As part of **One Scottsdale**, the Scottsdale Road scenic easement where *Culvert #1* is being constructed will be redesigned. It will be necessary for the scenic easement to be designed to incorporate the culverts and drainage concept described in this report.

Culvert#2 is located 150 feet north of Princess Drive, approximate Scottsdale Road centerline station 125+00. Culvert #2 is a double barrel 8'x 3' CBC until it leaves the roadway corridor, at which point it becomes a double barrel 8'x4' CBC. This then ties into the existing box culvert beneath Princess Drive. Calculations for this culvert are done using XPStorm software and are provided in **Appendix C**. *Channel #2* is being designed by Wood, Patel & Associates and is documented in Reference #18.

Culvert #3

Culvert #2 also receives runoff from the frontage of the Automotive Group Realty automall by way of 2-36" storm drain pipes. The existing channel fronting the automall has been designed to accommodate additional offsite flow. However, at the southern end of the automall property there is no outfall for the channel, it simply ends. Culvert #3 begins here and ties into the box culvert (Culvert #2) crossing Scottsdale Road. As part of this drainage plan the existing low flow crossing at Chauncey Lane is removed and offsite flow is directed south in a channel (Channel #2) designed by Wood, Patel, & Associates. This greatly reduces the runoff reaching the automall frontage. The 100-year peak flow used for the design of Culvert #3 is 76 cfs. The peak flow was calculated using the Rational Method. The time of concentration was calculated based on pipe travel time for the Scottsdale Road storm drain outfalling to the automall frontage (36") plus the travel time in the frontage channel itself. The drainage area includes the drainage area contributing to the Scottsdale Road storm drain, the area of the automall frontage, and the west half-street pavement area between Union Hills Drive and the scupper at station 131+60. Calculations are provided in **Appendix C**.

D. North Scottsdale Gateway Retention and Outfall Design

As stated in section III.B.4, North Scottsdale Gateway (NSG) is a triangular shaped site located on the east side of Scottsdale Road, adjacent to and north of the Central Arizona Project Canal (CAP). The property was originally designed to retain both the onsite and offsite 100-year 2hr storm runoff, for which there existed no outfall and which ponded on the site prior to development. The total area of offsite runoff is bounded by the western limit of the Scottsdale Road right-of-way to the west, Princess Drive to the north, the BOR flood control berm to the east, and the CAP canal to south. See **Figure 2** on page 7.

With the widening of Scottsdale Road, the area of paved surface has increased beyond that which the previous drainage design anticipated. Also, the widened roadway extends into the area of the scenic corridor that is currently used for retention. The goal of the current project is to maximize the remaining area within the scenic corridor for retention and provide a system outfall to drain the basins and reduce the likelihood of stormwater runoff entering the CAP canal.

In calculating runoff volume, the relevant watershed area was divided into onsite and offsite areas. Onsite areas refer to the NSG property, the scenic easement, and the roadway half-street fronting the NSG. Offsite areas correspond to the western half street and the area upstream of the NSG property up to Princess Drive. Runoff generated north of Princess Drive drains to conveyances that outfall to the BOR storage impoundment areas. **Figure 4** shows the drainage area boundaries for each proposed retention basin.

Data for the runoff generated on the NSG property is obtained from the drainage report for the project *Master Drainage Report for North Scottsdale Gateway*. Offsite, roadway, and scenic easement runoff volumes are calculated using the equation presented din section 4-1.807 of the DSPM. These calculations were done using a spreadsheet and can be found in **Appendix D**.

During the planning stage of this project, when it was discovered that the retention basins existing in the scenic easement fronting the NSG would not be large enough to accommodate the 100 year 2 hour runoff volume for both the onsite and offsite runoff reaching the development and the CAP boundary, alternatives were presented to the city for consideration. It was decided at that time that retention basins would be used in the remaining scenic easement area, and a 24 inch outflow pipe would extend from the southernmost basin, across the canal and Frank Lloyd Wright Boulevard, finally tying into an existing 24 inch storm drain at the Promenade development. It was understood that this option would likely not provide 100-yr or 10-yr retention of the watershed area (including the NSG property) but runoff in excess of the provided capacity would outfall in a controlled manner to Scottsdale Road and continue south. Meeting minutes relevant to these discussions are provided in **Appendix D**. **Table 2** and **Figure 4** present the summary of runoff calculations and the capacity of the associated retention basins. Retention basins are cascading, each overflowing into the next or returning to the street when its capacity is exceeded. Small diameter drain pipes connect each basin so they may drain slowly. It can be seen in **Table 2** that the percent of the 100-year and 10-year volumes that are provided are 72% and 81% respectively. This suggests that the peak runoff values from these storms will be attenuated significantly, reducing the load on the 24" outfall pipe. Based on modeling of the 24" storm drain outfall system, its capacity is approximately 22cfs. However, because of the uncertainties associated with the capacity of the Promenade storm drain it is possible that the system could back up and not be capable of draining runoff from the NSG retention basins. This would be a relatively rare occurrence and last for a short duration. The Hydraflow model for the NSG outfall storm drain system is provided in **Appendix D**, titled *FLW_Stormdrain.stm.*

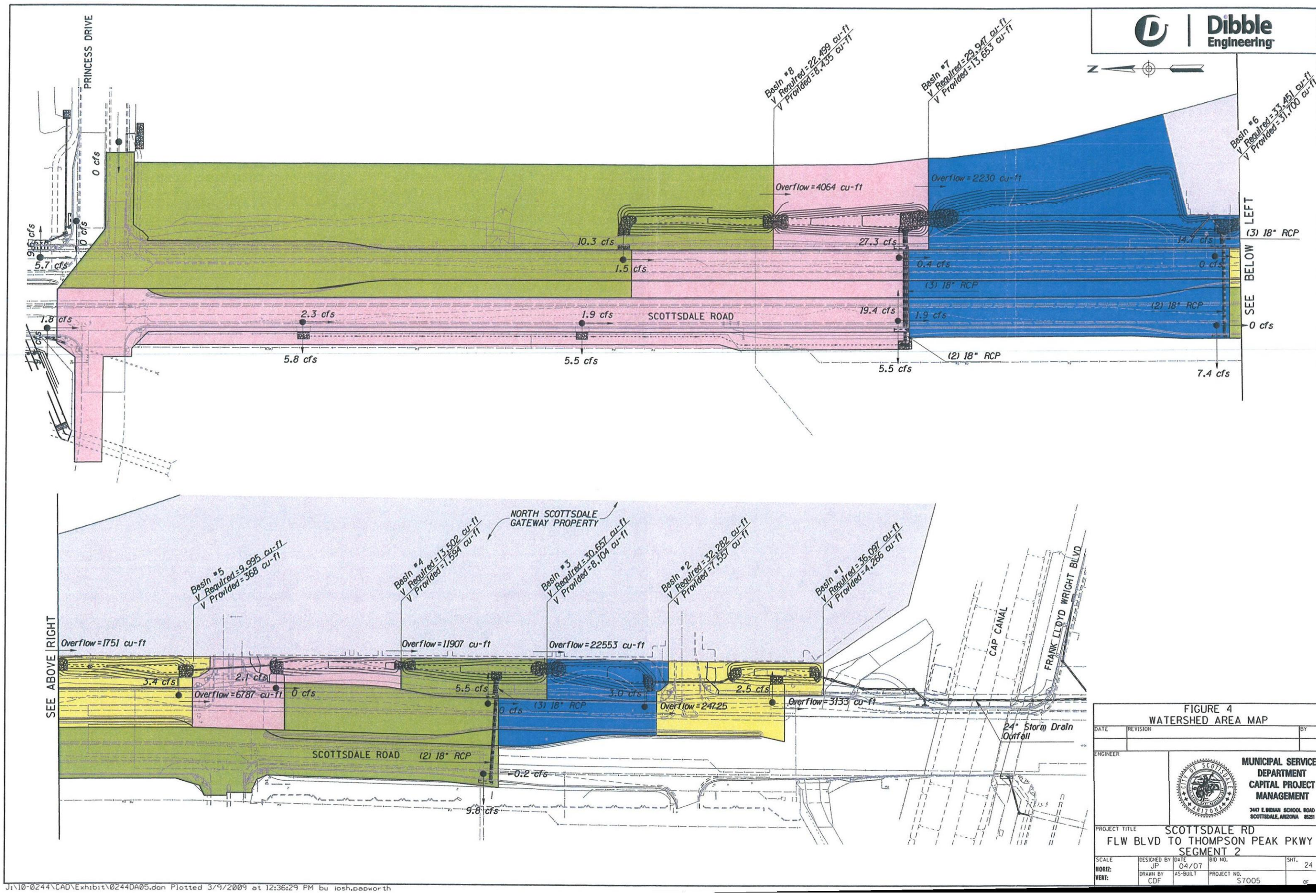
Table 2 – North Scottsdale Gateway Retention Summary

100 yr 2 hr - Proposed Design

	Volume Req'd	Volume Provided	Difference	Cumulative Difference
TOTAL BASIN #8	22499	8435	14064	14064
TOTAL BASIN #7	15883	13653	2230	16294
TOTAL BASIN #6	17157	31700	-14543	1751
TOTAL BASIN #5	8204	3168	5036	6787
TOTAL BASIN #4	6715	1594	5121	11907
TOTAL BASIN #3	18750	8104	10646	22553
TOTAL BASIN #2	9729	7557	2172	24725
TOTAL BASIN #1	11372	4766	6606	31331
Total	110308	78977		31331
			% Provided	**0.72**

10 yr 6 Hour - Proposed Design

	Volume Req'd	Volume Provided	Difference	Cumulative Difference
TOTAL BASIN #8	16649	8435	8214	8214
TOTAL BASIN #7	11753	13653	-1900	6314
TOTAL BASIN #6	12696	31700	-19004	0
TOTAL BASIN #5	6071	3168	2903	2903
TOTAL BASIN #4	4969	1594	3375	6277
TOTAL BASIN #3	13875	8104	5771	12048
TOTAL BASIN #2	7200	7557	-357	11691
TOTAL BASIN #1	8415	4766	3649	15340
Total	81628	78977		15340
			% Provided	**0.81**



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In order to convey the 100-yr 2-hr runoff volume to the retention basins, scuppers, catchbasins and cross road culverts south of Princess Drive have been designed for the 100 -year peak flows using the rational method. Output from the 100-year Hydraflow surface calculations and culvert calculations are provided in **Appendix D**. The following models are provided:

File Name	*Description*
100+74.44.stm	Analysis of cross road culvert at Station 100+74.44. 100-year peak flow.
107+23.stm	Analysis of cross road culvert at Station 107+23. 100-year peak flow.
111+82.stm	Analysis of cross road culvert at Station 111+82. 100-year peak flow.

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ADOT - HIGHWAY DRAINAGE DESIGN MANUAL - HYDROLOGY
RAINFALL DEPTH-DURATION-FREQUENCY (D-D-F) WORKSHEET

Project No.: 10-0244.2 TRACS No: N/A
Project Name: Scottsdale Road - Frank Lloyd Wright to Thompson Peak Pkwy Date: 22-Mar-07
Location/Sta: MARICOPA COUNTY, AZ
Designer: Josh Papworth

PART A
=======

Rainfall Depths from Isopluvials:

2-year, 6-hour =	1.30 in.
2-year, 24-hour =	1.70 in.
100-year, 6-hour =	3.30 in.
100-year, 24-hour=	4.05 in.

PART B
=======

2-year, 1-hour =	0.93 in.
100-year, 1-hour =	2.52 in.
2-year, 2-hour =	1.05 in.
2-year, 3-hour =	1.14 in.
2-year, 12-hour =	1.50 in.
100-year, 2-hour =	2.79 in.
100-year, 3-hour =	2.97 in.
100-year, 12-hour=	3.68 in.

PART C
=======

Zone = 8 (6 or 8)

2-year, 5-min =	0.31 in.
2-year, 10-min =	0.47 in.
2-year, 15-min =	0.57 in.
2-year, 30-min =	0.76 in.
100-year, 5-min =	0.76 in.
100-year, 10-min =	1.16 in.
100-year, 15-min =	1.49 in.
100-year, 30-min =	2.02 in.

Duration (Min)	|----- Ratio ----| 2-yr	100-yr
5	0.34	0.30
10	0.51	0.46
15	0.62	0.59
30	0.82	0.80

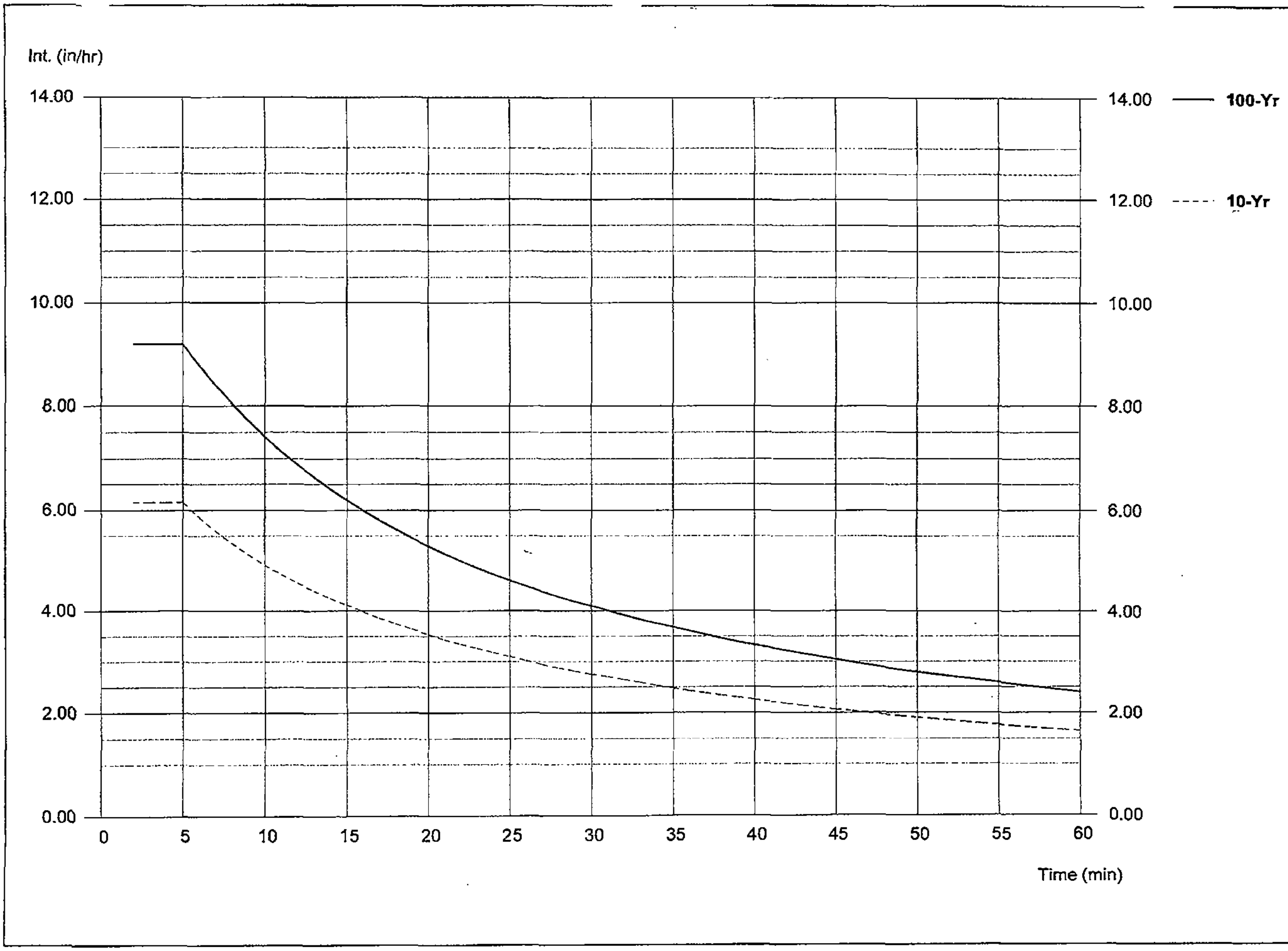
PART D & E
==== =======

Rainfall Depth, (in)

	Frequency (yrs)					
Duration	2-yr	5-yr	10-yr	25-yr	50-yr	500-yr
5-min =	0.31	0.42	0.50	0.60	0.68	0.94
10-min =	0.47	0.64	0.76	0.92	1.04	1.44
15-min =	0.57	0.80	0.95	1.16	1.33	1.86
30-min =	0.76	1.07	1.28	1.57	1.80	2.53
1-hour =	0.93	1.33	1.59	1.96	2.24	3.17
2-hour =	1.05	1.49	1.77	2.17	2.48	3.50
3-hour =	1.14	1.59	1.90	2.32	2.64	3.71
6-hour =	1.30	1.79	2.13	2.59	2.95	4.12
12-hour =	1.50	2.03	2.39	2.90	3.29	4.57
24-hour =	1.70	2.27	2.66	3.21	3.63	5.02

Storm Sewer IDF Curves

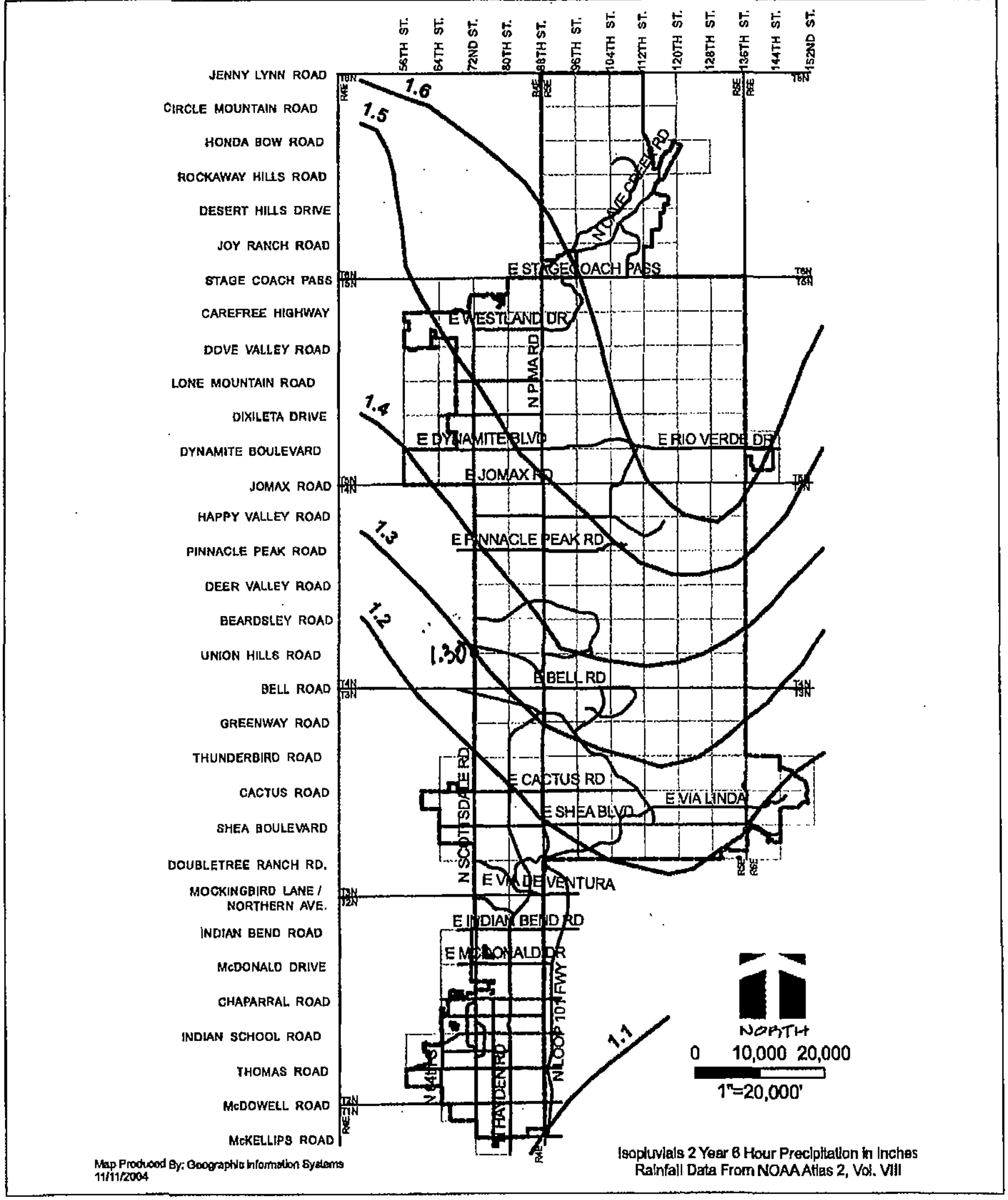
IDF file: ScottsdaleIDF.IDF



Hydraflow Storm Sewers 2003

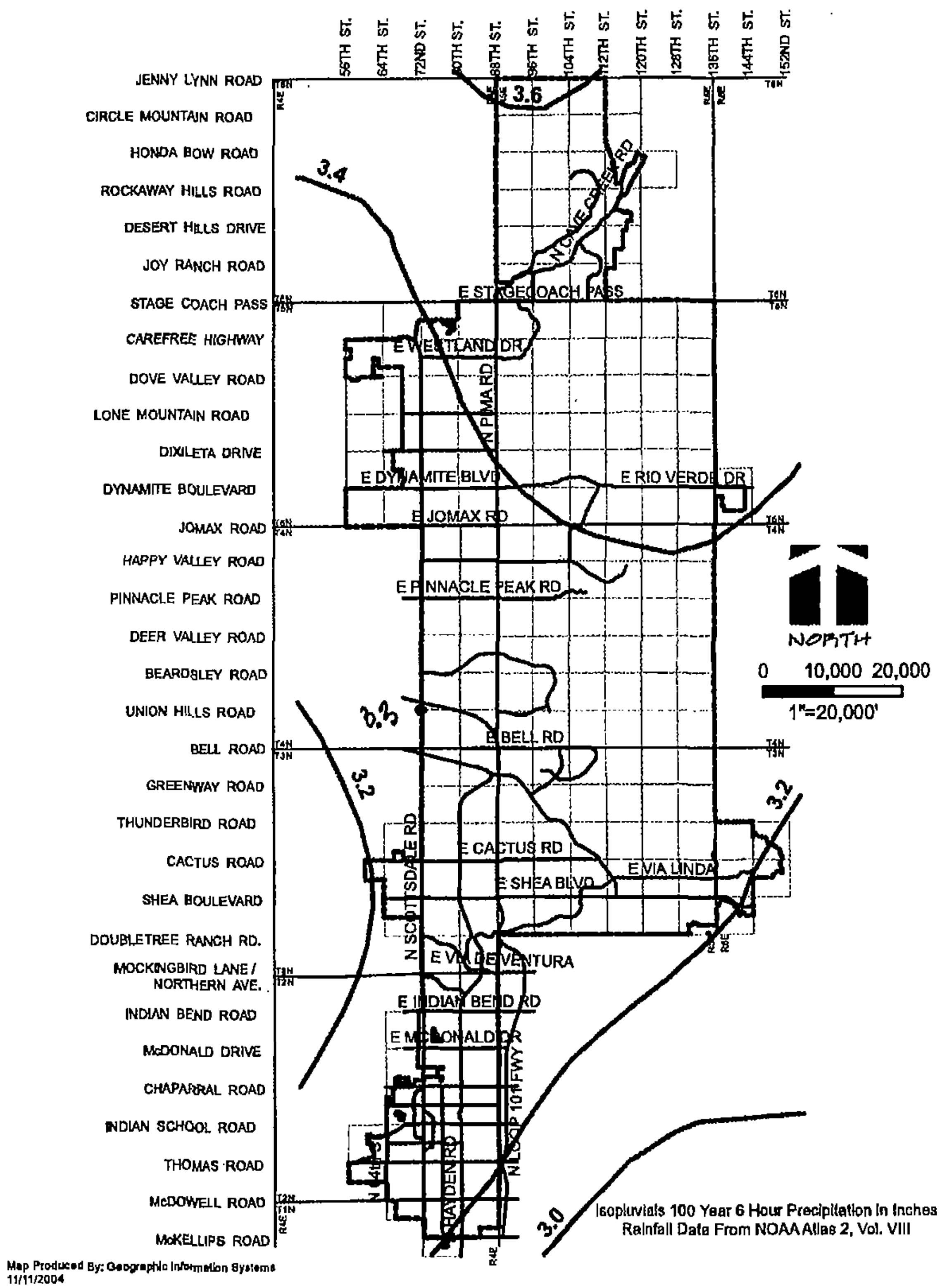
ISOPLUVIALS

2 Year 6 Hour Precipitation in Inches



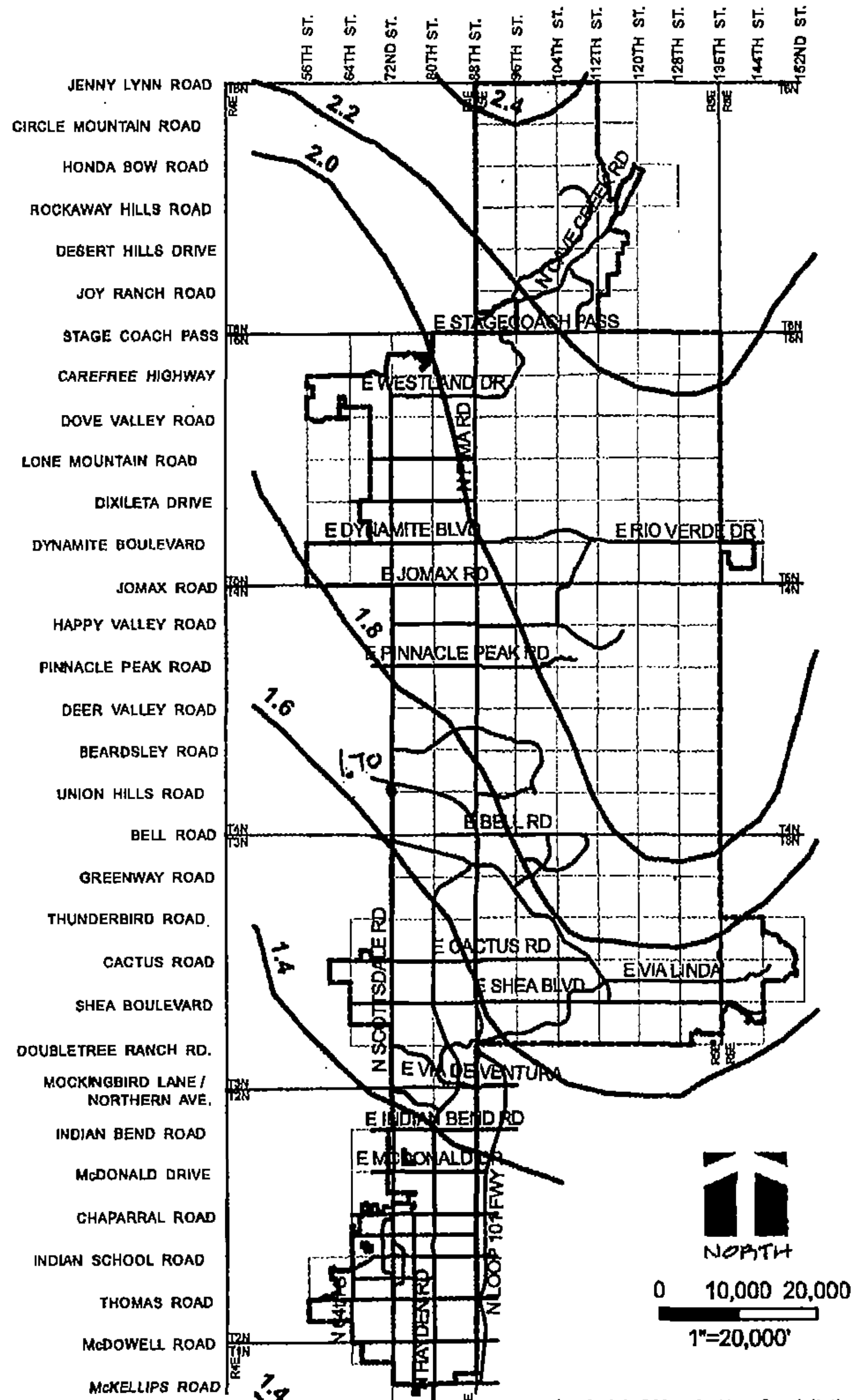
ISOPLUVIALS

100 Year 6 Hour Precipitation in Inches



ISOPLUVIALS

2 Year 24 Hour Precipitation in Inches

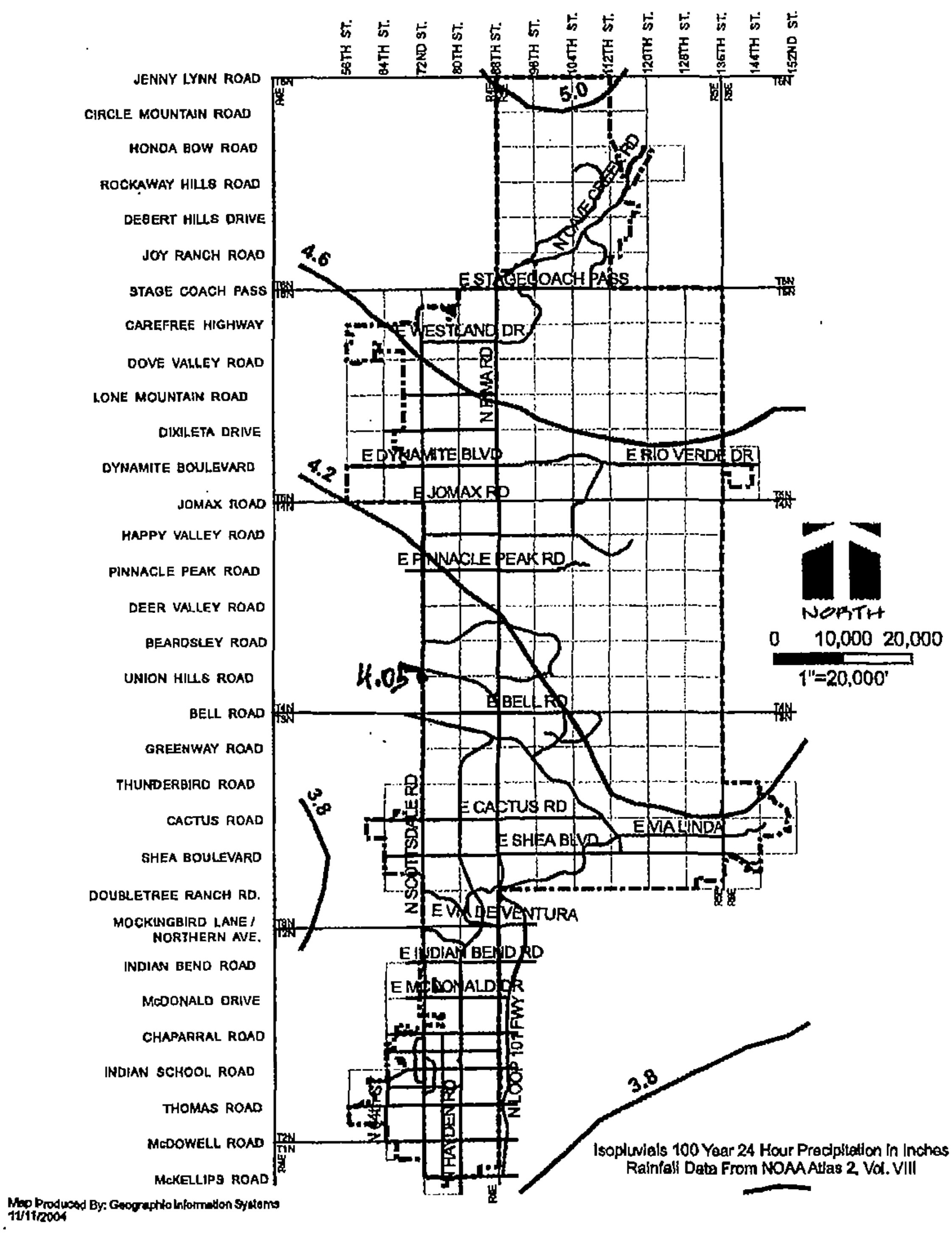


Map Produced By: Geographic Information Systems
11/11/2004

Isopluvials 2 Year 24 Hour Precipitation in Inches
Rainfall Data From NOAA Atlas 2, Vol. VIII

ISOPLUVIALS

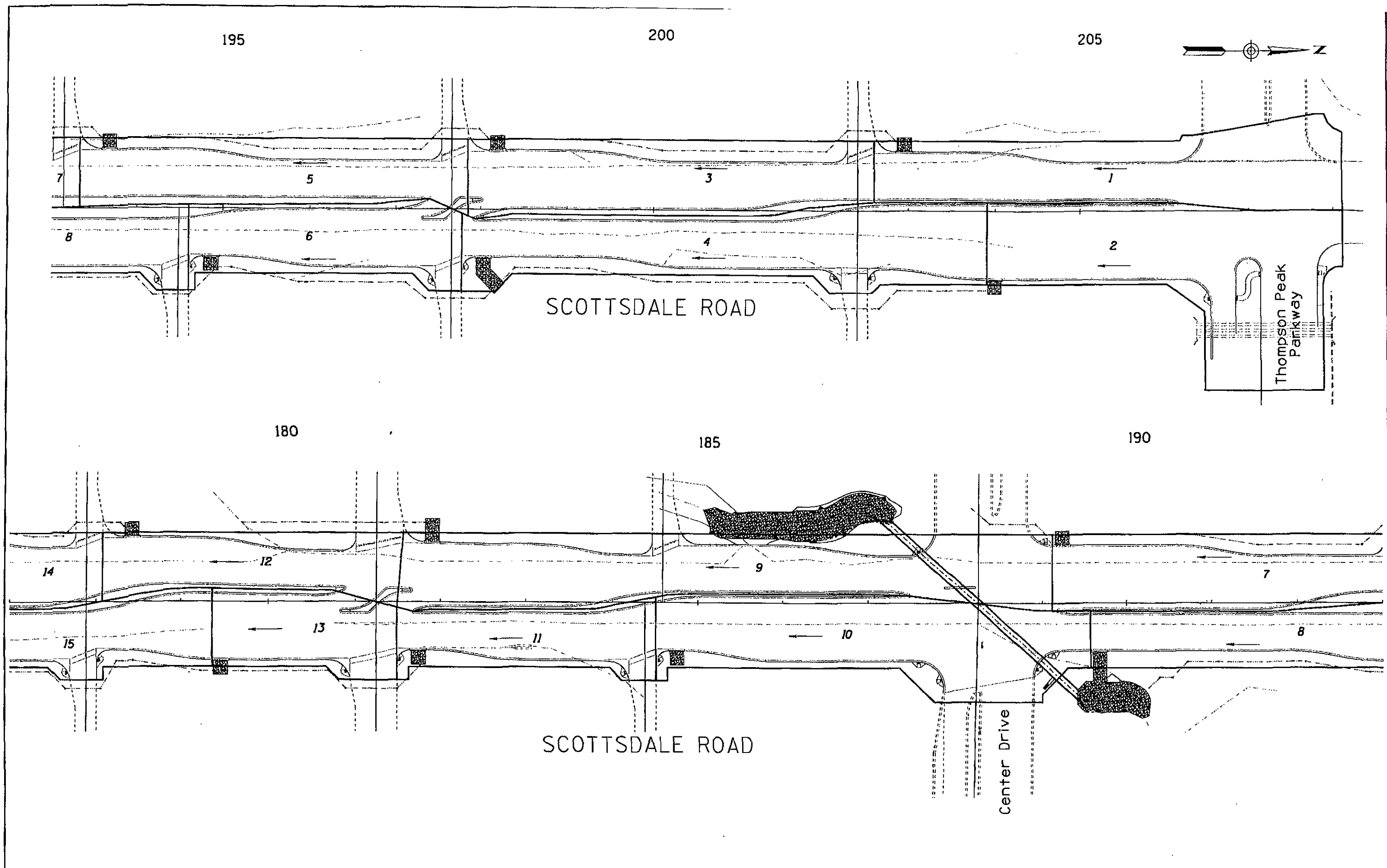
100 Year 24 Hour Precipitation in Inches



Appendix B
Roadway Drainage Calculations

Scottsdale Road - Segment 2
Drainage Area Summary Sheet

Drainage Area	AREA (ac)	S-l (ft/ft)	S-x (ft/ft)	Lc (min.)
1	0.998	0.016	0.022	5
2	1.284	0.025	0.020	5
3	0.917	0.015	0.018	5
4	1.118	0.015	0.022	5
5	0.784	0.015	0.020	5
6	0.611	0.015	0.021	5
7	0.844	0.018	0.010	5
8	0.836	0.017	0.014	5
9	1.377	0.015	0.018	5
10	1.077	0.006	0.020	5
11	0.492	0.011	0.024	5
12	0.553	0.015	0.025	5
13	0.443	0.020	0.019	5
14	0.696	0.024	0.019	5
15	0.593	0.012	0.026	5
16	0.398	0.012	0.020	5
17	0.703	0.013	0.025	5
18	0.800	0.018	0.020	5
19	0.674	0.017	0.020	5
20	0.989	0.018	0.020	5
21	0.951	0.013	0.020	5
22	0.741	0.015	0.024	5
23	0.844	0.014	0.014	5
24	0.653	0.007	0.021	5
25	0.845	0.000	0.022	5
26	1.510	0.016	0.026	5
27	1.245	0.011	0.022	5
28	0.242	0.0072	0.013	5
29	0.238	0.0041	0.023	5
30	0.221	0.0055	0.017	5
31	0.809	0.0000	0.021	5
32	0.400	0.0040	0.023	5
33	0.694	0.0000	0.03	5
34	0.819	0.013	0.023	5
35	0.701	0.013	0.016	5
36	0.627	0.012	0.009	5
37	0.597	0.013	0.012	5
38	1.148	0.017	0.025	5
39	0.889	0.016	0.022	5
40	0.911	0.011	0.025	5
41	0.814	0.016	0.022	5
~~42~~	~~0.877~~	~~0.018~~	~~0.014~~	~~5~~
43	0.770	0.007	0.021	5
44	1.310	0.013	0.010	5
45	0.632	0.009	0.011	5
46	0.718	0.014	0.024	5
47	0.785	0.014	0.021	5
48	0.252	0.0060	0.017	5
49	0.100	0.0120	0.023	5
50	0.591	0.012	0.021	5
51	0.699	0.012	0.023	5
52	0.750	0.014	0.022	5
53	0.793	0.014	0.022	5
54	0.797	0.006	0.024	5
55	0.778	0.005	0.028	5
56	1.140	0.009	0.033	5
57	0.390	0.013	0.027	5
58	0.238	0.017	0.009	5
59	0.632	0.006	0.022	5
60	0.818	0.006	0.025	5
61	0.337	0.010	0.029	5
62	0.278	0.008	0.031	5
63	0.424	0.012	0.015	5
64	0.623	0.012	0.019	5
65	2.960	-	-	5
66	2.060	-	-	5



Scottsdale Road - Segments 1 & 2
Drainage Areas
1" =100'

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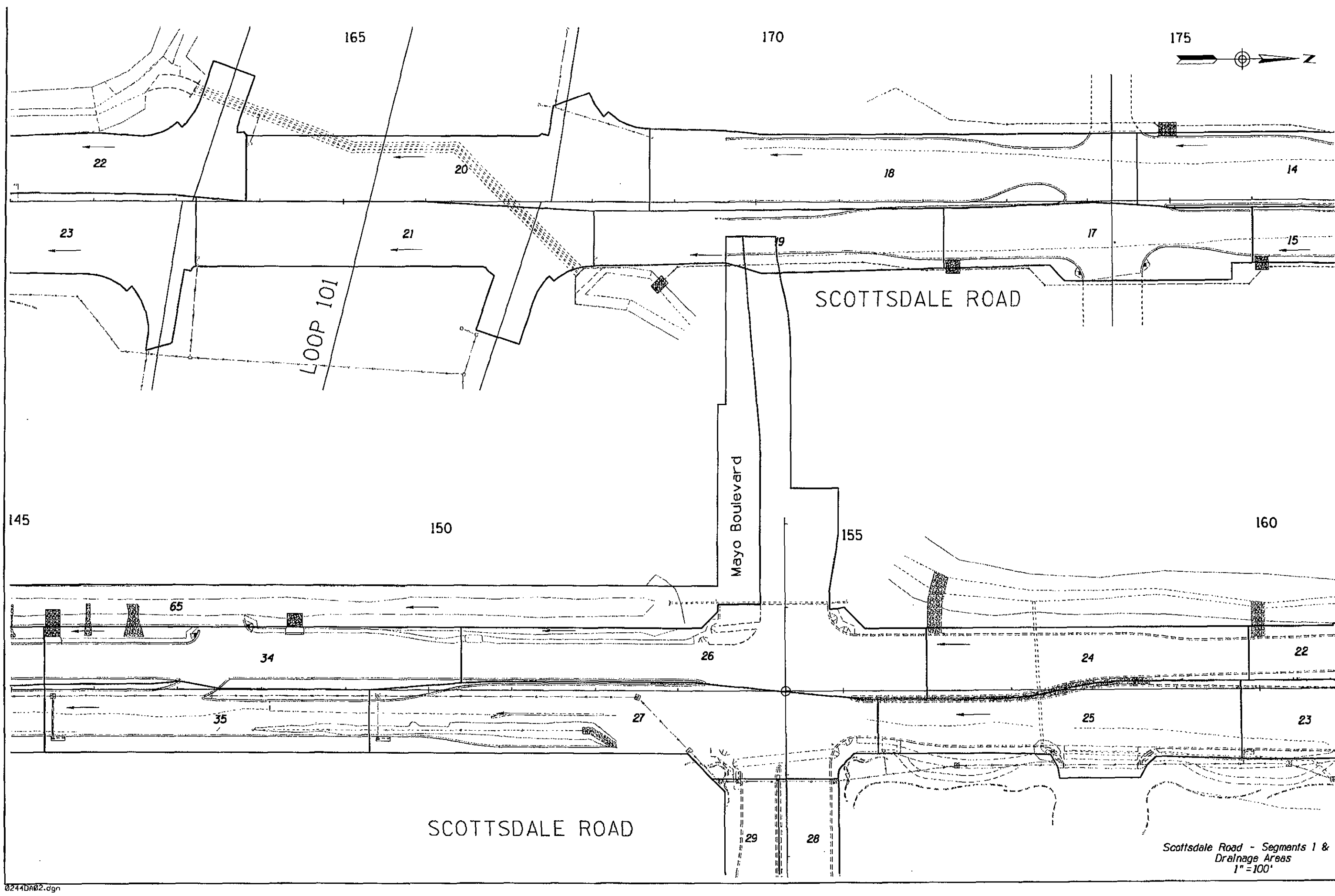
165
170
175
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22
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21
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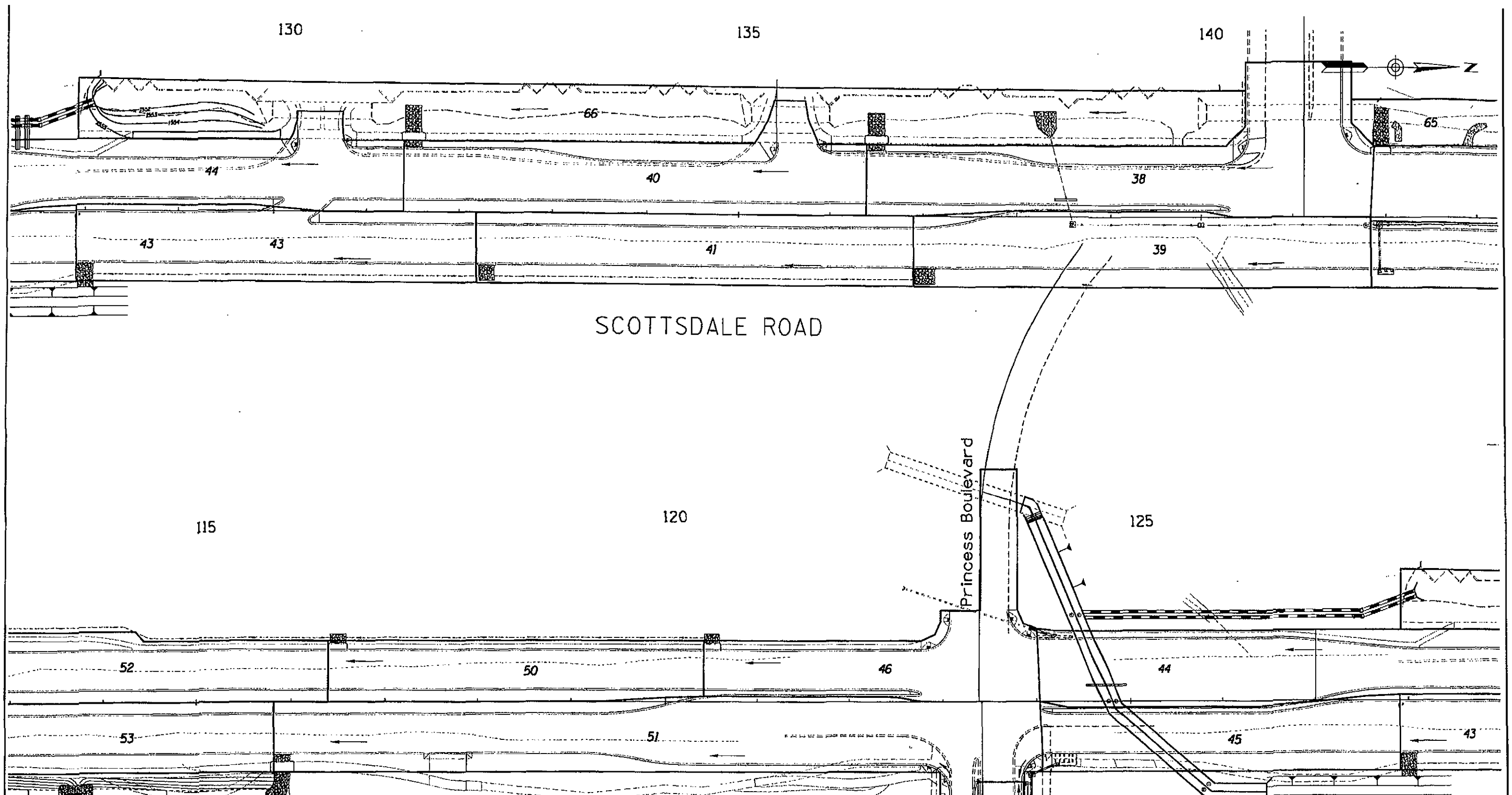
15
SCOTTSDALE ROAD
LOOP 101
Mayo Boulevard
145
150
155
160
65
34
26
24
22
35
27
25
23
SCOTTSDALE ROAD
29
28
Scottsdale Road - Segments 1 & 2
Drainage Areas
1" =100'
0244DA02.dgn



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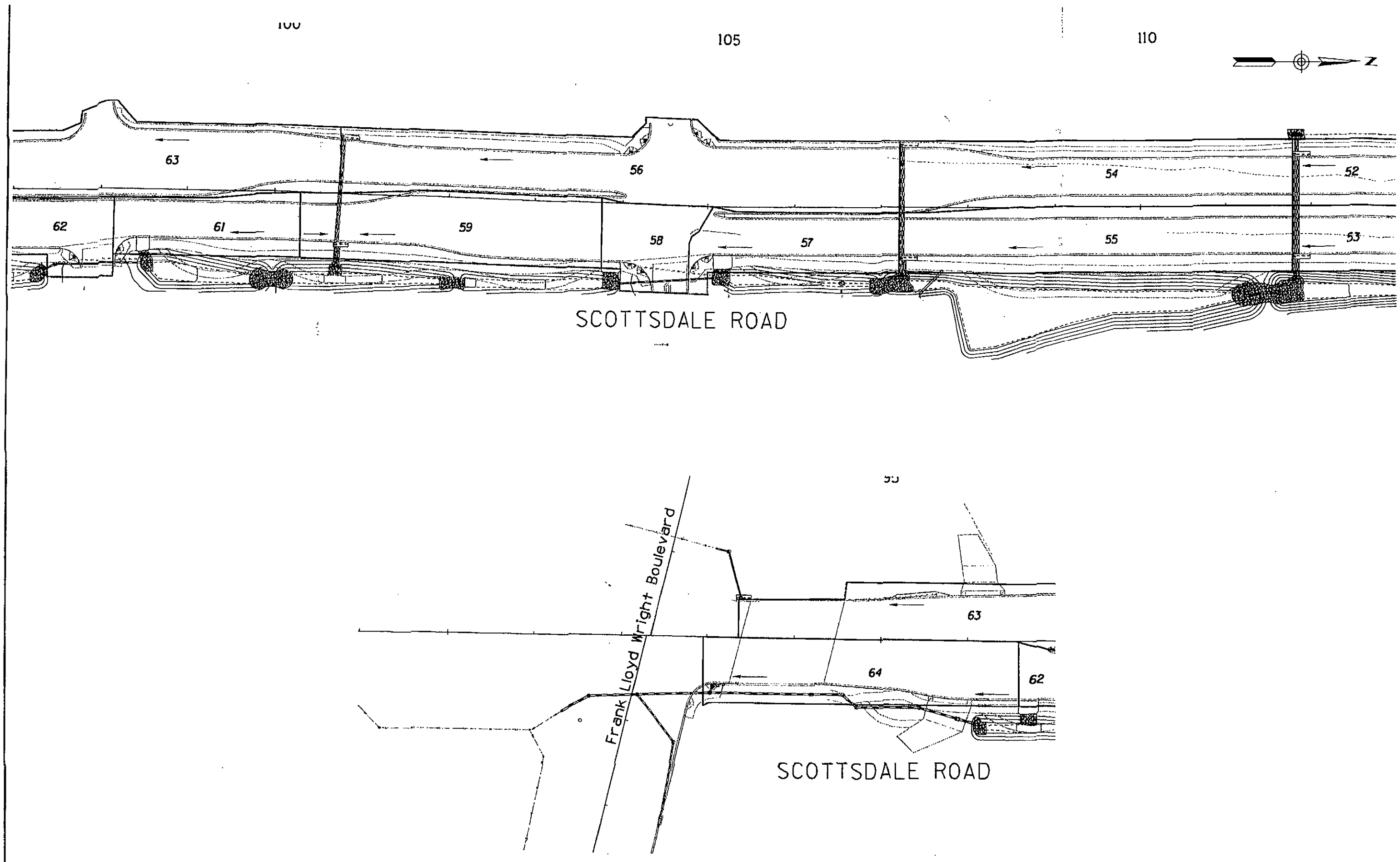

Scottsdale Road - Segments 1 & 2
Drainage Areas
1" = 100'

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DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

Scottsdale Road
Channel Design

Date	23-Mar-07
Job No.	10-0244
By	JEP
RCE	
Chk'd	BJF
Filepath: J:\10-0244\EXCEL\DRAINAGE\CHANNDES.xls	

TYPICAL SECTION - MANNINGS RATING CURVES

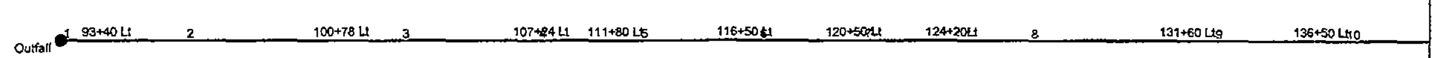
Channel: SCOTTSDALE ROAD - Typical Calculation for Roadside Ditch - 10Yr

INPUT DATA:

Manning's n =	0.024 Compacted Soil
T allow =	0.30 lb/ft^2
Sideslope Left =	4.0 :1
Sideslope Right =	4.0 :1
Bottom slope =	0.0 percent

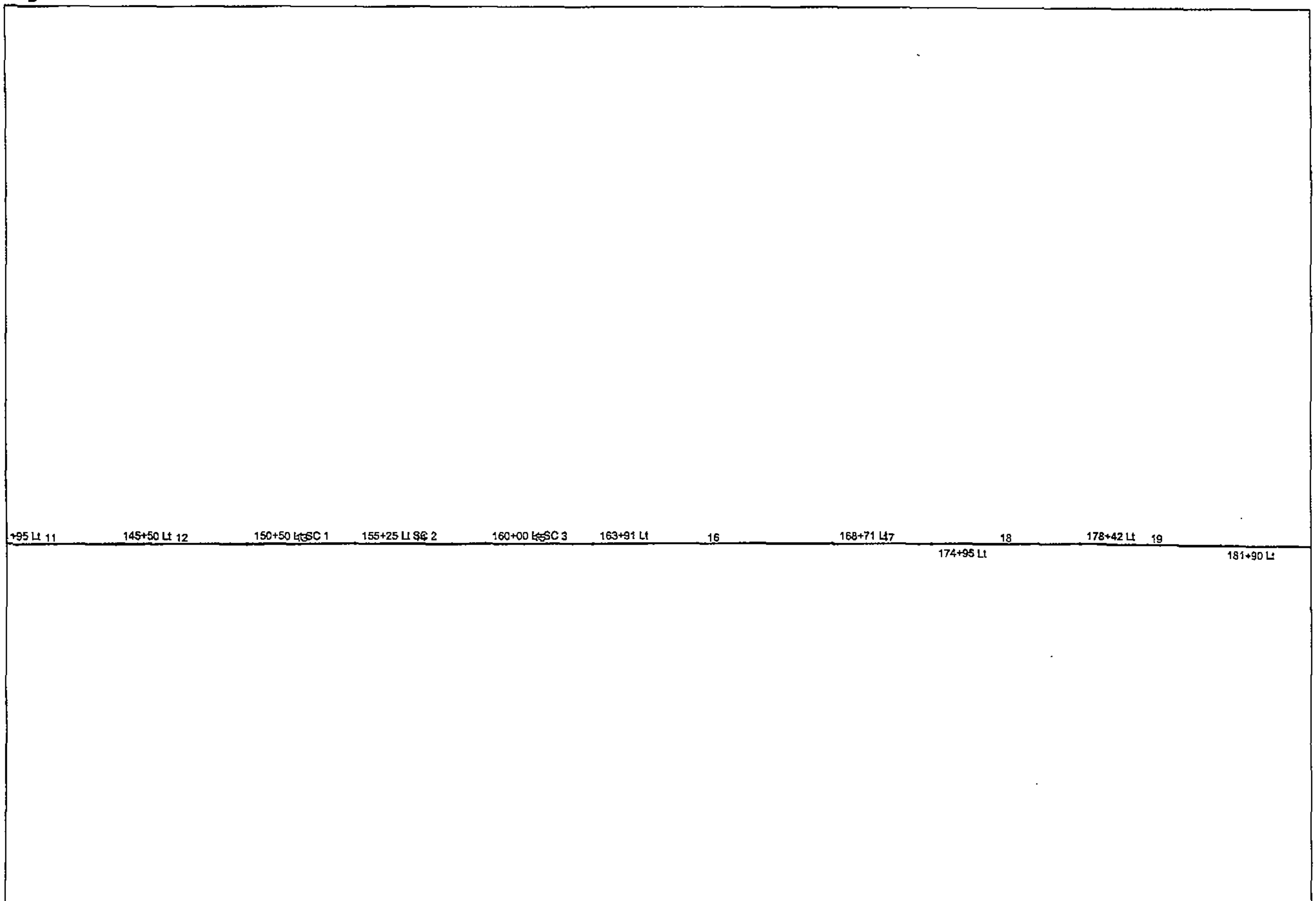
												Topwidth			
Reach	Slope	BW (ft)	t	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Roadside Ditch	0.0150	**0.0**	0.0	0.92	**4.43**	0.024	15.0	1.15	0.42	1.00	1.92	7.36	**15.36**	22.08	0.20
Roadside Ditch	0.0150	0.0	0.0	0.79	**4.00**	0.024	10.0	1.12	0.36	1.00	1.79	6.32	**14.32**	18.97	0.17
Roadside Ditch	0.0150	0.0	0.0	0.61	**3.37**	0.024	5.0	1.07	0.28	1.00	1.61	4.88	**12.88**	14.63	0.12
Roadside Ditch	0.0100	0.0	0.0	0.99	**3.80**	0.024	15.0	0.95	0.30	1.00	1.99	7.94	**15.94**	23.83	0.15
Roadside Ditch	0.0100	0.0	0.0	0.85	**3.44**	0.024	10.0	0.93	0.26	1.00	1.85	6.82	**14.82**	20.47	0.12
Roadside Ditch	0.0100	0.0	0.0	0.66	**2.89**	0.024	5.0	0.89	0.20	1.00	1.66	5.26	**13.26**	15.78	0.09
Roadside Ditch	0.0050	0.0	0.0	1.13	**2.93**	0.024	15.0	0.69	0.17	1.00	2.13	9.05	**17.05**	27.14	0.09
Roadside Ditch	0.0050	0.0	0.0	0.97	**2.65**	0.024	10.0	0.67	0.15	1.00	1.97	7.77	**15.77**	23.31	0.07
Roadside Ditch	0.0050	0.0	0.0	0.75	**2.23**	0.024	5.0	0.64	0.11	1.00	1.75	5.99	**13.99**	17.97	0.05

Hyd. flow Storm Sewers Extension for . itoCAD® Civil 3D® 2009 Plan



Project File: SurfaceCalcs_West.stm	Number of lines: 23	Date: 03-02-2009

Hyd. .flow Storm Sewers Extension for . .utoCAD® Civil 3D® 2009 Plan



Project File: SurfaceCalcs_West.stm	Number of lines: 23	Date: 03-02-2009

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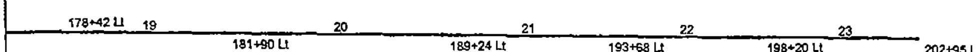
Hyd flow Storm Sewers Extension for ıtoCAD® Civil 3D® 2009 Plan



Project File: SurfaceCalcs_West.stm	Number of lines: 23	Date: 03-02-2009

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	50.0	1.06	20.99	0.95	1.01	19.94	5.0	310.9	0.4	7.52	0.00	0.27	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
2	1	840.0	1.14	19.93	0.95	1.08	18.93	5.0	295.7	0.4	7.49	0.00	0.26	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
3	2	730.0	0.80	18.79	0.95	0.76	17.85	5.0	282.4	0.4	7.38	0.00	0.26	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
4	3	270.0	0.75	17.99	0.95	0.71	17.09	5.0	277.4	0.4	7.18	0.00	0.25	72	0.00	1.00	1.00	7.01	7.00	0.00	0.00	Dummy Line
5	4	470.0	0.59	17.24	0.95	0.56	16.38	5.0	268.6	0.4	7.10	0.00	0.25	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
6	5	400.0	0.72	16.65	0.95	0.68	15.82	5.0	261.1	0.4	7.04	0.00	0.25	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
7	6	365.0	0.43	15.93	0.95	0.41	15.13	5.0	254.2	0.5	6.91	0.00	0.24	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
8	7	235.0	0.88	15.50	0.95	0.84	14.73	5.0	249.8	0.5	6.84	0.00	0.24	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
9	8	500.0	0.91	14.62	0.95	0.86	13.89	5.0	240.1	0.5	6.70	0.00	0.24	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
10	9	355.0	1.15	13.71	0.95	1.09	13.02	5.0	233.1	0.5	6.46	0.00	0.23	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
11	10	500.0	0.63	12.56	0.95	0.60	11.93	5.0	222.8	0.5	6.18	0.00	0.22	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
12	11	475.0	0.82	11.93	0.95	0.78	11.33	5.0	213.0	0.5	6.12	0.00	0.22	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
13	12	475.0	1.51	11.11	0.95	1.43	10.55	5.0	203.0	0.6	5.96	0.00	0.21	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
14	13	391.0	0.79	9.60	0.95	0.75	9.12	5.0	194.0	0.6	5.38	0.00	0.19	72	0.00	1.00	1.00	7.02	7.01	0.00	0.00	Dummy Line
15	14	475.0	0.75	8.81	0.95	0.71	8.37	5.0	182.6	0.6	5.22	0.00	0.18	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
16	15	391.0	0.68	8.06	0.95	0.65	7.66	5.0	172.9	0.7	5.02	0.00	0.18	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
17	16	874.0	1.20	7.38	0.95	1.14	7.01	5.0	152.1	0.7	5.18	0.00	0.18	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
18	17	359.2	0.70	6.18	0.95	0.67	5.87	5.0	142.4	0.8	4.60	0.00	0.16	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
19	18	540.0	0.55	5.48	0.95	0.52	5.21	5.0	127.3	0.9	4.52	0.00	0.16	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
20	19	515.0	1.38	4.93	0.95	1.31	4.68	5.0	112.9	1.0	4.52	0.00	0.16	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
21	20	685.0	0.84	3.55	0.95	0.80	3.37	5.0	89.6	1.2	3.99	0.00	0.14	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line

Project File: SurfaceCalcs_West.stm | Number of lines: 24 | Run Date: 03-22-2007

NOTES: Intensity = 129.35 / (Inlet time + 15.50) ^ 1.01; Return period = 10 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	21	500.0	0.79	2.71	0.95	0.75	2.57	5.0	69.8	1.5	3.75	0.00	0.13	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
23	22	500.0	0.92	1.92	0.95	0.87	1.82	5.0	45.4	2.1	3.74	0.00	0.13	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line
24	23	500.0	1.00	1.00	0.95	0.95	0.95	5.0	5.0	6.1	5.84	0.00	0.21	72	0.00	1.00	1.00	7.02	7.02	0.00	0.00	Dummy Line

Project File: SurfaceCalcs_West.stm | Number of lines: 24 | Run Date: 03-22-2007

NOTES: Intensity = 129.35 / (Inlet time + 15.50) ^ 1.01; Return period = $\boxed{\text{10 Yrs.}}$

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter Depth (ft)	Gutter Spread (ft)	Inlet Depth (ft)	Inlet Spread (ft)	Inlet Depr (in)	Byp line No
1	93+40 Lt	6.19	0.00	4.92	1.27	Curb	3.0	12.80	0.00	0.00	0.00	0.012	1.42	0.058	0.015	0.015	0.30	15.86	0.47	14.67	3.0	Off
2	100+78 Lt	6.66	0.00	6.66	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.009	1.42	0.058	0.033	0.015	0.38	10.59	0.57	9.76	3.0	1
3	107+24 Lt	4.67	0.07	4.74	0.00	Curb	3.0	16.00	0.00	0.00	0.00	Sag	1.42	0.058	0.024	0.000	0.26	8.84	0.46	8.84	3.0	Off
4	111+80 Lt	4.38	0.72	5.03	0.07	Curb	3.0	16.00	0.00	0.00	0.00	0.014	1.42	0.058	0.022	0.015	0.30	11.27	0.47	10.09	3.0	3
5	116+50 Lt	3.44	0.73	3.45	0.72	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.021	0.015	0.28	11.07	0.45	9.76	3.0	4
6	120+50 Lt	4.20	0.04	3.51	0.73	Curb	3.0	9.60	0.00	0.00	0.00	0.014	1.42	0.058	0.024	0.015	0.29	9.95	0.46	8.67	3.0	5
7	124+20Lt	7.65	2.88	10.49	0.04	Curb	3.0	29.60	0.00	0.00	0.00	0.010	1.42	0.058	0.013	0.015	0.35	22.59	0.52	21.68	3.0	6
8	131+60 Lt	5.32	3.11	5.55	2.88	Curb	3.0	9.60	0.00	0.00	0.00	0.011	1.42	0.058	0.025	0.015	0.38	13.25	0.56	12.40	3.0	7
9	136+50 Lt	6.71	3.55	7.15	3.11	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.025	0.015	0.37	13.13	0.56	12.28	3.0	8
10	141+95 Lt	3.68	3.64	3.77	3.55	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.009	0.015	0.28	23.27	0.45	22.00	3.0	9
11	145+50 Lt	4.79	4.35	5.49	3.64	Curb	3.0	9.60	0.00	0.00	0.00	0.013	1.42	0.058	0.023	0.015	0.37	13.93	0.55	13.04	3.0	10
12	150+50 Lt SC 1	8.82	1.35	5.82	4.35	Curb	3.0	9.60	0.00	0.00	0.00	0.016	1.42	0.058	0.026	0.015	0.38	12.91	0.56	12.08	3.0	11
13	155+25 Lt SC 2	4.61	1.40	4.67	1.35	Curb	3.0	9.60	0.00	0.00	0.00	0.007	1.42	0.058	0.021	0.015	0.35	14.12	0.53	13.19	3.0	12
14	160+00 Lt SC 3	4.38	1.08	4.06	1.40	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.024	0.015	0.31	10.82	0.48	9.67	3.0	13
15	163+91 Lt	3.97	2.38	5.27	1.08	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.020	0.015	0.32	13.20	0.49	12.10	3.0	14
16	168+71 Lt	7.01	1.27	5.90	2.38	Curb	3.0	12.80	0.00	0.00	0.00	0.018	1.42	0.058	0.020	0.015	0.33	13.75	0.50	12.70	3.0	15
17	174+95 Lt	4.09	3.90	6.72	1.27	Curb	3.0	12.80	0.00	0.00	0.00	0.012	1.42	0.058	0.029	0.015	0.38	11.65	0.56	10.79	3.0	16
18	178+42 Lt	3.21	6.31	5.62	3.90	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.025	0.015	0.37	13.09	0.55	12.20	3.0	17
19	181+90 Lt	8.06	3.96	5.72	6.31	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.018	0.015	0.37	17.51	0.55	16.67	3.0	18
20	189+24 Lt	4.90	2.78	3.73	3.96	Curb	3.0	9.60	0.00	0.00	0.00	0.018	1.42	0.058	0.010	0.015	0.27	20.58	0.44	19.20	3.0	19
21	193+68 Lt	4.61	2.75	4.58	2.78	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.020	0.015	0.33	13.60	0.50	12.55	3.0	20
22	198+20 Lt	5.37	1.75	4.37	2.75	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.018	0.015	0.31	14.34	0.49	13.22	3.0	21
23	202+95 Lt	5.84	0.00	4.09	1.75	Curb	3.0	9.60	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.31	11.59	0.48	10.41	3.0	22

Project File: SurfaceCalcs_West.stm   Number of lines: 23   Run Date: 03-02-2009

NOTES: Inlet N-Values = 0.016 ; Intensity = 129.35 / (Inlet time + 15.50) ^ 1.01; Return period = 10 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

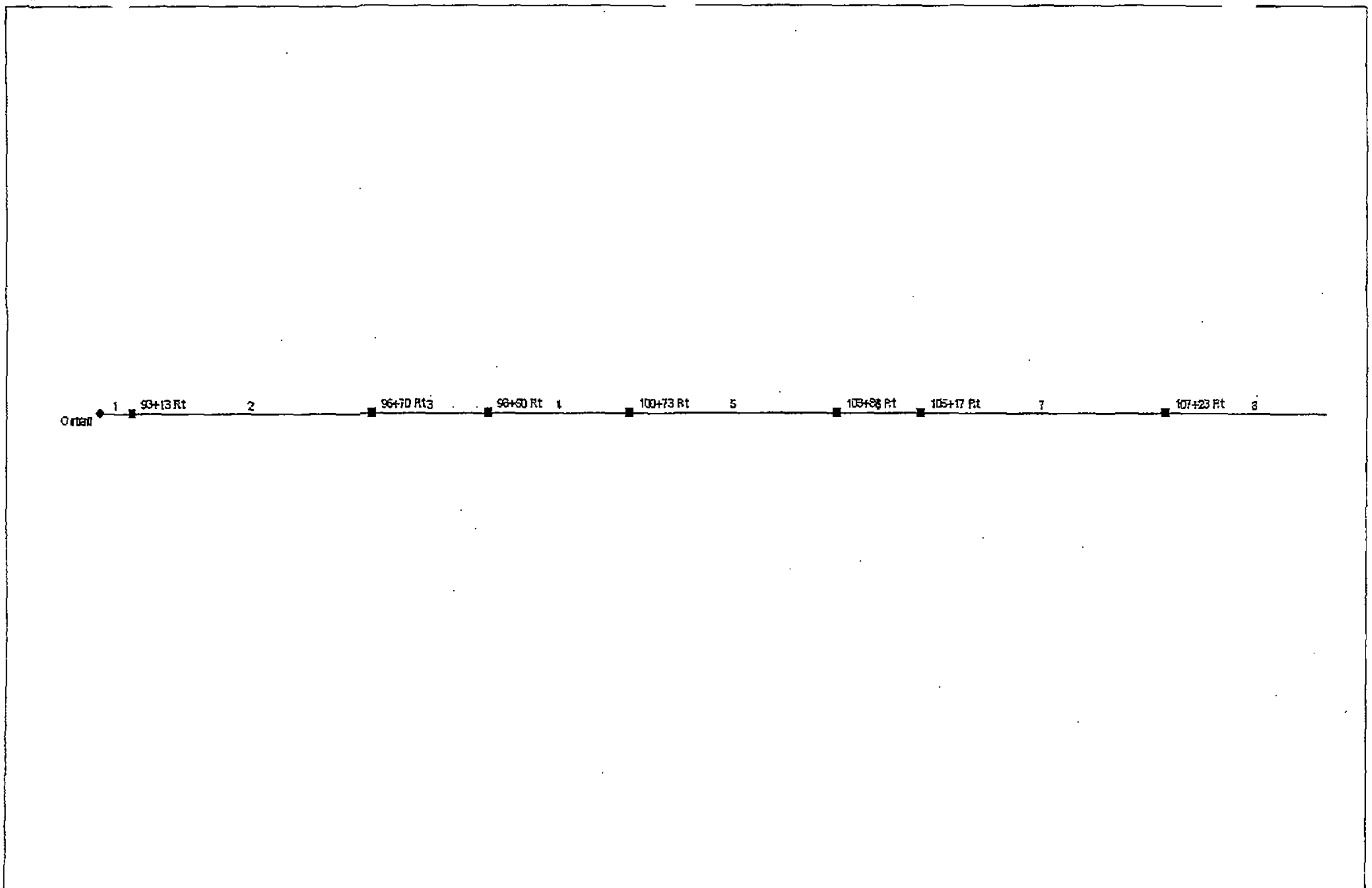
Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter Depth (ft)	Gutter Spread (ft)	Inlet Depth (ft)	Inlet Spread (ft)	Inlet Depr (in)	Byp line No
1	93+40 Lt	9.26	0.58	6.41	3.43	Curb	3.0	12.80	0.00	0.00	0.00	0.012	1.42	0.058	0.015	0.015	0.35	19.00	0.52	18.00	3.0	Off
2	100+78 Lt	9.96	0.00	9.38	0.58	Curb	3.0	16.00	0.00	0.00	0.00	0.009	1.42	0.058	0.033	0.015	0.44	12.35	0.63	11.64	3.0	1
3	107+24 Lt	6.99	1.96	8.95	0.00	Curb	3.0	16.00	0.00	0.00	0.00	Sag	1.42	0.058	0.024	0.000	0.37	13.53	0.57	13.53	3.0	Off
4	111+80 Lt	6.55	3.74	8.33	1.96	Curb	3.0	16.00	0.00	0.00	0.00	0.014	1.42	0.058	0.022	0.015	0.38	14.77	0.56	13.91	3.0	3
5	116+50 Lt	5.16	4.02	5.43	3.74	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.021	0.015	0.37	14.97	0.55	14.10	3.0	4
6	120+50 Lt	6.29	3.40	5.67	4.02	Curb	3.0	9.60	0.00	0.00	0.00	0.014	1.42	0.058	0.024	0.015	0.38	13.70	0.56	12.83	3.0	5
7	124+20Lt	11.45	9.53	17.57	3.40	Curb	3.0	29.60	0.00	0.00	0.00	0.010	1.42	0.058	0.013	0.015	0.43	29.39	0.61	28.72	3.0	6
8	131+60 Lt	7.96	9.89	8.32	9.53	Curb	3.0	9.60	0.00	0.00	0.00	0.011	1.42	0.058	0.025	0.015	0.49	17.65	0.67	17.00	3.0	7
9	136+50 Lt	10.05	10.27	10.44	9.89	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.025	0.015	0.47	17.05	0.66	16.40	3.0	8
10	141+95 Lt	5.51	10.12	5.35	10.27	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.009	0.015	0.35	31.16	0.52	30.22	3.0	9
11	145+50 Lt	7.17	10.78	7.83	10.12	Curb	3.0	9.60	0.00	0.00	0.00	0.013	1.42	0.058	0.023	0.015	0.46	18.01	0.65	17.35	3.0	10
12	150+50 Lt SC 1	13.20	5.62	8.03	10.78	Curb	3.0	9.60	0.00	0.00	0.00	0.016	1.42	0.058	0.026	0.015	0.47	16.33	0.66	15.69	3.0	11
13	155+25 Lt SC 2	6.90	5.87	7.15	5.62	Curb	3.0	9.60	0.00	0.00	0.00	0.007	1.42	0.058	0.021	0.015	0.45	18.83	0.63	18.19	3.0	12
14	160+00 Lt SC 3	6.55	5.64	6.33	5.87	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.024	0.015	0.40	14.74	0.58	13.96	3.0	13
15	163+91 Lt	5.94	8.03	8.33	5.64	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.020	0.015	0.41	17.85	0.59	17.10	3.0	14
16	168+71 Lt	10.49	6.16	8.62	8.03	Curb	3.0	12.80	0.00	0.00	0.00	0.018	1.42	0.058	0.020	0.015	0.41	17.95	0.59	17.20	3.0	15
17	174+95 Lt	6.12	10.55	10.50	6.16	Curb	3.0	12.80	0.00	0.00	0.00	0.012	1.42	0.058	0.029	0.015	0.49	15.41	0.68	14.79	3.0	16
18	178+42 Lt	4.81	13.70	7.96	10.55	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.025	0.015	0.47	16.85	0.65	16.20	3.0	17
19	181+90 Lt	12.06	9.22	7.57	13.70	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.018	0.015	0.45	21.79	0.63	21.11	3.0	18
20	189+24 Lt	7.34	6.79	4.91	9.22	Curb	3.0	9.60	0.00	0.00	0.00	0.018	1.42	0.058	0.010	0.015	0.33	25.98	0.50	25.00	3.0	19
21	193+68 Lt	6.90	6.04	6.15	6.79	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.020	0.015	0.39	16.90	0.57	16.10	3.0	20
22	198+20 Lt	8.04	3.63	5.64	6.04	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.018	0.015	0.37	17.34	0.55	16.44	3.0	21
23	202+95 Lt	8.74	0.00	5.11	3.63	Curb	3.0	9.60	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.35	13.54	0.53	12.55	3.0	22

Project File: SurfaceCalcs_West.stm | Number of lines: 23 | Run Date: 03-02-2009

NOTES: Inlet N-Values = 0.016 ; Intensity = 301.57 / (Inlet time + 18.30) ^ 1.11; Return period = $\boxed{100\ Yrs}$; * Indicates Known Q added. All curb inlets are Horiz throat.

Hydraflow Plan View



Project file: SurfaceCalcsEast_S_Chauncey.stm	No. Lines: 13	03-22-2007

Hydraflow Storm Sewers 2003

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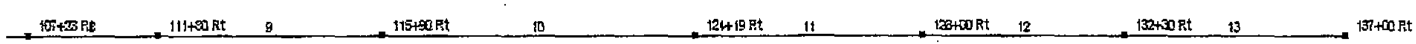
Hydraf w Plan View



Project file: SurfaceCalcsEast_S_Chauncey.stm	No. Lines: 13	03-22-2007

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Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	50.0	0.62	8.72	0.95	0.59	8.29	5.0	173.5	0.7	6.03	0.00	3.03	72	0.00	1.00	1.00	1.88	1.64	0.00	0.00	Dummy Line
2	1	370.0	0.28	8.10	0.95	0.27	7.70	5.0	164.6	0.7	5.85	0.00	0.21	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
3	2	180.0	0.34	7.82	0.95	0.32	7.43	5.0	160.3	0.8	5.78	0.00	0.20	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
4	3	219.0	0.63	7.48	0.95	0.60	7.11	5.0	154.9	0.8	5.69	0.00	0.20	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
5	4	320.0	0.24	6.85	0.95	0.23	6.51	5.0	146.8	0.8	5.45	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
6	5	131.0	0.39	6.61	0.95	0.37	6.28	5.0	143.4	0.8	5.36	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
7	6	380.0	0.78	6.22	0.95	0.74	5.91	5.0	133.6	0.9	5.34	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
8	7	278.0	0.79	5.44	0.95	0.75	5.17	5.0	125.8	0.9	4.92	0.00	0.17	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
9	8	472.0	0.70	4.65	0.95	0.67	4.42	5.0	111.6	1.0	4.63	0.00	0.16	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
10	9	668.9	1.48	3.95	0.95	1.41	3.76	5.0	91.1	1.2	4.62	0.00	0.16	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
11	10	484.2	0.77	2.47	0.95	0.73	2.35	5.0	70.3	1.4	3.56	0.00	0.13	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
12	11	430.0	0.81	1.70	0.95	0.77	1.62	5.0	46.6	2.0	3.32	0.00	0.12	72	0.00	1.00	1.00	7.01	7.00	0.00	0.00	Dummy Line
13	12	470.0	0.89	0.89	0.95	0.85	0.85	5.0	5.0	6.1	5.33	0.00	0.19	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line

Project File: SurfaceCalcsEast_S_Chauncey.stm | Number of lines: 13 | Run Date: 03-22-2007

NOTES: Intensity = 64.98 / (Inlet time + 10.30) ^ 0.87; Return period = $\boxed{10 \text{ Yrs.}}$

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Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter depth (ft)	Gutter spread (ft)	Inlet depth (ft)	Inlet spread (ft)	Inlet Dep (in)	Byp line No
1	93+13 Rt	3.60	0.00	2.98	0.62	Curb	3.0	7.20	0.00	0.00	0.00	0.012	1.42	0.058	0.019	0.015	0.27	11.30	0.43	9.63	3.00	Off
2	96+70 Rt	1.63	0.00	1.63	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.008	1.42	0.058	0.031	0.015	0.24	6.51	0.40	4.87	3.00	1
3	98+50 Rt	1.97	0.00	1.97	0.00	Curb	3.0	9.60	0.00	0.00	0.00	0.010	1.42	0.058	0.029	0.015	0.25	7.20	0.41	5.38	3.00	2
4	100+73 Rt	3.66	0.00	3.66	0.00	Curb	3.0	16.00	0.00	0.00	0.00	Sag	1.42	0.058	0.022	0.000	0.23	8.10	0.43	8.10	3.00	Off
5	103+88 Rt	1.39	0.00	1.39	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.009	0.015	0.17	11.16	0.31	7.22	3.00	4
6	105+17 Rt	2.26	0.00	2.26	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.027	0.015	0.25	7.63	0.40	5.67	3.00	5
7	107+23 Rt	4.53	0.00	4.53	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.005	1.42	0.058	0.028	0.015	0.36	11.34	0.54	10.39	3.00	6
8	111+80 Rt	4.59	0.00	4.59	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.014	1.42	0.058	0.022	0.015	0.29	10.86	0.46	9.55	3.00	7
9	115+90 Rt	4.06	1.70	5.76	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.012	1.42	0.058	0.023	0.015	0.33	12.19	0.50	10.78	3.00	8
10	124+19 Rt	8.62	0.26	7.18	1.70	Curb	3.0	12.80	0.00	0.00	0.00	0.009	1.42	0.058	0.015	0.015	0.35	19.26	0.52	18.33	3.00	9
11	128+00 Rt	4.47	0.67	4.88	0.26	Curb	3.0	10.40	0.00	0.00	0.00	0.007	1.42	0.058	0.021	0.015	0.34	13.69	0.51	12.29	3.00	10
12	132+30 Rt	4.70	0.66	4.69	0.67	Curb	3.0	10.40	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.30	11.31	0.47	10.00	3.00	11
13	137+00 Rt	5.33*	0.00	4.67	0.66	Curb	3.0	10.40	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.30	11.31	0.47	9.95	3.00	12

Project File: SurfaceCalcsEast_S_Chauncey.stm | I-D-F File: ScottsdaleIDF.IDF | Number of lines: 13 | Run Date: 03-22-2007

NOTES: Inlet N-Values = 0.016 ; Intensity = 64.98 / (Inlet time + 10.30) ^ 0.87; Return period = $\boxed{10 \text{ Yrs.}}$; * Indicates Known Q added

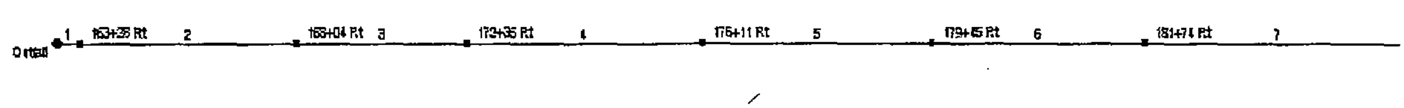
Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1	93+13 Rt	5.42	0.00	3.73	1.69	Curb	3.0	7.20	0.00	0.00	0.00	0.012	1.42	0.058	0.019	0.015	0.31	13.40	0.47	11.84	3.00	Off
2	96+70 Rt	2.45	0.00	2.45	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.008	1.42	0.058	0.031	0.015	0.28	7.80	0.45	6.32	3.00	1
3	98+50 Rt	2.97	0.00	2.97	0.00	Curb	3.0	9.60	0.00	0.00	0.00	0.010	1.42	0.058	0.029	0.015	0.28	8.24	0.45	6.90	3.00	2
4	100+73 Rt	5.51	0.00	5.51	0.00	Curb	3.0	16.00	0.00	0.00	0.00	Sag	1.42	0.058	0.022	0.000	0.29	10.65	0.48	10.65	3.00	Off
5	103+88 Rt	2.10	0.00	2.10	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.009	0.015	0.19	13.38	0.34	10.33	3.00	4
6	105+17 Rt	3.41	0.00	3.41	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.027	0.015	0.28	8.74	0.45	7.26	3.00	5
7	107+23 Rt	6.82	0.44	7.26	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.005	1.42	0.058	0.028	0.015	0.43	13.84	0.61	12.82	3.00	6
8	111+80 Rt	6.90	1.52	7.98	0.44	Curb	3.0	16.00	0.00	0.00	0.00	0.014	1.42	0.058	0.022	0.015	0.36	14.04	0.53	12.73	3.00	7
9	115+90 Rt	6.12	5.67	10.27	1.52	Curb	3.0	16.00	0.00	0.00	0.00	0.012	1.42	0.058	0.023	0.015	0.41	15.67	0.59	14.83	3.00	8
10	124+19 Rt	12.97	2.29	9.58	5.67	Curb	3.0	12.80	0.00	0.00	0.00	0.009	1.42	0.058	0.015	0.015	0.42	23.93	0.59	23.00	3.00	9
11	128+00 Rt	6.73	2.75	7.19	2.29	Curb	3.0	10.40	0.00	0.00	0.00	0.007	1.42	0.058	0.021	0.015	0.41	17.02	0.59	16.05	3.00	10
12	132+30 Rt	7.08	2.03	6.36	2.75	Curb	3.0	10.40	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.36	14.04	0.53	12.82	3.00	11
13	137+00 Rt	7.94*	0.00	5.90	2.03	Curb	3.0	10.40	0.00	0.00	0.00	0.016	1.42	0.058	0.022	0.015	0.34	13.13	0.51	12.05	3.00	12

Project File: SurfaceCalcsEast_S_Chauncey.stm   I-D-F File: ScottsdaleIDF.IDF   Number of lines: 13   Run Date: 03-23-2007

*NOTES: Inlet N-Values = 0.016 ; Intensity = 301.57 / (Inlet time + 18.30) ^ 1.11; Return period = $\boxed{\text{100 Yrs}}$; * Indicates Known Q added*

Hydraflow Plan View



Project file: SurfaceCalcsEast_N_101.stm	No. Lines: 11	03-22-2007

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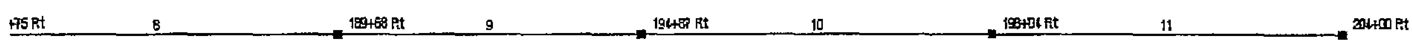
Hydraflow Plan View



Project file: SurfaceCalcsEast_N_101.stm	No. Lines: 11	03-22-2007

Storm Sewer Tabulation

Station Line	To Line	Len (ft)	Drng Area Incr (ac)	Drng Area Total (ac)	Rnoff coeff (C)	Area x C Incr	Area x C Total	Tc Inlet (min)	Tc Syst (min)	Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe Size (in)	Pipe Slope (%)	Invert Elev Up (ft)	Invert Elev Dn (ft)	HGL Elev Up (ft)	HGL Elev Dn (ft)	Grnd / Rim Elev Up (ft)	Grnd / Rim Elev Dn (ft)	Line ID
1	End	50.0	0.48	8.31	0.95	0.45	7.89	5.0	165.8	0.7	5.38	0.00	2.84	72	0.00	1.00	1.00	1.83	1.63	0.00	0.00	Dummy Line
2	1	476.0	0.67	7.83	0.95	0.64	7.44	5.0	153.7	0.7	5.44	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
3	2	376.0	0.70	7.16	0.95	0.67	6.80	5.0	143.9	0.8	5.28	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
4	3	520.0	0.59	6.45	0.95	0.56	6.13	5.0	129.8	0.9	5.22	0.00	0.18	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
5	4	508.6	0.44	5.86	0.95	0.42	5.57	5.0	115.9	0.9	5.25	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
6	5	469.3	0.49	5.42	0.95	0.47	5.15	5.0	103.1	1.0	5.39	0.00	0.19	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
7	6	595.0	1.08	4.93	0.95	1.02	4.68	5.0	87.1	1.2	5.67	0.00	0.20	72	0.00	1.00	1.00	7.00	7.00	0.00	0.00	Dummy Line
8	7	510.0	0.84	3.85	0.95	0.79	3.66	5.0	71.4	1.4	5.24	0.00	0.19	72	0.00	1.00	1.00	7.01	7.00	0.00	0.00	Dummy Line
9	8	432.0	0.61	3.01	0.95	0.58	2.86	5.0	56.0	1.7	4.99	0.00	0.18	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
10	9	500.0	1.12	2.40	0.95	1.06	2.28	5.0	36.4	2.4	5.49	0.00	0.19	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line
11	10	500.0	1.28	1.28	0.95	1.22	1.22	5.0	5.0	6.1	7.50	0.00	0.27	72	0.00	1.00	1.00	7.01	7.01	0.00	0.00	Dummy Line

Project File: SurfaceCalcsEast_N_101.stm | Number of lines: 11 | Run Date: 03-22-2007

NOTES: Intensity = 129.35 / (Inlet time + 15.50) ^ 1.01; Return period = $\boxed{\text{10 Yrs.}}$

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter depth (ft)	Gutter spread (ft)	Inlet depth (ft)	Inlet spread (ft)	Inlet Dep (in)	Byp line No
1	163+28 Rt	2.77	0.01	2.79	0.00	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.020	0.015	0.25	9.80	0.41	7.90	3.00	Off
2	168+04 Rt	3.94	0.23	4.15	0.01	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.020	0.015	0.27	10.80	0.43	9.20	3.00	1
3	172+35 Rt	4.10	0.05	3.92	0.23	Curb	3.0	9.60	0.00	0.00	0.00	0.013	1.42	0.058	0.025	0.015	0.30	10.13	0.46	8.52	3.00	2
4	176+11 Rt	3.46	0.08	3.50	0.05	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.026	0.015	0.29	9.41	0.45	7.81	3.00	3
5	179+45 Rt	2.59	0.38	2.89	0.08	Curb	3.0	9.60	0.00	0.00	0.00	0.020	1.42	0.058	0.019	0.015	0.24	9.72	0.39	7.47	3.00	4
6	181+74 Rt	2.87	1.86	4.35	0.38	Curb	3.0	9.60	0.00	0.00	0.00	0.011	1.42	0.058	0.024	0.015	0.31	10.91	0.48	9.75	3.00	5
7	184+75 Rt	6.29	1.90	6.33	1.86	Curb	3.0	9.60	0.00	0.00	0.00	0.006	1.42	0.058	0.020	0.015	0.40	17.30	0.57	16.10	3.00	6
8	189+68 Rt	4.88	1.56	4.54	1.90	Curb	3.0	9.60	0.00	0.00	0.00	0.017	1.42	0.058	0.014	0.015	0.29	16.25	0.45	14.43	3.00	7
9	194+87 Rt	3.56	3.02	5.03	1.56	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.021	0.015	0.32	12.74	0.49	11.52	3.00	8
10	198+04 Rt	6.53	2.51	6.02	3.02	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.022	0.015	0.36	14.04	0.53	12.95	3.00	9
11	204+00 Rt	7.50	0.00	4.98	2.51	Curb	3.0	9.60	0.00	0.00	0.00	0.025	1.42	0.058	0.020	0.015	0.31	12.80	0.47	11.20	3.00	10

Project File: SurfaceCalcsEast_N_101.stm   I-D-F File: ScottsdaleIDF.IDF   Number of lines: 11   Run Date: 03-22-2007

NOTES: Inlet N-Values = 0.016 ; Intensity = 129.35 / (Inlet time + 15.50) ^ 1.01; Return period = 10 Yrs ; * Indicates Known Q added

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter Depth (ft)	Gutter Spread (ft)	Inlet Depth (ft)	Inlet Spread (ft)	Inlet Depr (in)	Byp line No
1	163+28 Rt	4.15	3.59	5.96	1.78	Curb	3.0	12.80	0.00	0.00	0.00	0.013	1.42	0.058	0.020	0.015	0.34	14.25	0.51	13.25	3.0	Off
2	168+04 Rt	5.89	4.43	6.74	3.59	Curb	3.0	12.80	0.00	0.00	0.00	0.017	1.42	0.058	0.020	0.015	0.36	15.10	0.53	14.20	3.0	1
3	172+35 Rt	6.14	4.37	6.08	4.43	Curb	3.0	9.60	0.00	0.00	0.00	0.013	1.42	0.058	0.025	0.015	0.40	13.97	0.58	13.16	3.0	2
4	176+11 Rt	5.18	5.49	6.30	4.37	Curb	3.0	9.60	0.00	0.00	0.00	0.012	1.42	0.058	0.026	0.015	0.41	13.91	0.59	13.12	3.0	3
5	179+45 Rt	3.87	6.82	5.20	5.49	Curb	3.0	9.60	0.00	0.00	0.00	0.020	1.42	0.058	0.019	0.015	0.35	15.35	0.52	14.37	3.0	4
6	181+74 Rt	4.30	9.75	7.23	6.82	Curb	3.0	9.60	0.00	0.00	0.00	0.011	1.42	0.058	0.024	0.015	0.44	16.49	0.63	15.83	3.0	5
7	184+75 Rt	9.41	9.18	8.85	9.75	Curb	3.0	9.60	0.00	0.00	0.00	0.006	1.42	0.058	0.020	0.015	0.52	23.10	0.70	22.50	3.0	6
8	189+68 Rt	7.31	7.58	5.70	9.18	Curb	3.0	9.60	0.00	0.00	0.00	0.017	1.42	0.058	0.014	0.015	0.37	21.75	0.54	20.86	3.0	7
9	194+87 Rt	5.33	8.77	6.52	7.58	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.021	0.015	0.41	16.93	0.59	16.14	3.0	8
10	198+04 Rt	9.77	6.03	7.02	8.77	Curb	3.0	9.60	0.00	0.00	0.00	0.015	1.42	0.058	0.022	0.015	0.43	17.18	0.61	16.45	3.0	9
11	204+00 Rt	11.22	0.00	5.19	6.03	Curb	3.0	9.60	0.00	0.00	0.00	0.025	1.42	0.058	0.020	0.015	0.34	14.50	0.52	13.50	3.0	10

Project File: SurfaceCalcsEast_N_101.stm | Number of lines: 11 | Run Date: 03-02-2009

NOTES: Inlet N-Values = 0.016 ; Intensity = 301.57 / (Inlet time + 18.30) ^ 1.11; Return period = $\boxed{\text{100 Yrs}}$; * Indicates Known Q added. All curb inlets are Horiz throat.

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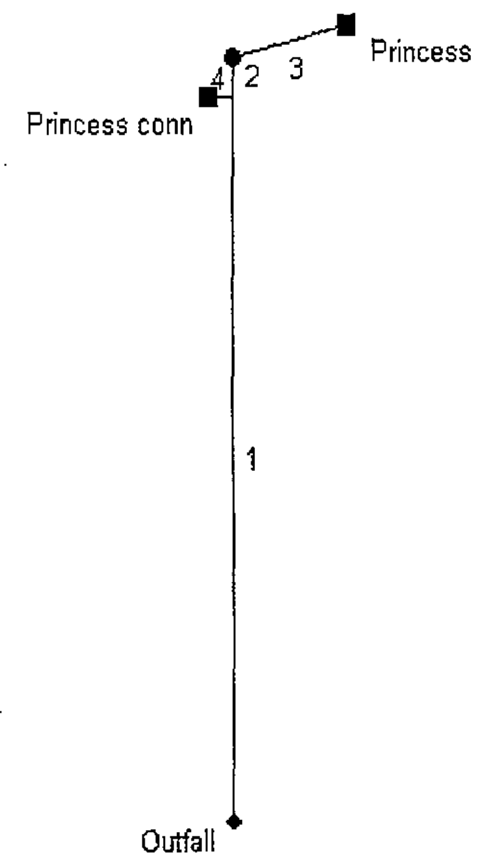
Hydra ow Plan View



Project file: Princess_StormDrain.stm	No. Lines: 4	03-22-2007

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Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	157.0	0.00	0.90	0.00	0.00	0.86	0.0	5.3	6.0	5.14	4.67	2.91	18	0.20	46.31	46.00	48.17	47.79	50.10	0.00	Inserted Line
2	1	8.6	0.00	0.63	0.00	0.00	0.60	0.0	5.2	6.0	3.61	5.07	2.04	18	0.23	46.33	46.31	48.31	48.30	50.20	50.10	Inserted Line
3	2	28.3	0.63	0.63	0.95	0.60	0.60	5.0	5.0	6.1	3.66	4.42	2.07	18	0.18	46.38	46.33	48.40	48.36	50.60	50.20	Inserted Line
4	1	5.7	0.27	0.27	0.95	0.26	0.26	5.0	5.0	6.1	1.57	18.64	0.89	18	3.15	46.49	46.31	48.30	48.30	49.30	50.10	Inserted Line

Project File: Princess_StormDrain.stm

Number of lines: 4

Run Date: 03-22-2007

NOTES: Intensity = 64.98 / (Inlet time + 10.30) ^ 0.87; Return period = $\boxed{10\ \text{Yrs.}}$

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter depth (ft)	Gutter spread (ft)	Inlet depth (ft)	Inlet spread (ft)	Inlet Dep (in)	Byp line No
1		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	Off
2		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	Off
3	Princess	3.66	0.00	3.66	0.00	Curb	3.0	13.60	0.00	0.00	0.00	0.009	1.42	0.058	0.011	0.015	0.25	16.66	0.41	15.00	3.00	2
4	Princess conn	1.57	0.00	1.57	0.00	Curb	3.0	16.00	0.00	0.00	0.00	0.006	1.42	0.058	0.170	0.015	0.32	2.82	0.53	1.68	3.00	1

Project File: Princess_StormDrain.stm | I-D-F File: ScottsdaleIDF.IDF | Number of lines: 4 | Run Date: 03-22-2007

NOTES: Inlet N-Values = 0.016 ; Intensity = 64.98 / (Inlet time + 10.30) ^ 0.87; Return period = $\boxed{10 \text{ Yrs.}}$; * Indicates Known Q added

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Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	18	5.14	46.00	47.79	1.50	1.77	2.91	0.13	47.92	0.240	157	46.31	48.17	1.50	1.77	2.91	0.13	48.30	0.239	0.239	0.376	1.00	0.13
2	18	3.61	46.31	48.30	1.50	1.77	2.04	0.06	48.36	0.118	8.6	46.33	48.31	1.50	1.77	2.04	0.06	48.37	0.118	0.118	0.010	0.85	0.06
3	18	3.66	46.33	48.36	1.50	1.77	2.07	0.07	48.43	0.121	28.3	46.38	48.40	1.50	1.77	2.07	0.07	48.46	0.121	0.121	0.034	0.50	0.03
4	18	1.57	46.31	48.30	1.50	1.77	0.89	0.01	48.31	0.022	5.7	46.49	48.30	1.50	1.77	0.89	0.01	48.31	0.022	0.022	0.001	0.50	0.01

Project File: Princess_StormDrain.stm	Number of lines: 4	Run Date: 03-22-2007

NOTES: * Normal depth assumed., ** Critical depth assumed.

Appendix C
Offsite Drainage
Calculations

CULVERT #1 - CENTER DR.

HY-8 Culvert Analysis Report

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Table 1 - Culvert Summary Table: 188+24.97

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
100.00	100.00	1632.28	2.616	2.616	1-S2n	1.487	1.697	1.489	2.240	8.395	0.000
120.00	120.00	1632.66	2.997	2.997	1-S2n	1.680	1.916	1.685	2.240	8.903	0.000
140.00	140.00	1633.04	3.380	3.380	5-S2n	1.868	2.123	1.872	2.240	9.347	0.000
160.00	160.00	1633.44	3.776	3.776	5-S2n	2.050	2.321	2.050	2.240	9.756	0.000
180.00	180.00	1633.85	4.194	4.194	5-S2n	2.225	2.511	2.230	2.240	10.092	0.000
200.00	200.00	1634.30	4.639	0.980	5-S2n	2.397	2.693	2.402	2.240	10.407	0.000
220.00	220.00	1634.78	5.118	0.980	5-S2n	2.563	2.870	2.569	2.240	10.705	0.000
224.00	224.00	1634.88	5.218	0.980	5-S2n	2.597	2.905	2.604	2.240	10.754	0.000
260.00	235.97	1635.19	5.526	5.249	5-S2n	2.696	3.000	2.900	2.240	10.171	0.000
280.00	238.96	1635.27	5.605	5.339	5-S2n	3.000	3.000	3.000	2.240	9.957	0.000
300.00	241.55	1635.33	5.674	5.417	5-S2n	3.000	3.000	3.000	2.240	10.064	0.000

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****

Inlet Elevation (invert): 1629.66 ft, Outlet Elevation (invert): 1628.40 ft

Culvert Length: 306.00 ft, Culvert Slope: 0.0041

****

Site Data - 188+24.97

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1629.66 ft

Outlet Station: 306.00 ft

Outlet Elevation: 1628.40 ft

Number of Barrels: 1

Culvert Data Summary - 188+24.97

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 3.00 ft

Barrel Material: Concrete

Barrel Manning's *n*: 0.0120

Inlet Type: Conventional

Inlet Edge Condition: 1:1 Bevel (45° flare) Wingwall

Inlet Depression: None

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Water Surface Profile Plot for Culvert: 188+24.97

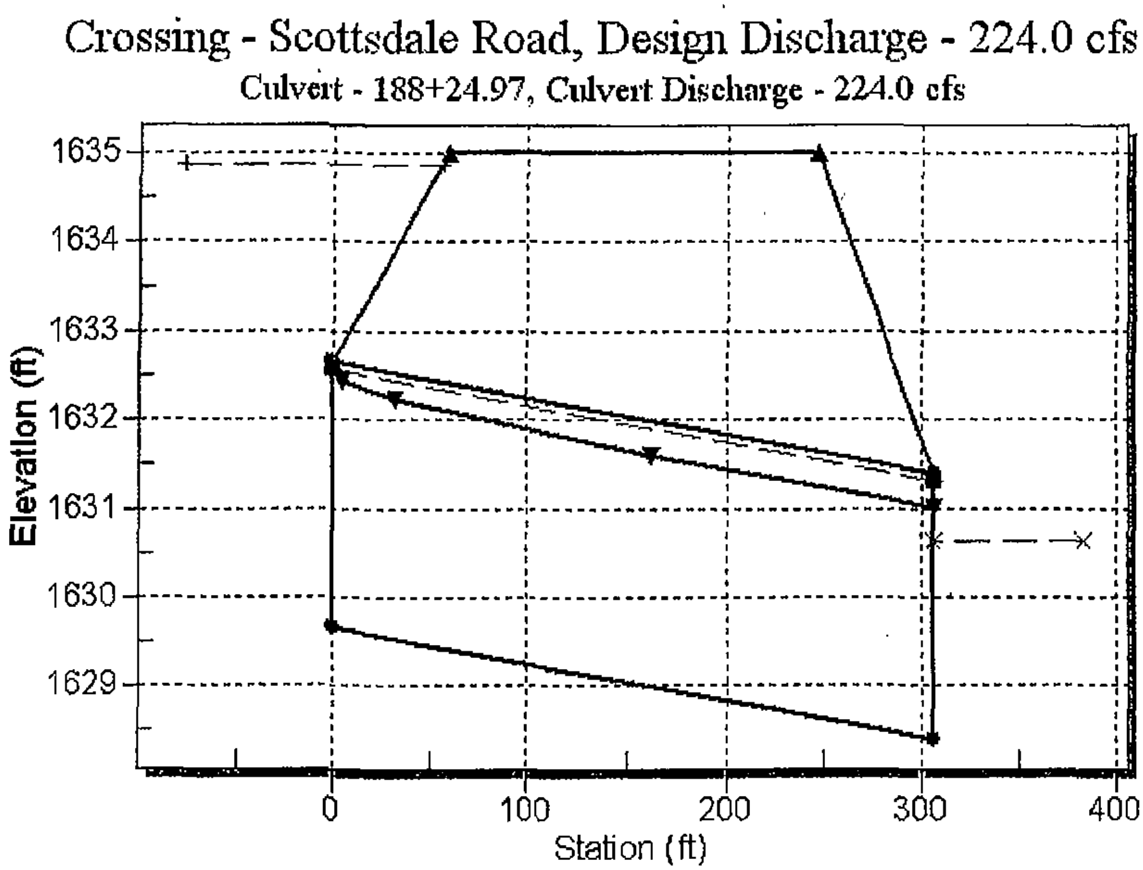

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Table 2 - Downstream Channel Rating Curve (Crossing: Scottsdale Road)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
100.00	1630.64	2.24
120.00	1630.64	2.24
140.00	1630.64	2.24
160.00	1630.64	2.24
180.00	1630.64	2.24
200.00	1630.64	2.24
220.00	1630.64	2.24
224.00	1630.64	2.24
260.00	1630.64	2.24
280.00	1630.64	2.24
300.00	1630.64	2.24

Tailwater Channel Data - Scottsdale Road

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 1630.64 ft

Roadway Data for Crossing: Scottsdale Road

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 1635.00 ft

Roadway Surface: Paved

Roadway Top Width: 188.00 ft

DIBBLE & ASSOCIATES		Date	23-Mar-07
CONSULTING ENGINEERS		Job No.	10-0244
		By	JEP
		RCE	
Scottsdale Road		Chk'd	
Channel Design		Filepath:	J:\10-0244\EXCEL\DRAINAGE\CHANNDES.xls

CHANNEL DESIGN REFERENCES

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TYPICAL SECTION - MANNINGS RATING CURVE

Channel: SCOTTSDALE ROAD - Offsite Channel 1A

INPUT DATA:

Manning's n = 0.038
T allow = 2.00 lb/ft^2
Sideslope Left = 3.0 :1
Sideslope Right = 3.0 :1
Bottom slope = 0.0 percent

													Topwidth			
Reach	Slope	BW (ft)	t	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Channel1A	0.0010	**10.0**	0.0	4.22	**2.34**	0.038	224.0	0.25	0.16	0.26	1.08	5.30	35.32	**41.78**	105.97	0.06
Channel1A	0.0020	10.0	0.0	3.58	**3.02**	0.038	224.0	0.35	0.28	0.45	1.00	4.58	31.45	**37.45**	94.36	0.09
Channel1A	0.0030	10.0	0.0	3.24	**3.51**	0.038	224.0	0.42	0.39	0.61	1.00	4.24	29.44	**35.44**	88.31	0.13
Channel1A	0.0040	10.0	0.0	3.02	**3.90**	0.038	224.0	0.48	0.49	0.75	1.00	4.02	28.11	**34.11**	84.32	0.16
Channel1A	0.0050	10.0	0.0	2.86	**4.23**	0.038	224.0	0.53	0.59	0.89	1.00	3.86	27.13	**33.13**	81.39	0.18
Channel1A	0.0060	10.0	0.0	2.73	**4.52**	0.038	224.0	0.58	0.68	1.02	1.00	3.73	26.37	**32.37**	79.10	0.21
Channel1A	0.0070	10.0	0.0	2.62	**4.78**	0.038	224.0	0.62	0.77	1.15	1.00	3.62	25.75	**31.75**	77.24	0.24
Channel1A	0.0080	10.0	0.0	2.54	**5.01**	0.038	224.0	0.66	0.86	1.27	1.00	3.54	25.22	**31.22**	75.67	0.26
Channel1A	0.0090	10.0	0.0	2.46	**5.23**	0.038	224.0	0.70	0.94	1.38	1.00	3.46	24.78	**30.78**	74.33	0.28
Channel1A	0.0150	10.0	0.0	2.20	**6.14**	0.038	224.0	0.86	1.35	1.92	1.00	3.20	23.26	**29.26**	69.59	0.39
Channel1A	0.0010	**12.0**	0.0	4.01	**2.33**	0.038	224.0	0.25	0.16	0.25	1.02	5.03	36.05	**42.19**	108.16	0.06
Channel1A	0.0020	12.0	0.0	3.38	**3.00**	0.038	224.0	0.35	0.28	0.42	1.00	4.38	32.27	**38.27**	96.81	0.09
Channel1A	*0.0030*	*12.0*	*0.0*	*3.05*	***3.47***	*0.038*	*224.0*	*0.42*	*0.39*	*0.57*	*1.00*	*4.05*	*30.31*	***36.31***	*90.92*	*0.12*
Channel1A	0.0040	12.0	0.0	2.84	**3.85**	0.038	224.0	0.48	0.48	0.71	1.00	3.84	29.02	**35.02**	87.05	0.15
Channel1A	0.0050	12.0	0.0	2.68	**4.17**	0.038	224.0	0.53	0.58	0.84	1.00	3.68	28.07	**34.07**	84.22	0.18
Channel1A	0.0060	12.0	0.0	2.56	**4.46**	0.038	224.0	0.58	0.67	0.96	1.00	3.56	27.33	**33.33**	82.00	0.21
Channel1A	0.0070	12.0	0.0	2.46	**4.71**	0.038	224.0	0.62	0.75	1.07	1.00	3.46	26.73	**32.73**	80.20	0.23
Channel1A	0.0080	12.0	0.0	2.37	**4.94**	0.038	224.0	0.66	0.84	1.18	1.00	3.37	26.23	**32.23**	78.69	0.25
Channel1A	0.0090	12.0	0.0	2.30	**5.15**	0.038	224.0	0.70	0.92	1.29	1.00	3.30	25.80	**31.80**	77.40	0.27
Channel1A	0.0150	12.0	0.0	2.01	**6.18**	0.038	224.0	0.89	1.37	1.88	1.00	3.01	24.06	**30.06**	72.18	0.40
Channel1A	0.0010	**14.0**	0.0	3.82	**2.31**	0.038	224.0	0.25	0.16	0.24	1.00	4.82	36.90	**42.90**	110.70	0.06
Channel1A	0.0020	14.0	0.0	3.20	**2.96**	0.038	224.0	0.35	0.28	0.40	1.00	4.20	33.21	**39.21**	99.63	0.09
Channel1A	0.0030	14.0	0.0	2.88	**3.43**	0.038	224.0	0.42	0.38	0.54	1.00	3.88	31.30	**37.30**	93.90	0.12
Channel1A	0.0040	14.0	0.0	2.68	**3.80**	0.038	224.0	0.48	0.48	0.67	1.00	3.68	30.05	**36.05**	90.15	0.15
Channel1A	0.0050	14.0	0.0	2.52	**4.12**	0.038	224.0	0.53	0.57	0.79	1.00	3.52	29.14	**35.14**	87.41	0.18
Channel1A	0.0060	14.0	0.0	2.40	**4.39**	0.038	224.0	0.58	0.65	0.90	1.00	3.40	28.42	**34.42**	85.27	0.20
Channel1A	0.0070	14.0	0.0	2.31	**4.64**	0.038	224.0	0.62	0.74	1.01	1.00	3.31	27.85	**33.85**	83.54	0.22
Channel1A	0.0080	14.0	0.0	2.23	**4.86**	0.038	224.0	0.66	0.82	1.11	1.00	3.23	27.36	**33.36**	82.08	0.24
Channel1A	0.0090	14.0	0.0	2.16	**5.07**	0.038	224.0	0.70	0.90	1.21	1.00	3.16	26.95	**32.95**	80.84	0.27
Channel1A	0.0150	14.0	0.0	1.88	**6.07**	0.038	224.0	0.88	1.33	1.76	1.00	2.88	25.28	**31.28**	75.84	0.38

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

Scottsdale Road
Channel Design

Date	23-Mar-07
Job No.	10-0244
By	JEP
RCE	
Chk'd	BJF
Filepath: J:\10-0244\EXCEL\DRAINAGE\CHANNDES.xls	

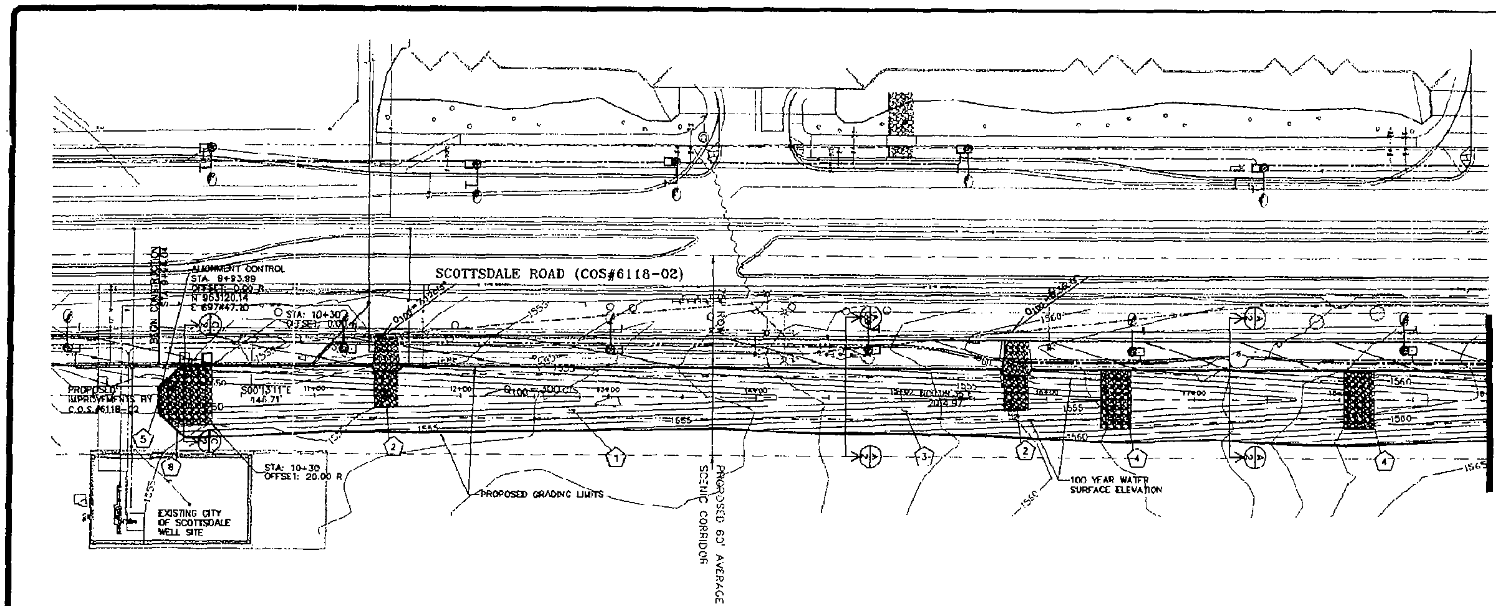
TYPICAL SECTION MANNINGS RATING CURVE

Channel: SCOTTSDALE ROAD - Offsite Channel 1B

INPUT DATA:

Manning's n =	0.038	Riprap
T allow =	2.00	lb/ft^2
Sideslope Left =	3.0	:1
Sideslope Right =	3.0	:1
Bottom slope =	0.0	percent

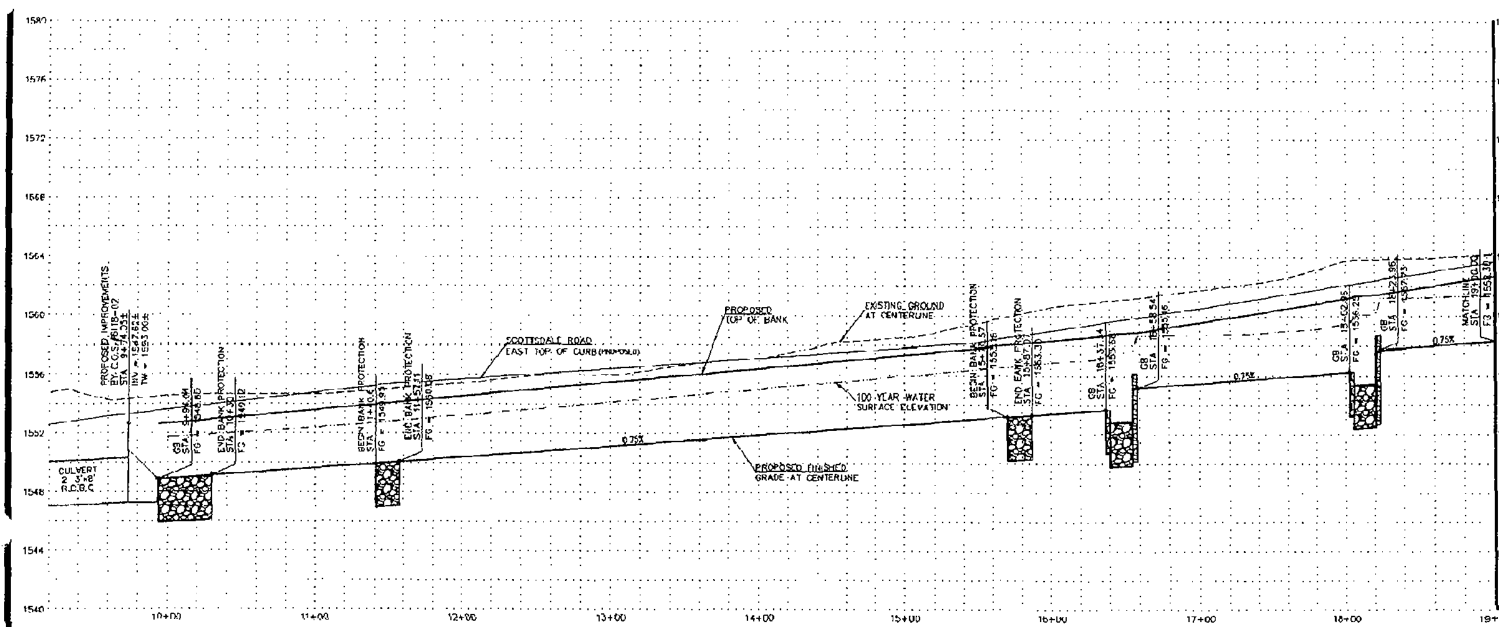
													Topwidth		
Reach	Slope	BW (ft)	t	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Channel1B	0.0100	**10.0**	0.0	2.40	**5.43**	0.038	224.0	0.74	1.02	1.00	3.40	24.39	**30.39**	73.16	0.31
Channel1B	0.0101	10.0	0.0	2.39	**5.45**	0.038	224.0	0.74	1.03	1.00	3.39	24.35	**30.35**	73.05	0.31
Channel1B	0.0102	10.0	0.0	2.39	**5.47**	0.038	224.0	0.74	1.04	1.00	3.39	24.31	**30.31**	72.94	0.31
Channel1B	0.0103	10.0	0.0	2.38	**5.49**	0.038	224.0	0.75	1.05	1.00	3.38	24.28	**30.28**	72.83	0.31
Channel1B	0.0104	10.0	0.0	2.37	**5.51**	0.038	224.0	0.75	1.05	1.00	3.37	24.24	**30.24**	72.73	0.31
Channel1B	0.0105	10.0	0.0	2.37	**5.53**	0.038	224.0	0.75	1.06	1.00	3.37	24.21	**30.21**	72.62	0.32
Channel1B	0.0106	10.0	0.0	2.36	**5.55**	0.038	224.0	0.76	1.07	1.00	3.36	24.17	**30.17**	72.52	0.32
Channel1B	0.0107	10.0	0.0	2.36	**5.57**	0.038	224.0	0.76	1.08	1.00	3.36	24.14	**30.14**	72.42	0.32
Channel1B	0.0108	10.0	0.0	2.35	**5.59**	0.038	224.0	0.76	1.09	1.00	3.35	24.11	**30.11**	72.32	0.32
Channel1B	0.0109	10.0	0.0	2.35	**5.61**	0.038	224.0	0.77	1.09	1.00	3.35	24.07	**30.07**	72.22	0.33
Channel1B	0.0110	10.0	0.0	2.34	**5.62**	0.038	224.0	0.77	1.10	1.00	3.34	24.04	**30.04**	72.12	0.33
Channel1B	0.0111	10.0	0.0	2.33	**5.64**	0.038	224.0	0.77	1.11	1.00	3.33	24.01	**30.01**	72.02	0.33
Channel1B	0.0112	10.0	0.0	2.33	**5.66**	0.038	224.0	0.78	1.12	1.00	3.33	23.98	**29.98**	71.93	0.33
Channel1B	0.0113	10.0	0.0	2.32	**5.68**	0.038	224.0	0.78	1.13	1.00	3.32	23.94	**29.94**	71.83	0.33
Channel1B	0.0114	10.0	0.0	2.32	**5.70**	0.038	224.0	0.78	1.13	1.00	3.32	23.91	**29.91**	71.74	0.34
Channel1B	0.0115	10.0	0.0	2.31	**5.72**	0.038	224.0	0.79	1.14	1.00	3.31	23.88	**29.88**	71.64	0.34
Channel1B	0.0116	10.0	0.0	2.31	**5.73**	0.038	224.0	0.79	1.15	1.00	3.31	23.85	**29.85**	71.55	0.34
Channel1B	0.0117	10.0	0.0	2.30	**5.75**	0.038	224.0	0.79	1.16	1.00	3.30	23.82	**29.82**	71.46	0.34
Channel1B	0.0118	10.0	0.0	2.30	**5.77**	0.038	224.0	0.80	1.17	1.00	3.30	23.79	**29.79**	71.37	0.34
Channel1B	0.0119	10.0	0.0	2.29	**5.79**	0.038	224.0	0.80	1.17	1.00	3.29	23.76	**29.76**	71.28	0.35
Channel1B	0.0120	10.0	0.0	2.29	**5.80**	0.038	224.0	0.80	1.18	1.00	3.29	23.73	**29.73**	71.19	0.35
Channel1B	0.0121	10.0	0.0	2.28	**5.82**	0.038	224.0	0.81	1.19	1.00	3.28	23.70	**29.70**	71.10	0.35
Channel1B	0.0122	10.0	0.0	2.28	**5.84**	0.038	224.0	0.81	1.20	1.00	3.28	23.67	**29.67**	71.02	0.35
Channel1B	0.0123	10.0	0.0	2.27	**5.86**	0.038	224.0	0.81	1.20	1.00	3.27	23.64	**29.64**	70.93	0.35
Channel1B	0.0124	10.0	0.0	2.27	**5.87**	0.038	224.0	0.81	1.21	1.00	3.27	23.62	**29.62**	70.85	0.36
Channel1B	0.0125	10.0	0.0	2.26	**5.89**	0.038	224.0	0.82	1.22	1.00	3.26	23.59	**29.59**	70.76	0.36
Channel1B	0.0126	10.0	0.0	2.26	**5.91**	0.038	224.0	0.82	1.23	1.00	3.26	23.56	**29.56**	70.68	0.36
Channel1B	0.0127	10.0	0.0	2.26	**5.92**	0.038	224.0	0.82	1.24	1.00	3.26	23.53	**29.53**	70.60	0.36
Channel1B	[illegible]	10.0	0.0	[illegible]	[illegible]	0.038	224.0	[illegible]	[illegible]	1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



CHANNEL CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND PROFILE ELEVATION. COMPACT NATIVE SOIL PER M.A.G. SPEC. 215.
2. EXTEND RIP-RAP SPILLWAY 25 FEET EAST PER SCUPPER EXTENTION DETAIL SHEET 2, SECTION D-D.
3. HYDROSEED CHANNEL SOIL PER REVEGETATION PLAN ON SHEET 7.
4. INSTALL RIP-RAP DROP ASSEMBLY PER RIP-RAP DROP ASSEMBLY DETAIL ON SHEET 2
5. CONTRACTOR TO LOCATE EXISTING CULVERT AND HEADWALL. GRADE PROPOSED CHANNEL TO EXISTING CONDITIONS.
6. INSTALL CHANNEL EROSION PROTECTION PER CHANNEL EROSION PROTECTION DETAIL SHEET 2, SECTION C-C.

*INFORMATION FROM CITY OF SCOTTSDALE FURNISHED FOR COS#6118-02



Call two working days before you dig
602-263-1100
1-800-STAKE-IT
(outside Maricopa County)

DMB

WOOD/PATEL
LAND DEVELOPMENT • WATER RESOURCES
STRUCTURES • TRANSPORTATION / TRAFFIC
WATER / WASTEWATER • SURVEYING
CONSTRUCTION MANAGEMENT
(602) 335-8500
PHOENIX • MESA • GOODYEAR • TUCSON

INTERIM REGIONAL DRAINAGE CHANNEL
CITY OF SCOTTSDALE, ARIZONA

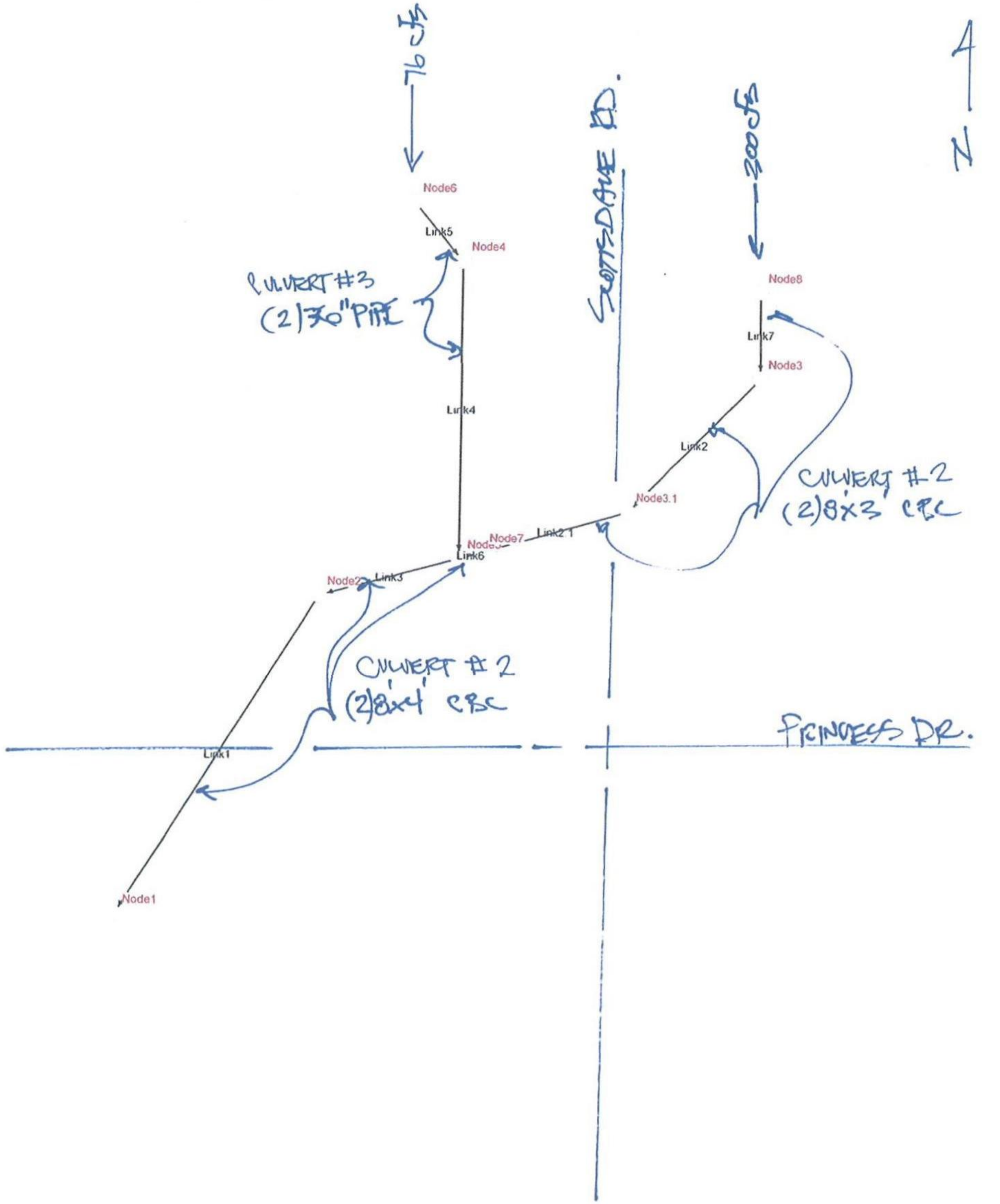
PRELIMINARY
NOT
FOR
CONSTRUCTION
OR RECORDING

EXPIRES 03-31-11

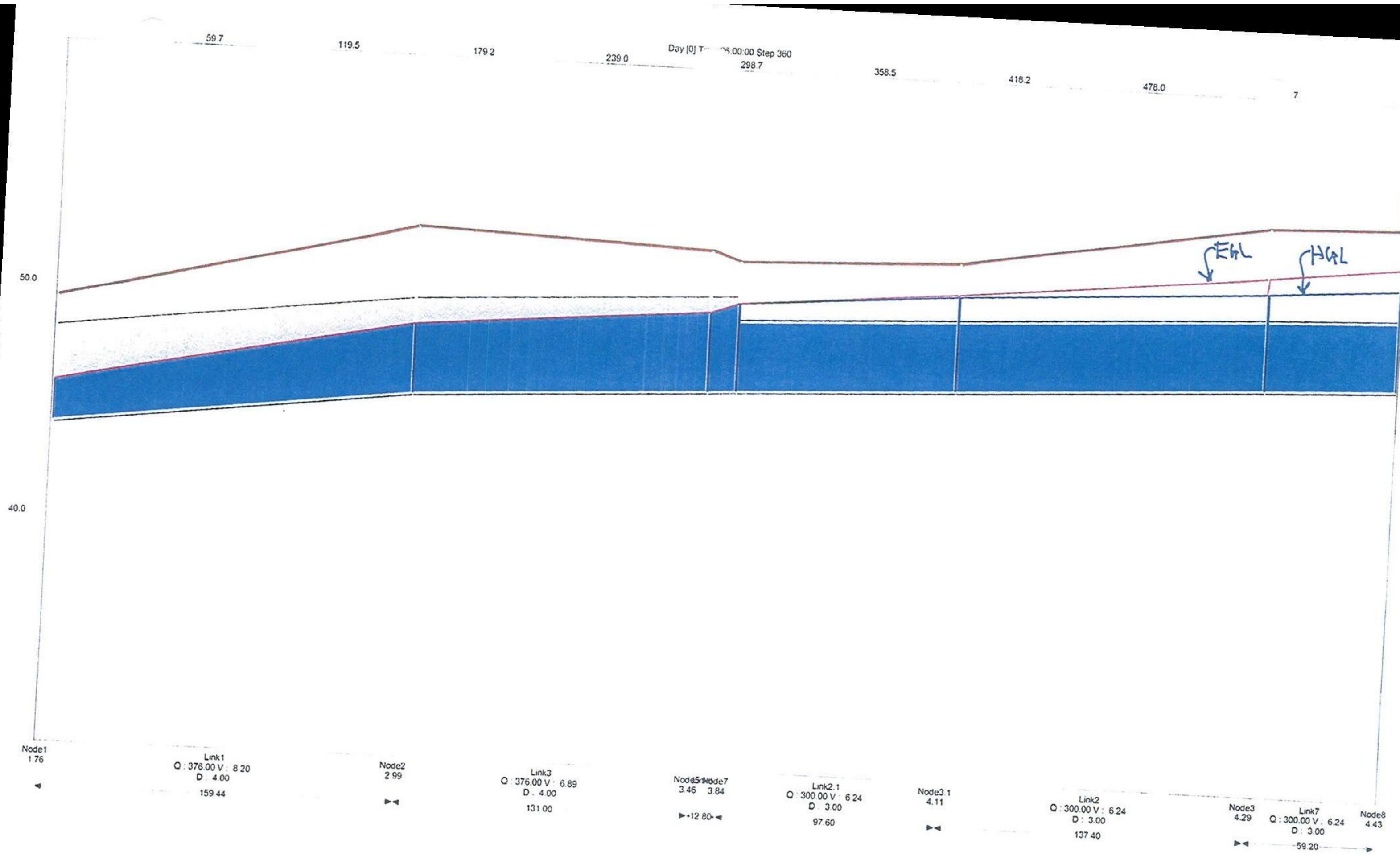
DESIGNED	RJ
CHECKED	GB
DATE	05/09/08
SCALE	1" = 40'
JOB NO.	073022
SHEET	3 of 8

5-SA-2008 19-ZN-2008 1672-08-1 Q.S.#38-45

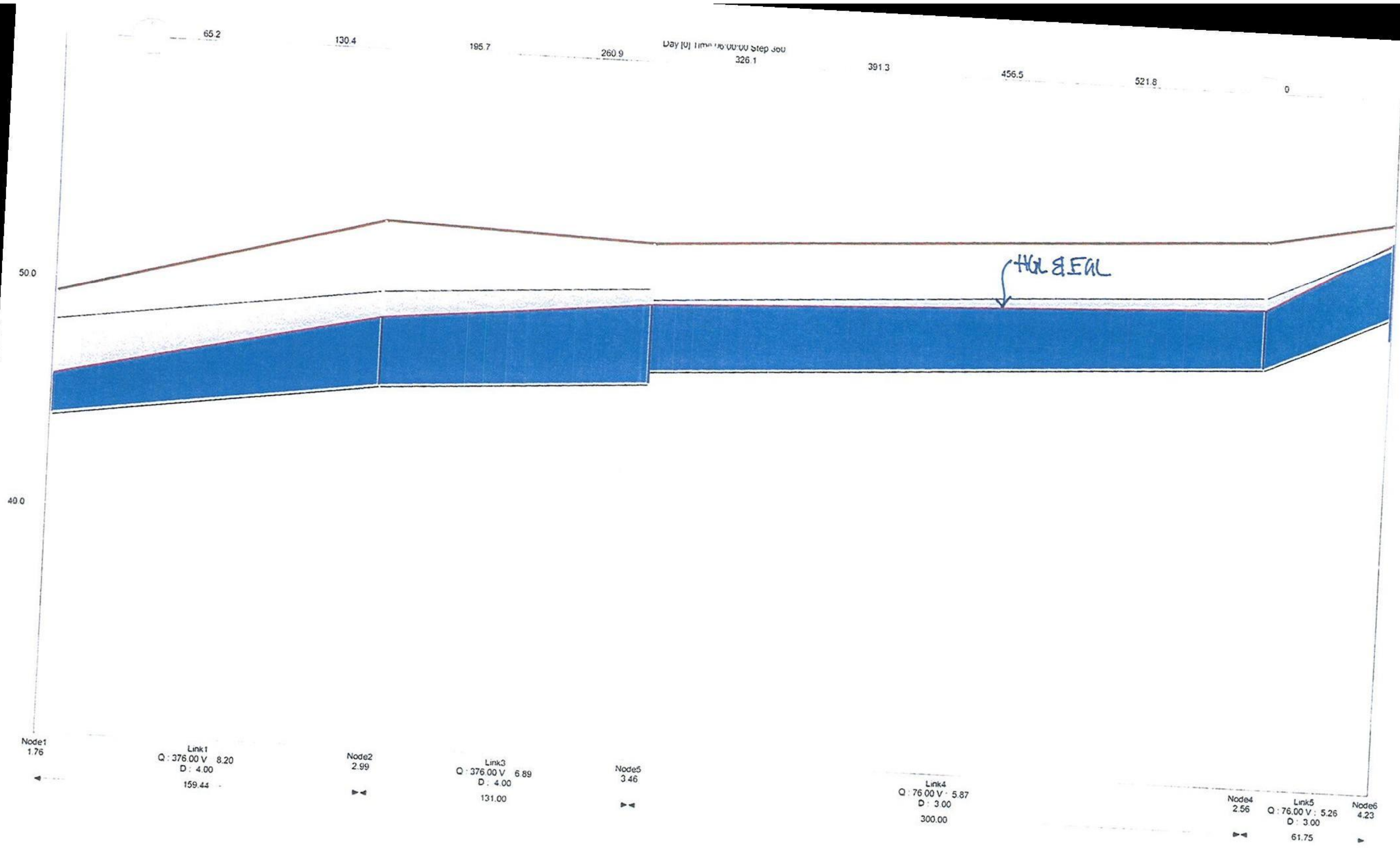
CULVERT #2 & #3



Scale 1 : 780.89



Day [0] T 06:00:00 Step 360
59.7
119.5
179.2
239.0
298.7
358.5
418.2
478.0
50.0
40.0
EGL
HGL
Node1
1.76
Link1
Q : 376.00 V : 8.20
D : 4.00
159.44
Node2
2.99
Link3
Q : 376.00 V : 6.89
D : 4.00
131.00
Node7
3.84
3.46
12.80
Link2.1
Q : 300.00 V : 6.24
D : 3.00
97.60
Node3.1
4.11
Link2
Q : 300.00 V : 6.24
D : 3.00
137.40
Node3
4.29
Link7
Q : 300.00 V : 6.24
D : 3.00
59.20
Node8
4.43

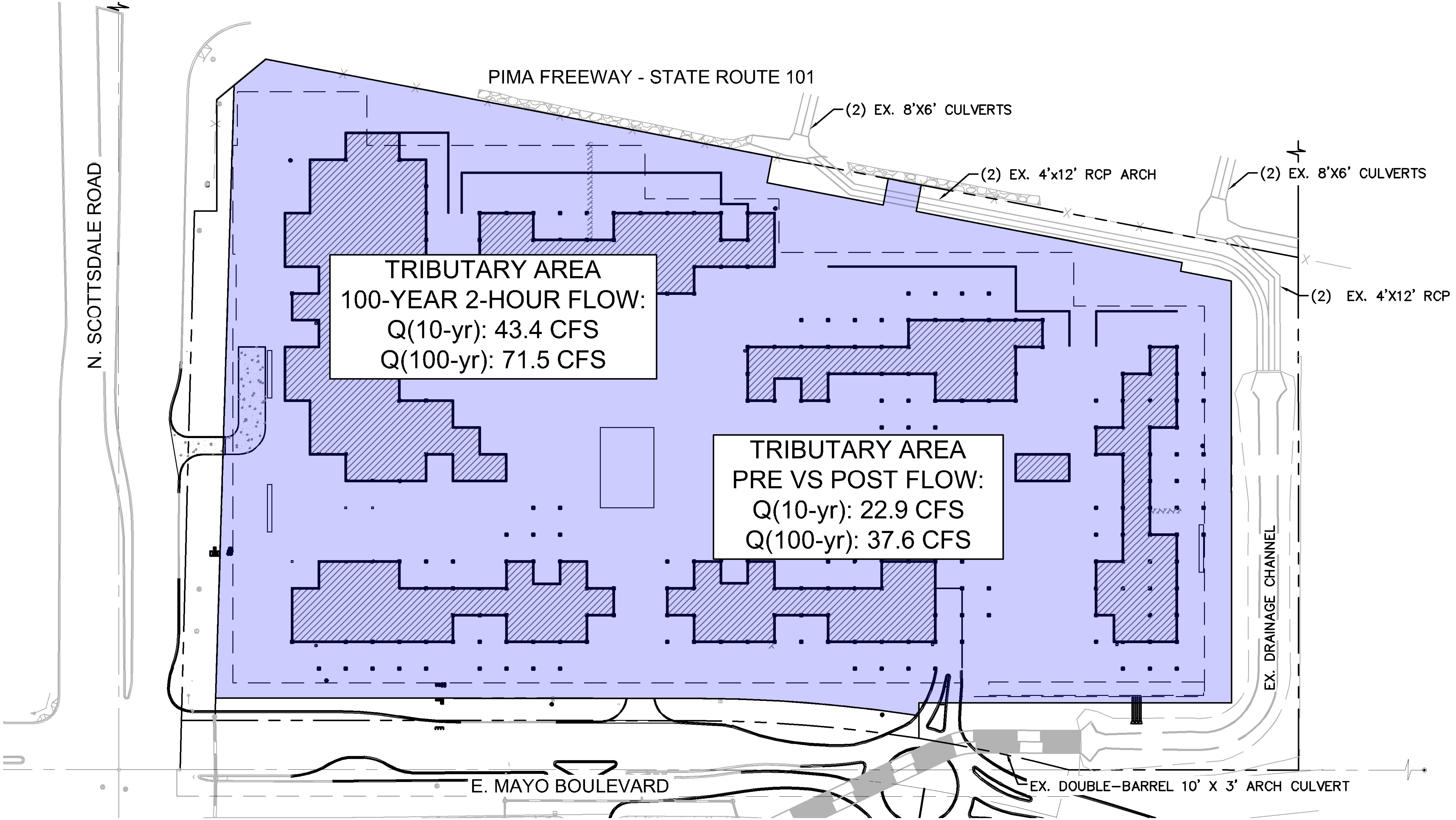


Day [0] Time 06:00:00 Step 360
65.2
130.4
195.7
260.9
326.1
391.3
456.5
521.8
0
50.0
40.0
HGL & EGL
Node1
1.76
Link1
Q : 376.00 V : 8.20
D : 4.00
159.44
Node2
2.99
Link3
Q : 376.00 V : 6.89
D : 4.00
131.00
Node5
3.46
Link4
Q : 76.00 V : 5.87
D : 3.00
300.00
Node4
2.56
Link5
Q : 76.00 V : 5.26
D : 3.00
61.75
Node6
4.23

3/10

Appendix J

Watershed Delineation



Kimley»Horn

Optima McDowell Mountain Village

WATERSHED DELINEATION

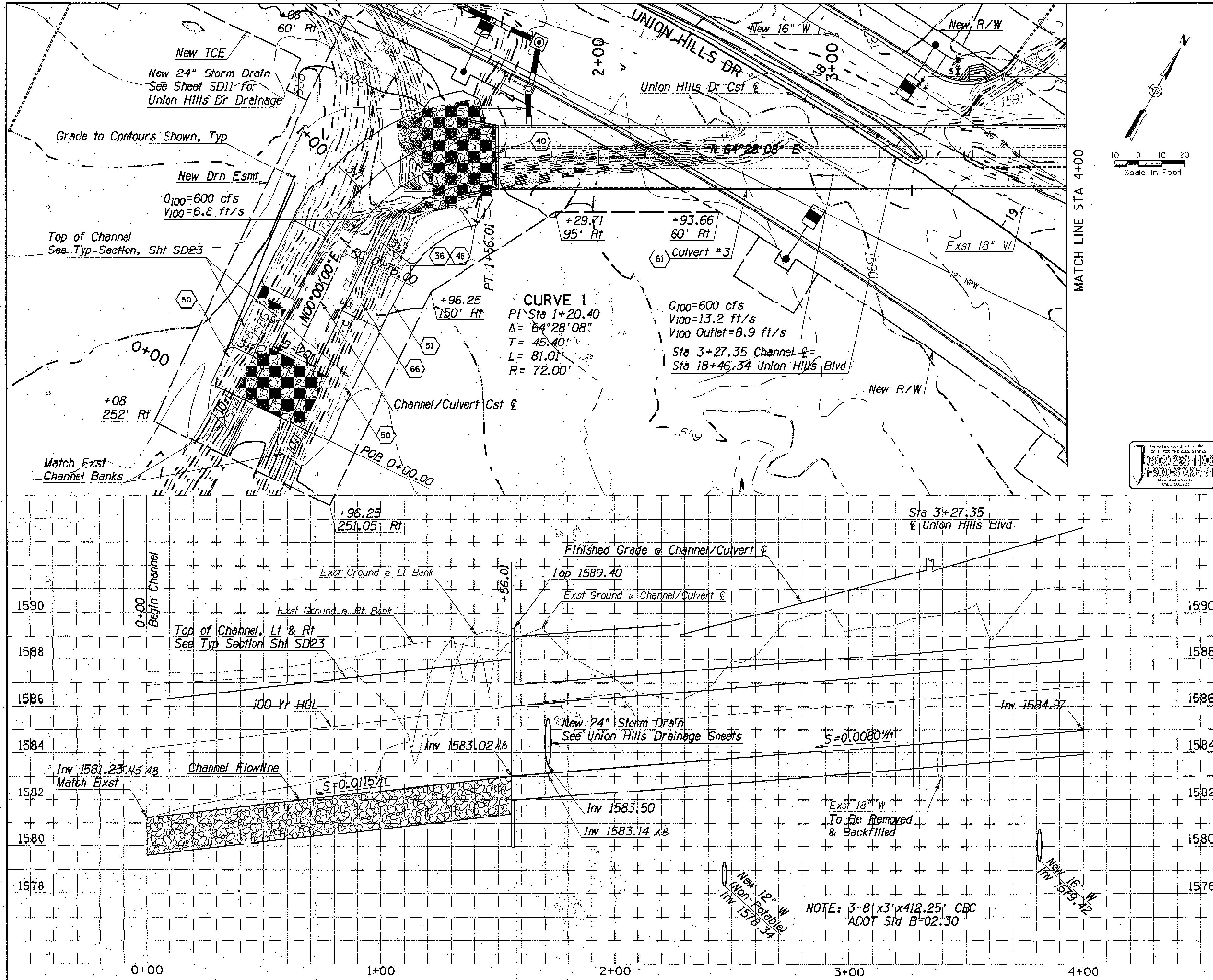
September 1, 2022

0 50 100 200

NORTH

Appendix K

As- Builts for Lund Channel



DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

REMOVAL & RELOCATION NOTES

Description	Unit	Quan.

CONSTRUCTION NOTES

Description	Unit	Quan.
36 Sta 1+56.01, Install Outlet Wings Per ADOT Std Dwg B-04.10, Dimension & Reinf Per H=5', 4:1 Slope, 0° Skew; Construct Parapet Per Detail 4, Sheet SD23; All Concrete Shall be Color 'Mesa Beige'; Visible Surfaces Shall be Exposed Aggregate; See Specifications.	Ea	1
40 Install Access Barrier per COS Std Det 2552-1 - Modified; W=105', H=40', 14 Equal Bar Spaces Horiz., 6 Equal Bar Spaces Vert., Other Specifications Per 46" Conduit; Paint Color Shall be 'Western Reserve'	Ea	1
48 Sta 1+56.01 Install Steel Handrails Per COS Std 2503 Paint Color Shall be 'Western Reserve'	LF	55
50 Install Turf Reinforcement Mat (TRM) Per Typical Channel Section & Detail, Sht SD23	SF	1520
51 Sta 00+00 to Sta 1+56.01 Construct Channel Per Typ Section, Sheet SD23	CY	860
61 Sta 1+56.01 to Sta 4+00 Install 3-8'x3'x412.25 CBC Per ADOT Std B-02.30	LF	244
66 Install Grouted Rock Riprap D_{min}=10", D_{max}=14", Depth = 24"; See Typ Channel Section and Detail, Sheet SD23	SY	700

52204

LUND CHANNEL
PLAN STA 0+00 TO 4+00

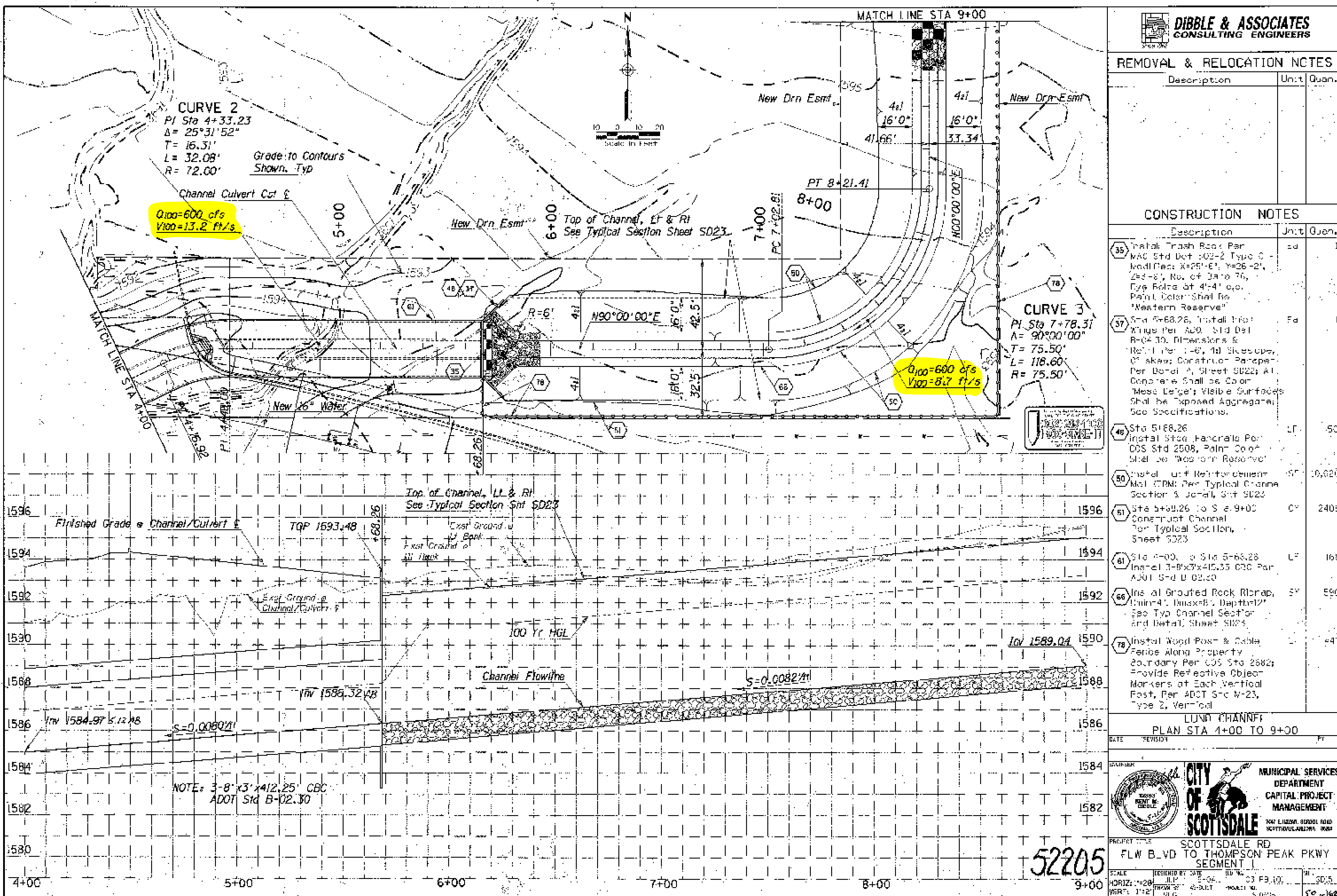
CITY OF SCOTTSDALE
MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT

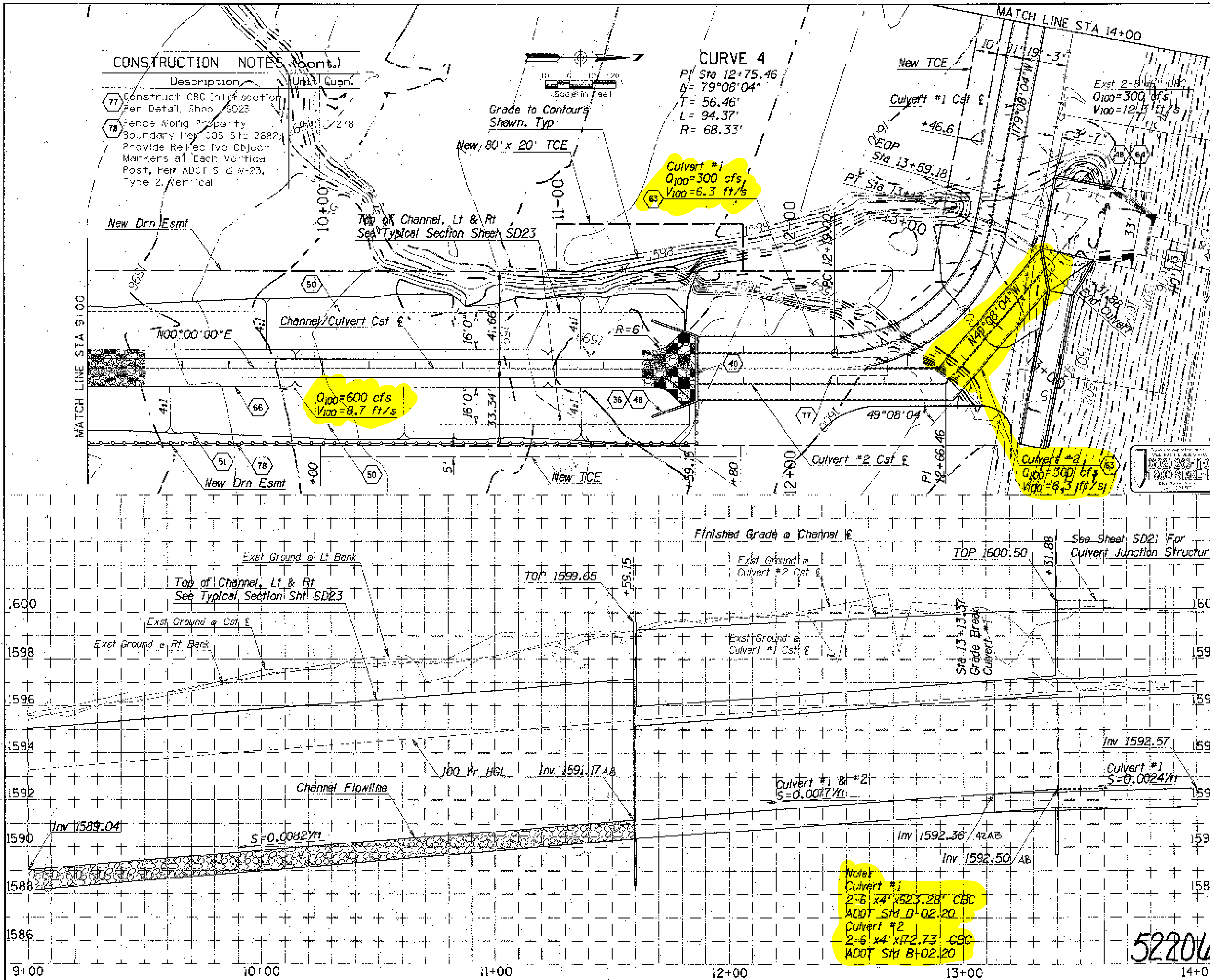
SCOTTSDALE RD
FLW BLVD TO THOMPSON PEAK PKWY
SEGMENT I

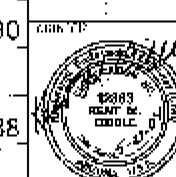
HORIZ: 1"=20'
VERT: 1"=2'
SD24
49 of 162

Q.S. 37-45, 38-45, 39-45, 40-45 49-DR-2003
6118-02

ASBUILT 6/1/06


MATCH LINE STA 9+00
MATCH LINE STA 4+00
CURVE 2
PI Sta 4+33.23
Δ= 25°31'52"
T= 16.31'
L= 32.08'
R= 72.00'
Grade to Contours Shown, Typ
Channel Culvert Cot ℄
Q100=600 cfs
V100=13.2 ft/s
New Drn Esmt
Top of Channel, Lt & Rt See Typical Section Sheet SD23
PT 8+21.41
PC 7+02.81
N00°00'00"E
N90°00'00"E
CURVE 3
PI Sta 7+78.31
Δ= 90°00'00"
T= 75.50'
L= 118.60'
R= 75.50'
Q100=600 cfs
V100=8.7 ft/s
New 16" Water
Scale in Feet
Finished Grade @ Channel/Culvert ℄
TOP 1593.48
Top of Channel, Lt & Rt See Typical Section Sht SD23
Exst Ground @ Channel/Culvert ℄
100 Yr HGL
Channel Flowline
Inv 1589.04
S=0.0082'/ft
Inv 1586.32
Inv 1584.97
S=0.0080'/ft
NOTE: 3-8'x3'x412.25' CBC ADOT Std B-02.30
52205
DIBBLE & ASSOCIATES CONSULTING ENGINEERS
REMOVAL & RELOCATION NOTES
Description | Unit | Quan.
CONSTRUCTION NOTES
Description | Unit | Quan.
35 Install Trash Rack Per MAG Std Det 502-2 Type C - Modified: X=25'-6", Y=26'-2", Z=3'-6", No. of Bars 76, Eye Bolts at 4'-4" o.c. Paint Color Shall Be "Western Reserve" | Ea | 1
37 Sta 5+68.28, Install Inlet Wings Per ADOT Std Det B-04.30. Dimensions & Rebar Per 3'-6", 4:1 Sideslopes, 0° skew; Construct Parapet Per Detail A, Sheet SD22; All Concrete Shall be Color "Mesa Beige"; Visible Surfaces Shall be Exposed Aggregate; See Specifications. | Ea | 1
48 Sta 5+68.26 Install Steel Handrails Per COS Std 2508, Paint Color Shall be "Western Reserve" | LF | 50
50 Install Turf Reinforcement Mat (TRM) Per Typical Channel Section & Detail, Sht SD23 | SF | 10,020
51 Sta 5+69.26 to Sta 9+00 Construct Channel Per Typical Section, Sheet SD23 | CY | 2405
61 Sta 4+00 to Sta 5+68.28 Install 3-8'x3'x415.35 CBC Per ADOT Std B 02.30 | LF | 166
66 Install Grouted Rock Riprap, Dmin=4", Dmax=8", Depth=12" See Typ Channel Section and Detail Sheet SD23 | SY | 590
78 Install Wood Post & Cable Fence Along Property Boundary Per COS Std 2682; Provide Reflective Object Markers at Each Vertical Post, Per ADOT Std M-23, Type 2, Vertical | LF | 447
LUND CHANNEL
PLAN STA 4+00 TO 9+00
DATE REVISION BY
CITY OF SCOTTSDALE
MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT
SCOTTSDALE RD
FLW BLVD TO THOMPSON PEAK PKWY
SEGMENT I
6118-02 Q.S. 37-45, 38-45, 39-45, 40-45 49-DR-2003
ASBUILT 6/1/06





DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

REMOVAL & RELOCATION NOTES

Description	Unit	Quan.
13 Remove Existing Barb-wire Fence, Replace in Kind	LF	110

CONSTRUCTION NOTES

Description	Unit	Quan.
36 Sta 11+59.15, Install Outlet Wings Per ADOT Std Det B-07.20, Dimensions and Point For H-4, 4:1 Slope, 0° skew; Construct Parapet Per Detail 4, Sheet SD23; All Concrete Shall be Color "Mesa Beige"; Visible Surfaces Shall be Exposed Aggregate; See Specifications.	Ea	1
40 Install Access Barrier per COS Std Det 2562-1 - Modified: W=88", H=46", 12 Equally Space Bars Horiz., 7 Equally Space Bars Vert., Other Specifications Per 72" Cond. Paint Color Shall be "Western Reserve"	Ea	4
48 Install Steel Handrail Per COS Std 2508 Paint Color Shall be "Western Reserve", See Detail 1, Sht SD21 For Junction Structure Placement	LF	253
50 Install Turf Reinforcement Mat (TRM) Per Typical Channel Section & Detail, Sht SD23	SF	8290
51 Sta 9+00 to Sta 11+59.15 Construct Channel Per Typ Section, Sheet SD23	CY	1890
63 Sta 11+59.15, to Sta 14+00.00 Install 2-6'x4' x240.85 CBC Per ADOT Std B-02.20	LF	241
Sta 11+59.15 to 13+31.88 Install 2-6'x4' x172.73 CBC Per ADOT Std B-02.20	LF	173
64 Install Precast CBC Junction Per Detail D, Sheet SD21	EA	1
66 Install Grouted Rock Riprap, Dmin=4", Dmax=8", Depth=12" See Typ Channel Section and Detail, Sheet SD23	SY	465

LUND CHANNEL
PLAN STA 9+00 TO 14+00

CITY OF SCOTTSDALE
MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT

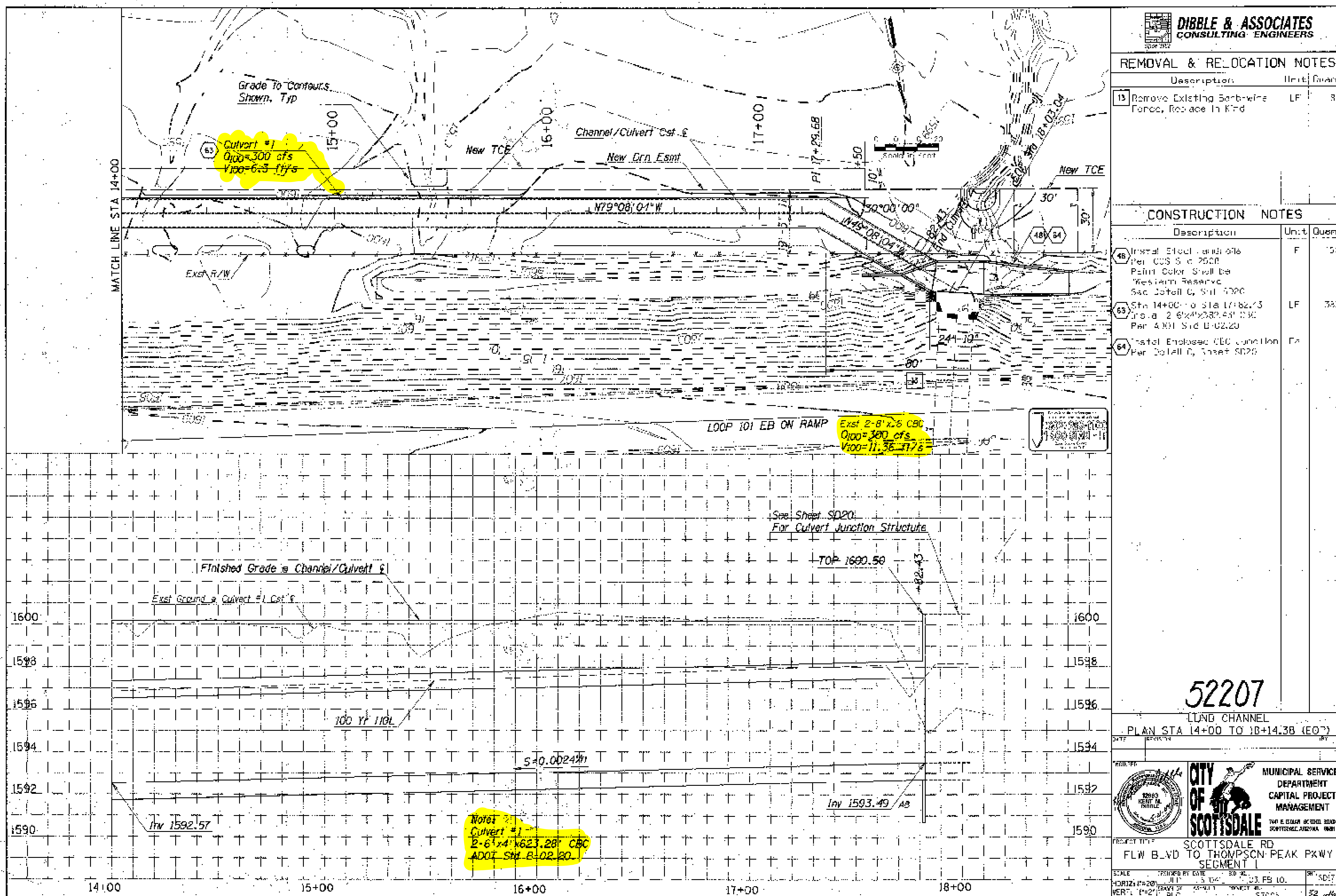
SCOTTSDALE RD
FLW BLVD TO THOMPSON PEAK PKWY
SEGMENT 1

HORIZ 1"=20'
VERT 1"=2'
SD16

Q.S. 37-45, 38-45, 39-45, 40-45 49-DR-2003
6118-02

52206

ASBUILT 6/1/06



49-DR-2003

Q.S. 37-45, 38-45, 39-45, 40-45

6118-02

Appendix L

As- Builts for One Scottsdale South Drainage Basin Improvement Plans

ONE SCOTTSDALE
SOUTH DRAINAGE BASIN IMPROVEMENTS
SCOTTSDALE, ARIZONA

ENGINEERS NOTES

1. MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION INCLUDING LATEST REVISION AND CURRENT SUPPLEMENTALS THEREOF PER THE LOCAL TOWN OR CITY) ARE INCORPORATED INTO THIS PLAN IN THEIR ENTIRETY.
2. ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH THE M.A.G. STANDARD SPECIFICATIONS AND DETAILS AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL CITY OR TOWN UNLESS SPECIFIED OTHERWISE IN THESE PLANS OR ELSEWHERE IN THE CONTRACT DOCUMENTS. CONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL REQUIRED STANDARD SPECIFICATIONS, DETAILS AND SUPPLEMENTS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, SEQUENCING, AND SAFETY CONCERNS ASSOCIATED WITH THIS PROJECT DURING CONSTRUCTION, UNLESS SPECIFICALLY ADDRESSED OTHERWISE IN THIS PLAN OR ELSEWHERE IN THE CONTRACT.
4. THE CONTRACTOR IS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION COVERED BY THIS PLAN.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE ALL WORK COVERED BY THIS PLAN.
6. THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
7. A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL CALL 48 HOURS IN ADVANCE FOR BLUE STAKE (1-800-STAKE-IT) PRIOR TO ANY EXCAVATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION OF CONSTRUCTION AFFECTING UTILITIES AND THE COORDINATION OF ANY NECESSARY UTILITY RELOCATION WORK.
9. ALL PAVING, GRADING, EXCAVATION, TRENCHING, PIPE BEDDING, CUT FILL AND BACKFILL SHALL COMPLY WITH THE RECOMMENDATIONS SET FORTH IN THE SOILS (GEOTECHNICAL) REPORT FOR THIS PROJECT IN ADDITION TO THE REFERENCED REQUIRED SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL BE AWARE THAT CERTAIN UTILITIES REQUIRE PROPER ATTENTION AND CAREFUL PLANNING DURING SITE CONSTRUCTION. PLEASE NOTE THAT UTILITIES ON THESE PLANS MAY NOT EXHIBIT THE FULL PROTECTIVE COVER REQUIRED DURING THE SUBGRADE PREPARATION PHASE OF THE CONSTRUCTION. IN SUCH INSTANCES, THE CONTRACTOR SHALL PROVIDE ADDITIONAL PROTECTION (SUCH AS RAMPING) OR INCREASED PIPE STRENGTH TO PROVIDE THE NECESSARY PROTECTION REQUIRED TO PREVENT DAMAGE DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL HOLD THE ENGINEER HARMLESS IN ALL CASES FOR DAMAGES TO UTILITIES WHERE INADEQUATE PROTECTIVE MEASURES OCCUR.
10. THE CONTRACTOR IS TO VERIFY THE LOCATION AND THE ELEVATIONS OF ALL EXISTING UTILITIES AT POINTS OF TIE-IN PRIOR TO COMMENCING ANY NEW CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER'S AGENT.
11. CONTRACTOR TO VERIFY AND COORDINATE ALL DIMENSIONS AND SITE LAYOUT WITH ARCHITECT'S FINAL SITE PLAN AND FINAL BUILDING DIMENSIONS BEFORE STARTING WORK. REPORT DISCREPANCIES TO OWNER'S AGENT.
12. COORDINATION BETWEEN ALL PARTIES IS ESSENTIAL PART OF CONTRACT.
13. CONTRACTOR IS RESPONSIBLE FOR PROJECT AND SITE CONDITIONS, AND TO WORK WITH WEATHER CONDITIONS AS THE PROJECT SITE MAY BE LOCATED IN A FLOOD PRONE AREA AND SUBJECT TO FLOODING AND ITS HAZARDS.
14. THE CONTRACTOR IS TO VERIFY THE LOCATION, ELEVATION, CONDITION, AND PAVEMENT CROSS-SLOPE OF ALL EXISTING SURFACES AT POINTS OF TIE-IN AND MATCHING, PRIOR TO COMMENCEMENT OF GRADING, PAVING, CURB AND GUTTER, OR OTHER SURFACE CONSTRUCTION. SHOULD EXISTING LOCATIONS, ELEVATIONS, CONDITION, OR PAVEMENT CROSS-SLOPE DIFFER FROM THAT SHOWN ON THESE PLANS, RESULTING IN THE DESIGN INTENT REFLECTED ON THESE PLANS NOT ABLE TO BE CONSTRUCTED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY FOR DIRECTION ON HOW TO PROCEED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL COSTS ASSOCIATED WITH CORRECTIVE ACTION IF THESE PROCEDURES ARE NOT FOLLOWED.
15. CONTRACTOR IS RESPONSIBLE TO COORDINATE UTILITY CROSSINGS AT CULVERT CROSSINGS BEFORE STARTING WORK ON CULVERT. COORDINATE WITH OWNER REPRESENTATIVE. VERIFY UTILITY LINES AND/OR CONDUITS ARE IN PLACE BEFORE STARTING CULVERT WORK.
16. CONSTRUCT RETENTION BASIN AS SHOWN. CONTRACTOR TO SCARIFY BOTTOM OF BASIN TWO FEET DEEP AND NOT ALLOW COMPACTION OVER BOX.
17. THIS PROJECT REQUIRES A REGULAR ONGOING MAINTENANCE PROGRAM FOR THE DESIGNED DRAINAGE SYSTEM(S) TO PRESERVE THE DESIGN INTEGRITY AND THE ABILITY TO PERFORM ITS OPERATIONAL INTENT. FAILURE TO PROVIDE MAINTENANCE WILL JEOPARDIZE THE DRAINAGE SYSTEM(S)' PERFORMANCE AND MAY LEAD TO IT'S INABILITY TO PERFORM PROPERLY AND/OR CAUSE DAMAGE ELSEWHERE IN THE PROJECT.
18. SEWER LINES DESIGNED IN PROFILE AND PUBLIC WATER LINES ARE REQUIRED TO BE ASBUILT AND THE INSTALLATION AND TESTING WITNESSED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODES R18-9-E301 "4.01 GENERAL PERMIT: SEWAGE COLLECTIONS SYSTEMS" AND R18-4-507 AND 508 "APPROVAL OF CONSTRUCTION" AND "RECORD DRAWINGS", RESPECTIVELY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY OWNER 72 HOURS IN ADVANCE WHEN THOSE SYSTEMS ARE READY TO BE WITNESSED.
19. THE WORK PRODUCT PRESENTED IS BELIEVED TO BE COMPLIANT WITH THE INTENT OF THE CURRENT AMERICANS DISABILITIES ACT (ADA) REQUIREMENTS AS INTERPRETED BY THE REVIEWING AGENCY(S). IF CONSTRUCTION OF THE PROJECT IS DELAYED, THIS WORK PRODUCT SHOULD BE UPDATED TO ACCOUNT FOR ANY RELEVANT ADA UPDATES BEFORE CONSTRUCTION BEGINS.

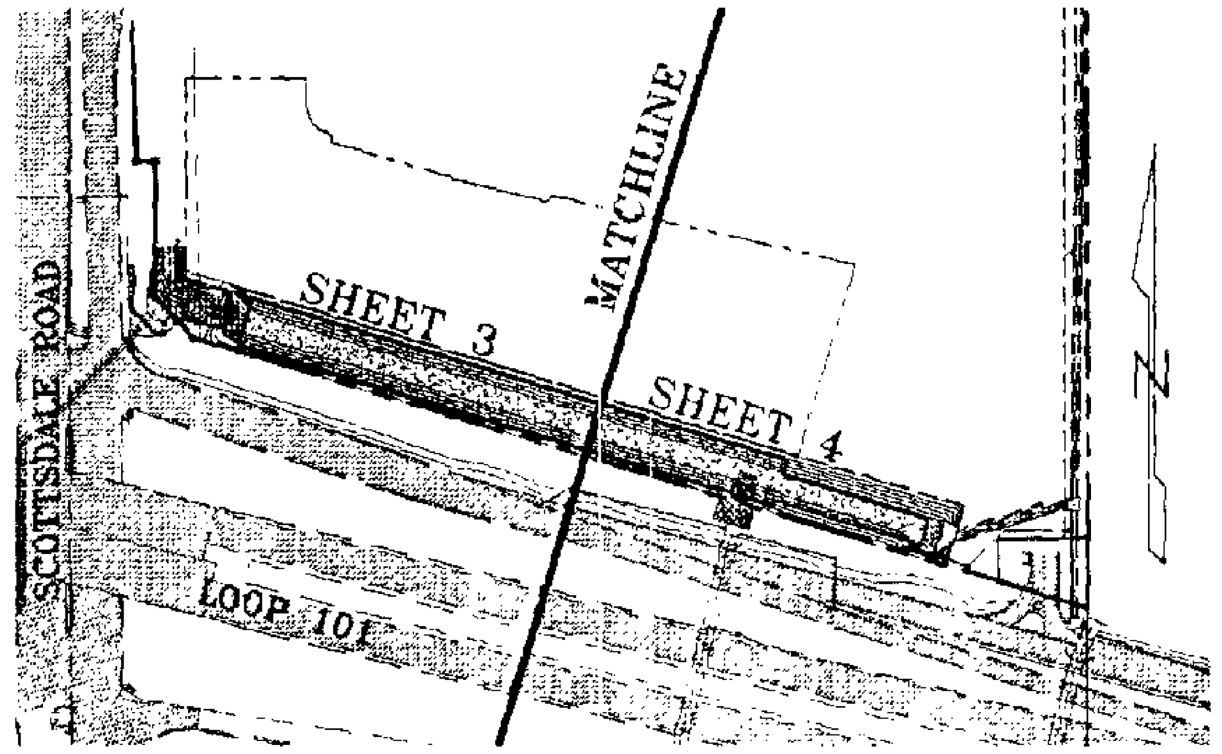
UTILITY NOTES

1. THESE PLANS HAVE BEEN SUBMITTED TO THE FOLLOWING UTILITY COMPANIES AND THE WORK CONTAINED IN THESE PLANS HAS BEEN APPROVED BY THESE COMPANIES WITHIN THEIR AREA OF INTEREST. THE SIZE AND LOCATIONS, AS SHOWN, OF THE GAS, TELEPHONE AND POWER LINES, AND CONNECTIONS AGREE WITH THE INFORMATION CONTAINED IN THE UTILITY COMPANY RECORDS. WHERE THE WORK TO BE DONE CONFLICTS WITH ANY OF THESE UTILITIES, THE CONFLICTS SHALL BE RESOLVED AS SPECIFIED. CONFLICTS ARISING DURING THE COURSE OF CONSTRUCTION FROM UNFORESEEN CIRCUMSTANCES SHALL BE REPORTED TO THE INTERESTED UTILITY COMPANY AND BE RESOLVED BY THEM AND THE DESIGN ENGINEER AND APPROVED BY THE COS.
2. THE CITY WILL NOT PARTICIPATE IN THE COST OF CONSTRUCTION OR UTILITY RELOCATION.
3. IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61.

HAUL ROUTE

HAUL ROUTE PERMITS ARE REQUIRED FOR ANY HAUL OPERATION WHICH UTILIZES CITY RIGHT-OF-WAY WITH A VOLUME EXCEEDING 5,000 C.Y.

SHEET INDEX



INDEX MAP
N.T.S.

GENERAL NOTES

CITY OF SCOTTSDALE GENERAL CONSTRUCTION NOTES FOR PUBLIC WORKS CONSTRUCTION

1. ALL CONSTRUCTION IN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE (COS) SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE LATTER SHALL GOVERN.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY THE CITY IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
3. APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF AN ENCROACHMENT PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS SHALL BE RESUBMITTED TO THE CITY FOR RE-APPROVAL.
4. A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHT-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO STARTING OF CONSTRUCTION (TELEPHONE 480-312-5750).
5. WHENEVER EXCAVATION IS TO BE DONE, CALL THE "BLUE STAKE CENTER", 263-1100, TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL "COLLECT" IF NECESSARY.
6. ENCROACHMENT PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. AN ENCROACHMENT PERMIT WILL BE ISSUED BY THE CITY UPON RECEIPT OF PAYMENT OF A BASE FEE PLUS A FEE FOR INSPECTION SERVICES TO BE PROVIDED BY THE CITY. COPIES OF ALL PERMITS SHALL BE RETAINED ONSITE AND SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE WORK STOPPAGE UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
7. ALL EXCAVATION AND GRADING WHICH IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO CHAPTER 70, EXCAVATION AND GRADING, OF THE LATEST EDITION OF THE UNIFORM BUILDING CODE PREPARED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE UNIFORM BUILDING CODE.
8. ALL CONCRETE SHALL BE SAN DIEGO BUFF.

INDEMNITY:

1. CITY OF SCOTTSDALE WILL NOT BE RESPONSIBLE FOR REMOVAL, REPAIR, OR REPLACEMENT OF SIDEWALKS, LANDSCAPING OR ANY OTHER IMPROVEMENTS LOCATED WITHIN CITY EASEMENT(S) AS A RESULT OF ACCESS TO MAINTENANCE OF, OR REPAIRS TO THE WATERLINE SHOWN ON THESE PLANS.
2. CITY OF SCOTTSDALE WILL NOT BE RESPONSIBLE FOR REMOVAL, REPAIR, OR REPLACEMENT OF THE RETAINING WALLS OR OTHER IMPROVEMENTS WITHIN CITY EASEMENT(S) AS A RESULT OF ACCESS TO, MAINTENANCE OF, OR REPAIRS TO THE RETAINING WALLS SURROUNDING THE DETENTION BASINS SHOWN ON THESE PLANS.

"THE ENGINEER OF RECORD ON THESE PLANS HAS RECEIVED A COPY OF THE APPROVED STIPULATIONS FOR THIS PROJECT AND HAS DESIGNED THESE PLANS IN CONFORMANCE WITH THE APPROVED STIPULATIONS."

ENGINEER: LISA L CRANE, P.E.

LAND SURVEY DATA

E/W STREET ALIGN	BEARDSLEY ROAD		
N/S STREET	SCOTTSDALE ROAD ALIGN		
DESCRIPTION	MC BC HH, N. BOUND LANE, DOWN 0.6'		
TOWNSHIP	4N	RANGE	4E
SEC	26	DATE UPDATED	NA
COR	NW		
NORTHING (f)	15,283.524	EASTING (f)	27,356.033
NAVD '88 ELEV (f)	1662.878		

BENCHMARK AND TOPO SOURCE

ALL TOPOGRAPHY WAS OBTAINED FROM AERIAL MAPPING COMPANY, INC., PROJECT NUMBER 04134, FLIGHT DATE JUNE 26, 2004

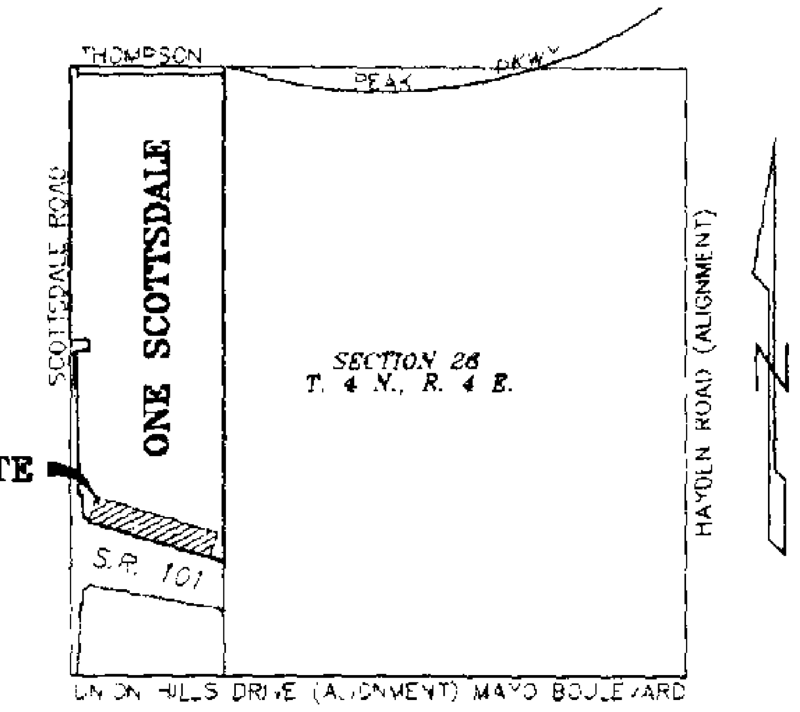
I HEREBY CERTIFY THAT ALL ELEVATIONS REPRESENTED ON THIS PLAN ARE BASED ON THE ELEVATION DATUM FOR THE CITY OF SCOTTSDALE BENCHMARK PROVIDED ABOVE.

CITY OF SCOTTSDALE
REVIEW & RECOMMENDED APPROVAL BY:

FIRE DEPT	N/A	GRADING & DRAINAGE	Aziz S. Helal 10-24-07
PLANNING	[signature] 10/25/07	WATER & SEWER	N/A
TRAFFIC	N/A	PAVING	N/A
STRUCTURAL	Aziz S. Helal 10-24-07	RET. WALL	Aziz S. Helal 10-24-07

APPROVED BY:

Joseph D. Morris — ENGINEERING COORDINATOR MANAGER OR DESIGNEE — 10/25/07 DATE



VICINITY MAP
N.T.S.

OWNER / DEVELOPER

ONE SCOTTSDALE HOLDINGS LLC.
7600 E. DOUBLETREE RANCH RD. SUITE 300
SCOTTSDALE, AZ 85258
CONTACT: MR. ART NEHF
TEL.:(480) 367-7000
FAX (480) 367-7558

ENGINEER

WOOD, PATEL & ASSOCIATES INC.
2051 WEST NORTHERN, SUITE 100
PHOENIX, ARIZONA 85021
CONTACT: MS. LISA L. CRANE, P.E.
(602) 335-8500
(FAX) 335-8580

EARTHWORK QUANTITIES

QUANTITIES ARE IN PLACE ESTIMATES. VOLUME OF CUT FOR UNDERGROUND STORAGE IS INCLUDED. NO SHRINK OR SWELL IS ASSUMED.

DESCRIPTION	QUANTITY
CUT	17,800 C.Y.
FILL	80 C.Y.

DETENTION CALCULATIONS

THIS PLAN SHOULD BE REVIEWED WITH THE MASTER DRAINAGE REPORT DATED 09-26-06 PREPARED BY WOOD, PATEL & ASSOCIATES.

NO CONFLICT SIGNATURE BLOCK

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE SENT
WATER	CITY OF SCOTTSDALE	CITY OF SCOTTSDALE	N/A	N\A
SANITARY SEWER	CITY OF SCOTTSDALE	CITY OF SCOTTSDALE	N/A	N\A
ELECTRIC	A.P.S.	BARBARA HEIMER	602-371-6688	02-13-07
TELEPHONE	QWEST COMM.	CONFLICT LIAISON DEPT.	602-630-0496	02-13-07
NATURAL GAS	SOUTHWEST GAS CORP.	POM JINTASAWANG	602-749-8550	02-13-07
CABLE TV	COX CABLE	THANH DOAN	623-322-7086	02-13-07
OTHER	-	-	-	-
OTHER	-	-	-	-

ENGINEER'S CERTIFICATION:

I, LISA L. CRANE, BEING THE PERSON RESPONSIBLE FOR DESIGNING THE FACILITIES NECESSARY TO SERVE THIS DEVELOPMENT, HEREBY CERTIFY THAT ALL OF THE UTILITY COMPANIES LISTED ABOVE, HAVE REVIEWED THIS PROJECT PROPOSAL AND ALL CONFLICTS HAVE BEEN RESOLVED AT THIS POINT. "NO CONFLICTS" FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL. I ALSO CERTIFY THAT ALL ONSITE TRANSFORMERS, CABLE BOXES AND ANY OTHER PUBLIC/PRIVATE UTILITY APPURTENANCES ARE PLACED SUCH THAT THEY DO NOT NEGATIVELY IMPACT THE USE OR INTENDED USE OF ANY DEDICATED EASEMENTS OR FACILITIES DEVELOPED WITH THIS PROJECT INCLUDING BUT NOT LIMITED TO STORMWATER STORAGE BASINS, SIGHT DISTANCE EASEMENTS AND NAOS OR OTHER OPEN SPACE EASEMENTS.

SIGNATURE: Lisa L Crane — DATE: 10/29/07

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM	FIRM ZONE	BASE FLOOD ELEVATION (IN AO ZONE, USE DEPTH)
045012	1245	G	SEPT. 30, 2005	AO	1'

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

DMB

WOOD/PATEL
Civil Engineers
Hydrologists
Land Surveyors
Construction Managers
(602) 335-8500

ONE SCOTTSDALE
SOUTH DRAINAGE BASIN IMPROVEMENTS
SCOTTSDALE, ARIZONA

Registered Professional Engineer (Civil) Certificate No. 44687 LISA L. CRANE, Date Signed 10/29/07, ARIZONA, U.S.A.

DRAWN	YLJ
CHECKED	SAA
DATE	27 JULY 2007
SCALE	
JOB NO	021584.14
SHEET	1 OF 5

SA #396-SA-2006 SA #280-SA-2006 54-N.P.-2006 D.R. #1-DR-2006 2 Z #20-ZN-2002 #2 PLAN CHECK #6787-06-2 Q.S. #39-45

S:\2007\021584.14\dwg\Imp\South Basin\021584-14-01CVR.dwg

LEGAL DESCRIPTION

THE WEST HALF OF THE WEST HALF OF SECTION 26, TOWNSHIP 4 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA;

EXCEPT THE NORTH 100 FEET OF THE WEST 165 FEET OF THAT PART OF THE NORTHWEST QUARTER OF SECTION 26, TOWNSHIP 4 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, LYING SOUTH OF AND ADJOINING A STRAIGHT LINE DRAWN AT A RIGHT ANGLE FROM A POINT ON THE WEST LINE OF SAID NORTHWEST QUARTER OF SAID SECTION 26, SAID POINT BEING 2367.00 FEET SOUTH OF THE NORTHWEST CORNER OF SAID SECTION 26; AND ALSO

EXCEPT THAT PORTION OF THE WEST HALF OF THE WEST HALF OF SECTION 26, TOWNSHIP 4 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, WHICH LIES WITHIN THE PARCEL OF LAND DESCRIBED AS FOLLOWS:

BEGINNING AT A UNITED STATES GENERAL LAND OFFICE BRASS CAP MARKING THE SOUTHWEST CORNER OF SAID SECTION 26; THENCE ALONG THE WEST LINE OF SAID SECTION 26, NORTH 0 DEGREES 02 MINUTES 06 SECONDS WEST, 2642.06 FEET TO A MARICOPA COUNTY HIGHWAY DEPARTMENT BRASS CAP MARKING THE WEST QUARTER CORNER OF SAID SECTION 26; THENCE CONTINUING ALONG SAID WEST LINE, NORTH 0 DEGREES 02 MINUTES 06 SECONDS WEST 170.94 FEET TO A POINT 2467.00 FEET SOUTH OF THE NORTHWEST CORNER OF SAID SECTION 26; THENCE LEAVING SAID WEST LINE, NORTH 89 DEGREES 57 MINUTES 54 SECONDS EAST 52.30 FEET TO A POINT HEREINAFTER CALLED POINT "A";
THENCE SOUTH 01 DEGREES 32 MINUTES 53 SECONDS EAST, 1238.42 FEET TO A POINT HEREINAFTER CALLED POINT "B";
THENCE NORTH 89 DEGREES 57 MINUTES 54 SECONDS EAST, 25.00 FEET TO A LINE PARALLEL WITH AND 110.00 FEET EAST OF THE WEST LINE OF SAID SECTION 26;
THENCE ALONG SAID PARALLEL LINE, SOUTH 0 DEGREES 02 MINUTES 06 SECONDS EAST, 175.00 FEET;
THENCE SOUTH 42 DEGREES 29 MINUTES 44 SECONDS EAST, 74.07 FEET;
THENCE SOUTH 73 DEGREES 12 MINUTES 54 SECONDS EAST, 1212.44 FEET TO THE EAST LINE OF SAID WEST HALF OF THE WEST HALF;
THENCE ALONG SAID EAST LINE, SOUTH 0 DEGREES 01 MINUTES 50 SECONDS EAST, 421.96 FEET;
THENCE NORTH 79 DEGREES 08 MINUTES 01 SECONDS WEST, 1176.82 FEET;
THENCE SOUTH 50 DEGREES 34 MINUTES 39 SECONDS WEST, 71.10 FEET TO A LINE PARALLEL WITH AND 110.00 FEET EAST OF THE WEST LINE OF SAID SECTION 26;
THENCE ALONG SAID PARALLEL LINE, SOUTH 0 DEGREES 02 MINUTES 06 SECONDS EAST, 125.00 FEET;
THENCE SOUTH 89 DEGREES 57 MINUTES 54 SECONDS WEST, 25.00 FEET TO A POINT HEREINAFTER CALLED POINT "C";
THENCE SOUTH 01 DEGREES 28 MINUTES 41 SECONDS WEST, 825.30 FEET TO THE SOUTH LINE OF SAID SECTION 26 AND TO A POINT HEREINAFTER CALLED POINT "D";
THENCE ALONG SAID SOUTH LINE, NORTH 89 DEGREES 58 MINUTES 35 SECONDS WEST, 68.49 FEET TO THE POINT OF BEGINNING; AND ALSO

EXCEPT THAT PORTION OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 26, DESCRIBED AS FOLLOWS:

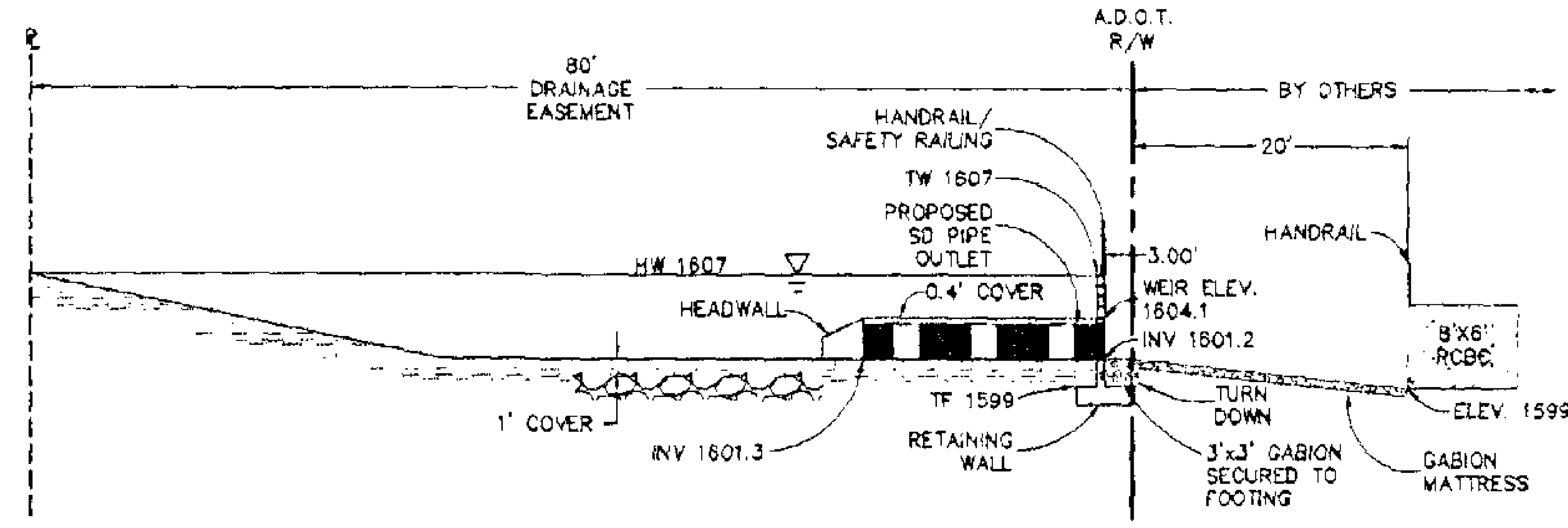
COMMENCING AT A UNITED STATES GENERAL LAND OFFICE BRASS CAP MARKING THE SOUTHWEST CORNER OF SAID SECTION 26, BEING NORTH 89 DEGREES 58 MINUTES 35 SECONDS WEST 2641.00 FEET FROM A 3/4 INCH REBAR MARKING THE SOUTH QUARTER CORNER OF SAID SECTION 26;
THENCE ALONG THE WEST LINE OF SAID SECTION 26, NORTH 0 DEGREES 02 MINUTES 26 SECONDS WEST 625.01 FEET TO A POINT BEING SOUTH 0 DEGREES 02 MINUTES 26 SECONDS EAST 2015.76 FEET FROM THE MARICOPA COUNTY HIGHWAY BRASS CAP MARKING THE WEST QUARTER CORNER OF SAID SECTION 26;
THENCE NORTH 89 DEGREES 57 MINUTES 34 SECONDS EAST 110.00 FEET TO THE POINT OF BEGINNING ON THE SOUTHERLY RIGHT OF WAY LINE OF STATE ROUTE 101L (PIMA FREEWAY);
THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 89 DEGREES 57 MINUTES 54 SECONDS WEST 25.00 FEET;
THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 01 DEGREES 28 MINUTES 41 SECONDS WEST 50.00 FEET;
THENCE NORTH 27 DEGREES 44 MINUTES 09 SECONDS EAST 56.49 FEET TO THE POINT OF BEGINNING; AND ALSO

EXCEPT A PARCEL OF LAND LYING WITHIN SAID SECTION 26, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

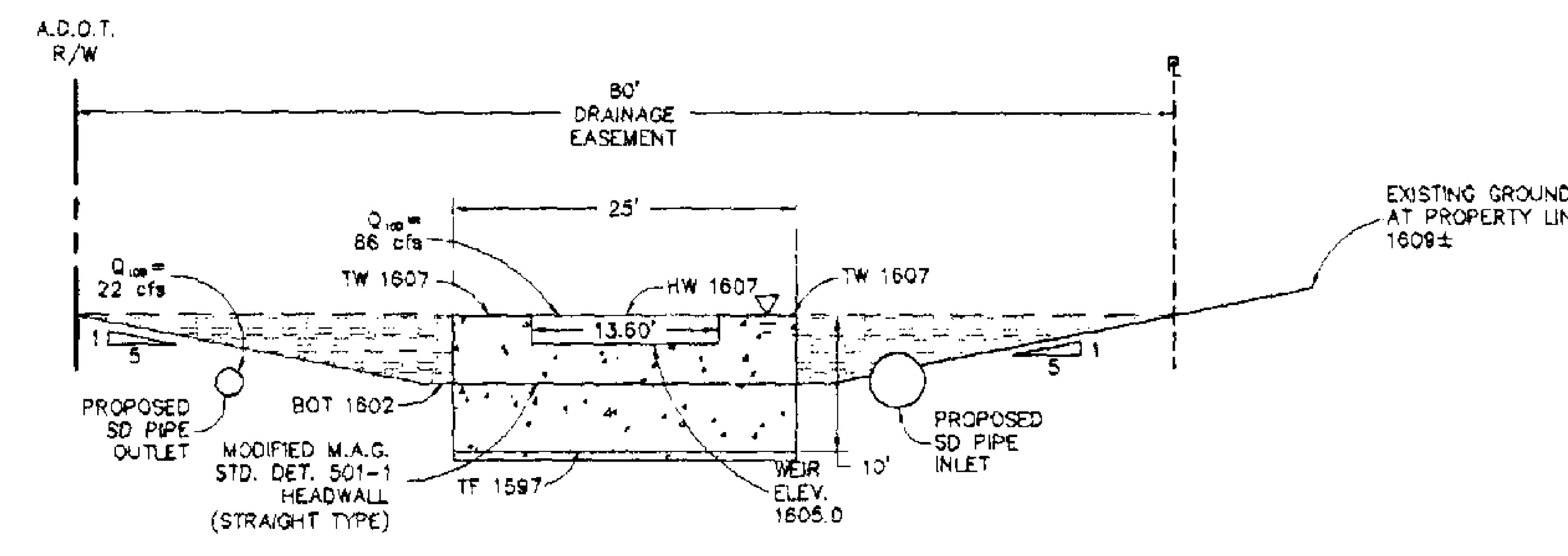
COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 26;
THENCE ALONG THE SOUTH LINE OF SAID SECTION, SOUTH 89 DEGREES 58 MINUTES 26 SECONDS EAST, A DISTANCE OF 68.49 FEET TO THE EASTERLY LINE OF PARCEL NO. 7-5398, TRACT NO. 1, AS RECORDED IN INSTRUMENT NO. 2002-0294002, AND THE POINT OF BEGINNING;
THENCE LEAVING SAID SOUTH LINE ALONG SAID EASTERLY LINE, NORTH 01 DEGREES 28 MINUTES 38 SECONDS EAST, A DISTANCE OF 625.29 FEET;
THENCE NORTH 89 DEGREES 57 MINUTES 52 SECONDS EAST, A DISTANCE OF 25.00 FEET;
THENCE NORTH 00 DEGREES 02 MINUTES 08 SECONDS WEST, A DISTANCE OF 124.88 FEET;
THENCE NORTH 50 DEGREES 34 MINUTES 37 SECONDS EAST, A DISTANCE OF 71.10 FEET;
THENCE SOUTH 79 DEGREES 08 MINUTES 03 SECONDS EAST, A DISTANCE OF 1176.65 FEET TO THE EAST LINE OF THE WEST HALF OF THE WEST HALF OF SAID SECTION 26;
THENCE LEAVING SAID EASTERLY LINE ALONG SAID EAST LINE, SOUTH 00 DEGREES 02 MINUTES 11 SECONDS EAST, A DISTANCE OF 573.88 FEET TO THE SOUTH LINE OF SAID SECTION;
THENCE LEAVING SAID EAST LINE ALONG SAID SOUTH LINE, NORTH 89 DEGREES 58 MINUTES 26 SECONDS WEST, A DISTANCE OF 1251.89 FEET TO THE POINT OF BEGINNING.

LEGEND

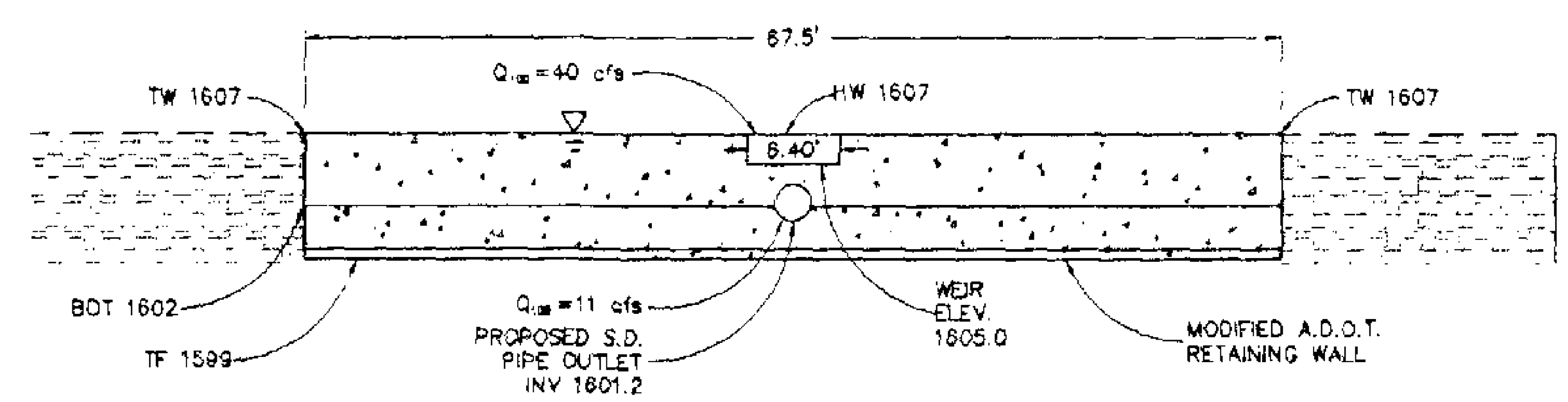
1337	PROPOSED CONTOUR
1337	EXISTING CONTOUR
	PROPOSED RIGHT OF WAY
	ROADWAY CENTERLINE
	VERTICAL CURB & GUTTER
INV 34.0	PROPOSED INVERT ELEVATION
35.5	TOP OF CURB ELEVATION (FROM CITY OF SCOTTSDALE DIBBLE PLAN)
W	RIP-RAP AREA ID
TC 13.37	TOP OF CURB ELEVATION (FROM TOPO)
GE 13.37	GUTTER ELEVATION (FROM TOPO)
NG 13.37	NATURAL GROUND ELEVATION (FROM TOPO)
PCL 13.37	PAVEMENT CENTERLINE ELEVATION (FROM ADOT PLANS)
MCL 13.37	MEDIAN CENTERLINE ELEVATIONS (FROM ADOT PLANS)
A.D.O.T.	ARIZONA DEPARTMENT OF TRANSPORTATION
TF	TOP OF FOOTING
TW	TOP OF WALL
R/W	RIGHT OF WAY
HW	HIGH WATER
BOT	BOTTOM
INV	INVERT
SD	STORM DRAIN
TYP	TYPICAL
EG	EXISTING GROUND
ELEV	ELEVATION
C.Y.	CUBIC YARD
R.C.P.	REINFORCED CONCRETE PIPE
R.C.B.C.	REINFORCED CONCRETE BOX CULVERT
	PROPOSED STAND PIPE
	EXISTING STORM DRAIN
	PROPOSED STORM DRAIN
	PROPOSED CATCH BASIN
	EXISTING ROAD
	EXISTING CURB AND GUTTER
	FLOWLINE
	MISCELLANEOUS UTILITIES
	TRAFFIC SIGNAL
	TRAFFIC SIGNAL
	SIGN
	HEADWALL WITH HANDRAIL
	LIMITS OF CONSTRUCTION



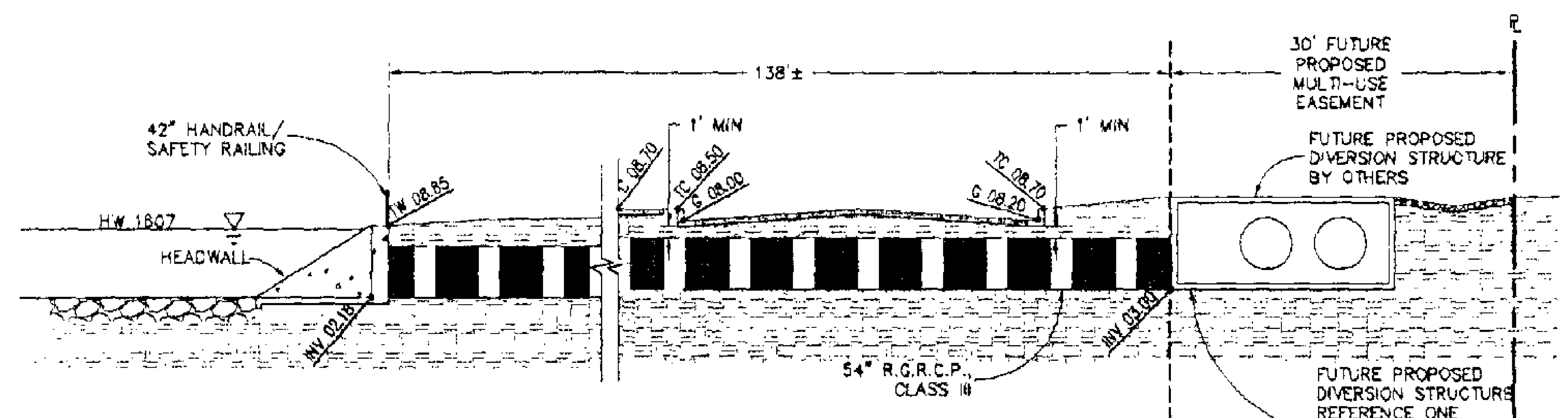
SECTION B-B
SCALE: 1"=10'



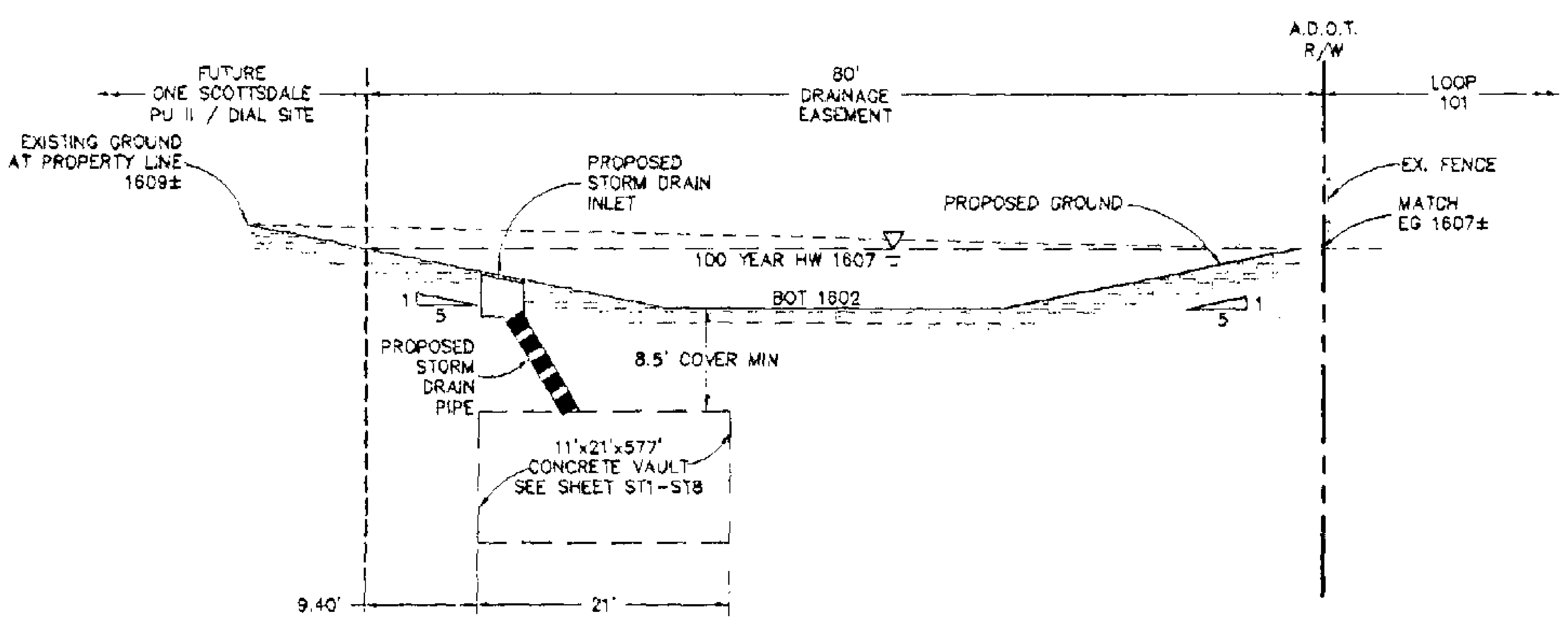
SECTION C-C
SCALE: 1"=10'



SECTION D-D
SCALE: 1"=10'



SECTION E-E
SCALE: 1"=10'



SECTION A-A (TYPICAL)
N.T.S.

*UNDERGROUND RETENTION SOLUTION NOT YET SELECTED

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WOOD/PATEL
Civil Engineers
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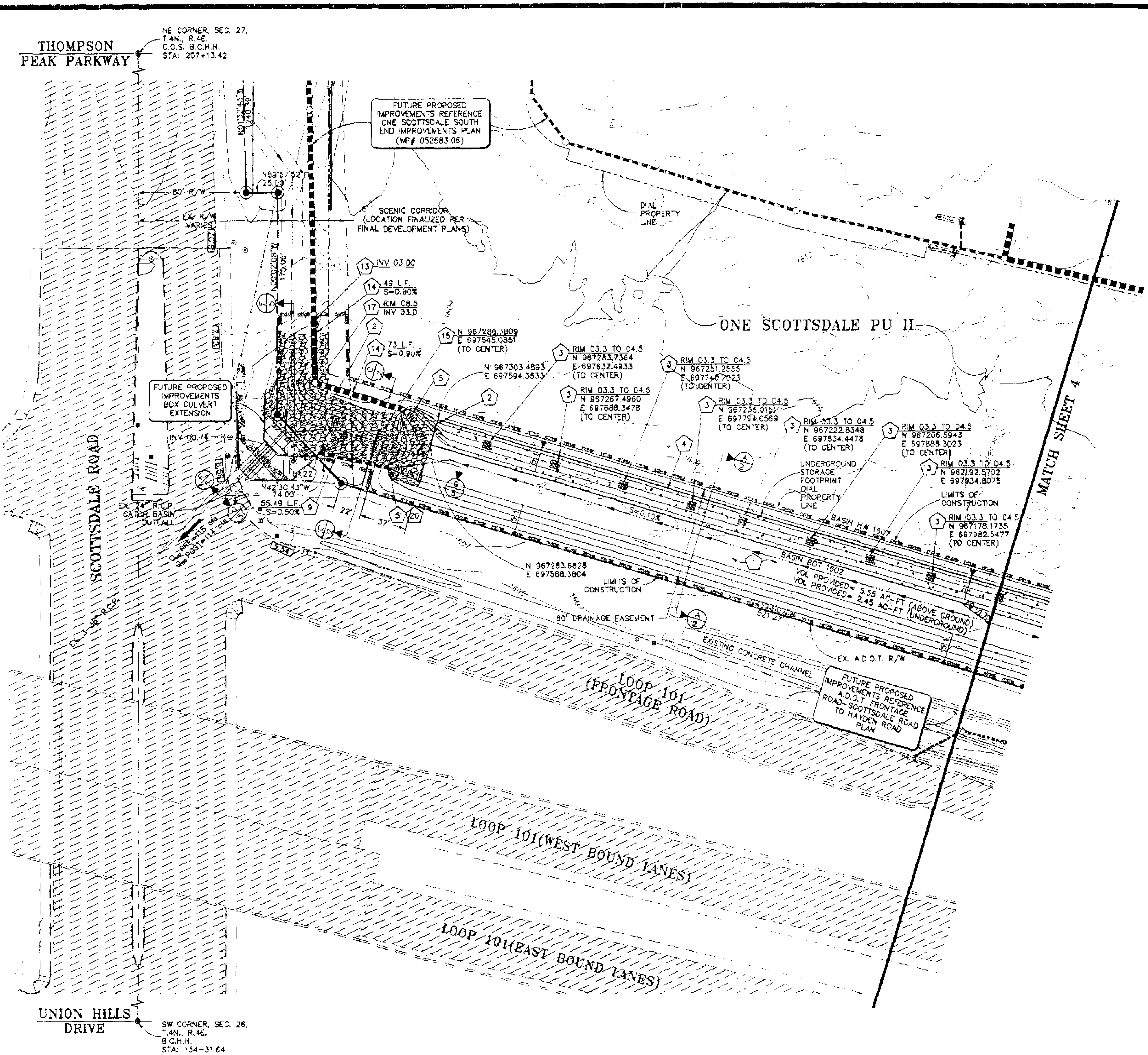
(602) 335-8500

ONE SCOTTSDALE
SOUTH DRAINAGE BASIN IMPROVEMENTS
SCOTTSDALE, ARIZONA

Registered Professional Engineer (Civil) CERTIFICATE NO. 44687 LISA L. CRANE ARIZONA, U.S.A.

DRAWN	YLJ
CHECKED	SAA
DATE	27 JULY 2007
SCALE	
JOB NO.	021584.14
SHEET	2 OF 5

S.A. #396-SA-2006 S.A. #280-SA-2006 54-N.P.-2006 D.R. #1-DR-2006 Z.N. #20-ZN-2002 #2 PLAN CHECK #6787-06-2 Q.S. #39-45



Horz. 1 in. = 40 ft.

CONSTRUCTION NOTES

1. CONTRACTOR TO REMOVE EARTH, BUILD APPROVED CONTAINMENT STRUCTURE, PLACE FILL OVER STRUCTURE, AND GRADE FINAL BASIN PER PLAN AND APPROPRIATE SECTIONS.
2. INSTALL 3' THICK BURIED RIP-RAP, D_{50}=8" PER GRADATION TABLE AND RIP-RAP AREA TABLE. SEE SHEET 4. SEE BURIED RIP-RAP DETAIL, SHEET 5.
3. INSTALL TWO CATCH BASIN INLETS SIDE BY SIDE PER MODIFIED A.D.O.T. STD. DET. C-15.90. SEE SHEET 5 FOR MODIFICATIONS. CONNECT CATCH BASIN TO UNDERGROUND STORAGE VIA 18" H.D.P.E. STORM DRAIN PIPE.
4. INSTALL STORM TRAP UNDERGROUND CONTAINMENT STRUCTURE FOR STORM WATER STORAGE HOLDING 106,722 C.F. (2.45 AC. FT.). SLOPE STRUCTURE TO DRAIN TO EAST AT 0.0010 FT/FT MINIMUM. SEE STORM TRAP PLAN, ST1-ST8.
5. INSTALL HEADWALL PER MAG STD. DET. 501-4 WITH TRASH RACK PER MAG. STD. DETAIL 502-1 & 42" HANDRAIL PER C.O.S. STD. DETAIL 2508. COLOR TO BE SAN DIEGO BUFF.
9. INSTALL 24" R.G.R.C.P., CLASS III. TRENCH BEDDING & BACKFILL PER C.O.S. STD. DET. 2201.
13. INSTALL 48" PLUG. FOR CONTINUATION SEE ONE SCOTTSDALE SOUTH END IMPROVEMENT PLAN. CONTRACTOR TO VERIFY HORIZANTAL AND VERTICAL LOCATION PRIOR TO START OF CONSTRUCTION AND NOTIFY OWNER OF ANY DISCREPANCIES.
14. INSTALL 48" R.G.R.C.P., CLASS III. TRENCH BEDDING & BACKFILL PER C.O.S. STD. DET. 2201.
15. CONSTRUCT 13.6' WIER IN MODIFIED M.A.G. STD. DET. 501-1 HEADWALL (STRAIGHT TYPE). SEE SHEET 2, SECTION C-C FOR MODIFICATIONS. COLOR TO BE SAN DIEGO BUFF.
17. CONSTRUCT STORM DRAIN MANHOLE PER M.A.G. STD. DET. 520 & 522. ADJUST MANHOLE RIM TO FINAL GRADE PER C.O.S. STD. DET. 2270.
20. INSTALL 19.8" ORIFICE PLATE OVER STORM DRAIN INLET PER DETAIL ON SHEET 5.
22. INSTALL STRAIGHT TYPE BLOCK HEADWALL PER M.A.G. STD. DET. 501-1 AND 501-2 WITH TRASH RACK PER M.A.G. STD. DET. 502-1 & 42" HANDRAIL PER C.O.S. STD. DET. 2508. CONNECT TO EXISTING A.D.O.T. HEADWALL COLOR TO BE SAN DIEGO BUFF.

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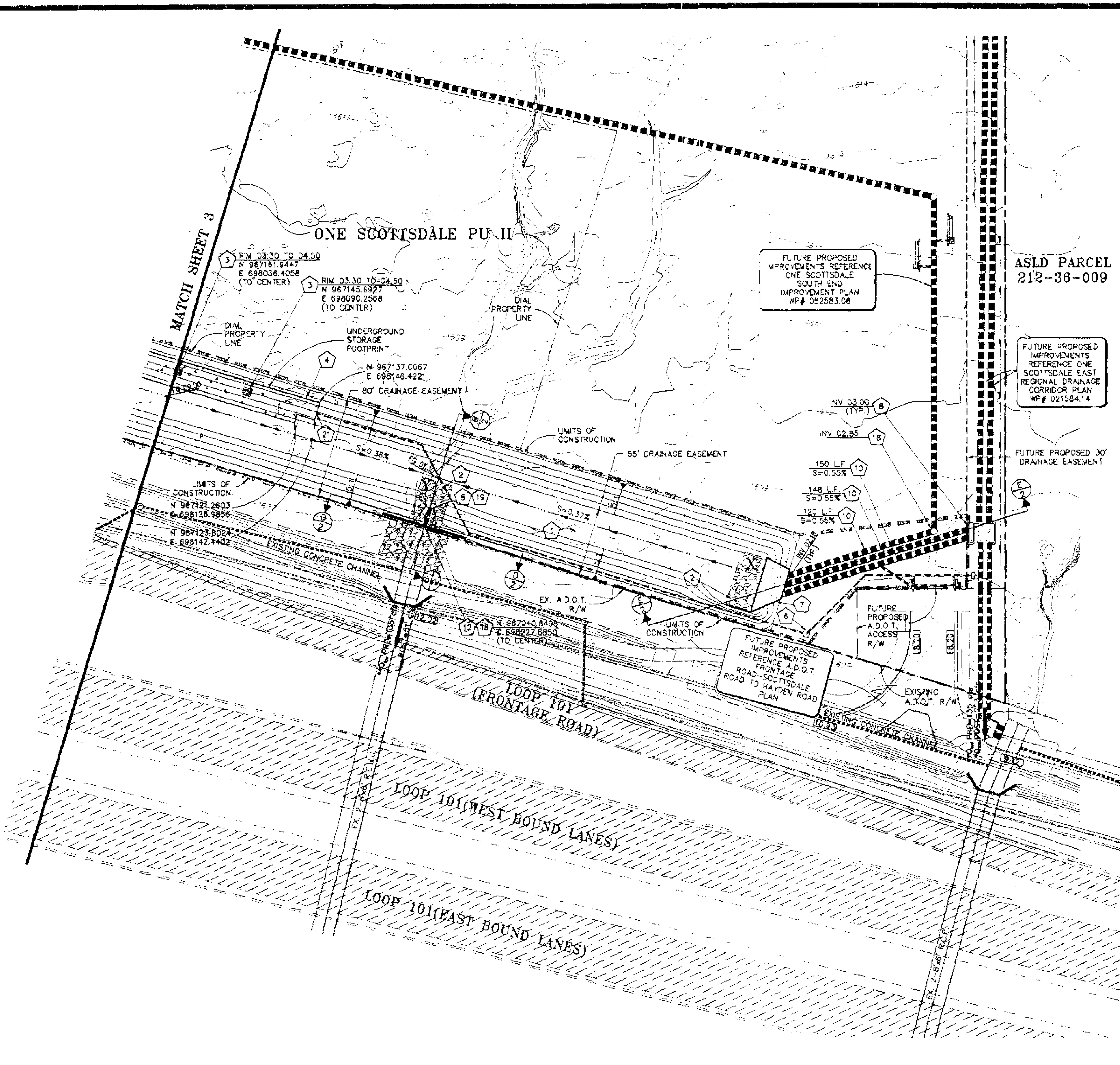
ONE SCOTTSDALE
SOUTH DRAINAGE BASIN IMPROVEMENTS
SCOTTSDALE, ARIZONA

DRAWN	YLJ
CHECKED	SAA
DATE	27 JULY 2007
SCALE	1"=40'
JOB NO.	021584.14
SHEET	3 OF 5

SA #396-SA-2006 SA #280-SA-2006 54-NP-2006 D.R. #1-DR-2006 Z.N. #20-ZN-2002 #2 PLAN CHECK #6787-06-2 Q.S. #39-45



CONSTRUCTION NOTES

1. CONTRACTOR TO REMOVE EARTH, BUILD APPROVED CONTAINMENT STRUCTURE, PLACE FILL OVER STRUCTURE, AND GRADE FINAL BASIN PER PLAN AND APPROPRIATE SECTIONS.
2. INSTALL 3' THICK BURIED RIP-RAP, D_{50}=8" PER GRADATION TABLE AND RIP-RAP AREA TABLE. SEE SHEET 4. SEE BURIED RIP-RAP DETAIL, SHEET 5.
3. INSTALL TWO CATCH BASIN INLETS SIDE BY SIDE PER MODIFIED A.D.O.T. STD. DET. C-15.90. SEE SHEET 5 FOR MODIFICATIONS. CONNECT CATCH BASIN TO UNDERGROUND STORAGE VIA 18" H.D.P.E. STORM DRAIN PIPE.
4. INSTALL STORM TRAP UNDERGROUND CONTAINMENT STRUCTURE FOR STORM WATER STORAGE HOLDING 470,448 C.F. (10.8 AC. FT.). SLOPE STRUCTURE TO DRAIN TO EAST 0.0010 FT/FT MINIMUM. SEE STORM TRAP PLAN, ST1-ST8.
5. INSTALL HEADWALL PER M.A.G. STD. DET. 501-4 WITH TRASH RACK PER M.A.G. STD. DET. 502-1 & 42" HANDRAIL PER C.O.S. STD. DET. 2508. COLOR TO BE SAN DIEGO BUFF.
6. REFERENCE WOOD/PATEL LIFT STATION PLAN.
7. CONSTRUCT MULTIPLE PIPE OUTLET PER ADOT STD. DET. B11.14 WITH 30° SKEW ANGLE & 4:1 WING WALLS. EXTEND SOUTH WING WALL PER PLAN AND DETAIL A OF A.D.O.T. STD. DET. B-11.12. INSTALL TRASH RACK PER MAG. STD. DETAIL 502-1 & HANDRAIL PER C.O.S. STD. DETAIL 2508. COLOR TO BE SAN DIEGO BUFF.
8. FOR CONTINUATION SEE EAST REGIONAL DRAINAGE CORRIDOR PLAN. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION PRIOR TO START OF CONSTRUCTION AND NOTIFY OWNER OF ANY DISCREPANCIES.
10. INSTALL 54" R.G.R.C.P., CLASS III. TRENCH BEDDING AND BACKFILL PER C.O.S. STD. DET. 2201.
12. CONSTRUCT A.D.O.T. RETAINING WALL (MODIFIED) WITH 6.4' WIDE WEIR OPENING. CONTRACTOR TO SELECT WALL TYPE, EITHER A.D.O.T. STD. DET. B-18.10 OR B-18.50. FOR B-18.10 USE H=8' AND W=5'-0". FOR B-18.50 USE H=8' AND W=5'-6". SEE SHEET 5 FOR DETAILS. SEE SECTION B-B AND D-D ON SHEET 2. COLOR TO BE SAN DIEGO BUFF.
16. INSTALL THREE 3'x3' GABIONS CENTERED BENEATH WEIR OPENING IN RETAINING WALL. CONTRACTOR TO SECURE GABIONS TO FOOTING. SEE SECTION B-B ON SHEET 2.
18. INSTALL 54" PLUG. FOR CONTINUATION SEE ONE SCOTTSDALE PLANNING UNIT II GRADING AND DRAINAGE PLAN. CONTRACTOR TO VERIFY HORIZANTAL AND VERTICAL LOCATION PRIOR TO START OF CONSTRUCTION AND NOTIFY OWNER OF ANY DISCREPANCIES.
19. INSTALL 13.6" ORIFICE PLATE OVER STORM DRAIN INVERT PER DETAIL ON SHEET 5.
21. REFERENCE STORM TRAP PLAN FOR SUMP INVERT.

Horz. 1 in. = 40 ft.

GRADATION TABLE*

PERCENT PASSING	SIZE	D_{50} CLASS, INCHES			
		4	6	8	12
100 TO 90	2.0 D_{50}	8	12	16	24
85 TO 70	1.5 D_{50}	6	9	12	18
50 TO 30	1.0 D_{50}	4	6	8	12
15 TO 5	0.67 D_{50}	3	4	5	8
5 TO 0	0.33 D	1	2	3	4

*INDIGENOUS/NATIVE STONE

RIP-RAP TABLE

AREA ID	AREA SIZE
W	40'x150'
X	20'x40'
Y	25'x35'
Z	25'x55'

*THE 100 YEAR POST DEVELOPMENT DISCHARGE IS DESIGNED TO EXCEED THE 100 YEAR PRE DEVELOPMENT DISCHARGE DUE TO A DOWNSTREAM REGIONAL FLOOD CONTROL SOLUTION.

**FLOWS FROM THE EXISTING A.D.O.T. BOX CULVERTS MERGE SOUTH OF THE LOOP 101. THE COMBINED 100 YEAR PRE DEVELOPMENT DISCHARGE IS APPROXIMATED AT 135 CFS.

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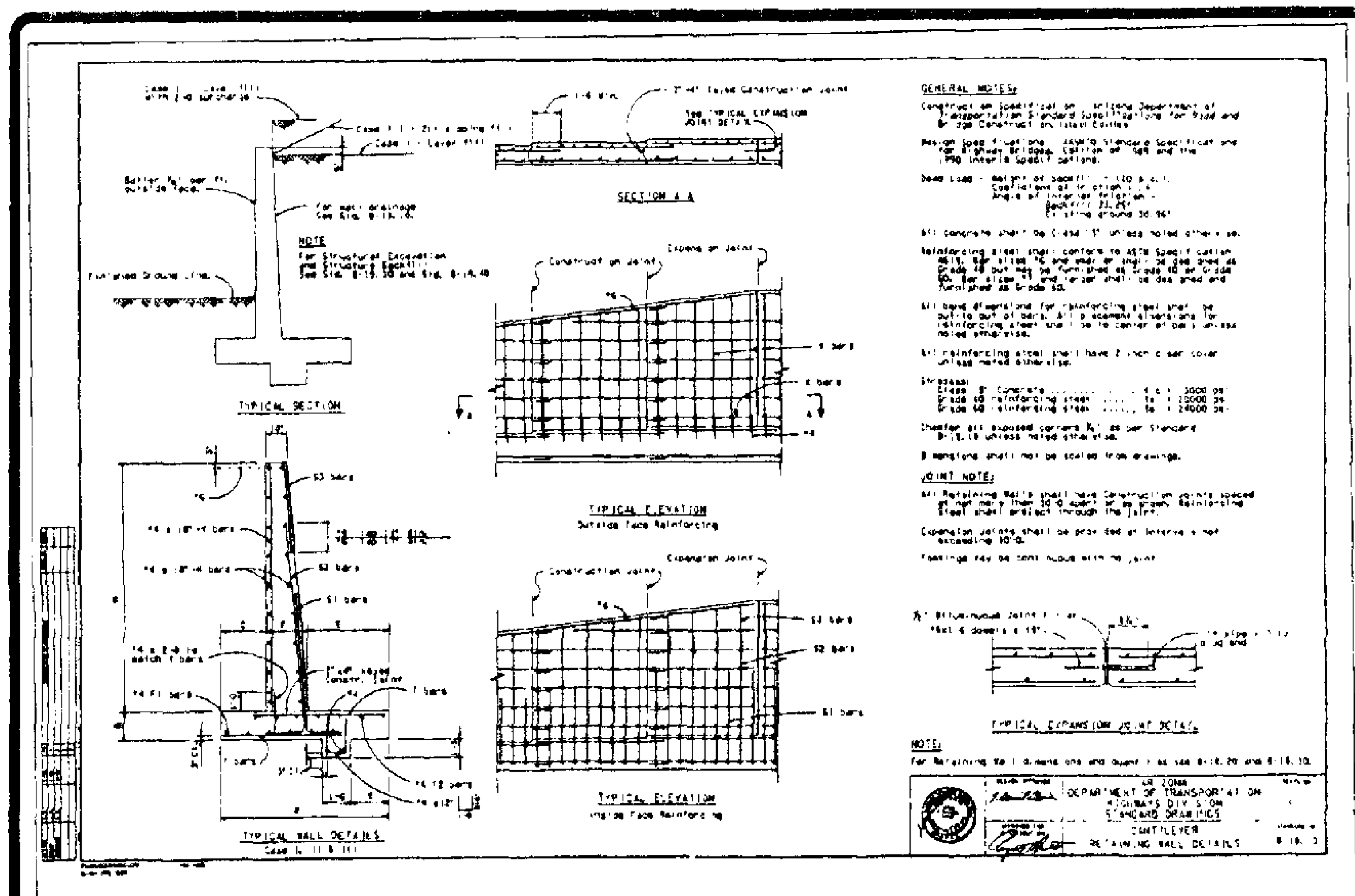
ONE SCOTTSDALE

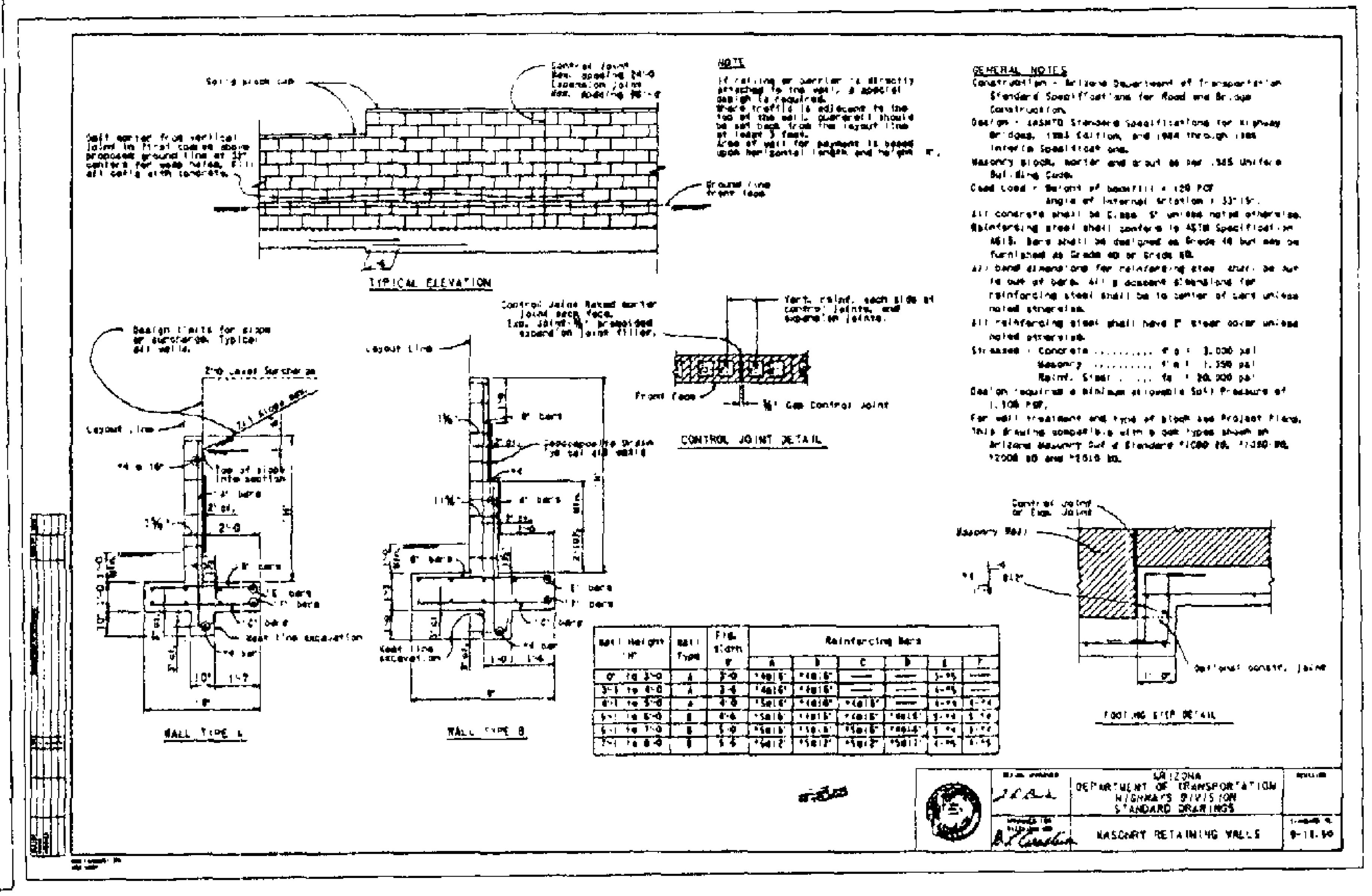
SOUTH DRAINAGE BASIN IMPROVEMENTS
SCOTTSDALE, ARIZONA

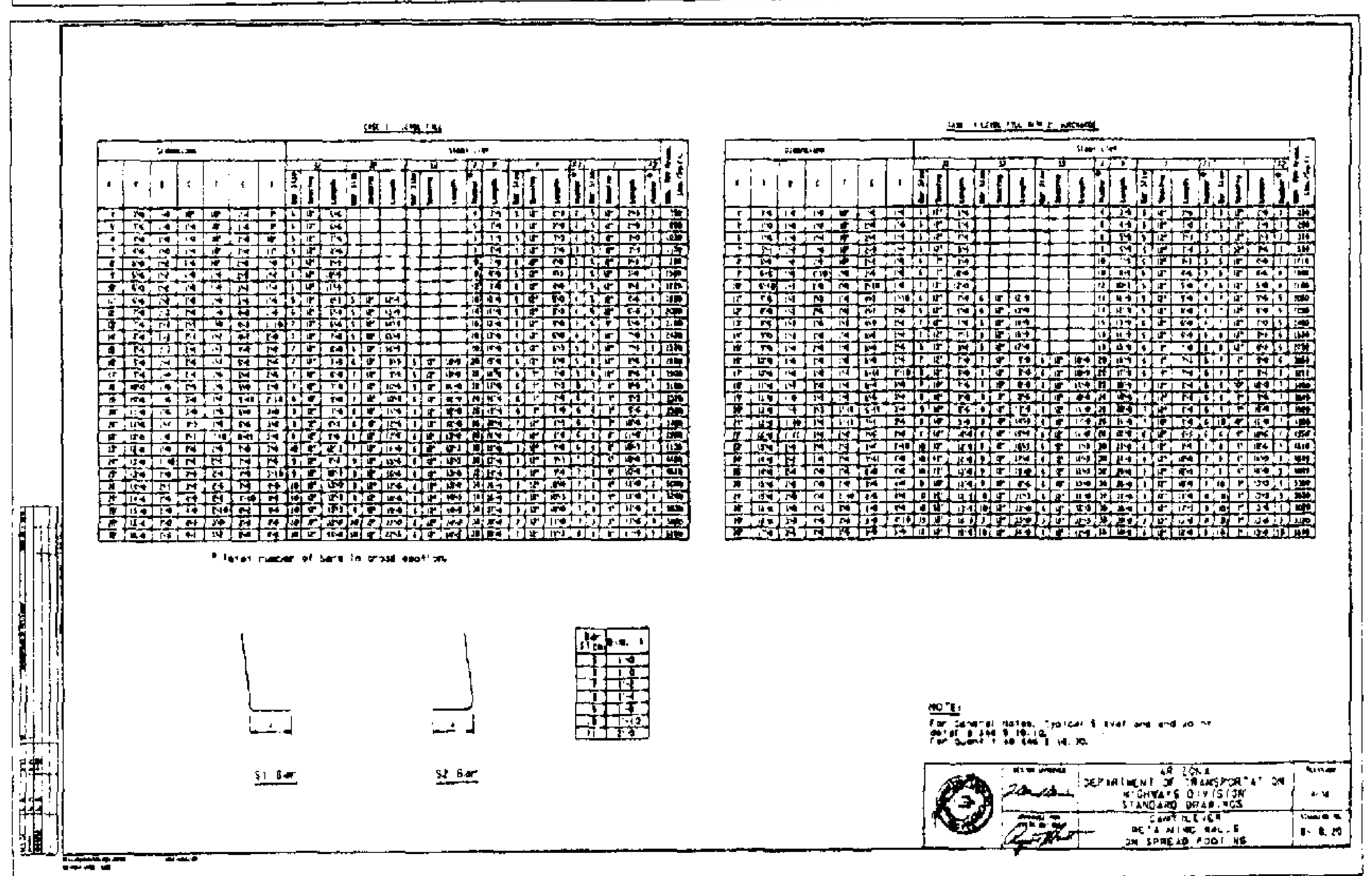
Registered Professional Engineer
CERTIFICATE NO. 44667
LISA L. CRANE
ARIZONA, U.S.A.

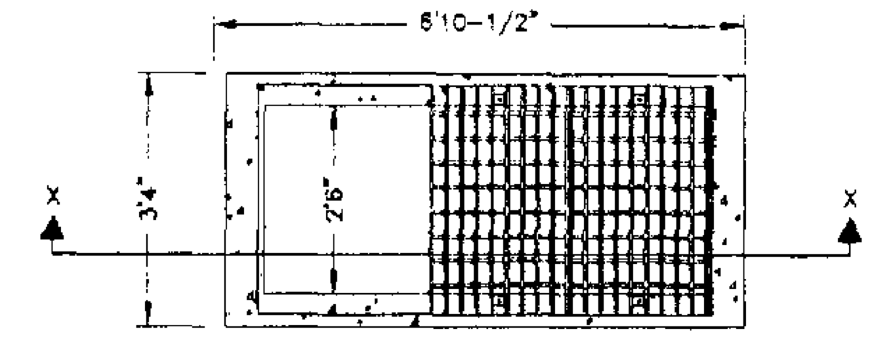
DRAWN	YLJ
CHECKED	SAA
DATE	27 JULY 2007
SCALE	1"=40'
JOB NO.	021584.14
SHEET	4 OF 5

S.A. #396-SA-2006 S.A. #280-SA-2006 54-NP-2006 D.R. #1-DR-2006 Z.N. #20-ZN-2002 #2 PLAN CHECK #6787-06-2 Q.S. #39-45

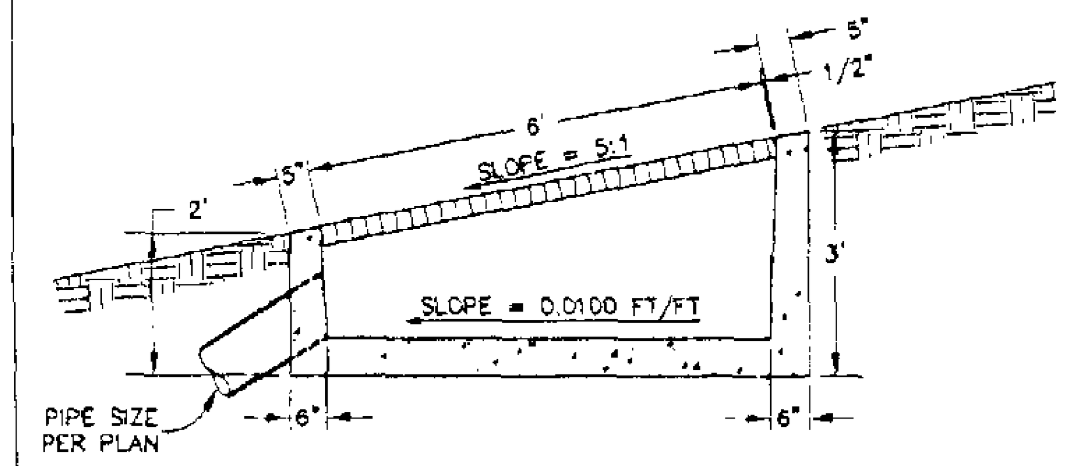








PLAN

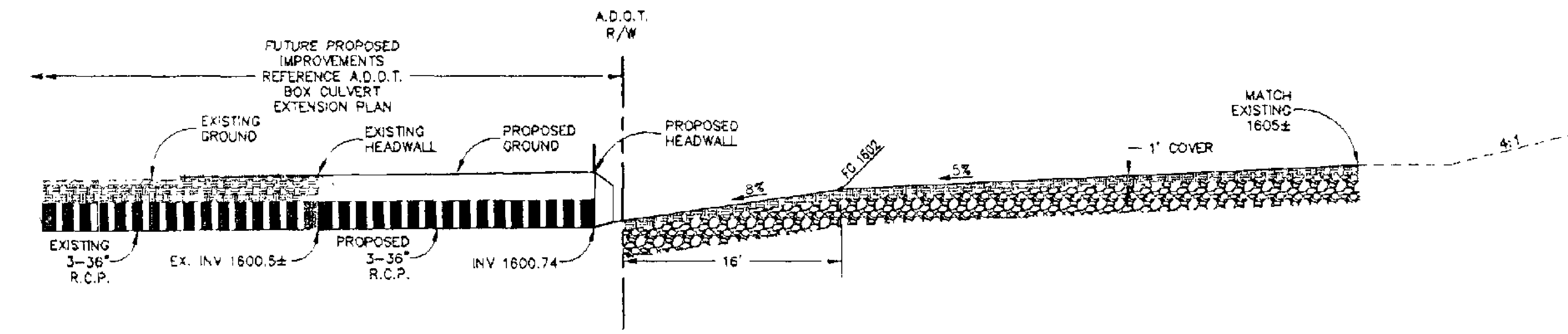


SECTION X-X

BASIN INLET STRUCTURE DETAIL

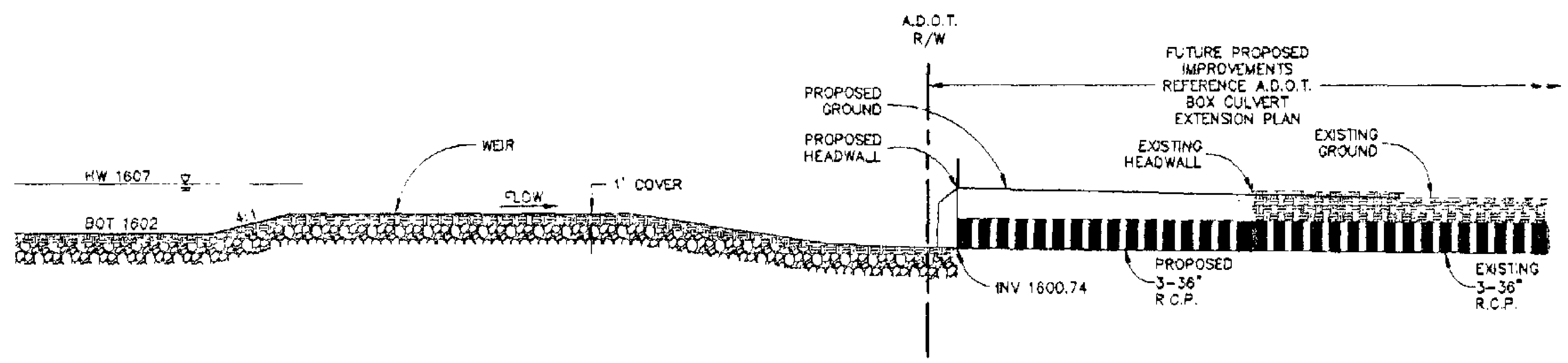
MODIFICATIONS TO A.D.O.T. STANDARD DETAIL C-15.90

SCALE: N.T.S.



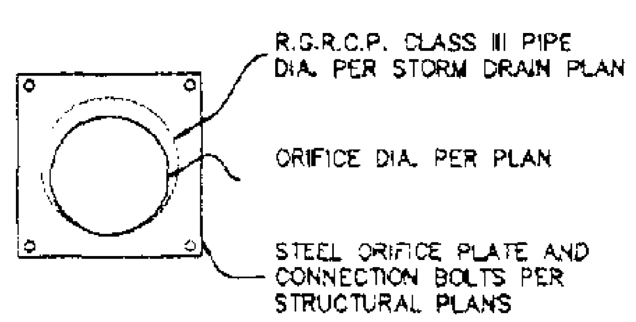
SECTION F-F

SCALE 1"=10'



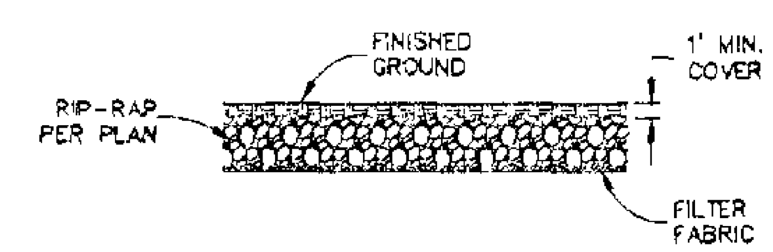
SECTION G-G

SCALE 1"=10'



ORIFICE PLATE DETAIL

N.T.S.



BURIED RIP-RAP DETAIL

ONE SCOTTSDALE

SOUTH DRAINAGE BASIN IMPROVEMENTS

SCOTTSDALE, ARIZONA

S.A. #396-SA-2006 S.A. #280-SA-2006 54-NP-2006 D.R. #1-DR-2006 Z.N. #20-ZN-2002 #2 PLAN CHECK #6787-06-2 Q.S. #39-45

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Construction Managers
(602) 335-8500

Registered Professional Engineer, Certificate No. 44687, LISA L. CRANE, Arizona, U.S.A.

DRAWN	YLV
CHECKED	SAA
DATE	27 JULY 2007
SCALE	
JOB NO.	021584.14
SHEET	5 OF 5

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(OUTSIDE MARICOPA COUNTY)

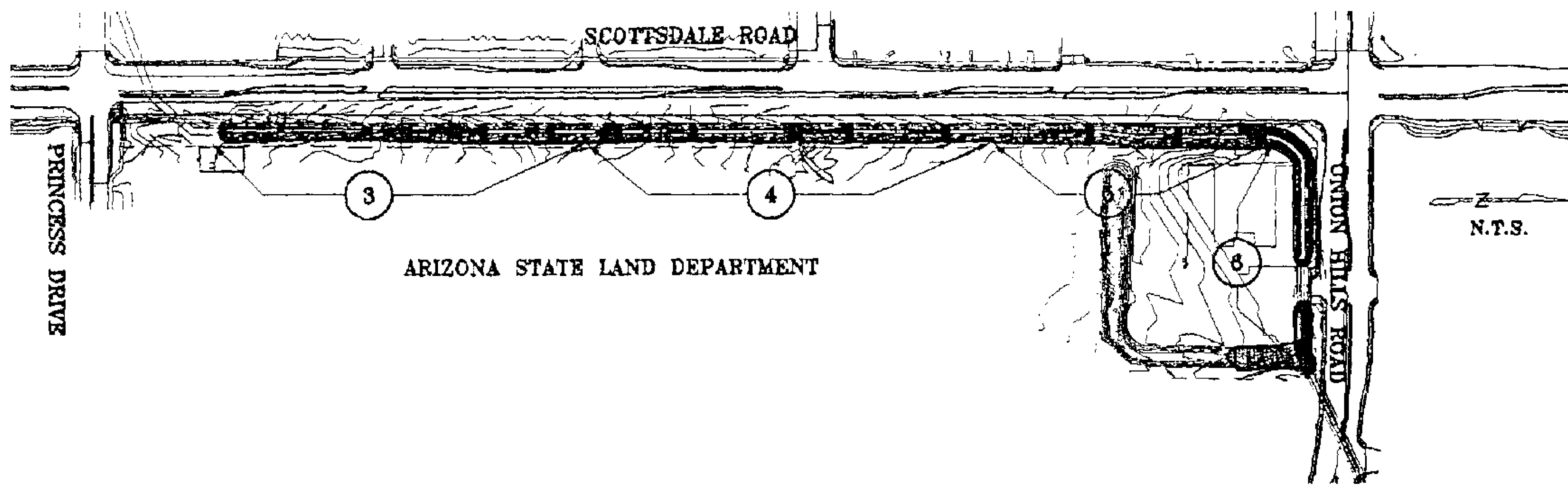
S:\2002\021584.14\Dwg\Imp\South Basin\021584.14-05SH1.DWG

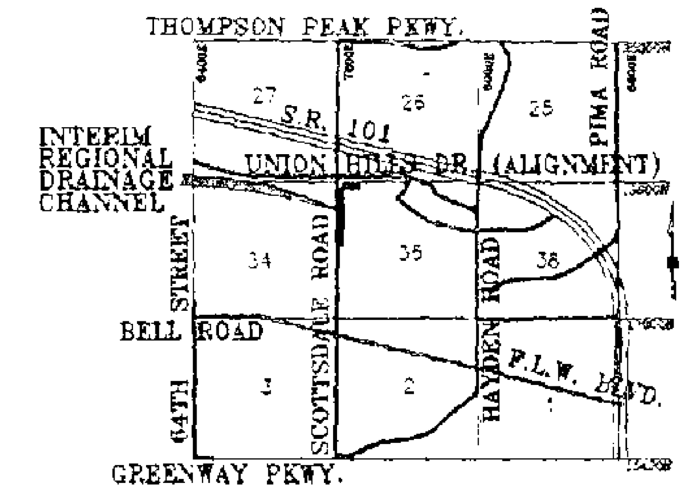
Appendix M

As- Builts for Scottsdale Road Intrim Drainage Channel

INTERIM REGIONAL DRAINAGE CHANNEL IMPROVEMENT PLAN

A PORTION OF SECTION 35 T.4N., R.4E., OF THE G.&S.R.M., MARICOPA COUNTY, ARIZONA





SITE MAP
N.T.S.

ENGINEERS NOTES

1. MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION INCLUDING LATEST REVISION AND CURRENT SUPPLEMENTALS THEREOF PER THE LOCAL TOWN OR CITY) ARE INCORPORATED INTO THIS PLAN IN THEIR ENTIRETY.
2. ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH THE M.A.G. STANDARD SPECIFICATIONS AND DETAILS AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL CITY OR TOWN UNLESS SPECIFIED OTHERWISE IN THESE PLANS OR ELSEWHERE IN THE CONTRACT DOCUMENTS. CONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL REQUIRED STANDARD SPECIFICATIONS, DETAILS AND SUPPLEMENTS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, SEQUENCING, AND SAFETY CONCERNS ASSOCIATED WITH THIS PROJECT DURING CONSTRUCTION, UNLESS SPECIFICALLY ADDRESSED OTHERWISE IN THIS PLAN OR ELSEWHERE IN THE CONTRACT.
4. THE CONTRACTOR IS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION COVERED BY THIS PLAN.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE ALL WORK COVERED BY THIS PLAN.
6. THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
7. A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL CALL 48 HOURS IN ADVANCE FOR BLUE STAKE (1-800-STAKE-IT) PRIOR TO ANY EXCAVATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION OF CONSTRUCTION AFFECTING UTILITIES AND THE COORDINATION OF ANY NECESSARY UTILITY RELOCATION WORK.
9. ALL PAVING, GRADING, EXCAVATION, TRENCHING, PIPE BEDDING, CUT FILL AND BACKFILL SHALL COMPLY WITH THE RECOMMENDATIONS SET FORTH IN THE SOILS (GEOTECHNICAL) REPORT FOR THIS PROJECT IN ADDITION TO THE REFERENCED REQUIRED SPECIFICATIONS AND DETAILS.
10. THE CONTRACTOR IS TO VERIFY THE LOCATION AND THE ELEVATIONS OF ALL EXISTING UTILITIES AT POINTS OF TIE-IN PRIOR TO COMMENCING ANY NEW CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER'S AGENT.
11. CONTRACTOR TO VERIFY AND COORDINATE ALL DIMENSIONS AND SITE LAYOUT WITH ARCHITECTURE'S FINAL SITE PLAN AND FINAL BUILDING DIMENSIONS BEFORE STARTING WORK. REPORT DISCREPANCIES TO OWNER'S AGENT.
12. COORDINATION BETWEEN ALL PARTIES IS ESSENTIAL PART OF CONTRACT.
13. CONTRACTOR IS RESPONSIBLE FOR PROJECT AND SITE CONDITIONS, AND TO WORK WITH WEATHER CONDITIONS AS THE PROJECT SITE IS LOCATED IN A FLOOD PRONE AREA AND SUBJECT TO FLOODING AND ITS HAZARDS.
14. THE CONTRACTOR IS TO VERIFY THE LOCATION, ELEVATION, CONDITION, AND PAVEMENT CROSS-SLOPE OF ALL EXISTING SURFACES AT POINTS OF TIE-IN AND MATCHING, PRIOR TO COMMENCEMENT OF GRADING, PAVING, CURB AND GUTTER, OR OTHER SURFACE CONSTRUCTION. SHOULD EXISTING LOCATIONS, ELEVATIONS, CONDITION, OR PAVEMENT CROSS-SLOPE DIFFER FROM THAT SHOWN ON THESE PLANS, RESULTING IN THE DESIGN INTENT REFLECTED ON THESE PLANS NOT ABLE TO BE CONSTRUCTED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY FOR DIRECTION ON HOW TO PROCEED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL COSTS ASSOCIATED WITH CORRECTIVE ACTION IF THESE PROCEDURES ARE NOT FOLLOWED.
15. CONTRACTOR IS RESPONSIBLE TO COORDINATE UTILITY CROSSINGS AT CULVERT CROSSINGS BEFORE STARTING WORK ON CULVERT. COORDINATE WITH OWNER REPRESENTATIVE. VERIFY UTILITY LINES AND/OR CONDUITS ARE IN PLACE BEFORE STARTING CULVERT WORK.
16. THIS PROJECT REQUIRES A REGULAR ONGOING MAINTENANCE PROGRAM FOR THE DESIGNED DRAINAGE SYSTEM(S) TO PRESERVE THE DESIGN INTEGRITY AND THE ABILITY TO PERFORM ITS OPERATIONAL INTENT. FAILURE TO PROVIDE MAINTENANCE WILL JEOPARDIZE THE DRAINAGE SYSTEM(S)' PERFORMANCE AND MAY LEAD TO IT'S INABILITY TO PERFORM PROPERLY AND/OR CAUSE DAMAGE ELSEWHERE IN THE PROJECT.
17. CONTRACTOR TO NOTIFY WOOD/PATEL, IF ENGAGED, 72 HOURS PRIOR TO BEGINNING CONSTRUCTION FOR THE PURPOSE OF WITNESSING THE INSTALLATION OF ALL UNDERGROUND WET UTILITIES DIRECTED BY THIS PLAN. CONTRACTOR IS ALSO RESPONSIBLE FOR PROVIDING TO WOOD/PATEL, IF ENGAGED, A SET OF REPRODUCIBLE AS-BUILTS OF SAID UTILITIES (5 DAY REVIEW TIME REQUIRED). CONTRACTOR TO NOTIFY WOOD/PATEL, IF ENGAGED, 72 HOURS PRIOR TO ANY TESTING OF WET UTILITIES AND TO PROVIDE A COPY OF TEST RESULTS AFTER COMPLETION.
18. THOSE SEWER LINES DESIGNED IN PROFILE ARE REQUIRED TO BE ASBUILT AND THE INSTALLATION AND TESTING WITNESSED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODE R18-9-E301 "4.01 GENERAL PERMIT: SEWAGE COLLECTION SYSTEMS". IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER WHEN THOSE SERVICES ARE READY TO BE WITNESSED.
19. THE PUBLIC WATER LINE INSTALLATION AND TESTING MAY BE REQUIRED TO BE WITNESSED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODES R18-4-507 AND 508 "APPPROVAL OF CONSTRUCTION" AND "RECORD DRAWINGS", RESPECTIVELY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER WHEN THOSE SERVICES ARE READY TO BE WITNESSED.
20. LOWEST FLOOR (LF) REFERS TO EITHER FLOOR/SLAB ELEVATION OR TOP OF BASEMENT SLAB. LF ELEVATIONS ON THE GRADING AND DRAINAGE PLANS FOR RESIDENTIAL UNITS REFLECT SLAB ON GRADE CONDITIONS AND CANNOT BE LOWERED WITHOUT AGENCY APPROVAL IN LOCATIONS WHERE 'SPECIAL FLOOD HAZARD AREAS' EXIST. IN NON-FLOOD HAZARD LOCATIONS, TO ENSURE THAT ADEQUATE RESIDENTIAL LOT DRAINAGE CAN BE ACHIEVED, A PROFESSIONAL ENGINEER SHOULD BE CONSULTED IF THE LF FOR THE SLAB IS PROPOSED TO BE LOWERED, OR IF A BASEMENT IS TO BE CONSTRUCTED.

GENERAL NOTES

CITY OF SCOTTSDALE
GENERAL CONSTRUCTION NOTES
FOR PUBLIC WORKS CONSTRUCTION

1. ALL CONSTRUCTION IN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE (COS) SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE LATTER SHALL GOVERN.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY THE CITY IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
3. APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF AN ENCROACHMENT PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS SHALL BE RESUBMITTED TO THE CITY FOR RE-APPROVAL.
4. A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHT-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO STARTING OF CONSTRUCTION (TELEPHONE 480-312-5750).
5. WHENEVER EXCAVATION IS TO BE DONE, CALL THE "BLUE STAKE CENTER", 263-1100, TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL "COLLECT" IF NECESSARY.
6. ENCROACHMENT PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. AN ENCROACHMENT PERMIT WILL BE ISSUED BY THE CITY UPON RECEIPT OF PAYMENT OF A BASE FEE PLUS A FEE FOR INSPECTION SERVICES TO BE PROVIDED BY THE CITY. COPIES OF ALL PERMITS SHALL BE RETAINED ONSITE AND SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE WORK STOPPAGE UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
7. ALL EXCAVATION AND GRADING WHICH IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO CHAPTER 70, EXCAVATION AND GRADING, OF THE LATEST EDITION OF THE UNIFORM BUILDING CODE PREPARED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE UNIFORM BUILDING CODE.

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE SIGNED
ELECTRIC	ARIZONA PUBLIC SERVICE	MAP RECEIVED		4/21/08
TELEPHONE	QWEST COMMUNICATIONS	IAN HOLMES	(480) 768-4588	4/28/08
NATURAL GAS	SOUTHWEST GASc/o AR UTIL	HOWARD WARREN	(480) 730-3843	4/18/08
CABLE TV	COX COMMUNICATIONS	ARTURO BAYLON	(623) 328-3625	4/21/08
OTHER	N/A	N/A	N/A	
OTHER	N/A	N/A	N/A	

ENGINEER'S CERTIFICATION

I, Geoffrey G. Brownell, BEING THE PERSON RESPONSIBLE FOR DESIGNING THE FACILITIES NECESSARY TO SERVE THIS DEVELOPMENT, HEREBY CERTIFY THAT ALL OF THE UTILITY COMPANIES LISTED ABOVE, HAVE REVIEWED THIS PROJECT PROPOSAL AND ALL CONFLICTS HAVE BEEN RESOLVED AT THIS POINT. 'NO CONFLICT' FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL. I ALSO CERTIFY THAT ALL ONSITE TRANSFORMERS, CABLE BOXES AND ANY OTHER PUBLIC/PRIVATE UTILITY APPURTENANCES ARE PLACED SUCH THAT THEY DO NOT NEGATIVELY IMPACT THE USE OR INTENDED USE OF ANY DEDICATED EASEMENTS OR FACILITIES DEVELOPED WITH THIS PROJECT INCLUDING BUT NOT LIMITED TO STORMWATER STORAGE BASINS, SITE DISTANCE EASEMENTS AND NAOS OR OTHER OPEN SPACE EASEMENTS.

SIGNATURE 12/12/08 DATE

RELATED PROJECTS

SCOTTSDALE ROAD PUBLIC IMPROVEMENTS COS#6118-02

STIPULATION CONFORMANCE STATEMENT

THE ENGINEER OF RECORD ON THESE PLANS HAS RECEIVED A COPY OF THE APPROVED STIPULATIONS FOR THIS PROJECT AND HAS DESIGNED THESE PLANS IN CONFORMANCE WITH THE APPROVED STIPULATIONS.

NATURAL OPEN SPACE & LIMITS OF CONSTRUCTION PROTECTION PLAN

1. NO BUILDING, GRADING, OR CONSTRUCTION ACTIVITY SHALL ENCROACH INTO AREAS DESIGNATED AS NOS.
2. ALL NOS AND LOC AREAS SHALL BE PROTECTED FROM DAMAGE PRIOR TO AND DURING CONSTRUCTION BY THE FOLLOWING METHODS:
   - *A REGISTERED LAND SURVEYOR SHALL STAKE ALL NOS AND LOC AREAS BASED ON THIS EXHIBIT.
   - *±THREE (3) FOOT TALL STEEL REBAR SHALL BE SET ALONG THE NOS AND LOC LINE AND CONNECTED WITH GOLD ROPING BY THE CONTRACTOR PRIOR TO ANY CLEARING OR GRADING.
   - *THE STAKING AND ROPING SHALL BE MAINTAINED INTACT BY THE CONTRACTOR DURING THE DURATION OF THE CONSTRUCTION ACTIVITY.
3. THE CONTRACTOR SHALL REMOVE STAKING AND ROPING AFTER RECEIPT OF THE CERTIFICATE OF OCCUPANCY FROM THE CITY OF SCOTTSDALE FOR THE ADJACENT HOME OR CONSTRUCTION WORK.

UTILITY NOTES

1. COMPANIES AND THE WORK CONTAINED IN THESE PLANS HAS BEEN APPROVED BY THESE COMPANIES WITHIN THEIR AREA OF INTEREST. THE SIZE AND LOCATIONS, AS SHOWN, OF THE GAS, TELEPHONE AND POWER LINES, AND CONNECTIONS AGREE WITH THE INFORMATION CONTAINED IN THE UTILITY COMPANY RECORDS. WHERE THE WORK TO BE DONE CONFLICTS WITH ANY OF THESE UTILITIES, THE CONFLICTS SHALL BE RESOLVED AS SPECIFIED. CONFLICTS ARISING DURING THE COURSE OF CONSTRUCTION FROM UNFORESEEN CIRCUMSTANCES SHALL BE REPORTED TO THE INTERESTED UTILITY COMPANY AND BE RESOLVED BY THEM AND THE DESIGN ENGINEER AND APPROVED BY C.O.S.
2. THE CITY WILL NOT PARTICIPATE IN THE COST OF CONSTRUCTION OR UTILITY RELOCATION.
3. "IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61."

CITY OF SCOTTSDALE

REVIEW & RECOMMENDED APPROVAL BY:

PAVING	2-5-09	TRAFFIC	N/A
G & D	2-5-09	PLANNING	2/5/2009
W & S	N/A	FIRE	2-5-2009
RET. WALLS	N/A		

Engineering Coordination Manager (or designee) 2-5-2009 Date

(4) PLAN & PROFILE SHEET NUMBER

SHEET INDEX

LAND OWNER

ARIZONA STATE LAND DEPARTMENT
1616 WEST ADAMS STREET
PHOENIX, ARIZONA 85007
TEL: (602) 542-2648

DEVELOPER

ONE SCOTTSDALE HOLDINGS, LLC
C/O DMB ASSOCIATES, INC
7600 EAST DOUBLETREE RANCH ROAD
SUITE 300
SCOTTSDALE, ARIZONA 85258
CONTACT: ART NEHF
TEL: (480) 367-7000

ENGINEER

WOOD, PATEL & ASSOCIATES INC.
2051 WEST NORTHERN, SUITE 100
PHOENIX, ARIZONA 85021
CONTACT: MR. DARREL WOOD P.E. R.L.S.,
MR. GEOFF BROWNELL P.E., CFM
TEL: (602) 335-8500

BENCHMARK

CITY OF SCOTTSDALE BRASS CAP FLUSH IN CONCRETE MEDIAN.
NORTHING 967396.89
EASTING 697368.18
ELEVATION = 1609.79 CITY OF SCOTTSDALE NAVD 88 DATUM

APN#

215-07-004-A
215-07-005

NOTE

CONCRETE SHALL BE COLORED "SAN DIEGO BUFF".

ESTIMATED QUANTITIES

GABION BASKETS 3'X3'X6'	76	EA
RIP-RAP	1,821	CY
HYDROSEED	14,793	SY

THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THESE PLANS.

GRADING QUANTITIES

RAW CUT	20,291	CY
RAW FILL	1,805	CY
NET RAW CUT	18,486	CY

ALL EARTHWORK QUANTITIES ARE IN PLACE QUANTITIES. NO EARTH SHRINKAGE HAS BEEN ESTIMATED.

HAUL ROUTE PERMITS ARE REQUIRED FOR ANY HAUL OPERATION WHICH UTILIZES CITY RIGHT OF WAY WITH A VOLUME EXCEEDING 5,000 C.Y.

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WOOD/PATEL
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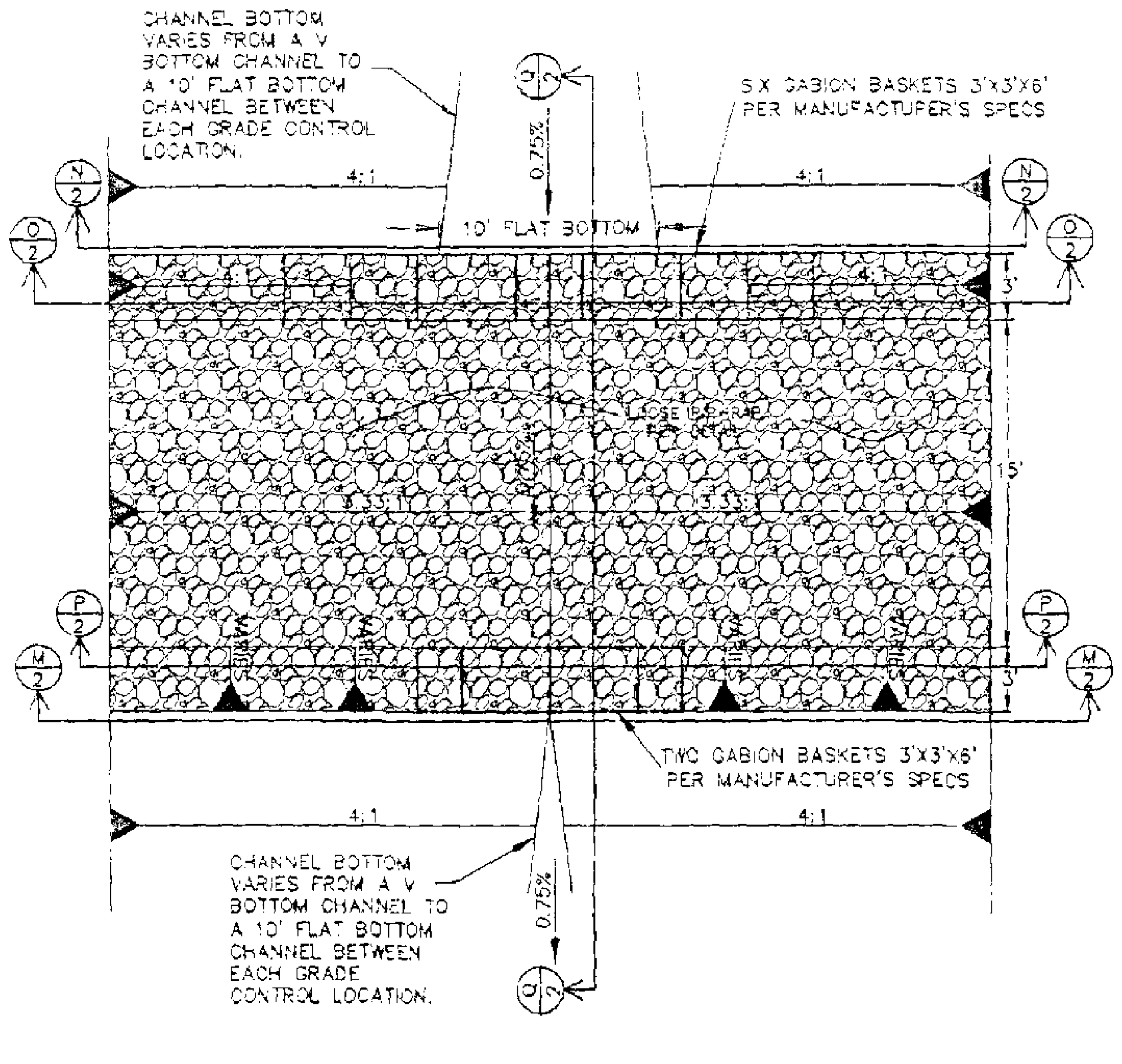
(602) 335-8500

INTERIM REGIONAL DRAINAGE CHANNEL
CITY OF SCOTTSDALE, ARIZONA

GEOFFREY SCOTT BROWNELL
EXPIRES 03-31-11

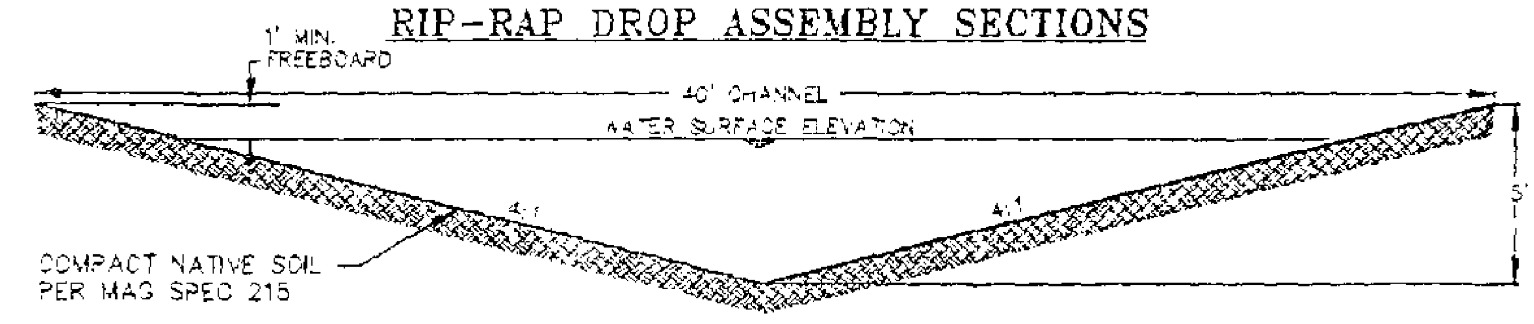
DESIGNED GV
CHECKED GB
DATE 11/03/08
SCALE NO SCALE
JOB NO. 073022
SHEET 1 of 8

55-SA-2008 19-ZN-2008 1672-08-1 Q.S.#38-45

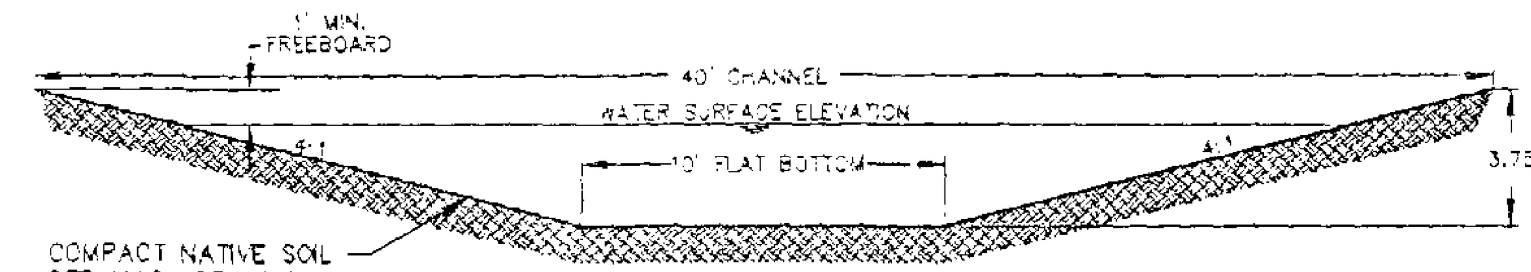


RIP-RAP DROP ASSEMBLY DETAIL

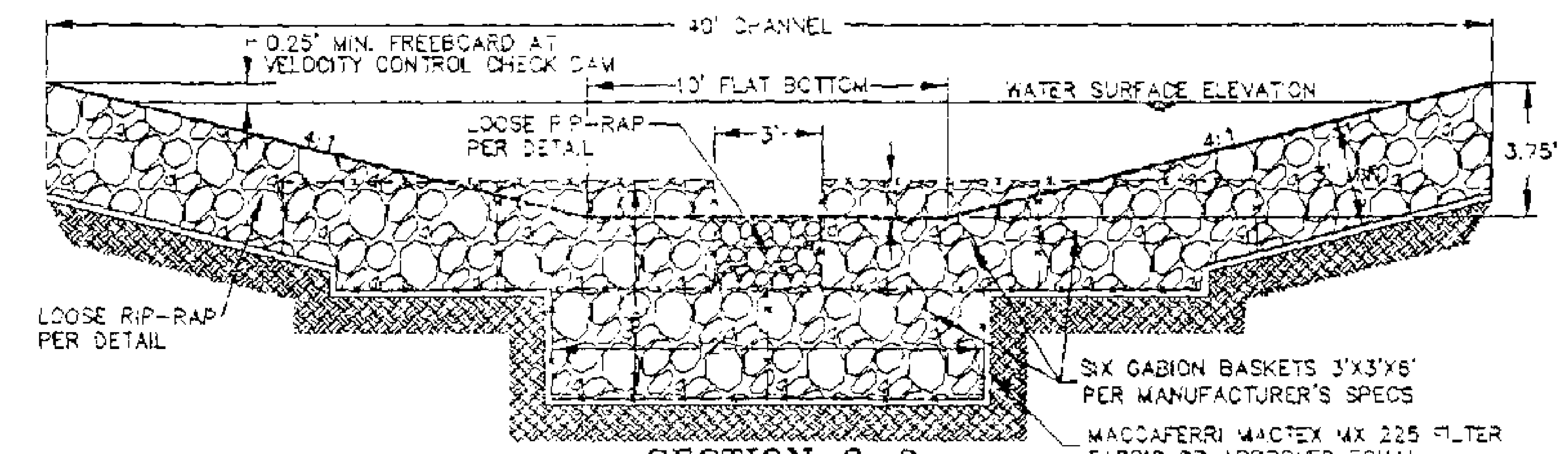
RIP-RAP DROP ASSEMBLY SECTIONS



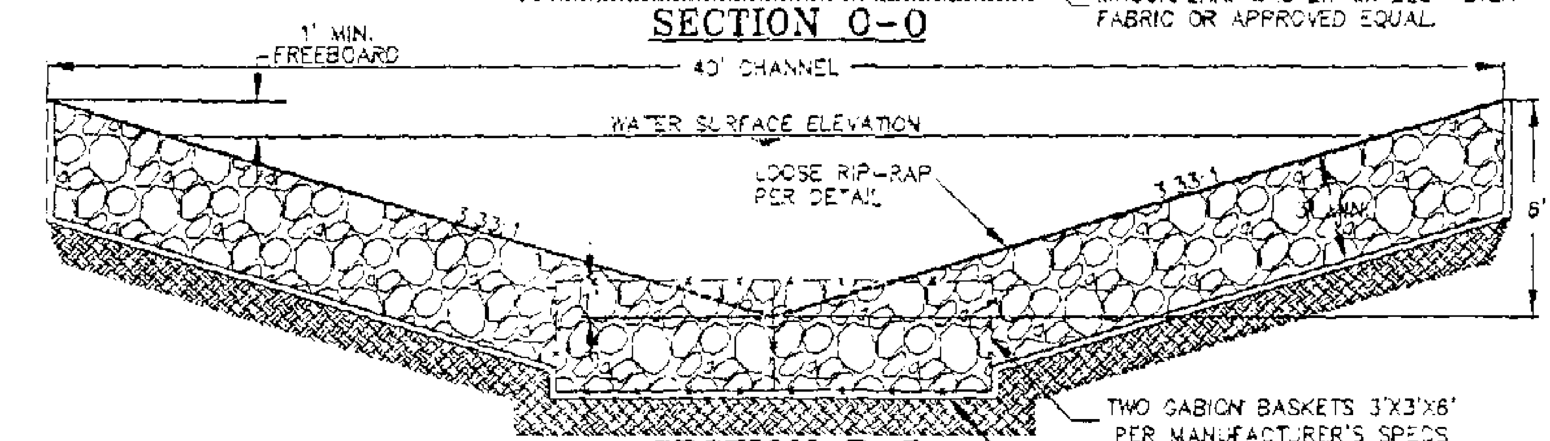
SECTION M-M



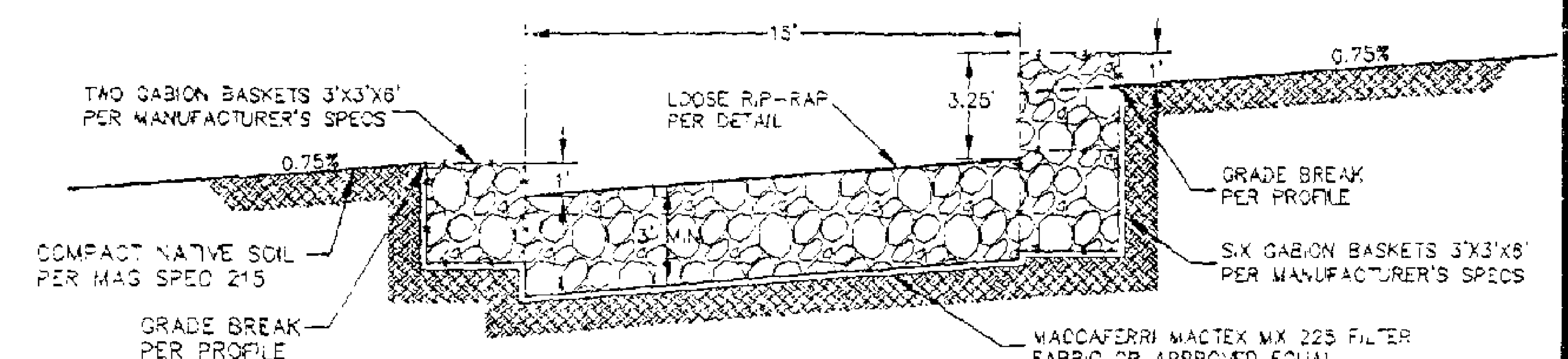
SECTION N-N



SECTION O-O

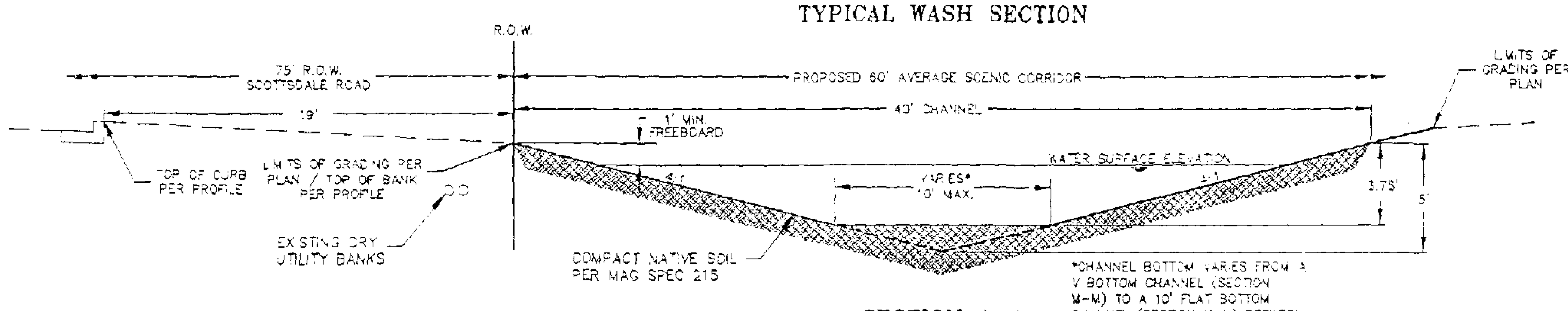


SECTION P-P

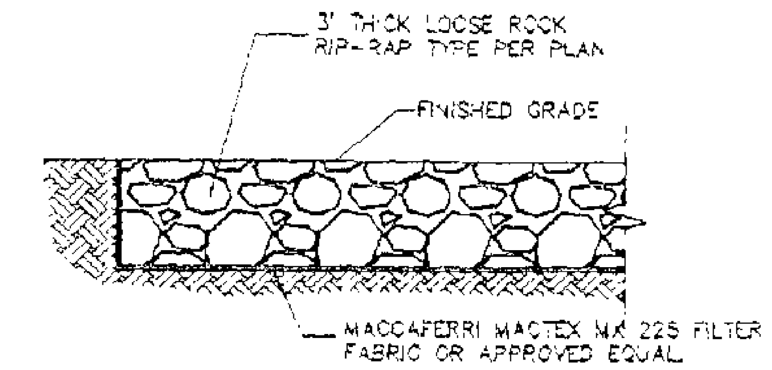


SECTION Q-Q

TYPICAL WASH SECTION



SECTION A-A



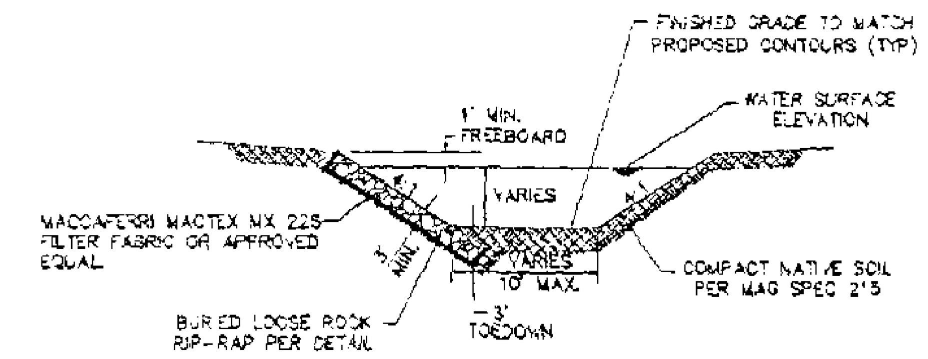
LOOSE ROCK RIP-RAP DETAIL

NOTE: RIP-RAP TO BE ANGULAR STONE OR APPROVED EQUAL

LOOSE ROCK RIP-RAP GRADATION	
PERCENT FINER BY WEIGHT (D)	SIEVE SIZE
15	4"
50	8"
85	14"
100	18"
INSTALL LOOSE RIP-RAP PER M.A.G. SPEC. 220	
* INSTALL "MACCAFERRI MACTEX MX 225" OR APPROVED EQUAL FILTER FABRIC UNDER ALL LOOSE RIP-RAP	

NOTES:

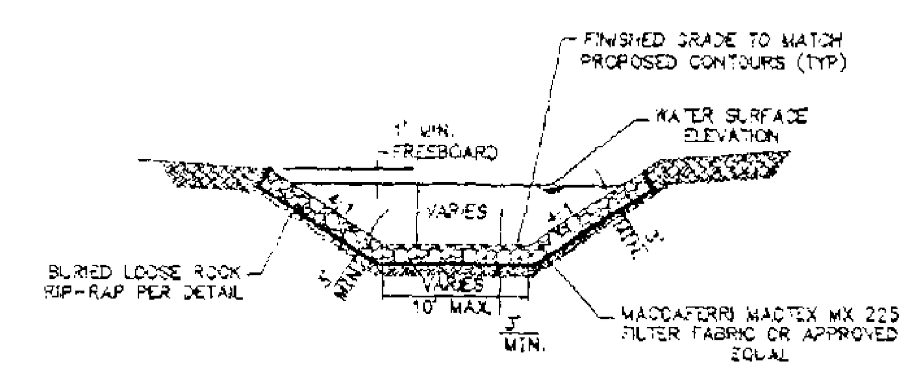
1. IF ADDITIONAL BURIED ROCK PROTECTION IS AVAILABLE, CONTRACTOR MAY INSTALL BURIED LOOSE ROCK ON SIDE SLOPES IN ADDITION TO REQUIRED MINIMUM LOCATIONS SHOWN ON PLANS, PROVIDED THAT FILTER FABRIC IS INSTALLED BENEATH THE ROCK.
2. ROCK TYPE PER PLAN, GRADATION PER TABLE.



SECTION B-B

BANK EROSION PROTECTION DETAIL

N.T.S.

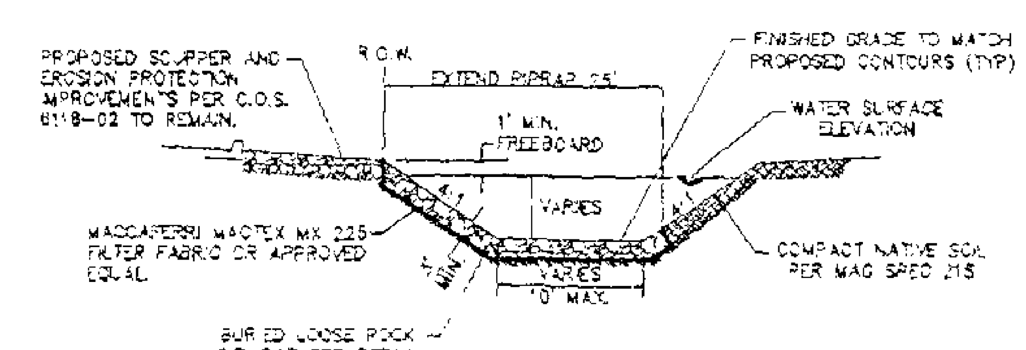


SECTION C-C

CHANNEL EROSION PROTECTION DETAIL

PROPOSED WASH AT BANK PROTECTION ON BOTH SIDES

N.T.S.



SECTION D-D

SCUPPER EXTENTION DETAIL

PROPOSED EXTENTION OF EXISTING SCUPPER

N.T.S.

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PHOENIX • MESA • GOODYEAR • TUCSON

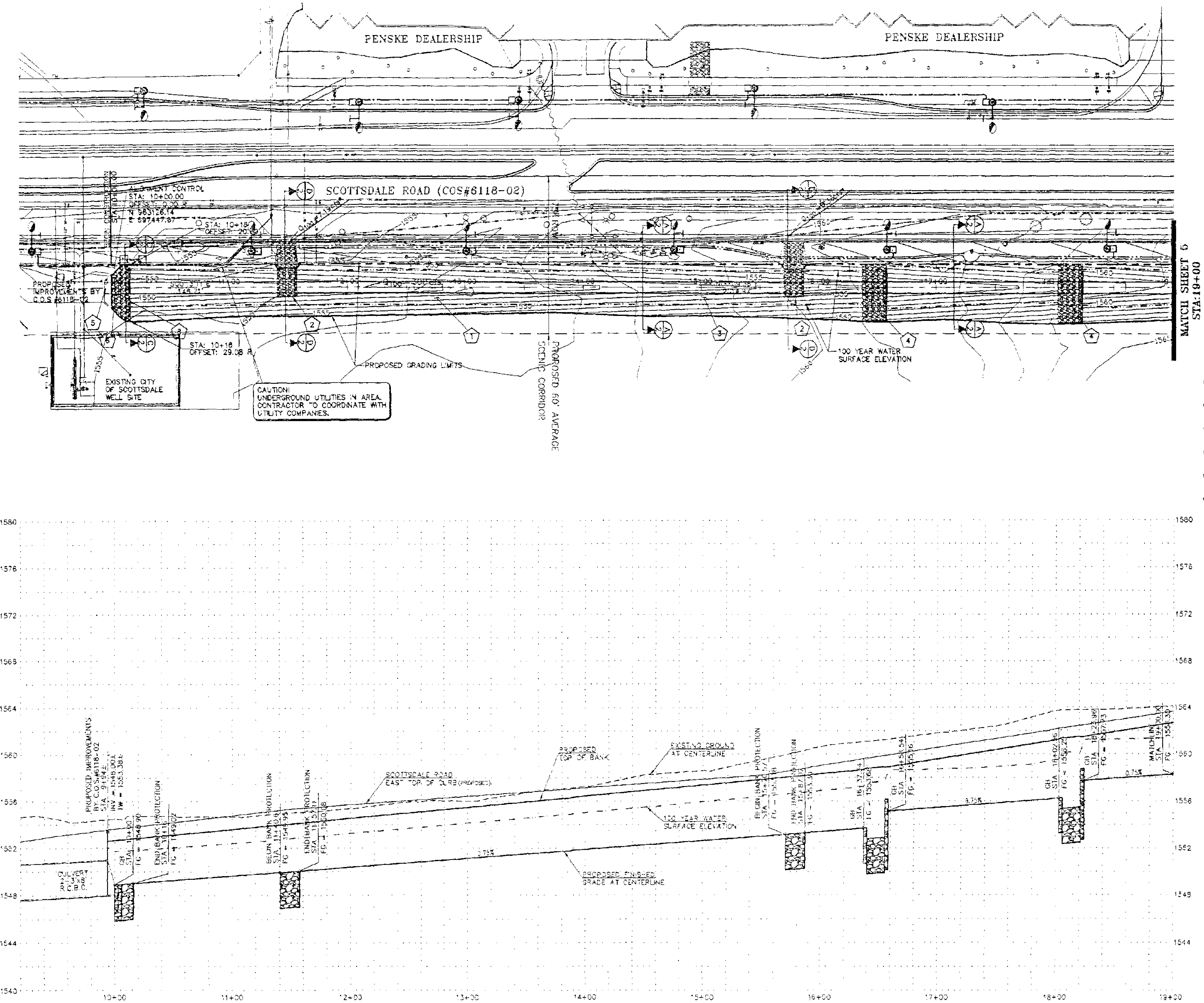
INTERIM REGIONAL DRAINAGE CHANNEL

CITY OF SCOTTSDALE, ARIZONA

EXPIRES 03-31-11

DESIGNED	GV
CHECKED	GB
DATE	11/03/08
SCALE	NO SCALE
JOB NO.	073022
SHEET	2 of 8

55-SA-2008 19-ZN-2008 1672-08-1 Q.S.#38-45



CHANNEL CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND PROFILE ELEVATION. COMPACT NATIVE SOIL PER M.A.G. SPEC. 215.
2. EXTEND RIP-RAP SPILLWAY 25 FEET EAST PER SCUPPER EXTENTION DETAIL SHEET 2, SECTION D-D.
3. HYDROSEED CHANNEL SOIL PER REVEGETATION PLAN ON SHEET 7.
4. INSTALL RIP-RAP DROP ASSEMBLY PER RIP-RAP DROP ASSEMBLY DETAIL ON SHEET 2
5. CONTRACTOR TO LOCATE EXISTING CULVERT AND HEADWALL. GRADE PROPOSED CHANNEL TO EXISTING CONDITIONS.
6. INSTALL TWO ROWS OF 3'X3'X6' GABION BASKETS (4 BASKETS) IN BOTTOM OF CHANNEL AT DROP INLET.
8. INSTALL CHANNEL EROSION PROTECTION PER CHANNEL EROSION PROTECTION DETAIL SHEET 2, SECTION C-C.

*INFORMATION FROM CITY OF SCOTTSDALE FURNISHED FOR COS#6118-02

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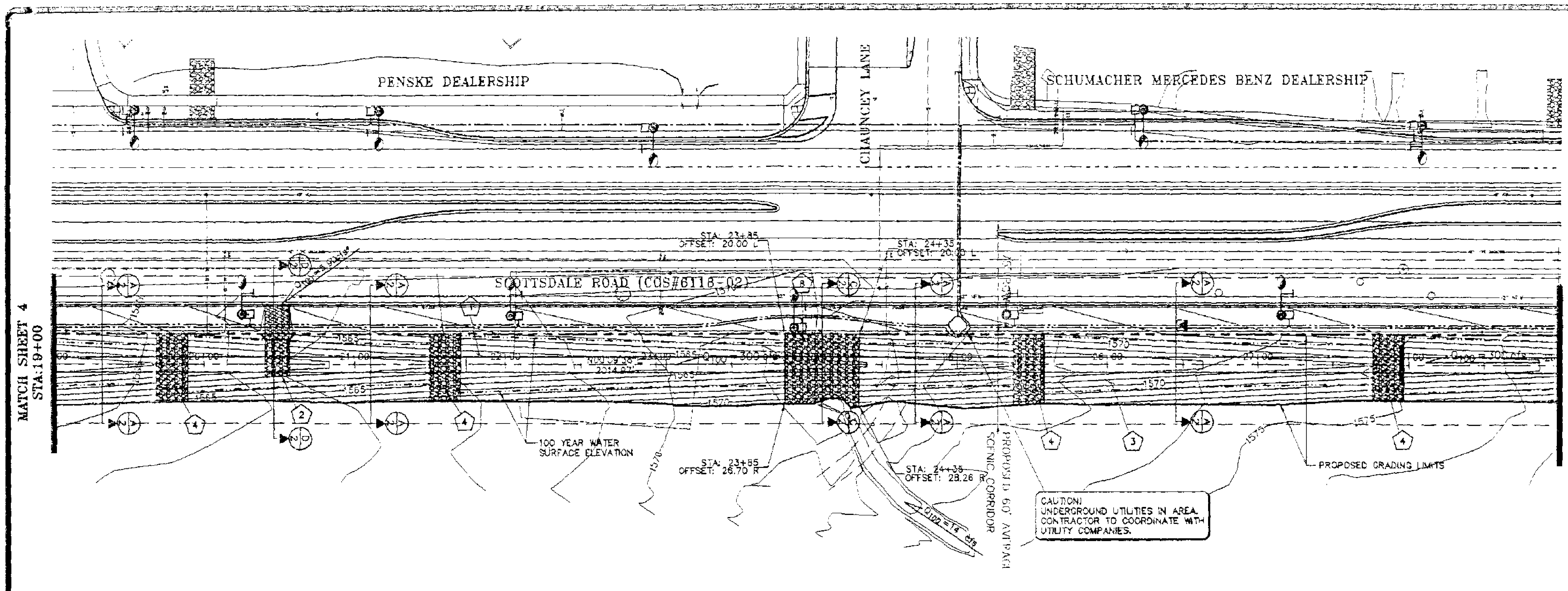
INTERIM REGIONAL DRAINAGE CHANNEL

CITY OF SCOTTSDALE, ARIZONA

Q.S.#38-45 1672-08-1 19-ZN-2008 56-SA-2008

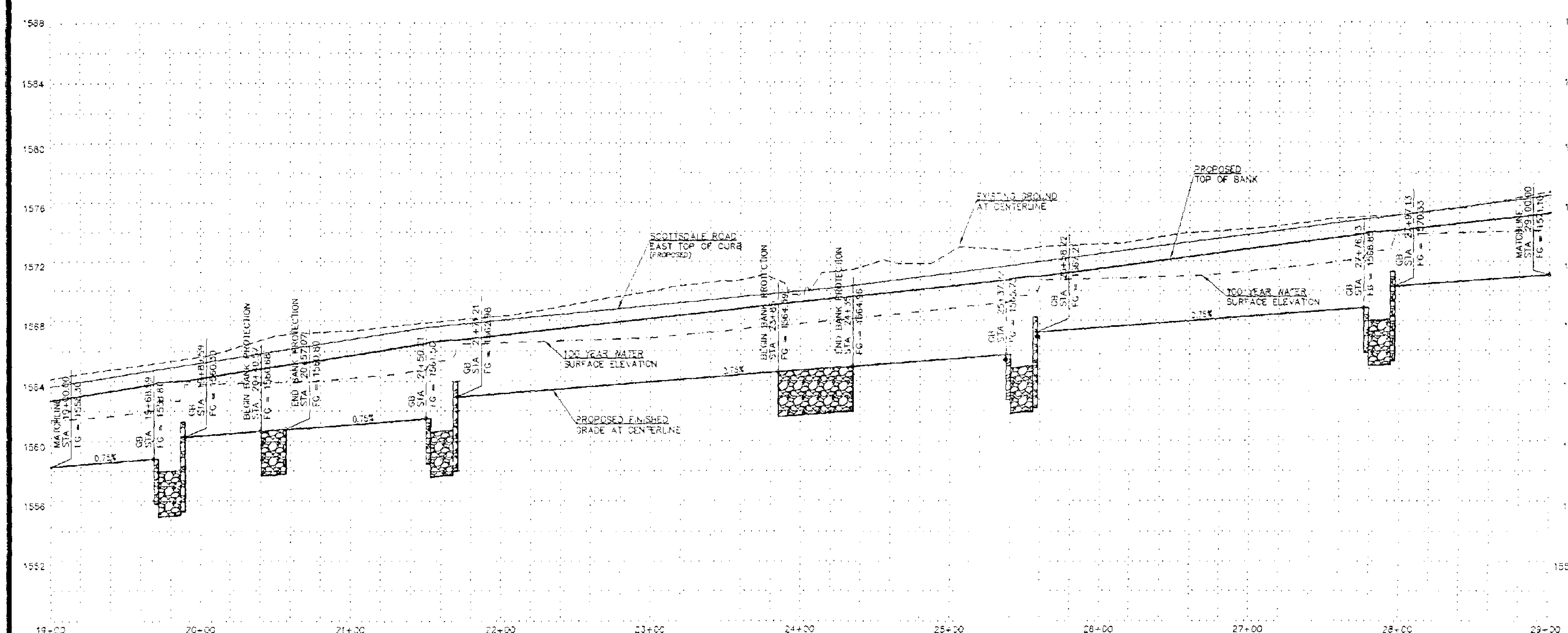
DESIGNED GV
CHECKED GB
DATE 11/03/08
SCALE 1" = 40'
JOB NO. 073022
SHEET 3 of 8



CHANNEL CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND PROFILE ELEVATION. COMPACT NATIVE SOIL PER M.A.G. SPEC. 215.
2. EXTEND RIP-RAP SPILLWAY 25 FEET EAST PER SCUPPER EXTENTION DETAIL SHEET 2, SECTION D-D.
3. HYDROSEED CHANNEL SOIL PER REVEGETATION PLAN ON SHEET 7.
4. INSTALL RIP-RAP DROP ASSEMBLY PER RIP-RAP DROP ASSEMBLY DETAIL ON SHEET 2
8. INSTALL CHANNEL EROSION PROTECTION PER CHANNEL EROSION PROTECTION DETAIL SHEET 2, SECTION C-C.

*INFORMATION FROM CITY OF SCOTTSDALE FURNISHED FOR COS#6118-02



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INTERIM REGIONAL DRAINAGE CHANNEL

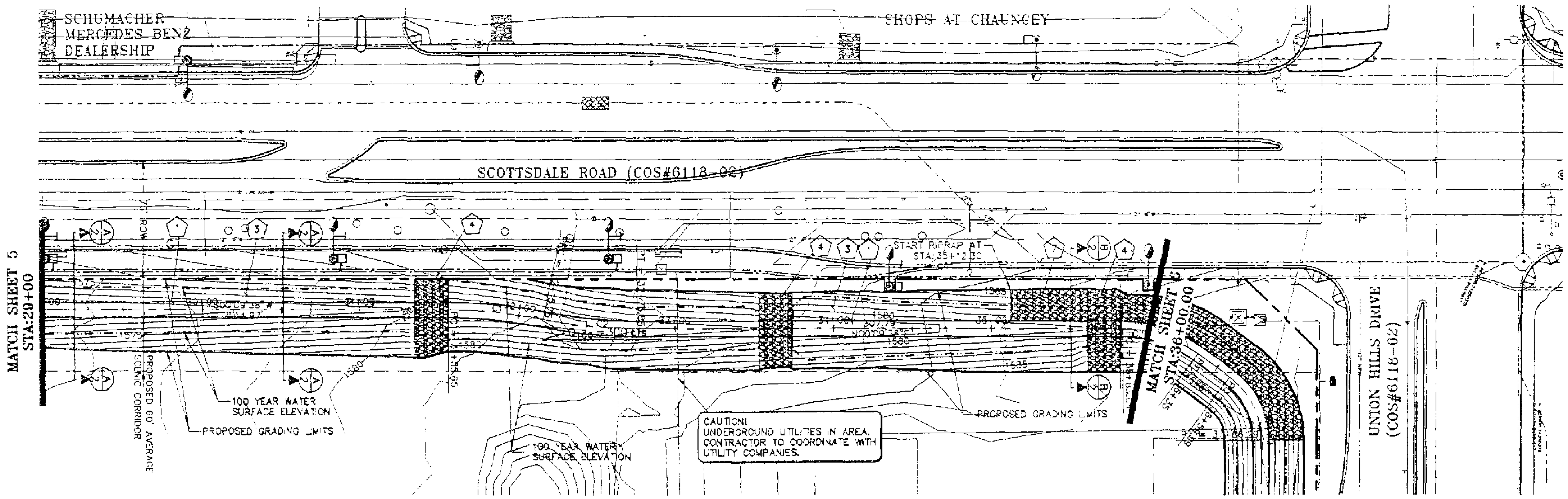
CITY OF SCOTTSDALE, ARIZONA

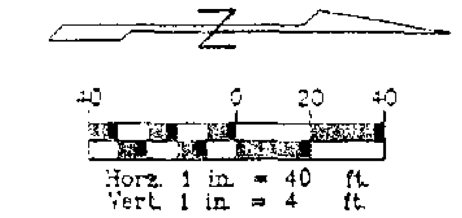
1672-08-1 Q.S.#38-45

19-ZN-2008

55-SA-2008

DESIGNED	GV
CHECKED	GB
DATE	11/03/08
SCALE	1" = 40'
JOB NO.	073022
SHEET	4 of 8

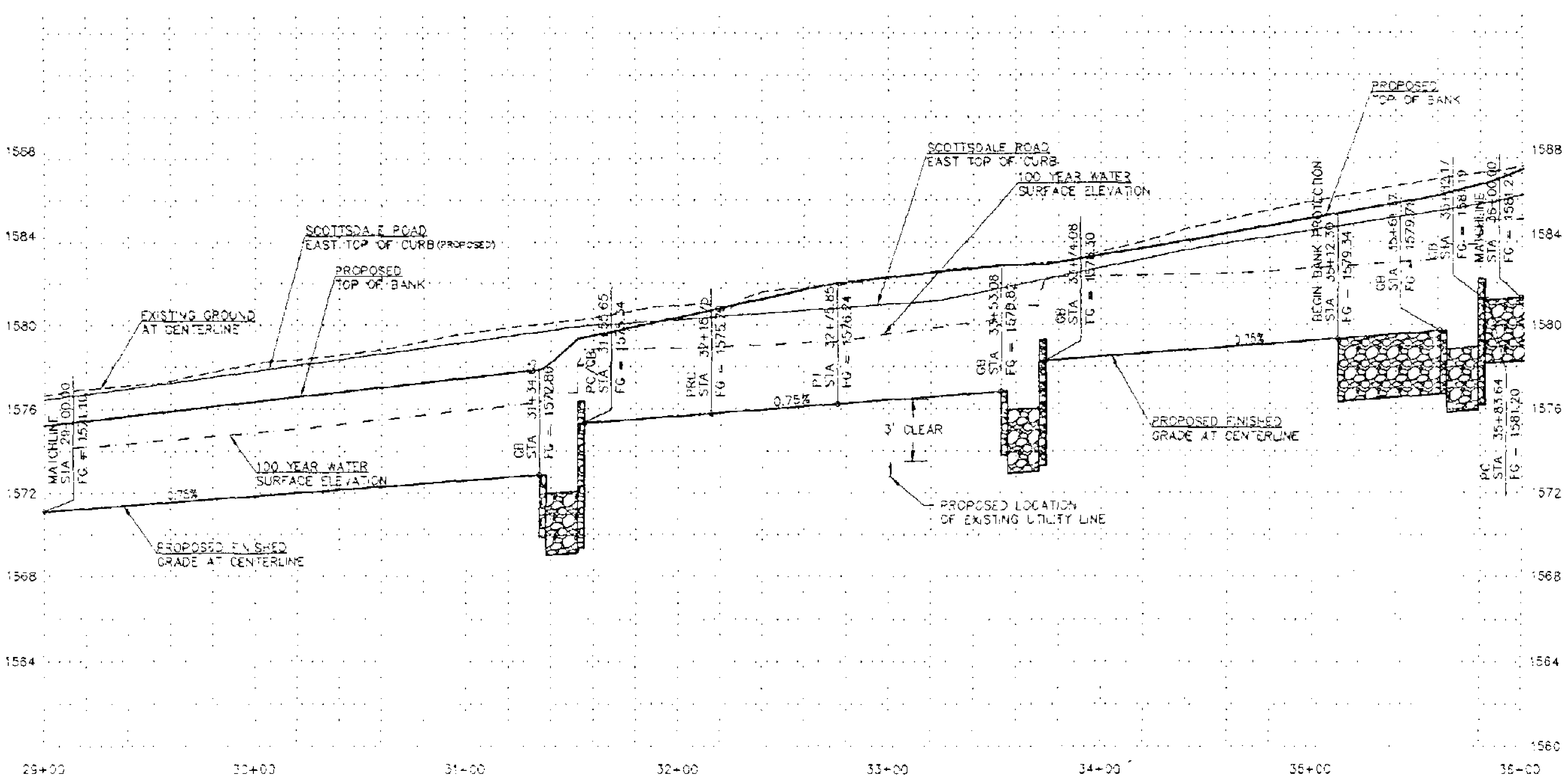


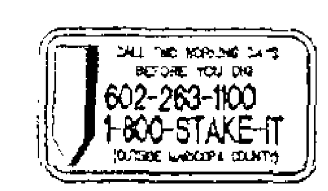


CURVE TABLE					
CURVE	DELTA	RADIUS	ARC	TANGENT	CHORD
C1	11°28'42"	300.00	60.10	30.15	60.00
C2	11°28'42"	300.00	60.10	30.15	60.00
C3	36°46'55"	80.00	51.36	26.60	50.48

CHANNEL CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND PROFILE ELEVATION. COMPACT NATIVE SOIL PER M.A.G. SPEC. 215.
3. HYDROSEED CHANNEL SOIL PER REVEGETATION PLAN ON SHEET 7.
4. INSTALL RIP-RAP DROP ASSEMBLY PER RIP-RAP DROP ASSEMBLY DETAIL ON SHEET 2
7. INSTALL BANK EROSION PROTECTION PER BANK EROSION PROTECTION DETAIL SHEET 2, SECTION B-B.





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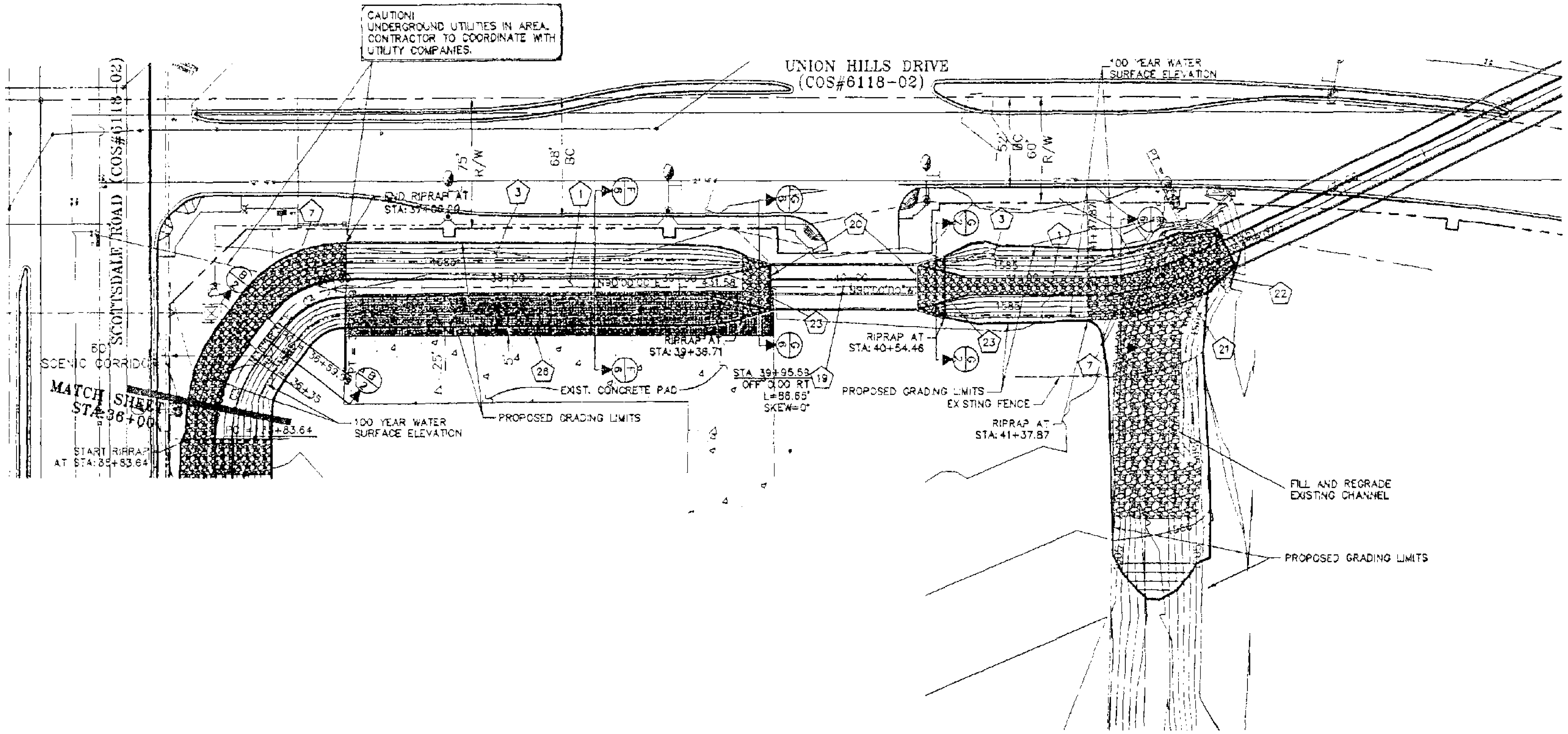
INTERIM REGIONAL DRAINAGE CHANNEL

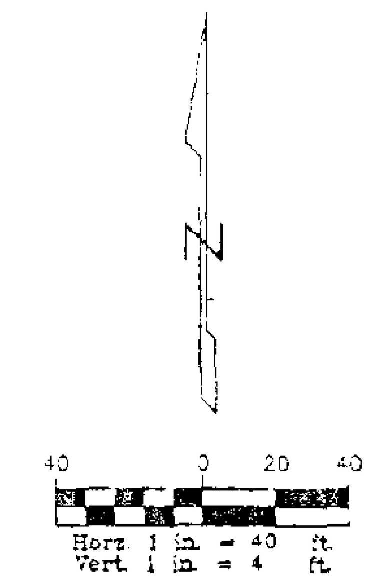
CITY OF SCOTTSDALE, ARIZONA

Q.S.#38-45 1672-08-1 19-ZN-2008 55-SA-2008

EXPIRES 03-31-11

DESIGNED	GV
CHECKED	GB
DATE	11/03/08
SCALE	1" = 40'
JOB NO.	073022
SHEET	5 OF 8

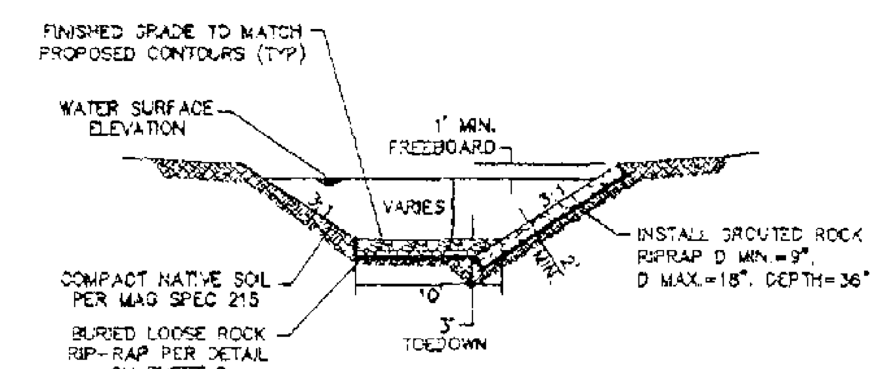




CURVE TABLE					
CURVE	DELTA	RADIUS	ARC	TANGENT	CHORD
C3	36°46'55"	80.00'	51.36'	26.60'	50.48'
C4	53°03'29"	50.00'	46.30'	24.96'	44.67'
C5	25°31'53"	150.00'	66.84'	33.98'	66.29'

CHANNEL CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND PROFILE ELEVATION. COMPACT NATIVE SOIL PER M.A.G. SPEC. 215.
3. HYDROSEED CHANNEL SOIL PER REVEGETATION PLAN ON SHEET 7.
7. INSTALL BANK EROSION PROTECTION PER BANK EROSION PROTECTION DETAIL SHEET 2, SECTION B-B.
19. INSTALL 3- 8'W X 3'H ARCH CONCRETE CULVERT PER A.D.O.T. STD. DET. B-01.10 AND B-0230.
20. INSTALL STEEL HANDRAILS PER C.O.S. DET. 2508. ALL PAINT SAN DIEGO BUFF.
21. REMOVE EXISTING GROUTED RIPRAP IN AREAS OF CONFLICT WITH NEW CHANNEL.
22. INSTALL GROUTED ROCK RIPRAP D MIN.=9", D MAX.=18", DEPTH=38". EXPOSE FACE OF ROCK
23. INSTALL CHANNEL EROSION PROTECTION PER CHANNEL EROSION PROTECTION DETAIL SHEET 6, SECTION G-G.
26. SAWCUT CONCRETE SLAB TO NEAT EDGE. REMOVE 692 S.Y.



SECTION E-E

BANK EROSION PROTECTION DETAIL

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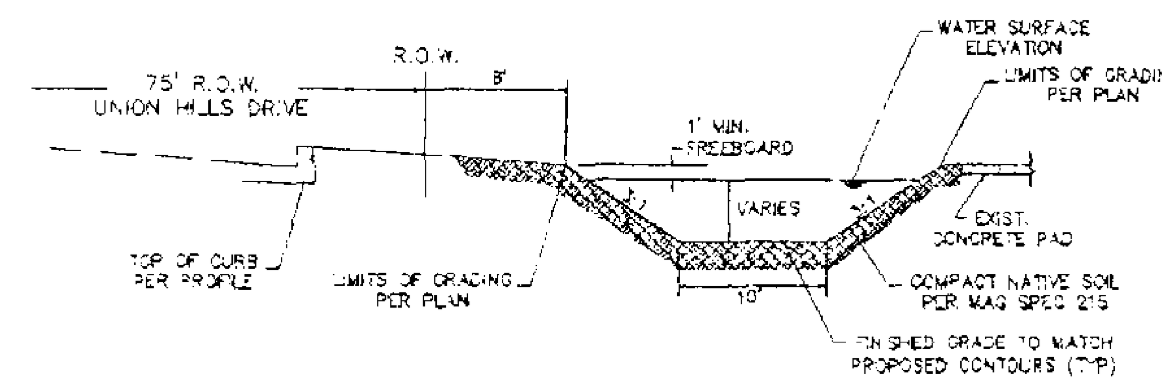

SECTION F-F

TYPICAL WASH SECTION

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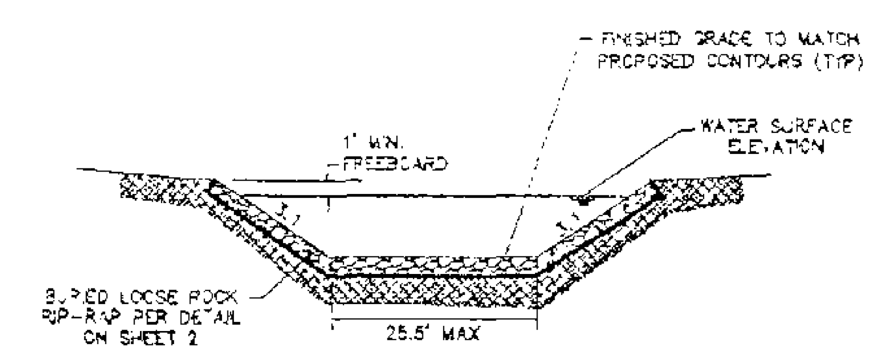

SECTION G-G

BANK EROSION PROTECTION DETAIL

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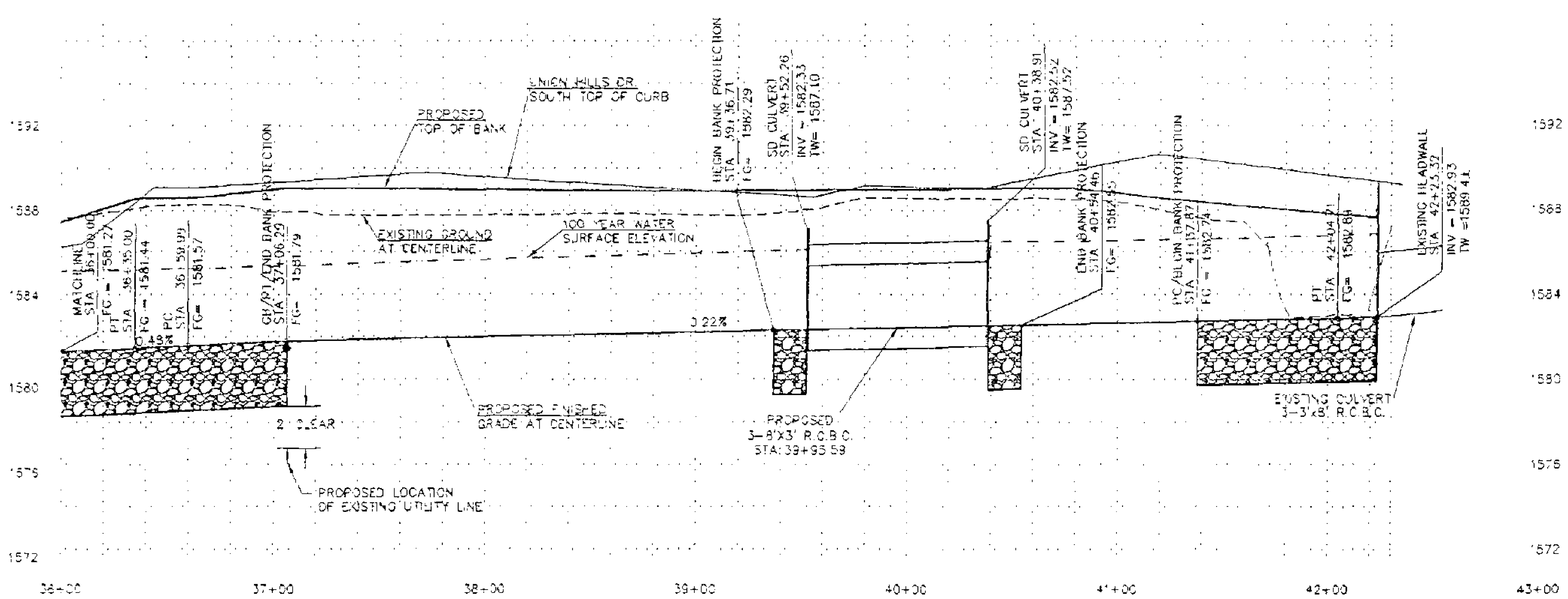

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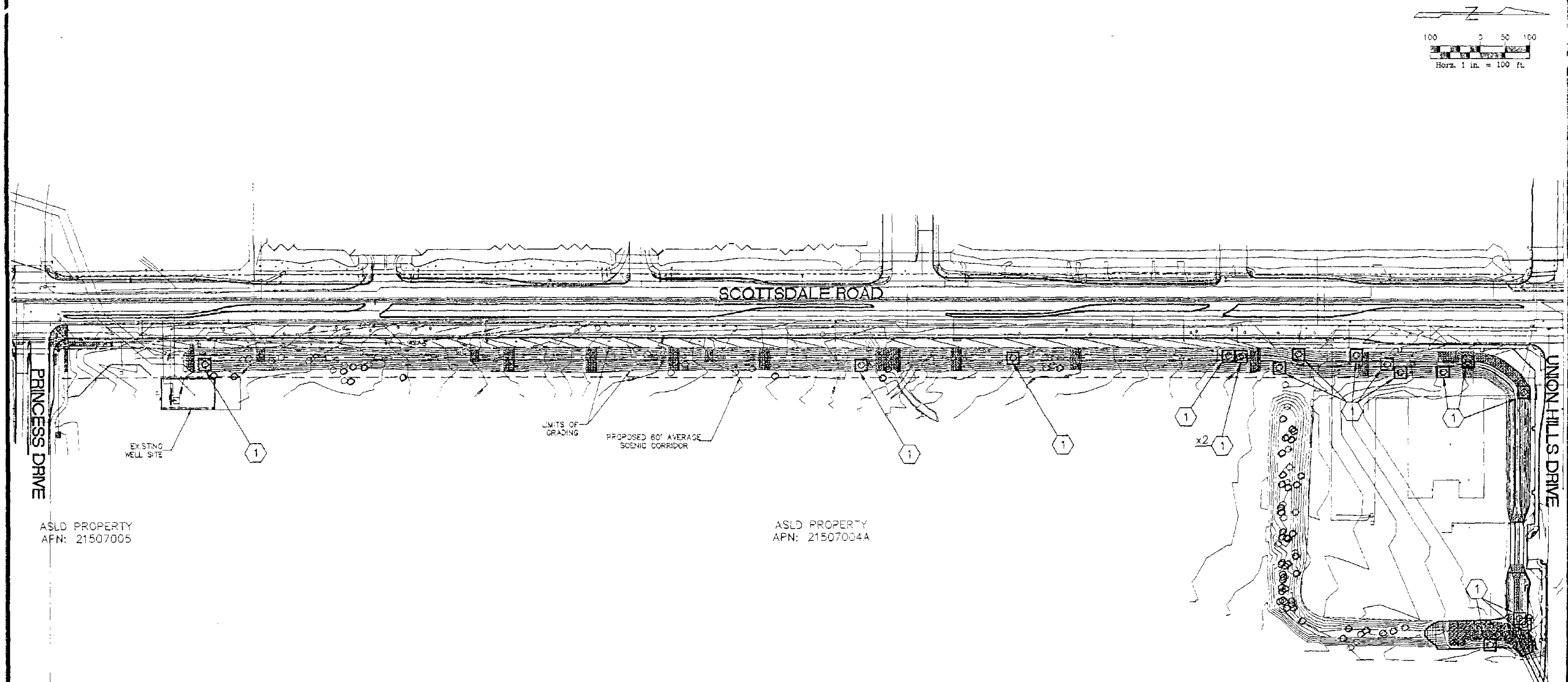
INTERIM REGIONAL DRAINAGE CHANNEL

CITY OF SCOTTSDALE, ARIZONA

EXPIRES 03-31-11

DESIGNED	GV
CHECKED	GB
DATE	11/03/08
SCALE	1" = 40'
JOB NO.	073022
SHEET	6 of 8

55-SA-2008 19-ZN-2008 1672-08-1 Q.S.#38-45



CONSTRUCTION NOTE

(1) ONE OF SEVENTEEN PLANTS TO BE REMOVED. REFERENCE NATIVE PLANT INVENTORY PLANS BY DESIERTO VERDE DATED 3/31/08 AND 10/31/08 FOR PLANT INVENTORY TAG NUMBERS AND COLORS.

SUMMARY OF INVENTORY-PERFORMED BY DESIERTO VERDE

- NON-SALVAGEABLE (30) – BLUE TAG
- SALVAGEABLE (89) – RED TAG

TAKE PRECAUTION AND CARE TO AVOID CONTACT WITH OR DISRUPTION OF TREES TO REMAIN IN PLACE.

SALVAGE PLANTS

- TO BE REMOVED (17)
- TO REMAIN IN PLACE (72)

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INTERIM REGIONAL DRAINAGE CHANNEL

CITY OF SCOTTSDALE, ARIZONA

EXPIRES 12-31-11

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SHEET	8 of 8

55-SA-2008 19-ZN-2008 1672-08-1 Q.S.#38-45

Appendix N

As- Builts for Interim Drainage Channel Report

FINAL DRAINAGE REPORT

FOR

INTERIM REGIONAL DRAINAGE CHANNEL

October 1, 2008

WP# 073022

Prepared for:

One Scottsdale Holdings, LLC
c/o DMB Associates, Inc.
7600 East Doubletree Ranch Road
Suite 300
Scottsdale, Arizona 85258
Phone: (480) 367-7000
Fax: (480) 367-7558

Submitted to:

City of Scottsdale
7447 East Indian School Road
Suite 300
Scottsdale, Arizona 85251
Phone: (480) 312-2352
Fax: (480) 312-2672

Prepared by:

Wood, Patel & Associates, Inc.
2051 West Northern Avenue
Suite 100
Phoenix, Arizona 85021
Phone: (602) 335-8500
Fax: (602) 335-8580
Website: www.woodpatel.com

Registered Professional Engineer (Civil)
CERTIFICATE NO
42317
GEOFFREY SCOTT BROWNELL
Date Signed 10-1-08
ARIZONA U.S.A.

expires 3/31/11

TABLE OF CONTENTS

APPENDICES

EXHIBITS

km
Y:\WP\Reports\Hydrology\073022 Interim Regional Drainage Channel Final Drainage Report.doc

Registered Professional Engineer (Civil)
CERTIFICATE NO
42317
GEOFFREY SCOTT
BROWNELL
Date Signed 10-1-08
ARIZONA U.S.A.

expires 3/31/11

1.0 EXECUTIVE SUMMARY

- The Interim Regional Drainage Channel is a proposed 3,200-linear foot open channel along Union Hills Road and Scottsdale Road within the City of Scottsdale.
- The channel is intended to provide increased flood protection in a known floodplain, as well as protection for future improvements of Scottsdale Road.
- The Interim Regional Drainage Channel completes the downstream reach of City of Scottsdale initiated regional drainage improvements.
- The channel will convey flow from an existing culvert under Union Hills Drive. It will run east adjacent to Union Hills Drive, turn south and flow adjacent to the Scottsdale Road right-of-way within a future scenic corridor easement to a proposed box culvert under Scottsdale Road. Storm water will ultimately be retained in the Reach 11 Recreation Area of the Central Arizona Project canal.
- The maximum channel width is proposed to be 40 feet.
- The box culvert conveying flows under Scottsdale Road is currently under design by the City of Scottsdale.
- Grade control structures are incorporated in the design to maintain the 100-year flow velocities in the channel within permissible velocities appropriate for an unlined native channel.
- Riprap erosion protection will be incorporated into each grade control structure, as well as at horizontal turns in the channel alignment and inlet/outlet of culverts.
- The design flow for the Interim Regional Drainage Channel is 300 cubic feet per second.

2.0 GENERAL BACKGROUND

The Interim Regional Drainage Channel presents the opportunity for implementation of flood protection in the City of Scottsdale. It completes the downstream reach of drainage improvements initiated by the City of Scottsdale. In addition, it provides protection to proposed improvements to Scottsdale Road. It will be located within a scenic corridor easement and add aesthetic open space along a major arterial roadway. The solution is anticipated to prevent redundancies in the drainage system that could occur if development occurred in a disjointed manner.

The proposed Interim Regional Drainage Channel is located within the northwest quarter of Section 35, Township 4 North, Range 4 East, of the Gila and Salt River Base and Meridian. More specifically, the channel is located along the east side of the Scottsdale Road right-of-way between Union Hills Drive and Princess Drive. A map of the area can be seen on Exhibit 1 – *Vicinity Map*.

The project site lies in a Federal Emergency Management Agency (FEMA) designated Zone "AO" Special Flood Hazard Area, with depths of one foot and velocities of three feet per second, per the Flood Insurance Rate Map (FIRM) panel number 04013C1245H, effective date September 30, 2005 (see Exhibit 2 – *FEMA Map*).

Currently, drainage from the north passes south under the Loop 101 Freeway through existing box culverts. Flow is conveyed past Union Hills Drive via existing drainage improvements, then flows in an existing wash in a westerly and southerly direction across the Arizona State Land Department (ASLD) property. There is current planning for concrete box culverts that would convey this flow west under Scottsdale Road. An existing channel running west on the north side of Princess Drive would not be disturbed by the Interim Regional Drainage Channel and would continue to operate independently.

3.0 DESIGN CONCEPT

The alignment for the Interim Regional Drainage Channel was chosen with input from the Arizona State Land Department (ASLD) and the City of Scottsdale. The proposed alignment maintains connection with the existing drainage improvements south of Union Hills Drive. The proposed channel begins at the outlet of an existing culvert on the south side of Union Hills Drive. The channel will flow east adjacent to Union Hills Drive for approximately 550 feet where it turns south and flows for approximately 2,650 feet within a future scenic corridor easement adjacent to the Scottsdale Road right-of-way. The planned access to the ASLD parcel is a driveway off Union Hills Drive. The proposed channel will be conveyed through three (3) 3-foot by 8-foot concrete box culverts at the proposed driveway location. The proposed regional channel ultimately outfalls into proposed culverts that are currently under design by Dibble & Associates, Inc. The storm water then flows west under Scottsdale Road and into the Central Arizona Project Reach 11 Recreation Area retention. The proposed channel alignment is shown on Exhibit 3 -- *Conceptual Grading and Drainage Plan.*

The Interim Regional Drainage Channel is proposed to be an unlined earthen channel. Grade control structures are incorporated into the vertical design of the channel in order to maintain the 100-year flow velocities within appropriate ranges. A variable bottom width is employed in the channel in order to maintain a constant channel slope adjacent to a variable sloped roadway. A 10-foot wide bottom occurs at the upstream end of each grade control structure. The drop is created by extending the sideslopes down to make a triangular channel at the downstream end of the structure. The channel transitions back to the flat bottom at the upstream end of the next grade control structure.

Erosion protection was incorporated into the channel design. Riprap erosion protection was integrated as part of each grade control structure. This protection will be of sufficient length to include the hydraulic jump associated with each structure. Riprap erosion protection is also proposed at the bends in the channel alignment to reduce the possibility of breakout and lateral migration. Revegetation and hydroseed will be used along the length of the channel for aesthetic purposes and increased erosion control.

Typical cross sections for the Interim Regional Drainage Channel were selected to provide adequate conveyance for the 100-year storm. A minimum of one foot of freeboard is provided within the channel, and the top width of the channel, including freeboard, is limited to 40 feet. The channel side slopes are limited to 4:1 along Scottsdale Road, and 3:1 along Union Hills Drive.

4.0 HYDROLOGY

The 100-year design flow for the Interim Regional Drainage Channel is 300 cfs. This is based on a 100-year, 6-hour design storm utilizing HEC-1 hydrology modeling software (Ref. 3). Results of this model are included in Appendix A -- *Hydrology*. These results are compared to those published in *Drainage Study Core North/Core South* by Robert L. Ward (Ref. 4).

The included HEC-1 model is an expansion of the hydrology model completed for the *One Scottsdale Master Drainage Plan*, by Wood, Patel & Associates, Inc. (Ref. 5). The One Scottsdale development lies upstream of the project site to the north of the Loop 101 Freeway. The model was revised to expand to the south to include the proposed improvements. Flow at the Loop 101 Freeway culverts (identifier 33E.1) is now routed through the Interim Regional Drainage Channel (identifier R33E.1). The runoff from the adjacent State Land parcel (identifier ASLD) joins at the outfall culvert under Scottsdale Road near Princess Road (identifier CPPRIN). This downstream flow of 300 cfs was used as the design flow for the entire channel. The ASLD sub basin was determined to be a 35-acre area with a curve number of 77, chosen to represent desert shrub with poor hydrologic conditions. The other revision to the *One Scottsdale Master Drainage Plan* hydrology model is modification to the storage routing to account for the changes in storm water storage requirements due to channel improvements proposed here. This resulted in increased runoff under the Loop 101 Freeway.

These results are compared to existing conditions and proposed conditions models published in *Core North/Core South* (Ref. 4). Both of these models also use a curve number of 77 for the State Land sub basin. The flows published in that model are lower than those proposed here, which is considered conservative. In a separate hydraulics section of that report, the culvert design flows for the Loop 101 Freeway culverts are listed as 300 cfs, including large offsite impacts. The report proposes that offsite impacts would not affect these culverts, and revises the design flow to 65 cfs. This further establishes that the design flow for the Interim Regional Drainage Channel of 300 cfs is conservative.

	Interim Regional Drainage Channel		Core North/South Existing Conditions		Core North/South Plan 1 Proposed Conditions	
	HEC-1 CP	Q100 (cfs)	HEC-1 CP	Q100 (cfs)	HEC-1 CP	Q100 (cfs)
Loop 101 Culvert	33E.1	256	SCNA1	129	N61.3	173
State Land	ASLD	90	3B	98	N63	98
Proposed Channel	R22E.1	252	3B.1	125	N63.1	169
Outfall Culvert	CPPRIN	300	3B.2	178	N63.2	256

An existing wash traverses the ASLD parcel in a southwesterly direction. This wash is a Section 404 *jurisdictional wash. In the existing conditions, it is blocked on the upstream side from receiving flow* by the existing retention basin near Station 36+00. It collects only local flow and discharges into the proposed channel near Station 24+00. This local flow is estimated as 14 cfs by a Rational Method calculation which is included in Appendix A -- *Hydrology*.

5.0 HYDRAULICS

Final design and analysis of the Interim Regional Drainage Channel was completed using HEC-RAS (Ref. 6) hydraulic modeling software. Grade control structures are specified to manage the longitudinal slope and maintain velocity within the design range. The results of the hydraulic model are the basis for analysis of erosion potential. Grade control structures are used in lieu of bank erosion protection along the entire channel reach.

Cross sections were cut upstream, downstream, and at each grade control structure, horizontal channel bends, changes in channel lining, and along the channel length. Roughness coefficients for the channel were selected to reflect graded earth with expected landscaping and vegetation. The downstream boundary condition was set as the calculated headwater required for the proposed culvert, currently under design by Dibble & Associates, Inc. This culvert is assumed to be a reinforced concrete box culvert with two (2) 8- foot wide by 3-foot tall barrels. Culvert headwater calculations were completed with *Bentley CulvertMaster* (Ref. 7). The culvert inlet loss coefficient was set as 0.7 to reflect a drop inlet with possible skew. The upstream boundary condition was set as critical depth to reflect flow exiting the existing culverts under Union Hills Drive. Hydraulic models of the 2-year and 10-year storms were also run to analyze hydraulic conditions. Flows for these storms were approximated as 10% and 35% of the 100-year discharge, respectively, per the *Drainage Design Manual* (Ref. 8). Input hydraulic data and results are located in Appendix B – *Hydraulic Calculations*.

Velocities within the channel for the 100-year storm were found to range from 3.5 to 7 feet per second. Supercritical flow was not found to occur. The highest velocities occur as the flow exits the proposed stilling basins and slows as it approaches normal depth through the length of the open channel. The lowest velocities occur within the proposed stilling basins and where under the influence of the backwater caused by rock check dams. Provided freeboard ranges from 0.25 feet to 3 feet within the 40-foot channel corridor. Less than one foot of freeboard occurs where flow is under the influence of backwater from the rock check dams. At each location with less than one foot of provided freeboard, additional freeboard will be provided outside of the easement in the grading to existing. In order to mitigate any flooding hazard low amounts of provided freeboard might create, it is reminded that according to City of Scottsdale requirements for development within FEMA flood Zone "AO" (1 foot, 3 feet per second), all adjacent buildings must have a lowest floor a minimum of 12 inches above the water surface elevation.

Flow velocities for the 10-year storm range from 2 to 5.6 feet per second. This is within the recommended range to prevent sedimentation aggradation, as well as channel erosion. At least 1.3 feet of freeboard is provided in all locations. The flow velocities for the 2-year storm range from 1 to 4.5 feet per second. At least 2 feet of freeboard is provided in all locations.

Erosion potential was analyzed using the results of the hydraulic modeling. These analyses are included in Appendix C – *Erosion Protection*. An ADWR Level 1 scour analysis found the estimated scour depth to be 3 feet. A minimum erosion protection thickness of 3 feet is therefore specified. Bend scour around the outside bank of the horizontal turns in the channel was also analyzed. A minimum length of bank protection downstream of the bends is specified as 70 feet. Riprap was selected for use as erosion protection. A fiftieth percentile diameter of 9 inches was chosen for these locations. Gradation per the *Drainage Design Manual* (Ref. 1) is specified.

Scour erosion is not expected on the upstream side of the check dams. The purpose of the check dams is to slow the rate of flow. This would more likely result in aggradation. The flow velocity for each of these check dams in the 100-year storm is approximately 3.6 feet per second, with an energy grade slope of approximately 0.26%. Since the channel slope is 0.75%, this shows that the check dams effectively produce a backwater effect and scour is not anticipated. Additionally, these dams are constructed of rock-filled gabion baskets, and are keyed into the sides and bottom of the channel to reduce the possibility of overturning. The flow will become supercritical as it pours over the dams; so erosion protection is proposed on the downstream side. For a graphical and tabular representation, please see the HEC-RAS profiles and results included in Appendix B – *Hydraulics*.

6.0 MAINTENANCE

Ongoing maintenance of the designed or recommended drainage systems is required to preserve the design integrity and purpose of the drainage system. Failure to provide maintenance can prevent the drainage system from performing to its intended design purpose and can result in reduced performance. Maintenance within the public right-of-way is the responsibility of the governing municipality. However, it is the responsibility of private developers, homeowners associations, etc. for facilities on private property within drainage easements, and includes private streets. A regular maintenance program is required to have drainage systems perform to the level of protection or service as presented in this report and related construction documents and specifications.

7.0 REFERENCES

1. *Drainage Design Manual for Maricopa County, Arizona, Hydraulics* (Draft), Flood Control District of Maricopa County, September 2003.
2. *Design Standards & Policies Manual, Chapter 4 – Grading and Drainage*, City of Scottsdale, August 2007.
3. *Flood Hydrograph Package (HEC-1), Version 4.1,* U.S. Army Corps of Engineers, June 1998.
4. *Drainage Study Core North/Core South Scottsdale, Arizona*, Robert L. Ward, Consulting Engineer, September 25, 2001.
5. *One Scottsdale Master Drainage Plan*, Wood, Patel & Associates, Inc., September 26, 2006.
6. *River Analysis System (HEC-RAS), Version 3.1.3,* U.S. Army Corps of Engineers, May 2005.
7. *Bentley CulvertMaster, Version 3.1, Service Pack 1,* Bentley Systems, Inc., copyright 2005.
8. *Drainage Design Manual for Maricopa County, Arizona, Hydrology* (Draft), Flood Control District of Maricopa County, September 2003.

APPENDIX A

Hydrology

```
*****************************************              ******************************************
*                                       *              *                                        *
*   FLOOD HYDROGRAPH PACKAGE   (HEC 1)  *              *   U S. ARMY CORPS OF ENGINEERS         *
*            JUN    1998                *              *   HYDROLOGIC ENGINEERING CENTER        *
*          VERSION 4 1                  *              *         609 SECOND STREET              *
*                                       *              *     DAVIS, CALIFORNIA 95616            *
*  RUN DATE    04FEB08   TIME  15 12.09 *              *        (916) 756-1104                  *
*                                       *              *                                        *
*****************************************              ******************************************


               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


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  THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS WRITE STAGE FREQUENCY,
DSS READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM
```

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1                                           HEC-1 INPUT                                              PAGE  1

 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID     ONE SCOTTSDALE (STACKED 40S) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
   2          ID     OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA GOVERNED BY PRE-POST CRITERIA
   3          ID     OPTION A - ASLD CHANNEL
   4          ID     FILE:  100YR-pick.DAT
   5          ID           OPTION B - 34 1 ACRES OF ASLD PARCEL
   6          ID
   7          ID     BASED ON MODELS PREPARED BY: ROBERT L  WARD, P E , CONSULTING ENGINEER
   8          ID
   9          ID                    PRSW-100 61
  10          ID                    C1 61        (CENTER DRIVE PROJECT)
  11          ID                    S40EX100 61 (STACKED 40S EXISTING CONDITION)
  12          ID
  13          ID     ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 13, 2003
  14          ID     100 YEAR, 6-HOUR HYPOTHETICAL STORM
  15          ID
  16          ID     AREAL RAINFALL REDUCTION IS BASED ON A 14 SQUARE MILE STORM
  17          ID
              *DIAGRAM
  18          IT       5                 300
  19          IO       5
              *
              *        BEGIN GRAYHAWK - VILLAGE 1 DRAINAGE PLAN
              *        PREPARED BY:  GILBERTSON ASSOCIATES, INC , HEC-1 FILE  UDPLAN DAT
              *        THIS GILBERTSON MODEL USES SCS UNIT HYDROGRAPH METHODOLOGY
              *        THE ORIGINAL MODEL WAS BASED ON A 1-MINUTE COMPUTATION INTERVAL
              *

  20          KK     1A1
  21          KM        EXCESS RUNOFF FROM SUBAREA 1A1
  22          KM        RAINFALL REGION 3
  23          BA     0180
  24          PH             14     0 76     1.5     2 54     2 81     2.99     3 31
  25          LS             77       36
  26          UD     0 06

  27          KK   DET1A1
  28          KM        DETENTION BASIN FOR SUBAREA 1A1
  29          RS       1     STOR       0
  30          SV       0     1 76
  31          SO       0       20
  32          SE       0      1 0
  33          ST     1 0       15     2 8     1 5

  34          KK   RA1-C4
  35          KM        ROUTE OUTFLOW FROM DET1A1 TO CP1C4
  36          KM        TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
  37          KM                       SIDE SLOPE = 1 1 (H:V)
  38          KM                       MAX DEPTH  = 1 35 FT
  39          RS       1     FLOW      -1
  40          RC   0 025    0 025    0 025     670  0 0179
  41          RX       0      0.5      1.0    5 04    5 05     9 1     9 5      10
  42          RY    1 37     1.36     1 35       0       0    1 35    1 36    1 37
1                                           HEC-1 INPUT                                              PAGE  2

 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  43          KK     1C4
  44          KM        EXCESS RUNOFF FROM SUBAREA 1C4
  45          BA     005
  46          LS             77        5
  47          UD      08

  48          KK   CP1C4
  49          KM        COMBINE HYDROGRAPHS FROM RA1-C4 AND 1C4
  50          HC       2
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```
KK  RC4-C3
KM         ROUTE OUTFLOW FROM CP1C4 TO CP1C3I
KM         TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
KM                            SIDE SLOPE = 3.1 (H V)
KM                            MAX DEPTH  = 1.5 FT.
RS       1     FLOW      -1
RC   0 025   0.025   0 025     400   0.020
RX       0     0.5     1 0    4.49     5 5       9     9.5      10
RY    1.52    1 51     1 5       0       0     1 5    1 51    1 52

KK    1Da3
KM         EXCESS RUNOFF FROM SUBAREA 1Da3
BA    0140
LS              77      31
UD     .06

KK  DE1Da3
KM         DETENTION FOR SUBAREA 1Da3
KM         OUTLET IS A 18" RGRCP WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
RS       1    STOR       0
SV       0    1 27
SQ       0       4
SE       0     3.0
ST     3 0      15     2 8     1 5

KK    1Da4
KM         EXCESS RUNOFF FROM SUBAREA 1Da4
BA      01
LS              77      38
UD     .05

KK  CP1Da4
KM         COMBINE HYDROGRAPHS FROM 1Da4 AND DE1Da3
HC       2

KK  DE1Da4
KM         DETENTION FOR SUBAREA 1Da4
KM         OUTLET IS A 10" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
RS       1    STOR       0
SV       0    0.76
SQ       0       4
SE       0     3.0
ST     3 0      15     2 8     1.5
                                          HEC-1 INPUT                                  PAGE 3

LINE      ID .     1     . 2.     3 . .  4      5       6       7   . .8. .... 9..     10

KK    1Da5
KM         EXCESS RUNOFF FROM SUBAREA 1Da5
BA     001
LS              77       5
UD      08

KK  CP1C3I
KM         COMBINE HYDROGRAPHS FROM RC4-C3, 1Da5 AND DE1Da4
HC       3

KK  RC3-C3
KM         ROUTE OUTFLOW FROM CP1C3I TO DET1C3
KM         TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
KM                            SIDE SLOPE = 2 1 (H V)
KM                            MAX DEPTH  = 2.35 FT
RS       1    FLOW       -1
RC   0 025   0 025   0.025     850   0 005
RX       0     0.5     1.0    8.04    8 05    15 1    15.5      16
RY    2 37    2 36    2 35       0       0    2 35    2.36    2 37
*     ***************************************************************
*     *START AT OFF-SITE BASIN ON THE NORTHEAST CORNER OF VILLAGE 1*
*     ***************************************************************

KK  Off-1A
KM         OFF-SITE CONTRIBUTING AREA LOCATED ON CITY'S LAND
BA     012
LS              77
UD      06

KK     1A2
KM         EXCESS RUNOFF FROM SUBAREA 1A2
BA     004
LS              77      44
UD      06

KK     1A3
KM         EXCESS RUNOFF FROM SUBAREA 1A3
BA     006
LS              77      40
UD      05

KK     CPA3
KM         COMBINE HYDROGRAPHS FROM 1A1, Off-1A AND 1A3
HC       3

KK  DET1A3
KM         DETENTION BASIN FOR SUBAREA 1A3
RS       1    STOR       0
SV       0    0 35
SQ       0      22
SE       0     2 5
ST     2 5      15     2 8     1 5
                                          HEC-1 INPUT                                  PAGE 4

LINE      ID       1 .     .2     ..3 .     4   . . 5       6 .     7   .  8     .. 9  . . 10
```

```
KK  RA3-A6
KM       ROUTE OUTFLOW HYDROGRAPH FROM DET1A3 TO DET1A6
KM                     TRAPEZOIDAL CHANNEL (ASSUMED)
KM                        SIDE SLOPE = 5:1 (H:V)
KM                        MAX DEPTH  = 1 0 FT
KM                        BOT.WIDTH  = 10.0 FT
RS     1    FLOW       1
RC  0.025  0.025   0 025      550  0 0115
RX      0    0.5     1 0        6      16      21    21 5    22.0
RY   1.02   1.01     1 0        0       0     1 0    1 01    1 02

KK    1A6
KM       EXCESS RUNOFF FROM SUBAREA 1A6
BA    007
LS            77      14
UD     05

KK   CP1A6
KM       COMBINE HYDROGRAPHS FROM RA3-A6 AND 1A6
HC      2

KK  DET1A6
KM       DETENTION BASIN FOR SUBAREA 1A6
RS      1    STOR       0
SV      0    0 20
SQ      0      22
SE      0     2 5
ST    2.5      15     2 8     1.5

KK    1A5
KM       EXCESS RUNOFF FROM SUBAREA 1A5
BA    016
LS            77      46
UD     07

KK   CP1A5
KM       COMBINE HYDROGRAPHS FROM DET1A6 AND 1A5
HC      2

KK  DET1A5
KM       DETENTION BASIN FOR SUBAREA 1A5
RS      1    STOR       0
SV      0    0 65
SQ      0      34
SE      0     2 5
ST    3 5      15     2 8     1.5

KK    1A4
KM       EXCESS RUNOFF FROM SUBAREA 1A4
BA    010
LS            77      48
UD     07
```

HEC-1 INPUT PAGE 5

```
LINE      ID . 1 .2 .3 ... .4. 5 6 . . 7.. .. 8 . . 9. 10

KK  RA4-A7
KM       ROUTE OUTFLOW FROM DET1A4 TO DET1A7
KM                     TRAPEZOIDAL CHANNEL (ASSUMED)
KM                        SIDE SLOPE = 10:1 (H:V)
KM                        MAX DEPTH  = 1 0 FT
KM                        BOT WIDTH  = 10 0 FT.
RS      1    FLOW      -1
RC  0 030  0 030   0.030      300  0 0175
RX      0    0.5     1 0       11      21      31    31.5    32 0
RY   1.02   1 01     1 0        0       0     1 0    1 01    1 02

KK  DET1A4
KM       DETENTION BASIN FOR SUBAREA 1A4
RS      1    STOR       0
SV      0    0.57
SQ      0      11
SE      0     2 5
ST    2.5      15     2.0     1 5

KK    1A7
KM       EXCESS RUNOFF FROM SUBAREA 1A7
BA    008
LS            77      27
UD     05

KK   CP1A7
KM       COMBINE HYDROGRAPHS FROM DET1A5, DET1A4, AND 1A7
HC      3

KK  DET1A7
KM       DETENTION BASIN FOR SUBAREA 1A7
RS      1    STOR       0
SV      0    0 93
SQ      0      11
SE      0     2.5
ST    2 5      15     2 8     1 5

KK    1C1
KM       EXCESS RUNOFF FROM SUBAREA 1C1
BA    021
LS            77      38
UD     09

KK   CP1C1
KM       COMBINE HYDROGRAPHS FROM DET1A7, AND 1C1
```

```
215           HC       2

216           KK  DETIC1
217           KM        DETENTION BASIN FOR SUBAREA 1C1
218           KM        STORAGE VOLUME PER PLANS (405-E-95)
219           KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
220           RS       1     STOR       0
221           SV       0      1 5
222           SQ       0       14
1                                         HEC-1 INPUT                                        PAGE  6

LINE          ID      .1 . . .2       3. .  4... . 5      6  . . 7. .. .8 . .   9   ..10

223           SE       0      3 6
224           ST     3 6      15     2 8     1.5

225           KK     1C2
226           KM        EXCESS RUNOFF FROM SUBAREA 1C2
227           BA    .024
228           LS              77       12
229           UD      08

230           KK   CP1C2
231           KM        COMBINE HYDROGRAPHS FROM DETIC1 AND 1C2
232           HC       2

233           KK  DE1C2A
234           KM        DETENTION BASIN FOR SUBAREA 1C2
235           KM        STORAGE VOLUME PER PLANS (405-E-95)
236           KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
237           RS       1     STOR       0
238           SV       0    0 39
239           SQ       0       14
240           SE       0      1 6
241           ST     3 6      15     2 8     1 5

242           KK  DE1C2B
243           KM        DETENTION BASIN FOR SUBAREAS 1C2
244           KM        STORAGE VOLUME PER PLANS (405-E-95)
245           KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
246           RS       1     STOR       0
247           SV       0    0 22
248           SQ       0       14
249           SE       0      3 6
250           ST     3 6      15     2.8     1.5

251           KK  DE1C2C
252           KM        DETENTION BASIN FOR SUBAREAS 1C2
253           KM        STORAGE VOLUME PER PLANS (405-E-95)
254           KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
255           RS       1     STOR       0
256           SV       0    0 54
257           SQ       0       14
258           SE       0      1 6
259           ST     3 6      15     2 8     1.5

260           KK     1C3
261           KM        EXCESS RUNOFF FROM SUBAREA 1C3
262           BA     026
263           LS              77       15
264           UD      06

265           KK   CP1C3
266           KM        COMBINE HYDROGRAPHS FROM RC2-C3, DETIC2C, AND 1C3
267           HC       3
1                                         HEC 1 INPUT                                        PAGE  7

LINE          ID       1       2       3. ... . 4 .    5 .    6     .7      8     .9 . .  10


268           KK  DETIC3
269           KM        DETENTION BASIN FOR SUBAREAS 1C3
270           KM        STORAGE VOLUME PER PLANS (405-E-95)
271           KM        OUTLET IS A 6'W x 3'H CBC PER PLANS (1102-E 99 AND 190-E 95)
272           RS       1     STOR       0
273           SV       0      1 1
274           SQ       0     150
275           SE       0      3 5
276           ST     3 5      15     2 8     1 5

277           KK  RC3COM
278           KM        ROUTE OUTFLOW FROM DETIC3 TO WHERE DETCOM OUTFLOWS
279           RS       1     FLOW      -1
280           RC   0.030   0 030   0 030    1000   0 016
281           RX       0       5      10      20      30      40      45      50
282           RY    12 0   11 75    11 5    10 0    10 0    11 5   11.75    12 0

283           KK    COMM
284           KM        EXCESS RUNOFF FROM SUBAREA COMMERCIAL
285           BA      03
286           LS              77       90
287           UD      07

288           KK  DETCOM
289           KM        DETENTION FOR SUBAREA COMMERCIAL
290           RS       1     STOR       0
291           SV       0      1 1
292           SQ       0      13
293           SE       0       3
294           ST       3      15     2 8     1 5

295           KK   CPCOM
296           KM        COMBINE HYDROGRAPHS FROM RC3COM AND COMM
297           HC       2
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298           KK  COMOF1
299           KM        ROUTE CPCON TO CPOFF1
300           RS       1    FLOW     -1
301           RC   0.030   0 030   0 030     900  0 0155
302           RX       0       5      10      20      30      40      45      50
303           RY    12 0   11 75   11 5    10 0    10 0    11.5   11.75    13.0

304           KK    OFF1
305           KM        EXCESS RUNOFF FROM SUBAREA OFF1
306           BA      02
307           LS              77      90
308           UD      05

309           KK  DEOFF1
310           KM        DETENTION FOR SUBAREA OFF1
311           RS       1    STOR       0
312           SV       0     2 4
313           SQ       0      13
314           SE       0       3
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

315           ST       1      15     2 8     1 5

316           KK  CPOFF1
317           KM        COMBINE HYDROGRAPHS FROM COMOFF AND DEOFF1
318           HC       2

319           KK  OF1OF3
320           KM        ROUTE CPOFF1 TO CPOFF3
321           RS       1    FLOW     -1
322           RC   0 030   0 030   0 030     500   0 013
323           RX       0       5      10      20      30      40      45      50
324           RY    12 0   11.75    11.5    10.0    10 0    11.5   11.75    12 0

325           KK    OFF3
326           KM        EXCESS RUNOFF FROM SUBAREA OFF3
327           BA     016
328           LS              77      90
329           UD      07

330           KK  DEOFF3
331           KM        DETENTION FOR SUBAREA OFF3
332           RS       1    STOR       0
333           SV       0    2 34
334           SQ       0      13
335           SE       0       3
336           ST       3      15     2 8     1 5

337           KK  CPOFF3
338           KM        COMBINE HYDROGRAPHS FROM DEOFF3 AND OF1OF3
339           HC       2
              *
              *     START WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
              *

340           KK    33A1      CP
341           KM        ROUTE CPOFF3 THROUGH SUB 33A
342           RK    1960    0161     045             TRAP      20       3
              *

343           KK     33A     SUB
344           KM        RUNOFF FROM SUB 33A. INCLUDES WEST SIDE OF CENTER DRIVE
345           BA     054
346           LS              77      35
347           UK     300   0 020      05     100
348           RK    2325     013     015             TRAP      20       3
              *

349           KK    33A3      CP
350           KO       1
351           KM        COMBINE SUB 33A, CP 33A1
352           HC       2
              *
              *     END WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
              *
              *
              *     BEGIN GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 3
              *     START AT NORTHEAST CORNER OF PARCEL 1Db AND GO SOUTHWEST THROUGH
              *     PROPOSED PARK SITE
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

353           KK     1Db
354           KM        EXCESS RUNOFF FROM SUBAREA 1Db
355           BA      04
356           LS              77      35
357           UD      06

358           KK  DE1Db
359           KM        DETENTION FOR SUBAREA 1Db
360           RS       1    STOR       0
361           SV       0     2.7
362           SQ       0      13
363           SE       0     3 0
364           ST     3 0      15     2 8     1 5

365           KK    1Da1
366           KM        EXCESS RUNOFF FROM SUBAREA 1Da1
```

```
357            BA    0009
358            LS              77       35
369            UD      05

370            KK  DE1Da1
371            KM        DETENTION FOR SUBAREA 1Da1
372            KM        OUTLET IS A 18" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905 E-95)
373            RS       1    STOR        0
374            SV       0    0 548
375            SQ       0        4
376            SE       0      3 0
377            ST     3 0      15      3 8      1 5

378            KK    1Da2
379            KM        EXCESS RUNOFF FROM SUBAREA 1Da2
380            BA     003
381            LS              77
382            UD      08

383            KK  CP1Dab
384            KM        COMBINE HYDROGRAPHS FROM 1Da2, DE1Db AND DE1Da1
385            HC       3

386            KK  RDabE2
387            KM        ROUTE OTFLOW FROM CP1Dab TO CP1Ea2
388            KM        TRAPEZOIDAL CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
389            KM                           SIDE SLOPE = 4:1 (H V)
390            KM                           MAX DEPTH  = 1 0 FT
391            KM                           BOT.WIDTH  = 3 0 FT
392            RS       1    FLOW       -1
393            RC   0.030   0 030   0 030    1400  0 0171
394            RX       0     0 5     1.0       5       6      12     12 5      13
395            RY     1.2     1.1     1 0       0       0     1 0     1 1     1 2
                                         HEC-1 INPUT                                       PAGE 10

LINE           ID       1 .      2       3 .      4       5       6      7 . .    8 .     9 . ..10

396            KK    1Ea1
397            KM        EXCESS RUNOFF FROM SUBAREA 1Ea1
398            BA     019
399            LS              77       37
400            UD     .08

401            KK  DE1Ea1
402            KM        DETENTION FOR SUBAREA 1Ea1
403            KM        OUTLET IS A 8" PVC CONNECTED TO AN 18" RGRCP (407-E-95)
404            RS       1    STOR        0
405            SV       0    1 54
406            SQ       0       1
407            SE       0       3
408            ST       3      15      2.8      1 5

409            KK    1Ea2
410            KM        EXCESS RUNOFF FROM SUBAREA 1Ea2
411            BA     021
412            LS              77       39
413            UD      06

414            KK  CP1Ea2
415            KM        COMBINE HYDROGRAPHS FROM DE1Ea1 AND 1Ea2
416            HC       2

417            KK  DE1Ea2
418            KM        DETENTION FOR SUBAREA 1Ea2
419            RS       1    STOR        0
420            SV       0     1 5
421            SQ       0      10
422            SE       0       3
423            ST       3      15      2 8      1 5

424            KK  CP1Ea2
425            KM        COMBINE HYDROGRAPHS FROM DE1Ea2 AND RDabE2
426            HC       2

427            KK    PARK
428            KM        EXCESS RUNOFF FROM PROPOSED CITY'S PARK SITE
429            BA     021
430            LS              77
431            UD      06

432            KK  SCHOOL
433            KM        EXCESS RUNOFF FROM PROPOSED SCHOOL SITE
434            BA     015
435            LS              77       80
436            UD      05
                                         HEC-1 INPUT                                       PAGE 11

LINE           ID.      1        2       3        4 .     5       6   .  7       8       9       10

437            KK  DETSCH
438            KM        DETENTION FOR SUBAREA SCHOOL
439            RS       1    STOR        0
440            SV       0     1 3
441            SQ       0      13
442            SE       0       3
443            ST       3      15      2 0      1 5

444            KK   SCH1E
445            KM        ROUTE OUTFLOW FROM DETSCH TO CP1EC
446            RS       1    FLOW       -1
447            RC   0 030   0 030   0 030     500   0 009
448            RX       0     2.5       5      10      20      25    27 5      30
```

```
449          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

450          KK     1Ec
451          KM        EXCESS RUNOFF FROM SUBAREA 1Ec
452          BA    .0089
453          LS             77       90
454        * UD      06

455          KK   DE1Ec
456          KM        DETENTION FOR SUBAREA 1Ec
457          RS       1    STOR       0
458          SV       0     0.8
459          SQ       0      11
460          SE       0       3
461          ST       3      15     2.8     1.5

462          KK   CP1Ec
463          KM        COMBINE HYDROGRAPHS FROM SCH1Z AND DE1Ec
464          HC       2

465          KK  1EcEa2
466          KM        ROUTE OUTFLOW FROM CP1Ec TO CP1Ea2
467          RS       1    FLOW     -1
468          RC   0.030   0.030   0.030     500   0.009
469          RX       0     2.5       5      10      20      25    27.5      30
470          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

471          KK   CP1Ea
472          KM        COMBINE HYDROGRAPHS FROM CP1Ea2, 1EcEa2 AND PARK
473          HC       3

474          KK  REATPP
475          KM        ROUTE CP1EA TO THOMPSON PEAK PARKWAY
476          RS       1    FLOW     -1
477          RC   0.030   0.030   0.030     750  0.0146
478          RX       0     2.5       5      10      20      25    27.5      30
479          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0
1                                         HEC-1 INPUT                                        PAGE 12

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


480          KK     1Eb
481          KM        EXCESS RUNOFF FROM SUBAREA 1Eb
482          BA   .0576
483          LS             77       52
484          UD      08

485          KK  DET1Eb
486          KM        DETENTION FOR PARCEL 1Eb
487          RS       1    STOR       0
488          SV       0     4.9
489          SQ       0      52
490          SE       0       3
491          ST       3      15     2.8     1.5

492          KK    OFF2
493          KM        EXCESS RUNOFF FROM SUBAREA OFF2  PUMPED HOSPITAL FLOWS
494          BA     013
495          LS             77       90
496          UD      07

497          KK  DEOFF2
498          KM        DETENTION FOR SUBAREA OFF2  PUMPED HOSPITAL FLOWS
499          RS       1    STOR       0
500          SV       0     1.5
501          SQ       0      13
502          SE       0       3
503          ST       3      15     2.8     1.5

504          KK  CPOFF2
505          KM        COMBINE HYDROGRAPHS REATPP, DET1Eb AND DEOFF2
506          HC       3
             *
             *      END GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 1
             *
             *
             *      START EAST SIDE OF STACKED 40 DESIGN
             *
             *


507          KK   1Kr 1   ROUTE
508          KM        ROUTE CPOFF2 THROUGH SUB 1Kr
509          RK     840    0135     045            TRAP      10       2
             *

510          KK     1Kr     SUB
511          KM        R/O FROM SUB 1Kr
512          KM        DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1K
513          BA   .0515
514          LS             77       55
515          UD    0.15
1                                         HEC-1 INPUT                                        PAGE 13

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


516          KK   DET1K
517          KM        DETENTION FOR SUBAREA 1Kr
518          RS       1    STOR       0
519          SV       0     4.6
520          SQ       0      20
521          SE       0       3
522          ST       3      15     2.8     1.5
```

```
                  *
 523              KK   1Kr 2 COMBINE
 524              KM        COMBINE DETIK & 1Kr 1
 525              HC        2
                  *
 526              KK   1Hr 1   ROUTE
 527              KM        ROUTE 1Kr 2 THROUGH SUB 1Hr
 528              RK     1300     0149      045              TRAP       10        2
                  *
 529              KK     1Hr      SUB
 530              KM        R/O FROM SUB 1Hr
 531              KM        DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1H
 532              BA     0537
 533              LS               77       61
 534              UD       08
                  *
 535              KK   DETIH      DAM
 536              KM        ROUTE SUB 1H THROUGH DETENTION BASIN
 537              RS       1     STOR        0
 538              SV       0      3.3
 539              SQ       0       20
 540              SE       0        3
 541              ST       3       15      2 0     1 5
                  *
 542              KK   1Hr 2 COMBINE
 543              KM        COMBINE DETIH & 1Hr 1
 544              HC        2
                  *
                  *         STACKED 40 BASIN 11E 1 NORTH OF CENTER DR
                  *
                  *
 545              KK      33E       SUB
 546              KM        R/O FROM SUB 33E
 547              BA     0395
 548              LS               77       01
 549              UK      100     0 02    0 050      100
 550              RK     2110   0 015    0 035              TRAP       20        3
                  *
                  *
1                                          HEC-1 INPUT                                            PAGE 14

 LINE             ID      1        2        3        4  .     5  .     6        7        8        9 . ...10


 551              KK     33BE      SUB
 552              KM        RUNOFF FROM SUB 33BE  EAST SIDE OF CENTER DRIVE
 553              BA     0011
 554              LS               77       78
 555              UK      100   0 020      035       100
 556              RK     2125     017      015              TRAP       20        3
                  *
 557              KK   33E 2 COMBINE
 558              KM        COMBINE 1Hr 2 & 33E & 33BE  FLOW INTO CULVERT AND SD SYSTEM
 559              KM        UNDER CENTER DRIVE
 560              HC        3
                  *
 561              KK  R33E 2   ROUTE
 562              KM        ROUTE 33E 2 ALONG EAST SIDE OF STACK 40 PARCEL TO FRONTAGE ROAD
 563              KM        2-54" PIPES  DIAMETER PROVIDED IN ROUTING IS EQUIVALENT DIA OF
 564              KM        BOTH PIPES
 565              RK     2250     0147      015              CIRC      6.3
                  *
                  *         INSERT EXISTING CONDITION SUBBASIN 330
                  *
 566              KK      330     SUB
 567              KM        RUNOFF FROM SUB 330
 568              KO        5
 569              BA     0403
 570              LS               77
 571              UK       89    0213       10       100
 572              RK     2250   .0148      015              TRAP       30        3
                  *
 573              KK    S40ET      SUB
 574              KM        SUB SOUTH OF CENTER DRIVE, EASTERN SIDE OF PROPERTY, FLOWS TO
 575              KM        EASTERN DIVERSION STRUCTURE
 576              BA     0183
 577              LS               77       86
 578              UK      175    0075       05       100
 579              RK     2000     008      015              CIRC        5
                  *
                  *
 580              KK  CT13 0 COMBINE
 581              KO        1
 582              KM  COMBINE R33E 2, SUB 330, S40ET, & S40CN  FLOWS INTO JUNCTION STRUCTURE
 583              HC        3
                  *
 584              KK  D_ADOT
 585              KM  DIVERT FLOW FROM BASIN DIRECTLY TO ADOT CULVERT 6
 586              KM  FLOW TO ADOT CULVERT 6 OF 221 CFS
 587              DT  P_ADOT
 588              DI        0      2 7     10 4     22 6     38 7     58 4     80 8    105 4    143 3    191 9
 589              DI    246 9    306.5    361 9    119 9
```

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LINE     ID .......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 590     DQ      0     2.7    10.4    22.6    38.7    58.4    80.8   105.4   131.6   158.5
 591     DQ  185.7   212.3   230.2   246.9
         *

 592     KK    33C     SUB
 593     KM  SUBBASIN 33C SOUTH OF CENTER DRIVE WEST SIDE OF PROPERTY
 594     KM  MODIFIED AREA TO ACCOUNT FOR NEW SITE PLAN AND SUBS 04-27-06 - ADDED SOUTHWEST
 595     BA  0.0296
 596     LS             77      87
 597     UK    200   .0068     .05     100
 598     RK   1750    .017    .015            CIRC       5
         *

 599     KK  S40CH     SUB
 600     KM  SUB SOUTH OF CENTER DRIVE, CENTRAL BASIN FLOWING DIRECTLY INTO DET/RET
 601     KM  INCLUDES DETENTION BASIN
 602     BA   0448
 603     LS             77      87
 604     UK    250   .0075     .05     100
 605     RK   1500    .009    .015            CIRC     4.5
         *
         *

 606     KK  CT13 1 COMBINE
 607     KM  COMBINE CT13.0, 33C FLOWS (Total Flow at the BASIN)
 608     HC      3
         *
         *

 609     KK   D_BAS
 610     KM  BY-PASS FLOW THROUGH 42' PIPE (MAX q = 30 CFS) BASIN OUTLETS PROVIDE
 611     KM  EQUIVALENT AMOUNT OF DISCHARGE
 612     DT  P-PIPE
 613     DI      0     1.0    10.0    30.0      30   100.0   300.0   500.0   800.0
 614     DO      0     1.0    10.0    30.0      30      30      30      30      30
         *

 615     KK  D_BAS1
 616     KM  DIVERT THE FIRST 1 AC-FT INTO THE SURFACE STORAGE
 617     DT  D-BAS2     1.0
 618     DI      0     1.0    10.0    40.0    70.0   100.0   300.0   500.0   800.0
 619     DO      0     1.0    10.0    40.0    70.0   100.0   300.0   500.0   800.0
         *

 620     KK  D_SURF
 621     KM  DIVERT FLOW INTO SUB_SURFACE STORAGE
 622     KM  (1110', 10' DIAMETER PIPE, VOL = 2.0 Ac-Ft)
 623     KO      1
 624     DT  D-SURF       2
 625     DI      0     1.0    10.0    10.0    70.0   100.0   300.0   500.0   800.0
 626     DQ      0     1.0    10.0    10.0    70.0   100.0   300.0   500.0   800.0
         *
```



```
LINE     ID .......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 627     KK  B_PIPE
 628     KM  RETRIEVE DIVERTED PIPE FLOW
 629     DR  P-PIPE
         *

 630     KK  B_SURF
 631     KM  RETRIEVE DIVERTED SURFACE FLOW
 632     DR  D-BAS2
         *

 633     KK   C540B COMBINE
 634     KO      1                                 21
 635     KM  COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW
 636     HC      3
         *

 637     KK  S40BAS
 638     KO      1
 639     KM  ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
 640     KM  ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
 641     KM  24" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'
 642     RS      1    STOR      -1
 643     SV      0    .001     .14     .87    1.84    3.01    4.49    5.16    5.49    5.82
 644     SV   6.15
 645     SE      0      .8       1       2       3       4       5     5.4     5.6     5.8
 646     SE      6
 647     SQ      1    3.14    0.62     0.5
 648     SS    3.8      20     2.8     1.5
         *

 649     KK  P33E.1
 650     KO      1
 651     KM  DIVIDE THE FLOW INTO TWO ADOT CULVERTS
 652     DT  D33C.2
 653     DI      0     100     200     400     600
 654     DO      0      68     136     272     408
         *
         *

 655     KK  R_ADOT
 656     KM  RETRIEVE DIVERTED ADOT CULVERT FLOW
 657     DR  P_ADOT
         *
```

```
        658          KK   33E.1 COMBINE
        659          KO       1
        660          KM  COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6
        661          HC       2
                     *
1                                                  HEC-1 INPUT                                              PAGE 17

       LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


        662          KK  R33E 1   ROUTE
        663          KO       1
        664          KM  ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND
        665          KM  OPTION 5 - PROPOSED CHANNEL SOUTH OF LUND CADILLAC TO SCOTTSDALE ROAD
        666          KM  FROM SCOTTSDALE ROAD SOUTH TO PRINCESS DRIVE
        667          KM  ROUTE L=4600', TRAP SECTION BW=19' Z=5, THmax=3?'
        668          KM  ASSUME GRASS LINED CHANNEL N=.030 UP=1597 5 DWN=1553
        669          RK    4600  0.0088    0.03              TRAP      19        5
                     *

        670          KK    ASLD     SUB
        671          KO       1
        672          KM  ASLD PARCEL EAST OF SCOTTSDALE ROAD
        673          BA  0.0533
        674          LS              77
        675          UK      89  0.0213     0 1      100
        676          RK    2300  0 0088    0.03              TRAP      19        5
                     *
                     *

        677          KK  CPPRIN COMBINE
        678          KO       1
        679          KM  COMBINE ROUTED ADOT 5 AND 6 WITH ASLD PARCEL
        680          HC       2
                     *

        681          KK  R33C.2
        682          KO       1
        683          KM  RETRIEVE DIVERTED PIPE FLOW
        684          DR  D33C.2
                     *

        685          KK   S40WT     SUB
        686          KO       1
        687          KM  SUB EAST OF SCOTTSDALE RD, FLOWING DIRECTLY INTO SCOTTSDALE RD
        688          KM  CULVERT, TAKES SCOTTS RD HALF ST AND SCENIC CORRIDOR
        689          BA  0 0063
        690          LS              77      89
        691          UK      50      .01     .05      100
        692          RK     600      .01    .015             CIRC     4.5
                     *
                     *

        693          KK   33C.2 COMBINE
        694          KO       1
        695          KM  COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT
        696          HC       2
                     *
                     *
        697          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE       (V) ROUTING            (--->) DIVERSION OR PUMP FLOW

  NO.       (.) CONNECTOR          (<---) RETURN OF DIVERTED OR PUMPED FLOW

   20          1A1
                 V
                 V
   27       DET1A1
                 V
                 V
   34       RA1-C4
                 .
                 .
   43                       1C4
                              .
                 .            .
   48        CP1C4. . . . . . .
                 V
                 V
   51       RC4-C3

                 .
   60                     1Da3
                              V
                 .            V
   65                   DE1Da3
                 .            .
                              .
   73                         .          1Da4
                                            .
                 .
   78                   CP1Da4............
                 .            V
                 .            V
   81            .      DE1Da4
                              .
                              .
   89                         .          1Da5
                              .             .
                 .            .             .
```

```
 94     CP1C31..... ... .. . ...
             v
             v
 97     RC1-C1
             .

106          .        OFF-1A
             .         .
             .
111          .                  1A2
             .         .
                       .          .
116          .         .                   1A3
                       .          .
             .                    .          .
121                    CPA3.. .... .  ... .... ...
             .          v
                        v
124          .       DET1A3
             .          v
                        v
131          .       RA3-A6
                        .
             .          .
141          .                  1A6
             .                    .

146          .        CP1A6....... ....
             .          v
             .          v
149          .       DET1A6
             .
             .          .
156          .          .       1A5
             .          .         .
             .          .         .
161                   CP1A5   ...... .
             .          v
             .          v
164                  DET1A5
             .          .
             .          .
171                     .       1A4
                        .         v
             .                    v
176          .                RA4-A7
                                  v
             .          .         v
186          .                DET1A4

             .                    .
193                                          1A7
                        .                     .
             .          .                     .
198                   CP1A7  ......    . .     ... .
                        v
                        v
201          .       DET1A7
                        .
                        .
200          .          .       1C1
             .          .         .
             .          .         .
213          .        CP1C1...    ....
             .          v
             .          v
216          .       DET1C1
             .
             .          .
225          .                  1C2
                                  .
             .          .         .
230          .        CP1C2 ...     ...
                        v
                        v
233                  DE1C2A
             .          v
             .          v
242          .       DE1C2B
             .          v
             .          v
251                  DE1C2C
             .          .
             .          .
260          .                  1C3
             .                    .
             .
265       CP1C3............ .... ....
             v
             v
268     DET1C3
             v
             v
277     RC3COM
             .

203          .         COMM
             .          v
             .          v
288                  DETCOM
                        .
             .          .
295       CPCOM ..       ..
             v
```

```
               V
298       CONOF1

               .
304            .           OFF1
                              V
               .              V
309            .         DEOFF1
               .              .
               .
316       CPOFF1.     . .. ..
               V
               V
319       OF1OF2
               .
               .
325            .           OFF3
               .              V
               .              V
330            .         DEOFF3
               .              .
               .
337       CPOFF3..... ... ..
               V
               V
340         33A1
               .
               .
347            .            33A
               .              .
               .              .
349         33A3.  . .. . ..

               .
353            .            1Db
                              V
                              V
358            .          DE1Db
               .              .

365            .                        1Da1
               .              .            V
               .              .            V
370            .              .       DE1Da1
                              .
                              .
378            .                           .           1Da2
               .              .
                              .
383                     CP1Dab . .. .  ............. .
                              V
                              V
386                     RDabE2
               .              .
                              .
396                           .         1Ea1
               .                           V
               .                           V
401                           .       DE1Ea1
               .              .            .
               .              .            .
409                           .            .           1Ea2
               .                           .              .
               .              .            .              .
414            .                      CP1Ea2.. ..  . ...
               .              .            V
               .              .            V
417            .              .       DE1Ea2
               .                           .
               .              .
424            .        CP1Ea2. ......  ..
               .              .
               .              .
427                           .         PARK
                              .
               .              .            .
432            .              .            .         SCHOOL
               .              .            .              V
               .                           .              V
437            .              .            .         DETSCH
                                           .              V
                              .                           V
444            .              .            .          SCH12
                                           .              .
               .              .            .              .
450            .                                          .            1Ec
                              .                           .              V
                              .            .                             V
455                                        .              .          DE1Ec
               .              .                                          .
               .              .            .                             .
462            .              .            .          CP1Ec... ..  . .
               .              .            .              V
               .              .            .              V
465            .              .            .         1EcEa2
               .              .            .              .
               .              .            .              .
471            .          CP1Ea.    ... ......   .. ...
               .              V
               .              V
474            .        REATPP
                              .
               .
480            .              .          1Eb
```

```
                     .          V
          .          .          V
485                  .        DETIEb
          .          .          .
          .          .          .
492       .          .          .          OFF2
          .                     .            V
                                .            V
497       .          .                     DEOFF2
          .          .
          .          .                       .
504       .      CPOFF2.......  . ........  ....
          .          V
          .          V
507       .      1Kr.1
          .
                     .
510       .          .         1Kr
          .          .          V
          .          .          V
516       .          .        DETIK
          .          .          .
          .          .          .
523       .      1Kr.2.... ...  ..
                     V
          .          V
526       .      1Mr.1
                     .
          .          .
529       .          .         1Mr
          .          .          V
          .          .          V
535       .          .        DETIM
          .          .          .
          .          .          .
542       .      1Mr.2...........
          .          .
          .          .
545                  .         33E
          .          .          .
          .          .          .
551       .          .          .          33DE
          .          .          .
          .          .          .
557       .      33E.2  ...........   ......
          .          V
          .          V
561       .      R33E.2
          .          .
          .
566       .          .         33D
          .          .          .
          .          .          .
573       .          .          .          S40FT
          .          .                       .
          .          .          .
580       .      CT13.0.......................
          .          .
          .          .
587       .          .-------->  P_ADOT
584       .      D_ADOT
          .          .
          .          .
592       .          .         33C
          .          .          .
          .          .          .
599       .          .          .          S40CR
          .          .          .            .
          .
606       .      CT13.1.. . ..........   .......
          .          .
          .          .
612       .          .-------->  P-PIPE
609       .       D_BAS
          .          .
          .          .
617       .          .-------->  D-BAS2
615       .      D_BAS1
          .          .
          .          .
624       .          .-------->  D-SURF
620       .      D_SURF
          .          .
          .          .
629       .          .             <-------   P-PIPE
627       .          .        B_PIPE
          .          .          .
          .          .          .
632       .          .          .           .<--------   D-BAS2
630       .          .          .          B_SURP
          .          .          .
          .          .          .            .
633       .       CS40B................. ......
          .          V
          .          V
637       .      S40BAS
          .          .
                     .
652       .          .-------->  D33C.2
649       .      P33E 1
          .          .
          .          .
657       .          .            .<-------   P_ADOT
655       .          .        B_ADOT
```

```
658                 33E 1. .  ..
                        V
                        V
662                R33E.1

670                                 ASLD

677                 CPERIN        .  .

684                                       <------   033C.2
691                             R33C 2

685                                             S40WT

693                             33C 2
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 1.1                *
*                                       *
*  RUN DATE   04FEB08  TIME  15 12 09   *
*                                       *
*****************************************

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

```
                    ONE SCOTTSDALE (STACKED 40S) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
                    OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA COVERED BY PRE-POST CRITERIA
                    OPTION A - ASLD CHANNEL
                    FILE   100YR-preR DAT
                           OPTION B - 34 1 ACRES OF ASLD PARCEL

                    BASED ON MODELS PREPARED BY: ROBERT L  WARD, P E , CONSULTING ENGINEER

                                      PRSW-100 6I
                                      CI 6I        (CENTER DRIVE PROJECT)
                                      S10EX100 6I  (STACKED 40S EXISTING CONDITION)

                    ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 11, 2002
                    100-YEAR, 6-HOUR HYPOTHETICAL STORM

                    AREAL RAINFALL REDUCTION IS BASED ON A 11 SQUARE MILE STORM

 19 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                     NMIN          5  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       0055  ENDING TIME
                    ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL      08 HOURS
                    TOTAL TIME BASE   24 92 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

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
319 KK       *    33A1    *          CP
             *            *
             **************

350 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0  HYDROGRAPH PLOT SCALE
                              COMBINE SUB 33A, CP 33A1

352 HC        HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                         ***
```

HYDROGRAPH AT STATION 33A3
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		0615	76	41	1		1230	151	5.	1		1845	226	1
1		0005	2	0.	1		0620	77	40	1		1235	152	4	1		1850	227	1
1		0010	3	0	1		0625	78	38	1		1240	153	4.	1		1855	228	1
1		0015	4	0	1		0630	79	37	1		1245	154	4	1		1900	229	1
1		0020	5	0	1		0635	80	36	1		1250	155	4	1		1905	230	1
1		0025	6	0	1		0640	81	35	1		1255	156	4	1		1910	231	1.
1		0030	7	1	1		0645	82	34	1		1300	157	4	1		1915	232	1
1		0035	8	1	1		0650	83	34	1		1305	158	4	1		1920	233	1
1		0040	9	2.	1		0655	84	33	1		1310	159	4	1		1925	234	1.
1		0045	10	1	1		0700	85	32	1		1315	160	3	1		1930	235	1
1		0050	11	3	1		0705	86	31	1		1320	161	3	1		1935	236	1
1		0055	12	4.	1		0710	87	30	1		1325	162	3	1		1940	237	1
1		0100	13	4	1		0715	88	30	1		1330	163	3	1		1945	238	0
1		0105	14	4.	1		0720	89	29	1		1335	164	3	1		1950	239	0
1		0110	15	5	1		0725	90	28.	1		1340	165	3	1		1955	240	0
1		0115	16	5	1		0730	91	28	1		1345	166	3	1		2000	241	0.
1		0120	17	5.	1		0735	92	27	1		1350	167	3	1		2005	242	0
1		0125	18	6	1		0740	93	26	1		1355	168	3	1		2010	243	0
1		0130	19	6	1		0745	94	26	1		1400	169	3	1		2015	244	0
1		0135	20	7	1		0750	95	25	1		1405	170	3	1		2020	245	0
1		0140	21	7.	1		0755	96	24	1		1410	171	3.	1		2025	246	0
1		0145	22	8	1		0800	97	23	1		1415	172	2	1		2030	247	0.
1		0150	23	8	1		0805	98	23	1		1420	173	2	1		2035	248	0
1		0155	24	9	1		0810	99	22	1		1425	174	2	1		2040	249	0
1		0200	25	9	1		0815	100	22	1		1430	175	2	1		2045	250	0
1		0205	26	10	1		0820	101	21	1		1435	176	2	1		2050	251	0
1		0210	27	11	1		0825	102	21	1		1440	177	2	1		2055	252	0.
1		0215	28	11	1		0830	103	20.	1		1445	178	2	1		2100	253	0
1		0220	29	12	1		0835	104	19	1		1450	179	2	1		2105	254	0
1		0225	30	13.	1		0840	105	19	1		1455	180	2	1		2110	255	0
1		0230	31	15	1		0845	106	18	1		1500	181	2	1		2115	256	0.
1		0235	32	18	1		0850	107	18	1		1505	182	2	1		2120	257	0
1		0240	33	25.	1		0855	108	17	1		1510	183	2	1		2125	258	0
1		0245	34	33	1		0900	109	17	1		1515	184	2	1		2130	259	0
1		0250	35	45.	1		0905	110	16	1		1520	185	2	1		2135	260	0
1		0255	36	60	1		0910	111	16	1		1525	186	2	1		2140	261	0
1		0300	37	109	1		0915	112	15	1		1530	187	2	1		2145	262	0
1		0305	38	232.	1		0920	113	15	1		1535	188	2	1		2150	263	0
1		0310	39	198	1		0925	114	15	1		1540	189	2	1		2155	264	0
1		0315	40	150	1		0930	115	14	1		1545	190	2	1		2200	265	0
1		0320	41	143	1		0935	116	13	1		1550	191	1	1		2205	266	0
1		0325	42	141	1		0940	117	13	1		1555	192	1	1		2210	267	0
1		0330	43	135	1		0945	118	13	1		1600	193	1.	1		2215	268	0
1		0335	44	132.	1		0950	119	12	1		1605	194	1	1		2220	269	0
1		0340	45	138	1		0955	120	12	1		1610	195	1	1		2225	270	0
1		0345	46	149	1		1000	121	12	1		1615	196	1	1		2230	271	0
1		0350	47	151	1		1005	122	11	1		1620	197	1	1		2235	272	0.
1		0355	48	144	1		1010	123	11	1		1625	198	1	1		2240	273	0
1		0400	49	133	1		1015	124	11	1		1630	199	1	1		2245	274	0
1		0405	50	121	1		1020	125	10	1		1635	200	1	1		2250	275	0
1		0410	51	114	1		1025	126	10	1		1640	201	1	1		2255	276	0
1		0415	52	107	1		1030	127	10	1		1645	202	1	1		2300	277	0
1		0420	53	99.	1		1035	128	9.	1		1650	203	1	1		2305	278	0.
1		0425	54	93	1		1040	129	9	1		1655	204	1	1		2310	279	0
1		0430	55	88	1		1045	130	9	1		1700	205	1	1		2315	280	0
1		0435	56	83.	1		1050	131	9	1		1705	206	1.	1		2320	281	0
1		0440	57	78	1		1055	132	8	1		1710	207	1	1		2325	282	0
1		0445	58	74	1		1100	133	8	1		1715	208	1	1		2330	283	0
1		0450	59	70	1		1105	134	8	1		1720	209	1.	1		2335	284	0.
1		0455	60	67	1		1110	135	8	1		1725	210	1	1		2340	285	0
1		0500	61	64	1		1115	136	7	1		1730	211	1	1		2345	286	0
1		0505	62	61.	1		1120	137	7	1		1735	212	1	1		2350	287	0
1		0510	63	59.	1		1125	138	7	1		1740	213	1	1		2355	288	0
1		0515	64	56	1		1130	139	7	1		1745	214	1	2		0000	289	0
1		0520	65	54	1		1135	140	6	1		1750	215	1	2		0005	290	0
1		0525	66	53	1		1140	141	6.	1		1755	216	1	2		0010	291	0.
1		0530	67	51	1		1145	142	6	1		1800	217	1	2		0015	292	0
1		0535	68	50	1		1150	143	6	1		1805	218	1	2		0020	293	0
1		0540	69	49	1		1155	144	6	1		1810	219	1	2		0025	294	0
1		0545	70	48	1		1200	145	5	1		1815	220	1	2		0030	295	0
1		0550	71	47	1		1205	146	5	1		1820	221	1	2		0035	296	0.
1		0555	72	46.	1		1210	147	5	1		1825	222	1	2		0040	297	0
1		0600	73	45	1		1215	148	5	1		1830	223	1	2		0045	298	0.
1		0605	74	44	1		1220	149	5	1		1835	224	1	2		0050	299	0
1		0610	75	42.	1		1225	150	5	1		1840	225	1.	2		0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.92 HR
+ (CFS)	(HR)					
		(CFS)				
+ 232	3.08		65	19	19	19
		(INCHES)	1.384	2.334	2.334	2.334
		(AC-FT)	32	38	38	38

CUMULATIVE AREA = .31 SQ MI

550 ZO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

```
580 KK    *************
          *           *
          *  CT13 0   *     COMBINE
          *           *
          *************

581 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0  HYDROGRAPH PLOT SCALE
                       COMBINE RISE 2, SUB 33D, S40ET, & S40CH  FLOWS INTO JUNCTION STRUCTURE

583 HC         HYDROGRAPH COMBINATION
                    ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE
```

HYDROGRAPH AT STATION CT13 0
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	0615	76	58	1	1230	151	5	1	1845	226	1
1	0005	2	0	1	0620	77	55	1	1235	152	5	1	1850	227	1.
1	0010	3	0	1	0625	78	53	1	1240	153	5	1	1855	228	1
1	0015	4	0.	1	0630	79	50	1	1245	154	5	1	1900	229	1
1	0020	5	0	1	0635	80	48.	1	1250	155	5	1	1905	230	1.
1	0025	6	1.	1	0640	81	46	1	1255	156	5	1	1910	231	1
1	0030	7	1	1	0645	82	43.	1	1300	157	5	1	1915	232	1
1	0035	8	2	1	0650	83	42	1	1305	158	5	1	1920	233	1.
1	0040	9	3	1	0655	84	41	1	1310	159	4	1	1925	234	1.
1	0045	10	4	1	0700	85	39	1	1315	160	4	1	1930	235	1
1	0050	11	5	1	0705	86	38	1	1320	161	4	1	1935	236	1
1	0055	12	6	1	0710	87	36	1	1325	162	4	1	1940	237	1
1	0100	13	6	1	0715	88	35	1	1330	163	4	1	1945	238	1
1	0105	14	7	1	0720	89	34	1	1335	164	4	1	1950	239	1
1	0110	15	7	1	0725	90	32	1	1340	165	4	1	1955	240	1
1	0115	16	8	1	0730	91	31	1	1345	166	4	1	2000	241	1
1	0120	17	9	1	0735	92	30	1	1350	167	4	1	2005	242	1
1	0125	18	9	1	0740	93	29	1	1355	168	4	1	2010	243	1
1	0130	19	10	1	0745	94	28	1	1400	169	3	1	2015	244	1
1	0135	20	10	1	0750	95	27	1	1405	170	3	1	2020	245	1.
1	0140	21	11	1	0755	96	26	1	1410	171	3	1	2025	246	1
1	0145	22	12	1	0800	97	25.	1	1415	172	3	1	2030	247	1
1	0150	23	12.	1	0805	98	25	1	1420	173	3	1	2035	248	1.
1	0155	24	13	1	0810	99	24	1	1425	174	3	1	2040	249	1
1	0200	25	14	1	0815	100	23	1	1430	175	3	1	2045	250	1
1	0205	26	15.	1	0820	101	22	1	1435	176	3	1	2050	251	1
1	0210	27	16.	1	0825	102	22	1	1440	177	3.	1	2055	252	1
1	0215	28	17	1	0830	103	21	1	1445	178	3	1	2100	253	1
1	0220	29	18	1	0835	104	20	1	1450	179	3	1	2105	254	1.
1	0225	30	20	1	0840	105	20	1	1455	180	3	1	2110	255	1
1	0230	31	21	1	0845	106	19	1	1500	181	3	1	2115	256	1
1	0235	32	25	1	0850	107	18	1	1505	182	3	1	2120	257	1
1	0240	33	33	1	0855	108	18	1	1510	183	2.	1	2125	258	0
1	0245	34	44	1	0900	109	17.	1	1515	184	2	1	2130	259	0
1	0250	35	59	1	0905	110	17	1	1520	185	2	1	2135	260	0
1	0255	36	77	1	0910	111	16	1	1525	186	2	1	2140	261	0
1	0300	37	134	1	0915	112	16	1	1530	187	2	1	2145	262	0
1	0305	38	295	1	0920	113	15	1	1535	188	2	1	2150	263	0
1	0310	39	340	1	0925	114	15	1	1540	189	2	1	2155	264	0
1	0315	40	303	1	0930	115	14	1	1545	190	2	1	2200	265	0
1	0320	41	275	1	0935	116	14	1	1550	191	2	1	2205	266	0
1	0325	42	257	1	0940	117	13	1	1555	192	2	1	2210	267	0
1	0330	43	243.	1	0945	118	13	1	1600	193	2	1	2215	268	0
1	0335	44	226	1	0950	119	13	1	1605	194	2	1	2220	269	0
1	0340	45	205	1	0955	120	12	1	1610	195	2.	1	2225	270	0
1	0345	46	184	1	1000	121	12	1	1615	196	2	1	2230	271	0
1	0350	47	168	1	1005	122	12	1	1620	197	2	1	2235	272	0
1	0355	48	156	1	1010	123	11	1	1625	198	2	1	2240	273	0
1	0400	49	147	1	1015	124	11	1	1630	199	2.	1	2245	274	0
1	0405	50	140	1	1020	125	11	1	1635	200	2	1	2250	275	0
1	0410	51	134	1	1025	126	10	1	1640	201	2	1	2255	276	0
1	0415	52	129	1	1030	127	10	1	1645	202	2	1	2300	277	0
1	0420	53	125	1	1035	128	10	1	1650	203	2	1	2305	278	0
1	0425	54	120	1	1040	129	10	1	1655	204	2	1	2310	279	0
1	0430	55	116	1	1045	130	9	1	1700	205	2	1	2315	280	0.
1	0435	56	112.	1	1050	131	9	1	1705	206	1	1	2320	281	0
1	0440	57	108	1	1055	132	9	1	1710	207	1	1	2325	282	0
1	0445	58	105	1	1100	133	9	1	1715	208	1	1	2330	283	0
1	0450	59	101	1	1105	134	8	1	1720	209	1	1	2335	284	0
1	0455	60	98	1	1110	135	8	1	1725	210	1	1	2340	285	0
1	0500	61	95	1	1115	136	8	1	1730	211	1	1	2345	286	0.
1	0505	62	92	1	1120	137	8	1	1735	212	1	1	2350	287	0
1	0510	63	89	1	1125	138	8	1	1740	213	1	1	2355	288	0
1	0515	64	86.	1	1130	139	7	1	1745	214	1	2	0000	289	0
1	0520	65	83	1	1135	140	7	1	1750	215	1	2	0005	290	0
1	0525	66	81	1	1140	141	7	1	1755	216	1	2	0010	291	0
1	0530	67	78	1	1145	142	7	1	1800	217	1	2	0015	292	0
1	0535	68	76	1	1150	143	7.	1	1805	218	1	2	0020	293	0
1	0540	69	74	1	1155	144	6	1	1810	219	1	2	0025	294	0
1	0545	70	72	1	1200	145	6	1	1815	220	1	2	0030	295	0
1	0550	71	70	1	1205	146	6.	1	1820	221	1	2	0035	296	0.
1	0555	72	68	1	1210	147	6.	1	1825	222	1	2	0040	297	0
1	0600	73	66	1	1215	148	5	1	1830	223	1	2	0045	298	0

1		0605	74	64.	1		1220	149	6.	1		1835	224	1	2		0050	299	0
1		0610	75	61.	1		1225	150	6.	1		1840	225	1	2		0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
340	3.17		92	26	25	25
		(INCHES)	1.960	2.259	2.259	2.259
		(AC-FT)	45.	52	52	52

CUMULATIVE AREA = .41 SQ MI

620 KK * D_SURF *

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623 KO         OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0  HYDROGRAPH PLOT SCALE

    DT         DIVERSION
                     ISTAD     D-SUBF  DIVERSION HYDROGRAPH IDENTIFICATION
                     DSTRKX      2.00  MAXIMUM VOLUME TO BE DIVERTED

    DI             INFLOW         .00     1.00    10.00    40.00    70.00   100.00   300.00   500.00   800.00

    DQ      DIVERTED FLOW         .00     1.00    10.00    40.00    70.00   100.00   300.00   500.00   800.00
```

DIVERSION HYDROGRAPH D-SUBF

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		0615	76	0.	1		1230	151	0	1		1845	226	0
1		0005	2	0	1		0620	77	0	1		1235	152	0	1		1850	227	0
1		0010	3	0	1		0625	78	0.	1		1240	153	0	1		1855	228	0
1		0015	4	0	1		0630	79	0	1		1245	154	0	1		1900	229	0.
1		0020	5	0	1		0635	80	0	1		1250	155	0	1		1905	230	0
1		0025	6	0	1		0640	81	0	1		1255	156	0	1		1910	231	0.
1		0030	7	0	1		0645	82	0	1		1300	157	0	1		1915	232	0
1		0035	8	0.	1		0650	83	0	1		1305	158	0	1		1920	233	0
1		0040	9	0	1		0655	84	0	1		1310	159	0	1		1925	234	0
1		0045	10	0	1		0700	85	0	1		1315	160	0	1		1930	235	0
1		0050	11	0	1		0705	86	0	1		1320	161	0	1		1935	236	0
1		0055	12	0	1		0710	87	0	1		1325	162	0	1		1940	237	0
1		0100	13	0	1		0715	88	0	1		1330	163	0	1		1945	238	0
1		0105	14	0	1		0720	89	0	1		1335	164	0	1		1950	239	0
1		0110	15	0	1		0725	90	0.	1		1340	165	0	1		1955	240	0
1		0115	16	0	1		0730	91	0	1		1345	166	0	1		2000	241	0
1		0120	17	0	1		0735	92	0	1		1350	167	0.	1		2005	242	0
1		0125	18	0	1		0740	93	0	1		1355	168	0	1		2010	243	0
1		0130	19	0	1		0745	94	0	1		1400	169	0	1		2015	244	0
1		0135	20	0	1		0750	95	0.	1		1405	170	0	1		2020	245	0
1		0140	21	0	1		0755	96	0.	1		1410	171	0	1		2025	246	0
1		0145	22	0	1		0800	97	0	1		1415	172	0	1		2030	247	0
1		0150	23	0	1		0805	98	0	1		1420	173	0.	1		2035	248	0
1		0155	24	0	1		0810	99	0	1		1425	174	0.	1		2040	249	0
1		0200	25	0	1		0815	100	0	1		1430	175	0	1		2045	250	0
1		0205	26	0	1		0820	101	0	1		1435	176	0	1		2050	251	0
1		0210	27	0	1		0825	102	0	1		1440	177	0	1		2055	252	0
1		0215	28	0	1		0830	103	0	1		1445	178	0	1		2100	253	0
1		0220	29	0	1		0835	104	0	1		1450	179	0	1		2105	254	0
1		0225	30	0	1		0840	105	0	1		1455	180	0	1		2110	255	0
1		0230	31	0	1		0845	106	0	1		1500	181	0	1		2115	256	0
1		0235	32	0	1		0850	107	0	1		1505	182	0	1		2120	257	0
1		0240	33	0.	1		0855	108	0	1		1510	183	0	1		2125	258	0
1		0245	34	0	1		0900	109	0	1		1515	184	0	1		2130	259	0
1		0250	35	0.	1		0905	110	0	1		1520	185	0	1		2135	260	0
1		0255	36	0	1		0910	111	0.	1		1525	186	0	1		2140	261	0
1		0300	37	53.	1		0915	112	0	1		1530	187	0	1		2145	262	0
1		0305	38	237	1		0920	113	0.	1		1535	188	0.	1		2150	263	0
1		0310	39	0	1		0925	114	0	1		1540	189	0	1		2155	264	0
1		0315	40	0	1		0930	115	0	1		1545	190	0	1		2200	265	0
1		0320	41	0	1		0935	116	0	1		1550	191	0	1		2205	266	0
1		0325	42	0	1		0940	117	0	1		1555	192	0	1		2210	267	0
1		0330	43	0.	1		0945	118	0	1		1600	193	0.	1		2215	268	0
1		0335	44	0	1		0950	119	0.	1		1605	194	0	1		2220	269	0
1		0340	45	0	1		0955	120	0	1		1610	195	0	1		2225	270	0
1		0345	46	0	1		1000	121	0	1		1615	196	0	1		2230	271	0
1		0350	47	0	1		1005	122	0	1		1620	197	0	1		2235	272	0
1		0355	48	0	1		1010	123	0.	1		1625	198	0	1		2240	273	0
1		0400	49	0	1		1015	124	0	1		1630	199	0	1		2245	274	0
1		0405	50	0	1		1020	125	0	1		1635	200	0	1		2250	275	0.
1		0410	51	0	1		1025	126	0	1		1640	201	0	1		2255	276	0
1		0415	52	0	1		1030	127	0	1		1645	202	0	1		2300	277	0
1		0420	53	0	1		1035	128	0	1		1650	203	0	1		2305	278	0
1		0425	54	0	1		1040	129	0	1		1655	204	0	1		2310	279	0

1	0430	55	0	1	1045	130	0	1	1700	205	0	1	2315	280	0
1	0435	56	0	1	1050	131	0	1	1705	206	0	1	2320	281	0
1	0440	57	0	1	1055	132	0	1	1710	207	0	1	2325	282	0
1	0445	58	0.	1	1100	133	0.	1	1715	208	0	1	2330	283	0
1	0450	59	0	1	1105	134	0.	1	1720	209	0	1	2335	284	0
1	0455	60	0.	1	1110	135	0.	1	1725	210	0	1	2340	285	0
1	0500	61	0	1	1115	136	0	1	1730	211	0	1	2345	286	0
1	0505	62	0.	1	1120	137	0.	1	1735	212	0	1	2350	287	0
1	0510	63	0	1	1125	138	0.	1	1740	213	0	1	2355	288	0
1	0515	64	0	1	1130	139	0	1	1745	214	0	2	0000	289	0
1	0520	65	0	1	1135	140	0	1	1750	215	0	2	0005	290	0.
1	0525	66	0	1	1140	141	0	1	1755	216	0	2	0010	291	0.
1	0530	67	0	1	1145	142	0.	1	1800	217	0	2	0015	292	0.
1	0535	68	0.	1	1150	143	0	1	1805	218	0	2	0020	293	0
1	0540	69	0	1	1155	144	0	1	1810	219	0.	2	0025	294	0.
1	0545	70	0	1	1200	145	0	1	1815	220	0	2	0030	295	0
1	0550	71	0.	1	1205	146	0	1	1820	221	0	2	0035	296	0
1	0555	72	0	1	1210	147	0	1	1825	222	0	2	0040	297	0
1	0600	73	0	1	1215	148	0	1	1830	223	0	2	0045	298	0
1	0605	74	0	1	1220	149	0	1	1835	224	0	2	0050	299	0
1	0610	75	0	1	1225	150	0.	1	1840	225	0	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
237	3.08		1	1	1	1
		(INCHES)	.074	.074	.074	.071
		(AC-FT)	2	2	2	2

CUMULATIVE AREA = .51 SQ MI

HYDROGRAPH AT STATION D_SURF

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	0615	76	0	1	1230	151	0	1	1845	226	0
1	0005	2	0	1	0620	77	0	1	1235	152	0	1	1850	227	0
1	0010	3	0	1	0625	78	0	1	1240	153	0	1	1855	228	0
1	0015	4	0	1	0630	79	0	1	1245	154	0	1	1900	229	0
1	0020	5	0	1	0635	80	0.	1	1250	155	0	1	1905	230	0.
1	0025	6	0	1	0640	81	0	1	1255	156	0	1	1910	231	0
1	0030	7	0	1	0645	82	0	1	1300	157	0	1	1915	232	0
1	0035	8	0	1	0650	83	0.	1	1305	158	0	1	1920	233	0.
1	0040	9	0.	1	0655	84	0	1	1310	159	0	1	1925	234	0
1	0045	10	0	1	0700	85	0	1	1315	160	0	1	1930	235	0
1	0050	11	0	1	0705	86	0	1	1320	161	0	1	1935	236	0
1	0055	12	0	1	0710	87	0	1	1325	162	0	1	1940	237	0
1	0100	13	0	1	0715	88	0	1	1330	163	0	1	1945	238	0
1	0105	14	0	1	0720	89	0	1	1335	164	0	1	1950	239	0
1	0110	15	0	1	0725	90	0	1	1340	165	0	1	1955	240	0
1	0115	16	0	1	0730	91	0	1	1345	166	0	1	2000	241	0
1	0120	17	0	1	0735	92	0	1	1350	167	0	1	2005	242	0
1	0125	18	0	1	0740	93	0	1	1355	168	0	1	2010	243	0
1	0130	19	0	1	0745	94	0	1	1400	169	0	1	2015	244	0
1	0135	20	0	1	0750	95	0	1	1405	170	0	1	2020	245	0
1	0140	21	0.	1	0755	96	0	1	1410	171	0	1	2025	246	0
1	0145	22	0	1	0800	97	0	1	1415	172	0	1	2030	247	0.
1	0150	23	0	1	0805	98	0	1	1420	173	0.	1	2035	248	0
1	0155	24	0	1	0810	99	0	1	1425	174	0	1	2040	249	0
1	0200	25	0	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	0	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	0.	1	0825	102	0	1	1440	177	0	1	2055	252	0.
1	0215	28	0	1	0830	103	0	1	1445	178	0	1	2100	253	0.
1	0220	29	0	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	0	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	0	1	0845	106	0	1	1500	181	0	1	2115	256	0
1	0235	32	0	1	0850	107	0	1	1505	182	0	1	2120	257	0
1	0240	33	0	1	0855	108	0	1	1510	183	0	1	2125	258	0
1	0245	34	0	1	0900	109	0	1	1515	184	0	1	2130	259	0
1	0250	35	0	1	0905	110	0	1	1520	185	0	1	2135	260	0
1	0255	36	0	1	0910	111	0	1	1525	186	0	1	2140	261	0
1	0300	37	0	1	0915	112	0	1	1530	187	0	1	2145	262	0.
1	0305	38	126	1	0920	113	0	1	1535	188	0	1	2150	263	0
1	0310	39	309	1	0925	114	0	1	1540	189	0	1	2155	264	0
1	0315	40	189.	1	0930	115	0	1	1545	190	0	1	2200	265	0
1	0320	41	131	1	0935	116	0	1	1550	191	0	1	2205	266	0
1	0325	42	101	1	0940	117	0	1	1555	192	0	1	2210	267	0
1	0330	43	82	1	0945	118	0.	1	1600	193	0	1	2215	268	0
1	0335	44	60	1	0950	119	0	1	1605	194	0.	1	2220	269	0
1	0340	45	38.	1	0955	120	0	1	1610	195	0	1	2225	270	0
1	0345	46	21	1	1000	121	0	1	1615	196	0	1	2230	271	0
1	0350	47	10	1	1005	122	0	1	1620	197	0	1	2235	272	0
1	0355	48	3	1	1010	123	0	1	1625	198	0	1	2240	273	0
1	0400	49	0.	1	1015	124	0	1	1630	199	0	1	2245	274	0
1	0405	50	0.	1	1020	125	0	1	1635	200	0	1	2250	275	0
1	0410	51	0	1	1025	126	0	1	1640	201	0	1	2255	276	0
1	0415	52	0	1	1030	127	0	1	1645	202	0	1	2300	277	0
1	0420	53	0	1	1035	128	0	1	1650	203	0	1	2305	278	0
1	0425	54	0	1	1040	129	0	1	1655	204	0	1	2310	279	0.
1	0430	55	0	1	1045	130	0	1	1700	205	0	1	2315	280	0
1	0435	56	0	1	1050	131	0	1	1705	206	0	1	2320	281	0.
1	0440	57	0	1	1055	132	0	1	1710	207	0	1	2325	282	0
1	0445	58	0	1	1100	133	0	1	1715	208	0	1	2330	283	0.
1	0450	59	0	1	1105	134	0	1	1720	209	0	1	2335	284	0
1	0455	60	0	1	1110	135	0.	1	1725	210	0	1	2340	285	0
1	0500	61	0	1	1115	136	0	1	1730	211	0	1	2345	286	0

1	0505	62	0	1	1120	137	0	1	1735	212	0	1	2350	287	0
1	0510	63	0	1	1125	138	0.	1	1740	213	0	1	2355	288	0.
1	0515	64	0	1	1130	139	0	1	1745	214	0	2	0000	289	0
1	0520	65	0	1	1135	140	0	1	1750	215	0	2	0005	290	0.
1	0525	66	0	1	1140	141	0	1	1755	216	0	2	0010	291	0.
1	0530	67	0	1	1145	142	0	1	1800	217	0	2	0015	292	0
1	0535	68	0	1	1150	143	0	1	1805	218	0	2	0020	293	0
1	0540	69	0	1	1155	144	0	1	1810	219	0	2	0025	294	0
1	0545	70	0.	1	1200	145	0	1	1815	220	0	2	0030	295	0
1	0550	71	0	1	1205	146	0	1	1820	221	0	2	0035	296	0.
1	0555	72	0.	1	1210	147	0	1	1825	222	0	2	0040	297	0
1	0600	73	0	1	1215	148	0	1	1830	223	0	2	0045	298	0
1	0605	74	0	1	1220	149	0	1	1835	224	0	2	0050	299	0
1	0610	75	0	1	1225	150	0.	1	1840	225	0.	2	0055	300	0

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
109	3.17		15	4	4	4
		(INCHES)	.271	.271	.271	.271
		(AC-FT)	7	7	7	7

CUMULATIVE AREA = .51 SQ MI

633 KK CS40B COMBINE

634 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW

636 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION CS40B
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	0615	76	3	1	1230	151	0	1	1845	226	0
1	0005	2	0.	1	0620	77	2	1	1235	152	0	1	1850	227	0
1	0010	3	0.	1	0625	78	2	1	1240	153	0	1	1855	228	0
1	0015	4	0	1	0630	79	1	1	1245	154	0	1	1900	229	0
1	0020	5	1	1	0635	80	1	1	1250	155	0	1	1905	230	0.
1	0025	6	1	1	0640	81	1	1	1255	156	0	1	1910	231	0
1	0030	7	2	1	0645	82	1	1	1300	157	0	1	1915	232	0
1	0035	8	2	1	0650	83	1	1	1305	158	0	1	1920	233	0
1	0040	9	3	1	0655	84	1	1	1310	159	0	1	1925	234	0.
1	0045	10	4	1	0700	85	0	1	1315	160	0	1	1930	235	0
1	0050	11	4	1	0705	86	0	1	1320	161	0	1	1935	236	0
1	0055	12	4.	1	0710	87	0	1	1325	162	0	1	1940	237	0
1	0100	13	5.	1	0715	88	0	1	1330	163	0	1	1945	238	0
1	0105	14	5	1	0720	89	0	1	1335	164	0	1	1950	239	0
1	0110	15	5	1	0725	90	0	1	1340	165	0	1	1955	240	0
1	0115	16	5	1	0730	91	0	1	1345	166	0	1	2000	241	0
1	0120	17	5	1	0735	92	0	1	1350	167	0	1	2005	242	0
1	0125	18	6	1	0740	93	0	1	1355	168	0	1	2010	243	0
1	0130	19	6.	1	0745	94	0	1	1400	169	0.	1	2015	244	0
1	0135	20	6	1	0750	95	0	1	1405	170	0	1	2020	245	0
1	0140	21	6	1	0755	96	0	1	1410	171	0	1	2025	246	0
1	0145	22	7	1	0800	97	0	1	1415	172	0	1	2030	247	0
1	0150	23	7	1	0805	98	0.	1	1420	173	0	1	2035	248	0
1	0155	24	7	1	0810	99	0	1	1425	174	0.	1	2040	249	0
1	0200	25	8	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	8	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	9.	1	0825	102	0	1	1440	177	0.	1	2055	252	0
1	0215	28	10	1	0830	103	0	1	1445	178	0	1	2100	253	0
1	0220	29	10	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	11	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	13	1	0845	106	0	1	1500	181	0	1	2115	256	0
1	0235	32	19.	1	0850	107	0	1	1505	182	0	1	2120	257	0.
1	0240	33	28	1	0855	108	0	1	1510	183	0	1	2125	258	0
1	0245	34	39	1	0900	109	0	1	1515	184	0.	1	2130	259	0
1	0250	35	53	1	0905	110	0	1	1520	185	0	1	2135	260	0
1	0255	36	74	1	0910	111	0	1	1525	186	0	1	2140	261	0
1	0300	37	99	1	0915	112	0	1	1530	187	0	1	2145	262	0
1	0305	38	156	1	0920	113	0	1	1535	188	0	1	2150	263	0
1	0310	39	339	1	0925	114	0	1	1540	189	0	1	2155	264	0

1	0315	40	219	1	0930	115	0	1	1545	190	0.	1	2200	265	0
1	0320	41	161.	1	0935	116	0	1	1550	191	0	1	2205	266	0
1	0325	42	131	1	0940	117	0	1	1555	192	0	1	2210	267	0
1	0330	43	112	1	0945	118	0.	1	1600	193	0	1	2215	268	0
1	0335	44	90	1	0950	119	0.	1	1605	194	0	1	2220	269	0
1	0340	45	68	1	0955	120	0.	1	1610	195	0	1	2225	270	0
1	0345	46	51.	1	1000	121	0	1	1615	196	0.	1	2230	271	0
1	0350	47	40	1	1005	122	0	1	1620	197	0	1	2235	272	0
1	0355	48	33	1	1010	123	0.	1	1625	198	0	1	2240	273	0
1	0400	49	27	1	1015	124	0	1	1630	199	0.	1	2245	274	0
1	0405	50	23	1	1020	125	0	1	1635	200	0	1	2250	275	0
1	0410	51	20	1	1025	126	0.	1	1640	201	0	1	2255	276	0
1	0415	52	18	1	1030	127	0	1	1645	202	0.	1	2300	277	0
1	0420	53	16	1	1035	128	0	1	1650	203	0	1	2305	278	0
1	0425	54	14.	1	1040	129	0.	1	1655	204	0	1	2310	279	0
1	0430	55	12	1	1045	130	0.	1	1700	205	0	1	2315	280	0
1	0435	56	11	1	1050	131	0	1	1705	206	0.	1	2320	281	0
1	0440	57	9	1	1055	132	0	1	1710	207	0	1	2325	282	0
1	0445	58	8	1	1100	133	0	1	1715	208	0.	1	2330	283	0
1	0450	59	7	1	1105	134	0	1	1720	209	0.	1	2335	284	0
1	0455	60	7	1	1110	135	0	1	1725	210	0	1	2340	285	0
1	0500	61	7.	1	1115	136	0	1	1730	211	0	1	2345	286	0
1	0505	62	7	1	1120	137	0	1	1735	212	0.	1	2350	287	0
1	0510	63	6.	1	1125	138	0	1	1740	213	0	1	2355	288	0
1	0515	64	6	1	1130	139	0	1	1745	214	0	2	0000	289	0
1	0520	65	6	1	1135	140	0	1	1750	215	0	2	0005	290	0
1	0525	66	6	1	1140	141	0	1	1755	216	0	2	0010	291	0.
1	0530	67	5	1	1145	142	0	1	1800	217	0	2	0015	292	0
1	0535	68	5	1	1150	143	0	1	1805	218	0	2	0020	293	0
1	0540	69	5	1	1155	144	0	1	1810	219	0.	2	0025	294	0
1	0545	70	5	1	1200	145	0.	1	1815	220	0.	2	0030	295	0
1	0550	71	5	1	1205	146	0.	1	1820	221	0	2	0035	296	0.
1	0555	72	5	1	1210	147	0	1	1825	222	0.	2	0040	297	0
1	0600	73	5	1	1215	148	0	1	1830	223	0	2	0045	298	0
1	0605	74	4.	1	1220	149	0	1	1835	224	0	2	0050	299	0
1	0610	75	3.	1	1225	150	0	1	1840	225	0	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	21.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 339	3.17		30	7	7	7
		(INCHES)	.540	.544	.544	.544
		(AC-FT)	15	15	15	15

CUMULATIVE AREA = .51 SQ MI

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             **************
             *            *
637 KK       *   S40BAS   *
             *            *
             **************

638 KO          OUTPUT CONTROL VARIABLES
                      IPRNT         1  PRINT CONTROL
                      IPLOT         0  PLOT CONTROL
                      QSCAL        0.  HYDROGRAPH PLOT SCALE
                         ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
                         ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
                         21" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'

             HYDROGRAPH ROUTING DATA

642 RS          STORAGE ROUTING
                      NSTPS         1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                      RSVRIC     1.00  INITIAL CONDITION
                      X           .00  WORKING R AND D COEFFICIENT

643 SV            STORAGE          .0        .0        .1        .9       1.8       3.0       1.5       5.2       5.5       5.8
                                  6.2

645 SE            ELEVATION       .00       .80      1.00      2.00      3.00      4.00      5.00      5.40      5.60      5.80
                                 6.00

647 SL          LOW-LEVEL OUTLET
                      ELEVL      1.00  ELEVATION AT CENTER OF OUTLET
                      CAREA      3.14  CROSS-SECTIONAL AREA
                      COQL        .62  COEFFICIENT
                      EXPL        .50  EXPONENT OF HEAD

648 SS          SPILLWAY
                      CREL       3.80  SPILLWAY CREST ELEVATION
                      SPWID     20.00  SPILLWAY WIDTH
                      COQW       2.80  WEIR COEFFICIENT
                      EXPW       1.50  EXPONENT OF HEAD

                                          ***

                                COMPUTED OUTFLOW-ELEVATION DATA

     OUTFLOW       .00      .00    15.21    16.18    17.27    18.53    19.98    21.58    23.70    26.13
   ELEVATION       .00     1.00     1.95     2.07     2.22     2.41     2.54     2.93     3.30     3.80

     OUTFLOW     26.75    28.09    31.54    41.68    54.26    72.26    96.63   128.34   168.36   217.65
   ELEVATION      3.84     3.92     4.03     4.19     4.39     4.63     4.91     5.23     5.60     6.00
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.00	.14	.83	.87	.94	1.09	1.27	1.49	1.77
OUTFLOW	.00	.00	.00	15.21	15.61	16.18	17.27	18.53	19.98	21.68
ELEVATION	.00	.80	1.00	1.95	2.00	2.07	2.22	2.41	2.64	2.93
STORAGE	1.84	2.20	2.80	2.85	2.94	3.04	3.09	3.32	3.61	3.96
OUTFLOW	22.08	23.70	26.13	26.75	28.89	32.05	33.54	41.68	54.26	72.26
ELEVATION	3.00	3.30	3.80	3.84	3.92	4.00	4.03	4.19	4.39	4.63
STORAGE	4.36	4.69	4.88	5.16	5.48	5.82	6.15			
OUTFLOW	96.63	104.84	128.34	146.09	168.36	192.60	217.65			
ELEVATION	4.91	5.00	5.21	5.40	5.60	5.80	6.00			

HYDROGRAPH AT STATION 540BAS

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	.8	1		0820	101	1	.2	1.0	1		1640	201	0	.1	1.0
1		0005	2	0	0	.8	1		0825	102	0.	.2	1.0	1		1645	202	0	.1	1.0
1		0010	3	0	0	.8	1		0830	103	0	.2	1.0	1		1650	203	0	.1	1.0
1		0015	4	0	0	.8	1		0835	104	0	.2	1.0	1		1655	204	0	.1	1.0
1		0020	5	0	0	.8	1		0840	105	0	.2	1.0	1		1700	205	0	.1	1.0
1		0025	6	0	0	.8	1		0845	106	0	.2	1.0	1		1705	206	0	.1	1.0
1		0030	7	0	.0	.8	1		0850	107	0.	.2	1.0	1		1710	207	0	.1	1.0
1		0035	8	0	0	.9	1		0855	108	0	.2	1.0	1		1715	208	0	.1	1.0
1		0040	9	0	.1	.9	1		0900	109	0.	.1	1.0	1		1720	209	0	.1	1.0
1		0045	10	0	.1	.9	1		0905	110	0	.1	1.0	1		1725	210	0	.1	1.0
1		0050	11	0	.1	.9	1		0910	111	0	.1	1.0	1		1730	211	0	.1	1.0
1		0055	12	0	.1	1.0	1		0915	112	0	.1	1.0	1		1735	212	0	.1	1.0
1		0100	13	0	.1	1.0	1		0920	113	0.	.1	1.0	1		1740	213	0	.1	1.0
1		0105	14	1	.2	1.1	1		0925	114	0	.1	1.0	1		1745	214	0	.1	1.0
1		0110	15	2	.2	1.1	1		0930	115	0.	.1	1.0	1		1750	215	0	.1	1.0
1		0115	16	2.	.2	1.1	1		0935	116	0	.1	1.0	1		1755	216	0	.1	1.0
1		0120	17	3	.3	1.2	1		0940	117	0.	.1	1.0	1		1800	217	0.	.1	1.0
1		0125	18	3	.3	1.2	1		0945	118	0	.1	1.0	1		1805	218	0	.1	1.0
1		0130	19	3	.3	1.2	1		0950	119	0.	.1	1.0	1		1810	219	0	.1	1.0
1		0135	20	4	.3	1.2	1		0955	120	0.	.1	1.0	1		1815	220	0	.1	1.0
1		0140	21	4	.3	1.3	1		1000	121	0	.1	1.0	1		1820	221	0	.1	1.0
1		0145	22	4	.3	1.3	1		1005	122	0.	.1	1.0	1		1825	222	0	.1	1.0
1		0150	23	5	.4	1.3	1		1010	123	0	.1	1.0	1		1830	223	0	.1	1.0
1		0155	24	5	.4	1.3	1		1015	124	0.	.1	1.0	1		1835	224	0	.1	1.0
1		0200	25	5	.4	1.3	1		1020	125	0	.1	1.0	1		1840	225	0	.1	1.0
1		0205	26	6	.4	1.4	1		1025	126	0	.1	1.0	1		1845	226	0	.1	1.0
1		0210	27	6	.4	1.4	1		1030	127	0	.1	1.0	1		1850	227	0	.1	1.0
1		0215	28	7.	.4	1.4	1		1035	128	0	.1	1.0	1		1855	228	0	.1	1.0
1		0220	29	7	.5	1.4	1		1040	129	0	.1	1.0	1		1900	229	0	.1	1.0
1		0225	30	8	.5	1.5	1		1045	130	0	.1	1.0	1		1905	230	0	.1	1.0
1		0230	31	8.	.5	1.5	1		1050	131	0	.1	1.0	1		1910	231	0	.1	1.0
1		0235	32	9	.6	1.6	1		1055	132	0.	.1	1.0	1		1915	232	0	.1	1.0
1		0240	33	11	.7	1.7	1		1100	133	0	.1	1.0	1		1920	233	0	.1	1.0
1		0245	34	13	.8	1.9	1		1105	134	0	.1	1.0	1		1925	234	0	.1	1.0
1		0250	35	17	1.0	2.1	1		1110	135	0	.1	1.0	1		1930	235	0	.1	1.0
1		0255	36	19	1.3	2.5	1		1115	136	0	.1	1.0	1		1935	236	0	.1	1.0
1		0300	37	22	1.8	2.9	1		1120	137	0	.1	1.0	1		1940	237	0	.1	1.0
1		0305	38	25	2.5	3.5	1		1125	138	0	.1	1.0	1		1945	238	0.	.1	1.0
1		0310	39	68	3.9	4.6	1		1130	139	0	.1	1.0	1		1950	239	0	.1	1.0
1		0315	40	141.	5.1	5.4	1		1135	140	0	.1	1.0	1		1955	240	0	.1	1.0
1		0320	41	159	5.4	5.5	1		1140	141	0	.1	1.0	1		2000	241	0	.1	1.0
1		0325	42	159	5.3	5.5	1		1145	142	0	.1	1.0	1		2005	242	0	.1	1.0
1		0330	43	142	5.1	5.3	1		1150	143	0.	.1	1.0	1		2010	243	0.	.1	1.0
1		0335	44	127	4.9	5.2	1		1155	144	0	.1	1.0	1		2015	244	0	.1	1.0
1		0340	45	111	4.6	5.1	1		1200	145	0	.1	1.0	1		2020	245	0	.1	1.0
1		0345	46	93	4.3	4.9	1		1205	146	0.	.1	1.0	1		2025	246	0.	.1	1.0
1		0350	47	77	4.0	4.7	1		1210	147	0.	.1	1.0	1		2030	247	0	.1	1.0
1		0355	48	61	3.8	4.5	1		1215	148	0	.1	1.0	1		2035	248	0	.1	1.0
1		0400	49	51	3.6	4.4	1		1220	149	0	.1	1.0	1		2040	249	0	.1	1.0
1		0405	50	45	3.4	4.3	1		1225	150	0	.1	1.0	1		2045	250	0	.1	1.0
1		0410	51	40	3.2	4.2	1		1230	151	0	.1	1.0	1		2050	251	0	.1	1.0
1		0415	52	36	3.1	4.1	1		1235	152	0	.1	1.0	1		2055	252	0	.1	1.0
1		0420	53	32	3.0	4.0	1		1240	153	0	.1	1.0	1		2100	253	0	.1	1.0
1		0425	54	29	2.9	3.9	1		1245	154	0	.1	1.0	1		2105	254	0	.1	1.0
1		0430	55	27	2.8	3.8	1		1250	155	0	.1	1.0	1		2110	255	0	.1	1.0
1		0435	56	26	2.7	3.7	1		1255	156	0.	.1	1.0	1		2115	256	0	.1	1.0
1		0440	57	25	2.6	3.7	1		1300	157	0	.1	1.0	1		2120	257	0	.1	1.0
1		0445	58	25	2.5	3.6	1		1305	158	0	.1	1.0	1		2125	258	0	.1	1.0
1		0450	59	24.	2.4	3.5	1		1310	159	0.	.1	1.0	1		2130	259	0	.1	1.0
1		0455	60	24	2.3	3.3	1		1315	160	0	.1	1.0	1		2135	260	0	.1	1.0
1		0500	61	23	2.2	3.3	1		1320	161	0	.1	1.0	1		2140	261	0	.1	1.0
1		0505	62	23	2.0	3.2	1		1325	162	0	.1	1.0	1		2145	262	0	.1	1.0
1		0510	63	22	1.9	3.1	1		1330	163	0	.1	1.0	1		2150	263	0	.1	1.0
1		0515	64	22	1.8	3.0	1		1335	164	0	.1	1.0	1		2155	264	0	.1	1.0
1		0520	65	21	1.7	2.9	1		1340	165	0	.1	1.0	1		2200	265	0	.1	1.0
1		0525	66	21	1.6	2.8	1		1345	166	0	.1	1.0	1		2205	266	0.	.1	1.0
1		0530	67	20	1.5	2.7	1		1350	167	0	.1	1.0	1		2210	267	0	.1	1.0
1		0535	68	19	1.4	2.6	1		1355	168	0	.1	1.0	1		2215	268	0	.1	1.0
1		0540	69	19	1.3	2.5	1		1400	169	0.	.1	1.0	1		2220	269	0	.1	1.0
1		0545	70	18	1.2	2.4	1		1405	170	0	.1	1.0	1		2225	270	0	.1	1.0
1		0550	71	18	1.1	2.3	1		1410	171	0	.1	1.0	1		2230	271	0	.1	1.0
1		0555	72	17	1.0	2.2	1		1415	172	0	.1	1.0	1		2235	272	0	.1	1.0
1		0600	73	16	1.0	2.1	1		1420	173	0	.1	1.0	1		2240	273	0	.1	1.0
1		0605	74	16	.9	2.0	1		1425	174	0	.1	1.0	1		2245	274	0	.1	1.0
1		0610	75	15	.8	1.9	1		1430	175	0	.1	1.0	1		2250	275	0	.1	1.0
1		0615	76	13	.7	1.8	1		1435	176	0	.1	1.0	1		2255	276	0	.1	1.0
1		0620	77	11	.7	1.7	1		1440	177	0	.1	1.0	1		2300	277	0	.1	1.0
1		0625	78	10.	.6	1.6	1		1445	178	0	.1	1.0	1		2305	278	0.	.1	1.0
1		0630	79	9	.5	1.6	1		1450	179	0	.1	1.0	1		2310	279	0	.1	1.0
1		0635	80	8	.5	1.5	1		1455	180	0.	.1	1.0	1		2315	280	0	.1	1.0

1	0640	81	7.	.5	1.4	1	1500	181	0.	.1	1.0	1	2320	281	0.	1	1.0
1	0645	82	6.	.4	1.4	1	1505	182	0.	.1	1.0	1	2325	282	0.	.1	1.0
1	0650	83	5	4	1.3	1	1510	183	0.	.1	1.0	1	2330	283	0	1	1.0
1	0655	84	5	.4	1.3	1	1515	184	0	.1	1.0	1	2335	284	0	.1	1.0
1	0700	85	4	.3	1.3	1	1520	185	0.	.1	1.0	1	2340	285	0.	1	1.0
1	0705	86	4.	.3	1.2	1	1525	186	0.	.1	1 0	1	2345	286	0	.1	1.0
1	0710	87	3.	.3	1 2	1	1530	187	0.	.1	1.0	1	2350	287	0.	1	1.0
1	0715	88	3.	3	1.2	1	1535	188	0.	.1	1.0	1	2355	288	0	.1	1.0
1	0720	89	2.	2	1.1	1	1540	189	0	.1	1.0	2	0000	289	0.	.1	1.0
1	0725	90	2	.2	1 1	1	1545	190	0.	.1	1 0	2	0005	290	0.	.1	1.0
1	0730	91	2.	.2	1.1	1	1550	191	0.	.1	1.0	2	0010	291	0.	1	1 0
1	0735	92	2.	2	1 1	1	1555	192	0	.1	1.0	2	0015	292	0.	.1	1.0
1	0740	93	1.	.2	1.1	1	1600	193	0.	1	1.0	2	0020	293	0	1	1.0
1	0745	94	1.	2	1.1	1	1605	194	0.	1	1.0	2	0025	294	0	.1	1 0
1	0750	95	1	.2	1.1	1	1610	195	0.	1	1.0	2	0030	295	0	.1	1 0
1	0755	96	1	.2	1.1	1	1615	196	0.	.1	1.0	2	0035	296	0	.1	1.0
1	0800	97	1.	.2	1 1	1	1620	197	0	1	1.0	2	0040	297	0.	.1	1.0
1	0805	98	1.	.2	1 0	1	1625	198	0.	.1	1.0	2	0045	298	0.	.1	1.0
1	0810	99	1.	.2	1.0	1	1630	199	0.	1	1.0	2	0050	299	0.	.1	1.0
1	0815	100	1.	.2	1 0	1	1635	200	0.	1	1.0	2	0055	300	0.	.1	1.0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 159.	3.33		29	7.	7	7.
		(INCHES)	537	.539	.539	539
		(AC-FT)	14	15.	15.	15.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
5.	3 33		2	1	1	1

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
5.57	3 33		2 64	1.42	1.40	1.40

CUMULATIVE AREA = .51 SQ MI

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                **************
                *            *
649 KK          *   P33E.1   *
                *            *
                **************

650 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0. HYDROGRAPH PLOT SCALE
                       DIVIDE THE FLOW INTO TWO ADOT CULVERTS

    DT          DIVERSION
                     ISTAD      D33C.2  DIVERSION HYDROGRAPH IDENTIFICATION

    DI              INFLOW          00    100.00    200.00    400.00    600.00

    DQ          DIVERTED FLOW      .00     68.00    136.00    272.00    408.00
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DIVERSION HYDROGRAPH D33C 2

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		0615	76	9.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	8.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	7	1		1240	153	0	1		1855	228	0.
1		0015	4	0.	1		0630	79	6	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5.	1		1250	155	0.	1		1905	230	0
1		0025	6	0	1		0640	81	5	1		1255	156	0	1		1910	231	0.
1		0030	7	0	1		0645	82	4	1		1300	157	0.	1		1915	232	0.
1		0035	8	0	1		0650	83	4.	1		1305	158	0.	1		1920	233	0
1		0040	9	0	1		0655	84	3.	1		1310	159	0	1		1925	234	0
1		0045	10	0.	1		0700	85	3	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2.	1		1330	163	0.	1		1945	238	0.
1		0105	14	1.	1		0720	89	2.	1		1335	164	0	1		1950	239	0.
1		0110	15	2.	1		0725	90	1	1		1340	165	0	1		1955	240	0.
1		0115	16	1.	1		0730	91	1.	1		1345	166	0.	1		2000	241	0.
1		0120	17	2.	1		0735	92	1	1		1350	167	0	1		2005	242	0.
1		0125	18	2.	1		0740	93	1.	1		1355	168	0	1		2010	243	0
1		0130	19	2.	1		0745	94	1.	1		1400	169	0	1		2015	244	0.
1		0135	20	3.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	3.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0
1		0145	22	3.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	3	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	4	1		0815	100	0	1		1430	175	0.	1		2045	250	0.
1		0205	26	4	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.

1	0210	27	4.	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	5.	1	0830	103	0.	1	1445	178	0	1	2100	253	0.
1	0220	29	5.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	5.	1	0840	105	0.	1	1455	180	0	1	2110	255	0.
1	0230	31	6.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	6.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0
1	0240	33	8.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.
1	0245	34	10.	1	0900	109	0.	1	1515	184	0	1	2130	259	0.
1	0250	35	11	1	0905	110	0.	1	1520	185	0.	1	2135	260	0
1	0255	36	13.	1	0910	111	0	1	1525	186	0.	1	2140	261	0.
1	0300	37	15.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0
1	0305	38	17	1	0920	113	0.	1	1535	188	0	1	2150	263	0.
1	0310	39	46.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	96	1	0930	115	0.	1	1545	190	0	1	2200	265	0
1	0320	41	108.	1	0935	116	0.	1	1550	191	0	1	2205	266	0.
1	0325	42	105	1	0940	117	0.	1	1555	192	0	1	2210	267	0.
1	0330	43	96.	1	0945	118	0.	1	1600	193	0.	1	2215	268	0.
1	0335	44	86	1	0950	119	0.	1	1605	194	0.	1	2220	269	0.
1	0340	45	75.	1	0955	120	0.	1	1610	195	0.	1	2225	270	0
1	0345	46	63.	1	1000	121	0.	1	1615	196	0.	1	2230	271	0.
1	0350	47	57	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	44.	1	1010	123	0	1	1625	198	0.	1	2240	273	0.
1	0400	49	37.	1	1015	124	0.	1	1630	199	0.	1	2245	274	0.
1	0405	50	31.	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	27.	1	1025	126	0.	1	1640	201	0.	1	2255	276	0
1	0415	52	24.	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	22.	1	1035	128	0	1	1650	203	0.	1	2305	278	0.
1	0425	54	19.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0
1	0430	55	18	1	1045	130	0	1	1700	205	0.	1	2315	280	0.
1	0435	56	18.	1	1050	131	0	1	1705	206	0	1	2320	281	0
1	0440	57	17.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	17.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	17.	1	1105	134	0	1	1720	209	0	1	2335	284	0
1	0455	60	16.	1	1110	135	0.	1	1725	210	0.	1	2340	285	0
1	0500	61	16	1	1115	136	0.	1	1730	211	0.	1	2345	286	0
1	0505	62	16.	1	1120	137	0	1	1735	212	0	1	2350	287	0.
1	0510	63	15.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	15.	1	1130	139	0	1	1745	214	0	2	0000	289	0.
1	0520	65	14	1	1135	140	0.	1	1750	215	0.	2	0005	290	0
1	0525	66	14	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	14	1	1145	142	0	1	1800	217	0	2	0015	292	0
1	0535	68	13	1	1150	143	0	1	1805	218	0	2	0020	293	0.
1	0540	69	13	1	1155	144	0.	1	1810	219	0.	2	0025	294	0
1	0545	70	12.	1	1200	145	0	1	1815	220	0	2	0030	295	0
1	0550	71	12.	1	1205	146	0	1	1820	221	0	2	0035	296	0.
1	0555	72	12.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0
1	0600	73	11	1	1215	148	0.	1	1830	223	0.	2	0045	298	0
1	0605	74	11.	1	1220	149	0	1	1835	224	0	2	0050	299	0
1	0610	75	10.	1	1225	150	0	1	1840	225	0	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
108.	3.33		20.	5.	5	5.
		(INCHES)	.362	.366	.366	.366
		(AC-FT)	10.	10	10.	10.

CUMULATIVE AREA = 51 SQ MI

HYDROGRAPH AT STATION P33E.1

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	0615	76	5	1	1230	151	0.	1	1845	226	0
1	0005	2	0.	1	0620	77	4.	1	1235	152	0	1	1850	227	0.
1	0010	3	0.	1	0625	78	3.	1	1240	153	0.	1	1855	228	0.
1	0015	4	0.	1	0630	79	3	1	1245	154	0	1	1900	229	0
1	0020	5	0.	1	0635	80	3.	1	1250	155	0.	1	1905	230	0.
1	0025	6	0.	1	0640	81	2	1	1255	156	0.	1	1910	231	0.
1	0030	7	0.	1	0645	82	2.	1	1300	157	0.	1	1915	232	0.
1	0035	8	0.	1	0650	83	2	1	1305	158	0.	1	1920	233	0
1	0040	9	0.	1	0655	84	1	1	1310	159	0.	1	1925	234	0
1	0045	10	0.	1	0700	85	1.	1	1315	160	0.	1	1930	235	0.
1	0050	11	0.	1	0705	86	1.	1	1320	161	0.	1	1935	236	0.
1	0055	12	0.	1	0710	87	1	1	1325	162	0.	1	1940	237	0
1	0100	13	0.	1	0715	88	1.	1	1330	163	0.	1	1945	238	0.
1	0105	14	0.	1	0720	89	1.	1	1335	164	0.	1	1950	239	0.
1	0110	15	1.	1	0725	90	1	1	1340	165	0.	1	1955	240	0.
1	0115	16	1.	1	0730	91	1.	1	1345	166	0	1	2000	241	0.
1	0120	17	1.	1	0735	92	1.	1	1350	167	0.	1	2005	242	0.
1	0125	18	1	1	0740	93	0.	1	1355	168	0.	1	2010	243	0
1	0130	19	1	1	0745	94	0.	1	1400	169	0.	1	2015	244	0.
1	0135	20	1.	1	0750	95	0.	1	1405	170	0.	1	2020	245	0.
1	0140	21	1	1	0755	96	0	1	1410	171	0.	1	2025	246	0
1	0145	22	1.	1	0800	97	0.	1	1415	172	0	1	2030	247	0.
1	0150	23	2.	1	0805	98	0.	1	1420	173	0.	1	2035	248	0
1	0155	24	2.	1	0810	99	0	1	1425	174	0.	1	2040	249	0.
1	0200	25	2.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	2.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	2.	1	0825	102	0.	1	1440	177	0	1	2055	252	0.
1	0215	28	2.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	2.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0
1	0225	30	2.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0
1	0230	31	3	1	0845	106	0.	1	1500	181	0.	1	2115	256	0
1	0235	32	3	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	4.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.

1	0245	34	5.	1	0900	109	0.	1	1515	184	0.	1	2130	259	0.
1	0250	35	5.	1	0905	110	0	1	1520	185	0.	1	2135	260	0.
1	0255	36	6	1	0910	111	0.	1	1525	186	0	1	2140	261	0.
1	0300	37	7.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0
1	0305	38	8.	1	0920	113	0.	1	1535	188	0.	1	2150	263	0.
1	0310	39	22.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	45.	1	0930	115	0.	1	1545	190	0.	1	2200	265	0.
1	0320	41	51	1	0935	116	0.	1	1550	191	0.	1	2205	266	0.
1	0325	42	49	1	0940	117	0.	1	1555	192	0	1	2210	267	0.
1	0330	43	45.	1	0945	118	0	1	1600	193	0.	1	2215	268	0.
1	0335	44	41	1	0950	119	0.	1	1605	194	0.	1	2220	269	0
1	0340	45	35.	1	0955	120	0	1	1610	195	0.	1	2225	270	0
1	0345	46	30	1	1000	121	0.	1	1615	196	0	1	2230	271	0.
1	0350	47	25.	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	20.	1	1010	123	0.	1	1625	198	0.	1	2240	273	0.
1	0400	49	17.	1	1015	124	0	1	1630	199	0.	1	2245	274	0.
1	0405	50	15	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	13	1	1025	126	0.	1	1640	201	0.	1	2255	276	0.
1	0415	52	11	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	10	1	1035	128	0.	1	1650	203	0.	1	2305	278	0.
1	0425	54	9.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0.
1	0430	55	8.	1	1045	130	0	1	1700	205	0.	1	2315	280	0.
1	0435	56	8.	1	1050	131	0.	1	1705	206	0.	1	2320	281	0
1	0440	57	8.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	8.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	8.	1	1105	134	0.	1	1720	209	0.	1	2335	284	0.
1	0455	60	8	1	1110	135	0	1	1725	210	0	1	2340	285	0.
1	0500	61	8.	1	1115	136	0.	1	1730	211	0	1	2345	286	0.
1	0505	62	7	1	1120	137	0.	1	1735	212	0	1	2350	287	0.
1	0510	63	7.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	7.	1	1130	139	0	1	1745	214	0.	2	0000	289	0
1	0520	65	7.	1	1135	140	0.	1	1750	215	0.	2	0005	290	0
1	0525	66	7.	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	6	1	1145	142	0.	1	1800	217	0.	2	0015	292	0
1	0535	68	6.	1	1150	143	0.	1	1805	218	0.	2	0020	293	0.
1	0540	69	6.	1	1155	144	0.	1	1810	219	0.	2	0025	294	0
1	0545	70	6.	1	1200	145	0.	1	1815	220	0.	2	0030	295	0
1	0550	71	6.	1	1205	146	0.	1	1820	221	0.	2	0035	296	0.
1	0555	72	5.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0.
1	0600	73	5.	1	1215	148	0.	1	1830	223	0.	2	0045	298	0
1	0605	74	5	1	1220	149	0	1	1835	224	0.	2	0050	299	0
1	0610	75	5	1	1225	150	0.	1	1840	225	0	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
51	3.33		9.	2.	2.	2
		(INCHES)	.170	.172	.172	.172
		(AC-FT)	5.	5.	5.	5

CUMULATIVE AREA = .51 SQ MI

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              *************
              *           *
658 KK        *   33C 1   *     COMBINE
              *           *
              *************

659 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          1  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE
                      COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6

661 HC        HYDROGRAPH COMBINATION
                   ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 33C.1
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	0615	76	62.	1	1230	151	5.	1	1845	226	1.
1	0005	2	0.	1	0620	77	59.	1	1235	152	5.	1	1850	227	1.
1	0010	3	0.	1	0625	78	56.	1	1240	153	5.	1	1855	228	1
1	0015	4	0.	1	0630	79	53.	1	1245	154	5.	1	1900	229	1.
1	0020	5	0.	1	0635	80	51.	1	1250	155	5.	1	1905	230	1.
1	0025	6	1	1	0640	81	48.	1	1255	156	5.	1	1910	231	1.
1	0030	7	1.	1	0645	82	46.	1	1300	157	5.	1	1915	232	1.
1	0035	8	2	1	0650	83	44.	1	1305	158	5.	1	1920	233	1.
1	0040	9	3.	1	0655	84	42.	1	1310	159	4.	1	1925	234	1.
1	0045	10	4.	1	0700	85	40.	1	1315	160	4	1	1930	235	1.
1	0050	11	5	1	0705	86	39.	1	1320	161	4.	1	1935	236	1
1	0055	12	6.	1	0710	87	37	1	1325	162	4.	1	1940	237	1
1	0100	13	7	1	0715	88	36.	1	1330	163	4.	1	1945	238	1.
1	0105	14	7	1	0720	89	34.	1	1335	164	4.	1	1950	239	1
1	0110	15	8.	1	0725	90	33	1	1340	165	4.	1	1955	240	1.
1	0115	16	9	1	0730	91	32.	1	1345	166	4.	1	2000	241	1.
1	0120	17	9	1	0735	92	31.	1	1350	167	4.	1	2005	242	1.

1	0125	18	10	.	1	0740	93	30	.	1	1355	168	3.	.	1	2010	243	1.
1	0130	19	11	.	1	0745	94	29	.	1	1400	169	3.	.	1	2015	244	1
1	0135	20	12	.	1	0750	95	28	.	1	1405	170	3	.	1	2020	245	1.
1	0140	21	12	.	1	0755	96	27.	.	1	1410	171	3	.	1	2025	246	1
1	0145	22	13	.	1	0800	97	26	.	1	1415	172	3.	.	1	2030	247	1.
1	0150	23	14	.	1	0805	98	25	.	1	1420	173	3.	.	1	2035	248	1.
1	0155	24	15	.	1	0810	99	24	.	1	1425	174	3	.	1	2040	249	1.
1	0200	25	16	.	1	0815	100	23	.	1	1430	175	3	.	1	2045	250	1
1	0205	26	17	.	1	0820	101	22	.	1	1435	176	3	.	1	2050	251	1
1	0210	27	18	.	1	0825	102	22	.	1	1440	177	3	.	1	2055	252	1
1	0215	28	19	.	1	0830	103	21	.	1	1445	178	3	.	1	2100	253	1
1	0220	29	21.	.	1	0835	104	20	.	1	1450	179	3.	.	1	2105	254	1
1	0225	30	23	.	1	0840	105	20	.	1	1455	180	3.	.	1	2110	255	1
1	0230	31	24	.	1	0845	106	19	.	1	1500	181	3.	.	1	2115	256	1
1	0235	32	28	.	1	0850	107	18	.	1	1505	182	3	.	1	2120	257	1
1	0240	33	37.	.	1	0855	108	18	.	1	1510	183	2	.	1	2125	258	0
1	0245	34	49	.	1	0900	109	17	.	1	1515	184	2	.	1	2130	259	0
1	0250	35	63	.	1	0905	110	17	.	1	1520	185	2	.	1	2135	260	0.
1	0255	36	83	.	1	0910	111	16	.	1	1525	186	2	.	1	2140	261	0
1	0300	37	132.	.	1	0915	112	16	.	1	1530	187	2	.	1	2145	262	0
1	0305	38	215	.	1	0920	113	15.	.	1	1535	188	2	.	1	2150	263	0
1	0310	39	245	.	1	0925	114	15	.	1	1540	189	2	.	1	2155	264	0
1	0315	40	256	.	1	0930	115	14	.	1	1545	190	2	.	1	2200	265	0
1	0320	41	249	.	1	0935	116	14	.	1	1550	191	2	.	1	2205	266	0
1	0325	42	240	.	1	0940	117	14	.	1	1555	192	2.	.	1	2210	267	0
1	0330	43	229	.	1	0945	118	13	.	1	1600	193	2	.	1	2215	268	0
1	0335	44	216	.	1	0950	119	13	.	1	1605	194	2	.	1	2220	269	0
1	0340	45	200	.	1	0955	120	12	.	1	1610	195	2	.	1	2225	270	0
1	0345	46	184	.	1	1000	121	12.	.	1	1615	196	2.	.	1	2230	271	0
1	0350	47	170	.	1	1005	122	12	.	1	1620	197	2.	.	1	2235	272	0
1	0355	48	159	.	1	1010	123	11.	.	1	1625	198	2	.	1	2240	273	0
1	0400	49	151	.	1	1015	124	11	.	1	1630	199	2	.	1	2245	274	0
1	0405	50	144	.	1	1020	125	11	.	1	1635	200	2	.	1	2250	275	0
1	0410	51	138	.	1	1025	126	10	.	1	1640	201	2	.	1	2255	276	0
1	0415	52	133	.	1	1030	127	10	.	1	1645	202	2	.	1	2300	277	0.
1	0420	53	129	.	1	1035	128	10	.	1	1650	203	2	.	1	2305	278	0
1	0425	54	125	.	1	1040	129	10	.	1	1655	204	2	.	1	2310	279	0
1	0430	55	121	.	1	1045	130	9.	.	1	1700	205	2	.	1	2315	280	0.
1	0435	56	118	.	1	1050	131	9	.	1	1705	206	1	.	1	2320	281	0
1	0440	57	116	.	1	1055	132	9	.	1	1710	207	1	.	1	2325	282	0
1	0445	58	113	.	1	1100	133	9	.	1	1715	208	1	.	1	2330	283	0
1	0450	59	109	.	1	1105	134	8	.	1	1720	209	1	.	1	2335	284	0
1	0455	60	106	.	1	1110	135	8	.	1	1725	210	1	.	1	2340	285	0
1	0500	61	102.	.	1	1115	136	8.	.	1	1730	211	1	.	1	2345	286	0
1	0505	62	99	.	1	1120	137	8	.	1	1735	212	1	.	1	2350	287	0
1	0510	63	96	.	1	1125	138	8	.	1	1740	213	1	.	1	2355	288	0
1	0515	64	93	.	1	1130	139	7	.	1	1745	214	1	.	2	0000	289	0.
1	0520	65	90	.	1	1135	140	7	.	1	1750	215	1	.	2	0005	290	0
1	0525	66	87	.	1	1140	141	7	.	1	1755	216	1	.	2	0010	291	0
1	0530	67	85	.	1	1145	142	7	.	1	1800	217	1.	.	2	0015	292	0.
1	0535	68	82	.	1	1150	143	7	.	1	1805	218	1.	.	2	0020	293	0
1	0540	69	80	.	1	1155	144	6	.	1	1810	219	1	.	2	0025	294	0
1	0545	70	78	.	1	1200	145	6	.	1	1815	220	1	.	2	0030	295	0
1	0550	71	75	.	1	1205	146	6	.	1	1820	221	1	.	2	0035	296	0
1	0555	72	73	.	1	1210	147	6	.	1	1825	222	1	.	2	0040	297	0
1	0600	73	71	.	1	1215	148	6.	.	1	1830	223	1	.	2	0045	298	0
1	0605	74	69	.	1	1220	149	6	.	1	1835	224	1	.	2	0050	299	0
1	0610	75	66	.	1	1225	150	6	.	1	1840	225	1	.	2	0055	300	0

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
256	3.25	(CFS)	91	26	25	25
		(INCHES)	2.655	1.917	1.918	1.918
		(AC-FT)	45	52	52	52

CUMULATIVE AREA = .51 SQ MI

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              **************
              *            *
662 KK        *   R33E 1   *        ROUTE
              *            *
              **************

661 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          1   PRINT CONTROL
                   IPLOT          0   PLOT CONTROL
                   QSCAL          0   HYDROGRAPH PLOT SCALE
                      ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND
                      OPTION 5 - PROPOSED CHANNEL SOUTH OF LUND CADILLAC TO SCOTTSDALE ROAD
                      FROM SCOTTSDALE ROAD SOUTH TO PRINCESS DRIVE
                      ROUTE L=4600 , TRAP SECTION BW=19' Z=5, TWmax=39'
                      ASSUME GRASS LINED CHANNEL N=.030 UP=1597.5 DN=1552

              HYDROGRAPH ROUTING DATA

669 RK        KINEMATIC WAVE STREAM ROUTING
                        L        4600   CHANNEL LENGTH
                        S       .0098   SLOPE
                        N        .030   CHANNEL ROUGHNESS COEFFICIENT
                        CA        .00   CONTRIBUTING AREA
                    SHAPE        TRAP   CHANNEL SHAPE
                       WD       19.00   BOTTOM WIDTH OR DIAMETER
                        Z        5.00   SIDE SLOPE
                   NDXMIN           2   MINIMUM NUMBER OF DX INTERVALS
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COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.98	1.43	3.15	533.3	255.03	201.54	1.92	7.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5200E+02 EXCESS= .0000E+00 OUTFLOW= .5203E+02 BASIN STORAGE= .2409E-01 PERCENT ERROR= 1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
MAIN	.98	1.43	5.00		251.70	200.00	1.92

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HYDROGRAPH AT STATION 833E 1

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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 0615	76	69	1 1230	151	6	1 1845	226	1.
1 0005	2	0	1 0620	77	66	1 1235	152	6	1 1850	227	1.
1 0010	3	0.	1 0625	78	63	1 1240	153	6	1 1855	228	1.
1 0015	4	0	1 0630	79	60	1 1245	154	6	1 1900	229	1
1 0020	5	0	1 0635	80	57.	1 1250	155	5.	1 1905	230	1
1 0025	6	0	1 0640	81	54	1 1255	156	5.	1 1910	231	1
1 0030	7	0	1 0645	82	51	1 1300	157	5	1 1915	232	1
1 0035	8	0	1 0650	83	49	1 1305	158	5	1 1920	233	1
1 0040	9	0.	1 0655	84	47	1 1310	159	5	1 1925	234	1
1 0045	10	0	1 0700	85	45.	1 1315	160	5	1 1930	235	1
1 0050	11	0	1 0705	86	43	1 1320	161	5	1 1935	236	1
1 0055	12	0	1 0710	87	41	1 1325	162	5	1 1940	237	1
1 0100	13	1.	1 0715	88	40	1 1330	163	4	1 1945	238	1
1 0105	14	2	1 0720	89	39.	1 1335	164	4.	1 1950	239	1
1 0110	15	3	1 0725	90	37	1 1340	165	4	1 1955	240	1
1 0115	16	5	1 0730	91	35	1 1345	166	4	1 2000	241	1
1 0120	17	6	1 0735	92	34	1 1350	167	4	1 2005	242	1
1 0125	18	7	1 0740	93	33	1 1355	168	4	1 2010	243	1.
1 0130	19	8	1 0745	94	31	1 1400	169	4	1 2015	244	1.
1 0135	20	9	1 0750	95	30	1 1405	170	4	1 2020	245	1
1 0140	21	10	1 0755	96	29	1 1410	171	4	1 2025	246	1.
1 0145	22	10	1 0800	97	28	1 1415	172	4	1 2030	247	1.
1 0150	23	11	1 0805	98	27	1 1420	173	3.	1 2035	248	1
1 0155	24	12	1 0810	99	26	1 1425	174	3	1 2040	249	1
1 0200	25	13	1 0815	100	26	1 1430	175	3	1 2045	250	1
1 0205	26	14	1 0820	101	25	1 1435	176	3	1 2050	251	1
1 0210	27	15	1 0825	102	24	1 1440	177	3	1 2055	252	1
1 0215	28	16	1 0830	103	23	1 1445	178	3	1 2100	253	1
1 0220	29	17	1 0835	104	23.	1 1450	179	3.	1 2105	254	1
1 0225	30	18	1 0840	105	22	1 1455	180	3	1 2110	255	1
1 0230	31	19	1 0845	106	21	1 1500	181	3	1 2115	256	1.
1 0235	32	21	1 0850	107	20	1 1505	182	3	1 2120	257	1
1 0240	33	22	1 0855	108	20	1 1510	183	3	1 2125	258	1.
1 0245	34	26.	1 0900	109	19	1 1515	184	3	1 2130	259	1.
1 0250	35	33	1 0905	110	19	1 1520	185	3	1 2135	260	1
1 0255	36	45	1 0910	111	18	1 1525	186	3	1 2140	261	1
1 0300	37	61	1 0915	112	17	1 1530	187	3	1 2145	262	1
1 0305	38	93	1 0920	113	17.	1 1535	188	3	1 2150	263	1.
1 0310	39	166	1 0925	114	16	1 1540	189	2	1 2155	264	1.
1 0315	40	210	1 0930	115	16	1 1545	190	2	1 2200	265	1
1 0320	41	252	1 0935	116	15	1 1550	191	2	1 2205	266	1
1 0325	42	252	1 0940	117	15	1 1555	192	2	1 2210	267	0
1 0330	43	243	1 0945	118	15	1 1600	193	2	1 2215	268	0
1 0335	44	233	1 0950	119	14	1 1605	194	2	1 2220	269	0
1 0340	45	222	1 0955	120	14	1 1610	195	2	1 2225	270	0
1 0345	46	207	1 1000	121	13	1 1615	196	2	1 2230	271	0
1 0350	47	192	1 1005	122	13	1 1620	197	2	1 2235	272	0
1 0355	48	177	1 1010	123	13	1 1625	198	2	1 2240	273	0.
1 0400	49	165	1 1015	124	12	1 1630	199	2	1 2245	274	0
1 0405	50	156	1 1020	125	12	1 1635	200	2	1 2250	275	0
1 0410	51	148	1 1025	126	12	1 1640	201	2	1 2255	276	0
1 0415	52	142.	1 1030	127	11	1 1645	202	2	1 2300	277	0
1 0420	53	137	1 1035	128	11	1 1650	203	2	1 2305	278	0.
1 0425	54	132	1 1040	129	11	1 1655	204	2.	1 2310	279	0
1 0430	55	128	1 1045	130	10	1 1700	205	2	1 2315	280	0.
1 0435	56	121	1 1050	131	10	1 1705	206	2	1 2320	281	0
1 0440	57	121	1 1055	132	10	1 1710	207	2	1 2325	282	0
1 0445	58	118	1 1100	133	10	1 1715	208	2	1 2330	283	0
1 0450	59	115	1 1105	134	9	1 1720	209	2	1 2335	284	0
1 0455	60	112	1 1110	135	9	1 1725	210	2	1 2340	285	0
1 0500	61	108	1 1115	136	9	1 1730	211	2	1 2345	286	0
1 0505	62	105	1 1120	137	9	1 1735	212	2	1 2350	287	0
1 0510	63	102	1 1125	138	8	1 1740	213	1	1 2355	288	0
1 0515	64	99	1 1130	139	8	1 1745	214	2	2 0000	289	0
1 0520	65	96	1 1135	140	8	1 1750	215	1	2 0005	290	0
1 0525	66	93	1 1140	141	8	1 1755	216	1	2 0010	291	0
1 0530	67	90	1 1145	142	8	1 1800	217	1	2 0015	292	0
1 0535	68	87	1 1150	143	7	1 1805	218	1.	2 0020	293	0.
1 0540	69	85	1 1155	144	7	1 1810	219	1	2 0025	294	0.
1 0545	70	82	1 1200	145	7	1 1815	220	1	2 0030	295	0
1 0550	71	80	1 1205	146	7	1 1820	221	1	2 0035	296	0
1 0555	72	78	1 1210	147	7	1 1825	222	1	2 0040	297	0
1 0600	73	75	1 1215	148	6	1 1830	223	1.	2 0045	298	0
1 0605	74	73	1 1220	149	6	1 1835	224	1	2 0050	299	0
1 0610	75	71	1 1225	150	6	1 1840	225	1	2 0055	300	0

```
 PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72 HR      24 92-HR
+   (CFS)       (HR)
                            (CFS)
+     252       3 33                  91          26          25          24
                         (INCHES)   1 655       1 916       1 916       1 916
                          (AC-FT)     15.          52          52          52

                       CUMULATIVE AREA =       51 SQ MI
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            **************
            *            *
 670 KK     *   ASLD     *          SUB
            *            *
            **************

 671 KO         OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL        0    HYDROGRAPH PLOT SCALE
                       ASLD PARCEL EAST OF SCOTTSDALE ROAD

              SUBBASIN RUNOFF DATA

 673 BA         SUBBASIN CHARACTERISTICS
                     TAREA         05  SUBBASIN AREA

                PRECIPITATION DATA

  24 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                     HYDRO-35                          TP-40                              TP-49
                5-MIN  15-MIN  60 MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7 DAY  10-DAY
                  76    1.50    2 51    2 81    2 99    3 33     00      00      00      00      00      00

                                                   STORM AREA =    11 00

 674 LS         SCS LOSS RATE
                     STRTL         60  INITIAL ABSTRACTION
                    CRVNBR      77.00  CURVE NUMBER
                     RTIMP         00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
 675 UK           OVERLAND-FLOW ELEMENT NO  1
                         L         69  OVERLAND FLOW LENGTH
                         S       0211  SLOPE
                         N       .100  ROUGHNESS COEFFICIENT
                        PA      100.0  PERCENT OF SUBBASIN
                     DXMIN          5  MINIMUM NUMBER OF DX INTERVALS

                KINEMATIC WAVE
 676 RK           MAIN CHANNEL
                         L       2100  CHANNEL LENGTH
                         S       0088  SLOPE
                         N        030  CHANNEL ROUGHNESS COEFFICIENT
                        CA         05  CONTRIBUTING AREA
                     SHAPE       TRAP  CHANNEL SHAPE
                        WD      10 00  BOTTOM WIDTH OR DIAMETER
                         Z       5 00  SIDE SLOPE
                    NDXMIN          2  MINIMUM NUMBER OF DX INTERVALS
                    RUPSTQ         NO  ROUTE UPSTREAM HYDROGRAPH

                                                   ***
                               COMPUTED KINEMATIC PARAMETERS
                                    VARIABLE TIME STEP
                                  (DT SHOWN IS A MINIMUM)
```

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	2 17	1 67	35	17 80	123.41	185 05	1 23	19
MAIN	93	1 43	1 70	525 00	91 71	190 26	1 22	5 76

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CONTINUITY SUMMARY (AC-FT) - INFLOW=  0000E+00  EXCESS=  3491E+01 OUTFLOW=  3478E+01 BASIN STORAGE=  3007E-03 PERCENT ERROR=    4

                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL
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MAIN	98	1 13	5 00		39 79	190 00	1 21

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                                   HYDROGRAPH AT STATION      ASLD
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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	00	00	00	0	*	1		1230	151	00	00	00	0
1		0005	2	01	01	00	0.	*	1		1235	152	00	00	00	0
1		0010	3	01	01	00	0	*	1		1240	153	00	00	00	0
1		0015	4	01	01	00	0	*	1		1245	153	00	00	00	0.
1		0020	5	01	01	00	0	*	1		1250	155	00	00	00	0

1	0025	6	01	01	00	0	.
1	0030	7	01	01	00	0	.
1	0035	8	01	01	00	0	.
1	0040	9	01	.01	.00	0	.
1	0045	10	.01	.01	00	0	.
1	0050	11	01	.01	00	0	.
1	0055	12	.01	.01	.00	0	.
1	0100	13	.01	.01	00	0	.
1	0105	14	.01	.01	00	0.	.
1	0110	15	01	.01	00	0	.
1	0115	16	01	.01	.00	0	.
1	0120	17	01	.01	00	0	.
1	0125	18	.01	01	00	0	.
1	0130	19	01	01	00	0.	.
1	0135	20	01	01	00	0	.
1	0140	21	.01	01	00	0	.
1	0145	22	.02	02	00	0.	.
1	0150	23	02	02	00	0	.
1	0155	24	.02	02	00	0	.
1	0200	25	02	02	00	0	.
1	0205	26	02	02	00	0	.
1	0210	27	.02	02	00	0.	.
1	0215	28	02	.02	00	0	.
1	0220	29	02	.02	00	0	.
1	0225	30	03	03	00	0	.
1	0230	31	03	03	00	0	.
1	0235	32	08	09	00	0	.
1	0240	33	09	09	00	0.	.
1	0245	34	10	10	00	0	.
1	0250	35	11	12	01	0	.
1	0255	36	10	.14	03	1	.
1	0300	37	10	20	12	5	.
1	0305	38	69	36	33	17	.
1	0310	39	28	.12	16	90	.
1	0315	40	15	.06	09	69	.
1	0320	41	11	01	07	17	.
1	0325	42	09	04	06	15	.
1	0330	43	08	01	05	29	.
1	0335	44	03	01	02	23	.
1	0340	45	03	01	02	10.	.
1	0345	46	03	01	.03	13	.
1	0350	47	02	01	02	11	.
1	0355	48	02	01	01	9	.
1	0400	49	.02	01	01	8	.
1	0405	50	02	01	01	7	.
1	0410	51	02	01	01	6	.
1	0415	52	02	01	01	5	.
1	0420	53	02	00	01	5	.
1	0425	54	02	00	01	5	.
1	0430	55	01	00	.01	5	.
1	0435	56	01	00	01	5	.
1	0440	57	01	00	01	4	.
1	0445	58	01	00	.01	1	.
1	0450	59	01	00	01	4.	.
1	0455	60	01	00	01	3	.
1	0500	61	01	00	01	4	.
1	0505	62	01	00	01	4	.
1	0510	63	01	00	01	3	.
1	0515	64	01	00	01	3	.
1	0520	65	01	00	01	1	.
1	0525	66	01	00	01	1	.
1	0530	67	01	00	01	2	.
1	0535	68	01	00	01	3	.
1	0540	69	01	.00	.01	3	.
1	0545	70	01	00	01	3	.
1	0550	71	.01	00	01	3.	.
1	0555	72	01	00	.01	3.	.
1	0600	73	01	00	01	3	.
1	0605	74	00	00	00	2	.
1	0610	75	00	00	00	2.	.
1	0615	76	00	00	00	2	.
1	0620	77	.00	00	00	2	.
1	0625	78	00	00	00	1	.
1	0630	79	00	00	00	1	.
1	0635	80	00	00	00	1	.
1	0640	81	00	00	.00	1	.
1	0645	82	00	00	00	1	.
1	0650	83	00	00	00	0	.
1	0655	84	00	00	00	0	.
1	0700	85	00	00	00	0	.
1	0705	86	00	00	00	0	.
1	0710	87	00	00	00	0	.
1	0715	88	00	00	00	0	.
1	0720	89	00	.00	00	0	.
1	0725	90	00	00	00	0	.
1	0730	91	00	00	00	0	.
1	0735	92	00	00	00	0	.
1	0740	93	00	.00	00	0	.
1	0745	94	00	00	00	0	.
1	0750	95	00	00	00	0	.
1	0755	96	00	00	00	0	.
1	0800	97	00	00	00	0	.
1	0805	98	00	00	00	0	.
1	0810	99	00	00	00	0	.
1	0815	100	00	.00	00	0	.
1	0820	101	00	00	00	0	.
1	0825	102	00	00	00	0	.
1	0830	103	00	.00	00	0	.
1	0835	104	00	00	.00	0	.
1	0840	105	00	00	00	0	.
1	0845	106	00	00	00	0	.
1	0850	107	00	00	00	0	.
1	0855	108	00	00	00	0	.
1	0900	109	00	00	00	0	.

1	1255	156	00	00	.00	0
1	1300	157	.00	00	00	0
1	1305	158	00	00	.00	0
1	1310	159	.00	00	00	0
1	1315	160	00	00	00	0
1	1320	161	.00	00	00	0
1	1325	162	00	00	00	0
1	1330	163	00	00	00	0
1	1335	164	.00	00	00	0
1	1340	165	00	00	00	0
1	1345	166	.00	00	.00	0
1	1350	167	00	00	00	0.
1	1355	168	.00	00	00	0
1	1400	169	00	00	00	0
1	1405	170	00	00	00	0.
1	1410	171	00	00	00	0
1	1415	172	00	00	00	0.
1	1420	173	00	00	00	0.
1	1425	174	.00	00	00	0
1	1430	175	00	.00	00	0
1	1435	176	00	00	00	0.
1	1440	177	.00	00	00	0
1	1445	178	00	00	.00	0
1	1450	179	00	00	00	0
1	1455	180	00	00	.00	0
1	1500	181	00	00	00	0
1	1505	182	00	00	00	0
1	1510	183	00	00	00	0
1	1515	184	00	00	00	0
1	1520	185	00	00	00	0
1	1525	186	00	00	00	0
1	1530	187	00	00	00	0
1	1535	188	.00	00	00	0
1	1540	189	00	00	.00	0
1	1545	190	00	00	00	0
1	1550	191	00	00	00	0
1	1555	192	00	00	00	0
1	1600	193	00	00	00	0
1	1605	194	00	00	00	0
1	1610	195	00	00	00	0
1	1615	196	00	00	00	0
1	1620	197	00	00	00	0
1	1625	198	00	00	00	0
1	1630	199	00	00	00	0
1	1635	200	00	00	00	0
1	1640	201	00	00	00	0
1	1645	202	00	00	00	0
1	1650	203	00	00	00	0
1	1655	204	00	.00	00	0
1	1700	205	00	00	00	0
1	1705	206	00	00	00	0
1	1710	207	00	.00	00	0
1	1715	208	.00	00	00	0
1	1720	209	00	00	00	0
1	1725	210	00	00	.00	0
1	1730	211	.00	00	00	0
1	1735	212	00	00	00	0
1	1740	213	00	00	00	0
1	1745	214	00	00	00	0
1	1750	215	00	00	00	0
1	1755	216	00	00	00	0
1	1800	217	00	00	00	0
1	1805	218	00	00	00	0
1	1810	219	00	00	00	0
1	1815	220	.00	00	00	0
1	1820	221	00	00	00	0
1	1825	222	00	00	00	0
1	1830	223	00	.00	00	0
1	1835	224	00	00	00	0
1	1840	225	00	00	00	0
1	1845	226	00	00	00	0
1	1850	227	00	00	00	0.
1	1855	228	00	00	00	0
1	1900	229	00	00	00	0
1	1905	230	00	00	00	0
1	1910	231	00	00	.00	0
1	1915	232	.00	00	00	0.
1	1920	233	00	00	00	0
1	1925	234	00	00	00	0
1	1930	235	00	00	00	0
1	1935	236	00	00	00	0
1	1940	237	00	00	00	0
1	1945	238	00	00	00	0.
1	1950	239	.00	00	00	0
1	1955	240	00	00	00	0
1	2000	241	00	00	00	0
1	2005	242	.00	00	00	0
1	2010	243	00	.00	00	0
1	2015	244	00	.00	00	0
1	2020	245	00	00	.00	0
1	2025	246	00	00	00	0
1	2030	247	.00	00	00	0
1	2035	248	00	00	00	0
1	2040	249	00	00	00	0.
1	2045	250	.00	00	00	0
1	2050	251	.00	00	00	0
1	2055	252	.00	00	00	0.
1	2100	253	00	.00	00	0
1	2105	254	00	00	00	0
1	2110	255	00	00	00	0
1	2115	256	00	00	00	0
1	2120	257	00	00	00	0
1	2125	258	00	00	00	0
1	2130	259	00	00	00	0

1	0905	110	00	00	.00	0	*	1	2135	260	.00	.00	00	0
1	0910	111	00	00	00	0	*	1	2140	261	00	00	00	0
1	0915	112	00	00	00	0	*	1	2145	262	00	.00	00	0
1	0920	113	00	00	00	0.	*	1	2150	263	00	00	.00	0
1	0925	114	.00	00	.00	0	*	1	2155	264	00	00	.00	0
1	0930	115	00	.00	.00	0	*	1	2200	265	00	00	00	0
1	0935	116	00	00	00	0	*	1	2205	266	00	00	00	0
1	0940	117	00	00	.00	0	*	1	2210	267	00	00	.00	0
1	0945	118	00	00	00	0	*	1	2215	268	.00	00	00	0
1	0950	119	00	00	00	0	*	1	2220	269	00	00	00	0
1	0955	120	00	.00	.00	0	*	1	2225	270	00	00	00	0
1	1000	121	00	00	.00	0	*	1	2230	271	00	.00	.00	0
1	1005	122	00	00	00	0	*	1	2235	272	00	.00	.00	0
1	1010	123	00	00	00	0	*	1	2240	273	00	00	.00	0
1	1015	124	00	00	00	0	*	1	2245	274	00	00	00	0
1	1020	125	.00	00	.00	0	*	1	2250	275	00	00	.00	0
1	1025	126	00	00	00	0	*	1	2255	276	00	00	00	0
1	1030	127	00	.00	.00	0	*	1	2300	277	00	00	00	0
1	1035	128	00	00	00	0	*	1	2305	278	00	00	00	0
1	1040	129	00	00	00	0	*	1	2310	279	00	.00	00	0
1	1045	130	00	00	00	0	*	1	2315	280	00	00	00	0
1	1050	131	00	00	00	0	*	1	2320	281	00	00	00	0
1	1055	132	00	.00	00	0	*	1	2325	282	.00	.00	.00	0
1	1100	133	00	00	00	0	*	1	2330	283	00	00	.00	0
1	1105	134	.00	00	.00	0	*	1	2335	284	00	00	00	0
1	1110	135	00	00	00	0	*	1	2340	285	.00	00	00	0
1	1115	136	00	00	00	0	*	1	2345	286	00	.00	00	0
1	1120	137	00	00	.00	0	*	1	2350	287	00	00	00	0
1	1125	138	00	00	00	0	*	1	2355	288	00	00	00	0
1	1130	139	00	00	00	0	*	2	0000	289	00	00	00	0
1	1135	140	00	00	00	0	*	2	0005	290	00	00	.00	0
1	1140	141	00	00	00	0	*	2	0010	291	00	00	.00	0.
1	1145	142	00	.00	00	0	*	2	0015	292	00	00	00	0
1	1150	143	00	00	00	0	*	2	0020	293	00	00	00	0
1	1155	144	.00	00	00	0	*	2	0025	294	00	00	00	0
1	1200	145	00	00	.00	0	*	2	0030	295	00	00	00	0
1	1205	146	00	00	00	0	*	2	0035	296	00	00	00	0
1	1210	147	00	.00	00	0	*	2	0040	297	00	00	.00	0
1	1215	148	00	00	00	0	*	2	0045	298	00	00	00	0
1	1220	149	00	.00	00	0	*	2	0050	299	00	00	00	0
1	1225	150	00	.00	00	0	*	2	0055	300	00	00	00	0

TOTAL RAINFALL = 3.22, TOTAL LOSS = 1.99, TOTAL EXCESS = 1.23

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
90	3 17		7	2	2	2
		(INCHES)	1.224	1.226	1.226	1.226
		(AC-FT)	3	3	3	3

CUMULATIVE AREA = .05 SQ MI

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              ***************
              *             *
677 KK        *   CPPRIN    *     COMBINE
              *             *
              ***************

678 KO           OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL           0  HYDROGRAPH PLOT SCALE
                          COMBINE ROUTED ALOT 5 AND 6 WITH ASLD PARCEL

680 HC           HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION CPPRIN
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		0615	76	71	*	1		1230	151	6	*	1		1845	226	1
1		0005	2	0	*	1		0620	77	68	*	1		1235	152	6.	*	1		1850	227	1
1		0010	3	0	*	1		0625	78	64	*	1		1240	153	6	*	1		1855	228	1
1		0015	4	0	*	1		0630	79	61	*	1		1245	154	6	*	1		1900	229	1
1		0020	5	0.	*	1		0635	80	57	*	1		1250	155	5	*	1		1905	230	1
1		0025	6	0	*	1		0640	81	55	*	1		1255	156	5	*	1		1910	231	1.
1		0030	7	0	*	1		0645	82	52	*	1		1300	157	5	*	1		1915	232	1
1		0035	8	0	*	1		0650	83	50	*	1		1305	158	5	*	1		1920	233	1
1		0040	9	0	*	1		0655	84	47	*	1		1310	159	5	*	1		1925	234	1
1		0045	10	0	*	1		0700	85	45	*	1		1315	160	5	*	1		1930	235	1
1		0050	11	0	*	1		0705	86	43	*	1		1320	161	5	*	1		1935	236	1
1		0055	12	0	*	1		0710	87	41	*	1		1325	162	5.	*	1		1940	237	1
1		0100	13	1	*	1		0715	88	40	*	1		1330	163	4	*	1		1945	238	1
1		0105	14	2	*	1		0720	89	38	*	1		1335	164	4	*	1		1950	239	1
1		0110	15	3	*	1		0725	90	37	*	1		1340	165	4	*	1		1955	240	1
1		0115	16	5	*	1		0730	91	35	*	1		1345	166	3	*	1		2000	241	1

DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW
1	0120	17	6	*	1	0735	92	31	*	1	1350	167	4	*	1	2005	242	1.
1	0125	18	7	*	1	0740	93	33	*	1	1355	168	4	*	1	2010	243	1
1	0130	19	8	*	1	0745	94	32	*	1	1400	169	4	*	1	2015	244	1.
1	0135	20	9.	*	1	0750	95	30	*	1	1405	170	4	*	1	2020	245	1
1	0140	21	10.	*	1	0755	96	29	*	1	1410	171	4	*	1	2025	246	1.
1	0145	22	10	*	1	0800	97	28	*	1	1415	172	4	*	1	2030	247	1
1	0150	23	11	*	1	0805	98	27.	*	1	1420	173	3	*	1	2035	248	1
1	0155	24	12	*	1	0810	99	26	*	1	1425	174	3	*	1	2040	249	1.
1	0200	25	13	*	1	0815	100	26	*	1	1430	175	3	*	1	2045	250	1.
1	0205	26	14	*	1	0820	101	25	*	1	1435	176	3	*	1	2050	251	1
1	0210	27	15	*	1	0825	102	24	*	1	1440	177	3	*	1	2055	252	1
1	0215	28	16.	*	1	0830	103	23	*	1	1445	178	3	*	1	2100	253	1
1	0220	29	17	*	1	0835	104	22	*	1	1450	179	3	*	1	2105	254	1.
1	0225	30	18	*	1	0840	105	22	*	1	1455	180	3	*	1	2110	255	1
1	0230	31	19	*	1	0845	106	21.	*	1	1500	181	3	*	1	2115	256	1.
1	0235	32	21	*	1	0850	107	20	*	1	1505	182	3	*	1	2120	257	1
1	0240	33	22	*	1	0855	108	20	*	1	1510	183	3	*	1	2125	258	1
1	0245	34	26	*	1	0900	109	19	*	1	1515	184	3	*	1	2130	259	1
1	0250	35	33.	*	1	0905	110	19	*	1	1520	185	3	*	1	2135	260	1
1	0255	36	45	*	1	0910	111	18.	*	1	1525	186	3	*	1	2140	261	1
1	0300	37	66	*	1	0915	112	17.	*	1	1530	187	3	*	1	2145	262	1
1	0305	38	130	*	1	0920	113	17.	*	1	1535	188	3.	*	1	2150	263	1
1	0310	39	256	*	1	0925	114	16	*	1	1540	189	2	*	1	2155	264	1
1	0315	40	300	*	1	0930	115	16	*	1	1545	190	2	*	1	2200	265	1
1	0320	41	299	*	1	0935	116	15	*	1	1550	191	2	*	1	2205	266	1
1	0325	42	287	*	1	0940	117	15	*	1	1555	192	2	*	1	2210	267	0
1	0330	43	272	*	1	0945	118	15.	*	1	1600	193	2	*	1	2215	268	0
1	0335	44	257	*	1	0950	119	14	*	1	1605	194	2	*	1	2220	269	0
1	0340	45	239	*	1	0955	120	14	*	1	1610	195	2	*	1	2225	270	0
1	0345	46	221	*	1	1000	121	13	*	1	1615	196	2	*	1	2230	271	0
1	0350	47	202	*	1	1005	122	13	*	1	1620	197	2	*	1	2235	272	0
1	0355	48	186	*	1	1010	123	13.	*	1	1625	198	2	*	1	2240	273	0.
1	0400	49	173.	*	1	1015	124	12	*	1	1630	199	2	*	1	2245	274	0
1	0405	50	163	*	1	1020	125	12	*	1	1635	200	2	*	1	2250	275	0
1	0410	51	155	*	1	1025	126	12	*	1	1640	201	2.	*	1	2255	276	0
1	0415	52	148	*	1	1030	127	11	*	1	1645	202	2	*	1	2300	277	0
1	0420	53	142	*	1	1035	128	11	*	1	1650	203	2	*	1	2305	278	0
1	0425	54	137	*	1	1040	129	11	*	1	1655	204	2.	*	1	2310	279	0
1	0430	55	133	*	1	1045	130	10	*	1	1700	205	2	*	1	2315	280	0
1	0435	56	129	*	1	1050	131	10	*	1	1705	206	2	*	1	2320	281	0
1	0440	57	125	*	1	1055	132	10	*	1	1710	207	2	*	1	2325	282	0
1	0445	58	122	*	1	1100	133	10	*	1	1715	208	2	*	1	2330	283	0
1	0450	59	119	*	1	1105	134	9	*	1	1720	209	2	*	1	2335	284	0
1	0455	60	116	*	1	1110	135	9	*	1	1725	210	2	*	1	2340	285	0
1	0500	61	112.	*	1	1115	136	9.	*	1	1730	211	2.	*	1	2345	286	0.
1	0505	62	108	*	1	1120	137	9	*	1	1735	212	2.	*	1	2350	287	0
1	0510	63	105	*	1	1125	138	8	*	1	1740	213	1.	*	1	2355	288	0
1	0515	64	102	*	1	1130	139	8.	*	1	1745	214	1	*	2	0000	289	0
1	0520	65	99	*	1	1135	140	8	*	1	1750	215	1	*	2	0005	290	0
1	0525	66	96	*	1	1140	141	8	*	1	1755	216	1	*	2	0010	291	0
1	0530	67	93	*	1	1145	142	8	*	1	1800	217	1	*	2	0015	292	0
1	0535	68	90	*	1	1150	143	7	*	1	1805	218	1	*	2	0020	293	0
1	0540	69	87	*	1	1155	144	7	*	1	1810	219	1	*	2	0025	294	0
1	0545	70	85	*	1	1200	145	7	*	1	1815	220	1	*	2	0030	295	0
1	0550	71	83	*	1	1205	146	7	*	1	1820	221	1	*	2	0035	296	0
1	0555	72	80	*	1	1210	147	7	*	1	1825	222	1	*	2	0040	297	0
1	0600	73	78	*	1	1215	148	6	*	1	1830	223	1	*	2	0045	298	0.
1	0605	74	76	*	1	1220	149	6	*	1	1835	224	1	*	2	0050	299	0
1	0610	75	73	*	1	1225	150	5	*	1	1840	225	1	*	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
300	3.25		90	28	27	27
		(INCHES)	1.614	1.851	1.851	1.851
		(AC-FT)	48.	56	56.	56

CUMULATIVE AREA = .56 SQ MI

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              **************
              *            *
681 KK        *   R33C 2   *
              *            *
              **************

682 KO        OUTPUT CONTROL VARIABLES
                    IPRNT         1  PRINT CONTROL
                    IPLOT         0  PLOT CONTROL
                    QSCAL         0  HYDROGRAPH PLOT SCALE
                      RETRIEVE DIVERTED PIPE FLOW

683 DR        RETRIEVE DIVERSION HYDROGRAPH
                    ISTAD     D33C 2  DIVERSION HYDROGRAPH IDENTIFICATION
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HYDROGRAPH AT STATION R33C 2

DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW	*	DA	HRMN	ORD	FLOW
1	0000	1	0	*	1	0615	76	9	*	1	1230	151	0	*	1	1845	226	0

1	0005	2	0	.	1	0620	77	8	.	1	1235	152	0.	.	1	1850	227	0
1	0010	3	0	.	1	0625	78	7.	.	1	1240	153	0	.	1	1855	228	0
1	0015	4	0	.	1	0630	79	6	.	1	1245	154	0	.	1	1900	229	0
1	0020	5	0.	.	1	0635	80	5	.	1	1250	155	0	.	1	1905	230	0.
1	0025	6	0	.	1	0640	81	5	.	1	1255	156	0.	.	1	1910	231	0
1	0030	7	0	.	1	0645	82	4	.	1	1300	157	0	.	1	1915	232	0
1	0035	8	0	.	1	0650	83	4	.	1	1305	158	0	.	1	1920	233	0.
1	0040	9	0	.	1	0655	84	3	.	1	1310	159	0	.	1	1925	234	0
1	0045	10	0	.	1	0700	85	3	.	1	1315	160	0.	.	1	1930	235	0
1	0050	11	0	.	1	0705	86	2.	.	1	1320	161	0	.	1	1935	236	0
1	0055	12	0	.	1	0710	87	2	.	1	1325	162	0	.	1	1940	237	0
1	0100	13	0	.	1	0715	88	2	.	1	1330	163	0	.	1	1945	238	0
1	0105	14	1	.	1	0720	89	2	.	1	1335	164	0.	.	1	1950	239	0.
1	0110	15	1	.	1	0725	90	1	.	1	1340	165	0	.	1	1955	240	0
1	0115	16	1	.	1	0730	91	1.	.	1	1345	166	0	.	1	2000	241	0.
1	0120	17	2	.	1	0735	92	1	.	1	1350	167	0	.	1	2005	242	0
1	0125	18	2	.	1	0740	93	1	.	1	1355	168	0.	.	1	2010	243	0
1	0130	19	2	.	1	0745	94	1	.	1	1400	169	0	.	1	2015	244	0
1	0135	20	3	.	1	0750	95	1	.	1	1405	170	0.	.	1	2020	245	0
1	0140	21	3	.	1	0755	96	1	.	1	1410	171	0	.	1	2025	246	0
1	0145	22	3	.	1	0800	97	1	.	1	1415	172	0	.	1	2030	247	0
1	0150	23	3	.	1	0805	98	1.	.	1	1420	173	0.	.	1	2035	248	0
1	0155	24	3	.	1	0810	99	0	.	1	1425	174	0.	.	1	2040	249	0
1	0200	25	3.	.	1	0815	100	0	.	1	1430	175	0	.	1	2045	250	0
1	0205	26	4	.	1	0820	101	0	.	1	1435	176	0	.	1	2050	251	0
1	0210	27	4	.	1	0825	102	0	.	1	1440	177	0	.	1	2055	252	0.
1	0215	28	5	.	1	0830	103	0.	.	1	1445	178	0	.	1	2100	253	0
1	0220	29	5	.	1	0835	104	0	.	1	1450	179	0	.	1	2105	254	0
1	0225	30	5	.	1	0840	105	0	.	1	1455	180	0	.	1	2110	255	0
1	0230	31	6	.	1	0845	106	0.	.	1	1500	181	0.	.	1	2115	256	0
1	0235	32	6	.	1	0850	107	0	.	1	1505	182	0	.	1	2120	257	0.
1	0240	33	8	.	1	0855	108	0	.	1	1510	183	0.	.	1	2125	258	0
1	0245	34	10	.	1	0900	109	0	.	1	1515	184	0	.	1	2130	259	0
1	0250	35	11	.	1	0905	110	0.	.	1	1520	185	0	.	1	2135	260	0
1	0255	36	13	.	1	0910	111	0	.	1	1525	186	0	.	1	2140	261	0
1	0300	37	15	.	1	0915	112	0	.	1	1530	187	0	.	1	2145	262	0
1	0305	38	17	.	1	0920	113	0	.	1	1535	188	0	.	1	2150	263	0
1	0310	39	46	.	1	0925	114	0	.	1	1540	189	0	.	1	2155	264	0
1	0315	40	96	.	1	0930	115	0	.	1	1545	190	0	.	1	2200	265	0
1	0320	41	108	.	1	0935	116	0	.	1	1550	191	0	.	1	2205	266	0
1	0325	42	105	.	1	0940	117	0	.	1	1555	192	0	.	1	2210	267	0
1	0330	43	96	.	1	0945	118	0	.	1	1600	193	0.	.	1	2215	268	0
1	0335	44	86	.	1	0950	119	0	.	1	1605	194	0	.	1	2220	269	0
1	0340	45	75	.	1	0955	120	0	.	1	1610	195	0	.	1	2225	270	0
1	0345	46	63	.	1	1000	121	0	.	1	1615	196	0	.	1	2230	271	0
1	0350	47	52	.	1	1005	122	0	.	1	1620	197	0	.	1	2235	272	0
1	0355	48	41	.	1	1010	123	0	.	1	1625	198	0	.	1	2240	273	0
1	0400	49	37	.	1	1015	124	0	.	1	1630	199	0	.	1	2245	274	0
1	0405	50	31	.	1	1020	125	0.	.	1	1635	200	0	.	1	2250	275	0
1	0410	51	27	.	1	1025	126	0	.	1	1640	201	0	.	1	2255	276	0.
1	0415	52	24	.	1	1030	127	0	.	1	1645	202	0	.	1	2300	277	0
1	0420	53	22	.	1	1035	128	0	.	1	1650	203	0	.	1	2305	278	0
1	0425	54	19	.	1	1040	129	0	.	1	1655	204	0	.	1	2310	279	0.
1	0430	55	18	.	1	1045	130	0	.	1	1700	205	0	.	1	2315	280	0
1	0435	56	18	.	1	1050	131	0	.	1	1705	206	0	.	1	2320	281	0
1	0440	57	17	.	1	1055	132	0	.	1	1710	207	0	.	1	2325	282	0.
1	0445	58	17	.	1	1100	133	0	.	1	1715	208	0	.	1	2330	283	0
1	0450	59	17	.	1	1105	134	0	.	1	1720	209	0	.	1	2335	284	0
1	0455	60	15	.	1	1110	135	0	.	1	1725	210	0	.	1	2340	285	0
1	0500	61	16	.	1	1115	136	0	.	1	1730	211	0	.	1	2345	286	0
1	0505	62	16	.	1	1120	137	0	.	1	1735	212	0	.	1	2350	287	0
1	0510	63	15	.	1	1125	138	0	.	1	1740	213	0	.	1	2355	288	0
1	0515	64	15	.	1	1130	139	0	.	1	1745	214	0	.	2	0000	289	0
1	0520	65	14	.	1	1135	140	0	.	1	1750	215	0.	.	2	0005	290	0
1	0525	66	14	.	1	1140	141	0	.	1	1755	216	0	.	2	0010	291	0
1	0530	67	14.	.	1	1145	142	0	.	1	1800	217	0	.	2	0015	292	0
1	0535	68	13.	.	1	1150	143	0	.	1	1805	218	0	.	2	0020	293	0
1	0540	69	13.	.	1	1155	144	0	.	1	1810	219	0	.	2	0025	294	0
1	0545	70	12.	.	1	1200	145	0	.	1	1815	220	0	.	2	0030	295	0
1	0550	71	12	.	1	1205	146	0	.	1	1820	221	0	.	2	0035	296	0
1	0555	72	12	.	1	1210	147	0	.	1	1825	222	0	.	2	0040	297	0
1	0600	73	11	.	1	1215	148	0	.	1	1830	223	0.	.	2	0045	298	0
1	0605	74	11	.	1	1220	149	0.	.	1	1835	224	0	.	2	0050	299	0
1	0610	75	10	.	1	1225	150	0	.	1	1840	225	0	.	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
108	3.33		10	5	5	5
		(INCHES)	.327	.332	.332	.332
		(AC-FT)	10	10	10	10

CUMULATIVE AREA = .00 SQ MI

605 KK * S40WT * SUB

606 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0 HYDROGRAPH PLOT SCALE
SUB EAST OF SCOTTSDALE RD. FLOWING DIRECTLY INTO SCOTTSDALE RD

CULVERT, TAZES SCOTTS RD HALF ST AND SCENIC CORRIDOR

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             SUBBASIN RUNOFF DATA

689 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

 24 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                    HYDRO-35                  ..          TP-40                  .         ..  .   TP-49 .     .     .
                5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY   7-DAY  10-DAY
                  .76    1.50    2.51     2.81     2.99     3.33      .00      .00      .00      .00     .00     .00

                                                      STORM AREA =    14.00

690 LS          SCS LOSS RATE
                      STRTL          .60  INITIAL ABSTRACTION
                     CRVNBR        77.00  CURVE NUMBER
                      RTIMP        69.00  PERCENT IMPERVIOUS AREA

                KINEMATIC WAVE
691 UK            OVERLAND-FLOW ELEMENT NO  1
                          L          50   OVERLAND FLOW LENGTH
                          S        .0100  SLOPE
                          N         .050  ROUGHNESS COEFFICIENT
                         PA        100.0  PERCENT OF SUBBASIN
                      DXMIN            5  MINIMUM NUMBER OF DX INTERVALS

                KINEMATIC WAVE
692 RK            MAIN CHANNEL
                          L          600  CHANNEL LENGTH
                          S        .0100  SLOPE
                          N         .015  CHANNEL ROUGHNESS COEFFICIENT
                         CA          .01  CONTRIBUTING AREA
                      SHAPE         CIRC  CHANNEL SHAPE
                         WD         4.50  BOTTOM WIDTH OR DIAMETER
                          Z          .00  SIDE SLOPE
                     NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS
                     RUPSTQ           NO  ROUTE UPSTREAM HYDROGRAPH

                                                            ***
                                     COMPUTED KINEMATIC PARAMETERS
                                          VARIABLE TIME STEP
                                         (DT SHOWN IS A MINIMUM)

                ELEMENT     ALPHA        M          DT         DX        PEAK     TIME TO     VOLUME     MAXIMUM
                                                                                    PEAK                  CELERITY
                                                   (MIN)      (FT)      (CFS)     (MIN)       (IN)       (FPS)

                PLANE1       4.98      1.67          .13      10.00      31.73     184.61      3.00          .54
                MAIN         5.89      1.25          .33     200.00      31.72     164.75      3.09        12.58

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00  EXCESS= .1009E+01 OUTFLOW= .1005E+01 BASIN STORAGE= .4154E-05 PERCENT ERROR=    .1

                                    INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                MAIN         6.39      1.25         5.00                 31.47     155.00      3.01
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HYDROGRAPH AT STATION   S40WT

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DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	0000	1	.00	.00	.00	0.	*	1	1230	151	.00	.00	.00	0.
1	0005	2	.01	.00	.01	0.	*	1	1235	152	.00	.00	.00	0.
1	0010	3	.01	.00	.01	0.	*	1	1240	153	.00	.00	.00	0.
1	0015	4	.01	.00	.01	0.	*	1	1245	154	.00	.00	.00	0.
1	0020	5	.01	.00	.01	0.	*	1	1250	155	.00	.00	.00	0.
1	0025	6	.01	.00	.01	0.	*	1	1255	156	.00	.00	.00	0.
1	0030	7	.01	.00	.01	0.	*	1	1300	157	.00	.00	.00	0.
1	0035	8	.01	.00	.01	0.	*	1	1305	158	.00	.00	.00	0.
1	0040	9	.01	.00	.01	0.	*	1	1310	159	.00	.00	.00	0.
1	0045	10	.01	.00	.01	0.	*	1	1315	160	.00	.00	.00	0.
1	0050	11	.01	.00	.01	0.	*	1	1320	161	.00	.00	.00	0.
1	0055	12	.01	.00	.01	0.	*	1	1325	162	.00	.00	.00	0.
1	0100	13	.01	.00	.01	0.	*	1	1330	163	.00	.00	.00	0.
1	0105	14	.01	.00	.01	0.	*	1	1335	164	.00	.00	.00	0.
1	0110	15	.01	.00	.01	0.	*	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.00	.01	0.	*	1	1345	166	.00	.00	.00	0.
1	0120	17	.01	.00	.01	1.	*	1	1350	167	.00	.00	.00	0.
1	0125	18	.01	.00	.01	1.	*	1	1355	168	.00	.00	.00	0.
1	0130	19	.01	.00	.01	1.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.01	.00	.01	1.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.01	.00	.01	1.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.00	.01	1.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.02	.00	.01	1.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.02	.00	.02	1.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.02	.00	.02	1.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.02	.00	.02	1.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.02	.00	.02	1.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.02	.00	.02	1.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.02	.00	.02	1.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.03	.00	.02	1.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.03	.00	.03	1.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.08	.01	.07	1.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.09	.01	.08	1.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.10	.01	.09	4.	*	1	1515	184	.00	.00	.00	0.

1	0250	35	.14	01	12	6	.	1	1520	185	00	00	00	0.
1	0255	36	18	02	16	8.	.	1	1525	186	00	00	.00	0.
1	0300	37	.40	03	37	18.	.	1	1530	187	00	00	00	0
1	0305	38	69	04	65	31.	.	1	1535	188	00	.00	00	0.
1	0310	39	28	.01	26	13.	.	1	1540	189	00	00	00	0.
1	0315	40	.15	01	15	7	.	1	1545	190	00	.00	.00	0.
1	0320	41	.11	.00	10	5.	.	1	1550	191	.00	00	00	0
1	0325	42	09	.00	09	4	.	1	1555	192	00	.00	00	0.
1	0330	43	.08	00	08	4.	.	1	1600	193	00	00	.00	0
1	0335	44	03	00	03	2	.	1	1605	194	00	00	00	0
1	0340	45	03	00	03	1	.	1	1610	195	00	00	00	0
1	0345	46	.03	00	.03	1.	.	1	1615	196	00	00	00	0.
1	0350	47	02	.00	02	1	.	1	1620	197	00	00	00	0
1	0355	48	02	00	02	1	.	1	1625	198	00	00	00	0
1	0400	49	02	00	02	1	.	1	1630	199	.00	00	00	0
1	0405	50	02	00	02	1	.	1	1635	200	00	00	00	0
1	0410	51	02	00	02	1	.	1	1640	201	00	00	00	0.
1	0415	52	02	00	02	1	.	1	1645	202	00	00	00	0
1	0420	53	.02	00	02	1.	.	1	1650	203	00	.00	00	0.
1	0425	54	.02	.00	01	1	.	1	1655	204	.00	00	00	0.
1	0430	55	01	00	01	1	.	1	1700	205	00	00	00	0
1	0435	56	.01	00	01	1	.	1	1705	206	00	00	00	0
1	0440	57	.01	00	01	1	.	1	1710	207	00	00	00	0
1	0445	58	01	00	01	1	.	1	1715	208	.00	.00	00	0
1	0450	59	01	00	01	1	.	1	1720	209	00	00	00	0
1	0455	60	01	00	01	1	.	1	1725	210	00	00	.00	0
1	0500	61	.01	00	01	1	.	1	1730	211	00	00	00	0
1	0505	62	01	00	01	1	.	1	1735	212	00	00	00	0
1	0510	63	01	00	01	0	.	1	1740	213	00	00	00	0
1	0515	64	01	00	.01	0	.	1	1745	214	00	00	00	0
1	0520	65	01	00	01	0	.	1	1750	215	00	00	00	0
1	0525	66	01	00	01	0	.	1	1755	216	00	00	00	0
1	0530	67	01	00	01	0	.	1	1800	217	00	00	00	0
1	0535	68	01	00	01	0	.	1	1805	218	00	00	00	0
1	0540	69	01	00	01	0	.	1	1810	219	00	00	00	0
1	0545	70	01	00	01	0	.	1	1815	220	00	00	00	0
1	0550	71	01	00	01	0	.	1	1820	221	00	00	00	0
1	0555	72	01	.00	01	0	.	1	1825	222	00	00	00	0
1	0600	73	01	.00	01	0	.	1	1830	223	00	.00	00	0.
1	0605	74	00	00	00	0	.	1	1835	224	.00	00	00	0
1	0610	75	00	00	00	0	.	1	1840	225	00	00	00	0
1	0615	76	00	00	00	0	.	1	1845	226	00	00	00	0
1	0620	77	00	00	00	0	.	1	1850	227	00	00	00	0
1	0625	78	00	00	00	0	.	1	1855	228	00	00	00	0
1	0630	79	00	00	00	0	.	1	1900	229	00	00	00	0
1	0635	80	00	00	00	0	.	1	1905	230	00	00	00	0
1	0640	81	00	00	00	0	.	1	1910	231	00	00	00	0.
1	0645	82	00	00	00	0	.	1	1915	232	00	00	00	0.
1	0650	83	00	00	00	0	.	1	1920	233	00	00	00	0.
1	0655	84	00	00	.00	0	.	1	1925	234	.00	.00	00	0
1	0700	85	00	00	00	0	.	1	1930	235	00	00	00	0
1	0705	86	00	00	00	0	.	1	1935	236	00	00	00	0
1	0710	87	00	00	00	0	.	1	1940	237	00	00	00	0
1	0715	88	00	00	00	0	.	1	1945	238	00	00	00	0
1	0720	89	00	00	00	0	.	1	1950	239	00	00	00	0
1	0725	90	00	00	00	0	.	1	1955	240	00	00	00	0
1	0730	91	00	00	00	0	.	1	2000	241	00	00	00	0.
1	0735	92	00	00	00	0	.	1	2005	242	00	00	00	0
1	0740	93	00	00	00	0	.	1	2010	243	00	00	00	0
1	0745	94	00	00	00	0	.	1	2015	244	00	00	00	0
1	0750	95	00	00	00	0	.	1	2020	245	00	00	00	0.
1	0755	96	00	00	00	0	.	1	2025	246	00	00	.00	0
1	0800	97	00	00	00	0	.	1	2030	247	00	00	00	0
1	0805	98	00	00	00	0	.	1	2035	248	00	.00	00	0.
1	0810	99	00	00	00	0	.	1	2040	249	00	00	00	0
1	0815	100	00	00	00	0	.	1	2045	250	00	00	.00	0
1	0820	101	00	00	00	0	.	1	2050	251	00	00	00	0
1	0825	102	.00	00	00	0	.	1	2055	252	00	00	00	0.
1	0830	103	00	00	00	0	.	1	2100	253	00	00	.00	0
1	0835	104	00	00	00	0	.	1	2105	254	00	00	00	0
1	0840	105	00	00	00	0	.	1	2110	255	00	00	00	0
1	0845	106	00	00	00	0	.	1	2115	256	00	.00	00	0.
1	0850	107	00	00	00	0	.	1	2120	257	00	00	00	0
1	0855	108	00	00	00	0	.	1	2125	258	00	00	00	0
1	0900	109	00	00	00	0	.	1	2130	259	00	00	.00	0
1	0905	110	00	00	00	0	.	1	2135	260	00	00	00	0
1	0910	111	00	00	00	0	.	1	2140	261	00	00	00	0
1	0915	112	00	00	00	0	.	1	2145	262	00	00	.00	0
1	0920	113	00	00	00	0	.	1	2150	263	00	00	00	0
1	0925	114	00	00	00	0	.	1	2155	264	00	00	00	0
1	0930	115	00	00	00	0	.	1	2200	265	00	.00	00	0
1	0935	116	00	00	00	0	.	1	2205	266	.00	00	00	0.
1	0940	117	.00	00	00	0	.	1	2210	267	00	00	00	0
1	0945	118	00	00	00	0	.	1	2215	268	00	00	00	0
1	0950	119	00	00	00	0	.	1	2220	269	00	00	00	0
1	0955	120	00	00	00	0	.	1	2225	270	00	00	00	0
1	1000	121	00	00	00	0	.	1	2230	271	00	00	00	0
1	1005	122	00	00	00	0	.	1	2235	272	00	00	00	0
1	1010	123	00	00	00	0	.	1	2240	273	00	00	00	0
1	1015	124	00	00	00	0	.	1	2245	274	00	00	00	0
1	1020	125	00	00	00	0	.	1	2250	275	00	00	00	0
1	1025	126	00	00	00	0	.	1	2255	276	00	00	00	0
1	1030	127	00	00	00	0	.	1	2300	277	00	00	00	0
1	1035	128	00	00	00	0	.	1	2305	278	00	00	00	0
1	1040	129	00	00	00	0	.	1	2310	279	00	00	00	0
1	1045	130	00	00	00	0	.	1	2315	280	00	00	00	0
1	1050	131	00	00	00	0	.	1	2320	281	00	00	00	0
1	1055	132	00	00	00	0	.	1	2325	282	00	00	00	0
1	1100	133	.00	00	00	0	.	1	2330	283	00	00	00	0
1	1105	134	00	.00	00	0	.	1	2335	284	00	00	00	0
1	1110	135	.00	00	00	0	.	1	2340	285	00	00	00	0
1	1115	136	00	00	00	0	.	1	2345	286	00	00	00	0
1	1120	137	00	00	00	0	.	1	2350	287	.00	00	00	0
1	1125	138	00	00	00	0	.	1	2355	288	00	00	00	0

1	1130	139	.90	00	.00	0	2	0000	289	00	.00	.00	0
1	1135	140	90	.00	00	0.	2	0005	290	.00	00	00	0
1	1140	141	90	00	.00	0	2	0010	291	00	00	.00	0
1	1145	142	90	00	.00	0.	2	0015	292	.00	00	.00	0.
1	1150	143	.90	.00	00	0	2	0020	293	00	00	00	0
1	1155	144	90	00	.00	0	2	0025	294	.00	00	00	0.
1	1200	145	90	.00	00	0	2	0030	295	00	00	00	0
1	1205	146	.90	.00	00	0	2	0035	296	00	00	00	0
1	1210	147	90	00	00	0	2	0040	297	00	.00	00	0
1	1215	148	90	00	.00	0	2	0045	298	00	.00	00	0
1	1220	149	.90	00	00	0	2	0050	299	00	00	00	0
1	1225	150	.90	00	00	0	2	0055	300	00	00	.00	0

TOTAL RAINFALL = 3 32, TOTAL LOSS = 32, TOTAL EXCESS = 3 00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
31.	3.08		2.	1.	0	0.
		(INCHES)	3 004	3.013	3 013	3 013
		(AC-FT)	1.	1	1.	1

CUMULATIVE AREA = .01 SQ MI

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693 KK   *  33C 2  *     COMBINE
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694 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0 HYDROGRAPH PLOT SCALE
COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT

695 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION 33C 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	0615	75	9	1	1230	151	0	1	1845	226	0
1	0005	2	0	1	0620	77	8	1	1235	152	0	1	1850	227	0.
1	0010	3	0	1	0625	78	7	1	1240	153	0	1	1855	228	0.
1	0015	4	0	1	0630	79	6	1	1245	154	0	1	1900	229	0
1	0020	5	0	1	0635	80	5.	1	1250	155	0	1	1905	230	0
1	0025	6	0	1	0640	81	5	1	1255	156	0.	1	1910	231	0
1	0030	7	0	1	0645	82	4	1	1300	157	0	1	1915	232	0
1	0035	8	0	1	0650	83	4	1	1305	158	0	1	1920	233	0
1	0040	9	0	1	0655	84	3	1	1310	159	0.	1	1925	234	0
1	0045	10	0	1	0700	85	3	1	1315	160	0	1	1930	235	0
1	0050	11	0	1	0705	86	2	1	1320	161	0	1	1935	236	0
1	0055	12	0	1	0710	87	2	1	1325	162	0	1	1940	237	0
1	0100	13	1	1	0715	88	2	1	1330	163	0	1	1945	238	0
1	0105	14	1	1	0720	89	2.	1	1335	164	0	1	1950	239	0
1	0110	15	2.	1	0725	90	1	1	1340	165	0	1	1955	240	0
1	0115	16	2	1	0730	91	1	1	1345	166	0	1	2000	241	0
1	0120	17	2	1	0735	92	1	1	1350	167	0	1	2005	242	0
1	0125	18	3	1	0740	93	1	1	1355	168	0.	1	2010	243	0
1	0130	19	3	1	0745	94	1	1	1400	169	0	1	2015	244	0.
1	0135	20	3	1	0750	95	1	1	1405	170	0	1	2020	245	0
1	0140	21	3	1	0755	96	1	1	1410	171	0	1	2025	246	0
1	0145	22	4	1	0800	97	1	1	1415	172	0	1	2030	247	0
1	0150	23	4	1	0805	98	1	1	1420	173	0	1	2035	248	0
1	0155	24	4	1	0810	99	0	1	1425	174	0	1	2040	249	0
1	0200	25	5	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	5	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	5.	1	0825	102	0	1	1440	177	0	1	2055	252	0
1	0215	28	6.	1	0830	103	0	1	1445	178	0	1	2100	253	0
1	0220	29	6.	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	5	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	7	1	0845	106	0	1	1500	181	0	1	2115	256	0
1	0235	32	9	1	0850	107	0.	1	1505	182	0.	1	2120	257	0
1	0240	33	11	1	0855	108	0	1	1510	183	0	1	2125	258	0
1	0245	34	14	1	0900	109	0	1	1515	184	0	1	2130	259	0
1	0250	35	17	1	0905	110	0	1	1520	185	0	1	2135	260	0.
1	0255	36	21	1	0910	111	0	1	1525	186	0.	1	2140	261	0
1	0300	37	33	1	0915	112	0.	1	1530	187	0	1	2145	262	0
1	0305	38	48	1	0920	113	0	1	1535	188	0	1	2150	263	0
1	0310	39	59	1	0925	114	0	1	1540	189	0	1	2155	264	0
1	0315	40	103	1	0930	115	0	1	1545	190	0.	1	2200	265	0
1	0320	41	114	1	0935	116	0	1	1550	191	0	1	2205	266	0
1	0325	42	109	1	0940	117	0	1	1555	192	0	1	2210	267	0
1	0330	43	100	1	0945	118	0.	1	1600	193	0.	1	2215	268	0
1	0335	44	89	1	0950	119	0	1	1605	194	0	1	2220	269	0
1	0340	45	77	1	0955	120	0	1	1610	195	0	1	2225	270	0.

1	0345	46	64	.	1	1000	121	0	.	1	1615	196	0	.	1	2230	271	0.	
1	0350	47	53	.	1	1005	122	0	.	1	1620	197	0	.	1	2235	272	0.	
1	0355	48	45	.	1	1010	123	0	.	1	1625	198	0	.	1	2240	273	0	
1	0400	49	38	.	1	1015	124	0	.	1	1630	199	0	.	1	2245	274	0	
1	0405	50	32	.	1	1020	125	0.	.	1	1635	200	0.	.	1	2250	275	0	
1	0410	51	28	.	1	1025	126	0	.	1	1640	201	0	.	1	2255	276	0	
1	0415	52	25	.	1	1030	127	0.	.	1	1645	202	0	.	1	2300	277	0	
1	0420	53	22	.	1	1035	128	0	.	1	1650	203	0	.	1	2305	278	0	
1	0425	54	20	.	1	1040	129	0.	.	1	1655	204	0	.	1	2310	279	0	
1	0430	55	19.	.	1	1045	130	0.	.	1	1700	205	0.	.	1	2315	280	0	
1	0435	56	18.	.	1	1050	131	0	.	1	1705	206	0	.	1	2320	281	0.	
1	0440	57	18	.	1	1055	132	0	.	1	1710	207	0	.	1	2325	282	0.	
1	0445	58	18	.	1	1100	133	0	.	1	1715	208	0.	.	1	2330	283	0	
1	0450	59	17	.	1	1105	134	0	.	1	1720	209	0	.	1	2335	284	0	
1	0455	60	17	.	1	1110	135	0.	.	1	1725	210	0	.	1	2340	285	0	
1	0500	61	16.	.	1	1115	136	0	.	1	1730	211	0	.	1	2345	286	0.	
1	0505	62	16	.	1	1120	137	0	.	1	1735	212	0	.	1	2350	287	0.	
1	0510	63	16	.	1	1125	138	0	.	1	1740	213	0	.	1	2355	288	0	
1	0515	64	15	.	1	1130	139	0.	.	1	1745	214	0	.	2	0000	289	0.	
1	0520	65	15	.	1	1135	140	0.	.	1	1750	215	0	.	2	0005	290	0.	
1	0525	66	15	.	1	1140	141	0	.	1	1755	216	0	.	2	0010	291	0	
1	0530	67	14	.	1	1145	142	0.	.	1	1800	217	0	.	2	0015	292	0	
1	0535	68	14	.	1	1150	143	0	.	1	1805	218	0.	.	2	0020	293	0	
1	0540	69	13	.	1	1155	144	0	.	1	1810	219	0.	.	2	0025	294	0.	
1	0545	70	13	.	1	1200	145	0	.	1	1815	220	0	.	2	0030	295	0	
1	0550	71	12	.	1	1205	146	0	.	1	1820	221	0.	.	2	0035	296	0	
1	0555	72	12	.	1	1210	147	0	.	1	1825	222	0.	.	2	0040	297	0.	
1	0600	73	11	.	1	1215	148	0	.	1	1830	223	0	.	2	0045	298	0	
1	0605	74	11	.	1	1220	149	0	.	1	1835	224	0	.	2	0050	299	0	
1	0610	75	10.	.	1	1225	150	0	.	1	1840	225	0	.	2	0055	300	0	

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
114	3.13		22.	6	5	5
		(INCHES)	32.113	32.619	32.619	32.619
		(AC-FT)	11	11	11	11

CUMULATIVE AREA = .01 SQ MI

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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	1A1	41.	3.17	1	1	1	.02		
ROUTED TO	DET1A1	12	3.50	1	1	1	.02	1.71	3.50
ROUTED TO	RA1-C4	11.	3.50	4	1	1	.02	.91	3.50
HYDROGRAPH AT	1C4	9.	3.17	1	0	0	.00		
2 COMBINED AT	CP1C4	15	3.17	4	1	1	.02		
ROUTED TO	RC4-C1	15	3.25	4	1	1	.02	1.05	3.25
HYDROGRAPH AT	1DA3	18	3.08	2	1	1	.01		
ROUTED TO	DE1DA3	3	3.67	2	1	1	.01	2.51	3.67
HYDROGRAPH AT	1DA4	29	3.08	2	1	1	.01		
2 COMBINED AT	CP1DA4	30	3.08	4	1	1	.02		
ROUTED TO	DE1DA4	6	3.58	4	1	1.	.02	3.14	3.58
HYDROGRAPH AT	1DA5	7	3.17	1	0	0	.00		
3 COMBINED AT	CP1C3I	25	3.17	9	3	3	.05		
ROUTED TO	RC3-C1	24	3.25	9	3	3	.05	1.52	3.25
HYDROGRAPH AT	OFF-1A	21	3.08	2.	0	0	.01		
HYDROGRAPH AT									

+		1A2	11.	3 00	1	0	0.	.00		
+	HYDROGRAPH AT	1A3	18	3 00	1	0	0	01		
+	3 COMBINED AT	CPA3	50.	3.08	4	1	1.	.02		
+	ROUTED TO	DETIA3	33	3.17	4	1	1	02	2 83	3 17
+	ROUTED TO	RA3-A6	35	3 25	4	1	1	02	60	3 25
+	HYDROGRAPH AT	1A6	12	3 08	1	0	0	00		
+	2 COMBINED AT	CP1A6	40	3 25	5	1	1	03		
+	ROUTED TO	DET1A6	35	3.33	5	1	1	03	2 07	3 33
+	HYDROGRAPH AT	1A5	43	3 08	1.	1	1	02		
+	2 COMBINED AT	CP1A5	59	3.25	8	2	2	04		
+	ROUTED TO	DET1A5	53	3 33	8	2	2	04	2 96	3 33
+	HYDROGRAPH AT	1A4	27	3 08	2	1	1	01		
+	ROUTED TO	RA1-A7	25	3 17	2	1	1	01	50	3.17
+	ROUTED TO	DET1A4	14	3.33	2	1	1	01	4 65	3 33
+	HYDROGRAPH AT	1A7	21	3 08	2	0	0	01		
+	3 COMBINED AT	CP1A7	75	3 33	12	3	3	06		
+	ROUTED TO	DET1A7	65	3 42	13	3	3	06	1 62	3 42
+	HYDROGRAPH AT	1C1	57	3 17	4	1	1	02		
+	2 COMBINED AT	CP1C1	85	3 33	17	4	4	08		
+	ROUTED TO	DET1C1	70	3 50	16	4	4	08	4 06	3 50
+	HYDROGRAPH AT	1C2	54	3 17	4.	1	1	02		
+	2 COMBINED AT	CP1C2	92.	3.50	21	6	5	11		
+	ROUTED TO	DE1C2A	93	3 50	21	6	5	.11	5 05	3 50
+	ROUTED TO	DE1C2B	90	3 50	21	5	5	11	5 07	3 50
+	ROUTED TO	DE1C2C	92	3 50	21	6	5	11	5 04	3.50
+	HYDROGRAPH AT	1C3	68	3 00	5	1	1	03		
+	3 COMBINED AT	CP1C3	128	3 50	33	10.	9	19		
+	ROUTED TO	DET1C3	109	3 67	33	10	9.	19	2 55	3 67
+	ROUTED TO	RC3COM	108	3 67	33	10	9	19	11 14	3 67
+	HYDROGRAPH AT	COMB	110	3 08	10	2	2	03		
+	ROUTED TO	DETCOM	13	3 67	7	2	2	03		

								2 55	3 67
2 COMBINED AT	CPCOM	119.	3 67	41	12	12.	32		
ROUTED TO	COMOF1	119	3 75	41	12	12	32	11 20	3 75
HYDROGRAPH AT	OFF1	84	3 08	6	2	2	.02		
ROUTED TO	DEOFF1	11.	3 50	6	2	2	02	2 61	3 50
2 COMBINED AT	CPOFF1	130	3.75	16	14	13	34		
ROUTED TO	OF1OF1	129.	3 75	16	14	13	34	11.31	3.75
HYDROGRAPH AT	OFF3	58	3.08	5	1	1.	02		
ROUTED TO	DEOFF3	10.	3 50	5.	1	1	02	2 20	3 50
2 COMBINED AT	CPOFF3	138	3 75	51	15	14	25		
ROUTED TO	13A1	137	3.83	51	15	14	.25		
HYDROGRAPH AT	33A	213.	3 08	17	4	4	05		
2 COMBINED AT	13A3	232	3.08	65.	19	19	31		
HYDROGRAPH AT	1DB	104	3 08	8	2	2	04		
ROUTED TO	OF1DB	11	3.50	7	2	2.	04	2 99	3 58
HYDROGRAPH AT	1DA1	25	3 08	2	0	0	01		
ROUTED TO	DE1DA1	1	3 50	2	0	0	01	2 95	3 50
HYDROGRAPH AT	1DA2	5	3 17	0.	0	0	00		
1 COMBINED AT	CP1DAD	18	3.50	9	3	3	05		
ROUTED TO	RDADE2	15.	3.50	9	3	3.	05	75	3.50
HYDROGRAPH AT	1EA1	41	3 17	4	1	1	02		
ROUTED TO	DE1EA1	4.	3.75	1.	1	1	02	2.81	3 75
HYDROGRAPH AT	11A2	65	3 08	5.	1	1	03		
2 COMBINED AT	CP11A2	66.	3 08	7	2	2	04		
ROUTED TO	DE11A2	16	3 50	7	2	2	04	1 25	3 50
2 COMBINED AT	CP11A2	34	3 50	16	5	5	09		
HYDROGRAPH AT	PARK	37	3 08	3	1	1	02		
HYDROGRAPH AT	SCHOOL	59	3 08	5	1	1	01		
ROUTED TO	DETSCH	17	3 42	1.	1	1	01	2 84	3 42
ROUTED TO	SCH12	12.	3 42	1	1	1	01	10 13	3 42
HYDROGRAPH AT	1BC	33	3 09	1	1	1	01		
ROUTED TO									

	DETEC	9.	3.33	3.	1	1.	01	2.47	3.33
2 COMBINED AT	CP1EC	21	3.43	7	2.	2	02		
ROUTED TO	1ECBAZ	21	3.42	7	2	2	02	10.59	3.17
3 COMBINED AT	CP1EB	67.	3.17	26	7	7	11		
ROUTED TO	RESEPP	67	3.17	26	7.	7	11	10.92	3.17
HYDROGRAPH AT	1EB	151.	3.17	14	3	3	06		
ROUTED TO	DET1EB	39	3.50	13	3	3	06	4.26	3.50
HYDROGRAPH AT	OFF2	121	3.08	11	3	3	03		
ROUTED TO	DEOFF2	11	3.67	8	3	3.	03	2.59	3.67
3 COMBINED AT	CPOFF2	115.	3.50	46	14	13	23		
ROUTED TO	1KF 1	115.	3.50	46	14	13	23		
HYDROGRAPH AT	1KF	118	3.17	13	3	3	05		
ROUTED TO	DET1K	18	3.75	11	3.	3	05	2.77	3.75
2 COMBINED AT	1KF 3	132	3.50	57	17	16	28		
ROUTED TO	1KF 1	132	3.50	57	17	16	28		
HYDROGRAPH AT	1M1	152	3.17	14	4	3	05		
ROUTED TO	DET1M	19	3.42	13	4	3.	05	1.70	3.42
2 COMBINED AT	1M1 2	178	3.50	79	20	20	34		
HYDROGRAPH AT	13E	160.	3.08	12	3	3	04		
HYDROGRAPH AT	13RE	3	3.17	0	0.	0	00		
3 COMBINED AT	11E 2	225	3.17	81	24	23	38		
ROUTED TO	R11E 2	224	3.17	81.	24	23	18		
HYDROGRAPH AT	13D	61	3.17	5	1	1	01		
HYDROGRAPH AT	SIDE7	76	3.08	6	1.	1	02		
3 COMBINED AT	CT13.0	310	3.17	97	26	25	13		
DIVERSION TO	P_ADOT	223	3.17	87	24	23	43		
HYDROGRAPH AT	D_ADOT	117	3.17	10	3	2	13		
HYDROGRAPH AT	13C	126	3.08	9	2	2	03		
HYDROGRAPH AT	540CH	130	3.08	14	4	3	04		
3 COMBINED AT	CT11.1	393	3.08	34	8	8	51		
DIVERSION TO	P-PIPE	30	3.08	13	3	3	51		
HYDROGRAPH AT	D_BAS	363	3.08	21	5	5	51		
DIVERSION TO	D-BAS2	69	3.08	7	1.	0	51		

```
          HYDROGRAPH AT
+                         D_BAS1       363.     3 08          19          5           5          51

          DIVERSION TO
+                         D-SUBF       237      3 17           4          1.          1          51

          HYDROGRAPH AT
+                         D_SURF       309      3 17          15          4           1          51

          HYDROGRAPH AT
+                         B_PIPE        30      2 75          13          3           1.         00

          HYDROGRAPH AT
+                         B_SURF        69      1 00           2          1.          0          00

          3 COMBINED AT
+                          CS40B       339      3.17          10.         7           7          51

          ROUTED TO
+                         S40BAS       159      3 33          29          7           7          51
+                                                                                                         5 52        3 33

          DIVERSION TO
+                         D33C 2       108      3 33          20.         5           5          51

          HYDROGRAPH AT
+                         P33E 1        51.     3 33           9          2           2.         51

          HYDROGRAPH AT
+                         R_ADOT       223      3 17          82         21          23          00

          3 COMBINED AT
+                          33E 1       356      3 25          91.        26          25          51

          ROUTED TO
+                         R33E 1       252      3 33          91         26          25          51

          HYDROGRAPH AT
+                           ASLP        90      3 17           7          2           2          05

          2 COMBINED AT
+                         CPPRIS       300      3 25          98         28          27          56

          HYDROGRAPH AT
+                         R33C 2       108      3 33          26          5           5.         00

          HYDROGRAPH AT
+                          S40WT        31      3 08           2          1           0         .01

          2 COMBINED AT
+                          33C 2       114      3 33          22          5           5          01
1
                                    SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                        (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                     INTERPOLATED TO
                                                                                COMPUTATION INTERVAL
            ISTAQ     ELEMENT       DT        PEAK     TIME TO       VOLUME       DT        PEAK    TIME TO        VOLUME
                                                         PEAK                                          PEAK

                                  (MIN)       (CFS)      (MIN)        (IN)      (MIN)      (CFS)     (MIN)          (IN)

                33A1  MANE         1.88     138 05     228 99        2 21       5 00     137.32     210 00          2 21

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2975E+02 EXCESS= 0000E+00 OUTFLOW= 2974E+02 BASIN STORAGE= 7425E-02 PERCENT ERROR=      0

                 33A  MANE           94     235 59     186 25        2 93       5 00     213 27     185.00          2 93

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 8119E+01 OUTFLOW= 8121E+01 BASIN STORAGE  3781E-03 PERCENT ERROR=     -1

               1Kr 1  MANE          .88     115 21     210 94        2 20       5 00     115 14     210 00          2 20

CONTINUITY SUMMARY (AC FT) - INFLOW= 2702E+02 EXCESS= 0000E+00 OUTFLOW= 2702E+03 BASIN STORAGE= 3402E-02 PERCENT ERROR=      0

               1Sr 1  MANE         1 01     132 38     212 01        2 22       5 00     131 65     210 00          2 22

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3141E+02 EXCESS= 0000E+00 OUTFLOW= 3311E+02 BASIN STORAGE= 5096E 02 PERCENT ERROR=      0

                 33C  MANE         1 58     168 66     186 51        2 90       5 00     159 61     185.00          2 91

CONTINUITY SUMMARY (AC-FT)   INFLOW= 0000E+00 EXCESS= 6117E+01 OUTFLOW= 6111E+01 BASIN STORAGE= 6650E-04 PERCENT ERROR=      1

                33BE  MANE         3.45       3 22     190 37        2 70       5 00       3 19     190 00          2 75

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 1633E+00 OUTFLOW= 1630E+00 BASIN STORAGE= 1193E-04 PERCENT ERROR=      2

              R33E 2  MANE           67     224 58     190 57        2 34       5 00     224 36     190 00          2 33

CONTINUITY SUMMARY (AC-FT) - INFLOW= 4587E+02 EXCESS= 0000E+00 OUTFLOW= 4587E+02 BASIN STORAGE= 1478E-02 PERCENT ERROR=      0
```

33D MANE 2.02 54 29 192.41 1 22 5 00 51 02 190 00 1 22

CONTINUITY SUMMARY (AC-FT) - INFLOW .0000E+00 EXCESS= .2639E+01 OUTFLOW= .2627E+01 BASIN STORAGE= .1883E-01 PERCENT ERROR= 5

S10ET MANE 85 79 65 180 49 2.94 5 00 76 00 185 00 2 95

CONTINUITY SUMMARY (AC FT) INFLOW= .0000E+00 EXCESS= .2873E+01 OUTFLOW= .2871E+01 BASIN STORAGE .1120E-01 PERCENT ERROR= 0

33C MANE 51 129.46 185 80 2 96 5 00 125 66 185 00 2 97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4670E+01 OUTFLOW= .4675E+01 BASIN STORAGE= .1952E-01 PERCENT ERROR= 1

S40CN MANE 57 187.23 186 05 2.96 5 00 179 92 185.00 2 97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7080E+01 OUTFLOW= .7077E+01 BASIN STORAGE= .4086E-01 PERCENT ERROR= 0

R33E 1 MANE 3 45 255 03 201 54 1 92 5 00 251 70 200.00 1 92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5208E+02 EXCESS= .0000E+00 OUTFLOW= .5103E+02 BASIN STORAGE= .2109E+01 PERCENT ERROR= 1

AGLD MANE 2 70 91.21 190 26 1 23 5 00 89 79 190 00 1 23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3491E+01 OUTFLOW= .3478E+01 BASIN STORAGE= .2007E-03 PERCENT ERROR= 4

S40ET MANE 33 31 72 184 75 3.00 5 00 31 47 185 00 3 01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1009E+01 OUTFLOW= .1008E+01 BASIN STORAGE= .4154E-05 PERCENT ERROR= 1

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIA1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3 00	3 00
STORAGE	0	2	2
OUTFLOW	0	20	20

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	1 73	.00	1	12	.00	3 50	.00

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDA3
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3 00	3 00
STORAGE	0.	1	1
OUTFLOW	0	4.	4.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 51	.00	1.	3	.00	3 67	.00

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDA4
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	4	4

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 14	.14	1	4	1.42	3 58	.00

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIA1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	2 50	2 50
STORAGE	0	0	0
OUTFLOW	0	22	22.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 31	.14	0	33	.25	3 17	.00

1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIA6
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2.50	2.50
STORAGE	0.	0	0
OUTFLOW	0.	22	22

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.87	.37	0.	35.	33	3.33	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A5
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2 50
STORAGE	0	1	1.
OUTFLOW	0	34	34

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 96	46	1	51	33	3 33	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A4
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2 50
STORAGE	0	0	0
OUTFLOW	0	11.	11

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 65	15	0	14	17	3 23	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A7
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2.50
STORAGE	0	1	1
OUTFLOW	0	11	11.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 62	1 12	1	66	1 50	3 42	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11C1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	2.	2
OUTFLOW	0	14.	14.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	4 86	1 26	2	78	1 83	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2A
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3.60	3 60
STORAGE	0	0	0
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 05	1 45	1	93	2 75	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2B
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	1	1
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 02	1 42	1	90	2 92	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2C

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	1.	1.
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 04	1.44	1.	92.	3 00	3.50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DET1C3

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 50	3 50
STORAGE	0	1	1
OUTFLOW	0	150.	150.

RATIO OF PMF	MAXIMUM RESERVOIR W S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 55	00	1	109	00	3 67	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETCOM

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	4	4
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 55	00	3	11	00	3 67	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF1

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3.00
STORAGE	0	2	2
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 61	00	2	11	00	3.50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF4

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . . . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3.00	3.00
STORAGE	0	2	2
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 20	00	2	10	00	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDB

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	3	3.
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 99	.00	3	13	00	3 58	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDA1

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	4	4

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2 95	00	1	4	00	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Ea1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . . . . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0.	2.	2
OUTFLOW	0	:	1

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 81	00	1	1.	00	3 75	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Ea2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	1 00	3 00
STORAGE	0	2	2.
OUTFLOW	0	10.	10

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 25	25	2	16	67	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETSCH
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 84	00	1.	12	00	3.42	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIIc
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	11	11

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 47	00	1	9	00	3 33	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIGD
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5
OUTFLOW	0.	52	52

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 76	00	4	39	00	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFFJ
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 59	00	4.	12	00	3 67	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIK
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5.
OUTFLOW	0	29	29

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS

1 00	2.77	.00	4	18.	00	3.75	.00

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIH
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ...

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	3.	3
OUTFLOW	0	20.	30

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 70	70	4	49	.83	3 42	00

*** NORMAL END OF HEC-1 ***

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: Interim Regional Drainage Chan

Project Description:

Drainage Point: 404 Wash

Location: Channel Station 24+00

Drainage Basin Data

Water Course Length: 820.00 ft

Basin Area: 3.220 acres

High Elevation: 1581.00 ft

Low Elevation: 1570.00 ft

Average Slope: 0.0134 ft/ft

Roughness, Kb: 0.0368 (A)

10-Year Runoff Coefficient: 0.400

10-Year 6 Hour Rainfall Depth: 2.10 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	4	6	7	9	12	14
C	0.400	0.400	0.400	0.440	0.480	0.500
Tc (min)	8 3	7.3	6.8	6.3	6.0	5.7
i (in/hr)	3.2	4.4	5.3	6.6	7.6	8.8

Computed by JMG, Wood, Patel & Associates
Thursday, May 08, 2008 10.08 51 a

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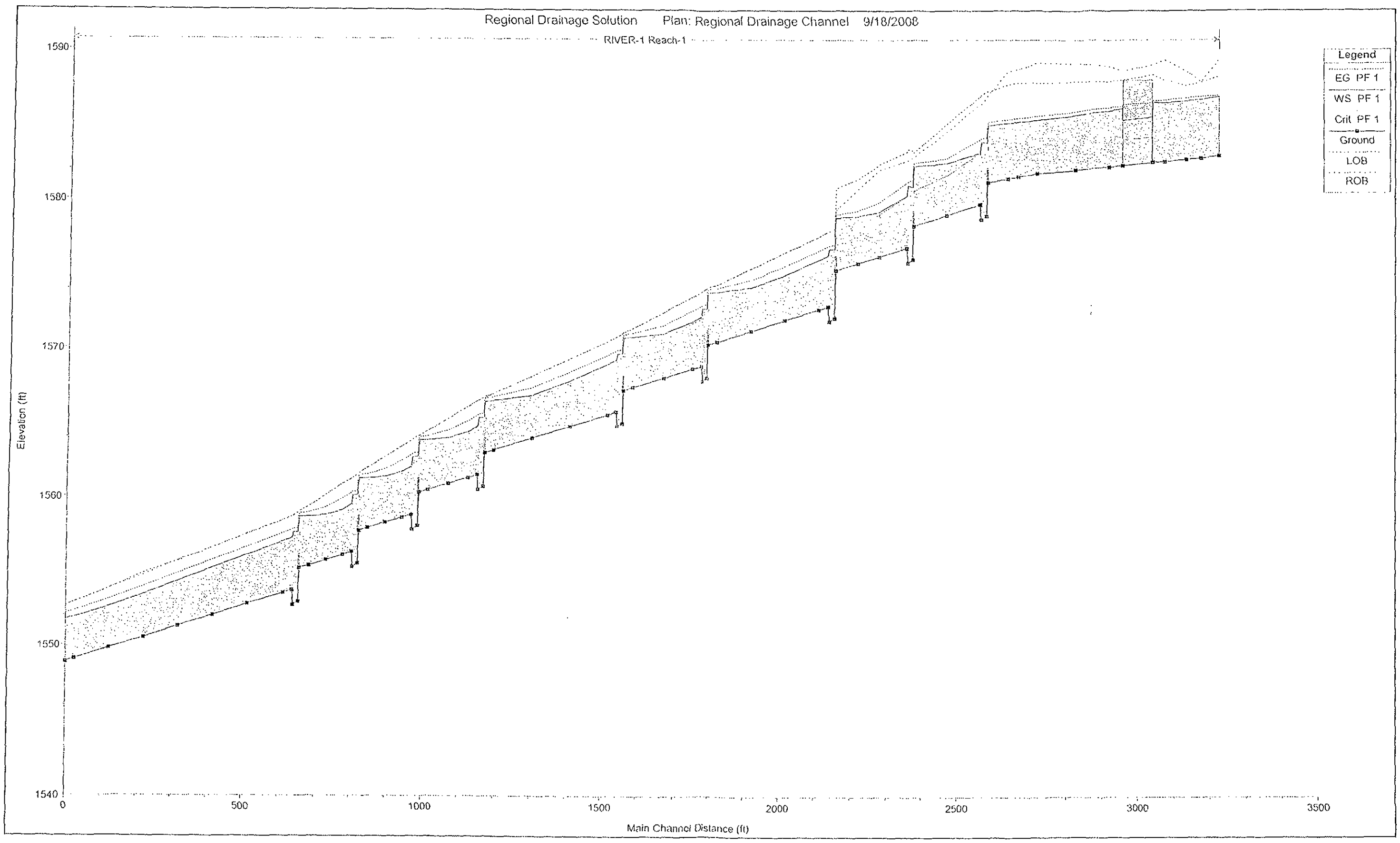
APPENDIX B

Hydraulic Calculations

HEC-RAS Plan: RDC 100 River: RIVER-1 Reach: Reach-1 Profile: PF 1

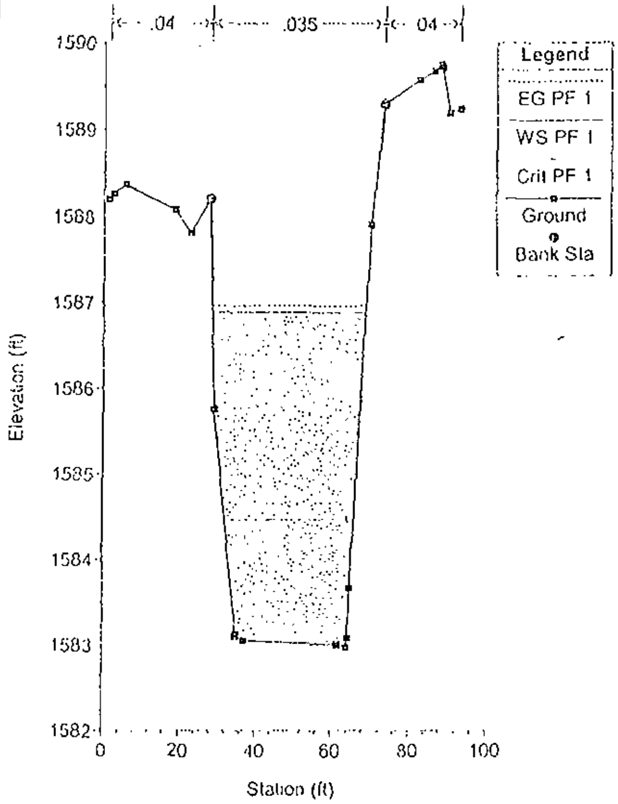
River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	LOB Elev (ft)	ROB Elev (ft)	Flow Depth (ft)	Freeboard Req (ft)	Freeboard Prov (ft)
4222	300	1582.97	1586.88	1586.96	0.000577	2.20	136.44	40.32	0.21	1588.20	1589.30	3.91	1.02	1.32
4172	300	1582.80	1586.70	1586.89	0.002174	3.58	83.81	33.20	0.40	1587.82	1587.84	3.90	1.07	1.12
4130	300	1582.73	1586.61	1586.80	0.002152	3.55	84.36	33.53	0.40	1587.60	1588.56	3.88	1.07	0.99
4070	300	1582.59	1586.50	1586.68	0.001859	3.38	88.72	34.04	0.37	1588.00	1589.33	3.91	1.07	1.50
4039	300	1582.53	1586.49	1586.62	0.001065	2.91	103.17	26.10	0.26	1588.33	1588.98	3.96	1.06	1.84
4004	Culvert													
3953	300	1582.33	1586.12	1586.26	0.001218	3.04	98.73	26.07	0.28	1587.99	1588.61	3.79	1.02	1.87
3915	300	1582.25	1585.96	1586.19	0.002674	3.87	77.54	31.91	0.44	1587.00	1588.90	3.71	1.04	1.94
3819	300	1582.04	1585.68	1585.92	0.002809	3.93	76.32	31.87	0.45	1587.90	1589.11	3.64	1.03	2.22
3715	300	1581.80	1585.36	1585.62	0.003119	4.09	73.44	31.32	0.47	1587.80	1589.14	3.56	1.02	2.44
3663	300	1581.57	1585.22	1585.46	0.002787	3.92	76.60	31.99	0.45	1587.80	1588.70	3.65	1.03	2.58
3635	300	1581.44	1585.15	1585.38	0.002613	3.83	78.43	32.32	0.43	1587.70	1588.57	3.71	1.04	2.55
3582	300	1581.19	1585.03	1585.25	0.002239	3.75	79.99	29.78	0.40	1587.23	1587.03	3.84	1.07	2.00
3581	Inl Struct													
3579	300	1578.96	1583.86	1584.21	0.004005	4.74	63.31	25.18	0.53	1587.24	1586.88	4.90	1.40	3.02
3564	300	1578.70	1583.90	1584.13	0.002489	3.84	78.11	30.25	0.42	1587.02	1586.40	5.20	1.41	2.50
3561	300	1579.71	1583.16	1584.05	0.016160	7.55	39.76	23.04	1.01	1586.89	1586.40	3.45	1.31	3.24
3467	300	1579.00	1582.50	1582.81	0.004580	4.51	66.59	33.05	0.56	1585.10	1584.55	3.50	1.03	2.05
3374	300	1578.30	1582.30	1582.51	0.002052	3.70	81.10	28.57	0.39	1583.20	1582.91	4.00	1.11	0.61
3373	Inl Struct													
3371	300	1576.07	1580.88	1581.30	0.006206	5.66	52.99	22.05	0.64	1583.36	1582.90	4.81	1.45	2.02
3359	300	1575.82	1581.00	1581.24	0.002647	3.91	76.65	30.23	0.43	1583.42	1582.70	5.18	1.41	1.70
3353	300	1576.82	1580.29	1581.16	0.015790	7.48	40.09	23.11	1.00	1583.22	1582.64	3.47	1.30	2.35
3276	300	1576.24	1579.23	1579.86	0.011545	6.38	47.00	27.66	0.86	1582.40	1582.03	2.99	1.06	2.00
3216	300	1575.79	1578.94	1579.31	0.005728	4.87	61.57	32.20	0.62	1581.40	1580.73	3.15	1.00	1.79
3156	300	1575.34	1578.84	1579.04	0.002516	3.56	84.27	38.12	0.42	1580.80	1579.34	3.50	1.00	0.50
3155	Inl Struct													
3152	300	1572.09	1576.77	1577.04	0.003261	4.13	72.56	31.02	0.48	1578.10	1578.13	4.68	1.30	1.33
3138	300	1571.86	1576.76	1576.98	0.002556	3.77	79.48	32.42	0.42	1577.91	1577.91	4.90	1.34	1.15
3135	300	1572.86	1576.31	1576.93	0.011152	6.29	47.70	27.67	0.84	1577.86	1577.90	3.45	1.17	1.55
3110	300	1572.67	1576.04	1576.65	0.010850	6.25	47.99	27.72	0.84	1577.58	1577.58	3.37	1.15	1.54
3014	300	1571.95	1575.00	1575.61	0.010923	6.25	47.99	27.94	0.84	1576.51	1576.51	3.05	1.07	1.51
2918	300	1571.20	1574.18	1574.67	0.008218	5.59	53.71	30.00	0.74	1575.43	1575.43	2.98	1.00	1.25
2822	300	1570.50	1573.89	1574.12	0.003236	3.92	76.54	35.19	0.47	1574.36	1574.36	3.39	1.00	0.47
2797	300	1570.30	1573.84	1574.01	0.002621	3.63	82.62	37.37	0.43	1574.17	1574.17	3.54	1.00	0.33
2796	Inl Struct													
2794	300	1568.08	1572.74	1573.01	0.003367	4.19	71.66	30.83	0.48	1574.12	1574.12	4.66	1.30	1.38
2779	300	1567.85	1572.72	1572.95	0.002625	3.81	78.66	32.24	0.43	1573.90	1573.90	4.87	1.33	1.18
2776	300	1568.85	1572.20	1572.89	0.013016	6.65	45.11	26.93	0.91	1573.05	1573.85	3.35	1.18	1.65
2751	300	1568.66	1571.84	1572.56	0.013511	6.79	44.21	26.63	0.93	1573.52	1573.52	3.18	1.15	1.68
2668	300	1568.04	1571.02	1571.57	0.009690	5.97	50.23	23.66	0.80	1572.43	1572.43	2.98	1.02	1.41
2586	300	1567.40	1570.78	1571.03	0.003459	4.03	74.45	35.48	0.49	1571.35	1571.35	3.38	1.00	0.57
2561	300	1567.20	1570.74	1570.94	0.002633	3.64	82.40	37.34	0.43	1571.07	1571.10	3.54	1.00	0.33
2559	Inl Struct													
2557	300	1564.98	1569.66	1569.93	0.003263	4.14	72.51	31.01	0.48	1571.00	1571.02	4.68	1.30	1.34
2543	300	1564.80	1569.65	1569.87	0.002573	3.78	79.42	32.59	0.43	1570.80	1570.80	4.85	1.32	1.15
2540	300	1565.75	1569.23	1569.82	0.010714	6.18	48.52	27.91	0.83	1570.75	1570.75	3.48	1.17	1.52
2515	300	1565.56	1568.96	1569.55	0.010483	6.17	48.63	27.92	0.82	1570.47	1570.47	3.40	1.15	1.51
2408	300	1564.76	1567.84	1568.43	0.010601	6.18	48.55	28.14	0.83	1569.32	1569.32	3.08	1.07	1.48
2302	300	1563.97	1566.87	1567.30	0.008824	5.73	52.37	29.71	0.76	1568.16	1568.16	2.90	1.00	1.29
2196	300	1563.17	1566.52	1566.76	0.003297	3.94	76.09	36.17	0.48	1567.00	1567.00	3.35	1.00	0.48
2171	300	1562.98	1566.47	1566.68	0.002687	3.66	81.91	37.25	0.44	1566.72	1566.82	3.49	1.00	0.25
2170	Inl Struct													
2168	300	1560.72	1565.38	1565.65	0.003387	4.10	71.69	30.74	0.48	1566.69	1566.77	4.66	1.30	1.31
2153	300	1560.50	1565.36	1565.59	0.002655	3.83	78.23	32.12	0.43	1566.50	1566.50	4.86	1.33	1.14
2150	300	1561.49	1564.78	1565.52	0.014412	6.93	43.32	26.32	0.95	1566.49	1566.49	3.29	1.20	1.71
2125	300	1561.30	1564.40	1565.16	0.014646	7.00	42.84	26.16	0.96	1566.13	1566.10	3.10	1.16	1.70
2071	300	1560.90	1563.98	1564.49	0.009524	5.69	52.99	29.33	0.75	1565.33	1565.33	3.08	1.02	1.35
2015	300	1560.49	1563.85	1564.11	0.003655	4.12	72.78	34.92	0.50	1564.49	1564.49	3.36	1.00	0.64
1990	300	1560.29	1563.82	1564.02	0.002561	3.60	83.30	37.49	0.43	1564.13	1564.13	3.53	1.00	0.31
1989	Inl Struct													
1986	300	1558.04	1562.70	1562.97	0.003360	4.17	71.94	30.82	0.48	1564.10	1564.08	4.66	1.30	1.38
1972	300	1557.81	1562.69	1562.92	0.002601	3.80	78.85	32.25	0.43	1563.90	1563.86	4.88	1.33	1.17
1969	300	1558.81	1562.04	1562.84	0.015946	7.19	41.71	25.88	1.00	1563.81	1563.81	3.23	1.21	1.77
1944	300	1558.60	1561.69	1562.45	0.014631	6.99	42.89	26.22	0.96	1563.43	1563.40	3.09	1.15	1.71
1896	300	1558.27	1561.37	1561.86	0.008189	5.61	53.49	29.55	0.73	1562.69	1562.69	3.10	1.02	1.32
1849	300	1557.92	1561.27	1561.54	0.003791	4.19	71.68	34.47	0.51	1561.96	1562.00	3.35	1.00	0.69
1824	300	1557.70	1561.24	1561.44	0.002625	3.63	82.56	37.35	0.43	1561.57	1561.60	3.54	1.00	0.33
1822	Inl Struct													
1821	300	1555.48	1560.14	1560.41	0.003364	4.18	71.70	30.83	0.48	1561.52	1561.52	4.66	1.30	1.38
1806	300	1555.25	1560.12	1560.35	0.002643	3.82	78.61	32.23	0.43	1561.30	1561.30	4.87	1.33	1.18
1803	300	1556.30	1559.51	1560.28	0.015062	7.05	42.56	26.10	0.97	1561.20	1561.25	3.21	1.19	1.69
1778	300	1556.06	1559.11	1559.90	0.015490	7.15	41.96	25.92	0.99	1560.86	1560.90	3.05	1.16	1.75
1731	300	1555.70	1558.80	1559.29	0.008204	5.61	53.44	29.53	0.74	1560.13	1560.13	3.10	1.02	1.33
1683	300	1555.35	1558.70	1558.97	0.003783	4.18	71.72	34.54	0.51	1559.39	1559.40	3.35	1.00	0.69
1658	300	1555.16	1558.66	1558.87	0.002707	3.67	81.66	37.17	0.44	1559.00	1559.00	3.50	1.00	0.34
1657	Inl Struct													
1655	300	1552.91	1557.63	1557.88	0.003131	4.07	73.68	31.12	0.47	1558.95	1558.95	4.72	1.31	1.32
1640	300	1552.68	1557.61	1557.83	0.002403	3.73	80.39	32.63	0.42	1558.73	1558.70	4.93	1.34	1.09
1637	300	1553.68	1557.24	1557.78	0.009394	5.91	50.80	28.45	0.78	1558.60	1558.70	3.56	1.16	1.44
1612	300	1553.49	1557.00	1557.55	0.009394	5.92	50.69	28.53	0.78	1558.40	1558.44	3.51	1.15	1.40
1514	300	1552.76	1556.09	1556.63	0.009303	5.90	50.87	28.61	0.78	1557.50	1557.51	3.33	1.10	1.41
1416	300	1552.00	1555.19	1555.72	0.009139	5.85	51.29	28.86	0.77	1556.58	1556.58	3.19	1.06	1.39
1319	300	1551.28	1554.30	1554.83	0.009087	5.82	51.55	29.16	0.77	1555.65	1555.70	3.02	1.02	1.35
1221	300	1550.50	1553.43	1553.94	0.008964	5.76	52.05	29.60	0.77	1554.85	1554.70	2.93	1.00	1.27
1123	300	1549.80	1552.58	1553.07	0.008680	5.66	52.97	30.24	0.75	1553.79	1553.80	2.78	1.00	1.21
1025	300	1549.08	1551.87	1552.29	0.007044	5.21	57.60	31.90	0.68	1552.87	1552.87	2.79	1.00	1.00
1000	300	1548.89	1551.73	1552.11	0.006105	4.95	60.59	32.77	0.64	1552.63	1552.63	2.84	1.00	0.90



Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
1590
1580
1570
1560
1550
1540
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)

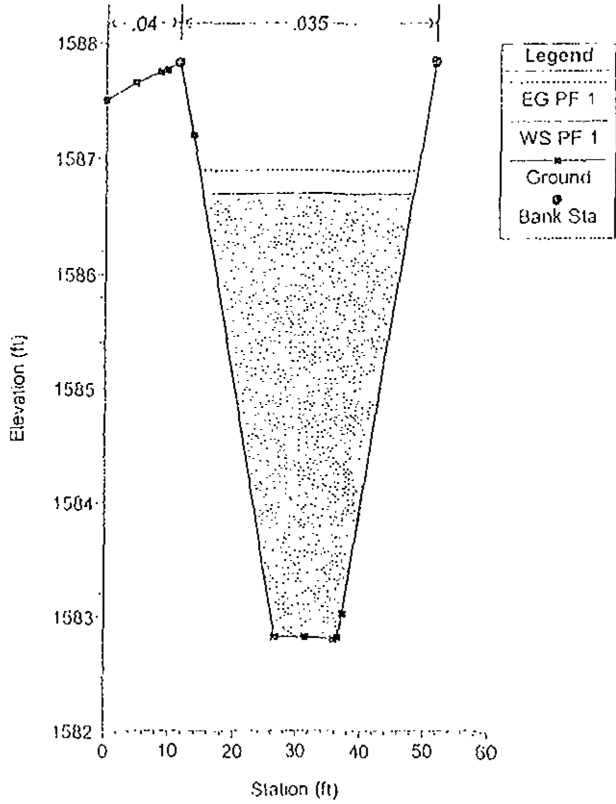
Regional Drainage Solution   Plan: Regional Drainage Channel   9/10/2008

River = RIVER-1   Reach = Reach-1   RS = 4222



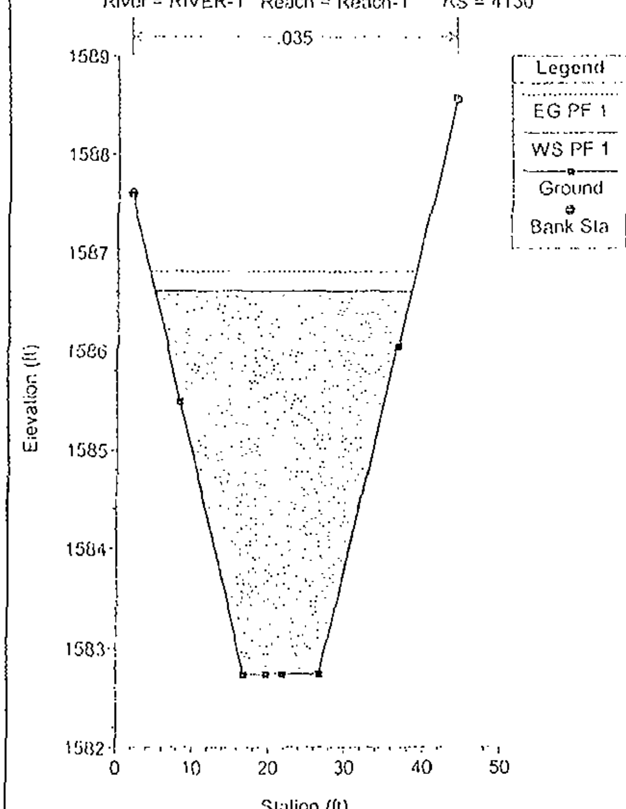
Regional Drainage Solution   Plan: Regional Drainage Channel   9/10/2008

River = RIVER-1   Reach = Reach-1   RS = 4172



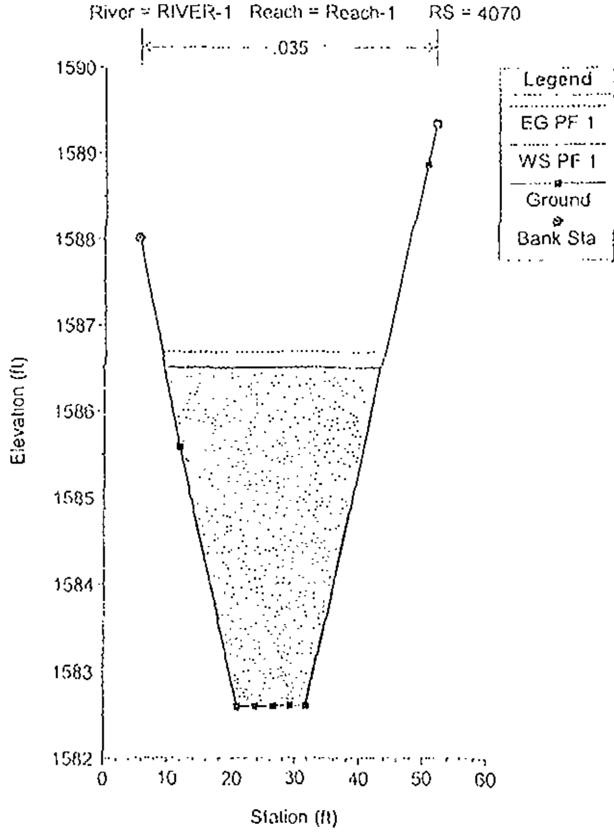
Regional Drainage Solution   Plan: Regional Drainage Channel   9/10/2008

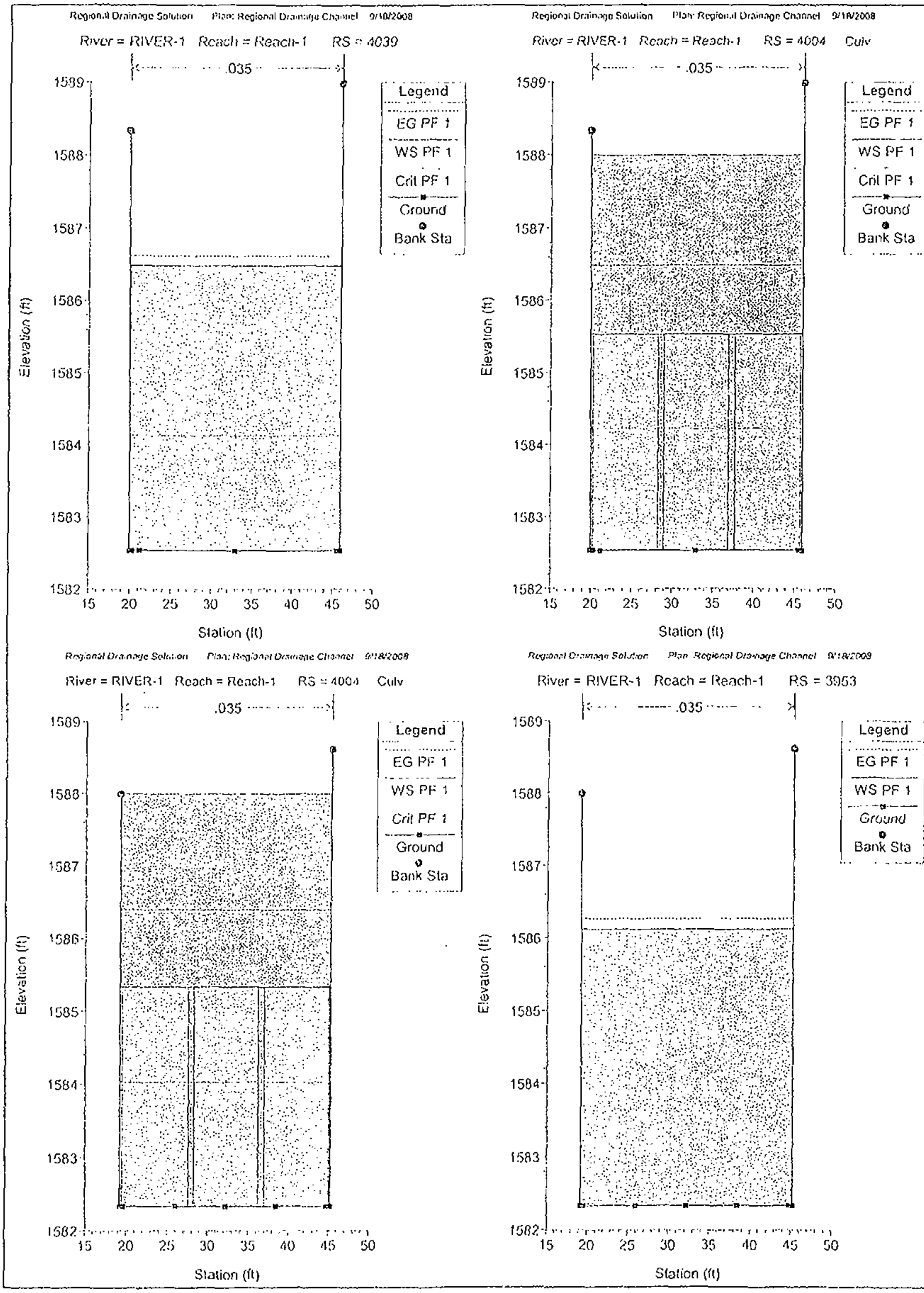
River = RIVER-1   Reach = Reach-1   RS = 4130



Regional Drainage Solution   Plan: Regional Drainage Channel   9/10/2008

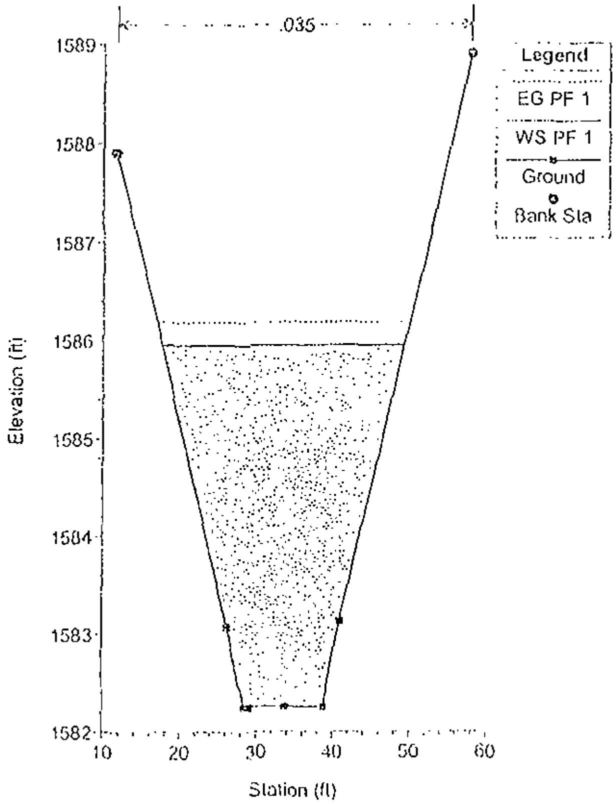
River = RIVER-1   Reach = Reach-1   RS = 4070




Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4039
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1582
1583
1584
1585
1586
1587
1588
1589
15
20
25
30
35
40
45
50
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4004 Culv
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4004 Culv
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3953
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

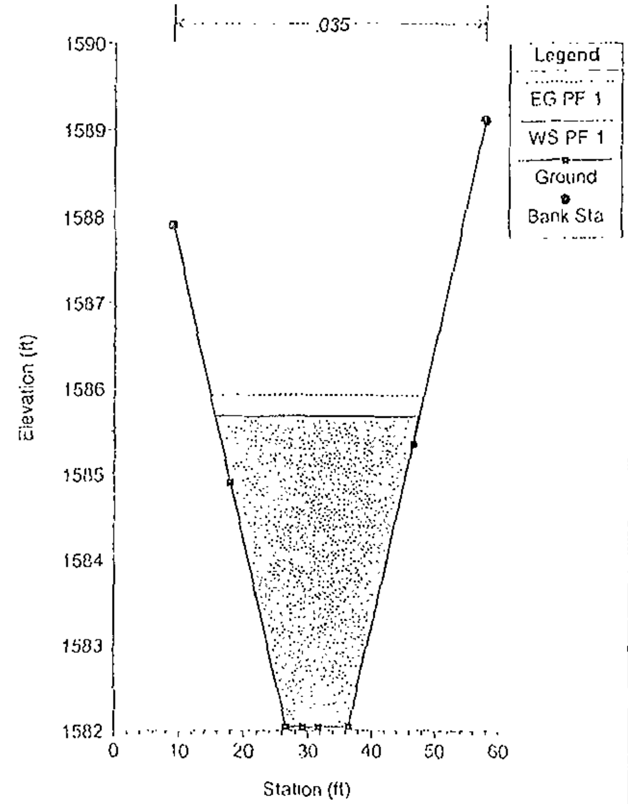
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008

River = RIVER-1 Reach = Reach-1 RS = 3915



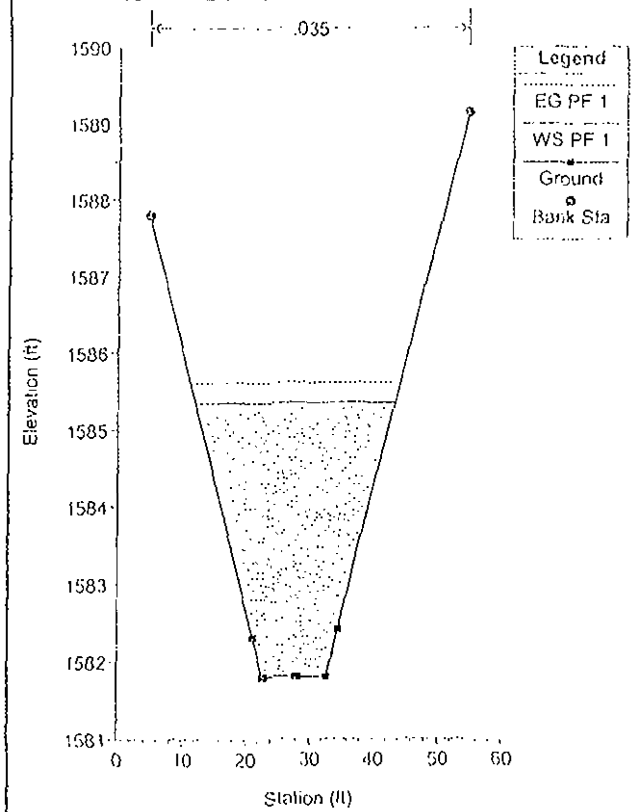
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008

River = RIVER-1 Reach = Reach-1 RS = 3819



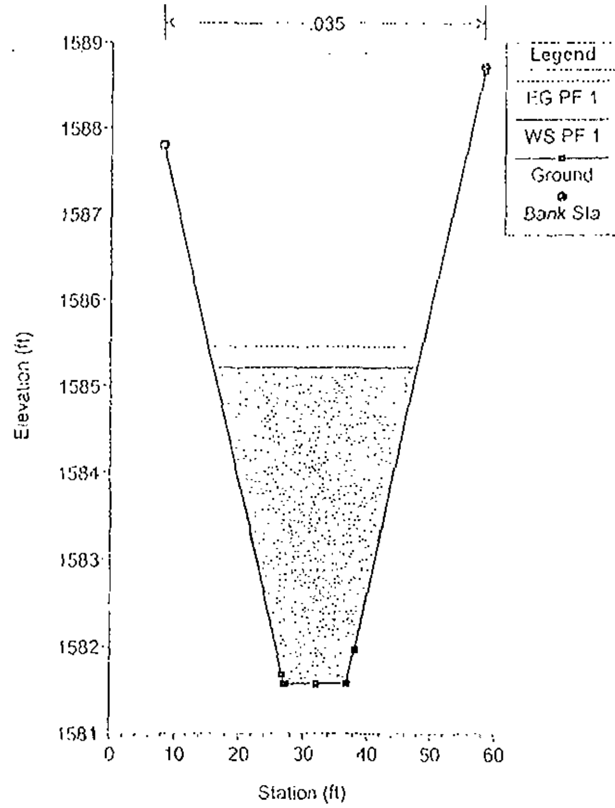
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008

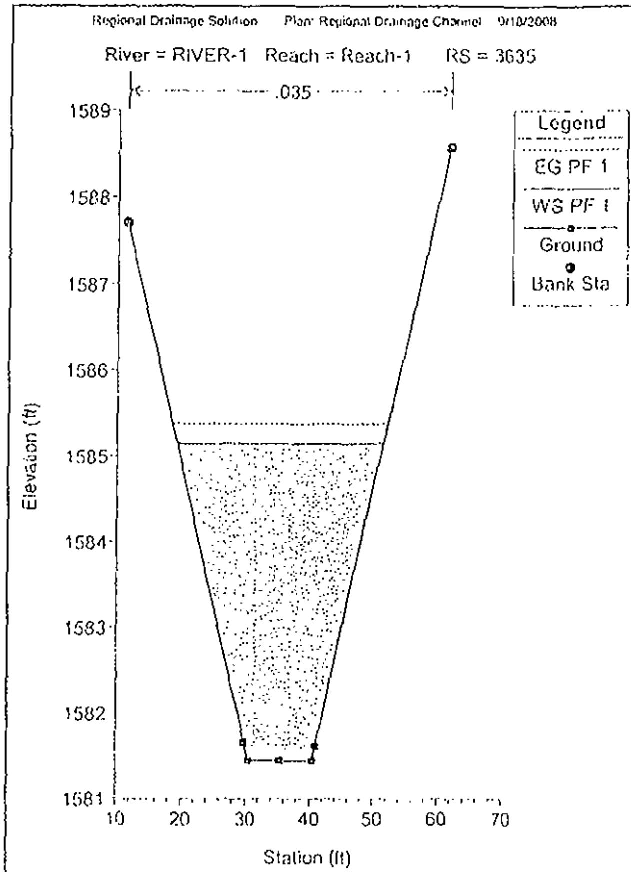
River = RIVER-1 Reach = Reach-1 RS = 3715

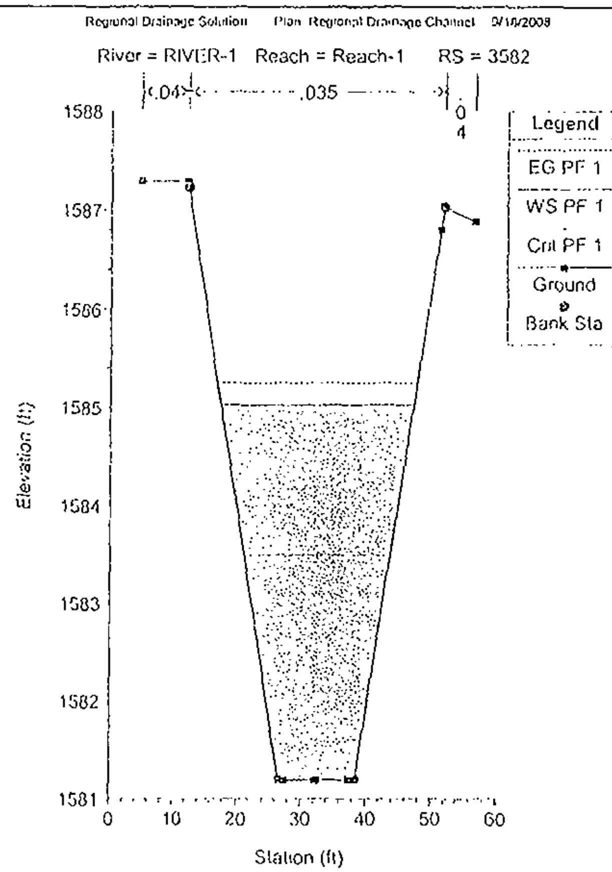


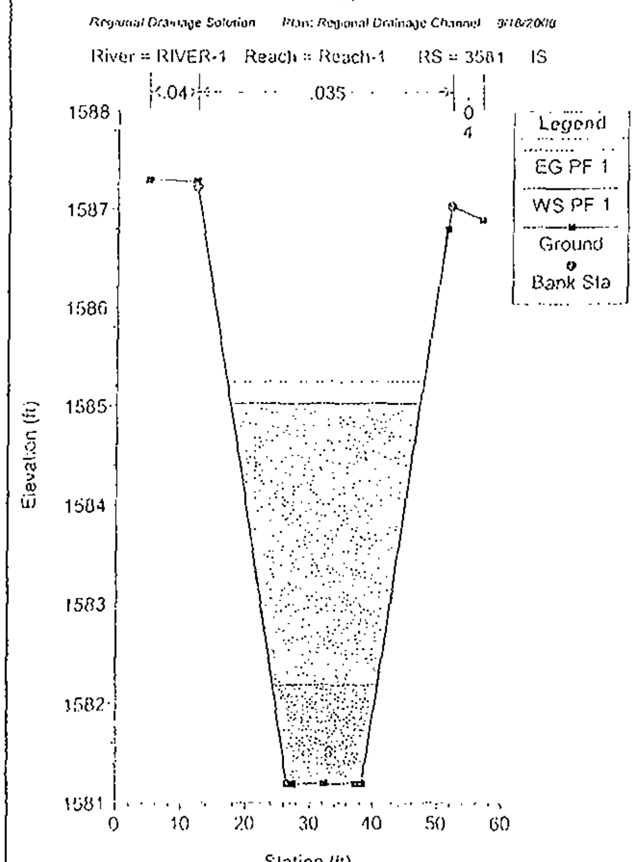
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008

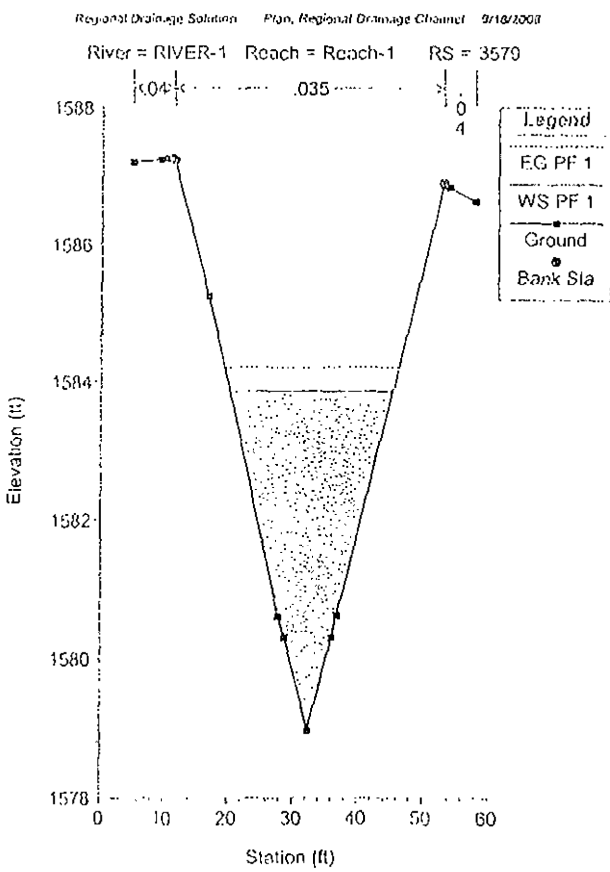
River = RIVER-1 Reach = Reach-1 RS = 3663

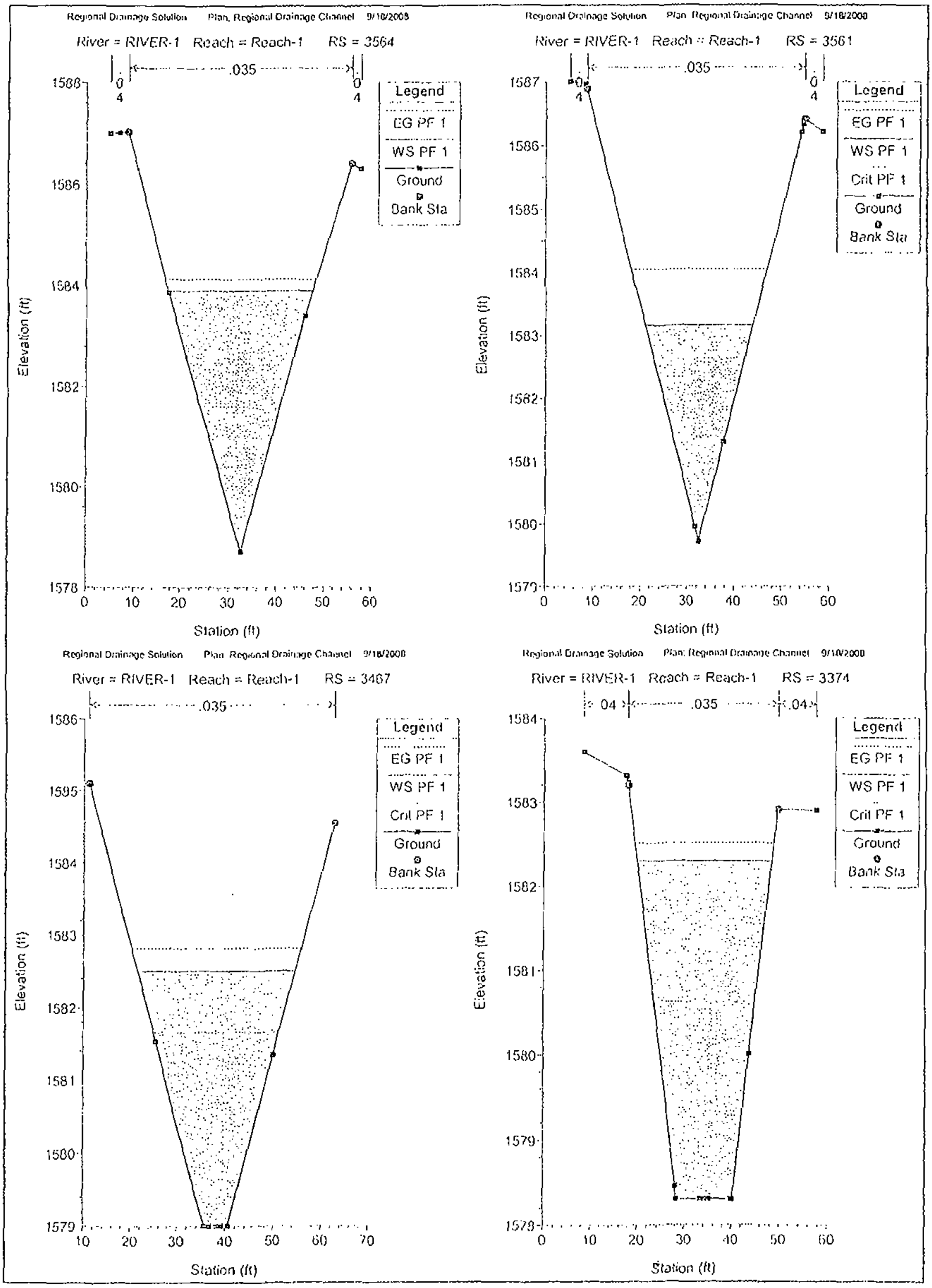


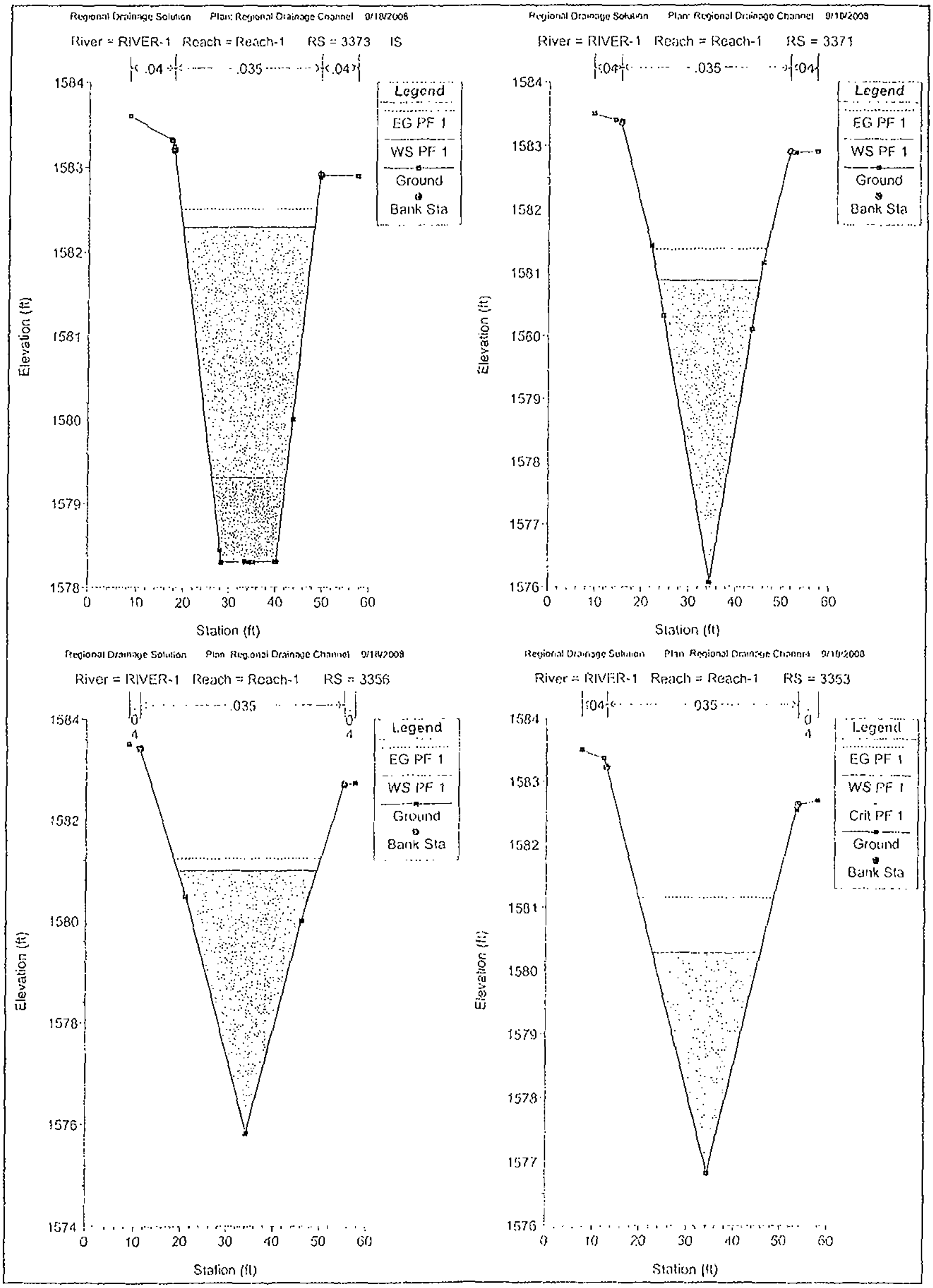

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3635
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

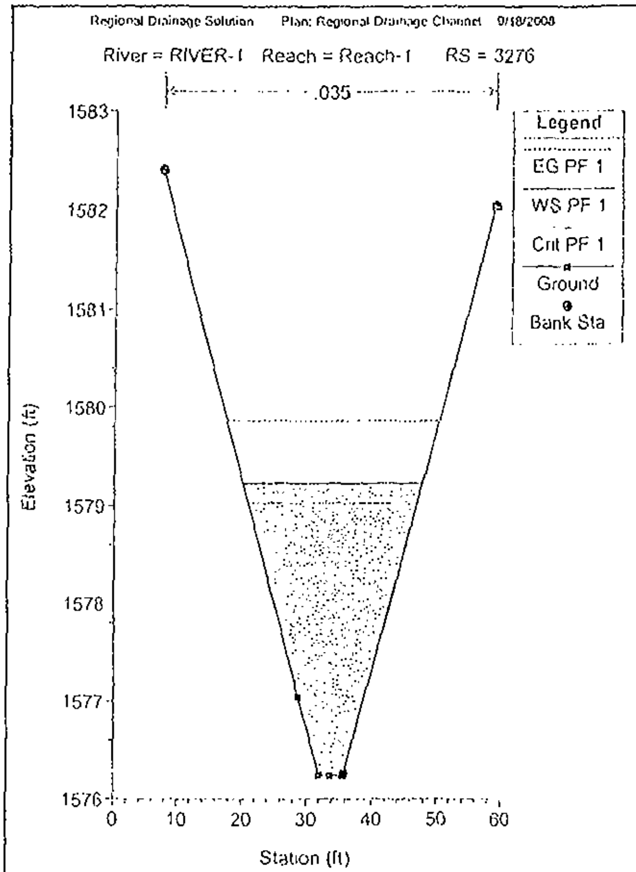

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3582
.04
.035
0
4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

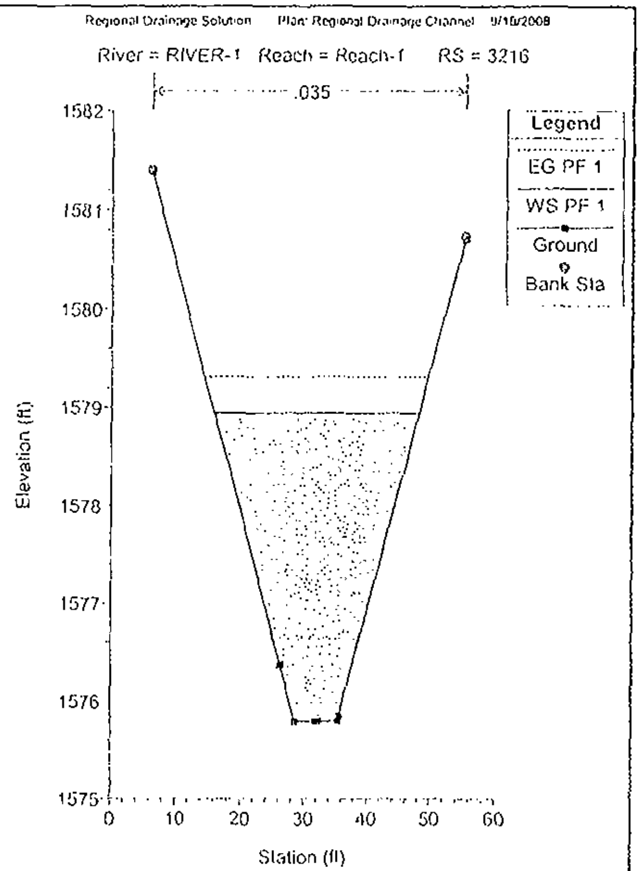

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3581 IS
.04
.035
0
4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

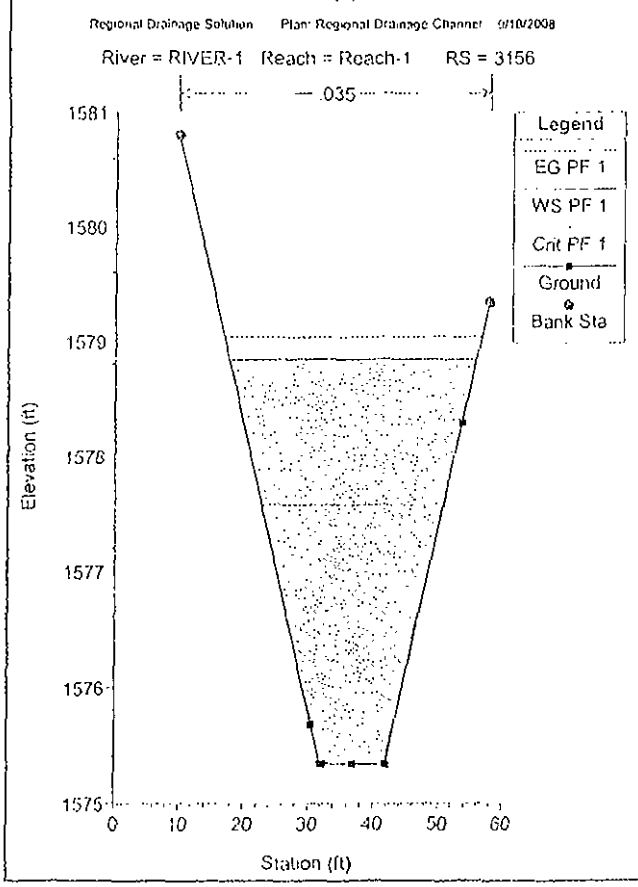

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3570
.04
.035
0
4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

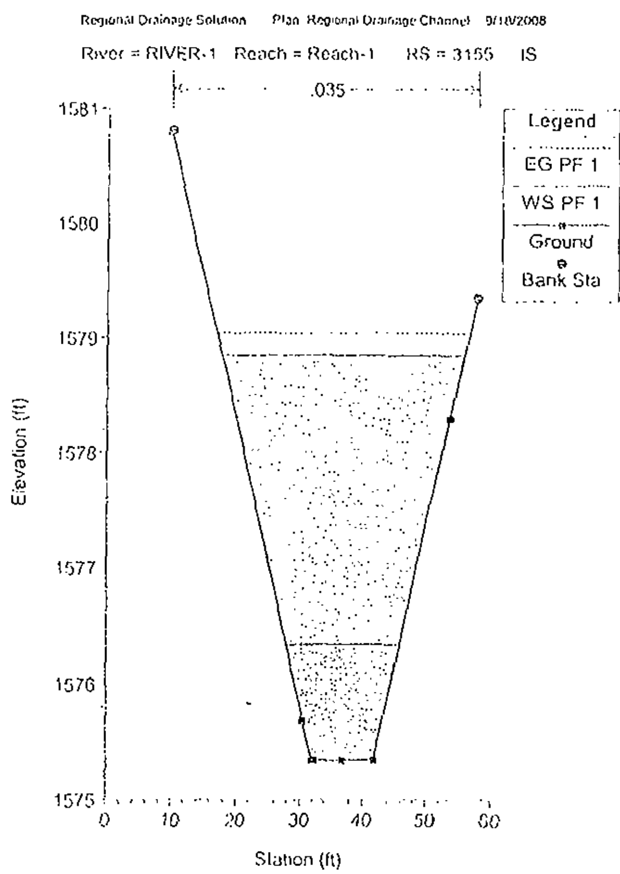

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3564
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3561
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3467
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3374
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

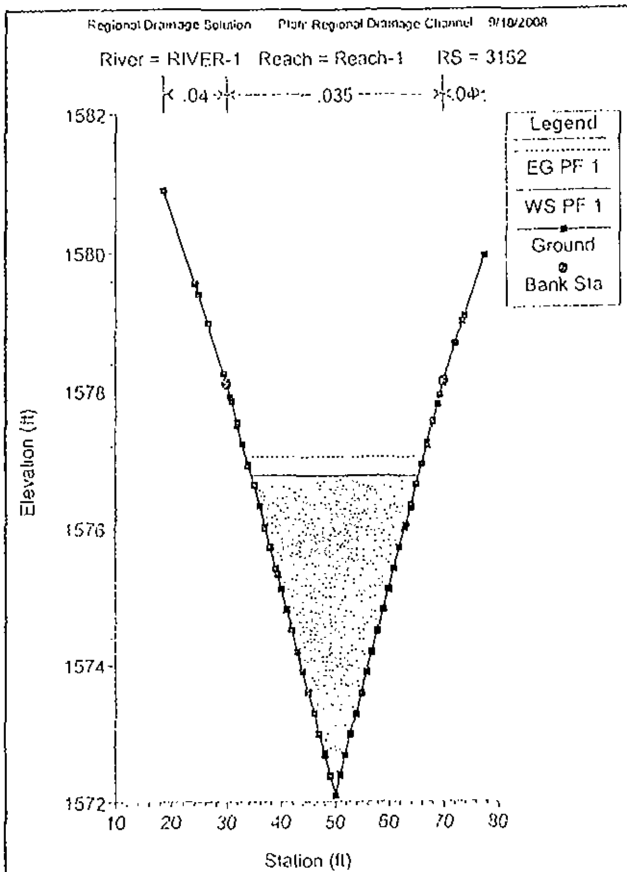

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3373 IS
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3371
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3356
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3353
.04 .035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

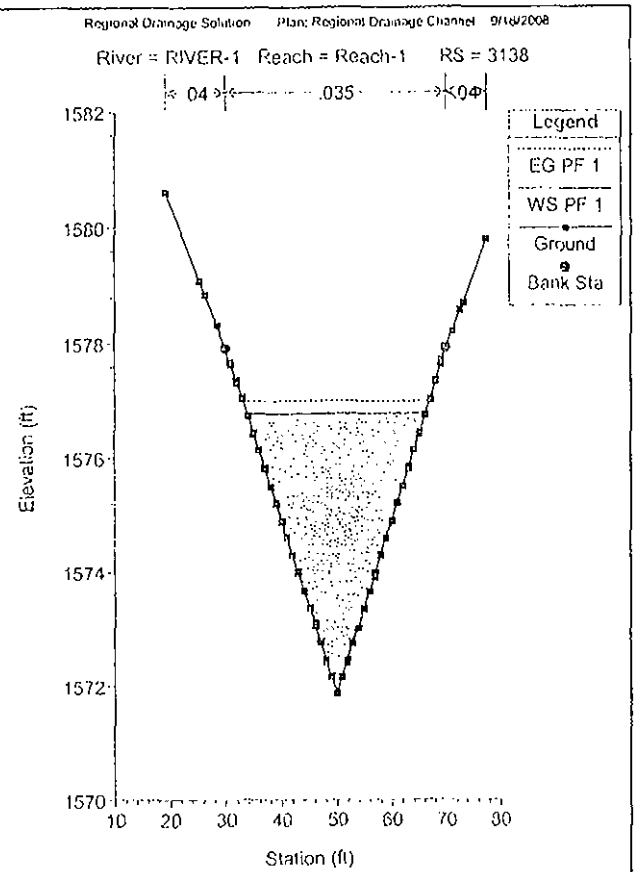

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3276
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1583
1582
1581
1580
1579
1578
1577
1576
0
10
20
30
40
50
60

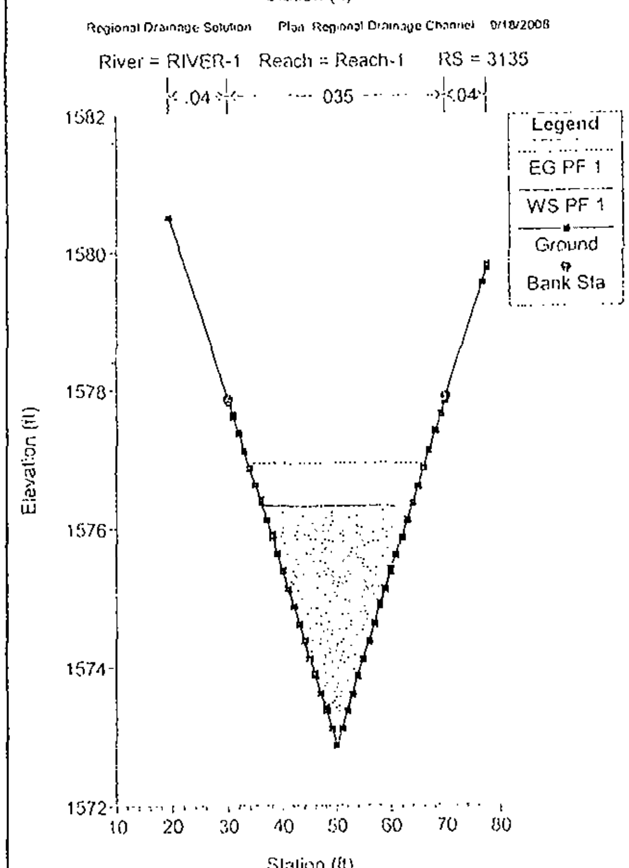

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3216
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1582
1581
1580
1579
1578
1577
1576
1575
0
10
20
30
40
50
60

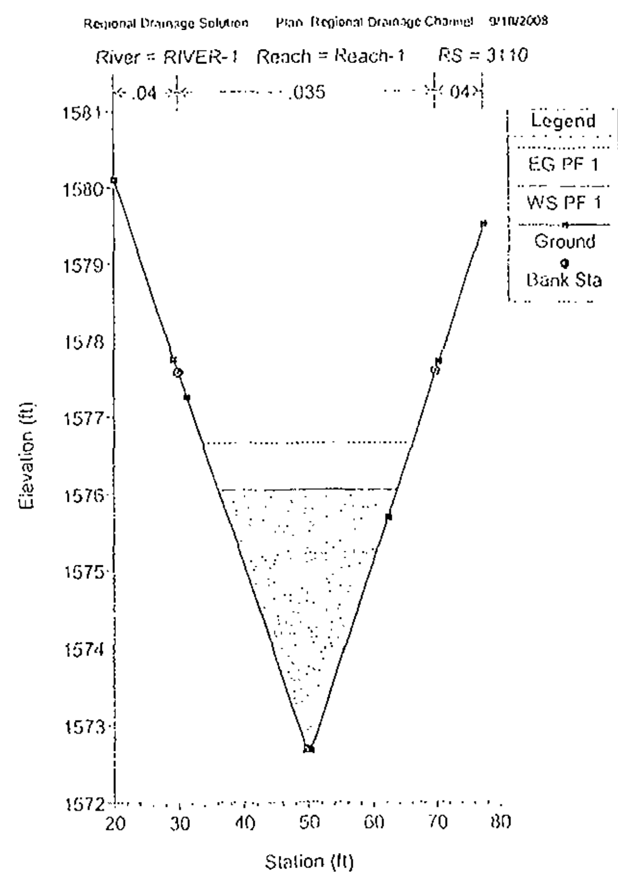

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3156
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1581
1580
1579
1578
1577
1576
1575
0
10
20
30
40
50
60

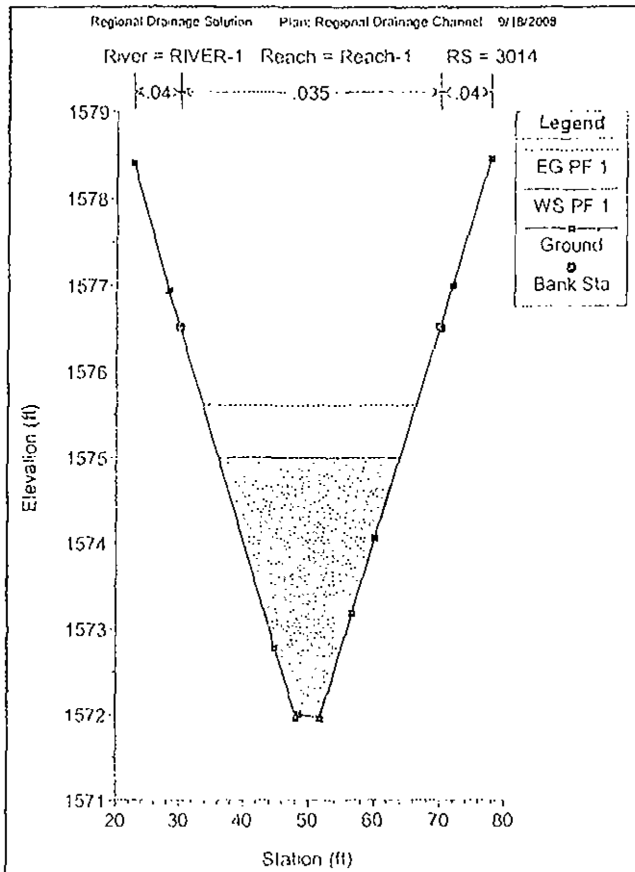

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3155 IS
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1581
1580
1579
1578
1577
1576
1575
0
10
20
30
40
50
60

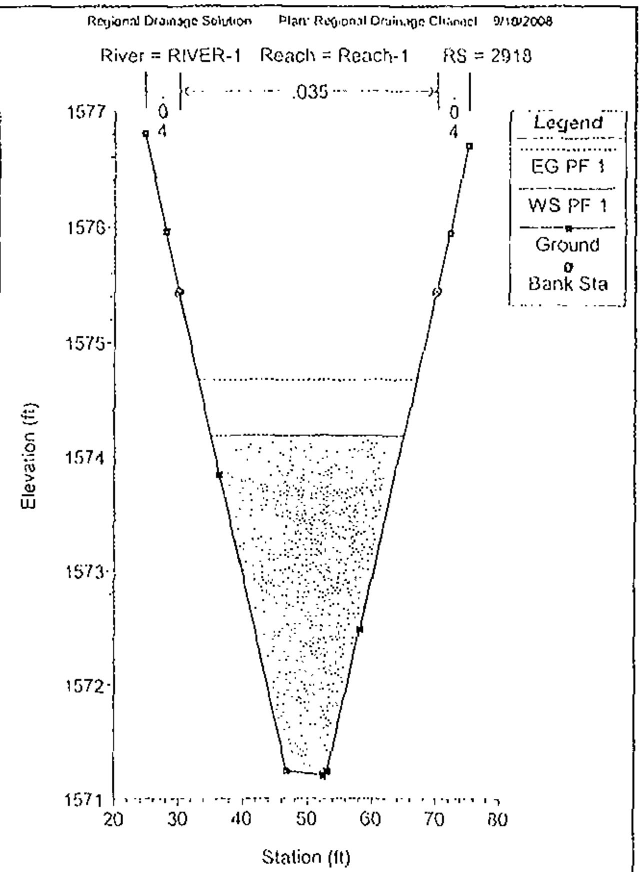

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3152
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

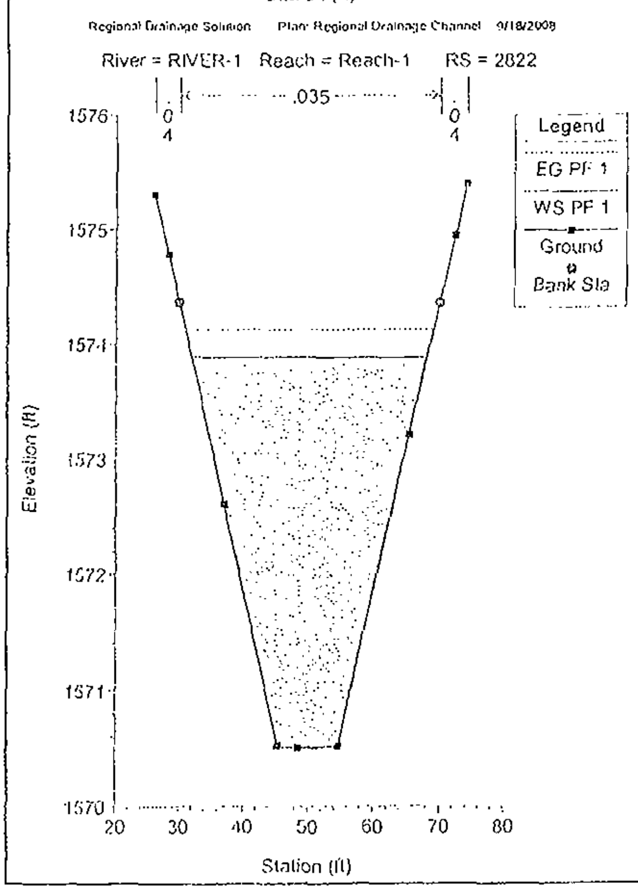

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3138
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

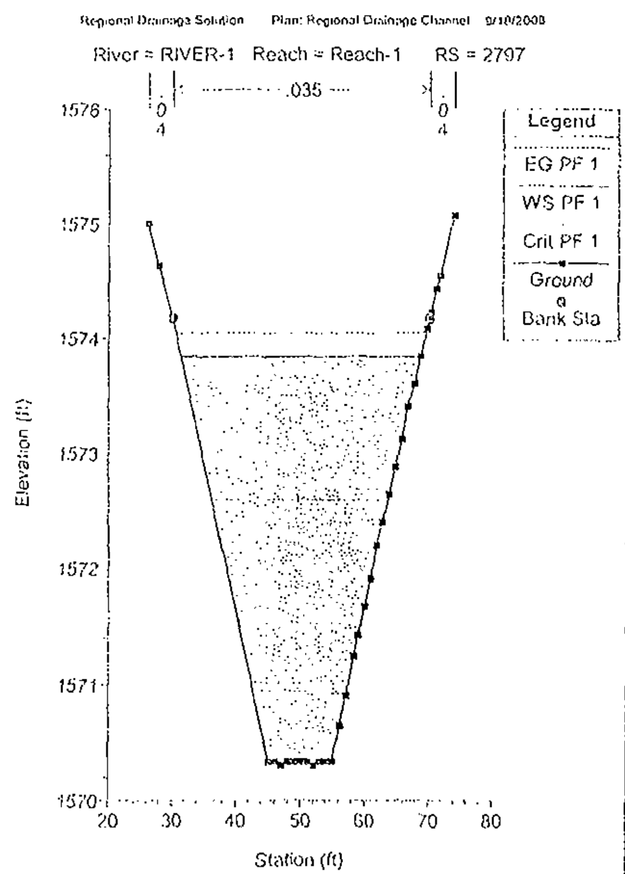

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3135
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

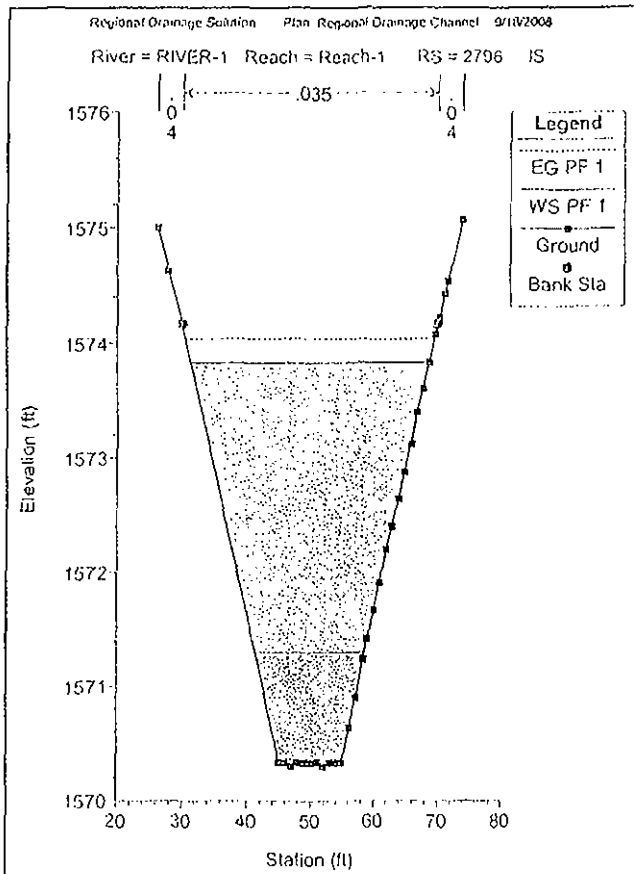

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3110
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

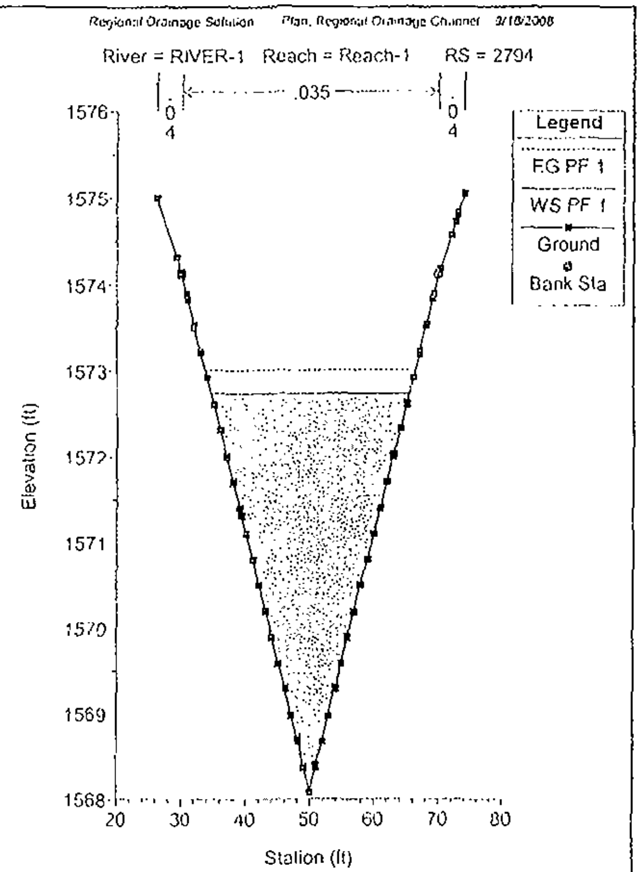

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3014
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1571
1572
1573
1574
1575
1576
1577
1578
1579
20
30
40
50
60
70
80

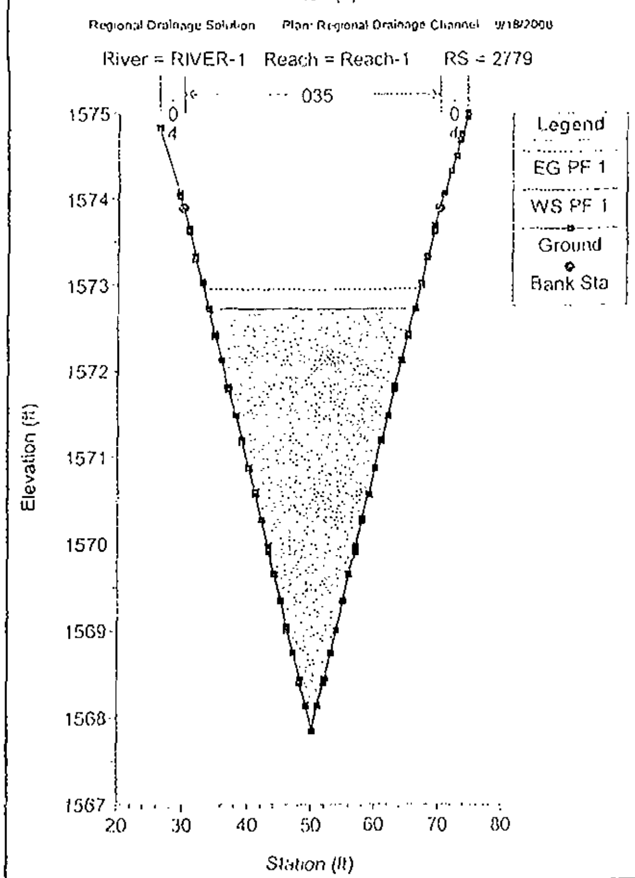

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2918
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1571
1572
1573
1574
1575
1576
1577
20
30
40
50
60
70
80

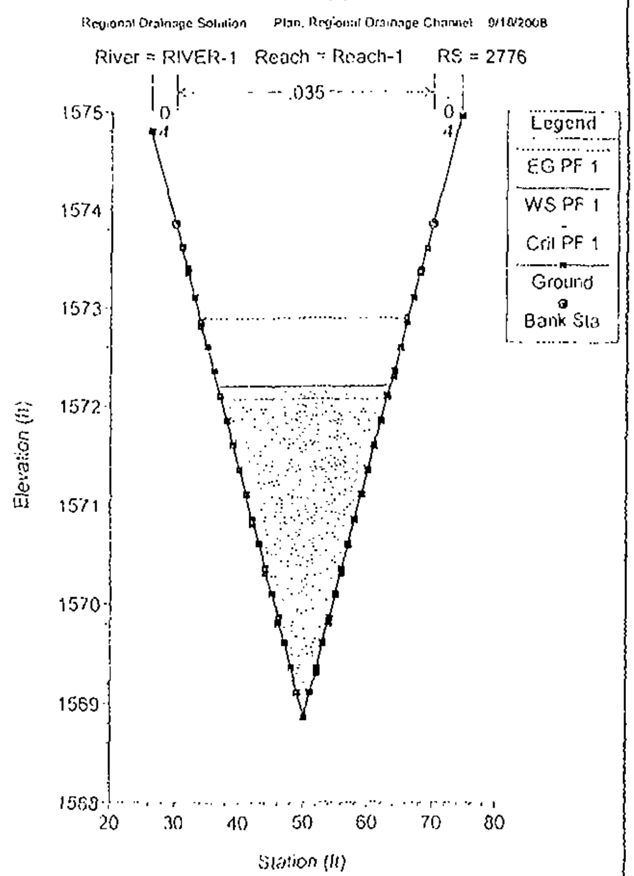

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2822
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1570
1571
1572
1573
1574
1575
1576
20
30
40
50
60
70
80

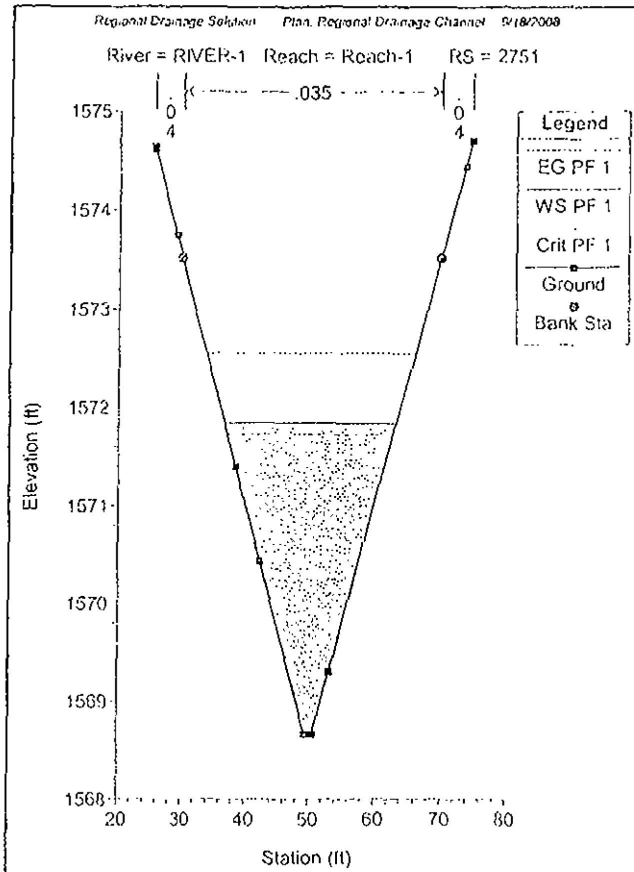

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2797
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1570
1571
1572
1573
1574
1575
1576
20
30
40
50
60
70
80

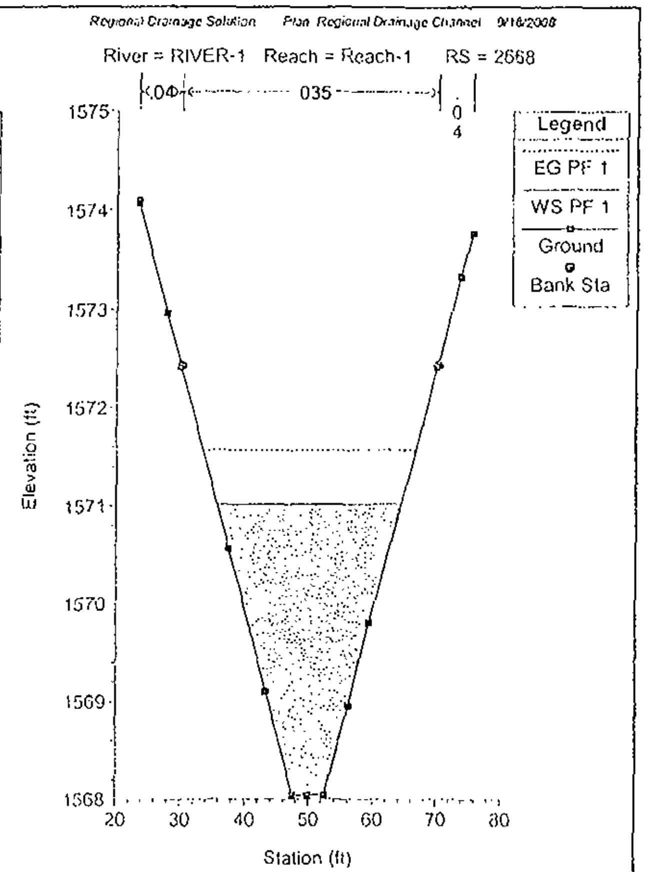

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2796 IS
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

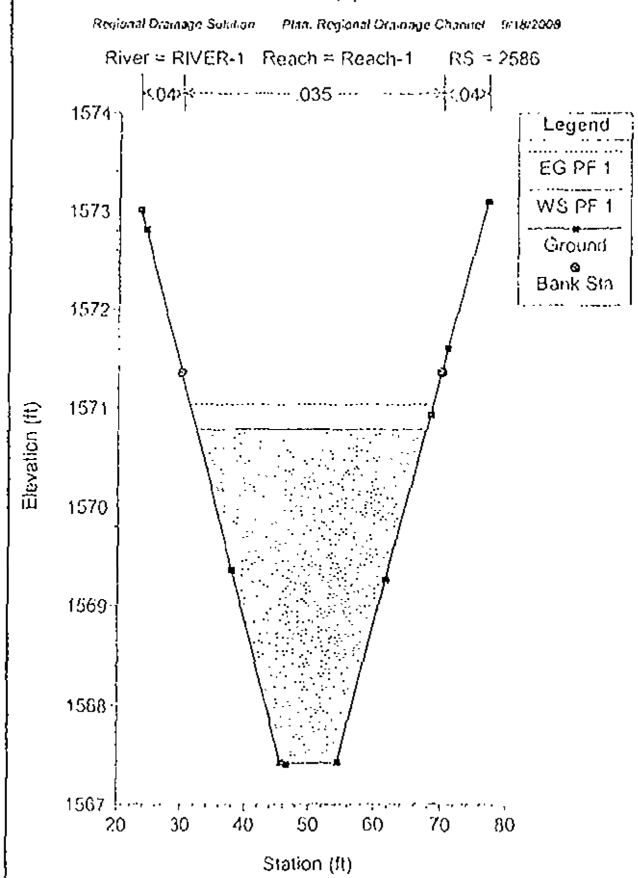

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2794
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

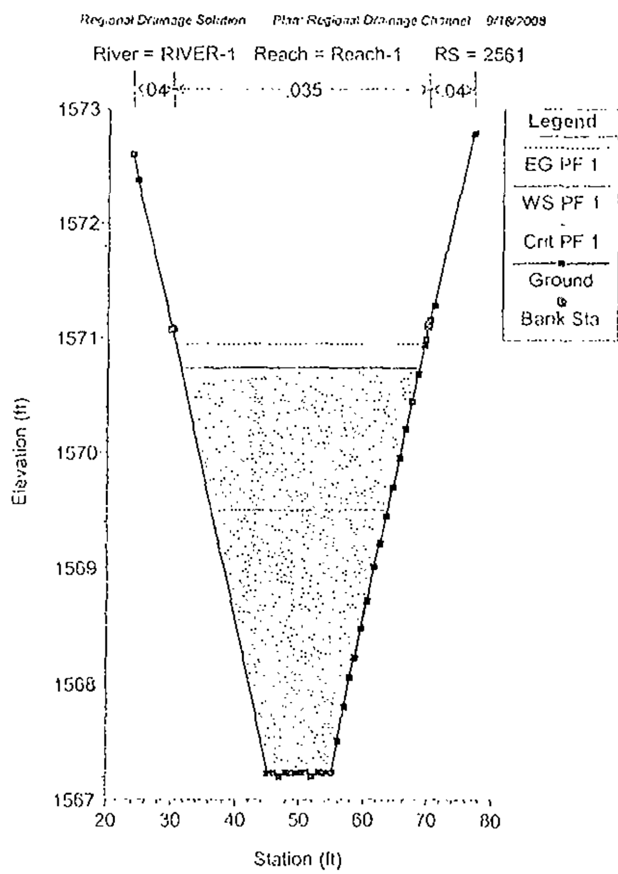

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2779
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

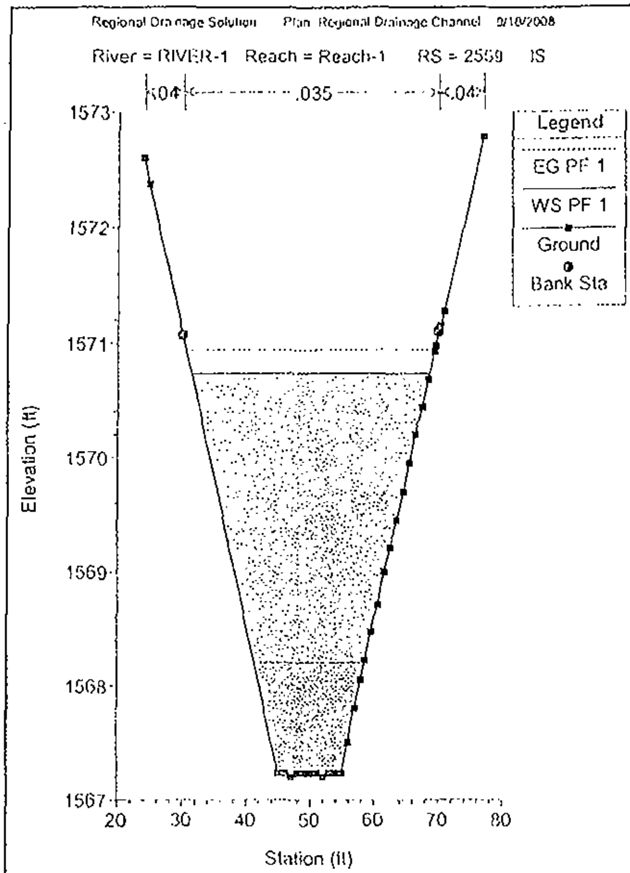

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2776
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

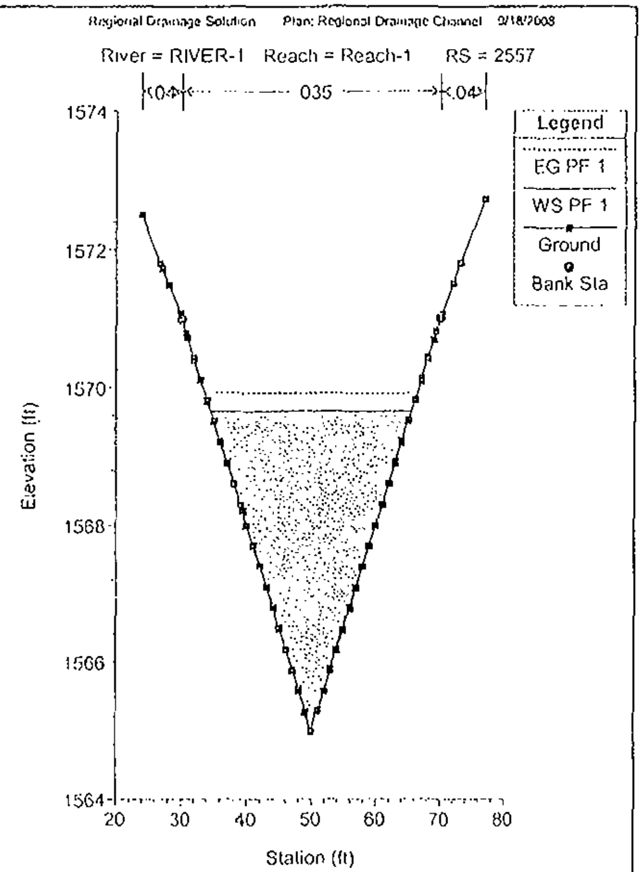

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2751
.04 .035 .04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1568 1569 1570 1571 1572 1573 1574 1575
20 30 40 50 60 70 80

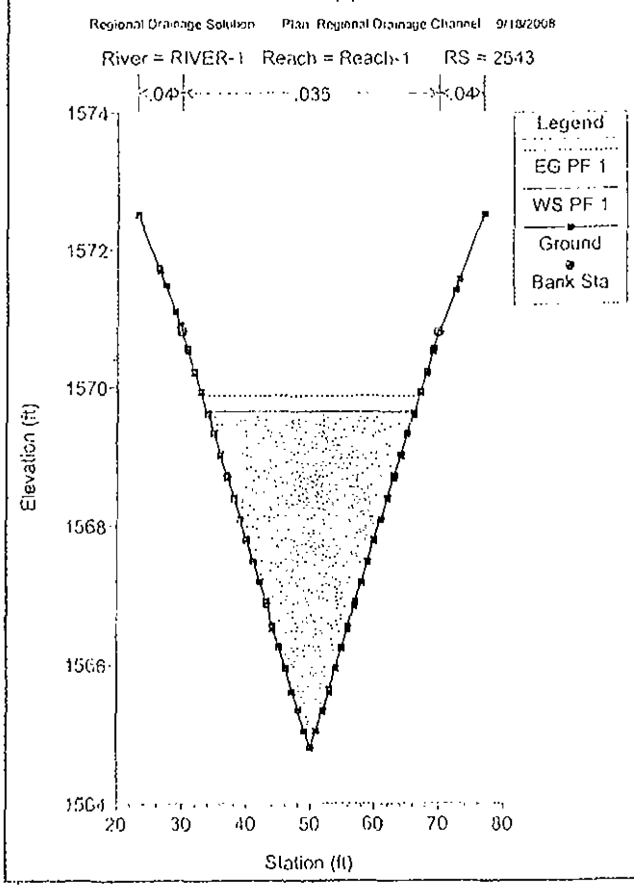

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2668
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1568 1569 1570 1571 1572 1573 1574 1575
20 30 40 50 60 70 80

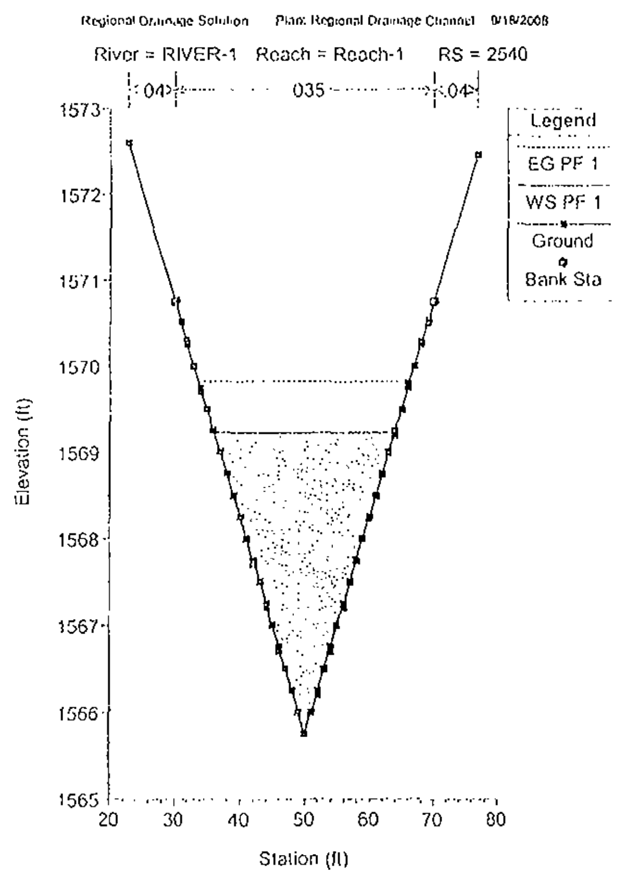

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2586
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1567 1568 1569 1570 1571 1572 1573 1574
20 30 40 50 60 70 80

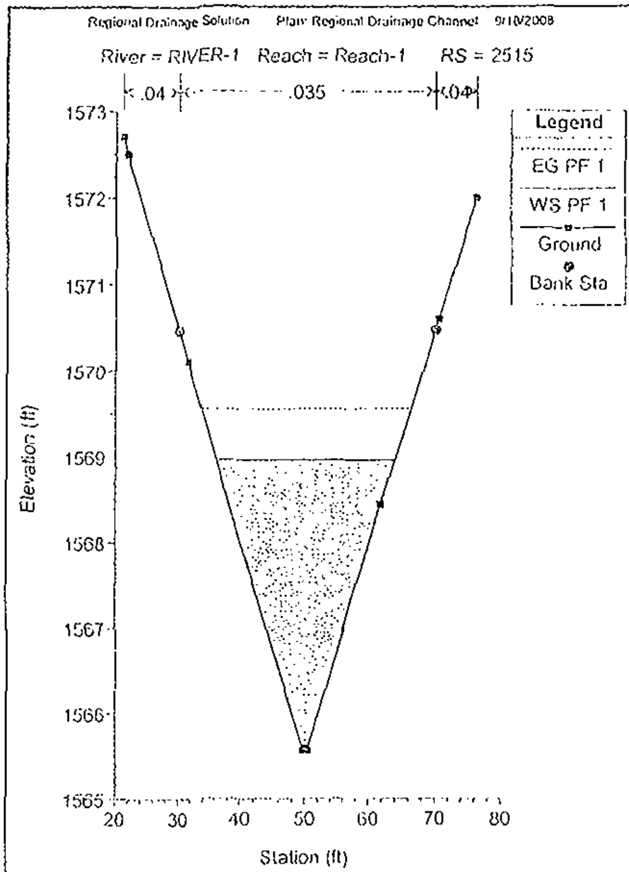

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2561
.04 .035 .04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1567 1568 1569 1570 1571 1572 1573
20 30 40 50 60 70 80

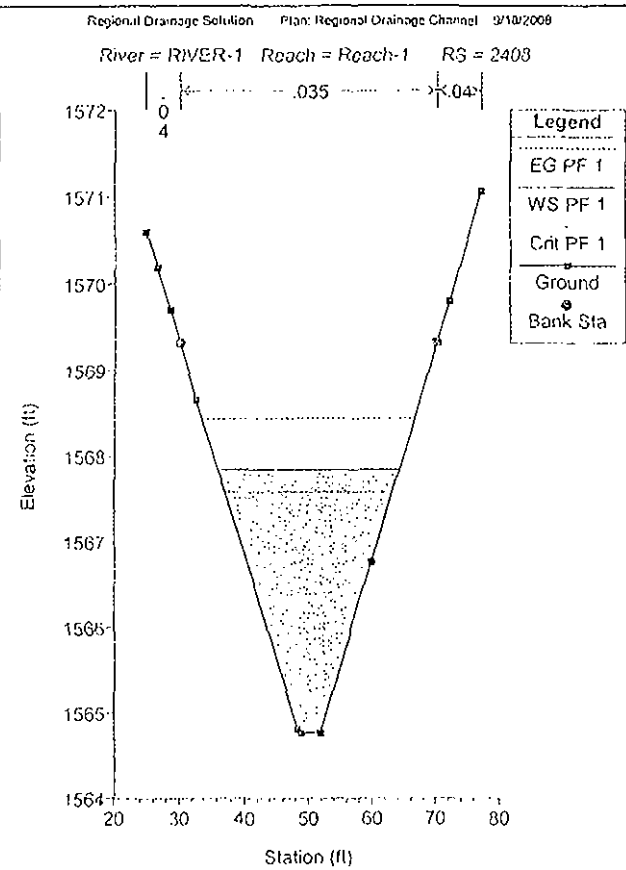

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2559 IS
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

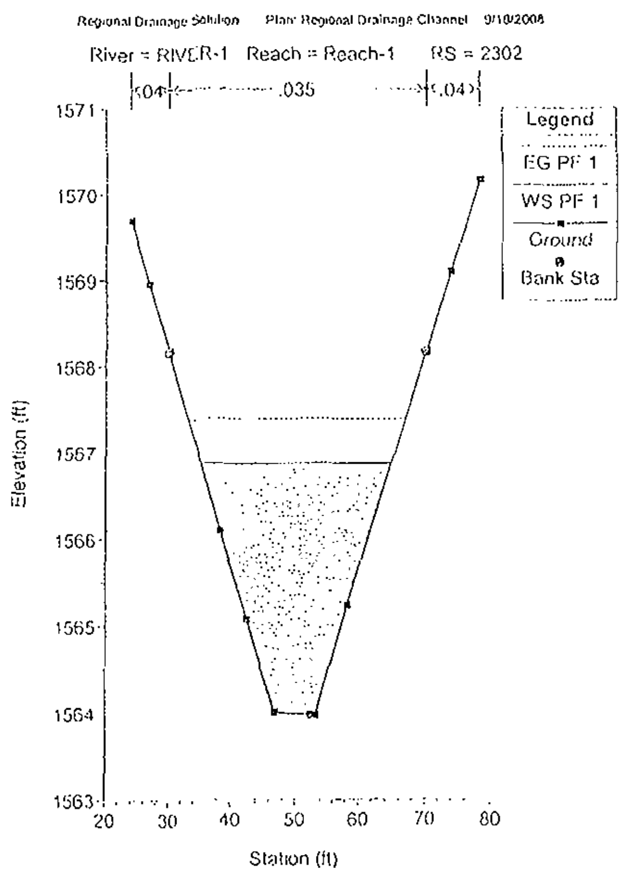

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2557
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

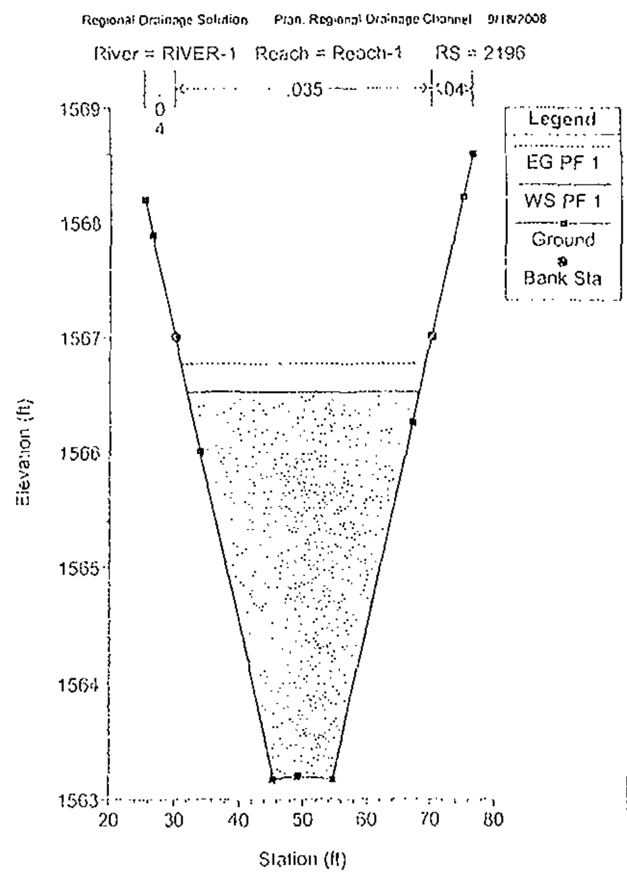

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2543
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

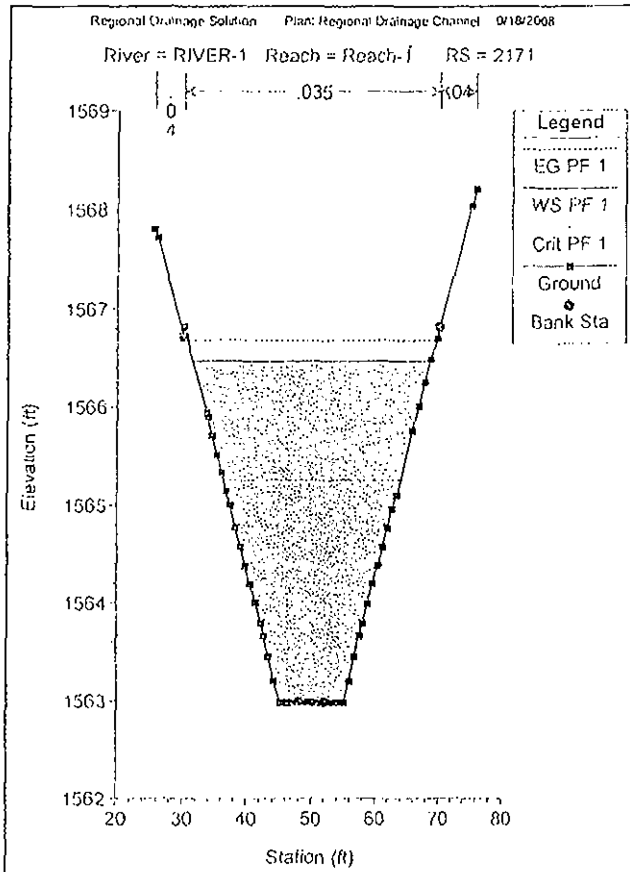

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2540
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

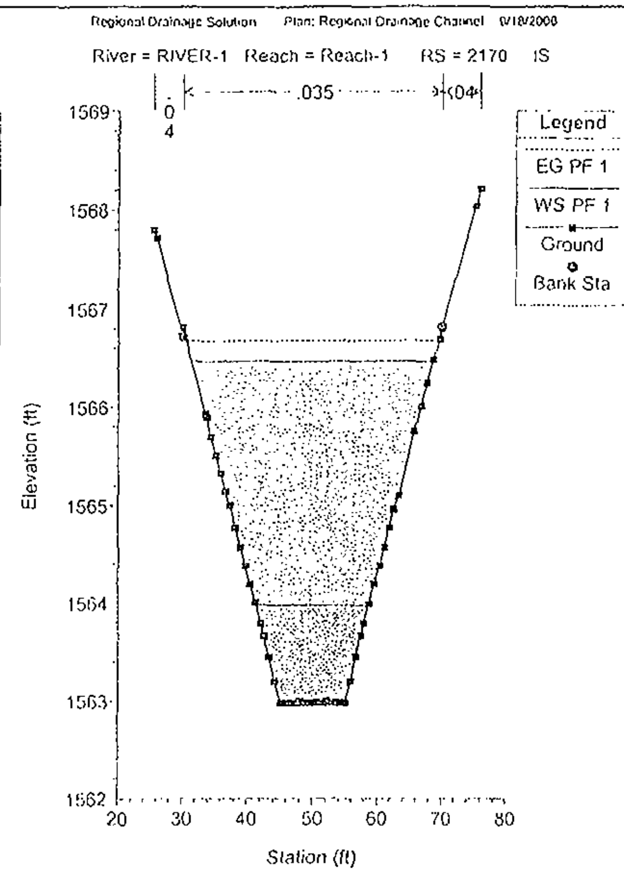

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2515
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

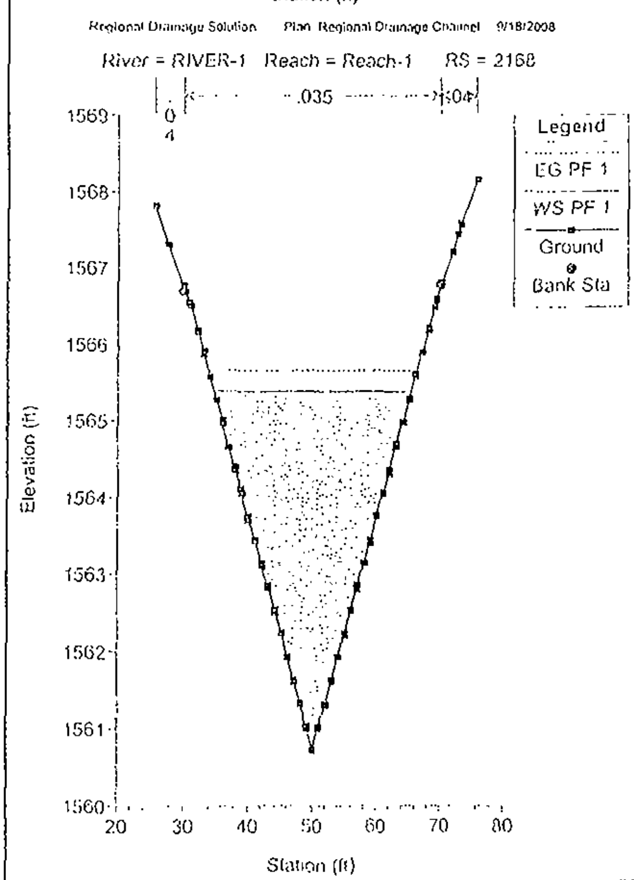

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2408
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

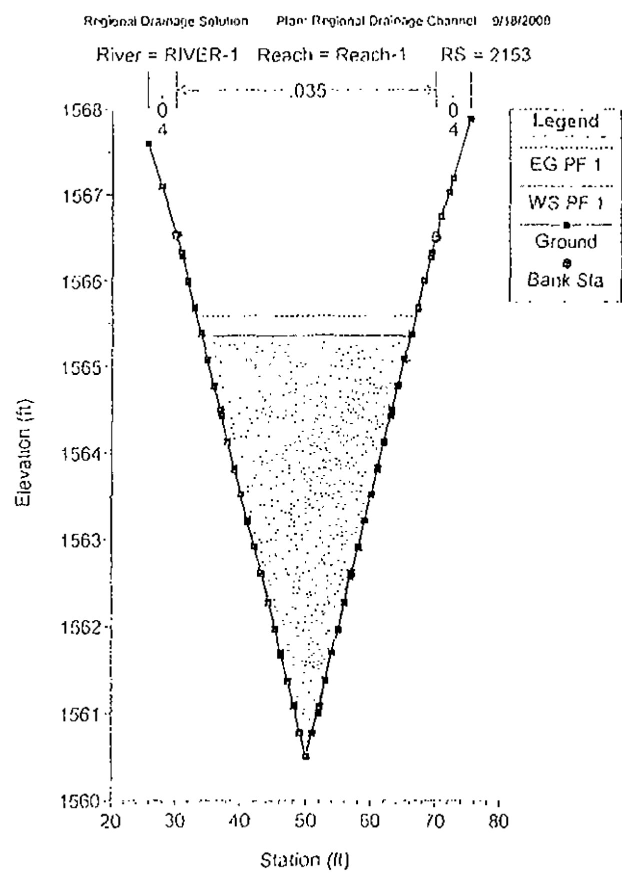

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2302
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

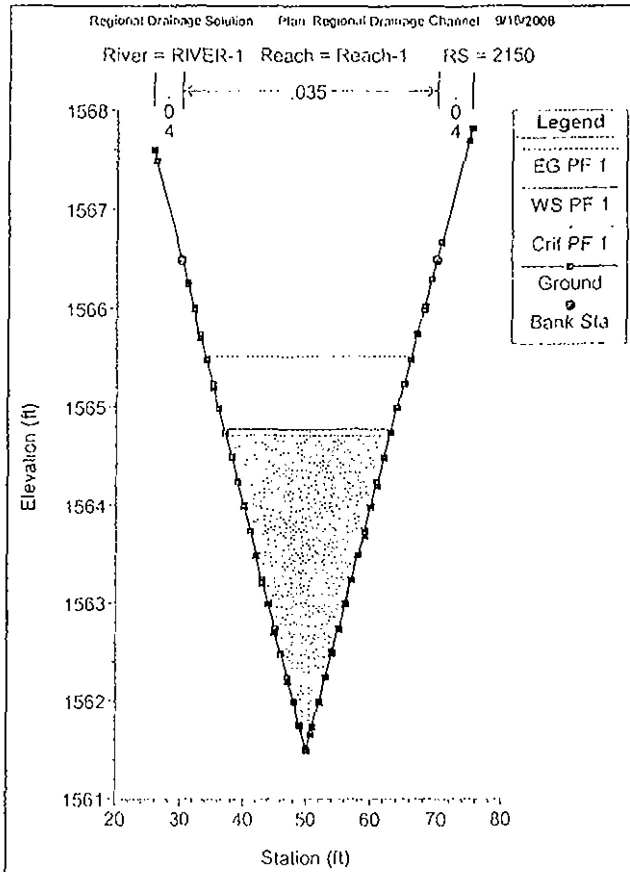

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2196
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

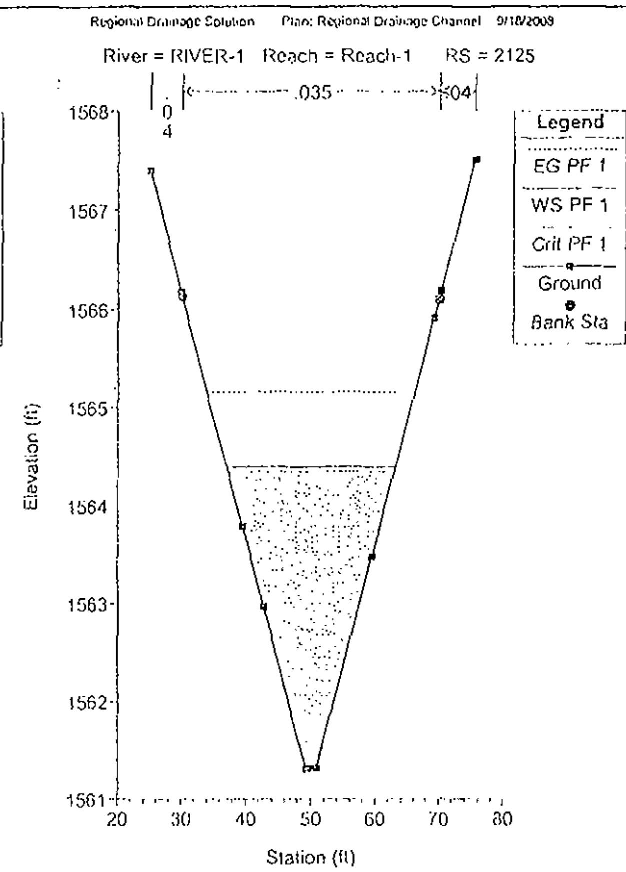

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2171
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

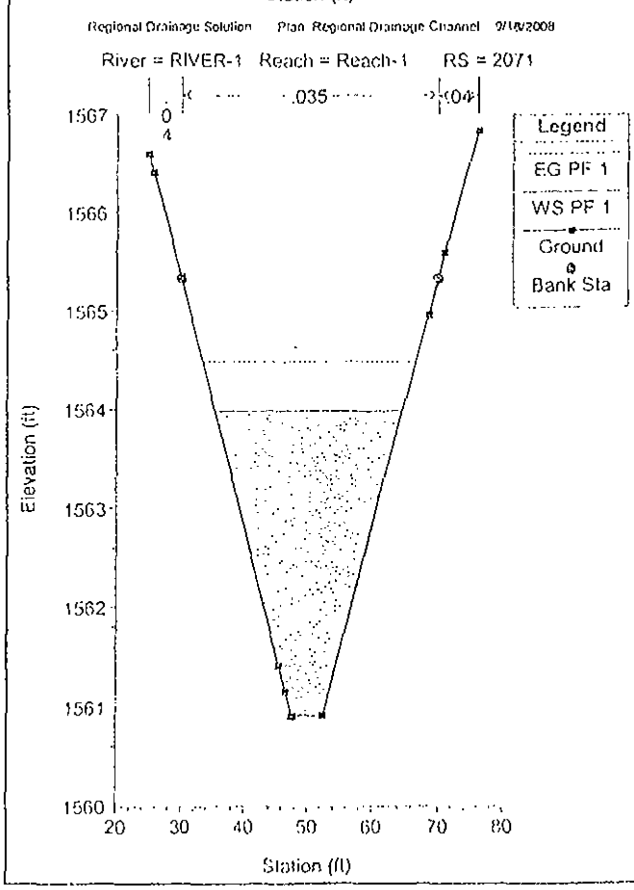

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2170 IS
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

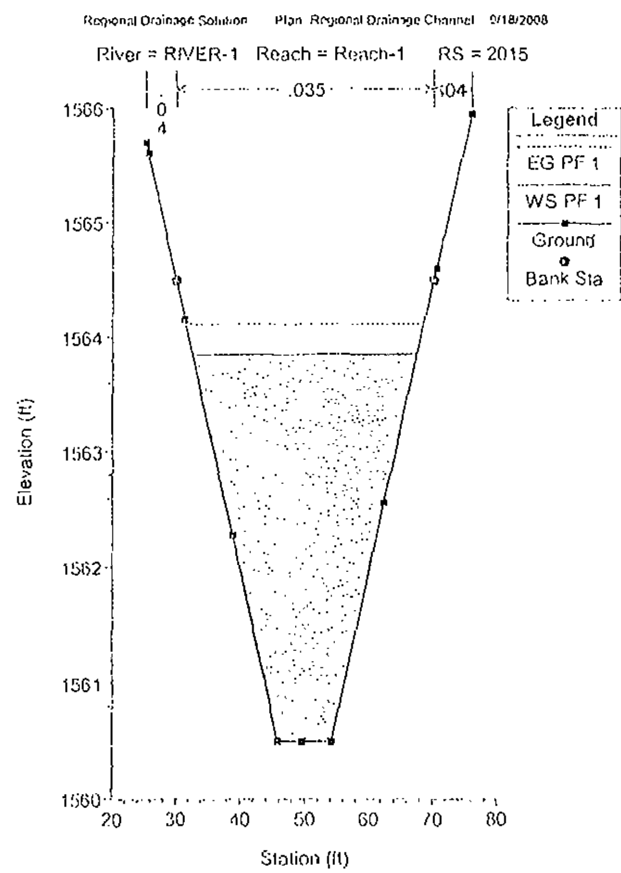

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2168
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

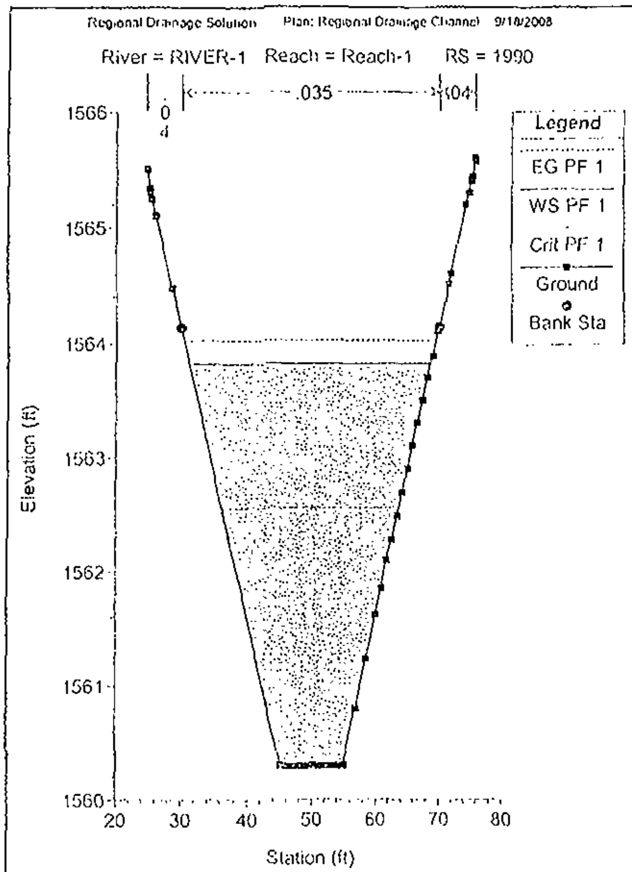

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2153
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

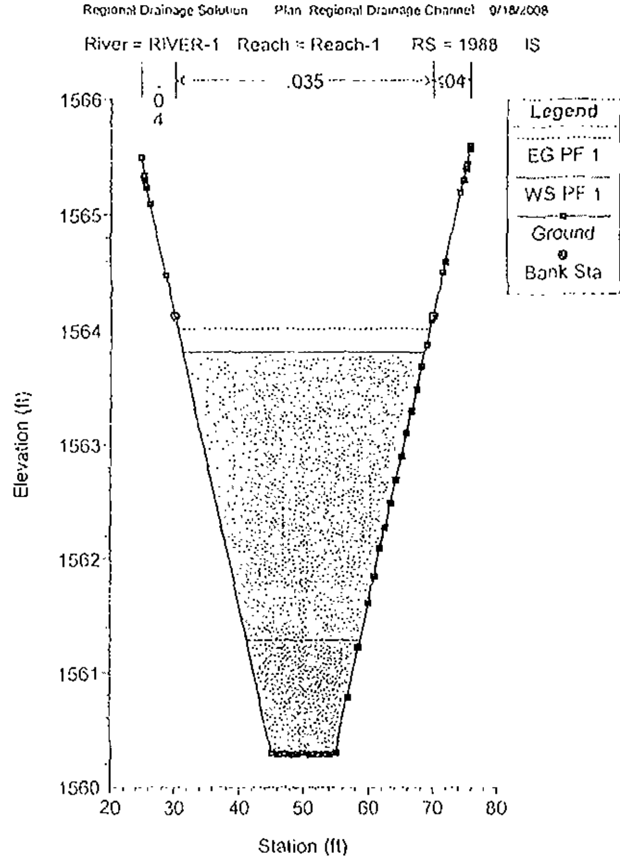

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2150
.035
0 4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1561
1562
1563
1564
1565
1566
1567
1568
Station (ft)
20
30
40
50
60
70
80

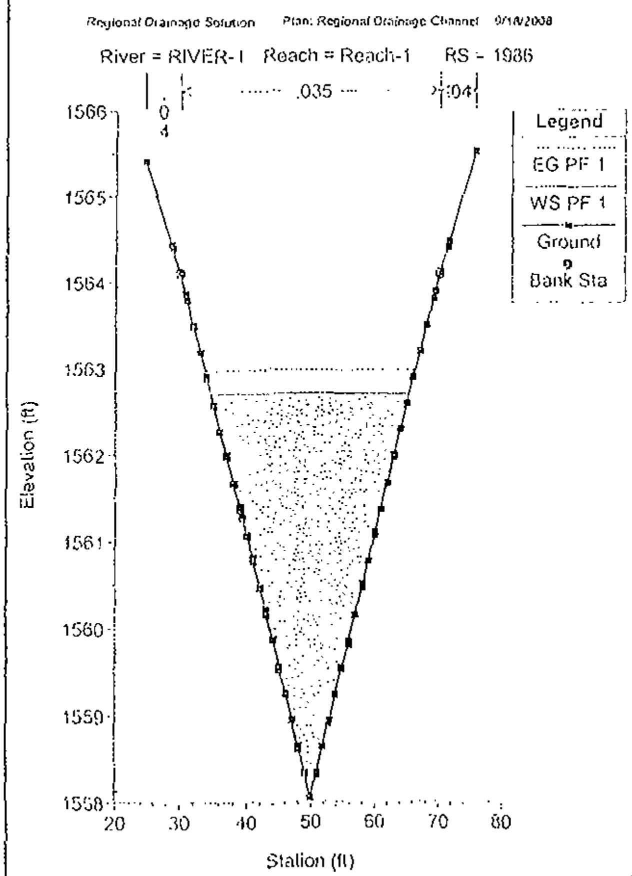

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2125
.035
.04
0 4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1561
1562
1563
1564
1565
1566
1567
1568
Station (ft)
20
30
40
50
60
70
80

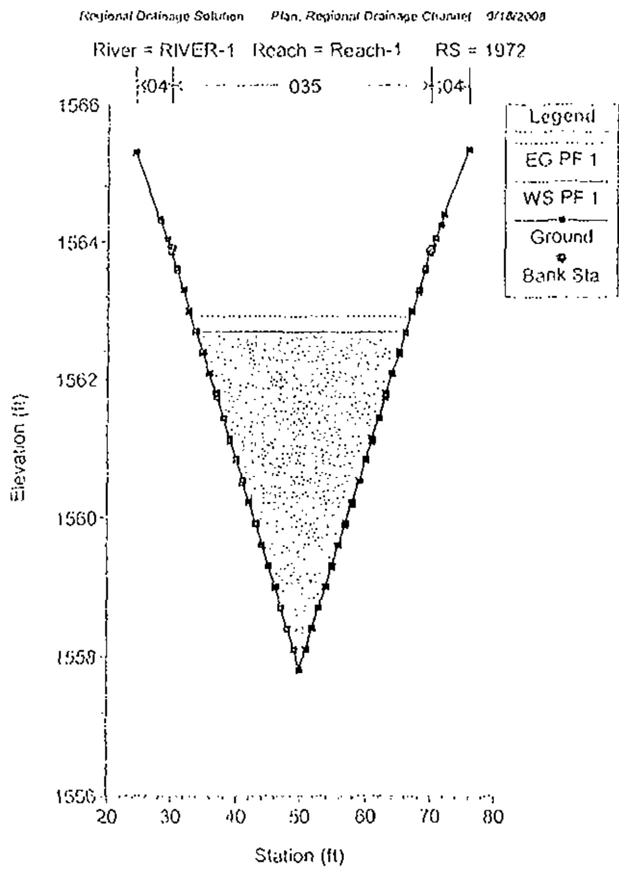

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2071
.035
.04
0 4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1560
1561
1562
1563
1564
1565
1566
1567
Station (ft)
20
30
40
50
60
70
80

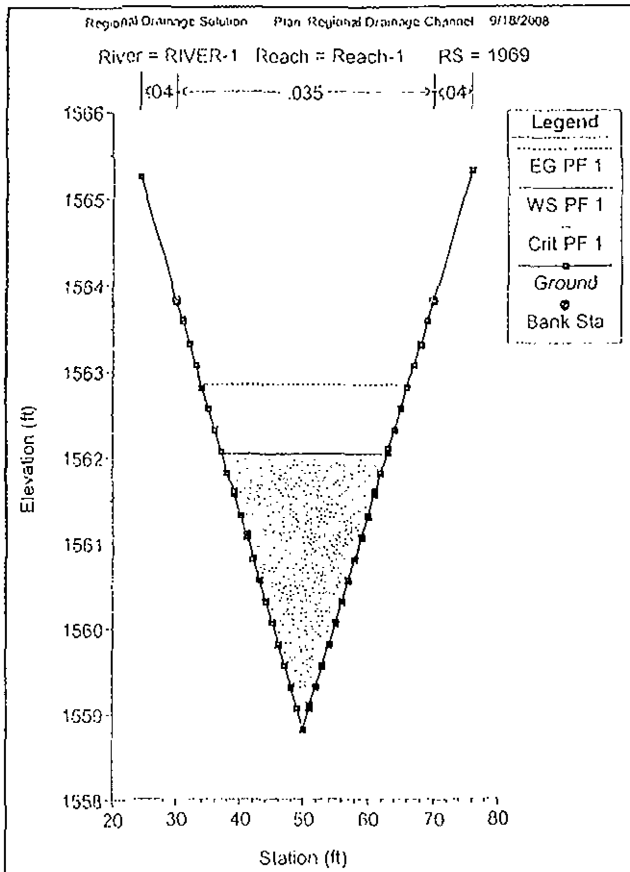

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2015
.035
.04
0 4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1560
1561
1562
1563
1564
1565
1566
Station (ft)
20
30
40
50
60
70
80

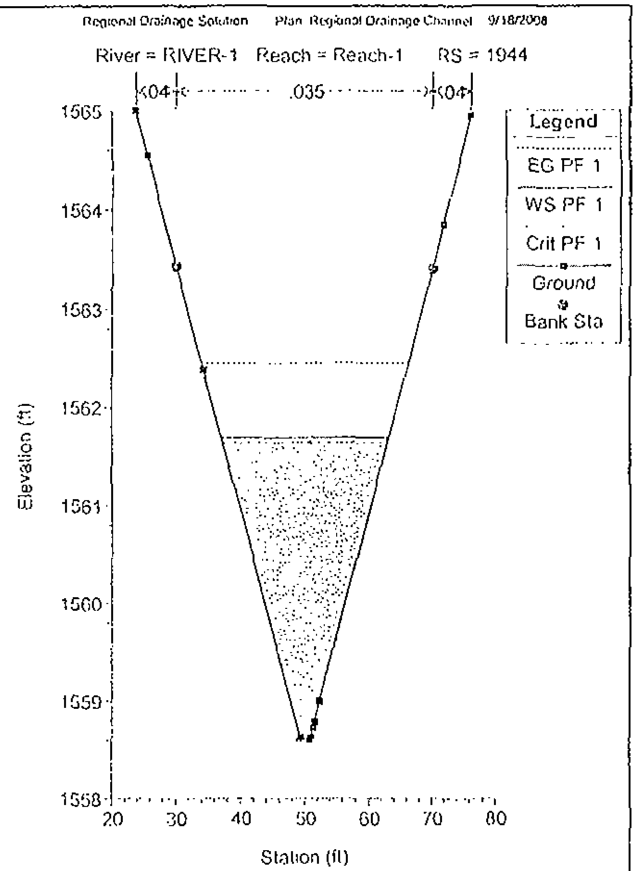

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1990
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

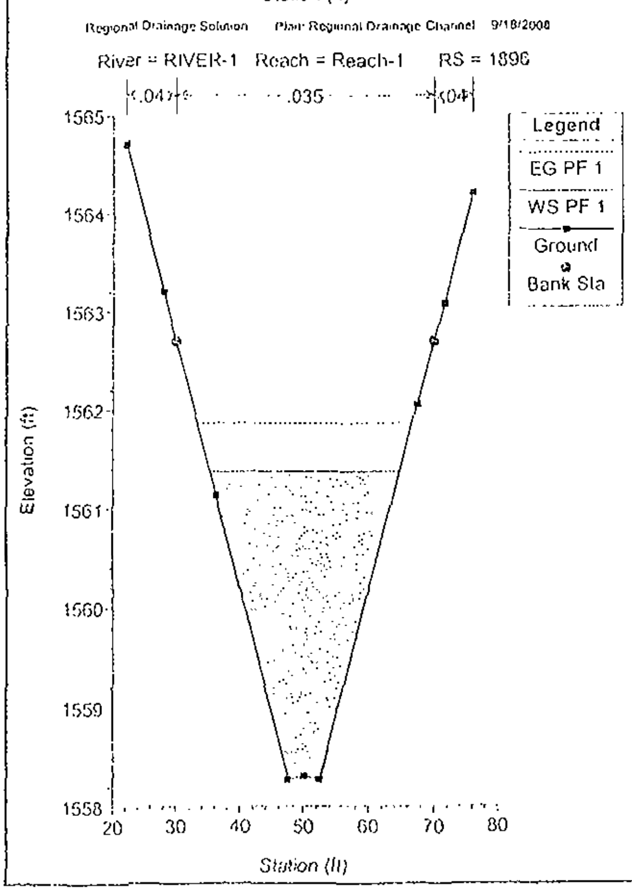

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1988 IS
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

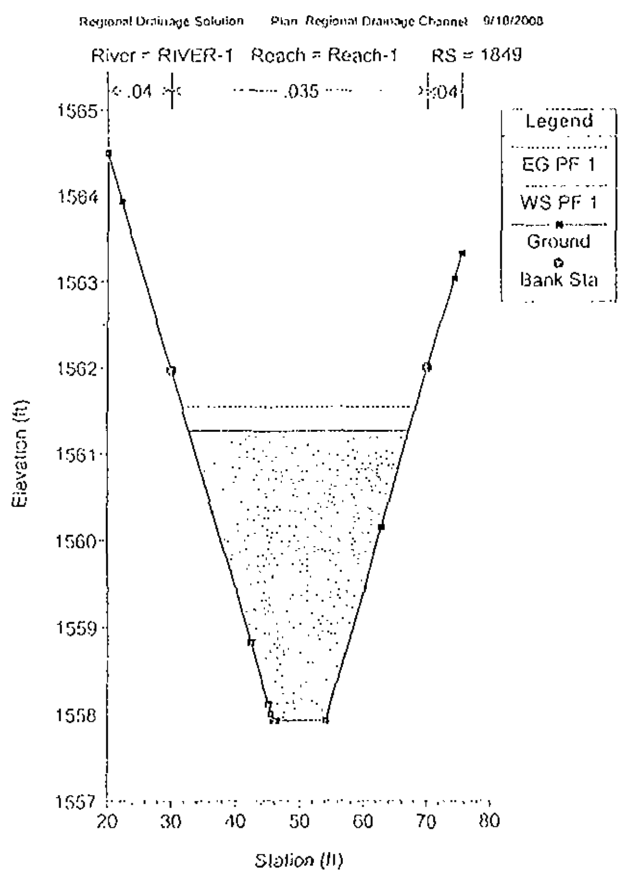

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1986
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

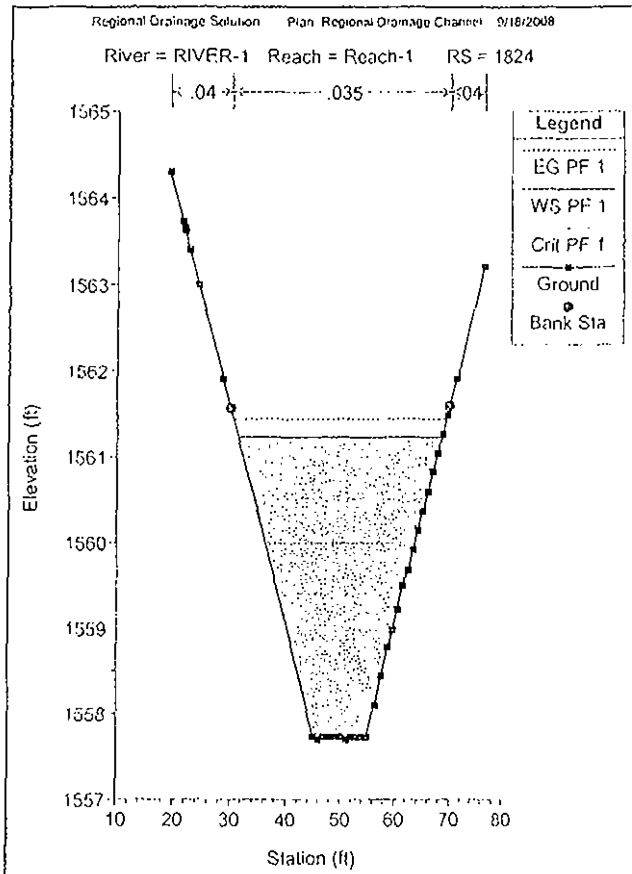

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1972
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

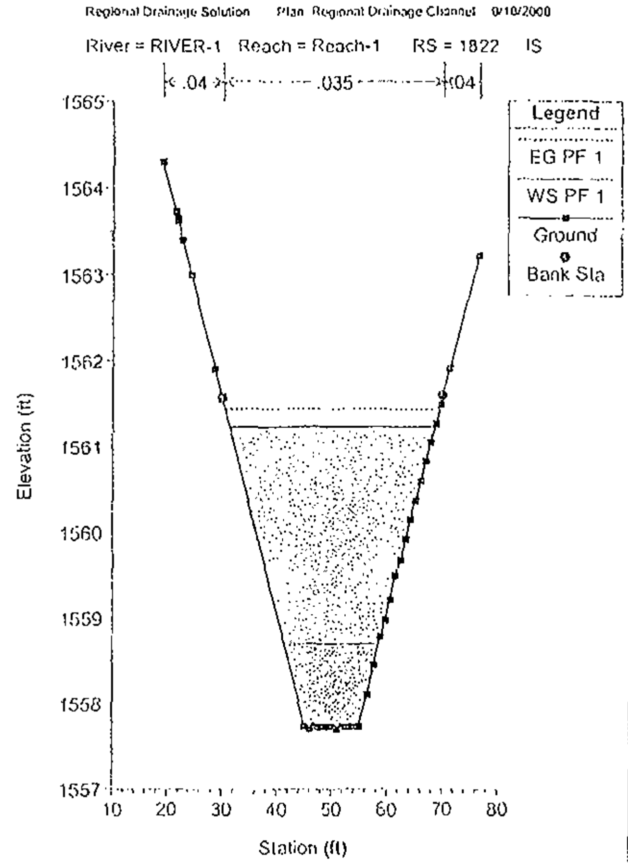

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1969
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
1566
20
30
40
50
60
70
80

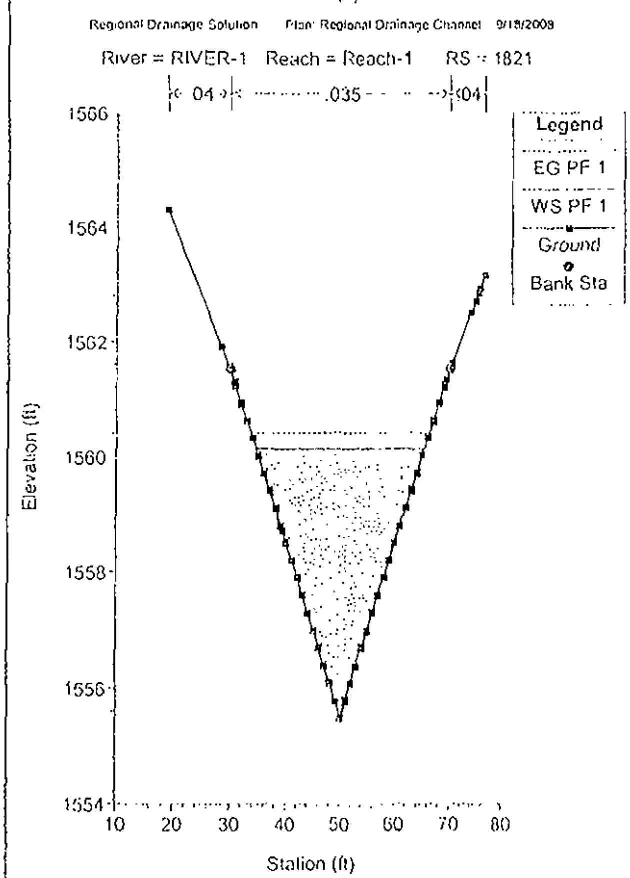

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1944
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

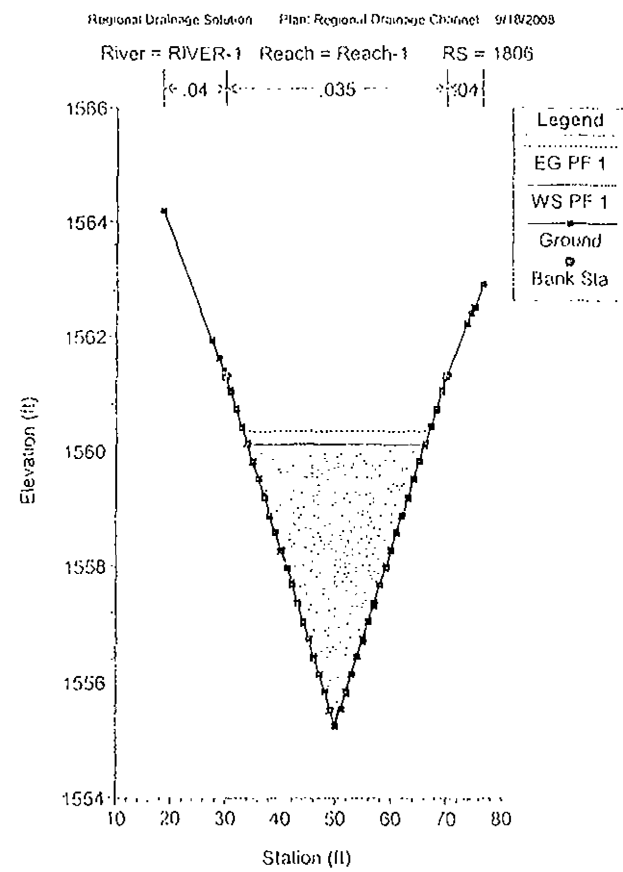

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1896
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

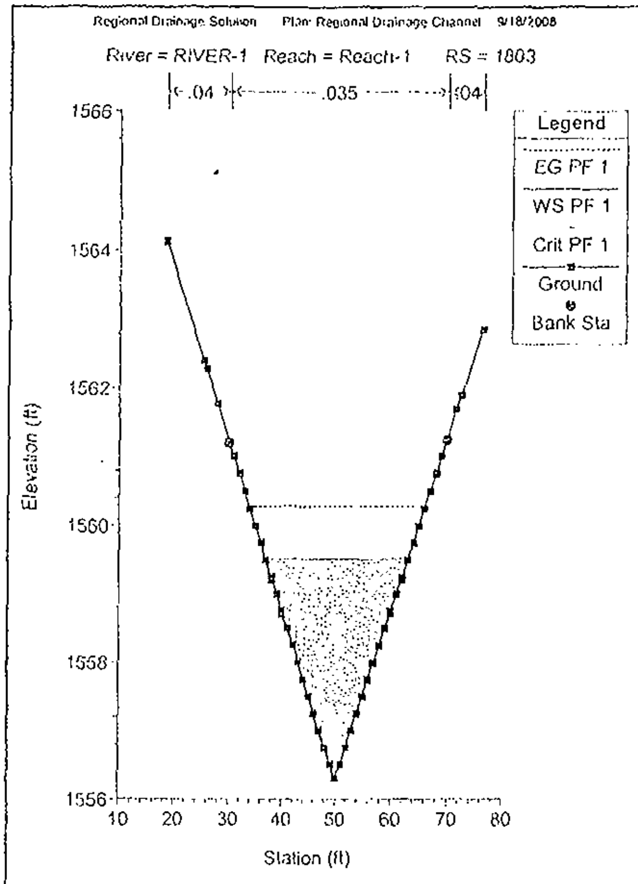

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1849
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1557
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

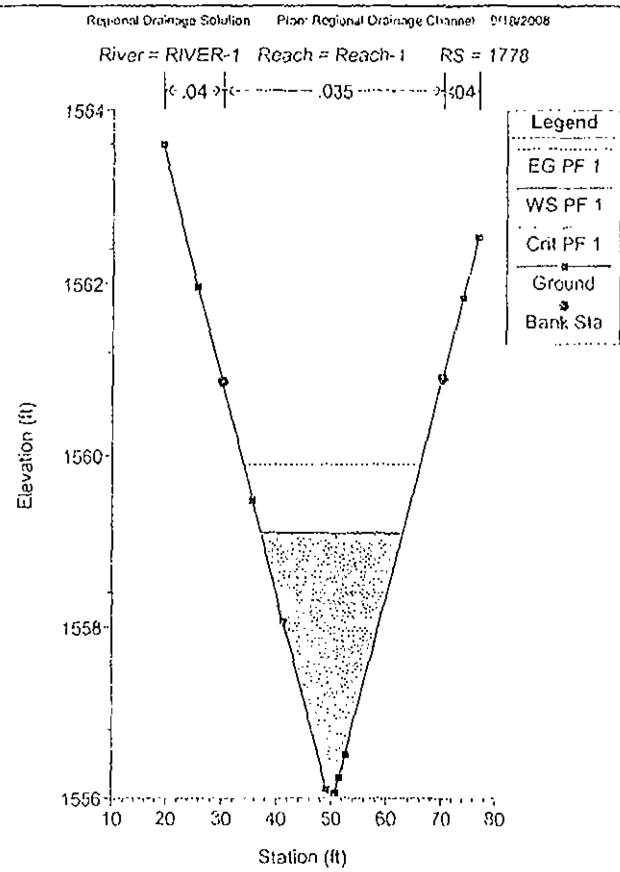

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1824
.04 .035 .04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

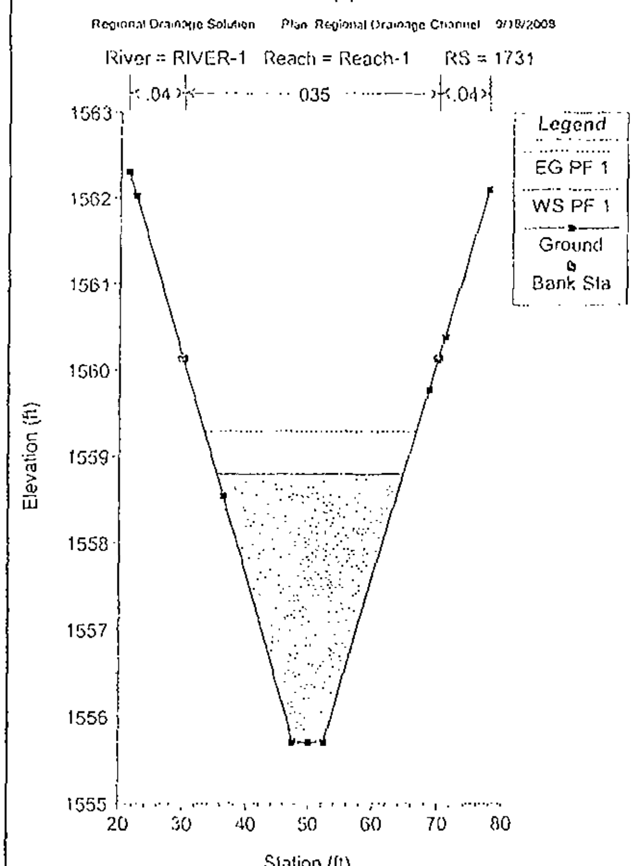

Regional Drainage Solution Plan: Regional Drainage Channel
River = RIVER-1 Reach = Reach-1 RS = 1822 IS
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

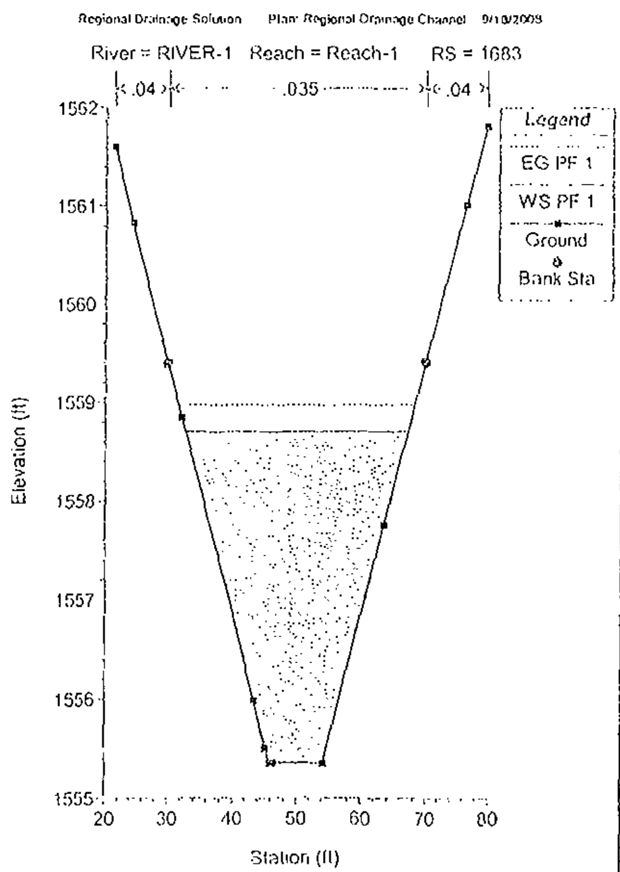

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1821
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

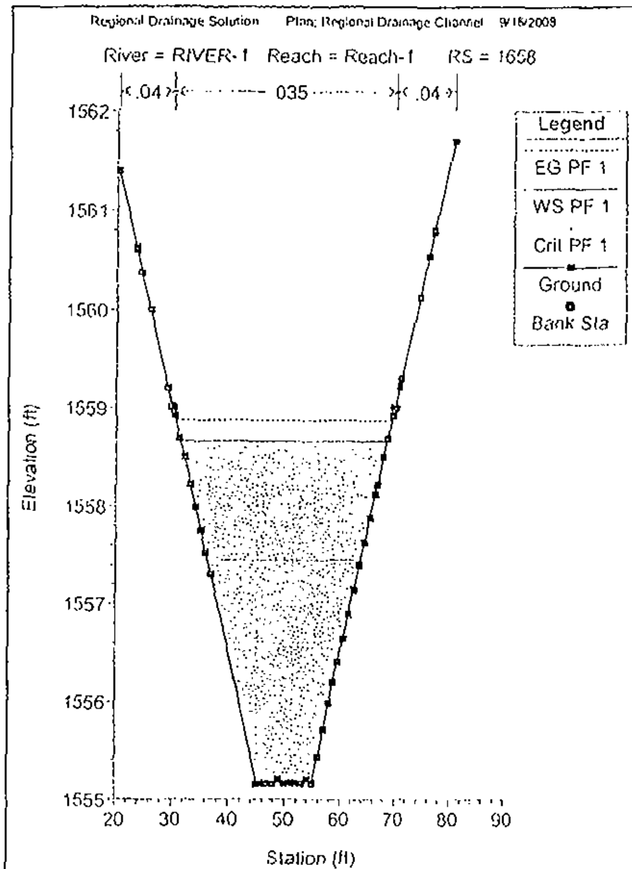

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1806
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

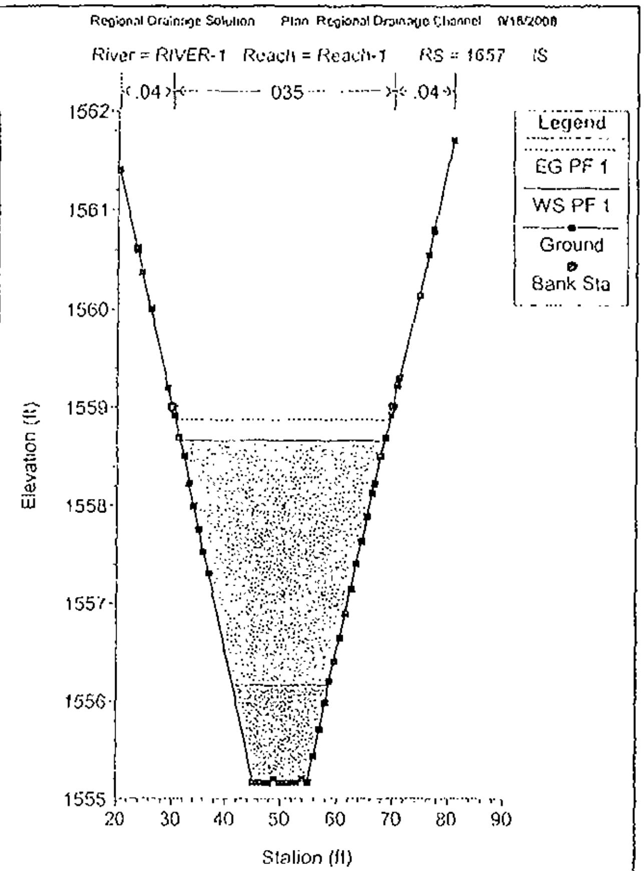

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1803
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

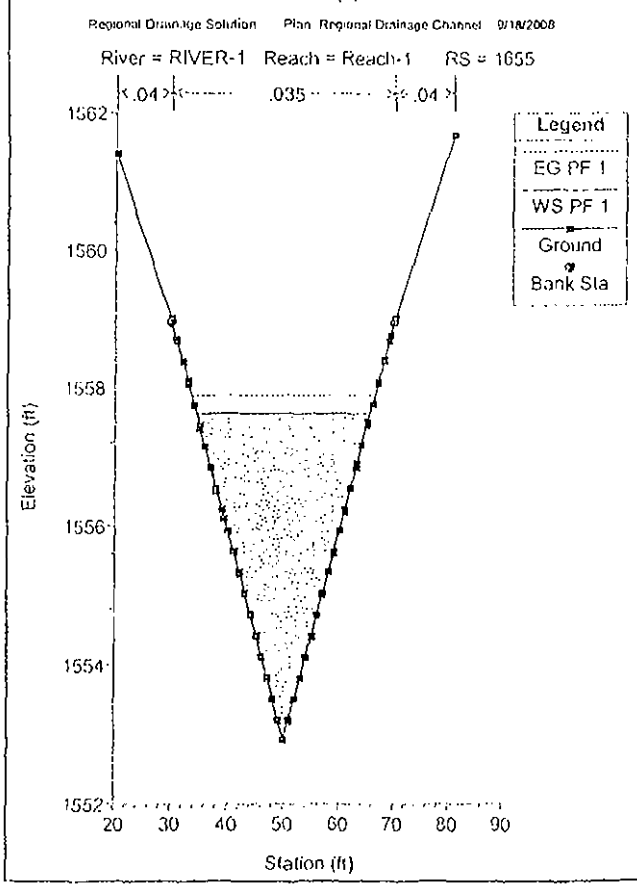

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1778
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

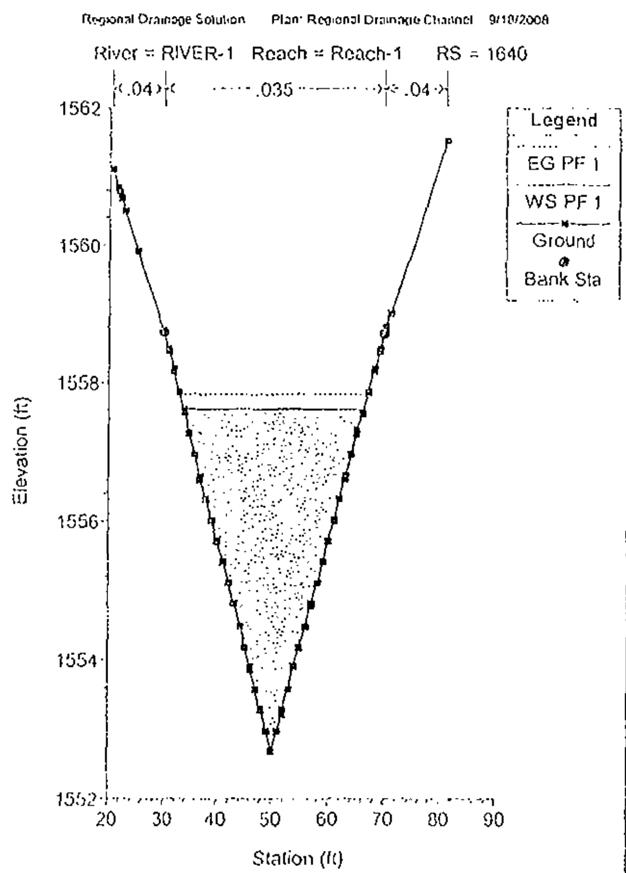

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1731
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

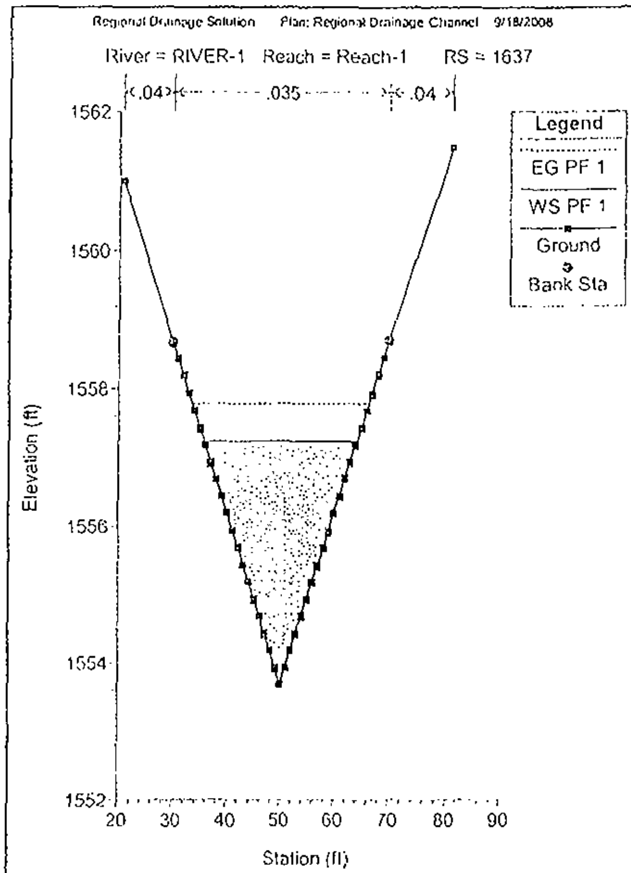

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1683
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

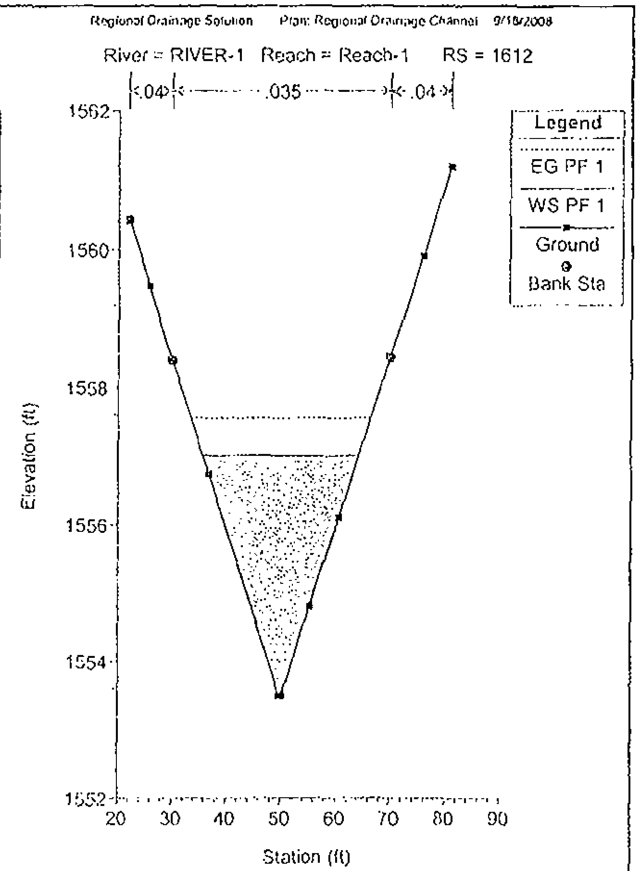

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1658
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

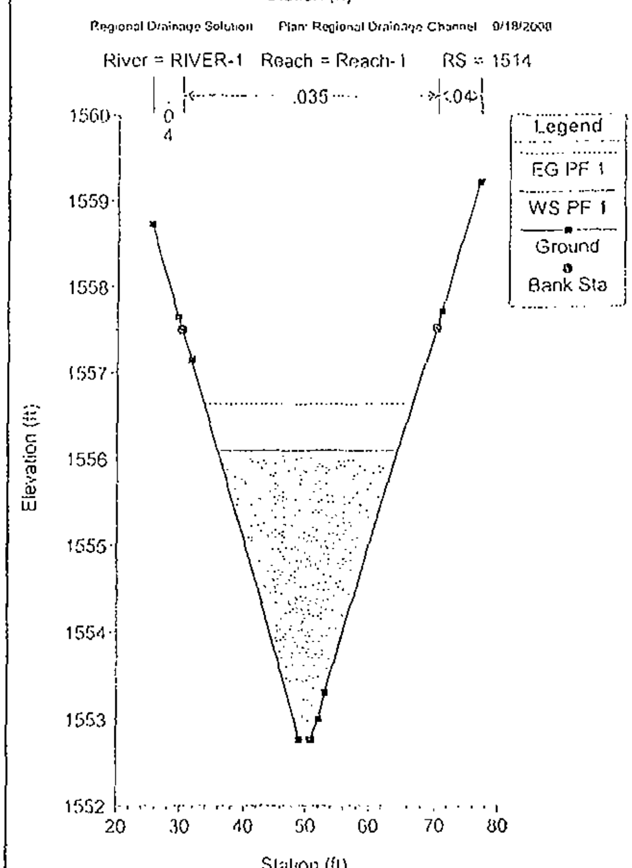

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1657 IS
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

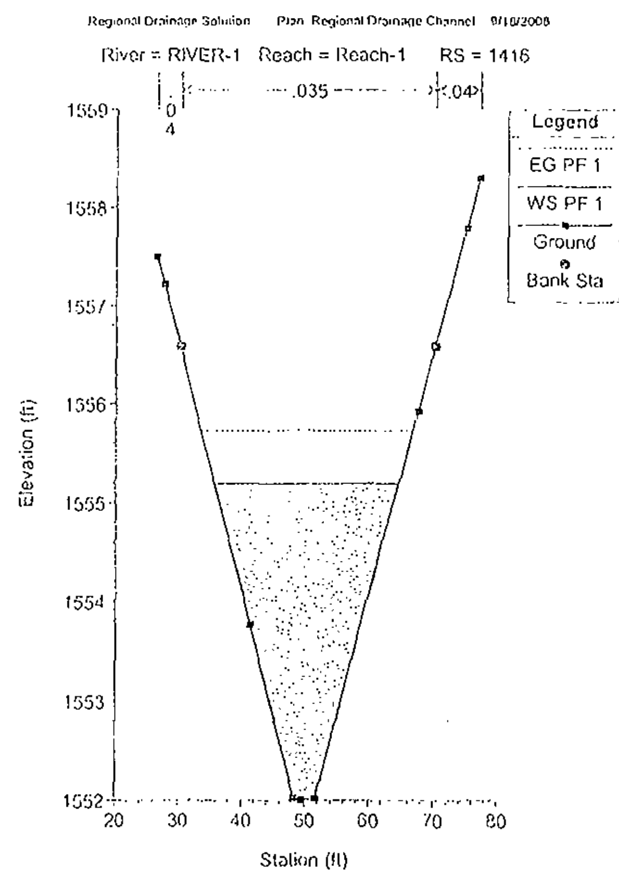

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1655
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

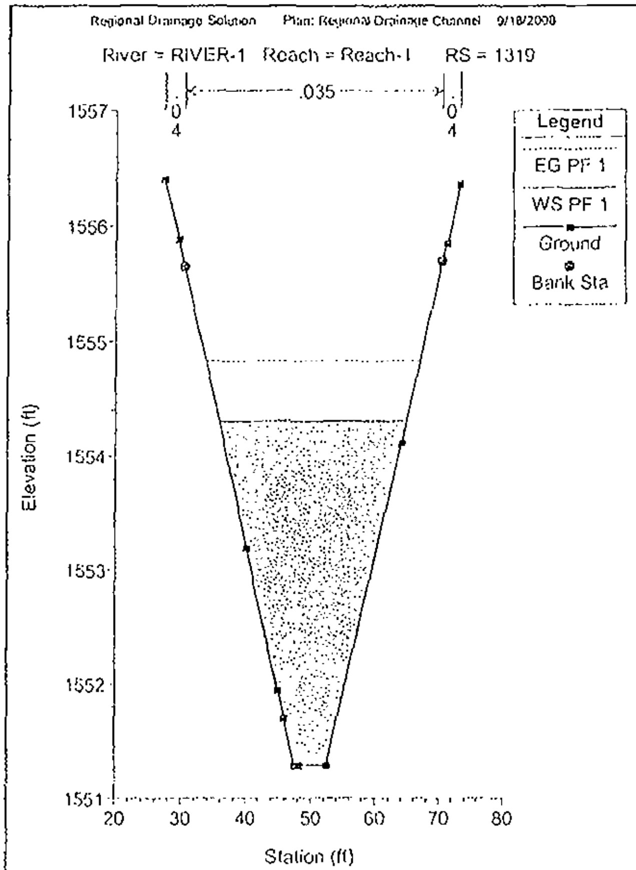

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1640
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

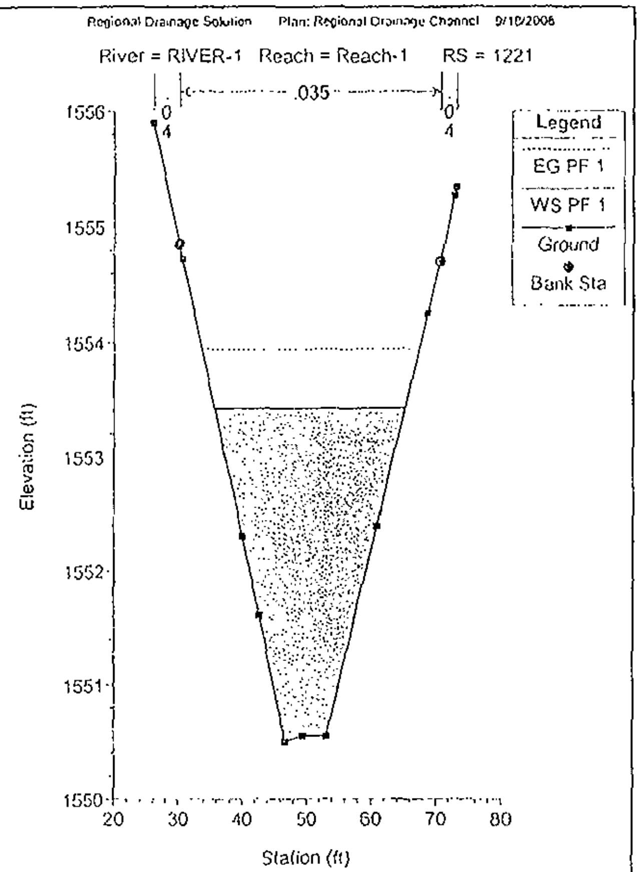

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1637
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1560
1558
1556
1554
1552
20 30 40 50 60 70 80 90
Station (ft)

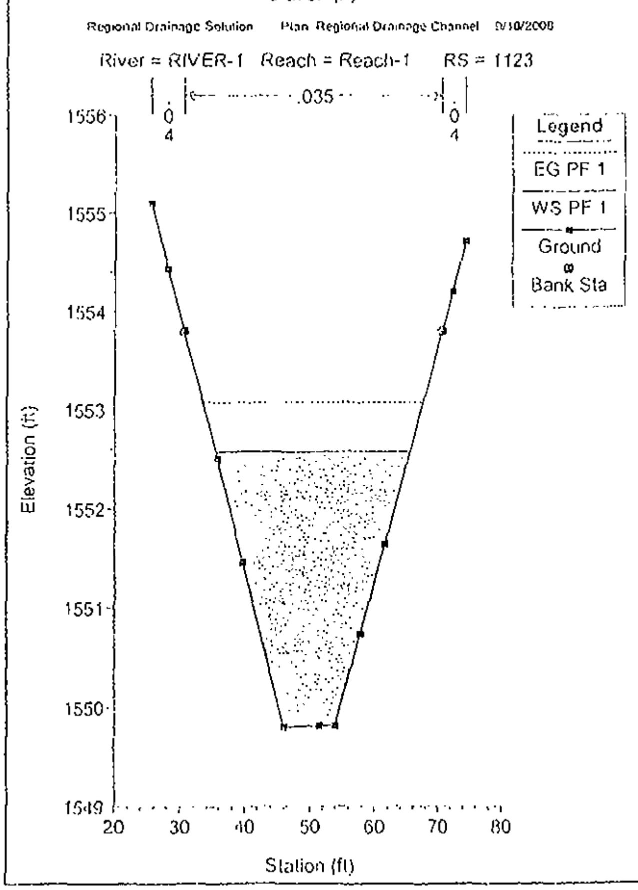

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1612
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1560
1558
1556
1554
1552
20 30 40 50 60 70 80 90
Station (ft)

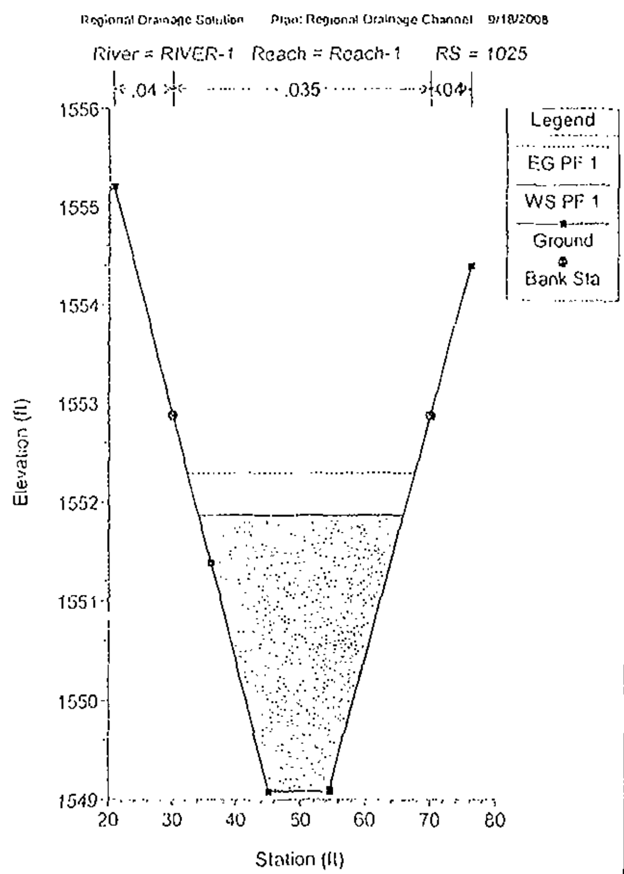

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1514
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1560
1559
1558
1557
1556
1555
1554
1553
1552
20 30 40 50 60 70 80
Station (ft)

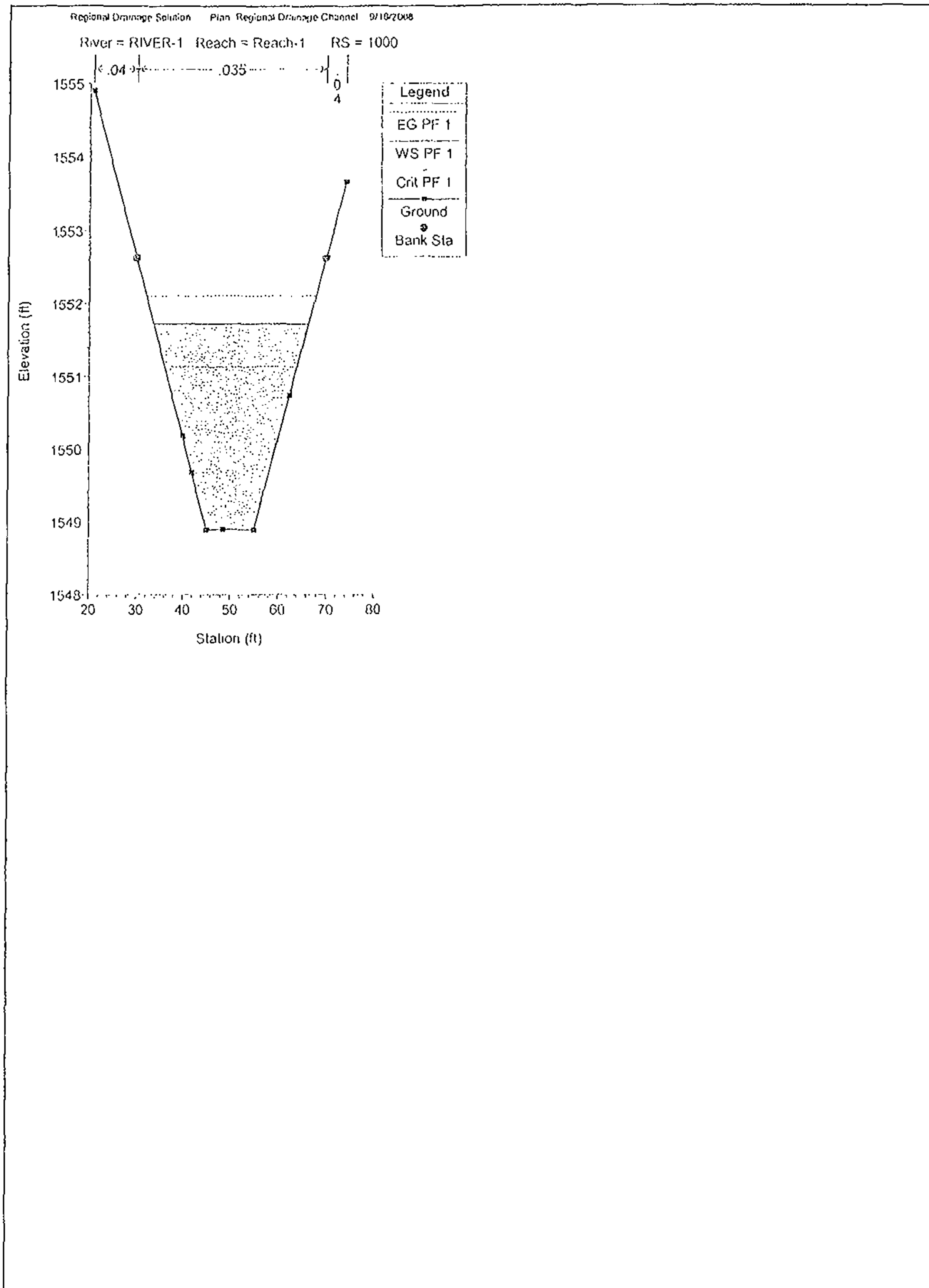

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1416
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1559
1558
1557
1556
1555
1554
1553
1552
20 30 40 50 60 70 80
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1319
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1221
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1123
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1025
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 1000
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1555
1554
1553
1552
1551
1550
1549
1548
20
30
40
50
60
70
80
Station (ft)

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3581 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1585.25	Q Gates (cfs)	
W.S. Elev (ft)	1585.03	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1583.86
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	72.37	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	16.98	Gate Submerg	0.00
Weir Sta Rgt (ft)	47.77	Gate Invert (ft)	0.00
Weir Max Depth (ft)	3.06	Gate Weir Coef	0.000
Weir Avg Depth (ft)	2.35		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.44	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1582.20	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	30.79		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3373 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1582.51	Q Gates (cfs)	
W.S. Elev (ft)	1582.30	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1580.88
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	73.03	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	19.30	Gate Submerg	0.00
Weir Sta Rgt (ft)	48.75	Gate Invert (ft)	0.00
Weir Max Depth (ft)	3.20	Gate Weir Coef	0.000
Weir Avg Depth (ft)	2.48		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.40	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1579.32	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	29.44		

Errors Warnings and Notes

Warning:	The inline structure solution failed to converge. The program used the solution with the least error.

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3155 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1579.04	Q Gates (cfs)	
W.S. Elev (ft)	1578.84	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1576.77
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.91	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	16.94	Gate Submerg	0.00
Weir Sta Rgt (ft)	56.63	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.70	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.96		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.11	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1576.35	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	39.70		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2796 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1574.04	Q Gates (cfs)	
W.S. Elev (ft)	1573.84	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1572.74
Q Weir (cfs)	300.00	Gate #Open	

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2796 Inl Struct Profile: PF 1 (Continued)

Weir Flow Area (sq ft)	77.07	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.50	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.49	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.42	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1571.31	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.99		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2559 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1570.94	Q Gates (cfs)	
W.S. Elev (ft)	1570.74	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1569.66
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.03	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.51	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.46	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.43	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1568.21	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.96		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2170 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1566.68	Q Gates (cfs)	
W.S. Elev (ft)	1566.47	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1565.38
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	76.16	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.56	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.57	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.70	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.95		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.45	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1563.99	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	39.00		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1988 Inl Struct Profile: PF 1

E.G. Elev (ft)	1564.02	Q Gates (cfs)	
W.S. Elev (ft)	1563.82	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1562.70
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.23	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.44	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.44	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.73	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.41	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1561.30	Breach Flow Area (sq ft)	

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1988 Inl Struct: Profile: PF 1 (Continued)

Wr Top Wdth (ft)	39.01		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1822 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1561.44	Q Gates (cfs)	
W.S. Elev (ft)	1561.24	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1560.14
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.05	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.50	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.47	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.42	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1558.71	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.97		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1657 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1558.87	Q Gates (cfs)	
W.S. Elev (ft)	1558.66	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1557.63
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	76.02	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.54	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.46	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.71	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.95		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.47	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1556.17	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.91		

Culvert Calculator Report
RDC Outfall 100yr

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,552.00 ft	Headwater Depth/Height	1 37
Computed Headwater Elev:	1,551.73 ft	Discharge	300.00 cfs
Inlet Control HW Elev.	1,551.51 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev	1,551.73 ft	Control Type	Entrance Control

Grades

Upstream Invert	1,547.62 ft	Downstream Invert	1,545 80 ft
Length	375.00 ft	Constructed Slope	0.004853 ft/ft

Hydraulic Profile

Profile	S2	Depth, Downstream	1.96 ft
Slope Type	Steep	Normal Depth	1.96 ft
Flow Regime	Supercritical	Critical Depth	2.22 ft
Velocity Downstream	9.56 ft/s	Critical Slope	0.003401 ft/ft

Section

Section Shape	Box	Mannings Coefficient	0 013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	2		

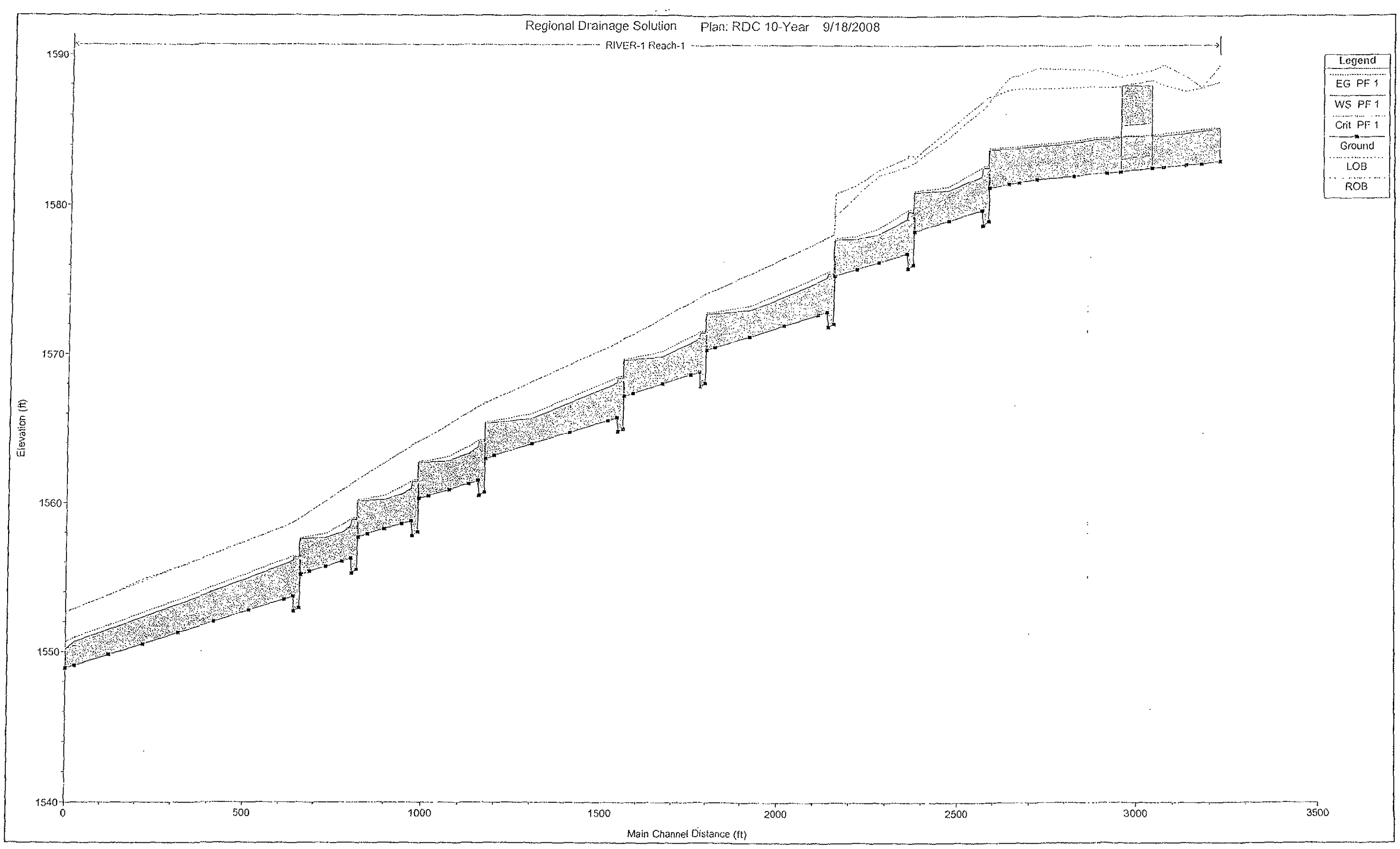
Outlet Control Properties

Outlet Control HW Elev.	1,551.73 ft	Upstream Velocity Head	1.11 ft
Ke	0 70	Entrance Loss	0 78 ft

Inlet Control Properties

Inlet Control HW Elev.	1,551.51 ft	Flow Control	Transition
Inlet Type	0° wingwall flares	Area Full	48.0 ft²
K	0.06100	HDS 5 Chart	8
M	0 75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

HEC-RAS Plan: RDC 10yr River: RIVER-1 Reach: Reach-1 Profile: PF 1														
River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	LOB Elev	ROB Elev	Flow Depth	Freeboard Req	Freeboard Prov
	(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
4222	105.00	1582.97	1585.13	1585.17	0.000576	1.53	68.79	36.28	0.20	1588.20	1589.30	2.16	1.00	3.07
4172	105	1582.80	1584.97	1585.10	0.002851	2.97	35.35	22.87	0.42	1587.82	1587.84	2.17	1.00	2.85
4130	105	1582.73	1584.84	1584.98	0.003072	3.04	34.50	22.78	0.44	1587.60	1588.56	2.11	1.00	2.76
4070	105	1582.59	1584.67	1584.80	0.002829	2.93	35.78	23.47	0.42	1588.00	1589.33	2.08	1.00	3.33
4039	105	1582.53	1584.68	1584.73	0.000866	1.88	55.86	26.06	0.23	1588.33	1588.98	2.15	1.00	3.65
4004	Culvert													
3953	105	1582.33	1584.63	1584.67	0.000701	1.76	59.80	26.06	0.20	1587.99	1588.61	2.30	1.00	3.36
3915	105	1582.25	1584.50	1584.62	0.002423	2.81	37.38	23.22	0.39	1587.90	1588.90	2.25	1.00	3.40
3819	105	1582.04	1584.26	1584.38	0.002524	2.84	36.96	23.33	0.40	1587.90	1589.11	2.22	1.00	3.64
3715	105	1581.80	1583.98	1584.11	0.002715	2.92	35.99	23.06	0.41	1587.80	1589.14	2.18	1.00	3.82
3663	105	1581.57	1583.87	1583.98	0.002203	2.70	38.84	23.84	0.37	1587.80	1588.70	2.30	1.00	3.93
3635	105	1581.44	1583.81	1583.92	0.001941	2.58	40.64	24.27	0.35	1587.70	1588.57	2.37	1.00	3.89
3582	105	1581.19	1583.75	1583.83	0.001308	2.30	45.62	23.80	0.29	1587.23	1587.03	2.56	1.00	3.28
3581	Inl Struct													
3579	105	1578.96	1582.52	1582.67	0.002612	3.10	33.89	18.55	0.40	1587.24	1586.88	3.56	1.00	4.36
3564	105	1578.70	1582.52	1582.62	0.001559	2.49	42.23	22.09	0.32	1587.02	1586.40	3.82	1.00	3.88
3561	105	1579.71	1581.98	1582.56	0.018555	6.11	17.18	15.14	1.01	1586.89	1586.40	2.27	1.00	4.42
3467	105	1579.00	1581.01	1581.26	0.006804	3.99	26.31	21.14	0.63	1585.10	1584.55	2.01	1.00	3.54
3374	105	1578.30	1580.89	1580.98	0.001296	2.33	45.07	22.76	0.29	1583.20	1582.91	2.59	1.00	2.02
3373	Inl Struct													
3371	105	1576.07	1579.59	1579.80	0.004030	3.70	28.34	16.12	0.49	1583.36	1582.90	3.52	1.00	3.31
3356	105	1575.82	1579.63	1579.73	0.001646	2.55	41.25	21.67	0.33	1583.42	1582.70	3.81	1.00	3.07
3353	105	1576.82	1579.12	1579.67	0.017321	5.96	17.62	15.32	0.98	1583.22	1582.64	2.30	1.00	3.52
3276	105	1576.24	1578.11	1578.50	0.012316	5.01	20.97	18.69	0.83	1582.40	1582.03	1.87	1.00	3.92
3216	105	1575.79	1577.82	1578.01	0.004662	3.43	30.57	23.21	0.53	1581.40	1580.73	2.03	1.00	2.91
3156	105	1575.34	1577.75	1577.83	0.001469	2.21	47.48	29.38	0.31	1580.80	1579.34	2.41	1.00	1.59
3155	Inl Struct													
3152	105	1572.09	1575.51	1575.63	0.002130	2.71	38.71	22.68	0.37	1578.10	1578.13	3.42	1.00	2.59
3138	105	1571.86	1575.50	1575.59	0.001522	2.39	43.91	24.10	0.31	1577.91	1577.91	3.64	1.00	2.41
3135	105	1572.86	1575.19	1575.55	0.011170	4.84	21.70	18.69	0.79	1577.86	1577.90	2.33	1.00	2.67
3110	105	1572.67	1574.92	1575.28	0.010755	4.79	21.91	18.74	0.78	1577.58	1577.58	2.25	1.00	2.66
3014	105	1571.95	1573.91	1574.25	0.010566	4.73	22.21	19.20	0.77	1576.51	1576.51	1.96	1.00	2.60
2918	105	1571.20	1573.00	1573.30	0.009150	4.42	23.76	20.49	0.72	1575.43	1575.43	1.80	1.00	2.43
2822	105	1570.50	1572.76	1572.86	0.002187	2.57	40.84	27.16	0.37	1574.36	1574.36	2.26	1.00	1.60
2797	105	1570.30	1572.73	1572.81	0.001569	2.28	46.08	28.60	0.32	1574.17	1574.17	2.43	1.00	1.44
2796	Inl Struct													
2794	105	1568.08	1571.47	1571.59	0.002228	2.76	38.07	22.48	0.37	1574.12	1574.12	3.39	1.00	2.65
2779	105	1567.85	1571.47	1571.56	0.001577	2.42	43.32	23.90	0.32	1573.90	1573.90	3.62	1.00	2.43
2776	105	1568.85	1571.11	1571.52	0.012857	5.09	20.62	18.12	0.84	1573.85	1573.85	2.26	1.00	2.74
2751	105	1568.66	1570.78	1571.19	0.013134	5.16	20.34	18.08	0.86	1573.52	1573.52	2.12	1.00	2.74
2668	105	1568.04	1569.85	1570.20	0.010667	4.73	22.21	19.39	0.78	1572.43	1572.43	1.81	1.00	2.58
2586	105	1567.40	1569.66	1569.77	0.002339	2.65	39.68	26.58	0.38	1571.35	1571.35	2.26	1.00	1.69
2561	105	1567.20	1569.63	1569.71	0.001574	2.28	46.03	28.60	0.32	1571.07	1571.10	2.43	1.00	1.44
2559	Inl Struct													
2557	105	1564.98	1568.40	1568.51	0.002147	2.72	38.60	22.63	0.37	1571.00	1571.02	3.42	1.00	2.60
2543	105	1564.80	1568.39	1568.48	0.001526	2.40	43.80	24.01	0.31	1570.80	1570.80	3.59	1.00	2.41
2540	105	1565.75	1568.09	1568.44	0.010724	4.76	22.08	18.76	0.77	1570.75	1570.75	2.34	1.00	2.66
2515	105	1565.56	1567.83	1568.18	0.010577	4.76	22.06	18.81	0.77	1570.47	1570.47	2.27	1.00	2.64
2408	105	1564.76	1566.76	1567.09	0.009827	4.60	22.80	19.44	0.75	1569.32	1569.32	2.00	1.00	2.56
2302	105	1563.97	1565.69	1566.02	0.010257	4.60	22.84	20.25	0.76	1568.16	1568.16	1.72	1.00	2.47
2196	105	1563.17	1565.42	1565.52	0.002158	2.55	41.11	27.34	0.37	1567.00	1567.00	2.25	1.00	1.58
2171	105	1562.98	1565.39	1565.47	0.001567	2.27	46.23	28.80	0.32	1566.72	1566.82	2.41	1.00	1.33
2170	Inl Struct													
2168	105	1560.72	1564.11	1564.23	0.002236	2.76	38.10	22.46	0.37	1566.69	1566.77	3.39	1.00	2.58
2153	105	1560.50	1564.10	1564.20	0.001615	2.44	42.96	23.88	0.32	1566.53	1566.50	3.60	1.00	2.40
2150	105	1561.49	1563.72	1564.15	0.014208	5.29	19.86	17.90	0.88	1566.49	1566.49	2.23	1.00	2.77
2125	105	1561.30	1563.32	1563.78	0.015240	5.47	19.21	17.54	0.92	1566.13	1566.10	2.02	1.00	2.78
2071	105	1560.90	1562.85	1563.13	0.008222	4.29	24.47	20.31	0.69	1565.33	1565.33	1.95	1.00	2.48
2015	105	1560.49	1562.73	1562.85	0.002487	2.71	38.70	26.11	0.39	1564.49	1564.49	2.24	1.00	1.76
1990	105	1560.29	1562.71	1562.79	0.001522	2.25	46.61	28.76	0.31	1564.13	1564.13	2.42	1.00	1.42
1988	Inl Struct													
1986	105	1558.04	1561.43	1561.55	0.002241	2.76	38.07	22.34	0.37	1564.10	1564.08	3.39	1.00	2.65
1972	105	1557.81	1561.42	1561.51	0.001587	2.43	43.20	23.89	0.32	1563.90	1563.86	3.61	1.00	2.44
1969	105	1558.81	1560.99	1561.46	0.015562	5.50	19.08	17.41	0.93	1563.81	1563.81	2.18	1.00	2.82
1944	105	1558.60	1560.60	1561.07	0.015615	5.51	19.06	17.52	0.93	1563.43	1563.40	2.00	1.00	2.80
1896	105	1558.27	1560.24	1560.51	0.007636	4.17	25.17	20.61	0.67	1562.69	1562.69	1.97	1.00	2.45
1849	105	1557.92	1560.15	1560.27	0.002592	2.76	38.04	25.81	0.40	1561.96	1562.00	2.23	1.00	1.01
1824	105	1557.70	1560.13	1560.21	0.001571	2.28	46.04	28.56	0.32	1561.57	1561.60	2.43	1.00	1.44
1822	Inl Struct													
1821	105	1555.48	1558.88	1558.99	0.002224	2.76	38.09	22.49	0.37	1561.52	1561.52	3.40	1.00	2.64
1806	105	1555.25	1558.87	1558.96	0.001595	2.43	43.26	23.91	0.32	1561.30	1561.30	3.62	1.00	2.43
1803	105	1556.30	1558.46	1558.91	0.014548	5.36	19.59	17.75	0.90	1561.20	1561.25	2.16	1.00	2.74
1778	105	1556.06	1558.03	1558.52	0.016615	5.63	18.65	17.40	0.96	1560.86	1560.90	1.97	1.00	2.83
1731	105	1555.70	1557.69	1557.95	0.007342	4.11	25.52	20.73	0.65	1560.13	1560.13	1.99	1.00	2.44
1683	105	1555.35	1557.60	1557.72	0.002481	2.72	38.65	25.98	0.39	1559.39	1559.40	2.25	1.00	1.79
1658	105	1555.16	1557.58	1557.66	0.001562	2.28	46.14	28.59	0.32	1559.00	1559.00	2.42	1.00	1.42
1657	Inl Struct													
1655	105	1552.91	1556.36	1556.47	0.002036	2.66	39.42	27.88	0.36	1558.95	1558.95	3.45	1.00	2.59
1640	105	1552.68	1556.35	1556.44	0.001473	2.36	44.45	24.27	0.31	1558.73	1558.70	3.67	1.00	2.35
1637	105	1553.68	1556.08	1556.40	0.009380	4.53	23.19	19.30	0.73	1558.68	1558.70	2.40	1.00	2.60
1612	105	1553.49	1555.85	1556.17	0.009400	4.55	23.05	19.23	0.73	1558.40	1558.44	2.36	1.00	2.55
1514	105	1552.76	1554.94	1555.26	0.009265	4.53	23.20	19.37	0.73	1557.50	1557.51	2.18	1.00	2.56
1416	105	1552.00	1554.05	1554.36	0.009013	4.46	23.54	19.71	0.72	1556.58	1556.58	2.05	1.00	2.53
1319	105	1551.28	1553.18	1553.48	0.008959	4.42	23.76	20.13	0.72	1555.65	1555.70	1.90	1.00	2.47
1221	105	1550.50	1552.31	1552.61	0.008793	4.35	24.13	20.68	0.71	1554.85	1554.70	1.81	1.00	2.39
1123	105	1549.80	1551.48	1551.76	0.008518	4.25	24.71	21.46	0.70	1553.79	1553.80	1.68	1.00	2.31
1025	105	1549.08	1550.69	1550.95	0.008034	4.11	25.56	22.38	0.68	1552.87	1552.87	1.61	1.00	2.18
1000	105	1548.89	1550.16	1550.63	0.018070	5.55	18.93	20.11	1.01	1552.63	1552.63	1.27	1.00	2.47



Regional Drainage Solution Plan: RDC 10-Year 9/18/2008
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
Main Channel Distance (ft)
1540
1550
1560
1570
1580
1590
0
500
1000
1500
2000
2500
3000
3500

Culvert Calculator Report
RDC Outfall 10yr

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,552.00 ft	Headwater Depth/Height	0.68
Computed Headwater Elev:	1,549.66 ft	Discharge	105.00 cfs
Inlet Control HW Elev.	1,549.48 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev.	1,549.66 ft	Control Type	Entrance Control

Grades

Upstream Invert	1,547.62 ft	Downstream Invert	1,545.80 ft
Length	375.00 ft	Constructed Slope	0.004853 ft/ft

Hydraulic Profile

Profile	S2	Depth, Downstream	0.97 ft
Slope Type	Steep	Normal Depth	0.97 ft
Flow Regime	Supercritical	Critical Depth	1.10 ft
Velocity Downstream	6.76 ft/s	Critical Slope	0.003298 ft/ft

Section

Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	2		

Outlet Control Properties

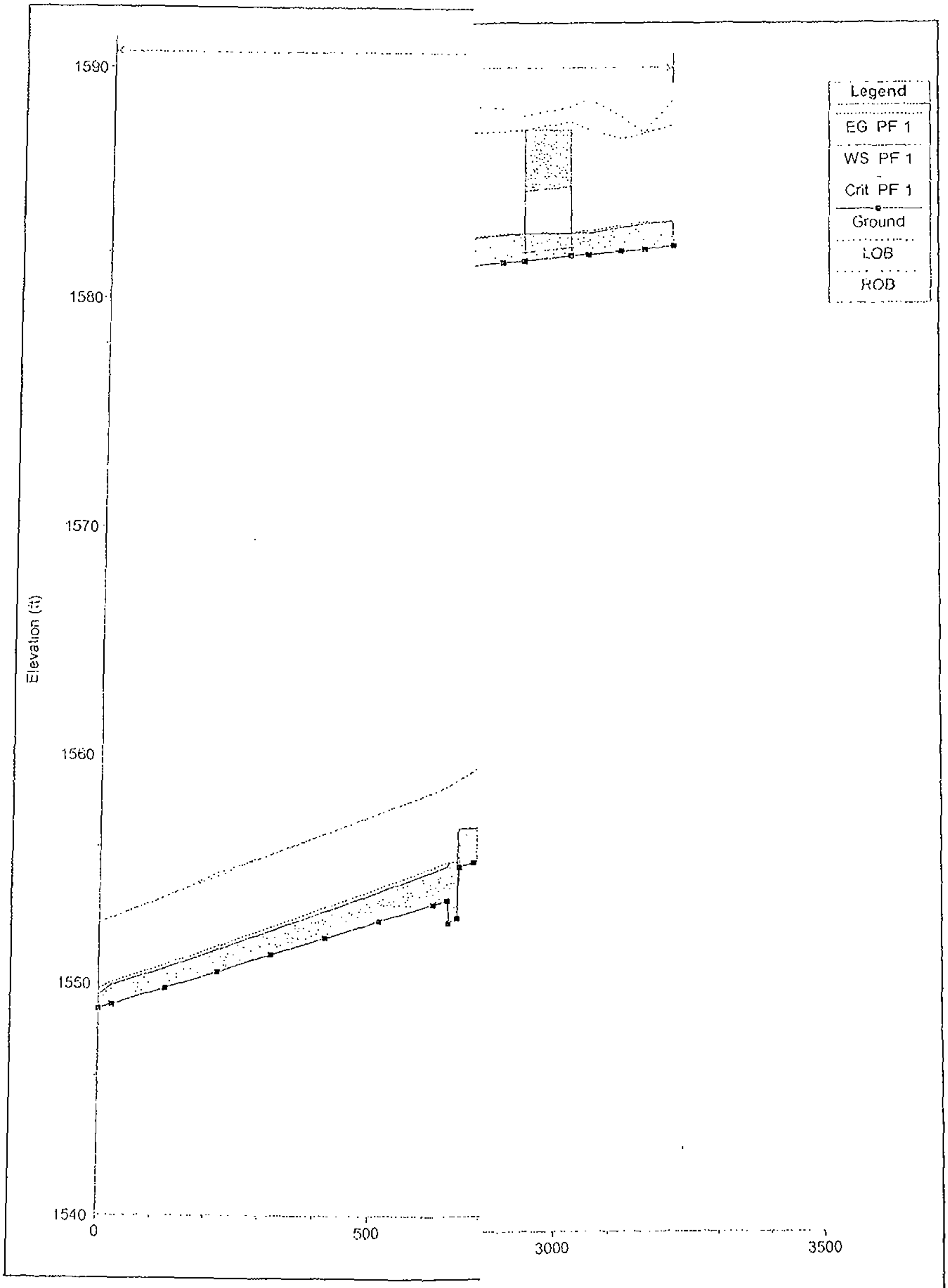
Outlet Control HW Elev.	1,549.66 ft	Upstream Velocity Head	0.55 ft
Ke	0.70	Entrance Loss	0.39 ft

Inlet Control Properties

Inlet Control HW Elev	1,549.48 ft	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	48.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

HEC-RAS Plan RDC 2yr River RIVER-1 Reach Reach-1 Profile: PF 1

River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	LOB Elev	ROB Elev	Flow Depth	Freeboard Req	Freeboard Prov
	(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
4222	30	1582.97	1584.03	1584.04	0.000583	0.98	30.71	32.42	0.18	1588.20	1589.30	1.06	1.00	4.17
4172	30	1582.80	1583.91	1583.98	0.002872	2.06	14.57	16.56	0.39	1587.82	1587.84	1.11	1.00	3.91
4130	30	1582.73	1583.77	1583.85	0.003454	2.19	13.70	16.32	0.42	1587.60	1588.56	1.04	1.00	3.83
4070	30	1582.59	1583.54	1583.62	0.004075	2.28	13.15	16.72	0.45	1588.00	1589.33	0.95	1.00	4.46
4039	30	1582.53	1583.53	1583.56	0.000803	1.15	26.13	26.03	0.20	1588.33	1588.98	1.00	1.00	4.80
4004	Culvert													
3953	30	1582.33	1583.51	1583.53	0.000470	0.97	30.84	26.05	0.16	1587.99	1588.61	1.18	1.00	4.48
3915	30	1582.25	1583.44	1583.49	0.002122	1.86	16.11	16.91	0.34	1587.90	1588.90	1.19	1.00	4.46
3819	30	1582.04	1583.24	1583.29	0.002089	1.84	16.28	17.19	0.33	1587.90	1589.11	1.20	1.00	4.66
3715	30	1581.80	1583.04	1583.09	0.001858	1.77	16.95	17.41	0.32	1587.80	1589.14	1.24	1.00	4.76
3663	30	1581.57	1582.97	1583.01	0.001170	1.50	19.94	18.45	0.26	1587.80	1588.70	1.40	1.00	4.83
3635	30	1581.44	1582.95	1582.98	0.000839	1.37	21.87	19.05	0.23	1587.70	1588.57	1.51	1.00	4.75
3582	30	1581.19	1582.92	1582.94	0.000446	1.09	27.59	19.97	0.16	1587.23	1587.03	1.73	1.00	4.11
3581	Inl Struct													
3579	30	1578.96	1581.45	1581.50	0.001388	1.78	16.88	13.27	0.28	1587.24	1586.88	2.49	1.00	5.43
3564	30	1578.70	1581.45	1581.48	0.000744	1.38	21.78	15.06	0.21	1587.02	1586.40	2.75	1.00	4.95
3561	30	1579.71	1581.09	1581.44	0.021934	4.76	6.30	9.17	1.01	1586.89	1586.40	1.38	1.00	5.31
3467	30	1579.00	1580.08	1580.21	0.007706	3.00	10.01	13.62	0.62	1585.10	1584.55	1.08	1.00	4.47
3374	30	1578.30	1580.05	1580.07	0.000440	1.10	27.40	19.29	0.16	1583.20	1582.91	1.75	1.00	2.86
3373	Inl Struct													
3371	30	1576.07	1578.56	1578.63	0.002092	2.12	14.16	11.40	0.33	1583.36	1582.90	2.49	1.00	4.34
3356	30	1575.82	1578.57	1578.60	0.000770	1.40	21.44	15.62	0.21	1583.42	1582.70	2.75	1.00	4.13
3353	30	1576.82	1578.32	1578.57	0.013852	4.01	7.49	9.99	0.82	1583.22	1582.64	1.50	1.00	4.32
3276	30	1576.24	1577.25	1577.47	0.014457	3.83	7.83	11.80	0.83	1582.40	1582.03	1.01	1.00	4.78
3216	30	1575.79	1577.04	1577.11	0.002727	2.01	14.91	16.94	0.38	1581.40	1580.73	1.25	1.00	3.69
3156	30	1575.34	1577.01	1577.03	0.000516	1.07	27.97	23.44	0.17	1580.80	1579.34	1.67	1.00	2.33
3155	Inl Struct													
3152	30	1572.09	1574.51	1574.55	0.001096	1.55	19.39	16.01	0.25	1578.10	1578.13	2.42	1.00	3.59
3138	30	1571.86	1574.51	1574.53	0.000675	1.29	23.23	17.46	0.20	1577.91	1577.91	2.65	1.00	3.40
3135	30	1572.86	1574.32	1574.51	0.011228	3.54	8.47	11.69	0.73	1577.86	1577.90	1.46	1.00	3.54
3110	30	1572.67	1574.03	1574.23	0.011444	3.58	8.37	11.60	0.74	1577.58	1577.58	1.36	1.00	3.55
3014	30	1571.95	1573.11	1573.27	0.008627	3.17	9.47	12.87	0.65	1576.51	1576.51	1.16	1.00	3.40
2918	30	1571.20	1572.11	1572.29	0.011998	3.45	8.69	13.36	0.75	1575.43	1575.43	0.91	1.00	3.32
2822	30	1570.50	1572.00	1572.03	0.000924	1.33	22.51	21.08	0.23	1574.36	1574.36	1.50	1.00	2.36
2797	30	1570.30	1571.99	1572.01	0.000550	1.11	27.11	22.70	0.18	1574.17	1574.17	1.69	1.00	2.18
2796	Inl Struct													
2794	30	1568.08	1570.48	1570.52	0.001158	1.58	19.02	15.88	0.25	1574.12	1574.12	2.40	1.00	3.64
2779	30	1567.85	1570.48	1570.50	0.000696	1.31	22.93	17.29	0.20	1573.90	1573.90	2.63	1.00	3.42
2776	30	1568.85	1570.26	1570.48	0.012992	3.72	8.07	11.51	0.78	1573.85	1573.85	1.41	1.00	3.59
2751	30	1568.66	1569.98	1570.17	0.011024	3.53	8.49	11.70	0.73	1573.52	1573.52	1.32	1.00	3.54
2668	30	1568.04	1568.98	1569.18	0.013124	3.63	8.27	12.62	0.79	1572.43	1572.43	0.94	1.00	3.45
2586	30	1567.40	1568.90	1568.93	0.000905	1.38	21.80	20.55	0.24	1571.35	1571.35	1.50	1.00	2.45
2561	30	1567.20	1568.89	1568.91	0.000554	1.11	27.02	22.64	0.18	1571.07	1571.10	1.69	1.00	2.18
2559	Inl Struct													
2557	30	1564.98	1567.40	1567.44	0.001101	1.55	19.39	16.03	0.25	1571.00	1571.02	2.42	1.00	3.60
2543	30	1564.80	1567.40	1567.43	0.000677	1.29	23.24	17.54	0.20	1570.80	1570.80	2.60	1.00	3.40
2540	30	1565.75	1567.22	1567.40	0.010545	3.43	8.75	12.01	0.71	1570.75	1570.75	1.47	1.00	3.53
2515	30	1565.56	1566.90	1567.11	0.012611	3.72	8.07	11.40	0.78	1570.47	1570.47	1.34	1.00	3.57
2408	30	1564.76	1566.00	1566.13	0.006811	2.91	10.31	13.31	0.58	1569.32	1569.32	1.24	1.00	3.32
2302	30	1563.97	1564.77	1565.01	0.017535	3.93	7.63	12.86	0.90	1568.16	1568.16	0.80	1.00	3.39
2196	30	1563.17	1564.67	1564.70	0.000888	1.31	22.89	21.35	0.22	1567.00	1567.00	1.50	1.00	2.33
2171	30	1562.98	1564.66	1564.68	0.000536	1.09	27.41	22.89	0.18	1566.72	1566.82	1.68	1.00	2.06
2170	Inl Struct													
2166	30	1560.72	1563.12	1563.16	0.001150	1.57	19.09	15.94	0.25	1566.69	1566.77	2.40	1.00	3.57
2153	30	1560.50	1563.12	1563.14	0.000731	1.33	22.62	17.38	0.20	1566.53	1566.50	2.62	1.00	3.38
2150	30	1561.49	1562.89	1563.12	0.013394	3.79	7.91	11.24	0.80	1566.49	1566.49	1.40	1.00	3.60
2125	30	1561.30	1562.48	1562.74	0.016679	4.12	7.28	10.87	0.89	1566.13	1566.10	1.18	1.00	3.62
2071	30	1560.90	1562.04	1562.16	0.006503	2.82	10.62	13.89	0.57	1565.33	1565.33	1.14	1.00	3.29
2015	30	1560.49	1561.98	1562.01	0.001053	1.41	21.28	20.18	0.24	1564.49	1564.49	1.49	1.00	2.51
1990	30	1560.29	1561.97	1561.99	0.000524	1.09	27.56	22.82	0.17	1564.13	1564.13	1.68	1.00	2.16
1988	Inl Struct													
1986	30	1558.04	1560.44	1560.48	0.001137	1.57	19.12	15.75	0.25	1564.10	1564.08	2.40	1.00	3.64
1972	30	1557.81	1560.43	1560.46	0.000718	1.32	22.78	17.47	0.20	1563.90	1563.86	2.62	1.00	3.43
1969	30	1558.81	1560.20	1560.43	0.014411	3.90	7.70	11.13	0.83	1563.81	1563.81	1.39	1.00	3.61
1944	30	1558.60	1559.76	1560.03	0.017505	4.19	7.15	10.01	0.91	1563.43	1563.40	1.16	1.00	3.64
1896	30	1558.27	1559.45	1559.56	0.005499	2.65	11.31	14.33	0.53	1562.69	1562.69	1.18	1.00	3.24
1849	30	1557.92	1559.40	1559.44	0.001095	1.43	20.93	19.93	0.25	1561.96	1562.00	1.49	1.00	2.56
1824	30	1557.70	1559.39	1559.41	0.000541	1.10	27.22	22.65	0.18	1561.57	1561.60	1.69	1.00	2.18
1822	Inl Struct													
1821	30	1555.48	1557.89	1557.93	0.001132	1.56	19.19	15.94	0.25	1561.52	1561.52	2.41	1.00	3.63
1806	30	1555.25	1557.89	1557.91	0.000696	1.30	23.03	17.36	0.20	1561.30	1561.30	2.64	1.00	3.41
1803	30	1556.30	1557.67	1557.89	0.012797	3.73	8.04	11.41	0.78	1561.20	1561.25	1.37	1.00	3.53
1778	30	1556.06	1557.19	1557.49	0.019991	4.40	6.82	10.61	0.97	1560.86	1560.90	1.13	1.00	3.67
1731	30	1555.70	1556.90	1557.00	0.005023	2.57	11.67	14.49	0.50	1560.13	1560.13	1.20	1.00	3.23
1683	30	1555.35	1556.86	1556.89	0.001013	1.39	21.52	20.15	0.24	1559.39	1559.40	1.51	1.00	2.53
1658	30	1555.16	1556.85	1556.87	0.000529	1.09	27.49	22.80	0.18	1559.00	1559.00	1.69	1.00	2.15
1657	Inl Struct													
1655	30	1552.91	1555.35	1555.39	0.001048	1.52	19.77	16.24	0.24	1558.95	1558.95	2.44	1.00	3.60
1640	30	1552.68	1555.35	1555.37	0.000662	1.28	23.46	17.05	0.20	1558.73	1558.70	2.67	1.00	3.35
1637	30	1553.68	1555.18	1555.35	0.009305	3.31	9.07	12.03	0.67	1558.68	1558.70	1.50	1.00	3.50
1612	30	1553.49	1554.95	1555.12	0.009333	3.33	9.02	12.00	0.68	1558.40	1558.44	1.46	1.00	3.45
1514	30	1552.76	1554.05	1554.21	0.009165	3.29	9.12	12.23	0.67	1557.50	1557.51	1.29	1.00	3.45
1416	30	1552.00	1553.18	1553.34	0.008700	3.19	9.41	12.74	0.65	1556.58	1556.58	1.18	1.00	3.40
1319	30	1551.28	1552.32	1552.48	0.008819	3.15	9.53	13.33	0.66	1555.65	1555.70	1.04	1.00	3.33
1221	30	1550.50	1551.50	1551.64	0.008351	3.03	9.91	14.12	0.64	1554.85	1554.70	1.00	1.00	3.20
1123	30	1549.80	1550.68	1550.82	0.008631	2.99	10.04	15.02	0.64	1553.79	1553.80	0.88	1.00	3.11
1025	30	1549.08	1549.94	1550.05	0.005972	2.71	11.08	16.36	0.58	1552.87	1552.87	0.86	1.00	2.93
1000	30	1548.89	1549.50	1549.75	0.022047	4.03	7.44	14.79	1.00	1552.63	1552.63	0.61	1.00	3.13


Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
1590
1580
1570
1560
1550
1540
0
500
3000
3500

Culvert Calculator Report
RDC Outfall 2yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	1,552.00	ft	Headwater Depth/Height	0.29	
Computed Headwater Elev.	1,548.50	ft	*Discharge*	30.00	cfs
Inlet Control HW Elev.	1,548.42	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	1,548.50	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	1,547.62	ft	Downstream Invert	1,545.80	ft
Length	375.00	ft	Constructed Slope	0.004853	ft/ft

Hydraulic Profile					
Profile	S2		*Depth, Downstream*	0.44	ft
Slope Type	Steep		Normal Depth	0.44	ft
Flow Regime	Supercritical		Critical Depth	0.48	ft
Velocity Downstream	4.28	ft/s	*Critical Slope*	0.003661	ft/ft

Section				
Section Shape	Box	Mannings Coefficient	0.013	
Section Material	Concrete	*Span*	8.00	ft
Section Size	8 x 3 ft	Rise	3.00	ft
Number Sections	2			

Outlet Control Properties					
Outlet Control HW Elev.	1,548.50	ft	Upstream Velocity Head	0.24	ft
Ke	0.70		Entrance Loss	0.17	ft

Inlet Control Properties					
Inlet Control HW Elev.	1,548.42	ft	Flow Control	Unsubmerged	
Inlet Type	0° wingwall flares		Area Full	48.0	ft²
K	0.06100		HDS 5 Chart	8	
M	0.75000		HDS 5 Scale	3	
C	0.04230		Equation Form	1	
Y	0.82000				

APPENDIX C

Erosion Protection

Level I Scour

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/16/2008

Level 1 Analysis of Stream Degradation

Reference: ADWR, Flood Warning and Dam Safety Section, 1996.
State Standard 5-96: "Watercourse System Sediment Balance - Guideline 2:
Channel Degradation Estimation for Alluvial Channels in Arizona"

Assumptions: Channel reaches without major disturbances, such as dams and bridges.

Equations: Ds = Dgs + Dlts

where:
Ds = total scour depth, in feet;
Dgs = general degradation, in feet;
Dlts = long term degradation, in feet;

For straight channel reaches:
Dgs = 0.157*Q100^0.4

For channel reaches with curvature:
Dgs = 0.219*Q100^0.4

Long term degradation:
Dlts = 0.02*Q100^0.6

Project Name: Regional Drainage Solution **Location:** Scottsdale

Input Data:

Q100 = *300 cfs*

Ds =	2.15 ft	for straight channel
Ds =	2.76 ft	otherwise

Recommended Scour Depth = 3.0 ft

Note: the minimum total scour depth, Ds, shall be 3 feet.

Bend Scour Calculation

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Bend Scour Design Calculations
Date:	9/16/2008

Bend Scour Calculation Sheet

Reference: ADWR, Design Manual for Engineering Analysis of Fluvial Systems, 1985 p5 105-5.110

Project Name. Regional Drainage Solution Wood/Patel # 073022

Scour Depth Equation:

Zbs = (0.0685*Y*V^0.8)[2.1*(sin²(a/2)/cos(a))^0.2-1]/(Yh^0.4*Se^0.3)

Where Zbs = bend scour component of total scour depth (ft)
V = mean velocity of upstream flow (fps)
Y = maximum depth of upstream flow (ft)
Yh = hydraulic depth of upstream flow (ft)
Se = upstream energy slope (bed slope for uniform flow conditions, ft/ft)
a = angle formed by the projection of the channel centerline from the point of curvature to a point which meets a line tangent to the outer bank of the channel (degrees)

Scour Length Equation

X = 2.3*(C/g^0.5)*Y

Where X = distance from the end of channel curvature (point of tangency P.T.) to the downstream point at which secondary currents have dissipated (ft)
*C = Chezy coefficient = 1.486*R^(1/6)/n*
g = gravitational acceleration (32.2 ft/s²)
Y = depth of flow (to be conservative, use maximum depth of flow, exclusive of scour, within the bend) (ft)

Input Data

V =	4.1	(ft/s)	n =	0.035	
Y =	3.56	(ft)	A =	73.54	(ft²)
Yh =	2.35	(ft)	P =	33	(ft)
Se =	0.003104		R =	2.23	(ft)
a =	40	(degree)	C =	48.52	
		Stable bank side slope =		3	(H:V)

Computed Scour Values

Scour Depth:		Scour Length:		Scour Width:	
Zbs =	1.34 (ft)	X =	70 (ft)	W =	4.0 (ft)

Rip Rap Design

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Rip Rap Design Calculations
Date:	9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, Engineering and Design Hydraulic Design of Flood Control Channels. No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24, (Suggested gradation for riprap).

$$D_{30} = S_f C_S C_V C_T d \left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w} \right)^{1/2} \cdot \frac{V}{\sqrt{K_1 g d}} \right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Inlet Driveway Culvert

Inlet Riprap Size

Safety Factor, S_f	1.3	
Stability Coefficient, C_s	0.375	*(Assume rounded rock)*
Vertical Velocity Dist., C_v	1.00	
Thickness Coefficient, C_T	1.00	
Local Depth, d	3.94	ft
Unit Weight of Water, γ_w	62.4	lbs/ft^3
Unit Weight of Stones, γ_s	165	lbs/ft^3
Local Velocity, V	3.6	ft/sec
Bank Angle With Horizontal, θ	18.43	°
Rip Rap Angle of Repose (Fig 6-8), Φ	37	°
Bank Angle Correction Factor, K_1	0.8509	
Computed Riprap Size, D_{30}	0.9	inches
Computed Riprap Size, D_{50}	1.3	inches
Computed Riprap Size, D_{15}	0.6	inches
Computed Riprap Size, D_{85}	2.0	inches
Design Riprap Size, D_{50}	**9 inches**	TYPE I

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, *Engineering and Design Hydraulic Design of Flood Control Channels*. No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment
Hydraulic and Environmental Design Considerations
May 1975, pVI-24, (Suggested gradation for riprap).

$$D_{30} = S_f C_S C_V C_T d\left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w}\right)^{1/2} \frac{V}{\sqrt{K_1 g d}}\right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Channel Bend

Inlet Riprap Size

Safety Factor, S_f	1.3	
Stability Coefficient, C_s	0.375	(Assume rounded rock)
Vertical Velocity Dist., C_v	1.15	
Thickness Coefficient, C_T	1.00	
Local Depth, d	3.56	ft
Unit Weight of Water, γ_w	62.4	lbs/ft^3
Unit Weight of Stones, γ_s	165	lbs/ft^3
Local Velocity, V	4.1	ft/sec
Bank Angle With Horizontal, θ	18.43	°
Rip Rap Angle of Repose (Fig 6-8), Φ	39	°
Bank Angle Correction Factor, K_1	0.8647	
Computed Riprap Size, D_{30}	1.4	inches
Computed Riprap Size, D_{50}	2.1	inches
Computed Riprap Size, D_{15}	0.9	inches
Computed Riprap Size, D_{85}	3.1	inches
Design Riprap Size, D_{50}	9	inches TYPE I

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, Engineering and Design Hydraulic Design of Flood Control Channels. No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24, (Suggested gradation for riprap).

$$D_{30} = S_f C_S C_V C_T d\left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w}\right)^{1/2} \frac{V}{\sqrt{K_1 g d}}\right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Culvert Under Scottdale Road

Inlet Riprap Size

Safety Factor, S_f	1.3	
Stability Coefficient, C_s	0.375	(Assume rounded rock)
Vertical Velocity Dist., C_v	1.00	
Thickness Coefficient, C_T	1.00	
Local Depth, d	2.84	ft
Unit Weight of Water, γ_w	62.4	lbs/ft^3
Unit Weight of Stones, γ_s	165	lbs/ft^3
Local Velocity, V	5.0	ft/sec
Bank Angle With Horizontal, θ	14.1	°
Rip Rap Angle of Repose (Fig 6-8), Φ	37	°
Bank Angle Correction Factor, K_1	0.9144	
Computed Riprap Size, D_{30}	1.9	inches
Computed Riprap Size, D_{50}	2.9	inches
Computed Riprap Size, D_{15}	1.3	inches
Computed Riprap Size, D_{85}	4.4	inches
Design Riprap Size, D_{50}	**9**	**inches** TYPE I

Rip Rap Design

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Rip Rap Design Calculations
Date:	9/15/2008

Riprap Design Spreadsheet

References: *US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24.*

US DOT, FHWA, Hydraulic Design of Energy Dissipaters for Culverts and Channel. Sept. 1983, pII-5-II-9.

FCDMC, Drainage Design Manual for Maricopa County Arizona, Vol. II - Hydraulics. January 1996, p5.75-5.77.

Project Name: Interim Regional Drainage Channel
Project #: 073022

Structure ID: Union Hills Outlet
Culvert Size: 3- 8'x3' CBC

1. Riprap Size D50

Max. flow width Wo =	24.00 ft	
Max. culvert flow depth h =	3.00 ft	
Tailwater depth TW =	3.00 ft	
Exit Velocity Ve =	4.16 fps	
Tailwater velocity Vd =	2.20 fps	normal
Wash bottom width =	25.00 ft	
Computed Riprap Size D50 =	1.2 in	
Design Riprap Size D50 =	9 in	
Sieve Size =	TYPE I	

2. Riprap Sizes D15 and D85

Design Riprap Size D15 =	4 in
Design Riprap Size D85 =	14 in

3. Riprap Apron Length

Riprap Apron Length = 14 ft

4. Riprap Apron Width

Min. Riprap Apron Width =	30 ft
Max. Riprap Apron Width =	31 ft

5. Riprap Thickness

Riprap Thickness = 36 in

6. Total Riprap Volume

Riprap Rock Volume = 46 CY

Please note fields highlighted are input values from the Culvert Modeling Summary

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: *US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24.*

US DOT, FHWA, Hydraulic Design of Energy Dissipaters for Culverts and Channel. Sept. 1983, pII-5-II-9.

FCDMC, Drainage Design Manual for Maricopa County Arizona, Vol. II - Hydraulics. January 1996, p5.75-5.77.

Project Name: Interim Regional Drainage Channel — Structure ID: **Driveway Outlet**
Project #: 073022 — Culvert Size: 3- 8'x3' CBC

1. Riprap Size D50

Max. flow width Wo =	24.00 ft	
Max. culvert flow depth h =	3.00 ft	
Tailwater depth TW =	3.00	
Exit Velocity Ve =	4.17 fps	
Tailwater velocity Vd =	3.05 fps	normal
Wash bottom width =	25.00 ft	
Computed Riprap Size D50 =	12 in	
Design Riprap Size D50 =	9 in	
Sieve Size =	TYPE I	

2. Riprap Sizes D15 and D85

Design Riprap Size D15 =	4 in
Design Riprap Size D85 =	14 in

3. Riprap Apron Length

Riprap Apron Length =	8 ft

4. Riprap Apron Width

Min. Riprap Apron Width =	30 ft
Max. Riprap Apron Width =	31 ft

5. Riprap Thickness

Riprap Thickness =	36 in

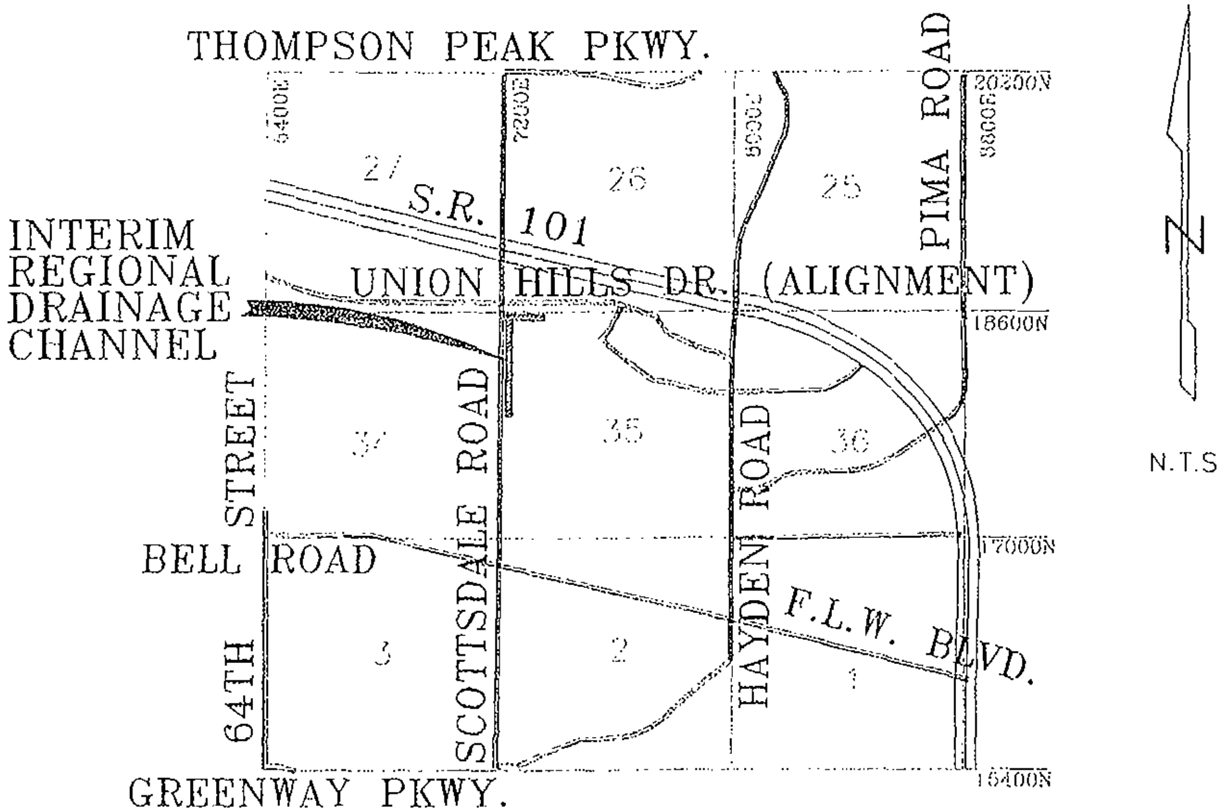
6. Total Riprap Volume

Riprap Rock Volume =	26 CY

Please note fields highlighted are input values from the Culvert Modeling Summary

EXHIBIT 1

Vicinity Map



INTERIM REGIONAL
DRAINAGE CHANNEL

Exhibit 1
Vicinity Map

WOOD/PATEL
LAND DEVELOPMENT • WATER RESOURCES
TRANSPORTATION / TRAFFIC
WATER / WASTEWATER • SURVEYING
CONSTRUCTION MANAGEMENT
(602) 335-8500
PHOENIX • MESA • TUCSON

S: \2007\073022\Dwg\Exhibits\Vicinity Map.dwg

Appendix O

As- Builts for Interim Regional Channel Design Report

FINAL DRAINAGE REPORT

FOR

INTERIM REGIONAL DRAINAGE CHANNEL

October 1, 2008

WP# 073022

Prepared for:

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Registered Professional Engineer (Civil)
CERTIFICATE NO
42317
GEOFFREY SCOTT BROWNELL
Date Signed 10-1-08
ARIZONA U.S.A.

expires 3/31/11

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APPENDICES

EXHIBITS

km
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Registered Professional Engineer (Civil)
CERTIFICATE NO
42317
GEOFFREY SCOTT
BROWNELL
Date Signed 10-1-08
ARIZONA U.S.A.

Geoffrey Scott Brownell

expires 3/31/11

1.0 EXECUTIVE SUMMARY

- The Interim Regional Drainage Channel is a proposed 3,200-linear foot open channel along Union Hills Road and Scottsdale Road within the City of Scottsdale.
- The channel is intended to provide increased flood protection in a known floodplain, as well as protection for future improvements of Scottsdale Road.
- The Interim Regional Drainage Channel completes the downstream reach of City of Scottsdale initiated regional drainage improvements.
- The channel will convey flow from an existing culvert under Union Hills Drive. It will run east adjacent to Union Hills Drive, turn south and flow adjacent to the Scottsdale Road right-of-way within a future scenic corridor easement to a proposed box culvert under Scottsdale Road. Storm water will ultimately be retained in the Reach 11 Recreation Area of the Central Arizona Project canal.
- The maximum channel width is proposed to be 40 feet.
- The box culvert conveying flows under Scottsdale Road is currently under design by the City of Scottsdale.
- Grade control structures are incorporated in the design to maintain the 100-year flow velocities in the channel within permissible velocities appropriate for an unlined native channel.
- Riprap erosion protection will be incorporated into each grade control structure, as well as at horizontal turns in the channel alignment and inlet/outlet of culverts.
- The design flow for the Interim Regional Drainage Channel is 300 cubic feet per second.

2.0 GENERAL BACKGROUND

The Interim Regional Drainage Channel presents the opportunity for implementation of flood protection in the City of Scottsdale. It completes the downstream reach of drainage improvements initiated by the City of Scottsdale. In addition, it provides protection to proposed improvements to Scottsdale Road. It will be located within a scenic corridor easement and add aesthetic open space along a major arterial roadway. The solution is anticipated to prevent redundancies in the drainage system that could occur if development occurred in a disjointed manner.

The proposed Interim Regional Drainage Channel is located within the northwest quarter of Section 35, Township 4 North, Range 4 East, of the Gila and Salt River Base and Meridian. More specifically, the channel is located along the east side of the Scottsdale Road right-of-way between Union Hills Drive and Princess Drive. A map of the area can be seen on Exhibit 1 – *Vicinity Map*.

The project site lies in a Federal Emergency Management Agency (FEMA) designated Zone "AO" Special Flood Hazard Area, with depths of one foot and velocities of three feet per second, per the Flood Insurance Rate Map (FIRM) panel number 04013C1245H, effective date September 30, 2005 (see Exhibit 2 – *FEMA Map*).

Currently, drainage from the north passes south under the Loop 101 Freeway through existing box culverts. Flow is conveyed past Union Hills Drive via existing drainage improvements, then flows in an existing wash in a westerly and southerly direction across the Arizona State Land Department (ASLD) property. There is current planning for concrete box culverts that would convey this flow west under Scottsdale Road. An existing channel running west on the north side of Princess Drive would not be disturbed by the Interim Regional Drainage Channel and would continue to operate independently.

3.0 DESIGN CONCEPT

The alignment for the Interim Regional Drainage Channel was chosen with input from the Arizona State Land Department (ASLD) and the City of Scottsdale. The proposed alignment maintains connection with the existing drainage improvements south of Union Hills Drive. The proposed channel begins at the outlet of an existing culvert on the south side of Union Hills Drive. The channel will flow east adjacent to Union Hills Drive for approximately 550 feet where it turns south and flows for approximately 2,650 feet within a future scenic corridor easement adjacent to the Scottsdale Road right-of-way. The planned access to the ASLD parcel is a driveway off Union Hills Drive. The proposed channel will be conveyed through three (3) 3-foot by 8-foot concrete box culverts at the proposed driveway location. The proposed regional channel ultimately outfalls into proposed culverts that are currently under design by Dibble & Associates, Inc. The storm water then flows west under Scottsdale Road and into the Central Arizona Project Reach 11 Recreation Area retention. The proposed channel alignment is shown on Exhibit 3 -- *Conceptual Grading and Drainage Plan*.

The Interim Regional Drainage Channel is proposed to be an unlined earthen channel. Grade control structures are incorporated into the vertical design of the channel in order to maintain the 100-year flow velocities within appropriate ranges. A variable bottom width is employed in the channel in order to maintain a constant channel slope adjacent to a variable sloped roadway. A 10-foot wide bottom occurs at the upstream end of each grade control structure. The drop is created by extending the sideslopes down to make a triangular channel at the downstream end of the structure. The channel transitions back to the flat bottom at the upstream end of the next grade control structure.

Erosion protection was incorporated into the channel design. Riprap erosion protection was integrated as part of each grade control structure. This protection will be of sufficient length to include the hydraulic jump associated with each structure. Riprap erosion protection is also proposed at the bends in the channel alignment to reduce the possibility of breakout and lateral migration. Revegetation and hydroseed will be used along the length of the channel for aesthetic purposes and increased erosion control.

Typical cross sections for the Interim Regional Drainage Channel were selected to provide adequate conveyance for the 100-year storm. A minimum of one foot of freeboard is provided within the channel, and the top width of the channel, including freeboard, is limited to 40 feet. The channel side slopes are limited to 4:1 along Scottsdale Road, and 3:1 along Union Hills Drive.

4.0 HYDROLOGY

The 100-year design flow for the Interim Regional Drainage Channel is 300 cfs. This is based on a 100-year, 6-hour design storm utilizing HEC-1 hydrology modeling software (Ref. 3). Results of this model are included in Appendix A -- *Hydrology*. These results are compared to those published in *Drainage Study Core North/Core South* by Robert L. Ward (Ref. 4).

The included HEC-1 model is an expansion of the hydrology model completed for the *One Scottsdale Master Drainage Plan*, by Wood, Patel & Associates, Inc. (Ref. 5). The One Scottsdale development lies upstream of the project site to the north of the Loop 101 Freeway. The model was revised to expand to the south to include the proposed improvements. Flow at the Loop 101 Freeway culverts (identifier 33E.1) is now routed through the Interim Regional Drainage Channel (identifier R33E.1). The runoff from the adjacent State Land parcel (identifier ASLD) joins at the outfall culvert under Scottsdale Road near Princess Road (identifier CPPRIN). This downstream flow of 300 cfs was used as the design flow for the entire channel. The ASLD sub basin was determined to be a 35-acre area with a curve number of 77, chosen to represent desert shrub with poor hydrologic conditions. The other revision to the *One Scottsdale Master Drainage Plan* hydrology model is modification to the storage routing to account for the changes in storm water storage requirements due to channel improvements proposed here. This resulted in increased runoff under the Loop 101 Freeway.

These results are compared to existing conditions and proposed conditions models published in *Core North/Core South* (Ref. 4). Both of these models also use a curve number of 77 for the State Land sub basin. The flows published in that model are lower than those proposed here, which is considered conservative. In a separate hydraulics section of that report, the culvert design flows for the Loop 101 Freeway culverts are listed as 300 cfs, including large offsite impacts. The report proposes that offsite impacts would not affect these culverts, and revises the design flow to 65 cfs. This further establishes that the design flow for the Interim Regional Drainage Channel of 300 cfs is conservative.

	Interim Regional Drainage Channel		Core North/South Existing Conditions		Core North/South Plan 1 Proposed Conditions	
	HEC-1 CP	Q100 (cfs)	HEC-1 CP	Q100 (cfs)	HEC-1 CP	Q100 (cfs)
Loop 101 Culvert	33E.1	256	SCNA1	129	N61.3	173
State Land	ASLD	90	3B	98	N63	98
Proposed Channel	R22E.1	252	3B.1	125	N63.1	169
Outfall Culvert	CPPRIN	300	3B.2	178	N63.2	256

An existing wash traverses the ASLD parcel in a southwesterly direction. This wash is a Section 404 *jurisdictional wash. In the existing conditions, it is blocked on the upstream side from receiving flow* by the existing retention basin near Station 36+00. It collects only local flow and discharges into the proposed channel near Station 24+00. This local flow is estimated as 14 cfs by a Rational Method calculation which is included in Appendix A -- *Hydrology*.

5.0 HYDRAULICS

Final design and analysis of the Interim Regional Drainage Channel was completed using HEC-RAS (Ref. 6) hydraulic modeling software. Grade control structures are specified to manage the longitudinal slope and maintain velocity within the design range. The results of the hydraulic model are the basis for analysis of erosion potential. Grade control structures are used in lieu of bank erosion protection along the entire channel reach.

Cross sections were cut upstream, downstream, and at each grade control structure, horizontal channel bends, changes in channel lining, and along the channel length. Roughness coefficients for the channel were selected to reflect graded earth with expected landscaping and vegetation. The downstream boundary condition was set as the calculated headwater required for the proposed culvert, currently under design by Dibble & Associates, Inc. This culvert is assumed to be a reinforced concrete box culvert with two (2) 8- foot wide by 3-foot tall barrels. Culvert headwater calculations were completed with *Bentley CulvertMaster* (Ref. 7). The culvert inlet loss coefficient was set as 0.7 to reflect a drop inlet with possible skew. The upstream boundary condition was set as critical depth to reflect flow exiting the existing culverts under Union Hills Drive. Hydraulic models of the 2-year and 10-year storms were also run to analyze hydraulic conditions. Flows for these storms were approximated as 10% and 35% of the 100-year discharge, respectively, per the *Drainage Design Manual* (Ref. 8). Input hydraulic data and results are located in Appendix B – *Hydraulic Calculations*.

Velocities within the channel for the 100-year storm were found to range from 3.5 to 7 feet per second. Supercritical flow was not found to occur. The highest velocities occur as the flow exits the proposed stilling basins and slows as it approaches normal depth through the length of the open channel. The lowest velocities occur within the proposed stilling basins and where under the influence of the backwater caused by rock check dams. Provided freeboard ranges from 0.25 feet to 3 feet within the 40-foot channel corridor. Less than one foot of freeboard occurs where flow is under the influence of backwater from the rock check dams. At each location with less than one foot of provided freeboard, additional freeboard will be provided outside of the easement in the grading to existing. In order to mitigate any flooding hazard low amounts of provided freeboard might create, it is reminded that according to City of Scottsdale requirements for development within FEMA flood Zone "AO" (1 foot, 3 feet per second), all adjacent buildings must have a lowest floor a minimum of 12 inches above the water surface elevation.

Flow velocities for the 10-year storm range from 2 to 5.6 feet per second. This is within the recommended range to prevent sedimentation aggradation, as well as channel erosion. At least 1.3 feet of freeboard is provided in all locations. The flow velocities for the 2-year storm range from 1 to 4.5 feet per second. At least 2 feet of freeboard is provided in all locations.

Erosion potential was analyzed using the results of the hydraulic modeling. These analyses are included in Appendix C – *Erosion Protection*. An ADWR Level 1 scour analysis found the estimated scour depth to be 3 feet. A minimum erosion protection thickness of 3 feet is therefore specified. Bend scour around the outside bank of the horizontal turns in the channel was also analyzed. A minimum length of bank protection downstream of the bends is specified as 70 feet. Riprap was selected for use as erosion protection. A fiftieth percentile diameter of 9 inches was chosen for these locations. Gradation per the *Drainage Design Manual* (Ref. 1) is specified.

Scour erosion is not expected on the upstream side of the check dams. The purpose of the check dams is to slow the rate of flow. This would more likely result in aggradation. The flow velocity for each of these check dams in the 100-year storm is approximately 3.6 feet per second, with an energy grade slope of approximately 0.26%. Since the channel slope is 0.75%, this shows that the check dams effectively produce a backwater effect and scour is not anticipated. Additionally, these dams are constructed of rock-filled gabion baskets, and are keyed into the sides and bottom of the channel to reduce the possibility of overturning. The flow will become supercritical as it pours over the dams; so erosion protection is proposed on the downstream side. For a graphical and tabular representation, please see the HEC-RAS profiles and results included in Appendix B – *Hydraulics*.

6.0 MAINTENANCE

Ongoing maintenance of the designed or recommended drainage systems is required to preserve the design integrity and purpose of the drainage system. Failure to provide maintenance can prevent the drainage system from performing to its intended design purpose and can result in reduced performance. Maintenance within the public right-of-way is the responsibility of the governing municipality. However, it is the responsibility of private developers, homeowners associations, etc. for facilities on private property within drainage easements, and includes private streets. A regular maintenance program is required to have drainage systems perform to the level of protection or service as presented in this report and related construction documents and specifications.

7.0 REFERENCES

1. *Drainage Design Manual for Maricopa County, Arizona, Hydraulics* (Draft), Flood Control District of Maricopa County, September 2003.

2. *Design Standards & Policies Manual, Chapter 4 – Grading and Drainage*, City of Scottsdale, August 2007.

3. *Flood Hydrograph Package (HEC-1), Version 4.1*, U.S. Army Corps of Engineers, June 1998.

4. *Drainage Study Core North/Core South Scottsdale, Arizona*, Robert L. Ward, Consulting Engineer, September 25, 2001.

5. *One Scottsdale Master Drainage Plan*, Wood, Patel & Associates, Inc., September 26, 2006.

6. *River Analysis System (HEC-RAS), Version 3.1.3*, U.S. Army Corps of Engineers, May 2005.

7. *Bentley CulvertMaster, Version 3.1, Service Pack 1*, Bentley Systems, Inc., copyright 2005.

8. *Drainage Design Manual for Maricopa County, Arizona, Hydrology* (Draft), Flood Control District of Maricopa County, September 2003.

APPENDIX A

Hydrology

```
****************************************          ****************************************
*                                      *          *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *          *   U.S. ARMY CORPS OF ENGINEERS       *
*              JUN   1998              *          *   HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.1               *          *          609 SECOND STREET           *
*                                      *          *      DAVIS, CALIFORNIA 95616         *
* RUN DATE   04FEB08  TIME  15:12:09   *          *          (916) 756-1104              *
*                                      *          *                                      *
****************************************          ****************************************


                 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


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  THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS WRITE STAGE FREQUENCY,
DSS READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                        HEC-1 INPUT                                          PAGE  1

  LINE        ID      1      2.      .3       .4       5       .6      7 .   . 8      9     .10

   1          ID    ONE SCOTTSDALE (STACKED 40S) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
   2          ID    OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA GOVERNED BY PRE-POST CRITERIA
   3          ID    OPTION A - ASLD CHANNEL
   4          ID    FILE:  100YR-pre8.DAT
   5          ID          OPTION B - 34.1 ACRES OF ASLD PARCEL
   6          ID
   7          ID    BASED ON MODELS PREPARED BY: ROBERT L  WARD, P E , CONSULTING ENGINEER
   8          ID
   9          ID                    PR5W-100 61
  10          ID                    C1 61        (CENTER DRIVE PROJECT)
  11          ID                    S40EX100 61 (STACKED 40S EXISTING CONDITION)
  12          ID
  13          ID    ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 13, 2003
  14          ID    100 YEAR, 6-HOUR HYPOTHETICAL STORM
  15          ID
  16          ID    AREAL RAINFALL REDUCTION IS BASED ON A 14 SQUARE MILE STORM
  17          ID
              *DIAGRAM
  18          IT      5                300
  19          IO      5
              *
              *      BEGIN GRAYHAWK - VILLAGE 1 DRAINAGE PLAN
              *      PREPARED BY:  GILBERTSON ASSOCIATES, INC , HEC-1 FILE  UDPLAN DAT
              *      THIS GILBERTSON MODEL USES SCS UNIT HYDROGRAPH METHODOLOGY
              *      THE ORIGINAL MODEL WAS BASED ON A 1-MINUTE COMPUTATION INTERVAL
              *

  20          KK     1A1
  21          KM       EXCESS RUNOFF FROM SUBAREA 1A1
  22          KM       RAINFALL REGION 3
  23          BA    0180
  24          PH             14     0 76     1.5     2 54     2 81     2.99     3 31
  25          LS             77       36
  26          UD    0 06

  27          KK  DET1A1
  28          KM       DETENTION BASIN FOR SUBAREA 1A1
  29          RS       1    STOR       0
  30          SV       0    1 76
  31          SO       0      20
  32          SE       0     1 0
  33          ST     1 0      15     2 8      1 5

  34          KK  RA1-C4
  35          KM       ROUTE OUTFLOW FROM DET1A1 TO CP1C4
  36          KM       TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
  37          KM                       SIDE SLOPE = 3 1 (H:V)
  38          KM                       MAX DEPTH  = 1 35 FT
  39          RS       1    FLOW      -1
  40          RC   0 025   0 025   0 025     670  0 0179
  41          RX       0     0.5     1.0    5 04    5 05     9 1     9 5      10
  42          RY    1 37    1.36    1 35       0       0    1 35    1 36    1 37
1                                        HEC-1 INPUT                                          PAGE  2

  LINE        ID      1  .  .2       3  .  4  . .  5. .    6  .  7. . .  8 .     9     10


  43          KK     1C4
  44          KM       EXCESS RUNOFF FROM SUBAREA 1C4
  45          BA     005
  46          LS             77        5
  47          UD      08

  48          KK   CP1C4
  49          KM       COMBINE HYDROGRAPHS FROM RA1-C4 AND 1C4
  50          HC       2
```

```
KK  RC4-C3
KM        ROUTE OUTFLOW FROM CP1C4 TO CP1C3I
KM        TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
KM                         SIDE SLOPE = 3.1 (H V)
KM                         MAX DEPTH  = 1.5 FT.
RS      1    FLOW      -1
RC  0 025   0.025   0 025     400   0.020
RX      0     0.5     1 0    4.49     5 5       9     9.5      10
RY   1.52    1 51     1 5       0       0     1 5    1 51    1 52

KK    1Da3
KM        EXCESS RUNOFF FROM SUBAREA 1Da3
BA   0140
LS             77      31
UD    .06

KK  DE1Da3
KM        DETENTION FOR SUBAREA 1Da3
KM        OUTLET IS A 18" RGRCP WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
RS      1    STOR       0
SV      0    1 27
SQ      0       4
SE      0     3.0
ST    3 0      15     2 8     1 5

KK    1Da4
KM        EXCESS RUNOFF FROM SUBAREA 1Da4
BA     01
LS             77      38
UD    .05

KK  CP1Da4
KM        COMBINE HYDROGRAPHS FROM 1Da4 AND DE1Da3
HC      2

KK  DE1Da4
KM        DETENTION FOR SUBAREA 1Da4
KM        OUTLET IS A 10" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905-E-95)
RS      1    STOR       0
SV      0    0.76
SQ      0       4
SE      0     3.0
ST    3 0      15     2 8     1.5
```



```
KK    1Da5
KM        EXCESS RUNOFF FROM SUBAREA 1Da5
BA    001
LS             77       5
UD     08

KK  CP1C31
KM        COMBINE HYDROGRAPHS FROM RC4-C3, 1Da5 AND DE1Da4
HC      3

KK  RC3-C2
KM        ROUTE OUTFLOW FROM CP1C3I TO DET1C3
KM        TRIANGULAR CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
KM                         SIDE SLOPE - 3 1 (H V)
KM                         MAX DEPTH  - 2.35 FT
RS      1    FLOW      -1
RC  0 025   0 025   0.025     850   0 005
RX      0     0.5     1.0    8.04    8 05    15 1    15.5      16
RY   2 37    2 36    2 35       0       0    2 35    2.36    2 37
*    ****************************************************************
*    *START AT OFF-SITE BASIN ON THE NORTHEAST CORNER OF VILLAGE 1*
*    ****************************************************************

KK  Off-1A
KM        OFF-SITE CONTRIBUTING AREA LOCATED ON CITY'S LAND
BA    012
LS             77
UD     06

KK    1A2
KM        EXCESS RUNOFF FROM SUBAREA 1A2
BA    004
LS             77      44
UD     06

KK    1A3
KM        EXCESS RUNOFF FROM SUBAREA 1A3
BA    006
LS             77      40
UD     05

KK    CPA3
KM        COMBINE HYDROGRAPHS FROM 1A1, Off-1A AND 1A3
HC      3

KK  DET1A3
KM        DETENTION BASIN FOR SUBAREA 1A3
RS      1    STOR       0
SV      0    0 35
SQ      0      22
SE      0     2 5
ST    2 5      15     2 0     1 5
```

```
131          KK  RA3-A6
132          KM        ROUTE OUTFLOW HYDROGRAPH FROM DET1A3 TO DET1A6
133          KM                       TRAPEZOIDAL CHANNEL (ASSUMED)
134          KM                          SIDE SLOPE = 5:1 (H:V)
135          KM                          MAX DEPTH  = 1.0 FT
136          KM                          BOT.WIDTH  = 10.0 FT
137          RS       1    FLOW       1
138          RC   0.025   0.025   0.025     550  0.0115
139          RX       0     0.5     1.0       6      16      21    21.5    22.0
140          RY    1.02    1.01     1.0       0       0     1.0    1.01    1.02

141          KK     1A6
142          KM        EXCESS RUNOFF FROM SUBAREA 1A6
143          BA     007
144          LS             77       14
145          UD      05

146          KK   CP1A6
147          KM        COMBINE HYDROGRAPHS FROM RA3-A6 AND 1A6
148          HC       2

149          KK  DET1A6
150          KM        DETENTION BASIN FOR SUBAREA 1A6
151          RS       1    STOR       0
152          SV       0    0.20
153          SQ       0      22
154          SE       0     2.5
155          ST     2.5      15     2.8     1.5

156          KK     1A5
157          KM        EXCESS RUNOFF FROM SUBAREA 1A5
158          BA     016
159          LS             77       46
160          UD      07

161          KK   CP1A5
162          KM        COMBINE HYDROGRAPHS FROM DET1A6 AND 1A5
163          HC       2

164          KK  DET1A5
165          KM        DETENTION BASIN FOR SUBAREA 1A5
166          RS       1    STOR       0
167          SV       0    0.65
168          SQ       0      34
169          SE       0     2.5
170          ST     3.5      15     2.8     1.5

171          KK     1A4
172          KM        EXCESS RUNOFF FROM SUBAREA 1A4
173          BA     010
174          LS             77       48
175          UD      07
```

HEC-1 INPUT

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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

176          KK  RA4-A7
177          KM        ROUTE OUTFLOW FROM DET1A4 TO DET1A7
178          KM                       TRAPEZOIDAL CHANNEL (ASSUMED)
179          KM                          SIDE SLOPE = 10:1 (H:V)
180          KM                          MAX DEPTH  = 1.0 FT
181          KM                          BOT WIDTH  = 10.0 FT.
182          RS       1    FLOW      -1
183          RC   0.030   0.030   0.030     300  0.0175
184          RX       0     0.5     1.0      11      21      31    31.5    32.0
185          RY    1.02    1.01     1.0       0       0     1.0    1.01    1.02

186          KK  DET1A4
187          KM        DETENTION BASIN FOR SUBAREA 1A4
188          RS       1    STOR       0
189          SV       0    0.37
190          SQ       0      11
191          SE       0     2.5
192          ST     2.5      15     2.0     1.5

193          KK     1A7
194          KM        EXCESS RUNOFF FROM SUBAREA 1A7
195          BA     008
196          LS             77       27
197          UD      05

198          KK   CP1A7
199          KM        COMBINE HYDROGRAPHS FROM DET1A5, DET1A4, AND 1A7
200          HC       3

201          KK  DET1A7
202          KM        DETENTION BASIN FOR SUBAREA 1A7
203          RS       1    STOR       0
204          SV       0    0.93
205          SQ       0      11
206          SE       0     2.5
207          ST     2.5      15     2.8     1.5

208          KK     1C1
209          KM        EXCESS RUNOFF FROM SUBAREA 1C1
210          BA     023
211          LS             77       38
212          UD      09

213          KK   CP1C1
214          KM        COMBINE HYDROGRAPHS FROM DET1A7, AND 1C1
```

```
  215        HC       2

  216        KK  DETIC1
  217        KM        DETENTION BASIN FOR SUBAREA 1C1
  218        KM        STORAGE VOLUME PER PLANS (405-E-95)
  219        KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
  220        RS       1    STOR       0
  221        SV       0     1 5
  222        SQ       0      14
1                                HEC-1 INPUT                                             PAGE  6

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  223        SE       0     3 6
  224        ST     3 6      15     2 8     1.5

  225        KK     1C2
  226        KM        EXCESS RUNOFF FROM SUBAREA 1C2
  227        BA    .024
  228        LS              77      12
  229        UD      08

  230        KK   CP1C2
  231        KM        COMBINE HYDROGRAPHS FROM DETIC1 AND 1C2
  232        HC       2

  233        KK  DE1C2A
  234        KM        DETENTION BASIN FOR SUBAREA 1C2
  235        KM        STORAGE VOLUME PER PLANS (405-E-95)
  236        KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
  237        RS       1    STOR       0
  238        SV       0    0 39
  239        SQ       0      14
  240        SE       0     1 6
  241        ST     3 6      15     2 8     1 5

  242        KK  DE1C2B
  243        KM        DETENTION BASIN FOR SUBAREAS 1C2
  244        KM        STORAGE VOLUME PER PLANS (405-E-95)
  245        KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
  246        RS       1    STOR       0
  247        SV       0    0 92
  248        SQ       0      14
  249        SE       0     3 6
  250        ST     3 6      15     2.8     1.5

  251        KK  DE1C2C
  252        KM        DETENTION BASIN FOR SUBAREAS 1C2
  253        KM        STORAGE VOLUME PER PLANS (405-E-95)
  254        KM        OUTLET IS A 18" RGRCP PER PLANS (405-E-95)
  255        RS       1    STOR       0
  256        SV       0    0 54
  257        SQ       0      14
  258        SE       0     3 6
  259        ST     3 6      15     2 8     1.5

  260        KK     1C3
  261        KM        EXCESS RUNOFF FROM SUBAREA 1C3
  262        BA     026
  263        LS              77      15
  264        UD      06

  265        KK   CP1C3
  266        KM        COMBINE HYDROGRAPHS FROM RC2-C3, DETIC2C, AND 1C3
  267        HC       3
1                                HEC-1 INPUT                                             PAGE  7

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


  268        KK  DETIC3
  269        KM        DETENTION BASIN FOR SUBAREAS 1C3
  270        KM        STORAGE VOLUME PER PLANS (405-E-95)
  271        KM        OUTLET IS A 6'W x 3'H CBC PER PLANS (1102-E 99 AND 190-E 95)
  272        RS       1    STOR       0
  273        SV       0     1 1
  274        SQ       0     150
  275        SE       0     3 5
  276        ST     3 5      15     2 8     1 5

  277        KK  RC3COM
  278        KM        ROUTE OUTFLOW FROM DETIC3 TO WHERE DETCOM OUTFLOWS
  279        RS       1    FLOW      -1
  280        RC   0.030   0 030   0 030    1000   0 016
  281        RX       0       5      10      20      30      40      45      50
  282        RY    12 0   11 75    11 5    10 0    10 0    11 5   11.75    12 0

  283        KK    COMM
  284        KM        EXCESS RUNOFF FROM SUBAREA COMMERCIAL
  285        BA      03
  286        LS              77      90
  287        UD      07

  288        KK  DETCOM
  289        KM        DETENTION FOR SUBAREA COMMERCIAL
  290        RS       1    STOR       0
  291        SV       0     1 1
  292        SQ       0      13
  293        SE       0       3
  294        ST       3      15     2 8     1 5

  295        KK   CPCOM
  296        KM        COMBINE HYDROGRAPHS FROM RC3COM AND COMM
  297        HC       2
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```
298            KK  COMOF1
299            KM       ROUTE CPCON TO CPOFF1
300            RS       1    FLOW      -1
301            RC   0.030   0 030   0 030     900  0 0155
302            RX       0       5      10      20      30      40      45      50
303            RY    12 0   11 75    11 5    10 0    10 0    11.5   11.75    12.0

304            KK    OFF1
305            KM       EXCESS RUNOFF FROM SUBAREA OFF1
306            BA      02
307            LS              77      90
308            UD      05

309            KK  DEOFF1
310            KM       DETENTION FOR SUBAREA OFF1
311            RS       1    STOR       0
312            SV       0     2 4
313            SQ       0      13
314            SE       0       3
1                                          HEC-1 INPUT                                          PAGE  8

LINE           ID .....1.......2.......3.......4.......5.......6.......7.......8.......9......10

315            ST       1      15     2 8     1 5

316            KK  CPOFF1
317            KM       COMBINE HYDROGRAPHS FROM COMOFF AND DEOFF1
318            HC       2

319            KK  OF1OF3
320            KM       ROUTE CPOFF1 TO CPOFF3
321            RS       1    FLOW      -1
322            RC   0 030   0 030   0 030     500   0 013
323            RX       0       5      10      20      30      40      45      50
324            RY    12 0   11.75    11.5    10.0    10 0    11.5   11.75    12 0

325            KK    OFF3
326            KM       EXCESS RUNOFF FROM SUBAREA OFF3
327            BA     016
328            LS              77      90
329            UD      07

330            KK  DEOFF3
331            KM       DETENTION FOR SUBAREA OFF3
332            RS       1    STOR       0
333            SV       0    2 34
334            SQ       0      13
335            SE       0       3
336            ST       1      15     2 8     1 5

337            KK  CPOFF3
338            KM       COMBINE HYDROGRAPHS FROM DEOFF3 AND OF1OF3
339            HC       2
               *
               *       START WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
               *

340            KK    33A1       CP
341            KM       ROUTE CPOFF3 THROUGH SUB 33A
342            RK    1960    0161     045              TRAP       20        3
               *

343            KK     33A     SUB
344            KM       RUNOFF FROM SUB 33A. INCLUDES WEST SIDE OF CENTER DRIVE
345            BA     054
346            LS              77      35
347            UK     300   0 020      05     100
348            RK    2325     013     015              TRAP       20        3
               *

349            KK    33A3      CP
350            KO       1
351            KM       COMBINE SUB 33A, CP 33A1
352            HC       2
               *
               *       END WEST SIDE OF STACKED 40 DESIGN CONCEPT CROSSING SCOTTSDALE RD
               *
               *
               *       BEGIN GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 1
               *       START AT NORTHEAST CORNER OF PARCEL 1Db AND GO SOUTHWEST THROUGH
               *       PROPOSED PARK SITE
               *
1                                          HEC-1 INPUT                                          PAGE  9

LINE           ID      1       2       3       4       5       6       7       8       9      10

353            KK     1Db
354            KM       EXCESS RUNOFF FROM SUBAREA 1Db
355            BA      04
356            LS              77      35
357            UD      06

358            KK   DE1Db
359            KM       DETENTION FOR SUBAREA 1Db
360            RS       1    STOR       0
361            SV       0     2.7
362            SQ       0      13
363            SE       0     3 0
364            ST     3 0      15     2 8     1 5

365            KK    1Da1
366            KM       EXCESS RUNOFF FROM SUBAREA 1Da1
```

```
357           BA    0009
358           LS               77       35
359           UD     05

370           KK  DE1Da1
371           KM        DETENTION FOR SUBAREA 1Da1
372           KM        OUTLET IS A 18" PVC WITH AN 8" ORIFICE PLATE PER PLANS (905 E-95)
373           RS      1     STOR        0
374           SV      0    0 548
375           SQ      0       4
376           SE      0     3 0
377           ST    3 0      15      3 8      1 5

378           KK    1Da2
379           KM        EXCESS RUNOFF FROM SUBAREA 1Da2
380           BA     003
381           LS               77
382           UD      08

383           KK  CP1Dab
384           KM        COMBINE HYDROGRAPHS FROM 1Da2, DE1Db AND DE1Da1
385           HC       3

386           KK  RDaDE2
387           KM        ROUTE OUTFLOW FROM CP1Dab TO CP1Ea2
388           KM        TRAPEZOIDAL CHANNEL PER PLANS (1182-E-94 AND 190-E-95)
389           KM                          SIDE SLOPE = 4:1 (H V)
390           KM                          MAX DEPTH  = 1 0 FT
391           KM                          BOT.WIDTH  = 1 0 FT
392           RS      1     FLOW       -1
393           RC   0.030   0 030   0 030     1400  0 0171
394           RX      0     0 5     1.0      5       6       12     12 5      13
395           RY    1.2     1.1     1 0      0       0      1 0     1 1     1 2
                                          HEC-1 INPUT                                       PAGE 10

LINE          ID      1 .     2       3.      4       5       6       7 . .   8.      9 . . .10


396           KK    1Ea1
397           KM        EXCESS RUNOFF FROM SUBAREA 1Ea1
398           BA     019
399           LS               77       37
400           UD     .08

401           KK  DE1Ea1
402           KM        DETENTION FOR SUBAREA 1Ea1
403           KM        OUTLET IS A 8" PVC CONNECTED TO AN 18" RGRCP (407-E-95)
404           RS      1     STOR        0
405           SV      0     1 54
406           SQ      0        1
407           SE      0        3
408           ST      3      15      2.8      1 5

409           KK    1Ea2
410           KM        EXCESS RUNOFF FROM SUBAREA 1Ea2
411           BA     021
412           LS               77       39
413           UD      06

414           KK  CP1Ea2
415           KM        COMBINE HYDROGRAPHS FROM DE1Ea1 AND 1Ea2
416           HC       2

417           KK  DE1Ea2
418           KM        DETENTION FOR SUBAREA 1Ea2
419           RS      1     STOR        0
420           SV      0      1 5
421           SQ      0       10
422           SE      0        3
423           ST      3      15      2 8      1 5

424           KK  CP1Ea2
425           KM        COMBINE HYDROGRAPHS FROM DE1Ea2 AND RDaDE2
426           HC       2

427           KK    PARK
428           KM        EXCESS RUNOFF FROM PROPOSED CITY'S PARK SITE
429           BA     021
430           LS               77
431           UD      06

432           KK  SCHOOL
433           KM        EXCESS RUNOFF FROM PROPOSED SCHOOL SITE
434           BA     015
435           LS               77       80
436           UD      05
                                          HEC-1 INPUT                                       PAGE 11

LINE          ID.     1       2       3       4 .     5       6   .   7       8       9      10


437           KK  DETSCH
438           KM        DETENTION FOR SUBAREA SCHOOL
439           RS      1     STOR        0
440           SV      0      1 3
441           SQ      0       13
442           SE      0        3
443           ST      3      15      2 0      1 5

444           KK   SCH1E
445           KM     ROUTE OUTFLOW FROM DETSCH TO CP1EC
446           RS      1     FLOW       -1
447           RC   0 030   0 030   0 030     500   0 009
448           RX      0     2.5       5       10      20      25    27 5      30
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```
449          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

450          KK     1Ec
451          KM       EXCESS RUNOFF FROM SUBAREA 1Ec
452          BA    .0089
453          LS              77       90
454          UD      06

455          KK   DE1Ec
456          KM       DETENTION FOR SUBAREA 1Ec
457          RS       1    STOR       0
458          SV       0     0.8
459          SQ       0      11
460          SE       0       3
461          ST       3      15      2.8     1.5

462          KK   CP1Ec
463          KM       COMBINE HYDROGRAPHS FROM SCH12 AND DE1Ec
464          HC       2

465          KK  1EcEa2
466          KM       ROUTE OUTFLOW FROM CP1Ec TO CP1Ea2
467          RS       1    FLOW      -1
468          RC   0.030   0.030   0.030     500   0.009
469          RX       0     2.5       5      10      20      25    27.5      30
470          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0

471          KK   CP1Ea
472          KM       COMBINE HYDROGRAPHS FROM CP1Ea2, 1EcEa2 AND PARK
473          HC       3

474          KK  REATPP
475          KM       ROUTE CP1EA TO THOMPSON PEAK PARKWAY
476          RS       1    FLOW      -1
477          RC   0.030   0.030   0.030     750  0.0146
478          RX       0     2.5       5      10      20      25    27.5      30
479          RY    12.0   11.75    11.5    10.0    10.0    11.5   11.75    12.0
1                                            HEC-1 INPUT                                          PAGE 12

LINE         ID.....1.......2.......3.......4.......5.......6.......7.......8.......9......10

480          KK     1Eb
481          KM       EXCESS RUNOFF FROM SUBAREA 1Eb
482          BA    .0576
483          LS              77       52
484          UD      08

485          KK  DET1Eb
486          KM       DETENTION FOR PARCEL 1Eb
487          RS       1    STOR       0
488          SV       0     4.9
489          SQ       0      52
490          SE       0       3
491          ST       3      15      2.8     1.5

492          KK    OFF2
493          KM       EXCESS RUNOFF FROM SUBAREA OFF2  PUMPED HOSPITAL FLOWS
494          BA     011
495          LS              77       90
496          UD      07

497          KK  DEOFF2
498          KM       DETENTION FOR SUBAREA OFF2  PUMPED HOSPITAL FLOWS
499          RS       1    STOR       0
500          SV       0     1.5
501          SQ       0      13
502          SE       0       3
503          ST       3      15      2.8     1.5

504          KK  CPOFF2
505          KM       COMBINE HYDROGRAPHS REATPP, DET1Eb AND DEOFF2
506          HC       3
             *
             *        END GILBERTSON MODEL FOR GRAYHAWK - VILLAGE 1
             *
             *
             *        START EAST SIDE OF STACKED 40 DESIGN
             *
             *

507          KK   1Kr 1   ROUTE
508          KM       ROUTE CPOFF2 THROUGH SUB 1Kr
509          RD     840    0135     045            TRAP      10       2
             *

510          KK     1Kr     SUB
511          KM       R/O FROM SUB 1Kr
512          KM       DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1K
513          BA    .0515
514          LS              77       55
515          UD     0.15
1                                            HEC-1 INPUT                                          PAGE 13

LINE         ID.....1.......2.......3.......4.......5.......6.......7.......8.......9......10

516          KK    DET1K
517          KM       DETENTION FOR SUBAREA 1Kr
518          RS       1    STOR       0
519          SV       0     4.6
520          SQ       0      20
521          SE       0       3
522          ST       3      15      2.8     1.5
```

```
              *
 523          KK   1Kr 2 COMBINE
 524          KM        COMBINE DETIK & 1Kr 1
 525          HC        2
              *

 526          KK   1Hr 1   ROUTE
 527          KM        ROUTE 1Kr 2 THROUGH SUB 1Hr
 528          RK    1300    0149     045             TRAP       10        2
              *

 529          KK     1Hr      SUB
 530          KM        R/O FROM SUB 1Hr
 531          KM        DA HAS BEEN REVISED TO REFLECT DEVELOPED SHAPE OF PARCEL 1H
 532          BA     0537
 533          LS              77       61
 534          UD       08
              *

 535          KK   DETIH      DAM
 536          KM        ROUTE SUB 1H THROUGH DETENTION BASIN
 537          RS        1     STOR       0
 538          SV        0      3.3
 539          SQ        0      20
 540          SE        0       3
 541          ST        3       15      2 0      1 5
              *

 542          KK   1Hr 2 COMBINE
 543          KM        COMBINE DETIH & 1Hr 1
 544          HC        2
              *
              *        STACKED 40 BASIN 11E 1 NORTH OF CENTER DR
              *
              *

 545          KK      33E      SUB
 546          KM        R/O FROM SUB 33E
 547          BA     0395
 548          LS              77       01
 549          UK     100    0 02    0 050     100
 550          RK    2110   0 015    0 035             TRAP       20        3
              *
              *
1                                        HEC-1 INPUT                                        PAGE 14

LINE          ID       1        2        3        4 .      5 .      6        7        8        9 . ...10

 551          KK     33BE      SUB
 552          KM        RUNOFF FROM SUB 33BE  EAST SIDE OF CENTER DRIVE
 553          BA     0011
 554          LS              77       78
 555          UK     100   0 020     035      100
 556          RK    2125     017     015             TRAP       20        3
              *

 557          KK   33E 2 COMBINE
 558          KM        COMBINE 1Hr 2 & 33E & 33BE  FLOW INTO CULVERT AND SD SYSTEM
 559          KM        UNDER CENTER DRIVE
 560          HC        3
              *

 561          KK  R33E 2   ROUTE
 562          KM        ROUTE 33E 2 ALONG EAST SIDE OF STACK 40 PARCEL TO FRONTAGE ROAD
 563          KM        2-54" PIPES  DIAMETER PROVIDED IN ROUTING IS EQUIVALENT DIA OF
 564          KM        BOTH PIPES
 565          RK    2250    0147     015             CIRC      6.3
              *
              *        INSERT EXISTING CONDITION SUBBASIN 330
              *

 566          KK     330     SUB
 567          KM        RUNOFF FROM SUB 330
 568          KO       5
 569          BA     0403
 570          LS              77
 571          UK      89    0213      10      100
 572          RK    2250   .0148     015             TRAP       20        3
              *

 573          KK   S40ET     SUB
 574          KM        SUB SOUTH OF CENTER DRIVE, EASTERN SIDE OF PROPERTY, FLOWS TO
 575          KM        EASTERN DIVERSION STRUCTURE
 576          BA     0183
 577          LS              77       86
 578          UK     175    0075      05      100
 579          RK    2000     008     015             CIRC       5
              *
              *

 580          KK  CT13 0 COMBINE
 581          KO       1
 582          KM  COMBINE R33E 2, SUB 330, S40ET, & S40CN  FLOWS INTO JUNCTION STRUCTURE
 583          HC       3
              *

 584          KK  D_ADOT
 585          KM  DIVERT FLOW FROM BASIN DIRECTLY TO ADOT CULVERT 6
 586          KM  FLOW TO ADOT CULVERT 6 OF 221 CFS
 587          DT  P_ADOT
 588          DI       0      2 7     10 4     22 6     38 7     58 4     80 8    105 4    143 3    191 9
 589          DI    246 9   306.5   361 9   319 9
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 590          DQ       0     2.7    10.4    22.6    38.7    58.4    80.8   105.4   131.6   158.5
 591          DQ   185.7   212.3   230.2   246.9
              *

 592          KK     33C     SUB
 593          KM  SUBBASIN 33C SOUTH OF CENTER DRIVE WEST SIDE OF PROPERTY
 594          KM  MODIFIED AREA TO ACCOUNT FOR NEW SITE PLAN AND SUBS 04-27-06 - ADDED SOUTHWEST
 595          BA  0.0296
 596          LS              77      87
 597          UK     200   .0068     .05     100
 598          RK    1750    .017    .015            CIRC       5
              *

 599          KK  S40CH      SUB
 600          KM  SUB SOUTH OF CENTER DRIVE, CENTRAL BASIN FLOWING DIRECTLY INTO DET/RET
 601          KM  INCLUDES DETENTION BASIN
 602          BA    0448
 603          LS              77      87
 604          UK     250   .0075     .05     100
 605          RK    1500    .009    .015            CIRC     4.5
              *
              *

 606          KK  CT13 2 COMBINE
 607          KM  COMBINE CT13.0, 33C FLOWS (Total Flow at the BASIN)
 608          HC       3
              *
              *

 609          KK   D_BAS
 610          KM  BY-PASS FLOW THROUGH 042' PIPE (MAX q = 30 CFS) BASIN OUTLETS PROVIDE
 611          KM  EQUIVALENT AMOUNT OF DISCHARGE
 612          DT  P-PIPE
 613          DI       0     1.0    10.0    30.0      30   100.0   300.0   500.0   800.0
 614          DQ       0     1.0    10.0    30.0      30      30      30      30      30
              *

 615          KK  D_BAS1
 616          KM  DIVERT THE FIRST 1 AC-FT INTO THE SURFACE STORAGE
 617          DT  D-BAS2     1.0
 618          DI       0     1.0    10.0    40.0    70.0   100.0   300.0   500.0   800.0
 619          DQ       0     1.0    10.0    40.0    70.0   100.0   300.0   500.0   800.0
              *

 620          KK  D_SURF
 621          KM  DIVERT FLOW INTO SUB_SURFACE STORAGE
 622          KM  (1110', 10' DIAMETER PIPE, VOL = 2.0 Ac-Ft)
 623          KO       1
 624          DT  D-SURF       2
 625          DI       0     1.0    10.0    10.0    70.0   100.0   300.0   500.0   800.0
 626          DQ       0     1.0    10.0    10.0    70.0   100.0   300.0   500.0   800.0
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 627          KK  B_PIPE
 628          KM  RETRIEVE DIVERTED PIPE FLOW
 629          DR  P-PIPE
              *

 630          KK  B_SURF
 631          KM  RETRIEVE DIVERTED SURFACE FLOW
 632          DR  D-BAS2
              *

 633          KK   C540B COMBINE
 634          KO       1                               21
 635          KM  COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW
 636          HC       3
              *

 637          KK  S40BAS
 638          KO       1
 639          KM  ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
 640          KM  ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
 641          KM  24" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'
 642          RS       1    STOR      -1
 643          SV       0    .001     .14     .87    1.84    3.01    4.49    5.16    5.49    5.82
 644          SV    6.15
 645          SE       0      .8       1       2       3       4       5     5.4     5.6     5.8
 646          SE       6
 647          SL       1    3.14    0.62     0.5
 648          SS     3.8      20     2.8     1.5
              *

 649          KK  P33E.1
 650          KO       1
 651          KM  DIVIDE THE FLOW INTO TWO ADOT CULVERTS
 652          DT  D33C.2
 653          DI       0     100     200     400     600
 654          DQ       0      68     136     272     408
              *
              *

 655          KK  R_ADOT
 656          KM  RETRIEVE DIVERTED ADOT CULVERT FLOW
 657          DR  P_ADOT
              *
```

```
          658            KK   33E.1 COMBINE
          659            KO       1
          660            KM  COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6
          661            HC       2
                         *
1                                                           HEC-1 INPUT                                          PAGE 17

         LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          662            KK  R33E.1   ROUTE
          663            KO       1
          664            KM  ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND
          665            KM  OPTION 5 - PROPOSED CHANNEL SOUTH OF LUND CADILLAC TO SCOTTSDALE ROAD
          666            KM  FROM SCOTTSDALE ROAD SOUTH TO PRINCESS DRIVE
          667            KM  ROUTE L=4600', TRAP SECTION BW=19' Z=5, TWmax=39'
          668            KM  ASSUME GRASS LINED CHANNEL N=.030 UP=1597 5 DWN=1553
          669            RK    4600  0.0088    0.03              TRAP      19        5
                         *

          670            KK    ASLD      SUB
          671            KO       1
          672            KM  ASLD PARCEL EAST OF SCOTTSDALE ROAD
          673            BA  0.0533
          674            LS              77
          675            UK      89  0.0213     0.1     100
          676            RK    2300  0.0088    0.03              TRAP      19        5
                         *
                         *

          677            KK  CPPRIN COMBINE
          678            KO       1
          679            KM  COMBINE ROUTED ADOT 5 AND 6 WITH ASLD PARCEL
          680            HC       2
                         *

          681            KK  R33C.2
          682            KO       1
          683            KM  RETRIEVE DIVERTED PIPE FLOW
          684            DR  D33C.2
                         *

          685            KK   S4ONT      SUB
          686            KO       1
          687            KM  SUB EAST OF SCOTTSDALE RD, FLOWING DIRECTLY INTO SCOTTSDALE RD
          688            KM  CULVERT, TAKES SCOTTS RD HALF ST AND SCENIC CORRIDOR
          689            BA  0.0063
          690            LS              77      89
          691            UK      50     .01     .05     100
          692            RK     600     .01    .015              CIRC     4.5
                         *
                         *

          693            KK   33C.2 COMBINE
          694            KO       1
          695            KM  COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT
          696            HC       2
                         *
                         *
          697            ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING            (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR          (<---) RETURN OF DIVERTED OR PUMPED FLOW

   20        1A1
               V
               V
   27     DET1A1
               V
               V
   34     RA1-C4
               .
               .
   43                    1C4
                           .
               .           .
   40      CP1C4. . . . . .
               V
               V
   51     RC4-C3

               .
   60                   1Da3
               .           V
                           V
   65                 DE1Da3
               .           .
                           .
   73                      .        1Da4
                                       .
               .
   78              CP1Da4............
               .           V
               .           V
   81          .      DE1Da4
                           .
                           .
   89                      .        1Da5
                           .           .
               .           .           .
```

```
 94    CP1C31.....  ... .. . ...
            v
            v
 97    RC1-C1
            .

106         .    OFF-1A
            .         .
            .
111         .                 1A2
            .         .
                      .         .
116         .         .                 1A3
                      .         .
            .                   .         .
121                CPA3..  .... .  ... .... ...
            .         v
                      v
124         .    DET1A3
            .         v
                      v
131         .    RA3-A6
                      .
            .         .
141         .                 1A6
            .                   .

146         .     CP1A6....... ....
            .         v
            .         v
149         .    DET1A6
            .
            .         .
156         .         .       1A5
            .         .         .
            .         .         .
161               CP1A5   .... .. .
            .         v
            .         v
164              DET1A5
            .         .
            .         .
171                   .       1A4
                      .         v
            .                   v
176         .              RA4-A7
                                v
            .         .         v
186         .              DET1A4

            .                   .
193                                     1A7
                      .                   .
            .         .                   .
198               CP1A7  ......    . .    ...  .
                      v
                      v
201         .    DET1A7
                      .
                      .
208         .         .       1C1
            .         .         .
            .         .         .
213         .     CP1C1...    ....
                      v
            .         v
216         .    DET1C1
            .
            .         .
225         .                 1C2
                                .
            .         .         .
230         .     CP1C2 ...     ...
                      v
                      v
233              DE1C2A
            .         v
            .         v
242         .    DE1C2B
            .         v
            .         v
251              DE1C2C
            .         .
            .         .
260         .                 1C3
            .                   .
            .
265     CP1C3............  .... ....
            v
            v
268    DET1C3
            v
            v
277    RC3COM
            .

283         .      COMM
            .         v
            .         v
288              DETCOM
                      .
            .         .
295     CPCOM ..        ..
            v
```

```
                v
298       COMOF1

305             .       OFF1
                           v
                           v
309             .     DEOFF1

316       CPOFF1.     . .. ..
                v
                v
319       OF1OF2

325             .       OFF3
                           v
                           v
330             .     DEOFF3

337       CPOFF3..... ... ..
                v
                v
340         33A1

347             .        33A

349         33A3. . .. . ..

353             .        1Db
                           v
                           v
358             .      DE1Db

365             .                  1Da1
                           .          v
                           .          v
370             .          .     DE1Da1

378             .                     .         1Da2

383                  CP1Dab . .. .  ............. .
                           v
                           v
386                   RDabE2

396                        .       1Ea1
                                      v
                                      v
401                        .     DE1Ea1

409                        .          .         1Ea2

414             .                CP1Ea2.. ..  . ...
                           .          v
                           .          v
417             .          .     DE1Ea2

424             .    CP1Ea2. ......  ..

427                        .       PARK

432             .          .          .       SCHOOL
                                                  v
                                                  v
437             .          .          .       DETSCH
                                                  v
                                                  v
444             .          .          .        SCH12

450             .                                 .       1Ec
                                                            v
                                                            v
455                                   .           .     DE1Ec

462             .          .          .        CP1Ec... ..  . .
                                                  v
                                                  v
465             .          .          .       1EcEa2

471             .     CP1Ea.    ... ......   .. ...
                           v
                           v
474             .     REaTPP

480             .          .        1Eb
```

```
                           .           V
               .           .           V
485                        .      DSTIEb
               .           .           .
               .           .           .
492            .           .           .          OFF2
               .                       .             V
                                       .             V
497            .           .                    DEOFF2
               .           .
               .           .                         .
504            .      CPOFF2....... . ......... ....
               .           V
               .           V
507            .      1Kr.1
               .
                           .
510            .           .         1Kr
               .           .           V
               .           .           V
516            .           .       DETIK
               .           .           .
               .           .           .
523            .      1Kr.2.... ...   ..
                           V
               .           V
526            .      1Mr.1
                           .
               .           .
529            .           .         1Mr
               .           .           V
               .           .           V
535            .           .       DETIM
               .           .           .
               .           .           .
542            .      1Mr.2...........
               .           .
               .           .
545                        .         33E
               .           .           .
               .           .           .
551            .           .           .          33DE
               .           .           .
               .           .           .
557            .      33E.2  ...........    ......
               .           V
               .           V
561            .     R33E.2
               .           .
               .
566            .           .         33D
               .           .           .
               .           .           .
573            .           .           .         S40FT
               .           .                         .
               .           .           .
580            .      CT13.0........................
               .           .
               .           .
587            .           .------->  P_ADOT
581            .     D_ADOT
               .           .
               .           .
592            .           .         33C
               .           .           .
               .           .           .
599            .           .           .         S40CR
               .           .           .             .
               .
606            .      CT13.1.. . ..........   .......
               .           .
               .           .
612            .           .------->  P-PIPE
609            .       D_BAS
               .           .
               .           .
617            .           .------->  D-BAS2
615            .      D_BAS1
               .           .
               .           .
624            .           .------->  D-SUBF
620            .      D_SURF
               .           .
               .           .
629            .           .            <-------  P-PIPE
627            .           .      B_PIPE
               .           .           .
               .           .           .
632            .           .           .             .<-------  D-BAS2
630            .           .           .      B_SURP
               .           .           .
               .           .           .             .
633            .       CS40B................. ......
               .           V
               .           V
637            .      S40BAS
               .           .
                           .
652            .           .------->  D33C.2
649                   P33E 1
               .           .
               .           .
657            .           .           .<-------  P_ADOT
655            .           .      P_ADOT
```

```
  658                33E 1. .  ..
                         V
                 .       V
  662                R33E.1
                 .

  670                              ASLD
                 .

  677                CPERIN        .   .
                 .

  684            .                       <------    033C.?
  691                              R33C 2
                 .

  685                         .                       S40WT
                              .

  693            .                 33C 2

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)  *
*              JUN   1998               *
*            VERSION 1.1                *
*                                       *
*  RUN DATE   04FEB08  TIME  15 12 09   *
*                                       *
*****************************************
```

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

```
ONE SCOTTSDALE (STACKED 105) POST DEVELOPMENT CONDITION 100-YR 6-HR STORM
OFFSITE HYDROLOGY & ONSITE HYDROLOGY FOR AREA COVERED BY PRE-POST CRITERIA
OPTION A - ASLD CHANNEL
FILE    100YR-preB DAT
        OPTION B - 34 1 ACRES OF ASLD PARCEL

BASED ON MODELS PREPARED BY  ROBERT L  WARD, P E , CONSULTING ENGINEER

                      PRSN-100 6I
                      CI 6I         (CENTER DRIVE PROJECT)
                      S10EX100 6I  (STACKED 40S EXISTING CONDITION)

ALL CURVE NUMBERS ADJUSTED TO 6-HOUR VALUES ON AUGUST 11, 2002
100-YEAR, 6-HOUR HYPOTHETICAL STORM

AREAL RAINFALL REDUCTION IS BASED ON A 11 SQUARE MILE STORM
```

```
19 IO        OUTPUT CONTROL VARIABLES
                   IPRNT           5  PRINT CONTROL
                   IPLOT           0  PLOT CONTROL
                   QSCAL          0   HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                   NMIN            5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1    0  STARTING DATE
                   ITIME        0000  STARTING TIME
                      NQ         100  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2    0  ENDING DATE
                  NDTIME        0055  ENDING TIME
                  ICENT           19  CENTURY MARK

              COMPUTATION INTERVAL      08 HOURS
                   TOTAL TIME BASE   23 92 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
```

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

          ***************
          *             *
319 KK    *      33A1   *           CP
          *             *
          ***************

350 KO       OUTPUT CONTROL VARIABLES
                   IPRNT           1  PRINT CONTROL
                   IPLOT           0  PLOT CONTROL
                   QSCAL          0   HYDROGRAPH PLOT SCALE
                             COMBINE SUB 33A, CP 33A1

352 HC       HYDROGRAPH COMBINATION
                   ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                ***
```

HYDROGRAPH AT STATION 33A1
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		0615	76	41	1		1230	151	5.	1		1845	226	1
1		0005	2	0.	1		0620	77	40	1		1235	152	4	1		1850	227	1
1		0010	3	0	1		0625	78	38	1		1240	153	4.	1		1855	228	1
1		0015	4	0	1		0630	79	37	1		1245	154	4	1		1900	229	1
1		0020	5	0	1		0635	80	36	1		1250	155	4	1		1905	230	1
1		0025	6	0	1		0640	81	35	1		1255	156	4	1		1910	231	1.
1		0030	7	1	1		0645	82	34	1		1300	157	4	1		1915	232	1
1		0035	8	1	1		0650	83	34	1		1305	158	4	1		1920	233	1
1		0040	9	2.	1		0655	84	33	1		1310	159	4	1		1925	234	1.
1		0045	10	1	1		0700	85	32	1		1315	160	3	1		1930	235	1
1		0050	11	3	1		0705	86	31	1		1320	161	3	1		1935	236	1
1		0055	12	4.	1		0710	87	30	1		1325	162	3	1		1940	237	1
1		0100	13	4	1		0715	88	30	1		1330	163	3	1		1945	238	0
1		0105	14	4.	1		0720	89	29	1		1335	164	3	1		1950	239	0
1		0110	15	5	1		0725	90	28.	1		1340	165	3	1		1955	240	0
1		0115	16	5	1		0730	91	28	1		1345	166	3	1		2000	241	0.
1		0120	17	5.	1		0735	92	27	1		1350	167	3	1		2005	242	0
1		0125	18	6	1		0740	93	26	1		1355	168	3	1		2010	243	0
1		0130	19	6	1		0745	94	26	1		1400	169	3	1		2015	244	0
1		0135	20	7	1		0750	95	25	1		1405	170	3	1		2020	245	0
1		0140	21	7.	1		0755	96	24	1		1410	171	3.	1		2025	246	0
1		0145	22	8	1		0800	97	24	1		1415	172	2	1		2030	247	0.
1		0150	23	8	1		0805	98	23	1		1420	173	2	1		2035	248	0
1		0155	24	9	1		0810	99	22	1		1425	174	2	1		2040	249	0
1		0200	25	9	1		0815	100	22	1		1430	175	2	1		2045	250	0
1		0205	26	10	1		0820	101	21	1		1435	176	2	1		2050	251	0
1		0210	27	11	1		0825	102	21	1		1440	177	2	1		2055	252	0.
1		0215	28	11	1		0830	103	20.	1		1445	178	2	1		2100	253	0
1		0220	29	12	1		0835	104	19	1		1450	179	2	1		2105	254	0
1		0225	30	13.	1		0840	105	19	1		1455	180	2	1		2110	255	0
1		0230	31	15	1		0845	106	18	1		1500	181	2	1		2115	256	0.
1		0235	32	18	1		0850	107	18	1		1505	182	2	1		2120	257	0
1		0240	33	25.	1		0855	108	17	1		1510	183	2	1		2125	258	0
1		0245	34	33	1		0900	109	17	1		1515	184	2	1		2130	259	0
1		0250	35	45.	1		0905	110	16	1		1520	185	2	1		2135	260	0
1		0255	36	60	1		0910	111	16	1		1525	186	2	1		2140	261	0
1		0300	37	109	1		0915	112	15	1		1530	187	2	1		2145	262	0
1		0305	38	232.	1		0920	113	15	1		1535	188	2	1		2150	263	0
1		0310	39	198	1		0925	114	15	1		1540	189	2	1		2155	264	0
1		0315	40	150	1		0930	115	14	1		1545	190	2	1		2200	265	0
1		0320	41	143	1		0935	116	13	1		1550	191	1	1		2205	266	0
1		0325	42	141	1		0940	117	13	1		1555	192	1	1		2210	267	0
1		0330	43	135	1		0945	118	13	1		1600	193	1.	1		2215	268	0
1		0335	44	132.	1		0950	119	12	1		1605	194	1	1		2220	269	0
1		0340	45	138	1		0955	120	12	1		1610	195	1	1		2225	270	0
1		0345	46	149	1		1000	121	12	1		1615	196	1	1		2230	271	0
1		0350	47	151	1		1005	122	11	1		1620	197	1	1		2235	272	0.
1		0355	48	144	1		1010	123	11	1		1625	198	1	1		2240	273	0
1		0400	49	133	1		1015	124	11	1		1630	199	1	1		2245	274	0
1		0405	50	121	1		1020	125	10	1		1635	200	1	1		2250	275	0
1		0410	51	114	1		1025	126	10	1		1640	201	1	1		2255	276	0
1		0415	52	107	1		1030	127	10	1		1645	202	1	1		2300	277	0
1		0420	53	99.	1		1035	128	9.	1		1650	203	1	1		2305	278	0.
1		0425	54	93	1		1040	129	9	1		1655	204	1	1		2310	279	0
1		0430	55	88	1		1045	130	9	1		1700	205	1	1		2315	280	0
1		0435	56	83.	1		1050	131	9	1		1705	206	1.	1		2320	281	0
1		0440	57	78	1		1055	132	8	1		1710	207	1	1		2325	282	0
1		0445	58	74	1		1100	133	8	1		1715	208	1	1		2330	283	0
1		0450	59	70	1		1105	134	8	1		1720	209	1.	1		2335	284	0.
1		0455	60	67	1		1110	135	8	1		1725	210	1	1		2340	285	0
1		0500	61	64	1		1115	136	7	1		1730	211	1	1		2345	286	0
1		0505	62	61.	1		1120	137	7	1		1735	212	1	1		2350	287	0
1		0510	63	59.	1		1125	138	7	1		1740	213	1	1		2355	288	0
1		0515	64	56	1		1130	139	7	1		1745	214	1	2		0000	289	0
1		0520	65	54	1		1135	140	6	1		1750	215	1	2		0005	290	0
1		0525	66	53	1		1140	141	6.	1		1755	216	1	2		0010	291	0.
1		0530	67	51	1		1145	142	6	1		1800	217	1	2		0015	292	0
1		0535	68	50	1		1150	143	6	1		1805	218	1	2		0020	293	0
1		0540	69	49	1		1155	144	6	1		1810	219	1	2		0025	294	0
1		0545	70	48	1		1200	145	5	1		1815	220	1	2		0030	295	0
1		0550	71	47	1		1205	146	5	1		1820	221	1	2		0035	296	0.
1		0555	72	46.	1		1210	147	5	1		1825	222	1	2		0040	297	0
1		0600	73	45	1		1215	148	5	1		1830	223	1	2		0045	298	0.
1		0605	74	44	1		1220	149	5	1		1835	224	1	2		0050	299	0
1		0610	75	42.	1		1225	150	5	1		1840	225	1.	2		0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92 HR
+ (CFS)	(HR)					
		(CFS)				
+ 232	3.08		65	19	19	19
		(INCHES)	1.384	2.334	2.334	2.334
		(AC-FT)	32	38	38	38

CUMULATIVE AREA = .31 SQ MI

560 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0	HYDROGRAPH PLOT SCALE

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

             **************
             *            *
580 KK       *   CT13 0   *     COMBINE
             *            *
             **************

581 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL           0  HYDROGRAPH PLOT SCALE
                        COMBINE RISE 2, SUB 33D, 540FT. & 540CH  FLOWS INTO JUNCTION STRUCTURE

583 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE
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***

HYDROGRAPH AT STATION CT13 0
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	0615	76	58	1	1230	151	5	1	1845	226	1
1	0005	2	0	1	0620	77	55	1	1235	152	5	1	1850	227	1.
1	0010	3	0	1	0625	78	51	1	1240	153	5	1	1855	228	1
1	0015	4	0.	1	0630	79	50	1	1245	154	5	1	1900	229	1
1	0020	5	0	1	0635	80	48.	1	1250	155	5	1	1905	230	1.
1	0025	6	1.	1	0640	81	46	1	1255	156	5	1	1910	231	1
1	0030	7	1	1	0645	82	43.	1	1300	157	5	1	1915	232	1
1	0035	8	2	1	0650	83	42	1	1305	158	5	1	1920	233	1.
1	0040	9	3	1	0655	84	41	1	1310	159	4	1	1925	234	1.
1	0045	10	4	1	0700	85	39	1	1315	160	4	1	1930	235	1
1	0050	11	5	1	0705	86	38	1	1320	161	4	1	1935	236	1
1	0055	12	6	1	0710	87	36	1	1325	162	4	1	1940	237	1
1	0100	13	6	1	0715	88	35	1	1330	163	4	1	1945	238	1
1	0105	14	7	1	0720	89	34	1	1335	164	4	1	1950	239	1
1	0110	15	7	1	0725	90	32	1	1340	165	4	1	1955	240	1
1	0115	16	8	1	0730	91	31	1	1345	166	4	1	2000	241	1
1	0120	17	9	1	0735	92	30	1	1350	167	4	1	2005	242	1
1	0125	18	9	1	0740	93	29	1	1355	168	4	1	2010	243	1
1	0130	19	10	1	0745	94	28	1	1400	169	3	1	2015	244	1
1	0135	20	10	1	0750	95	27	1	1405	170	3	1	2020	245	1.
1	0140	21	11	1	0755	96	26	1	1410	171	3	1	2025	246	1
1	0145	22	12	1	0800	97	25.	1	1415	172	3	1	2030	247	1
1	0150	23	12.	1	0805	98	25	1	1420	173	3	1	2035	248	1.
1	0155	24	13	1	0810	99	24	1	1425	174	3	1	2040	249	1
1	0200	25	14	1	0815	100	23	1	1430	175	3	1	2045	250	1
1	0205	26	15.	1	0820	101	22	1	1435	176	3	1	2050	251	1
1	0210	27	16.	1	0825	102	22	1	1440	177	3.	1	2055	252	1
1	0215	28	17	1	0830	103	21	1	1445	178	3	1	2100	253	1
1	0220	29	18	1	0835	104	20	1	1450	179	3	1	2105	254	1.
1	0225	30	20	1	0840	105	20	1	1455	180	3	1	2110	255	1
1	0230	31	21	1	0845	106	19	1	1500	181	3	1	2115	256	1
1	0235	32	25	1	0850	107	18	1	1505	182	3	1	2120	257	1
1	0240	33	33	1	0855	108	18	1	1510	183	2.	1	2125	258	0
1	0245	34	44	1	0900	109	17.	1	1515	184	2	1	2130	259	0
1	0250	35	58	1	0905	110	17	1	1520	185	2	1	2135	260	0
1	0255	36	77	1	0910	111	16	1	1525	186	2	1	2140	261	0
1	0300	37	134	1	0915	112	16	1	1530	187	2	1	2145	262	0
1	0305	38	295	1	0920	113	15	1	1535	188	2	1	2150	263	0
1	0310	39	340	1	0925	114	15	1	1540	189	2	1	2155	264	0
1	0315	40	303	1	0930	115	14	1	1545	190	2	1	2200	265	0
1	0320	41	275	1	0935	116	14	1	1550	191	2	1	2205	266	0
1	0325	42	257	1	0940	117	13	1	1555	192	2	1	2210	267	0
1	0330	43	243.	1	0945	118	13	1	1600	193	2	1	2215	268	0
1	0335	44	226	1	0950	119	13	1	1605	194	2	1	2220	269	0
1	0340	45	201	1	0955	120	12	1	1610	195	2.	1	2225	270	0
1	0345	46	184	1	1000	121	12	1	1615	196	2	1	2230	271	0
1	0350	47	160	1	1005	122	12	1	1620	197	2	1	2235	272	0
1	0355	48	156	1	1010	123	11	1	1625	198	2	1	2240	273	0
1	0400	49	147	1	1015	124	11	1	1630	199	2.	1	2245	274	0
1	0405	50	140	1	1020	125	11	1	1635	200	2	1	2250	275	0
1	0410	51	134	1	1025	126	10	1	1640	201	2	1	2255	276	0
1	0415	52	129	1	1030	127	10	1	1645	202	2	1	2300	277	0
1	0420	53	125	1	1035	128	10	1	1650	203	2	1	2305	278	0
1	0425	54	120	1	1040	129	10	1	1655	204	2	1	2310	279	0
1	0430	55	116	1	1045	130	9	1	1700	205	2	1	2315	280	0.
1	0435	56	112.	1	1050	131	9	1	1705	206	1	1	2320	281	0
1	0440	57	108	1	1055	132	9	1	1710	207	1	1	2325	282	0
1	0445	58	105	1	1100	133	9	1	1715	208	1	1	2330	283	0
1	0450	59	101	1	1105	134	8	1	1720	209	1	1	2335	284	0
1	0455	60	98	1	1110	135	8	1	1725	210	1	1	2340	285	0
1	0500	61	95	1	1115	136	8	1	1730	211	1	1	2345	286	0.
1	0505	62	92	1	1120	137	8	1	1735	212	1	1	2350	287	0
1	0510	63	89	1	1125	138	8	1	1740	213	1	1	2355	288	0
1	0515	64	86.	1	1130	139	7	1	1745	214	1	2	0000	289	0
1	0520	65	83	1	1135	140	7	1	1750	215	1	2	0005	290	0
1	0525	66	81	1	1140	141	7	1	1755	216	1	2	0010	291	0
1	0530	67	78	1	1145	142	7	1	1800	217	1	2	0015	292	0
1	0535	68	76	1	1150	143	7.	1	1805	218	1	2	0020	293	0
1	0540	69	74	1	1155	144	6	1	1810	219	1	2	0025	294	0
1	0545	70	72	1	1200	145	6	1	1815	220	1	2	0030	295	0
1	0550	71	70	1	1205	146	6.	1	1820	221	1	2	0035	296	0.
1	0555	72	68	1	1210	147	6.	1	1825	222	1	2	0040	297	0
1	0600	73	66	1	1215	148	5	1	1830	223	1	2	0045	298	0

1	0605	74	64.	1	1220	149	6.	1	1835	224	1	2	0050	299	0
1	0610	75	61.	1	1225	150	6.	1	1840	225	1	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
340	3.17		92	26	25	25
		(INCHES)	1.960	2.259	2.259	2.259
		(AC-FT)	45.	52	52	52

CUMULATIVE AREA = .43 SQ MI

620 KK D_SURF

621 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0 HYDROGRAPH PLOT SCALE

DT DIVERSION
ISTAD D-SURF DIVERSION HYDROGRAPH IDENTIFICATION
DSTRRX 2.00 MAXIMUM VOLUME TO BE DIVERTED

DI	INFLOW	.00	1.00	10.00	40.00	70.00	100.00	300.00	500.00	800.00
DQ	DIVERTED FLOW	.00	1.00	10.00	40.00	70.00	100.00	300.00	500.00	800.00

DIVERSION HYDROGRAPH D-SURF

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	0615	76	0.	1	1230	151	0	1	1845	226	0
1	0005	2	0	1	0620	77	0	1	1235	152	0	1	1850	227	0
1	0010	3	0	1	0625	78	0.	1	1240	153	0	1	1855	228	0
1	0015	4	0	1	0630	79	0	1	1245	154	0	1	1900	229	0.
1	0020	5	0	1	0635	80	0	1	1250	155	0	1	1905	230	0
1	0025	6	0	1	0640	81	0	1	1255	156	0	1	1910	231	0.
1	0030	7	0	1	0645	82	0	1	1300	157	0	1	1915	232	0
1	0035	8	0.	1	0650	83	0	1	1305	158	0	1	1920	233	0
1	0040	9	0	1	0655	84	0	1	1310	159	0	1	1925	234	0
1	0045	10	0	1	0700	85	0	1	1315	160	0	1	1930	235	0
1	0050	11	0	1	0705	86	0	1	1320	161	0	1	1935	236	0
1	0055	12	0	1	0710	87	0	1	1325	162	0	1	1940	237	0
1	0100	13	0	1	0715	88	0	1	1330	163	0	1	1945	238	0
1	0105	14	0	1	0720	89	0	1	1335	164	0	1	1950	239	0
1	0110	15	0	1	0725	90	0.	1	1340	165	0	1	1955	240	0
1	0115	16	0	1	0730	91	0	1	1345	166	0	1	2000	241	0
1	0120	17	0	1	0735	92	0	1	1350	167	0.	1	2005	242	0
1	0125	18	0	1	0740	93	0	1	1355	168	0	1	2010	243	0
1	0130	19	0	1	0745	94	0	1	1400	169	0	1	2015	244	0
1	0135	20	0	1	0750	95	0.	1	1405	170	0	1	2020	245	0
1	0140	21	0	1	0755	96	0.	1	1410	171	0	1	2025	246	0
1	0145	22	0	1	0800	97	0	1	1415	172	0	1	2030	247	0
1	0150	23	0	1	0805	98	0	1	1420	173	0.	1	2035	248	0
1	0155	24	0	1	0810	99	0	1	1425	174	0.	1	2040	249	0
1	0200	25	0	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	0	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	0	1	0825	102	0	1	1440	177	0	1	2055	252	0
1	0215	28	0	1	0830	103	0	1	1445	178	0	1	2100	253	0
1	0220	29	0	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	0	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	0	1	0845	106	0	1	1500	181	0	1	2115	256	0
1	0235	32	0	1	0850	107	0	1	1505	182	0	1	2120	257	0
1	0240	33	0.	1	0855	108	0	1	1510	183	0	1	2125	258	0
1	0245	34	0	1	0900	109	0	1	1515	184	0	1	2130	259	0
1	0250	35	0.	1	0905	110	0	1	1520	185	0	1	2135	260	0
1	0255	36	0	1	0910	111	0.	1	1525	186	0	1	2140	261	0
1	0300	37	53.	1	0915	112	0	1	1530	187	0	1	2145	262	0
1	0305	38	237	1	0920	113	0.	1	1535	188	0.	1	2150	263	0
1	0310	39	0	1	0925	114	0	1	1540	189	0	1	2155	264	0
1	0315	40	0	1	0930	115	0	1	1545	190	0	1	2200	265	0
1	0320	41	0	1	0935	116	0	1	1550	191	0	1	2205	266	0
1	0325	42	0	1	0940	117	0	1	1555	192	0	1	2210	267	0
1	0330	43	0.	1	0945	118	0	1	1600	193	0.	1	2215	268	0
1	0335	44	0	1	0950	119	0.	1	1605	194	0	1	2220	269	0
1	0340	45	0	1	0955	120	0	1	1610	195	0	1	2225	270	0
1	0345	46	0	1	1000	121	0	1	1615	196	0	1	2230	271	0
1	0350	47	0	1	1005	122	0	1	1620	197	0	1	2235	272	0
1	0355	48	0	1	1010	123	0.	1	1625	198	0	1	2240	273	0
1	0400	49	0	1	1015	124	0	1	1630	199	0	1	2245	274	0
1	0405	50	0	1	1020	125	0	1	1635	200	0	1	2250	275	0.
1	0410	51	0	1	1025	126	0	1	1640	201	0	1	2255	276	0
1	0415	52	0	1	1030	127	0	1	1645	202	0	1	2300	277	0
1	0420	53	0	1	1035	128	0	1	1650	203	0	1	2305	278	0
1	0425	54	0	1	1040	129	0	1	1655	204	0	1	2310	279	0

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0430	55	0	1		1045	130	0	1		1700	205	0	1		2315	280	0
1		0435	56	0	1		1050	131	0	1		1705	206	0	1		2320	281	0
1		0440	57	0	1		1055	132	0	1		1710	207	0	1		2325	282	0
1		0445	58	0.	1		1100	133	0.	1		1715	208	0	1		2330	283	0
1		0450	59	0	1		1105	134	0.	1		1720	209	0	1		2335	284	0
1		0455	60	0.	1		1110	135	0.	1		1725	210	0	1		2340	285	0
1		0500	61	0	1		1115	136	0	1		1730	211	0	1		2345	286	0
1		0505	62	0.	1		1120	137	0.	1		1735	212	0	1		2350	287	0
1		0510	63	0	1		1125	138	0.	1		1740	213	0	1		2355	288	0
1		0515	64	0	1		1130	139	0	1		1745	214	0	2		0000	289	0
1		0520	65	0	1		1135	140	0	1		1750	215	0	2		0005	290	0.
1		0525	66	0	1		1140	141	0	1		1755	216	0	2		0010	291	0.
1		0530	67	0	1		1145	142	0.	1		1800	217	0	2		0015	292	0.
1		0535	68	0.	1		1150	143	0	1		1805	218	0	2		0020	293	0
1		0540	69	0	1		1155	144	0	1		1810	219	0.	2		0025	294	0.
1		0545	70	0	1		1200	145	0	1		1815	220	0	2		0030	295	0
1		0550	71	0.	1		1205	146	0	1		1820	221	0	2		0035	296	0
1		0555	72	0	1		1210	147	0	1		1825	222	0	2		0040	297	0
1		0600	73	0	1		1215	148	0	1		1830	223	0	2		0045	298	0
1		0605	74	0	1		1220	149	0	1		1835	224	0	2		0050	299	0
1		0610	75	0	1		1225	150	0.	1		1840	225	0	2		0055	300	0

PEAK FLOW (CFS)	TIME (HR)		6-HR	24-HR	72-HR	24.92-HR
			MAXIMUM AVERAGE FLOW			
		(CFS)				
237	3.08		1	1	1	1
		(INCHES)	.074	.074	.074	.071
		(AC-FT)	2	2	2	2

CUMULATIVE AREA = .51 SQ MI

HYDROGRAPH AT STATION D_SURF

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		0615	76	0	1		1230	151	0	1		1845	226	0
1		0005	2	0	1		0620	77	0	1		1235	152	0	1		1850	227	0
1		0010	3	0	1		0625	78	0	1		1240	153	0	1		1855	228	0
1		0015	4	0	1		0630	79	0	1		1245	154	0	1		1900	229	0
1		0020	5	0	1		0635	80	0.	1		1250	155	0	1		1905	230	0.
1		0025	6	0	1		0640	81	0	1		1255	156	0	1		1910	231	0
1		0030	7	0	1		0645	82	0	1		1300	157	0	1		1915	232	0
1		0035	8	0	1		0650	83	0.	1		1305	158	0	1		1920	233	0.
1		0040	9	0.	1		0655	84	0	1		1310	159	0	1		1925	234	0
1		0045	10	0	1		0700	85	0	1		1315	160	0	1		1930	235	0
1		0050	11	0	1		0705	86	0	1		1320	161	0	1		1935	236	0
1		0055	12	0	1		0710	87	0	1		1325	162	0	1		1940	237	0
1		0100	13	0	1		0715	88	0	1		1330	163	0	1		1945	238	0
1		0105	14	0	1		0720	89	0	1		1335	164	0	1		1950	239	0
1		0110	15	0	1		0725	90	0	1		1340	165	0	1		1955	240	0
1		0115	16	0	1		0730	91	0	1		1345	166	0	1		2000	241	0
1		0120	17	0	1		0735	92	0	1		1350	167	0	1		2005	242	0
1		0125	18	0	1		0740	93	0	1		1355	168	0	1		2010	243	0
1		0130	19	0	1		0745	94	0	1		1400	169	0	1		2015	244	0
1		0135	20	0	1		0750	95	0	1		1405	170	0	1		2020	245	0
1		0140	21	0.	1		0755	96	0	1		1410	171	0	1		2025	246	0
1		0145	22	0	1		0800	97	0	1		1415	172	0	1		2030	247	0.
1		0150	23	0	1		0805	98	0	1		1420	173	0.	1		2035	248	0
1		0155	24	0	1		0810	99	0	1		1425	174	0	1		2040	249	0
1		0200	25	0	1		0815	100	0	1		1430	175	0	1		2045	250	0
1		0205	26	0	1		0820	101	0	1		1435	176	0	1		2050	251	0
1		0210	27	0.	1		0825	102	0	1		1440	177	0	1		2055	252	0.
1		0215	28	0	1		0830	103	0	1		1445	178	0	1		2100	253	0.
1		0220	29	0	1		0835	104	0	1		1450	179	0	1		2105	254	0
1		0225	30	0	1		0840	105	0	1		1455	180	0	1		2110	255	0
1		0230	31	0	1		0845	106	0	1		1500	181	0	1		2115	256	0
1		0235	32	0	1		0850	107	0	1		1505	182	0	1		2120	257	0
1		0240	33	0	1		0855	108	0	1		1510	183	0	1		2125	258	0
1		0245	34	0	1		0900	109	0	1		1515	184	0	1		2130	259	0
1		0250	35	0	1		0905	110	0	1		1520	185	0	1		2135	260	0
1		0255	36	0	1		0910	111	0	1		1525	186	0	1		2140	261	0
1		0300	37	0	1		0915	112	0	1		1530	187	0	1		2145	262	0.
1		0305	38	126	1		0920	113	0	1		1535	188	0	1		2150	263	0
1		0310	39	309	1		0925	114	0	1		1540	189	0	1		2155	264	0
1		0315	40	189.	1		0930	115	0	1		1545	190	0	1		2200	265	0
1		0320	41	131	1		0935	116	0	1		1550	191	0	1		2205	266	0
1		0325	42	101	1		0940	117	0	1		1555	192	0	1		2210	267	0
1		0330	43	82	1		0945	118	0.	1		1600	193	0	1		2215	268	0
1		0335	44	60	1		0950	119	0	1		1605	194	0.	1		2220	269	0
1		0340	45	38.	1		0955	120	0	1		1610	195	0	1		2225	270	0
1		0345	46	21	1		1000	121	0	1		1615	196	0	1		2230	271	0
1		0350	47	10	1		1005	122	0	1		1620	197	0	1		2235	272	0
1		0355	48	3	1		1010	123	0	1		1625	198	0	1		2240	273	0
1		0400	49	0.	1		1015	124	0	1		1630	199	0	1		2245	274	0
1		0405	50	0.	1		1020	125	0	1		1635	200	0	1		2250	275	0
1		0410	51	0	1		1025	126	0	1		1640	201	0	1		2255	276	0
1		0415	52	0	1		1030	127	0	1		1645	202	0	1		2300	277	0
1		0420	53	0	1		1035	128	0	1		1650	203	0	1		2305	278	0
1		0425	54	0	1		1040	129	0	1		1655	204	0	1		2310	279	0.
1		0430	55	0	1		1045	130	0	1		1700	205	0	1		2315	280	0
1		0435	56	0	1		1050	131	0	1		1705	206	0	1		2320	281	0.
1		0440	57	0	1		1055	132	0	1		1710	207	0	1		2325	282	0
1		0445	58	0	1		1100	133	0	1		1715	208	0	1		2330	283	0.
1		0450	59	0	1		1105	134	0	1		1720	209	0	1		2335	284	0
1		0455	60	0	1		1110	135	0.	1		1725	210	0	1		2340	285	0
1		0500	61	0	1		1115	136	0	1		1730	211	0	1		2345	286	0

1	0505	62	0	1	1120	137	0	1	1735	212	0	1	2350	287	0
1	0510	63	0	1	1125	138	0.	1	1740	213	0	1	2355	288	0.
1	0515	64	0	1	1130	139	0	1	1745	214	0	2	0000	289	0
1	0520	65	0	1	1135	140	0	1	1750	215	0	2	0005	290	0.
1	0525	66	0	1	1140	141	0	1	1755	216	0	2	0010	291	0.
1	0530	67	0	1	1145	142	0	1	1800	217	0	2	0015	292	0
1	0535	68	0	1	1150	143	0	1	1805	218	0	2	0020	293	0
1	0540	69	0	1	1155	144	0	1	1810	219	0	2	0025	294	0
1	0545	70	0.	1	1200	145	0	1	1815	220	0	2	0030	295	0
1	0550	71	0	1	1205	146	0	1	1820	221	0	2	0035	296	0.
1	0555	72	0.	1	1210	147	0	1	1825	222	0	2	0040	297	0
1	0600	73	0	1	1215	148	0	1	1830	223	0	2	0045	298	0
1	0605	74	0	1	1220	149	0	1	1835	224	0	2	0050	299	0
1	0610	75	0	1	1225	150	0.	1	1840	225	0.	2	0055	300	0

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
109	3.17		15	4	4	4
		(INCHES)	.271	.271	.271	.271
		(AC-FT)	7	7	7	7

CUMULATIVE AREA = .51 SQ MI

633 KK CS40B COMBINE

634 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

COMBINE PIPE FLOW,DIVERETD SURFACE FLOW AND REMAINING SURFACE FLOW

636 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION CS40B
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	0615	76	3	1	1230	151	0	1	1845	226	0
1	0005	2	0.	1	0620	77	2	1	1235	152	0	1	1850	227	0
1	0010	3	0.	1	0625	78	2	1	1240	153	0	1	1855	228	0
1	0015	4	0	1	0630	79	1	1	1245	154	0	1	1900	229	0
1	0020	5	1	1	0635	80	1	1	1250	155	0	1	1905	230	0.
1	0025	6	1	1	0640	81	1	1	1255	156	0	1	1910	231	0
1	0030	7	2	1	0645	82	1	1	1300	157	0	1	1915	232	0
1	0035	8	2	1	0650	83	1	1	1305	158	0	1	1920	233	0
1	0040	9	3	1	0655	84	1	1	1310	159	0	1	1925	234	0.
1	0045	10	4	1	0700	85	0	1	1315	160	0	1	1930	235	0
1	0050	11	4	1	0705	86	0	1	1320	161	0	1	1935	236	0
1	0055	12	4.	1	0710	87	0	1	1325	162	0	1	1940	237	0
1	0100	13	5.	1	0715	88	0	1	1330	163	0	1	1945	238	0
1	0105	14	5	1	0720	89	0	1	1335	164	0	1	1950	239	0
1	0110	15	5	1	0725	90	0	1	1340	165	0	1	1955	240	0
1	0115	16	5	1	0730	91	0	1	1345	166	0	1	2000	241	0
1	0120	17	5	1	0735	92	0	1	1350	167	0	1	2005	242	0
1	0125	18	6	1	0740	93	0	1	1355	168	0	1	2010	243	0
1	0130	19	6.	1	0745	94	0	1	1400	169	0.	1	2015	244	0
1	0135	20	6	1	0750	95	0	1	1405	170	0	1	2020	245	0
1	0140	21	6	1	0755	96	0	1	1410	171	0	1	2025	246	0
1	0145	22	7	1	0800	97	0	1	1415	172	0	1	2030	247	0
1	0150	23	7	1	0805	98	0.	1	1420	173	0	1	2035	248	0
1	0155	24	7	1	0810	99	0	1	1425	174	0.	1	2040	249	0
1	0200	25	8	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	8	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	9.	1	0825	102	0	1	1440	177	0.	1	2055	252	0
1	0215	28	10	1	0830	103	0	1	1445	178	0	1	2100	253	0
1	0220	29	10	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	11	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	13	1	0845	106	0	1	1500	181	0	1	2115	256	0
1	0235	32	19.	1	0850	107	0	1	1505	182	0	1	2120	257	0.
1	0240	33	28	1	0855	108	0	1	1510	183	0	1	2125	258	0
1	0245	34	39	1	0900	109	0	1	1515	184	0.	1	2130	259	0
1	0250	35	57	1	0905	110	0	1	1520	185	0	1	2135	260	0
1	0255	36	74	1	0910	111	0	1	1525	186	0	1	2140	261	0
1	0300	37	99	1	0915	112	0	1	1530	187	0	1	2145	262	0
1	0305	38	156	1	0920	113	0	1	1535	188	0	1	2150	263	0
1	0310	39	339	1	0925	114	0	1	1540	189	0	1	2155	264	0

1	0315	40	219	*	1	0910	115	0	*	1	1545	190	0.	*	1	2200	265	0	
1	0320	41	161.	*	1	0915	116	0	*	1	1550	191	0	*	1	2205	266	0	
1	0325	42	131	*	1	0920	117	0	*	1	1555	192	0	*	1	2210	267	0	
1	0330	43	112	*	1	0925	118	0.	*	1	1600	193	0	*	1	2215	268	0	
1	0335	44	90	*	1	0930	119	0.	*	1	1605	194	0	*	1	2220	269	0	
1	0340	45	68	*	1	0935	120	0.	*	1	1610	195	0	*	1	2225	270	0	
1	0345	46	51.	*	1	1000	121	0	*	1	1615	196	0.	*	1	2230	271	0	
1	0350	47	40	*	1	1005	122	0	*	1	1620	197	0	*	1	2235	272	0	
1	0355	48	33	*	1	1010	123	0.	*	1	1625	198	0	*	1	2240	273	0	
1	0400	49	27	*	1	1015	124	0	*	1	1630	199	0.	*	1	2245	274	0	
1	0405	50	23	*	1	1020	125	0	*	1	1635	200	0	*	1	2250	275	0	
1	0410	51	20	*	1	1025	126	0.	*	1	1640	201	0	*	1	2255	276	0	
1	0415	52	18	*	1	1030	127	0	*	1	1645	202	0.	*	1	2300	277	0	
1	0420	53	16	*	1	1035	128	0	*	1	1650	203	0	*	1	2305	278	0	
1	0425	54	14.	*	1	1040	129	0.	*	1	1655	204	0	*	1	2310	279	0	
1	0430	55	12	*	1	1045	130	0.	*	1	1700	205	0	*	1	2315	280	0	
1	0435	56	11	*	1	1050	131	0	*	1	1705	206	0.	*	1	2320	281	0	
1	0440	57	9	*	1	1055	132	0	*	1	1710	207	0	*	1	2325	282	0	
1	0445	58	8	*	1	1100	133	0	*	1	1715	208	0.	*	1	2330	283	0	
1	0450	59	7	*	1	1105	134	0	*	1	1720	209	0.	*	1	2335	284	0	
1	0455	60	7	*	1	1110	135	0	*	1	1725	210	0	*	1	2340	285	0	
1	0500	61	7.	*	1	1115	136	0	*	1	1730	211	0	*	1	2345	286	0	
1	0505	62	7	*	1	1120	137	0	*	1	1735	212	0.	*	1	2350	287	0	
1	0510	63	6.	*	1	1125	138	0	*	1	1740	213	0	*	1	2355	288	0	
1	0515	64	6	*	1	1130	139	0	*	1	1745	214	0	*	2	0000	289	0	
1	0520	65	6	*	1	1135	140	0	*	1	1750	215	0	*	2	0005	290	0	
1	0525	66	6	*	1	1140	141	0	*	1	1755	216	0	*	2	0010	291	0.	
1	0530	67	5	*	1	1145	142	0	*	1	1800	217	0	*	2	0015	292	0	
1	0535	68	5	*	1	1150	143	0	*	1	1805	218	0	*	2	0020	293	0	
1	0540	69	5	*	1	1155	144	0	*	1	1810	219	0.	*	2	0025	294	0	
1	0545	70	5	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0	
1	0550	71	5	*	1	1205	146	0.	*	1	1820	221	0	*	2	0035	296	0.	
1	0555	72	5	*	1	1210	147	0	*	1	1825	222	0.	*	2	0040	297	0	
1	0600	73	5	*	1	1215	148	0	*	1	1830	223	0	*	2	0045	298	0	
1	0605	74	4.	*	1	1220	149	0	*	1	1835	224	0	*	2	0050	299	0	
1	0610	75	3.	*	1	1225	150	0	*	1	1840	225	0	*	2	0055	300	0	

```
  PEAK FLOW      TIME                     MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR      72-HR      21.92-HR
+   (CFS)        (HR)
                          (CFS)
+    339         3.17                30          7          7          7
                          (INCHES)  .540       .544       .544       .544
                          (AC-FT)    15         15         15         15

                          CUMULATIVE AREA =    .51 SQ MI
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                  **************
                  *            *
637 KK            *   S40BAS   *
                  *            *
                  **************

638 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                      ROUTE DIVERTED FLOW THROUGH OFFLINE BASIN CONCEPT MAX H =5.9
                      ASSUMED 1000'X 80' BASIN WITH 5:1 SIDE SLOPES & 36" OUTLET
                      21" BLEED-OFF PIPE PLUS 20' WIDE SPILLWAY AT 3.8'

          HYDROGRAPH ROUTING DATA

642 RS        STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                    ITYP        STOR  TYPE OF INITIAL CONDITION
                    RSVRIC      1.00  INITIAL CONDITION
                    X            .00  WORKING R AND D COEFFICIENT

643 SV          STORAGE          .0        .0        .1        .9       1.8       3.0       4.5       5.3       5.5       5.8
                                6.2

645 SE          ELEVATION       .00       .80      1.00      2.00      3.00      4.00      5.00      5.40      5.60      5.80
                               6.00

647 SL        LOW-LEVEL OUTLET
                    ELEVL       1.00  ELEVATION AT CENTER OF OUTLET
                    CAREA       3.14  CROSS-SECTIONAL AREA
                    COQL         .62  COEFFICIENT
                    EXPL         .50  EXPONENT OF HEAD

648 SS        SPILLWAY
                    CREL        3.80  SPILLWAY CREST ELEVATION
                    SPWID      20.00  SPILLWAY WIDTH
                    COQW        2.80  WEIR COEFFICIENT
                    EXPW        1.50  EXPONENT OF HEAD

                                                 ***

                                   COMPUTED OUTFLOW-ELEVATION DATA

     OUTFLOW       .00       .00     15.21     15.18     17.27     18.53     19.98     21.58     23.70     24.13
   ELEVATION       .00      1.00      1.95      2.07      2.22      2.41      2.54      2.93      3.30      3.80

     OUTFLOW     26.75     28.09     33.54     41.68     54.26     72.26     96.63    128.34    168.36    217.65
   ELEVATION      3.84      3.92      4.03      4.19      4.39      4.63      4.91      5.23      5.60      6.00
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.00	.14	.83	.87	.91	1.09	1.27	1.49	1.77
OUTFLOW	.00	.00	.00	15.21	15.61	16.18	17.27	18.53	19.98	21.68
ELEVATION	.00	.80	1.00	1.95	2.00	2.07	2.22	2.41	2.64	2.93
STORAGE	1.84	2.20	2.80	2.85	2.94	3.04	3.09	3.32	3.61	3.96
OUTFLOW	22.08	23.70	26.13	26.75	28.89	32.05	33.54	41.68	54.26	72.26
ELEVATION	3.00	3.30	3.80	3.84	3.92	4.00	4.03	4.19	4.39	4.63
STORAGE	4.36	4.69	4.88	5.16	5.48	5.82	6.15			
OUTFLOW	96.63	104.84	128.34	146.09	168.36	192.60	217.65			
ELEVATION	4.91	5.00	5.21	5.40	5.60	5.80	6.00			

HYDROGRAPH AT STATION 546BAS

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	.8	1		0820	101	1	.2	1.0	1		1640	201	0	.1	1.0
1		0005	2	0	0	.8	1		0825	102	0.	.2	1.0	1		1645	202	0	.1	1.0
1		0010	3	0	0	.8	1		0830	103	0	.2	1.0	1		1650	203	0	.1	1.0
1		0015	4	0	0	.8	1		0835	104	0	.2	1.0	1		1655	204	0	.1	1.0
1		0020	5	0	0	.8	1		0840	105	0	.2	1.0	1		1700	205	0	.1	1.0
1		0025	6	0	0	.8	1		0845	106	0	.2	1.0	1		1705	206	0	.1	1.0
1		0030	7	0	.0	.8	1		0850	107	0.	.2	1.0	1		1710	207	0	.1	1.0
1		0035	8	0	0	.9	1		0855	108	0	.2	1.0	1		1715	208	0	.1	1.0
1		0040	9	0	.1	.9	1		0900	109	0.	.1	1.0	1		1720	209	0	.1	1.0
1		0045	10	0	.1	.9	1		0905	110	0	.1	1.0	1		1725	210	0	.1	1.0
1		0050	11	0	.1	.9	1		0910	111	0	.1	1.0	1		1730	211	0	.1	1.0
1		0055	12	0	.1	1.0	1		0915	112	0	.1	1.0	1		1735	212	0	.1	1.0
1		0100	13	0	.2	1.0	1		0920	113	0.	.1	1.0	1		1740	213	0	.1	1.0
1		0105	14	1	.2	1.1	1		0925	114	0	.1	1.0	1		1745	214	0	.1	1.0
1		0110	15	2	.2	1.1	1		0930	115	0.	.1	1.0	1		1750	215	0	.1	1.0
1		0115	16	2.	.2	1.1	1		0935	116	0	.1	1.0	1		1755	216	0	.1	1.0
1		0120	17	3	.3	1.2	1		0940	117	0.	.1	1.0	1		1800	217	0.	.1	1.0
1		0125	18	3	.3	1.2	1		0945	118	0	.1	1.0	1		1805	218	0	.1	1.0
1		0130	19	3	.3	1.2	1		0950	119	0.	.1	1.0	1		1810	219	0	.1	1.0
1		0135	20	4	.3	1.2	1		0955	120	0.	.1	1.0	1		1815	220	0	.1	1.0
1		0140	21	4	.3	1.3	1		1000	121	0	.1	1.0	1		1820	221	0	.1	1.0
1		0145	22	4	.3	1.3	1		1005	122	0.	.1	1.0	1		1825	222	0	.1	1.0
1		0150	23	5	.4	1.3	1		1010	123	0	.1	1.0	1		1830	223	0	.1	1.0
1		0155	24	5	.4	1.3	1		1015	124	0.	.1	1.0	1		1835	224	0	.1	1.0
1		0200	25	5	.4	1.3	1		1020	125	0	.1	1.0	1		1840	225	0	.1	1.0
1		0205	26	6	.4	1.4	1		1025	126	0	.1	1.0	1		1845	226	0	.1	1.0
1		0210	27	6	.4	1.4	1		1030	127	0	.1	1.0	1		1850	227	0	.1	1.0
1		0215	28	7.	.4	1.4	1		1035	128	0	.1	1.0	1		1855	228	0	.1	1.0
1		0220	29	7	.5	1.5	1		1040	129	0	.1	1.0	1		1900	229	0	.1	1.0
1		0225	30	8	.5	1.5	1		1045	130	0	.1	1.0	1		1905	230	0	.1	1.0
1		0230	31	8.	.5	1.5	1		1050	131	0	.1	1.0	1		1910	231	0	.1	1.0
1		0235	32	9	.6	1.6	1		1055	132	0.	.1	1.0	1		1915	232	0	.1	1.0
1		0240	33	11	.7	1.7	1		1100	133	0	.1	1.0	1		1920	233	0	.1	1.0
1		0245	34	13	.8	1.9	1		1105	134	0	.1	1.0	1		1925	234	0	.1	1.0
1		0250	35	17	1.0	2.1	1		1110	135	0	.1	1.0	1		1930	235	0	.1	1.0
1		0255	36	19	1.1	2.5	1		1115	136	0	.1	1.0	1		1935	236	0	.1	1.0
1		0300	37	22	1.8	2.9	1		1120	137	0	.1	1.0	1		1940	237	0	.1	1.0
1		0305	38	25	2.5	3.5	1		1125	138	0	.1	1.0	1		1945	238	0.	.1	1.0
1		0310	39	68	3.9	4.6	1		1130	139	0	.1	1.0	1		1950	239	0	.1	1.0
1		0315	40	141.	5.1	5.4	1		1135	140	0	.1	1.0	1		1955	240	0	.1	1.0
1		0320	41	159	5.4	5.5	1		1140	141	0	.1	1.0	1		2000	241	0	.1	1.0
1		0325	42	159	5.3	5.5	1		1145	142	0	.1	1.0	1		2005	242	0	.1	1.0
1		0330	43	142	5.1	5.3	1		1150	143	0.	.1	1.0	1		2010	243	0.	.1	1.0
1		0335	44	127	4.9	5.2	1		1155	144	0	.1	1.0	1		2015	244	0	.1	1.0
1		0340	45	111	4.6	5.1	1		1200	145	0	.1	1.0	1		2020	245	0	.1	1.0
1		0345	46	93	4.3	4.9	1		1205	146	0.	.1	1.0	1		2025	246	0.	.1	1.0
1		0350	47	77	4.0	4.7	1		1210	147	0.	.1	1.0	1		2030	247	0	.1	1.0
1		0355	48	61	3.8	4.5	1		1215	148	0	.1	1.0	1		2035	248	0	.1	1.0
1		0400	49	51	3.6	4.4	1		1220	149	0	.1	1.0	1		2040	249	0	.1	1.0
1		0405	50	45	3.4	4.3	1		1225	150	0	.1	1.0	1		2045	250	0	.1	1.0
1		0410	51	40	3.2	4.2	1		1230	151	0	.1	1.0	1		2050	251	0	.1	1.0
1		0415	52	36	3.1	4.1	1		1235	152	0	.1	1.0	1		2055	252	0	.1	1.0
1		0420	53	32	3.0	4.0	1		1240	153	0	.1	1.0	1		2100	253	0	.1	1.0
1		0425	54	29	2.9	3.9	1		1245	154	0	.1	1.0	1		2105	254	0	.1	1.0
1		0430	55	27	2.8	3.8	1		1250	155	0	.1	1.0	1		2110	255	0	.1	1.0
1		0435	56	26	2.7	3.7	1		1255	156	0.	.1	1.0	1		2115	256	0	.1	1.0
1		0440	57	25	2.6	3.7	1		1300	157	0	.1	1.0	1		2120	257	0	.1	1.0
1		0445	58	25	2.5	3.6	1		1305	158	0	.1	1.0	1		2125	258	0	.1	1.0
1		0450	59	24.	2.4	3.5	1		1310	159	0.	.1	1.0	1		2130	259	0	.1	1.0
1		0455	60	24	2.3	3.3	1		1315	160	0	.1	1.0	1		2135	260	0	.1	1.0
1		0500	61	23	2.2	3.3	1		1320	161	0	.1	1.0	1		2140	261	0	.1	1.0
1		0505	62	23	2.0	3.2	1		1325	162	0	.1	1.0	1		2145	262	0	.1	1.0
1		0510	63	22	1.9	3.1	1		1330	163	0	.1	1.0	1		2150	263	0	.1	1.0
1		0515	64	22	1.8	3.0	1		1335	164	0	.1	1.0	1		2155	264	0	.1	1.0
1		0520	65	21	1.7	2.9	1		1340	165	0	.1	1.0	1		2200	265	0	.1	1.0
1		0525	66	21	1.6	2.8	1		1345	166	0	.1	1.0	1		2205	266	0.	.1	1.0
1		0530	67	20	1.5	2.7	1		1350	167	0	.1	1.0	1		2210	267	0	.1	1.0
1		0535	68	19	1.4	2.6	1		1355	168	0	.1	1.0	1		2215	268	0	.1	1.0
1		0540	69	19	1.3	2.5	1		1400	169	0.	.1	1.0	1		2220	269	0	.1	1.0
1		0545	70	18	1.2	2.4	1		1405	170	0	.1	1.0	1		2225	270	0	.1	1.0
1		0550	71	18	1.1	2.3	1		1410	171	0	.1	1.0	1		2230	271	0	.1	1.0
1		0555	72	17	1.0	2.2	1		1415	172	0	.1	1.0	1		2235	272	0	.1	1.0
1		0600	73	16	1.0	2.1	1		1420	173	0	.1	1.0	1		2240	273	0	.1	1.0
1		0605	74	16	.9	2.0	1		1425	174	0	.1	1.0	1		2245	274	0	.1	1.0
1		0610	75	15	.8	1.9	1		1430	175	0	.1	1.0	1		2250	275	0	.1	1.0
1		0615	76	13	.7	1.8	1		1435	176	0	.1	1.0	1		2255	276	0	.1	1.0
1		0620	77	11	.7	1.7	1		1440	177	0	.1	1.0	1		2300	277	0	.1	1.0
1		0625	78	10.	.6	1.6	1		1445	178	0	.1	1.0	1		2305	278	0.	.1	1.0
1		0630	79	9	.5	1.6	1		1450	179	0	.1	1.0	1		2310	279	0	.1	1.0
1		0635	80	8	.5	1.5	1		1455	180	0.	.1	1.0	1		2315	280	0	.1	1.0

1	0640	81	7.	.5	1.4	1	1500	181	0.	.1	1.0	1	2320	281	0.	.1	1.0
1	0645	82	6.	.4	1.4	1	1505	182	0.	.1	1.0	1	2325	282	0.	.1	1.0
1	0650	83	5	.4	1.3	1	1510	183	0.	.1	1.0	1	2330	283	0	.1	1.0
1	0655	84	5	.4	1.3	1	1515	184	0	.1	1.0	1	2335	284	0	.1	1.0
1	0700	85	4	.3	1.3	1	1520	185	0.	.1	1.0	1	2340	285	0.	.1	1.0
1	0705	86	4.	.3	1.2	1	1525	186	0.	.1	1.0	1	2345	286	0	.1	1.0
1	0710	87	3.	.3	1.2	1	1530	187	0.	.1	1.0	1	2350	287	0.	.1	1.0
1	0715	88	3.	.3	1.2	1	1535	188	0.	.1	1.0	1	2355	288	0	.1	1.0
1	0720	89	2.	.2	1.1	1	1540	189	0	.1	1.0	2	0000	289	0.	.1	1.0
1	0725	90	2	.2	1.1	1	1545	190	0.	.1	1.0	2	0005	290	0.	.1	1.0
1	0730	91	2.	.2	1.1	1	1550	191	0.	.1	1.0	2	0010	291	0.	.1	1.0
1	0735	92	2.	.2	1.1	1	1555	192	0	.1	1.0	2	0015	292	0.	.1	1.0
1	0740	93	1.	.2	1.1	1	1600	193	0.	.1	1.0	2	0020	293	0	.1	1.0
1	0745	94	1.	.2	1.1	1	1605	194	0.	.1	1.0	2	0025	294	0	.1	1.0
1	0750	95	1	.2	1.1	1	1610	195	0.	.1	1.0	2	0030	295	0	.1	1.0
1	0755	96	1	.2	1.1	1	1615	196	0.	.1	1.0	2	0035	296	0	.1	1.0
1	0800	97	1.	.2	1.1	1	1620	197	0	.1	1.0	2	0040	297	0.	.1	1.0
1	0805	98	1.	.2	1.0	1	1625	198	0.	.1	1.0	2	0045	298	0.	.1	1.0
1	0810	99	1.	.2	1.0	1	1630	199	0.	.1	1.0	2	0050	299	0.	.1	1.0
1	0815	100	1.	.2	1.0	1	1635	200	0.	.1	1.0	2	0055	300	0.	.1	1.0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 159.	3.33		29	7.	7	7.
		(INCHES)	.537	.539	.539	.539
		(AC-FT)	14	15.	15.	15.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
5.	3.33	2	1	1	1

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
5.57	3.33	2.64	1.42	1.40	1.40

CUMULATIVE AREA = .51 SQ MI

649 KK * D33E.1 *

650 KO OUTPUT CONTROL VARIABLES

IPRNT 1 PRINT CONTROL

IPLOT 0 PLOT CONTROL

QSCAL 0. HYDROGRAPH PLOT SCALE

DIVIDE THE FLOW INTO TWO ADOT CULVERTS

DT DIVERSION

ISTAD D33C.2 DIVERSION HYDROGRAPH IDENTIFICATION

DI	INFLOW	.00	100.00	200.00	400.00	600.00
DQ	DIVERTED FLOW	.00	68.00	136.00	272.00	408.00

DIVERSION HYDROGRAPH D33C 2

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		0615	76	9.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	8.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	7	1		1240	153	0	1		1855	228	0.
1		0015	4	0.	1		0630	79	6	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5.	1		1250	155	0.	1		1905	230	0
1		0025	6	0	1		0640	81	5	1		1255	156	0	1		1910	231	0.
1		0030	7	0	1		0645	82	4	1		1300	157	0.	1		1915	232	0.
1		0035	8	0	1		0650	83	4.	1		1305	158	0.	1		1920	233	0
1		0040	9	0	1		0655	84	3.	1		1310	159	0	1		1925	234	0
1		0045	10	0.	1		0700	85	3	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2.	1		1330	163	0.	1		1945	238	0.
1		0105	14	1.	1		0720	89	2.	1		1335	164	0	1		1950	239	0.
1		0110	15	2.	1		0725	90	1	1		1340	165	0	1		1955	240	0.
1		0115	16	1.	1		0730	91	1.	1		1345	166	0.	1		2000	241	0.
1		0120	17	2.	1		0735	92	1	1		1350	167	0	1		2005	242	0.
1		0125	18	2.	1		0740	93	1.	1		1355	168	0	1		2010	243	0
1		0130	19	2.	1		0745	94	1.	1		1400	169	0	1		2015	244	0.
1		0135	20	3.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	3.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0
1		0145	22	3.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	3	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	4	1		0815	100	0	1		1430	175	0.	1		2045	250	0.
1		0205	26	4	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.

1	0210	27	4	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	5.	1	0830	103	0.	1	1445	178	0	1	2100	253	0.
1	0220	29	5.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	5.	1	0840	105	0.	1	1455	180	0	1	2110	255	0.
1	0230	31	6.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	6.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0
1	0240	33	8.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.
1	0245	34	10.	1	0900	109	0.	1	1515	184	0	1	2130	259	0.
1	0250	35	11	1	0905	110	0.	1	1520	185	0.	1	2135	260	0
1	0255	36	13.	1	0910	111	0	1	1525	186	0.	1	2140	261	0.
1	0300	37	15.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0
1	0305	38	17	1	0920	113	0.	1	1535	188	0	1	2150	263	0.
1	0310	39	46.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	96	1	0930	115	0.	1	1545	190	0	1	2200	265	0
1	0320	41	108.	1	0935	116	0.	1	1550	191	0	1	2205	266	0.
1	0325	42	105	1	0940	117	0.	1	1555	192	0	1	2210	267	0.
1	0330	43	96.	1	0945	118	0.	1	1600	193	0.	1	2215	268	0.
1	0335	44	86	1	0950	119	0.	1	1605	194	0.	1	2220	269	0.
1	0340	45	75.	1	0955	120	0.	1	1610	195	0.	1	2225	270	0
1	0345	46	63.	1	1000	121	0.	1	1615	196	0.	1	2230	271	0.
1	0350	47	57	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	44.	1	1010	123	0	1	1625	198	0.	1	2240	273	0.
1	0400	49	37.	1	1015	124	0.	1	1630	199	0.	1	2245	274	0.
1	0405	50	31.	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	27.	1	1025	126	0.	1	1640	201	0.	1	2255	276	0
1	0415	52	24.	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	22.	1	1035	128	0	1	1650	203	0.	1	2305	278	0.
1	0425	54	19.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0
1	0430	55	18	1	1045	130	0	1	1700	205	0.	1	2315	280	0.
1	0435	56	18.	1	1050	131	0	1	1705	206	0	1	2320	281	0
1	0440	57	17.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	17.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	17.	1	1105	134	0	1	1720	209	0	1	2335	284	0
1	0455	60	16.	1	1110	135	0.	1	1725	210	0.	1	2340	285	0
1	0500	61	16	1	1115	136	0.	1	1730	211	0.	1	2345	286	0
1	0505	62	16.	1	1120	137	0	1	1735	212	0.	1	2350	287	0.
1	0510	63	15.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	15.	1	1130	139	0	1	1745	214	0.	2	0000	289	0.
1	0520	65	14	1	1135	140	0.	1	1750	215	0.	2	0005	290	0
1	0525	66	14	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	14	1	1145	142	0	1	1800	217	0.	2	0015	292	0
1	0535	68	13	1	1150	143	0	1	1805	218	0.	2	0020	293	0.
1	0540	69	13	1	1155	144	0.	1	1810	219	0.	2	0025	294	0
1	0545	70	12.	1	1200	145	0	1	1815	220	0.	2	0030	295	0
1	0550	71	12.	1	1205	146	0	1	1820	221	0.	2	0035	296	0.
1	0555	72	12.	1	1210	147	0.	1	1825	222	0	2	0040	297	0
1	0600	73	11	1	1215	148	0.	1	1830	223	0	2	0045	298	0
1	0605	74	11.	1	1220	149	0	1	1835	224	0.	2	0050	299	0
1	0610	75	10.	1	1225	150	0	1	1840	225	0.	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
108.	3.33		20.	5.	5	5.
		(INCHES)	.362	.366	.366	.366
		(AC-FT)	10.	10	10.	10.

CUMULATIVE AREA = .51 SQ MI

HYDROGRAPH AT STATION P33E.1

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	0615	76	5	1	1230	151	0.	1	1845	226	0
1	0005	2	0.	1	0620	77	4.	1	1235	152	0	1	1850	227	0.
1	0010	3	0.	1	0625	78	3.	1	1240	153	0.	1	1855	228	0.
1	0015	4	0.	1	0630	79	3	1	1245	154	0	1	1900	229	0
1	0020	5	0.	1	0635	80	3.	1	1250	155	0.	1	1905	230	0.
1	0025	6	0.	1	0640	81	2	1	1255	156	0.	1	1910	231	0.
1	0030	7	0.	1	0645	82	2.	1	1300	157	0.	1	1915	232	0.
1	0035	8	0.	1	0650	83	2	1	1305	158	0.	1	1920	233	0
1	0040	9	0.	1	0655	84	1	1	1310	159	0.	1	1925	234	0
1	0045	10	0.	1	0700	85	1.	1	1315	160	0.	1	1930	235	0.
1	0050	11	0.	1	0705	86	1.	1	1320	161	0.	1	1935	236	0.
1	0055	12	0.	1	0710	87	1	1	1325	162	0.	1	1940	237	0
1	0100	13	0.	1	0715	88	1.	1	1330	163	0.	1	1945	238	0.
1	0105	14	0.	1	0720	89	1.	1	1335	164	0.	1	1950	239	0.
1	0110	15	1.	1	0725	90	1	1	1340	165	0.	1	1955	240	0.
1	0115	16	1.	1	0730	91	1.	1	1345	166	0	1	2000	241	0.
1	0120	17	1.	1	0735	92	1.	1	1350	167	0.	1	2005	242	0.
1	0125	18	1	1	0740	93	0.	1	1355	168	0.	1	2010	243	0
1	0130	19	1	1	0745	94	0.	1	1400	169	0.	1	2015	244	0.
1	0135	20	1.	1	0750	95	0.	1	1405	170	0.	1	2020	245	0.
1	0140	21	1	1	0755	96	0	1	1410	171	0.	1	2025	246	0
1	0145	22	1.	1	0800	97	0.	1	1415	172	0	1	2030	247	0.
1	0150	23	2.	1	0805	98	0.	1	1420	173	0.	1	2035	248	0
1	0155	24	2.	1	0810	99	0	1	1425	174	0.	1	2040	249	0.
1	0200	25	2.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	2.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	2.	1	0825	102	0.	1	1440	177	0	1	2055	252	0.
1	0215	28	2.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	2.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0
1	0225	30	2.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0
1	0230	31	3	1	0845	106	0.	1	1500	181	0.	1	2115	256	0
1	0235	32	3	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	4.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.

1	0245	34	5.	1	0900	109	0.	1	1515	184	0.	1	2130	259	0.
1	0250	35	5.	1	0905	110	0	1	1520	185	0.	1	2135	260	0.
1	0255	36	6	1	0910	111	0.	1	1525	186	0	1	2140	261	0.
1	0300	37	7.	1	0915	112	0.	1	1530	187	0.	1	2145	262	0
1	0305	38	8.	1	0920	113	0.	1	1535	188	0.	1	2150	263	0.
1	0310	39	22.	1	0925	114	0.	1	1540	189	0.	1	2155	264	0.
1	0315	40	45.	1	0930	115	0.	1	1545	190	0.	1	2200	265	0.
1	0320	41	51	1	0935	116	0.	1	1550	191	0.	1	2205	266	0.
1	0325	42	49	1	0940	117	0.	1	1555	192	0	1	2210	267	0.
1	0330	43	45.	1	0945	118	0	1	1600	193	0.	1	2215	268	0.
1	0335	44	41	1	0950	119	0.	1	1605	194	0.	1	2220	269	0
1	0340	45	35.	1	0955	120	0	1	1610	195	0.	1	2225	270	0
1	0345	46	30	1	1000	121	0.	1	1615	196	0	1	2230	271	0.
1	0350	47	25.	1	1005	122	0.	1	1620	197	0.	1	2235	272	0.
1	0355	48	20.	1	1010	123	0.	1	1625	198	0.	1	2240	273	0.
1	0400	49	17.	1	1015	124	0	1	1630	199	0.	1	2245	274	0.
1	0405	50	15	1	1020	125	0.	1	1635	200	0.	1	2250	275	0.
1	0410	51	13	1	1025	126	0.	1	1640	201	0.	1	2255	276	0.
1	0415	52	11	1	1030	127	0.	1	1645	202	0.	1	2300	277	0.
1	0420	53	10	1	1035	128	0.	1	1650	203	0.	1	2305	278	0.
1	0425	54	9.	1	1040	129	0.	1	1655	204	0.	1	2310	279	0.
1	0430	55	8.	1	1045	130	0	1	1700	205	0.	1	2315	280	0.
1	0435	56	8.	1	1050	131	0.	1	1705	206	0.	1	2320	281	0
1	0440	57	8.	1	1055	132	0.	1	1710	207	0.	1	2325	282	0.
1	0445	58	8.	1	1100	133	0.	1	1715	208	0.	1	2330	283	0.
1	0450	59	8.	1	1105	134	0.	1	1720	209	0.	1	2335	284	0.
1	0455	60	8	1	1110	135	0	1	1725	210	0	1	2340	285	0.
1	0500	61	8.	1	1115	136	0.	1	1730	211	0	1	2345	286	0.
1	0505	62	7	1	1120	137	0.	1	1735	212	0	1	2350	287	0.
1	0510	63	7.	1	1125	138	0.	1	1740	213	0.	1	2355	288	0.
1	0515	64	7.	1	1130	139	0	1	1745	214	0.	2	0000	289	0
1	0520	65	7.	1	1135	140	0.	1	1750	215	0.	2	0005	290	0
1	0525	66	7.	1	1140	141	0.	1	1755	216	0.	2	0010	291	0.
1	0530	67	6	1	1145	142	0.	1	1800	217	0.	2	0015	292	0
1	0535	68	6.	1	1150	143	0.	1	1805	218	0.	2	0020	293	0.
1	0540	69	6.	1	1155	144	0.	1	1810	219	0.	2	0025	294	0
1	0545	70	6.	1	1200	145	0.	1	1815	220	0.	2	0030	295	0
1	0550	71	6.	1	1205	146	0.	1	1820	221	0.	2	0035	296	0.
1	0555	72	5.	1	1210	147	0.	1	1825	222	0.	2	0040	297	0.
1	0600	73	5.	1	1215	148	0.	1	1830	223	0.	2	0045	298	0
1	0605	74	5	1	1220	149	0	1	1835	224	0.	2	0050	299	0
1	0610	75	5	1	1225	150	0.	1	1840	225	0	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
51	3 33		9.	2.	2.	2
		(INCHES)	.170	.172	.172	.172
		(AC-FT)	5.	5.	5.	5

CUMULATIVE AREA = .51 SQ MI

```
              **************
              *            *
658 KK        *   33C 1    *     COMBINE
              *            *
              **************

659 KO        OUTPUT CONTROL VARIABLES
                    IPRNT            1  PRINT CONTROL
                    IPLOT            0  PLOT CONTROL
                    QSCAL           0.  HYDROGRAPH PLOT SCALE
                      COMBINED DISCHARGE AT ADOT CULVERT 5 AND 6

661 HC        HYDROGRAPH COMBINATION
                    ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 33E.1
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		0615	76	62.	1		1230	151	5.	1		1845	226	1.
1		0005	2	0.	1		0620	77	59.	1		1235	152	5.	1		1850	227	1.
1		0010	3	0.	1		0625	78	56.	1		1240	153	5.	1		1855	228	1
1		0015	4	0.	1		0630	79	53.	1		1245	154	5.	1		1900	229	1.
1		0020	5	0.	1		0635	80	51.	1		1250	155	5.	1		1905	230	1.
1		0025	6	1	1		0640	81	48.	1		1255	156	5.	1		1910	231	1.
1		0030	7	1.	1		0645	82	46.	1		1300	157	5.	1		1915	232	1.
1		0035	8	2	1		0650	83	44.	1		1305	158	5.	1		1920	233	1.
1		0040	9	3.	1		0655	84	42.	1		1310	159	4.	1		1925	234	1.
1		0045	10	4.	1		0700	85	40.	1		1315	160	4	1		1930	235	1.
1		0050	11	5	1		0705	86	39.	1		1320	161	4.	1		1935	236	1
1		0055	12	6.	1		0710	87	37	1		1325	162	4.	1		1940	237	1
1		0100	13	7	1		0715	88	36.	1		1330	163	4.	1		1945	238	1.
1		0105	14	7	1		0720	89	34.	1		1335	164	4.	1		1950	239	1
1		0110	15	8.	1		0725	90	33	1		1340	165	4.	1		1955	240	1.
1		0115	16	9	1		0730	91	32.	1		1345	166	4.	1		2000	241	1.
1		0120	17	9	1		0735	92	31.	1		1350	167	4.	1		2005	242	1.

1	0125	18	10	.	1	0740	93	30	.	1	1355	168	4	.	1	2010	243	1.
1	0130	19	11	.	1	0745	94	29	.	1	1400	169	3.	.	1	2015	244	1
1	0135	20	12	.	1	0750	95	28	.	1	1405	170	3	.	1	2020	245	1.
1	0140	21	12	.	1	0755	96	27.	.	1	1410	171	3	.	1	2025	246	1
1	0145	22	13	.	1	0800	97	26	.	1	1415	172	3.	.	1	2030	247	1.
1	0150	23	14	.	1	0805	98	25	.	1	1420	173	3.	.	1	2035	248	1.
1	0155	24	15	.	1	0810	99	24	.	1	1425	174	3	.	1	2040	249	1.
1	0200	25	16	.	1	0815	100	23	.	1	1430	175	3	.	1	2045	250	1
1	0205	26	17	.	1	0820	101	22	.	1	1435	176	3	.	1	2050	251	1
1	0210	27	18	.	1	0825	102	22	.	1	1440	177	3	.	1	2055	252	1
1	0215	28	19	.	1	0830	103	21	.	1	1445	178	3	.	1	2100	253	1
1	0220	29	21.	.	1	0835	104	20	.	1	1450	179	3.	.	1	2105	254	1
1	0225	30	22	.	1	0840	105	20	.	1	1455	180	3.	.	1	2110	255	1
1	0230	31	24	.	1	0845	106	19	.	1	1500	181	3.	.	1	2115	256	1
1	0235	32	28	.	1	0850	107	18	.	1	1505	182	3	.	1	2120	257	1
1	0240	33	37.	.	1	0855	108	18	.	1	1510	183	2	.	1	2125	258	0
1	0245	34	49	.	1	0900	109	17	.	1	1515	184	2	.	1	2130	259	0
1	0250	35	63	.	1	0905	110	17	.	1	1520	185	2	.	1	2135	260	0.
1	0255	36	83	.	1	0910	111	16	.	1	1525	186	2	.	1	2140	261	0
1	0300	37	132.	.	1	0915	112	16	.	1	1530	187	2	.	1	2145	262	0
1	0305	38	215	.	1	0920	113	15.	.	1	1535	188	2	.	1	2150	263	0
1	0310	39	245	.	1	0925	114	15	.	1	1540	189	2	.	1	2155	264	0
1	0315	40	256	.	1	0930	115	14	.	1	1545	190	2	.	1	2200	265	0
1	0320	41	249	.	1	0935	116	14	.	1	1550	191	2	.	1	2205	266	0
1	0325	42	240	.	1	0940	117	14	.	1	1555	192	2.	.	1	2210	267	0
1	0330	43	229	.	1	0945	118	13	.	1	1600	193	2	.	1	2215	268	0
1	0335	44	216	.	1	0950	119	13	.	1	1605	194	2	.	1	2220	269	0
1	0340	45	200	.	1	0955	120	12	.	1	1610	195	2	.	1	2225	270	0
1	0345	46	184	.	1	1000	121	12.	.	1	1615	196	2.	.	1	2230	271	0
1	0350	47	170	.	1	1005	122	12	.	1	1620	197	2.	.	1	2235	272	0
1	0355	48	159	.	1	1010	123	11.	.	1	1625	198	2	.	1	2240	273	0
1	0400	49	151	.	1	1015	124	11	.	1	1630	199	2	.	1	2245	274	0
1	0405	50	144	.	1	1020	125	11	.	1	1635	200	2	.	1	2250	275	0
1	0410	51	138	.	1	1025	126	10	.	1	1640	201	2	.	1	2255	276	0
1	0415	52	133	.	1	1030	127	10	.	1	1645	202	2	.	1	2300	277	0.
1	0420	53	129	.	1	1035	128	10	.	1	1650	203	2	.	1	2305	278	0
1	0425	54	125	.	1	1040	129	10	.	1	1655	204	2	.	1	2310	279	0
1	0430	55	121	.	1	1045	130	9.	.	1	1700	205	2	.	1	2315	280	0.
1	0435	56	118	.	1	1050	131	9	.	1	1705	206	1	.	1	2320	281	0
1	0440	57	116	.	1	1055	132	9	.	1	1710	207	1	.	1	2325	282	0
1	0445	58	113	.	1	1100	133	9	.	1	1715	208	1	.	1	2330	283	0
1	0450	59	109	.	1	1105	134	8	.	1	1720	209	1	.	1	2335	284	0
1	0455	60	106	.	1	1110	135	8	.	1	1725	210	1	.	1	2340	285	0
1	0500	61	102.	.	1	1115	136	8.	.	1	1730	211	1	.	1	2345	286	0
1	0505	62	99	.	1	1120	137	8	.	1	1735	212	1	.	1	2350	287	0
1	0510	63	96	.	1	1125	138	8	.	1	1740	213	1	.	1	2355	288	0
1	0515	64	93	.	1	1130	139	7	.	1	1745	214	1	.	2	0000	289	0.
1	0520	65	90	.	1	1135	140	7	.	1	1750	215	1	.	2	0005	290	0
1	0525	66	87	.	1	1140	141	7	.	1	1755	216	1	.	2	0010	291	0
1	0530	67	85	.	1	1145	142	7	.	1	1800	217	1.	.	2	0015	292	0.
1	0535	68	82	.	1	1150	143	7	.	1	1805	218	1.	.	2	0020	293	0
1	0540	69	80	.	1	1155	144	6	.	1	1810	219	1	.	2	0025	294	0
1	0545	70	78	.	1	1200	145	6	.	1	1815	220	1	.	2	0030	295	0
1	0550	71	75	.	1	1205	146	6	.	1	1820	221	1	.	2	0035	296	0
1	0555	72	73	.	1	1210	147	6	.	1	1825	222	1	.	2	0040	297	0
1	0600	73	71	.	1	1215	148	6.	.	1	1830	223	1	.	2	0045	298	0
1	0605	74	69	.	1	1220	149	6	.	1	1835	224	1	.	2	0050	299	0
1	0610	75	66	.	1	1225	150	6	.	1	1840	225	1	.	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
256	3.35		91	26	25	25
		(INCHES)	1.655	1.917	1.918	1.918
		(AC-FT)	45	52	52	52

CUMULATIVE AREA = .51 SQ MI

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662 KK   *  R33E 1  *     ROUTE

661 KO      OUTPUT CONTROL VARIABLES
                IPRNT          1  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL          0  HYDROGRAPH PLOT SCALE
              ROUTE ADOT CULVERT 5 AND 6 FLOWS THROUGH ASLD LAND
              OPTION 5 - PROPOSED CHANNEL SOUTH OF LUND CADILLAC TO SCOTTSDALE ROAD
              FROM SCOTTSDALE ROAD SOUTH TO PRINCESS DRIVE
              ROUTE L=4600 , TRAP SECTION BW=19' Z=5, TWmax=39'
              ASSUME GRASS LINED CHANNEL N=.030 UP=1597.5 DN=1552

           HYDROGRAPH ROUTING DATA

669 RK      KINEMATIC WAVE STREAM ROUTING
                    L        4600  CHANNEL LENGTH
                    S       .0098  SLOPE
                    N        .030  CHANNEL ROUGHNESS COEFFICIENT
                   CA         .00  CONTRIBUTING AREA
                SHAPE        TRAP  CHANNEL SHAPE
                   WD       19.00  BOTTOM WIDTH OR DIAMETER
                    Z        5.00  SIDE SLOPE
               NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS
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COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.98	1.43	3.15	1533.33	255.01	201.54	1.92	7.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5200E+02 EXCESS= .0000E+00 OUTFLOW= .5203E+02 BASIN STORAGE= .2409E-01 PERCENT ERROR= 1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.98	1.43	5.00		251.70	200.00	1.92

HYDROGRAPH AT STATION 833E 1

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	0615	76	69	1	1230	151	6	1	1845	226	1.
1	0005	2	0	1	0620	77	66	1	1235	152	6	1	1850	227	1.
1	0010	3	0.	1	0625	78	63	1	1240	153	6	1	1855	228	1.
1	0015	4	0	1	0630	79	60	1	1245	154	6	1	1900	229	1
1	0020	5	0	1	0635	80	57.	1	1250	155	5.	1	1905	230	1
1	0025	6	0	1	0640	81	54	1	1255	156	5.	1	1910	231	1
1	0030	7	0	1	0645	82	51	1	1300	157	5	1	1915	232	1
1	0035	8	0	1	0650	83	49	1	1305	158	5	1	1920	233	1
1	0040	9	0.	1	0655	84	47	1	1310	159	5	1	1925	234	1
1	0045	10	0	1	0700	85	45.	1	1315	160	5	1	1930	235	1
1	0050	11	0	1	0705	86	43	1	1320	161	5	1	1935	236	1
1	0055	12	0	1	0710	87	41	1	1325	162	5	1	1940	237	1
1	0100	13	1.	1	0715	88	40	1	1330	163	4	1	1945	238	1
1	0105	14	2	1	0720	89	38.	1	1335	164	4.	1	1950	239	1
1	0110	15	3	1	0725	90	37	1	1340	165	4	1	1955	240	1
1	0115	16	5	1	0730	91	35	1	1345	166	4	1	2000	241	1
1	0120	17	6	1	0735	92	34	1	1350	167	4	1	2005	242	1
1	0125	18	7	1	0740	93	33	1	1355	168	4	1	2010	243	1.
1	0130	19	8	1	0745	94	31	1	1400	169	4	1	2015	244	1.
1	0135	20	9	1	0750	95	30	1	1405	170	4	1	2020	245	1
1	0140	21	10	1	0755	96	29	1	1410	171	4	1	2025	246	1.
1	0145	22	10	1	0800	97	28	1	1415	172	4	1	2030	247	1.
1	0150	23	11	1	0805	98	27	1	1420	173	3.	1	2035	248	1
1	0155	24	12	1	0810	99	26	1	1425	174	3	1	2040	249	1
1	0200	25	13	1	0815	100	26	1	1430	175	3	1	2045	250	1
1	0205	26	14	1	0820	101	25	1	1435	176	3	1	2050	251	1
1	0210	27	15	1	0825	102	24	1	1440	177	3	1	2055	252	1
1	0215	28	16	1	0830	103	23	1	1445	178	3	1	2100	253	1
1	0220	29	17	1	0835	104	23.	1	1450	179	3.	1	2105	254	1
1	0225	30	18	1	0840	105	22	1	1455	180	3	1	2110	255	1
1	0230	31	19	1	0845	106	21	1	1500	181	3	1	2115	256	1.
1	0235	32	21	1	0850	107	20	1	1505	182	3	1	2120	257	1
1	0240	33	22	1	0855	108	20	1	1510	183	3	1	2125	258	1.
1	0245	34	26.	1	0900	109	19	1	1515	184	3	1	2130	259	1.
1	0250	35	33	1	0905	110	19	1	1520	185	3	1	2135	260	1
1	0255	36	45	1	0910	111	18	1	1525	186	3	1	2140	261	1
1	0300	37	61	1	0915	112	17	1	1530	187	3	1	2145	262	1
1	0305	38	91	1	0920	113	17.	1	1535	188	3	1	2150	263	1.
1	0310	39	166	1	0925	114	16	1	1540	189	2	1	2155	264	1.
1	0315	40	210	1	0930	115	16	1	1545	190	2	1	2200	265	1
1	0320	41	252	1	0935	116	15	1	1550	191	2	1	2205	266	1
1	0325	42	252	1	0940	117	15	1	1555	192	2	1	2210	267	0
1	0330	43	243	1	0945	118	15	1	1600	193	2	1	2215	268	0
1	0335	44	233	1	0950	119	14	1	1605	194	2	1	2220	269	0
1	0340	45	222	1	0955	120	14	1	1610	195	2	1	2225	270	0
1	0345	46	207	1	1000	121	13	1	1615	196	2	1	2230	271	0
1	0350	47	192	1	1005	122	13	1	1620	197	2	1	2235	272	0
1	0355	48	177	1	1010	123	13	1	1625	198	2	1	2240	273	0.
1	0400	49	165	1	1015	124	12	1	1630	199	2	1	2245	274	0
1	0405	50	156	1	1020	125	12	1	1635	200	2	1	2250	275	0
1	0410	51	148	1	1025	126	12	1	1640	201	2	1	2255	276	0
1	0415	52	142.	1	1030	127	11	1	1645	202	2	1	2300	277	0
1	0420	53	137	1	1035	128	11	1	1650	203	2	1	2305	278	0.
1	0425	54	132	1	1040	129	11	1	1655	204	2.	1	2310	279	0
1	0430	55	128	1	1045	130	10	1	1700	205	2	1	2315	280	0.
1	0435	56	124	1	1050	131	10	1	1705	206	2	1	2320	281	0
1	0440	57	121	1	1055	132	10	1	1710	207	2	1	2325	282	0
1	0445	58	118	1	1100	133	10	1	1715	208	2	1	2330	283	0
1	0450	59	115	1	1105	134	9	1	1720	209	2	1	2335	284	0
1	0455	60	112	1	1110	135	9	1	1725	210	2	1	2340	285	0
1	0500	61	108	1	1115	136	9	1	1730	211	2	1	2345	286	0
1	0505	62	105	1	1120	137	9	1	1735	212	2	1	2350	287	0
1	0510	63	102	1	1125	138	8	1	1740	213	1	1	2355	288	0
1	0515	64	99	1	1130	139	8	1	1745	214	1	2	0000	289	0
1	0520	65	96	1	1135	140	8	1	1750	215	1	2	0005	290	0
1	0525	66	93	1	1140	141	8	1	1755	216	1	2	0010	291	0
1	0530	67	90	1	1145	142	8	1	1800	217	1	2	0015	292	0
1	0535	68	87	1	1150	143	7	1	1805	218	1.	2	0020	293	0.
1	0540	69	85	1	1155	144	7	1	1810	219	1	2	0025	294	0.
1	0545	70	82	1	1200	145	7	1	1815	220	1	2	0030	295	0
1	0550	71	80	1	1205	146	7	1	1820	221	1	2	0035	296	0
1	0555	72	78	1	1210	147	7	1	1825	222	1	2	0040	297	0
1	0600	73	75	1	1215	148	6	1	1830	223	1.	2	0045	298	0
1	0605	74	73	1	1220	149	6	1	1835	224	1	2	0050	299	0
1	0610	75	71	1	1225	150	6	1	1840	225	1	2	0055	300	0

```
 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR       72-HR      24.92-HR
 +  (CFS)       (HR)
                          (CFS)
 +    252       3.33                 91          26          25          25
                        (INCHES)   1.655       1.916       1.916       1.916
                         (AC-FT)     15.         52          52          52

                       CUMULATIVE AREA =      .51 SQ MI
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            *************
            *           *
 670 KK     *   ASLD    *        SUB
            *           *
            *************

 671 KO        OUTPUT CONTROL VARIABLES
                  IPRNT          1  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL          0. HYDROGRAPH PLOT SCALE
                    ASLD PARCEL EAST OF SCOTTSDALE ROAD

            SUBBASIN RUNOFF DATA

 673 BA        SUBBASIN CHARACTERISTICS
                  TAREA        .05  SUBBASIN AREA

               PRECIPITATION DATA

  24 PH                           DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  HYDRO-35                        TP-40                              TP-49
               5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR  12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
                 .76   1.50    2.51    2.85   2.99   3.33    .00    .00    .00    .00    .00    .00

                                             STORM AREA =   .00

 674 LS        SCS LOSS RATE
                  STRTL        .60  INITIAL ABSTRACTION
                  CRVNBR     77.00  CURVE NUMBER
                  RTIMP        .00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
 675 UK          OVERLAND-FLOW ELEMENT NO. 1
                      L         69  OVERLAND FLOW LENGTH
                      S       .0211 SLOPE
                      N        .100 ROUGHNESS COEFFICIENT
                      PA      100.0 PERCENT OF SUBBASIN
                    DXMIN         5 MINIMUM NUMBER OF DX INTERVALS

               KINEMATIC WAVE
 676 RK          MAIN CHANNEL
                      L        3100 CHANNEL LENGTH
                      S       .0088 SLOPE
                      N        .050 CHANNEL ROUGHNESS COEFFICIENT
                      CA        .05 CONTRIBUTING AREA
                    SHAPE      TRAP CHANNEL SHAPE
                      WD      10.00 BOTTOM WIDTH OR DIAMETER
                      Z        5.00 SIDE SLOPE
                   NDXMIN         2 MINIMUM NUMBER OF DX INTERVALS
                   RUPSTQ        NO ROUTE UPSTREAM HYDROGRAPH

                                                    ***
                                   COMPUTED KINEMATIC PARAMETERS
                                        VARIABLE TIME STEP
                                      (DT SHOWN IS A MINIMUM)

              ELEMENT    ALPHA      M        DT        DX      PEAK    TIME TO   VOLUME   MAXIMUM
                                                                          PEAK              CELERITY
                                           (MIN)      (FT)    (CFS)    (MIN)     (IN)     (FPS)

              PLANE1      2.17     1.67       .35     17.00   123.41   185.05    1.23        .19
              MAIN         .93     1.43      1.70    775.00    91.71   190.26    1.22       5.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3491E+01 OUTFLOW= .3478E+01 BASIN STORAGE= .3007E-01 PERCENT ERROR=   .4

                                   INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

              MAIN         .98     1.13      5.00               39.79   190.00    1.21
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                                      HYDROGRAPH AT STATION    ASLD
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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.01	.01	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.01	.01	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.01	.01	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.01	.01	.00	0.	*	1		1250	155	.00	.00	.00	0.

1	0025	6	01	01	00	0	.	1	1255	156	00	00	.00	0
1	0030	7	01	01	00	0	.	1	1300	157	.00	00	00	0
1	0035	8	01	01	00	0	.	1	1305	158	00	00	.00	0
1	0040	9	01	.01	.00	0	.	1	1310	159	.00	00	00	0
1	0045	10	.01	.01	00	0	.	1	1315	160	00	00	00	0
1	0050	11	01	.01	00	0	.	1	1320	161	.00	00	00	0
1	0055	12	.01	.01	.00	0	.	1	1325	162	00	00	00	0
1	0100	13	.01	.01	00	0	.	1	1330	163	00	00	00	0
1	0105	14	.01	.01	00	0.	.	1	1335	164	.00	00	00	0
1	0110	15	01	.01	00	0	.	1	1340	165	00	00	00	0
1	0115	16	01	.01	.00	0	.	1	1345	166	.00	00	.00	0
1	0120	17	01	.01	00	0	.	1	1350	167	00	00	00	0.
1	0125	18	.01	01	00	0	.	1	1355	168	.00	00	00	0
1	0130	19	01	01	00	0.	.	1	1400	169	00	00	00	0
1	0135	20	01	01	00	0	.	1	1405	170	00	00	00	0.
1	0140	21	.01	01	00	0	.	1	1410	171	00	00	00	0
1	0145	22	.02	02	00	0.	.	1	1415	172	00	00	00	0.
1	0150	23	02	02	00	0	.	1	1420	173	00	00	00	0.
1	0155	24	.02	02	00	0	.	1	1425	174	.00	00	00	0
1	0200	25	02	02	00	0	.	1	1430	175	00	.00	00	0
1	0205	26	02	02	00	0	.	1	1435	176	00	00	00	0.
1	0210	27	.02	02	00	0.	.	1	1440	177	.00	00	00	0
1	0215	28	02	.02	00	0	.	1	1445	178	00	00	.00	0
1	0220	29	02	.02	00	0	.	1	1450	179	00	00	00	0
1	0225	30	03	03	00	0	.	1	1455	180	00	00	.00	0
1	0230	31	03	03	00	0	.	1	1500	181	00	00	00	0
1	0235	32	08	09	00	0	.	1	1505	182	00	00	00	0
1	0240	33	09	09	00	0.	.	1	1510	183	00	00	00	0
1	0245	34	10	10	00	0	.	1	1515	184	00	00	00	0
1	0250	35	13	13	01	0	.	1	1520	185	00	00	00	0
1	0255	36	18	.14	03	1	.	1	1525	186	00	00	00	0
1	0300	37	10	28	12	5	.	1	1530	187	00	00	00	0
1	0305	38	69	36	33	17	.	1	1535	188	.00	00	00	0
1	0310	39	28	.12	16	90	.	1	1540	189	00	00	.00	0
1	0315	40	15	.06	09	69	.	1	1545	190	00	00	00	0
1	0320	41	11	01	07	17	.	1	1550	191	00	00	00	0
1	0325	42	09	04	06	35	.	1	1555	192	00	00	00	0
1	0330	43	08	03	05	29	.	1	1600	193	00	00	00	0
1	0335	44	03	01	02	23	.	1	1605	194	00	00	00	0
1	0340	45	03	01	02	10.	.	1	1610	195	00	00	00	0
1	0345	46	03	01	.03	13	.	1	1615	196	00	00	00	0
1	0350	47	02	01	02	11	.	1	1620	197	00	00	00	0
1	0355	48	02	01	01	9	.	1	1625	198	00	00	00	0
1	0400	49	.02	01	01	8	.	1	1630	199	00	00	00	0
1	0405	50	02	01	01	7	.	1	1635	200	00	00	00	0
1	0410	51	02	01	01	6	.	1	1640	201	00	00	00	0
1	0415	52	02	01	01	5	.	1	1645	202	00	00	00	0
1	0420	53	02	00	01	5	.	1	1650	203	00	00	00	0
1	0425	54	02	00	01	5	.	1	1655	204	00	.00	00	0
1	0430	55	01	00	.01	5	.	1	1700	205	00	00	00	0
1	0435	56	01	00	01	5	.	1	1705	206	00	00	00	0
1	0440	57	01	00	01	4	.	1	1710	207	00	.00	00	0
1	0445	58	01	00	.01	1	.	1	1715	208	.00	00	00	0
1	0450	59	01	00	01	4.	.	1	1720	209	00	00	00	0
1	0455	60	01	00	01	3	.	1	1725	210	00	00	.00	0
1	0500	61	01	00	01	4	.	1	1730	211	.00	00	00	0
1	0505	62	01	00	01	4	.	1	1735	212	00	00	00	0
1	0510	63	01	00	01	3	.	1	1740	213	00	00	00	0
1	0515	64	01	00	01	3	.	1	1745	214	00	00	00	0
1	0520	65	01	00	01	1	.	1	1750	215	00	00	00	0
1	0525	66	01	00	01	1	.	1	1755	216	00	00	00	0
1	0530	67	01	00	01	2	.	1	1800	217	00	00	00	0
1	0535	68	01	00	01	1	.	1	1805	218	00	00	00	0
1	0540	69	01	.00	.01	1	.	1	1810	219	00	00	00	0
1	0545	70	01	00	01	2	.	1	1815	220	.00	00	00	0
1	0550	71	.01	00	01	1.	.	1	1820	221	00	00	00	0
1	0555	72	01	00	.01	1.	.	1	1825	222	00	00	00	0
1	0600	73	01	00	01	3	.	1	1830	223	00	.00	00	0
1	0605	74	00	00	00	2	.	1	1835	224	00	00	00	0
1	0610	75	00	00	00	2.	.	1	1840	225	00	00	00	0
1	0615	76	00	00	00	2	.	1	1845	226	00	00	00	0
1	0620	77	.00	00	00	2	.	1	1850	227	00	00	00	0.
1	0625	78	00	00	00	1	.	1	1855	228	00	00	00	0
1	0630	79	00	00	00	1	.	1	1900	229	00	00	00	0
1	0635	80	00	00	00	1	.	1	1905	230	00	00	00	0
1	0640	81	00	00	.00	1	.	1	1910	231	00	00	.00	0
1	0645	82	00	00	00	1	.	1	1915	232	.00	00	00	0.
1	0650	83	00	00	00	0	.	1	1920	233	00	00	00	0
1	0655	84	00	00	00	0	.	1	1925	234	00	00	00	0
1	0700	85	00	00	00	0	.	1	1930	235	00	00	00	0
1	0705	86	00	00	00	0	.	1	1935	236	00	00	00	0
1	0710	87	00	00	00	0	.	1	1940	237	00	00	00	0
1	0715	88	00	00	00	0	.	1	1945	238	00	00	00	0.
1	0720	89	00	.00	00	0	.	1	1950	239	.00	00	00	0
1	0725	90	00	00	00	0	.	1	1955	240	00	00	00	0
1	0730	91	00	00	00	0	.	1	2000	241	00	00	00	0
1	0735	92	00	00	00	0	.	1	2005	242	.00	00	00	0
1	0740	93	00	.00	00	0	.	1	2010	243	00	.00	00	0
1	0745	94	00	00	00	0	.	1	2015	244	00	.00	00	0
1	0750	95	00	00	00	0	.	1	2020	245	00	00	.00	0
1	0755	96	00	00	00	0	.	1	2025	246	00	00	00	0
1	0800	97	00	00	00	0	.	1	2030	247	.00	00	00	0
1	0805	98	00	00	00	0	.	1	2035	248	00	00	00	0
1	0810	99	00	00	00	0	.	1	2040	249	00	00	00	0.
1	0815	100	00	.00	00	0	.	1	2045	250	.00	00	00	0
1	0820	101	00	00	00	0	.	1	2050	251	.00	00	00	0
1	0825	102	00	00	00	0	.	1	2055	252	.00	00	00	0.
1	0830	103	00	.00	00	0	.	1	2100	253	00	.00	00	0
1	0835	104	00	00	.00	0	.	1	2105	254	00	00	00	0
1	0840	105	00	00	00	0	.	1	2110	255	00	00	00	0
1	0845	106	00	00	00	0	.	1	2115	256	00	00	00	0
1	0850	107	00	00	00	0	.	1	2120	257	00	00	00	0
1	0855	108	00	00	00	0	.	1	2125	258	00	00	00	0
1	0900	109	00	00	00	0	.	1	2130	259	00	00	00	0

1	0905	110	00	00	.00	0	1	2135	260	.00	.00	00	0
1	0910	111	00	00	00	0	1	2140	261	00	00	00	0
1	0915	112	00	00	00	0	1	2145	262	00	.00	00	0
1	0920	113	00	00	00	0.	1	2150	263	00	00	.00	0
1	0925	114	.00	00	.00	0	1	2155	264	00	00	.00	0
1	0930	115	00	.00	.00	0	1	2200	265	00	00	00	0
1	0935	116	00	00	00	0	1	2205	266	00	00	00	0
1	0940	117	00	00	.00	0	1	2210	267	00	00	.00	0
1	0945	118	00	00	00	0	1	2215	268	.00	00	00	0
1	0950	119	00	00	00	0	1	2220	269	00	00	00	0
1	0955	120	00	.00	.00	0	1	2225	270	00	00	00	0
1	1000	121	00	00	.00	0	1	2230	271	00	.00	.00	0
1	1005	122	00	00	00	0	1	2235	272	00	.00	.00	0
1	1010	123	00	00	00	0	1	2240	273	00	00	.00	0
1	1015	124	00	00	00	0	1	2245	274	00	00	00	0
1	1020	125	.00	00	.00	0	1	2250	275	00	00	.00	0
1	1025	126	00	00	00	0	1	2255	276	00	00	00	0
1	1030	127	00	.00	.00	0	1	2300	277	00	00	00	0
1	1035	128	00	00	00	0	1	2305	278	00	00	00	0
1	1040	129	00	00	00	0	1	2310	279	00	.00	00	0
1	1045	130	00	00	00	0	1	2315	280	00	00	00	0
1	1050	131	00	00	00	0	1	2320	281	00	00	00	0
1	1055	132	00	.00	00	0	1	2325	282	.00	.00	.00	0
1	1100	133	00	00	00	0	1	2330	283	00	00	.00	0
1	1105	134	.00	00	.00	0	1	2335	284	00	00	00	0
1	1110	135	00	00	00	0	1	2340	285	.00	00	00	0
1	1115	136	00	00	00	0	1	2345	286	00	.00	00	0
1	1120	137	00	00	.00	0	1	2350	287	00	00	00	0
1	1125	138	00	00	00	0	1	2355	288	00	00	00	0
1	1130	139	00	00	00	0	2	0000	289	00	00	00	0
1	1135	140	00	00	00	0	2	0005	290	00	00	.00	0
1	1140	141	00	00	00	0	2	0010	291	00	00	.00	0.
1	1145	142	00	.00	00	0	2	0015	292	00	00	00	0
1	1150	143	00	00	00	0	2	0020	293	00	00	00	0
1	1155	144	.00	00	00	0	2	0025	294	00	00	00	0
1	1200	145	00	00	.00	0	2	0030	295	00	00	00	0
1	1205	146	00	00	00	0	2	0035	296	00	00	00	0
1	1210	147	00	.00	00	0	2	0040	297	00	00	.00	0
1	1215	148	00	00	00	0	2	0045	298	00	00	00	0
1	1220	149	00	.00	00	0	2	0050	299	00	00	00	0
1	1225	150	00	.00	00	0	2	0055	300	00	00	00	0

TOTAL RAINFALL = 3.22, TOTAL LOSS = 1.99, TOTAL EXCESS = 1.23

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
90	3.17		7	2	2	2
		(INCHES)	1.224	1.226	1.226	1.226
		(AC-FT)	3	3	3	3

CUMULATIVE AREA = .05 SQ MI

677 KK * CPPRIN * COMBINE

678 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
COMBINE ROUTED ALOT 5 AND 6 WITH ASLD PARCEL

680 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION CPPRIN
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		0615	76	71	1		1230	151	6	1		1845	226	1
1		0005	2	0	1		0620	77	68	1		1235	152	6.	1		1850	227	1
1		0010	3	0	1		0625	78	64	1		1240	153	6	1		1855	228	1
1		0015	4	0	1		0630	79	61	1		1245	154	6	1		1900	229	1
1		0020	5	0.	1		0635	80	57	1		1250	155	5	1		1905	230	1
1		0025	6	0	1		0640	81	55	1		1255	156	5	1		1910	231	1.
1		0030	7	0	1		0645	82	52	1		1300	157	5	1		1915	232	1
1		0035	8	0	1		0650	83	50	1		1305	158	5	1		1920	233	1
1		0040	9	0	1		0655	84	47	1		1310	159	5	1		1925	234	1
1		0045	10	0	1		0700	85	45	1		1315	160	5	1		1930	235	1
1		0050	11	0	1		0705	86	43	1		1320	161	5	1		1935	236	1
1		0055	12	0	1		0710	87	41	1		1325	162	5.	1		1940	237	1
1		0100	13	1	1		0715	88	40	1		1330	163	4	1		1945	238	1
1		0105	14	2	1		0720	89	38	1		1335	164	4	1		1950	239	1
1		0110	15	3	1		0725	90	37	1		1340	165	4	1		1955	240	1
1		0115	16	5	1		0730	91	35	1		1345	166	3	1		2000	241	1

1	0120	17	6	*	1	0735	92	31	*	1	1350	167	4	*	1	2005	242	1.
1	0125	18	7	*	1	0740	93	33	*	1	1355	168	4	*	1	2010	243	1
1	0130	19	8	*	1	0745	94	32	*	1	1400	169	4	*	1	2015	244	1.
1	0135	20	9.	*	1	0750	95	30	*	1	1405	170	4	*	1	2020	245	1
1	0140	21	10.	*	1	0755	96	29	*	1	1410	171	4	*	1	2025	246	1.
1	0145	22	10	*	1	0800	97	28	*	1	1415	172	4	*	1	2030	247	1
1	0150	23	11	*	1	0805	98	27.	*	1	1420	173	4	*	1	2035	248	1
1	0155	24	12	*	1	0810	99	26	*	1	1425	174	3	*	1	2040	249	1.
1	0200	25	13	*	1	0815	100	26	*	1	1430	175	3	*	1	2045	250	1.
1	0205	26	14	*	1	0820	101	25	*	1	1435	176	3	*	1	2050	251	1
1	0210	27	15	*	1	0825	102	24	*	1	1440	177	3	*	1	2055	252	1
1	0215	28	16.	*	1	0830	103	23	*	1	1445	178	3	*	1	2100	253	1
1	0220	29	17	*	1	0835	104	22	*	1	1450	179	3	*	1	2105	254	1.
1	0225	30	18	*	1	0840	105	22	*	1	1455	180	3	*	1	2110	255	1
1	0230	31	19	*	1	0845	106	21.	*	1	1500	181	3	*	1	2115	256	1.
1	0235	32	21	*	1	0850	107	20	*	1	1505	182	3	*	1	2120	257	1
1	0240	33	22	*	1	0855	108	20	*	1	1510	183	3	*	1	2125	258	1
1	0245	34	26	*	1	0900	109	19	*	1	1515	184	3	*	1	2130	259	1
1	0250	35	33.	*	1	0905	110	19	*	1	1520	185	3	*	1	2135	260	1
1	0255	36	45	*	1	0910	111	18.	*	1	1525	186	3	*	1	2140	261	1
1	0300	37	66	*	1	0915	112	17.	*	1	1530	187	3	*	1	2145	262	1
1	0305	38	130	*	1	0920	113	17.	*	1	1535	188	3.	*	1	2150	263	1
1	0310	39	256	*	1	0925	114	16	*	1	1540	189	2	*	1	2155	264	1
1	0315	40	300	*	1	0930	115	16	*	1	1545	190	2	*	1	2200	265	1
1	0320	41	299	*	1	0935	116	15	*	1	1550	191	2	*	1	2205	266	1
1	0325	42	287	*	1	0940	117	15	*	1	1555	192	2	*	1	2210	267	0
1	0330	43	272	*	1	0945	118	15.	*	1	1600	193	2	*	1	2215	268	0
1	0335	44	257	*	1	0950	119	14	*	1	1605	194	2	*	1	2220	269	0
1	0340	45	239	*	1	0955	120	14	*	1	1610	195	2	*	1	2225	270	0
1	0345	46	221	*	1	1000	121	13	*	1	1615	196	2	*	1	2230	271	0
1	0350	47	202	*	1	1005	122	13	*	1	1620	197	2	*	1	2235	272	0
1	0355	48	186	*	1	1010	123	13.	*	1	1625	198	2	*	1	2240	273	0.
1	0400	49	173.	*	1	1015	124	12	*	1	1630	199	2	*	1	2245	274	0
1	0405	50	163	*	1	1020	125	12	*	1	1635	200	2	*	1	2250	275	0
1	0410	51	155	*	1	1025	126	12	*	1	1640	201	2.	*	1	2255	276	0
1	0415	52	148	*	1	1030	127	11	*	1	1645	202	2	*	1	2300	277	0
1	0420	53	142	*	1	1035	128	11	*	1	1650	203	2	*	1	2305	278	0
1	0425	54	137	*	1	1040	129	11	*	1	1655	204	2.	*	1	2310	279	0
1	0430	55	133	*	1	1045	130	10	*	1	1700	205	2	*	1	2315	280	0
1	0435	56	129	*	1	1050	131	10	*	1	1705	206	2	*	1	2320	281	0
1	0440	57	125	*	1	1055	132	10	*	1	1710	207	2	*	1	2325	282	0
1	0445	58	122	*	1	1100	133	10	*	1	1715	208	2	*	1	2330	283	0
1	0450	59	119	*	1	1105	134	9	*	1	1720	209	2	*	1	2335	284	0
1	0455	60	116	*	1	1110	135	9	*	1	1725	210	2	*	1	2340	285	0
1	0500	61	112.	*	1	1115	136	9.	*	1	1730	211	2.	*	1	2345	286	0.
1	0505	62	108	*	1	1120	137	9	*	1	1735	212	2.	*	1	2350	287	0
1	0510	63	105	*	1	1125	138	8	*	1	1740	213	1.	*	1	2355	288	0
1	0515	64	102	*	1	1130	139	8.	*	1	1745	214	1	*	2	0000	289	0
1	0520	65	99	*	1	1135	140	8	*	1	1750	215	1	*	2	0005	290	0
1	0525	66	96	*	1	1140	141	8	*	1	1755	216	1	*	2	0010	291	0
1	0530	67	93	*	1	1145	142	8	*	1	1800	217	1	*	2	0015	292	0
1	0535	68	90	*	1	1150	143	7	*	1	1805	218	1	*	2	0020	293	0
1	0540	69	87	*	1	1155	144	7	*	1	1810	219	1	*	2	0025	294	0
1	0545	70	85	*	1	1200	145	7	*	1	1815	220	1	*	2	0030	295	0
1	0550	71	83	*	1	1205	146	7	*	1	1820	221	1	*	2	0035	296	0
1	0555	72	80	*	1	1210	147	7	*	1	1825	222	1	*	2	0040	297	0
1	0600	73	78	*	1	1215	148	6	*	1	1830	223	1	*	2	0045	298	0.
1	0605	74	76	*	1	1220	149	6	*	1	1835	224	1	*	2	0050	299	0
1	0610	75	73	*	1	1225	150	5	*	1	1840	225	1	*	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
300	3.25		90	20	27	27
		(INCHES)	1.614	1.851	1.851	1.851
		(AC-FT)	40.	56	56.	56

CUMULATIVE AREA = .56 SQ MI

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                 **************
                 *            *
681 KK           *   R33C 2   *
                 *            *
                 **************

682 KO           OUTPUT CONTROL VARIABLES
                       IPRNT          1  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0  HYDROGRAPH PLOT SCALE
                          RETRIEVE DIVERTED PIPE FLOW

683 DR           RETRIEVE DIVERSION HYDROGRAPH
                       ISTAD      D33C 2  DIVERSION HYDROGRAPH IDENTIFICATION
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HYDROGRAPH AT STATION R33C 2

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		0615	76	9	*	1		1230	151	0	*	1		1845	226	0

1	0005	2	0	1	0620	77	8	1	1235	152	0.	1	1850	227	0
1	0010	3	0	1	0625	78	7.	1	1240	153	0	1	1855	228	0
1	0015	4	0	1	0630	79	6	1	1245	154	0	1	1900	229	0
1	0020	5	0.	1	0635	80	5	1	1250	155	0	1	1905	230	0.
1	0025	6	0	1	0640	81	5	1	1255	156	0.	1	1910	231	0
1	0030	7	0	1	0645	82	4	1	1300	157	0	1	1915	232	0
1	0035	8	0	1	0650	83	4	1	1305	158	0	1	1920	233	0.
1	0040	9	0	1	0655	84	3	1	1310	159	0	1	1925	234	0
1	0045	10	0	1	0700	85	3	1	1315	160	0.	1	1930	235	0
1	0050	11	0	1	0705	86	2.	1	1320	161	0	1	1935	236	0
1	0055	12	0	1	0710	87	2	1	1325	162	0	1	1940	237	0
1	0100	13	0	1	0715	88	2	1	1330	163	0	1	1945	238	0
1	0105	14	1	1	0720	89	2	1	1335	164	0.	1	1950	239	0.
1	0110	15	1	1	0725	90	1	1	1340	165	0	1	1955	240	0
1	0115	16	1	1	0730	91	1.	1	1345	166	0	1	2000	241	0.
1	0120	17	2	1	0735	92	1	1	1350	167	0	1	2005	242	0
1	0125	18	2	1	0740	93	1	1	1355	168	0.	1	2010	243	0
1	0130	19	2	1	0745	94	1	1	1400	169	0	1	2015	244	0
1	0135	20	3	1	0750	95	1	1	1405	170	0.	1	2020	245	0
1	0140	21	3	1	0755	96	1	1	1410	171	0	1	2025	246	0
1	0145	22	3	1	0800	97	1	1	1415	172	0	1	2030	247	0
1	0150	23	3	1	0805	98	1.	1	1420	173	0.	1	2035	248	0
1	0155	24	3	1	0810	99	0	1	1425	174	0.	1	2040	249	0
1	0200	25	3.	1	0815	100	0	1	1430	175	0	1	2045	250	0
1	0205	26	4	1	0820	101	0	1	1435	176	0	1	2050	251	0
1	0210	27	4	1	0825	102	0	1	1440	177	0	1	2055	252	0.
1	0215	28	5	1	0830	103	0.	1	1445	178	0	1	2100	253	0
1	0220	29	5	1	0835	104	0	1	1450	179	0	1	2105	254	0
1	0225	30	5	1	0840	105	0	1	1455	180	0	1	2110	255	0
1	0230	31	6	1	0845	106	0.	1	1500	181	0.	1	2115	256	0
1	0235	32	6	1	0850	107	0	1	1505	182	0	1	2120	257	0.
1	0240	33	8	1	0855	108	0	1	1510	183	0.	1	2125	258	0
1	0245	34	10	1	0900	109	0	1	1515	184	0	1	2130	259	0
1	0250	35	11	1	0905	110	0.	1	1520	185	0	1	2135	260	0
1	0255	36	13	1	0910	111	0	1	1525	186	0	1	2140	261	0
1	0300	37	15	1	0915	112	0	1	1530	187	0	1	2145	262	0
1	0305	38	17	1	0920	113	0	1	1535	188	0	1	2150	263	0
1	0310	39	46	1	0925	114	0	1	1540	189	0	1	2155	264	0
1	0315	40	96	1	0930	115	0	1	1545	190	0	1	2200	265	0
1	0320	41	108	1	0935	116	0	1	1550	191	0	1	2205	266	0
1	0325	42	105	1	0940	117	0	1	1555	192	0	1	2210	267	0
1	0330	43	96	1	0945	118	0	1	1600	193	0.	1	2215	268	0
1	0335	44	86	1	0950	119	0	1	1605	194	0	1	2220	269	0
1	0340	45	75	1	0955	120	0	1	1610	195	0	1	2225	270	0
1	0345	46	63	1	1000	121	0	1	1615	196	0	1	2230	271	0
1	0350	47	52	1	1005	122	0	1	1620	197	0	1	2235	272	0
1	0355	48	41	1	1010	123	0	1	1625	198	0	1	2240	273	0
1	0400	49	37	1	1015	124	0	1	1630	199	0	1	2245	274	0
1	0405	50	31	1	1020	125	0.	1	1635	200	0	1	2250	275	0
1	0410	51	27	1	1025	126	0	1	1640	201	0	1	2255	276	0.
1	0415	52	24	1	1030	127	0	1	1645	202	0	1	2300	277	0
1	0420	53	22	1	1035	128	0	1	1650	203	0	1	2305	278	0
1	0425	54	19	1	1040	129	0	1	1655	204	0	1	2310	279	0.
1	0430	55	18	1	1045	130	0	1	1700	205	0	1	2315	280	0
1	0435	56	18	1	1050	131	0	1	1705	206	0	1	2320	281	0
1	0440	57	17	1	1055	132	0	1	1710	207	0	1	2325	282	0.
1	0445	58	17	1	1100	133	0	1	1715	208	0	1	2330	283	0
1	0450	59	17	1	1105	134	0	1	1720	209	0	1	2335	284	0
1	0455	60	15	1	1110	135	0	1	1725	210	0	1	2340	285	0
1	0500	61	16	1	1115	136	0	1	1730	211	0	1	2345	286	0
1	0505	62	16	1	1120	137	0	1	1735	212	0	1	2350	287	0
1	0510	63	15	1	1125	138	0	1	1740	213	0	1	2355	288	0
1	0515	64	15	1	1130	139	0	1	1745	214	0	2	0000	289	0
1	0520	65	14	1	1135	140	0	1	1750	215	0.	2	0005	290	0
1	0525	66	14	1	1140	141	0	1	1755	216	0	2	0010	291	0
1	0530	67	14.	1	1145	142	0	1	1800	217	0	2	0015	292	0
1	0535	68	13.	1	1150	143	0	1	1805	218	0	2	0020	293	0
1	0540	69	13.	1	1155	144	0	1	1810	219	0	2	0025	294	0
1	0545	70	12.	1	1200	145	0	1	1815	220	0	2	0030	295	0
1	0550	71	12	1	1205	146	0	1	1820	221	0	2	0035	296	0
1	0555	72	12	1	1210	147	0	1	1825	222	0	2	0040	297	0
1	0600	73	11	1	1215	148	0	1	1830	223	0.	2	0045	298	0
1	0605	74	11	1	1220	149	0.	1	1835	224	0	2	0050	299	0
1	0610	75	10	1	1225	150	0	1	1840	225	0	2	0055	300	0

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
108	3.33		10	5	5	5
		(INCHES)	.327	.332	.332	.332
		(AC-FT)	10	10	10	10

CUMULATIVE AREA = .00 SQ MI

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              **************
              *            *
605 KK        *   S40WT    *        SUB
              *            *
              **************

606 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1   PRINT CONTROL
                    IPLOT          0   PLOT CONTROL
                    QSCAL          0   HYDROGRAPH PLOT SCALE
                       SUB EAST OF SCOTTSDALE RD. FLOWING DIRECTLY INTO SCOTTSDALE RD
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CULVERT, TAZES SCOTTS RD HALF ST AND SCENIC CORRIDOR

SUBBASIN RUNOFF DATA

689 BA SUBBASIN CHARACTERISTICS

TAREA	01	SUBBASIN AREA

PRECIPITATION DATA

24 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35				TP-40				TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
76	1 50	2 51	2 81	2 99	3 33	00	00	00	00	00	00

STORM AREA = 14 00

690 LS SCS LOSS RATE

STRTL	60	INITIAL ABSTRACTION
CRVNBR	77 00	CURVE NUMBER
RTIMP	69 00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

691 UK OVERLAND-FLOW ELEMENT NO 1

L	50	OVERLAND FLOW LENGTH
S	0100	SLOPE
N	050	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

KINEMATIC WAVE

692 RK MAIN CHANNEL

L	600	CHANNEL LENGTH
S	0100	SLOPE
N	015	CHANNEL ROUGHNESS COEFFICIENT
CA	.01	CONTRIBUTING AREA
SHAPE	CIRC	CHANNEL SHAPE
WD	4 50	BOTTOM WIDTH OR DIAMETER
Z	00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

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COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	4 98	1 67	13	10 00	11 73	184 61	3 00	54
MAIN	5 89	1 25	33	200 00	11 72	164 75	3 00	12 50

CONTINUITY SUMMARY (AC-FT) - INFLOW. 0000E+00 EXCESS 1009E+01 OUTFLOW= 1005E+01 BASIN STORAGE= 4154E-05 PERCENT ERROR= 1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	6 39	1 25	5 00	11 67	155 00	3 01

****

HYDROGRAPH AT STATION S40WT

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DA MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	0000	1	00	00	00	0	.	1	1230	151	00	00	00	0
1	0005	2	01	00	01	0	.	1	1235	152	00	00	00	0
1	0010	3	01	00	01	0	.	1	1240	153	.00	00	00	0
1	0015	4	01	00	01	0	.	1	1245	154	00	00	00	0
1	0020	5	01	00	01	0	.	1	1250	155	00	00	00	0
1	0025	6	01	00	01	0	.	1	1255	156	00	00	00	0
1	0030	7	01	00	01	0	.	1	1300	157	00	00	00	0
1	0035	8	01	00	01	0	.	1	1305	158	00	00	00	0
1	0040	9	01	00	01	0	.	1	1310	159	00	00	00	0
1	0045	10	01	00	01	0	.	1	1315	160	00	00	00	0
1	0050	11	01	00	01	0	.	1	1320	161	00	00	00	0
1	0055	12	01	00	01	0	.	1	1325	162	00	00	00	0
1	0100	13	01	00	01	0	.	1	1330	163	00	00	00	0
1	0105	14	01	00	01	0	.	1	1335	164	00	00	00	0
1	0110	15	01	00	01	0.	.	1	1340	165	00	00	00	0
1	0115	16	01	00	01	0.	.	1	1345	166	00	00	00	0
1	0120	17	01	00	01	1	.	1	1350	167	00	00	00	0
1	0125	18	01	00	01	1	.	1	1355	168	00	00	00	0
1	0130	19	01	00	01	1.	.	1	1400	169	00	00	00	0
1	0135	20	01	00	01	1.	.	1	1405	170	00	00	00	0
1	0140	21	01	00	01	1	.	1	1410	171	00	00	00	0
1	0145	22	02	00	01	1	.	1	1415	172	00	00	00	0
1	0150	23	02	00	01	1	.	1	1420	173	00	00	00	0
1	0155	24	02	00	02	1	.	1	1425	174	.00	00	00	0
1	0200	25	02	00	02	1	.	1	1430	175	00	00	00	0
1	0205	26	02	00	02	1	.	1	1435	176	00	00	00	0
1	0210	27	02	00	02	1	.	1	1440	177	00	00	00	0
1	0215	28	02	00	02	1	.	1	1445	178	00	00	00	0
1	0220	29	02	00	02	1	.	1	1450	179	00	00	00	0
1	0225	30	03	00	02	1	.	1	1455	180	00	.00	00	0
1	0230	31	03	00	03	1	.	1	1500	181	00	00	00	0
1	0235	32	06	01	07	1	.	1	1505	182	00	00	00	0
1	0240	33	09	01	08	1	.	1	1510	183	00	00	00	0.
1	0245	34	.10	01	09	4	.	1	1515	184	00	00	.00	0

1	0250	35	.14	01	12	6	.	1	1520	185	00	00	00	0.
1	0255	36	18	02	16	8.	.	1	1525	186	00	00	.00	0.
1	0300	37	.40	03	37	18.	.	1	1530	187	00	00	00	0
1	0305	38	69	04	65	31.	.	1	1535	188	00	.00	00	0.
1	0310	39	28	.01	26	13.	.	1	1540	189	00	00	00	0.
1	0315	40	.15	01	15	7	.	1	1545	190	00	.00	.00	0.
1	0320	41	.17	.00	10	5.	.	1	1550	191	.00	00	00	0
1	0325	42	09	.00	09	4	.	1	1555	192	00	.00	00	0.
1	0330	43	.08	00	08	4.	.	1	1600	193	00	00	.00	0
1	0335	44	03	00	03	2	.	1	1605	194	00	00	00	0
1	0340	45	03	00	03	1	.	1	1610	195	00	00	00	0
1	0345	46	.03	00	.03	1.	.	1	1615	196	00	00	00	0.
1	0350	47	02	.00	02	1	.	1	1620	197	00	00	00	0
1	0355	48	02	00	02	1	.	1	1625	198	00	00	00	0
1	0400	49	02	00	02	1	.	1	1630	199	.00	00	00	0
1	0405	50	02	00	02	1	.	1	1635	200	00	00	00	0
1	0410	51	02	00	02	1	.	1	1640	201	00	00	00	0.
1	0415	52	02	00	02	1	.	1	1645	202	00	00	00	0
1	0420	53	.02	00	02	1.	.	1	1650	203	00	.00	00	0.
1	0425	54	.02	.00	01	1	.	1	1655	204	.00	00	00	0.
1	0430	55	01	00	01	1	.	1	1700	205	00	00	00	0
1	0435	56	.01	00	01	1	.	1	1705	206	00	00	00	0
1	0440	57	.01	00	01	1	.	1	1710	207	00	00	00	0
1	0445	58	01	00	01	1	.	1	1715	208	.00	.00	00	0
1	0450	59	01	00	01	1	.	1	1720	209	00	00	00	0
1	0455	60	01	00	01	1	.	1	1725	210	00	00	.00	0
1	0500	61	.01	00	01	1	.	1	1730	211	00	00	00	0
1	0505	62	01	00	01	1	.	1	1735	212	00	00	00	0
1	0510	63	01	00	01	0	.	1	1740	213	00	00	00	0
1	0515	64	01	00	.01	0	.	1	1745	214	00	00	00	0
1	0520	65	01	00	01	0	.	1	1750	215	00	00	00	0
1	0525	66	01	00	01	0	.	1	1755	216	00	00	00	0
1	0530	67	01	00	01	0	.	1	1800	217	00	00	00	0
1	0535	68	01	00	01	0	.	1	1805	218	00	00	00	0
1	0540	69	01	00	01	0	.	1	1810	219	00	00	00	0
1	0545	70	01	00	01	0	.	1	1815	220	00	00	00	0
1	0550	71	01	00	01	0	.	1	1820	221	00	00	00	0
1	0555	72	01	.00	01	0	.	1	1825	222	00	00	00	0
1	0600	73	01	.00	01	0	.	1	1830	223	00	.00	00	0.
1	0605	74	00	00	00	0	.	1	1835	224	.00	00	00	0
1	0610	75	00	00	00	0	.	1	1840	225	00	00	00	0
1	0615	76	00	00	00	0	.	1	1845	226	00	00	00	0
1	0620	77	00	00	00	0	.	1	1850	227	00	00	00	0
1	0625	78	00	00	00	0	.	1	1855	228	00	00	00	0
1	0630	79	00	00	00	0	.	1	1900	229	00	00	00	0
1	0635	80	00	00	00	0	.	1	1905	230	00	00	00	0
1	0640	81	00	00	00	0	.	1	1910	231	00	00	00	0.
1	0645	82	00	00	00	0	.	1	1915	232	00	00	00	0.
1	0650	83	00	00	00	0	.	1	1920	233	00	00	00	0.
1	0655	84	00	00	.00	0	.	1	1925	234	.00	.00	00	0
1	0700	85	00	00	00	0	.	1	1930	235	00	00	00	0
1	0705	86	00	00	00	0	.	1	1935	236	00	00	00	0
1	0710	87	00	00	00	0	.	1	1940	237	00	00	00	0
1	0715	88	00	00	00	0	.	1	1945	238	00	00	00	0
1	0720	89	00	00	00	0	.	1	1950	239	00	00	00	0
1	0725	90	00	00	00	0	.	1	1955	240	00	00	00	0
1	0730	91	00	00	00	0	.	1	2000	241	00	00	00	0.
1	0735	92	00	00	00	0	.	1	2005	242	00	00	00	0
1	0740	93	00	00	00	0	.	1	2010	243	00	00	00	0
1	0745	94	00	00	00	0	.	1	2015	244	00	00	00	0
1	0750	95	00	00	00	0	.	1	2020	245	00	00	00	0.
1	0755	96	00	00	00	0	.	1	2025	246	00	00	.00	0
1	0800	97	00	00	00	0	.	1	2030	247	00	00	00	0
1	0805	98	00	00	00	0	.	1	2035	248	00	.00	00	0.
1	0810	99	00	00	00	0	.	1	2040	249	00	00	00	0
1	0815	100	00	00	00	0	.	1	2045	250	00	00	.00	0
1	0820	101	00	00	00	0	.	1	2050	251	00	00	00	0
1	0825	102	.00	00	00	0	.	1	2055	252	00	00	00	0.
1	0830	103	00	00	00	0	.	1	2100	253	00	00	.00	0
1	0835	104	00	00	00	0	.	1	2105	254	00	00	00	0
1	0840	105	00	00	00	0	.	1	2110	255	00	00	00	0
1	0845	106	00	00	00	0	.	1	2115	256	00	.00	00	0.
1	0850	107	00	00	00	0	.	1	2120	257	00	00	00	0
1	0855	108	00	00	00	0	.	1	2125	258	00	00	00	0
1	0900	109	00	00	00	0	.	1	2130	259	00	00	.00	0
1	0905	110	00	00	00	0	.	1	2135	260	00	00	00	0
1	0910	111	00	00	00	0	.	1	2140	261	00	00	00	0
1	0915	112	00	00	00	0	.	1	2145	262	00	00	.00	0
1	0920	113	00	00	00	0	.	1	2150	263	00	00	00	0
1	0925	114	00	00	00	0	.	1	2155	264	00	00	00	0
1	0930	115	00	00	00	0	.	1	2200	265	00	.00	00	0
1	0935	116	00	00	00	0	.	1	2205	266	.00	00	00	0.
1	0940	117	.00	00	00	0	.	1	2210	267	00	00	00	0
1	0945	118	00	00	00	0	.	1	2215	268	00	00	00	0
1	0950	119	00	00	00	0	.	1	2220	269	00	00	00	0
1	0955	120	00	00	00	0	.	1	2225	270	00	00	00	0
1	1000	121	00	00	00	0	.	1	2230	271	00	00	00	0
1	1005	122	00	00	00	0	.	1	2235	272	00	00	00	0
1	1010	123	00	00	00	0	.	1	2240	273	00	00	00	0
1	1015	124	00	00	00	0	.	1	2245	274	00	00	00	0
1	1020	125	00	00	00	0	.	1	2250	275	00	00	00	0
1	1025	126	00	00	00	0	.	1	2255	276	00	00	00	0
1	1030	127	00	00	00	0	.	1	2300	277	00	00	00	0
1	1035	128	00	00	00	0	.	1	2305	278	00	00	00	0
1	1040	129	00	00	00	0	.	1	2310	279	00	00	00	0
1	1045	130	00	00	00	0	.	1	2315	280	00	00	00	0
1	1050	131	00	00	00	0	.	1	2320	281	00	00	00	0
1	1055	132	00	00	00	0	.	1	2325	282	00	00	00	0
1	1100	133	.00	00	00	0	.	1	2330	283	00	00	00	0
1	1105	134	00	.00	00	0	.	1	2335	284	00	00	00	0
1	1110	135	.00	00	00	0	.	1	2340	285	00	00	00	0
1	1115	136	00	00	00	0	.	1	2345	286	00	00	00	0
1	1120	137	00	00	00	0	.	1	2350	287	.00	00	00	0
1	1125	138	00	00	00	0	.	1	2355	288	00	00	00	0

1	1130	139	.90	00	.00	0	*	2	0000	289	00	.00	.00	0
1	1135	140	90	.00	00	0.	*	2	0005	290	.00	00	00	0
1	1140	141	90	00	.00	0	*	2	0010	291	00	00	.00	0
1	1145	142	90	00	.00	0.	*	2	0015	292	.00	00	.00	0.
1	1150	143	.90	.00	00	0	*	2	0020	293	00	00	00	0
1	1155	144	90	00	.00	0	*	2	0025	294	.00	00	00	0.
1	1200	145	90	.00	00	0	*	2	0030	295	00	00	00	0
1	1205	146	.90	.00	00	0	*	2	0035	296	00	00	00	0
1	1210	147	90	00	00	0	*	2	0040	297	00	.00	00	0
1	1215	148	90	00	.00	0	*	2	0045	298	00	.00	00	0
1	1220	149	.90	00	00	0	*	2	0050	299	00	00	00	0
1	1225	150	.90	00	00	0	*	2	0055	300	00	00	.00	0

TOTAL RAINFALL = 3 32, TOTAL LOSS = 32, TOTAL EXCESS = 3 00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24 92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 31.	3.08		2.	1.	0	0.
		(INCHES)	3 004	3.013	3 013	3 013
		(AC-FT)	1.	1	1.	1

CUMULATIVE AREA = .01 SQ MI

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                  **************
                  *            *
693 KK            *   33C 2    *     COMBINE
                  *            *
                  **************

694 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0  HYDROGRAPH PLOT SCALE
                        COMBINED DISCHARGE AT SCOTTSDALE ROAD CULVERT

695 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION 33C 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		0615	76	9	*	1		1230	151	0	*	1		1845	226	0
1		0005	2	0	*	1		0620	77	8	*	1		1235	152	0	*	1		1850	227	0.
1		0010	3	0	*	1		0625	78	7	*	1		1240	153	0	*	1		1855	228	0.
1		0015	4	0	*	1		0630	79	6	*	1		1245	154	0	*	1		1900	229	0
1		0020	5	0	*	1		0635	80	5.	*	1		1250	155	0	*	1		1905	230	0
1		0025	6	0	*	1		0640	81	5	*	1		1255	156	0.	*	1		1910	231	0
1		0030	7	0	*	1		0645	82	4	*	1		1300	157	0	*	1		1915	232	0
1		0035	8	0	*	1		0650	83	1	*	1		1305	158	0	*	1		1920	233	0
1		0040	9	0	*	1		0655	84	1	*	1		1310	159	0.	*	1		1925	234	0
1		0045	10	0	*	1		0700	85	3	*	1		1315	160	0	*	1		1930	235	0
1		0050	11	0	*	1		0705	86	2	*	1		1320	161	0	*	1		1935	236	0
1		0055	12	0	*	1		0710	87	2	*	1		1325	162	0	*	1		1940	237	0
1		0100	13	1	*	1		0715	88	2	*	1		1330	163	0	*	1		1945	238	0
1		0105	14	1	*	1		0720	89	2.	*	1		1335	164	0	*	1		1950	239	0
1		0110	15	2.	*	1		0725	90	1	*	1		1340	165	0	*	1		1955	240	0
1		0115	16	2	*	1		0730	91	1	*	1		1345	166	0	*	1		2000	241	0
1		0120	17	2	*	1		0735	92	1	*	1		1350	167	0	*	1		2005	242	0
1		0125	18	3	*	1		0740	93	1	*	1		1355	168	0.	*	1		2010	243	0
1		0130	19	3	*	1		0745	94	1	*	1		1400	169	0	*	1		2015	244	0.
1		0135	20	3	*	1		0750	95	1	*	1		1405	170	0	*	1		2020	245	0
1		0140	21	3	*	1		0755	96	1	*	1		1410	171	0	*	1		2025	246	0
1		0145	22	4	*	1		0800	97	1	*	1		1415	172	0	*	1		2030	247	0
1		0150	23	4	*	1		0805	98	1	*	1		1420	173	0	*	1		2035	248	0
1		0155	24	4	*	1		0810	99	0	*	1		1425	174	0	*	1		2040	249	0
1		0200	25	5	*	1		0815	100	0	*	1		1430	175	0	*	1		2045	250	0
1		0205	26	5	*	1		0820	101	0	*	1		1435	176	0	*	1		2050	251	0
1		0210	27	5.	*	1		0825	102	0	*	1		1440	177	0	*	1		2055	252	0
1		0215	28	6.	*	1		0830	103	0	*	1		1445	178	0	*	1		2100	253	0
1		0220	29	6.	*	1		0835	104	0	*	1		1450	179	0	*	1		2105	254	0
1		0225	30	5	*	1		0840	105	0	*	1		1455	180	0	*	1		2110	255	0
1		0230	31	7	*	1		0845	106	0	*	1		1500	181	0	*	1		2115	256	0
1		0235	32	9	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0
1		0240	33	11	*	1		0855	108	0	*	1		1510	183	0	*	1		2125	258	0
1		0245	34	14	*	1		0900	109	0	*	1		1515	184	0	*	1		2130	259	0
1		0250	35	17	*	1		0905	110	0	*	1		1520	185	0	*	1		2135	260	0.
1		0255	36	21	*	1		0910	111	0	*	1		1525	186	0.	*	1		2140	261	0
1		0300	37	33	*	1		0915	112	0.	*	1		1530	187	0	*	1		2145	262	0
1		0305	38	48	*	1		0920	113	0	*	1		1535	188	0	*	1		2150	263	0
1		0310	39	59	*	1		0925	114	0	*	1		1540	189	0	*	1		2155	264	0
1		0315	40	103	*	1		0930	115	0	*	1		1545	190	0.	*	1		2200	265	0
1		0320	41	114	*	1		0935	116	0	*	1		1550	191	0	*	1		2205	266	0
1		0325	42	109	*	1		0940	117	0	*	1		1555	192	0	*	1		2210	267	0
1		0330	43	100	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0
1		0335	44	89	*	1		0950	119	0	*	1		1605	194	0	*	1		2220	269	0
1		0340	45	77	*	1		0955	120	0	*	1		1610	195	0	*	1		2225	270	0.

1	0345	46	64	.	1	1000	121	0	.	1	1615	196	0	.	1	2230	271	0.
1	0350	47	53	.	1	1005	122	0	.	1	1620	197	0	.	1	2235	272	0.
1	0355	48	45	.	1	1010	123	0	.	1	1625	198	0	.	1	2240	273	0
1	0400	49	38	.	1	1015	124	0	.	1	1630	199	0	.	1	2245	274	0
1	0405	50	32	.	1	1020	125	0.	.	1	1635	200	0.	.	1	2250	275	0
1	0410	51	28	.	1	1025	126	0	.	1	1640	201	0	.	1	2255	276	0
1	0415	52	25	.	1	1030	127	0.	.	1	1645	202	0	.	1	2300	277	0
1	0420	53	22	.	1	1035	128	0	.	1	1650	203	0	.	1	2305	278	0
1	0425	54	20	.	1	1040	129	0.	.	1	1655	204	0	.	1	2310	279	0
1	0430	55	19.	.	1	1045	130	0.	.	1	1700	205	0.	.	1	2315	280	0
1	0435	56	18.	.	1	1050	131	0	.	1	1705	206	0	.	1	2320	281	0.
1	0440	57	18	.	1	1055	132	0	.	1	1710	207	0	.	1	2325	282	0.
1	0445	58	18	.	1	1100	133	0	.	1	1715	208	0.	.	1	2330	283	0
1	0450	59	17	.	1	1105	134	0	.	1	1720	209	0	.	1	2335	284	0
1	0455	60	17	.	1	1110	135	0.	.	1	1725	210	0	.	1	2340	285	0
1	0500	61	16.	.	1	1115	136	0	.	1	1730	211	0	.	1	2345	286	0.
1	0505	62	16	.	1	1120	137	0	.	1	1735	212	0	.	1	2350	287	0.
1	0510	63	16	.	1	1125	138	0	.	1	1740	213	0	.	1	2355	288	0
1	0515	64	15	.	1	1130	139	0.	.	1	1745	214	0	.	2	0000	289	0.
1	0520	65	15	.	1	1135	140	0.	.	1	1750	215	0	.	2	0005	290	0.
1	0525	66	15	.	1	1140	141	0	.	1	1755	216	0	.	2	0010	291	0
1	0530	67	14	.	1	1145	142	0.	.	1	1800	217	0	.	2	0015	292	0
1	0535	68	14	.	1	1150	143	0	.	1	1805	218	0.	.	2	0020	293	0
1	0540	69	13	.	1	1155	144	0	.	1	1810	219	0.	.	2	0025	294	0.
1	0545	70	13	.	1	1200	145	0	.	1	1815	220	0	.	2	0030	295	0
1	0550	71	12	.	1	1205	146	0	.	1	1820	221	0.	.	2	0035	296	0
1	0555	72	12	.	1	1210	147	0	.	1	1825	222	0.	.	2	0040	297	0.
1	0600	73	11	.	1	1215	148	0	.	1	1830	223	0	.	2	0045	298	0
1	0605	74	11	.	1	1220	149	0	.	1	1835	224	0	.	2	0050	299	0
1	0610	75	10	.	1	1225	150	0	.	1	1840	225	0	.	2	0055	300	0

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
114	3.13	(CFS)	22.	6	5	5
		(INCHES)	32.113	32.619	32.619	32.619
		(AC-FT)	11	11	11	11

CUMULATIVE AREA = .01 SQ MI

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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	1A1	41.	3.17	1	1	1	.02		
ROUTED TO	DET1A1	12	3.50	1	1	1	.02	1.71	3.50
ROUTED TO	RA1-C4	11.	3.50	4	1	1	.02	.91	3.50
HYDROGRAPH AT	1C4	9.	3.17	1	0	0	.00		
2 COMBINED AT	CP1C4	15	3.17	4	1	1	.02		
ROUTED TO	RC4-C1	15	3.25	4	1	1	.02	1.05	3.25
HYDROGRAPH AT	1DA3	18	3.08	2	1	1	.01		
ROUTED TO	DE1DA3	3	3.57	2	1	1	.01	2.51	3.67
HYDROGRAPH AT	1DA4	29	3.08	2	1	1	.01		
2 COMBINED AT	CP1DA4	30	3.08	4	1	1	.02		
ROUTED TO	DE1DA4	6	3.58	4	1	1.	.02	3.14	3.58
HYDROGRAPH AT	1DA5	7	3.17	1	0	0	.00		
3 COMBINED AT	CP1C31	25	3.17	9	3	3	.05		
ROUTED TO	RC3-C1	24	3.25	9	3	3	.05	1.52	3.25
HYDROGRAPH AT	OFF-1A	21	3.08	2.	0	0	.01		
HYDROGRAPH AT									

	1A2	11.	3.00	1	0	0.	.00		
HYDROGRAPH AT	1A3	18	3.00	1	0	0	01		
3 COMBINED AT	CPA3	50.	3.08	4	1	1.	.02		
ROUTED TO	DET1A3	33	1.17	4	1	1	02	2.81	3.17
ROUTED TO	RA3-A6	35	3.25	4	1	1	02	.60	3.25
HYDROGRAPH AT	1A6	12	3.08	1	0	0	00		
2 COMBINED AT	CP1A6	40	3.25	5	1	1	03		
ROUTED TO	DET1A6	35	1.33	5	1	1	03	2.07	3.33
HYDROGRAPH AT	1A5	43	1.08	1.	1	1	02		
2 COMBINED AT	CP1A5	59	3.25	8	2	2	04		
ROUTED TO	DET1A5	53	3.33	8	2	2	04	2.96	3.33
HYDROGRAPH AT	1A4	27	3.08	2	1	1	01		
ROUTED TO	RA1-A7	25	3.17	2	1	1	01	.50	3.17
ROUTED TO	DET1A4	14	3.13	2	1	1	01	4.65	3.33
HYDROGRAPH AT	1A7	21	3.08	2	0	0	01		
3 COMBINED AT	CP1A7	75	3.33	12	3	3	06		
ROUTED TO	DET1A7	65	3.42	13	3	3	06	1.62	3.42
HYDROGRAPH AT	1C1	57	3.17	4	1	1	02		
2 COMBINED AT	CP1C1	85	3.33	17	4	4	08		
ROUTED TO	DET1C1	70	3.50	16	4	4	08	4.06	3.50
HYDROGRAPH AT	1C2	54	3.17	4.	1	1	02		
2 COMBINED AT	CP1C2	93.	3.50	21	6	5	11		
ROUTED TO	DE1C2A	93	3.50	21	6	5	.11	5.05	3.50
ROUTED TO	DE1C2B	90	3.50	21	5	5	11	5.07	3.50
ROUTED TO	DE1C2C	92	3.50	21	6	5	11	5.04	3.50
HYDROGRAPH AT	1C3	68	3.00	5	1	1	03		
3 COMBINED AT	CP1C3	128	3.50	33	10.	9	19		
ROUTED TO	DET1C3	109	3.67	33	10	9.	19	2.55	3.67
ROUTED TO	RC3COM	108	3.67	33	10	9	19	11.14	3.67
HYDROGRAPH AT	COMM	110	3.08	10	2	2	03		
ROUTED TO	DETCOM	13	3.67	7	2	2	03		

								2 55	3 67
2 COMBINED AT	CPCOM	119.	3 67	41	12	12.	32		
ROUTED TO	COMOF1	119	3 75	41	12	12	32	11 20	3 75
HYDROGRAPH AT	OFF1	84	3 08	6	2	2	.02		
ROUTED TO	DEOFF1	11.	3 50	6	2	2	02	2 61	3 50
2 COMBINED AT	CPOFF1	130	3.75	16	14	13	34		
ROUTED TO	OF1OF1	129.	3 75	16	14	13	.34	11.31	3.75
HYDROGRAPH AT	OFF3	56	3.08	5	1	1.	02		
ROUTED TO	DEOFF3	10.	3 50	5.	1	1	02	2 20	3 50
2 COMBINED AT	CPOFF3	138	3 75	51	15	14	25		
ROUTED TO	13A1	137	3.83	51	15	14	.25		
HYDROGRAPH AT	33A	213.	3 08	17	4	4	05		
2 COMBINED AT	13A3	232	3.08	65.	19	19	31		
HYDROGRAPH AT	1DB	104	3 08	8	2	2	04		
ROUTED TO	OF1DB	11	3.50	7	2	2.	04	2 99	3 58
HYDROGRAPH AT	1DA1	25	3 08	2	0	0	01		
ROUTED TO	DE1DA1	1	3 50	2	0	0	01	2 95	3 50
HYDROGRAPH AT	1DA2	5	3 17	0.	0	0	00		
1 COMBINED AT	CP1DAD	18	3.50	9	3	3	05		
ROUTED TO	RDADE2	15.	3.50	9	3	3.	05	75	3.50
HYDROGRAPH AT	1EA1	41	3 17	4	1	1	02		
ROUTED TO	DE1EA1	4.	3.75	1.	1	1	02	2.81	3 75
HYDROGRAPH AT	11A2	65	3 08	5.	1	1	03		
2 COMBINED AT	CP1EA2	66.	3 08	7	2	2	04		
ROUTED TO	DE1EA2	16	3 50	7	2	2	04	1 25	3 50
2 COMBINED AT	CP1EA?	34	3 50	16	5	5	09		
HYDROGRAPH AT	PARK	37	3 08	3	1	1	02		
HYDROGRAPH AT	SCHOOL	59	3 08	5	1	1	01		
ROUTED TO	DETSCH	17	3 42	1.	1	1	01	2 84	3 42
ROUTED TO	SCH12	12.	3 42	1	1	1	01	10 13	3 42
HYDROGRAPH AT	1BC	33	3 09	1	1	1	01		
ROUTED TO									

	DETEC	9.	3.33	3.	1	1.	01	2.47	3.33
2 COMBINED AT	CP1EC	21	3.43	7	3.	3	02		
ROUTED TO	TECEA2	21	3.42	7	3	2	02	10.59	3.17
3 COMBINED AT	CP1EA	67.	3.17	26	7	7	11		
ROUTED TO	REAEPP	67	3.17	26	7.	7	11	10.92	3.17
HYDROGRAPH AT	1EB	151.	3.17	14	3	3	06		
ROUTED TO	DETIEB	39	3.50	13	3	3	06	4.26	3.50
HYDROGRAPH AT	OFF2	121	3.08	11	3	3	03		
ROUTED TO	DEOFF2	11	3.67	8	3	3.	03	2.59	3.67
3 COMBINED AT	CPOFF2	115.	3.50	46	14	13	23		
ROUTED TO	1KF 1	115.	3.50	46	14	11	23		
HYDROGRAPH AT	1KF	118	3.17	13	3	3	05		
ROUTED TO	DETIK	18	3.75	11	3.	3	05	2.77	3.75
2 COMBINED AT	1KF 1	132	3.50	57	17	16	28		
ROUTED TO	1KF 1	132	3.50	57	17	16	28		
HYDROGRAPH AT	1KI	152	3.17	14	4	3	05		
ROUTED TO	DETIK	19	3.42	13	4	3.	05	1.70	3.42
2 COMBINED AT	1KI 2	178	3.50	79	20	20	34		
HYDROGRAPH AT	13E	160.	3.08	12	3	3	04		
HYDROGRAPH AT	138E	1	3.17	0	0.	0	00		
3 COMBINED AT	31E 2	225	3.17	91	24	23	38		
ROUTED TO	R31E 2	224	3.17	51.	24	23	18		
HYDROGRAPH AT	33D	61	3.17	5	1	1	01		
HYDROGRAPH AT	SIDE2	76	3.08	6	1.	1	02		
3 COMBINED AT	CT13 0	310	3.17	97	26	25	13		
DIVERSION TO	P_ADOT	223	3.17	87	25	23	43		
HYDROGRAPH AT	D_ADOT	117	3.17	10	3	2	33		
HYDROGRAPH AT	31C	126	3.08	9	2	2	03		
HYDROGRAPH AT	S40CH	130	3.08	14	4	3	04		
3 COMBINED AT	CT11.1	393	3.08	34	8	8	51		
DIVERSION TO	P-PIPE	30	3.08	13	1	3	51		
HYDROGRAPH AT	D_BAS	363	3.08	21	5	5	51		
DIVERSION TO	D-BAS2	69	3.08	2	1.	0	51		

	HYDROGRAPH AT									
+		D_BAS1	363.	3 08	19	5	5	51		
	DIVERSION TO									
+		D-SUBF	237	3 17	4	1.	1	51		
	HYDROGRAPH AT									
+		D_SURF	309	3 17	15	4	4	51		
	HYDROGRAPH AT									
+		B_PIPE	30	2 75	13	3	3.	00		
	HYDROGRAPH AT									
+		B_SURF	69	1 00	2	1.	0	00		
	3 COMBINED AT									
+		CS40B	339	3.17	10.	7	7	51		
	ROUTED TO									
+		S40BAS	159	3 33	29	7	7	51		
+									5 52	3 33
	DIVERSION TO									
+		D33C 2	108	3 33	20.	5	5	51		
	HYDROGRAPH AT									
+		R33E 1	51.	3 33	9	2	2.	51		
	HYDROGRAPH AT									
+		R_ADOT	223	3 17	82	71	23	00		
	3 COMBINED AT									
+		33C 1	356	3 25	91.	26	25	51		
	ROUTED TO									
+		R33E 1	252	3 33	91	26	25	51		
	HYDROGRAPH AT									
+		ASLP	50	3 17	7	2	2	05		
	2 COMBINED AT									
+		CPPKIN	300	3 25	98	28	27	56		
	HYDROGRAPH AT									
+		R33C 2	108	3 33	20	5	5.	00		
	HYDROGRAPH AT									
+		S40WT	31	3 08	2	1	0	.01		
	2 COMBINED AT									
+		33C 2	114	3 33	22	5	5	01		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
						INTERPOLATED TO COMPUTATION INTERVAL			
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
33A1	MANE	1.88	138 05	228 99	2 21	5 00	137.32	210 00	2 21

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2975E+02 EXCESS= 0000E+00 OUTFLOW= 2974E+02 BASIN STORAGE= 7425E-02 PERCENT ERROR= 0

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
33A	MANE	94	235 59	186 25	2 93	5 00	213 27	185.00	2 93

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 8119E+01 OUTFLOW= 8121E+01 BASIN STORAGE 3781E-03 PERCENT ERROR= -1

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
1Kr 1	MANE	.88	115 21	210 94	2 20	5 00	115 14	210 00	2 20

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2702E+02 EXCESS= 0000E+00 OUTFLOW= 2702E+02 BASIN STORAGE= 3402E-02 PERCENT ERROR= 0

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
1Kr 1	MANE	1 01	132 38	212 01	2 22	5 00	131 65	210 00	2 22

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3341E+02 EXCESS= 0000E+00 OUTFLOW= 3311E+02 BASIN STORAGE= 5096E-02 PERCENT ERROR= 0

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
33C	MANE	1 58	168 66	186 51	2 90	5 00	159 61	185.00	2 91

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 6117E+01 OUTFLOW= 6111E+01 BASIN STORAGE= 6650E-04 PERCENT ERROR= 1

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
33BE	MANE	3.45	3 22	190 32	2 70	5 00	3 19	190 00	2 78

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 1633E+00 OUTFLOW= 1630E+00 BASIN STORAGE= 1193E-04 PERCENT ERROR= 2

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
R33E 2	MANE	67	224 58	190 57	2 34	5 00	224 36	190 00	2 33

CONTINUITY SUMMARY (AC-FT) - INFLOW= 4587E+02 EXCESS= 0000E+00 OUTFLOW= 4587E+02 BASIN STORAGE= 1478E-02 PERCENT ERROR= 0

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             33D  MANE        2.02      54 29    192.41       1 22       5 00      51 02     150 00        1 22

CONTINUITY SUMMARY (AC-FT) - INFLOW   0000E+00 EXCESS= 2639E+01 OUTFLOW= 2627E+01 BASIN STORAGE= 1883E-03 PERCENT ERROR-      5

            S10ET  MANE           85     79 65    180 49       2.94       5 00      76 00     185 00        2 95

CONTINUITY SUMMARY (AC FT)   INFLOW= 0000E+00 EXCESS= 2873E+01 OUTFLOW= .2871E+01 BASIN STORAGE .1120E-01 PERCENT ERROR=      0

             33C  MANE            51    179.46    185 80       2 96       5 00     175 66     185 00        2 97

CONTINUITY SUMMARY (AC-FT) - INFLOW.  0000E+00 EXCESS= 4670E+01 OUTFLOW= 4675E+01 BASIN STORAGE= 1952E 03 PERCENT ERROR-      1

            S40CN  MANE           57    187.23    186 05       2.96       5 00     179 92     185.00        2 97

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 7080E+01 OUTFLOW= 7077E+01 BASIN STORAGE= 4086E-03 PERCENT ERROR=      0

           R33E 1  MANE         3 45    255 03    201 54       1 92       5 00     351 70     200.00        1 92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5208E+02 EXCESS= .0000E+00 OUTFLOW= 5103E+02 BASIN STORAGE= 2109E-01 PERCENT ERROR-      1

             A9LD  MANE         2 70     91.21    190 26       1 23       5 00      89 79     190 00        1 23

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 3491E+01 OUTFLOW= .3178E+01 BASIN STORAGE= 2007E-03 PERCENT ERROR-      4

            S40NT  MANE           33     31 72    184 75       3.00       5 00      31 57     185 00        3 01

CONTINUITY SUMMARY (AC-FT) - INFLOW= 0000E+00 EXCESS= 1009E+01 OUTFLOW= 1008E+01 BASIN STORAGE= 4154E-05 PERCENT ERROR=      1

1                            SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DETIA1
                          (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1                                  INITIAL VALUE      SPILLWAY CREST      TOP OF DAM
                            ELEVATION              .00               3 00               3 00
                            STORAGE                 0                  2                  2
                            OUTFLOW                 0                 20                 20

                  RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
                   OF      RESERVOIR      DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
                   PMF     W.S ELEV     OVER DAM      AC-FT        CFS         HOURS       HOURS        HOURS

                  1 00        1 73         00           1          12           00         3 50          00
1                            SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DEIDA1
                          (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1                                  INITIAL VALUE      SPILLWAY CREST      TOP OF DAM
                            ELEVATION              .00               3 00               3 00
                            STORAGE                 0.                 1                  1
                            OUTFLOW                 0                  4.                 4.

                  RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
                   OF      RESERVOIR      DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
                   PMF     W S ELEV     OVER DAM      AC-FT        CFS         HOURS       HOURS        HOURS

                  1 00        2 51         00           1.          3           00         3 67          00
1                            SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DEIDA4
                          (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1                                  INITIAL VALUE      SPILLWAY CREST      TOP OF DAM
                            ELEVATION              .00               3 00               3 00
                            STORAGE                 0                  1                  1
                            OUTFLOW                 0                  4                  4

                  RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
                   OF      RESERVOIR      DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
                   PMF     W S ELEV     OVER DAM      AC-FT        CFS         HOURS       HOURS        HOURS

                  1 00        3 14         14           1           4         1.42         3 58          00
1                            SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DETIA1
                          (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)

     PLAN  1                                  INITIAL VALUE      SPILLWAY CREST      TOP OF DAM
                            ELEVATION              .00               2 50               2 50
                            STORAGE                 0                  0                  0
                            OUTFLOW                 0                 22                 22.

                  RATIO     MAXIMUM      MAXIMUM     MAXIMUM     MAXIMUM     DURATION     TIME OF      TIME OF
                   OF      RESERVOIR      DEPTH      STORAGE     OUTFLOW     OVER TOP   MAX OUTFLOW    FAILURE
                   PMF     W S ELEV     OVER DAM      AC-FT        CFS         HOURS       HOURS        HOURS

                  1 00        2 31         14           0          13           25         3 17          00
1                            SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION   DETIA6
                          (PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED  DURING BREACH FORMATION)
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PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2.50	2 50
STORAGE	0.	0	0
OUTFLOW	0.	22	22

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2.87	.37	0.	35.	33	3.33	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A5
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2 50
STORAGE	0	1	1.
OUTFLOW	0	34	34

RATIO OF PMF	MAXIMUM RESERVOIR W S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 96	46	1	51	33	3 33	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A4
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2 50
STORAGE	0	0	0
OUTFLOW	0	11.	11

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 65	15	0	14	17	3 23	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11A7
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	2 50	2.50
STORAGE	0	1	1
OUTFLOW	0	11	11.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 62	1 12	1	66	1 50	3 42	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE11C1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	2.	2
OUTFLOW	0	14.	14.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	4 86	1 26	2	78	1 83	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2A
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3.60	3 60
STORAGE	0	0	0
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 05	1 45	1	93	2 75	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2B
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	1	1
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 02	1 42	1	90	2 92	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1C2C

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 60	3 60
STORAGE	0	1.	1.
OUTFLOW	0	14	14

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	5 04	1.44	1.	92.	3 00	3.50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIC3

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 50	3 50
STORAGE	0	1	1
OUTFLOW	0	150.	150.

RATIO OF PMF	MAXIMUM RESERVOIR W S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 55	00	1	109	00	3 67	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETCOM

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	4	4
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 55	00	3	11	00	3 67	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF1

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3.00
STORAGE	0	2	2
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 61	00	2	11	00	3.50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF4

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . . . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3.00	3.00
STORAGE	0	2	2
OUTFLOW	0	13	13.

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 20	00	2	10	00	3 50	.00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDB

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	3	3.
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 99	.00	3	13	00	3 58	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEIDA1

(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 . .

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	4	4

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2 95	00	1	4	00	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Ea1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0.	2.	2
OUTFLOW	0	1	1

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 81	00	1	1.	00	3 75	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1EA2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	.00	1 00	3 00
STORAGE	0	2	2.
OUTFLOW	0	10.	10

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	3 25	25	2	16	67	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETSCH
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 84	00	1.	12	00	3.42	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DE1Ec
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	1	1
OUTFLOW	0	11	11

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 47	00	1	9	00	3 33	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIGb
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5
OUTFLOW	0.	52	52

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 26	00	4	39	00	3 50	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DEOFF2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5
OUTFLOW	0	13	13

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1 00	2 59	00	4.	12	00	3 67	00

1 SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIX
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3 00	3 00
STORAGE	0	5	5.
OUTFLOW	0	29	29

RATIO OF PMF	MAXIMUM RESERVOIR W S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS

1.00	2.77	.00	4	18.	00	3.75	.00

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION DETIH
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 ...

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	00	3.00	3.00
STORAGE	0	3.	3
OUTFLOW	0	20.	20

RATIO OF PMF	MAXIMUM RESERVOIR W.S ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	3.70	.70	4	49	.83	3.42	.00

*** NORMAL END OF HEC-1 ***

RATIONAL FOR WINDOWS

Flood Control District of Maricopa County Rational Method

Project Information

Project Name: Interim Regional Drainage Chan

Project Description:

Drainage Point: 404 Wash

Location: Channel Station 24+00

Drainage Basin Data

Water Course Length: 820.00 ft

Basin Area: 3.220 acres

High Elevation: 1581.00 ft

Low Elevation: 1570.00 ft

Average Slope: 0.0134 ft/ft

Roughness, Kb: 0.0368 (A)

10-Year Runoff Coefficient: 0.400

10-Year 6 Hour Rainfall Depth: 2.10 inches

Hydrological Summary Table

Parameter	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Q (cfs)	4	6	7	9	12	14
C	0.400	0.400	0.400	0.440	0.480	0.500
Tc (min)	8 3	7.3	6.8	6.3	6.0	5.7
i (in/hr)	3.2	4.4	5.3	6.6	7.6	8.8

Computed by JMG, Wood, Patel & Associates
Thursday, May 08, 2008 10.08 51 a

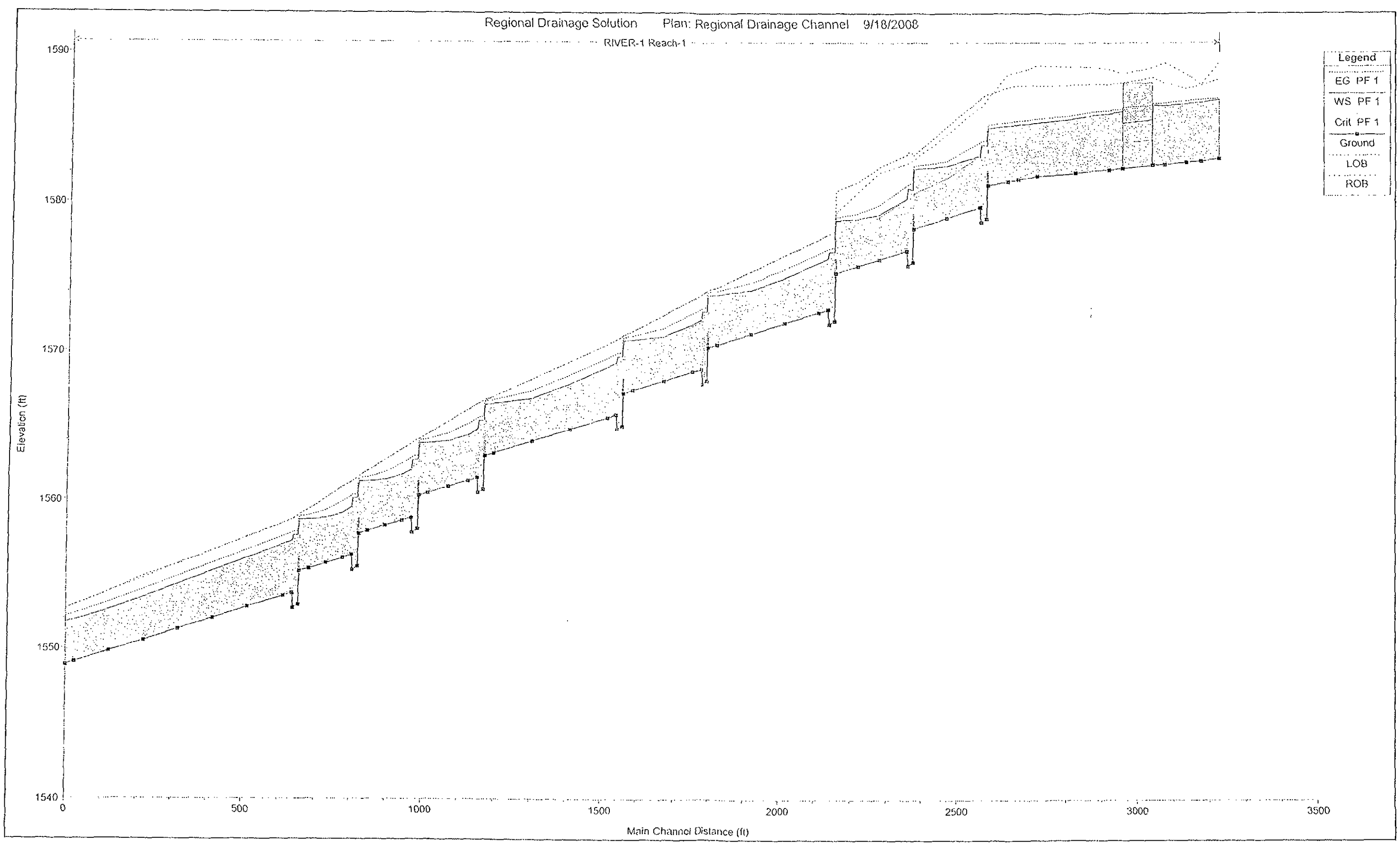
File: S:\2007\07302.2\Project Support\Hydro\Rational\RDC rat

APPENDIX B

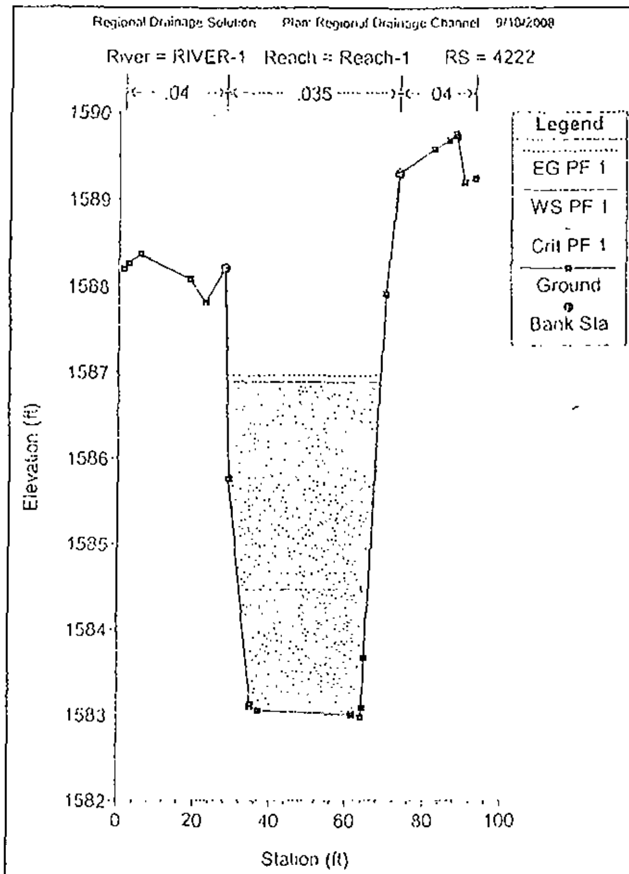
Hydraulic Calculations

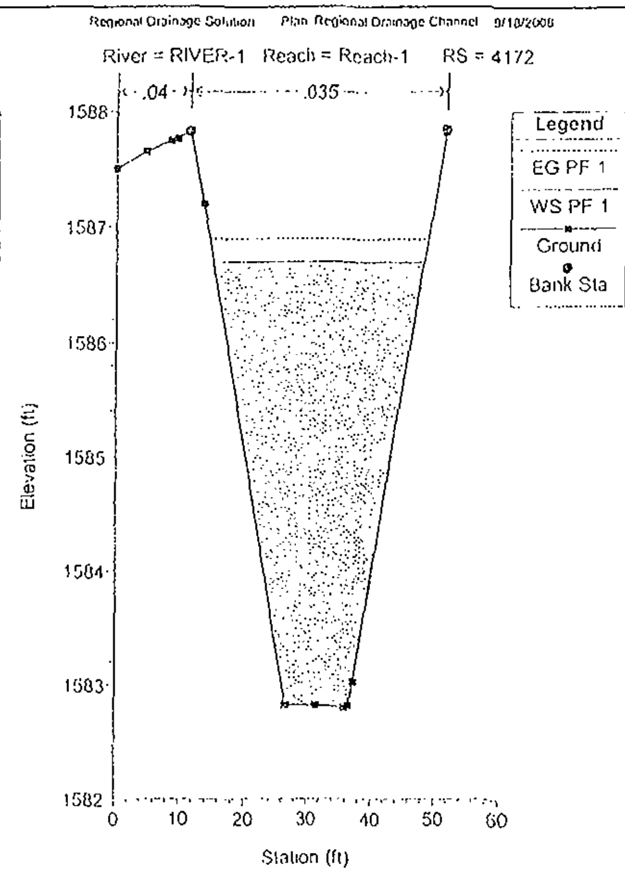
HEC-RAS Plan: RDC 100 River: RIVER-1 Reach: Reach-1 Profile: PF 1

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	LOB Elev (ft)	ROB Elev (ft)	Flow Depth (ft)	Freeboard Req (ft)	Freeboard Prov (ft)
4222	300	1582.97	1586.88	1586.96	0.000577	2.20	136.44	40.32	0.21	1588.20	1589.30	3.91	1.02	1.32
4172	300	1582.80	1586.70	1586.89	0.002174	3.58	83.81	33.20	0.40	1587.82	1587.84	3.90	1.07	1.12
4130	300	1582.73	1586.61	1586.80	0.002152	3.55	84.36	33.53	0.40	1587.60	1588.56	3.88	1.07	0.99
4070	300	1582.59	1586.50	1586.68	0.001859	3.38	88.72	34.04	0.37	1588.00	1589.33	3.91	1.07	1.50
4039	300	1582.53	1586.49	1586.62	0.001065	2.91	103.17	26.10	0.26	1588.33	1588.98	3.96	1.06	1.84
4004	Culvert													
3953	300	1582.33	1586.12	1586.26	0.001218	3.04	98.73	26.07	0.28	1587.99	1588.61	3.79	1.02	1.87
3915	300	1582.25	1585.96	1586.19	0.002674	3.87	77.54	31.91	0.44	1587.00	1588.90	3.71	1.04	1.94
3819	300	1582.04	1585.68	1585.92	0.002809	3.93	76.32	31.87	0.45	1587.90	1589.11	3.64	1.03	2.22
3715	300	1581.80	1585.36	1585.62	0.003119	4.09	73.44	31.32	0.47	1587.80	1589.14	3.56	1.02	2.44
3663	300	1581.57	1585.22	1585.46	0.002787	3.92	76.60	31.99	0.45	1587.80	1588.70	3.65	1.03	2.58
3635	300	1581.44	1585.15	1585.38	0.002613	3.83	78.43	32.32	0.43	1587.70	1588.57	3.71	1.04	2.55
3582	300	1581.19	1585.03	1585.25	0.002239	3.75	79.99	29.78	0.40	1587.23	1587.03	3.84	1.07	2.00
3581	Inl Struct													
3579	300	1578.96	1583.86	1584.21	0.004005	4.74	63.31	25.18	0.53	1587.24	1586.88	4.90	1.40	3.02
3564	300	1578.70	1583.90	1584.13	0.002489	3.84	78.11	30.25	0.42	1587.02	1586.40	5.20	1.41	2.50
3561	300	1579.71	1583.16	1584.05	0.016160	7.55	39.76	23.04	1.01	1586.89	1586.40	3.45	1.31	3.24
3467	300	1579.00	1582.50	1582.81	0.004580	4.51	66.59	33.05	0.56	1585.10	1584.55	3.50	1.03	2.05
3374	300	1578.30	1582.30	1582.51	0.002052	3.70	81.10	28.57	0.39	1583.20	1582.91	4.00	1.11	0.61
3373	Inl Struct													
3371	300	1576.07	1580.88	1581.30	0.006206	5.66	52.99	22.05	0.64	1583.36	1582.90	4.81	1.45	2.02
3359	300	1575.82	1581.00	1581.24	0.002647	3.91	76.65	30.23	0.43	1583.42	1582.70	5.18	1.41	1.70
3353	300	1576.82	1580.29	1581.16	0.015790	7.48	40.09	23.11	1.00	1583.22	1582.64	3.47	1.30	2.35
3276	300	1576.24	1579.23	1579.86	0.011545	6.38	47.00	27.66	0.86	1582.40	1582.03	2.99	1.06	2.80
3216	300	1575.79	1578.94	1579.31	0.005728	4.87	61.57	32.20	0.62	1581.40	1580.73	3.15	1.00	1.79
3156	300	1575.34	1578.84	1579.04	0.002516	3.56	84.27	38.12	0.42	1580.80	1579.34	3.50	1.00	0.50
3155	Inl Struct													
3152	300	1572.09	1576.77	1577.04	0.003261	4.13	72.56	31.02	0.48	1578.10	1578.13	4.68	1.30	1.33
3138	300	1571.86	1576.76	1576.98	0.002556	3.77	79.48	32.42	0.42	1577.91	1577.91	4.90	1.34	1.15
3135	300	1572.86	1576.31	1576.93	0.011152	6.29	47.70	27.67	0.84	1577.86	1577.90	3.45	1.17	1.55
3110	300	1572.67	1576.04	1576.65	0.010850	6.25	47.99	27.72	0.84	1577.58	1577.58	3.37	1.15	1.54
3014	300	1571.95	1575.00	1575.61	0.010923	6.25	47.99	27.94	0.84	1576.51	1576.51	3.05	1.07	1.51
2918	300	1571.20	1574.18	1574.67	0.008218	5.59	53.71	30.00	0.74	1575.43	1575.43	2.98	1.00	1.25
2822	300	1570.50	1573.89	1574.12	0.003236	3.92	76.54	35.19	0.47	1574.36	1574.36	3.39	1.00	0.47
2797	300	1570.30	1573.84	1574.01	0.002621	3.63	82.62	37.37	0.43	1574.17	1574.17	3.54	1.00	0.33
2796	Inl Struct													
2794	300	1568.08	1572.74	1573.01	0.003367	4.19	71.66	30.83	0.48	1574.12	1574.12	4.66	1.30	1.38
2779	300	1567.85	1572.72	1572.95	0.002625	3.81	78.66	32.24	0.43	1573.90	1573.90	4.87	1.33	1.18
2776	300	1568.85	1572.20	1572.89	0.013016	6.65	45.11	26.93	0.91	1573.85	1573.85	3.35	1.18	1.65
2751	300	1568.66	1571.84	1572.56	0.013511	6.79	44.21	26.63	0.93	1573.52	1573.52	3.18	1.15	1.68
2668	300	1568.04	1571.02	1571.57	0.009690	5.97	50.23	23.66	0.80	1572.43	1572.43	2.98	1.02	1.41
2586	300	1567.40	1570.78	1571.03	0.003459	4.03	74.45	35.48	0.49	1571.35	1571.35	3.38	1.00	0.57
2561	300	1567.20	1570.74	1570.94	0.002633	3.64	82.40	37.34	0.43	1571.07	1571.10	3.54	1.00	0.33
2559	Inl Struct													
2557	300	1564.98	1569.66	1569.93	0.003263	4.14	72.51	31.01	0.48	1571.00	1571.02	4.68	1.30	1.34
2543	300	1564.80	1569.65	1569.87	0.002573	3.78	79.42	32.59	0.43	1570.80	1570.80	4.85	1.32	1.15
2540	300	1565.75	1569.23	1569.82	0.010714	6.18	48.52	27.91	0.83	1570.75	1570.75	3.48	1.17	1.52
2515	300	1565.56	1568.96	1569.55	0.010483	6.17	48.63	27.92	0.82	1570.47	1570.47	3.40	1.15	1.51
2408	300	1564.76	1567.84	1568.43	0.010601	6.18	48.55	28.14	0.83	1569.32	1569.32	3.08	1.07	1.48
2302	300	1563.97	1566.87	1567.38	0.008824	5.73	52.37	29.71	0.76	1568.16	1568.16	2.90	1.00	1.29
2196	300	1563.17	1566.52	1566.76	0.003297	3.94	76.09	36.17	0.48	1567.00	1567.00	3.35	1.00	0.48
2171	300	1562.98	1566.47	1566.68	0.002607	3.66	81.91	37.25	0.44	1566.72	1566.82	3.49	1.00	0.25
2170	Inl Struct													
2168	300	1560.72	1565.38	1565.65	0.003387	4.18	71.69	30.74	0.48	1566.69	1566.77	4.66	1.30	1.31
2153	300	1560.50	1565.36	1565.59	0.002655	3.83	78.23	32.12	0.43	1566.50	1566.50	4.86	1.33	1.14
2150	300	1561.49	1564.78	1565.52	0.014412	6.93	43.32	26.32	0.95	1566.49	1566.49	3.29	1.20	1.71
2125	300	1561.30	1564.40	1565.16	0.014646	7.00	42.84	26.16	0.96	1566.13	1566.10	3.10	1.16	1.70
2071	300	1560.90	1563.98	1564.49	0.009524	5.69	52.99	29.33	0.75	1565.33	1565.33	3.08	1.02	1.35
2015	300	1560.49	1563.85	1564.11	0.003655	4.12	72.78	34.92	0.50	1564.49	1564.49	3.36	1.00	0.64
1990	300	1560.29	1563.82	1564.02	0.002561	3.60	83.30	37.49	0.43	1564.13	1564.13	3.53	1.00	0.31
1969	Inl Struct													
1966	300	1558.04	1562.70	1562.97	0.003360	4.17	71.94	30.82	0.48	1564.10	1564.08	4.66	1.30	1.38
1972	300	1557.81	1562.69	1562.92	0.002601	3.80	78.85	32.25	0.43	1563.99	1563.86	4.88	1.33	1.17
1959	300	1558.81	1562.04	1562.84	0.015946	7.19	41.71	25.88	1.00	1563.81	1563.81	3.23	1.21	1.77
1944	300	1558.60	1561.69	1562.45	0.014631	6.99	42.89	26.22	0.96	1563.43	1563.40	3.09	1.15	1.71
1896	300	1558.27	1561.37	1561.86	0.008189	5.61	53.49	29.55	0.73	1562.69	1562.69	3.10	1.02	1.32
1849	300	1557.92	1561.27	1561.54	0.003791	4.19	71.68	34.47	0.51	1561.96	1562.00	3.35	1.00	0.69
1824	300	1557.70	1561.24	1561.44	0.002625	3.63	82.56	37.35	0.43	1561.57	1561.60	3.54	1.00	0.33
1822	Inl Struct													
1821	300	1555.48	1560.14	1560.41	0.003364	4.18	71.70	30.83	0.48	1561.52	1561.52	4.66	1.30	1.38
1806	300	1555.25	1560.12	1560.35	0.002643	3.82	78.61	32.23	0.43	1561.30	1561.30	4.87	1.33	1.18
1803	300	1556.30	1559.51	1560.28	0.015062	7.05	42.56	26.10	0.97	1561.20	1561.25	3.21	1.19	1.69
1778	300	1556.06	1559.11	1559.90	0.015490	7.15	41.96	25.92	0.99	1560.86	1560.90	3.05	1.16	1.75
1731	300	1555.70	1558.80	1559.29	0.008204	5.61	53.44	29.53	0.74	1560.13	1560.13	3.10	1.02	1.33
1683	300	1555.35	1558.70	1558.97	0.003783	4.18	71.72	34.51	0.51	1559.39	1559.40	3.35	1.00	0.69
1659	300	1555.16	1558.66	1558.87	0.002707	3.67	81.66	37.17	0.44	1559.00	1559.00	3.50	1.00	0.34
1657	Inl Struct													
1655	300	1552.91	1557.63	1557.88	0.003131	4.07	73.68	31.12	0.47	1558.95	1558.95	4.72	1.31	1.32
1640	300	1552.68	1557.61	1557.83	0.002403	3.73	80.39	32.63	0.42	1558.73	1558.70	4.93	1.34	1.09
1637	300	1553.68	1557.24	1557.78	0.009394	5.91	50.80	28.45	0.78	1558.60	1558.70	3.56	1.16	1.44
1612	300	1553.49	1557.00	1557.55	0.009394	5.92	50.69	28.53	0.78	1558.40	1558.44	3.51	1.15	1.40
1514	300	1552.76	1556.09	1556.63	0.009303	5.90	50.87	28.61	0.78	1557.50	1557.51	3.33	1.10	1.41
1416	300	1552.00	1555.19	1555.72	0.009139	5.85	51.29	28.86	0.77	1556.58	1556.58	3.19	1.06	1.39
1319	300	1551.28	1554.30	1554.83	0.009087	5.82	51.55	29.16	0.77	1555.65	1555.70	3.02	1.02	1.35
1221	300	1550.50	1553.43	1553.94	0.008964	5.76	52.05	29.60	0.77	1554.85	1554.70	2.93	1.00	1.27
1123	300	1549.80	1552.58	1553.07	0.008680	5.66	52.97	30.24	0.75	1553.79	1553.80	2.78	1.00	1.21
1025	300	1549.08	1551.87	1552.29	0.007044	5.21	57.60	31.90	0.68	1552.87	1552.87	2.79	1.00	1.00
1000	300	1548.89	1551.73	1552.11	0.006105	4.95	60.59	32.77	0.64	1552.63	1552.63	2.84	1.00	0.90



Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
Main Channel Distance (ft)
1540
1550
1560
1570
1580
1590
0
500
1000
1500
2000
2500
3000
3500


Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 4222
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1590
1589
1588
1587
1586
1585
1584
1583
1582
0
20
40
60
80
100
Station (ft)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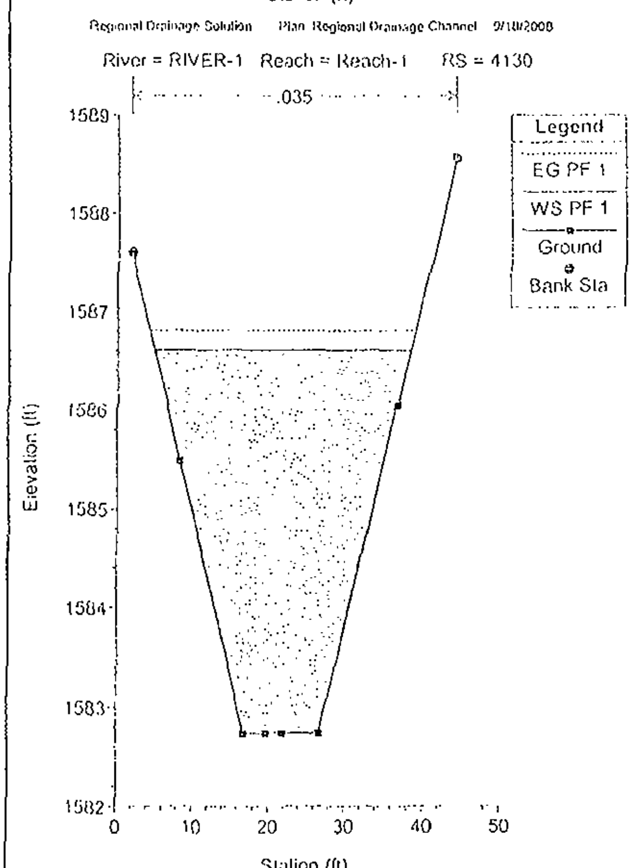
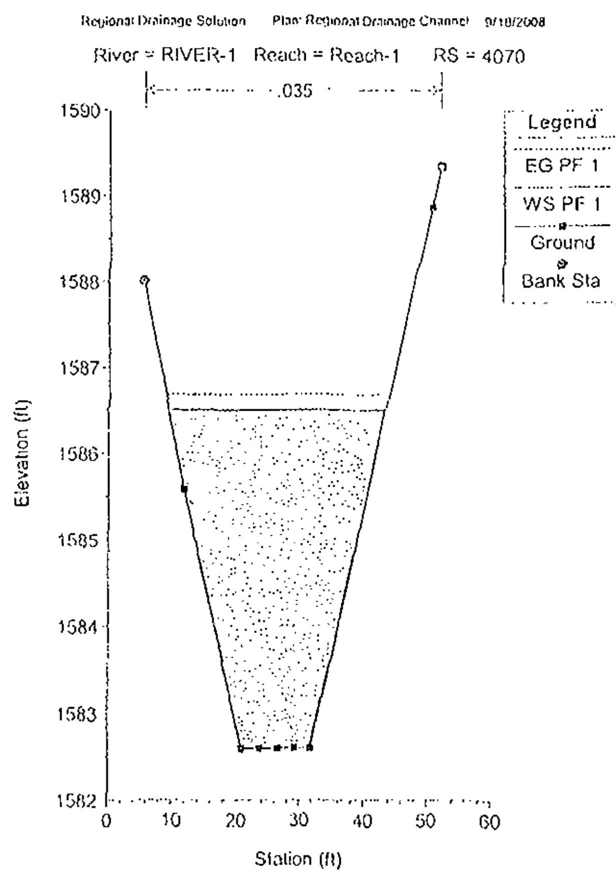
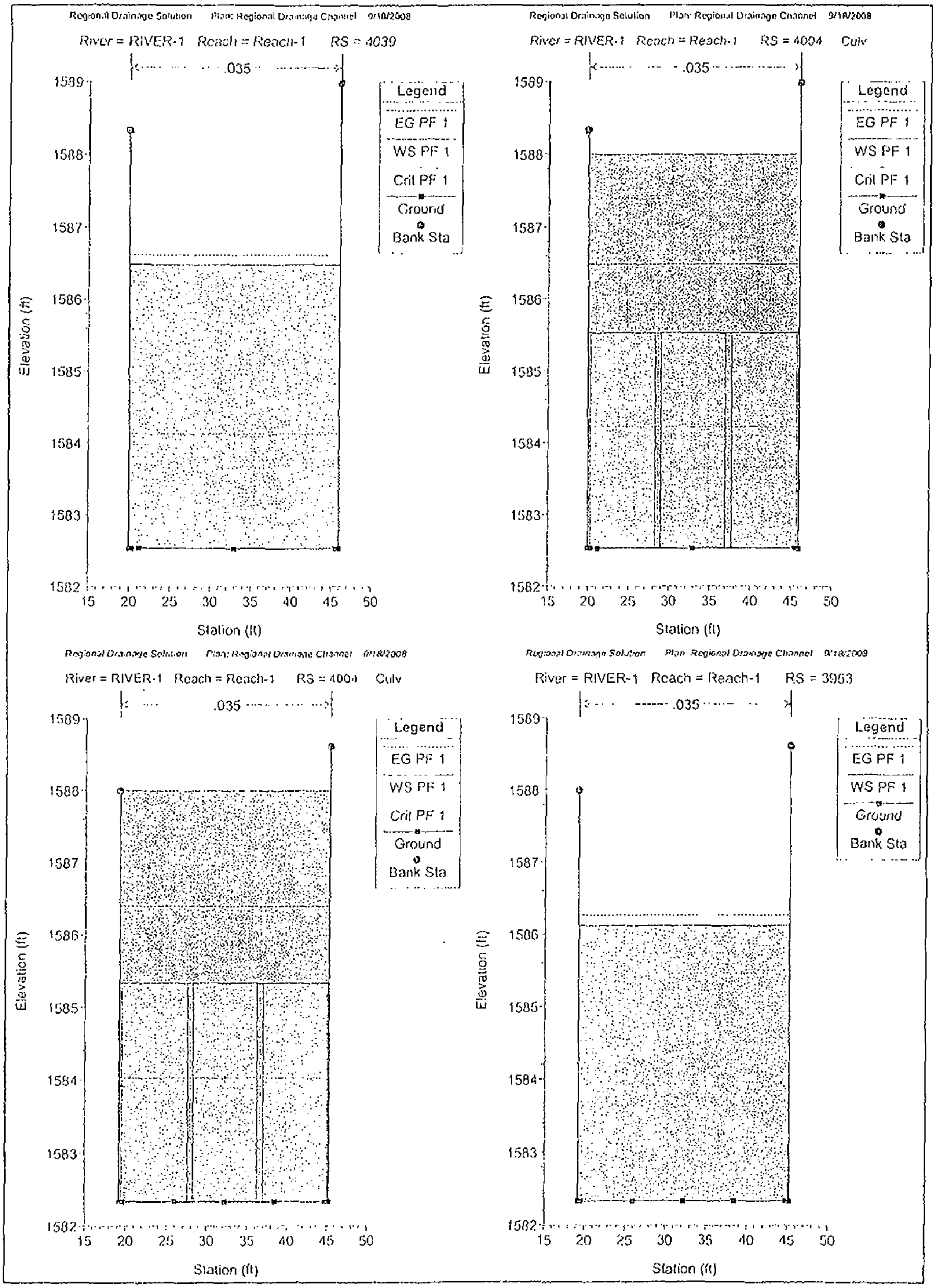
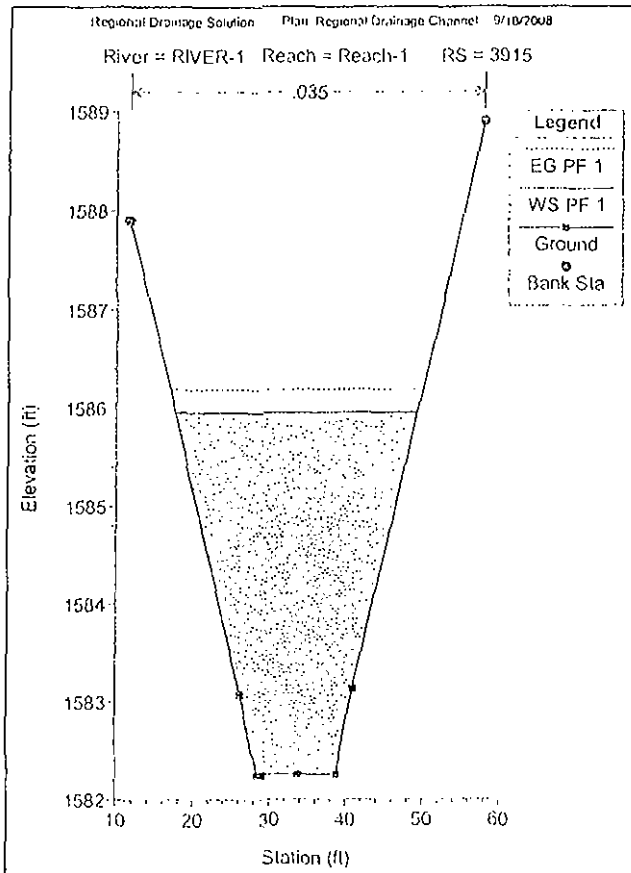
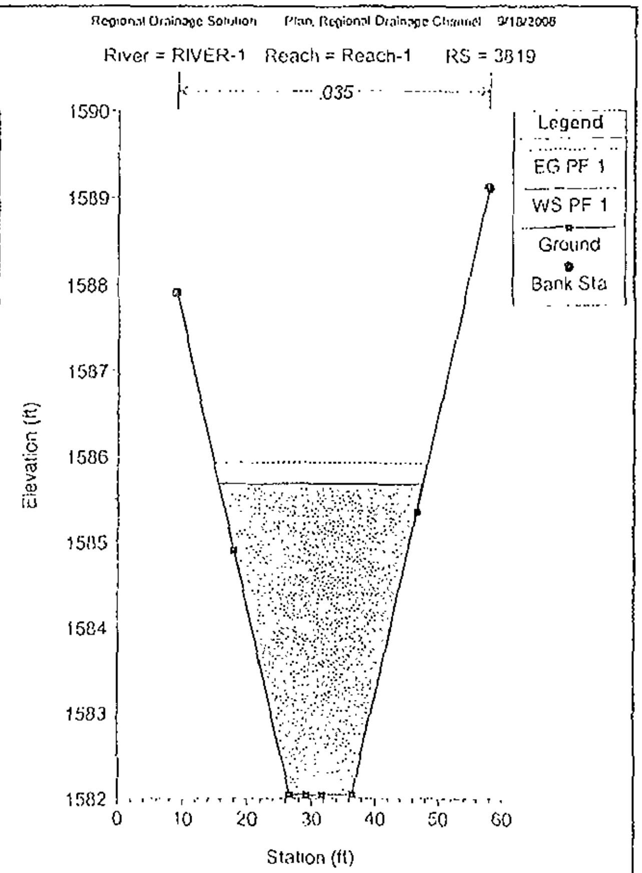
River = RIVER-1 Reach = Reach-1 RS = 4172
.04
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1588
1587
1586
1585
1584
1583
1582
0
10
20
30
40
50
60
Station (ft)

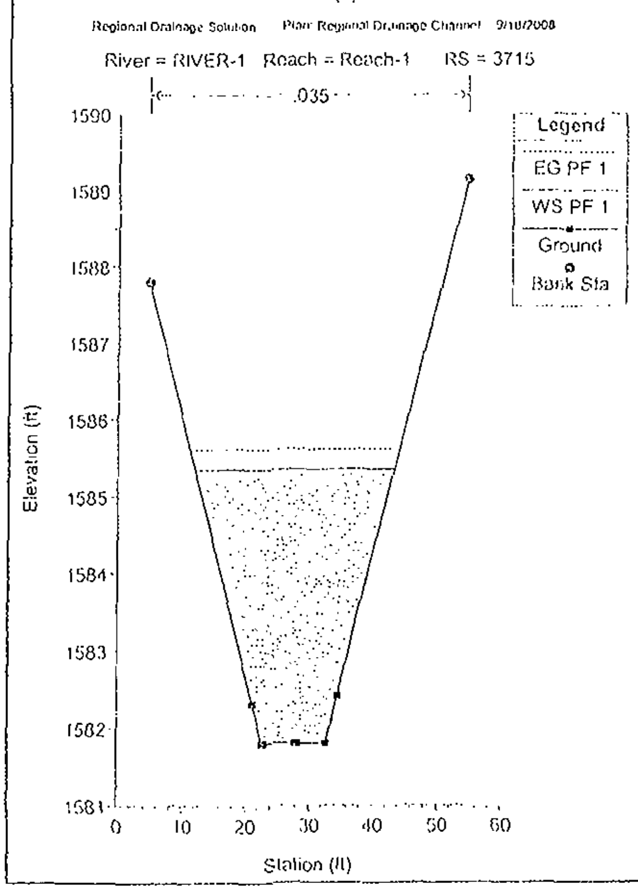

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 4130
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1589
1588
1587
1586
1585
1584
1583
1582
0
10
20
30
40
50
Station (ft)

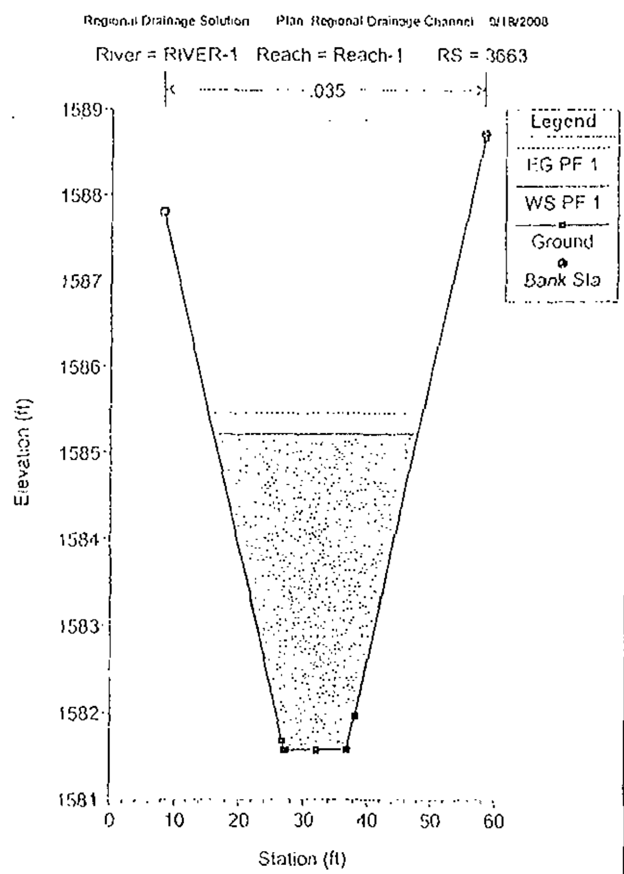

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 4070
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1590
1589
1588
1587
1586
1585
1584
1583
1582
0
10
20
30
40
50
60
Station (ft)

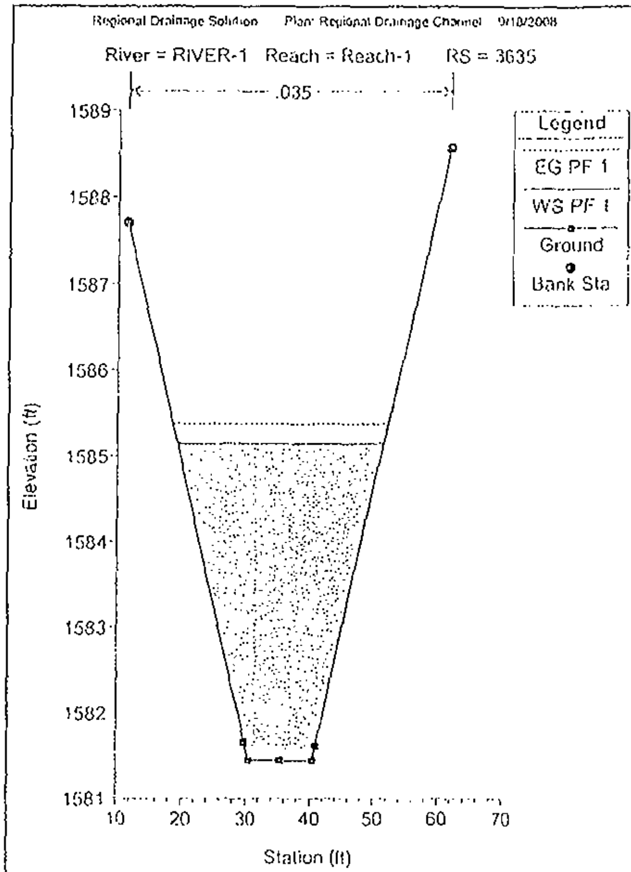

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4039
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4004 Culv
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 4004 Culv
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3953
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

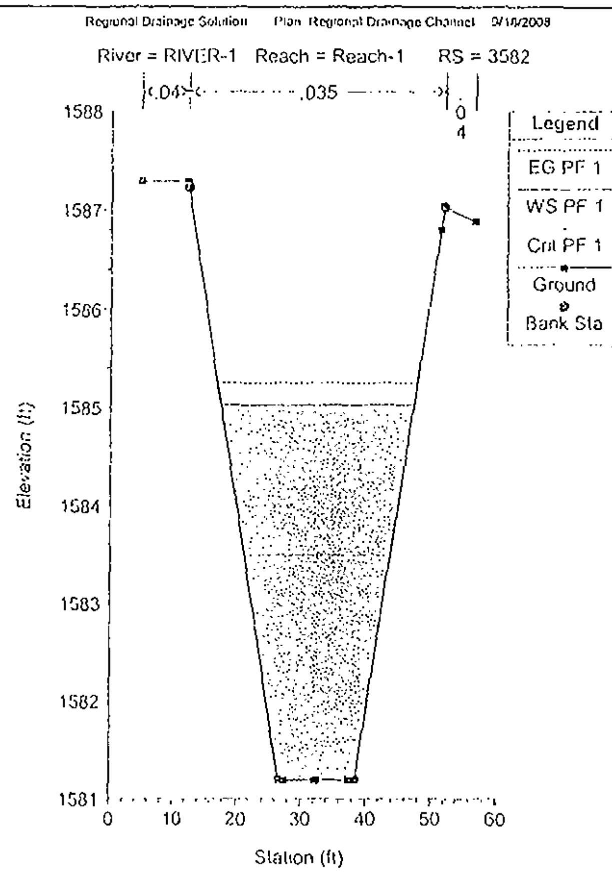

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3915
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1583
1584
1585
1586
1587
1588
1589
Station (ft)
10
20
30
40
50
60

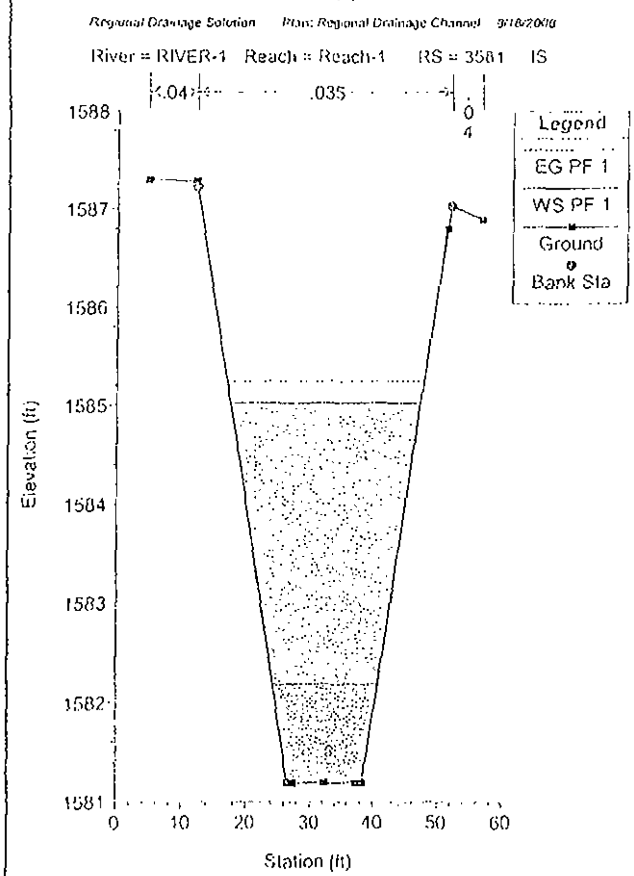

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3819
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1583
1584
1585
1586
1587
1588
1589
1590
Station (ft)
0
10
20
30
40
50
60

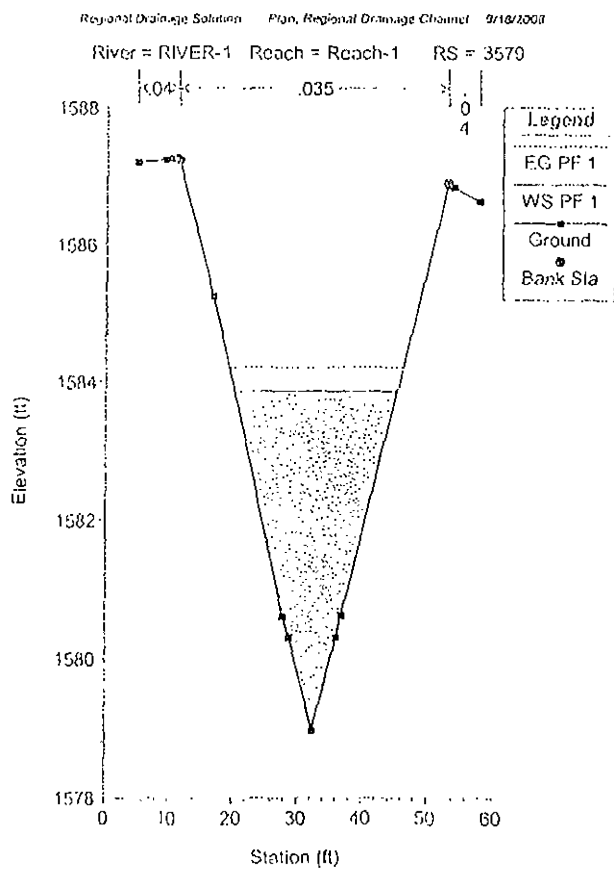

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3715
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
Station (ft)
0
10
20
30
40
50
60

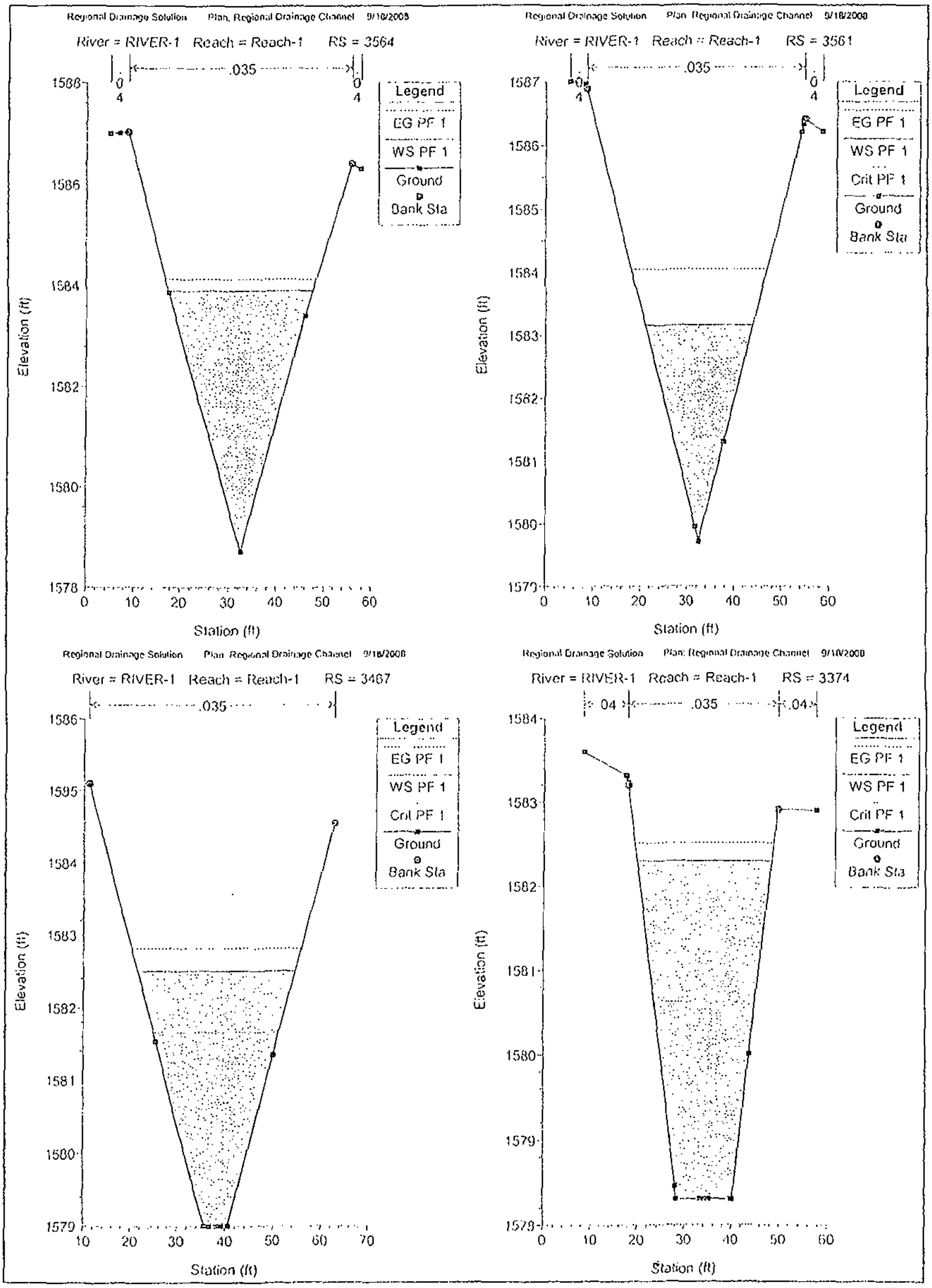

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3663
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1581
1582
1583
1584
1585
1586
1587
1588
1589
Station (ft)
0
10
20
30
40
50
60

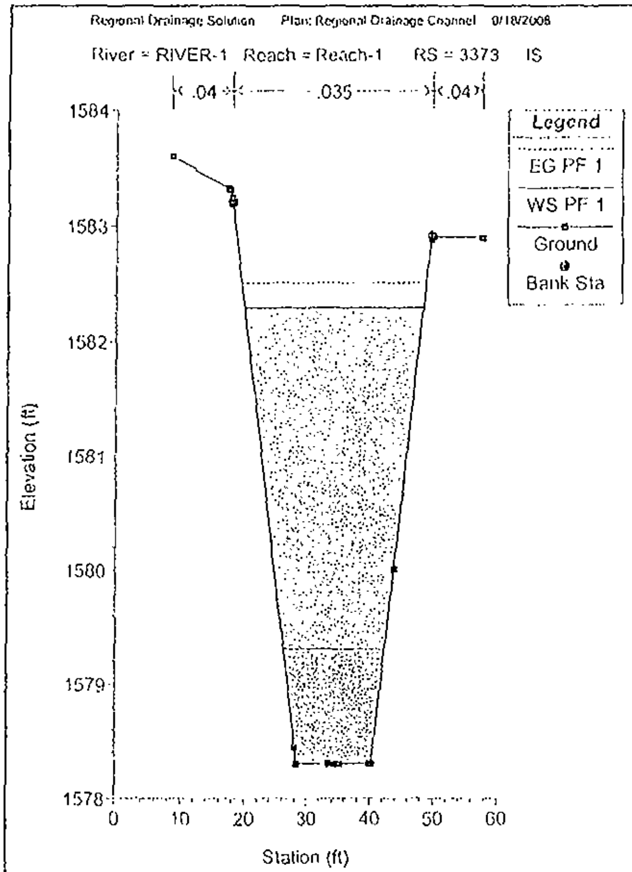

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3635
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

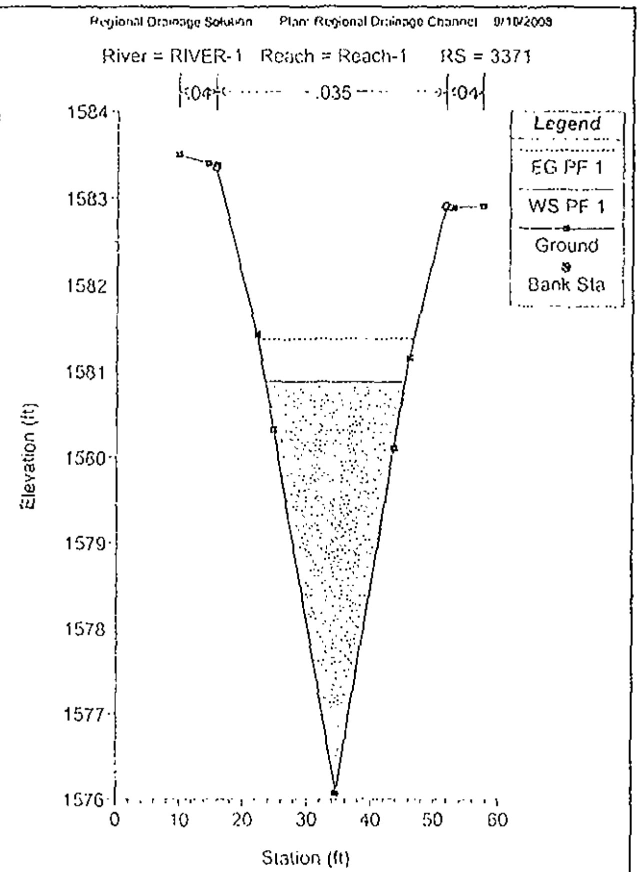

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3582
.04 .035 .04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

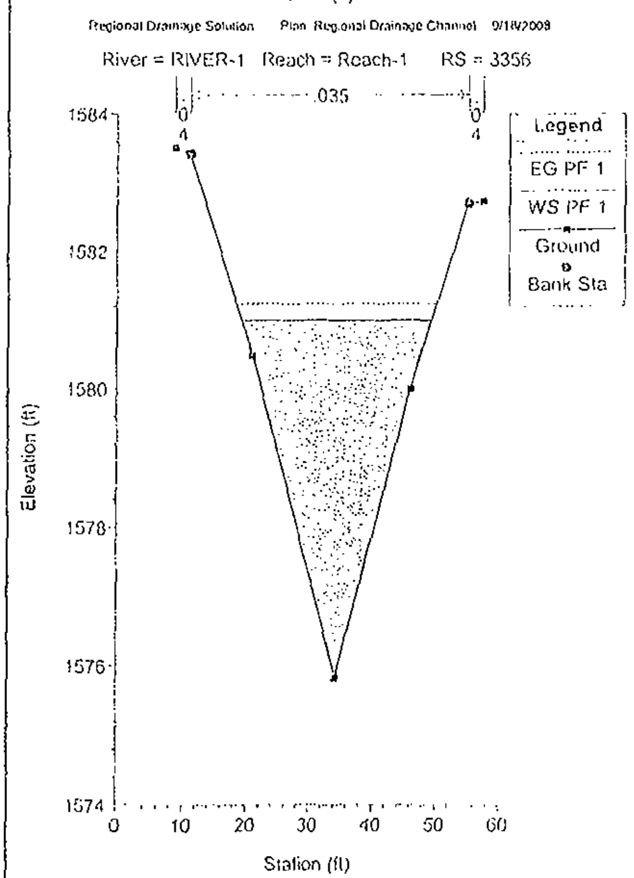

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3581 IS
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

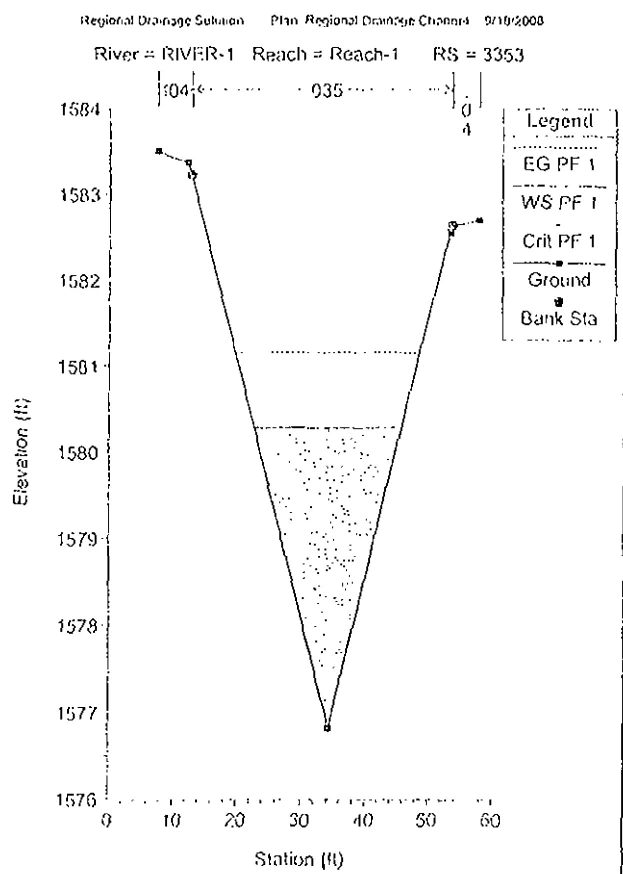

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3570
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

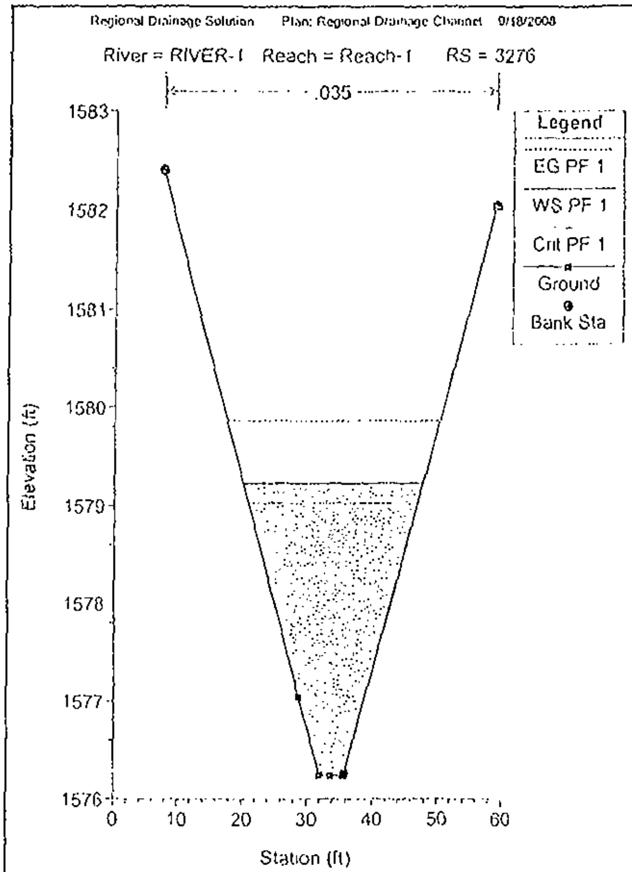

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3564
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3561
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3467
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3374
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

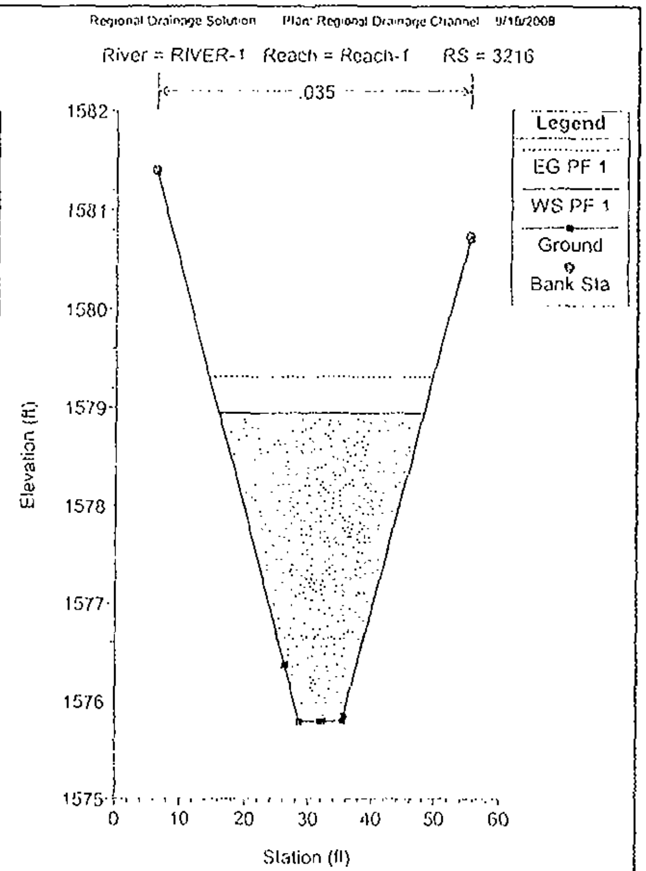

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3373 IS
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1578
1579
1580
1581
1582
1583
1584
0
10
20
30
40
50
60

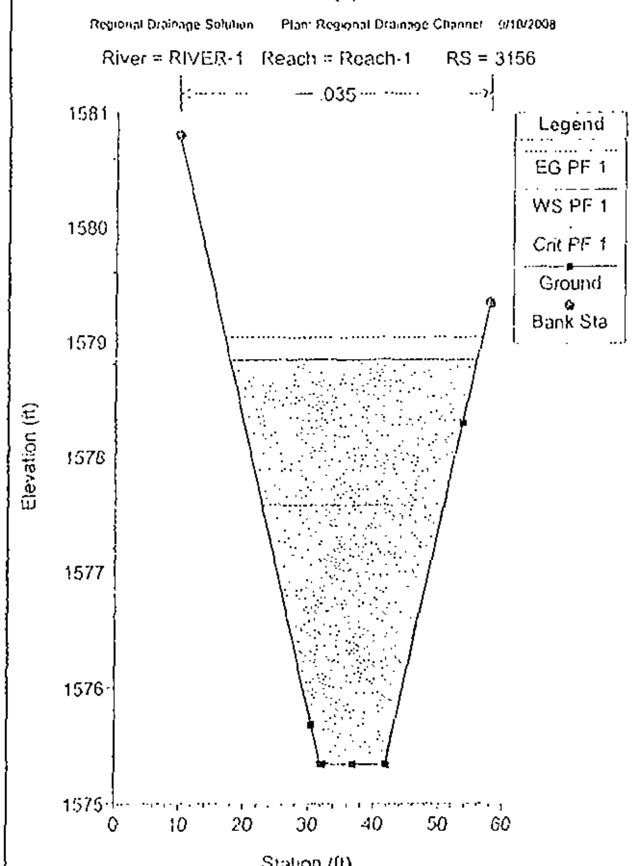

Regional Drainage Solution Plan: Regional Drainage Channel
River = RIVER-1 Reach = Reach-1 RS = 3371
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1576
1577
1578
1579
1580
1581
1582
1583
1584
0
10
20
30
40
50
60

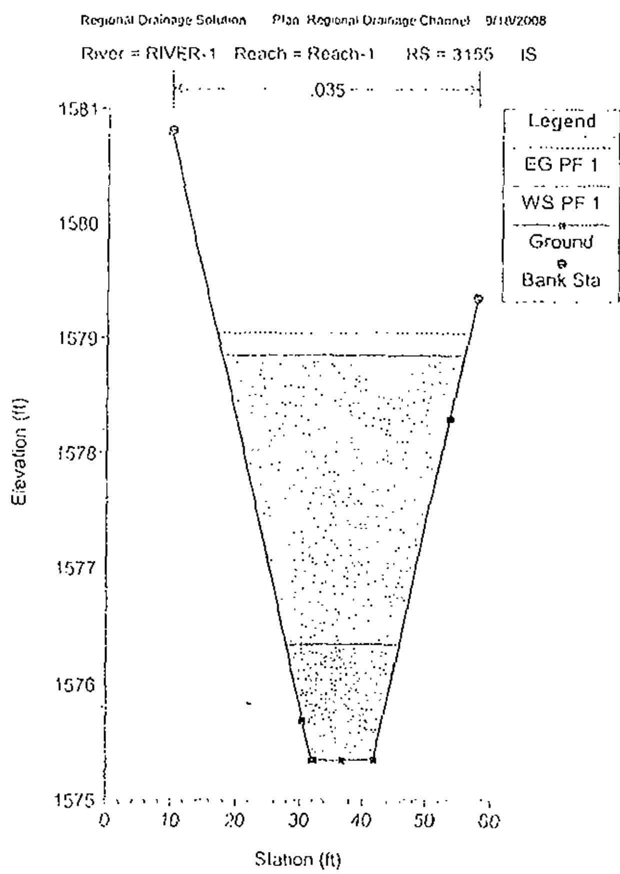

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3356
.035
0
4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1574
1576
1578
1580
1582
1584
0
10
20
30
40
50
60

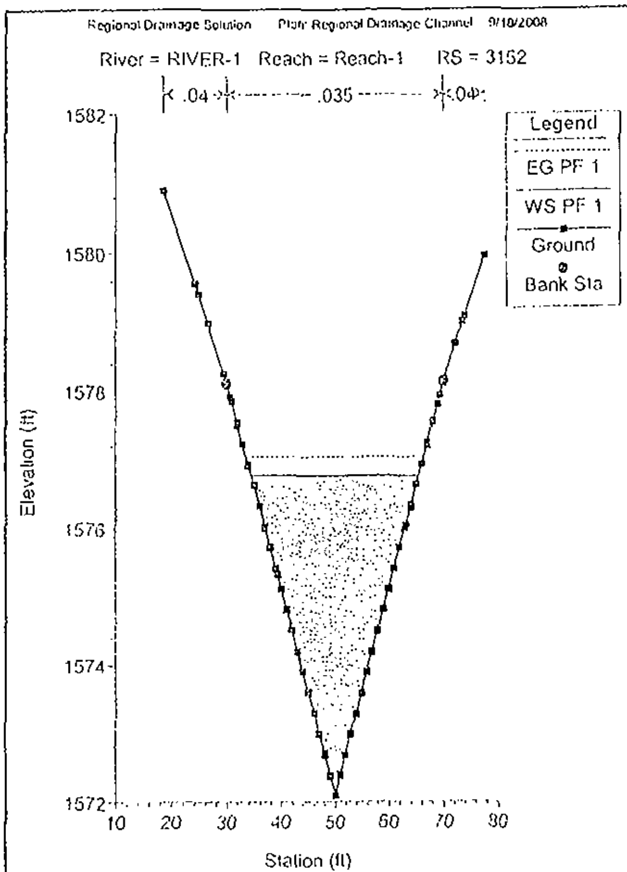

Regional Drainage Solution Plan: Regional Drainage Channel
River = RIVER-1 Reach = Reach-1 RS = 3353
.04
.035
0
4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1576
1577
1578
1579
1580
1581
1582
1583
1584
0
10
20
30
40
50
60


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3276
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1583
1582
1581
1580
1579
1578
1577
1576
0 10 20 30 40 50 60
Station (ft)

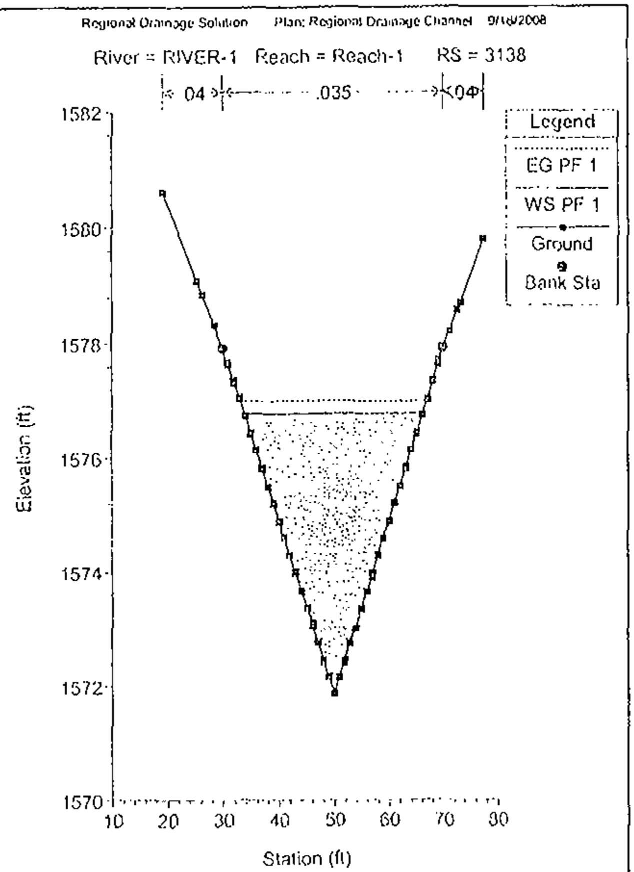

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3216
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1581
1580
1579
1578
1577
1576
1575
0 10 20 30 40 50 60
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3156
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1581
1580
1579
1578
1577
1576
1575
0 10 20 30 40 50 60
Station (ft)

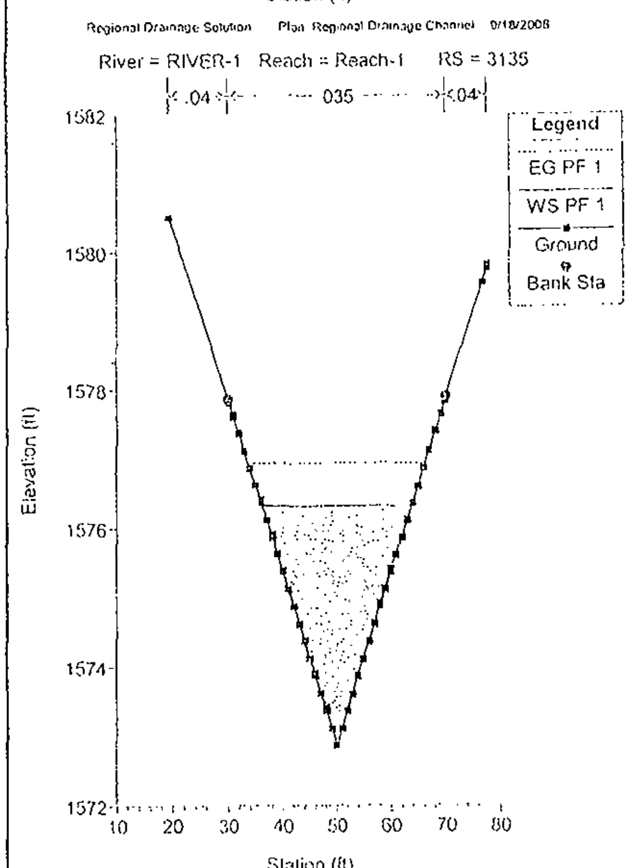

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3155 IS
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1581
1580
1579
1578
1577
1576
1575
0 10 20 30 40 50 60
Station (ft)



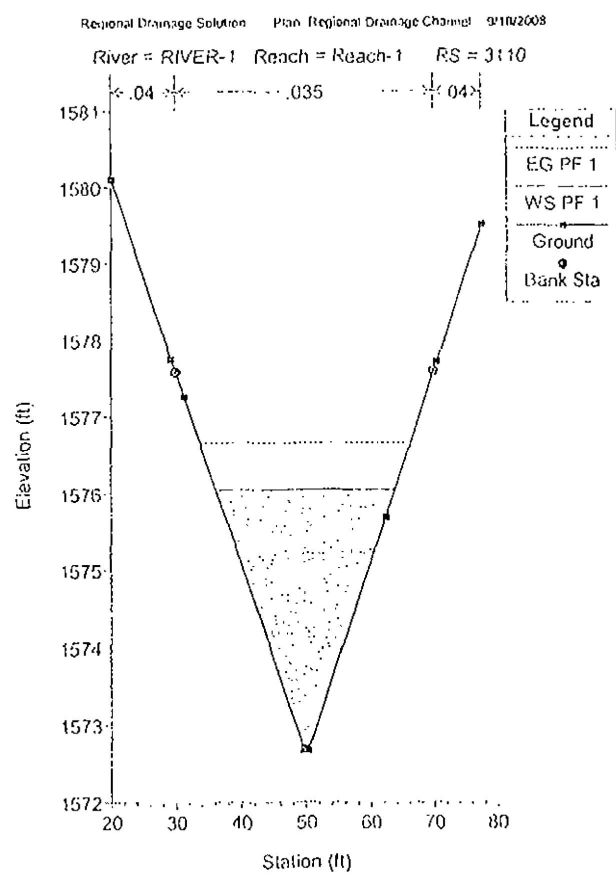
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3152
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1580
1578
1576
1574
1572
10 20 30 40 50 60 70 80
Station (ft)



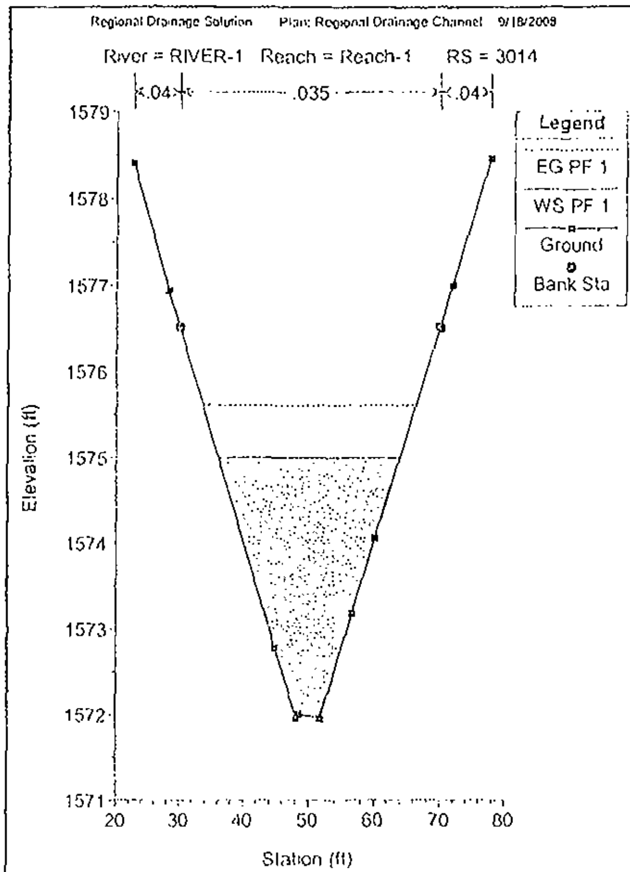
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3138
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1580
1578
1576
1574
1572
1570
10 20 30 40 50 60 70 80
Station (ft)

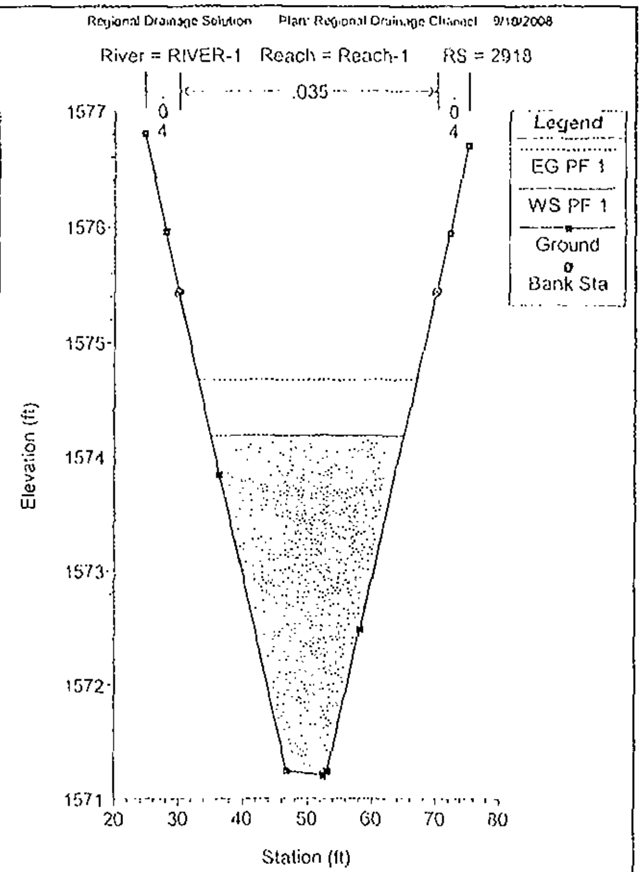


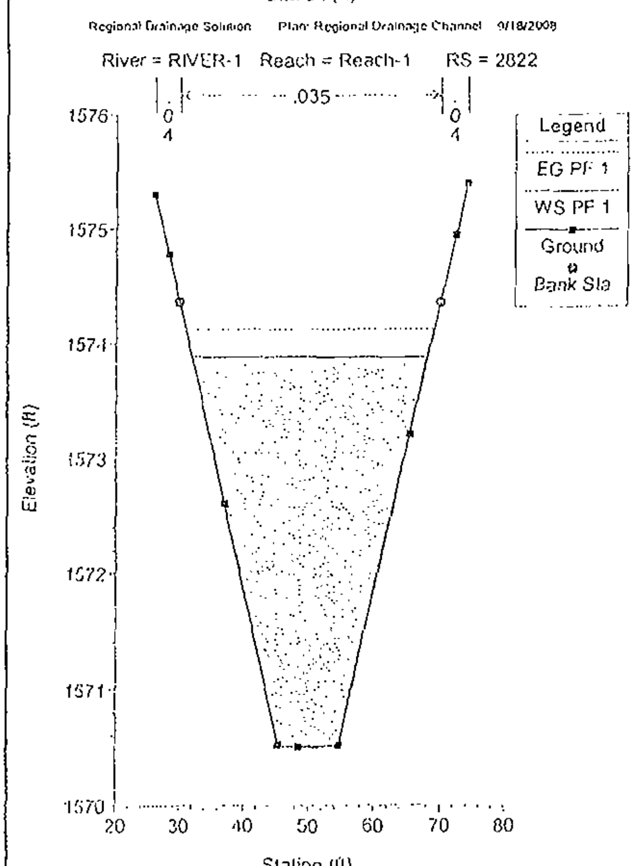
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3135
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1582
1580
1578
1576
1574
1572
10 20 30 40 50 60 70 80
Station (ft)

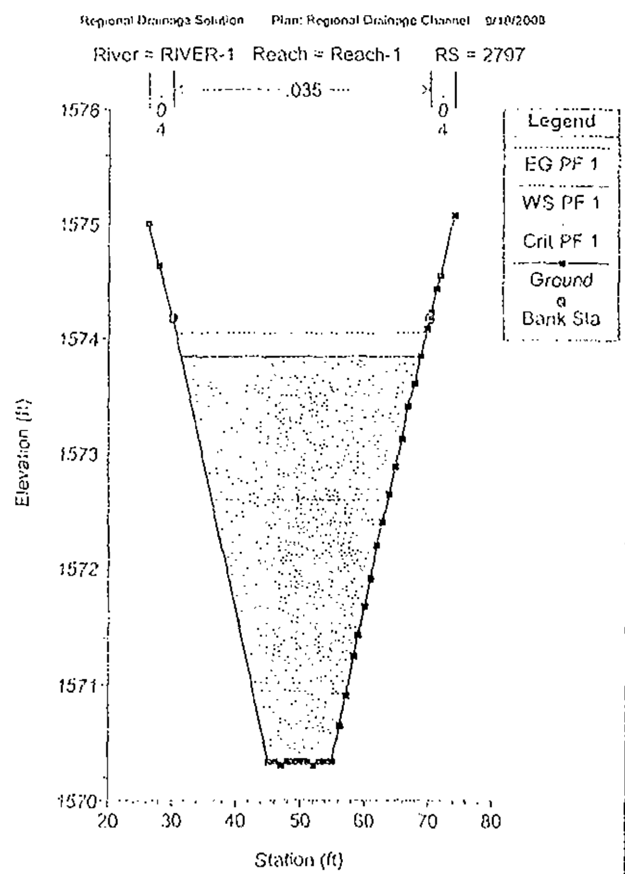


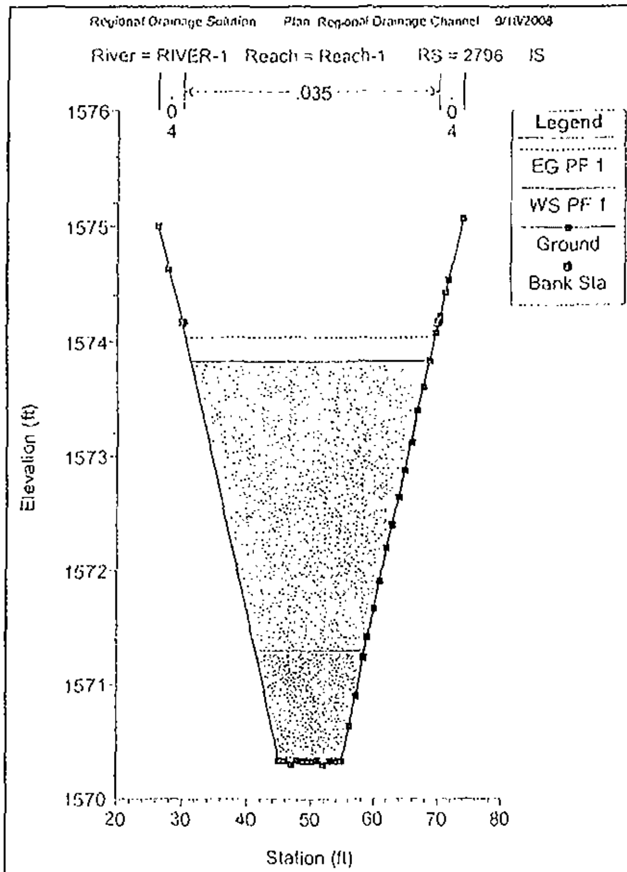
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3110
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1581
1580
1579
1578
1577
1576
1575
1574
1573
1572
20 30 40 50 60 70 80
Station (ft)

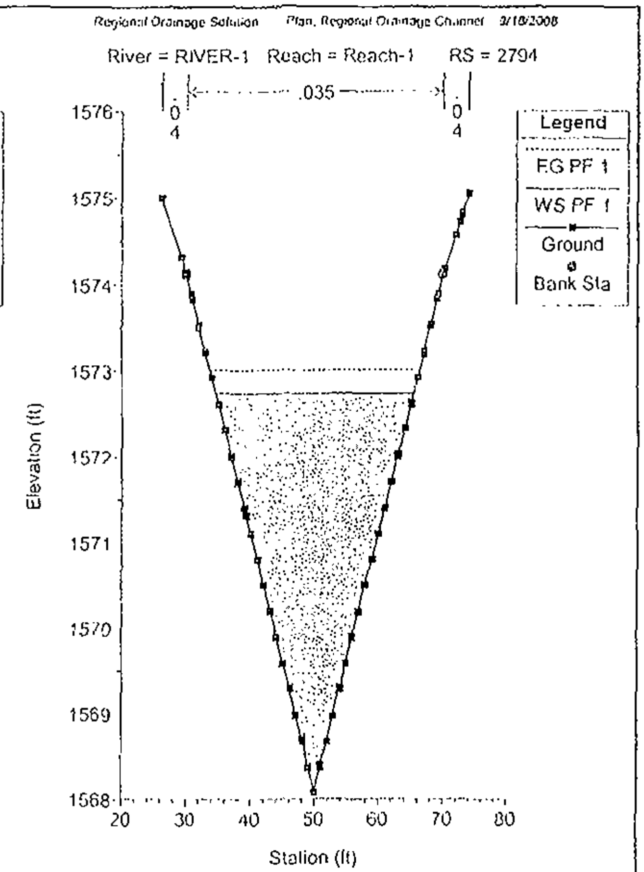

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 3014
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1579
1578
1577
1576
1575
1574
1573
1572
1571
20 30 40 50 60 70 80
Station (ft)

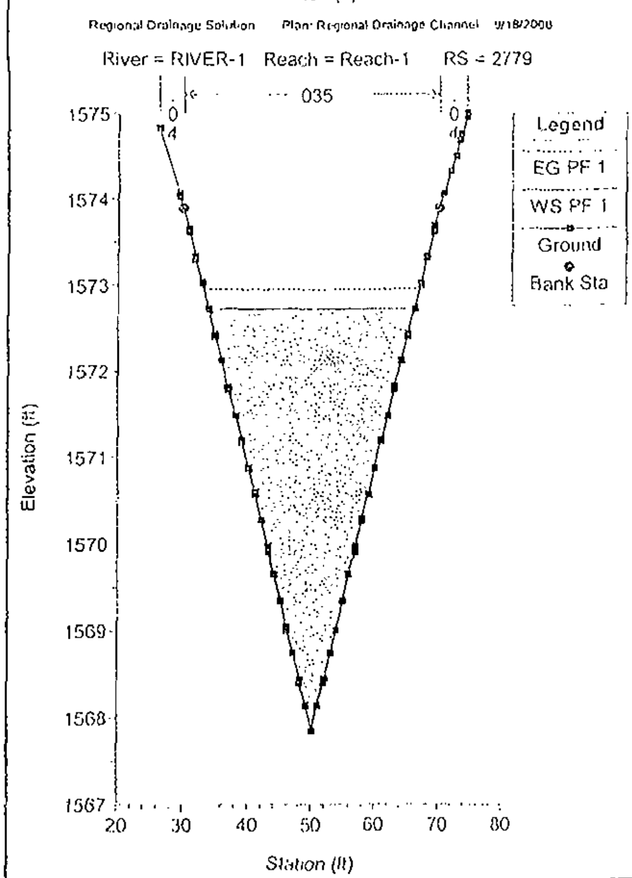

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2918
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1577
1576
1575
1574
1573
1572
1571
20 30 40 50 60 70 80
Station (ft)

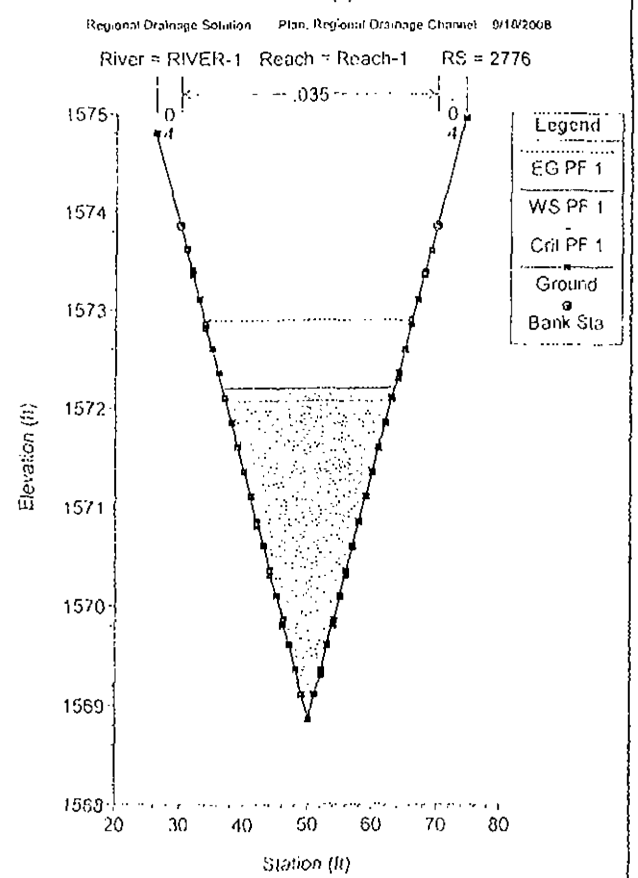

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2822
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1576
1575
1574
1573
1572
1571
1570
20 30 40 50 60 70 80
Station (ft)

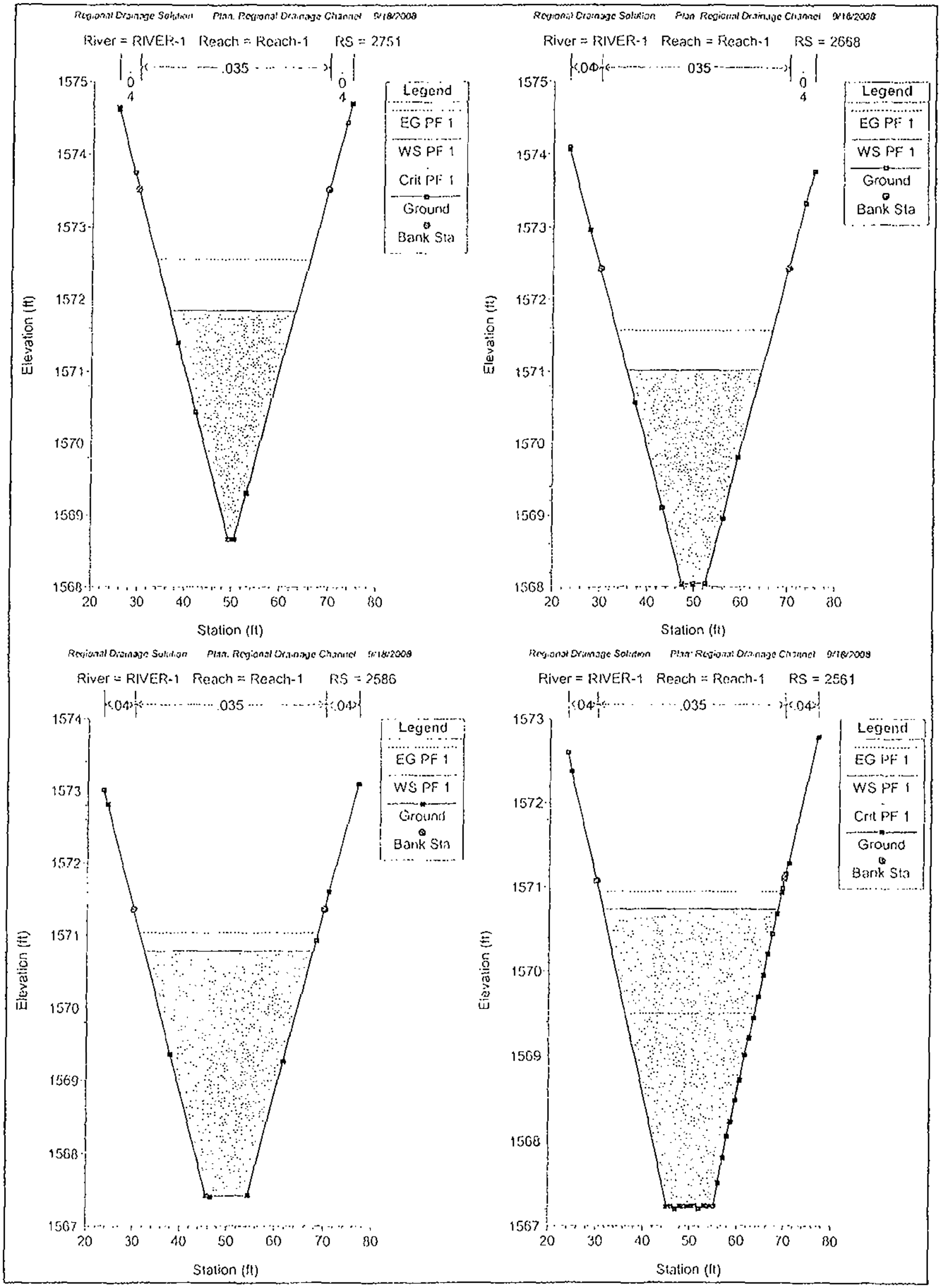

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2797
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1576
1575
1574
1573
1572
1571
1570
20 30 40 50 60 70 80
Station (ft)

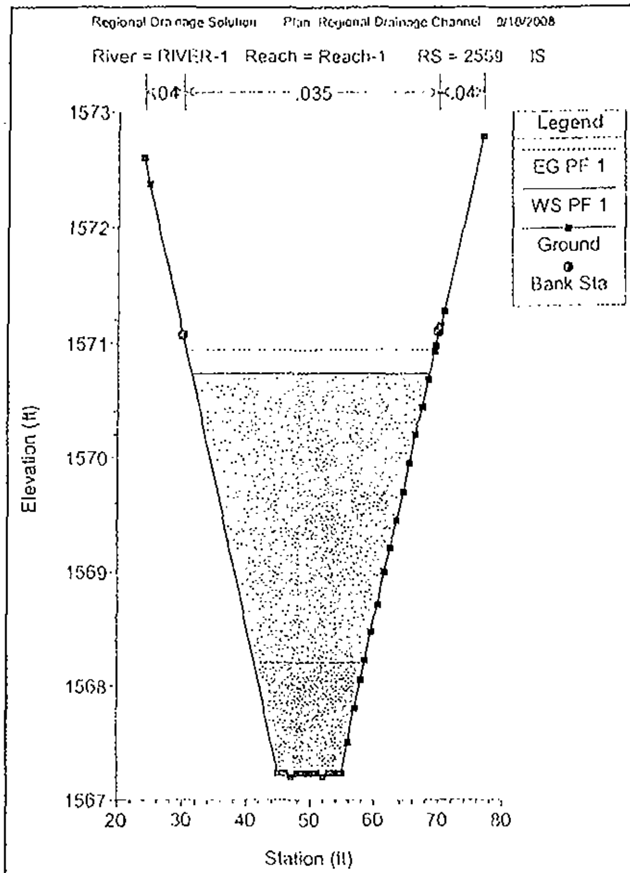

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2796 IS
.035
.04
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1570
1571
1572
1573
1574
1575
1576
Station (ft)
20
30
40
50
60
70
80

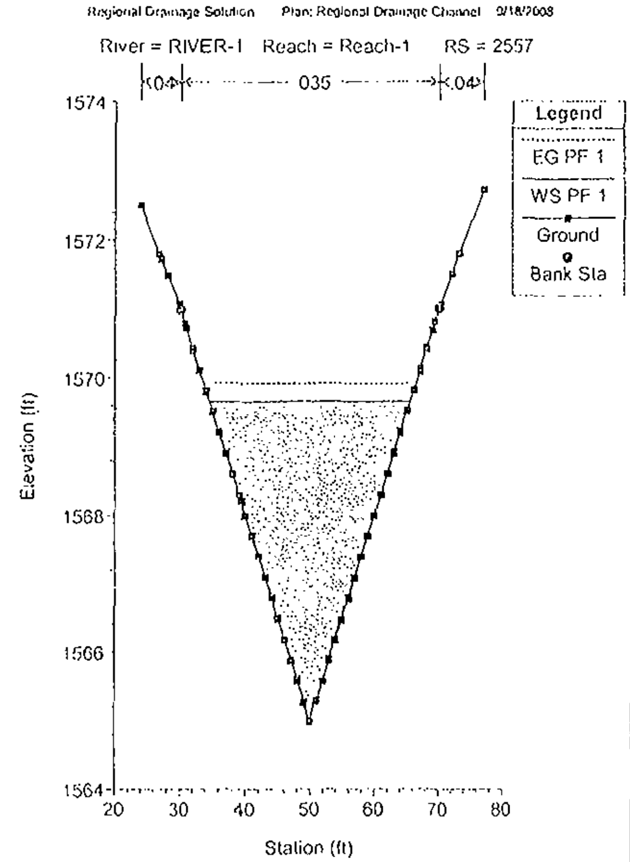

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2794
.035
.04
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1568
1569
1570
1571
1572
1573
1574
1575
1576
Station (ft)
20
30
40
50
60
70
80

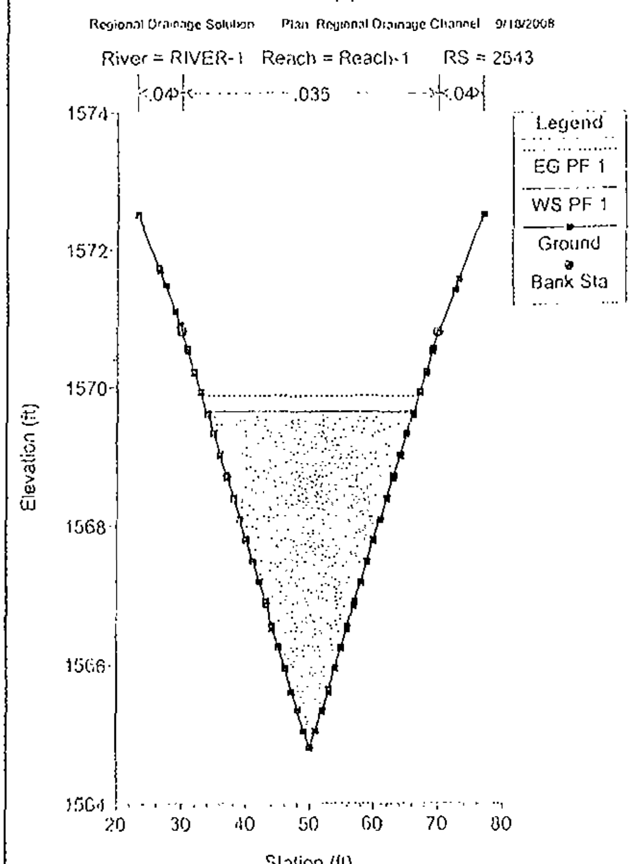

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2779
.035
.04
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1567
1568
1569
1570
1571
1572
1573
1574
1575
Station (ft)
20
30
40
50
60
70
80

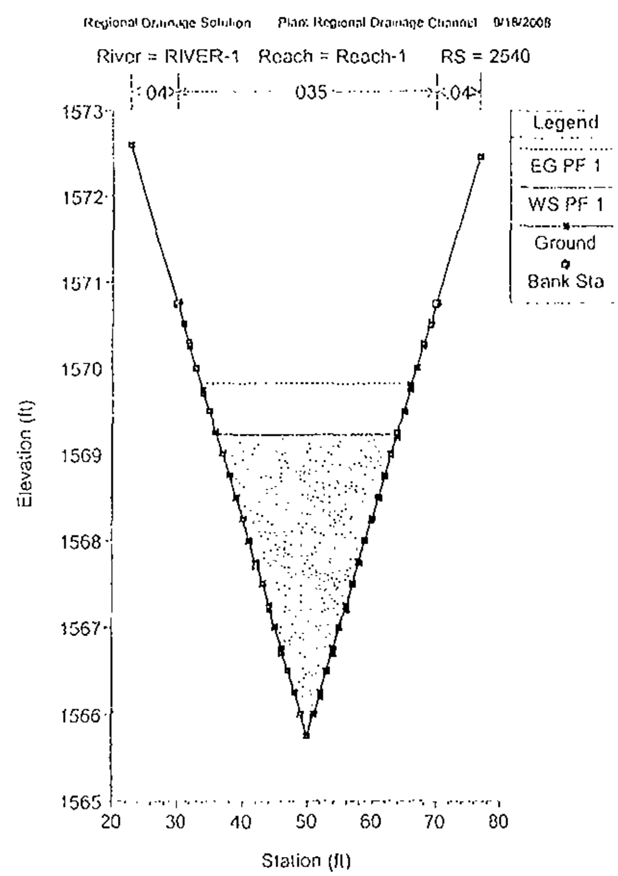

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2776
.035
.04
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1568
1569
1570
1571
1572
1573
1574
1575
Station (ft)
20
30
40
50
60
70
80

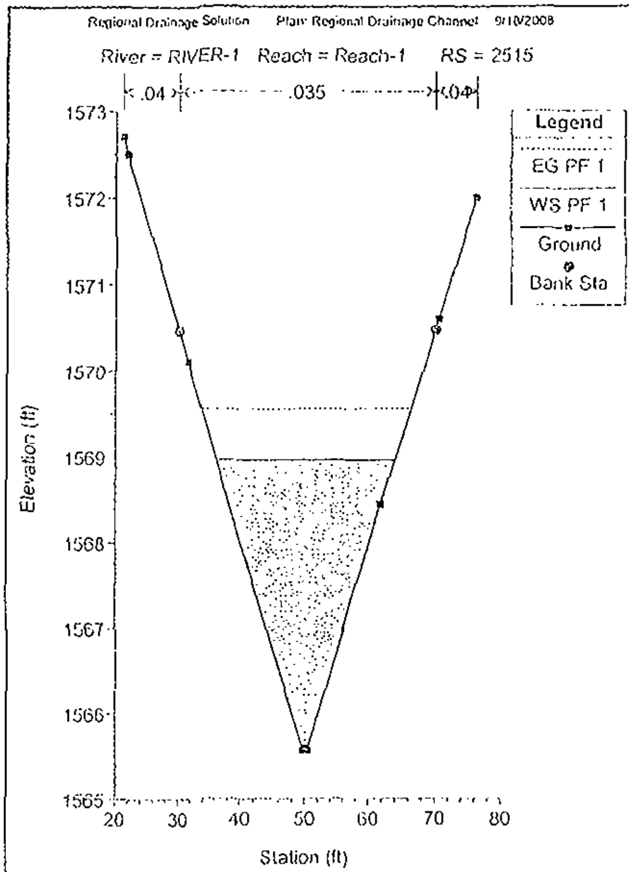
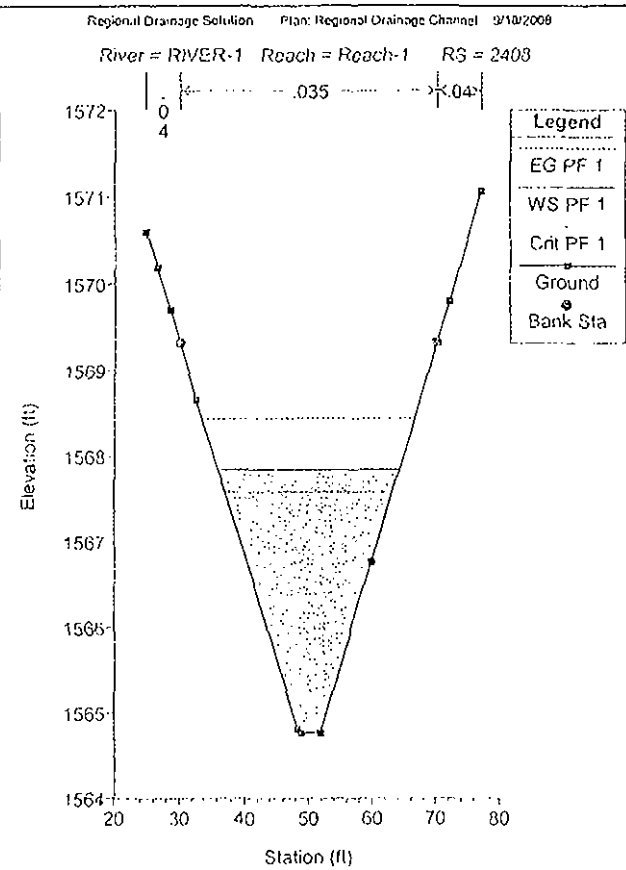
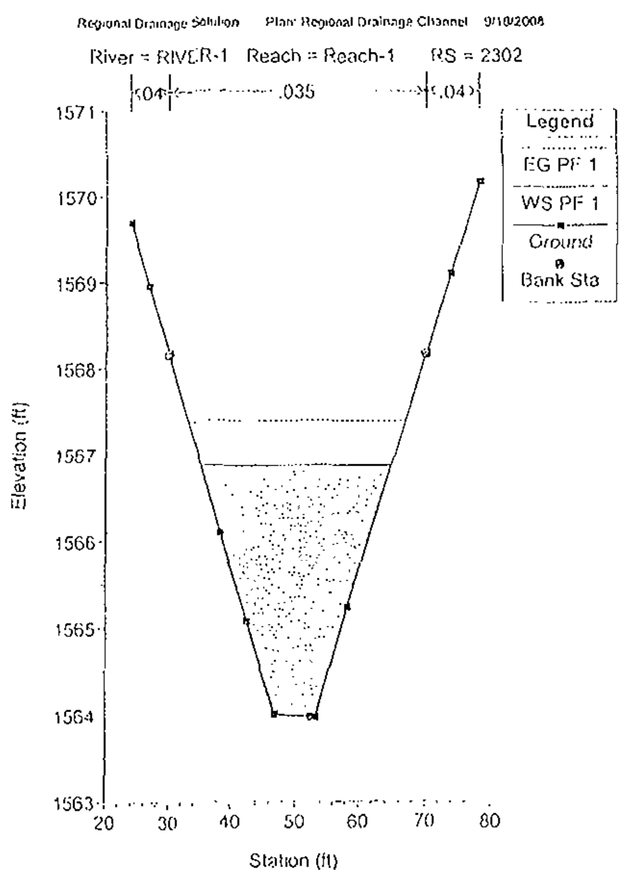
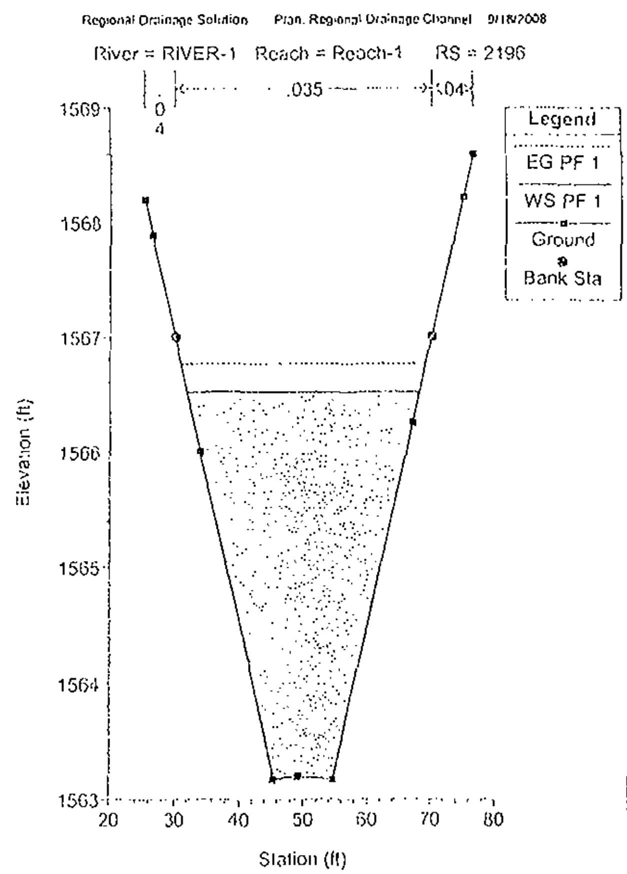

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2751
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2668
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2586
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2561
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

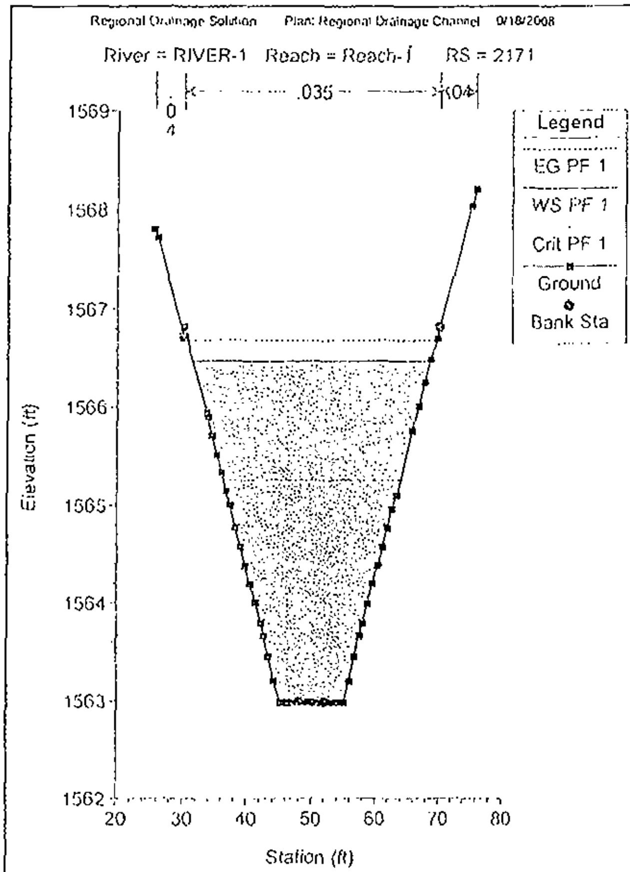

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2559 IS
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

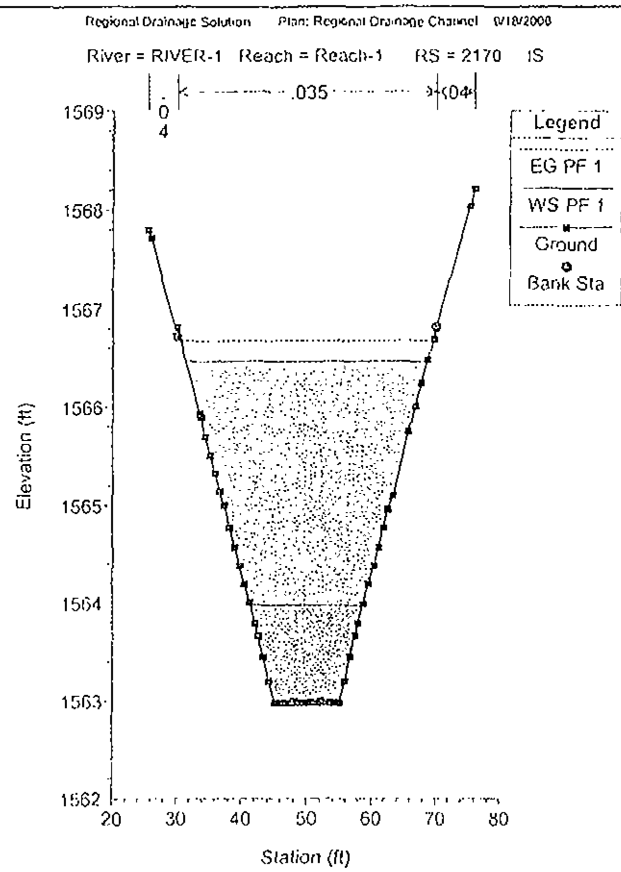

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2557
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

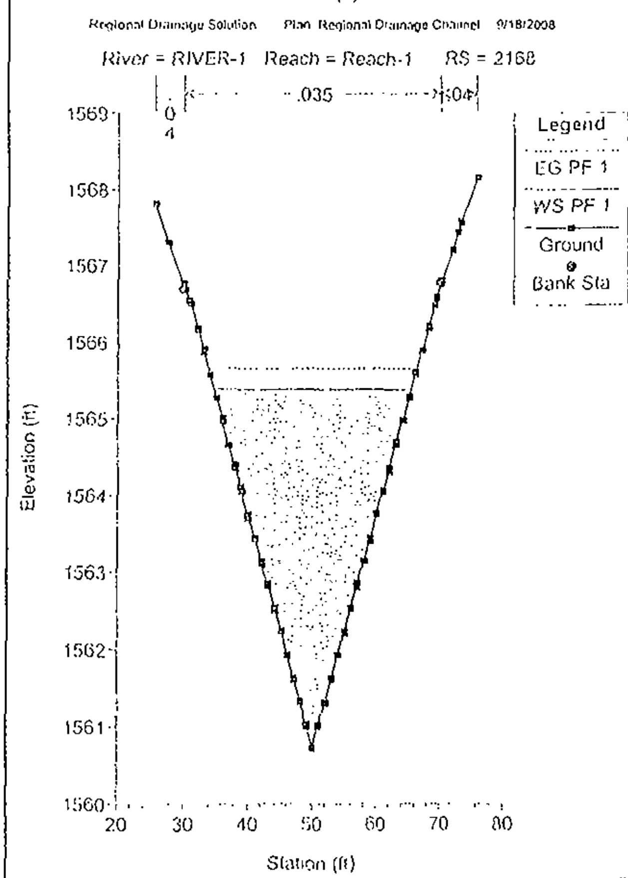

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2543
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

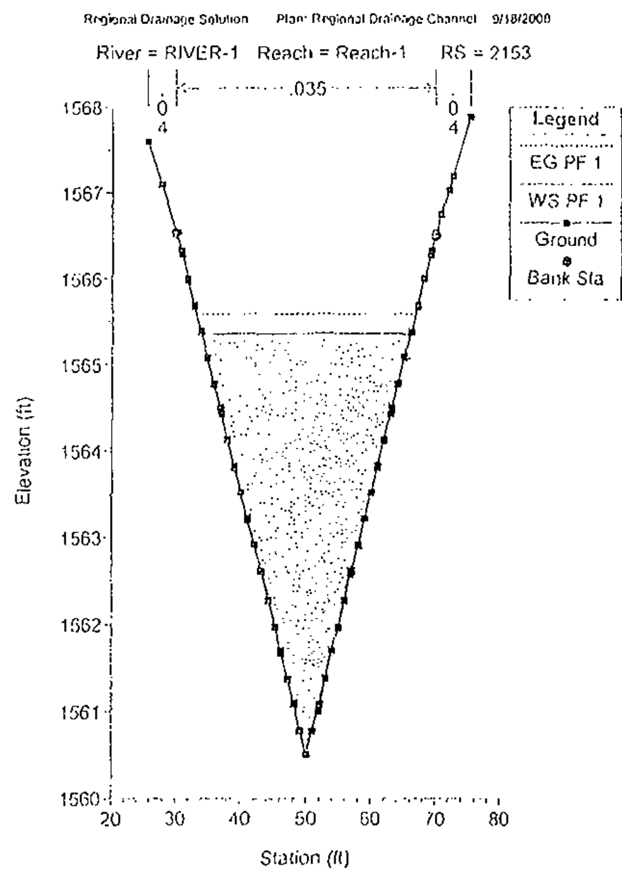

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2540
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

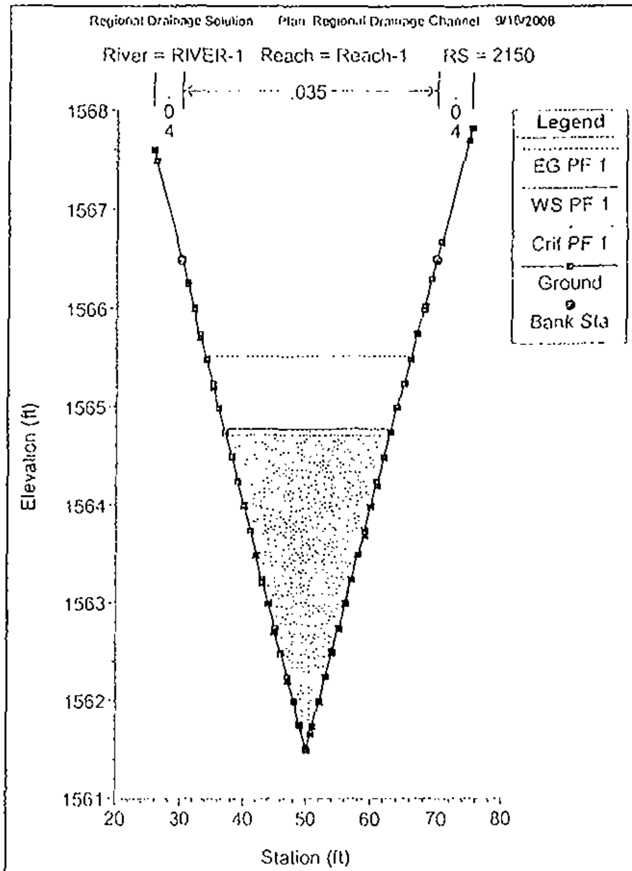

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2515
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1565
1566
1567
1568
1569
1570
1571
1572
1573
20
30
40
50
60
70
80

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2408
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1564
1565
1566
1567
1568
1569
1570
1571
1572
20
30
40
50
60
70
80

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2302
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1563
1564
1565
1566
1567
1568
1569
1570
1571
20
30
40
50
60
70
80

Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 2196
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1563
1564
1565
1566
1567
1568
1569
20
30
40
50
60
70
80

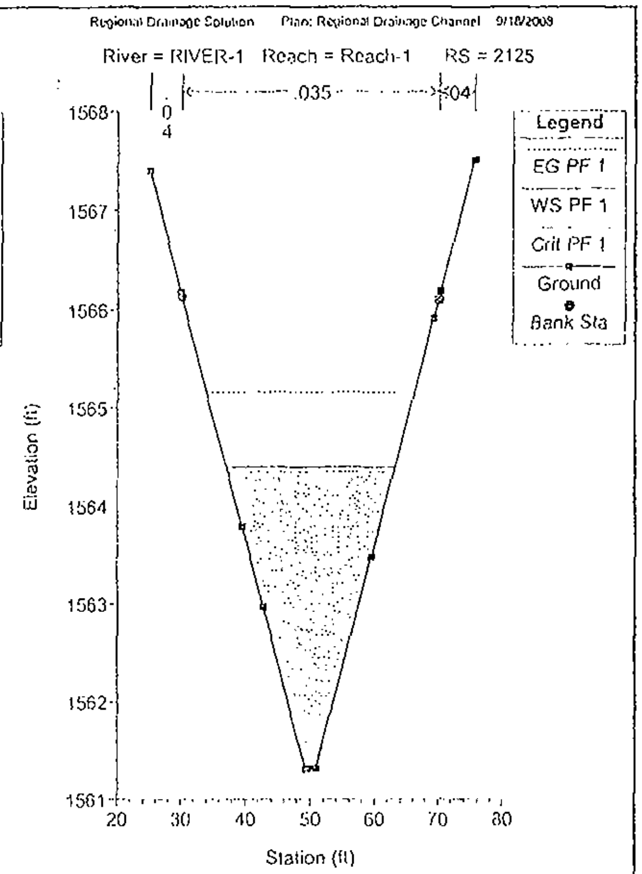

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2171
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

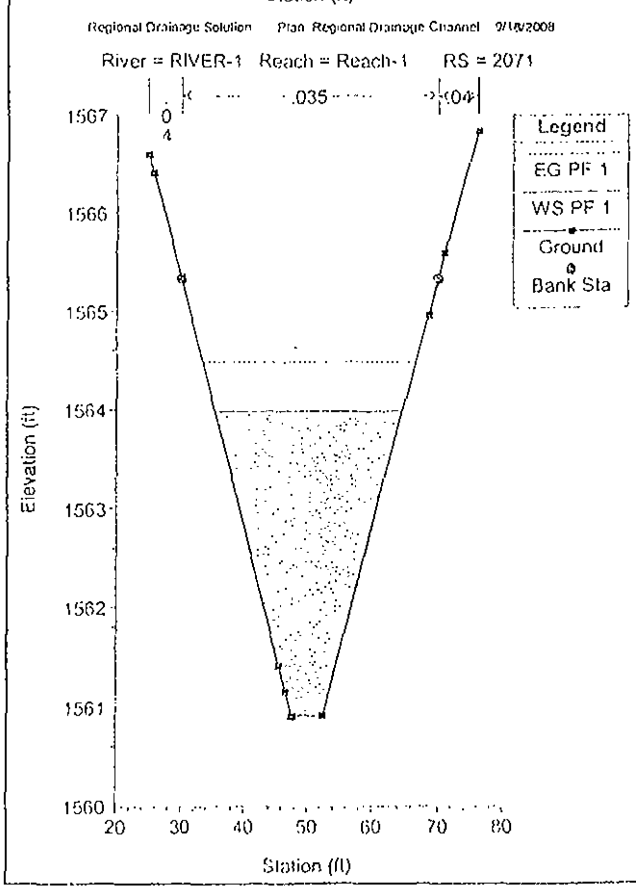

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2170 IS
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

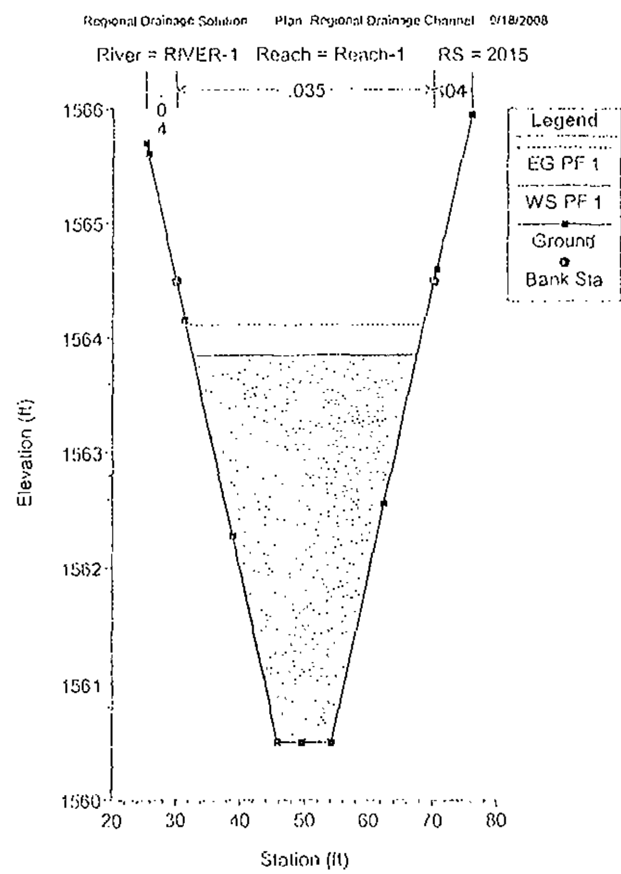

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2168
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

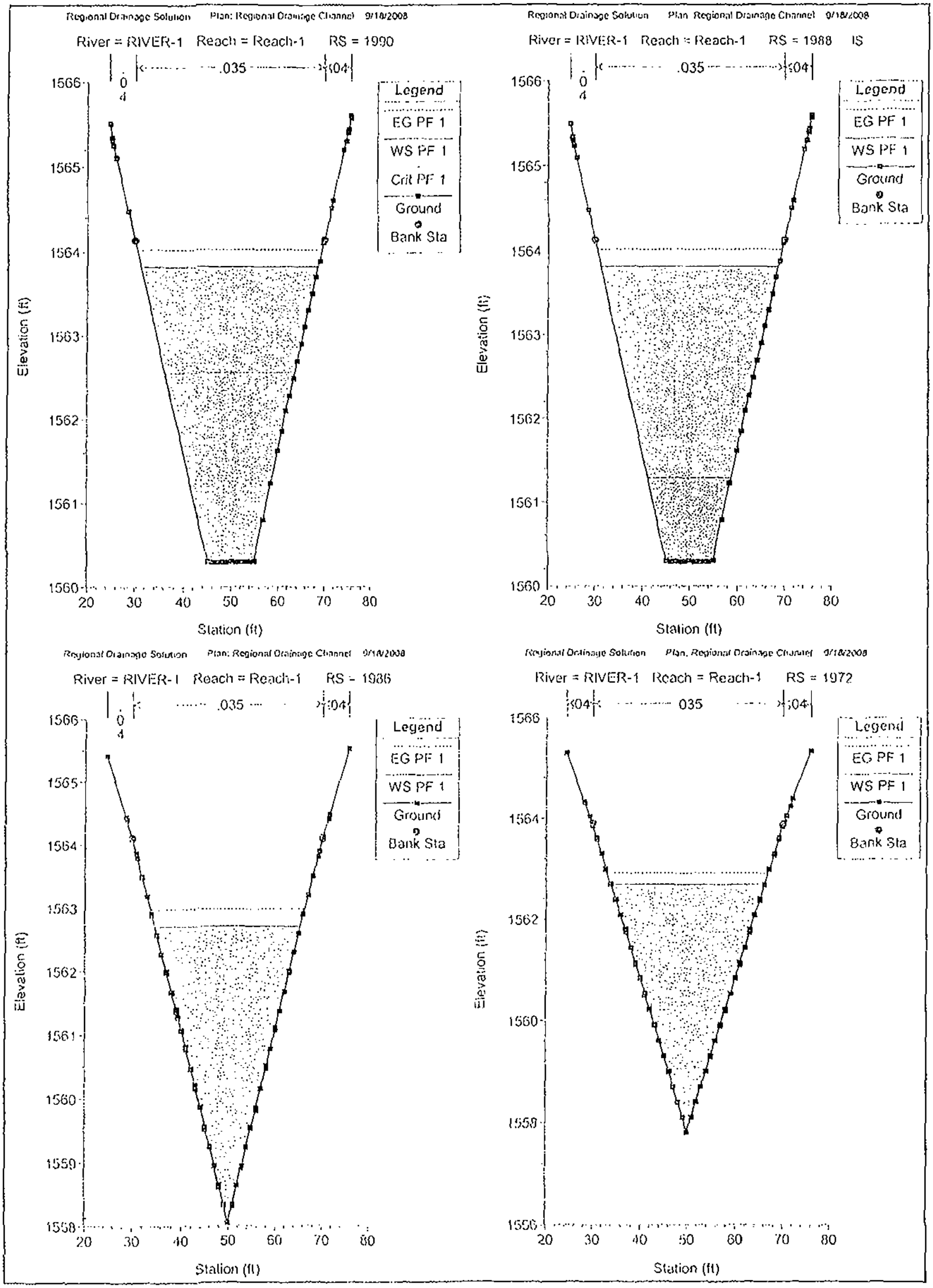

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2153
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2150
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

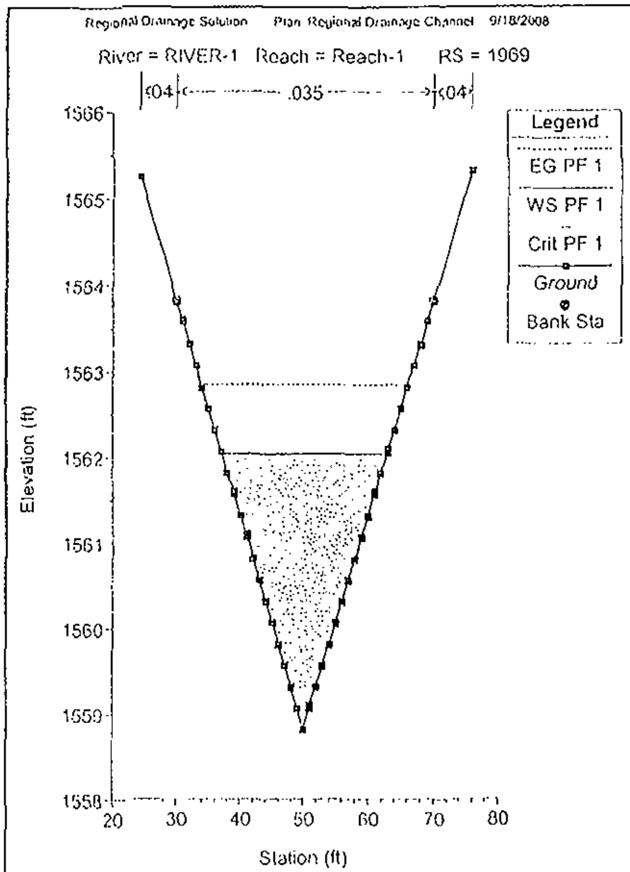

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2125
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

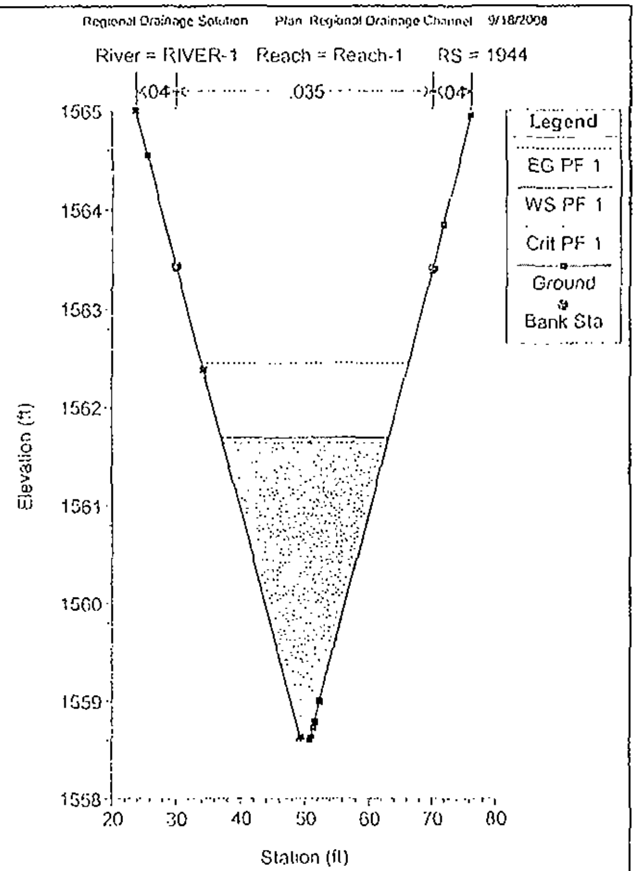

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2071
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

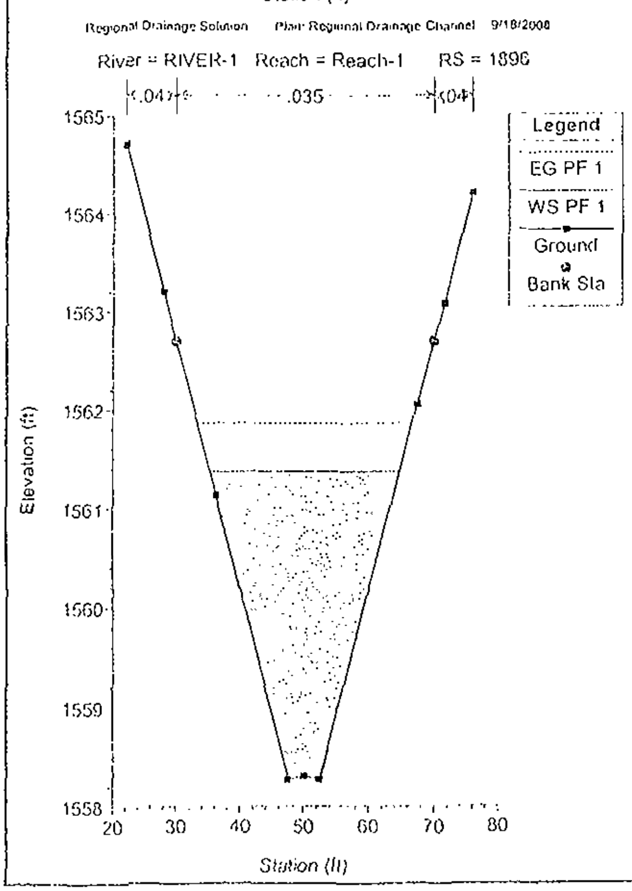

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 2015
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

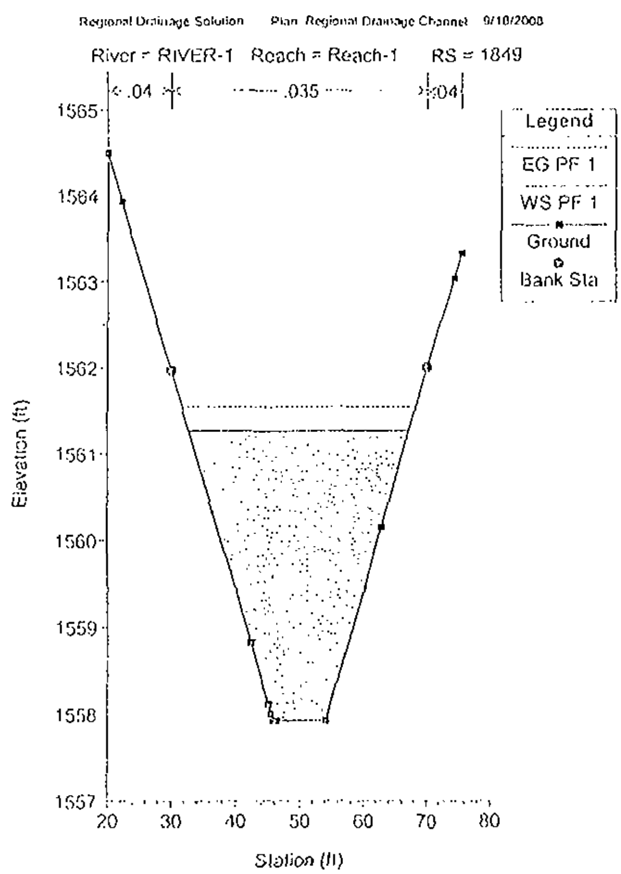


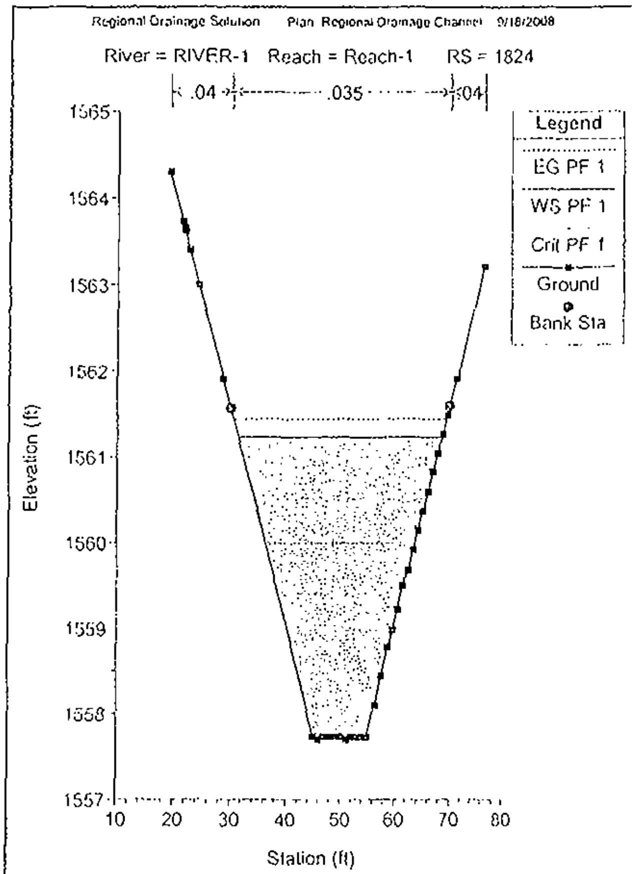
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1990
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1988 IS
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1986
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1972
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

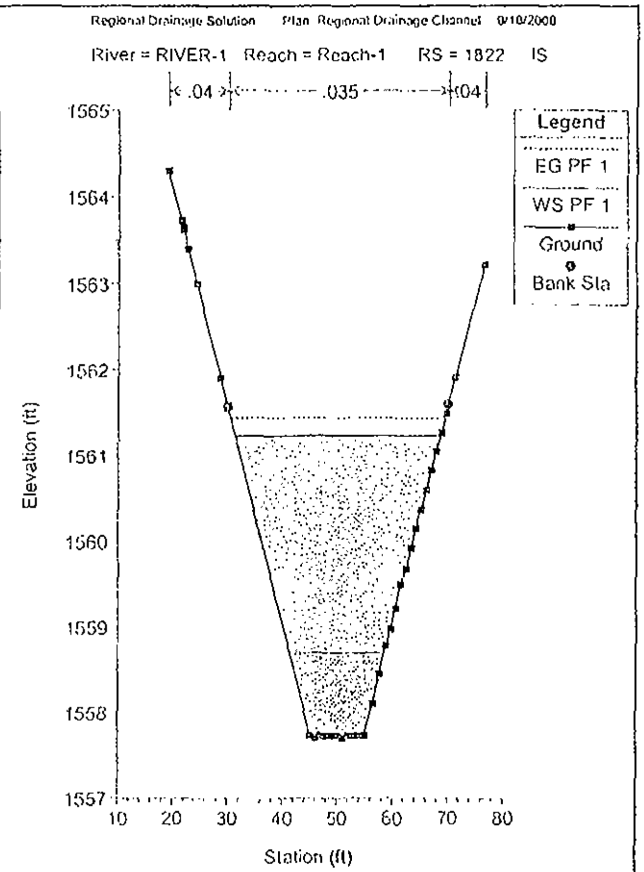

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1969
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
1566
20
30
40
50
60
70
80

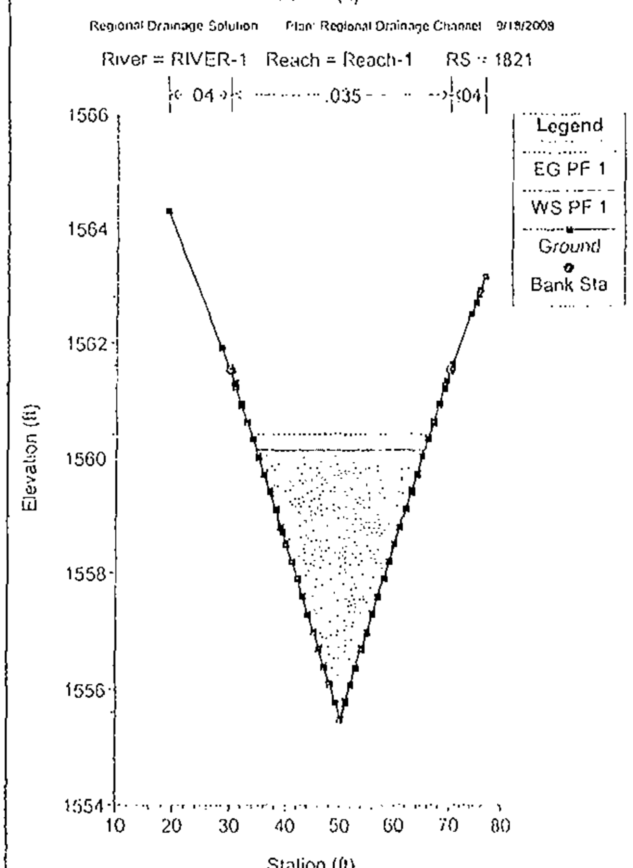

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1944
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

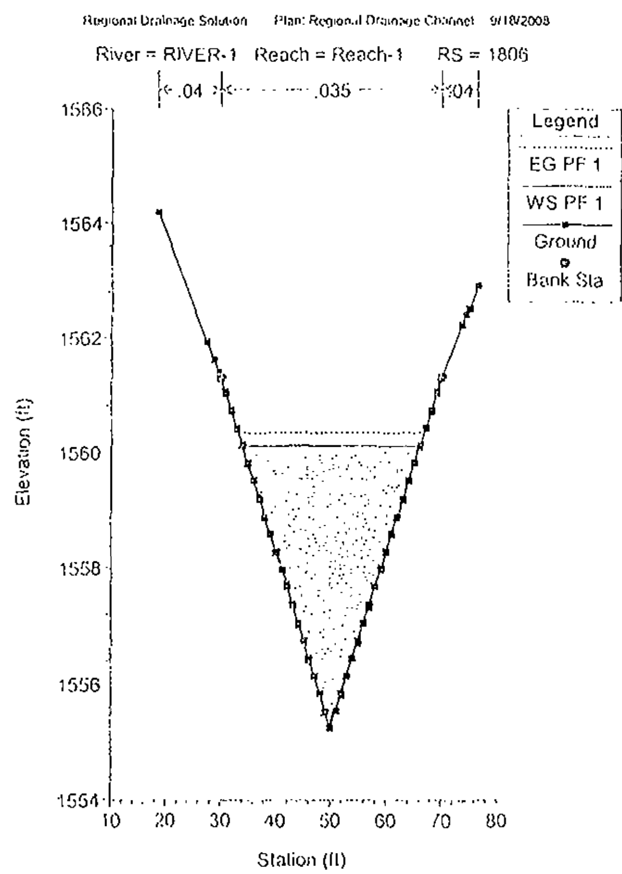

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1896
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

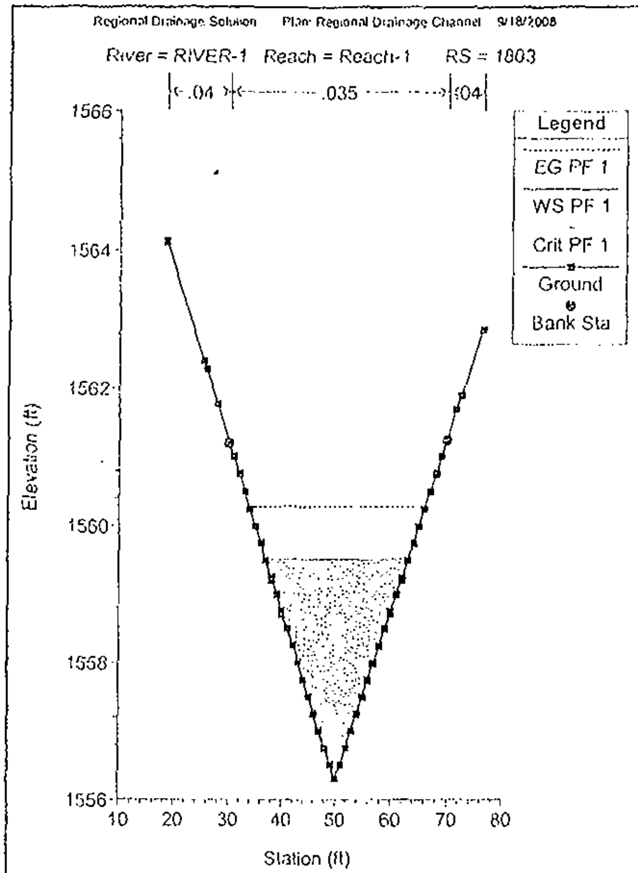

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1849
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1557
1558
1559
1560
1561
1562
1563
1564
1565
20
30
40
50
60
70
80

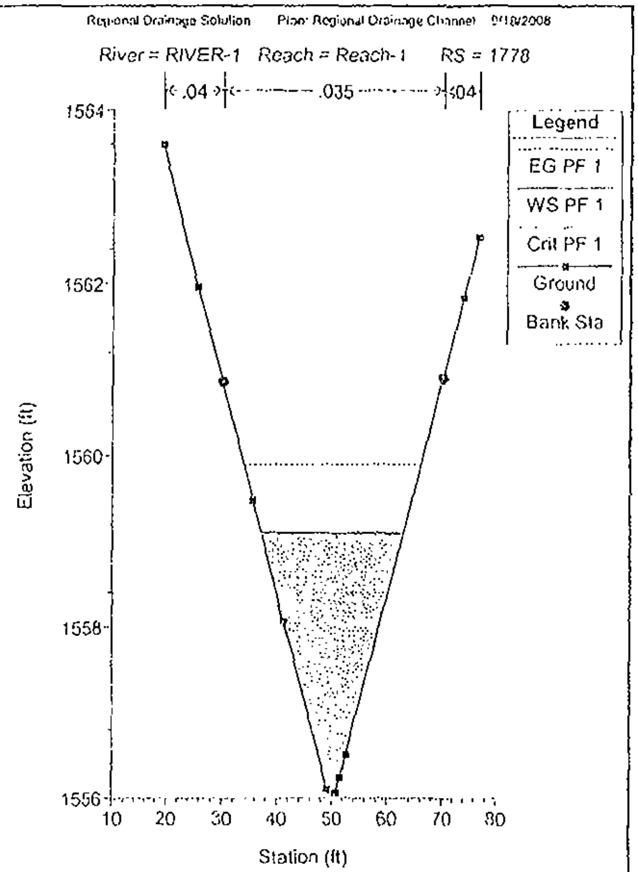

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1824
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

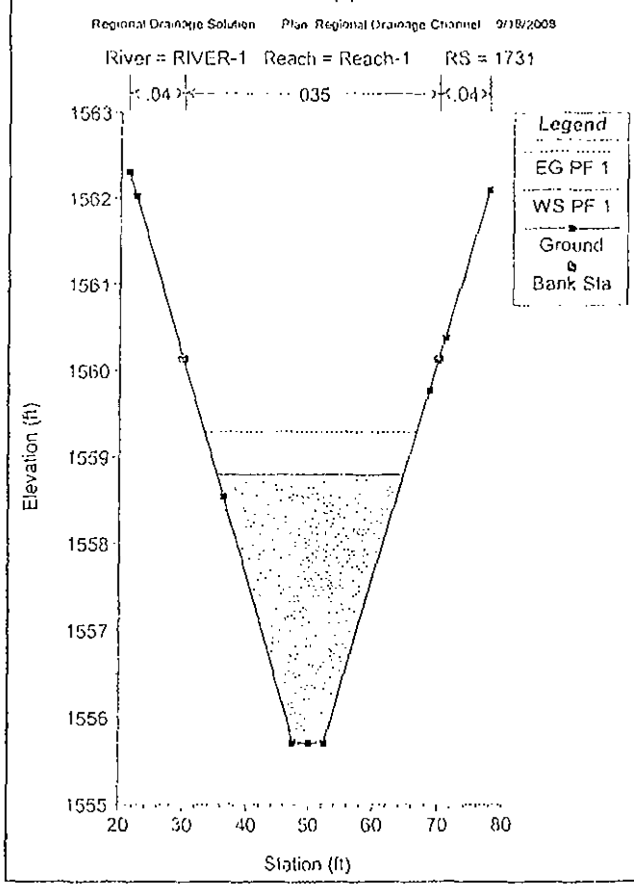

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1822 IS
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

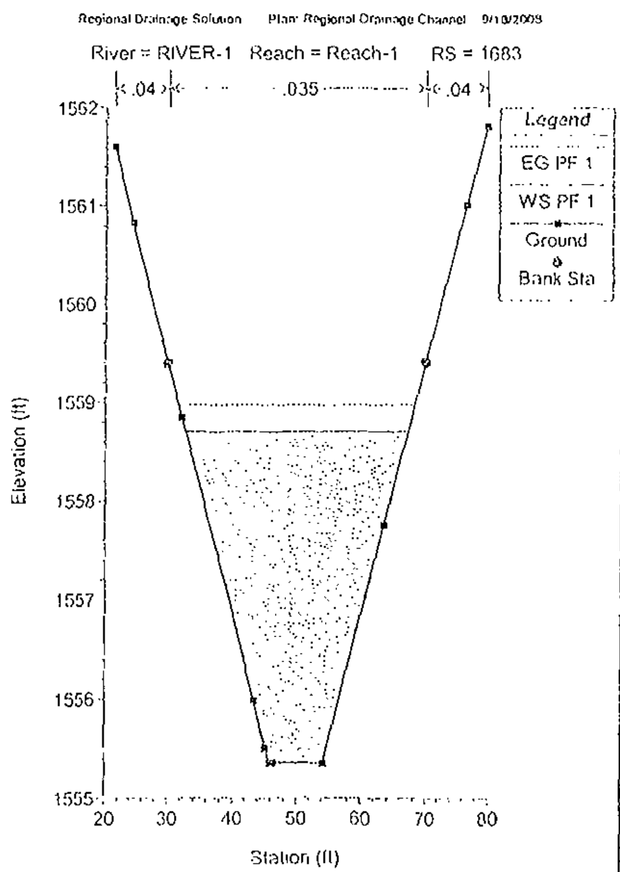

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1821
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

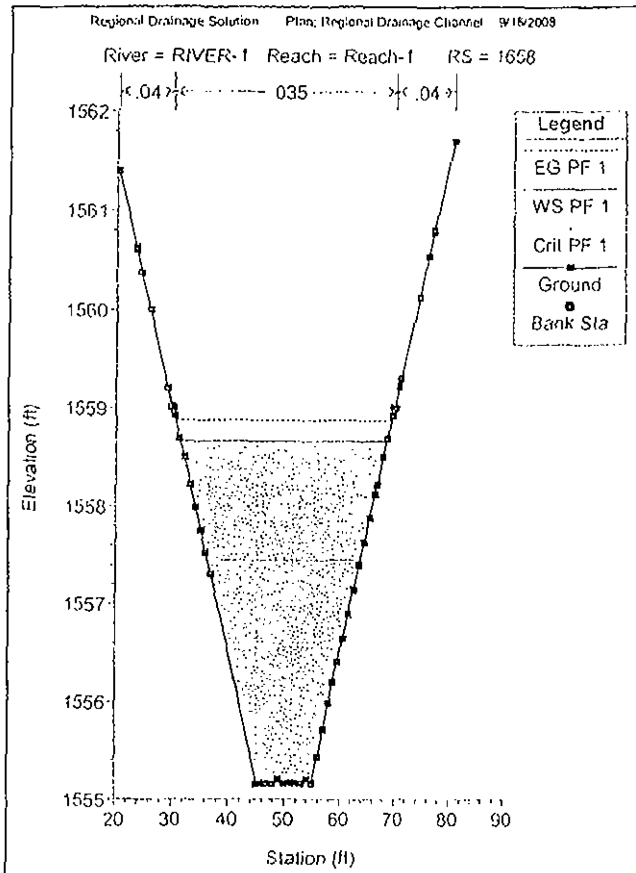

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1806
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

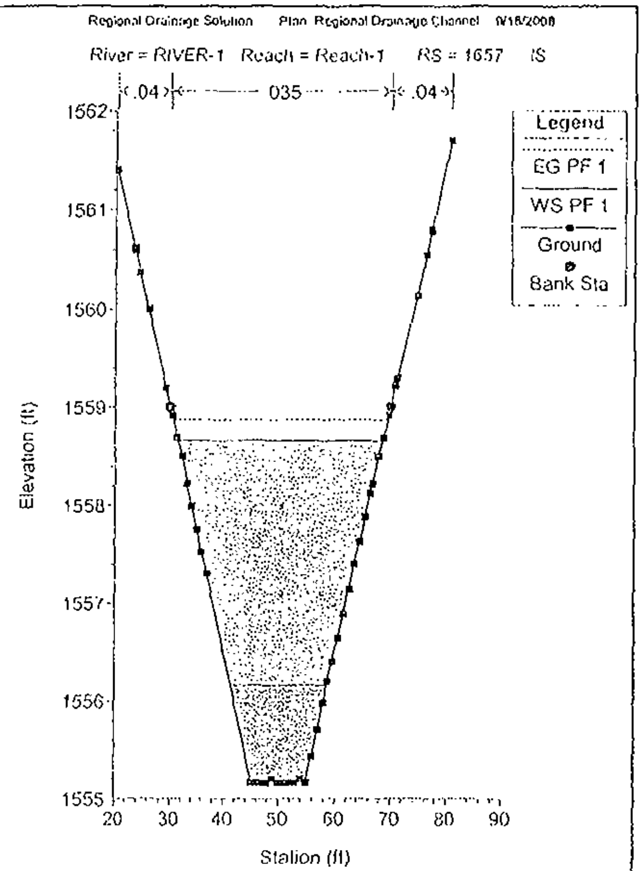

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1803
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1566
1564
1562
1560
1558
1556
10
20
30
40
50
60
70
80
Station (ft)

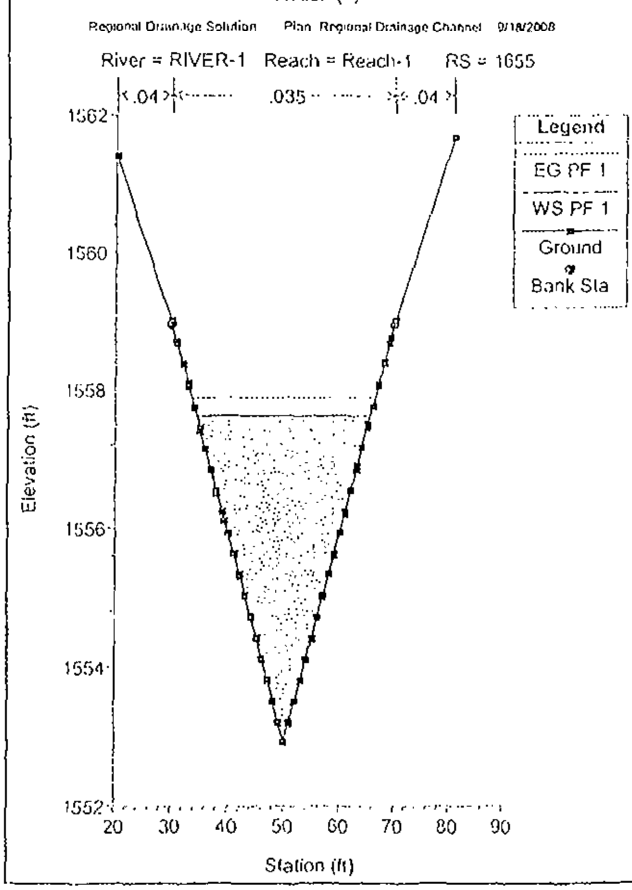

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1778
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1564
1562
1560
1558
1556
10
20
30
40
50
60
70
80
Station (ft)

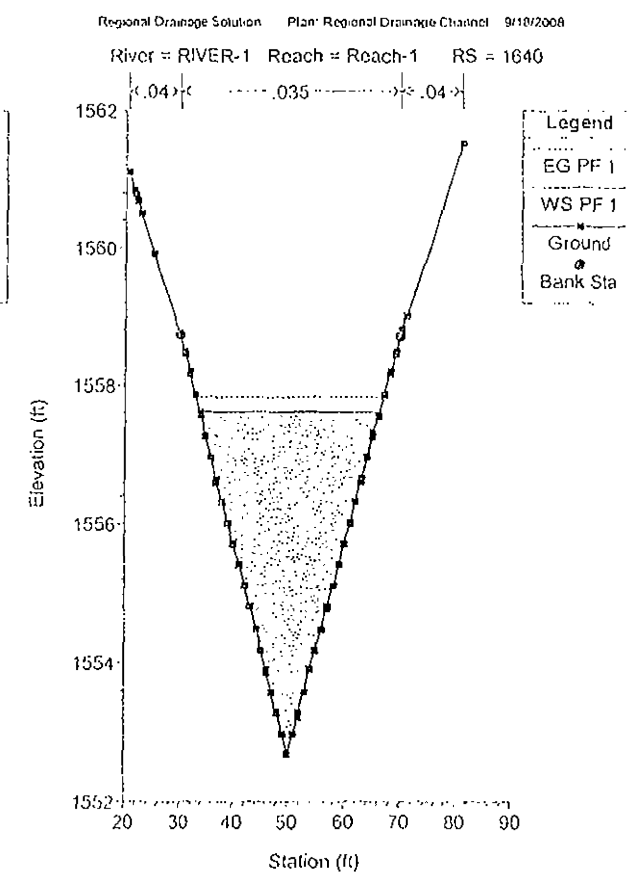

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1731
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1563
1562
1561
1560
1559
1558
1557
1556
1555
20
30
40
50
60
70
80
Station (ft)

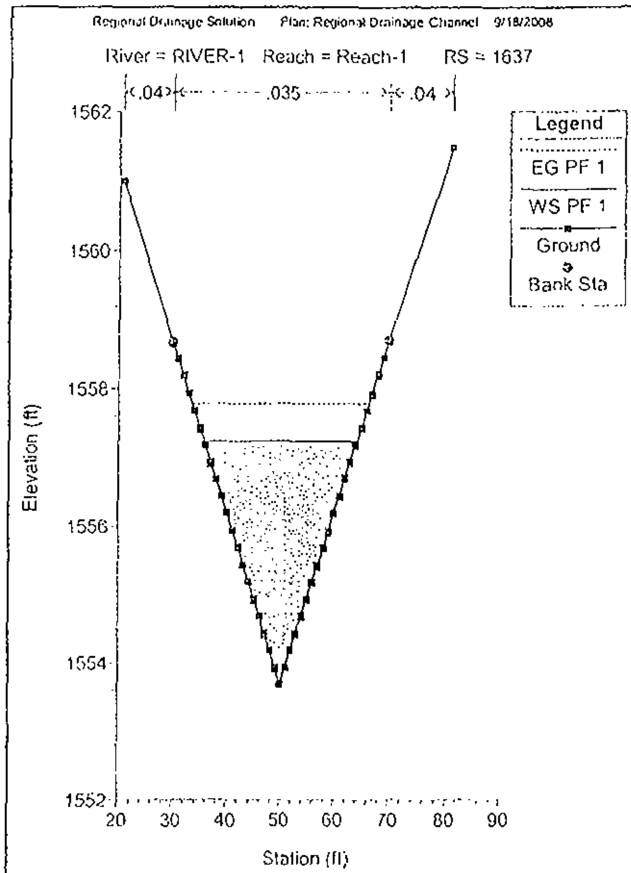

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1683
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1561
1560
1559
1558
1557
1556
1555
20
30
40
50
60
70
80
Station (ft)

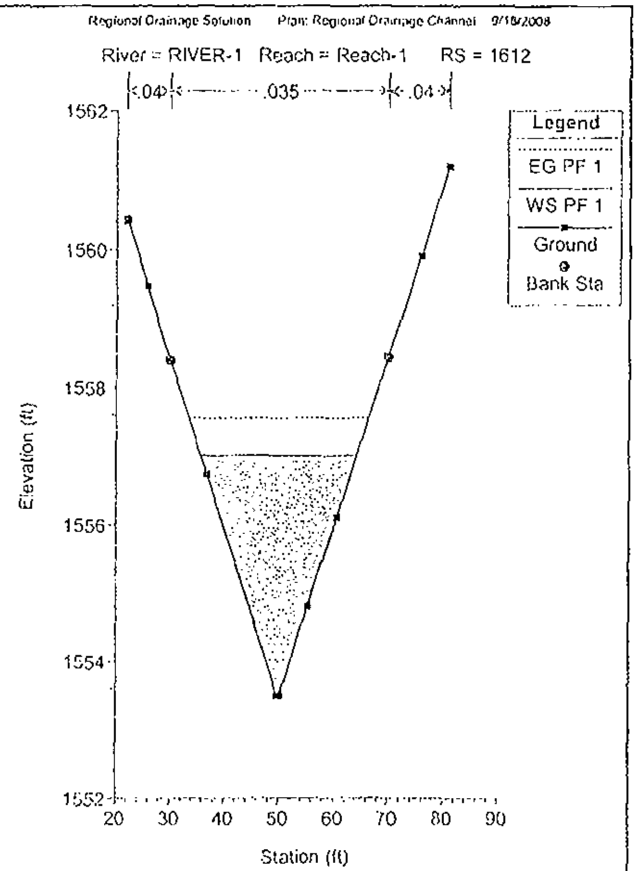

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1658
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1562
1561
1560
1559
1558
1557
1556
1555
20 30 40 50 60 70 80 90
Station (ft)

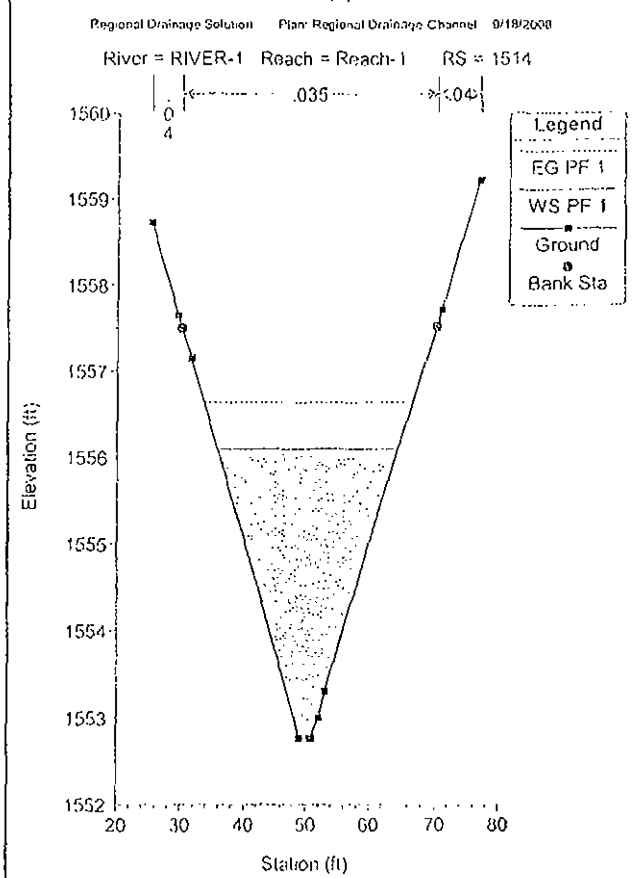

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1657 IS
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1561
1560
1559
1558
1557
1556
1555
20 30 40 50 60 70 80 90
Station (ft)

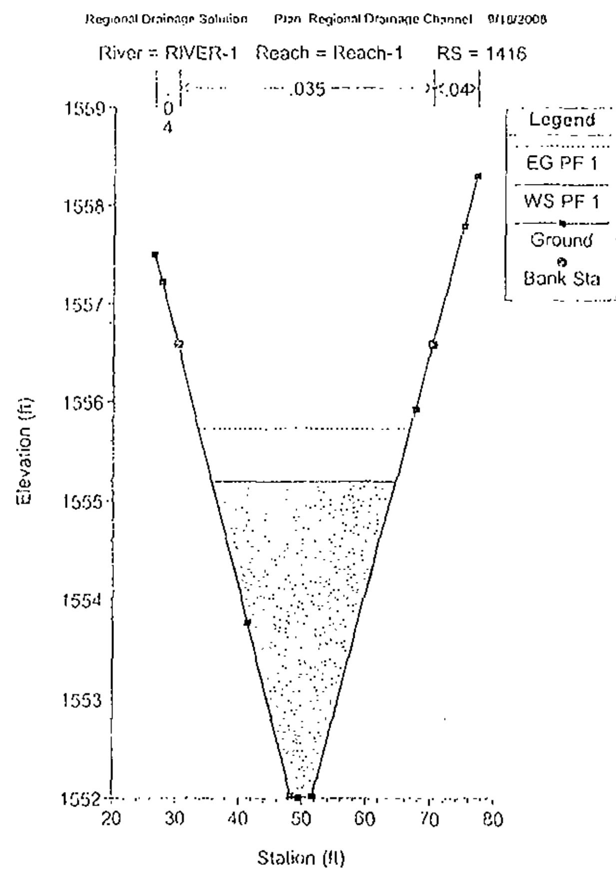

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1655
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1560
1558
1556
1554
1552
20 30 40 50 60 70 80 90
Station (ft)

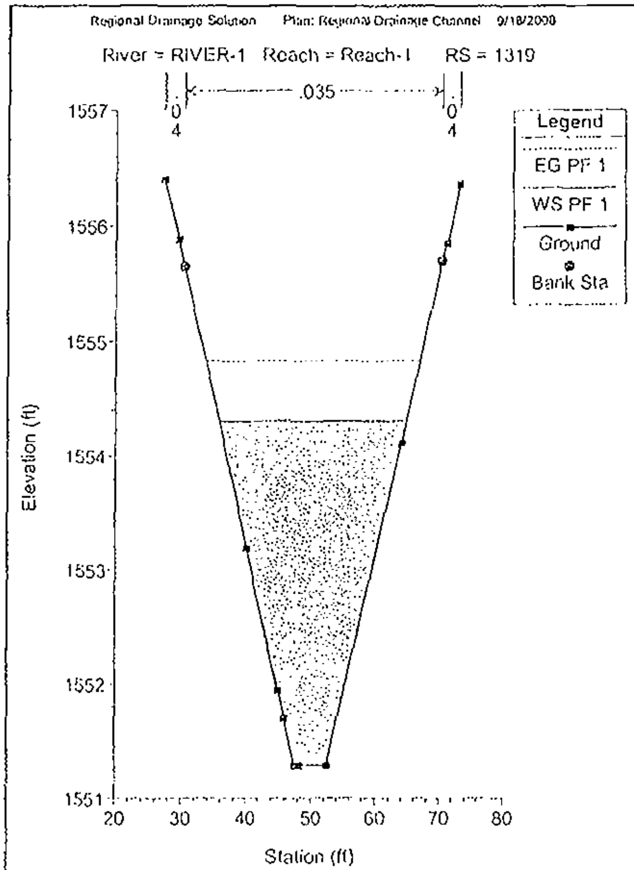

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1640
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1562
1560
1558
1556
1554
1552
20 30 40 50 60 70 80 90
Station (ft)

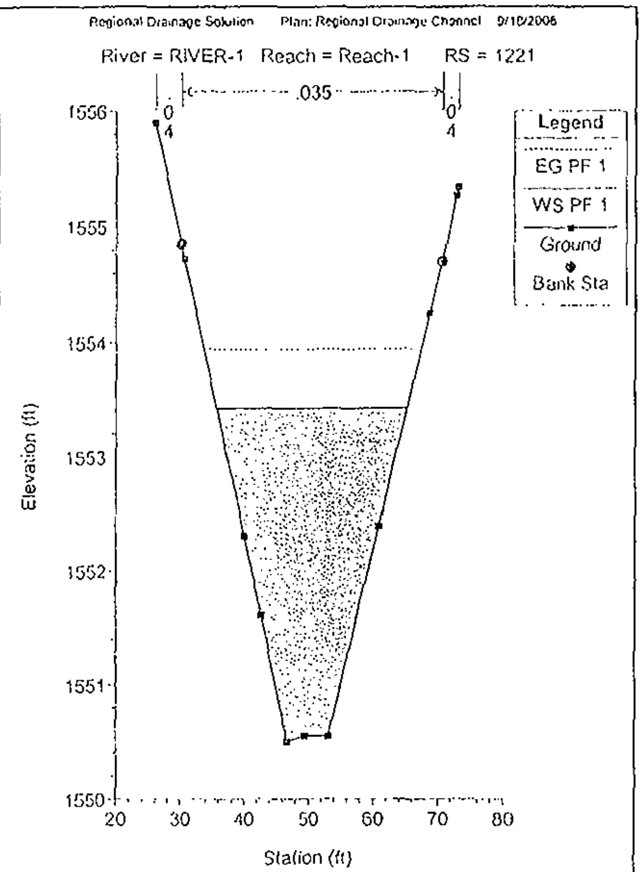

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1637
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

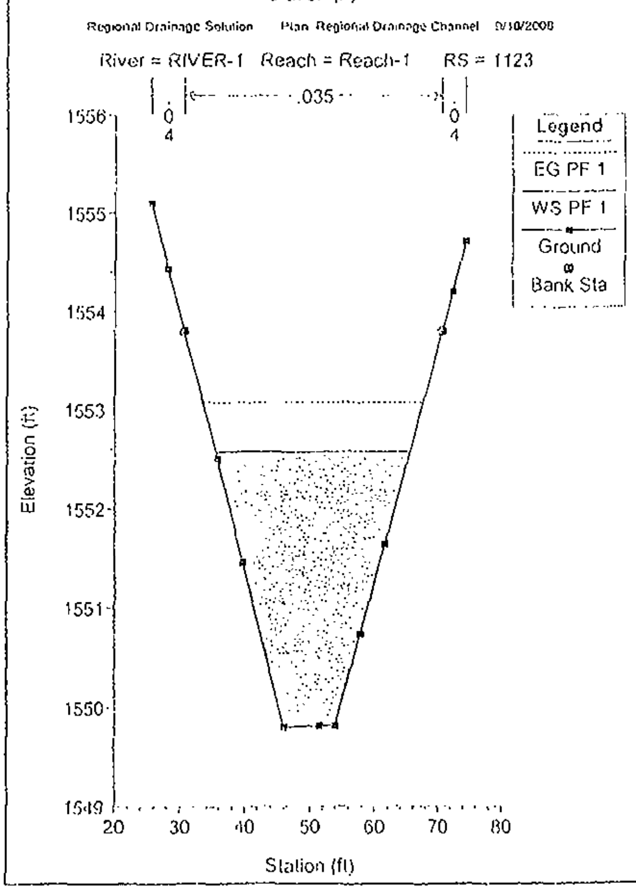

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1612
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

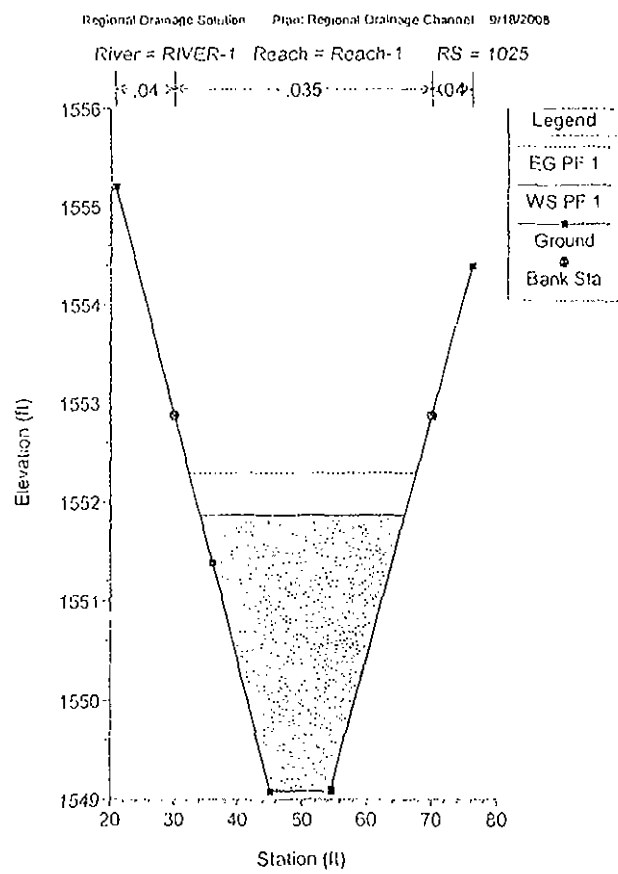

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1514
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

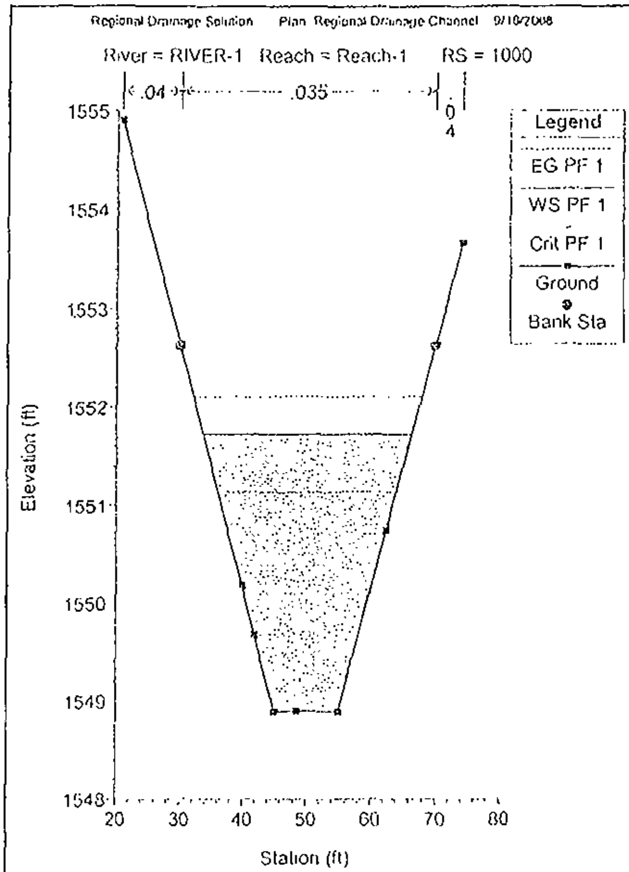

Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1416
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1319
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1551
1552
1553
1554
1555
1556
1557
20 30 40 50 60 70 80


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1221
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1550
1551
1552
1553
1554
1555
1556
20 30 40 50 60 70 80


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1123
.035
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1549
1550
1551
1552
1553
1554
1555
1556
20 30 40 50 60 70 80


Regional Drainage Solution Plan: Regional Drainage Channel 9/18/2008
River = RIVER-1 Reach = Reach-1 RS = 1025
.04 .035 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1549
1550
1551
1552
1553
1554
1555
1556
20 30 40 50 60 70 80



Regional Drainage Solution Plan: Regional Drainage Channel 9/10/2008
River = RIVER-1 Reach = Reach-1 RS = 1000
.04
.035
.04
1555
1554
1553
1552
1551
1550
1549
1548
Elevation (ft)
20
30
40
50
60
70
80
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3581 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1585.25	Q Gates (cfs)	
W.S. Elev (ft)	1585.03	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1583.86
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	72.37	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	16.98	Gate Submerg	0.00
Weir Sta Rgt (ft)	47.77	Gate Invert (ft)	0.00
Weir Max Depth (ft)	3.06	Gate Weir Coef	0.000
Weir Avg Depth (ft)	2.35		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.44	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1582.20	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	30.79		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3373 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1582.51	Q Gates (cfs)	
W.S. Elev (ft)	1582.30	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1580.88
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	73.03	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	19.30	Gate Submerg	0.00
Weir Sta Rgt (ft)	48.75	Gate Invert (ft)	0.00
Weir Max Depth (ft)	3.20	Gate Weir Coef	0.000
Weir Avg Depth (ft)	2.48		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.40	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1579.32	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	29.44		

Errors Warnings and Notes

Warning:	The inline structure solution failed to converge. The program used the solution with the least error.

Plan: RDC 100yr RIVER-1 Reach-1 RS: 3155 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1579.04	Q Gates (cfs)	
W.S. Elev (ft)	1578.84	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1576.77
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.91	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	16.94	Gate Submerg	0.00
Weir Sta Rgt (ft)	56.63	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.70	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.96		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.11	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1576.35	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	39.70		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2796 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1574.04	Q Gates (cfs)	
W.S. Elev (ft)	1573.84	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1572.74
Q Weir (cfs)	300.00	Gate #Open	

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2796 Inl Struct Profile: PF 1 (Continued)

Weir Flow Area (sq ft)	77.07	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.50	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.49	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.42	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1571.31	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.99		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2559 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1570.94	Q Gates (cfs)	
W.S. Elev (ft)	1570.74	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1569.66
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.03	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.51	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.46	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.43	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1568.21	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.96		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 2170 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1566.68	Q Gates (cfs)	
W.S. Elev (ft)	1566.47	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1565.38
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	76.16	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.56	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.57	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.70	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.95		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.45	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1563.99	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	39.00		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1988 Inl Struct Profile: PF 1

E.G. Elev (ft)	1564.02	Q Gates (cfs)	
W.S. Elev (ft)	1563.82	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1562.70
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.23	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.44	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.44	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.73	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.41	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1561.30	Breach Flow Area (sq ft)	

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1988 Inl Struct: Profile: PF 1 (Continued)

Wr.Top Wdth (ft)	39.01		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1822 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1561.44	Q Gates (cfs)	
W.S. Elev (ft)	1561.24	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1560.14
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	77.05	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.50	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.47	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.74	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.98		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.42	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1558.71	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.97		

Plan: RDC 100yr RIVER-1 Reach-1 RS: 1657 Inl Struct: Profile: PF 1

E.G. Elev (ft)	1558.87	Q Gates (cfs)	
W.S. Elev (ft)	1558.66	Q Gate Group (cfs)	0.00
Q Total (cfs)	300.00	Gate Open Ht (ft)	1557.63
Q Weir (cfs)	300.00	Gate #Open	
Weir Flow Area (sq ft)	76.02	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	30.54	Gate Submerg	0.00
Weir Sta Rgt (ft)	69.46	Gate Invert (ft)	0.00
Weir Max Depth (ft)	2.71	Gate Weir Coef	0.000
Weir Avg Depth (ft)	1.95		
Weir Coef	2.600	Q Breach (cfs)	
Weir Submerg	0.47	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1556.17	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	38.91		

Culvert Calculator Report
RDC Outfall 100yr

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,552.00 ft	Headwater Depth/Height	1 37
Computed Headwater Elev:	1,551.73 ft	Discharge	300.00 cfs
Inlet Control HW Elev.	1,551.51 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev	*1,551.73 ft*	*Control Type*	*Entrance Control*

Grades

Upstream Invert	1,547.62 ft	*Downstream Invert*	1,545 80 ft
Length	375.00 ft	Constructed Slope	0.004853 ft/ft

Hydraulic Profile

Profile	S2	Depth, Downstream	1.96 ft
Slope Type	Steep	Normal Depth	1.96 ft
Flow Regime	Supercritical	Critical Depth	2.22 ft
Velocity Downstream	9.56 ft/s	Critical Slope	0.003401 ft/ft

Section

Section Shape	Box	Mannings Coefficient	0 013
Section Material	*Concrete*	*Span*	*8.00 ft*
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	2		

Outlet Control Properties

Outlet Control HW Elev.	1,551.73 ft	Upstream Velocity Head	1.11 ft
Ke	0 70	Entrance Loss	0 78 ft

Inlet Control Properties

Inlet Control HW Elev.	1,551.51 ft	Flow Control	Transition
Inlet Type	0° wingwall flares	Area Full	48.0 ft²
K	0.06100	HDS 5 Chart	8
M	0 75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

HEC-RAS Plan: RDC 10yr River: RIVER-1 Reach: Reach-1 Profile: PF 1														
River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	LOB Elev	ROB Elev	Flow Depth	Freeboard Req	Freeboard Prov
	(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
4222	105.00	1582.97	1585.13	1585.17	0.000576	1.53	68.79	36.28	0.20	1588.20	1589.30	2.16	1.00	3.07
4172	105	1582.80	1584.97	1585.10	0.002851	2.97	35.35	22.87	0.42	1587.82	1587.84	2.17	1.00	2.85
4130	105	1582.73	1584.84	1584.98	0.003072	3.04	34.50	22.78	0.44	1587.60	1588.56	2.11	1.00	2.76
4070	105	1582.59	1584.67	1584.80	0.002829	2.93	35.78	23.47	0.42	1588.00	1589.33	2.08	1.00	3.33
4039	105	1582.53	1584.68	1584.73	0.000866	1.88	55.86	26.06	0.23	1588.33	1588.98	2.15	1.00	3.65
4004	Culvert													
3953	105	1582.33	1584.63	1584.67	0.000701	1.76	59.80	26.06	0.20	1587.99	1588.61	2.30	1.00	3.36
3915	105	1582.25	1584.50	1584.62	0.002423	2.81	37.38	23.22	0.39	1587.90	1588.90	2.25	1.00	3.40
3819	105	1582.04	1584.26	1584.38	0.002524	2.84	36.96	23.33	0.40	1587.90	1589.11	2.22	1.00	3.64
3715	105	1581.80	1583.98	1584.11	0.002715	2.92	35.99	23.06	0.41	1587.80	1589.14	2.18	1.00	3.82
3663	105	1581.57	1583.87	1583.98	0.002203	2.70	38.84	23.84	0.37	1587.80	1588.70	2.30	1.00	3.93
3635	105	1581.44	1583.81	1583.92	0.001941	2.58	40.64	24.27	0.35	1587.70	1588.57	2.37	1.00	3.89
3582	105	1581.19	1583.75	1583.83	0.001308	2.30	45.62	23.80	0.29	1587.23	1587.03	2.56	1.00	3.28
3581	Inl Struct													
3579	105	1578.96	1582.52	1582.67	0.002612	3.10	33.89	18.55	0.40	1587.24	1586.88	3.56	1.00	4.36
3564	105	1578.70	1582.52	1582.62	0.001559	2.49	42.23	22.09	0.32	1587.02	1586.40	3.82	1.00	3.88
3561	105	1579.71	1581.98	1582.56	0.018555	6.11	17.18	15.14	1.01	1586.89	1586.40	2.27	1.00	4.42
3467	105	1579.00	1581.01	1581.26	0.006804	3.99	26.31	21.14	0.63	1585.10	1584.55	2.01	1.00	3.54
3374	105	1578.30	1580.89	1580.98	0.001296	2.33	45.07	22.76	0.29	1583.20	1582.91	2.59	1.00	2.02
3373	Inl Struct													
3371	105	1576.07	1579.59	1579.80	0.004030	3.70	28.34	16.12	0.49	1583.30	1582.90	3.52	1.00	3.31
3356	105	1575.82	1579.63	1579.73	0.001646	2.55	41.25	21.67	0.33	1583.42	1582.70	3.81	1.00	3.07
3353	105	1576.82	1579.12	1579.67	0.017321	5.96	17.62	15.32	0.98	1583.22	1582.64	2.30	1.00	3.52
3276	105	1576.24	1578.11	1578.50	0.012316	5.01	20.97	18.69	0.83	1582.40	1582.03	1.87	1.00	3.92
3216	105	1575.79	1577.82	1578.01	0.004662	3.43	30.57	23.21	0.53	1581.40	1580.73	2.03	1.00	2.91
3156	105	1575.34	1577.75	1577.83	0.001469	2.21	47.48	29.38	0.31	1580.80	1579.34	2.41	1.00	1.59
3155	Inl Struct													
3152	105	1572.09	1575.51	1575.63	0.002130	2.71	38.71	22.68	0.37	1578.10	1578.13	3.42	1.00	2.59
3138	105	1571.86	1575.50	1575.59	0.001522	2.39	43.91	24.10	0.31	1577.91	1577.91	3.64	1.00	2.41
3135	105	1572.86	1575.19	1575.55	0.011170	4.84	21.70	18.69	0.79	1577.86	1577.90	2.33	1.00	2.67
3110	105	1572.67	1574.92	1575.28	0.010755	4.79	21.91	18.74	0.78	1577.58	1577.58	2.25	1.00	2.66
3014	105	1571.95	1573.91	1574.25	0.010566	4.73	22.21	19.20	0.77	1576.51	1576.51	1.96	1.00	2.60
2918	105	1571.20	1573.00	1573.30	0.009150	4.42	23.76	20.49	0.72	1575.43	1575.43	1.80	1.00	2.43
2822	105	1570.50	1572.76	1572.86	0.002107	2.57	40.84	27.16	0.37	1574.36	1574.36	2.26	1.00	1.60
2797	105	1570.30	1572.73	1572.81	0.001569	2.28	46.08	28.60	0.32	1574.17	1574.17	2.43	1.00	1.44
2796	Inl Struct													
2794	105	1568.08	1571.47	1571.59	0.002228	2.76	38.07	22.48	0.37	1574.12	1574.12	3.39	1.00	2.65
2779	105	1567.85	1571.47	1571.56	0.001577	2.42	43.32	23.90	0.32	1573.90	1573.90	3.62	1.00	2.43
2776	105	1568.85	1571.11	1571.52	0.012857	5.09	20.62	18.12	0.84	1573.85	1573.85	2.26	1.00	2.74
2751	105	1568.66	1570.78	1571.19	0.013134	5.16	20.34	18.08	0.86	1573.52	1573.52	2.12	1.00	2.74
2668	105	1568.04	1569.85	1570.20	0.010667	4.73	22.21	19.39	0.78	1572.43	1572.43	1.81	1.00	2.58
2586	105	1567.40	1569.66	1569.77	0.002339	2.65	39.68	26.58	0.38	1571.35	1571.35	2.26	1.00	1.69
2561	105	1567.20	1569.63	1569.71	0.001574	2.28	46.03	28.60	0.32	1571.07	1571.10	2.43	1.00	1.44
2559	Inl Struct													
2557	105	1564.98	1568.40	1568.51	0.002147	2.72	30.60	22.63	0.37	1571.00	1571.02	3.42	1.00	2.60
2543	105	1564.80	1568.39	1568.48	0.001526	2.40	43.80	24.01	0.31	1570.80	1570.80	3.59	1.00	2.41
2540	105	1565.75	1568.09	1568.44	0.010724	4.76	22.08	18.76	0.77	1570.75	1570.75	2.34	1.00	2.66
2515	105	1565.56	1567.83	1568.18	0.010577	4.76	22.06	18.81	0.77	1570.47	1570.47	2.27	1.00	2.64
2408	105	1564.76	1566.76	1567.09	0.009827	4.60	22.80	19.44	0.75	1569.32	1569.32	2.00	1.00	2.56
2302	105	1563.97	1565.69	1566.02	0.010257	4.60	22.84	20.25	0.76	1568.16	1568.16	1.72	1.00	2.47
2196	105	1563.17	1565.42	1565.52	0.002158	2.55	41.11	27.34	0.37	1567.00	1567.00	2.25	1.00	1.58
2171	105	1562.98	1565.39	1565.47	0.001567	2.27	46.23	28.80	0.32	1566.72	1566.82	2.41	1.00	1.33
2170	Inl Struct													
2168	105	1560.72	1564.11	1564.23	0.002236	2.76	38.10	22.46	0.37	1566.69	1566.77	3.39	1.00	2.58
2153	105	1560.50	1564.10	1564.20	0.001615	2.44	42.96	23.88	0.32	1566.53	1566.50	3.60	1.00	2.40
2150	105	1561.49	1563.72	1564.15	0.014208	5.29	19.86	17.90	0.88	1566.49	1566.49	2.23	1.00	2.77
2125	105	1561.30	1563.32	1563.78	0.015240	5.47	19.21	17.54	0.92	1566.13	1566.10	2.02	1.00	2.78
2071	105	1560.90	1562.85	1563.13	0.008222	4.29	24.47	20.31	0.69	1565.33	1565.33	1.95	1.00	2.48
2015	105	1560.49	1562.73	1562.85	0.002487	2.71	38.70	26.11	0.39	1564.49	1564.49	2.24	1.00	1.76
1990	105	1560.29	1562.71	1562.79	0.001522	2.25	46.61	28.76	0.31	1564.13	1564.13	2.42	1.00	1.42
1988	Inl Struct													
1986	105	1558.04	1561.43	1561.55	0.002241	2.76	38.07	22.34	0.37	1564.10	1564.00	3.39	1.00	2.65
1972	105	1557.81	1561.42	1561.51	0.001587	2.43	43.20	23.89	0.32	1563.90	1563.86	3.61	1.00	2.44
1969	105	1558.81	1560.99	1561.46	0.015562	5.50	19.08	17.41	0.93	1563.81	1563.81	2.18	1.00	2.82
1944	105	1558.60	1560.60	1561.07	0.015615	5.51	19.06	17.52	0.93	1563.43	1563.40	2.00	1.00	2.80
1896	105	1558.27	1560.24	1560.51	0.007636	4.17	25.17	20.61	0.67	1562.69	1562.69	1.97	1.00	2.45
1849	105	1557.92	1560.15	1560.27	0.002592	2.76	38.04	25.81	0.40	1561.96	1562.00	2.23	1.00	1.81
1824	105	1557.70	1560.13	1560.21	0.001571	2.28	46.04	28.56	0.32	1561.57	1561.60	2.43	1.00	1.44
1822	Inl Struct													
1821	105	1555.48	1558.88	1558.99	0.002224	2.76	38.09	22.49	0.37	1561.52	1561.52	3.40	1.00	2.64
1806	105	1555.25	1558.87	1558.96	0.001595	2.43	43.26	23.91	0.32	1561.30	1561.30	3.62	1.00	2.43
1803	105	1556.30	1558.46	1558.91	0.014548	5.36	19.59	17.75	0.90	1561.20	1561.25	2.16	1.00	2.74
1778	105	1556.06	1558.03	1558.52	0.016615	5.63	18.65	17.40	0.96	1560.86	1560.90	1.97	1.00	2.83
1731	105	1555.70	1557.69	1557.95	0.007342	4.11	25.52	20.73	0.65	1560.13	1560.13	1.99	1.00	2.44
1683	105	1555.35	1557.60	1557.72	0.002481	2.72	38.65	25.98	0.39	1559.39	1559.40	2.25	1.00	1.79
1658	105	1555.16	1557.58	1557.66	0.001562	2.28	46.14	28.59	0.32	1559.00	1559.00	2.42	1.00	1.42
1657	Inl Struct													
1655	105	1552.91	1556.36	1556.47	0.002036	2.66	39.42	27.88	0.36	1558.95	1558.95	3.45	1.00	2.59
1640	105	1552.68	1556.35	1556.44	0.001473	2.36	44.45	24.27	0.31	1558.73	1558.70	3.67	1.00	2.35
1637	105	1553.68	1556.08	1556.40	0.009380	4.53	23.19	19.30	0.73	1558.68	1558.70	2.40	1.00	2.60
1612	105	1553.49	1555.85	1556.17	0.009400	4.55	23.05	19.23	0.73	1558.40	1558.44	2.36	1.00	2.55
1514	105	1552.76	1554.94	1555.26	0.009265	4.53	23.20	19.37	0.73	1557.50	1557.51	2.18	1.00	2.56
1416	105	1552.00	1554.05	1554.36	0.009013	4.46	23.54	19.71	0.72	1556.58	1556.58	2.05	1.00	2.53
1319	105	1551.28	1553.18	1553.48	0.008959	4.42	23.76	20.13	0.72	1555.65	1555.70	1.90	1.00	2.47
1221	105	1550.50	1552.31	1552.61	0.008793	4.35	24.13	20.68	0.71	1554.05	1554.70	1.81	1.00	2.39
1123	105	1549.80	1551.48	1551.76	0.008518	4.25	24.71	21.46	0.70	1553.79	1553.80	1.68	1.00	2.31
1025	105	1549.08	1550.69	1550.95	0.008034	4.11	25.56	22.38	0.68	1552.07	1552.87	1.61	1.00	2.18
1000	105	1548.89	1550.16	1550.63	0.018070	5.55	18.93	20.11	1.01	1552.63	1552.63	1.27	1.00	2.47

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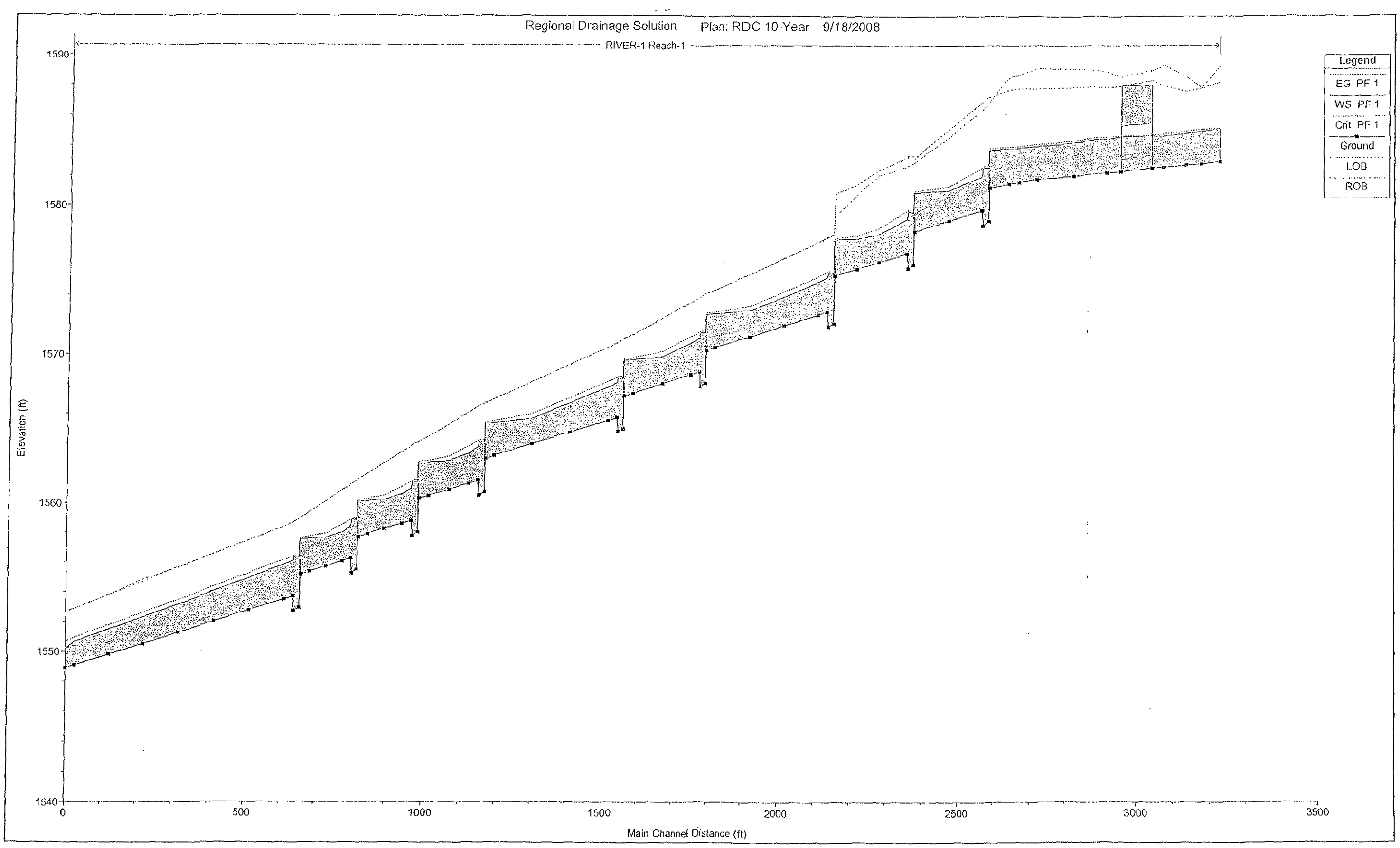


Regional Drainage Solution Plan: RDC 10-Year 9/18/2008
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
1540
1550
1560
1570
1580
1590
Main Channel Distance (ft)
0
500
1000
1500
2000
2500
3000
3500

Culvert Calculator Report
RDC Outfall 10yr

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	1,552 00 ft	Headwater Depth/Height	0.68
Computed Headwater Elev:	1,549.66 ft	Discharge	105.00 cfs
Inlet Control HW Elev.	1,549.48 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev.	1,549 66 ft	Control Type	Entrance Control

Grades			
Upstream Invert	1,547.62 ft	Downstream Invert	1,545.80 ft
Length	375.00 ft	Constructed Slope	0.004853 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	0.97 ft
Slope Type	Steep	Normal Depth	0.97 ft
Flow Regime	Supercritical	Critical Depth	1.10 ft
Velocity Downstream	6.76 ft/s	Critical Slope	0.003298 ft/ft

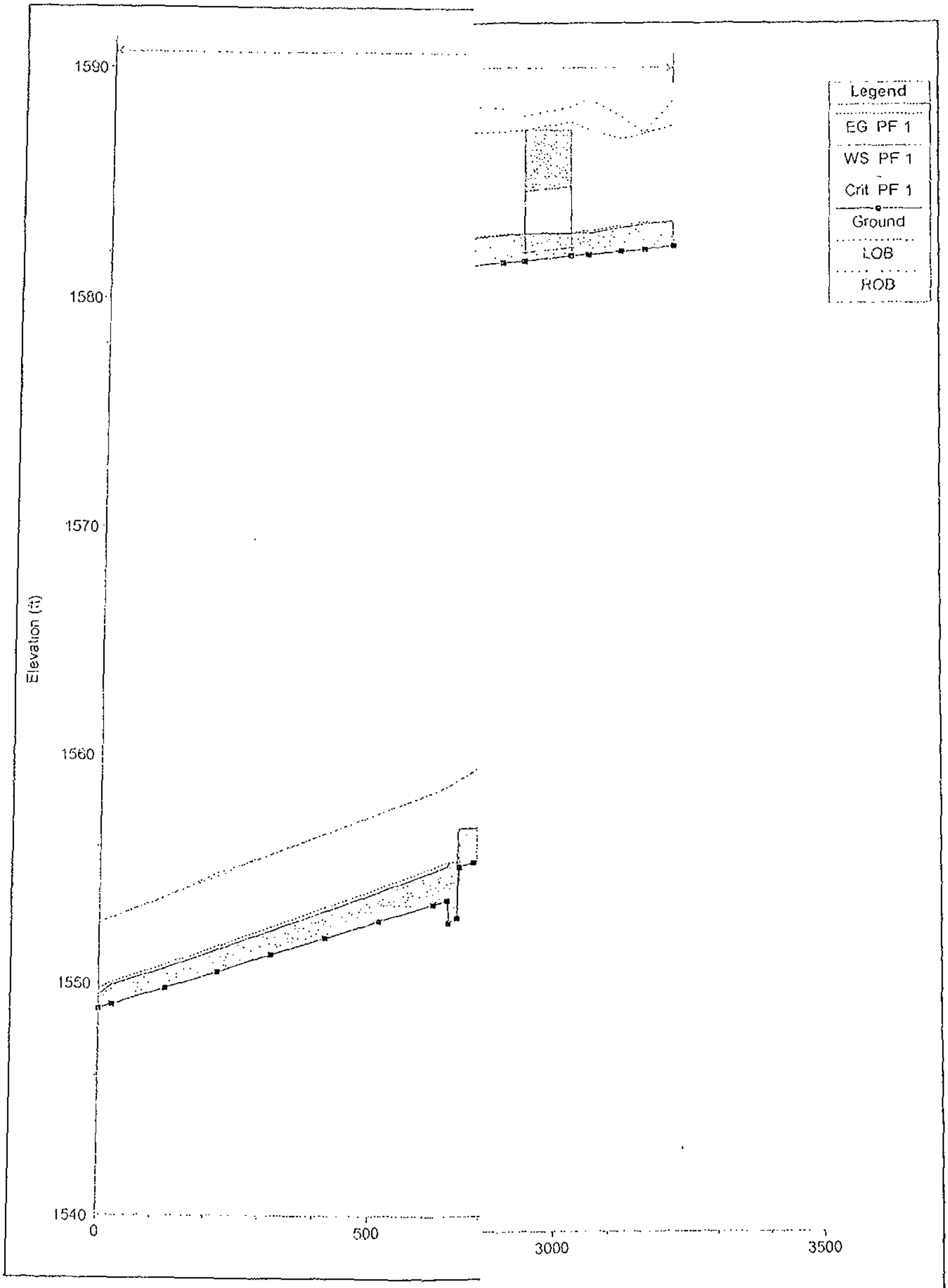
Section			
Section Shape	Box	Mannings Coefficient	0 013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev.	1,549.66 ft	Upstream Velocity Head	0.55 ft
Ke	0.70	Entrance Loss	0.39 ft

Inlet Control Properties			
Inlet Control HW Elev	1,549.48 ft	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	48.0 ft²
K	0.06100	HDS 5 Chart	8
M	0 75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

HEC-RAS Plan RDC 2yr River RIVER-1 Reach Reach-1 Profile: PF 1

River Sta	Q Total	Min Ch El	W.S. Elev	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	LOB Elev	ROB Elev	Flow Depth	Freeboard Req	Freeboard Prov
	(cfs)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
4222	30	1582.97	1584.03	1584.04	0.000583	0.90	30.71	32.42	0.18	1588.20	1589.30	1.06	1.00	4.17
4172	30	1582.80	1583.91	1583.98	0.002872	2.06	14.57	16.56	0.39	1587.82	1587.84	1.11	1.00	3.91
4130	30	1582.73	1583.77	1583.85	0.003454	2.19	13.70	16.32	0.42	1587.60	1588.56	1.04	1.00	3.83
4070	30	1582.59	1583.54	1583.62	0.004075	2.28	13.15	16.72	0.45	1588.00	1589.33	0.95	1.00	4.46
4039	30	1582.53	1583.53	1583.56	0.000803	1.15	26.13	26.03	0.20	1588.33	1588.98	1.00	1.00	4.80
4004	Culvert													
3953	30	1582.33	1583.51	1583.53	0.000470	0.97	30.84	26.05	0.16	1587.99	1588.61	1.18	1.00	4.48
3915	30	1582.25	1583.44	1583.49	0.002122	1.86	16.11	16.91	0.34	1587.90	1588.90	1.19	1.00	4.46
3819	30	1582.04	1583.24	1583.29	0.002089	1.84	16.28	17.19	0.33	1587.90	1589.11	1.20	1.00	4.66
3715	30	1581.80	1583.04	1583.09	0.001858	1.77	16.95	17.41	0.32	1587.80	1589.14	1.24	1.00	4.76
3663	30	1581.57	1582.97	1583.01	0.001170	1.50	19.94	18.45	0.26	1587.80	1588.70	1.40	1.00	4.83
3635	30	1581.44	1582.95	1582.98	0.000899	1.37	21.87	19.05	0.23	1587.70	1588.57	1.51	1.00	4.75
3582	30	1581.19	1582.92	1582.94	0.000446	1.09	27.59	19.97	0.16	1587.23	1587.03	1.73	1.00	4.11
3581	Inl Struct													
3579	30	1578.96	1581.45	1581.50	0.001388	1.78	16.88	13.27	0.28	1587.24	1586.88	2.49	1.00	5.43
3564	30	1578.70	1581.45	1581.48	0.000744	1.38	21.78	15.06	0.21	1587.02	1586.40	2.75	1.00	4.95
3561	30	1579.71	1581.09	1581.44	0.021934	4.76	6.30	9.17	1.01	1586.89	1586.40	1.38	1.00	5.31
3467	30	1579.00	1580.08	1580.21	0.007706	3.00	10.01	13.62	0.62	1585.10	1584.55	1.08	1.00	4.47
3374	30	1578.30	1580.05	1580.07	0.000440	1.10	27.40	19.29	0.16	1583.20	1582.91	1.75	1.00	2.86
3373	Inl Struct													
3371	30	1576.07	1578.56	1578.63	0.002092	2.12	14.16	11.40	0.33	1583.36	1582.90	2.49	1.00	4.34
3356	30	1575.82	1578.57	1578.60	0.000770	1.40	21.44	15.62	0.21	1583.42	1582.70	2.75	1.00	4.13
3353	30	1576.82	1578.32	1578.57	0.013852	4.01	7.49	9.99	0.82	1583.22	1582.64	1.50	1.00	4.32
3276	30	1576.24	1577.25	1577.47	0.014457	3.83	7.83	11.80	0.83	1582.40	1582.03	1.01	1.00	4.78
3216	30	1575.79	1577.04	1577.11	0.002727	2.01	14.91	16.94	0.38	1581.40	1580.73	1.25	1.00	3.69
3156	30	1575.34	1577.01	1577.03	0.000516	1.07	27.97	23.44	0.17	1580.80	1579.34	1.67	1.00	2.33
3155	Inl Struct													
3152	30	1572.09	1574.51	1574.55	0.001096	1.55	19.39	16.01	0.25	1578.10	1578.13	2.42	1.00	3.59
3138	30	1571.86	1574.51	1574.53	0.000675	1.29	23.23	17.46	0.20	1577.91	1577.91	2.65	1.00	3.40
3135	30	1572.86	1574.32	1574.51	0.011228	3.54	8.47	11.69	0.73	1577.86	1577.90	1.46	1.00	3.54
3110	30	1572.67	1574.03	1574.23	0.011444	3.58	8.37	11.60	0.74	1577.58	1577.58	1.35	1.00	3.55
3014	30	1571.95	1573.11	1573.27	0.008627	3.17	9.47	12.87	0.65	1576.51	1576.51	1.16	1.00	3.40
2918	30	1571.20	1572.11	1572.29	0.011998	3.45	8.69	13.36	0.75	1575.43	1575.43	0.91	1.00	3.32
2822	30	1570.50	1572.00	1572.03	0.000924	1.33	22.51	21.08	0.23	1574.36	1574.36	1.50	1.00	2.36
2797	30	1570.30	1571.99	1572.01	0.000550	1.11	27.11	22.70	0.18	1574.17	1574.17	1.69	1.00	2.18
2796	Inl Struct													
2794	30	1568.08	1570.48	1570.52	0.001158	1.58	19.02	15.88	0.25	1574.12	1574.12	2.40	1.00	3.64
2779	30	1567.85	1570.48	1570.50	0.000696	1.31	22.93	17.29	0.20	1573.90	1573.90	2.63	1.00	3.42
2776	30	1568.85	1570.26	1570.48	0.012992	3.72	8.07	11.51	0.78	1573.85	1573.85	1.41	1.00	3.59
2751	30	1568.66	1569.98	1570.17	0.011024	3.53	8.49	11.70	0.73	1573.52	1573.52	1.32	1.00	3.54
2688	30	1568.04	1568.98	1569.18	0.013124	3.63	8.27	12.62	0.79	1572.43	1572.43	0.94	1.00	3.45
2586	30	1567.40	1568.90	1568.93	0.000995	1.38	21.80	20.55	0.24	1571.35	1571.35	1.50	1.00	2.45
2561	30	1567.20	1568.89	1568.91	0.000554	1.11	27.02	22.64	0.18	1571.07	1571.10	1.69	1.00	2.18
2559	Inl Struct													
2557	30	1564.98	1567.40	1567.44	0.001101	1.55	19.39	16.03	0.25	1571.00	1571.02	2.42	1.00	3.60
2543	30	1564.80	1567.40	1567.43	0.000677	1.29	23.24	17.54	0.20	1570.80	1570.80	2.60	1.00	3.40
2540	30	1565.75	1567.22	1567.40	0.010545	3.43	8.75	12.01	0.71	1570.75	1570.75	1.47	1.00	3.53
2515	30	1565.56	1566.90	1567.11	0.012611	3.72	8.07	11.40	0.78	1570.47	1570.47	1.34	1.00	3.57
2408	30	1564.76	1566.00	1566.13	0.006811	2.91	10.31	13.31	0.58	1569.32	1569.32	1.24	1.00	3.32
2302	30	1563.97	1564.77	1565.01	0.017535	3.93	7.63	12.86	0.90	1568.16	1568.16	0.80	1.00	3.39
2196	30	1563.17	1564.67	1564.70	0.000888	1.31	22.89	21.35	0.22	1567.00	1567.00	1.50	1.00	2.33
2171	30	1562.98	1564.66	1564.68	0.000536	1.09	27.41	22.89	0.18	1566.72	1566.82	1.68	1.00	2.06
2170	Inl Struct													
2166	30	1560.72	1563.12	1563.16	0.001150	1.57	19.09	15.94	0.25	1566.69	1566.77	2.40	1.00	3.57
2153	30	1560.50	1563.12	1563.14	0.000731	1.33	22.62	17.38	0.20	1566.53	1566.50	2.62	1.00	3.38
2150	30	1561.49	1562.89	1563.12	0.013394	3.79	7.91	11.24	0.80	1566.49	1566.49	1.40	1.00	3.60
2125	30	1561.30	1562.48	1562.74	0.016679	4.12	7.28	10.87	0.89	1566.13	1566.10	1.18	1.00	3.62
2071	30	1560.90	1562.04	1562.16	0.005503	2.82	10.62	13.89	0.57	1565.33	1565.33	1.14	1.00	3.29
2015	30	1560.49	1561.98	1562.01	0.001053	1.41	21.28	20.18	0.24	1564.49	1564.49	1.49	1.00	2.51
1990	30	1560.29	1561.97	1561.99	0.000524	1.09	27.56	22.82	0.17	1564.13	1564.13	1.68	1.00	2.16
1988	Inl Struct													
1986	30	1558.04	1560.44	1560.48	0.001137	1.57	19.12	15.75	0.25	1564.10	1564.08	2.40	1.00	3.64
1972	30	1557.81	1560.43	1560.46	0.000718	1.32	22.78	17.47	0.20	1563.90	1563.86	2.62	1.00	3.43
1969	30	1558.81	1560.20	1560.43	0.014411	3.90	7.70	11.13	0.83	1563.81	1563.81	1.39	1.00	3.61
1944	30	1558.60	1559.76	1560.03	0.017505	4.19	7.15	10.81	0.91	1563.43	1563.40	1.16	1.00	3.64
1896	30	1558.27	1559.45	1559.56	0.005499	2.65	11.31	14.33	0.53	1562.69	1562.69	1.18	1.00	3.24
1849	30	1557.92	1559.40	1559.44	0.001095	1.43	20.93	19.93	0.25	1561.96	1562.00	1.49	1.00	2.56
1824	30	1557.70	1559.39	1559.41	0.000541	1.10	27.22	22.65	0.18	1561.57	1561.60	1.69	1.00	2.18
1822	Inl Struct													
1821	30	1555.48	1557.89	1557.93	0.001132	1.56	19.19	15.94	0.25	1561.52	1561.52	2.41	1.00	3.63
1806	30	1555.25	1557.89	1557.91	0.000696	1.30	23.03	17.36	0.20	1561.30	1561.30	2.64	1.00	3.41
1803	30	1556.30	1557.67	1557.89	0.012797	3.73	8.04	11.41	0.78	1561.20	1561.25	1.37	1.00	3.53
1778	30	1556.06	1557.19	1557.49	0.019991	4.40	6.82	10.61	0.97	1560.86	1560.90	1.13	1.00	3.67
1731	30	1555.70	1556.90	1557.00	0.005023	2.57	11.67	14.49	0.50	1560.13	1560.13	1.20	1.00	3.23
1683	30	1555.35	1556.86	1556.89	0.001013	1.39	21.52	20.15	0.24	1559.39	1559.40	1.51	1.00	2.53
1658	30	1555.16	1556.85	1556.87	0.000529	1.09	27.49	22.80	0.18	1559.00	1559.00	1.69	1.00	2.15
1657	Inl Struct													
1655	30	1552.91	1555.35	1555.39	0.001048	1.52	19.77	16.24	0.24	1558.95	1558.95	2.44	1.00	3.60
1640	30	1552.68	1555.35	1555.37	0.000662	1.28	23.46	17.65	0.20	1558.73	1558.70	2.67	1.00	3.35
1637	30	1553.68	1555.18	1555.35	0.009305	3.31	9.07	12.03	0.67	1558.68	1558.70	1.50	1.00	3.50
1612	30	1553.49	1554.95	1555.12	0.009333	3.33	9.02	12.00	0.68	1558.40	1558.44	1.46	1.00	3.45
1514	30	1552.76	1554.05	1554.21	0.009165	3.29	9.12	12.23	0.67	1557.50	1557.51	1.29	1.00	3.45
1416	30	1552.00	1553.18	1553.34	0.008700	3.19	9.41	12.74	0.65	1556.58	1556.58	1.18	1.00	3.40
1319	30	1551.28	1552.32	1552.48	0.008019	3.15	9.53	13.33	0.66	1555.65	1555.70	1.04	1.00	3.33
1221	30	1550.50	1551.50	1551.64	0.008351	3.03	9.91	14.12	0.64	1554.85	1554.70	1.00	1.00	3.20
1123	30	1549.80	1550.68	1550.82	0.008631	2.99	10.04	15.02	0.64	1553.79	1553.80	0.88	1.00	3.11
1025	30	1549.08	1549.94	1550.05	0.005972	2.71	11.08	16.36	0.58	1552.87	1552.87	0.86	1.00	2.93
1000	30	1548.89	1549.50	1549.75	0.022047	4.03	7.44	14.79	1.00	1552.63	1552.63	0.61	1.00	3.13



Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
1590
1580
1570
1560
1550
1540
0
500
3000
3500

Culvert Calculator Report
RDC Outfall 2yr

Solve For: Headwater Elevation

Culvert Summary

Allowable HW Elevation	1,552.00 ft	Headwater Depth/Height	0.29
Computed Headwater Elev.	1,548.50 ft	Discharge	30.00 cfs
Inlet Control HW Elev.	1,548.42 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev.	1,548.50 ft	Control Type	Entrance Control

Grades

Upstream Invert	1,547.62 ft	Downstream Invert	1,545.80 ft
Length	375.00 ft	Constructed Slope	0.004853 ft/ft

Hydraulic Profile

Profile	S2	Depth, Downstream	0.44 ft
Slope Type	Steep	Normal Depth	0.44 ft
Flow Regime	Supercritical	Critical Depth	0.48 ft
Velocity Downstream	4.28 ft/s	Critical Slope	0.003661 ft/ft

Section

Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	2		

Outlet Control Properties

Outlet Control HW Elev.	1,548.50 ft	Upstream Velocity Head	0.24 ft
Ke	0.70	Entrance Loss	0.17 ft

Inlet Control Properties

Inlet Control HW Elev.	1,548.42 ft	Flow Control	Unsubmerged
Inlet Type	0° wingwall flares	Area Full	48.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

APPENDIX C

Erosion Protection

Level I Scour

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Rip Rap Design Calculations
Date:	9/16/2008

Level 1 Analysis of Stream Degradation

Reference: ADWR, Flood Warning and Dam Safety Section, 1996.
State Standard 5-96: "Watercourse System Sediment Balance - Guideline 2:
Channel Degradation Estimation for Alluvial Channels in Arizona"

Assumptions: Channel reaches without major disturbances, such as dams and bridges.

Equations: Ds = Dgs + Dlts

where:
Ds = total scour depth, in feet;
Dgs = general degradation, in feet;
Dlts = long term degradation, in feet;

For straight channel reaches:
Dgs = 0.157*Q100^0.4

For channel reaches with curvature:
Dgs = 0.219*Q100^0.4

Long term degradation:
Dlts = 0.02*Q100^0.6

Project Name: Regional Drainage Solution **Location:** Scottsdale

Input Data:

Q100 = 300 *cfs*

Ds =	2.15 ft	for straight channel
Ds =	2.76 ft	otherwise

Recommended Scour Depth = 3.0 ft

Note: the minimum total scour depth, Ds, shall be 3 feet.

Bend Scour Calculation

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Bend Scour Design Calculations
Date:	9/16/2008

Bend Scour Calculation Sheet

Reference: ADWR, Design Manual for Engineering Analysis of Fluvial Systems, 1985 p5 105-5.110

Project Name. Regional Drainage Solution — Wood/Patel # 073022

Scour Depth Equation:

Zbs = (0.0685*Y*V^0.8)[2.1*(sin²(a/2)/cos(a))^0.2-1]/(Yh^0.4*Se^0.3)

Where Zbs = bend scour component of total scour depth (ft)
V = mean velocity of upstream flow (fps)
Y = maximum depth of upstream flow (ft)
Yh = hydraulic depth of upstream flow (ft)
Se = upstream energy slope (bed slope for uniform flow conditions, ft/ft)
a = angle formed by the projection of the channel centerline from the point of curvature to a point which meets a line tangent to the outer bank of the channel (degrees)

Scour Length Equation

X = 2.3*(C/g^0.5)*Y

Where X = distance from the end of channel curvature (point of tangency P.T.) to the downstream point at which secondary currents have dissipated (ft)
*C = Chezy coefficient = 1.486*R^(1/6)/n*
g = gravitational acceleration (32.2 ft/s²)
Y = depth of flow (to be conservative, use maximum depth of flow, exclusive of scour, within the bend) (ft)

Input Data

V =	4.1	(ft/s)	n =	0.035	
Y =	3.56	(ft)	A =	73.54	(ft²)
Yh =	2.35	(ft)	P =	33	(ft)
Se =	0.003104		R =	2.23	(ft)
a =	40	(degree)	C =	48.52	
		Stable bank side slope =		3	(H:V)

Computed Scour Values

Scour Depth:		Scour Length:		Scour Width:	
Zbs =	1.34 (ft)	X =	70 (ft)	W =	4.0 (ft)

Rip Rap Design

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Rip Rap Design Calculations
Date:	9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, Engineering and Design Hydraulic Design of Flood Control Channels. No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24, (Suggested gradation for riprap).

$$D_{30} = S_f C_S C_V C_T d \left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w} \right)^{1/2} \cdot \frac{V}{\sqrt{K_1 g d}} \right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Inlet Driveway Culvert

Inlet Riprap Size

Safety Factor, S_f	1.3	
Stability Coefficient, C_s	0.375	*(Assume rounded rock)*
Vertical Velocity Dist., C_v	1.00	
Thickness Coefficient, C_T	1.00	
Local Depth, d	3.94	ft
Unit Weight of Water, γ_w	62.4	lbs/ft^3
Unit Weight of Stones, γ_s	165	lbs/ft^3
Local Velocity, V	3.6	ft/sec
Bank Angle With Horizontal, θ	18.43	°
Rip Rap Angle of Repose (Fig 6-8), Φ	37	°
Bank Angle Correction Factor, K_1	0.8509	
Computed Riprap Size, D_{30}	0.9	inches
Computed Riprap Size, D_{50}	1.3	inches
Computed Riprap Size, D_{15}	0.6	inches
Computed Riprap Size, D_{85}	2.0	inches

Design Riprap Size, D_{50} **9 inches** TYPE I

WOOD/PATEL

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS

Rip Rap Design

Site:	Interim Regional Drainage Channel
Location:	Scottsdale, Arizona
Description:	Rip Rap Design Calculations
Date:	9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, *Engineering and Design Hydraulic Design of Flood Control Channels.* No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations *May 1975, pVI-24, (Suggested gradation for riprap).*

$$D_{30} = S_f C_S C_V C_T d \left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w} \right)^{1/2} \frac{V}{\sqrt{K_1 g d}} \right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Channel Bend

Inlet Riprap Size

Safety Factor, S_f	1.3		
Stability Coefficient, C_s	0.375	(Assume rounded rock)	
Vertical Velocity Dist., C_v	1.15		
Thickness Coefficient, C_T	1.00		
Local Depth, d	3.56	ft	
Unit Weight of Water, γ_w	62.4	lbs/ft^3	
Unit Weight of Stones, γ_s	165	lbs/ft^3	
Local Velocity, V	4.1	ft/sec	
Bank Angle With Horizontal, θ	18.43	°	
Rip Rap Angle of Repose (Fig 6-8), Φ	39	°	
Bank Angle Correction Factor, K_1	0.8647		
Computed Riprap Size, D_{30}	1.4	inches	
Computed Riprap Size, D_{50}	2.1	inches	
Computed Riprap Size, D_{15}	0.9	inches	
Computed Riprap Size, D_{85}	3.1	inches	
Design Riprap Size, D_{50}	9	inches	TYPE I

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: Department of the Army, U.S. Army Corps of Engineers, Engineering and Design Hydraulic Design of Flood Control Channels. No. 1110-2-1601, Dated 30 June 1994, Chapter 3 (Riprap Protection)

US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24, (Suggested gradation for riprap).

$$D_{30} = S_f C_S C_V C_T d \left[\left(\frac{\gamma_w}{\gamma_S - \lambda_w} \right)^{1/2} \frac{V}{\sqrt{K_1 g d}} \right]^{2.5}$$

Project Name: Interim Regional Drainage Channel
Location: Culvert Under Scottdale Road

Inlet Riprap Size

Safety Factor, S_f	1.3	
Stability Coefficient, C_s	0.375	(Assume rounded rock)
Vertical Velocity Dist., C_v	1.00	
Thickness Coefficient, C_T	1.00	
Local Depth, d	2.84	ft
Unit Weight of Water, γ_w	62.4	lbs/ft^3
Unit Weight of Stones, γ_s	165	lbs/ft^3
Local Velocity, V	5.0	ft/sec
Bank Angle With Horizontal, θ	14.1	°
Rip Rap Angle of Repose (Fig 6-8), Φ	37	°
Bank Angle Correction Factor, K_1	0.9144	
Computed Riprap Size, D_{30}	1.9	inches
Computed Riprap Size, D_{50}	2.9	inches
Computed Riprap Size, D_{15}	1.3	inches
Computed Riprap Size, D_{85}	4.4	inches

Design Riprap Size, D_{50} **9 inches** TYPE I

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: *US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24.*

US DOT, FHWA, Hydraulic Design of Energy Dissipaters for Culverts and Channel, Sept. 1983, pII-5-II-9.

FCDMC, Drainage Design Manual for Maricopa County Arizona, Vol. II - Hydraulics. January 1996, p5.75-5.77.

Project Name: Interim Regional Drainage Channel
Project #: 073022

Structure ID: Union Hills Outlet
Culvert Size: 3- 8'x3' CBC

1. Riprap Size D50

Max. flow width Wo =	24.00 ft	
Max. culvert flow depth h =	3.00 ft	
Tailwater depth TW =	3.00 ft	
Exit Velocity Ve =	4.16 fps	
Tailwater velocity Vd =	2.20 fps	normal
Wash bottom width =	25.00 ft	
Computed Riprap Size D50 =	1.2 in	
Design Riprap Size D50 =	9 in	
Sieve Size =	TYPE I	

2. Riprap Sizes D15 and D85

Design Riprap Size D15 =	4 in
Design Riprap Size D85 =	14 in

3. Riprap Apron Length

Riprap Apron Length =	14 ft

4. Riprap Apron Width

Min. Riprap Apron Width =	30 ft
Max. Riprap Apron Width =	31 ft

5. Riprap Thickness

Riprap Thickness =	36 in

6. Total Riprap Volume

Riprap Rock Volume =	46 CY

Please note fields highlighted are input values from the Culvert Modeling Summary

Rip Rap Design

Site: Interim Regional Drainage Channel
Location: Scottsdale, Arizona
Description: Rip Rap Design Calculations
Date: 9/15/2008

Riprap Design Spreadsheet

References: *US DOT, FHWA, Highways in the River Environment Hydraulic and Environmental Design Considerations May 1975, pVI-24.*

US DOT, FHWA, Hydraulic Design of Energy Dissipaters for Culverts and Channel. Sept. 1983, pII-5-II-9.

FCDMC, Drainage Design Manual for Maricopa County Arizona, Vol. II - Hydraulics. January 1996, p5.75-5.77.

Project Name: Interim Regional Drainage Channel — Structure ID: **Driveway Outlet**
Project #: 073022 — Culvert Size: 3- 8'x3' CBC

1. Riprap Size D50

Max. flow width Wo =	24.00 ft	
Max. culvert flow depth h =	3.00 ft	
Tailwater depth TW =	3.00	
Exit Velocity Ve =	4.17 fps	
Tailwater velocity Vd =	3.05 fps	normal
Wash bottom width =	25.00 ft	
Computed Riprap Size D50 =	12 in	
Design Riprap Size D50 =	9 in	
Sieve Size =	TYPE I	

2. Riprap Sizes D15 and D85

Design Riprap Size D15 =	4 in
Design Riprap Size D85 =	14 in

3. Riprap Apron Length

Riprap Apron Length =	8 ft

4. Riprap Apron Width

Min. Riprap Apron Width =	30 ft
Max. Riprap Apron Width =	31 ft

5. Riprap Thickness

Riprap Thickness =	36 in

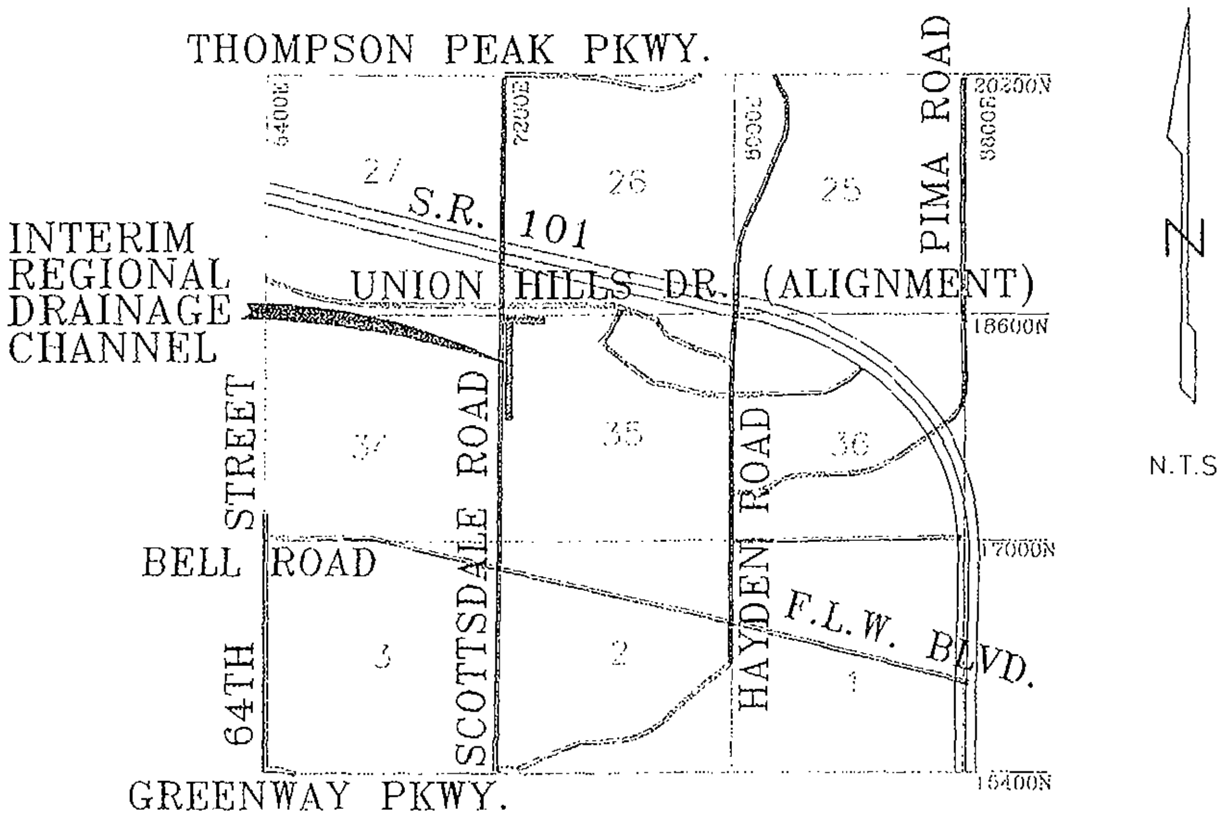
6. Total Riprap Volume

Riprap Rock Volume =	26 CY

Please note fields highlighted are input values from the Culvert Modeling Summary

EXHIBIT 1

Vicinity Map



INTERIM REGIONAL DRAINAGE CHANNEL

Exhibit 1
Vicinity Map

WOOD/PATEL
LAND DEVELOPMENT • WATER RESOURCES
TRANSPORTATION/TRAFFIC
WATER/WASTEWATER • SURVEYING
CONSTRUCTION MANAGEMENT
(602) 335-8500
PHOENIX • MESA • TUCSON

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EXHIBIT 2

FEMA Map

LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

~~513~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the National Geodetic Vertical Datum of 1929

(A)——(A)	Cross section line
(2)······(2)	Transect line
112°07'08", 33°25'41"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere.
$^{41}76^{000m}$E	1000-meter Universal Transverse Mercator grid tick values zone 12
875000 FT	5000-foot grid tick values: Arizona State Plane coordinate system, central zone (FIPSZONE 3176) NAD83 (Transverse Mercator)
X DV2313	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORY

Refer to Repositories Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

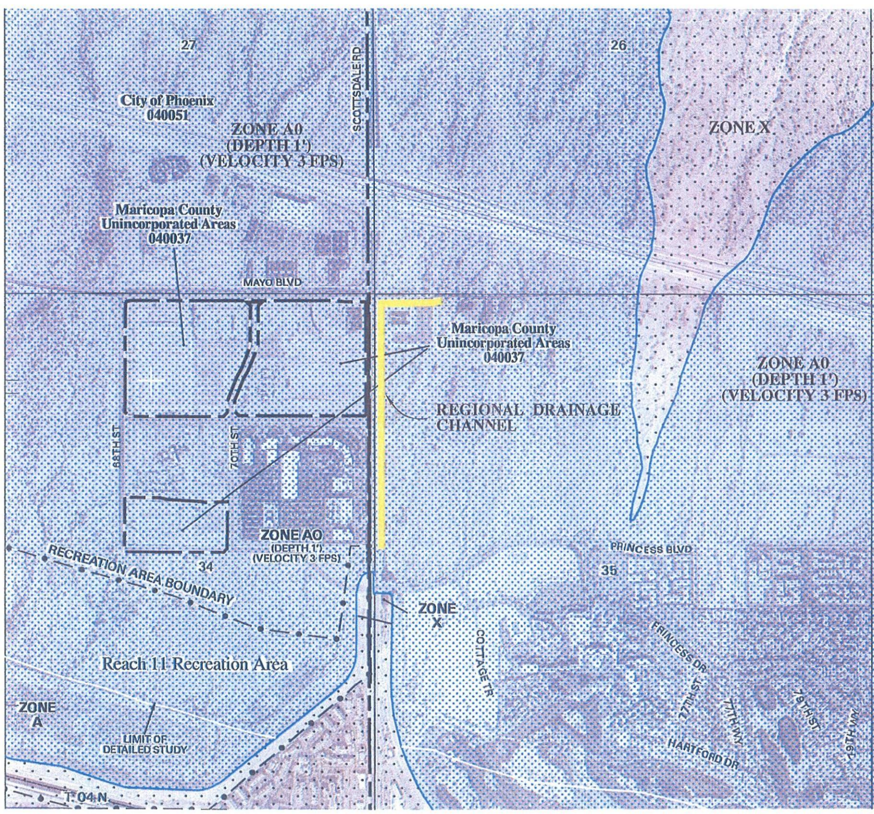
April 15, 1988

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

December 3, 1993, September 30, 1995, July 19, 2001

eptember 30, 2005 - to update corporate limits, to change Base Flood Elevations, add Base Flood Elevations, to add Special Flood Hazard Areas, to change pecial Flood Hazard Areas, to change zone designations, to add roads and road ames, to incorporate previously issued Letters of Map Revision, and to incorporate previously issued Letters of Map Amendment.

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



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1245H

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

PANEL 1245 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1245	H
PHOENIX, CITY OF	040051	1245	H
SCOTTSDALE, CITY OF	045012	1245	H

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

MAP NUMBER
04013C1245H

MAP REVISED
SEPTEMBER 30, 2005

Federal Emergency Management Agency

NOT FOR
CONSTRUCTION
OR RECORDING

INTERIM REGIONAL
DRAINAGE CHANNEL

WP# 073022 DATE: 09-15-2008

EXHIBIT 2
FEMA MAP

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