Project Specific
Preliminary Water Quality Management Plan

For: **Parcel 1 & 2 of TPM NO. 30522**

Southeast Corner of Bundy Canyon Rd. & Orange Street
Wildomar, CA

DEVELOPMENT NO. **TPM NO. 30522**
DESIGN REVIEW NO.

Prepared for:

Orange Bundy Partners, Ltd., a California Limited Partnership
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Prepared by:
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WQMP Preparation/Revision Date: February 23, 2012

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:

Orange Bundy Partners, Ltd., a California Limited Partnership

by Land Development Design Company, LLC for the project known as **Parcel 1 & 2 of TPM NO. 30522** at the **Southeast Corner of Bundy Canyon Road and Orange Street, Wildomar, CA**.

This WQMP is intended to comply with the requirements of the City of Wildomar for **TPM 30522**, which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Wildomar Water Quality Ordinance (Municipal Code Section).

If the undersigned transfers its interest in the subject property/project, its successor in interest the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Joseph Lacko	Managing Member
Owner's Printed Name	Owner's Title/Position

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APPENDICES

A. CONDITIONS OF APPROVAL (NOT INCLUDED)

B. VICINITY MAP, WQMP SITE PLAN, AND RECEIVING WATERS MAP

C. SUPPORTING DETAIL RELATED TO HYDRAULIC CONDITIONS OF CONCERN (IF APPLICABLE)

D. EDUCATIONAL MATERIALS

E. SOILS REPORT (NONE)

F. TREATMENT CONTROL BMP SIZING CALCULATIONS AND DESIGN DETAILS

G. AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS AND/OR OTHER MECHANISMS FOR ENSURING ONGOING OPERATION, MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC WQMP (NOT INCLUDED)

H. PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS (NONE)

I. Project Description

Project Owner: Orange Bundy Partners, Ltd., a California Limited Partnership
629 Camino de los Mares, Suite 206
San Clemente, CA 92673
Telephone: (949)489-0450

WQMP Preparer: Kevin J. Richer, Project Manager
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2313 E. Philadelphia Street, Suite F
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Telephone: (909)930-1466

Project Site Address:	Southeast Corner of Orange Street and Bundy Canyon Road Wildomar, CA
Planning Area/ Community Name/ Development Name:	None
APN Number(s):	367-100-024 & 367-100-026
Thomas Bros. Map:	Thomas Bros. Map Page 897, B4 & C4
Project Watershed:	Santa Margarita Watershed
Sub-watershed:	Murrieta Creek to Santa Margarita River to Santa Margarita Lagoon
Project Site Size:	2.31 Acres

Standard Industrial Classification (SIC) Code: 5812 & 5172

Formation of Home Owners' Association (HOA) or Property Owners Association (POA):

Y ☐ N ☒

Additional Permits/Approvals required for the Project

AGENCY	Permit required
State Department of Fish and Game, 1601 Streambed Alteration Agreement	Y ☐ N☒
State Water Resources Control Board, Clean Water Act (CWA) section 401 Water Quality Certification	Y ☐ N☒
US Army Corps of Engineers, CWA section 404 permit	Y ☐ N☒
US Fish and Wildlife, Endangered Species Act section 7 biological opinion	Y ☐ N☒
Other *(please list in the space below as required)* California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ)	Y ☒ N☐

The project is located on a 2.31 acre site on the southeast corner of Bundy Canyon Road and Orange Street in the City of Wildomar. The project site is currently undeveloped and has minimal vegetation. The site is bounded on the north by Bundy Canyon Road, a fully improved street; on the west by Orange Street, a partially improved street; on the east by the Interstate-15 freeway; and on the south by Parcels 3 & 4 of TPM No. 30522. The site has a few a few mounds but majorly sheet flows in a westerly direction towards Orange Street. The project is accepting tributary stormwater runoff from a small area between the freeway on-ramp and the project's right-of-way.

The project is proposing to construct a gas station with a convenience store on Parcel 1 and a fast food restaurant on Parcel 2. The easterly parcel, Parcel 2, is proposing to direct the stormwater runoff towards two drain inlets being near the southwest corner of Parcel 2. The westerly parcel, Parcel 1, is proposing to direct the stormwater runoff towards a drain inlet at the southwest corner of the parcel. A small area of the southeast corner of the site will direct stormwater runoff towards a drain inlet located easterly of the northeast corner of the convenience store building. All of the previously described areas are shown as Area 1 on the WQMP Exhibit in Appendix B and will discharge into a temporary Infiltration Basin that will be constructed on the Parcel to the south, Parcel 3 of the TPM No. 30522. The parcels being developed and Parcel 3 are under the same ownership. The owner plans to develop the parcels to the south at later time. As a result, the owner will construct a temporary Infiltration Basin on the parcel to the south. Once the parcel to the south is developed, an underground infiltration pipe system will be constructed in the future parking lot area of Parcel 5 to provide the required treatment volume for Parcel 1 to 7 on TPM No. 30522. The temporary Infiltration Basin was sized for Vbmp per the design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD). The temporary Infiltration Basin will be sufficient to treat the site for project pollutants of concern and will promote infiltration. See Appendix F for the infiltration basin sizing calculations. Furthermore, all of the drain inlets will have a FlexStorm Inlet Filter. Moreover, the maintenance shall be performed by a qualified maintenance contractor as outlined in Section VI.

Appendix A of this project-specific WQMP includes a complete copy of the final Conditions of Approval.

Appendix B of this project-specific WQMP includes a vicinity map, WQMP Exhibit, and Receiving Water Map.

Appendix G of this project-specific WQMP shall include copies of CC&Rs, Covenant and Agreements, and/or other mechanisms used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements.

II. Site Characterization

Land Use Designation or Zoning: C-P-S Scenic Highway Commercial

Current Property Use: Undeveloped

Proposed Property Use: Restaurant and Gas Station with Convenience Store

Availability of Soils Report: Y ☐ N ☒ *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*

Phase 1 Site Assessment: Y ☐ N ☒ *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Receiving Waters for Urban Runoff from Site

Receiving Waters	303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Murrieta Creek	Iron, Manganese, & Nitrogen	MUN, AGR, IND, PROC, GWR, REC2, WARM, WILD	N/A
Santa Margarita River	Phosphorus	MUN, AGR, IND, REC1, REC2, WARM, COLD, WILD, RARE	12 MILES
Santa Margarita Lagoon	Eutrophic	IND, NAV, REC1, REC2, COMM, WILD, RARE, EST, BIOL, MAR, AQUA, SHELL, SPAWN	28 MILES

III. Pollutants of Concern

Potential pollutants associated with Urban Runoff from the proposed project must be identified. Exhibit B of the WQMP provides brief descriptions of typical pollutants associated with Urban Runoff and a table that associates typical potential pollutants with types of development (land use). It should be noted that at the Co-Permittees discretion, the Co-Permittees may also accept updated studies from the California Association of Stormwater Quality Agencies (CASQA), USEPA, SWRCB and/or other commonly accepted agencies/associations acceptable to the Co-Permittee for determination of Pollutants of Concern associated with given land use. Additionally, in identifying Pollutants of Concern, the presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses and their potential for exposure to Urban Runoff must be addressed in project-specific WQMPs. The Co-Permittee may also require specific pollutants commonly associated with urban runoff to be addressed based on known problems in the watershed. The list of potential Urban Runoff pollutants identified for the project must be compared with the pollutants identified as causing an impairment of Receiving Waters, if any. To identify pollutants impairing proximate Receiving Waters, each project proponent preparing a project-specific WQMP shall, at a minimum, do the following:

1. For each of the proposed project discharge points, identify the proximate Receiving Water for each discharge point, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for the Santa Ana River Basin or the San Diego Region.
2. Identify each proximate identified above that is listed on the most recent list of Clean Water Act Section 303(d) list of impaired water bodies, which can be found at website www.swrcb.ca.gov/tmdl/303d_lists.html. List all pollutants for which the proximate Receiving Waters are impaired.
3. Compare the list of pollutants for which the proximate Receiving Waters are impaired with the pollutants expected to be generated by the project.

Urban Runoff Pollutants: The proximate receiving water is the Murrieta Creek, Hydrologic Unit #902.52. The Murrieta Creek discharges into the Santa Margarita River, Hydrologic Unit #902.22. The Santa Margarita River discharges into the Santa Margarita Lagoon, Hydrologic Unit #902.11.

The site contains no presence of Recognized Environmental Conditions (RECs).

The expected pollutants for this type of development are Pathogens, Oxygen Demanding Substances, Organic Compounds (hydrocarbons), Trash & Debris, Oil & Grease, and Metals.

The potential pollutants for this type of development are Sediment/Turbidity, Nutrients, and Pesticides.

The Murrieta Creek, Santa Margarita River, and Santa Margarita Lagoon are all listed as being impaired on the 303(d) list. The Murrieta Creek is listed as being impaired for Iron, Manganese, & Nitrogen. The Santa Margarita River is listed as being impaired for Phosphorus. The Santa Margarita Lagoon is listed as being impaired for Eutrophic. The Infiltration Basin will have a high/medium removal efficiency of pathogens, nutrients, sediments, and oxygen demanding substances;

and a high removal efficiency of metals. Moreover, the potential for nutrients is low because the potential for soil erosion is low and the use of fertilizers will be minimized per the landscape maintenance planning; the potential for Oxygen Demanding Substances is low because the site only has 10 % of landscape area and will be minimized per the landscape maintenance planning.

The Infiltration Basin has an unknown removal efficiency for Pesticides, Organic Compounds (hydrocarbons), Trash & Debris, and Oil & Grease; however, the Flex Storm Inlet Filters will have a high/medium removal efficiency for organic compounds (hydrocarbons), trash & debris, and oil & grease. The use of pesticides will be minimized per the landscape maintenance planning.

The site does not have presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses. Therefore, the site does not have the potential for exposure of legacy pesticides, nutrients, or hazardous substances to the project site's stormwater runoff.

IV. Hydrologic Conditions of Concern

Impacts to the hydrologic regime resulting from the Project may include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to the hydrologic regime of a Project's site would be considered a hydrologic condition of concern if the change would have a significant impact on downstream erosion compared to the pre-development condition or have significant impacts on stream habitat, alone or as part of a cumulative impact from development in the watershed.

This project-specific WQMP must address the issue of Hydrologic Conditions of Concern unless one of the following conditions are met:

- **Condition A:** Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with Co-Permittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the Co-Permittee.
- **Condition B:** The project disturbs less than 1 acre. The disturbed area calculation should include all disturbances associated with larger plans of development.
- **Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the Co-Permittee.

This Project meets the following condition: **Condition A**

The Hydrology Study included in Appendix C has been prepared for this project to size the temporary Infiltration Basin, to size the Orifice in the Infiltration Basin, and to size the overflow drain inlet in the Infiltration Basin. The Infiltration Basin will provide the required Vbmp, as dead storage, per the design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD). The temporary Infiltration Basin will have a concrete 36" by 36" Brooks Box or equal constructed for overflows from larger storms. The Brooks Box will have a 3" diameter orifice core drilled on one side to serve as a low flow orifice outlet. The invert of the orifice will be set at the maximum allowed depth for dead storage to treat the required Vbmp. The Hydrology Study prepared Unit Hydrographs and Routing to demonstrate that the Infiltration Basin will provide the sufficient capacity to mitigate increased flows for the 2-year, 24-hour and 10-year 24-hour rainfall events. Furthermore, the infiltration basin will provide 1-foot of freeboard as required per the Infiltration Basin design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD).

The project is proposing to mitigate the increased flows as stated in the paragraph above; however, the project is not required to mitigate the increased flows created by the development. The project will be discharging into an MS4 storm drain system that was sized to accept the developed runoff from site. The Hydrology and Hydrologic Report for Parcel Map 24032 prepared by The Keith Companies/Butterfield on October 22, 1990, for the "Sedco M.D.P. Line "F" Stage 2" shows that the existing 60" diameter storm drain running southerly of the northerly property line for Parcel 3 and 4 of

TPM No. 30522 was sized to accept the developed (commercial) runoff for Q100. The study shows that the existing storm drain was sized to accept the runoff from the freeway on-ramp, Bundy Canyon Road, Orange Street, and all of the runoff from TPM No. 30522. A copy of the study has been included for reference in the Hydrology Study in Appenix C. Furthermore, a copy of the Storm Drain Plan has been included for reference in the Hydrology Study in Appenix C.

V. Best Management Practices

V.1 SITE DESIGN BMPS

Project proponents shall implement Site Design concepts that achieve each of the following:

1) Minimize Urban Runoff
2) Minimize Impervious Footprint
3) Conserve Natural Areas
4) Minimize Directly Connected Impervious Areas (DCIAs)

The project proponent should identify the specific BMPs implemented to achieve each Site Design concept and provide a brief explanation for those Site Design concepts considered not applicable.

Table 1. Site Design BMPs

Design Concept	Technique	Specific BMP	Included: Yes	Included: No	Included: N/A
Site Design Concept 1	*Minimize Urban Runoff*	Maximize the permeable area (See Section 4.5.1 of the WQMP).	☒	☐	☐
		Incorporate landscaped buffer areas between sidewalks and streets.	☒	☐	☐
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	☒	☐	☐
		Use natural drainage systems.	☐	☐	☒
		Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	☒	☐	☐
		Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.	☒	☐	☐
		Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required to describe BMP and how it addresses Site Design concept).	☐	☐	☒

Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 2	*Minimize Impervious Footprint*	Maximize the permeable area (See Section 4.5.1 of the WQMP).	☒	☐	☐
		Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low -traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.	☐	☒	☐
		Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.	☐	☐	☒
		Reduce widths of street where off-street parking is available.	☐	☐	☒
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	☒	☐	☐
Site Design Concept 3	*Conserve Natural Areas*	Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	☐	☐	☒
		Conserve natural areas (See WQMP Section 4.5.1).	☐	☐	☒
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	☒	☐	☐
		Use natural drainage systems.	☐	☐	☒
		Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	☐	☐	☒

Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 4	*Minimize Directly Connected Impervious Areas (DCIAs)*	Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible.	☒	☐	☐
		Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	☒	☐	☐
		Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.	☐	☒	☐
		Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	☐	☐	☒
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.	☐	☐	☒
		Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to MS4s.	☐	☐	☒
		Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4.	☒	☐	☐
		Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface, or designed to drain into landscaping prior to discharging to the MS4.	☐	☐	☒
		Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	☐	☒	☐
		Overflow parking (parking stalls provided in excess of the Co-Permittee's minimum parking requirements) may be constructed with permeable paving.	☐	☐	☒
		Other comparable and equally effective design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	☐	☒	☐

Non-applicable Site Design BMPs:

There are no natural drainage systems to preserve.

There are no trails, patios, overflow parking lots, alleys, etc., and the walkways will be ADA accessible paths. The use of permeable surfaces is not suitable for this site.

The street improvements are being designed per the City requirements. Moreover, the City determines the width of the street.

There are no natural areas to conserve.

There are no natural drainage systems to conserve.

The use of vegetated drainage swales is not adequate for the design layout of this site.

The City has developed street improvement standards that do not allow for the use of rural swale systems, urban curb/swale system, and dual drainage systems.

The development is not proposing temporary, guest, or overflow parking.

Incorporating the landscaping that is proposed in parking areas into the drainage design is not adequate for the design layout of the site.

Project Site Design BMPs:

The project site proposes to maximize the permeable area for this type of development by proposing as much landscaping as possible.

There is a large landscape setback between the public streets and the site paving areas.

There are no trees or shrubs onsite; however, the proposed landscape will significantly increase the canopy interception for the site. The landscape will include the use of native and drought tolerant tree and shrubs.

The site is proposing to use an Infiltration Basin for low infiltration.

The site is proposing to use an Infiltration Basin to treat the stormwater runoff, increase infiltration opportunities, and mitigate the increased flows consistent with vector control objectives.

The landscape design does not propose the use of decorative concrete or other impervious materials. This will help maximize the permeable area.

The roof drains will discharge into landscape areas where feasible. All of the roof runoff will be collected by drain inlets and will go into the Infiltration Basin.

Where landscaping is proposed, the impervious sidewalks, walkways, trails, and patios are being drained into the adjacent landscaping as much as possible. Areas that do not drain toward landscape are directed to the Infiltration Basin.

The driveway is being designed as a shared access driveway.

See Section VI for any additional maintenance requirements of the Project Site Design BMPs. The maintenance shall be performed by a qualified maintenance contractor.

V.2 SOURCE CONTROL BMPS

Instructions: *Complete Table 2.*

Table 2. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	☒	☐	
Activity Restrictions	☒	☐	
Irrigation System and Landscape Maintenance	☒	☐	
Common Area Litter Control	☒	☐	
Street Sweeping Private Streets and Parking Lots	☒	☐	
Drainage Facility Inspection and Maintenance	☒	☐	
Structural Source Control BMPs			
MS4 Stenciling and Signage	☒	☐	
Landscape and Irrigation System Design	☒	☐	
Protect Slopes and Channels	☒	☐	
Provide Community Car Wash Racks	☐	☒	No Wash Facilities
Properly Design:	☐	☐	
Fueling Areas	☒	☐	
Air/Water Supply Area Drainage	☒	☐	
Trash Storage Areas	☒	☐	
Loading Docks	☐	☒	No loading docks
Maintenance Bays	☐	☒	No maintenance bays
Vehicle and Equipment Wash Areas	☐	☒	No Wash Areas
Outdoor Material Storage Areas	☐	☒	No Outdoor Storage
Outdoor Work Areas or Processing Areas	☐	☒	No Outdoor Processing
Provide Wash Water Controls for Food Preparation Areas	☒	☐	

<u>Property Owner and Tenant Education</u>- The owner shall familiarize himself with the pamphlets from the City of Wildomar discussing business operations, etc. and shall furnish copies of this document to all future tenants through lease agreements or CC&R's. The owner shall utilize the City of Wildomar's education materials for employee training on stormwater runoff regulations. The education materials will be provided by the Owner upon occupancy and annually thereafter to the owner/tenant.

<u>Activity Restrictions</u>- Tenants shall not be allowed to discharge chemicals, chemical residues, wastewater or other prohibited discharges listed in the Municipal Code, to the outside, paved areas of the site.

The Owner will include in the documents given to employees, tenants, etc. the prohibited activities listed below. The landscape maintenance contractor will also be instructed to prohibit these activities. The owner is responsible to enforce these restrictions until such time as the building is sold.

1. *The dumping of any waste into drainage areas. Waste disposal shall be limited to approved receptacles.*
2. *Blowing or sweeping of debris such as grass clippings, plant trimmings, dead leaves, etc. into the drainage areas, drain inlets, infiltration basin, or streets is prohibited.*

3. *The discharge of fertilizer or pesticides into streets is prohibited.*
4. *The trash dumpsters are to be leak proof, have closable lids, and maintained closed at all times.*
5. *Maintenance or repair is prohibited. There are no facilities for these activities.*
6. *Outdoor storage prohibited.*
7. *Vehicle washing is prohibited.*

Irrigation System & Landscape Maintenance- The owner will contract with a qualified landscaping contractor. The maintenance visits shall be conducted on a weekly basis at a minimum. Landscape crews shall inspect the irrigation system and the landscape for drainage problems after each landscape procedure. The landscape crew shall report problems to the owner and make repairs as necessary. All damaged or dead plants shall be removed and replanted. Any drainage problems shall be taken care of immediately to correct unwanted ponding.

Common Area Litter Control- A program shall be implemented to train employees to pick up litter, sweep, and clean the parking lot and trash enclosure on a daily basis..

Parking Lot Sweeping- Parking lots shall be swept weekly to prevent sediment, garden waste, and trash, or other pollutants from entering the infiltration basin and public storm channels.

Drainage System Maintenance- The Infiltration Basin shall be inspected every 6 months for the first year of operation. After the first year, the Infiltration Basin shall be inspected. Infiltration Basin shall be maintained perforated pipes accumulate 3 inches of sediment throughout the length of the pipes. See Appendix D for CASQA's recommendations. The maintenance shall be done by a qualified maintenance contractor. All drain inlets shall be inspected to ensure they are clean, free of standing water, working properly, and unobstructed from debris/sediment, etc.. All drainage problems shall be repaired and reported in the maintenance reports. This maintenance can be performed by a qualified maintenance contractor during regular landscape maintenance. All rip-rap pads shall be inspected and sediment shall be removed as required.

Stenciling and Signage- The Storm Drain System Stenciling and Signage shall be inspected annually at a minimum by the owner and shall be replaced as necessary. The Storm Drain System Stenciling and Signage shall be per City of Wildomar Standards.

Landscape & Irrigation System Design- The irrigation system for this project will be fitted with an automatic controller that controls the duration and the amount of water to be distributed into the irrigation system. The irrigation system shall also have overspray protection devices and automatic rain shutoff valves installed to reduce runoff from irrigation and to conserve water. The site will be landscaped and planted with grouped species, which have similar irrigation requirements, which will reduce runoff.

Protect Slopes & Channels- A Rip Rap Energy Dissipater will be placed at the headwall outlet of the storm drain pipes into the Infiltration Basin. Splash pads will be placed at all of the roof drain outlets in landscape areas. All manufactured slopes shall be landscaped. An irrigation system will be installed to promote growth of the slope landscaping. The landscape and irrigation system shall prevent erosion of the slope areas.

Fueling Areas- The Fueling Area will be under a covered canopy and will be paved with Portland Cement Concrete. In addition, the Fueling Area will be designed to prevent stormwater runoff from flowing through the concrete fueling area. The fuel dispensing area will be designed to have an appropriate slope to prevent ponding.

Air/Water Supply Area Drainage- The Air/Water Supply Area Drainage will be designed to contain spilled material for cleanup..

Trash Enclosure Design- A program shall be implemented to pick up litter and sweep and clean the trash enclosure on a daily basis. Trash enclosures are designed to divert all flows around the enclosure. All dumpsters will have lids installed and will be inspected to ensure that the dumpsters remain leak-proof. The owner shall ensure tenants contract with a refuse company to have the dumpsters emptied on a weekly basis at a minimum.

Wash Water Controls for Food Preparation Areas – The Food Preparation Areas will be within the proposed buildings. The Food Preparation Areas will drain into a proposed sewer line that connects to a grease interceptor before connecting to the existing sewer line.

See Section VI for any additional maintenance requirements of the Source Contorl BMPs. The maintenance shall be performed by a qualified maintenance contractor.

Appendix D includes copies of the educational materials that will be used in implementing this project-specific WQMP.

V.3 TREATMENT CONTROL BMPS

The treatment control BMP for this project will consist of a temporary Infiltration Basin. The parcel to the south, Parcel 3 of TPM No. 30522, and the parcels being developed, Parcels 1 & 2 of TPM No. 30522, are under the same ownership. The owner plans to develop the parcels to the south at later time. As a result the owner will construct a temporary Infiltration Basin on the parcel to the south. Once the parcel the parcel to the south is developed, an underground infiltration pipe system will be constructed in the parking lot area to provide the required treatment volume for Parcel 1 & 2 and also Parcel 3 to 7 of the same TPM. The site is proposing 1 drainage area as shown on the WQMP Exhibit in Appendix B. The temporary Infiltration Basin was sized for Vbmp per the design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD). The temporary Infiltration Basin will be sufficient to treat the site for project pollutant and will promote infiltration. See Appendix F for the infiltration basin sizing calculations. A soils report and infiltration test is not available at time; however, the site is listed as being in Soil Type “B” in the RCFC & WCD Hydrogic Soils Group Map for Elsinore (plate C-1.41). From previous project experience in the area with this Soil Type “B” we are assuming an infiltration rate of 2 inches per hour. Using a safety factor of 10 and a minimum draw down time of 48 hours, the maximum depth allowable in the Infiltration Basin will be 0.80 feet. The maximum depth proposed by the Infiltration Basin will be 0.80 feet. Furthermore, all of the drain inlets will have a FlexStorm Inlet Filter. **Moreover, the maintenance shall be performed by a qualified maintenance contractor as outlined in Section VI.**

The V(BMP) for AREA 1 is 5,881 CF.

Table 3: Treatment Control BMP Selection Matrix [1]

Pollutant of Concern	Treatment Control BMP Categories[2]							
	Veg. Swale & Veg. Filter Strips[3]	Detention Basins[4]	Infiltration Basins, Infiltration Trenches, & Porous Pavement[5]	Wet Ponds or Wetlands[6]	Sand Filter or Media Filters	Water Quality Inlets	Hydrodynamic Separator Systems [7]	Manufactured / Proprietary Devices[8]
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for turbidity)	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Y ☒ N ☐	☐	☐	☒	☐	☐	☐	☐	☒
Organic Compounds	U	U	U	U	H/M	L	L	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Oils & Grease	H/M	M	U	U	H/M	M	L/M	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Y ☐ N ☒	☐	☐	☒	☐	☐	☐	☐	☒
Metals	H/M	M	H	H	H	L	L	U
Y ☒ N ☐	☐	☐	☒	☐	☐	☐	☐	☒

Abbreviations:

L: Low removal efficiency H/M: High or medium removal efficiency U: Unknown removal efficiency

Notes:

(1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.

(2) Project applicants should base BMP designs on the Riverside County Stormwater Quality Best Management Practice Design Handbook. However, project applicants may also wish to reference the California Stormwater BMP Handbook – New Development and Redevelopment (www.cabmphandbooks.com). The Handbook contains additional information on BMP operation and maintenance.

(3) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.

(4) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.

(5) Projects that will utilize infiltration-based Treatment Control BMPs (e.g., Infiltration Basins, Infiltration Trenches, Porous Pavement, etc.) must include a copy of the property/project soils report as Appendix E to the project-specific WQMP. The selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff.

(6) Includes permanent pool wet ponds and constructed wetlands.

(7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.

(8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.

V.4 EQUIVALENT TREATMENT CONTROL ALTERNATIVES

NOT APPLICABLE

V.5 REGIONALLY-BASED TREATMENT CONTROL BMPS

NOT APPLICABLE

VI. Operation and Maintenance Responsibility for Treatment Control BMPs

The owner is responsible for funding, scheduling and implementation of all BMP inspections and maintenance. The owner is also responsible for assigning responsible parties for inspection and record keeping.

Owner: **Orange Bundy Partners, Ltd., a California Limited Partnership**
629 Camino de Los Mares, Suite 206
San Clemente, CA 92673
Contact Person: Joseph Lacko
Telephone: (949)489-0450

The Owner, Orange Bundy Partners, Ltd., a California Limited Partnership, shall be responsible for BMP Implementation, Maintenance, and Inspection. The paragraphs below contain the BMP implementation, maintenance, and inspection requirements. The form "Record of BMP Implementation, Maintenance, and Inspection" in Appendix I will be used to record implementation, maintenance, and inspection of BMPs. The inspection form shall include the date of the inspection, the name of the person who performed the inspection, the signature of the person who performed the inspection, the name of the bmp inspected/maintained, a description of the implementation, maintenance, and inspection activity performed. Completed forms shall be kept in Appendix J. Records shall be maintained continuously.

The owner will employ a qualified landscape maintenance contractor to maintain the landscape areas and irrigation system. The owner is responsible to implement this BMP at the time the landscape and irrigation systems are installed and continued for the perpetuity of ownership. The landscape maintenance shall be performed weekly at a minimum. This BMP shall commence upon installation of the landscape and irrigation system.

All paved areas of the site shall be swept weekly during the rainy season (October- May) and monthly during dry season by a sweeping contractor, to prevent sediment, debris, etc. from entering public storm channels. This BMP shall start after completion of the pavement.

The Infiltration Basin shall be inspected and maintained annually by a qualified maintenance contractor to ensure they are clean, free of standing water, working properly, and unobstructed from debris, sediment, etc.. The Infiltration Basin shall be inspected/maintained prior to, during, and after the rainy season at a minimum. During the first year of operation, the Infiltration Basin shall be inspected and maintained every 6 months at a minimum. See Appendix D for the CASQA's inspection and maintenance recommendations. This BMP shall start upon installation of the landscape and irrigation system.

The Owner shall have drain inlets inspected and maintained annually by a qualified maintenance contractor to ensure they are clean, free of standing water, working properly, and unobstructed from debris, sediment, etc.. The drain inlets shall be inspected/maintained prior to, during, and after the rainy season at a minimum. This BMP shall start after completion of the pavement.

The inlet filters shall be inspected, cleaned, and replaced as necessary. The debris shall be removed and disposed of in proper receptacles. The FlexStorm Inlet Filters shall be inspected/maintained prior to, during, and following the rainy season at a minimum. See manufactures maintenance recommendations in Appendix D. This BMP shall start after completion of the pavement.

Inspect Drain Inlets for Storm Drain System Stenciling and Signage. Replace as necessary. The catch basins shall be stenciled per the City of Wildomar's Standards. At a minimum the catch basin shall be stenciled "ONLY RAIN DOWN THE STORM DRAIN". The stencil on the catch basins shall be inspected by the owner annually at a minimum. This BMP shall start after completion of the pavement.

All rip-rap pads shall be inspected and sediment shall be removed as required. The rip-rap pads shall be inspected/maintained prior to, during, and following the rainy season at a minimum. This BMP shall start after completion of the pavement.

VII. Funding

A funding source or sources for the O&M of each Treatment Control BMP identified in the project-specific WQMP must be identified. By certifying the project-specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer O&M responsibilities is to record the project-specific WQMP against the title to the property.

The owner, **Orange Bundy Partners, Ltd., a California Limited Partnership,** is responsible for all funding sources for the operation and maintenance of each Treatment Control BMP included in the project.

Orange Bundy Partners, Ltd., a California Limited Partnership
629 Camino de Los Mares, Suite 206
San Clemente, CA 92673
Contact Person: Joseph Lacko
Telephone: (949)489-0450

Appendix A

Conditions of Approval

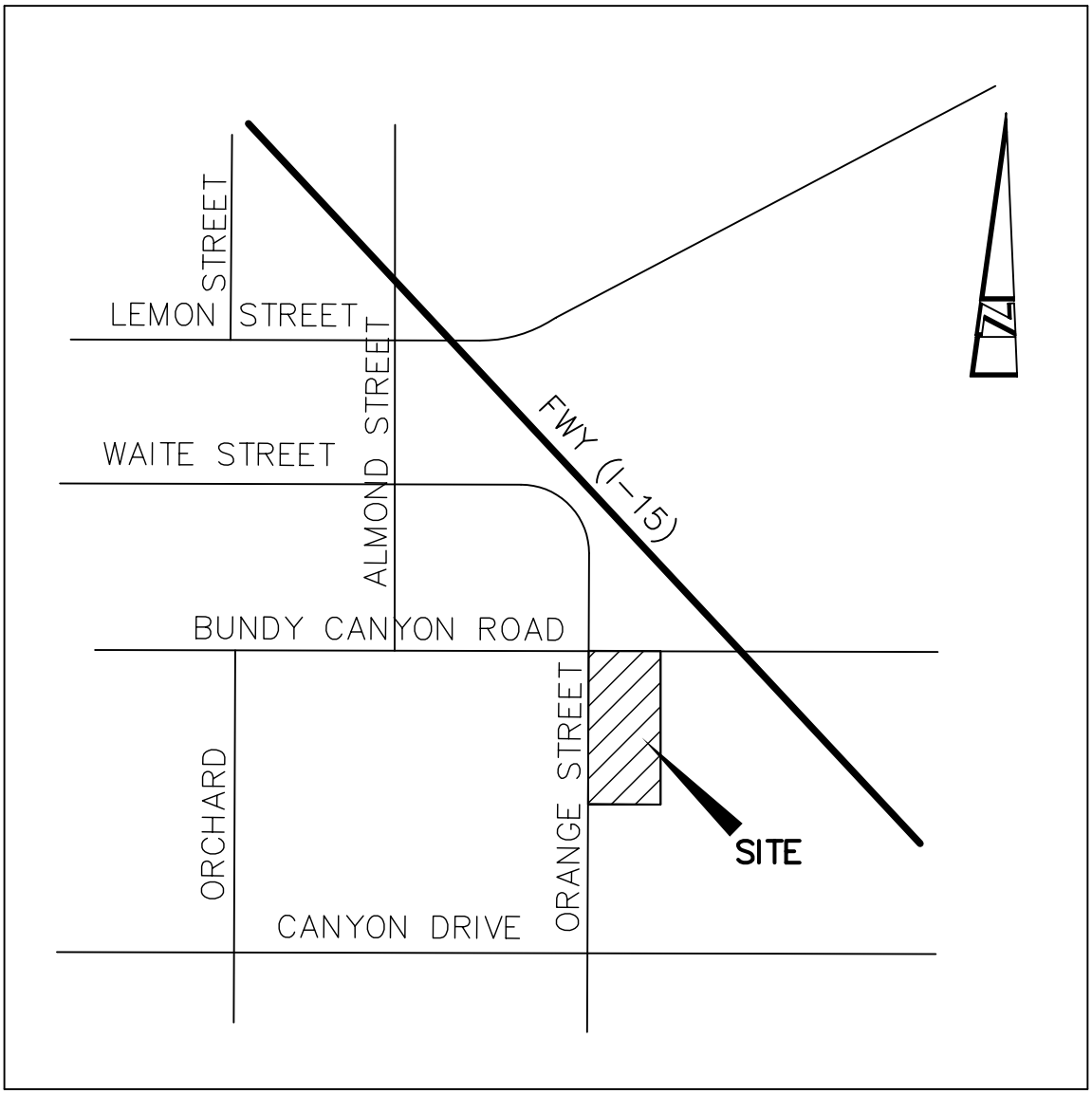
(NOT INCLUDED)

Planning Commission Resolution _____

Dated _____

Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map



VICINITY MAP

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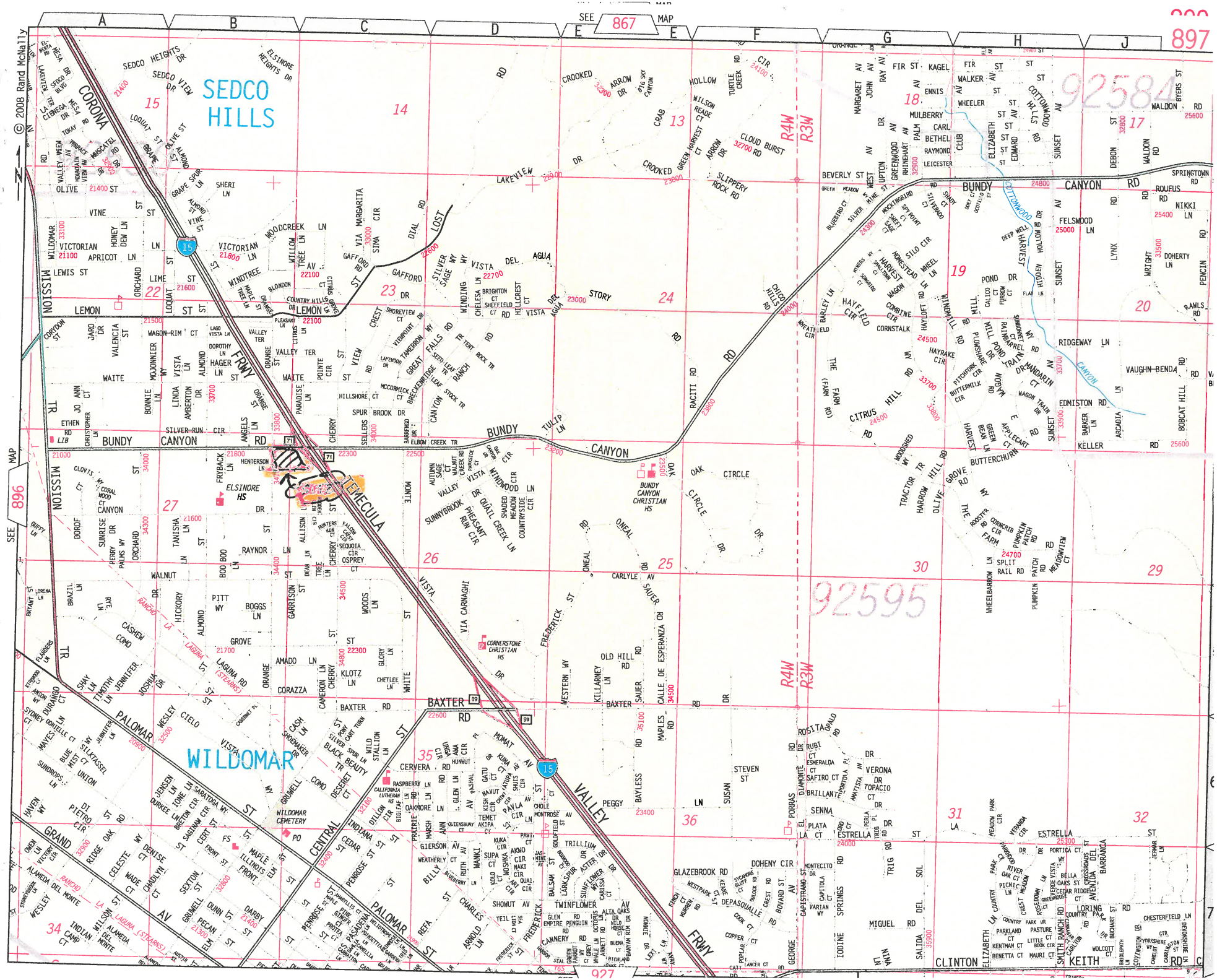
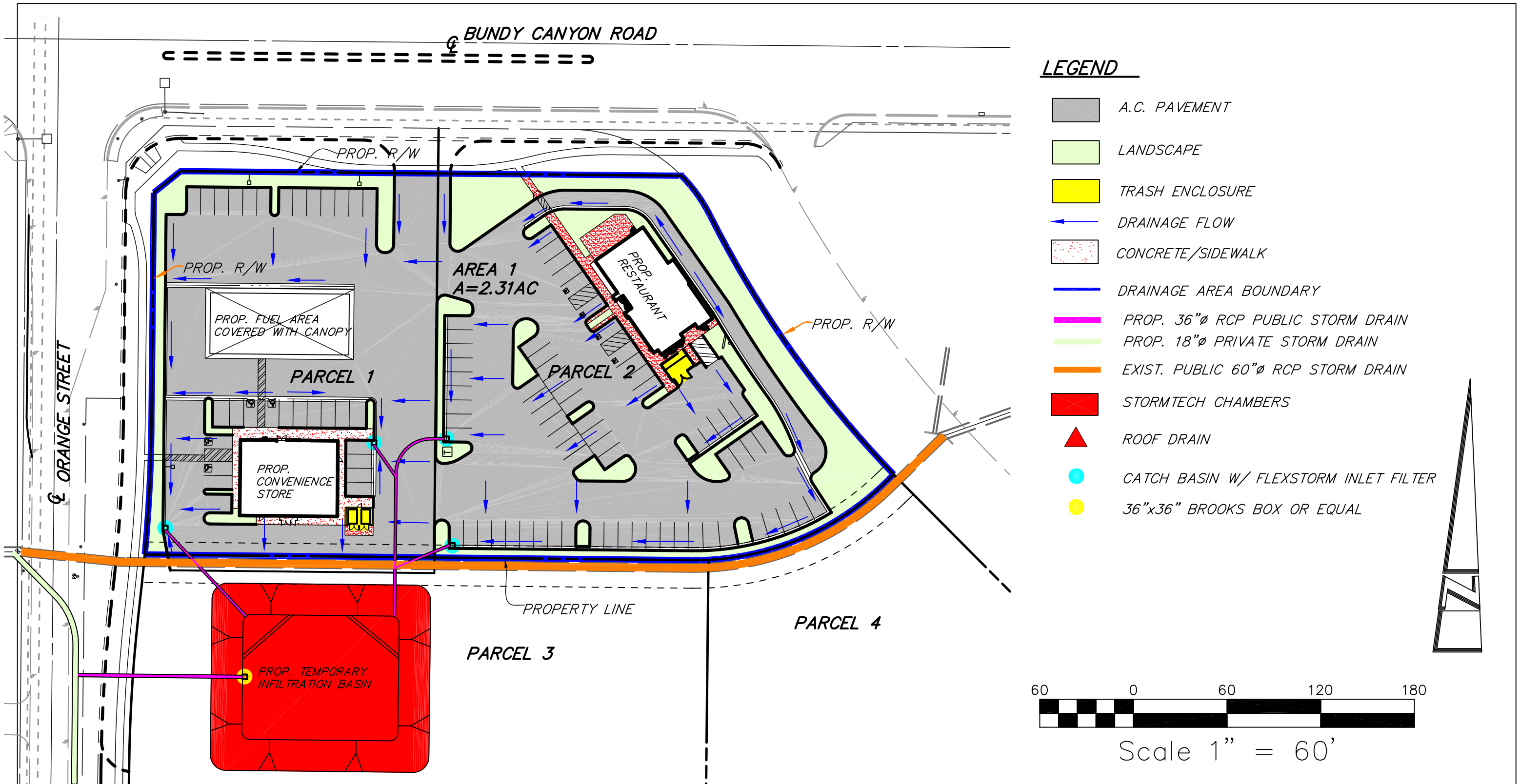
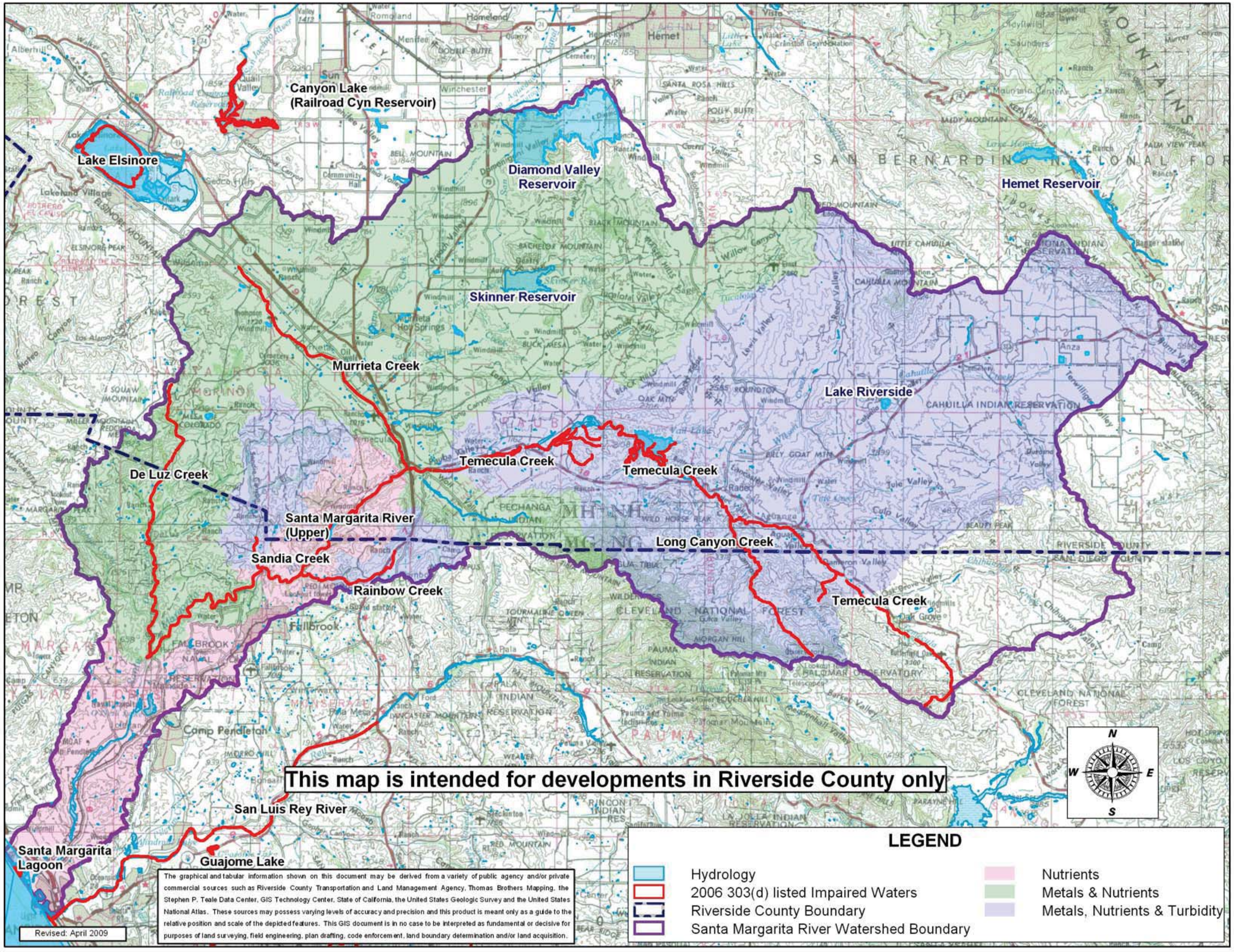
THOMAS GUIDE 2002 RIVERSIDE COUNTY
PAGE 897. GRID B-4


© 2008 Rand McNally
SEE 867 MAP
SEE 896 MAP
897
SEDCO HILLS
WILDOMAR
CORONA
MISSION
LEMON
BUNDY CANYON RD
ELSINORE HS
BUNDY CANYON CHRISTIAN HS
CORNERSTONE CHRISTIAN HS
WILDOMAR CEMETERY
LEMECULA
VALLEY
PALOMAR ST
BAXTER RD
CENTRAL
GRAND
CLINTON KEITH RD
FRWY
R4W
R3W
92584
92595



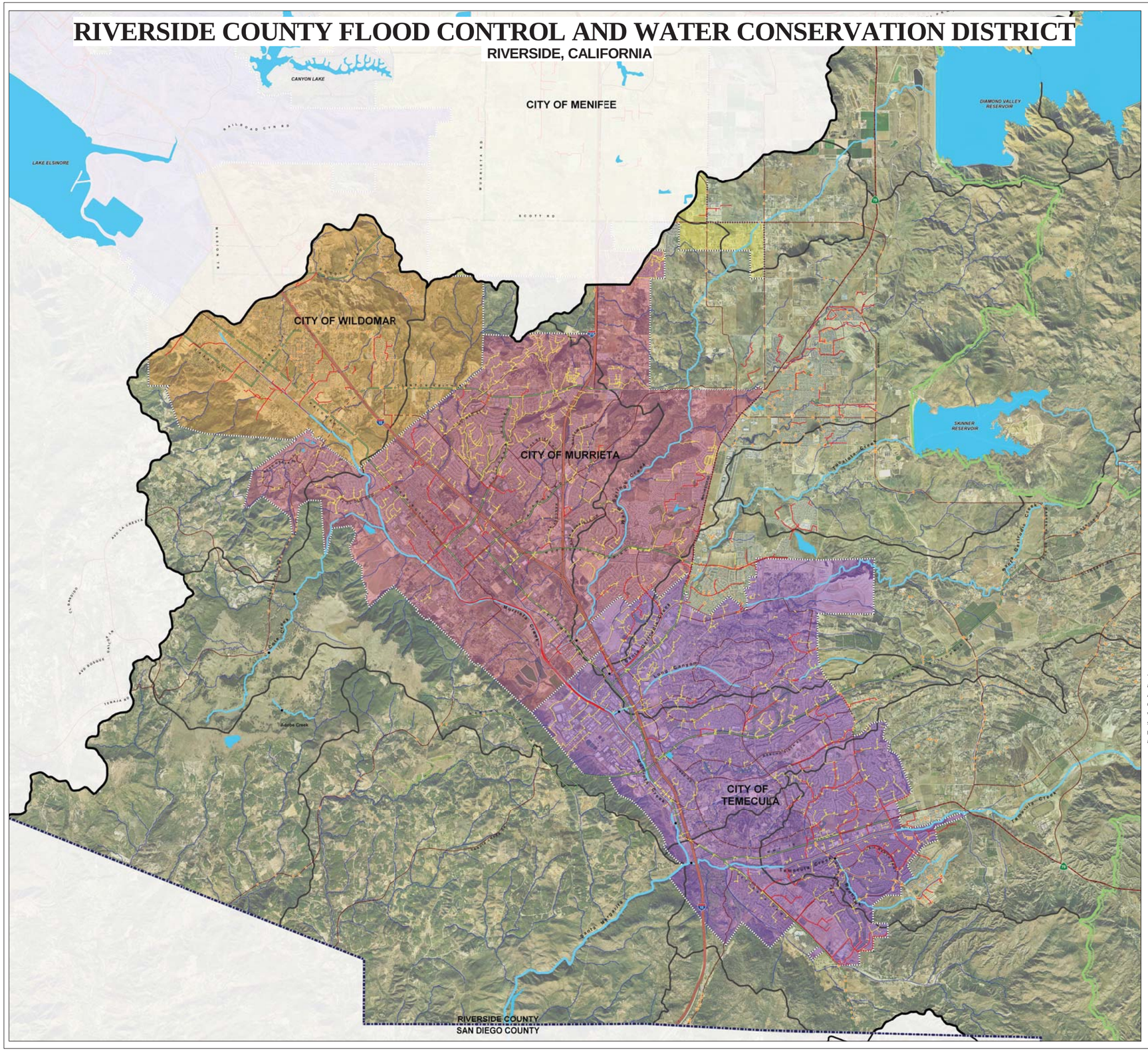
WQMP EXHIBIT

***NOTE: THE STORMWATER RUNOFF FROM PARCEL 1 & 2 WILL BE TREATED BY THE TEMPORARY INFILTRATION BASIN BEING CONSTRUCTED ON PARCEL 3. THE PREVIOUSLY MENTIONED PARCEL WILL BE DEVELOPED IN THE FUTURE. AT THAT TIME UNDERGROUND INFILTRATION PIPES WILL BE CONSTRUCTED AND SIZED TO TREAT PARCEL 1 TO 7 OF TENTATIVE TRACT MAP 30522. ALL OF THE PREVIOUSLY MENTIONED PARCELS ARE UNDER THE SAME OWNERSHIP.


Canyon Lake
(Railroad Cyn Reservoir)
Lake Elsinore
Diamond Valley
Reservoir
Hemet Reservoir
Skinner Reservoir
Murrieta Creek
Lake Riverside
Temecula Creek
Temecula Creek
De Luz Creek
Santa Margarita River
(Upper)
Long Canyon Creek
Sandia Creek
Rainbow Creek
Temecula Creek
This map is intended for developments in Riverside County only
San Luis Rey River
Santa Margarita
Lagoon
Guajome Lake
N
W
E
S
LEGEND
Hydrology
2006 303(d) listed Impaired Waters
Riverside County Boundary
Santa Margarita River Watershed Boundary
Nutrients
Metals & Nutrients
Metals, Nutrients & Turbidity
The graphical and tabular information shown on this document may be derived from a variety of public agency and/or private commercial sources such as Riverside County Transportation and Land Management Agency, Thomas Brothers Mapping, the Stephen P. Teale Data Center, GIS Technology Center, State of California, the United States Geologic Survey and the United States National Atlas. These sources may possess varying levels of accuracy and precision and this product is meant only as a guide to the relative position and scale of the depicted features. This GIS document is in no case to be interpreted as fundamental or decisive for purposes of land surveying, field engineering, plan drafting, code enforcement, land boundary determination and/or land acquisition.
Revised: April 2009

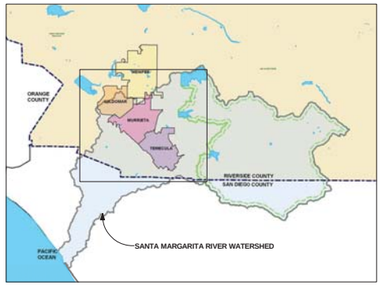
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RIVERSIDE, CALIFORNIA



- LEGEND -

- Wet/Dry Weather Monitoring Stations
- RCFC&WCD MS4 Facilities
- Riverside County MS4 Facilities
- City MS4 Facilities
- US Freeways
- State Highways
- Primary Arterial Roads
- Secondary Collector Roads
- Area Controlled by Vail Lake & Lake Skinner
- Watercourses
- Waterbodies
- HUC Subwatersheds
- Incorporated Areas
- Riverside County Boundary
- Santa Margarita River Watershed Boundary



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0 1 2 3 4 Miles

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT GEOGRAPHIC INFORMATION SYSTEM

SANTA MARGARITA RIVER WATERSHED FACILITIES MAP with Current MS4 Facilities Delineated

Map 1 of 2

REVISED OCT2009

Appendix C

Supporting Detail Related to Hydraulic Conditions of Concern

PRELIMINARY HYDROLOGY STUDY

Parcel 1 & 2 of TPM No. 30522

Southwest Corner of Bundy Canyon Rd. & Orange Street
Wildomar, California

(APNs 367-100-024 & 367-100-026)

***Prepared for**:*
Orange Bundy Partners, Ltd., a California Limited Partnership
629 Camino de Los Mares, Suite 206
San Clemente, CA 92673
Telephone: (949)489-0450

Prepared by:
Land Development Design Company, LLC (LDDC)
2313 E. Philadelphia St., Suite F
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(909) 930-1466
Kevin J. Richer
E-mail: Kevin.richer@lddc.net

Preparation Date: 3/21/2012

Prepared under the supervision of:

_____
Kevin J. Richer
RCE 43714, Exp. 3/31/13

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  - *Rainfall Data Map*

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Appendix D
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Appendix F
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Appendix I
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Discussion

The purpose of this study is to size of the Infiltration Basin, the size of the Orifice in the Infiltration Basin, and the size of the overflow drain Inlet in the Infiltration Basin for two parcels being developed, Parcels 1 & 2 of TPM No. 30522.

The project is located on a 2.31 acre site on the southeast corner of Bundy Canyon Road and Orange Street in the City of Wildomar. The project site is currently undeveloped and has minimal vegetation. The site is bounded on the north by Bundy Canyon Road, a fully improved street; on the west by Orange Street, a partially improved street; on the east by the Interstate-15 freeway; and on the south by Parcels 3 & 4 of TPM No. 30522. The site has a few a few mounds but majorly sheet flows in a westerly direction towards Orange Street. The project is accepting tributary stormwater runoff from a small area between the freeway on-ramp and the project's right-of-way.

The project is proposing to construct a gas station with a convenience store on Parcel 1 and a fast food restaurant on Parcel 2. The easterly parcel, Parcel 2, is proposing to direct the stormwater runoff towards two drain inlets near the southwest corner of Parcel 2. The westerly parcel, Parcel 1, is proposing to direct the stormwater runoff towards a drain inlet at the southwest corner of the parcel. A small area of the southeast corner of the site will direct stormwater runoff towards a drain inlet located easterly of the northeast corner of the convenience store building. All of the previously described areas are shown on the Developed Hydrology Map in Appendix B and will discharge into a temporary Infiltration Basin that will be constructed on the Parcel to the south, Parcel 3 of TPM No. 30522. The parcels being developed and Parcel 3 are under the same ownership. The owner plans to develop the parcels to the south, Parcels 3 through 7 of TPM No. 30522, at later time. As a result, the owner will construct a temporary Infiltration Basin on the parcel to the south. Once the parcels to the south are developed, an underground infiltration pipe system will be constructed in the future parking lot area of Parcel 5 to provide the required treatment volume for Parcel 1 to 7 on TPM No. 30522. The temporary Infiltration Basin will provide the required Vbmp, as dead storage, per the design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD). The temporary Infiltration Basin will have a concrete 36" by 36" Brooks Box or equal constructed to for the overflows from larger storms. The Brooks Box will have a 3" diameter orifice core drilled on one side to serve as low flow orifice outlet. The invert of the orifice will be set at the maximum allowed depth for dead storage to treat the required Vbmp. A maximum dead storage depth of 0.80 feet has been determined per the Preliminary WQMP prepared for this project.

The project will provide 6,828 CF of dead storage and the required Vbmp is 5,881 CF of dead storage. A 2-inch per hour infiltration rate has been assumed per previous project experience in the area for site's with Soil Type "B". Furthermore, the infiltration basin will provide 1-foot of freeboard as required per the Infiltration Basin design guidelines in the Stormwater Quality Best Management Practice Design Handbook for Riverside County Flood Control and Water Conservation District (RCFC & WCD).

The existing site is approximately 0% impervious. The proposed development will significantly increase the imperviousness of the site to approximately 90% impervious. Per the Soils Map from the RCFC & WCD Hydrology Manual, the site is located in a Type B soil area. The rainfall was obtained from the RCFC & WCD Hydrology Manual and is as follows: 0.63" for the 2-year--1-hour, 1.55" for the 100-year--1-hour, 2.8" for the 2-year--24-hour, and 7.7" for the 100-year--24-hour.

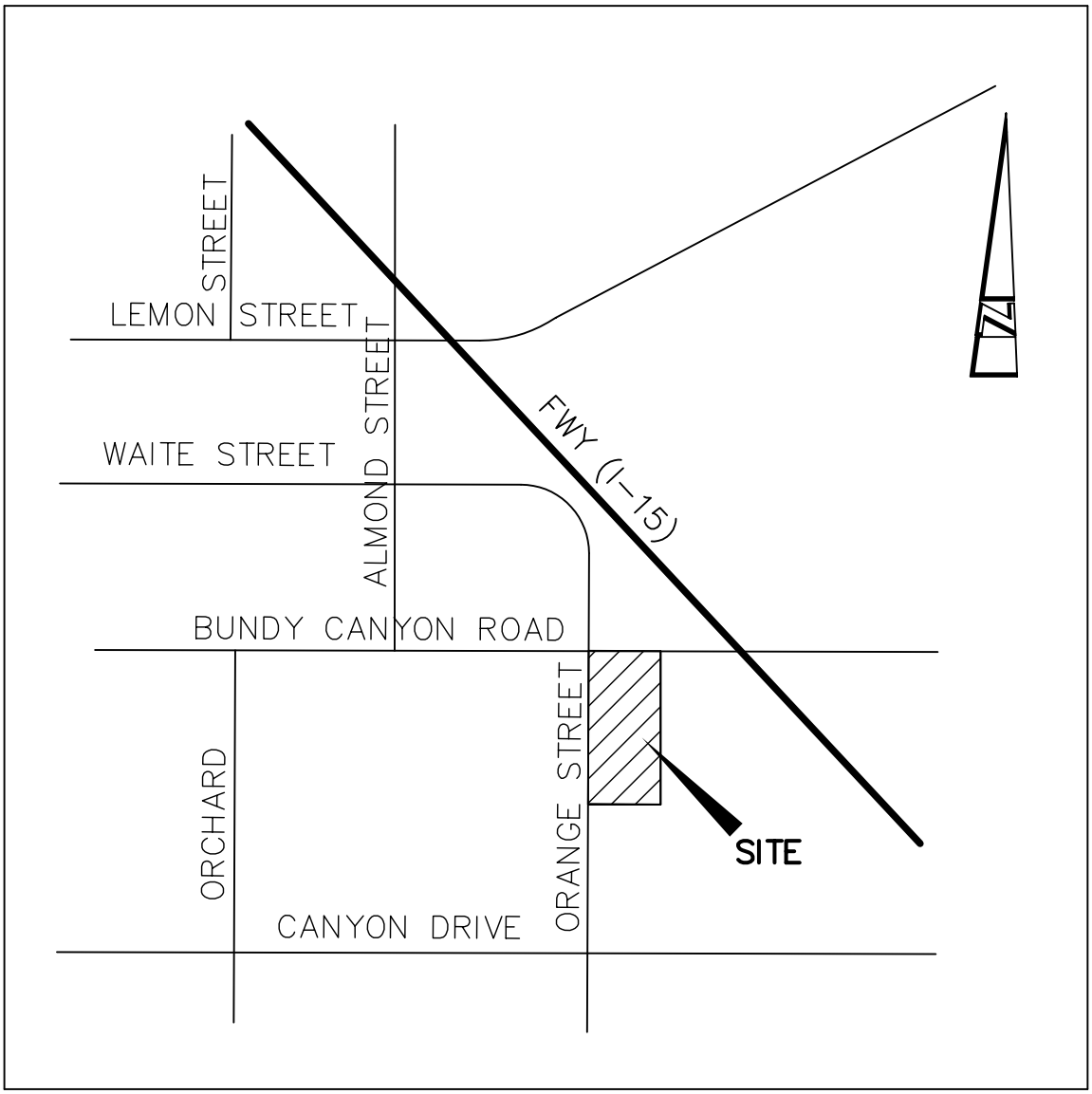
Rational Study hydrology's were calculated for the 2, 10, and 100 year storms for both the undeveloped and developed conditions. Unit hydrographs were calculated for the 2, 10, and 100 year storms of the 1 hour and 24 hour storms for both the undeveloped and developed conditions. The 2-year--24-hour and 10-year--24-hour unit hydrographs were used to verify that the project will not cause Hydrologic Conditions of Concerns. The 2-year 24-hour hydrograph yielded the highest increase in volume. As a result, the basin needs to detain 30,549 CF of storage to mitigate increased flows. The basin is being sized to provide 38,800 CF of storage. Furthermore, routing was prepared to verify the storage capacity, size of orifice, and size of overflow drain inlet for the 2, 10 and 100 year storms of the 1 and 24 hour storm events. The routing was also used to compare the undeveloped peak flow and developed peak flow rates for all storms (See Exhibit in Appendix G). Therefore, the routing calculation results demonstrate that the infiltration basin will provide the necessary storage capacity to mitigate the incremental increase in storm flows as a result of the development.

The project is proposing to mitigate the increased flows as stated in the paragraph above; however, the project is not required to mitigate the increased flows created by the development. The project will be discharging into an MS4 storm drain system that was sized to accept the developed runoff from site. The Hydrology and Hydrologic Report for Parcel Map 24032 prepared by The Keith Companies/Butterfield on October 22, 1990, for the "Sedco M.D.P. Line "F" Stage 2" shows that the existing 60" diameter storm drain running southerly of the northerly property line for Parcel 3 and 4 of TPM No. 30522 was sized to accept the developed (commercial) runoff for Q100. The study shows that the existing storm drain was sized to accept the runoff from the freeway on-ramp, Bundy Canyon Road, Orange Street, and

all of the runoff from TPM No. 30522. A copy of the study has been included for reference in Appendix H. Furthermore, a copy of the Storm Drain Plan has been included for reference in Appendix I.

Appendix A

Vicinity Map
Thomas Guide Map



VICINITY MAP

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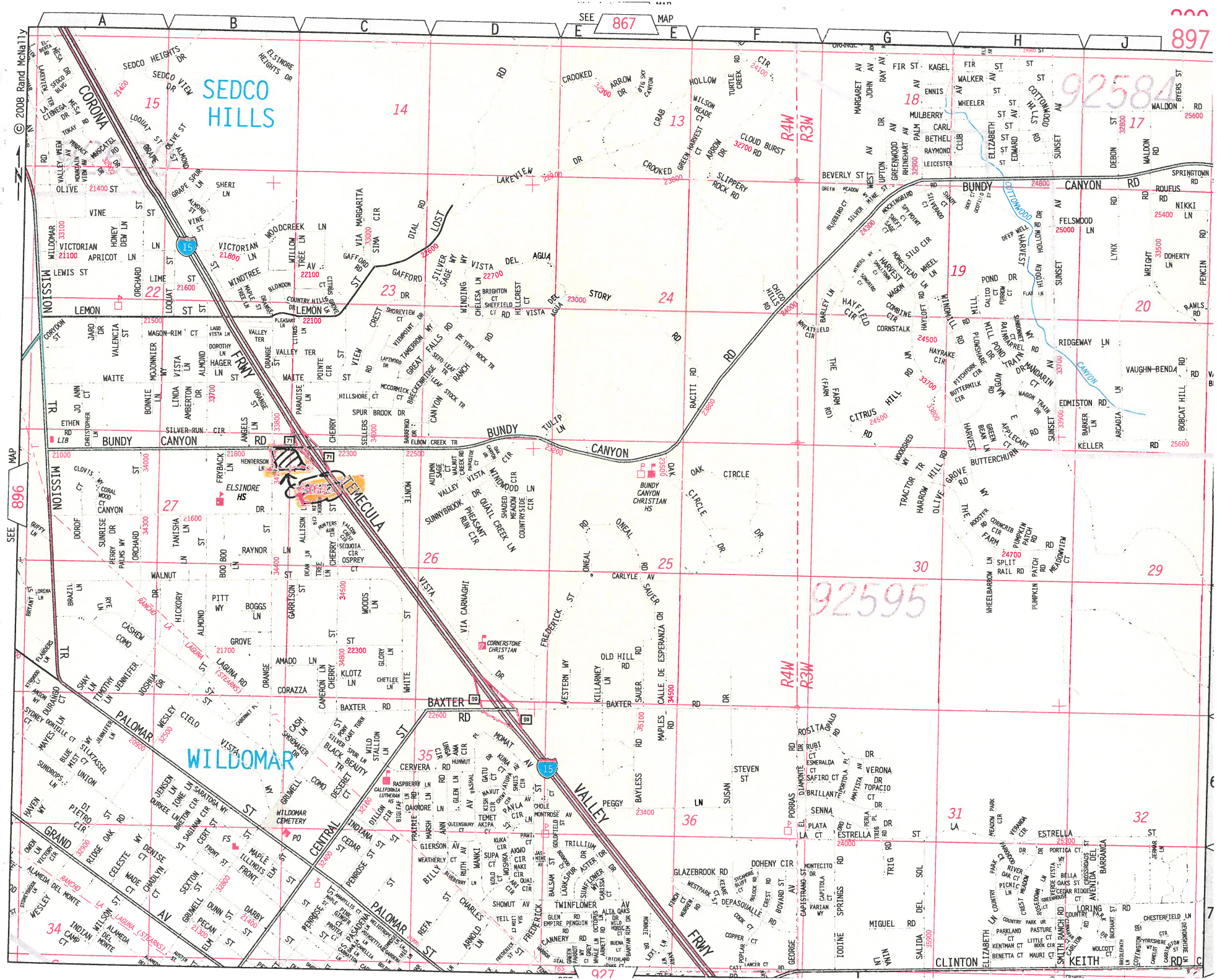
PAGE 897. GRID B-4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SEE 867 MAP
SEE 896 MAP
897
SEDCO HILLS
WILDOMAR
CORONA
MISSION
LEMON
BUNDY CANYON RD
ELSINORE HS
BUNDY CANYON CHRISTIAN HS
CORNERSTONE CHRISTIAN HS
WILDOMAR CEMETERY
LEMECULA
VALLEY
PALOMAR ST
BAXTER RD
CENTRAL
GRAND
CLINTON KEITH RD
FRWY
R4W
R3W
92584
92595

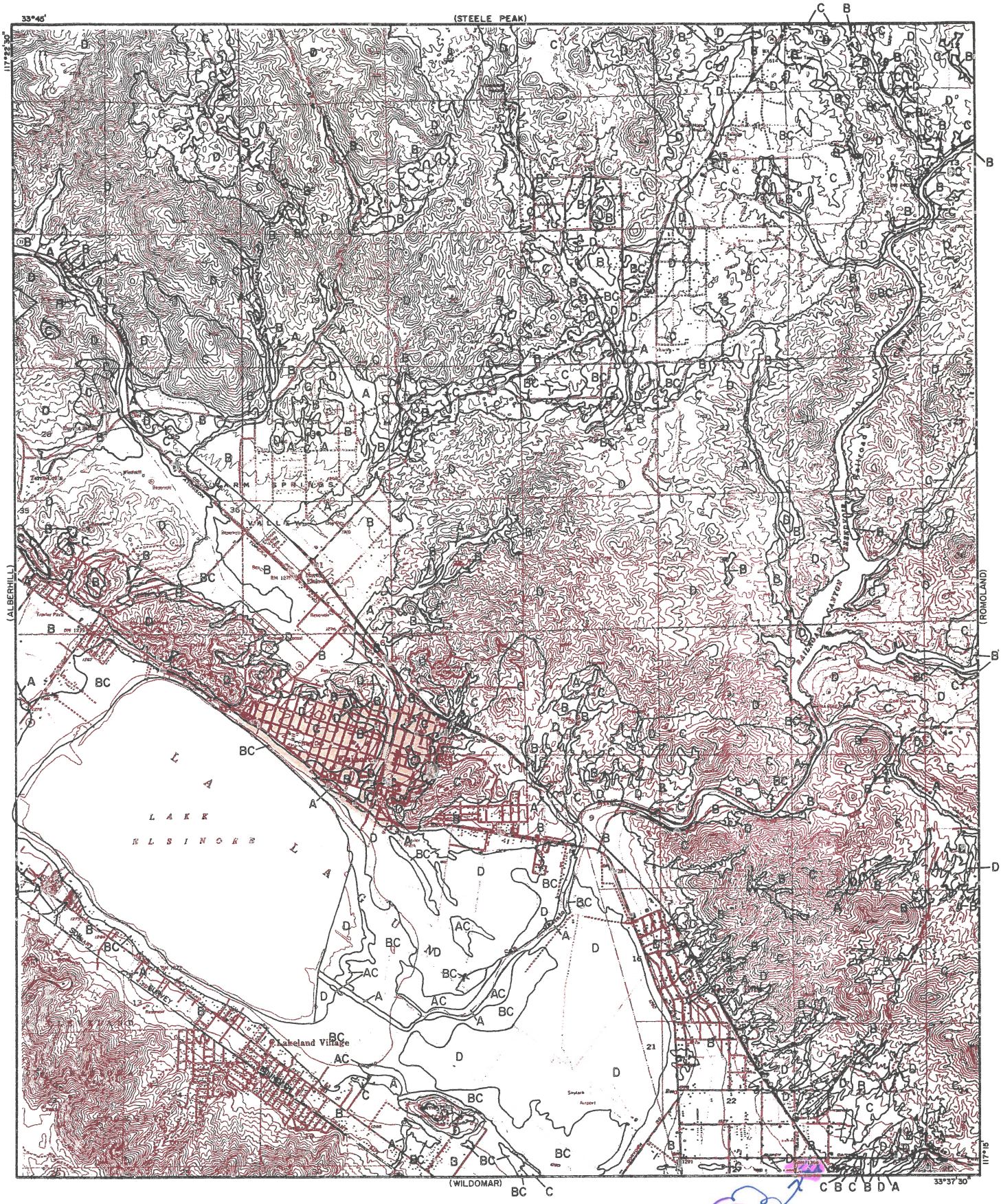
Appendix B

Hydrology Manual Reference Data

-Soils Map

-Standard Intensity-Duration Curves Data

-Rainfall Data Map



SITE

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ELSINORE

PLATE C-1.41

RAINFALL INTENSITY–INCHES PER HOUR

ANZA			BANNING			BEAUMONT			CALIMESA			CANYON LAKE		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	4.23	6.85	5	3.32	4.93	5	3.32	4.93	5	3.57	5.30	5	3.07	4.61
6	3.80	6.16	6	3.02	4.47	6	3.02	4.47	6	3.23	4.79	6	2.81	4.23
7	3.48	5.63	7	2.78	4.12	7	2.78	4.12	7	2.97	4.40	7	2.61	3.93
8	3.22	5.21	8	2.59	3.84	8	2.59	3.84	8	2.76	4.09	8	2.45	3.68
9	3.01	4.87	9	2.43	3.61	9	2.43	3.61	9	2.58	3.83	9	2.31	3.48
10	2.83	4.58	10	2.30	3.41	10	2.30	3.41	10	2.44	3.62	10	2.20	3.31
11	2.67	4.33	11	2.19	3.24	11	2.19	3.24	11	2.31	3.43	11	2.10	3.16
12	2.54	4.12	12	2.09	3.10	12	2.09	3.10	12	2.21	3.27	12	2.01	3.03
13	2.43	3.93	13	2.00	2.97	13	2.00	2.97	13	2.11	3.13	13	1.94	2.92
14	2.33	3.77	14	1.92	2.85	14	1.92	2.85	14	2.03	3.01	14	1.87	2.82
15	2.23	3.62	15	1.86	2.75	15	1.86	2.75	15	1.95	2.89	15	1.81	2.72
16	2.15	3.49	16	1.79	2.66	16	1.79	2.66	16	1.88	2.79	16	1.75	2.64
17	2.08	3.37	17	1.74	2.58	17	1.74	2.58	17	1.82	2.70	17	1.70	2.56
18	2.01	3.26	18	1.68	2.50	18	1.68	2.50	18	1.76	2.62	18	1.66	2.50
19	1.95	3.16	19	1.64	2.43	19	1.64	2.43	19	1.71	2.54	19	1.62	2.43
20	1.89	3.06	20	1.59	2.36	20	1.59	2.36	20	1.67	2.47	20	1.58	2.37
22	1.79	2.90	22	1.51	2.25	22	1.51	2.25	22	1.58	2.34	22	1.51	2.27
24	1.70	2.76	24	1.45	2.15	24	1.45	2.15	24	1.51	2.23	24	1.44	2.17
26	1.62	2.63	26	1.39	2.06	26	1.39	2.06	26	1.44	2.14	26	1.39	2.09
28	1.56	2.52	28	1.33	1.98	28	1.33	1.98	28	1.38	2.05	28	1.34	2.02
30	1.49	2.42	30	1.29	1.91	30	1.29	1.91	30	1.33	1.98	30	1.30	1.95
32	1.44	2.33	32	1.24	1.84	32	1.24	1.84	32	1.29	1.91	32	1.26	1.89
34	1.39	2.25	34	1.20	1.78	34	1.20	1.78	34	1.24	1.85	34	1.22	1.84
36	1.34	2.18	36	1.17	1.73	36	1.17	1.73	36	1.21	1.79	36	1.19	1.79
38	1.30	2.11	38	1.13	1.68	38	1.13	1.68	38	1.17	1.74	38	1.16	1.74
40	1.27	2.05	40	1.10	1.64	40	1.10	1.64	40	1.14	1.69	40	1.13	1.70
45	1.18	1.91	45	1.04	1.54	45	1.04	1.54	45	1.07	1.58	45	1.07	1.61
50	1.11	1.80	50	.98	1.45	50	.98	1.45	50	1.01	1.49	50	1.02	1.53
55	1.05	1.70	55	.93	1.38	55	.93	1.38	55	.95	1.42	55	.97	1.46
60	1.00	1.62	60	.89	1.32	60	.89	1.32	60	.91	1.35	60	.93	1.40
65	.95	1.55	65	.85	1.27	65	.85	1.27	65	.87	1.29	65	.89	1.35
70	.91	1.48	70	.82	1.22	70	.82	1.22	70	.84	1.24	70	.86	1.30
75	.88	1.42	75	.79	1.17	75	.79	1.17	75	.80	1.19	75	.84	1.26
80	.85	1.37	80	.76	1.13	80	.76	1.13	80	.78	1.15	80	.81	1.22
85	.82	1.32	85	.74	1.10	85	.74	1.10	85	.75	1.11	85	.79	1.18
SLOPE = .580			SLOPE = .530			SLOPE = .530			SLOPE = .550			SLOPE = .480		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY–DURATION CURVES DATA

NOTES:
1. Isohyetals based on NOAA Volume XI - California, 1973.

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

2-YEAR — 1-HOUR PRECIPITATION

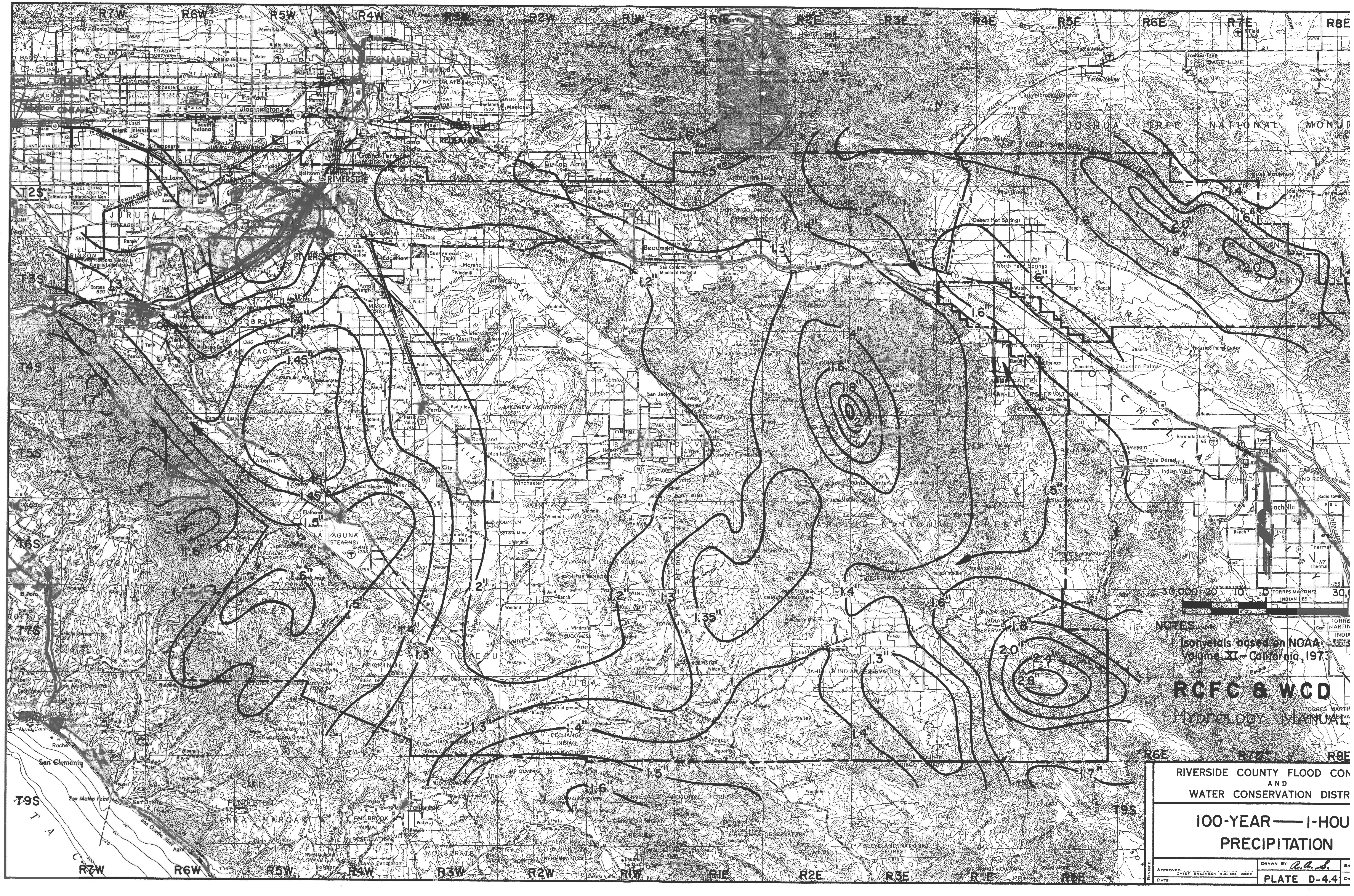
DRAWN BY: R.L.S.

APPROVED: CHIEF ENGINEER R.E. NO. 8822

DATE:

PLATE D-4.3

REVISED



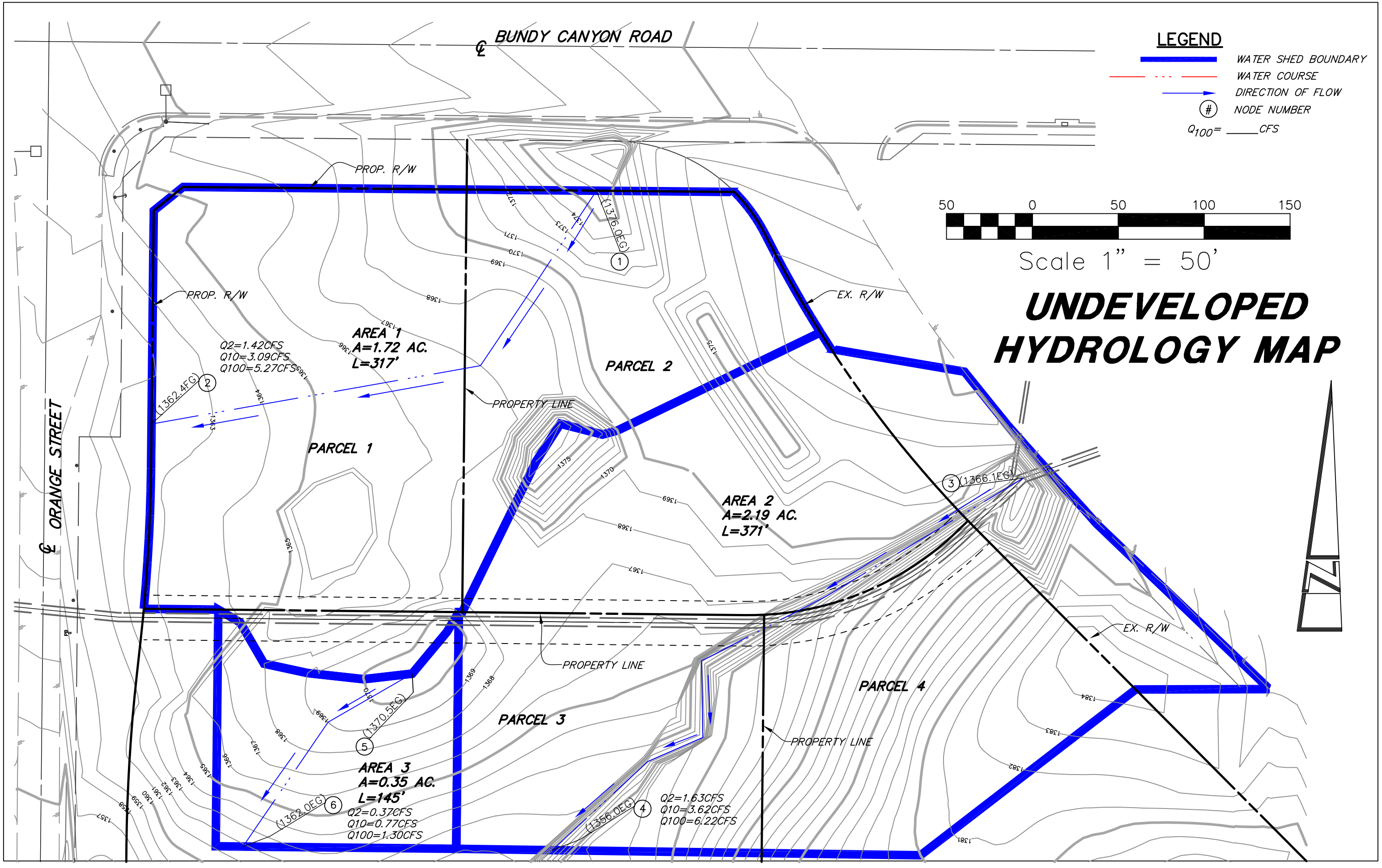
NOTES:
1. Isohyetals based on NOAA Atlas
Volume XI - California, 1973
RCFC & WCD
Hydrology Manual
RIVERSIDE COUNTY FLOOD CON
AND
WATER CONSERVATION DISTR
100-YEAR — 1-HOU
PRECIPITATION
APPROVED: CHIEF ENGINEER R.E. NO. 6822
DATE
REVISED:
DRAWN BY: R.A.S.
PLATE D-4.4

R6W
R4W
R1W
R4E
R5E
R6E
R7E
R8E
T2S
T3S
T4S
T5S
T6S
T7S
T9S
R7W
R6W
R2E
R3
SAN BERNARDINO
RIVERSIDE
Beaumont
Banning
Palm Springs
Thousand Palms
Palm Desert
Indian Wells
Indio
Hemet
San Jacinto
Elsinore
Murrieta
Fallbrook
San Clemente
Anza
JOSHUA TREE NATIONAL MONUM
NOTES:
1. Isohyetals from NOAA At
Volume XI - California, 197
RCFC & WCD
RIVERSIDE COUNTY FLOOD CON
AND
WATER CONSERVATION DISTR
2-YEAR — 24-HOU
PRECIPITATION
APPROVED: CHIEF ENGINEER R.E. NO. 8822
DATE:
DRAWN BY:
PLATE E-5.5
REVISED:

R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S
SAN BERNARDINO
RIALTO
ONTARIO
RIVERSIDE
JURUPA
NORTON AFB
Mira Loma
Moreno
Perris
Hemet
San Jacinto
Beaumont
Banning
Palm Springs
Thousand Palms
Indio
Coachella
Desert Hot Springs
Joshua Tree
LAKEVIEW MOUNTAINS
SAN JACINTO MOUNTAINS
SAN JACINTO RIVER
SAN JACINTO FAULT
SAN JACINTO VALLEY
SAN BERNARDINO NATIONAL FOREST
JOSHUA TREE NATIONAL MONUMENT
SANTA ROSA INDIAN RESERVATION
CAHUILLA INDIAN RESERVATION
PECHANGA INDIAN RESERVATION
CAMP PENDLETON
SANTA MARGARITA
FALLBROOK
MONSERATE
San Clemente
San Mateo Point
Roche
Sun City
Winchester
Romoland
Menifee
Lake Elsinore
Temecula
Murrieta
Corona
Norco
Mira Loma
Jurupa
Rialto
Fontana
Rancho California
Pala
Palm Desert
Indian Wells
Bermuda Dunes
Thermal
Mecca
Oasis
Anza
Isohyetals from NOAA Atlas
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
APPROVED: CHIEF ENGINEER R.E. NO. 8822
DATE:
DRAWN BY:
PLATE E-5.6
REVISED:

Appendix C

Rational Method Output (Undeveloped)


BUNDY CANYON ROAD
LEGEND
WATER SHED BOUNDARY
WATER COURSE
DIRECTION OF FLOW
NODE NUMBER
Q100= ____CFS
50 0 50 100 150
Scale 1" = 50'
UNDEVELOPED HYDROLOGY MAP
PROP. R/W
PROP. R/W
EX. R/W
EX. R/W
ORANGE STREET
AREA 1
A=1.72 AC.
L=317'
Q2=1.42CFS
Q10=3.09CFS
Q100=5.27CFS
(1376.0EG)
(1362.4FG)
(1366.1EG)
(1370.5EG)
(1362.0EG)
(1356.0EG)
PARCEL 1
PARCEL 2
PARCEL 3
PARCEL 4
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
AREA 2
A=2.19 AC.
L=371'
AREA 3
A=0.35 AC.
L=145'
Q2=0.37CFS
Q10=0.77CFS
Q100=1.30CFS
Q2=1.63CFS
Q10=3.62CFS
Q100=6.22CFS

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504Q2U1.out
------------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 1
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   317.000(Ft.)
Top (of initial area) elevation =  1376.000(Ft.)
Bottom (of initial area) elevation =  1362.400(Ft.)
Difference in elevation =    13.600(Ft.)
Slope =    0.04290  s(percent)=       4.29
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.959 min.
Rainfall intensity =      1.460(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.565
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.418(CFS)
Total initial stream area =        1.720(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            1.72 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q2u2.out
------------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 2
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   371.000(Ft.)
Top (of initial area) elevation =  1366.100(Ft.)
Bottom (of initial area) elevation =  1356.000(Ft.)
Difference in elevation =    10.100(Ft.)
Slope =    0.02722  s(percent)=       2.72
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.615 min.
Rainfall intensity =      1.356(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.549
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.630(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            2.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q2u3.out
------------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 3
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   145.000(Ft.)
Top (of initial area) elevation =  1370.500(Ft.)
Bottom (of initial area) elevation =  1362.000(Ft.)
Difference in elevation =     8.500(Ft.)
Slope =    0.05862  s(percent)=       5.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.842 min.
Rainfall intensity =      1.748(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.602
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.368(CFS)
Total initial stream area =        0.350(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            0.35 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10u1.out
------------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 1
Q10
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   317.000(Ft.)
Top (of initial area) elevation =  1376.000(Ft.)
Bottom (of initial area) elevation =  1362.400(Ft.)
Difference in elevation =    13.600(Ft.)
Slope =    0.04290  s(percent)=       4.29
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.959 min.
Rainfall intensity =      2.321(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.774
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.091(CFS)
Total initial stream area =        1.720(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            1.72 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10u2.out
----------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 2
Q10
----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

----------------------------------------------------------------------


Program License Serial Number 5016

----------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   371.000(Ft.)
Top (of initial area) elevation =  1366.100(Ft.)
Bottom (of initial area) elevation =  1356.000(Ft.)
Difference in elevation =    10.100(Ft.)
Slope =    0.02722  s(percent)=       2.72
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.615 min.
Rainfall intensity =      2.155(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.766
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.617(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            2.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10u3.out
----------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 3
Q10
----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

----------------------------------------------------------------------


Program License Serial Number 5016

----------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   145.000(Ft.)
Top (of initial area) elevation =  1370.500(Ft.)
Bottom (of initial area) elevation =  1362.000(Ft.)
Difference in elevation =     8.500(Ft.)
Slope =    0.05862  s(percent)=       5.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.842 min.
Rainfall intensity =      2.779(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.793
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.771(CFS)
Total initial stream area =        0.350(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            0.35 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q100u1.out
------------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 1
Q100
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   317.000(Ft.)
Top (of initial area) elevation =  1376.000(Ft.)
Bottom (of initial area) elevation =  1362.400(Ft.)
Difference in elevation =    13.600(Ft.)
Slope =    0.04290  s(percent)=       4.29
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.959 min.
Rainfall intensity =      3.552(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.863
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      5.274(CFS)
Total initial stream area =        1.720(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            1.72 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q100u2.out
----------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 2
Q100
----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

----------------------------------------------------------------------


Program License Serial Number 5016

----------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   371.000(Ft.)
Top (of initial area) elevation =  1366.100(Ft.)
Bottom (of initial area) elevation =  1356.000(Ft.)
Difference in elevation =    10.100(Ft.)
Slope =    0.02722  s(percent)=       2.72
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.615 min.
Rainfall intensity =      3.299(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.860
```

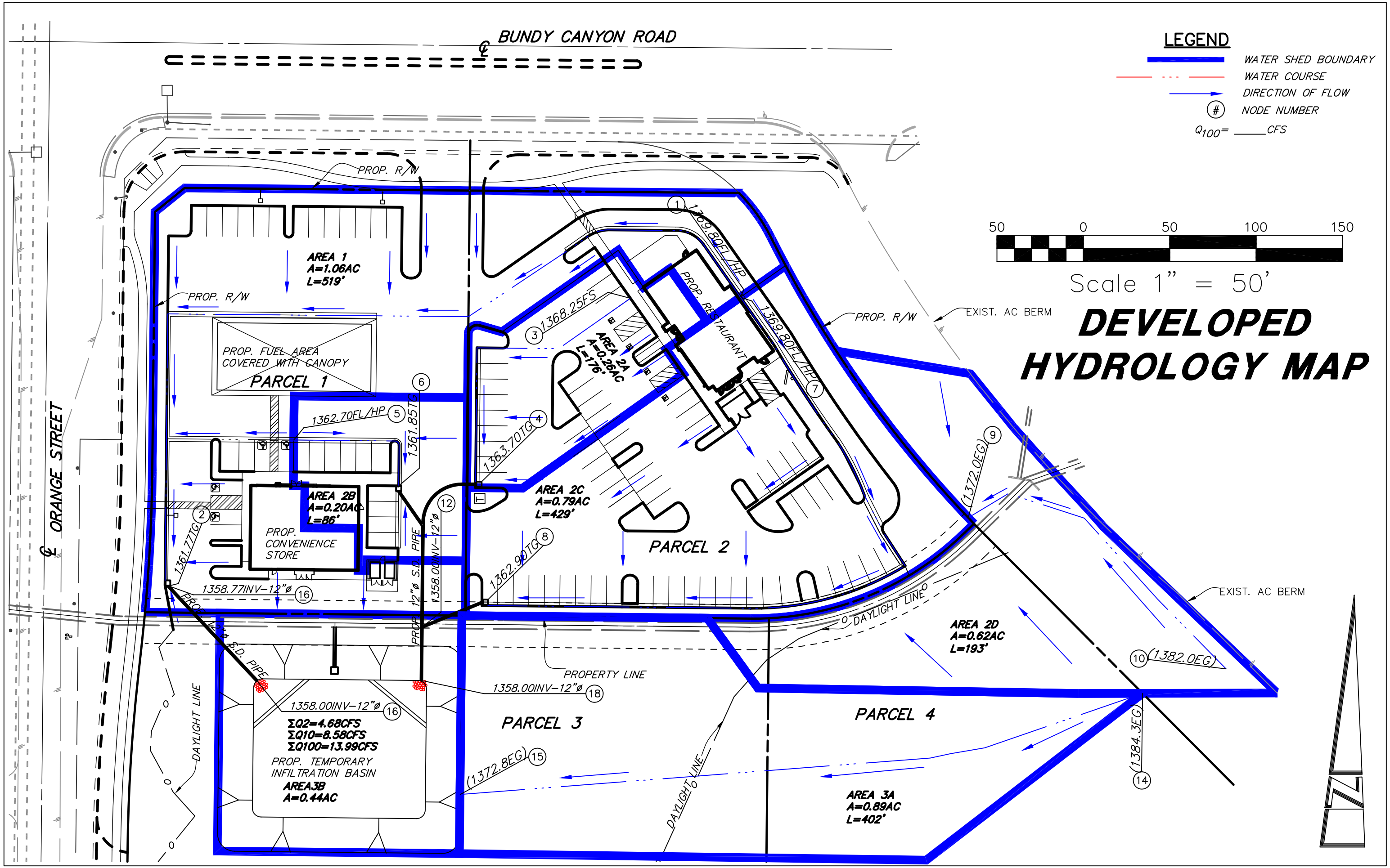
```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.217(CFS)
Total initial stream area =        2.190(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            2.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q100u3.out
----------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
AREA 3
Q100
----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

----------------------------------------------------------------------


Program License Serial Number 5016

----------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   145.000(Ft.)
Top (of initial area) elevation =  1370.500(Ft.)
Bottom (of initial area) elevation =  1362.000(Ft.)
Difference in elevation =     8.500(Ft.)
Slope =    0.05862  s(percent)=       5.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.842 min.
Rainfall intensity =      4.253(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.869
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.294(CFS)
Total initial stream area =        0.350(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            0.35 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

Appendix D

Rational Method Output (Developed)


BUNDY CANYON ROAD
LEGEND
WATER SHED BOUNDARY
WATER COURSE
DIRECTION OF FLOW
NODE NUMBER
Q100= ____CFS
50 0 50 100 150
Scale 1" = 50'
DEVELOPED HYDROLOGY MAP
PROP. R/W
AREA 1
A=1.06AC
L=519'
PROP. FUEL AREA
COVERED WITH CANOPY
PARCEL 1
1362.70FL/HP
1361.85TG
1361.77TG
AREA 2B
A=0.20AC
L=86'
PROP. CONVENIENCE STORE
1358.77INV-12"ø
PROP. 12"ø S.D. PIPE
1358.00INV-12"ø
1369.80FL/HP
1368.25FS
AREA 2A
A=0.26AC
L=176'
PROP. RESTAURANT
1363.70TG
AREA 2C
A=0.79AC
L=429'
1362.90TG
PARCEL 2
(1372.0EG)
EXIST. AC BERM
DAYLIGHT LINE
AREA 2D
A=0.62AC
L=193'
(1382.0EG)
PROPERTY LINE
1358.00INV-12"ø
PARCEL 3
PARCEL 4
ΣQ2=4.68CFS
ΣQ10=8.58CFS
ΣQ100=13.99CFS
PROP. TEMPORARY INFILTRATION BASIN
AREA3B
A=0.44AC
(1372.8EG)
(1384.3EG)
AREA 3A
A=0.89AC
L=402'
ORANGE STREET

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q2d1.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 1
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   519.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1361.770(Ft.)
Difference in elevation =     8.030(Ft.)
Slope =    0.01547  s(percent)=       1.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.419 min.
Rainfall intensity =      1.582(In/Hr) for a     2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.846
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.419(CFS)
Total initial stream area =        1.060(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       16.000 to Point/Station       17.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.770(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    76.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     1.419(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     1.419(CFS)
Normal flow depth in pipe =    4.78(In.)
Flow top width inside pipe =   11.75(In.)
Critical Depth =    6.05(In.)
Pipe flow velocity =      4.86(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =     8.68 min.
End of computations, total study area =            1.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q2d2.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 2
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   176.000(Ft.)
Top (of initial area) elevation =  1368.250(Ft.)
Bottom (of initial area) elevation =  1363.700(Ft.)
Difference in elevation =     4.550(Ft.)
Slope =    0.02585  s(percent)=       2.59
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.032(In/Hr) for a     2.0 year storm
```

```
COMMERCIAL subarea type
Runoff Coefficient = 0.852
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.450(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.450(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     2.032(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =    86.000(Ft.)
Top (of initial area) elevation =  1362.700(Ft.)
Bottom (of initial area) elevation =  1361.850(Ft.)
Difference in elevation =     0.850(Ft.)
Slope =    0.00988  s(percent)=       0.99
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.032(In/Hr) for a     2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.852
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.346(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.200(Ac.)
```

```
Runoff from this stream =      0.346(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     2.032(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        0.450      5.00                 2.032
2        0.346      5.00                 2.032
Largest stream flow has longer time of concentration
Qp =      0.450 + sum of
        Qb         Ia/Ib
         0.346 *    1.000 =      0.346
Qp =      0.796

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.450       0.346
Area of streams before confluence:
        0.260        0.200
Results of confluence:
Total flow rate =      0.796(CFS)
Time of concentration =     5.000 min.
Effective stream area after confluence =      0.460(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1359.500(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     0.796(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     0.796(CFS)
Normal flow depth in pipe =    3.49(In.)
Flow top width inside pipe =   10.90(In.)
Critical Depth =    4.47(In.)
Pipe flow velocity =      4.20(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =     5.41 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      0.460(Ac.)
Runoff from this stream =      0.796(CFS)
Time of concentration =    5.41 min.
Rainfall intensity =     1.956(In/Hr)
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   429.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1362.900(Ft.)
Difference in elevation =     6.900(Ft.)
Slope =    0.01608  s(percent)=       1.61
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.742 min.
Rainfall intensity =      1.648(In/Hr) for a     2.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.847
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.102(CFS)
Total initial stream area =        0.790(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       10.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.590
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =     7.74 min.
Rainfall intensity =      1.648(In/Hr) for a     2.0 year storm
Subarea runoff =      0.602(CFS) for      0.620(Ac.)
Total runoff =      1.705(CFS)      Total area =       1.410(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.900(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     1.705(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     1.705(CFS)
Normal flow depth in pipe =    4.92(In.)
Flow top width inside pipe =   11.80(In.)
```

```
Critical Depth =    6.67(In.)
Pipe flow velocity =      5.62(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =     7.85 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.410(Ac.)
Runoff from this stream =      1.705(CFS)
Time of concentration =    7.85 min.
Rainfall intensity =     1.636(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        0.796      5.41               1.956
2        1.705      7.85               1.636
Largest stream flow has longer time of concentration
Qp =      1.705 + sum of
        Qb         Ia/Ib
         0.796 *    0.836 =      0.666
Qp =      2.370

Total of 2 main streams to confluence:
Flow rates before confluence point:
       0.796       1.705
Area of streams before confluence:
        0.460        1.410


Results of confluence:
Total flow rate =      2.370(CFS)
Time of concentration =     7.854 min.
Effective stream area after confluence  =      1.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       18.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.400(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     2.370(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     2.370(CFS)
Normal flow depth in pipe =    6.02(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    7.90(In.)
Pipe flow velocity =      6.00(Ft/s)
```

Travel time through pipe = 0.09 min.
Time of concentration (TC) = 7.94 min.
End of computations, total study area = 1.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.398
Area averaged RI index number = 63.3

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q2d3.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 3
Q2
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.617(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   402.000(Ft.)
Top (of initial area) elevation =  1384.300(Ft.)
Bottom (of initial area) elevation =  1372.800(Ft.)
Difference in elevation =    11.500(Ft.)
Slope =    0.02861  s(percent)=       2.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.876 min.
Rainfall intensity =      1.342(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.547
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.653(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       19.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
USER INPUT of soil data for subarea
Runoff Coefficient = 0.406
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  45.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.88 min.
Rainfall intensity =      1.342(In/Hr) for a     2.0 year storm
Subarea runoff =      0.240(CFS) for      0.440(Ac.)
Total runoff =      0.893(CFS)      Total area =       1.330(Ac.)
End of computations, total study area =            1.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  73.7
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10d1.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 1
Q10
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   519.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1361.770(Ft.)
Difference in elevation =     8.030(Ft.)
Slope =    0.01547  s(percent)=       1.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.419 min.
Rainfall intensity =      2.515(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.329(CFS)
Total initial stream area =        1.060(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       16.000 to Point/Station       17.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.770(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    76.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     2.329(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     2.329(CFS)
Normal flow depth in pipe =    6.35(In.)
Flow top width inside pipe =   11.98(In.)
Critical Depth =    7.84(In.)
Pipe flow velocity =      5.52(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     8.65 min.
End of computations, total study area =            1.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10d2.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 2
Q10
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   176.000(Ft.)
Top (of initial area) elevation =  1368.250(Ft.)
Bottom (of initial area) elevation =  1363.700(Ft.)
Difference in elevation =     4.550(Ft.)
Slope =    0.02585  s(percent)=       2.59
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      3.230(In/Hr) for a    10.0 year storm
```

```
COMMERCIAL subarea type
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.737(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.737(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     3.230(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =    86.000(Ft.)
Top (of initial area) elevation =  1362.700(Ft.)
Bottom (of initial area) elevation =  1361.850(Ft.)
Difference in elevation =     0.850(Ft.)
Slope =    0.00988  s(percent)=       0.99
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      3.230(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.567(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.200(Ac.)
```

```
Runoff from this stream =      0.567(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     3.230(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        0.737      5.00                 3.230
2        0.567      5.00                 3.230
Largest stream flow has longer time of concentration
Qp =      0.737 + sum of
        Qb         Ia/Ib
         0.567 *    1.000 =      0.567
Qp =      1.305

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.737       0.567
Area of streams before confluence:
        0.260        0.200
Results of confluence:
Total flow rate =      1.305(CFS)
Time of concentration =     5.000 min.
Effective stream area after confluence =      0.460(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1359.500(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     1.305(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     1.305(CFS)
Normal flow depth in pipe =    4.52(In.)
Flow top width inside pipe =   11.63(In.)
Critical Depth =    5.78(In.)
Pipe flow velocity =      4.83(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     5.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      0.460(Ac.)
Runoff from this stream =      1.305(CFS)
Time of concentration =    5.36 min.
Rainfall intensity =     3.124(In/Hr)
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   429.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1362.900(Ft.)
Difference in elevation =     6.900(Ft.)
Slope =    0.01608  s(percent)=       1.61
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.742 min.
Rainfall intensity =      2.619(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.809(CFS)
Total initial stream area =        0.790(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       10.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.787
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =     7.74 min.
Rainfall intensity =      2.619(In/Hr) for a    10.0 year storm
Subarea runoff =      1.278(CFS) for      0.620(Ac.)
Total runoff =      3.087(CFS)      Total area =       1.410(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.900(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     3.087(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     3.087(CFS)
Normal flow depth in pipe =    6.97(In.)
Flow top width inside pipe =   11.84(In.)
```

```
Critical Depth =    9.03(In.)
Pipe flow velocity =      6.52(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     7.84 min.


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Process from Point/Station       13.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.410(Ac.)
Runoff from this stream =      3.087(CFS)
Time of concentration =    7.84 min.
Rainfall intensity =     2.603(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        1.305      5.36               3.124
2        3.087      7.84               2.603
Largest stream flow has longer time of concentration
Qp =      3.087 + sum of
        Qb         Ia/Ib
         1.305 *    0.833 =      1.087
Qp =      4.173

Total of 2 main streams to confluence:
Flow rates before confluence point:
       1.305       3.087
Area of streams before confluence:
        0.460        1.410


Results of confluence:
Total flow rate =      4.173(CFS)
Time of concentration =     7.839 min.
Effective stream area after confluence  =      1.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       18.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.400(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     4.173(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     4.173(CFS)
Normal flow depth in pipe =    8.79(In.)
Flow top width inside pipe =   10.62(In.)
Critical Depth =   10.34(In.)
Pipe flow velocity =      6.77(Ft/s)
```

Travel time through pipe = 0.08 min.
Time of concentration (TC) = 7.92 min.
End of computations, total study area = 1.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.398
Area averaged RI index number = 63.3

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q10d3.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 3
Q10
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.980(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   402.000(Ft.)
Top (of initial area) elevation =  1384.300(Ft.)
Bottom (of initial area) elevation =  1372.800(Ft.)
Difference in elevation =    11.500(Ft.)
Slope =    0.02861  s(percent)=       2.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.876 min.
Rainfall intensity =      2.133(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.765
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.452(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       19.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
USER INPUT of soil data for subarea
Runoff Coefficient = 0.673
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  65.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.88 min.
Rainfall intensity =      2.133(In/Hr) for a    10.0 year storm
Subarea runoff =      0.632(CFS) for      0.440(Ac.)
Total runoff =      2.084(CFS)      Total area =       1.330(Ac.)
End of computations, total study area =            1.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  73.7
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q100d1.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 1
Q100
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   519.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1361.770(Ft.)
Difference in elevation =     8.030(Ft.)
Slope =    0.01547  s(percent)=       1.55
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.419 min.
Rainfall intensity =      3.850(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.891
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      3.635(CFS)
Total initial stream area =        1.060(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       16.000 to Point/Station       17.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.770(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    76.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     3.635(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     3.635(CFS)
Normal flow depth in pipe =    8.55(In.)
Flow top width inside pipe =   10.86(In.)
Critical Depth =    9.76(In.)
Pipe flow velocity =      6.07(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =     8.63 min.
End of computations, total study area =            1.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504Q100D2.out
------------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 2
Q100
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 5016

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   176.000(Ft.)
Top (of initial area) elevation =  1368.250(Ft.)
Bottom (of initial area) elevation =  1363.700(Ft.)
Difference in elevation =     4.550(Ft.)
Slope =    0.02585  s(percent)=       2.59
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.944(In/Hr) for a   100.0 year storm
```

```
COMMERCIAL subarea type
Runoff Coefficient = 0.893
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.147(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.260(Ac.)
Runoff from this stream =      1.147(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     4.944(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =    86.000(Ft.)
Top (of initial area) elevation =  1362.700(Ft.)
Bottom (of initial area) elevation =  1361.850(Ft.)
Difference in elevation =     0.850(Ft.)
Slope =    0.00988  s(percent)=       0.99
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.944(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.893
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.883(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.200(Ac.)
```

```
Runoff from this stream =      0.883(CFS)
Time of concentration =    5.00 min.
Rainfall intensity =     4.944(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        1.147      5.00                 4.944
2        0.883      5.00                 4.944
Largest stream flow has longer time of concentration
Qp =      1.147 + sum of
        Qb         Ia/Ib
         0.883 *    1.000 =      0.883
Qp =      2.030

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.147       0.883
Area of streams before confluence:
        0.260        0.200
Results of confluence:
Total flow rate =      2.030(CFS)
Time of concentration =     5.000 min.
Effective stream area after confluence =      0.460(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1359.500(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     2.030(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     2.030(CFS)
Normal flow depth in pipe =    5.78(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    7.30(In.)
Pipe flow velocity =      5.42(Ft/s)
Travel time through pipe =    0.32 min.
Time of concentration (TC) =     5.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      0.460(Ac.)
Runoff from this stream =      2.030(CFS)
Time of concentration =    5.32 min.
Rainfall intensity =     4.799(In/Hr)
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   429.000(Ft.)
Top (of initial area) elevation =  1369.800(Ft.)
Bottom (of initial area) elevation =  1362.900(Ft.)
Difference in elevation =     6.900(Ft.)
Slope =    0.01608  s(percent)=       1.61
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.742 min.
Rainfall intensity =      4.008(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.821(CFS)
Total initial stream area =        0.790(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       10.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.867
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =     7.74 min.
Rainfall intensity =      4.008(In/Hr) for a   100.0 year storm
Subarea runoff =      2.155(CFS) for      0.620(Ac.)
Total runoff =      4.976(CFS)      Total area =       1.410(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.900(Ft.)
Downstream point/station elevation =  1358.400(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     4.976(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     4.976(CFS)
Normal flow depth in pipe =   12.00(In.)
Flow top width inside pipe =    0.00(In.)
```

```
Critical Depth =   10.99(In.)
Pipe flow velocity =      6.15(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     7.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.410(Ac.)
Runoff from this stream =      4.976(CFS)
Time of concentration =    7.84 min.
Rainfall intensity =     3.983(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        2.030      5.32               4.799
2        4.976      7.84               3.983
Largest stream flow has longer time of concentration
Qp =      4.976 + sum of
        Qb         Ia/Ib
         2.030 *    0.830 =      1.685
Qp =      6.661

Total of 2 main streams to confluence:
Flow rates before confluence point:
       2.030       4.976
Area of streams before confluence:
        0.460        1.410


Results of confluence:
Total flow rate =      6.661(CFS)
Time of concentration =     7.845 min.
Effective stream area after confluence  =      1.870(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       18.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =  1358.400(Ft.)
Downstream point/station elevation =  1358.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.011
No. of pipes = 1  Required pipe flow  =     6.661(CFS)
Given pipe size =     12.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     1.518(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.801(Ft.)
 Minor friction loss =      1.117(Ft.)    K-factor =   1.00
```

Pipe flow velocity = 8.48(Ft/s)
Travel time through pipe = 0.06 min.
Time of concentration (TC) = 7.91 min.
End of computations, total study area = 1.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.398
Area averaged RI index number = 63.3

```
            Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
      Rational Hydrology Study        Date: 03/21/12  File:3504q100d3.out
----------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
AREA 3
Q100
----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

----------------------------------------------------------------------


Program License Serial Number 5016

----------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [ Elsinore-Wildomar ] area used.
10 year storm 10 minute intensity =  2.320(In/Hr)
10 year storm 60 minute intensity =  0.980(In/Hr)
100 year storm 10 minute intensity =  3.540(In/Hr)
100 year storm 60 minute intensity =  1.500(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.500(In/Hr)
Slope of intensity duration curve = 0.4800




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
Initial area flow distance =   402.000(Ft.)
Top (of initial area) elevation =  1384.300(Ft.)
Bottom (of initial area) elevation =  1372.800(Ft.)
Difference in elevation =    11.500(Ft.)
Slope =    0.02861  s(percent)=       2.86
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.876 min.
Rainfall intensity =      3.264(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.860
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.499(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       19.000 to Point/Station       20.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
USER INPUT of soil data for subarea
Runoff Coefficient = 0.826
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  82.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.88 min.
Rainfall intensity =      3.264(In/Hr) for a   100.0 year storm
Subarea runoff =      1.186(CFS) for      0.440(Ac.)
Total runoff =      3.685(CFS)      Total area =       1.330(Ac.)
End of computations, total study area =            1.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  73.7
```

Appendix E

Unit Hydrograph Output (Undeveloped)

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  03/22/12 File: 3504q2u1r12.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q2-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 0.630(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 0.630(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	60.6	0.464	0.000	0.464	1.000	0.464
					Sum (F) =	0.464

Area averaged mean soil loss (F) (In/Hr) = 0.464
Minimum soil loss rate ((In/Hr)) = 0.232
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.333	(0.464)	0.299	0.033
2	0.17	4.50	0.340	(0.464)	0.306	0.034
3	0.25	5.40	0.408	(0.464)	0.367	0.041
4	0.33	5.40	0.408	(0.464)	0.367	0.041
5	0.42	5.70	0.431	(0.464)	0.388	0.043

```
  6   0.50     6.40      0.484       (  0.464)       0.435        0.048
  7   0.58     7.90      0.597          0.464    (  0.537)        0.134
  8   0.67     9.10      0.688          0.464    (  0.619)        0.224
  9   0.75    12.80      0.968          0.464    (  0.871)        0.504
 10   0.83    25.60      1.935          0.464    (  1.742)        1.472
 11   0.92     7.90      0.597          0.464    (  0.537)        0.134
 12   1.00     4.90      0.370       (  0.464)       0.333        0.037
            (Loss Rate Not Used)
    Sum =     100.0                                    Sum =     2.7
     Flood volume = Effective rainfall      0.23(In)
      times area       4.2(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
     Total soil loss =      0.40(In)
     Total soil loss =     0.139(Ac.Ft)
     Total rainfall =      0.63(In)
     Flood volume =        3462.8 Cubic Feet
     Total soil loss =        6073.2 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      3.024(CFS)
     ---------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
  ----------------------------------------------------------------------
    0+ 5       0.0001      0.01  Q         |         |         |         |
    0+10       0.0004      0.06  Q         |         |         |         |
    0+15       0.0012      0.11  Q         |         |         |         |
    0+20       0.0021      0.13  QV        |         |         |         |
    0+25       0.0031      0.15  QV        |         |         |         |
    0+30       0.0043      0.17  Q V       |         |         |         |
    0+35       0.0057      0.20  Q V       |         |         |         |
    0+40       0.0082      0.36  |Q  V     |         |         |         |
    0+45       0.0129      0.68  | Q   V   |         |         |         |
    0+50       0.0232      1.50  |     Q   |V        |         |         |
    0+55       0.0441      3.02  |         | Q       | V       |         |
    1+ 0       0.0618      2.57  |         Q         |         |V        |
    1+ 5       0.0699      1.18  |   Q     |         |         |    V    |
    1+10       0.0744      0.65  | Q       |         |         |      V  |
    1+15       0.0769      0.36  |Q        |         |         |       V |
    1+20       0.0781      0.18  Q         |         |         |        V|
    1+25       0.0787      0.08  Q         |         |         |        V|
    1+30       0.0790      0.05  Q         |         |         |        V|
    1+35       0.0793      0.04  Q         |         |         |        V|
    1+40       0.0794      0.02  Q         |         |         |        V|
    1+45       0.0795      0.01  Q         |         |         |        V|
    1+50       0.0795      0.00  Q         |         |         |        V|
    1+55       0.0795      0.00  Q         |         |         |         V
----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  03/21/12 File: 3504q2u1r242.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q2-24HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 2.800(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	60.6	0.464	0.000	0.464	1.000	0.464
					Sum (F) =	0.464

Area averaged mean soil loss (F) (In/Hr) = 0.464
Minimum soil loss rate ((In/Hr)) = 0.232
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
			Sum = 100.000 Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.022	(0.822)	0.020	0.002
2	0.17	0.07	0.022	(0.819)	0.020	0.002
3	0.25	0.07	0.022	(0.815)	0.020	0.002
4	0.33	0.10	0.034	(0.812)	0.030	0.003
5	0.42	0.10	0.034	(0.809)	0.030	0.003
6	0.50	0.10	0.034	(0.806)	0.030	0.003
7	0.58	0.10	0.034	(0.803)	0.030	0.003

8	0.67	0.10	0.034	(0.800)	0.030	0.003
9	0.75	0.10	0.034	(0.796)	0.030	0.003
10	0.83	0.13	0.045	(0.793)	0.040	0.004
11	0.92	0.13	0.045	(0.790)	0.040	0.004
12	1.00	0.13	0.045	(0.787)	0.040	0.004
13	1.08	0.10	0.034	(0.784)	0.030	0.003
14	1.17	0.10	0.034	(0.781)	0.030	0.003
15	1.25	0.10	0.034	(0.778)	0.030	0.003
16	1.33	0.10	0.034	(0.775)	0.030	0.003
17	1.42	0.10	0.034	(0.772)	0.030	0.003
18	1.50	0.10	0.034	(0.769)	0.030	0.003
19	1.58	0.10	0.034	(0.765)	0.030	0.003
20	1.67	0.10	0.034	(0.762)	0.030	0.003
21	1.75	0.10	0.034	(0.759)	0.030	0.003
22	1.83	0.13	0.045	(0.756)	0.040	0.004
23	1.92	0.13	0.045	(0.753)	0.040	0.004
24	2.00	0.13	0.045	(0.750)	0.040	0.004
25	2.08	0.13	0.045	(0.747)	0.040	0.004
26	2.17	0.13	0.045	(0.744)	0.040	0.004
27	2.25	0.13	0.045	(0.741)	0.040	0.004
28	2.33	0.13	0.045	(0.738)	0.040	0.004
29	2.42	0.13	0.045	(0.735)	0.040	0.004
30	2.50	0.13	0.045	(0.732)	0.040	0.004
31	2.58	0.17	0.056	(0.729)	0.050	0.006
32	2.67	0.17	0.056	(0.726)	0.050	0.006
33	2.75	0.17	0.056	(0.723)	0.050	0.006
34	2.83	0.17	0.056	(0.720)	0.050	0.006
35	2.92	0.17	0.056	(0.717)	0.050	0.006
36	3.00	0.17	0.056	(0.714)	0.050	0.006
37	3.08	0.17	0.056	(0.711)	0.050	0.006
38	3.17	0.17	0.056	(0.708)	0.050	0.006
39	3.25	0.17	0.056	(0.705)	0.050	0.006
40	3.33	0.17	0.056	(0.702)	0.050	0.006
41	3.42	0.17	0.056	(0.699)	0.050	0.006
42	3.50	0.17	0.056	(0.697)	0.050	0.006
43	3.58	0.17	0.056	(0.694)	0.050	0.006
44	3.67	0.17	0.056	(0.691)	0.050	0.006
45	3.75	0.17	0.056	(0.688)	0.050	0.006
46	3.83	0.20	0.067	(0.685)	0.060	0.007
47	3.92	0.20	0.067	(0.682)	0.060	0.007
48	4.00	0.20	0.067	(0.679)	0.060	0.007
49	4.08	0.20	0.067	(0.676)	0.060	0.007
50	4.17	0.20	0.067	(0.673)	0.060	0.007
51	4.25	0.20	0.067	(0.670)	0.060	0.007
52	4.33	0.23	0.078	(0.668)	0.071	0.008
53	4.42	0.23	0.078	(0.665)	0.071	0.008
54	4.50	0.23	0.078	(0.662)	0.071	0.008
55	4.58	0.23	0.078	(0.659)	0.071	0.008
56	4.67	0.23	0.078	(0.656)	0.071	0.008
57	4.75	0.23	0.078	(0.653)	0.071	0.008
58	4.83	0.27	0.090	(0.651)	0.081	0.009
59	4.92	0.27	0.090	(0.648)	0.081	0.009
60	5.00	0.27	0.090	(0.645)	0.081	0.009
61	5.08	0.20	0.067	(0.642)	0.060	0.007
62	5.17	0.20	0.067	(0.639)	0.060	0.007
63	5.25	0.20	0.067	(0.637)	0.060	0.007
64	5.33	0.23	0.078	(0.634)	0.071	0.008

65	5.42	0.23	0.078	(0.631)	0.071	0.008
66	5.50	0.23	0.078	(0.628)	0.071	0.008
67	5.58	0.27	0.090	(0.626)	0.081	0.009
68	5.67	0.27	0.090	(0.623)	0.081	0.009
69	5.75	0.27	0.090	(0.620)	0.081	0.009
70	5.83	0.27	0.090	(0.617)	0.081	0.009
71	5.92	0.27	0.090	(0.615)	0.081	0.009
72	6.00	0.27	0.090	(0.612)	0.081	0.009
73	6.08	0.30	0.101	(0.609)	0.091	0.010
74	6.17	0.30	0.101	(0.606)	0.091	0.010
75	6.25	0.30	0.101	(0.604)	0.091	0.010
76	6.33	0.30	0.101	(0.601)	0.091	0.010
77	6.42	0.30	0.101	(0.598)	0.091	0.010
78	6.50	0.30	0.101	(0.596)	0.091	0.010
79	6.58	0.33	0.112	(0.593)	0.101	0.011
80	6.67	0.33	0.112	(0.590)	0.101	0.011
81	6.75	0.33	0.112	(0.588)	0.101	0.011
82	6.83	0.33	0.112	(0.585)	0.101	0.011
83	6.92	0.33	0.112	(0.582)	0.101	0.011
84	7.00	0.33	0.112	(0.580)	0.101	0.011
85	7.08	0.33	0.112	(0.577)	0.101	0.011
86	7.17	0.33	0.112	(0.574)	0.101	0.011
87	7.25	0.33	0.112	(0.572)	0.101	0.011
88	7.33	0.37	0.123	(0.569)	0.111	0.012
89	7.42	0.37	0.123	(0.567)	0.111	0.012
90	7.50	0.37	0.123	(0.564)	0.111	0.012
91	7.58	0.40	0.134	(0.561)	0.121	0.013
92	7.67	0.40	0.134	(0.559)	0.121	0.013
93	7.75	0.40	0.134	(0.556)	0.121	0.013
94	7.83	0.43	0.146	(0.554)	0.131	0.015
95	7.92	0.43	0.146	(0.551)	0.131	0.015
96	8.00	0.43	0.146	(0.549)	0.131	0.015
97	8.08	0.50	0.168	(0.546)	0.151	0.017
98	8.17	0.50	0.168	(0.543)	0.151	0.017
99	8.25	0.50	0.168	(0.541)	0.151	0.017
100	8.33	0.50	0.168	(0.538)	0.151	0.017
101	8.42	0.50	0.168	(0.536)	0.151	0.017
102	8.50	0.50	0.168	(0.533)	0.151	0.017
103	8.58	0.53	0.179	(0.531)	0.161	0.018
104	8.67	0.53	0.179	(0.528)	0.161	0.018
105	8.75	0.53	0.179	(0.526)	0.161	0.018
106	8.83	0.57	0.190	(0.523)	0.171	0.019
107	8.92	0.57	0.190	(0.521)	0.171	0.019
108	9.00	0.57	0.190	(0.518)	0.171	0.019
109	9.08	0.63	0.213	(0.516)	0.192	0.021
110	9.17	0.63	0.213	(0.514)	0.192	0.021
111	9.25	0.63	0.213	(0.511)	0.192	0.021
112	9.33	0.67	0.224	(0.509)	0.202	0.022
113	9.42	0.67	0.224	(0.506)	0.202	0.022
114	9.50	0.67	0.224	(0.504)	0.202	0.022
115	9.58	0.70	0.235	(0.501)	0.212	0.024
116	9.67	0.70	0.235	(0.499)	0.212	0.024
117	9.75	0.70	0.235	(0.497)	0.212	0.024
118	9.83	0.73	0.246	(0.494)	0.222	0.025
119	9.92	0.73	0.246	(0.492)	0.222	0.025
120	10.00	0.73	0.246	(0.489)	0.222	0.025
121	10.08	0.50	0.168	(0.487)	0.151	0.017

122	10.17	0.50	0.168	(0.485)	0.151	0.017
123	10.25	0.50	0.168	(0.482)	0.151	0.017
124	10.33	0.50	0.168	(0.480)	0.151	0.017
125	10.42	0.50	0.168	(0.478)	0.151	0.017
126	10.50	0.50	0.168	(0.475)	0.151	0.017
127	10.58	0.67	0.224	(0.473)	0.202	0.022
128	10.67	0.67	0.224	(0.471)	0.202	0.022
129	10.75	0.67	0.224	(0.468)	0.202	0.022
130	10.83	0.67	0.224	(0.466)	0.202	0.022
131	10.92	0.67	0.224	(0.464)	0.202	0.022
132	11.00	0.67	0.224	(0.462)	0.202	0.022
133	11.08	0.63	0.213	(0.459)	0.192	0.021
134	11.17	0.63	0.213	(0.457)	0.192	0.021
135	11.25	0.63	0.213	(0.455)	0.192	0.021
136	11.33	0.63	0.213	(0.453)	0.192	0.021
137	11.42	0.63	0.213	(0.450)	0.192	0.021
138	11.50	0.63	0.213	(0.448)	0.192	0.021
139	11.58	0.57	0.190	(0.446)	0.171	0.019
140	11.67	0.57	0.190	(0.444)	0.171	0.019
141	11.75	0.57	0.190	(0.441)	0.171	0.019
142	11.83	0.60	0.202	(0.439)	0.181	0.020
143	11.92	0.60	0.202	(0.437)	0.181	0.020
144	12.00	0.60	0.202	(0.435)	0.181	0.020
145	12.08	0.83	0.280	(0.433)	0.252	0.028
146	12.17	0.83	0.280	(0.431)	0.252	0.028
147	12.25	0.83	0.280	(0.428)	0.252	0.028
148	12.33	0.87	0.291	(0.426)	0.262	0.029
149	12.42	0.87	0.291	(0.424)	0.262	0.029
150	12.50	0.87	0.291	(0.422)	0.262	0.029
151	12.58	0.93	0.314	(0.420)	0.282	0.031
152	12.67	0.93	0.314	(0.418)	0.282	0.031
153	12.75	0.93	0.314	(0.416)	0.282	0.031
154	12.83	0.97	0.325	(0.413)	0.292	0.032
155	12.92	0.97	0.325	(0.411)	0.292	0.032
156	13.00	0.97	0.325	(0.409)	0.292	0.032
157	13.08	1.13	0.381	(0.407)	0.343	0.038
158	13.17	1.13	0.381	(0.405)	0.343	0.038
159	13.25	1.13	0.381	(0.403)	0.343	0.038
160	13.33	1.13	0.381	(0.401)	0.343	0.038
161	13.42	1.13	0.381	(0.399)	0.343	0.038
162	13.50	1.13	0.381	(0.397)	0.343	0.038
163	13.58	0.77	0.258	(0.395)	0.232	0.026
164	13.67	0.77	0.258	(0.393)	0.232	0.026
165	13.75	0.77	0.258	(0.391)	0.232	0.026
166	13.83	0.77	0.258	(0.389)	0.232	0.026
167	13.92	0.77	0.258	(0.387)	0.232	0.026
168	14.00	0.77	0.258	(0.385)	0.232	0.026
169	14.08	0.90	0.302	(0.383)	0.272	0.030
170	14.17	0.90	0.302	(0.381)	0.272	0.030
171	14.25	0.90	0.302	(0.379)	0.272	0.030
172	14.33	0.87	0.291	(0.377)	0.262	0.029
173	14.42	0.87	0.291	(0.375)	0.262	0.029
174	14.50	0.87	0.291	(0.373)	0.262	0.029
175	14.58	0.87	0.291	(0.371)	0.262	0.029
176	14.67	0.87	0.291	(0.370)	0.262	0.029
177	14.75	0.87	0.291	(0.368)	0.262	0.029
178	14.83	0.83	0.280	(0.366)	0.252	0.028

179	14.92	0.83	0.280	(0.364)	0.252	0.028
180	15.00	0.83	0.280	(0.362)	0.252	0.028
181	15.08	0.80	0.269	(0.360)	0.242	0.027
182	15.17	0.80	0.269	(0.358)	0.242	0.027
183	15.25	0.80	0.269	(0.356)	0.242	0.027
184	15.33	0.77	0.258	(0.355)	0.232	0.026
185	15.42	0.77	0.258	(0.353)	0.232	0.026
186	15.50	0.77	0.258	(0.351)	0.232	0.026
187	15.58	0.63	0.213	(0.349)	0.192	0.021
188	15.67	0.63	0.213	(0.347)	0.192	0.021
189	15.75	0.63	0.213	(0.346)	0.192	0.021
190	15.83	0.63	0.213	(0.344)	0.192	0.021
191	15.92	0.63	0.213	(0.342)	0.192	0.021
192	16.00	0.63	0.213	(0.340)	0.192	0.021
193	16.08	0.13	0.045	(0.339)	0.040	0.004
194	16.17	0.13	0.045	(0.337)	0.040	0.004
195	16.25	0.13	0.045	(0.335)	0.040	0.004
196	16.33	0.13	0.045	(0.333)	0.040	0.004
197	16.42	0.13	0.045	(0.332)	0.040	0.004
198	16.50	0.13	0.045	(0.330)	0.040	0.004
199	16.58	0.10	0.034	(0.328)	0.030	0.003
200	16.67	0.10	0.034	(0.327)	0.030	0.003
201	16.75	0.10	0.034	(0.325)	0.030	0.003
202	16.83	0.10	0.034	(0.323)	0.030	0.003
203	16.92	0.10	0.034	(0.322)	0.030	0.003
204	17.00	0.10	0.034	(0.320)	0.030	0.003
205	17.08	0.17	0.056	(0.319)	0.050	0.006
206	17.17	0.17	0.056	(0.317)	0.050	0.006
207	17.25	0.17	0.056	(0.315)	0.050	0.006
208	17.33	0.17	0.056	(0.314)	0.050	0.006
209	17.42	0.17	0.056	(0.312)	0.050	0.006
210	17.50	0.17	0.056	(0.311)	0.050	0.006
211	17.58	0.17	0.056	(0.309)	0.050	0.006
212	17.67	0.17	0.056	(0.308)	0.050	0.006
213	17.75	0.17	0.056	(0.306)	0.050	0.006
214	17.83	0.13	0.045	(0.304)	0.040	0.004
215	17.92	0.13	0.045	(0.303)	0.040	0.004
216	18.00	0.13	0.045	(0.301)	0.040	0.004
217	18.08	0.13	0.045	(0.300)	0.040	0.004
218	18.17	0.13	0.045	(0.299)	0.040	0.004
219	18.25	0.13	0.045	(0.297)	0.040	0.004
220	18.33	0.13	0.045	(0.296)	0.040	0.004
221	18.42	0.13	0.045	(0.294)	0.040	0.004
222	18.50	0.13	0.045	(0.293)	0.040	0.004
223	18.58	0.10	0.034	(0.291)	0.030	0.003
224	18.67	0.10	0.034	(0.290)	0.030	0.003
225	18.75	0.10	0.034	(0.289)	0.030	0.003
226	18.83	0.07	0.022	(0.287)	0.020	0.002
227	18.92	0.07	0.022	(0.286)	0.020	0.002
228	19.00	0.07	0.022	(0.284)	0.020	0.002
229	19.08	0.10	0.034	(0.283)	0.030	0.003
230	19.17	0.10	0.034	(0.282)	0.030	0.003
231	19.25	0.10	0.034	(0.280)	0.030	0.003
232	19.33	0.13	0.045	(0.279)	0.040	0.004
233	19.42	0.13	0.045	(0.278)	0.040	0.004
234	19.50	0.13	0.045	(0.277)	0.040	0.004
235	19.58	0.10	0.034	(0.275)	0.030	0.003

236	19.67	0.10	0.034	(0.274)	0.030	0.003
237	19.75	0.10	0.034	(0.273)	0.030	0.003
238	19.83	0.07	0.022	(0.272)	0.020	0.002
239	19.92	0.07	0.022	(0.270)	0.020	0.002
240	20.00	0.07	0.022	(0.269)	0.020	0.002
241	20.08	0.10	0.034	(0.268)	0.030	0.003
242	20.17	0.10	0.034	(0.267)	0.030	0.003
243	20.25	0.10	0.034	(0.266)	0.030	0.003
244	20.33	0.10	0.034	(0.264)	0.030	0.003
245	20.42	0.10	0.034	(0.263)	0.030	0.003
246	20.50	0.10	0.034	(0.262)	0.030	0.003
247	20.58	0.10	0.034	(0.261)	0.030	0.003
248	20.67	0.10	0.034	(0.260)	0.030	0.003
249	20.75	0.10	0.034	(0.259)	0.030	0.003
250	20.83	0.07	0.022	(0.258)	0.020	0.002
251	20.92	0.07	0.022	(0.257)	0.020	0.002
252	21.00	0.07	0.022	(0.256)	0.020	0.002
253	21.08	0.10	0.034	(0.255)	0.030	0.003
254	21.17	0.10	0.034	(0.254)	0.030	0.003
255	21.25	0.10	0.034	(0.253)	0.030	0.003
256	21.33	0.07	0.022	(0.252)	0.020	0.002
257	21.42	0.07	0.022	(0.251)	0.020	0.002
258	21.50	0.07	0.022	(0.250)	0.020	0.002
259	21.58	0.10	0.034	(0.249)	0.030	0.003
260	21.67	0.10	0.034	(0.248)	0.030	0.003
261	21.75	0.10	0.034	(0.247)	0.030	0.003
262	21.83	0.07	0.022	(0.246)	0.020	0.002
263	21.92	0.07	0.022	(0.246)	0.020	0.002
264	22.00	0.07	0.022	(0.245)	0.020	0.002
265	22.08	0.10	0.034	(0.244)	0.030	0.003
266	22.17	0.10	0.034	(0.243)	0.030	0.003
267	22.25	0.10	0.034	(0.242)	0.030	0.003
268	22.33	0.07	0.022	(0.242)	0.020	0.002
269	22.42	0.07	0.022	(0.241)	0.020	0.002
270	22.50	0.07	0.022	(0.240)	0.020	0.002
271	22.58	0.07	0.022	(0.239)	0.020	0.002
272	22.67	0.07	0.022	(0.239)	0.020	0.002
273	22.75	0.07	0.022	(0.238)	0.020	0.002
274	22.83	0.07	0.022	(0.238)	0.020	0.002
275	22.92	0.07	0.022	(0.237)	0.020	0.002
276	23.00	0.07	0.022	(0.236)	0.020	0.002
277	23.08	0.07	0.022	(0.236)	0.020	0.002
278	23.17	0.07	0.022	(0.235)	0.020	0.002
279	23.25	0.07	0.022	(0.235)	0.020	0.002
280	23.33	0.07	0.022	(0.234)	0.020	0.002
281	23.42	0.07	0.022	(0.234)	0.020	0.002
282	23.50	0.07	0.022	(0.233)	0.020	0.002
283	23.58	0.07	0.022	(0.233)	0.020	0.002
284	23.67	0.07	0.022	(0.233)	0.020	0.002
285	23.75	0.07	0.022	(0.232)	0.020	0.002
286	23.83	0.07	0.022	(0.232)	0.020	0.002
287	23.92	0.07	0.022	(0.232)	0.020	0.002
288	24.00	0.07	0.022	(0.232)	0.020	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.4

Flood volume = Effective rainfall 0.28(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)

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Total soil loss =      2.52(In)
Total soil loss =     0.876(Ac.Ft)
Total rainfall =      2.80(In)
Flood volume =        4238.4 Cubic Feet
Total soil loss =       38145.2 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =      0.159(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0000      0.00  Q          |         |         |         |
  0+15       0.0001      0.01  Q          |         |         |         |
  0+20       0.0001      0.01  Q          |         |         |         |
  0+25       0.0002      0.01  Q          |         |         |         |
  0+30       0.0003      0.01  Q          |         |         |         |
  0+35       0.0004      0.01  Q          |         |         |         |
  0+40       0.0005      0.01  Q          |         |         |         |
  0+45       0.0006      0.01  Q          |         |         |         |
  0+50       0.0007      0.01  Q          |         |         |         |
  0+55       0.0008      0.02  Q          |         |         |         |
  1+ 0       0.0009      0.02  Q          |         |         |         |
  1+ 5       0.0010      0.02  Q          |         |         |         |
  1+10       0.0011      0.02  Q          |         |         |         |
  1+15       0.0012      0.02  Q          |         |         |         |
  1+20       0.0013      0.01  Q          |         |         |         |
  1+25       0.0014      0.01  Q          |         |         |         |
  1+30       0.0015      0.01  Q          |         |         |         |
  1+35       0.0016      0.01  Q          |         |         |         |
  1+40       0.0017      0.01  Q          |         |         |         |
  1+45       0.0018      0.01  Q          |         |         |         |
  1+50       0.0019      0.01  Q          |         |         |         |
  1+55       0.0020      0.02  Q          |         |         |         |
  2+ 0       0.0022      0.02  Q          |         |         |         |
  2+ 5       0.0023      0.02  Q          |         |         |         |
  2+10       0.0024      0.02  Q          |         |         |         |
  2+15       0.0025      0.02  QV         |         |         |         |
  2+20       0.0027      0.02  QV         |         |         |         |
  2+25       0.0028      0.02  QV         |         |         |         |
  2+30       0.0029      0.02  QV         |         |         |         |
  2+35       0.0031      0.02  QV         |         |         |         |
  2+40       0.0032      0.02  QV         |         |         |         |
  2+45       0.0034      0.02  QV         |         |         |         |
  2+50       0.0035      0.02  QV         |         |         |         |
  2+55       0.0037      0.02  QV         |         |         |         |
  3+ 0       0.0038      0.02  QV         |         |         |         |
  3+ 5       0.0040      0.02  QV         |         |         |         |
  3+10       0.0042      0.02  QV         |         |         |         |
  3+15       0.0043      0.02  QV         |         |         |         |
  3+20       0.0045      0.02  QV         |         |         |         |
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3+25       0.0047      0.02  QV        |          |          |          |
3+30       0.0048      0.02  QV        |          |          |          |
3+35       0.0050      0.02  Q V       |          |          |          |
3+40       0.0051      0.02  Q V       |          |          |          |
3+45       0.0053      0.02  Q V       |          |          |          |
3+50       0.0055      0.02  Q V       |          |          |          |
3+55       0.0056      0.03  Q V       |          |          |          |
4+ 0       0.0058      0.03  Q V       |          |          |          |
4+ 5       0.0060      0.03  Q V       |          |          |          |
4+10       0.0062      0.03  Q V       |          |          |          |
4+15       0.0064      0.03  Q V       |          |          |          |
4+20       0.0066      0.03  Q V       |          |          |          |
4+25       0.0068      0.03  Q V       |          |          |          |
4+30       0.0070      0.03  Q V       |          |          |          |
4+35       0.0072      0.03  Q V       |          |          |          |
4+40       0.0075      0.03  Q  V      |          |          |          |
4+45       0.0077      0.03  Q  V      |          |          |          |
4+50       0.0079      0.03  Q  V      |          |          |          |
4+55       0.0082      0.03  Q  V      |          |          |          |
5+ 0       0.0084      0.04  Q  V      |          |          |          |
5+ 5       0.0087      0.04  Q  V      |          |          |          |
5+10       0.0089      0.03  Q  V      |          |          |          |
5+15       0.0091      0.03  Q  V      |          |          |          |
5+20       0.0093      0.03  Q  V      |          |          |          |
5+25       0.0095      0.03  Q  V      |          |          |          |
5+30       0.0097      0.03  Q   V     |          |          |          |
5+35       0.0100      0.03  Q   V     |          |          |          |
5+40       0.0102      0.03  Q   V     |          |          |          |
5+45       0.0105      0.04  Q   V     |          |          |          |
5+50       0.0107      0.04  Q   V     |          |          |          |
5+55       0.0110      0.04  Q   V     |          |          |          |
6+ 0       0.0112      0.04  Q   V     |          |          |          |
6+ 5       0.0115      0.04  Q   V     |          |          |          |
6+10       0.0118      0.04  Q   V     |          |          |          |
6+15       0.0120      0.04  Q   V     |          |          |          |
6+20       0.0123      0.04  Q    V    |          |          |          |
6+25       0.0126      0.04  Q    V    |          |          |          |
6+30       0.0129      0.04  Q    V    |          |          |          |
6+35       0.0132      0.04  Q    V    |          |          |          |
6+40       0.0135      0.04  Q    V    |          |          |          |
6+45       0.0138      0.05  Q    V    |          |          |          |
6+50       0.0141      0.05  Q    V    |          |          |          |
6+55       0.0145      0.05  Q    V    |          |          |          |
7+ 0       0.0148      0.05  Q     V   |          |          |          |
7+ 5       0.0151      0.05  Q     V   |          |          |          |
7+10       0.0154      0.05  Q     V   |          |          |          |
7+15       0.0158      0.05  Q     V   |          |          |          |
7+20       0.0161      0.05  Q     V   |          |          |          |
7+25       0.0164      0.05  Q     V   |          |          |          |
7+30       0.0168      0.05  Q     V   |          |          |          |
7+35       0.0171      0.05  Q      V  |          |          |          |
7+40       0.0175      0.05  Q      V  |          |          |          |
7+45       0.0179      0.06  Q      V  |          |          |          |
7+50       0.0183      0.06  Q      V  |          |          |          |
7+55       0.0187      0.06  Q      V  |          |          |          |
8+ 0       0.0191      0.06  Q      V  |          |          |          |
8+ 5       0.0195      0.06  Q       V |          |          |          |
```

```
 8+10       0.0199      0.06  Q       V |         |         |         |
 8+15       0.0204      0.07  Q       V |         |         |         |
 8+20       0.0209      0.07  Q       V |         |         |         |
 8+25       0.0214      0.07  Q       V |         |         |         |
 8+30       0.0218      0.07  Q       V |         |         |         |
 8+35       0.0223      0.07  Q        V|         |         |         |
 8+40       0.0228      0.07  Q        V|         |         |         |
 8+45       0.0233      0.07  Q        V|         |         |         |
 8+50       0.0238      0.07  Q        V|         |         |         |
 8+55       0.0244      0.08  Q         V         |         |         |
 9+ 0       0.0249      0.08  Q         V         |         |         |
 9+ 5       0.0255      0.08  Q         V         |         |         |
 9+10       0.0260      0.08  Q         V         |         |         |
 9+15       0.0266      0.09  Q         V         |         |         |
 9+20       0.0272      0.09  Q         |V        |         |         |
 9+25       0.0279      0.09  Q         |V        |         |         |
 9+30       0.0285      0.09  Q         |V        |         |         |
 9+35       0.0292      0.09  Q         |V        |         |         |
 9+40       0.0298      0.10  Q         | V       |         |         |
 9+45       0.0305      0.10  Q         | V       |         |         |
 9+50       0.0312      0.10  Q         | V       |         |         |
 9+55       0.0318      0.10  Q         |  V      |         |         |
10+ 0       0.0326      0.10  Q         |  V      |         |         |
10+ 5       0.0332      0.10  Q         |  V      |         |         |
10+10       0.0339      0.09  Q         |  V      |         |         |
10+15       0.0344      0.08  Q         |   V     |         |         |
10+20       0.0349      0.08  Q         |   V     |         |         |
10+25       0.0354      0.07  Q         |   V     |         |         |
10+30       0.0359      0.07  Q         |   V     |         |         |
10+35       0.0364      0.07  Q         |   V     |         |         |
10+40       0.0370      0.08  Q         |    V    |         |         |
10+45       0.0376      0.09  Q         |    V    |         |         |
10+50       0.0382      0.09  Q         |    V    |         |         |
10+55       0.0389      0.09  Q         |    V    |         |         |
11+ 0       0.0395      0.09  Q         |     V   |         |         |
11+ 5       0.0401      0.09  Q         |     V   |         |         |
11+10       0.0408      0.09  Q         |     V   |         |         |
11+15       0.0414      0.09  Q         |      V  |         |         |
11+20       0.0420      0.09  Q         |      V  |         |         |
11+25       0.0426      0.09  Q         |      V  |         |         |
11+30       0.0433      0.09  Q         |      V  |         |         |
11+35       0.0439      0.09  Q         |       V |         |         |
11+40       0.0445      0.09  Q         |       V |         |         |
11+45       0.0450      0.08  Q         |       V |         |         |
11+50       0.0456      0.08  Q         |       V |         |         |
11+55       0.0462      0.08  Q         |       V |         |         |
12+ 0       0.0467      0.08  Q         |        V|         |         |
12+ 5       0.0473      0.09  Q         |        V|         |         |
12+10       0.0480      0.10  Q         |        V|         |         |
12+15       0.0488      0.11  Q         |         V         |         |
12+20       0.0495      0.11  Q         |         V         |         |
12+25       0.0503      0.12  Q         |         V         |         |
12+30       0.0512      0.12  Q         |         |V        |         |
12+35       0.0520      0.12  Q         |         |V        |         |
12+40       0.0529      0.13  Q         |         |V        |         |
12+45       0.0538      0.13  Q         |         | V       |         |
12+50       0.0546      0.13  Q         |         | V       |         |
```

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12+55       0.0556      0.13  Q          |          | V       |         |
13+ 0       0.0565      0.13  Q          |          |  V      |         |
13+ 5       0.0574      0.14  Q          |          |  V      |         |
13+10       0.0584      0.15  Q          |          |   V     |         |
13+15       0.0595      0.15  Q          |          |   V     |         |
13+20       0.0606      0.16  Q          |          |   V     |         |
13+25       0.0617      0.16  Q          |          |    V    |         |
13+30       0.0628      0.16  Q          |          |    V    |         |
13+35       0.0638      0.16  Q          |          |     V   |         |
13+40       0.0648      0.14  Q          |          |     V   |         |
13+45       0.0656      0.12  Q          |          |     V   |         |
13+50       0.0664      0.12  Q          |          |      V  |         |
13+55       0.0672      0.11  Q          |          |      V  |         |
14+ 0       0.0680      0.11  Q          |          |      V  |         |
14+ 5       0.0687      0.11  Q          |          |       V |         |
14+10       0.0695      0.12  Q          |          |       V |         |
14+15       0.0704      0.12  Q          |          |       V |         |
14+20       0.0712      0.12  Q          |          |        V|         |
14+25       0.0721      0.12  Q          |          |        V|         |
14+30       0.0729      0.12  Q          |          |        V|         |
14+35       0.0738      0.12  Q          |          |         V         |
14+40       0.0746      0.12  Q          |          |         V         |
14+45       0.0755      0.12  Q          |          |         |V        |
14+50       0.0763      0.12  Q          |          |         |V        |
14+55       0.0771      0.12  Q          |          |         |V        |
15+ 0       0.0780      0.12  Q          |          |         | V       |
15+ 5       0.0788      0.12  Q          |          |         | V       |
15+10       0.0796      0.12  Q          |          |         | V       |
15+15       0.0804      0.11  Q          |          |         |  V      |
15+20       0.0811      0.11  Q          |          |         |  V      |
15+25       0.0819      0.11  Q          |          |         |  V      |
15+30       0.0827      0.11  Q          |          |         |  V      |
15+35       0.0834      0.11  Q          |          |         |   V     |
15+40       0.0841      0.10  Q          |          |         |   V     |
15+45       0.0848      0.09  Q          |          |         |   V     |
15+50       0.0854      0.09  Q          |          |         |    V    |
15+55       0.0860      0.09  Q          |          |         |    V    |
16+ 0       0.0866      0.09  Q          |          |         |    V    |
16+ 5       0.0872      0.09  Q          |          |         |    V    |
16+10       0.0877      0.06  Q          |          |         |     V   |
16+15       0.0879      0.04  Q          |          |         |     V   |
16+20       0.0881      0.03  Q          |          |         |     V   |
16+25       0.0883      0.02  Q          |          |         |     V   |
16+30       0.0884      0.02  Q          |          |         |     V   |
16+35       0.0886      0.02  Q          |          |         |     V   |
16+40       0.0887      0.02  Q          |          |         |     V   |
16+45       0.0888      0.02  Q          |          |         |     V   |
16+50       0.0889      0.02  Q          |          |         |     V   |
16+55       0.0890      0.01  Q          |          |         |     V   |
17+ 0       0.0891      0.01  Q          |          |         |     V   |
17+ 5       0.0892      0.01  Q          |          |         |     V   |
17+10       0.0893      0.02  Q          |          |         |     V   |
17+15       0.0895      0.02  Q          |          |         |     V   |
17+20       0.0896      0.02  Q          |          |         |     V   |
17+25       0.0898      0.02  Q          |          |         |     V   |
17+30       0.0900      0.02  Q          |          |         |     V   |
17+35       0.0901      0.02  Q          |          |         |      V  |
```

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17+40       0.0903      0.02  Q          |          |          |       V  |
17+45       0.0904      0.02  Q          |          |          |       V  |
17+50       0.0906      0.02  Q          |          |          |       V  |
17+55       0.0907      0.02  Q          |          |          |       V  |
18+ 0       0.0909      0.02  Q          |          |          |       V  |
18+ 5       0.0910      0.02  Q          |          |          |       V  |
18+10       0.0912      0.02  Q          |          |          |       V  |
18+15       0.0913      0.02  Q          |          |          |       V  |
18+20       0.0914      0.02  Q          |          |          |       V  |
18+25       0.0915      0.02  Q          |          |          |       V  |
18+30       0.0917      0.02  Q          |          |          |       V  |
18+35       0.0918      0.02  Q          |          |          |       V  |
18+40       0.0919      0.02  Q          |          |          |       V  |
18+45       0.0920      0.02  Q          |          |          |       V  |
18+50       0.0921      0.01  Q          |          |          |       V  |
18+55       0.0922      0.01  Q          |          |          |       V  |
19+ 0       0.0923      0.01  Q          |          |          |       V  |
19+ 5       0.0924      0.01  Q          |          |          |       V  |
19+10       0.0924      0.01  Q          |          |          |        V |
19+15       0.0925      0.01  Q          |          |          |        V |
19+20       0.0926      0.01  Q          |          |          |        V |
19+25       0.0927      0.02  Q          |          |          |        V |
19+30       0.0929      0.02  Q          |          |          |        V |
19+35       0.0930      0.02  Q          |          |          |        V |
19+40       0.0931      0.02  Q          |          |          |        V |
19+45       0.0932      0.02  Q          |          |          |        V |
19+50       0.0933      0.01  Q          |          |          |        V |
19+55       0.0934      0.01  Q          |          |          |        V |
20+ 0       0.0935      0.01  Q          |          |          |        V |
20+ 5       0.0935      0.01  Q          |          |          |        V |
20+10       0.0936      0.01  Q          |          |          |        V |
20+15       0.0937      0.01  Q          |          |          |        V |
20+20       0.0938      0.01  Q          |          |          |        V |
20+25       0.0939      0.01  Q          |          |          |        V |
20+30       0.0940      0.01  Q          |          |          |        V |
20+35       0.0941      0.01  Q          |          |          |        V |
20+40       0.0942      0.01  Q          |          |          |        V |
20+45       0.0943      0.01  Q          |          |          |        V |
20+50       0.0944      0.01  Q          |          |          |        V |
20+55       0.0945      0.01  Q          |          |          |        V |
21+ 0       0.0945      0.01  Q          |          |          |        V |
21+ 5       0.0946      0.01  Q          |          |          |        V |
21+10       0.0947      0.01  Q          |          |          |        V |
21+15       0.0948      0.01  Q          |          |          |        V |
21+20       0.0949      0.01  Q          |          |          |        V |
21+25       0.0949      0.01  Q          |          |          |         V|
21+30       0.0950      0.01  Q          |          |          |         V|
21+35       0.0951      0.01  Q          |          |          |         V|
21+40       0.0952      0.01  Q          |          |          |         V|
21+45       0.0953      0.01  Q          |          |          |         V|
21+50       0.0953      0.01  Q          |          |          |         V|
21+55       0.0954      0.01  Q          |          |          |         V|
22+ 0       0.0955      0.01  Q          |          |          |         V|
22+ 5       0.0956      0.01  Q          |          |          |         V|
22+10       0.0956      0.01  Q          |          |          |         V|
22+15       0.0957      0.01  Q          |          |          |         V|
22+20       0.0958      0.01  Q          |          |          |         V|
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   22+25       0.0959      0.01  Q          |          |          |         V|
   22+30       0.0960      0.01  Q          |          |          |         V|
   22+35       0.0961      0.01  Q          |          |          |         V|
   22+40       0.0961      0.01  Q          |          |          |         V|
   22+45       0.0962      0.01  Q          |          |          |         V|
   22+50       0.0963      0.01  Q          |          |          |         V|
   22+55       0.0963      0.01  Q          |          |          |         V|
   23+ 0       0.0964      0.01  Q          |          |          |         V|
   23+ 5       0.0964      0.01  Q          |          |          |         V|
   23+10       0.0965      0.01  Q          |          |          |         V|
   23+15       0.0966      0.01  Q          |          |          |         V|
   23+20       0.0966      0.01  Q          |          |          |         V|
   23+25       0.0967      0.01  Q          |          |          |         V|
   23+30       0.0968      0.01  Q          |          |          |         V|
   23+35       0.0968      0.01  Q          |          |          |         V|
   23+40       0.0969      0.01  Q          |          |          |         V|
   23+45       0.0970      0.01  Q          |          |          |         V|
   23+50       0.0970      0.01  Q          |          |          |         V|
   23+55       0.0971      0.01  Q          |          |          |         V|
   24+ 0       0.0972      0.01  Q          |          |          |         V|
   24+ 5       0.0972      0.01  Q          |          |          |         V|
   24+10       0.0973      0.01  Q          |          |          |         V|
   24+15       0.0973      0.00  Q          |          |          |         V|
   24+20       0.0973      0.00  Q          |          |          |         V|
   24+25       0.0973      0.00  Q          |          |          |         V|
   24+30       0.0973      0.00  Q          |          |          |         V|
   24+35       0.0973      0.00  Q          |          |          |         V|
   24+40       0.0973      0.00  Q          |          |          |         V|
   24+45       0.0973      0.00  Q          |          |          |         V|
   24+50       0.0973      0.00  Q          |          |          |         V|
   24+55       0.0973      0.00  Q          |          |          |         V|
-----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  03/22/12 File: 3504q10u1r110.out


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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q10-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 1.008(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.008(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	78.0	0.268	0.000	0.268	1.000	0.268
					Sum (F) =	0.268

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.532	0.268	(0.479)	0.265
2	0.17	4.50	0.545	0.268	(0.490)	0.277
3	0.25	5.40	0.653	0.268	(0.588)	0.386
4	0.33	5.40	0.653	0.268	(0.588)	0.386
5	0.42	5.70	0.690	0.268	(0.621)	0.422

```
  6   0.50     6.40      0.774          0.268    (  0.697)        0.507
  7   0.58     7.90      0.956          0.268    (  0.860)        0.688
  8   0.67     9.10      1.101          0.268    (  0.991)        0.834
  9   0.75    12.80      1.549          0.268    (  1.394)        1.281
 10   0.83    25.60      3.098          0.268    (  2.788)        2.830
 11   0.92     7.90      0.956          0.268    (  0.860)        0.688
 12   1.00     4.90      0.593          0.268    (  0.534)        0.325
            (Loss Rate Not Used)
    Sum =     100.0                                   Sum =     8.9
     Flood volume = Effective rainfall      0.74(In)
      times area       4.2(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
     Total soil loss =      0.27(In)
     Total soil loss =     0.093(Ac.Ft)
     Total rainfall =      1.01(In)
     Flood volume =       11214.4 Cubic Feet
     Total soil loss =        4050.7 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      6.800(CFS)
     ---------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
  ----------------------------------------------------------------------
    0+ 5       0.0005      0.07  Q         |         |         |         |
    0+10       0.0036      0.45  VQ        |         |         |         |
    0+15       0.0095      0.86  |V Q      |         |         |         |
    0+20       0.0176      1.17  | V Q     |         |         |         |
    0+25       0.0273      1.41  |   VQ    |         |         |         |
    0+30       0.0382      1.59  |    VQ   |         |         |         |
    0+35       0.0510      1.86  |      Q  |         |         |         |
    0+40       0.0670      2.32  |        QV         |         |         |
    0+45       0.0875      2.96  |         |Q V      |         |         |
    0+50       0.1173      4.33  |         |      QV |         |         |
    0+55       0.1641      6.80  |         |         |    V Q  |         |
    1+ 0       0.2057      6.04  |         |         |   Q     |V        |
    1+ 5       0.2295      3.45  |         |  Q      |         |    V    |
    1+10       0.2428      1.94  |      Q  |         |         |      V  |
    1+15       0.2498      1.01  |   Q     |         |         |       V |
    1+20       0.2534      0.53  | Q       |         |         |        V|
    1+25       0.2552      0.26  |Q        |         |         |        V|
    1+30       0.2562      0.15  Q         |         |         |        V|
    1+35       0.2568      0.10  Q         |         |         |        V|
    1+40       0.2572      0.06  Q         |         |         |        V|
    1+45       0.2574      0.02  Q         |         |         |        V|
    1+50       0.2574      0.01  Q         |         |         |        V|
    1+55       0.2574      0.00  Q         |         |         |         V
---------------------------------------------------------------------
```

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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/21/12 File: 3504q10u1r2410.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q10-24HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 4.816(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.816(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	78.0	0.268	0.000	0.268	1.000	0.268
					Sum (F) =	0.268

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
			Sum = 100.000 Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.039	(0.474)	0.035	0.004
2	0.17	0.07	0.039	(0.473)	0.035	0.004
3	0.25	0.07	0.039	(0.471)	0.035	0.004
4	0.33	0.10	0.058	(0.469)	0.052	0.006
5	0.42	0.10	0.058	(0.467)	0.052	0.006
6	0.50	0.10	0.058	(0.465)	0.052	0.006
7	0.58	0.10	0.058	(0.463)	0.052	0.006

8	0.67	0.10	0.058	(0.462)	0.052	0.006
9	0.75	0.10	0.058	(0.460)	0.052	0.006
10	0.83	0.13	0.077	(0.458)	0.069	0.008
11	0.92	0.13	0.077	(0.456)	0.069	0.008
12	1.00	0.13	0.077	(0.454)	0.069	0.008
13	1.08	0.10	0.058	(0.453)	0.052	0.006
14	1.17	0.10	0.058	(0.451)	0.052	0.006
15	1.25	0.10	0.058	(0.449)	0.052	0.006
16	1.33	0.10	0.058	(0.447)	0.052	0.006
17	1.42	0.10	0.058	(0.445)	0.052	0.006
18	1.50	0.10	0.058	(0.444)	0.052	0.006
19	1.58	0.10	0.058	(0.442)	0.052	0.006
20	1.67	0.10	0.058	(0.440)	0.052	0.006
21	1.75	0.10	0.058	(0.438)	0.052	0.006
22	1.83	0.13	0.077	(0.437)	0.069	0.008
23	1.92	0.13	0.077	(0.435)	0.069	0.008
24	2.00	0.13	0.077	(0.433)	0.069	0.008
25	2.08	0.13	0.077	(0.431)	0.069	0.008
26	2.17	0.13	0.077	(0.430)	0.069	0.008
27	2.25	0.13	0.077	(0.428)	0.069	0.008
28	2.33	0.13	0.077	(0.426)	0.069	0.008
29	2.42	0.13	0.077	(0.424)	0.069	0.008
30	2.50	0.13	0.077	(0.423)	0.069	0.008
31	2.58	0.17	0.096	(0.421)	0.087	0.010
32	2.67	0.17	0.096	(0.419)	0.087	0.010
33	2.75	0.17	0.096	(0.417)	0.087	0.010
34	2.83	0.17	0.096	(0.416)	0.087	0.010
35	2.92	0.17	0.096	(0.414)	0.087	0.010
36	3.00	0.17	0.096	(0.412)	0.087	0.010
37	3.08	0.17	0.096	(0.411)	0.087	0.010
38	3.17	0.17	0.096	(0.409)	0.087	0.010
39	3.25	0.17	0.096	(0.407)	0.087	0.010
40	3.33	0.17	0.096	(0.405)	0.087	0.010
41	3.42	0.17	0.096	(0.404)	0.087	0.010
42	3.50	0.17	0.096	(0.402)	0.087	0.010
43	3.58	0.17	0.096	(0.400)	0.087	0.010
44	3.67	0.17	0.096	(0.399)	0.087	0.010
45	3.75	0.17	0.096	(0.397)	0.087	0.010
46	3.83	0.20	0.116	(0.395)	0.104	0.012
47	3.92	0.20	0.116	(0.394)	0.104	0.012
48	4.00	0.20	0.116	(0.392)	0.104	0.012
49	4.08	0.20	0.116	(0.390)	0.104	0.012
50	4.17	0.20	0.116	(0.389)	0.104	0.012
51	4.25	0.20	0.116	(0.387)	0.104	0.012
52	4.33	0.23	0.135	(0.385)	0.121	0.013
53	4.42	0.23	0.135	(0.384)	0.121	0.013
54	4.50	0.23	0.135	(0.382)	0.121	0.013
55	4.58	0.23	0.135	(0.381)	0.121	0.013
56	4.67	0.23	0.135	(0.379)	0.121	0.013
57	4.75	0.23	0.135	(0.377)	0.121	0.013
58	4.83	0.27	0.154	(0.376)	0.139	0.015
59	4.92	0.27	0.154	(0.374)	0.139	0.015
60	5.00	0.27	0.154	(0.372)	0.139	0.015
61	5.08	0.20	0.116	(0.371)	0.104	0.012
62	5.17	0.20	0.116	(0.369)	0.104	0.012
63	5.25	0.20	0.116	(0.368)	0.104	0.012
64	5.33	0.23	0.135	(0.366)	0.121	0.013

65	5.42	0.23	0.135	(0.364)	0.121	0.013
66	5.50	0.23	0.135	(0.363)	0.121	0.013
67	5.58	0.27	0.154	(0.361)	0.139	0.015
68	5.67	0.27	0.154	(0.360)	0.139	0.015
69	5.75	0.27	0.154	(0.358)	0.139	0.015
70	5.83	0.27	0.154	(0.356)	0.139	0.015
71	5.92	0.27	0.154	(0.355)	0.139	0.015
72	6.00	0.27	0.154	(0.353)	0.139	0.015
73	6.08	0.30	0.173	(0.352)	0.156	0.017
74	6.17	0.30	0.173	(0.350)	0.156	0.017
75	6.25	0.30	0.173	(0.349)	0.156	0.017
76	6.33	0.30	0.173	(0.347)	0.156	0.017
77	6.42	0.30	0.173	(0.345)	0.156	0.017
78	6.50	0.30	0.173	(0.344)	0.156	0.017
79	6.58	0.33	0.193	(0.342)	0.173	0.019
80	6.67	0.33	0.193	(0.341)	0.173	0.019
81	6.75	0.33	0.193	(0.339)	0.173	0.019
82	6.83	0.33	0.193	(0.338)	0.173	0.019
83	6.92	0.33	0.193	(0.336)	0.173	0.019
84	7.00	0.33	0.193	(0.335)	0.173	0.019
85	7.08	0.33	0.193	(0.333)	0.173	0.019
86	7.17	0.33	0.193	(0.332)	0.173	0.019
87	7.25	0.33	0.193	(0.330)	0.173	0.019
88	7.33	0.37	0.212	(0.329)	0.191	0.021
89	7.42	0.37	0.212	(0.327)	0.191	0.021
90	7.50	0.37	0.212	(0.326)	0.191	0.021
91	7.58	0.40	0.231	(0.324)	0.208	0.023
92	7.67	0.40	0.231	(0.323)	0.208	0.023
93	7.75	0.40	0.231	(0.321)	0.208	0.023
94	7.83	0.43	0.250	(0.320)	0.225	0.025
95	7.92	0.43	0.250	(0.318)	0.225	0.025
96	8.00	0.43	0.250	(0.317)	0.225	0.025
97	8.08	0.50	0.289	(0.315)	0.260	0.029
98	8.17	0.50	0.289	(0.314)	0.260	0.029
99	8.25	0.50	0.289	(0.312)	0.260	0.029
100	8.33	0.50	0.289	(0.311)	0.260	0.029
101	8.42	0.50	0.289	(0.309)	0.260	0.029
102	8.50	0.50	0.289	(0.308)	0.260	0.029
103	8.58	0.53	0.308	(0.306)	0.277	0.031
104	8.67	0.53	0.308	(0.305)	0.277	0.031
105	8.75	0.53	0.308	(0.304)	0.277	0.031
106	8.83	0.57	0.327	(0.302)	0.295	0.033
107	8.92	0.57	0.327	(0.301)	0.295	0.033
108	9.00	0.57	0.327	(0.299)	0.295	0.033
109	9.08	0.63	0.366	0.298	(0.329)	0.068
110	9.17	0.63	0.366	0.296	(0.329)	0.070
111	9.25	0.63	0.366	0.295	(0.329)	0.071
112	9.33	0.67	0.385	0.294	(0.347)	0.092
113	9.42	0.67	0.385	0.292	(0.347)	0.093
114	9.50	0.67	0.385	0.291	(0.347)	0.094
115	9.58	0.70	0.405	0.289	(0.364)	0.115
116	9.67	0.70	0.405	0.288	(0.364)	0.116
117	9.75	0.70	0.405	0.287	(0.364)	0.118
118	9.83	0.73	0.424	0.285	(0.381)	0.138
119	9.92	0.73	0.424	0.284	(0.381)	0.140
120	10.00	0.73	0.424	0.283	(0.381)	0.141
121	10.08	0.50	0.289	(0.281)	0.260	0.029

122	10.17	0.50	0.289	(0.280)	0.260	0.029
123	10.25	0.50	0.289	(0.278)	0.260	0.029
124	10.33	0.50	0.289	(0.277)	0.260	0.029
125	10.42	0.50	0.289	(0.276)	0.260	0.029
126	10.50	0.50	0.289	(0.274)	0.260	0.029
127	10.58	0.67	0.385	0.273	(0.347)	0.112
128	10.67	0.67	0.385	0.272	(0.347)	0.113
129	10.75	0.67	0.385	0.270	(0.347)	0.115
130	10.83	0.67	0.385	0.269	(0.347)	0.116
131	10.92	0.67	0.385	0.268	(0.347)	0.117
132	11.00	0.67	0.385	0.266	(0.347)	0.119
133	11.08	0.63	0.366	0.265	(0.329)	0.101
134	11.17	0.63	0.366	0.264	(0.329)	0.102
135	11.25	0.63	0.366	0.263	(0.329)	0.103
136	11.33	0.63	0.366	0.261	(0.329)	0.105
137	11.42	0.63	0.366	0.260	(0.329)	0.106
138	11.50	0.63	0.366	0.259	(0.329)	0.107
139	11.58	0.57	0.327	0.257	(0.295)	0.070
140	11.67	0.57	0.327	0.256	(0.295)	0.071
141	11.75	0.57	0.327	0.255	(0.295)	0.073
142	11.83	0.60	0.347	0.254	(0.312)	0.093
143	11.92	0.60	0.347	0.252	(0.312)	0.094
144	12.00	0.60	0.347	0.251	(0.312)	0.096
145	12.08	0.83	0.482	0.250	(0.433)	0.232
146	12.17	0.83	0.482	0.249	(0.433)	0.233
147	12.25	0.83	0.482	0.247	(0.433)	0.234
148	12.33	0.87	0.501	0.246	(0.451)	0.255
149	12.42	0.87	0.501	0.245	(0.451)	0.256
150	12.50	0.87	0.501	0.244	(0.451)	0.257
151	12.58	0.93	0.539	0.242	(0.485)	0.297
152	12.67	0.93	0.539	0.241	(0.485)	0.298
153	12.75	0.93	0.539	0.240	(0.485)	0.299
154	12.83	0.97	0.559	0.239	(0.503)	0.320
155	12.92	0.97	0.559	0.238	(0.503)	0.321
156	13.00	0.97	0.559	0.236	(0.503)	0.322
157	13.08	1.13	0.655	0.235	(0.589)	0.420
158	13.17	1.13	0.655	0.234	(0.589)	0.421
159	13.25	1.13	0.655	0.233	(0.589)	0.422
160	13.33	1.13	0.655	0.232	(0.589)	0.423
161	13.42	1.13	0.655	0.230	(0.589)	0.425
162	13.50	1.13	0.655	0.229	(0.589)	0.426
163	13.58	0.77	0.443	0.228	(0.399)	0.215
164	13.67	0.77	0.443	0.227	(0.399)	0.216
165	13.75	0.77	0.443	0.226	(0.399)	0.217
166	13.83	0.77	0.443	0.225	(0.399)	0.218
167	13.92	0.77	0.443	0.223	(0.399)	0.220
168	14.00	0.77	0.443	0.222	(0.399)	0.221
169	14.08	0.90	0.520	0.221	(0.468)	0.299
170	14.17	0.90	0.520	0.220	(0.468)	0.300
171	14.25	0.90	0.520	0.219	(0.468)	0.301
172	14.33	0.87	0.501	0.218	(0.451)	0.283
173	14.42	0.87	0.501	0.217	(0.451)	0.284
174	14.50	0.87	0.501	0.216	(0.451)	0.285
175	14.58	0.87	0.501	0.214	(0.451)	0.286
176	14.67	0.87	0.501	0.213	(0.451)	0.288
177	14.75	0.87	0.501	0.212	(0.451)	0.289
178	14.83	0.83	0.482	0.211	(0.433)	0.270

179	14.92	0.83	0.482	0.210	(0.433)	0.272
180	15.00	0.83	0.482	0.209	(0.433)	0.273
181	15.08	0.80	0.462	0.208	(0.416)	0.254
182	15.17	0.80	0.462	0.207	(0.416)	0.255
183	15.25	0.80	0.462	0.206	(0.416)	0.257
184	15.33	0.77	0.443	0.205	(0.399)	0.238
185	15.42	0.77	0.443	0.204	(0.399)	0.239
186	15.50	0.77	0.443	0.203	(0.399)	0.240
187	15.58	0.63	0.366	0.202	(0.329)	0.164
188	15.67	0.63	0.366	0.201	(0.329)	0.165
189	15.75	0.63	0.366	0.200	(0.329)	0.166
190	15.83	0.63	0.366	0.199	(0.329)	0.167
191	15.92	0.63	0.366	0.198	(0.329)	0.168
192	16.00	0.63	0.366	0.197	(0.329)	0.169
193	16.08	0.13	0.077	(0.196)	0.069	0.008
194	16.17	0.13	0.077	(0.195)	0.069	0.008
195	16.25	0.13	0.077	(0.194)	0.069	0.008
196	16.33	0.13	0.077	(0.193)	0.069	0.008
197	16.42	0.13	0.077	(0.192)	0.069	0.008
198	16.50	0.13	0.077	(0.191)	0.069	0.008
199	16.58	0.10	0.058	(0.190)	0.052	0.006
200	16.67	0.10	0.058	(0.189)	0.052	0.006
201	16.75	0.10	0.058	(0.188)	0.052	0.006
202	16.83	0.10	0.058	(0.187)	0.052	0.006
203	16.92	0.10	0.058	(0.186)	0.052	0.006
204	17.00	0.10	0.058	(0.185)	0.052	0.006
205	17.08	0.17	0.096	(0.184)	0.087	0.010
206	17.17	0.17	0.096	(0.183)	0.087	0.010
207	17.25	0.17	0.096	(0.182)	0.087	0.010
208	17.33	0.17	0.096	(0.181)	0.087	0.010
209	17.42	0.17	0.096	(0.180)	0.087	0.010
210	17.50	0.17	0.096	(0.179)	0.087	0.010
211	17.58	0.17	0.096	(0.178)	0.087	0.010
212	17.67	0.17	0.096	(0.178)	0.087	0.010
213	17.75	0.17	0.096	(0.177)	0.087	0.010
214	17.83	0.13	0.077	(0.176)	0.069	0.008
215	17.92	0.13	0.077	(0.175)	0.069	0.008
216	18.00	0.13	0.077	(0.174)	0.069	0.008
217	18.08	0.13	0.077	(0.173)	0.069	0.008
218	18.17	0.13	0.077	(0.172)	0.069	0.008
219	18.25	0.13	0.077	(0.172)	0.069	0.008
220	18.33	0.13	0.077	(0.171)	0.069	0.008
221	18.42	0.13	0.077	(0.170)	0.069	0.008
222	18.50	0.13	0.077	(0.169)	0.069	0.008
223	18.58	0.10	0.058	(0.168)	0.052	0.006
224	18.67	0.10	0.058	(0.167)	0.052	0.006
225	18.75	0.10	0.058	(0.167)	0.052	0.006
226	18.83	0.07	0.039	(0.166)	0.035	0.004
227	18.92	0.07	0.039	(0.165)	0.035	0.004
228	19.00	0.07	0.039	(0.164)	0.035	0.004
229	19.08	0.10	0.058	(0.163)	0.052	0.006
230	19.17	0.10	0.058	(0.163)	0.052	0.006
231	19.25	0.10	0.058	(0.162)	0.052	0.006
232	19.33	0.13	0.077	(0.161)	0.069	0.008
233	19.42	0.13	0.077	(0.160)	0.069	0.008
234	19.50	0.13	0.077	(0.160)	0.069	0.008
235	19.58	0.10	0.058	(0.159)	0.052	0.006

236	19.67	0.10	0.058	(0.158)	0.052	0.006
237	19.75	0.10	0.058	(0.157)	0.052	0.006
238	19.83	0.07	0.039	(0.157)	0.035	0.004
239	19.92	0.07	0.039	(0.156)	0.035	0.004
240	20.00	0.07	0.039	(0.155)	0.035	0.004
241	20.08	0.10	0.058	(0.155)	0.052	0.006
242	20.17	0.10	0.058	(0.154)	0.052	0.006
243	20.25	0.10	0.058	(0.153)	0.052	0.006
244	20.33	0.10	0.058	(0.153)	0.052	0.006
245	20.42	0.10	0.058	(0.152)	0.052	0.006
246	20.50	0.10	0.058	(0.151)	0.052	0.006
247	20.58	0.10	0.058	(0.151)	0.052	0.006
248	20.67	0.10	0.058	(0.150)	0.052	0.006
249	20.75	0.10	0.058	(0.150)	0.052	0.006
250	20.83	0.07	0.039	(0.149)	0.035	0.004
251	20.92	0.07	0.039	(0.148)	0.035	0.004
252	21.00	0.07	0.039	(0.148)	0.035	0.004
253	21.08	0.10	0.058	(0.147)	0.052	0.006
254	21.17	0.10	0.058	(0.147)	0.052	0.006
255	21.25	0.10	0.058	(0.146)	0.052	0.006
256	21.33	0.07	0.039	(0.145)	0.035	0.004
257	21.42	0.07	0.039	(0.145)	0.035	0.004
258	21.50	0.07	0.039	(0.144)	0.035	0.004
259	21.58	0.10	0.058	(0.144)	0.052	0.006
260	21.67	0.10	0.058	(0.143)	0.052	0.006
261	21.75	0.10	0.058	(0.143)	0.052	0.006
262	21.83	0.07	0.039	(0.142)	0.035	0.004
263	21.92	0.07	0.039	(0.142)	0.035	0.004
264	22.00	0.07	0.039	(0.141)	0.035	0.004
265	22.08	0.10	0.058	(0.141)	0.052	0.006
266	22.17	0.10	0.058	(0.140)	0.052	0.006
267	22.25	0.10	0.058	(0.140)	0.052	0.006
268	22.33	0.07	0.039	(0.139)	0.035	0.004
269	22.42	0.07	0.039	(0.139)	0.035	0.004
270	22.50	0.07	0.039	(0.139)	0.035	0.004
271	22.58	0.07	0.039	(0.138)	0.035	0.004
272	22.67	0.07	0.039	(0.138)	0.035	0.004
273	22.75	0.07	0.039	(0.137)	0.035	0.004
274	22.83	0.07	0.039	(0.137)	0.035	0.004
275	22.92	0.07	0.039	(0.137)	0.035	0.004
276	23.00	0.07	0.039	(0.136)	0.035	0.004
277	23.08	0.07	0.039	(0.136)	0.035	0.004
278	23.17	0.07	0.039	(0.136)	0.035	0.004
279	23.25	0.07	0.039	(0.136)	0.035	0.004
280	23.33	0.07	0.039	(0.135)	0.035	0.004
281	23.42	0.07	0.039	(0.135)	0.035	0.004
282	23.50	0.07	0.039	(0.135)	0.035	0.004
283	23.58	0.07	0.039	(0.135)	0.035	0.004
284	23.67	0.07	0.039	(0.134)	0.035	0.004
285	23.75	0.07	0.039	(0.134)	0.035	0.004
286	23.83	0.07	0.039	(0.134)	0.035	0.004
287	23.92	0.07	0.039	(0.134)	0.035	0.004
288	24.00	0.07	0.039	(0.134)	0.035	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 18.4

Flood volume = Effective rainfall 1.54(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)

```
Total soil loss =      3.28(In)
Total soil loss =     1.140(Ac.Ft)
Total rainfall =      4.82(In)
Flood volume =       23252.4 Cubic Feet
Total soil loss =       49645.7 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =      1.762(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0001      0.01  Q          |         |         |         |
  0+15       0.0001      0.01  Q          |         |         |         |
  0+20       0.0002      0.01  Q          |         |         |         |
  0+25       0.0004      0.02  Q          |         |         |         |
  0+30       0.0005      0.02  Q          |         |         |         |
  0+35       0.0007      0.02  Q          |         |         |         |
  0+40       0.0008      0.02  Q          |         |         |         |
  0+45       0.0010      0.02  Q          |         |         |         |
  0+50       0.0012      0.02  Q          |         |         |         |
  0+55       0.0013      0.03  Q          |         |         |         |
  1+ 0       0.0016      0.03  Q          |         |         |         |
  1+ 5       0.0018      0.03  Q          |         |         |         |
  1+10       0.0020      0.03  Q          |         |         |         |
  1+15       0.0021      0.03  Q          |         |         |         |
  1+20       0.0023      0.03  Q          |         |         |         |
  1+25       0.0025      0.02  Q          |         |         |         |
  1+30       0.0027      0.02  Q          |         |         |         |
  1+35       0.0028      0.02  Q          |         |         |         |
  1+40       0.0030      0.02  Q          |         |         |         |
  1+45       0.0032      0.02  Q          |         |         |         |
  1+50       0.0033      0.02  Q          |         |         |         |
  1+55       0.0035      0.03  Q          |         |         |         |
  2+ 0       0.0037      0.03  Q          |         |         |         |
  2+ 5       0.0039      0.03  Q          |         |         |         |
  2+10       0.0042      0.03  Q          |         |         |         |
  2+15       0.0044      0.03  Q          |         |         |         |
  2+20       0.0046      0.03  Q          |         |         |         |
  2+25       0.0048      0.03  Q          |         |         |         |
  2+30       0.0050      0.03  Q          |         |         |         |
  2+35       0.0053      0.03  Q          |         |         |         |
  2+40       0.0055      0.04  Q          |         |         |         |
  2+45       0.0058      0.04  Q          |         |         |         |
  2+50       0.0061      0.04  Q          |         |         |         |
  2+55       0.0063      0.04  Q          |         |         |         |
  3+ 0       0.0066      0.04  Q          |         |         |         |
  3+ 5       0.0069      0.04  Q          |         |         |         |
  3+10       0.0072      0.04  Q          |         |         |         |
  3+15       0.0074      0.04  Q          |         |         |         |
  3+20       0.0077      0.04  Q          |         |         |         |
```

3+25	0.0080	0.04	Q				
3+30	0.0083	0.04	Q				
3+35	0.0086	0.04	Q				
3+40	0.0088	0.04	Q				
3+45	0.0091	0.04	Q				
3+50	0.0094	0.04	Q				
3+55	0.0097	0.04	Q				
4+ 0	0.0100	0.05	Q				
4+ 5	0.0103	0.05	Q				
4+10	0.0107	0.05	Q				
4+15	0.0110	0.05	Q				
4+20	0.0113	0.05	Q				
4+25	0.0117	0.05	Q				
4+30	0.0121	0.05	Q				
4+35	0.0125	0.06	Q				
4+40	0.0128	0.06	Q				
4+45	0.0132	0.06	Q				
4+50	0.0136	0.06	QV				
4+55	0.0140	0.06	QV				
5+ 0	0.0145	0.06	QV				
5+ 5	0.0149	0.06	QV				
5+10	0.0153	0.06	QV				
5+15	0.0157	0.05	QV				
5+20	0.0160	0.05	QV				
5+25	0.0164	0.05	QV				
5+30	0.0168	0.06	QV				
5+35	0.0171	0.06	QV				
5+40	0.0176	0.06	QV				
5+45	0.0180	0.06	QV				
5+50	0.0184	0.06	QV				
5+55	0.0189	0.06	QV				
6+ 0	0.0193	0.06	QV				
6+ 5	0.0198	0.07	QV				
6+10	0.0202	0.07	QV				
6+15	0.0207	0.07	QV				
6+20	0.0212	0.07	QV				
6+25	0.0217	0.07	QV				
6+30	0.0222	0.07	QV				
6+35	0.0227	0.07	QV				
6+40	0.0232	0.08	QV				
6+45	0.0238	0.08	QV				
6+50	0.0243	0.08	QV				
6+55	0.0249	0.08	QV				
7+ 0	0.0254	0.08	QV				
7+ 5	0.0260	0.08	QV				
7+10	0.0265	0.08	QV				
7+15	0.0271	0.08	Q V				
7+20	0.0277	0.08	Q V				
7+25	0.0282	0.08	Q V				
7+30	0.0288	0.09	Q V				
7+35	0.0294	0.09	Q V				
7+40	0.0301	0.09	Q V				
7+45	0.0307	0.09	Q V				
7+50	0.0314	0.10	Q V				
7+55	0.0321	0.10	Q V				
8+ 0	0.0328	0.10	Q V				
8+ 5	0.0335	0.10	Q V				

```
 8+10       0.0343      0.11  Q V       |         |         |         |
 8+15       0.0351      0.12  Q V       |         |         |         |
 8+20       0.0359      0.12  Q V       |         |         |         |
 8+25       0.0367      0.12  Q V       |         |         |         |
 8+30       0.0376      0.12  Q V       |         |         |         |
 8+35       0.0384      0.12  Q V       |         |         |         |
 8+40       0.0393      0.12  Q V       |         |         |         |
 8+45       0.0401      0.13  Q  V      |         |         |         |
 8+50       0.0410      0.13  Q  V      |         |         |         |
 8+55       0.0419      0.13  Q  V      |         |         |         |
 9+ 0       0.0429      0.14  Q  V      |         |         |         |
 9+ 5       0.0439      0.15  Q  V      |         |         |         |
 9+10       0.0452      0.20  Q  V      |         |         |         |
 9+15       0.0469      0.25  Q  V      |         |         |         |
 9+20       0.0488      0.28  |Q V      |         |         |         |
 9+25       0.0510      0.32  |Q V      |         |         |         |
 9+30       0.0535      0.36  |Q  V     |         |         |         |
 9+35       0.0561      0.38  |Q  V     |         |         |         |
 9+40       0.0590      0.42  |Q  V     |         |         |         |
 9+45       0.0621      0.46  |Q  V     |         |         |         |
 9+50       0.0654      0.48  |Q  V     |         |         |         |
 9+55       0.0690      0.52  | Q  V    |         |         |         |
10+ 0       0.0729      0.56  | Q  V    |         |         |         |
10+ 5       0.0766      0.54  | Q  V    |         |         |         |
10+10       0.0793      0.39  |Q   V    |         |         |         |
10+15       0.0810      0.24  Q     V   |         |         |         |
10+20       0.0823      0.19  Q     V   |         |         |         |
10+25       0.0834      0.16  Q     V   |         |         |         |
10+30       0.0843      0.14  Q     V   |         |         |         |
10+35       0.0854      0.15  Q     V   |         |         |         |
10+40       0.0872      0.27  |Q    V   |         |         |         |
10+45       0.0899      0.38  |Q    V   |         |         |         |
10+50       0.0928      0.43  |Q    V   |         |         |         |
10+55       0.0960      0.46  |Q     V  |         |         |         |
11+ 0       0.0992      0.47  |Q     V  |         |         |         |
11+ 5       0.1025      0.48  |Q     V  |         |         |         |
11+10       0.1057      0.46  |Q     V  |         |         |         |
11+15       0.1088      0.44  |Q      V |         |         |         |
11+20       0.1118      0.44  |Q      V |         |         |         |
11+25       0.1148      0.44  |Q      V |         |         |         |
11+30       0.1179      0.44  |Q      V |         |         |         |
11+35       0.1209      0.44  |Q       V|         |         |         |
11+40       0.1235      0.39  |Q       V|         |         |         |
11+45       0.1259      0.34  |Q       V|         |         |         |
11+50       0.1281      0.33  |Q       V|         |         |         |
11+55       0.1305      0.35  |Q       V|         |         |         |
12+ 0       0.1331      0.38  |Q       V|         |         |         |
12+ 5       0.1360      0.42  |Q        V         |         |         |
12+10       0.1404      0.63  | Q       V         |         |         |
12+15       0.1460      0.82  |  Q      V         |         |         |
12+20       0.1522      0.90  |  Q      |V        |         |         |
12+25       0.1589      0.97  |  Q      |V        |         |         |
12+30       0.1659      1.03  |   Q     | V       |         |         |
12+35       0.1732      1.06  |   Q     | V       |         |         |
12+40       0.1810      1.13  |   Q     |  V      |         |         |
12+45       0.1893      1.20  |   Q     |   V     |         |         |
12+50       0.1978      1.23  |   Q     |   V     |         |         |
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12+55       0.2065      1.28  |    Q    |    V    |         |         |
13+ 0       0.2156      1.32  |    Q    |     V   |         |         |
13+ 5       0.2250      1.36  |    Q    |     V   |         |         |
13+10       0.2354      1.51  |     Q   |      V  |         |         |
13+15       0.2467      1.65  |     Q   |       V |         |         |
13+20       0.2585      1.71  |     Q   |        V|         |         |
13+25       0.2705      1.74  |     Q   |         V         |         |
13+30       0.2826      1.76  |      Q  |         |V        |         |
13+35       0.2945      1.72  |     Q   |         | V       |         |
13+40       0.3043      1.42  |    Q    |         | V       |         |
13+45       0.3121      1.14  |   Q     |         |  V      |         |
13+50       0.3193      1.04  |   Q     |         |  V      |         |
13+55       0.3261      0.99  |  Q      |         |   V     |         |
14+ 0       0.3326      0.95  |  Q      |         |   V     |         |
14+ 5       0.3393      0.96  |  Q      |         |    V    |         |
14+10       0.3466      1.07  |   Q     |         |    V    |         |
14+15       0.3547      1.18  |   Q     |         |     V   |         |
14+20       0.3631      1.21  |   Q     |         |      V  |         |
14+25       0.3714      1.21  |   Q     |         |      V  |         |
14+30       0.3796      1.20  |   Q     |         |       V |         |
14+35       0.3879      1.20  |   Q     |         |        V|         |
14+40       0.3962      1.20  |   Q     |         |        V|         |
14+45       0.4045      1.20  |   Q     |         |         V         |
14+50       0.4128      1.20  |   Q     |         |         V         |
14+55       0.4209      1.18  |   Q     |         |         |V        |
15+ 0       0.4289      1.16  |   Q     |         |         | V       |
15+ 5       0.4368      1.15  |   Q     |         |         | V       |
15+10       0.4445      1.12  |   Q     |         |         |  V      |
15+15       0.4520      1.09  |   Q     |         |         |  V      |
15+20       0.4595      1.08  |   Q     |         |         |   V     |
15+25       0.4667      1.05  |   Q     |         |         |   V     |
15+30       0.4738      1.03  |   Q     |         |         |    V    |
15+35       0.4807      1.00  |   Q     |         |         |     V   |
15+40       0.4868      0.89  |  Q      |         |         |     V   |
15+45       0.4922      0.78  |  Q      |         |         |     V   |
15+50       0.4973      0.75  | Q       |         |         |      V  |
15+55       0.5023      0.73  | Q       |         |         |      V  |
16+ 0       0.5073      0.72  | Q       |         |         |       V |
16+ 5       0.5119      0.67  | Q       |         |         |       V |
16+10       0.5150      0.44  |Q        |         |         |       V |
16+15       0.5164      0.22  Q         |         |         |       V |
16+20       0.5174      0.13  Q         |         |         |       V |
16+25       0.5180      0.09  Q         |         |         |       V |
16+30       0.5184      0.06  Q         |         |         |       V |
16+35       0.5187      0.05  Q         |         |         |       V |
16+40       0.5190      0.04  Q         |         |         |       V |
16+45       0.5192      0.03  Q         |         |         |       V |
16+50       0.5194      0.03  Q         |         |         |       V |
16+55       0.5196      0.03  Q         |         |         |       V |
17+ 0       0.5197      0.02  Q         |         |         |       V |
17+ 5       0.5199      0.03  Q         |         |         |       V |
17+10       0.5201      0.03  Q         |         |         |       V |
17+15       0.5204      0.04  Q         |         |         |       V |
17+20       0.5206      0.04  Q         |         |         |        V|
17+25       0.5209      0.04  Q         |         |         |        V|
17+30       0.5212      0.04  Q         |         |         |        V|
17+35       0.5214      0.04  Q         |         |         |        V|
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17+40	0.5217	0.04	Q	|	|	|	V|
17+45	0.5220	0.04	Q	|	|	|	V|
17+50	0.5223	0.04	Q	|	|	|	V|
17+55	0.5225	0.04	Q	|	|	|	V|
18+ 0	0.5228	0.03	Q	|	|	|	V|
18+ 5	0.5230	0.03	Q	|	|	|	V|
18+10	0.5232	0.03	Q	|	|	|	V|
18+15	0.5235	0.03	Q	|	|	|	V|
18+20	0.5237	0.03	Q	|	|	|	V|
18+25	0.5239	0.03	Q	|	|	|	V|
18+30	0.5241	0.03	Q	|	|	|	V|
18+35	0.5243	0.03	Q	|	|	|	V|
18+40	0.5245	0.03	Q	|	|	|	V|
18+45	0.5247	0.03	Q	|	|	|	V|
18+50	0.5249	0.03	Q	|	|	|	V|
18+55	0.5250	0.02	Q	|	|	|	V|
19+ 0	0.5252	0.02	Q	|	|	|	V|
19+ 5	0.5253	0.02	Q	|	|	|	V|
19+10	0.5254	0.02	Q	|	|	|	V|
19+15	0.5256	0.02	Q	|	|	|	V|
19+20	0.5258	0.02	Q	|	|	|	V|
19+25	0.5259	0.03	Q	|	|	|	V|
19+30	0.5262	0.03	Q	|	|	|	V|
19+35	0.5264	0.03	Q	|	|	|	V|
19+40	0.5266	0.03	Q	|	|	|	V|
19+45	0.5267	0.03	Q	|	|	|	V|
19+50	0.5269	0.02	Q	|	|	|	V|
19+55	0.5271	0.02	Q	|	|	|	V|
20+ 0	0.5272	0.02	Q	|	|	|	V|
20+ 5	0.5273	0.02	Q	|	|	|	V|
20+10	0.5274	0.02	Q	|	|	|	V|
20+15	0.5276	0.02	Q	|	|	|	V|
20+20	0.5278	0.02	Q	|	|	|	V|
20+25	0.5279	0.02	Q	|	|	|	V|
20+30	0.5281	0.02	Q	|	|	|	V|
20+35	0.5283	0.02	Q	|	|	|	V|
20+40	0.5284	0.02	Q	|	|	|	V|
20+45	0.5286	0.02	Q	|	|	|	V|
20+50	0.5288	0.02	Q	|	|	|	V|
20+55	0.5289	0.02	Q	|	|	|	V|
21+ 0	0.5290	0.02	Q	|	|	|	V|
21+ 5	0.5292	0.02	Q	|	|	|	V|
21+10	0.5293	0.02	Q	|	|	|	V|
21+15	0.5294	0.02	Q	|	|	|	V|
21+20	0.5296	0.02	Q	|	|	|	V|
21+25	0.5297	0.02	Q	|	|	|	V|
21+30	0.5299	0.02	Q	|	|	|	V|
21+35	0.5300	0.02	Q	|	|	|	V|
21+40	0.5301	0.02	Q	|	|	|	V|
21+45	0.5303	0.02	Q	|	|	|	V|
21+50	0.5304	0.02	Q	|	|	|	V|
21+55	0.5306	0.02	Q	|	|	|	V|
22+ 0	0.5307	0.02	Q	|	|	|	V|
22+ 5	0.5308	0.02	Q	|	|	|	V|
22+10	0.5310	0.02	Q	|	|	|	V|
22+15	0.5311	0.02	Q	|	|	|	V|
22+20	0.5313	0.02	Q	|	|	|	V|

```
   22+25       0.5314      0.02  Q          |          |          |         V|
   22+30       0.5315      0.02  Q          |          |          |         V|
   22+35       0.5317      0.02  Q          |          |          |         V|
   22+40       0.5318      0.02  Q          |          |          |         V|
   22+45       0.5319      0.02  Q          |          |          |         V|
   22+50       0.5320      0.02  Q          |          |          |         V|
   22+55       0.5321      0.02  Q          |          |          |         V|
   23+ 0       0.5322      0.02  Q          |          |          |         V|
   23+ 5       0.5323      0.02  Q          |          |          |         V|
   23+10       0.5324      0.02  Q          |          |          |         V|
   23+15       0.5326      0.02  Q          |          |          |         V|
   23+20       0.5327      0.02  Q          |          |          |         V|
   23+25       0.5328      0.02  Q          |          |          |         V|
   23+30       0.5329      0.02  Q          |          |          |         V|
   23+35       0.5330      0.02  Q          |          |          |         V|
   23+40       0.5331      0.02  Q          |          |          |         V|
   23+45       0.5332      0.02  Q          |          |          |         V|
   23+50       0.5333      0.02  Q          |          |          |         V|
   23+55       0.5335      0.02  Q          |          |          |         V|
   24+ 0       0.5336      0.02  Q          |          |          |         V|
   24+ 5       0.5337      0.02  Q          |          |          |         V|
   24+10       0.5337      0.01  Q          |          |          |         V|
   24+15       0.5338      0.00  Q          |          |          |         V|
   24+20       0.5338      0.00  Q          |          |          |         V|
   24+25       0.5338      0.00  Q          |          |          |         V|
   24+30       0.5338      0.00  Q          |          |          |         V|
   24+35       0.5338      0.00  Q          |          |          |         V|
   24+40       0.5338      0.00  Q          |          |          |         V|
   24+45       0.5338      0.00  Q          |          |          |         V|
   24+50       0.5338      0.00  Q          |          |          |         V|
   24+55       0.5338      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
```

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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/22/12 File: 3504q100u1r1100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q100-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 1.550(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
					Sum (F) =	0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132
Minimum soil loss rate ((In/Hr)) = 0.066
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

	Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.818	0.132	(0.737)	0.686
2	0.17	4.50	0.837	0.132	(0.753)	0.705
3	0.25	5.40	1.004	0.132	(0.904)	0.872
4	0.33	5.40	1.004	0.132	(0.904)	0.872
5	0.42	5.70	1.060	0.132	(0.954)	0.928

```
  6   0.50     6.40      1.190          0.132    (  1.071)        1.058
  7   0.58     7.90      1.469          0.132    (  1.322)        1.337
  8   0.67     9.10      1.693          0.132    (  1.523)        1.560
  9   0.75    12.80      2.381          0.132    (  2.143)        2.248
 10   0.83    25.60      4.761          0.132    (  4.285)        4.629
 11   0.92     7.90      1.469          0.132    (  1.322)        1.337
 12   1.00     4.90      0.911          0.132    (  0.820)        0.779
            (Loss Rate Not Used)
    Sum =     100.0                                   Sum =    17.0
     Flood volume = Effective rainfall      1.42(In)
      times area       4.2(Ac.)/[(In)/(Ft.)] =       0.5(Ac.Ft)
     Total soil loss =      0.13(In)
     Total soil loss =     0.046(Ac.Ft)
     Total rainfall =      1.55(In)
     Flood volume =       21459.3 Cubic Feet
     Total soil loss =        2002.3 Cubic Feet
     --------------------------------------------------------------------
      Peak flow rate of this hydrograph =     11.623(CFS)
     --------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
     --------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

     --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------
    0+ 5       0.0012      0.17  Q         |         |         |         |
    0+10       0.0093      1.17  V Q       |         |         |         |
    0+15       0.0243      2.18  |V  Q     |         |         |         |
    0+20       0.0435      2.80  |  V Q    |         |         |         |
    0+25       0.0659      3.25  |    VQ   |         |         |         |
    0+30       0.0904      3.56  |      Q  |         |         |         |
    0+35       0.1181      4.01  |       QV|         |         |         |
    0+40       0.1506      4.73  |        Q| V       |         |         |
    0+45       0.1900      5.72  |         |Q   V    |         |         |
    0+50       0.2439      7.83  |         |    Q   V|         |         |
    0+55       0.3240     11.62  |         |         |  Q  V   |         |
    1+ 0       0.3960     10.46  |         |         Q         | V       |
    1+ 5       0.4401      6.40  |         | Q       |         |    V    |
    1+10       0.4654      3.68  |      Q  |         |         |      V  |
    1+15       0.4783      1.86  |  Q      |         |         |       V |
    1+20       0.4851      0.99  |Q        |         |         |        V|
    1+25       0.4885      0.49  Q         |         |         |        V|
    1+30       0.4903      0.27  Q         |         |         |        V|
    1+35       0.4915      0.17  Q         |         |         |        V|
    1+40       0.4922      0.10  Q         |         |         |        V|
    1+45       0.4925      0.05  Q         |         |         |        V|
    1+50       0.4926      0.01  Q         |         |         |        V|
    1+55       0.4926      0.00  Q         |         |         |         V
---------------------------------------------------------------------
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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/21/12 File: 3504q100u1r24100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
UNDEVELOPED CONDITION
UNIT HYDROGRAPH
Q100-24HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.133 Hr.
Lag time =     7.97 Min.
25% of lag time =     1.99 Min.
40% of lag time =     3.19 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 7.700(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.700(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	78.00	0.000

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
					Sum (F) =	0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132
Minimum soil loss rate ((In/Hr)) = 0.066
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	62.751	5.991	0.252
2	0.167	125.502	34.448	1.448
3	0.250	188.253	32.658	1.372
4	0.333	251.004	11.956	0.502
5	0.417	313.755	6.840	0.287
6	0.500	376.506	4.012	0.169
7	0.583	439.257	2.019	0.085
8	0.667	502.008	0.780	0.033
9	0.750	564.759	0.499	0.021
10	0.833	627.510	0.441	0.019
11	0.917	690.261	0.265	0.011
12	1.000	753.012	0.090	0.004
			Sum = 100.000 Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.062	(0.234)	0.055	0.006
2	0.17	0.07	0.062	(0.234)	0.055	0.006
3	0.25	0.07	0.062	(0.233)	0.055	0.006
4	0.33	0.10	0.092	(0.232)	0.083	0.009
5	0.42	0.10	0.092	(0.231)	0.083	0.009
6	0.50	0.10	0.092	(0.230)	0.083	0.009
7	0.58	0.10	0.092	(0.229)	0.083	0.009

8	0.67	0.10	0.092	(	0.228)	0.083	0.009
9	0.75	0.10	0.092	(	0.227)	0.083	0.009
10	0.83	0.13	0.123	(	0.226)	0.111	0.012
11	0.92	0.13	0.123	(	0.226)	0.111	0.012
12	1.00	0.13	0.123	(	0.225)	0.111	0.012
13	1.08	0.10	0.092	(	0.224)	0.083	0.009
14	1.17	0.10	0.092	(	0.223)	0.083	0.009
15	1.25	0.10	0.092	(	0.222)	0.083	0.009
16	1.33	0.10	0.092	(	0.221)	0.083	0.009
17	1.42	0.10	0.092	(	0.220)	0.083	0.009
18	1.50	0.10	0.092	(	0.219)	0.083	0.009
19	1.58	0.10	0.092	(	0.218)	0.083	0.009
20	1.67	0.10	0.092	(	0.218)	0.083	0.009
21	1.75	0.10	0.092	(	0.217)	0.083	0.009
22	1.83	0.13	0.123	(	0.216)	0.111	0.012
23	1.92	0.13	0.123	(	0.215)	0.111	0.012
24	2.00	0.13	0.123	(	0.214)	0.111	0.012
25	2.08	0.13	0.123	(	0.213)	0.111	0.012
26	2.17	0.13	0.123	(	0.212)	0.111	0.012
27	2.25	0.13	0.123	(	0.211)	0.111	0.012
28	2.33	0.13	0.123	(	0.211)	0.111	0.012
29	2.42	0.13	0.123	(	0.210)	0.111	0.012
30	2.50	0.13	0.123	(	0.209)	0.111	0.012
31	2.58	0.17	0.154	(	0.208)	0.139	0.015
32	2.67	0.17	0.154	(	0.207)	0.139	0.015
33	2.75	0.17	0.154	(	0.206)	0.139	0.015
34	2.83	0.17	0.154	(	0.206)	0.139	0.015
35	2.92	0.17	0.154	(	0.205)	0.139	0.015
36	3.00	0.17	0.154	(	0.204)	0.139	0.015
37	3.08	0.17	0.154	(	0.203)	0.139	0.015
38	3.17	0.17	0.154	(	0.202)	0.139	0.015
39	3.25	0.17	0.154	(	0.201)	0.139	0.015
40	3.33	0.17	0.154	(	0.200)	0.139	0.015
41	3.42	0.17	0.154	(	0.200)	0.139	0.015
42	3.50	0.17	0.154	(	0.199)	0.139	0.015
43	3.58	0.17	0.154	(	0.198)	0.139	0.015
44	3.67	0.17	0.154	(	0.197)	0.139	0.015
45	3.75	0.17	0.154	(	0.196)	0.139	0.015
46	3.83	0.20	0.185	(	0.195)	0.166	0.018
47	3.92	0.20	0.185	(	0.195)	0.166	0.018
48	4.00	0.20	0.185	(	0.194)	0.166	0.018
49	4.08	0.20	0.185	(	0.193)	0.166	0.018
50	4.17	0.20	0.185	(	0.192)	0.166	0.018
51	4.25	0.20	0.185	(	0.191)	0.166	0.018
52	4.33	0.23	0.216		0.191	(0.194)	0.025
53	4.42	0.23	0.216		0.190	(0.194)	0.026
54	4.50	0.23	0.216		0.189	(0.194)	0.027
55	4.58	0.23	0.216		0.188	(0.194)	0.028
56	4.67	0.23	0.216		0.187	(0.194)	0.028
57	4.75	0.23	0.216		0.186	(0.194)	0.029
58	4.83	0.27	0.246		0.186	(0.222)	0.061
59	4.92	0.27	0.246		0.185	(0.222)	0.062
60	5.00	0.27	0.246		0.184	(0.222)	0.062
61	5.08	0.20	0.185	(	0.183)	0.166	0.018
62	5.17	0.20	0.185	(	0.182)	0.166	0.018
63	5.25	0.20	0.185	(	0.182)	0.166	0.018
64	5.33	0.23	0.216		0.181	(0.194)	0.035

65	5.42	0.23	0.216	0.180	(0.194)	0.036
66	5.50	0.23	0.216	0.179	(0.194)	0.036
67	5.58	0.27	0.246	0.179	(0.222)	0.068
68	5.67	0.27	0.246	0.178	(0.222)	0.069
69	5.75	0.27	0.246	0.177	(0.222)	0.069
70	5.83	0.27	0.246	0.176	(0.222)	0.070
71	5.92	0.27	0.246	0.175	(0.222)	0.071
72	6.00	0.27	0.246	0.175	(0.222)	0.072
73	6.08	0.30	0.277	0.174	(0.249)	0.103
74	6.17	0.30	0.277	0.173	(0.249)	0.104
75	6.25	0.30	0.277	0.172	(0.249)	0.105
76	6.33	0.30	0.277	0.172	(0.249)	0.106
77	6.42	0.30	0.277	0.171	(0.249)	0.106
78	6.50	0.30	0.277	0.170	(0.249)	0.107
79	6.58	0.33	0.308	0.169	(0.277)	0.139
80	6.67	0.33	0.308	0.168	(0.277)	0.140
81	6.75	0.33	0.308	0.168	(0.277)	0.140
82	6.83	0.33	0.308	0.167	(0.277)	0.141
83	6.92	0.33	0.308	0.166	(0.277)	0.142
84	7.00	0.33	0.308	0.165	(0.277)	0.143
85	7.08	0.33	0.308	0.165	(0.277)	0.143
86	7.17	0.33	0.308	0.164	(0.277)	0.144
87	7.25	0.33	0.308	0.163	(0.277)	0.145
88	7.33	0.37	0.339	0.162	(0.305)	0.176
89	7.42	0.37	0.339	0.162	(0.305)	0.177
90	7.50	0.37	0.339	0.161	(0.305)	0.178
91	7.58	0.40	0.370	0.160	(0.333)	0.209
92	7.67	0.40	0.370	0.159	(0.333)	0.210
93	7.75	0.40	0.370	0.159	(0.333)	0.211
94	7.83	0.43	0.400	0.158	(0.360)	0.242
95	7.92	0.43	0.400	0.157	(0.360)	0.243
96	8.00	0.43	0.400	0.157	(0.360)	0.244
97	8.08	0.50	0.462	0.156	(0.416)	0.306
98	8.17	0.50	0.462	0.155	(0.416)	0.307
99	8.25	0.50	0.462	0.154	(0.416)	0.308
100	8.33	0.50	0.462	0.154	(0.416)	0.308
101	8.42	0.50	0.462	0.153	(0.416)	0.309
102	8.50	0.50	0.462	0.152	(0.416)	0.310
103	8.58	0.53	0.493	0.152	(0.444)	0.341
104	8.67	0.53	0.493	0.151	(0.444)	0.342
105	8.75	0.53	0.493	0.150	(0.444)	0.343
106	8.83	0.57	0.524	0.149	(0.471)	0.374
107	8.92	0.57	0.524	0.149	(0.471)	0.375
108	9.00	0.57	0.524	0.148	(0.471)	0.376
109	9.08	0.63	0.585	0.147	(0.527)	0.438
110	9.17	0.63	0.585	0.147	(0.527)	0.439
111	9.25	0.63	0.585	0.146	(0.527)	0.439
112	9.33	0.67	0.616	0.145	(0.554)	0.471
113	9.42	0.67	0.616	0.144	(0.554)	0.472
114	9.50	0.67	0.616	0.144	(0.554)	0.472
115	9.58	0.70	0.647	0.143	(0.582)	0.504
116	9.67	0.70	0.647	0.142	(0.582)	0.504
117	9.75	0.70	0.647	0.142	(0.582)	0.505
118	9.83	0.73	0.678	0.141	(0.610)	0.537
119	9.92	0.73	0.678	0.140	(0.610)	0.537
120	10.00	0.73	0.678	0.140	(0.610)	0.538
121	10.08	0.50	0.462	0.139	(0.416)	0.323

122	10.17	0.50	0.462	0.138	(0.416)	0.324
123	10.25	0.50	0.462	0.138	(0.416)	0.324
124	10.33	0.50	0.462	0.137	(0.416)	0.325
125	10.42	0.50	0.462	0.136	(0.416)	0.326
126	10.50	0.50	0.462	0.136	(0.416)	0.326
127	10.58	0.67	0.616	0.135	(0.554)	0.481
128	10.67	0.67	0.616	0.134	(0.554)	0.482
129	10.75	0.67	0.616	0.134	(0.554)	0.482
130	10.83	0.67	0.616	0.133	(0.554)	0.483
131	10.92	0.67	0.616	0.132	(0.554)	0.484
132	11.00	0.67	0.616	0.132	(0.554)	0.484
133	11.08	0.63	0.585	0.131	(0.527)	0.454
134	11.17	0.63	0.585	0.130	(0.527)	0.455
135	11.25	0.63	0.585	0.130	(0.527)	0.455
136	11.33	0.63	0.585	0.129	(0.527)	0.456
137	11.42	0.63	0.585	0.129	(0.527)	0.457
138	11.50	0.63	0.585	0.128	(0.527)	0.457
139	11.58	0.57	0.524	0.127	(0.471)	0.396
140	11.67	0.57	0.524	0.127	(0.471)	0.397
141	11.75	0.57	0.524	0.126	(0.471)	0.398
142	11.83	0.60	0.554	0.125	(0.499)	0.429
143	11.92	0.60	0.554	0.125	(0.499)	0.430
144	12.00	0.60	0.554	0.124	(0.499)	0.430
145	12.08	0.83	0.770	0.123	(0.693)	0.647
146	12.17	0.83	0.770	0.123	(0.693)	0.647
147	12.25	0.83	0.770	0.122	(0.693)	0.648
148	12.33	0.87	0.801	0.122	(0.721)	0.679
149	12.42	0.87	0.801	0.121	(0.721)	0.680
150	12.50	0.87	0.801	0.120	(0.721)	0.680
151	12.58	0.93	0.862	0.120	(0.776)	0.743
152	12.67	0.93	0.862	0.119	(0.776)	0.743
153	12.75	0.93	0.862	0.119	(0.776)	0.744
154	12.83	0.97	0.893	0.118	(0.804)	0.775
155	12.92	0.97	0.893	0.117	(0.804)	0.776
156	13.00	0.97	0.893	0.117	(0.804)	0.776
157	13.08	1.13	1.047	0.116	(0.942)	0.931
158	13.17	1.13	1.047	0.116	(0.942)	0.932
159	13.25	1.13	1.047	0.115	(0.942)	0.932
160	13.33	1.13	1.047	0.114	(0.942)	0.933
161	13.42	1.13	1.047	0.114	(0.942)	0.933
162	13.50	1.13	1.047	0.113	(0.942)	0.934
163	13.58	0.77	0.708	0.113	(0.638)	0.596
164	13.67	0.77	0.708	0.112	(0.638)	0.596
165	13.75	0.77	0.708	0.112	(0.638)	0.597
166	13.83	0.77	0.708	0.111	(0.638)	0.597
167	13.92	0.77	0.708	0.110	(0.638)	0.598
168	14.00	0.77	0.708	0.110	(0.638)	0.599
169	14.08	0.90	0.832	0.109	(0.748)	0.722
170	14.17	0.90	0.832	0.109	(0.748)	0.723
171	14.25	0.90	0.832	0.108	(0.748)	0.723
172	14.33	0.87	0.801	0.108	(0.721)	0.693
173	14.42	0.87	0.801	0.107	(0.721)	0.694
174	14.50	0.87	0.801	0.107	(0.721)	0.694
175	14.58	0.87	0.801	0.106	(0.721)	0.695
176	14.67	0.87	0.801	0.105	(0.721)	0.695
177	14.75	0.87	0.801	0.105	(0.721)	0.696
178	14.83	0.83	0.770	0.104	(0.693)	0.666

179	14.92	0.83	0.770	0.104	(0.693)	0.666
180	15.00	0.83	0.770	0.103	(0.693)	0.667
181	15.08	0.80	0.739	0.103	(0.665)	0.636
182	15.17	0.80	0.739	0.102	(0.665)	0.637
183	15.25	0.80	0.739	0.102	(0.665)	0.637
184	15.33	0.77	0.708	0.101	(0.638)	0.607
185	15.42	0.77	0.708	0.101	(0.638)	0.608
186	15.50	0.77	0.708	0.100	(0.638)	0.608
187	15.58	0.63	0.585	0.100	(0.527)	0.486
188	15.67	0.63	0.585	0.099	(0.527)	0.486
189	15.75	0.63	0.585	0.099	(0.527)	0.487
190	15.83	0.63	0.585	0.098	(0.527)	0.487
191	15.92	0.63	0.585	0.098	(0.527)	0.488
192	16.00	0.63	0.585	0.097	(0.527)	0.488
193	16.08	0.13	0.123	0.097	(0.111)	0.027
194	16.17	0.13	0.123	0.096	(0.111)	0.027
195	16.25	0.13	0.123	0.096	(0.111)	0.028
196	16.33	0.13	0.123	0.095	(0.111)	0.028
197	16.42	0.13	0.123	0.095	(0.111)	0.029
198	16.50	0.13	0.123	0.094	(0.111)	0.029
199	16.58	0.10	0.092	(0.094)	0.083	0.009
200	16.67	0.10	0.092	(0.093)	0.083	0.009
201	16.75	0.10	0.092	(0.093)	0.083	0.009
202	16.83	0.10	0.092	(0.092)	0.083	0.009
203	16.92	0.10	0.092	(0.092)	0.083	0.009
204	17.00	0.10	0.092	(0.091)	0.083	0.009
205	17.08	0.17	0.154	0.091	(0.139)	0.063
206	17.17	0.17	0.154	0.090	(0.139)	0.064
207	17.25	0.17	0.154	0.090	(0.139)	0.064
208	17.33	0.17	0.154	0.090	(0.139)	0.064
209	17.42	0.17	0.154	0.089	(0.139)	0.065
210	17.50	0.17	0.154	0.089	(0.139)	0.065
211	17.58	0.17	0.154	0.088	(0.139)	0.066
212	17.67	0.17	0.154	0.088	(0.139)	0.066
213	17.75	0.17	0.154	0.087	(0.139)	0.067
214	17.83	0.13	0.123	0.087	(0.111)	0.036
215	17.92	0.13	0.123	0.086	(0.111)	0.037
216	18.00	0.13	0.123	0.086	(0.111)	0.037
217	18.08	0.13	0.123	0.086	(0.111)	0.038
218	18.17	0.13	0.123	0.085	(0.111)	0.038
219	18.25	0.13	0.123	0.085	(0.111)	0.038
220	18.33	0.13	0.123	0.084	(0.111)	0.039
221	18.42	0.13	0.123	0.084	(0.111)	0.039
222	18.50	0.13	0.123	0.084	(0.111)	0.040
223	18.58	0.10	0.092	0.083	(0.083)	0.009
224	18.67	0.10	0.092	0.083	(0.083)	0.010
225	18.75	0.10	0.092	0.082	(0.083)	0.010
226	18.83	0.07	0.062	(0.082)	0.055	0.006
227	18.92	0.07	0.062	(0.082)	0.055	0.006
228	19.00	0.07	0.062	(0.081)	0.055	0.006
229	19.08	0.10	0.092	0.081	(0.083)	0.012
230	19.17	0.10	0.092	0.080	(0.083)	0.012
231	19.25	0.10	0.092	0.080	(0.083)	0.012
232	19.33	0.13	0.123	0.080	(0.111)	0.044
233	19.42	0.13	0.123	0.079	(0.111)	0.044
234	19.50	0.13	0.123	0.079	(0.111)	0.044
235	19.58	0.10	0.092	0.079	(0.083)	0.014

236	19.67	0.10	0.092	0.078	(	0.083)	0.014
237	19.75	0.10	0.092	0.078	(	0.083)	0.015
238	19.83	0.07	0.062	(0.078)		0.055	0.006
239	19.92	0.07	0.062	(0.077)		0.055	0.006
240	20.00	0.07	0.062	(0.077)		0.055	0.006
241	20.08	0.10	0.092	0.076	(	0.083)	0.016
242	20.17	0.10	0.092	0.076	(	0.083)	0.016
243	20.25	0.10	0.092	0.076	(	0.083)	0.017
244	20.33	0.10	0.092	0.075	(	0.083)	0.017
245	20.42	0.10	0.092	0.075	(	0.083)	0.017
246	20.50	0.10	0.092	0.075	(	0.083)	0.018
247	20.58	0.10	0.092	0.075	(	0.083)	0.018
248	20.67	0.10	0.092	0.074	(	0.083)	0.018
249	20.75	0.10	0.092	0.074	(	0.083)	0.018
250	20.83	0.07	0.062	(0.074)		0.055	0.006
251	20.92	0.07	0.062	(0.073)		0.055	0.006
252	21.00	0.07	0.062	(0.073)		0.055	0.006
253	21.08	0.10	0.092	0.073	(	0.083)	0.020
254	21.17	0.10	0.092	0.072	(	0.083)	0.020
255	21.25	0.10	0.092	0.072	(	0.083)	0.020
256	21.33	0.07	0.062	(0.072)		0.055	0.006
257	21.42	0.07	0.062	(0.072)		0.055	0.006
258	21.50	0.07	0.062	(0.071)		0.055	0.006
259	21.58	0.10	0.092	0.071	(	0.083)	0.021
260	21.67	0.10	0.092	0.071	(	0.083)	0.022
261	21.75	0.10	0.092	0.071	(	0.083)	0.022
262	21.83	0.07	0.062	(0.070)		0.055	0.006
263	21.92	0.07	0.062	(0.070)		0.055	0.006
264	22.00	0.07	0.062	(0.070)		0.055	0.006
265	22.08	0.10	0.092	0.070	(	0.083)	0.023
266	22.17	0.10	0.092	0.069	(	0.083)	0.023
267	22.25	0.10	0.092	0.069	(	0.083)	0.023
268	22.33	0.07	0.062	(0.069)		0.055	0.006
269	22.42	0.07	0.062	(0.069)		0.055	0.006
270	22.50	0.07	0.062	(0.069)		0.055	0.006
271	22.58	0.07	0.062	(0.068)		0.055	0.006
272	22.67	0.07	0.062	(0.068)		0.055	0.006
273	22.75	0.07	0.062	(0.068)		0.055	0.006
274	22.83	0.07	0.062	(0.068)		0.055	0.006
275	22.92	0.07	0.062	(0.068)		0.055	0.006
276	23.00	0.07	0.062	(0.067)		0.055	0.006
277	23.08	0.07	0.062	(0.067)		0.055	0.006
278	23.17	0.07	0.062	(0.067)		0.055	0.006
279	23.25	0.07	0.062	(0.067)		0.055	0.006
280	23.33	0.07	0.062	(0.067)		0.055	0.006
281	23.42	0.07	0.062	(0.067)		0.055	0.006
282	23.50	0.07	0.062	(0.067)		0.055	0.006
283	23.58	0.07	0.062	(0.067)		0.055	0.006
284	23.67	0.07	0.062	(0.066)		0.055	0.006
285	23.75	0.07	0.062	(0.066)		0.055	0.006
286	23.83	0.07	0.062	(0.066)		0.055	0.006
287	23.92	0.07	0.062	(0.066)		0.055	0.006
288	24.00	0.07	0.062	(0.066)		0.055	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 59.9

Flood volume = Effective rainfall 5.00(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)

```
Total soil loss =      2.70(In)
Total soil loss =     0.940(Ac.Ft)
Total rainfall =      7.70(In)
Flood volume =       75619.0 Cubic Feet
Total soil loss =       40935.7 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =      3.894(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0001      0.01  Q          |         |         |         |
  0+15       0.0002      0.02  Q          |         |         |         |
  0+20       0.0004      0.02  Q          |         |         |         |
  0+25       0.0006      0.03  Q          |         |         |         |
  0+30       0.0008      0.03  Q          |         |         |         |
  0+35       0.0011      0.04  Q          |         |         |         |
  0+40       0.0013      0.04  Q          |         |         |         |
  0+45       0.0016      0.04  Q          |         |         |         |
  0+50       0.0018      0.04  Q          |         |         |         |
  0+55       0.0022      0.04  Q          |         |         |         |
  1+ 0       0.0025      0.05  Q          |         |         |         |
  1+ 5       0.0028      0.05  Q          |         |         |         |
  1+10       0.0031      0.05  Q          |         |         |         |
  1+15       0.0034      0.04  Q          |         |         |         |
  1+20       0.0037      0.04  Q          |         |         |         |
  1+25       0.0040      0.04  Q          |         |         |         |
  1+30       0.0042      0.04  Q          |         |         |         |
  1+35       0.0045      0.04  Q          |         |         |         |
  1+40       0.0048      0.04  Q          |         |         |         |
  1+45       0.0051      0.04  Q          |         |         |         |
  1+50       0.0053      0.04  Q          |         |         |         |
  1+55       0.0056      0.04  Q          |         |         |         |
  2+ 0       0.0060      0.05  Q          |         |         |         |
  2+ 5       0.0063      0.05  Q          |         |         |         |
  2+10       0.0067      0.05  Q          |         |         |         |
  2+15       0.0070      0.05  Q          |         |         |         |
  2+20       0.0074      0.05  Q          |         |         |         |
  2+25       0.0077      0.05  Q          |         |         |         |
  2+30       0.0081      0.05  Q          |         |         |         |
  2+35       0.0084      0.05  Q          |         |         |         |
  2+40       0.0088      0.06  Q          |         |         |         |
  2+45       0.0092      0.06  Q          |         |         |         |
  2+50       0.0097      0.06  Q          |         |         |         |
  2+55       0.0101      0.06  Q          |         |         |         |
  3+ 0       0.0106      0.06  Q          |         |         |         |
  3+ 5       0.0110      0.06  Q          |         |         |         |
  3+10       0.0115      0.06  Q          |         |         |         |
  3+15       0.0119      0.06  Q          |         |         |         |
  3+20       0.0123      0.06  Q          |         |         |         |
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3+25	0.0128	0.06	Q	|	|	|	|
3+30	0.0132	0.06	Q	|	|	|	|
3+35	0.0137	0.06	Q	|	|	|	|
3+40	0.0141	0.06	Q	|	|	|	|
3+45	0.0146	0.06	Q	|	|	|	|
3+50	0.0150	0.07	Q	|	|	|	|
3+55	0.0155	0.07	Q	|	|	|	|
4+ 0	0.0160	0.07	Q	|	|	|	|
4+ 5	0.0165	0.08	Q	|	|	|	|
4+10	0.0171	0.08	Q	|	|	|	|
4+15	0.0176	0.08	Q	|	|	|	|
4+20	0.0181	0.08	Q	|	|	|	|
4+25	0.0188	0.09	Q	|	|	|	|
4+30	0.0194	0.10	Q	|	|	|	|
4+35	0.0202	0.11	Q	|	|	|	|
4+40	0.0209	0.11	Q	|	|	|	|
4+45	0.0217	0.11	Q	|	|	|	|
4+50	0.0226	0.13	Q	|	|	|	|
4+55	0.0238	0.17	Q	|	|	|	|
5+ 0	0.0253	0.22	Q	|	|	|	|
5+ 5	0.0269	0.23	Q	|	|	|	|
5+10	0.0281	0.18	Q	|	|	|	|
5+15	0.0289	0.12	Q	|	|	|	|
5+20	0.0296	0.11	Q	|	|	|	|
5+25	0.0304	0.12	Q	|	|	|	|
5+30	0.0314	0.14	Q	|	|	|	|
5+35	0.0324	0.15	Q	|	|	|	|
5+40	0.0338	0.20	Q	|	|	|	|
5+45	0.0355	0.25	Q	|	|	|	|
5+50	0.0374	0.27	VQ	|	|	|	|
5+55	0.0393	0.28	VQ	|	|	|	|
6+ 0	0.0413	0.29	VQ	|	|	|	|
6+ 5	0.0434	0.30	VQ	|	|	|	|
6+10	0.0458	0.35	|Q	|	|	|	|
6+15	0.0485	0.40	|Q	|	|	|	|
6+20	0.0514	0.42	|Q	|	|	|	|
6+25	0.0544	0.43	|Q	|	|	|	|
6+30	0.0574	0.44	|Q	|	|	|	|
6+35	0.0605	0.45	|Q	|	|	|	|
6+40	0.0640	0.50	|VQ	|	|	|	|
6+45	0.0677	0.55	|VQ	|	|	|	|
6+50	0.0716	0.57	|VQ	|	|	|	|
6+55	0.0756	0.58	|VQ	|	|	|	|
7+ 0	0.0797	0.59	|VQ	|	|	|	|
7+ 5	0.0838	0.59	|VQ	|	|	|	|
7+10	0.0879	0.60	| Q	|	|	|	|
7+15	0.0920	0.60	| Q	|	|	|	|
7+20	0.0962	0.61	| Q	|	|	|	|
7+25	0.1008	0.66	| Q	|	|	|	|
7+30	0.1057	0.71	| Q	|	|	|	|
7+35	0.1107	0.73	| Q	|	|	|	|
7+40	0.1161	0.79	| VQ	|	|	|	|
7+45	0.1219	0.84	| VQ	|	|	|	|
7+50	0.1279	0.87	| VQ	|	|	|	|
7+55	0.1343	0.93	| Q	|	|	|	|
8+ 0	0.1410	0.98	| Q	|	|	|	|
8+ 5	0.1480	1.01	| VQ	|	|	|	|

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 8+10       0.1557      1.12  |  VQ     |          |          |          |
 8+15       0.1640      1.21  |  VQ     |          |          |          |
 8+20       0.1726      1.25  |  VQ     |          |          |          |
 8+25       0.1814      1.27  |   VQ    |          |          |          |
 8+30       0.1902      1.28  |   VQ    |          |          |          |
 8+35       0.1992      1.30  |   VQ    |          |          |          |
 8+40       0.2085      1.35  |   VQ    |          |          |          |
 8+45       0.2181      1.40  |    Q    |          |          |          |
 8+50       0.2279      1.43  |    Q    |          |          |          |
 8+55       0.2381      1.48  |    Q    |          |          |          |
 9+ 0       0.2487      1.53  |    VQ   |          |          |          |
 9+ 5       0.2595      1.57  |    VQ   |          |          |          |
 9+10       0.2710      1.67  |     Q   |          |          |          |
 9+15       0.2832      1.77  |     VQ  |          |          |          |
 9+20       0.2956      1.81  |     VQ  |          |          |          |
 9+25       0.3086      1.88  |      Q  |          |          |          |
 9+30       0.3219      1.93  |      Q  |          |          |          |
 9+35       0.3354      1.96  |      Q  |          |          |          |
 9+40       0.3494      2.02  |       Q |          |          |          |
 9+45       0.3636      2.08  |       Q |          |          |          |
 9+50       0.3781      2.11  |       Q |          |          |          |
 9+55       0.3930      2.16  |       QV|          |          |          |
10+ 0       0.4083      2.21  |       QV|          |          |          |
10+ 5       0.4233      2.18  |       QV|          |          |          |
10+10       0.4363      1.88  |      Q  V          |          |          |
10+15       0.4473      1.60  |     Q   V          |          |          |
10+20       0.4576      1.49  |    Q    V          |          |          |
10+25       0.4674      1.44  |    Q    V          |          |          |
10+30       0.4771      1.40  |    Q    V          |          |          |
10+35       0.4869      1.43  |    Q    |V         |          |          |
10+40       0.4982      1.65  |     Q   |V         |          |          |
10+45       0.5110      1.86  |      Q  |V         |          |          |
10+50       0.5243      1.93  |      Q  | V        |          |          |
10+55       0.5379      1.98  |      Q  | V        |          |          |
11+ 0       0.5517      2.00  |       Q | V        |          |          |
11+ 5       0.5656      2.01  |       Q |  V       |          |          |
11+10       0.5792      1.98  |      Q  |  V       |          |          |
11+15       0.5925      1.94  |      Q  |  V       |          |          |
11+20       0.6058      1.93  |      Q  |  V       |          |          |
11+25       0.6191      1.92  |      Q  |   V      |          |          |
11+30       0.6323      1.92  |      Q  |   V      |          |          |
11+35       0.6455      1.91  |      Q  |   V      |          |          |
11+40       0.6580      1.82  |      Q  |    V     |          |          |
11+45       0.6699      1.74  |     Q   |    V     |          |          |
11+50       0.6818      1.72  |     Q   |    V     |          |          |
11+55       0.6938      1.75  |     Q   |    V     |          |          |
12+ 0       0.7060      1.78  |      Q  |     V    |          |          |
12+ 5       0.7188      1.85  |      Q  |     V    |          |          |
12+10       0.7337      2.17  |       Q |     V    |          |          |
12+15       0.7507      2.47  |        Q|      V   |          |          |
12+20       0.7686      2.59  |         Q      V   |          |          |
12+25       0.7872      2.70  |         Q       V  |          |          |
12+30       0.8063      2.78  |         |Q      V  |          |          |
12+35       0.8258      2.83  |         |Q       V|          |          |
12+40       0.8461      2.94  |         |Q       V|          |          |
12+45       0.8670      3.04  |         | Q      V|          |          |
12+50       0.8883      3.09  |         | Q       V          |          |
```

```
12+55       0.9100      3.16  |         | Q       V         |         |
13+ 0       0.9322      3.21  |         | Q       |V        |         |
13+ 5       0.9547      3.28  |         |  Q      |V        |         |
13+10       0.9789      3.51  |         |   Q     | V       |         |
13+15       1.0046      3.73  |         |   Q     |  V      |         |
13+20       1.0309      3.82  |         |    Q    |  V      |         |
13+25       1.0575      3.86  |         |    Q    |   V     |         |
13+30       1.0843      3.89  |         |    Q    |   V     |         |
13+35       1.1107      3.82  |         |    Q    |    V    |         |
13+40       1.1337      3.34  |         |  Q      |     V   |         |
13+45       1.1535      2.88  |         |Q        |     V   |         |
13+50       1.1723      2.72  |         Q         |      V  |         |
13+55       1.1903      2.62  |         Q         |      V  |         |
14+ 0       1.2080      2.57  |         Q         |      V  |         |
14+ 5       1.2258      2.57  |         Q         |       V |         |
14+10       1.2447      2.74  |         Q         |       V |         |
14+15       1.2647      2.91  |         |Q        |        V|         |
14+20       1.2851      2.96  |         |Q        |        V|         |
14+25       1.3054      2.95  |         |Q        |         V         |
14+30       1.3255      2.93  |         |Q        |         V         |
14+35       1.3457      2.93  |         |Q        |         |V        |
14+40       1.3658      2.92  |         |Q        |         |V        |
14+45       1.3859      2.92  |         |Q        |         |V        |
14+50       1.4060      2.92  |         |Q        |         | V       |
14+55       1.4258      2.87  |         |Q        |         | V       |
15+ 0       1.4453      2.83  |         |Q        |         |  V      |
15+ 5       1.4647      2.81  |         |Q        |         |  V      |
15+10       1.4837      2.76  |         |Q        |         |   V     |
15+15       1.5024      2.72  |         Q         |         |   V     |
15+20       1.5210      2.69  |         Q         |         |    V    |
15+25       1.5392      2.64  |         Q         |         |    V    |
15+30       1.5570      2.59  |         Q         |         |    V    |
15+35       1.5746      2.55  |         Q         |         |     V   |
15+40       1.5908      2.36  |        Q|         |         |     V   |
15+45       1.6059      2.19  |       Q |         |         |      V  |
15+50       1.6205      2.12  |       Q |         |         |      V  |
15+55       1.6349      2.09  |       Q |         |         |      V  |
16+ 0       1.6492      2.07  |       Q |         |         |      V  |
16+ 5       1.6625      1.94  |      Q  |         |         |       V |
16+10       1.6713      1.27  |    Q    |         |         |       V |
16+15       1.6757      0.64  | Q       |         |         |       V |
16+20       1.6785      0.41  |Q        |         |         |       V |
16+25       1.6804      0.27  |Q        |         |         |       V |
16+30       1.6817      0.20  Q         |         |         |       V |
16+35       1.6828      0.15  Q         |         |         |       V |
16+40       1.6836      0.11  Q         |         |         |       V |
16+45       1.6841      0.08  Q         |         |         |       V |
16+50       1.6845      0.06  Q         |         |         |       V |
16+55       1.6848      0.05  Q         |         |         |       V |
17+ 0       1.6851      0.04  Q         |         |         |       V |
17+ 5       1.6855      0.05  Q         |         |         |       V |
17+10       1.6864      0.13  Q         |         |         |       V |
17+15       1.6878      0.21  Q         |         |         |       V |
17+20       1.6894      0.23  Q         |         |         |       V |
17+25       1.6912      0.25  |Q        |         |         |       V |
17+30       1.6930      0.26  |Q        |         |         |        V|
17+35       1.6948      0.27  |Q        |         |         |        V|
```

```
17+40       1.6967      0.27  |Q         |          |          |         V|
17+45       1.6986      0.27  |Q         |          |          |         V|
17+50       1.7004      0.27  |Q         |          |          |         V|
17+55       1.7020      0.23  Q          |          |          |         V|
18+ 0       1.7033      0.19  Q          |          |          |         V|
18+ 5       1.7045      0.17  Q          |          |          |         V|
18+10       1.7056      0.17  Q          |          |          |         V|
18+15       1.7067      0.16  Q          |          |          |         V|
18+20       1.7079      0.16  Q          |          |          |         V|
18+25       1.7090      0.16  Q          |          |          |         V|
18+30       1.7101      0.16  Q          |          |          |         V|
18+35       1.7112      0.16  Q          |          |          |         V|
18+40       1.7120      0.11  Q          |          |          |         V|
18+45       1.7125      0.07  Q          |          |          |         V|
18+50       1.7129      0.06  Q          |          |          |         V|
18+55       1.7132      0.05  Q          |          |          |         V|
19+ 0       1.7134      0.04  Q          |          |          |         V|
19+ 5       1.7137      0.03  Q          |          |          |         V|
19+10       1.7139      0.04  Q          |          |          |         V|
19+15       1.7142      0.05  Q          |          |          |         V|
19+20       1.7146      0.06  Q          |          |          |         V|
19+25       1.7153      0.10  Q          |          |          |         V|
19+30       1.7164      0.15  Q          |          |          |         V|
19+35       1.7174      0.16  Q          |          |          |         V|
19+40       1.7183      0.12  Q          |          |          |         V|
19+45       1.7189      0.09  Q          |          |          |         V|
19+50       1.7194      0.07  Q          |          |          |         V|
19+55       1.7198      0.05  Q          |          |          |         V|
20+ 0       1.7200      0.04  Q          |          |          |         V|
20+ 5       1.7203      0.04  Q          |          |          |         V|
20+10       1.7206      0.05  Q          |          |          |         V|
20+15       1.7210      0.06  Q          |          |          |         V|
20+20       1.7214      0.06  Q          |          |          |         V|
20+25       1.7219      0.07  Q          |          |          |         V|
20+30       1.7224      0.07  Q          |          |          |         V|
20+35       1.7229      0.07  Q          |          |          |         V|
20+40       1.7234      0.07  Q          |          |          |         V|
20+45       1.7239      0.07  Q          |          |          |         V|
20+50       1.7244      0.07  Q          |          |          |         V|
20+55       1.7248      0.06  Q          |          |          |         V|
21+ 0       1.7251      0.04  Q          |          |          |         V|
21+ 5       1.7253      0.04  Q          |          |          |         V|
21+10       1.7257      0.05  Q          |          |          |         V|
21+15       1.7262      0.07  Q          |          |          |         V|
21+20       1.7267      0.07  Q          |          |          |         V|
21+25       1.7271      0.06  Q          |          |          |         V|
21+30       1.7273      0.04  Q          |          |          |         V|
21+35       1.7276      0.04  Q          |          |          |         V|
21+40       1.7280      0.06  Q          |          |          |         V|
21+45       1.7285      0.07  Q          |          |          |         V|
21+50       1.7290      0.08  Q          |          |          |         V|
21+55       1.7294      0.06  Q          |          |          |         V|
22+ 0       1.7297      0.04  Q          |          |          |         V|
22+ 5       1.7300      0.04  Q          |          |          |         V|
22+10       1.7304      0.06  Q          |          |          |         V|
22+15       1.7309      0.08  Q          |          |          |         V|
22+20       1.7315      0.08  Q          |          |          |         V|
```

```
   22+25       1.7320      0.06  Q          |          |          |         V|
   22+30       1.7322      0.04  Q          |          |          |         V|
   22+35       1.7325      0.04  Q          |          |          |         V|
   22+40       1.7327      0.03  Q          |          |          |         V|
   22+45       1.7329      0.03  Q          |          |          |         V|
   22+50       1.7331      0.03  Q          |          |          |         V|
   22+55       1.7333      0.03  Q          |          |          |         V|
   23+ 0       1.7335      0.03  Q          |          |          |         V|
   23+ 5       1.7336      0.03  Q          |          |          |         V|
   23+10       1.7338      0.03  Q          |          |          |         V|
   23+15       1.7340      0.03  Q          |          |          |         V|
   23+20       1.7342      0.03  Q          |          |          |         V|
   23+25       1.7343      0.03  Q          |          |          |         V|
   23+30       1.7345      0.03  Q          |          |          |         V|
   23+35       1.7347      0.03  Q          |          |          |         V|
   23+40       1.7349      0.03  Q          |          |          |         V|
   23+45       1.7351      0.03  Q          |          |          |         V|
   23+50       1.7352      0.03  Q          |          |          |         V|
   23+55       1.7354      0.03  Q          |          |          |         V|
   24+ 0       1.7356      0.03  Q          |          |          |         V|
   24+ 5       1.7358      0.02  Q          |          |          |         V|
   24+10       1.7359      0.02  Q          |          |          |         V|
   24+15       1.7359      0.01  Q          |          |          |         V|
   24+20       1.7359      0.00  Q          |          |          |         V|
   24+25       1.7360      0.00  Q          |          |          |         V|
   24+30       1.7360      0.00  Q          |          |          |         V|
   24+35       1.7360      0.00  Q          |          |          |         V|
   24+40       1.7360      0.00  Q          |          |          |         V|
   24+45       1.7360      0.00  Q          |          |          |         V|
   24+50       1.7360      0.00  Q          |          |          |         V|
   24+55       1.7360      0.00  Q          |          |          |          V
---------------------------------------------------------------------------
```

Appendix F

Unit Hydrograph Output (Developed)

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  03/22/12 File: 3504Q2D1R12.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q2-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 0.630(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 0.630(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.333	(0.134)	0.060	0.273
2	0.17	4.50	0.340	(0.134)	0.061	0.279
3	0.25	5.40	0.408	(0.134)	0.073	0.335
4	0.33	5.40	0.408	(0.134)	0.073	0.335
5	0.42	5.70	0.431	(0.134)	0.078	0.353
6	0.50	6.40	0.484	(0.134)	0.087	0.397
7	0.58	7.90	0.597	(0.134)	0.107	0.490
8	0.67	9.10	0.688	(0.134)	0.124	0.564

```
 9   0.75    12.80      0.968          0.134    (  0.174)        0.834
10   0.83    25.60      1.935          0.134    (  0.348)        1.801
11   0.92     7.90      0.597       (  0.134)       0.107        0.490
12   1.00     4.90      0.370       (  0.134)       0.067        0.304
           (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     6.5
    Flood volume = Effective rainfall      0.54(In)
     times area       4.2(Ac.)/[(In)/(Ft.)] =       0.2(Ac.Ft)
    Total soil loss =      0.09(In)
    Total soil loss =     0.032(Ac.Ft)
    Total rainfall =      0.63(In)
    Flood volume =        8140.2 Cubic Feet
    Total soil loss =        1395.8 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      5.056(CFS)
    ---------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ----------------------------------------------------------------------
   0+ 5       0.0007      0.10  Q         |         |         |         |
   0+10       0.0052      0.65  |VQ       |         |         |         |
   0+15       0.0118      0.97  | VQ      |         |         |         |
   0+20       0.0201      1.20  |   Q     |         |         |         |
   0+25       0.0292      1.33  |    QV   |         |         |         |
   0+30       0.0390      1.43  |    Q  V |         |         |         |
   0+35       0.0500      1.59  |     Q   V         |         |         |
   0+40       0.0628      1.87  |      Q  |  V      |         |         |
   0+45       0.0782      2.24  |       Q |     V   |         |         |
   0+50       0.1007      3.26  |         |  Q      |V        |         |
   0+55       0.1355      5.06  |         |         Q        V|         |
   1+ 0       0.1598      3.52  |         |   Q     |         |   V     |
   1+ 5       0.1744      2.13  |       Q |         |         |      V  |
   1+10       0.1814      1.01  |   Q     |         |         |       V |
   1+15       0.1844      0.43  |Q        |         |         |        V|
   1+20       0.1857      0.19  Q         |         |         |        V|
   1+25       0.1864      0.10  Q         |         |         |        V|
   1+30       0.1867      0.05  Q         |         |         |        V|
   1+35       0.1868      0.02  Q         |         |         |        V|
   1+40       0.1869      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
      U n i t   H y d r o g r a p h   A n a l y s i s

      Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
            Study date  03/21/12 File: 3504q2d1r242.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q2-24HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 2.800(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.800(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.900	0.134	1.000	0.134
					Sum (F) =	0.134

Area averaged mean soil loss (F) (In/Hr) = 0.134
Minimum soil loss rate ((In/Hr)) = 0.067
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.022	(0.238)	0.004	0.018
2	0.17	0.07	0.022	(0.237)	0.004	0.018
3	0.25	0.07	0.022	(0.236)	0.004	0.018
4	0.33	0.10	0.034	(0.235)	0.006	0.028
5	0.42	0.10	0.034	(0.234)	0.006	0.028
6	0.50	0.10	0.034	(0.233)	0.006	0.028
7	0.58	0.10	0.034	(0.232)	0.006	0.028
8	0.67	0.10	0.034	(0.231)	0.006	0.028
9	0.75	0.10	0.034	(0.230)	0.006	0.028
10	0.83	0.13	0.045	(0.230)	0.008	0.037

11	0.92	0.13	0.045	(0.229)	0.008	0.037
12	1.00	0.13	0.045	(0.228)	0.008	0.037
13	1.08	0.10	0.034	(0.227)	0.006	0.028
14	1.17	0.10	0.034	(0.226)	0.006	0.028
15	1.25	0.10	0.034	(0.225)	0.006	0.028
16	1.33	0.10	0.034	(0.224)	0.006	0.028
17	1.42	0.10	0.034	(0.223)	0.006	0.028
18	1.50	0.10	0.034	(0.222)	0.006	0.028
19	1.58	0.10	0.034	(0.222)	0.006	0.028
20	1.67	0.10	0.034	(0.221)	0.006	0.028
21	1.75	0.10	0.034	(0.220)	0.006	0.028
22	1.83	0.13	0.045	(0.219)	0.008	0.037
23	1.92	0.13	0.045	(0.218)	0.008	0.037
24	2.00	0.13	0.045	(0.217)	0.008	0.037
25	2.08	0.13	0.045	(0.216)	0.008	0.037
26	2.17	0.13	0.045	(0.215)	0.008	0.037
27	2.25	0.13	0.045	(0.214)	0.008	0.037
28	2.33	0.13	0.045	(0.214)	0.008	0.037
29	2.42	0.13	0.045	(0.213)	0.008	0.037
30	2.50	0.13	0.045	(0.212)	0.008	0.037
31	2.58	0.17	0.056	(0.211)	0.010	0.046
32	2.67	0.17	0.056	(0.210)	0.010	0.046
33	2.75	0.17	0.056	(0.209)	0.010	0.046
34	2.83	0.17	0.056	(0.208)	0.010	0.046
35	2.92	0.17	0.056	(0.208)	0.010	0.046
36	3.00	0.17	0.056	(0.207)	0.010	0.046
37	3.08	0.17	0.056	(0.206)	0.010	0.046
38	3.17	0.17	0.056	(0.205)	0.010	0.046
39	3.25	0.17	0.056	(0.204)	0.010	0.046
40	3.33	0.17	0.056	(0.203)	0.010	0.046
41	3.42	0.17	0.056	(0.202)	0.010	0.046
42	3.50	0.17	0.056	(0.202)	0.010	0.046
43	3.58	0.17	0.056	(0.201)	0.010	0.046
44	3.67	0.17	0.056	(0.200)	0.010	0.046
45	3.75	0.17	0.056	(0.199)	0.010	0.046
46	3.83	0.20	0.067	(0.198)	0.012	0.055
47	3.92	0.20	0.067	(0.197)	0.012	0.055
48	4.00	0.20	0.067	(0.197)	0.012	0.055
49	4.08	0.20	0.067	(0.196)	0.012	0.055
50	4.17	0.20	0.067	(0.195)	0.012	0.055
51	4.25	0.20	0.067	(0.194)	0.012	0.055
52	4.33	0.23	0.078	(0.193)	0.014	0.064
53	4.42	0.23	0.078	(0.192)	0.014	0.064
54	4.50	0.23	0.078	(0.192)	0.014	0.064
55	4.58	0.23	0.078	(0.191)	0.014	0.064
56	4.67	0.23	0.078	(0.190)	0.014	0.064
57	4.75	0.23	0.078	(0.189)	0.014	0.064
58	4.83	0.27	0.090	(0.188)	0.016	0.073
59	4.92	0.27	0.090	(0.187)	0.016	0.073
60	5.00	0.27	0.090	(0.187)	0.016	0.073
61	5.08	0.20	0.067	(0.186)	0.012	0.055
62	5.17	0.20	0.067	(0.185)	0.012	0.055
63	5.25	0.20	0.067	(0.184)	0.012	0.055
64	5.33	0.23	0.078	(0.183)	0.014	0.064
65	5.42	0.23	0.078	(0.183)	0.014	0.064
66	5.50	0.23	0.078	(0.182)	0.014	0.064
67	5.58	0.27	0.090	(0.181)	0.016	0.073

68	5.67	0.27	0.090	(0.180)	0.016	0.073
69	5.75	0.27	0.090	(0.179)	0.016	0.073
70	5.83	0.27	0.090	(0.179)	0.016	0.073
71	5.92	0.27	0.090	(0.178)	0.016	0.073
72	6.00	0.27	0.090	(0.177)	0.016	0.073
73	6.08	0.30	0.101	(0.176)	0.018	0.083
74	6.17	0.30	0.101	(0.175)	0.018	0.083
75	6.25	0.30	0.101	(0.175)	0.018	0.083
76	6.33	0.30	0.101	(0.174)	0.018	0.083
77	6.42	0.30	0.101	(0.173)	0.018	0.083
78	6.50	0.30	0.101	(0.172)	0.018	0.083
79	6.58	0.33	0.112	(0.172)	0.020	0.092
80	6.67	0.33	0.112	(0.171)	0.020	0.092
81	6.75	0.33	0.112	(0.170)	0.020	0.092
82	6.83	0.33	0.112	(0.169)	0.020	0.092
83	6.92	0.33	0.112	(0.169)	0.020	0.092
84	7.00	0.33	0.112	(0.168)	0.020	0.092
85	7.08	0.33	0.112	(0.167)	0.020	0.092
86	7.17	0.33	0.112	(0.166)	0.020	0.092
87	7.25	0.33	0.112	(0.165)	0.020	0.092
88	7.33	0.37	0.123	(0.165)	0.022	0.101
89	7.42	0.37	0.123	(0.164)	0.022	0.101
90	7.50	0.37	0.123	(0.163)	0.022	0.101
91	7.58	0.40	0.134	(0.162)	0.024	0.110
92	7.67	0.40	0.134	(0.162)	0.024	0.110
93	7.75	0.40	0.134	(0.161)	0.024	0.110
94	7.83	0.43	0.146	(0.160)	0.026	0.119
95	7.92	0.43	0.146	(0.159)	0.026	0.119
96	8.00	0.43	0.146	(0.159)	0.026	0.119
97	8.08	0.50	0.168	(0.158)	0.030	0.138
98	8.17	0.50	0.168	(0.157)	0.030	0.138
99	8.25	0.50	0.168	(0.157)	0.030	0.138
100	8.33	0.50	0.168	(0.156)	0.030	0.138
101	8.42	0.50	0.168	(0.155)	0.030	0.138
102	8.50	0.50	0.168	(0.154)	0.030	0.138
103	8.58	0.53	0.179	(0.154)	0.032	0.147
104	8.67	0.53	0.179	(0.153)	0.032	0.147
105	8.75	0.53	0.179	(0.152)	0.032	0.147
106	8.83	0.57	0.190	(0.151)	0.034	0.156
107	8.92	0.57	0.190	(0.151)	0.034	0.156
108	9.00	0.57	0.190	(0.150)	0.034	0.156
109	9.08	0.63	0.213	(0.149)	0.038	0.174
110	9.17	0.63	0.213	(0.149)	0.038	0.174
111	9.25	0.63	0.213	(0.148)	0.038	0.174
112	9.33	0.67	0.224	(0.147)	0.040	0.184
113	9.42	0.67	0.224	(0.147)	0.040	0.184
114	9.50	0.67	0.224	(0.146)	0.040	0.184
115	9.58	0.70	0.235	(0.145)	0.042	0.193
116	9.67	0.70	0.235	(0.144)	0.042	0.193
117	9.75	0.70	0.235	(0.144)	0.042	0.193
118	9.83	0.73	0.246	(0.143)	0.044	0.202
119	9.92	0.73	0.246	(0.142)	0.044	0.202
120	10.00	0.73	0.246	(0.142)	0.044	0.202
121	10.08	0.50	0.168	(0.141)	0.030	0.138
122	10.17	0.50	0.168	(0.140)	0.030	0.138
123	10.25	0.50	0.168	(0.140)	0.030	0.138
124	10.33	0.50	0.168	(0.139)	0.030	0.138

125	10.42	0.50	0.168	(0.138)	0.030	0.138
126	10.50	0.50	0.168	(0.138)	0.030	0.138
127	10.58	0.67	0.224	(0.137)	0.040	0.184
128	10.67	0.67	0.224	(0.136)	0.040	0.184
129	10.75	0.67	0.224	(0.136)	0.040	0.184
130	10.83	0.67	0.224	(0.135)	0.040	0.184
131	10.92	0.67	0.224	(0.134)	0.040	0.184
132	11.00	0.67	0.224	(0.134)	0.040	0.184
133	11.08	0.63	0.213	(0.133)	0.038	0.174
134	11.17	0.63	0.213	(0.132)	0.038	0.174
135	11.25	0.63	0.213	(0.132)	0.038	0.174
136	11.33	0.63	0.213	(0.131)	0.038	0.174
137	11.42	0.63	0.213	(0.130)	0.038	0.174
138	11.50	0.63	0.213	(0.130)	0.038	0.174
139	11.58	0.57	0.190	(0.129)	0.034	0.156
140	11.67	0.57	0.190	(0.128)	0.034	0.156
141	11.75	0.57	0.190	(0.128)	0.034	0.156
142	11.83	0.60	0.202	(0.127)	0.036	0.165
143	11.92	0.60	0.202	(0.126)	0.036	0.165
144	12.00	0.60	0.202	(0.126)	0.036	0.165
145	12.08	0.83	0.280	(0.125)	0.050	0.230
146	12.17	0.83	0.280	(0.125)	0.050	0.230
147	12.25	0.83	0.280	(0.124)	0.050	0.230
148	12.33	0.87	0.291	(0.123)	0.052	0.239
149	12.42	0.87	0.291	(0.123)	0.052	0.239
150	12.50	0.87	0.291	(0.122)	0.052	0.239
151	12.58	0.93	0.314	(0.121)	0.056	0.257
152	12.67	0.93	0.314	(0.121)	0.056	0.257
153	12.75	0.93	0.314	(0.120)	0.056	0.257
154	12.83	0.97	0.325	(0.120)	0.058	0.266
155	12.92	0.97	0.325	(0.119)	0.058	0.266
156	13.00	0.97	0.325	(0.118)	0.058	0.266
157	13.08	1.13	0.381	(0.118)	0.069	0.312
158	13.17	1.13	0.381	(0.117)	0.069	0.312
159	13.25	1.13	0.381	(0.117)	0.069	0.312
160	13.33	1.13	0.381	(0.116)	0.069	0.312
161	13.42	1.13	0.381	(0.115)	0.069	0.312
162	13.50	1.13	0.381	(0.115)	0.069	0.312
163	13.58	0.77	0.258	(0.114)	0.046	0.211
164	13.67	0.77	0.258	(0.114)	0.046	0.211
165	13.75	0.77	0.258	(0.113)	0.046	0.211
166	13.83	0.77	0.258	(0.113)	0.046	0.211
167	13.92	0.77	0.258	(0.112)	0.046	0.211
168	14.00	0.77	0.258	(0.111)	0.046	0.211
169	14.08	0.90	0.302	(0.111)	0.054	0.248
170	14.17	0.90	0.302	(0.110)	0.054	0.248
171	14.25	0.90	0.302	(0.110)	0.054	0.248
172	14.33	0.87	0.291	(0.109)	0.052	0.239
173	14.42	0.87	0.291	(0.109)	0.052	0.239
174	14.50	0.87	0.291	(0.108)	0.052	0.239
175	14.58	0.87	0.291	(0.107)	0.052	0.239
176	14.67	0.87	0.291	(0.107)	0.052	0.239
177	14.75	0.87	0.291	(0.106)	0.052	0.239
178	14.83	0.83	0.280	(0.106)	0.050	0.230
179	14.92	0.83	0.280	(0.105)	0.050	0.230
180	15.00	0.83	0.280	(0.105)	0.050	0.230
181	15.08	0.80	0.269	(0.104)	0.048	0.220

182	15.17	0.80	0.269	(0.104)	0.048	0.220
183	15.25	0.80	0.269	(0.103)	0.048	0.220
184	15.33	0.77	0.258	(0.103)	0.046	0.211
185	15.42	0.77	0.258	(0.102)	0.046	0.211
186	15.50	0.77	0.258	(0.102)	0.046	0.211
187	15.58	0.63	0.213	(0.101)	0.038	0.174
188	15.67	0.63	0.213	(0.101)	0.038	0.174
189	15.75	0.63	0.213	(0.100)	0.038	0.174
190	15.83	0.63	0.213	(0.100)	0.038	0.174
191	15.92	0.63	0.213	(0.099)	0.038	0.174
192	16.00	0.63	0.213	(0.099)	0.038	0.174
193	16.08	0.13	0.045	(0.098)	0.008	0.037
194	16.17	0.13	0.045	(0.098)	0.008	0.037
195	16.25	0.13	0.045	(0.097)	0.008	0.037
196	16.33	0.13	0.045	(0.097)	0.008	0.037
197	16.42	0.13	0.045	(0.096)	0.008	0.037
198	16.50	0.13	0.045	(0.096)	0.008	0.037
199	16.58	0.10	0.034	(0.095)	0.006	0.028
200	16.67	0.10	0.034	(0.095)	0.006	0.028
201	16.75	0.10	0.034	(0.094)	0.006	0.028
202	16.83	0.10	0.034	(0.094)	0.006	0.028
203	16.92	0.10	0.034	(0.093)	0.006	0.028
204	17.00	0.10	0.034	(0.093)	0.006	0.028
205	17.08	0.17	0.056	(0.092)	0.010	0.046
206	17.17	0.17	0.056	(0.092)	0.010	0.046
207	17.25	0.17	0.056	(0.091)	0.010	0.046
208	17.33	0.17	0.056	(0.091)	0.010	0.046
209	17.42	0.17	0.056	(0.090)	0.010	0.046
210	17.50	0.17	0.056	(0.090)	0.010	0.046
211	17.58	0.17	0.056	(0.089)	0.010	0.046
212	17.67	0.17	0.056	(0.089)	0.010	0.046
213	17.75	0.17	0.056	(0.089)	0.010	0.046
214	17.83	0.13	0.045	(0.088)	0.008	0.037
215	17.92	0.13	0.045	(0.088)	0.008	0.037
216	18.00	0.13	0.045	(0.087)	0.008	0.037
217	18.08	0.13	0.045	(0.087)	0.008	0.037
218	18.17	0.13	0.045	(0.086)	0.008	0.037
219	18.25	0.13	0.045	(0.086)	0.008	0.037
220	18.33	0.13	0.045	(0.086)	0.008	0.037
221	18.42	0.13	0.045	(0.085)	0.008	0.037
222	18.50	0.13	0.045	(0.085)	0.008	0.037
223	18.58	0.10	0.034	(0.084)	0.006	0.028
224	18.67	0.10	0.034	(0.084)	0.006	0.028
225	18.75	0.10	0.034	(0.084)	0.006	0.028
226	18.83	0.07	0.022	(0.083)	0.004	0.018
227	18.92	0.07	0.022	(0.083)	0.004	0.018
228	19.00	0.07	0.022	(0.082)	0.004	0.018
229	19.08	0.10	0.034	(0.082)	0.006	0.028
230	19.17	0.10	0.034	(0.082)	0.006	0.028
231	19.25	0.10	0.034	(0.081)	0.006	0.028
232	19.33	0.13	0.045	(0.081)	0.008	0.037
233	19.42	0.13	0.045	(0.080)	0.008	0.037
234	19.50	0.13	0.045	(0.080)	0.008	0.037
235	19.58	0.10	0.034	(0.080)	0.006	0.028
236	19.67	0.10	0.034	(0.079)	0.006	0.028
237	19.75	0.10	0.034	(0.079)	0.006	0.028
238	19.83	0.07	0.022	(0.079)	0.004	0.018

239	19.92	0.07	0.022	(0.078)	0.004	0.018
240	20.00	0.07	0.022	(0.078)	0.004	0.018
241	20.08	0.10	0.034	(0.078)	0.006	0.028
242	20.17	0.10	0.034	(0.077)	0.006	0.028
243	20.25	0.10	0.034	(0.077)	0.006	0.028
244	20.33	0.10	0.034	(0.077)	0.006	0.028
245	20.42	0.10	0.034	(0.076)	0.006	0.028
246	20.50	0.10	0.034	(0.076)	0.006	0.028
247	20.58	0.10	0.034	(0.076)	0.006	0.028
248	20.67	0.10	0.034	(0.075)	0.006	0.028
249	20.75	0.10	0.034	(0.075)	0.006	0.028
250	20.83	0.07	0.022	(0.075)	0.004	0.018
251	20.92	0.07	0.022	(0.074)	0.004	0.018
252	21.00	0.07	0.022	(0.074)	0.004	0.018
253	21.08	0.10	0.034	(0.074)	0.006	0.028
254	21.17	0.10	0.034	(0.073)	0.006	0.028
255	21.25	0.10	0.034	(0.073)	0.006	0.028
256	21.33	0.07	0.022	(0.073)	0.004	0.018
257	21.42	0.07	0.022	(0.073)	0.004	0.018
258	21.50	0.07	0.022	(0.072)	0.004	0.018
259	21.58	0.10	0.034	(0.072)	0.006	0.028
260	21.67	0.10	0.034	(0.072)	0.006	0.028
261	21.75	0.10	0.034	(0.072)	0.006	0.028
262	21.83	0.07	0.022	(0.071)	0.004	0.018
263	21.92	0.07	0.022	(0.071)	0.004	0.018
264	22.00	0.07	0.022	(0.071)	0.004	0.018
265	22.08	0.10	0.034	(0.071)	0.006	0.028
266	22.17	0.10	0.034	(0.070)	0.006	0.028
267	22.25	0.10	0.034	(0.070)	0.006	0.028
268	22.33	0.07	0.022	(0.070)	0.004	0.018
269	22.42	0.07	0.022	(0.070)	0.004	0.018
270	22.50	0.07	0.022	(0.069)	0.004	0.018
271	22.58	0.07	0.022	(0.069)	0.004	0.018
272	22.67	0.07	0.022	(0.069)	0.004	0.018
273	22.75	0.07	0.022	(0.069)	0.004	0.018
274	22.83	0.07	0.022	(0.069)	0.004	0.018
275	22.92	0.07	0.022	(0.069)	0.004	0.018
276	23.00	0.07	0.022	(0.068)	0.004	0.018
277	23.08	0.07	0.022	(0.068)	0.004	0.018
278	23.17	0.07	0.022	(0.068)	0.004	0.018
279	23.25	0.07	0.022	(0.068)	0.004	0.018
280	23.33	0.07	0.022	(0.068)	0.004	0.018
281	23.42	0.07	0.022	(0.068)	0.004	0.018
282	23.50	0.07	0.022	(0.068)	0.004	0.018
283	23.58	0.07	0.022	(0.067)	0.004	0.018
284	23.67	0.07	0.022	(0.067)	0.004	0.018
285	23.75	0.07	0.022	(0.067)	0.004	0.018
286	23.83	0.07	0.022	(0.067)	0.004	0.018
287	23.92	0.07	0.022	(0.067)	0.004	0.018
288	24.00	0.07	0.022	(0.067)	0.004	0.018

(Loss Rate Not Used)

Sum = 100.0 Sum = 27.6

Flood volume = Effective rainfall 2.30(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 0.50(In)
Total soil loss = 0.175(Ac.Ft)
Total rainfall = 2.80(In)

```
Flood volume =       34754.5 Cubic Feet
Total soil loss =        7629.0 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =      1.310(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0000      0.01  Q         |         |         |         |
  0+10       0.0003      0.04  Q         |         |         |         |
  0+15       0.0008      0.06  Q         |         |         |         |
  0+20       0.0013      0.07  Q         |         |         |         |
  0+25       0.0019      0.10  Q         |         |         |         |
  0+30       0.0027      0.11  Q         |         |         |         |
  0+35       0.0035      0.11  Q         |         |         |         |
  0+40       0.0042      0.11  Q         |         |         |         |
  0+45       0.0050      0.12  Q         |         |         |         |
  0+50       0.0059      0.12  Q         |         |         |         |
  0+55       0.0068      0.14  Q         |         |         |         |
  1+ 0       0.0078      0.15  Q         |         |         |         |
  1+ 5       0.0088      0.15  Q         |         |         |         |
  1+10       0.0097      0.13  Q         |         |         |         |
  1+15       0.0106      0.12  Q         |         |         |         |
  1+20       0.0114      0.12  Q         |         |         |         |
  1+25       0.0122      0.12  Q         |         |         |         |
  1+30       0.0130      0.12  Q         |         |         |         |
  1+35       0.0138      0.12  Q         |         |         |         |
  1+40       0.0146      0.12  Q         |         |         |         |
  1+45       0.0154      0.12  Q         |         |         |         |
  1+50       0.0162      0.12  Q         |         |         |         |
  1+55       0.0172      0.14  Q         |         |         |         |
  2+ 0       0.0182      0.15  Q         |         |         |         |
  2+ 5       0.0192      0.15  Q         |         |         |         |
  2+10       0.0203      0.15  QV        |         |         |         |
  2+15       0.0213      0.15  QV        |         |         |         |
  2+20       0.0224      0.15  QV        |         |         |         |
  2+25       0.0235      0.15  QV        |         |         |         |
  2+30       0.0245      0.15  QV        |         |         |         |
  2+35       0.0256      0.16  QV        |         |         |         |
  2+40       0.0268      0.18  QV        |         |         |         |
  2+45       0.0281      0.19  QV        |         |         |         |
  2+50       0.0294      0.19  QV        |         |         |         |
  2+55       0.0307      0.19  QV        |         |         |         |
  3+ 0       0.0321      0.19  QV        |         |         |         |
  3+ 5       0.0334      0.19  QV        |         |         |         |
  3+10       0.0347      0.19  QV        |         |         |         |
  3+15       0.0360      0.19  QV        |         |         |         |
  3+20       0.0374      0.19  QV        |         |         |         |
  3+25       0.0387      0.19  QV        |         |         |         |
  3+30       0.0400      0.19  Q V       |         |         |         |
  3+35       0.0414      0.19  Q V       |         |         |         |
```

```
3+40       0.0427      0.19  Q V       |          |          |          |
3+45       0.0440      0.19  Q V       |          |          |          |
3+50       0.0454      0.20  Q V       |          |          |          |
3+55       0.0469      0.21  Q V       |          |          |          |
4+ 0       0.0484      0.22  Q V       |          |          |          |
4+ 5       0.0500      0.23  Q V       |          |          |          |
4+10       0.0516      0.23  Q V       |          |          |          |
4+15       0.0532      0.23  Q V       |          |          |          |
4+20       0.0548      0.23  Q V       |          |          |          |
4+25       0.0565      0.25  |QV       |          |          |          |
4+30       0.0583      0.26  |QV       |          |          |          |
4+35       0.0602      0.27  |Q V      |          |          |          |
4+40       0.0620      0.27  |Q V      |          |          |          |
4+45       0.0639      0.27  |Q V      |          |          |          |
4+50       0.0658      0.27  |Q V      |          |          |          |
4+55       0.0678      0.29  |Q V      |          |          |          |
5+ 0       0.0698      0.30  |Q V      |          |          |          |
5+ 5       0.0719      0.30  |Q V      |          |          |          |
5+10       0.0737      0.26  |Q V      |          |          |          |
5+15       0.0754      0.25  Q  V      |          |          |          |
5+20       0.0771      0.24  Q  V      |          |          |          |
5+25       0.0788      0.26  |Q V      |          |          |          |
5+30       0.0807      0.26  |Q  V     |          |          |          |
5+35       0.0825      0.27  |Q  V     |          |          |          |
5+40       0.0845      0.29  |Q  V     |          |          |          |
5+45       0.0866      0.30  |Q  V     |          |          |          |
5+50       0.0887      0.31  |Q  V     |          |          |          |
5+55       0.0908      0.31  |Q  V     |          |          |          |
6+ 0       0.0929      0.31  |Q  V     |          |          |          |
6+ 5       0.0951      0.31  |Q  V     |          |          |          |
6+10       0.0974      0.33  |Q  V     |          |          |          |
6+15       0.0997      0.34  |Q  V     |          |          |          |
6+20       0.1021      0.34  |Q   V    |          |          |          |
6+25       0.1045      0.35  |Q   V    |          |          |          |
6+30       0.1069      0.35  |Q   V    |          |          |          |
6+35       0.1093      0.35  |Q   V    |          |          |          |
6+40       0.1118      0.37  |Q   V    |          |          |          |
6+45       0.1144      0.38  |Q   V    |          |          |          |
6+50       0.1171      0.38  |Q   V    |          |          |          |
6+55       0.1197      0.38  |Q    V   |          |          |          |
7+ 0       0.1224      0.39  |Q    V   |          |          |          |
7+ 5       0.1250      0.39  |Q    V   |          |          |          |
7+10       0.1277      0.39  |Q    V   |          |          |          |
7+15       0.1303      0.39  |Q    V   |          |          |          |
7+20       0.1330      0.39  |Q    V   |          |          |          |
7+25       0.1358      0.41  |Q    V   |          |          |          |
7+30       0.1387      0.42  |Q    V   |          |          |          |
7+35       0.1416      0.42  |Q     V  |          |          |          |
7+40       0.1447      0.45  |Q     V  |          |          |          |
7+45       0.1478      0.46  |Q     V  |          |          |          |
7+50       0.1510      0.46  |Q     V  |          |          |          |
7+55       0.1544      0.48  |Q     V  |          |          |          |
8+ 0       0.1578      0.49  |Q     V  |          |          |          |
8+ 5       0.1612      0.51  | Q     V |          |          |          |
8+10       0.1650      0.54  | Q     V |          |          |          |
8+15       0.1689      0.56  | Q     V |          |          |          |
8+20       0.1728      0.57  | Q     V |          |          |          |
```

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 8+25       0.1768      0.58  | Q     V |         |         |         |
 8+30       0.1808      0.58  | Q      V|         |         |         |
 8+35       0.1848      0.58  | Q      V|         |         |         |
 8+40       0.1889      0.60  | Q      V|         |         |         |
 8+45       0.1931      0.61  | Q      V|         |         |         |
 8+50       0.1974      0.62  | Q      V|         |         |         |
 8+55       0.2018      0.64  | Q       V         |         |         |
 9+ 0       0.2062      0.65  | Q       V         |         |         |
 9+ 5       0.2108      0.66  | Q       V         |         |         |
 9+10       0.2156      0.70  | Q       V         |         |         |
 9+15       0.2205      0.72  | Q       |V        |         |         |
 9+20       0.2255      0.73  | Q       |V        |         |         |
 9+25       0.2307      0.75  |  Q      |V        |         |         |
 9+30       0.2360      0.76  |  Q      |V        |         |         |
 9+35       0.2413      0.77  |  Q      | V       |         |         |
 9+40       0.2468      0.79  |  Q      | V       |         |         |
 9+45       0.2523      0.80  |  Q      | V       |         |         |
 9+50       0.2579      0.81  |  Q      | V       |         |         |
 9+55       0.2636      0.83  |  Q      |  V      |         |         |
10+ 0       0.2694      0.84  |  Q      |  V      |         |         |
10+ 5       0.2751      0.82  |  Q      |  V      |         |         |
10+10       0.2798      0.70  | Q       |   V     |         |         |
10+15       0.2842      0.63  | Q       |   V     |         |         |
10+20       0.2883      0.60  | Q       |   V     |         |         |
10+25       0.2924      0.59  | Q       |   V     |         |         |
10+30       0.2964      0.58  | Q       |   V     |         |         |
10+35       0.3005      0.60  | Q       |    V    |         |         |
10+40       0.3053      0.69  | Q       |    V    |         |         |
10+45       0.3103      0.74  | Q       |    V    |         |         |
10+50       0.3156      0.76  |  Q      |    V    |         |         |
10+55       0.3208      0.77  |  Q      |     V   |         |         |
11+ 0       0.3261      0.77  |  Q      |     V   |         |         |
11+ 5       0.3314      0.77  |  Q      |     V   |         |         |
11+10       0.3366      0.75  | Q       |     V   |         |         |
11+15       0.3417      0.74  | Q       |      V  |         |         |
11+20       0.3467      0.74  | Q       |      V  |         |         |
11+25       0.3518      0.74  | Q       |      V  |         |         |
11+30       0.3569      0.73  | Q       |      V  |         |         |
11+35       0.3619      0.73  | Q       |       V |         |         |
11+40       0.3666      0.69  | Q       |       V |         |         |
11+45       0.3712      0.67  | Q       |       V |         |         |
11+50       0.3758      0.67  | Q       |       V |         |         |
11+55       0.3805      0.68  | Q       |        V|         |         |
12+ 0       0.3853      0.69  | Q       |        V|         |         |
12+ 5       0.3902      0.72  | Q       |        V|         |         |
12+10       0.3960      0.85  |  Q      |        V|         |         |
12+15       0.4023      0.91  |  Q      |         V         |         |
12+20       0.4088      0.94  |  Q      |         V         |         |
12+25       0.4156      0.98  |  Q      |         V         |         |
12+30       0.4224      0.99  |  Q      |         |V        |         |
12+35       0.4293      1.00  |   Q     |         |V        |         |
12+40       0.4365      1.04  |   Q     |         |V        |         |
12+45       0.4439      1.07  |   Q     |         | V       |         |
12+50       0.4513      1.08  |   Q     |         | V       |         |
12+55       0.4589      1.10  |   Q     |         |  V      |         |
13+ 0       0.4665      1.11  |   Q     |         |  V      |         |
13+ 5       0.4743      1.13  |   Q     |         |  V      |         |
```

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13+10       0.4828      1.23  |   Q     |          |   V     |          |
13+15       0.4916      1.28  |    Q    |          |   V     |          |
13+20       0.5005      1.30  |    Q    |          |    V    |          |
13+25       0.5095      1.31  |    Q    |          |    V    |          |
13+30       0.5185      1.31  |    Q    |          |    V    |          |
13+35       0.5273      1.27  |    Q    |          |     V   |          |
13+40       0.5346      1.07  |   Q     |          |     V   |          |
13+45       0.5413      0.97  |  Q      |          |      V  |          |
13+50       0.5477      0.93  |  Q      |          |      V  |          |
13+55       0.5539      0.90  |  Q      |          |      V  |          |
14+ 0       0.5601      0.90  |  Q      |          |       V |          |
14+ 5       0.5663      0.91  |  Q      |          |       V |          |
14+10       0.5730      0.98  |  Q      |          |       V |          |
14+15       0.5800      1.01  |   Q     |          |        V|          |
14+20       0.5871      1.03  |   Q     |          |        V|          |
14+25       0.5941      1.02  |   Q     |          |        V|          |
14+30       0.6010      1.01  |   Q     |          |         V          |
14+35       0.6080      1.01  |   Q     |          |         V          |
14+40       0.6149      1.00  |   Q     |          |         V          |
14+45       0.6218      1.00  |   Q     |          |         |V         |
14+50       0.6287      1.00  |   Q     |          |         |V         |
14+55       0.6355      0.98  |  Q      |          |         |V         |
15+ 0       0.6422      0.97  |  Q      |          |         | V        |
15+ 5       0.6488      0.97  |  Q      |          |         | V        |
15+10       0.6553      0.95  |  Q      |          |         | V        |
15+15       0.6617      0.93  |  Q      |          |         |  V       |
15+20       0.6681      0.93  |  Q      |          |         |  V       |
15+25       0.6744      0.91  |  Q      |          |         |  V       |
15+30       0.6805      0.90  |  Q      |          |         |   V      |
15+35       0.6866      0.88  |  Q      |          |         |   V      |
15+40       0.6921      0.80  |  Q      |          |         |   V      |
15+45       0.6974      0.76  |  Q      |          |         |   V      |
15+50       0.7025      0.75  | Q       |          |         |    V     |
15+55       0.7076      0.74  | Q       |          |         |    V     |
16+ 0       0.7127      0.74  | Q       |          |         |    V     |
16+ 5       0.7174      0.68  | Q       |          |         |    V     |
16+10       0.7202      0.41  |Q        |          |         |     V    |
16+15       0.7220      0.26  |Q        |          |         |     V    |
16+20       0.7234      0.21  Q         |          |         |     V    |
16+25       0.7247      0.18  Q         |          |         |     V    |
16+30       0.7258      0.16  Q         |          |         |     V    |
16+35       0.7269      0.16  Q         |          |         |     V    |
16+40       0.7278      0.14  Q         |          |         |     V    |
16+45       0.7286      0.12  Q         |          |         |     V    |
16+50       0.7295      0.12  Q         |          |         |     V    |
16+55       0.7303      0.12  Q         |          |         |     V    |
17+ 0       0.7311      0.12  Q         |          |         |     V    |
17+ 5       0.7319      0.12  Q         |          |         |     V    |
17+10       0.7330      0.16  Q         |          |         |     V    |
17+15       0.7343      0.18  Q         |          |         |     V    |
17+20       0.7355      0.19  Q         |          |         |     V    |
17+25       0.7368      0.19  Q         |          |         |     V    |
17+30       0.7382      0.19  Q         |          |         |      V   |
17+35       0.7395      0.19  Q         |          |         |      V   |
17+40       0.7408      0.19  Q         |          |         |      V   |
17+45       0.7421      0.19  Q         |          |         |      V   |
17+50       0.7435      0.19  Q         |          |         |      V   |
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17+55       0.7446      0.17  Q          |          |          |       V  |
18+ 0       0.7457      0.16  Q          |          |          |       V  |
18+ 5       0.7468      0.16  Q          |          |          |       V  |
18+10       0.7479      0.16  Q          |          |          |       V  |
18+15       0.7490      0.16  Q          |          |          |       V  |
18+20       0.7500      0.15  Q          |          |          |       V  |
18+25       0.7511      0.15  Q          |          |          |       V  |
18+30       0.7522      0.15  Q          |          |          |       V  |
18+35       0.7532      0.15  Q          |          |          |       V  |
18+40       0.7541      0.13  Q          |          |          |       V  |
18+45       0.7550      0.12  Q          |          |          |       V  |
18+50       0.7558      0.12  Q          |          |          |       V  |
18+55       0.7564      0.10  Q          |          |          |       V  |
19+ 0       0.7570      0.09  Q          |          |          |       V  |
19+ 5       0.7576      0.08  Q          |          |          |       V  |
19+10       0.7583      0.10  Q          |          |          |        V |
19+15       0.7590      0.11  Q          |          |          |        V |
19+20       0.7598      0.12  Q          |          |          |        V |
19+25       0.7608      0.14  Q          |          |          |        V |
19+30       0.7618      0.15  Q          |          |          |        V |
19+35       0.7628      0.15  Q          |          |          |        V |
19+40       0.7637      0.13  Q          |          |          |        V |
19+45       0.7646      0.12  Q          |          |          |        V |
19+50       0.7653      0.12  Q          |          |          |        V |
19+55       0.7660      0.10  Q          |          |          |        V |
20+ 0       0.7666      0.09  Q          |          |          |        V |
20+ 5       0.7672      0.08  Q          |          |          |        V |
20+10       0.7679      0.10  Q          |          |          |        V |
20+15       0.7686      0.11  Q          |          |          |        V |
20+20       0.7694      0.11  Q          |          |          |        V |
20+25       0.7702      0.11  Q          |          |          |        V |
20+30       0.7710      0.12  Q          |          |          |        V |
20+35       0.7718      0.12  Q          |          |          |        V |
20+40       0.7726      0.12  Q          |          |          |        V |
20+45       0.7734      0.12  Q          |          |          |        V |
20+50       0.7741      0.11  Q          |          |          |        V |
20+55       0.7748      0.09  Q          |          |          |        V |
21+ 0       0.7754      0.08  Q          |          |          |        V |
21+ 5       0.7759      0.08  Q          |          |          |        V |
21+10       0.7766      0.10  Q          |          |          |        V |
21+15       0.7774      0.11  Q          |          |          |        V |
21+20       0.7781      0.11  Q          |          |          |         V|
21+25       0.7788      0.09  Q          |          |          |         V|
21+30       0.7794      0.08  Q          |          |          |         V|
21+35       0.7799      0.08  Q          |          |          |         V|
21+40       0.7806      0.10  Q          |          |          |         V|
21+45       0.7814      0.11  Q          |          |          |         V|
21+50       0.7821      0.11  Q          |          |          |         V|
21+55       0.7828      0.09  Q          |          |          |         V|
22+ 0       0.7834      0.08  Q          |          |          |         V|
22+ 5       0.7839      0.08  Q          |          |          |         V|
22+10       0.7846      0.10  Q          |          |          |         V|
22+15       0.7854      0.11  Q          |          |          |         V|
22+20       0.7861      0.11  Q          |          |          |         V|
22+25       0.7868      0.09  Q          |          |          |         V|
22+30       0.7873      0.08  Q          |          |          |         V|
22+35       0.7879      0.08  Q          |          |          |         V|
```

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   22+40       0.7884      0.08  Q          |          |          |         V|
   22+45       0.7890      0.08  Q          |          |          |         V|
   22+50       0.7895      0.08  Q          |          |          |         V|
   22+55       0.7900      0.08  Q          |          |          |         V|
   23+ 0       0.7906      0.08  Q          |          |          |         V|
   23+ 5       0.7911      0.08  Q          |          |          |         V|
   23+10       0.7916      0.08  Q          |          |          |         V|
   23+15       0.7922      0.08  Q          |          |          |         V|
   23+20       0.7927      0.08  Q          |          |          |         V|
   23+25       0.7932      0.08  Q          |          |          |         V|
   23+30       0.7938      0.08  Q          |          |          |         V|
   23+35       0.7943      0.08  Q          |          |          |         V|
   23+40       0.7948      0.08  Q          |          |          |         V|
   23+45       0.7954      0.08  Q          |          |          |         V|
   23+50       0.7959      0.08  Q          |          |          |         V|
   23+55       0.7964      0.08  Q          |          |          |         V|
   24+ 0       0.7970      0.08  Q          |          |          |         V|
   24+ 5       0.7974      0.07  Q          |          |          |         V|
   24+10       0.7977      0.03  Q          |          |          |         V|
   24+15       0.7978      0.01  Q          |          |          |         V|
   24+20       0.7978      0.01  Q          |          |          |         V|
   24+25       0.7978      0.00  Q          |          |          |         V|
   24+30       0.7978      0.00  Q          |          |          |         V|
   24+35       0.7979      0.00  Q          |          |          |         V|
   24+40       0.7979      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/22/12 File: 3504Q10D1R110.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q10-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 1.008(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.008(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.532	(0.097)	0.096	0.437
2	0.17	4.50	0.545	0.097	(0.098)	0.448
3	0.25	5.40	0.653	0.097	(0.118)	0.556
4	0.33	5.40	0.653	0.097	(0.118)	0.556
5	0.42	5.70	0.690	0.097	(0.124)	0.593
6	0.50	6.40	0.774	0.097	(0.139)	0.677
7	0.58	7.90	0.956	0.097	(0.172)	0.859
8	0.67	9.10	1.101	0.097	(0.198)	1.004

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 9   0.75    12.80      1.549          0.097    (  0.279)        1.452
10   0.83    25.60      3.098          0.097    (  0.558)        3.001
11   0.92     7.90      0.956          0.097    (  0.172)        0.859
12   1.00     4.90      0.593          0.097    (  0.107)        0.496
           (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    10.9
    Flood volume = Effective rainfall      0.91(In)
     times area       4.2(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
    Total soil loss =      0.10(In)
    Total soil loss =     0.034(Ac.Ft)
    Total rainfall =      1.01(In)
    Flood volume =       13797.6 Cubic Feet
    Total soil loss =        1467.6 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      8.544(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ----------------------------------------------------------------------
   0+ 5       0.0011      0.16  Q         |         |         |         |
   0+10       0.0083      1.04  |V  Q     |         |         |         |
   0+15       0.0190      1.56  | V   Q   |         |         |         |
   0+20       0.0326      1.97  |   V  Q  |         |         |         |
   0+25       0.0477      2.19  |     V Q |         |         |         |
   0+30       0.0641      2.38  |       VQ|         |         |         |
   0+35       0.0827      2.70  |         Q         |         |         |
   0+40       0.1049      3.24  |         | QV      |         |         |
   0+45       0.1321      3.94  |         |    QV   |         |         |
   0+50       0.1710      5.65  |         |         |VQ       |         |
   0+55       0.2298      8.54  |         |         |        V|   Q     |
   1+ 0       0.2711      5.99  |         |         |  Q      |   V     |
   1+ 5       0.2958      3.59  |         |   Q     |         |      V  |
   1+10       0.3075      1.70  |     Q   |         |         |       V |
   1+15       0.3126      0.73  | Q       |         |         |        V|
   1+20       0.3148      0.33  |Q        |         |         |        V|
   1+25       0.3159      0.16  Q         |         |         |        V|
   1+30       0.3165      0.09  Q         |         |         |        V|
   1+35       0.3167      0.03  Q         |         |         |        V|
   1+40       0.3167      0.01  Q         |         |         |         V
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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/21/12 File: 3504q10d1r2410.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q10-24HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 4.816(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.816(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.900	0.097	1.000	0.097
					Sum (F) =	0.097

Area averaged mean soil loss (F) (In/Hr) = 0.097
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
			Sum = 100.000 Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.039	(0.172)	0.007	0.032
2	0.17	0.07	0.039	(0.171)	0.007	0.032
3	0.25	0.07	0.039	(0.171)	0.007	0.032
4	0.33	0.10	0.058	(0.170)	0.010	0.047
5	0.42	0.10	0.058	(0.169)	0.010	0.047
6	0.50	0.10	0.058	(0.169)	0.010	0.047
7	0.58	0.10	0.058	(0.168)	0.010	0.047
8	0.67	0.10	0.058	(0.167)	0.010	0.047
9	0.75	0.10	0.058	(0.167)	0.010	0.047
10	0.83	0.13	0.077	(0.166)	0.014	0.063

11	0.92	0.13	0.077	(0.165)	0.014	0.063
12	1.00	0.13	0.077	(0.165)	0.014	0.063
13	1.08	0.10	0.058	(0.164)	0.010	0.047
14	1.17	0.10	0.058	(0.163)	0.010	0.047
15	1.25	0.10	0.058	(0.163)	0.010	0.047
16	1.33	0.10	0.058	(0.162)	0.010	0.047
17	1.42	0.10	0.058	(0.162)	0.010	0.047
18	1.50	0.10	0.058	(0.161)	0.010	0.047
19	1.58	0.10	0.058	(0.160)	0.010	0.047
20	1.67	0.10	0.058	(0.160)	0.010	0.047
21	1.75	0.10	0.058	(0.159)	0.010	0.047
22	1.83	0.13	0.077	(0.158)	0.014	0.063
23	1.92	0.13	0.077	(0.158)	0.014	0.063
24	2.00	0.13	0.077	(0.157)	0.014	0.063
25	2.08	0.13	0.077	(0.156)	0.014	0.063
26	2.17	0.13	0.077	(0.156)	0.014	0.063
27	2.25	0.13	0.077	(0.155)	0.014	0.063
28	2.33	0.13	0.077	(0.155)	0.014	0.063
29	2.42	0.13	0.077	(0.154)	0.014	0.063
30	2.50	0.13	0.077	(0.153)	0.014	0.063
31	2.58	0.17	0.096	(0.153)	0.017	0.079
32	2.67	0.17	0.096	(0.152)	0.017	0.079
33	2.75	0.17	0.096	(0.151)	0.017	0.079
34	2.83	0.17	0.096	(0.151)	0.017	0.079
35	2.92	0.17	0.096	(0.150)	0.017	0.079
36	3.00	0.17	0.096	(0.150)	0.017	0.079
37	3.08	0.17	0.096	(0.149)	0.017	0.079
38	3.17	0.17	0.096	(0.148)	0.017	0.079
39	3.25	0.17	0.096	(0.148)	0.017	0.079
40	3.33	0.17	0.096	(0.147)	0.017	0.079
41	3.42	0.17	0.096	(0.146)	0.017	0.079
42	3.50	0.17	0.096	(0.146)	0.017	0.079
43	3.58	0.17	0.096	(0.145)	0.017	0.079
44	3.67	0.17	0.096	(0.145)	0.017	0.079
45	3.75	0.17	0.096	(0.144)	0.017	0.079
46	3.83	0.20	0.116	(0.143)	0.021	0.095
47	3.92	0.20	0.116	(0.143)	0.021	0.095
48	4.00	0.20	0.116	(0.142)	0.021	0.095
49	4.08	0.20	0.116	(0.142)	0.021	0.095
50	4.17	0.20	0.116	(0.141)	0.021	0.095
51	4.25	0.20	0.116	(0.140)	0.021	0.095
52	4.33	0.23	0.135	(0.140)	0.024	0.111
53	4.42	0.23	0.135	(0.139)	0.024	0.111
54	4.50	0.23	0.135	(0.139)	0.024	0.111
55	4.58	0.23	0.135	(0.138)	0.024	0.111
56	4.67	0.23	0.135	(0.137)	0.024	0.111
57	4.75	0.23	0.135	(0.137)	0.024	0.111
58	4.83	0.27	0.154	(0.136)	0.028	0.126
59	4.92	0.27	0.154	(0.136)	0.028	0.126
60	5.00	0.27	0.154	(0.135)	0.028	0.126
61	5.08	0.20	0.116	(0.134)	0.021	0.095
62	5.17	0.20	0.116	(0.134)	0.021	0.095
63	5.25	0.20	0.116	(0.133)	0.021	0.095
64	5.33	0.23	0.135	(0.133)	0.024	0.111
65	5.42	0.23	0.135	(0.132)	0.024	0.111
66	5.50	0.23	0.135	(0.132)	0.024	0.111
67	5.58	0.27	0.154	(0.131)	0.028	0.126

68	5.67	0.27	0.154	(0.130)	0.028	0.126
69	5.75	0.27	0.154	(0.130)	0.028	0.126
70	5.83	0.27	0.154	(0.129)	0.028	0.126
71	5.92	0.27	0.154	(0.129)	0.028	0.126
72	6.00	0.27	0.154	(0.128)	0.028	0.126
73	6.08	0.30	0.173	(0.128)	0.031	0.142
74	6.17	0.30	0.173	(0.127)	0.031	0.142
75	6.25	0.30	0.173	(0.126)	0.031	0.142
76	6.33	0.30	0.173	(0.126)	0.031	0.142
77	6.42	0.30	0.173	(0.125)	0.031	0.142
78	6.50	0.30	0.173	(0.125)	0.031	0.142
79	6.58	0.33	0.193	(0.124)	0.035	0.158
80	6.67	0.33	0.193	(0.124)	0.035	0.158
81	6.75	0.33	0.193	(0.123)	0.035	0.158
82	6.83	0.33	0.193	(0.122)	0.035	0.158
83	6.92	0.33	0.193	(0.122)	0.035	0.158
84	7.00	0.33	0.193	(0.121)	0.035	0.158
85	7.08	0.33	0.193	(0.121)	0.035	0.158
86	7.17	0.33	0.193	(0.120)	0.035	0.158
87	7.25	0.33	0.193	(0.120)	0.035	0.158
88	7.33	0.37	0.212	(0.119)	0.038	0.174
89	7.42	0.37	0.212	(0.119)	0.038	0.174
90	7.50	0.37	0.212	(0.118)	0.038	0.174
91	7.58	0.40	0.231	(0.118)	0.042	0.190
92	7.67	0.40	0.231	(0.117)	0.042	0.190
93	7.75	0.40	0.231	(0.116)	0.042	0.190
94	7.83	0.43	0.250	(0.116)	0.045	0.205
95	7.92	0.43	0.250	(0.115)	0.045	0.205
96	8.00	0.43	0.250	(0.115)	0.045	0.205
97	8.08	0.50	0.289	(0.114)	0.052	0.237
98	8.17	0.50	0.289	(0.114)	0.052	0.237
99	8.25	0.50	0.289	(0.113)	0.052	0.237
100	8.33	0.50	0.289	(0.113)	0.052	0.237
101	8.42	0.50	0.289	(0.112)	0.052	0.237
102	8.50	0.50	0.289	(0.112)	0.052	0.237
103	8.58	0.53	0.308	(0.111)	0.055	0.253
104	8.67	0.53	0.308	(0.111)	0.055	0.253
105	8.75	0.53	0.308	(0.110)	0.055	0.253
106	8.83	0.57	0.327	(0.110)	0.059	0.269
107	8.92	0.57	0.327	(0.109)	0.059	0.269
108	9.00	0.57	0.327	(0.109)	0.059	0.269
109	9.08	0.63	0.366	(0.108)	0.066	0.300
110	9.17	0.63	0.366	(0.108)	0.066	0.300
111	9.25	0.63	0.366	(0.107)	0.066	0.300
112	9.33	0.67	0.385	(0.107)	0.069	0.316
113	9.42	0.67	0.385	(0.106)	0.069	0.316
114	9.50	0.67	0.385	(0.105)	0.069	0.316
115	9.58	0.70	0.405	(0.105)	0.073	0.332
116	9.67	0.70	0.405	(0.104)	0.073	0.332
117	9.75	0.70	0.405	(0.104)	0.073	0.332
118	9.83	0.73	0.424	(0.103)	0.076	0.348
119	9.92	0.73	0.424	(0.103)	0.076	0.348
120	10.00	0.73	0.424	(0.102)	0.076	0.348
121	10.08	0.50	0.289	(0.102)	0.052	0.237
122	10.17	0.50	0.289	(0.101)	0.052	0.237
123	10.25	0.50	0.289	(0.101)	0.052	0.237
124	10.33	0.50	0.289	(0.101)	0.052	0.237

125	10.42	0.50	0.289	(0.100)	0.052	0.237
126	10.50	0.50	0.289	(0.100)	0.052	0.237
127	10.58	0.67	0.385	(0.099)	0.069	0.316
128	10.67	0.67	0.385	(0.099)	0.069	0.316
129	10.75	0.67	0.385	(0.098)	0.069	0.316
130	10.83	0.67	0.385	(0.098)	0.069	0.316
131	10.92	0.67	0.385	(0.097)	0.069	0.316
132	11.00	0.67	0.385	(0.097)	0.069	0.316
133	11.08	0.63	0.366	(0.096)	0.066	0.300
134	11.17	0.63	0.366	(0.096)	0.066	0.300
135	11.25	0.63	0.366	(0.095)	0.066	0.300
136	11.33	0.63	0.366	(0.095)	0.066	0.300
137	11.42	0.63	0.366	(0.094)	0.066	0.300
138	11.50	0.63	0.366	(0.094)	0.066	0.300
139	11.58	0.57	0.327	(0.093)	0.059	0.269
140	11.67	0.57	0.327	(0.093)	0.059	0.269
141	11.75	0.57	0.327	(0.092)	0.059	0.269
142	11.83	0.60	0.347	(0.092)	0.062	0.284
143	11.92	0.60	0.347	(0.092)	0.062	0.284
144	12.00	0.60	0.347	(0.091)	0.062	0.284
145	12.08	0.83	0.482	(0.091)	0.087	0.395
146	12.17	0.83	0.482	(0.090)	0.087	0.395
147	12.25	0.83	0.482	(0.090)	0.087	0.395
148	12.33	0.87	0.501	0.089	(0.090)	0.412
149	12.42	0.87	0.501	0.089	(0.090)	0.412
150	12.50	0.87	0.501	0.088	(0.090)	0.413
151	12.58	0.93	0.539	0.088	(0.097)	0.451
152	12.67	0.93	0.539	0.087	(0.097)	0.452
153	12.75	0.93	0.539	0.087	(0.097)	0.452
154	12.83	0.97	0.559	0.087	(0.101)	0.472
155	12.92	0.97	0.559	0.086	(0.101)	0.473
156	13.00	0.97	0.559	0.086	(0.101)	0.473
157	13.08	1.13	0.655	0.085	(0.118)	0.570
158	13.17	1.13	0.655	0.085	(0.118)	0.570
159	13.25	1.13	0.655	0.084	(0.118)	0.571
160	13.33	1.13	0.655	0.084	(0.118)	0.571
161	13.42	1.13	0.655	0.084	(0.118)	0.571
162	13.50	1.13	0.655	0.083	(0.118)	0.572
163	13.58	0.77	0.443	(0.083)	0.080	0.363
164	13.67	0.77	0.443	(0.082)	0.080	0.363
165	13.75	0.77	0.443	(0.082)	0.080	0.363
166	13.83	0.77	0.443	(0.081)	0.080	0.363
167	13.92	0.77	0.443	(0.081)	0.080	0.363
168	14.00	0.77	0.443	(0.081)	0.080	0.363
169	14.08	0.90	0.520	0.080	(0.094)	0.440
170	14.17	0.90	0.520	0.080	(0.094)	0.440
171	14.25	0.90	0.520	0.079	(0.094)	0.441
172	14.33	0.87	0.501	0.079	(0.090)	0.422
173	14.42	0.87	0.501	0.079	(0.090)	0.422
174	14.50	0.87	0.501	0.078	(0.090)	0.423
175	14.58	0.87	0.501	0.078	(0.090)	0.423
176	14.67	0.87	0.501	0.077	(0.090)	0.423
177	14.75	0.87	0.501	0.077	(0.090)	0.424
178	14.83	0.83	0.482	0.077	(0.087)	0.405
179	14.92	0.83	0.482	0.076	(0.087)	0.405
180	15.00	0.83	0.482	0.076	(0.087)	0.406
181	15.08	0.80	0.462	0.075	(0.083)	0.387

182	15.17	0.80	0.462	0.075	(0.083)	0.387
183	15.25	0.80	0.462	0.075	(0.083)	0.388
184	15.33	0.77	0.443	0.074	(0.080)	0.369
185	15.42	0.77	0.443	0.074	(0.080)	0.369
186	15.50	0.77	0.443	0.073	(0.080)	0.370
187	15.58	0.63	0.366	(0.073)	0.066	0.300
188	15.67	0.63	0.366	(0.073)	0.066	0.300
189	15.75	0.63	0.366	(0.072)	0.066	0.300
190	15.83	0.63	0.366	(0.072)	0.066	0.300
191	15.92	0.63	0.366	(0.072)	0.066	0.300
192	16.00	0.63	0.366	(0.071)	0.066	0.300
193	16.08	0.13	0.077	(0.071)	0.014	0.063
194	16.17	0.13	0.077	(0.071)	0.014	0.063
195	16.25	0.13	0.077	(0.070)	0.014	0.063
196	16.33	0.13	0.077	(0.070)	0.014	0.063
197	16.42	0.13	0.077	(0.069)	0.014	0.063
198	16.50	0.13	0.077	(0.069)	0.014	0.063
199	16.58	0.10	0.058	(0.069)	0.010	0.047
200	16.67	0.10	0.058	(0.068)	0.010	0.047
201	16.75	0.10	0.058	(0.068)	0.010	0.047
202	16.83	0.10	0.058	(0.068)	0.010	0.047
203	16.92	0.10	0.058	(0.067)	0.010	0.047
204	17.00	0.10	0.058	(0.067)	0.010	0.047
205	17.08	0.17	0.096	(0.067)	0.017	0.079
206	17.17	0.17	0.096	(0.066)	0.017	0.079
207	17.25	0.17	0.096	(0.066)	0.017	0.079
208	17.33	0.17	0.096	(0.066)	0.017	0.079
209	17.42	0.17	0.096	(0.065)	0.017	0.079
210	17.50	0.17	0.096	(0.065)	0.017	0.079
211	17.58	0.17	0.096	(0.065)	0.017	0.079
212	17.67	0.17	0.096	(0.064)	0.017	0.079
213	17.75	0.17	0.096	(0.064)	0.017	0.079
214	17.83	0.13	0.077	(0.064)	0.014	0.063
215	17.92	0.13	0.077	(0.063)	0.014	0.063
216	18.00	0.13	0.077	(0.063)	0.014	0.063
217	18.08	0.13	0.077	(0.063)	0.014	0.063
218	18.17	0.13	0.077	(0.063)	0.014	0.063
219	18.25	0.13	0.077	(0.062)	0.014	0.063
220	18.33	0.13	0.077	(0.062)	0.014	0.063
221	18.42	0.13	0.077	(0.062)	0.014	0.063
222	18.50	0.13	0.077	(0.061)	0.014	0.063
223	18.58	0.10	0.058	(0.061)	0.010	0.047
224	18.67	0.10	0.058	(0.061)	0.010	0.047
225	18.75	0.10	0.058	(0.060)	0.010	0.047
226	18.83	0.07	0.039	(0.060)	0.007	0.032
227	18.92	0.07	0.039	(0.060)	0.007	0.032
228	19.00	0.07	0.039	(0.060)	0.007	0.032
229	19.08	0.10	0.058	(0.059)	0.010	0.047
230	19.17	0.10	0.058	(0.059)	0.010	0.047
231	19.25	0.10	0.058	(0.059)	0.010	0.047
232	19.33	0.13	0.077	(0.058)	0.014	0.063
233	19.42	0.13	0.077	(0.058)	0.014	0.063
234	19.50	0.13	0.077	(0.058)	0.014	0.063
235	19.58	0.10	0.058	(0.058)	0.010	0.047
236	19.67	0.10	0.058	(0.057)	0.010	0.047
237	19.75	0.10	0.058	(0.057)	0.010	0.047
238	19.83	0.07	0.039	(0.057)	0.007	0.032

239	19.92	0.07	0.039	(0.057)	0.007	0.032
240	20.00	0.07	0.039	(0.056)	0.007	0.032
241	20.08	0.10	0.058	(0.056)	0.010	0.047
242	20.17	0.10	0.058	(0.056)	0.010	0.047
243	20.25	0.10	0.058	(0.056)	0.010	0.047
244	20.33	0.10	0.058	(0.055)	0.010	0.047
245	20.42	0.10	0.058	(0.055)	0.010	0.047
246	20.50	0.10	0.058	(0.055)	0.010	0.047
247	20.58	0.10	0.058	(0.055)	0.010	0.047
248	20.67	0.10	0.058	(0.054)	0.010	0.047
249	20.75	0.10	0.058	(0.054)	0.010	0.047
250	20.83	0.07	0.039	(0.054)	0.007	0.032
251	20.92	0.07	0.039	(0.054)	0.007	0.032
252	21.00	0.07	0.039	(0.054)	0.007	0.032
253	21.08	0.10	0.058	(0.053)	0.010	0.047
254	21.17	0.10	0.058	(0.053)	0.010	0.047
255	21.25	0.10	0.058	(0.053)	0.010	0.047
256	21.33	0.07	0.039	(0.053)	0.007	0.032
257	21.42	0.07	0.039	(0.053)	0.007	0.032
258	21.50	0.07	0.039	(0.052)	0.007	0.032
259	21.58	0.10	0.058	(0.052)	0.010	0.047
260	21.67	0.10	0.058	(0.052)	0.010	0.047
261	21.75	0.10	0.058	(0.052)	0.010	0.047
262	21.83	0.07	0.039	(0.052)	0.007	0.032
263	21.92	0.07	0.039	(0.051)	0.007	0.032
264	22.00	0.07	0.039	(0.051)	0.007	0.032
265	22.08	0.10	0.058	(0.051)	0.010	0.047
266	22.17	0.10	0.058	(0.051)	0.010	0.047
267	22.25	0.10	0.058	(0.051)	0.010	0.047
268	22.33	0.07	0.039	(0.051)	0.007	0.032
269	22.42	0.07	0.039	(0.050)	0.007	0.032
270	22.50	0.07	0.039	(0.050)	0.007	0.032
271	22.58	0.07	0.039	(0.050)	0.007	0.032
272	22.67	0.07	0.039	(0.050)	0.007	0.032
273	22.75	0.07	0.039	(0.050)	0.007	0.032
274	22.83	0.07	0.039	(0.050)	0.007	0.032
275	22.92	0.07	0.039	(0.050)	0.007	0.032
276	23.00	0.07	0.039	(0.049)	0.007	0.032
277	23.08	0.07	0.039	(0.049)	0.007	0.032
278	23.17	0.07	0.039	(0.049)	0.007	0.032
279	23.25	0.07	0.039	(0.049)	0.007	0.032
280	23.33	0.07	0.039	(0.049)	0.007	0.032
281	23.42	0.07	0.039	(0.049)	0.007	0.032
282	23.50	0.07	0.039	(0.049)	0.007	0.032
283	23.58	0.07	0.039	(0.049)	0.007	0.032
284	23.67	0.07	0.039	(0.049)	0.007	0.032
285	23.75	0.07	0.039	(0.049)	0.007	0.032
286	23.83	0.07	0.039	(0.049)	0.007	0.032
287	23.92	0.07	0.039	(0.049)	0.007	0.032
288	24.00	0.07	0.039	(0.049)	0.007	0.032

(Loss Rate Not Used)

Sum = 100.0 Sum = 47.9

Flood volume = Effective rainfall 3.99(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.83(In)
Total soil loss = 0.288(Ac.Ft)
Total rainfall = 4.82(In)

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Flood volume =       60365.1 Cubic Feet
Total soil loss =       12533.1 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =      2.394(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q         |         |         |         |
  0+10       0.0006      0.07  Q         |         |         |         |
  0+15       0.0013      0.11  Q         |         |         |         |
  0+20       0.0022      0.13  Q         |         |         |         |
  0+25       0.0034      0.17  Q         |         |         |         |
  0+30       0.0046      0.18  Q         |         |         |         |
  0+35       0.0059      0.19  Q         |         |         |         |
  0+40       0.0073      0.20  Q         |         |         |         |
  0+45       0.0087      0.20  Q         |         |         |         |
  0+50       0.0101      0.20  Q         |         |         |         |
  0+55       0.0117      0.24  Q         |         |         |         |
  1+ 0       0.0134      0.25  VQ        |         |         |         |
  1+ 5       0.0152      0.25  VQ        |         |         |         |
  1+10       0.0167      0.23  Q         |         |         |         |
  1+15       0.0182      0.21  Q         |         |         |         |
  1+20       0.0196      0.20  Q         |         |         |         |
  1+25       0.0210      0.20  Q         |         |         |         |
  1+30       0.0224      0.20  Q         |         |         |         |
  1+35       0.0237      0.20  Q         |         |         |         |
  1+40       0.0251      0.20  Q         |         |         |         |
  1+45       0.0265      0.20  Q         |         |         |         |
  1+50       0.0279      0.21  Q         |         |         |         |
  1+55       0.0295      0.24  Q         |         |         |         |
  2+ 0       0.0313      0.25  VQ        |         |         |         |
  2+ 5       0.0331      0.26  VQ        |         |         |         |
  2+10       0.0349      0.26  |Q        |         |         |         |
  2+15       0.0367      0.26  |Q        |         |         |         |
  2+20       0.0385      0.27  |Q        |         |         |         |
  2+25       0.0404      0.27  |Q        |         |         |         |
  2+30       0.0422      0.27  |Q        |         |         |         |
  2+35       0.0441      0.27  |Q        |         |         |         |
  2+40       0.0461      0.30  |Q        |         |         |         |
  2+45       0.0483      0.32  |Q        |         |         |         |
  2+50       0.0506      0.33  |Q        |         |         |         |
  2+55       0.0529      0.33  |Q        |         |         |         |
  3+ 0       0.0551      0.33  |Q        |         |         |         |
  3+ 5       0.0574      0.33  |Q        |         |         |         |
  3+10       0.0597      0.33  |Q        |         |         |         |
  3+15       0.0620      0.33  |Q        |         |         |         |
  3+20       0.0643      0.33  |Q        |         |         |         |
  3+25       0.0666      0.33  |Q        |         |         |         |
  3+30       0.0689      0.33  |Q        |         |         |         |
  3+35       0.0711      0.33  |QV       |         |         |         |
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3+40       0.0734      0.33  |QV        |          |          |          |
3+45       0.0757      0.33  |QV        |          |          |          |
3+50       0.0781      0.34  |QV        |          |          |          |
3+55       0.0806      0.37  |QV        |          |          |          |
4+ 0       0.0833      0.39  |QV        |          |          |          |
4+ 5       0.0860      0.39  |QV        |          |          |          |
4+10       0.0887      0.40  |QV        |          |          |          |
4+15       0.0914      0.40  |QV        |          |          |          |
4+20       0.0942      0.40  |QV        |          |          |          |
4+25       0.0972      0.44  |QV        |          |          |          |
4+30       0.1003      0.45  |QV        |          |          |          |
4+35       0.1035      0.46  |QV        |          |          |          |
4+40       0.1067      0.46  |Q V       |          |          |          |
4+45       0.1099      0.46  |Q V       |          |          |          |
4+50       0.1131      0.47  |Q V       |          |          |          |
4+55       0.1166      0.50  | QV       |          |          |          |
5+ 0       0.1201      0.52  | QV       |          |          |          |
5+ 5       0.1237      0.51  | QV       |          |          |          |
5+10       0.1268      0.45  |Q V       |          |          |          |
5+15       0.1297      0.42  |Q V       |          |          |          |
5+20       0.1326      0.42  |Q V       |          |          |          |
5+25       0.1356      0.44  |Q V       |          |          |          |
5+30       0.1387      0.45  |Q  V      |          |          |          |
5+35       0.1419      0.47  |Q  V      |          |          |          |
5+40       0.1454      0.50  | Q V      |          |          |          |
5+45       0.1490      0.52  | Q V      |          |          |          |
5+50       0.1526      0.52  | Q V      |          |          |          |
5+55       0.1562      0.53  | Q V      |          |          |          |
6+ 0       0.1599      0.53  | Q V      |          |          |          |
6+ 5       0.1636      0.54  | Q V      |          |          |          |
6+10       0.1675      0.57  | Q V      |          |          |          |
6+15       0.1715      0.59  | Q V      |          |          |          |
6+20       0.1756      0.59  | Q  V     |          |          |          |
6+25       0.1797      0.60  | Q  V     |          |          |          |
6+30       0.1838      0.60  | Q  V     |          |          |          |
6+35       0.1879      0.60  | Q  V     |          |          |          |
6+40       0.1923      0.63  | Q  V     |          |          |          |
6+45       0.1968      0.65  | Q  V     |          |          |          |
6+50       0.2013      0.66  | Q  V     |          |          |          |
6+55       0.2059      0.66  | Q  V     |          |          |          |
7+ 0       0.2105      0.66  | Q   V    |          |          |          |
7+ 5       0.2150      0.66  | Q   V    |          |          |          |
7+10       0.2196      0.66  | Q   V    |          |          |          |
7+15       0.2242      0.66  | Q   V    |          |          |          |
7+20       0.2288      0.67  | Q   V    |          |          |          |
7+25       0.2336      0.70  | Q   V    |          |          |          |
7+30       0.2386      0.72  | Q   V    |          |          |          |
7+35       0.2436      0.73  | Q    V   |          |          |          |
7+40       0.2489      0.77  |  Q   V   |          |          |          |
7+45       0.2543      0.78  |  Q   V   |          |          |          |
7+50       0.2598      0.80  |  Q   V   |          |          |          |
7+55       0.2655      0.83  |  Q   V   |          |          |          |
8+ 0       0.2713      0.85  |  Q   V   |          |          |          |
8+ 5       0.2773      0.87  |  Q    V  |          |          |          |
8+10       0.2838      0.94  |  Q    V  |          |          |          |
8+15       0.2904      0.97  |  Q    V  |          |          |          |
8+20       0.2972      0.98  |  Q    V  |          |          |          |
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 8+25       0.3040      0.99  |  Q    V |          |          |          |
 8+30       0.3109      0.99  |  Q    V |          |          |          |
 8+35       0.3178      1.00  |   Q    V|          |          |          |
 8+40       0.3249      1.03  |   Q    V|          |          |          |
 8+45       0.3321      1.05  |   Q    V|          |          |          |
 8+50       0.3395      1.06  |   Q    V|          |          |          |
 8+55       0.3470      1.10  |   Q     V          |          |          |
 9+ 0       0.3547      1.12  |   Q     V          |          |          |
 9+ 5       0.3625      1.13  |   Q     V          |          |          |
 9+10       0.3708      1.20  |   Q     V          |          |          |
 9+15       0.3793      1.24  |   Q     V          |          |          |
 9+20       0.3879      1.26  |    Q    |V         |          |          |
 9+25       0.3968      1.29  |    Q    |V         |          |          |
 9+30       0.4059      1.31  |    Q    |V         |          |          |
 9+35       0.4150      1.33  |    Q    |V         |          |          |
 9+40       0.4244      1.36  |    Q    | V        |          |          |
 9+45       0.4339      1.38  |    Q    | V        |          |          |
 9+50       0.4435      1.39  |    Q    | V        |          |          |
 9+55       0.4534      1.43  |    Q    |  V       |          |          |
10+ 0       0.4634      1.45  |    Q    |  V       |          |          |
10+ 5       0.4731      1.41  |    Q    |  V       |          |          |
10+10       0.4813      1.20  |   Q     |  V       |          |          |
10+15       0.4888      1.08  |   Q     |   V      |          |          |
10+20       0.4959      1.04  |   Q     |   V      |          |          |
10+25       0.5029      1.01  |   Q     |   V      |          |          |
10+30       0.5098      1.00  |   Q     |   V      |          |          |
10+35       0.5169      1.03  |   Q     |   V      |          |          |
10+40       0.5251      1.19  |   Q     |    V     |          |          |
10+45       0.5338      1.27  |    Q    |    V     |          |          |
10+50       0.5427      1.30  |    Q    |    V     |          |          |
10+55       0.5518      1.32  |    Q    |    V     |          |          |
11+ 0       0.5609      1.32  |    Q    |     V    |          |          |
11+ 5       0.5700      1.32  |    Q    |     V    |          |          |
11+10       0.5789      1.29  |    Q    |     V    |          |          |
11+15       0.5877      1.27  |    Q    |     V    |          |          |
11+20       0.5964      1.27  |    Q    |      V   |          |          |
11+25       0.6051      1.26  |    Q    |      V   |          |          |
11+30       0.6138      1.26  |    Q    |      V   |          |          |
11+35       0.6224      1.25  |    Q    |      V   |          |          |
11+40       0.6306      1.19  |   Q     |       V  |          |          |
11+45       0.6385      1.15  |   Q     |       V  |          |          |
11+50       0.6464      1.15  |   Q     |       V  |          |          |
11+55       0.6545      1.17  |   Q     |       V  |          |          |
12+ 0       0.6627      1.19  |   Q     |        V|          |          |
12+ 5       0.6711      1.23  |   Q     |        V|          |          |
12+10       0.6812      1.46  |    Q    |        V|          |          |
12+15       0.6920      1.57  |     Q   |        V|          |          |
12+20       0.7032      1.63  |     Q   |         V          |          |
12+25       0.7148      1.68  |     Q   |         V          |          |
12+30       0.7266      1.71  |     Q   |         V          |          |
12+35       0.7385      1.74  |     Q   |         |V         |          |
12+40       0.7511      1.82  |      Q  |         |V         |          |
12+45       0.7639      1.87  |      Q  |         | V        |          |
12+50       0.7770      1.89  |      Q  |         | V        |          |
12+55       0.7903      1.94  |      Q  |         | V        |          |
13+ 0       0.8039      1.97  |      Q  |         |  V       |          |
13+ 5       0.8178      2.01  |       Q |         |  V       |          |
```

```
13+10       0.8330      2.21  |        Q |          |   V     |          |
13+15       0.8490      2.32  |         Q|          |   V     |          |
13+20       0.8652      2.36  |         Q|          |   V     |          |
13+25       0.8817      2.38  |         Q|          |    V    |          |
13+30       0.8982      2.39  |         Q|          |    V    |          |
13+35       0.9142      2.32  |         Q|          |     V   |          |
13+40       0.9273      1.91  |       Q  |          |     V   |          |
13+45       0.9389      1.69  |     Q    |          |      V  |          |
13+50       0.9500      1.60  |     Q    |          |      V  |          |
13+55       0.9607      1.56  |     Q    |          |      V  |          |
14+ 0       0.9714      1.54  |     Q    |          |       V |          |
14+ 5       0.9821      1.56  |     Q    |          |       V |          |
14+10       0.9939      1.71  |     Q    |          |       V |          |
14+15       1.0063      1.79  |      Q   |          |        V|          |
14+20       1.0188      1.82  |      Q   |          |        V|          |
14+25       1.0311      1.80  |      Q   |          |        V|          |
14+30       1.0434      1.78  |      Q   |          |         V          |
14+35       1.0557      1.78  |      Q   |          |         V          |
14+40       1.0679      1.78  |      Q   |          |         V          |
14+45       1.0802      1.78  |      Q   |          |         |V         |
14+50       1.0924      1.77  |      Q   |          |         |V         |
14+55       1.1044      1.74  |     Q    |          |         |V         |
15+ 0       1.1162      1.72  |     Q    |          |         | V        |
15+ 5       1.1280      1.71  |     Q    |          |         | V        |
15+10       1.1394      1.66  |     Q    |          |         | V        |
15+15       1.1508      1.64  |     Q    |          |         |  V       |
15+20       1.1620      1.63  |     Q    |          |         |  V       |
15+25       1.1729      1.59  |     Q    |          |         |  V       |
15+30       1.1837      1.57  |     Q    |          |         |   V      |
15+35       1.1943      1.53  |     Q    |          |         |   V      |
15+40       1.2039      1.39  |    Q     |          |         |   V      |
15+45       1.2130      1.32  |    Q     |          |         |    V     |
15+50       1.2218      1.29  |    Q     |          |         |    V     |
15+55       1.2306      1.27  |    Q     |          |         |    V     |
16+ 0       1.2393      1.27  |    Q     |          |         |    V     |
16+ 5       1.2474      1.18  |   Q      |          |         |     V    |
16+10       1.2523      0.70  | Q        |          |         |     V    |
16+15       1.2554      0.45  |Q         |          |         |     V    |
16+20       1.2578      0.35  |Q         |          |         |     V    |
16+25       1.2599      0.30  |Q         |          |         |     V    |
16+30       1.2618      0.28  |Q         |          |         |     V    |
16+35       1.2637      0.27  |Q         |          |         |     V    |
16+40       1.2653      0.23  Q          |          |         |     V    |
16+45       1.2668      0.21  Q          |          |         |     V    |
16+50       1.2682      0.21  Q          |          |         |     V    |
16+55       1.2696      0.20  Q          |          |         |     V    |
17+ 0       1.2709      0.20  Q          |          |         |     V    |
17+ 5       1.2724      0.21  Q          |          |         |     V    |
17+10       1.2743      0.27  |Q         |          |         |     V    |
17+15       1.2764      0.31  |Q         |          |         |     V    |
17+20       1.2786      0.32  |Q         |          |         |     V    |
17+25       1.2809      0.33  |Q         |          |         |     V    |
17+30       1.2831      0.33  |Q         |          |         |      V   |
17+35       1.2854      0.33  |Q         |          |         |      V   |
17+40       1.2877      0.33  |Q         |          |         |      V   |
17+45       1.2900      0.33  |Q         |          |         |      V   |
17+50       1.2922      0.33  |Q         |          |         |      V   |
```

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17+55       1.2943      0.29  |Q         |          |          |       V  |
18+ 0       1.2962      0.28  |Q         |          |          |       V  |
18+ 5       1.2980      0.27  |Q         |          |          |       V  |
18+10       1.2999      0.27  |Q         |          |          |       V  |
18+15       1.3017      0.27  |Q         |          |          |       V  |
18+20       1.3036      0.27  |Q         |          |          |       V  |
18+25       1.3054      0.27  |Q         |          |          |       V  |
18+30       1.3072      0.27  |Q         |          |          |       V  |
18+35       1.3090      0.26  |Q         |          |          |       V  |
18+40       1.3106      0.23  Q          |          |          |       V  |
18+45       1.3120      0.21  Q          |          |          |       V  |
18+50       1.3134      0.20  Q          |          |          |       V  |
18+55       1.3145      0.16  Q          |          |          |       V  |
19+ 0       1.3156      0.15  Q          |          |          |       V  |
19+ 5       1.3166      0.15  Q          |          |          |        V |
19+10       1.3177      0.17  Q          |          |          |        V |
19+15       1.3190      0.19  Q          |          |          |        V |
19+20       1.3204      0.20  Q          |          |          |        V |
19+25       1.3220      0.23  Q          |          |          |        V |
19+30       1.3238      0.25  |Q         |          |          |        V |
19+35       1.3255      0.25  |Q         |          |          |        V |
19+40       1.3271      0.23  Q          |          |          |        V |
19+45       1.3285      0.21  Q          |          |          |        V |
19+50       1.3299      0.20  Q          |          |          |        V |
19+55       1.3310      0.16  Q          |          |          |        V |
20+ 0       1.3320      0.15  Q          |          |          |        V |
20+ 5       1.3330      0.15  Q          |          |          |        V |
20+10       1.3342      0.17  Q          |          |          |        V |
20+15       1.3355      0.19  Q          |          |          |        V |
20+20       1.3368      0.19  Q          |          |          |        V |
20+25       1.3382      0.20  Q          |          |          |        V |
20+30       1.3396      0.20  Q          |          |          |        V |
20+35       1.3409      0.20  Q          |          |          |        V |
20+40       1.3423      0.20  Q          |          |          |        V |
20+45       1.3437      0.20  Q          |          |          |        V |
20+50       1.3450      0.19  Q          |          |          |        V |
20+55       1.3461      0.16  Q          |          |          |        V |
21+ 0       1.3471      0.15  Q          |          |          |        V |
21+ 5       1.3481      0.14  Q          |          |          |        V |
21+10       1.3493      0.17  Q          |          |          |        V |
21+15       1.3506      0.19  Q          |          |          |        V |
21+20       1.3519      0.19  Q          |          |          |         V|
21+25       1.3530      0.16  Q          |          |          |         V|
21+30       1.3540      0.14  Q          |          |          |         V|
21+35       1.3550      0.14  Q          |          |          |         V|
21+40       1.3562      0.17  Q          |          |          |         V|
21+45       1.3575      0.19  Q          |          |          |         V|
21+50       1.3588      0.19  Q          |          |          |         V|
21+55       1.3599      0.16  Q          |          |          |         V|
22+ 0       1.3608      0.14  Q          |          |          |         V|
22+ 5       1.3618      0.14  Q          |          |          |         V|
22+10       1.3630      0.17  Q          |          |          |         V|
22+15       1.3643      0.19  Q          |          |          |         V|
22+20       1.3656      0.19  Q          |          |          |         V|
22+25       1.3667      0.16  Q          |          |          |         V|
22+30       1.3677      0.14  Q          |          |          |         V|
22+35       1.3687      0.14  Q          |          |          |         V|
```

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   22+40       1.3696      0.14  Q          |          |          |         V|
   22+45       1.3705      0.13  Q          |          |          |         V|
   22+50       1.3714      0.13  Q          |          |          |         V|
   22+55       1.3724      0.13  Q          |          |          |         V|
   23+ 0       1.3733      0.13  Q          |          |          |         V|
   23+ 5       1.3742      0.13  Q          |          |          |         V|
   23+10       1.3751      0.13  Q          |          |          |         V|
   23+15       1.3760      0.13  Q          |          |          |         V|
   23+20       1.3769      0.13  Q          |          |          |         V|
   23+25       1.3778      0.13  Q          |          |          |         V|
   23+30       1.3788      0.13  Q          |          |          |         V|
   23+35       1.3797      0.13  Q          |          |          |         V|
   23+40       1.3806      0.13  Q          |          |          |         V|
   23+45       1.3815      0.13  Q          |          |          |         V|
   23+50       1.3824      0.13  Q          |          |          |         V|
   23+55       1.3833      0.13  Q          |          |          |         V|
   24+ 0       1.3842      0.13  Q          |          |          |         V|
   24+ 5       1.3851      0.12  Q          |          |          |         V|
   24+10       1.3855      0.06  Q          |          |          |         V|
   24+15       1.3856      0.02  Q          |          |          |         V|
   24+20       1.3857      0.01  Q          |          |          |         V|
   24+25       1.3858      0.00  Q          |          |          |         V|
   24+30       1.3858      0.00  Q          |          |          |         V|
   24+35       1.3858      0.00  Q          |          |          |         V|
   24+40       1.3858      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
```

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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/22/12 File: 3504Q100D1R1100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q100-1HR
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              0.63                    2.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              1.55                    6.46

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.630(In)
Area Averaged 100-Year Rainfall =    1.550(In)
```

Point rain (area averaged) = 1.550(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

Slope of intensity-duration curve for a 1 hour storm =0.4800

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
		Sum =	100.000	Sum= 4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.40	0.818	0.058	(0.147)	0.760
2	0.17	4.50	0.837	0.058	(0.151)	0.779
3	0.25	5.40	1.004	0.058	(0.181)	0.946
4	0.33	5.40	1.004	0.058	(0.181)	0.946
5	0.42	5.70	1.060	0.058	(0.191)	1.002
6	0.50	6.40	1.190	0.058	(0.214)	1.132
7	0.58	7.90	1.469	0.058	(0.264)	1.411
8	0.67	9.10	1.693	0.058	(0.305)	1.635

```
 9   0.75    12.80      2.381          0.058    (  0.429)        2.323
10   0.83    25.60      4.761          0.058    (  0.857)        4.703
11   0.92     7.90      1.469          0.058    (  0.264)        1.411
12   1.00     4.90      0.911          0.058    (  0.164)        0.853
           (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    17.9
    Flood volume = Effective rainfall      1.49(In)
     times area       4.2(Ac.)/[(In)/(Ft.)] =       0.5(Ac.Ft)
    Total soil loss =      0.06(In)
    Total soil loss =     0.020(Ac.Ft)
    Total rainfall =      1.55(In)
    Flood volume =       22583.4 Cubic Feet
    Total soil loss =         878.2 Cubic Feet
    --------------------------------------------------------------------
     Peak flow rate of this hydrograph =     13.514(CFS)
    --------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        1 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    --------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------
    0+ 5       0.0019      0.28  Q         |         |         |         |
    0+10       0.0144      1.81  |V Q      |         |         |         |
    0+15       0.0330      2.71  | V  Q    |         |         |         |
    0+20       0.0563      3.38  |   V Q   |         |         |         |
    0+25       0.0820      3.74  |     VQ  |         |         |         |
    0+30       0.1099      4.04  |       Q |         |         |         |
    0+35       0.1410      4.52  |        QV         |         |         |
    0+40       0.1779      5.36  |         Q  V      |         |         |
    0+45       0.2222      6.43  |         | Q    V  |         |         |
    0+50       0.2847      9.07  |         |       Q |V        |         |
    0+55       0.3778     13.51  |         |         |      Q V|         |
    1+ 0       0.4438      9.59  |         |        Q|         |   V     |
    1+ 5       0.4842      5.87  |         |Q        |         |      V  |
    1+10       0.5034      2.78  |    Q    |         |         |       V |
    1+15       0.5116      1.19  | Q       |         |         |        V|
    1+20       0.5153      0.53  |Q        |         |         |        V|
    1+25       0.5171      0.27  Q         |         |         |        V|
    1+30       0.5180      0.14  Q         |         |         |        V|
    1+35       0.5183      0.04  Q         |         |         |        V|
    1+40       0.5184      0.01  Q         |         |         |         V
---------------------------------------------------------------------
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      U n i t   H y d r o g r a p h   A n a l y s i s

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            Study date  03/21/12 File: 3504q100d1r24100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 5016

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
JN3504
DEVELOPED CONDITION
UNIT HYDROGRAPH
Q100-24hr
-------------------------------------------------------------------
Drainage Area =       4.17(Ac.)  =      0.007 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       4.17(Ac.)  =
0.007 Sq. Mi.
USER Entry of lag time in hours
Lag time =    0.106 Hr.
Lag time =     6.35 Min.
25% of lag time =     1.59 Min.
40% of lag time =     2.54 Min.
Unit time =     5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              2.80                  11.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        4.17              7.70                  32.11

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    2.800(In)
Area Averaged 100-Year Rainfall =    7.700(In)
```

Point rain (area averaged) = 7.700(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 7.700(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.170	56.00	0.900

Total Area Entered = 4.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.900	0.058	1.000	0.058
					Sum (F) =	0.058

Area averaged mean soil loss (F) (In/Hr) = 0.058
Minimum soil loss rate ((In/Hr)) = 0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.180

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	78.691	8.747	0.368
2	0.167	157.381	47.560	1.999
3	0.250	236.072	25.039	1.052
4	0.333	314.762	9.882	0.415
5	0.417	393.453	5.037	0.212
6	0.500	472.144	2.018	0.085
7	0.583	550.834	0.766	0.032
8	0.667	629.525	0.550	0.023
9	0.750	708.215	0.401	0.017
		Sum = 100.000	Sum=	4.203

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.062	(0.103)	0.011	0.051
2	0.17	0.07	0.062	(0.102)	0.011	0.051
3	0.25	0.07	0.062	(0.102)	0.011	0.051
4	0.33	0.10	0.092	(0.102)	0.017	0.076
5	0.42	0.10	0.092	(0.101)	0.017	0.076
6	0.50	0.10	0.092	(0.101)	0.017	0.076
7	0.58	0.10	0.092	(0.100)	0.017	0.076
8	0.67	0.10	0.092	(0.100)	0.017	0.076
9	0.75	0.10	0.092	(0.100)	0.017	0.076
10	0.83	0.13	0.123	(0.099)	0.022	0.101

11	0.92	0.13	0.123	(0.099)	0.022	0.101
12	1.00	0.13	0.123	(0.099)	0.022	0.101
13	1.08	0.10	0.092	(0.098)	0.017	0.076
14	1.17	0.10	0.092	(0.098)	0.017	0.076
15	1.25	0.10	0.092	(0.097)	0.017	0.076
16	1.33	0.10	0.092	(0.097)	0.017	0.076
17	1.42	0.10	0.092	(0.097)	0.017	0.076
18	1.50	0.10	0.092	(0.096)	0.017	0.076
19	1.58	0.10	0.092	(0.096)	0.017	0.076
20	1.67	0.10	0.092	(0.095)	0.017	0.076
21	1.75	0.10	0.092	(0.095)	0.017	0.076
22	1.83	0.13	0.123	(0.095)	0.022	0.101
23	1.92	0.13	0.123	(0.094)	0.022	0.101
24	2.00	0.13	0.123	(0.094)	0.022	0.101
25	2.08	0.13	0.123	(0.094)	0.022	0.101
26	2.17	0.13	0.123	(0.093)	0.022	0.101
27	2.25	0.13	0.123	(0.093)	0.022	0.101
28	2.33	0.13	0.123	(0.092)	0.022	0.101
29	2.42	0.13	0.123	(0.092)	0.022	0.101
30	2.50	0.13	0.123	(0.092)	0.022	0.101
31	2.58	0.17	0.154	(0.091)	0.028	0.126
32	2.67	0.17	0.154	(0.091)	0.028	0.126
33	2.75	0.17	0.154	(0.091)	0.028	0.126
34	2.83	0.17	0.154	(0.090)	0.028	0.126
35	2.92	0.17	0.154	(0.090)	0.028	0.126
36	3.00	0.17	0.154	(0.089)	0.028	0.126
37	3.08	0.17	0.154	(0.089)	0.028	0.126
38	3.17	0.17	0.154	(0.089)	0.028	0.126
39	3.25	0.17	0.154	(0.088)	0.028	0.126
40	3.33	0.17	0.154	(0.088)	0.028	0.126
41	3.42	0.17	0.154	(0.088)	0.028	0.126
42	3.50	0.17	0.154	(0.087)	0.028	0.126
43	3.58	0.17	0.154	(0.087)	0.028	0.126
44	3.67	0.17	0.154	(0.086)	0.028	0.126
45	3.75	0.17	0.154	(0.086)	0.028	0.126
46	3.83	0.20	0.185	(0.086)	0.033	0.152
47	3.92	0.20	0.185	(0.085)	0.033	0.152
48	4.00	0.20	0.185	(0.085)	0.033	0.152
49	4.08	0.20	0.185	(0.085)	0.033	0.152
50	4.17	0.20	0.185	(0.084)	0.033	0.152
51	4.25	0.20	0.185	(0.084)	0.033	0.152
52	4.33	0.23	0.216	(0.084)	0.039	0.177
53	4.42	0.23	0.216	(0.083)	0.039	0.177
54	4.50	0.23	0.216	(0.083)	0.039	0.177
55	4.58	0.23	0.216	(0.082)	0.039	0.177
56	4.67	0.23	0.216	(0.082)	0.039	0.177
57	4.75	0.23	0.216	(0.082)	0.039	0.177
58	4.83	0.27	0.246	(0.081)	0.044	0.202
59	4.92	0.27	0.246	(0.081)	0.044	0.202
60	5.00	0.27	0.246	(0.081)	0.044	0.202
61	5.08	0.20	0.185	(0.080)	0.033	0.152
62	5.17	0.20	0.185	(0.080)	0.033	0.152
63	5.25	0.20	0.185	(0.080)	0.033	0.152
64	5.33	0.23	0.216	(0.079)	0.039	0.177
65	5.42	0.23	0.216	(0.079)	0.039	0.177
66	5.50	0.23	0.216	(0.079)	0.039	0.177
67	5.58	0.27	0.246	(0.078)	0.044	0.202

68	5.67	0.27	0.246	(0.078)	0.044	0.202
69	5.75	0.27	0.246	(0.078)	0.044	0.202
70	5.83	0.27	0.246	(0.077)	0.044	0.202
71	5.92	0.27	0.246	(0.077)	0.044	0.202
72	6.00	0.27	0.246	(0.077)	0.044	0.202
73	6.08	0.30	0.277	(0.076)	0.050	0.227
74	6.17	0.30	0.277	(0.076)	0.050	0.227
75	6.25	0.30	0.277	(0.076)	0.050	0.227
76	6.33	0.30	0.277	(0.075)	0.050	0.227
77	6.42	0.30	0.277	(0.075)	0.050	0.227
78	6.50	0.30	0.277	(0.075)	0.050	0.227
79	6.58	0.33	0.308	(0.074)	0.055	0.253
80	6.67	0.33	0.308	(0.074)	0.055	0.253
81	6.75	0.33	0.308	(0.074)	0.055	0.253
82	6.83	0.33	0.308	(0.073)	0.055	0.253
83	6.92	0.33	0.308	(0.073)	0.055	0.253
84	7.00	0.33	0.308	(0.073)	0.055	0.253
85	7.08	0.33	0.308	(0.072)	0.055	0.253
86	7.17	0.33	0.308	(0.072)	0.055	0.253
87	7.25	0.33	0.308	(0.072)	0.055	0.253
88	7.33	0.37	0.339	(0.071)	0.061	0.278
89	7.42	0.37	0.339	(0.071)	0.061	0.278
90	7.50	0.37	0.339	(0.071)	0.061	0.278
91	7.58	0.40	0.370	(0.070)	0.067	0.303
92	7.67	0.40	0.370	(0.070)	0.067	0.303
93	7.75	0.40	0.370	(0.070)	0.067	0.303
94	7.83	0.43	0.400	0.069	(0.072)	0.331
95	7.92	0.43	0.400	0.069	(0.072)	0.331
96	8.00	0.43	0.400	0.069	(0.072)	0.332
97	8.08	0.50	0.462	0.068	(0.083)	0.394
98	8.17	0.50	0.462	0.068	(0.083)	0.394
99	8.25	0.50	0.462	0.068	(0.083)	0.394
100	8.33	0.50	0.462	0.067	(0.083)	0.395
101	8.42	0.50	0.462	0.067	(0.083)	0.395
102	8.50	0.50	0.462	0.067	(0.083)	0.395
103	8.58	0.53	0.493	0.066	(0.089)	0.426
104	8.67	0.53	0.493	0.066	(0.089)	0.427
105	8.75	0.53	0.493	0.066	(0.089)	0.427
106	8.83	0.57	0.524	0.066	(0.094)	0.458
107	8.92	0.57	0.524	0.065	(0.094)	0.458
108	9.00	0.57	0.524	0.065	(0.094)	0.459
109	9.08	0.63	0.585	0.065	(0.105)	0.521
110	9.17	0.63	0.585	0.064	(0.105)	0.521
111	9.25	0.63	0.585	0.064	(0.105)	0.521
112	9.33	0.67	0.616	0.064	(0.111)	0.552
113	9.42	0.67	0.616	0.063	(0.111)	0.553
114	9.50	0.67	0.616	0.063	(0.111)	0.553
115	9.58	0.70	0.647	0.063	(0.116)	0.584
116	9.67	0.70	0.647	0.062	(0.116)	0.584
117	9.75	0.70	0.647	0.062	(0.116)	0.585
118	9.83	0.73	0.678	0.062	(0.122)	0.616
119	9.92	0.73	0.678	0.062	(0.122)	0.616
120	10.00	0.73	0.678	0.061	(0.122)	0.616
121	10.08	0.50	0.462	0.061	(0.083)	0.401
122	10.17	0.50	0.462	0.061	(0.083)	0.401
123	10.25	0.50	0.462	0.060	(0.083)	0.402
124	10.33	0.50	0.462	0.060	(0.083)	0.402

125	10.42	0.50	0.462	0.060	(0.083)	0.402
126	10.50	0.50	0.462	0.060	(0.083)	0.402
127	10.58	0.67	0.616	0.059	(0.111)	0.557
128	10.67	0.67	0.616	0.059	(0.111)	0.557
129	10.75	0.67	0.616	0.059	(0.111)	0.557
130	10.83	0.67	0.616	0.058	(0.111)	0.558
131	10.92	0.67	0.616	0.058	(0.111)	0.558
132	11.00	0.67	0.616	0.058	(0.111)	0.558
133	11.08	0.63	0.585	0.057	(0.105)	0.528
134	11.17	0.63	0.585	0.057	(0.105)	0.528
135	11.25	0.63	0.585	0.057	(0.105)	0.528
136	11.33	0.63	0.585	0.057	(0.105)	0.529
137	11.42	0.63	0.585	0.056	(0.105)	0.529
138	11.50	0.63	0.585	0.056	(0.105)	0.529
139	11.58	0.57	0.524	0.056	(0.094)	0.468
140	11.67	0.57	0.524	0.056	(0.094)	0.468
141	11.75	0.57	0.524	0.055	(0.094)	0.468
142	11.83	0.60	0.554	0.055	(0.100)	0.499
143	11.92	0.60	0.554	0.055	(0.100)	0.500
144	12.00	0.60	0.554	0.054	(0.100)	0.500
145	12.08	0.83	0.770	0.054	(0.139)	0.716
146	12.17	0.83	0.770	0.054	(0.139)	0.716
147	12.25	0.83	0.770	0.054	(0.139)	0.716
148	12.33	0.87	0.801	0.053	(0.144)	0.747
149	12.42	0.87	0.801	0.053	(0.144)	0.748
150	12.50	0.87	0.801	0.053	(0.144)	0.748
151	12.58	0.93	0.862	0.053	(0.155)	0.810
152	12.67	0.93	0.862	0.052	(0.155)	0.810
153	12.75	0.93	0.862	0.052	(0.155)	0.810
154	12.83	0.97	0.893	0.052	(0.161)	0.841
155	12.92	0.97	0.893	0.051	(0.161)	0.842
156	13.00	0.97	0.893	0.051	(0.161)	0.842
157	13.08	1.13	1.047	0.051	(0.188)	0.996
158	13.17	1.13	1.047	0.051	(0.188)	0.996
159	13.25	1.13	1.047	0.050	(0.188)	0.997
160	13.33	1.13	1.047	0.050	(0.188)	0.997
161	13.42	1.13	1.047	0.050	(0.188)	0.997
162	13.50	1.13	1.047	0.050	(0.188)	0.997
163	13.58	0.77	0.708	0.049	(0.128)	0.659
164	13.67	0.77	0.708	0.049	(0.128)	0.659
165	13.75	0.77	0.708	0.049	(0.128)	0.659
166	13.83	0.77	0.708	0.049	(0.128)	0.660
167	13.92	0.77	0.708	0.048	(0.128)	0.660
168	14.00	0.77	0.708	0.048	(0.128)	0.660
169	14.08	0.90	0.832	0.048	(0.150)	0.784
170	14.17	0.90	0.832	0.048	(0.150)	0.784
171	14.25	0.90	0.832	0.047	(0.150)	0.784
172	14.33	0.87	0.801	0.047	(0.144)	0.754
173	14.42	0.87	0.801	0.047	(0.144)	0.754
174	14.50	0.87	0.801	0.047	(0.144)	0.754
175	14.58	0.87	0.801	0.046	(0.144)	0.754
176	14.67	0.87	0.801	0.046	(0.144)	0.755
177	14.75	0.87	0.801	0.046	(0.144)	0.755
178	14.83	0.83	0.770	0.046	(0.139)	0.724
179	14.92	0.83	0.770	0.046	(0.139)	0.724
180	15.00	0.83	0.770	0.045	(0.139)	0.725
181	15.08	0.80	0.739	0.045	(0.133)	0.694

182	15.17	0.80	0.739	0.045	(0.133)	0.694
183	15.25	0.80	0.739	0.045	(0.133)	0.695
184	15.33	0.77	0.708	0.044	(0.128)	0.664
185	15.42	0.77	0.708	0.044	(0.128)	0.664
186	15.50	0.77	0.708	0.044	(0.128)	0.664
187	15.58	0.63	0.585	0.044	(0.105)	0.541
188	15.67	0.63	0.585	0.043	(0.105)	0.542
189	15.75	0.63	0.585	0.043	(0.105)	0.542
190	15.83	0.63	0.585	0.043	(0.105)	0.542
191	15.92	0.63	0.585	0.043	(0.105)	0.542
192	16.00	0.63	0.585	0.043	(0.105)	0.543
193	16.08	0.13	0.123	(0.042)	0.022	0.101
194	16.17	0.13	0.123	(0.042)	0.022	0.101
195	16.25	0.13	0.123	(0.042)	0.022	0.101
196	16.33	0.13	0.123	(0.042)	0.022	0.101
197	16.42	0.13	0.123	(0.042)	0.022	0.101
198	16.50	0.13	0.123	(0.041)	0.022	0.101
199	16.58	0.10	0.092	(0.041)	0.017	0.076
200	16.67	0.10	0.092	(0.041)	0.017	0.076
201	16.75	0.10	0.092	(0.041)	0.017	0.076
202	16.83	0.10	0.092	(0.040)	0.017	0.076
203	16.92	0.10	0.092	(0.040)	0.017	0.076
204	17.00	0.10	0.092	(0.040)	0.017	0.076
205	17.08	0.17	0.154	(0.040)	0.028	0.126
206	17.17	0.17	0.154	(0.040)	0.028	0.126
207	17.25	0.17	0.154	(0.039)	0.028	0.126
208	17.33	0.17	0.154	(0.039)	0.028	0.126
209	17.42	0.17	0.154	(0.039)	0.028	0.126
210	17.50	0.17	0.154	(0.039)	0.028	0.126
211	17.58	0.17	0.154	(0.039)	0.028	0.126
212	17.67	0.17	0.154	(0.038)	0.028	0.126
213	17.75	0.17	0.154	(0.038)	0.028	0.126
214	17.83	0.13	0.123	(0.038)	0.022	0.101
215	17.92	0.13	0.123	(0.038)	0.022	0.101
216	18.00	0.13	0.123	(0.038)	0.022	0.101
217	18.08	0.13	0.123	(0.038)	0.022	0.101
218	18.17	0.13	0.123	(0.037)	0.022	0.101
219	18.25	0.13	0.123	(0.037)	0.022	0.101
220	18.33	0.13	0.123	(0.037)	0.022	0.101
221	18.42	0.13	0.123	(0.037)	0.022	0.101
222	18.50	0.13	0.123	(0.037)	0.022	0.101
223	18.58	0.10	0.092	(0.036)	0.017	0.076
224	18.67	0.10	0.092	(0.036)	0.017	0.076
225	18.75	0.10	0.092	(0.036)	0.017	0.076
226	18.83	0.07	0.062	(0.036)	0.011	0.051
227	18.92	0.07	0.062	(0.036)	0.011	0.051
228	19.00	0.07	0.062	(0.036)	0.011	0.051
229	19.08	0.10	0.092	(0.035)	0.017	0.076
230	19.17	0.10	0.092	(0.035)	0.017	0.076
231	19.25	0.10	0.092	(0.035)	0.017	0.076
232	19.33	0.13	0.123	(0.035)	0.022	0.101
233	19.42	0.13	0.123	(0.035)	0.022	0.101
234	19.50	0.13	0.123	(0.035)	0.022	0.101
235	19.58	0.10	0.092	(0.034)	0.017	0.076
236	19.67	0.10	0.092	(0.034)	0.017	0.076
237	19.75	0.10	0.092	(0.034)	0.017	0.076
238	19.83	0.07	0.062	(0.034)	0.011	0.051

239	19.92	0.07	0.062	(0.034)	0.011	0.051
240	20.00	0.07	0.062	(0.034)	0.011	0.051
241	20.08	0.10	0.092	(0.034)	0.017	0.076
242	20.17	0.10	0.092	(0.033)	0.017	0.076
243	20.25	0.10	0.092	(0.033)	0.017	0.076
244	20.33	0.10	0.092	(0.033)	0.017	0.076
245	20.42	0.10	0.092	(0.033)	0.017	0.076
246	20.50	0.10	0.092	(0.033)	0.017	0.076
247	20.58	0.10	0.092	(0.033)	0.017	0.076
248	20.67	0.10	0.092	(0.033)	0.017	0.076
249	20.75	0.10	0.092	(0.032)	0.017	0.076
250	20.83	0.07	0.062	(0.032)	0.011	0.051
251	20.92	0.07	0.062	(0.032)	0.011	0.051
252	21.00	0.07	0.062	(0.032)	0.011	0.051
253	21.08	0.10	0.092	(0.032)	0.017	0.076
254	21.17	0.10	0.092	(0.032)	0.017	0.076
255	21.25	0.10	0.092	(0.032)	0.017	0.076
256	21.33	0.07	0.062	(0.032)	0.011	0.051
257	21.42	0.07	0.062	(0.031)	0.011	0.051
258	21.50	0.07	0.062	(0.031)	0.011	0.051
259	21.58	0.10	0.092	(0.031)	0.017	0.076
260	21.67	0.10	0.092	(0.031)	0.017	0.076
261	21.75	0.10	0.092	(0.031)	0.017	0.076
262	21.83	0.07	0.062	(0.031)	0.011	0.051
263	21.92	0.07	0.062	(0.031)	0.011	0.051
264	22.00	0.07	0.062	(0.031)	0.011	0.051
265	22.08	0.10	0.092	(0.031)	0.017	0.076
266	22.17	0.10	0.092	(0.030)	0.017	0.076
267	22.25	0.10	0.092	(0.030)	0.017	0.076
268	22.33	0.07	0.062	(0.030)	0.011	0.051
269	22.42	0.07	0.062	(0.030)	0.011	0.051
270	22.50	0.07	0.062	(0.030)	0.011	0.051
271	22.58	0.07	0.062	(0.030)	0.011	0.051
272	22.67	0.07	0.062	(0.030)	0.011	0.051
273	22.75	0.07	0.062	(0.030)	0.011	0.051
274	22.83	0.07	0.062	(0.030)	0.011	0.051
275	22.92	0.07	0.062	(0.030)	0.011	0.051
276	23.00	0.07	0.062	(0.030)	0.011	0.051
277	23.08	0.07	0.062	(0.030)	0.011	0.051
278	23.17	0.07	0.062	(0.029)	0.011	0.051
279	23.25	0.07	0.062	(0.029)	0.011	0.051
280	23.33	0.07	0.062	(0.029)	0.011	0.051
281	23.42	0.07	0.062	(0.029)	0.011	0.051
282	23.50	0.07	0.062	(0.029)	0.011	0.051
283	23.58	0.07	0.062	(0.029)	0.011	0.051
284	23.67	0.07	0.062	(0.029)	0.011	0.051
285	23.75	0.07	0.062	(0.029)	0.011	0.051
286	23.83	0.07	0.062	(0.029)	0.011	0.051
287	23.92	0.07	0.062	(0.029)	0.011	0.051
288	24.00	0.07	0.062	(0.029)	0.011	0.051

(Loss Rate Not Used)

Sum = 100.0 Sum = 82.2

Flood volume = Effective rainfall 6.85(In)
times area 4.2(Ac.)/[(In)/(Ft.)] = 2.4(Ac.Ft)
Total soil loss = 0.85(In)
Total soil loss = 0.297(Ac.Ft)
Total rainfall = 7.70(In)

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Flood volume =      103628.0 Cubic Feet
Total soil loss =       12926.7 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =      4.181(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+ 5       0.0001      0.02  Q         |         |         |         |
  0+10       0.0010      0.12  Q         |         |         |         |
  0+15       0.0021      0.17  Q         |         |         |         |
  0+20       0.0035      0.20  Q         |         |         |         |
  0+25       0.0054      0.26  VQ        |         |         |         |
  0+30       0.0074      0.30  VQ        |         |         |         |
  0+35       0.0095      0.31  VQ        |         |         |         |
  0+40       0.0117      0.31  VQ        |         |         |         |
  0+45       0.0139      0.32  VQ        |         |         |         |
  0+50       0.0161      0.33  VQ        |         |         |         |
  0+55       0.0187      0.38  VQ        |         |         |         |
  1+ 0       0.0215      0.40  VQ        |         |         |         |
  1+ 5       0.0243      0.41  VQ        |         |         |         |
  1+10       0.0268      0.36  VQ        |         |         |         |
  1+15       0.0291      0.34  VQ        |         |         |         |
  1+20       0.0313      0.33  VQ        |         |         |         |
  1+25       0.0336      0.32  VQ        |         |         |         |
  1+30       0.0358      0.32  VQ        |         |         |         |
  1+35       0.0380      0.32  VQ        |         |         |         |
  1+40       0.0402      0.32  VQ        |         |         |         |
  1+45       0.0424      0.32  VQ        |         |         |         |
  1+50       0.0446      0.33  VQ        |         |         |         |
  1+55       0.0472      0.38  VQ        |         |         |         |
  2+ 0       0.0500      0.40  VQ        |         |         |         |
  2+ 5       0.0529      0.42  VQ        |         |         |         |
  2+10       0.0558      0.42  VQ        |         |         |         |
  2+15       0.0587      0.42  VQ        |         |         |         |
  2+20       0.0616      0.42  |Q        |         |         |         |
  2+25       0.0645      0.42  |Q        |         |         |         |
  2+30       0.0675      0.42  |Q        |         |         |         |
  2+35       0.0704      0.43  |Q        |         |         |         |
  2+40       0.0738      0.48  |Q        |         |         |         |
  2+45       0.0773      0.51  |VQ       |         |         |         |
  2+50       0.0809      0.52  |VQ       |         |         |         |
  2+55       0.0845      0.53  |VQ       |         |         |         |
  3+ 0       0.0882      0.53  |VQ       |         |         |         |
  3+ 5       0.0918      0.53  |VQ       |         |         |         |
  3+10       0.0955      0.53  |VQ       |         |         |         |
  3+15       0.0991      0.53  |VQ       |         |         |         |
  3+20       0.1028      0.53  |VQ       |         |         |         |
  3+25       0.1064      0.53  |VQ       |         |         |         |
  3+30       0.1101      0.53  |VQ       |         |         |         |
  3+35       0.1138      0.53  |VQ       |         |         |         |
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3+40       0.1174      0.53  |VQ        |          |          |          |
3+45       0.1211      0.53  | Q        |          |          |          |
3+50       0.1248      0.54  | Q        |          |          |          |
3+55       0.1289      0.59  | Q        |          |          |          |
4+ 0       0.1331      0.62  | Q        |          |          |          |
4+ 5       0.1374      0.63  | Q        |          |          |          |
4+10       0.1418      0.63  | Q        |          |          |          |
4+15       0.1462      0.64  | Q        |          |          |          |
4+20       0.1506      0.65  | Q        |          |          |          |
4+25       0.1554      0.70  | Q        |          |          |          |
4+30       0.1604      0.72  | Q        |          |          |          |
4+35       0.1655      0.73  | Q        |          |          |          |
4+40       0.1705      0.74  | Q        |          |          |          |
4+45       0.1757      0.74  | Q        |          |          |          |
4+50       0.1808      0.75  |  Q       |          |          |          |
4+55       0.1864      0.80  |  Q       |          |          |          |
5+ 0       0.1921      0.83  |  Q       |          |          |          |
5+ 5       0.1977      0.82  |  Q       |          |          |          |
5+10       0.2027      0.73  | QV       |          |          |          |
5+15       0.2074      0.67  | QV       |          |          |          |
5+20       0.2120      0.66  | QV       |          |          |          |
5+25       0.2168      0.70  | QV       |          |          |          |
5+30       0.2218      0.73  | QV       |          |          |          |
5+35       0.2269      0.75  | QV       |          |          |          |
5+40       0.2325      0.80  |  Q       |          |          |          |
5+45       0.2382      0.83  |  QV      |          |          |          |
5+50       0.2439      0.84  |  QV      |          |          |          |
5+55       0.2498      0.85  |  QV      |          |          |          |
6+ 0       0.2556      0.85  |  QV      |          |          |          |
6+ 5       0.2615      0.86  |  QV      |          |          |          |
6+10       0.2678      0.91  |  QV      |          |          |          |
6+15       0.2742      0.94  |  QV      |          |          |          |
6+20       0.2807      0.95  |  QV      |          |          |          |
6+25       0.2873      0.95  |  QV      |          |          |          |
6+30       0.2939      0.95  |  QV      |          |          |          |
6+35       0.3005      0.96  |  Q V     |          |          |          |
6+40       0.3075      1.02  |   QV     |          |          |          |
6+45       0.3147      1.04  |   QV     |          |          |          |
6+50       0.3219      1.05  |   QV     |          |          |          |
6+55       0.3292      1.06  |   QV     |          |          |          |
7+ 0       0.3365      1.06  |   QV     |          |          |          |
7+ 5       0.3438      1.06  |   QV     |          |          |          |
7+10       0.3511      1.06  |   QV     |          |          |          |
7+15       0.3584      1.06  |   Q V    |          |          |          |
7+20       0.3658      1.07  |   Q V    |          |          |          |
7+25       0.3735      1.12  |   Q V    |          |          |          |
7+30       0.3814      1.15  |   Q V    |          |          |          |
7+35       0.3895      1.17  |   Q V    |          |          |          |
7+40       0.3979      1.22  |   Q V    |          |          |          |
7+45       0.4065      1.25  |    QV    |          |          |          |
7+50       0.4153      1.27  |    QV    |          |          |          |
7+55       0.4245      1.34  |    Q V   |          |          |          |
8+ 0       0.4340      1.37  |    Q V   |          |          |          |
8+ 5       0.4436      1.41  |    Q V   |          |          |          |
8+10       0.4542      1.54  |     QV   |          |          |          |
8+15       0.4653      1.61  |     QV   |          |          |          |
8+20       0.4765      1.63  |     Q V  |          |          |          |
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 8+25       0.4879      1.65  |     Q V |         |         |         |
 8+30       0.4993      1.66  |     Q V |         |         |         |
 8+35       0.5108      1.67  |     Q V |         |         |         |
 8+40       0.5227      1.73  |     Q V |         |         |         |
 8+45       0.5349      1.77  |      QV |         |         |         |
 8+50       0.5473      1.79  |      Q V|         |         |         |
 8+55       0.5601      1.86  |      Q V|         |         |         |
 9+ 0       0.5732      1.90  |      Q V|         |         |         |
 9+ 5       0.5865      1.94  |      Q V|         |         |         |
 9+10       0.6008      2.07  |       Q V         |         |         |
 9+15       0.6155      2.14  |       Q V         |         |         |
 9+20       0.6305      2.18  |       Q V         |         |         |
 9+25       0.6460      2.25  |        QV         |         |         |
 9+30       0.6618      2.29  |        Q|V        |         |         |
 9+35       0.6778      2.32  |        Q|V        |         |         |
 9+40       0.6943      2.39  |        Q|V        |         |         |
 9+45       0.7110      2.43  |        Q|V        |         |         |
 9+50       0.7279      2.46  |        Q| V       |         |         |
 9+55       0.7453      2.53  |         Q V       |         |         |
10+ 0       0.7630      2.56  |         Q V       |         |         |
10+ 5       0.7802      2.50  |        Q|  V      |         |         |
10+10       0.7945      2.08  |       Q |  V      |         |         |
10+15       0.8073      1.85  |      Q  |  V      |         |         |
10+20       0.8194      1.77  |      Q  |  V      |         |         |
10+25       0.8313      1.72  |     Q   |  V      |         |         |
10+30       0.8430      1.71  |     Q   |   V     |         |         |
10+35       0.8551      1.76  |      Q  |   V     |         |         |
10+40       0.8693      2.06  |       Q |   V     |         |         |
10+45       0.8846      2.22  |       Q |   V     |         |         |
10+50       0.9004      2.29  |        Q|    V    |         |         |
10+55       0.9163      2.32  |        Q|    V    |         |         |
11+ 0       0.9324      2.33  |        Q|    V    |         |         |
11+ 5       0.9485      2.33  |        Q|    V    |         |         |
11+10       0.9641      2.27  |        Q|     V   |         |         |
11+15       0.9796      2.24  |       Q |     V   |         |         |
11+20       0.9949      2.23  |       Q |     V   |         |         |
11+25       1.0103      2.23  |       Q |     V   |         |         |
11+30       1.0256      2.23  |       Q |      V  |         |         |
11+35       1.0408      2.20  |       Q |      V  |         |         |
11+40       1.0551      2.08  |       Q |      V  |         |         |
11+45       1.0690      2.02  |       Q |      V  |         |         |
11+50       1.0828      2.00  |       Q |       V |         |         |
11+55       1.0969      2.05  |       Q |       V |         |         |
12+ 0       1.1112      2.08  |       Q |       V |         |         |
12+ 5       1.1262      2.17  |       Q |       V |         |         |
12+10       1.1441      2.61  |         Q        V|         |         |
12+15       1.1637      2.84  |         |Q       V|         |         |
12+20       1.1840      2.94  |         |Q       V|         |         |
12+25       1.2050      3.05  |         | Q       V         |         |
12+30       1.2263      3.10  |         | Q       V         |         |
12+35       1.2480      3.15  |         | Q       V         |         |
12+40       1.2706      3.28  |         |  Q      |V        |         |
12+45       1.2937      3.35  |         |  Q      |V        |         |
12+50       1.3171      3.39  |         |  Q      | V       |         |
12+55       1.3410      3.47  |         |  Q      | V       |         |
13+ 0       1.3652      3.51  |         |   Q     | V       |         |
13+ 5       1.3898      3.58  |         |   Q     |  V      |         |
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13+10       1.4167      3.90  |         |    Q    |  V      |         |
13+15       1.4447      4.07  |         |     Q   |   V     |         |
13+20       1.4732      4.13  |         |     Q   |   V     |         |
13+25       1.5019      4.17  |         |     Q   |    V    |         |
13+30       1.5307      4.18  |         |     Q   |    V    |         |
13+35       1.5586      4.06  |         |     Q   |     V   |         |
13+40       1.5820      3.39  |         |  Q      |     V   |         |
13+45       1.6029      3.04  |         | Q       |     V   |         |
13+50       1.6229      2.90  |         |Q        |      V  |         |
13+55       1.6423      2.83  |         |Q        |      V  |         |
14+ 0       1.6616      2.80  |         |Q        |      V  |         |
14+ 5       1.6811      2.83  |         |Q        |       V |         |
14+10       1.7023      3.07  |         | Q       |       V |         |
14+15       1.7243      3.20  |         | Q       |       V |         |
14+20       1.7466      3.24  |         | Q       |        V|         |
14+25       1.7687      3.21  |         | Q       |        V|         |
14+30       1.7906      3.18  |         | Q       |         V         |
14+35       1.8125      3.18  |         | Q       |         V         |
14+40       1.8344      3.17  |         | Q       |         V         |
14+45       1.8562      3.17  |         | Q       |         |V        |
14+50       1.8780      3.16  |         | Q       |         |V        |
14+55       1.8994      3.10  |         | Q       |         |V        |
15+ 0       1.9205      3.07  |         | Q       |         | V       |
15+ 5       1.9415      3.05  |         | Q       |         | V       |
15+10       1.9620      2.98  |         |Q        |         | V       |
15+15       1.9823      2.95  |         |Q        |         |  V      |
15+20       2.0024      2.92  |         |Q        |         |  V      |
15+25       2.0221      2.85  |         |Q        |         |  V      |
15+30       2.0415      2.82  |         |Q        |         |   V     |
15+35       2.0605      2.76  |         |Q        |         |   V     |
15+40       2.0777      2.51  |         Q         |         |   V     |
15+45       2.0941      2.38  |        Q|         |         |    V    |
15+50       2.1101      2.32  |        Q|         |         |    V    |
15+55       2.1260      2.30  |        Q|         |         |    V    |
16+ 0       2.1417      2.29  |        Q|         |         |     V   |
16+ 5       2.1563      2.12  |       Q |         |         |     V   |
16+10       2.1649      1.24  |   Q     |         |         |     V   |
16+15       2.1702      0.77  |  Q      |         |         |     V   |
16+20       2.1742      0.59  | Q       |         |         |     V   |
16+25       2.1776      0.49  |Q        |         |         |     V   |
16+30       2.1808      0.46  |Q        |         |         |     V   |
16+35       2.1838      0.43  |Q        |         |         |     V   |
16+40       2.1863      0.37  |Q        |         |         |     V   |
16+45       2.1886      0.34  |Q        |         |         |     V   |
16+50       2.1909      0.33  |Q        |         |         |     V   |
16+55       2.1931      0.32  |Q        |         |         |     V   |
17+ 0       2.1953      0.32  |Q        |         |         |     V   |
17+ 5       2.1977      0.34  |Q        |         |         |     V   |
17+10       2.2007      0.44  |Q        |         |         |      V  |
17+15       2.2041      0.49  |Q        |         |         |      V  |
17+20       2.2076      0.51  | Q       |         |         |      V  |
17+25       2.2112      0.52  | Q       |         |         |      V  |
17+30       2.2148      0.53  | Q       |         |         |      V  |
17+35       2.2185      0.53  | Q       |         |         |      V  |
17+40       2.2221      0.53  | Q       |         |         |      V  |
17+45       2.2258      0.53  | Q       |         |         |      V  |
17+50       2.2294      0.52  | Q       |         |         |      V  |
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17+55       2.2326      0.47  |Q         |          |          |       V  |
18+ 0       2.2357      0.44  |Q         |          |          |       V  |
18+ 5       2.2387      0.43  |Q         |          |          |       V  |
18+10       2.2416      0.43  |Q         |          |          |       V  |
18+15       2.2446      0.43  |Q         |          |          |       V  |
18+20       2.2475      0.43  |Q         |          |          |       V  |
18+25       2.2504      0.43  |Q         |          |          |       V  |
18+30       2.2533      0.42  |Q         |          |          |       V  |
18+35       2.2562      0.42  |Q         |          |          |       V  |
18+40       2.2587      0.36  |Q         |          |          |       V  |
18+45       2.2611      0.34  |Q         |          |          |        V |
18+50       2.2632      0.32  |Q         |          |          |        V |
18+55       2.2651      0.26  |Q         |          |          |        V |
19+ 0       2.2667      0.23  Q          |          |          |        V |
19+ 5       2.2683      0.23  Q          |          |          |        V |
19+10       2.2702      0.28  |Q         |          |          |        V |
19+15       2.2722      0.30  |Q         |          |          |        V |
19+20       2.2744      0.32  |Q         |          |          |        V |
19+25       2.2770      0.37  |Q         |          |          |        V |
19+30       2.2798      0.40  |Q         |          |          |        V |
19+35       2.2826      0.41  |Q         |          |          |        V |
19+40       2.2851      0.36  |Q         |          |          |        V |
19+45       2.2874      0.34  |Q         |          |          |        V |
19+50       2.2896      0.32  |Q         |          |          |        V |
19+55       2.2914      0.26  |Q         |          |          |        V |
20+ 0       2.2930      0.23  Q          |          |          |        V |
20+ 5       2.2946      0.23  Q          |          |          |        V |
20+10       2.2965      0.28  |Q         |          |          |        V |
20+15       2.2986      0.30  |Q         |          |          |        V |
20+20       2.3007      0.31  |Q         |          |          |        V |
20+25       2.3029      0.32  |Q         |          |          |        V |
20+30       2.3051      0.32  |Q         |          |          |        V |
20+35       2.3072      0.32  |Q         |          |          |        V |
20+40       2.3094      0.32  |Q         |          |          |        V |
20+45       2.3116      0.32  |Q         |          |          |        V |
20+50       2.3138      0.31  |Q         |          |          |        V |
20+55       2.3155      0.26  |Q         |          |          |        V |
21+ 0       2.3171      0.23  Q          |          |          |        V |
21+ 5       2.3187      0.23  Q          |          |          |        V |
21+10       2.3206      0.28  |Q         |          |          |         V|
21+15       2.3227      0.30  |Q         |          |          |         V|
21+20       2.3248      0.30  |Q         |          |          |         V|
21+25       2.3265      0.26  |Q         |          |          |         V|
21+30       2.3281      0.23  Q          |          |          |         V|
21+35       2.3297      0.23  Q          |          |          |         V|
21+40       2.3316      0.28  |Q         |          |          |         V|
21+45       2.3337      0.30  |Q         |          |          |         V|
21+50       2.3357      0.30  |Q         |          |          |         V|
21+55       2.3375      0.26  |Q         |          |          |         V|
22+ 0       2.3391      0.23  Q          |          |          |         V|
22+ 5       2.3407      0.23  Q          |          |          |         V|
22+10       2.3426      0.28  |Q         |          |          |         V|
22+15       2.3446      0.30  |Q         |          |          |         V|
22+20       2.3467      0.30  |Q         |          |          |         V|
22+25       2.3485      0.26  |Q         |          |          |         V|
22+30       2.3501      0.23  Q          |          |          |         V|
22+35       2.3516      0.22  Q          |          |          |         V|
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   22+40       2.3531      0.22  Q         |         |         |        V|
   22+45       2.3545      0.21  Q         |         |         |        V|
   22+50       2.3560      0.21  Q         |         |         |        V|
   22+55       2.3575      0.21  Q         |         |         |        V|
   23+ 0       2.3589      0.21  Q         |         |         |        V|
   23+ 5       2.3604      0.21  Q         |         |         |        V|
   23+10       2.3619      0.21  Q         |         |         |        V|
   23+15       2.3633      0.21  Q         |         |         |        V|
   23+20       2.3648      0.21  Q         |         |         |        V|
   23+25       2.3663      0.21  Q         |         |         |        V|
   23+30       2.3677      0.21  Q         |         |         |        V|
   23+35       2.3692      0.21  Q         |         |         |        V|
   23+40       2.3706      0.21  Q         |         |         |        V|
   23+45       2.3721      0.21  Q         |         |         |        V|
   23+50       2.3736      0.21  Q         |         |         |        V|
   23+55       2.3750      0.21  Q         |         |         |        V|
   24+ 0       2.3765      0.21  Q         |         |         |        V|
   24+ 5       2.3778      0.19  Q         |         |         |        V|
   24+10       2.3785      0.09  Q         |         |         |        V|
   24+15       2.3787      0.04  Q         |         |         |        V|
   24+20       2.3789      0.02  Q         |         |         |        V|
   24+25       2.3789      0.01  Q         |         |         |        V|
   24+30       2.3790      0.00  Q         |         |         |        V|
   24+35       2.3790      0.00  Q         |         |         |        V|
   24+40       2.3790      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

Appendix G

Routing Output

Discharge Summary (2YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	ROUTED PEAK FLOW (CFS)
2YR-1HR	3.02	5.06	0.120
2YR-24HR	0.16	1.31	0.430

Discharge Storage Summary (10YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	ROUTED PEAK FLOW (CFS)
10YR-1HR	6.80	8.54	0.320
10YR-24HR	1.76	2.39	1.670

Discharge Storage Summary (100YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	ROUTED PEAK FLOW (CFS)
100YR-1HR	11.62	13.51	0.440
100YR-24HR	3.89	4.18	4.000

Required Storage Summary (2YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (AF)			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
2YR-1HR	3.02	5.06	0.0954	0.1651	0.0696	3034

2YR-1HR	3.02	2.24	3.26	3.52	2.13
		0.0782	0.1007	0.1598	0.1744
			0.0954		0.1651

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
2YR-24HR	0.16	1.31	0.0256	0.7269	0.7013	30549

2YR-24HR	0.16	0.16	0.18	0.16	0.16
		0.0256	0.0268	0.7258	0.7269
			0.0256		0.7269

Required Storage Summary (10YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
10YR-1HR	6.80	8.54	0.1944	0.2580	0.0636	2770

10YR-1HR	6.80	5.65	8.54	8.54	5.99
		0.171	0.2298	0.2298	0.2711
			0.194397924		0.257981176

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
10YR-24HR	1.76	2.39	0.7417	1.0964	0.3548	15453

10YR-24HR	1.76	1.74	1.82	1.77	1.74
		0.7385	0.7511	1.0924	1.1044
			0.74165		1.0964

Required Storage Summary (100YR STORM)

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
100YR-1HR	11.62	13.51	0.3382	0.4096	0.0715	3112

100YR-1HR	11.62	9.07	13.51	13.51	9.59
		0.2847	0.3778	0.3778	0.4438
			0.338169595		0.409621429

STORM YEAR & STORM DURATION (HR)	UNDEVELOPED PEAK FLOW (CFS)	DEVELOPED PEAK FLOW (CFS)	INCREMENTAL VOLUME ABOVE			INCREMENTAL VOLUME ABOVE UNDEVELOPED FLOW (CF)
			ABOVE PEAK FLOW	BELOW PEAK FLOW	DIFFERENCE	
100YR-24HR	3.89	4.18	1.4159	1.5645	0.1487	6476

100YR-24HR	3.89	3.58	3.9	4.06	3.39
		1.3898	1.4167	1.5586	1.582
			1.415859375		1.564537313

Q (Basin)

Infiltration Rate at Basin (in/hr)	2
Safety Factor	3
Infiltration Rate at Basin w/ Safety Factor (ft/sec)	0.0000154321
Surface Area of Infiltration Basin (sf)	7950.00
Q (Infiltration) at Basin (cfs)	0.1226

STORAGE VOLUME CALCULATION'S

DEPTH	ELEV.	SF	AVG. SF	V (CF)	V (AC-FT)
			0	0	0.0000
0	1358	7,950			
			8240	3296	0.0757
0.4	1358.4	8,530			
			8830	6828	0.1567
0.8	1358.8	9,129			
			9283	8684	0.1994
1	1359	9,437			
			9594	10603	0.2434
1.2	1359.2	9,750			
			10070	14631	0.3359
1.6	1359.6	10,390			
			10720	18919	0.4343
2	1360	11,050			
			11565	25858	0.5936
2.6	1360.6	12,080			
			12393	30196	0.6932
2.95	1360.95	12,706			
			12749	30833	0.7078
3	1361	12,791			
			12973	33428	0.7674
3.2	1361.2	13,155			
			13339	36095	0.8286
3.4	1361.4	13,523			
			13899	41655	0.9563
3.8	1361.8	14,275			
			14859	50570	1.1609
4.4	1362.4	15,442			
			15636	53697	1.2327
4.6	1362.6	15,830			

Q (3" diameter Orifices in Catch Basin)

Proposed Diameter of Orifices (inches)			3
Proposed # of Orifices			1
Formula used for Orifice			Q=(0.70)(a){(2)(32.2)(h)}^(1/2)
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	0.27	0.143
	d=	1.20	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	0.67	0.226
	d=	1.60	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	1.07	0.285
	d=	2.00	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	1.67	0.356
	d=	2.60	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	2.02	0.392
	d=	2.95	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	2.07	0.397
	d=	3.00	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	2.27	0.415
	d=	3.20	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	2.47	0.433
	d=	3.40	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	2.87	0.467
	d=	3.80	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	3.47	0.514
	d=	4.40	
Q (cfs) at "h" above center of pipe & overall depth (d) above bottom of Infil. Basin	h=	3.67	0.528
	d=	4.60	

Q (Catch Basin Inlet--Weir Condition)

Proposed Catch Basin Width (W) (ft)			3
Proposed Catch Basin Width (L) (ft)			3
Perimeter (ft)			12
Safety Factor for Potential Clogging			2
Perimeter w/ Safety Factor (P) (ft)			6
Formula for Catch Basin Inlet in Weir Condition			Q=[(3){(h)}^(3/2)]*(P)
Q (cfs) at "h" above top of grate & overall depth (d) above bottom of Infil. Basin	h=	0.2	1.610
	d=	3.20	
Q (cfs) at "h" above top of grate & overall depth (d) above bottom of Infil. Basin	h=	0.4	4.554
	d=	3.40	

Q (Catch Basin Inlet--Orifice Condition)

Proposed Catch Basin Width (W) (ft)			3
Proposed Catch Basin Width (L) (ft)			3
Clear Open Area (ft)			4.5
Safety Factor for Potential Clogging			2
Area w/ Safety Factor (A) (ft)			2.25
Formula for Catch Basin Inlet in Weir Condition			Q=[(5.37){(h)}^(1/2)]*(A)
Q (cfs) at "h" above top of grate & overall depth (d) above bottom of Infil. Basin	h=	0.8	10.807
	d=	3.80	
Q (cfs) at "h" above top of grate & overall depth (d) above bottom of Infil. Basin	h=	1.4	14.296
	d=	4.40	
Q (cfs) at "h" above top of grate & overall depth (d) above bottom of Infil. Basin	h=	1.6	15.283
	d=	4.60	

STORAGE VS. DISCHARGE SUMMARY

Depth, "d" (ft)	Q (Infiltration) at Basin (cfs)	Q (3" diameter) Orifice in Catch Basin (cfs)	Q (Catch Basin Inlet--Weir Condition) (cfs)	Q (Catch Basin Inlet--Orifice Condition) (cfs)	Q (Total)	V (Ac-Ft) of storage
0.00	0.12	0.00	0.00	0.00	0.12	0.000
0.40	0.12	0.00	0.00	0.00	0.12	0.076
0.80	0.12	0.00	0.00	0.00	0.12	0.157
1.00	0.12	0.00	0.00	0.00	0.12	0.199
1.20	0.12	0.14	0.00	0.00	0.27	0.243
1.60	0.12	0.23	0.00	0.00	0.35	0.336
2.00	0.12	0.29	0.00	0.00	0.41	0.434
2.60	0.12	0.36	0.00	0.00	0.48	0.594
2.95	0.12	0.39	0.00	0.00	0.51	0.693
3.00	0.12	0.40	0.00	0.00	0.52	0.708
3.20	0.12	0.42	1.61	0.00	2.15	0.767
3.40	0.12	0.43	4.55	0.00	5.11	0.829
3.80	0.12	0.47	0.00	10.81	11.40	0.956
4.40	0.12	0.51	0.00	14.30	14.93	1.161
4.60	0.12	0.53	0.00	15.28	15.93	1.233

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------


JN3504
ROUTING
Q2-1HR

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Program License Serial Number 5016

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******************** HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q2d1r12.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =    20
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        5.056 (CFS)
            Total volume =       0.187 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
_____________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------
Total number of inflow hydrograph intervals = 20
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------
-----------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-----------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	1.3	2.53	3.79	5.06	Depth (Ft.)
0.083	0.10	0.00	0.000	O					0.00
0.167	0.65	0.00	0.003	O I					0.02
0.250	0.97	0.01	0.008	O I					0.04
0.333	1.20	0.02	0.016	O I					0.08
0.417	1.33	0.04	0.024	O I					0.13
0.500	1.43	0.05	0.033	O I					0.18
0.583	1.59	0.07	0.043	O I					0.23
0.667	1.87	0.09	0.055	O I					0.29
0.750	2.24	0.11	0.068	O I					0.36
0.833	3.26	0.12	0.086	O I					0.45
0.917	5.06	0.12	0.114	O I					0.59
1.000	3.52	0.12	0.143	O I					0.73
1.083	2.13	0.12	0.161	O I					0.82
1.167	1.01	0.12	0.171	O I					0.87
1.250	0.43	0.12	0.176	O I					0.89
1.333	0.19	0.12	0.177	OI					0.89
1.417	0.10	0.12	0.177	O					0.90
1.500	0.05	0.12	0.177	O					0.89
1.583	0.02	0.12	0.176	O					0.89
1.667	0.01	0.12	0.175	O					0.89
1.750	0.00	0.12	0.175	O					0.88
1.833	0.00	0.12	0.174	O					0.88
1.917	0.00	0.12	0.173	O					0.88
2.000	0.00	0.12	0.172	O					0.87
2.083	0.00	0.12	0.171	O					0.87
2.167	0.00	0.12	0.171	O					0.86
2.250	0.00	0.12	0.170	O					0.86
2.333	0.00	0.12	0.169	O					0.86
2.417	0.00	0.12	0.168	O					0.85
2.500	0.00	0.12	0.167	O					0.85
2.583	0.00	0.12	0.166	O					0.84
2.667	0.00	0.12	0.166	O					0.84
2.750	0.00	0.12	0.165	O					0.84
2.833	0.00	0.12	0.164	O					0.83
2.917	0.00	0.12	0.163	O					0.83

3.000	0.00	0.12	0.162	O	|	|	|	|	0.82
3.083	0.00	0.12	0.161	O	|	|	|	|	0.82
3.167	0.00	0.12	0.161	O	|	|	|	|	0.82
3.250	0.00	0.12	0.160	O	|	|	|	|	0.81
3.333	0.00	0.12	0.159	O	|	|	|	|	0.81
3.417	0.00	0.12	0.158	O	|	|	|	|	0.81
3.500	0.00	0.12	0.157	O	|	|	|	|	0.80
3.583	0.00	0.12	0.156	O	|	|	|	|	0.80
3.667	0.00	0.12	0.156	O	|	|	|	|	0.79
3.750	0.00	0.12	0.155	O	|	|	|	|	0.79
3.833	0.00	0.12	0.154	O	|	|	|	|	0.79
3.917	0.00	0.12	0.153	O	|	|	|	|	0.78
4.000	0.00	0.12	0.152	O	|	|	|	|	0.78
4.083	0.00	0.12	0.151	O	|	|	|	|	0.77
4.167	0.00	0.12	0.151	O	|	|	|	|	0.77
4.250	0.00	0.12	0.150	O	|	|	|	|	0.76
4.333	0.00	0.12	0.149	O	|	|	|	|	0.76
4.417	0.00	0.12	0.148	O	|	|	|	|	0.76
4.500	0.00	0.12	0.147	O	|	|	|	|	0.75
4.583	0.00	0.12	0.147	O	|	|	|	|	0.75
4.667	0.00	0.12	0.146	O	|	|	|	|	0.74
4.750	0.00	0.12	0.145	O	|	|	|	|	0.74
4.833	0.00	0.12	0.144	O	|	|	|	|	0.74
4.917	0.00	0.12	0.143	O	|	|	|	|	0.73
5.000	0.00	0.12	0.142	O	|	|	|	|	0.73
5.083	0.00	0.12	0.142	O	|	|	|	|	0.72
5.167	0.00	0.12	0.141	O	|	|	|	|	0.72
5.250	0.00	0.12	0.140	O	|	|	|	|	0.72
5.333	0.00	0.12	0.139	O	|	|	|	|	0.71
5.417	0.00	0.12	0.138	O	|	|	|	|	0.71
5.500	0.00	0.12	0.137	O	|	|	|	|	0.70
5.583	0.00	0.12	0.137	O	|	|	|	|	0.70
5.667	0.00	0.12	0.136	O	|	|	|	|	0.70
5.750	0.00	0.12	0.135	O	|	|	|	|	0.69
5.833	0.00	0.12	0.134	O	|	|	|	|	0.69
5.917	0.00	0.12	0.133	O	|	|	|	|	0.68
6.000	0.00	0.12	0.132	O	|	|	|	|	0.68
6.083	0.00	0.12	0.132	O	|	|	|	|	0.67
6.167	0.00	0.12	0.131	O	|	|	|	|	0.67
6.250	0.00	0.12	0.130	O	|	|	|	|	0.67
6.333	0.00	0.12	0.129	O	|	|	|	|	0.66
6.417	0.00	0.12	0.128	O	|	|	|	|	0.66
6.500	0.00	0.12	0.128	O	|	|	|	|	0.65
6.583	0.00	0.12	0.127	O	|	|	|	|	0.65
6.667	0.00	0.12	0.126	O	|	|	|	|	0.65
6.750	0.00	0.12	0.125	O	|	|	|	|	0.64
6.833	0.00	0.12	0.124	O	|	|	|	|	0.64
6.917	0.00	0.12	0.123	O	|	|	|	|	0.63
7.000	0.00	0.12	0.123	O	|	|	|	|	0.63
7.083	0.00	0.12	0.122	O	|	|	|	|	0.63
7.167	0.00	0.12	0.121	O	|	|	|	|	0.62
7.250	0.00	0.12	0.120	O	|	|	|	|	0.62
7.333	0.00	0.12	0.119	O	|	|	|	|	0.61
7.417	0.00	0.12	0.118	O	|	|	|	|	0.61
7.500	0.00	0.12	0.118	O	|	|	|	|	0.61
7.583	0.00	0.12	0.117	O	|	|	|	|	0.60
7.667	0.00	0.12	0.116	O	|	|	|	|	0.60

7.750	0.00	0.12	0.115	O	|	|	|	|	0.59
7.833	0.00	0.12	0.114	O	|	|	|	|	0.59
7.917	0.00	0.12	0.113	O	|	|	|	|	0.59
8.000	0.00	0.12	0.113	O	|	|	|	|	0.58
8.083	0.00	0.12	0.112	O	|	|	|	|	0.58
8.167	0.00	0.12	0.111	O	|	|	|	|	0.57
8.250	0.00	0.12	0.110	O	|	|	|	|	0.57
8.333	0.00	0.12	0.109	O	|	|	|	|	0.56
8.417	0.00	0.12	0.109	O	|	|	|	|	0.56
8.500	0.00	0.12	0.108	O	|	|	|	|	0.56
8.583	0.00	0.12	0.107	O	|	|	|	|	0.55
8.667	0.00	0.12	0.106	O	|	|	|	|	0.55
8.750	0.00	0.12	0.105	O	|	|	|	|	0.54
8.833	0.00	0.12	0.104	O	|	|	|	|	0.54
8.917	0.00	0.12	0.104	O	|	|	|	|	0.54
9.000	0.00	0.12	0.103	O	|	|	|	|	0.53
9.083	0.00	0.12	0.102	O	|	|	|	|	0.53
9.167	0.00	0.12	0.101	O	|	|	|	|	0.52
9.250	0.00	0.12	0.100	O	|	|	|	|	0.52
9.333	0.00	0.12	0.099	O	|	|	|	|	0.52
9.417	0.00	0.12	0.099	O	|	|	|	|	0.51
9.500	0.00	0.12	0.098	O	|	|	|	|	0.51
9.583	0.00	0.12	0.097	O	|	|	|	|	0.50
9.667	0.00	0.12	0.096	O	|	|	|	|	0.50
9.750	0.00	0.12	0.095	O	|	|	|	|	0.50
9.833	0.00	0.12	0.094	O	|	|	|	|	0.49
9.917	0.00	0.12	0.094	O	|	|	|	|	0.49
10.000	0.00	0.12	0.093	O	|	|	|	|	0.48
10.083	0.00	0.12	0.092	O	|	|	|	|	0.48
10.167	0.00	0.12	0.091	O	|	|	|	|	0.47
10.250	0.00	0.12	0.090	O	|	|	|	|	0.47
10.333	0.00	0.12	0.090	O	|	|	|	|	0.47
10.417	0.00	0.12	0.089	O	|	|	|	|	0.46
10.500	0.00	0.12	0.088	O	|	|	|	|	0.46
10.583	0.00	0.12	0.087	O	|	|	|	|	0.45
10.667	0.00	0.12	0.086	O	|	|	|	|	0.45
10.750	0.00	0.12	0.085	O	|	|	|	|	0.45
10.833	0.00	0.12	0.085	O	|	|	|	|	0.44
10.917	0.00	0.12	0.084	O	|	|	|	|	0.44
11.000	0.00	0.12	0.083	O	|	|	|	|	0.43
11.083	0.00	0.12	0.082	O	|	|	|	|	0.43
11.167	0.00	0.12	0.081	O	|	|	|	|	0.43
11.250	0.00	0.12	0.080	O	|	|	|	|	0.42
11.333	0.00	0.12	0.080	O	|	|	|	|	0.42
11.417	0.00	0.12	0.079	O	|	|	|	|	0.41
11.500	0.00	0.12	0.078	O	|	|	|	|	0.41
11.583	0.00	0.12	0.077	O	|	|	|	|	0.41
11.667	0.00	0.12	0.076	O	|	|	|	|	0.40
11.750	0.00	0.12	0.075	O	|	|	|	|	0.40
11.833	0.00	0.12	0.075	O	|	|	|	|	0.39
11.917	0.00	0.12	0.074	O	|	|	|	|	0.39
12.000	0.00	0.12	0.073	O	|	|	|	|	0.38
12.083	0.00	0.11	0.072	O	|	|	|	|	0.38
12.167	0.00	0.11	0.071	O	|	|	|	|	0.38
12.250	0.00	0.11	0.071	O	|	|	|	|	0.37
12.333	0.00	0.11	0.070	O	|	|	|	|	0.37
12.417	0.00	0.11	0.069	O	|	|	|	|	0.36

12.500	0.00	0.11	0.068	O	|	|	|	|	0.36
12.583	0.00	0.11	0.068	O	|	|	|	|	0.36
12.667	0.00	0.11	0.067	O	|	|	|	|	0.35
12.750	0.00	0.10	0.066	O	|	|	|	|	0.35
12.833	0.00	0.10	0.066	O	|	|	|	|	0.34
12.917	0.00	0.10	0.065	O	|	|	|	|	0.34
13.000	0.00	0.10	0.064	O	|	|	|	|	0.34
13.083	0.00	0.10	0.063	O	|	|	|	|	0.33
13.167	0.00	0.10	0.063	O	|	|	|	|	0.33
13.250	0.00	0.10	0.062	O	|	|	|	|	0.33
13.333	0.00	0.10	0.061	O	|	|	|	|	0.32
13.417	0.00	0.10	0.061	O	|	|	|	|	0.32
13.500	0.00	0.09	0.060	O	|	|	|	|	0.32
13.583	0.00	0.09	0.059	O	|	|	|	|	0.31
13.667	0.00	0.09	0.059	O	|	|	|	|	0.31
13.750	0.00	0.09	0.058	O	|	|	|	|	0.31
13.833	0.00	0.09	0.058	O	|	|	|	|	0.30
13.917	0.00	0.09	0.057	O	|	|	|	|	0.30
14.000	0.00	0.09	0.056	O	|	|	|	|	0.30
14.083	0.00	0.09	0.056	O	|	|	|	|	0.29
14.167	0.00	0.09	0.055	O	|	|	|	|	0.29
14.250	0.00	0.09	0.054	O	|	|	|	|	0.29
14.333	0.00	0.09	0.054	O	|	|	|	|	0.28
14.417	0.00	0.08	0.053	O	|	|	|	|	0.28
14.500	0.00	0.08	0.053	O	|	|	|	|	0.28
14.583	0.00	0.08	0.052	O	|	|	|	|	0.27
14.667	0.00	0.08	0.052	O	|	|	|	|	0.27
14.750	0.00	0.08	0.051	O	|	|	|	|	0.27
14.833	0.00	0.08	0.050	O	|	|	|	|	0.27
14.917	0.00	0.08	0.050	O	|	|	|	|	0.26
15.000	0.00	0.08	0.049	O	|	|	|	|	0.26
15.083	0.00	0.08	0.049	O	|	|	|	|	0.26
15.167	0.00	0.08	0.048	O	|	|	|	|	0.25
15.250	0.00	0.08	0.048	O	|	|	|	|	0.25
15.333	0.00	0.07	0.047	O	|	|	|	|	0.25
15.417	0.00	0.07	0.047	O	|	|	|	|	0.25
15.500	0.00	0.07	0.046	O	|	|	|	|	0.24
15.583	0.00	0.07	0.046	O	|	|	|	|	0.24
15.667	0.00	0.07	0.045	O	|	|	|	|	0.24
15.750	0.00	0.07	0.045	O	|	|	|	|	0.24
15.833	0.00	0.07	0.044	O	|	|	|	|	0.23
15.917	0.00	0.07	0.044	O	|	|	|	|	0.23
16.000	0.00	0.07	0.043	O	|	|	|	|	0.23
16.083	0.00	0.07	0.043	O	|	|	|	|	0.23
16.167	0.00	0.07	0.042	O	|	|	|	|	0.22
16.250	0.00	0.07	0.042	O	|	|	|	|	0.22
16.333	0.00	0.07	0.041	O	|	|	|	|	0.22
16.417	0.00	0.06	0.041	O	|	|	|	|	0.22
16.500	0.00	0.06	0.041	O	|	|	|	|	0.21
16.583	0.00	0.06	0.040	O	|	|	|	|	0.21
16.667	0.00	0.06	0.040	O	|	|	|	|	0.21
16.750	0.00	0.06	0.039	O	|	|	|	|	0.21
16.833	0.00	0.06	0.039	O	|	|	|	|	0.20
16.917	0.00	0.06	0.038	O	|	|	|	|	0.20
17.000	0.00	0.06	0.038	O	|	|	|	|	0.20
17.083	0.00	0.06	0.038	O	|	|	|	|	0.20
17.167	0.00	0.06	0.037	O	|	|	|	|	0.20

17.250	0.00	0.06	0.037	O	|	|	|	|	0.19
17.333	0.00	0.06	0.036	O	|	|	|	|	0.19
17.417	0.00	0.06	0.036	O	|	|	|	|	0.19
17.500	0.00	0.06	0.036	O	|	|	|	|	0.19
17.583	0.00	0.06	0.035	O	|	|	|	|	0.19
17.667	0.00	0.06	0.035	O	|	|	|	|	0.18
17.750	0.00	0.05	0.034	O	|	|	|	|	0.18
17.833	0.00	0.05	0.034	O	|	|	|	|	0.18
17.917	0.00	0.05	0.034	O	|	|	|	|	0.18
18.000	0.00	0.05	0.033	O	|	|	|	|	0.18
18.083	0.00	0.05	0.033	O	|	|	|	|	0.17
18.167	0.00	0.05	0.033	O	|	|	|	|	0.17
18.250	0.00	0.05	0.032	O	|	|	|	|	0.17
18.333	0.00	0.05	0.032	O	|	|	|	|	0.17
18.417	0.00	0.05	0.032	O	|	|	|	|	0.17
18.500	0.00	0.05	0.031	O	|	|	|	|	0.16
18.583	0.00	0.05	0.031	O	|	|	|	|	0.16
18.667	0.00	0.05	0.031	O	|	|	|	|	0.16
18.750	0.00	0.05	0.030	O	|	|	|	|	0.16
18.833	0.00	0.05	0.030	O	|	|	|	|	0.16
18.917	0.00	0.05	0.030	O	|	|	|	|	0.16
19.000	0.00	0.05	0.029	O	|	|	|	|	0.15
19.083	0.00	0.05	0.029	O	|	|	|	|	0.15
19.167	0.00	0.05	0.029	O	|	|	|	|	0.15
19.250	0.00	0.04	0.028	O	|	|	|	|	0.15
19.333	0.00	0.04	0.028	O	|	|	|	|	0.15
19.417	0.00	0.04	0.028	O	|	|	|	|	0.15
19.500	0.00	0.04	0.027	O	|	|	|	|	0.14
19.583	0.00	0.04	0.027	O	|	|	|	|	0.14
19.667	0.00	0.04	0.027	O	|	|	|	|	0.14
19.750	0.00	0.04	0.027	O	|	|	|	|	0.14
19.833	0.00	0.04	0.026	O	|	|	|	|	0.14
19.917	0.00	0.04	0.026	O	|	|	|	|	0.14
20.000	0.00	0.04	0.026	O	|	|	|	|	0.14
20.083	0.00	0.04	0.025	O	|	|	|	|	0.13
20.167	0.00	0.04	0.025	O	|	|	|	|	0.13
20.250	0.00	0.04	0.025	O	|	|	|	|	0.13
20.333	0.00	0.04	0.025	O	|	|	|	|	0.13
20.417	0.00	0.04	0.024	O	|	|	|	|	0.13
20.500	0.00	0.04	0.024	O	|	|	|	|	0.13
20.583	0.00	0.04	0.024	O	|	|	|	|	0.13
20.667	0.00	0.04	0.024	O	|	|	|	|	0.12
20.750	0.00	0.04	0.023	O	|	|	|	|	0.12
20.833	0.00	0.04	0.023	O	|	|	|	|	0.12
20.917	0.00	0.04	0.023	O	|	|	|	|	0.12
21.000	0.00	0.04	0.023	O	|	|	|	|	0.12
21.083	0.00	0.04	0.022	O	|	|	|	|	0.12
21.167	0.00	0.03	0.022	O	|	|	|	|	0.12
21.250	0.00	0.03	0.022	O	|	|	|	|	0.11
21.333	0.00	0.03	0.022	O	|	|	|	|	0.11
21.417	0.00	0.03	0.021	O	|	|	|	|	0.11
21.500	0.00	0.03	0.021	O	|	|	|	|	0.11
21.583	0.00	0.03	0.021	O	|	|	|	|	0.11
21.667	0.00	0.03	0.021	O	|	|	|	|	0.11
21.750	0.00	0.03	0.020	O	|	|	|	|	0.11
21.833	0.00	0.03	0.020	O	|	|	|	|	0.11
21.917	0.00	0.03	0.020	O	|	|	|	|	0.11

22.000	0.00	0.03	0.020	O	|	|	|	|	0.10
22.083	0.00	0.03	0.020	O	|	|	|	|	0.10
22.167	0.00	0.03	0.019	O	|	|	|	|	0.10
22.250	0.00	0.03	0.019	O	|	|	|	|	0.10
22.333	0.00	0.03	0.019	O	|	|	|	|	0.10
22.417	0.00	0.03	0.019	O	|	|	|	|	0.10
22.500	0.00	0.03	0.019	O	|	|	|	|	0.10
22.583	0.00	0.03	0.018	O	|	|	|	|	0.10
22.667	0.00	0.03	0.018	O	|	|	|	|	0.10
22.750	0.00	0.03	0.018	O	|	|	|	|	0.09
22.833	0.00	0.03	0.018	O	|	|	|	|	0.09
22.917	0.00	0.03	0.018	O	|	|	|	|	0.09
23.000	0.00	0.03	0.017	O	|	|	|	|	0.09
23.083	0.00	0.03	0.017	O	|	|	|	|	0.09
23.167	0.00	0.03	0.017	O	|	|	|	|	0.09
23.250	0.00	0.03	0.017	O	|	|	|	|	0.09
23.333	0.00	0.03	0.017	O	|	|	|	|	0.09
23.417	0.00	0.03	0.016	O	|	|	|	|	0.09
23.500	0.00	0.03	0.016	O	|	|	|	|	0.09
23.583	0.00	0.03	0.016	O	|	|	|	|	0.08
23.667	0.00	0.03	0.016	O	|	|	|	|	0.08
23.750	0.00	0.02	0.016	O	|	|	|	|	0.08
23.833	0.00	0.02	0.016	O	|	|	|	|	0.08
23.917	0.00	0.02	0.015	O	|	|	|	|	0.08
24.000	0.00	0.02	0.015	O	|	|	|	|	0.08
24.083	0.00	0.02	0.015	O	|	|	|	|	0.08
24.167	0.00	0.02	0.015	O	|	|	|	|	0.08
24.250	0.00	0.02	0.015	O	|	|	|	|	0.08
24.333	0.00	0.02	0.015	O	|	|	|	|	0.08
24.417	0.00	0.02	0.014	O	|	|	|	|	0.08
24.500	0.00	0.02	0.014	O	|	|	|	|	0.08
24.583	0.00	0.02	0.014	O	|	|	|	|	0.07
24.667	0.00	0.02	0.014	O	|	|	|	|	0.07
24.750	0.00	0.02	0.014	O	|	|	|	|	0.07
24.833	0.00	0.02	0.014	O	|	|	|	|	0.07
24.917	0.00	0.02	0.014	O	|	|	|	|	0.07
25.000	0.00	0.02	0.013	O	|	|	|	|	0.07
25.083	0.00	0.02	0.013	O	|	|	|	|	0.07
25.167	0.00	0.02	0.013	O	|	|	|	|	0.07
25.250	0.00	0.02	0.013	O	|	|	|	|	0.07
25.333	0.00	0.02	0.013	O	|	|	|	|	0.07
25.417	0.00	0.02	0.013	O	|	|	|	|	0.07
25.500	0.00	0.02	0.013	O	|	|	|	|	0.07
25.583	0.00	0.02	0.012	O	|	|	|	|	0.07
25.667	0.00	0.02	0.012	O	|	|	|	|	0.06
25.750	0.00	0.02	0.012	O	|	|	|	|	0.06
25.833	0.00	0.02	0.012	O	|	|	|	|	0.06
25.917	0.00	0.02	0.012	O	|	|	|	|	0.06
26.000	0.00	0.02	0.012	O	|	|	|	|	0.06
26.083	0.00	0.02	0.012	O	|	|	|	|	0.06
26.167	0.00	0.02	0.012	O	|	|	|	|	0.06
26.250	0.00	0.02	0.011	O	|	|	|	|	0.06
26.333	0.00	0.02	0.011	O	|	|	|	|	0.06
26.417	0.00	0.02	0.011	O	|	|	|	|	0.06
26.500	0.00	0.02	0.011	O	|	|	|	|	0.06
26.583	0.00	0.02	0.011	O	|	|	|	|	0.06
26.667	0.00	0.02	0.011	O	|	|	|	|	0.06

26.750	0.00	0.02	0.011	O	|	|	|	|	0.06
26.833	0.00	0.02	0.011	O	|	|	|	|	0.06
26.917	0.00	0.02	0.010	O	|	|	|	|	0.05
27.000	0.00	0.02	0.010	O	|	|	|	|	0.05
27.083	0.00	0.02	0.010	O	|	|	|	|	0.05
27.167	0.00	0.02	0.010	O	|	|	|	|	0.05
27.250	0.00	0.02	0.010	O	|	|	|	|	0.05
27.333	0.00	0.02	0.010	O	|	|	|	|	0.05
27.417	0.00	0.02	0.010	O	|	|	|	|	0.05
27.500	0.00	0.02	0.010	O	|	|	|	|	0.05
27.583	0.00	0.02	0.010	O	|	|	|	|	0.05
27.667	0.00	0.01	0.009	O	|	|	|	|	0.05
27.750	0.00	0.01	0.009	O	|	|	|	|	0.05
27.833	0.00	0.01	0.009	O	|	|	|	|	0.05
27.917	0.00	0.01	0.009	O	|	|	|	|	0.05
28.000	0.00	0.01	0.009	O	|	|	|	|	0.05
28.083	0.00	0.01	0.009	O	|	|	|	|	0.05
28.167	0.00	0.01	0.009	O	|	|	|	|	0.05
28.250	0.00	0.01	0.009	O	|	|	|	|	0.05
28.333	0.00	0.01	0.009	O	|	|	|	|	0.05
28.417	0.00	0.01	0.009	O	|	|	|	|	0.05
28.500	0.00	0.01	0.008	O	|	|	|	|	0.04
28.583	0.00	0.01	0.008	O	|	|	|	|	0.04
28.667	0.00	0.01	0.008	O	|	|	|	|	0.04
28.750	0.00	0.01	0.008	O	|	|	|	|	0.04
28.833	0.00	0.01	0.008	O	|	|	|	|	0.04
28.917	0.00	0.01	0.008	O	|	|	|	|	0.04
29.000	0.00	0.01	0.008	O	|	|	|	|	0.04
29.083	0.00	0.01	0.008	O	|	|	|	|	0.04
29.167	0.00	0.01	0.008	O	|	|	|	|	0.04
29.250	0.00	0.01	0.008	O	|	|	|	|	0.04
29.333	0.00	0.01	0.008	O	|	|	|	|	0.04
29.417	0.00	0.01	0.008	O	|	|	|	|	0.04
29.500	0.00	0.01	0.007	O	|	|	|	|	0.04
29.583	0.00	0.01	0.007	O	|	|	|	|	0.04
29.667	0.00	0.01	0.007	O	|	|	|	|	0.04
29.750	0.00	0.01	0.007	O	|	|	|	|	0.04
29.833	0.00	0.01	0.007	O	|	|	|	|	0.04
29.917	0.00	0.01	0.007	O	|	|	|	|	0.04
30.000	0.00	0.01	0.007	O	|	|	|	|	0.04
30.083	0.00	0.01	0.007	O	|	|	|	|	0.04
30.167	0.00	0.01	0.007	O	|	|	|	|	0.04
30.250	0.00	0.01	0.007	O	|	|	|	|	0.04
30.333	0.00	0.01	0.007	O	|	|	|	|	0.04
30.417	0.00	0.01	0.007	O	|	|	|	|	0.03
30.500	0.00	0.01	0.007	O	|	|	|	|	0.03
30.583	0.00	0.01	0.006	O	|	|	|	|	0.03
30.667	0.00	0.01	0.006	O	|	|	|	|	0.03
30.750	0.00	0.01	0.006	O	|	|	|	|	0.03
30.833	0.00	0.01	0.006	O	|	|	|	|	0.03
30.917	0.00	0.01	0.006	O	|	|	|	|	0.03
31.000	0.00	0.01	0.006	O	|	|	|	|	0.03
31.083	0.00	0.01	0.006	O	|	|	|	|	0.03
31.167	0.00	0.01	0.006	O	|	|	|	|	0.03
31.250	0.00	0.01	0.006	O	|	|	|	|	0.03
31.333	0.00	0.01	0.006	O	|	|	|	|	0.03
31.417	0.00	0.01	0.006	O	|	|	|	|	0.03

31.500	0.00	0.01	0.006	O	|	|	|	|	0.03
31.583	0.00	0.01	0.006	O	|	|	|	|	0.03
31.667	0.00	0.01	0.006	O	|	|	|	|	0.03
31.750	0.00	0.01	0.006	O	|	|	|	|	0.03
31.833	0.00	0.01	0.005	O	|	|	|	|	0.03
31.917	0.00	0.01	0.005	O	|	|	|	|	0.03
32.000	0.00	0.01	0.005	O	|	|	|	|	0.03
32.083	0.00	0.01	0.005	O	|	|	|	|	0.03
32.167	0.00	0.01	0.005	O	|	|	|	|	0.03
32.250	0.00	0.01	0.005	O	|	|	|	|	0.03
32.333	0.00	0.01	0.005	O	|	|	|	|	0.03
32.417	0.00	0.01	0.005	O	|	|	|	|	0.03
32.500	0.00	0.01	0.005	O	|	|	|	|	0.03
32.583	0.00	0.01	0.005	O	|	|	|	|	0.03
32.667	0.00	0.01	0.005	O	|	|	|	|	0.03
32.750	0.00	0.01	0.005	O	|	|	|	|	0.03
32.833	0.00	0.01	0.005	O	|	|	|	|	0.03
32.917	0.00	0.01	0.005	O	|	|	|	|	0.03
33.000	0.00	0.01	0.005	O	|	|	|	|	0.02
33.083	0.00	0.01	0.005	O	|	|	|	|	0.02
33.167	0.00	0.01	0.005	O	|	|	|	|	0.02
33.250	0.00	0.01	0.005	O	|	|	|	|	0.02
33.333	0.00	0.01	0.005	O	|	|	|	|	0.02
33.417	0.00	0.01	0.004	O	|	|	|	|	0.02
33.500	0.00	0.01	0.004	O	|	|	|	|	0.02
33.583	0.00	0.01	0.004	O	|	|	|	|	0.02
33.667	0.00	0.01	0.004	O	|	|	|	|	0.02
33.750	0.00	0.01	0.004	O	|	|	|	|	0.02
33.833	0.00	0.01	0.004	O	|	|	|	|	0.02
33.917	0.00	0.01	0.004	O	|	|	|	|	0.02
34.000	0.00	0.01	0.004	O	|	|	|	|	0.02
34.083	0.00	0.01	0.004	O	|	|	|	|	0.02
34.167	0.00	0.01	0.004	O	|	|	|	|	0.02
34.250	0.00	0.01	0.004	O	|	|	|	|	0.02
34.333	0.00	0.01	0.004	O	|	|	|	|	0.02
34.417	0.00	0.01	0.004	O	|	|	|	|	0.02
34.500	0.00	0.01	0.004	O	|	|	|	|	0.02
34.583	0.00	0.01	0.004	O	|	|	|	|	0.02
34.667	0.00	0.01	0.004	O	|	|	|	|	0.02
34.750	0.00	0.01	0.004	O	|	|	|	|	0.02
34.833	0.00	0.01	0.004	O	|	|	|	|	0.02
34.917	0.00	0.01	0.004	O	|	|	|	|	0.02
35.000	0.00	0.01	0.004	O	|	|	|	|	0.02
35.083	0.00	0.01	0.004	O	|	|	|	|	0.02
35.167	0.00	0.01	0.004	O	|	|	|	|	0.02
35.250	0.00	0.01	0.004	O	|	|	|	|	0.02
35.333	0.00	0.01	0.003	O	|	|	|	|	0.02
35.417	0.00	0.01	0.003	O	|	|	|	|	0.02
35.500	0.00	0.01	0.003	O	|	|	|	|	0.02
35.583	0.00	0.01	0.003	O	|	|	|	|	0.02
35.667	0.00	0.01	0.003	O	|	|	|	|	0.02
35.750	0.00	0.01	0.003	O	|	|	|	|	0.02
35.833	0.00	0.01	0.003	O	|	|	|	|	0.02
35.917	0.00	0.01	0.003	O	|	|	|	|	0.02
36.000	0.00	0.01	0.003	O	|	|	|	|	0.02
36.083	0.00	0.00	0.003	O	|	|	|	|	0.02
36.167	0.00	0.00	0.003	O	|	|	|	|	0.02

36.250	0.00	0.00	0.003	O					0.02
36.333	0.00	0.00	0.003	O					0.02
36.417	0.00	0.00	0.003	O					0.02
36.500	0.00	0.00	0.003	O					0.02
36.583	0.00	0.00	0.003	O					0.02
36.667	0.00	0.00	0.003	O					0.02
36.750	0.00	0.00	0.003	O					0.02
36.833	0.00	0.00	0.003	O					0.02
36.917	0.00	0.00	0.003	O					0.01
37.000	0.00	0.00	0.003	O					0.01
37.083	0.00	0.00	0.003	O					0.01
37.167	0.00	0.00	0.003	O					0.01
37.250	0.00	0.00	0.003	O					0.01
37.333	0.00	0.00	0.003	O					0.01
37.417	0.00	0.00	0.003	O					0.01
37.500	0.00	0.00	0.003	O					0.01
37.583	0.00	0.00	0.003	O					0.01
37.667	0.00	0.00	0.003	O					0.01
37.750	0.00	0.00	0.003	O					0.01
37.833	0.00	0.00	0.003	O					0.01
37.917	0.00	0.00	0.002	O					0.01
38.000	0.00	0.00	0.002	O					0.01
38.083	0.00	0.00	0.002	O					0.01
38.167	0.00	0.00	0.002	O					0.01
38.250	0.00	0.00	0.002	O					0.01
38.333	0.00	0.00	0.002	O					0.01
38.417	0.00	0.00	0.002	O					0.01
38.500	0.00	0.00	0.002	O					0.01
38.583	0.00	0.00	0.002	O					0.01
38.667	0.00	0.00	0.002	O					0.01
38.750	0.00	0.00	0.002	O					0.01
38.833	0.00	0.00	0.002	O					0.01
38.917	0.00	0.00	0.002	O					0.01
39.000	0.00	0.00	0.002	O					0.01
39.083	0.00	0.00	0.002	O					0.01
39.167	0.00	0.00	0.002	O					0.01
39.250	0.00	0.00	0.002	O					0.01
39.333	0.00	0.00	0.002	O					0.01
39.417	0.00	0.00	0.002	O					0.01
39.500	0.00	0.00	0.002	O					0.01
39.583	0.00	0.00	0.002	O					0.01
39.667	0.00	0.00	0.002	O					0.01
39.750	0.00	0.00	0.002	O					0.01
39.833	0.00	0.00	0.002	O					0.01
39.917	0.00	0.00	0.002	O					0.01
40.000	0.00	0.00	0.002	O					0.01
40.083	0.00	0.00	0.002	O					0.01
40.167	0.00	0.00	0.002	O					0.01
40.250	0.00	0.00	0.002	O					0.01
40.333	0.00	0.00	0.002	O					0.01
40.417	0.00	0.00	0.002	O					0.01
40.500	0.00	0.00	0.002	O					0.01
40.583	0.00	0.00	0.002	O					0.01
40.667	0.00	0.00	0.002	O					0.01
40.750	0.00	0.00	0.002	O					0.01
40.833	0.00	0.00	0.002	O					0.01
40.917	0.00	0.00	0.002	O					0.01

41.000	0.00	0.00	0.002	O	|	|	|	|	0.01
41.083	0.00	0.00	0.002	O	|	|	|	|	0.01
41.167	0.00	0.00	0.002	O	|	|	|	|	0.01
41.250	0.00	0.00	0.002	O	|	|	|	|	0.01
41.333	0.00	0.00	0.002	O	|	|	|	|	0.01
41.417	0.00	0.00	0.002	O	|	|	|	|	0.01
41.500	0.00	0.00	0.002	O	|	|	|	|	0.01
41.583	0.00	0.00	0.002	O	|	|	|	|	0.01
41.667	0.00	0.00	0.002	O	|	|	|	|	0.01
41.750	0.00	0.00	0.002	O	|	|	|	|	0.01
41.833	0.00	0.00	0.001	O	|	|	|	|	0.01
41.917	0.00	0.00	0.001	O	|	|	|	|	0.01
42.000	0.00	0.00	0.001	O	|	|	|	|	0.01
42.083	0.00	0.00	0.001	O	|	|	|	|	0.01
42.167	0.00	0.00	0.001	O	|	|	|	|	0.01
42.250	0.00	0.00	0.001	O	|	|	|	|	0.01
42.333	0.00	0.00	0.001	O	|	|	|	|	0.01
42.417	0.00	0.00	0.001	O	|	|	|	|	0.01
42.500	0.00	0.00	0.001	O	|	|	|	|	0.01
42.583	0.00	0.00	0.001	O	|	|	|	|	0.01
42.667	0.00	0.00	0.001	O	|	|	|	|	0.01
42.750	0.00	0.00	0.001	O	|	|	|	|	0.01
42.833	0.00	0.00	0.001	O	|	|	|	|	0.01
42.917	0.00	0.00	0.001	O	|	|	|	|	0.01
43.000	0.00	0.00	0.001	O	|	|	|	|	0.01
43.083	0.00	0.00	0.001	O	|	|	|	|	0.01
43.167	0.00	0.00	0.001	O	|	|	|	|	0.01
43.250	0.00	0.00	0.001	O	|	|	|	|	0.01
43.333	0.00	0.00	0.001	O	|	|	|	|	0.01
43.417	0.00	0.00	0.001	O	|	|	|	|	0.01
43.500	0.00	0.00	0.001	O	|	|	|	|	0.01
43.583	0.00	0.00	0.001	O	|	|	|	|	0.01
43.667	0.00	0.00	0.001	O	|	|	|	|	0.01
43.750	0.00	0.00	0.001	O	|	|	|	|	0.01
43.833	0.00	0.00	0.001	O	|	|	|	|	0.01
43.917	0.00	0.00	0.001	O	|	|	|	|	0.01
44.000	0.00	0.00	0.001	O	|	|	|	|	0.01
44.083	0.00	0.00	0.001	O	|	|	|	|	0.01
44.167	0.00	0.00	0.001	O	|	|	|	|	0.01
44.250	0.00	0.00	0.001	O	|	|	|	|	0.01
44.333	0.00	0.00	0.001	O	|	|	|	|	0.01
44.417	0.00	0.00	0.001	O	|	|	|	|	0.01
44.500	0.00	0.00	0.001	O	|	|	|	|	0.01
44.583	0.00	0.00	0.001	O	|	|	|	|	0.01
44.667	0.00	0.00	0.001	O	|	|	|	|	0.01
44.750	0.00	0.00	0.001	O	|	|	|	|	0.01
44.833	0.00	0.00	0.001	O	|	|	|	|	0.01
44.917	0.00	0.00	0.001	O	|	|	|	|	0.01
45.000	0.00	0.00	0.001	O	|	|	|	|	0.01
45.083	0.00	0.00	0.001	O	|	|	|	|	0.01
45.167	0.00	0.00	0.001	O	|	|	|	|	0.01
45.250	0.00	0.00	0.001	O	|	|	|	|	0.01
45.333	0.00	0.00	0.001	O	|	|	|	|	0.00
45.417	0.00	0.00	0.001	O	|	|	|	|	0.00
45.500	0.00	0.00	0.001	O	|	|	|	|	0.00
45.583	0.00	0.00	0.001	O	|	|	|	|	0.00
45.667	0.00	0.00	0.001	O	|	|	|	|	0.00

45.750	0.00	0.00	0.001	O	|	|	|	|	0.00
45.833	0.00	0.00	0.001	O	|	|	|	|	0.00
45.917	0.00	0.00	0.001	O	|	|	|	|	0.00
46.000	0.00	0.00	0.001	O	|	|	|	|	0.00
46.083	0.00	0.00	0.001	O	|	|	|	|	0.00
46.167	0.00	0.00	0.001	O	|	|	|	|	0.00
46.250	0.00	0.00	0.001	O	|	|	|	|	0.00
46.333	0.00	0.00	0.001	O	|	|	|	|	0.00
46.417	0.00	0.00	0.001	O	|	|	|	|	0.00
46.500	0.00	0.00	0.001	O	|	|	|	|	0.00
46.583	0.00	0.00	0.001	O	|	|	|	|	0.00
46.667	0.00	0.00	0.001	O	|	|	|	|	0.00
46.750	0.00	0.00	0.001	O	|	|	|	|	0.00
46.833	0.00	0.00	0.001	O	|	|	|	|	0.00
46.917	0.00	0.00	0.001	O	|	|	|	|	0.00
47.000	0.00	0.00	0.001	O	|	|	|	|	0.00
47.083	0.00	0.00	0.001	O	|	|	|	|	0.00
47.167	0.00	0.00	0.001	O	|	|	|	|	0.00
47.250	0.00	0.00	0.001	O	|	|	|	|	0.00
47.333	0.00	0.00	0.001	O	|	|	|	|	0.00
47.417	0.00	0.00	0.001	O	|	|	|	|	0.00
47.500	0.00	0.00	0.001	O	|	|	|	|	0.00
47.583	0.00	0.00	0.001	O	|	|	|	|	0.00
47.667	0.00	0.00	0.001	O	|	|	|	|	0.00
47.750	0.00	0.00	0.001	O	|	|	|	|	0.00
47.833	0.00	0.00	0.001	O	|	|	|	|	0.00
47.917	0.00	0.00	0.001	O	|	|	|	|	0.00
48.000	0.00	0.00	0.001	O	|	|	|	|	0.00
48.083	0.00	0.00	0.001	O	|	|	|	|	0.00
48.167	0.00	0.00	0.001	O	|	|	|	|	0.00
48.250	0.00	0.00	0.001	O	|	|	|	|	0.00
48.333	0.00	0.00	0.001	O	|	|	|	|	0.00
48.417	0.00	0.00	0.001	O	|	|	|	|	0.00

```
****************************HYDROGRAPH DATA***************************
            Number of intervals =   581
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        0.120 (CFS)
            Total volume =       0.186 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------


JN3504
ROUTING
Q2-24HR

-----------------------------------------------------------------


Program License Serial Number 5016

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q2d1r242.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =   296
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        1.310 (CFS)
            Total volume =       0.798 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------
Total number of inflow hydrograph intervals = 296
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------
-----------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-----------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	0.3	0.65	0.98	1.31	Depth (Ft.)
0.083	0.01	0.00	0.000	O	|	|	|	|	0.00
0.167	0.04	0.00	0.000	OI	|	|	|	|	0.00
0.250	0.06	0.00	0.001	OI	|	|	|	|	0.00
0.333	0.07	0.00	0.001	OI	|	|	|	|	0.01
0.417	0.10	0.00	0.002	O I	|	|	|	|	0.01
0.500	0.11	0.00	0.002	O I	|	|	|	|	0.01
0.583	0.11	0.00	0.003	O I	|	|	|	|	0.02
0.667	0.11	0.01	0.004	O I	|	|	|	|	0.02
0.750	0.12	0.01	0.004	O I	|	|	|	|	0.02
0.833	0.12	0.01	0.005	O I	|	|	|	|	0.03
0.917	0.14	0.01	0.006	O I	|	|	|	|	0.03
1.000	0.15	0.01	0.007	O I	|	|	|	|	0.04
1.083	0.15	0.01	0.008	O I	|	|	|	|	0.04
1.167	0.13	0.01	0.009	O I	|	|	|	|	0.05
1.250	0.12	0.02	0.010	O I	|	|	|	|	0.05
1.333	0.12	0.02	0.010	O I	|	|	|	|	0.05
1.417	0.12	0.02	0.011	O I	|	|	|	|	0.06
1.500	0.12	0.02	0.012	O I	|	|	|	|	0.06
1.583	0.12	0.02	0.012	O I	|	|	|	|	0.06
1.667	0.12	0.02	0.013	O I	|	|	|	|	0.07
1.750	0.12	0.02	0.014	O I	|	|	|	|	0.07
1.833	0.12	0.02	0.014	O I	|	|	|	|	0.08
1.917	0.14	0.02	0.015	O I	|	|	|	|	0.08
2.000	0.15	0.02	0.016	O I	|	|	|	|	0.08
2.083	0.15	0.03	0.017	O I	|	|	|	|	0.09
2.167	0.15	0.03	0.018	O I	|	|	|	|	0.09
2.250	0.15	0.03	0.018	O I	|	|	|	|	0.10
2.333	0.15	0.03	0.019	O I	|	|	|	|	0.10
2.417	0.15	0.03	0.020	O I	|	|	|	|	0.11
2.500	0.15	0.03	0.021	O I	|	|	|	|	0.11
2.583	0.16	0.03	0.022	O I	|	|	|	|	0.11
2.667	0.18	0.04	0.023	O I	|	|	|	|	0.12
2.750	0.19	0.04	0.024	O I	|	|	|	|	0.12
2.833	0.19	0.04	0.025	O I	|	|	|	|	0.13
2.917	0.19	0.04	0.026	O I	|	|	|	|	0.14

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3.000    0.19    0.04      0.027  |O  I   |        |        |        |      0.14
3.083    0.19    0.04      0.028  |O  I   |        |        |        |      0.15
3.167    0.19    0.05      0.029  |O  I   |        |        |        |      0.15
3.250    0.19    0.05      0.030  |O  I   |        |        |        |      0.16
3.333    0.19    0.05      0.031  |O  I   |        |        |        |      0.16
3.417    0.19    0.05      0.032  |O  I   |        |        |        |      0.17
3.500    0.19    0.05      0.033  |O  I   |        |        |        |      0.17
3.583    0.19    0.05      0.034  |O  I   |        |        |        |      0.18
3.667    0.19    0.05      0.035  |O  I   |        |        |        |      0.18
3.750    0.19    0.06      0.036  |O  I   |        |        |        |      0.19
3.833    0.20    0.06      0.037  |O  I   |        |        |        |      0.19
3.917    0.21    0.06      0.038  |O   I  |        |        |        |      0.20
4.000    0.22    0.06      0.039  |O   I  |        |        |        |      0.20
4.083    0.23    0.06      0.040  |O   I  |        |        |        |      0.21
4.167    0.23    0.06      0.041  |O   I  |        |        |        |      0.22
4.250    0.23    0.07      0.042  |O   I  |        |        |        |      0.22
4.333    0.23    0.07      0.043  |O   I  |        |        |        |      0.23
4.417    0.25    0.07      0.045  |O    I |        |        |        |      0.23
4.500    0.26    0.07      0.046  |O    I |        |        |        |      0.24
4.583    0.27    0.07      0.047  |O    I |        |        |        |      0.25
4.667    0.27    0.08      0.048  |O    I |        |        |        |      0.25
4.750    0.27    0.08      0.050  |O    I |        |        |        |      0.26
4.833    0.27    0.08      0.051  |O    I |        |        |        |      0.27
4.917    0.29    0.08      0.052  | O    I|        |        |        |      0.28
5.000    0.30    0.09      0.054  | O    I|        |        |        |      0.28
5.083    0.30    0.09      0.055  | O    I|        |        |        |      0.29
5.167    0.26    0.09      0.057  | O   I |        |        |        |      0.30
5.250    0.25    0.09      0.058  | O  I  |        |        |        |      0.30
5.333    0.24    0.09      0.059  | O  I  |        |        |        |      0.31
5.417    0.26    0.09      0.060  | O   I |        |        |        |      0.32
5.500    0.26    0.10      0.061  | O   I |        |        |        |      0.32
5.583    0.27    0.10      0.062  | O   I |        |        |        |      0.33
5.667    0.29    0.10      0.064  | O    I|        |        |        |      0.33
5.750    0.30    0.10      0.065  | O    I|        |        |        |      0.34
5.833    0.31    0.10      0.066  | O    I|        |        |        |      0.35
5.917    0.31    0.11      0.068  | O    I|        |        |        |      0.36
6.000    0.31    0.11      0.069  | O    I|        |        |        |      0.36
6.083    0.31    0.11      0.070  | O    I|        |        |        |      0.37
6.167    0.33    0.11      0.072  | O     I        |        |        |      0.38
6.250    0.34    0.12      0.073  | O     I        |        |        |      0.39
6.333    0.34    0.12      0.075  | O     I        |        |        |      0.39
6.417    0.35    0.12      0.076  | O     I        |        |        |      0.40
6.500    0.35    0.12      0.078  | O     I        |        |        |      0.41
6.583    0.35    0.12      0.080  | O     I        |        |        |      0.42
6.667    0.37    0.12      0.081  | O     |I       |        |        |      0.43
6.750    0.38    0.12      0.083  | O     |I       |        |        |      0.43
6.833    0.38    0.12      0.085  | O     |I       |        |        |      0.44
6.917    0.38    0.12      0.087  | O     |I       |        |        |      0.45
7.000    0.39    0.12      0.088  | O     |I       |        |        |      0.46
7.083    0.39    0.12      0.090  | O     |I       |        |        |      0.47
7.167    0.39    0.12      0.092  | O     |I       |        |        |      0.48
7.250    0.39    0.12      0.094  | O     |I       |        |        |      0.49
7.333    0.39    0.12      0.096  | O     |I       |        |        |      0.50
7.417    0.41    0.12      0.098  | O     |I       |        |        |      0.51
7.500    0.42    0.12      0.100  | O     | I      |        |        |      0.52
7.583    0.42    0.12      0.102  | O     | I      |        |        |      0.53
7.667    0.45    0.12      0.104  | O     | I      |        |        |      0.54
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7.750	0.46	0.12	0.106	O	I			0.55
7.833	0.46	0.12	0.109	O	I			0.56
7.917	0.48	0.12	0.111	O	I			0.57
8.000	0.49	0.12	0.114	O	I			0.59
8.083	0.51	0.12	0.116	O	I			0.60
8.167	0.54	0.12	0.119	O	I			0.61
8.250	0.56	0.12	0.122	O	I			0.63
8.333	0.57	0.12	0.125	O	I			0.64
8.417	0.58	0.12	0.128	O	I			0.66
8.500	0.58	0.12	0.131	O	I			0.67
8.583	0.58	0.12	0.134	O	I			0.69
8.667	0.60	0.12	0.138	O	I			0.70
8.750	0.61	0.12	0.141	O	I			0.72
8.833	0.62	0.12	0.144	O	I			0.74
8.917	0.64	0.12	0.148	O	I			0.76
9.000	0.65	0.12	0.152	O	I			0.77
9.083	0.66	0.12	0.155	O	I			0.79
9.167	0.70	0.12	0.159	O	I			0.81
9.250	0.72	0.12	0.163	O	I			0.83
9.333	0.73	0.12	0.167	O	I			0.85
9.417	0.75	0.12	0.172	O	I			0.87
9.500	0.76	0.12	0.176	O	I			0.89
9.583	0.77	0.12	0.180	O	I			0.91
9.667	0.79	0.12	0.185	O	I			0.93
9.750	0.80	0.12	0.190	O	I			0.96
9.833	0.81	0.12	0.194	O	I			0.98
9.917	0.83	0.12	0.199	O	I			1.00
10.000	0.84	0.14	0.204	O	I			1.02
10.083	0.82	0.15	0.209	O	I			1.04
10.167	0.70	0.17	0.213	O	I			1.06
10.250	0.63	0.18	0.216	O	I			1.08
10.333	0.60	0.19	0.219	O	I			1.09
10.417	0.59	0.20	0.222	O	I			1.10
10.500	0.58	0.21	0.225	O	I			1.12
10.583	0.60	0.22	0.227	O	I			1.13
10.667	0.69	0.23	0.230	O	I			1.14
10.750	0.74	0.24	0.234	O	I			1.16
10.833	0.76	0.25	0.237	O	I			1.17
10.917	0.77	0.26	0.240	O	I			1.19
11.000	0.77	0.27	0.244	O	I			1.20
11.083	0.77	0.27	0.247	O	I			1.22
11.167	0.75	0.28	0.251	O	I			1.23
11.250	0.74	0.28	0.254	O	I			1.25
11.333	0.74	0.28	0.257	O	I			1.26
11.417	0.74	0.28	0.260	O	I			1.27
11.500	0.73	0.29	0.263	O	I			1.29
11.583	0.73	0.29	0.266	O	I			1.30
11.667	0.69	0.29	0.269	O	I			1.31
11.750	0.67	0.29	0.272	O	I			1.32
11.833	0.67	0.30	0.274	O	I			1.33
11.917	0.68	0.30	0.277	O	I			1.35
12.000	0.69	0.30	0.280	O	I			1.36
12.083	0.72	0.30	0.282	O	I			1.37
12.167	0.85	0.31	0.286	O	I			1.38
12.250	0.91	0.31	0.290	O	I			1.40
12.333	0.94	0.31	0.294	O	I			1.42
12.417	0.98	0.32	0.298	O	I			1.44

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12.500    0.99    0.32      0.303  |      O|       |       I       |     1.46
12.583    1.00    0.33      0.308  |      O|       |       I       |     1.48
12.667    1.04    0.33      0.312  |       O       |       |I      |     1.50
12.750    1.07    0.33      0.317  |       O       |       | I     |     1.52
12.833    1.08    0.34      0.322  |       O       |       | I     |     1.54
12.917    1.10    0.34      0.328  |       O       |       | I     |     1.56
13.000    1.11    0.35      0.333  |       O       |       |  I    |     1.59
13.083    1.13    0.35      0.338  |       O       |       |  I    |     1.61
13.167    1.23    0.35      0.344  |       O       |       |    I  |     1.63
13.250    1.28    0.36      0.350  |       O       |       |      I|     1.66
13.333    1.30    0.36      0.356  |       O       |       |      I|     1.68
13.417    1.31    0.37      0.363  |       O       |       |      I|     1.71
13.500    1.31    0.37      0.369  |       |O      |       |       I     1.74
13.583    1.27    0.37      0.376  |       |O      |       |      I|     1.76
13.667    1.07    0.38      0.381  |       |O      |       | I     |     1.78
13.750    0.97    0.38      0.385  |       |O      |      I|       |     1.80
13.833    0.93    0.38      0.389  |       |O      |     I |       |     1.82
13.917    0.90    0.38      0.393  |       |O      |     I |       |     1.83
14.000    0.90    0.39      0.397  |       |O      |    I  |       |     1.85
14.083    0.91    0.39      0.400  |       |O      |     I |       |     1.86
14.167    0.98    0.39      0.404  |       |O      |      I|       |     1.88
14.250    1.01    0.39      0.408  |       |O      |       I       |     1.89
14.333    1.03    0.40      0.412  |       |O      |       |I      |     1.91
14.417    1.02    0.40      0.417  |       |O      |       I       |     1.93
14.500    1.01    0.40      0.421  |       |O      |       I       |     1.95
14.583    1.01    0.40      0.425  |       |O      |       I       |     1.96
14.667    1.00    0.41      0.429  |       |O      |       I       |     1.98
14.750    1.00    0.41      0.433  |       | O     |       I       |     2.00
14.833    1.00    0.41      0.437  |       | O     |       I       |     2.01
14.917    0.98    0.41      0.441  |       | O     |       I       |     2.03
15.000    0.97    0.41      0.445  |       | O     |      I|       |     2.04
15.083    0.97    0.42      0.449  |       | O     |      I|       |     2.06
15.167    0.95    0.42      0.453  |       | O     |      I|       |     2.07
15.250    0.93    0.42      0.456  |       | O     |     I |       |     2.08
15.333    0.93    0.42      0.460  |       | O     |     I |       |     2.10
15.417    0.91    0.42      0.463  |       | O     |     I |       |     2.11
15.500    0.90    0.42      0.466  |       | O     |    I  |       |     2.12
15.583    0.88    0.43      0.470  |       | O     |    I  |       |     2.13
15.667    0.80    0.43      0.473  |       | O     |  I    |       |     2.14
15.750    0.76    0.43      0.475  |       | O     | I     |       |     2.15
15.833    0.75    0.43      0.477  |       | O     | I     |       |     2.16
15.917    0.74    0.43      0.479  |       | O     | I     |       |     2.17
16.000    0.74    0.43      0.482  |       | O     |I      |       |     2.18
16.083    0.68    0.43      0.483  |       | O     I       |       |     2.19
16.167    0.41    0.43      0.484  |       |IO     |       |       |     2.19
16.250    0.26    0.43      0.484  |     I | O     |       |       |     2.19
16.333    0.21    0.43      0.482  |    I  | O     |       |       |     2.18
16.417    0.18    0.43      0.481  |   I   | O     |       |       |     2.17
16.500    0.16    0.43      0.479  |   I   | O     |       |       |     2.17
16.583    0.16    0.43      0.477  |  I    | O     |       |       |     2.16
16.667    0.14    0.43      0.475  |  I    | O     |       |       |     2.15
16.750    0.12    0.43      0.473  |  I    | O     |       |       |     2.15
16.833    0.12    0.43      0.471  | I     | O     |       |       |     2.14
16.917    0.12    0.43      0.469  | I     | O     |       |       |     2.13
17.000    0.12    0.42      0.467  | I     | O     |       |       |     2.12
17.083    0.12    0.42      0.464  |  I    | O     |       |       |     2.11
17.167    0.16    0.42      0.463  |  I    | O     |       |       |     2.11
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17.250    0.18    0.42      0.461  |   I   | O     |       |       |     2.10
17.333    0.19    0.42      0.459  |   I   | O     |       |       |     2.09
17.417    0.19    0.42      0.458  |   I   | O     |       |       |     2.09
17.500    0.19    0.42      0.456  |   I   | O     |       |       |     2.08
17.583    0.19    0.42      0.454  |   I   | O     |       |       |     2.08
17.667    0.19    0.42      0.453  |   I   | O     |       |       |     2.07
17.750    0.19    0.42      0.451  |   I   | O     |       |       |     2.06
17.833    0.19    0.42      0.450  |   I   | O     |       |       |     2.06
17.917    0.17    0.42      0.448  |   I   | O     |       |       |     2.05
18.000    0.16    0.42      0.446  |  I    | O     |       |       |     2.05
18.083    0.16    0.41      0.445  |  I    | O     |       |       |     2.04
18.167    0.16    0.41      0.443  |  I    | O     |       |       |     2.03
18.250    0.16    0.41      0.441  |  I    | O     |       |       |     2.03
18.333    0.15    0.41      0.439  |  I    | O     |       |       |     2.02
18.417    0.15    0.41      0.438  |  I    | O     |       |       |     2.01
18.500    0.15    0.41      0.436  |  I    | O     |       |       |     2.01
18.583    0.15    0.41      0.434  |  I    | O     |       |       |     2.00
18.667    0.13    0.41      0.432  |  I    |O      |       |       |     1.99
18.750    0.12    0.41      0.430  |  I    |O      |       |       |     1.98
18.833    0.12    0.41      0.428  | I     |O      |       |       |     1.98
18.917    0.10    0.41      0.426  | I     |O      |       |       |     1.97
19.000    0.09    0.40      0.424  | I     |O      |       |       |     1.96
19.083    0.08    0.40      0.422  | I     |O      |       |       |     1.95
19.167    0.10    0.40      0.420  | I     |O      |       |       |     1.94
19.250    0.11    0.40      0.418  | I     |O      |       |       |     1.93
19.333    0.12    0.40      0.416  | I     |O      |       |       |     1.93
19.417    0.14    0.40      0.414  |  I    |O      |       |       |     1.92
19.500    0.15    0.40      0.412  |  I    |O      |       |       |     1.91
19.583    0.15    0.40      0.410  |  I    |O      |       |       |     1.90
19.667    0.13    0.39      0.409  |  I    |O      |       |       |     1.90
19.750    0.12    0.39      0.407  | I     |O      |       |       |     1.89
19.833    0.12    0.39      0.405  | I     |O      |       |       |     1.88
19.917    0.10    0.39      0.403  | I     |O      |       |       |     1.87
20.000    0.09    0.39      0.401  | I     |O      |       |       |     1.86
20.083    0.08    0.39      0.399  | I     |O      |       |       |     1.86
20.167    0.10    0.39      0.397  | I     |O      |       |       |     1.85
20.250    0.11    0.39      0.395  | I     |O      |       |       |     1.84
20.333    0.11    0.38      0.393  | I     |O      |       |       |     1.83
20.417    0.11    0.38      0.391  | I     |O      |       |       |     1.82
20.500    0.12    0.38      0.389  | I     |O      |       |       |     1.82
20.583    0.12    0.38      0.387  | I     |O      |       |       |     1.81
20.667    0.12    0.38      0.385  | I     |O      |       |       |     1.80
20.750    0.12    0.38      0.384  | I     |O      |       |       |     1.79
20.833    0.11    0.38      0.382  | I     |O      |       |       |     1.79
20.917    0.09    0.38      0.380  | I     |O      |       |       |     1.78
21.000    0.08    0.38      0.378  | I     |O      |       |       |     1.77
21.083    0.08    0.37      0.376  | I     |O      |       |       |     1.76
21.167    0.10    0.37      0.374  | I     |O      |       |       |     1.76
21.250    0.11    0.37      0.372  | I     |O      |       |       |     1.75
21.333    0.11    0.37      0.370  | I     |O      |       |       |     1.74
21.417    0.09    0.37      0.369  | I     |O      |       |       |     1.73
21.500    0.08    0.37      0.367  | I     |O      |       |       |     1.72
21.583    0.08    0.37      0.365  | I     O       |       |       |     1.72
21.667    0.10    0.37      0.363  | I     O       |       |       |     1.71
21.750    0.11    0.37      0.361  | I     O       |       |       |     1.70
21.833    0.11    0.36      0.359  | I     O       |       |       |     1.69
21.917    0.09    0.36      0.357  | I     O       |       |       |     1.69
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22.000    0.08    0.36      0.355  | I     O       |        |        |     1.68
22.083    0.08    0.36      0.354  | I     O       |        |        |     1.67
22.167    0.10    0.36      0.352  | I     O       |        |        |     1.66
22.250    0.11    0.36      0.350  | I     O       |        |        |     1.66
22.333    0.11    0.36      0.348  | I     O       |        |        |     1.65
22.417    0.09    0.36      0.346  | I     O       |        |        |     1.64
22.500    0.08    0.36      0.345  | I     O       |        |        |     1.64
22.583    0.08    0.35      0.343  |I      O       |        |        |     1.63
22.667    0.08    0.35      0.341  |I      O       |        |        |     1.62
22.750    0.08    0.35      0.339  |I      O       |        |        |     1.61
22.833    0.08    0.35      0.337  |I      O       |        |        |     1.60
22.917    0.08    0.35      0.335  |I      O       |        |        |     1.60
23.000    0.08    0.35      0.333  |I      O       |        |        |     1.59
23.083    0.08    0.35      0.332  |I      O       |        |        |     1.58
23.167    0.08    0.34      0.330  |I      O       |        |        |     1.57
23.250    0.08    0.34      0.328  |I      O       |        |        |     1.56
23.333    0.08    0.34      0.326  |I      O       |        |        |     1.56
23.417    0.08    0.34      0.324  |I      O       |        |        |     1.55
23.500    0.08    0.34      0.322  |I      O       |        |        |     1.54
23.583    0.08    0.34      0.321  |I      O       |        |        |     1.53
23.667    0.08    0.34      0.319  |I      O       |        |        |     1.53
23.750    0.08    0.33      0.317  |I      O       |        |        |     1.52
23.833    0.08    0.33      0.315  |I      O       |        |        |     1.51
23.917    0.08    0.33      0.314  |I      O       |        |        |     1.50
24.000    0.08    0.33      0.312  |I      O       |        |        |     1.50
24.083    0.07    0.33      0.310  |I      O       |        |        |     1.49
24.167    0.03    0.33      0.308  I      O|       |        |        |     1.48
24.250    0.01    0.32      0.306  I      O|       |        |        |     1.47
24.333    0.01    0.32      0.304  I      O|       |        |        |     1.46
24.417    0.00    0.32      0.302  I      O|       |        |        |     1.45
24.500    0.00    0.32      0.300  I      O|       |        |        |     1.44
24.583    0.00    0.32      0.297  I      O|       |        |        |     1.43
24.667    0.00    0.31      0.295  I      O|       |        |        |     1.42
24.750    0.00    0.31      0.293  I      O|       |        |        |     1.42
24.833    0.00    0.31      0.291  I      O|       |        |        |     1.41
24.917    0.00    0.31      0.289  I      O|       |        |        |     1.40
25.000    0.00    0.31      0.287  I      O|       |        |        |     1.39
25.083    0.00    0.31      0.285  I      O|       |        |        |     1.38
25.167    0.00    0.30      0.282  I      O|       |        |        |     1.37
25.250    0.00    0.30      0.280  I      O|       |        |        |     1.36
25.333    0.00    0.30      0.278  I      O|       |        |        |     1.35
25.417    0.00    0.30      0.276  I      O|       |        |        |     1.34
25.500    0.00    0.30      0.274  I      O|       |        |        |     1.33
25.583    0.00    0.30      0.272  I      O|       |        |        |     1.33
25.667    0.00    0.29      0.270  I      O|       |        |        |     1.32
25.750    0.00    0.29      0.268  I      O|       |        |        |     1.31
25.833    0.00    0.29      0.266  I      O|       |        |        |     1.30
25.917    0.00    0.29      0.264  I      O|       |        |        |     1.29
26.000    0.00    0.29      0.262  I     O |       |        |        |     1.28
26.083    0.00    0.28      0.260  I     O |       |        |        |     1.27
26.167    0.00    0.28      0.258  I     O |       |        |        |     1.27
26.250    0.00    0.28      0.256  I     O |       |        |        |     1.26
26.333    0.00    0.28      0.254  I     O |       |        |        |     1.25
26.417    0.00    0.28      0.252  I     O |       |        |        |     1.24
26.500    0.00    0.28      0.250  I     O |       |        |        |     1.23
26.583    0.00    0.27      0.249  I     O |       |        |        |     1.22
26.667    0.00    0.27      0.247  I     O |       |        |        |     1.22
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26.750    0.00    0.27      0.245  I     O |        |        |        |     1.21
26.833    0.00    0.27      0.243  I     O |        |        |        |     1.20
26.917    0.00    0.26      0.241  I     O |        |        |        |     1.19
27.000    0.00    0.26      0.239  I     O |        |        |        |     1.18
27.083    0.00    0.25      0.238  I     O |        |        |        |     1.18
27.167    0.00    0.25      0.236  I     O |        |        |        |     1.17
27.250    0.00    0.24      0.234  I    O  |        |        |        |     1.16
27.333    0.00    0.23      0.233  I    O  |        |        |        |     1.15
27.417    0.00    0.23      0.231  I    O  |        |        |        |     1.15
27.500    0.00    0.22      0.229  I    O  |        |        |        |     1.14
27.583    0.00    0.22      0.228  I    O  |        |        |        |     1.13
27.667    0.00    0.21      0.226  I    O  |        |        |        |     1.12
27.750    0.00    0.21      0.225  I    O  |        |        |        |     1.12
27.833    0.00    0.20      0.224  I   O   |        |        |        |     1.11
27.917    0.00    0.20      0.222  I   O   |        |        |        |     1.11
28.000    0.00    0.19      0.221  I   O   |        |        |        |     1.10
28.083    0.00    0.19      0.219  I   O   |        |        |        |     1.09
28.167    0.00    0.19      0.218  I   O   |        |        |        |     1.09
28.250    0.00    0.18      0.217  I   O   |        |        |        |     1.08
28.333    0.00    0.18      0.216  I   O   |        |        |        |     1.08
28.417    0.00    0.17      0.214  I   O   |        |        |        |     1.07
28.500    0.00    0.17      0.213  I   O   |        |        |        |     1.06
28.583    0.00    0.16      0.212  I   O   |        |        |        |     1.06
28.667    0.00    0.16      0.211  I  O    |        |        |        |     1.05
28.750    0.00    0.16      0.210  I  O    |        |        |        |     1.05
28.833    0.00    0.15      0.209  I  O    |        |        |        |     1.04
28.917    0.00    0.15      0.208  I  O    |        |        |        |     1.04
29.000    0.00    0.15      0.207  I  O    |        |        |        |     1.04
29.083    0.00    0.14      0.206  I  O    |        |        |        |     1.03
29.167    0.00    0.14      0.205  I  O    |        |        |        |     1.03
29.250    0.00    0.14      0.204  I  O    |        |        |        |     1.02
29.333    0.00    0.13      0.203  I  O    |        |        |        |     1.02
29.417    0.00    0.13      0.202  I  O    |        |        |        |     1.01
29.500    0.00    0.13      0.201  I  O    |        |        |        |     1.01
29.583    0.00    0.12      0.200  I  O    |        |        |        |     1.01
29.667    0.00    0.12      0.199  I O     |        |        |        |     1.00
29.750    0.00    0.12      0.199  I O     |        |        |        |     1.00
29.833    0.00    0.12      0.198  I O     |        |        |        |     0.99
29.917    0.00    0.12      0.197  I O     |        |        |        |     0.99
30.000    0.00    0.12      0.196  I O     |        |        |        |     0.99
30.083    0.00    0.12      0.195  I O     |        |        |        |     0.98
30.167    0.00    0.12      0.194  I O     |        |        |        |     0.98
30.250    0.00    0.12      0.194  I O     |        |        |        |     0.97
30.333    0.00    0.12      0.193  I O     |        |        |        |     0.97
30.417    0.00    0.12      0.192  I O     |        |        |        |     0.97
30.500    0.00    0.12      0.191  I O     |        |        |        |     0.96
30.583    0.00    0.12      0.190  I O     |        |        |        |     0.96
30.667    0.00    0.12      0.189  I O     |        |        |        |     0.95
30.750    0.00    0.12      0.189  I O     |        |        |        |     0.95
30.833    0.00    0.12      0.188  I O     |        |        |        |     0.95
30.917    0.00    0.12      0.187  I O     |        |        |        |     0.94
31.000    0.00    0.12      0.186  I O     |        |        |        |     0.94
31.083    0.00    0.12      0.185  I O     |        |        |        |     0.94
31.167    0.00    0.12      0.185  I O     |        |        |        |     0.93
31.250    0.00    0.12      0.184  I O     |        |        |        |     0.93
31.333    0.00    0.12      0.183  I O     |        |        |        |     0.92
31.417    0.00    0.12      0.182  I O     |        |        |        |     0.92
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31.500	0.00	0.12	0.181	I O	|	|	|	0.92
31.583	0.00	0.12	0.180	I O	|	|	|	0.91
31.667	0.00	0.12	0.180	I O	|	|	|	0.91
31.750	0.00	0.12	0.179	I O	|	|	|	0.90
31.833	0.00	0.12	0.178	I O	|	|	|	0.90
31.917	0.00	0.12	0.177	I O	|	|	|	0.90
32.000	0.00	0.12	0.176	I O	|	|	|	0.89
32.083	0.00	0.12	0.175	I O	|	|	|	0.89
32.167	0.00	0.12	0.175	I O	|	|	|	0.88
32.250	0.00	0.12	0.174	I O	|	|	|	0.88
32.333	0.00	0.12	0.173	I O	|	|	|	0.88
32.417	0.00	0.12	0.172	I O	|	|	|	0.87
32.500	0.00	0.12	0.171	I O	|	|	|	0.87
32.583	0.00	0.12	0.170	I O	|	|	|	0.86
32.667	0.00	0.12	0.170	I O	|	|	|	0.86
32.750	0.00	0.12	0.169	I O	|	|	|	0.86
32.833	0.00	0.12	0.168	I O	|	|	|	0.85
32.917	0.00	0.12	0.167	I O	|	|	|	0.85
33.000	0.00	0.12	0.166	I O	|	|	|	0.84
33.083	0.00	0.12	0.166	I O	|	|	|	0.84
33.167	0.00	0.12	0.165	I O	|	|	|	0.84
33.250	0.00	0.12	0.164	I O	|	|	|	0.83
33.333	0.00	0.12	0.163	I O	|	|	|	0.83
33.417	0.00	0.12	0.162	I O	|	|	|	0.82
33.500	0.00	0.12	0.161	I O	|	|	|	0.82
33.583	0.00	0.12	0.161	I O	|	|	|	0.82
33.667	0.00	0.12	0.160	I O	|	|	|	0.81
33.750	0.00	0.12	0.159	I O	|	|	|	0.81
33.833	0.00	0.12	0.158	I O	|	|	|	0.81
33.917	0.00	0.12	0.157	I O	|	|	|	0.80
34.000	0.00	0.12	0.156	I O	|	|	|	0.80
34.083	0.00	0.12	0.156	I O	|	|	|	0.79
34.167	0.00	0.12	0.155	I O	|	|	|	0.79
34.250	0.00	0.12	0.154	I O	|	|	|	0.78
34.333	0.00	0.12	0.153	I O	|	|	|	0.78
34.417	0.00	0.12	0.152	I O	|	|	|	0.78
34.500	0.00	0.12	0.151	I O	|	|	|	0.77
34.583	0.00	0.12	0.151	I O	|	|	|	0.77
34.667	0.00	0.12	0.150	I O	|	|	|	0.76
34.750	0.00	0.12	0.149	I O	|	|	|	0.76
34.833	0.00	0.12	0.148	I O	|	|	|	0.76
34.917	0.00	0.12	0.147	I O	|	|	|	0.75
35.000	0.00	0.12	0.147	I O	|	|	|	0.75
35.083	0.00	0.12	0.146	I O	|	|	|	0.74
35.167	0.00	0.12	0.145	I O	|	|	|	0.74
35.250	0.00	0.12	0.144	I O	|	|	|	0.74
35.333	0.00	0.12	0.143	I O	|	|	|	0.73
35.417	0.00	0.12	0.142	I O	|	|	|	0.73
35.500	0.00	0.12	0.142	I O	|	|	|	0.72
35.583	0.00	0.12	0.141	I O	|	|	|	0.72
35.667	0.00	0.12	0.140	I O	|	|	|	0.72
35.750	0.00	0.12	0.139	I O	|	|	|	0.71
35.833	0.00	0.12	0.138	I O	|	|	|	0.71
35.917	0.00	0.12	0.137	I O	|	|	|	0.70
36.000	0.00	0.12	0.137	I O	|	|	|	0.70
36.083	0.00	0.12	0.136	I O	|	|	|	0.70
36.167	0.00	0.12	0.135	I O	|	|	|	0.69

36.250	0.00	0.12	0.134	I O	|	|	|	0.69
36.333	0.00	0.12	0.133	I O	|	|	|	0.68
36.417	0.00	0.12	0.132	I O	|	|	|	0.68
36.500	0.00	0.12	0.132	I O	|	|	|	0.67
36.583	0.00	0.12	0.131	I O	|	|	|	0.67
36.667	0.00	0.12	0.130	I O	|	|	|	0.67
36.750	0.00	0.12	0.129	I O	|	|	|	0.66
36.833	0.00	0.12	0.128	I O	|	|	|	0.66
36.917	0.00	0.12	0.128	I O	|	|	|	0.65
37.000	0.00	0.12	0.127	I O	|	|	|	0.65
37.083	0.00	0.12	0.126	I O	|	|	|	0.65
37.167	0.00	0.12	0.125	I O	|	|	|	0.64
37.250	0.00	0.12	0.124	I O	|	|	|	0.64
37.333	0.00	0.12	0.123	I O	|	|	|	0.63
37.417	0.00	0.12	0.123	I O	|	|	|	0.63
37.500	0.00	0.12	0.122	I O	|	|	|	0.63
37.583	0.00	0.12	0.121	I O	|	|	|	0.62
37.667	0.00	0.12	0.120	I O	|	|	|	0.62
37.750	0.00	0.12	0.119	I O	|	|	|	0.61
37.833	0.00	0.12	0.118	I O	|	|	|	0.61
37.917	0.00	0.12	0.118	I O	|	|	|	0.61
38.000	0.00	0.12	0.117	I O	|	|	|	0.60
38.083	0.00	0.12	0.116	I O	|	|	|	0.60
38.167	0.00	0.12	0.115	I O	|	|	|	0.59
38.250	0.00	0.12	0.114	I O	|	|	|	0.59
38.333	0.00	0.12	0.113	I O	|	|	|	0.59
38.417	0.00	0.12	0.113	I O	|	|	|	0.58
38.500	0.00	0.12	0.112	I O	|	|	|	0.58
38.583	0.00	0.12	0.111	I O	|	|	|	0.57
38.667	0.00	0.12	0.110	I O	|	|	|	0.57
38.750	0.00	0.12	0.109	I O	|	|	|	0.56
38.833	0.00	0.12	0.109	I O	|	|	|	0.56
38.917	0.00	0.12	0.108	I O	|	|	|	0.56
39.000	0.00	0.12	0.107	I O	|	|	|	0.55
39.083	0.00	0.12	0.106	I O	|	|	|	0.55
39.167	0.00	0.12	0.105	I O	|	|	|	0.54
39.250	0.00	0.12	0.104	I O	|	|	|	0.54
39.333	0.00	0.12	0.104	I O	|	|	|	0.54
39.417	0.00	0.12	0.103	I O	|	|	|	0.53
39.500	0.00	0.12	0.102	I O	|	|	|	0.53
39.583	0.00	0.12	0.101	I O	|	|	|	0.52
39.667	0.00	0.12	0.100	I O	|	|	|	0.52
39.750	0.00	0.12	0.099	I O	|	|	|	0.52
39.833	0.00	0.12	0.099	I O	|	|	|	0.51
39.917	0.00	0.12	0.098	I O	|	|	|	0.51
40.000	0.00	0.12	0.097	I O	|	|	|	0.50
40.083	0.00	0.12	0.096	I O	|	|	|	0.50
40.167	0.00	0.12	0.095	I O	|	|	|	0.50
40.250	0.00	0.12	0.094	I O	|	|	|	0.49
40.333	0.00	0.12	0.094	I O	|	|	|	0.49
40.417	0.00	0.12	0.093	I O	|	|	|	0.48
40.500	0.00	0.12	0.092	I O	|	|	|	0.48
40.583	0.00	0.12	0.091	I O	|	|	|	0.47
40.667	0.00	0.12	0.090	I O	|	|	|	0.47
40.750	0.00	0.12	0.089	I O	|	|	|	0.47
40.833	0.00	0.12	0.089	I O	|	|	|	0.46
40.917	0.00	0.12	0.088	I O	|	|	|	0.46

41.000	0.00	0.12	0.087	I O				0.45
41.083	0.00	0.12	0.086	I O				0.45
41.167	0.00	0.12	0.085	I O				0.45
41.250	0.00	0.12	0.085	I O				0.44
41.333	0.00	0.12	0.084	I O				0.44
41.417	0.00	0.12	0.083	I O				0.43
41.500	0.00	0.12	0.082	I O				0.43
41.583	0.00	0.12	0.081	I O				0.43
41.667	0.00	0.12	0.080	I O				0.42
41.750	0.00	0.12	0.080	I O				0.42
41.833	0.00	0.12	0.079	I O				0.41
41.917	0.00	0.12	0.078	I O				0.41
42.000	0.00	0.12	0.077	I O				0.41
42.083	0.00	0.12	0.076	I O				0.40
42.167	0.00	0.12	0.075	I O				0.40
42.250	0.00	0.12	0.075	I O				0.39
42.333	0.00	0.12	0.074	I O				0.39
42.417	0.00	0.12	0.073	I O				0.38
42.500	0.00	0.11	0.072	I O				0.38
42.583	0.00	0.11	0.071	I O				0.38
42.667	0.00	0.11	0.071	I O				0.37
42.750	0.00	0.11	0.070	I O				0.37
42.833	0.00	0.11	0.069	I O				0.36
42.917	0.00	0.11	0.068	I O				0.36
43.000	0.00	0.11	0.068	I O				0.36
43.083	0.00	0.11	0.067	I O				0.35
43.167	0.00	0.10	0.066	I O				0.35
43.250	0.00	0.10	0.066	I O				0.34
43.333	0.00	0.10	0.065	I O				0.34
43.417	0.00	0.10	0.064	I O				0.34
43.500	0.00	0.10	0.063	I O				0.33
43.583	0.00	0.10	0.063	I O				0.33
43.667	0.00	0.10	0.062	I O				0.33
43.750	0.00	0.10	0.061	I O				0.32
43.833	0.00	0.10	0.061	I O				0.32
43.917	0.00	0.09	0.060	I O				0.32
44.000	0.00	0.09	0.059	I O				0.31
44.083	0.00	0.09	0.059	I O				0.31
44.167	0.00	0.09	0.058	I O				0.31
44.250	0.00	0.09	0.057	I O				0.30
44.333	0.00	0.09	0.057	I O				0.30
44.417	0.00	0.09	0.056	I O				0.30
44.500	0.00	0.09	0.056	I O				0.29
44.583	0.00	0.09	0.055	I O				0.29
44.667	0.00	0.09	0.054	I O				0.29
44.750	0.00	0.09	0.054	I O				0.28
44.833	0.00	0.08	0.053	I O				0.28
44.917	0.00	0.08	0.053	I O				0.28
45.000	0.00	0.08	0.052	I O				0.27
45.083	0.00	0.08	0.052	IO				0.27
45.167	0.00	0.08	0.051	IO				0.27
45.250	0.00	0.08	0.050	IO				0.27
45.333	0.00	0.08	0.050	IO				0.26
45.417	0.00	0.08	0.049	IO				0.26
45.500	0.00	0.08	0.049	IO				0.26
45.583	0.00	0.08	0.048	IO				0.25
45.667	0.00	0.08	0.048	IO				0.25

45.750	0.00	0.07	0.047	IO				0.25
45.833	0.00	0.07	0.047	IO				0.25
45.917	0.00	0.07	0.046	IO				0.24
46.000	0.00	0.07	0.046	IO				0.24
46.083	0.00	0.07	0.045	IO				0.24
46.167	0.00	0.07	0.045	IO				0.24
46.250	0.00	0.07	0.044	IO				0.23
46.333	0.00	0.07	0.044	IO				0.23
46.417	0.00	0.07	0.043	IO				0.23
46.500	0.00	0.07	0.043	IO				0.23
46.583	0.00	0.07	0.042	IO				0.22
46.667	0.00	0.07	0.042	IO				0.22
46.750	0.00	0.07	0.041	IO				0.22
46.833	0.00	0.06	0.041	IO				0.22
46.917	0.00	0.06	0.041	IO				0.21
47.000	0.00	0.06	0.040	IO				0.21
47.083	0.00	0.06	0.040	IO				0.21
47.167	0.00	0.06	0.039	IO				0.21
47.250	0.00	0.06	0.039	IO				0.20
47.333	0.00	0.06	0.038	IO				0.20
47.417	0.00	0.06	0.038	IO				0.20
47.500	0.00	0.06	0.038	IO				0.20
47.583	0.00	0.06	0.037	IO				0.20
47.667	0.00	0.06	0.037	IO				0.19
47.750	0.00	0.06	0.036	IO				0.19
47.833	0.00	0.06	0.036	IO				0.19
47.917	0.00	0.06	0.036	IO				0.19
48.000	0.00	0.06	0.035	IO				0.19
48.083	0.00	0.06	0.035	IO				0.18
48.167	0.00	0.05	0.034	IO				0.18
48.250	0.00	0.05	0.034	IO				0.18
48.333	0.00	0.05	0.034	IO				0.18
48.417	0.00	0.05	0.033	IO				0.18
48.500	0.00	0.05	0.033	IO				0.17
48.583	0.00	0.05	0.033	IO				0.17
48.667	0.00	0.05	0.032	IO				0.17
48.750	0.00	0.05	0.032	IO				0.17
48.833	0.00	0.05	0.032	IO				0.17
48.917	0.00	0.05	0.031	IO				0.16
49.000	0.00	0.05	0.031	IO				0.16
49.083	0.00	0.05	0.031	IO				0.16
49.167	0.00	0.05	0.030	IO				0.16
49.250	0.00	0.05	0.030	IO				0.16
49.333	0.00	0.05	0.030	IO				0.16
49.417	0.00	0.05	0.029	IO				0.15
49.500	0.00	0.05	0.029	IO				0.15
49.583	0.00	0.05	0.029	IO				0.15
49.667	0.00	0.04	0.028	IO				0.15
49.750	0.00	0.04	0.028	IO				0.15
49.833	0.00	0.04	0.028	IO				0.15
49.917	0.00	0.04	0.027	IO				0.14
50.000	0.00	0.04	0.027	IO				0.14
50.083	0.00	0.04	0.027	IO				0.14
50.167	0.00	0.04	0.027	IO				0.14
50.250	0.00	0.04	0.026	IO				0.14
50.333	0.00	0.04	0.026	IO				0.14
50.417	0.00	0.04	0.026	O				0.14

50.500	0.00	0.04	0.025	O	|	|	|	|	0.13
50.583	0.00	0.04	0.025	O	|	|	|	|	0.13
50.667	0.00	0.04	0.025	O	|	|	|	|	0.13
50.750	0.00	0.04	0.025	O	|	|	|	|	0.13
50.833	0.00	0.04	0.024	O	|	|	|	|	0.13
50.917	0.00	0.04	0.024	O	|	|	|	|	0.13
51.000	0.00	0.04	0.024	O	|	|	|	|	0.13
51.083	0.00	0.04	0.024	O	|	|	|	|	0.12
51.167	0.00	0.04	0.023	O	|	|	|	|	0.12
51.250	0.00	0.04	0.023	O	|	|	|	|	0.12
51.333	0.00	0.04	0.023	O	|	|	|	|	0.12
51.417	0.00	0.04	0.023	O	|	|	|	|	0.12
51.500	0.00	0.04	0.022	O	|	|	|	|	0.12
51.583	0.00	0.03	0.022	O	|	|	|	|	0.12
51.667	0.00	0.03	0.022	O	|	|	|	|	0.11
51.750	0.00	0.03	0.022	O	|	|	|	|	0.11
51.833	0.00	0.03	0.021	O	|	|	|	|	0.11
51.917	0.00	0.03	0.021	O	|	|	|	|	0.11
52.000	0.00	0.03	0.021	O	|	|	|	|	0.11
52.083	0.00	0.03	0.021	O	|	|	|	|	0.11
52.167	0.00	0.03	0.020	O	|	|	|	|	0.11
52.250	0.00	0.03	0.020	O	|	|	|	|	0.11
52.333	0.00	0.03	0.020	O	|	|	|	|	0.11
52.417	0.00	0.03	0.020	O	|	|	|	|	0.10
52.500	0.00	0.03	0.020	O	|	|	|	|	0.10
52.583	0.00	0.03	0.019	O	|	|	|	|	0.10
52.667	0.00	0.03	0.019	O	|	|	|	|	0.10
52.750	0.00	0.03	0.019	O	|	|	|	|	0.10
52.833	0.00	0.03	0.019	O	|	|	|	|	0.10
52.917	0.00	0.03	0.019	O	|	|	|	|	0.10
53.000	0.00	0.03	0.018	O	|	|	|	|	0.10
53.083	0.00	0.03	0.018	O	|	|	|	|	0.10
53.167	0.00	0.03	0.018	O	|	|	|	|	0.09
53.250	0.00	0.03	0.018	O	|	|	|	|	0.09
53.333	0.00	0.03	0.018	O	|	|	|	|	0.09
53.417	0.00	0.03	0.017	O	|	|	|	|	0.09
53.500	0.00	0.03	0.017	O	|	|	|	|	0.09
53.583	0.00	0.03	0.017	O	|	|	|	|	0.09
53.667	0.00	0.03	0.017	O	|	|	|	|	0.09
53.750	0.00	0.03	0.017	O	|	|	|	|	0.09
53.833	0.00	0.03	0.016	O	|	|	|	|	0.09
53.917	0.00	0.03	0.016	O	|	|	|	|	0.09
54.000	0.00	0.03	0.016	O	|	|	|	|	0.08
54.083	0.00	0.03	0.016	O	|	|	|	|	0.08
54.167	0.00	0.02	0.016	O	|	|	|	|	0.08
54.250	0.00	0.02	0.016	O	|	|	|	|	0.08
54.333	0.00	0.02	0.015	O	|	|	|	|	0.08
54.417	0.00	0.02	0.015	O	|	|	|	|	0.08
54.500	0.00	0.02	0.015	O	|	|	|	|	0.08
54.583	0.00	0.02	0.015	O	|	|	|	|	0.08
54.667	0.00	0.02	0.015	O	|	|	|	|	0.08
54.750	0.00	0.02	0.015	O	|	|	|	|	0.08
54.833	0.00	0.02	0.014	O	|	|	|	|	0.08
54.917	0.00	0.02	0.014	O	|	|	|	|	0.08
55.000	0.00	0.02	0.014	O	|	|	|	|	0.07
55.083	0.00	0.02	0.014	O	|	|	|	|	0.07
55.167	0.00	0.02	0.014	O	|	|	|	|	0.07

55.250	0.00	0.02	0.014	O	|	|	|	|	0.07
55.333	0.00	0.02	0.014	O	|	|	|	|	0.07
55.417	0.00	0.02	0.013	O	|	|	|	|	0.07
55.500	0.00	0.02	0.013	O	|	|	|	|	0.07
55.583	0.00	0.02	0.013	O	|	|	|	|	0.07
55.667	0.00	0.02	0.013	O	|	|	|	|	0.07
55.750	0.00	0.02	0.013	O	|	|	|	|	0.07
55.833	0.00	0.02	0.013	O	|	|	|	|	0.07
55.917	0.00	0.02	0.013	O	|	|	|	|	0.07
56.000	0.00	0.02	0.012	O	|	|	|	|	0.07
56.083	0.00	0.02	0.012	O	|	|	|	|	0.06
56.167	0.00	0.02	0.012	O	|	|	|	|	0.06
56.250	0.00	0.02	0.012	O	|	|	|	|	0.06
56.333	0.00	0.02	0.012	O	|	|	|	|	0.06
56.417	0.00	0.02	0.012	O	|	|	|	|	0.06
56.500	0.00	0.02	0.012	O	|	|	|	|	0.06
56.583	0.00	0.02	0.011	O	|	|	|	|	0.06
56.667	0.00	0.02	0.011	O	|	|	|	|	0.06
56.750	0.00	0.02	0.011	O	|	|	|	|	0.06
56.833	0.00	0.02	0.011	O	|	|	|	|	0.06
56.917	0.00	0.02	0.011	O	|	|	|	|	0.06
57.000	0.00	0.02	0.011	O	|	|	|	|	0.06
57.083	0.00	0.02	0.011	O	|	|	|	|	0.06
57.167	0.00	0.02	0.011	O	|	|	|	|	0.06
57.250	0.00	0.02	0.011	O	|	|	|	|	0.06
57.333	0.00	0.02	0.010	O	|	|	|	|	0.05
57.417	0.00	0.02	0.010	O	|	|	|	|	0.05
57.500	0.00	0.02	0.010	O	|	|	|	|	0.05
57.583	0.00	0.02	0.010	O	|	|	|	|	0.05
57.667	0.00	0.02	0.010	O	|	|	|	|	0.05
57.750	0.00	0.02	0.010	O	|	|	|	|	0.05
57.833	0.00	0.02	0.010	O	|	|	|	|	0.05
57.917	0.00	0.02	0.010	O	|	|	|	|	0.05
58.000	0.00	0.02	0.010	O	|	|	|	|	0.05
58.083	0.00	0.01	0.009	O	|	|	|	|	0.05
58.167	0.00	0.01	0.009	O	|	|	|	|	0.05
58.250	0.00	0.01	0.009	O	|	|	|	|	0.05
58.333	0.00	0.01	0.009	O	|	|	|	|	0.05
58.417	0.00	0.01	0.009	O	|	|	|	|	0.05
58.500	0.00	0.01	0.009	O	|	|	|	|	0.05
58.583	0.00	0.01	0.009	O	|	|	|	|	0.05
58.667	0.00	0.01	0.009	O	|	|	|	|	0.05
58.750	0.00	0.01	0.009	O	|	|	|	|	0.05
58.833	0.00	0.01	0.009	O	|	|	|	|	0.05
58.917	0.00	0.01	0.008	O	|	|	|	|	0.04
59.000	0.00	0.01	0.008	O	|	|	|	|	0.04
59.083	0.00	0.01	0.008	O	|	|	|	|	0.04
59.167	0.00	0.01	0.008	O	|	|	|	|	0.04
59.250	0.00	0.01	0.008	O	|	|	|	|	0.04
59.333	0.00	0.01	0.008	O	|	|	|	|	0.04
59.417	0.00	0.01	0.008	O	|	|	|	|	0.04
59.500	0.00	0.01	0.008	O	|	|	|	|	0.04
59.583	0.00	0.01	0.008	O	|	|	|	|	0.04
59.667	0.00	0.01	0.008	O	|	|	|	|	0.04
59.750	0.00	0.01	0.008	O	|	|	|	|	0.04
59.833	0.00	0.01	0.008	O	|	|	|	|	0.04
59.917	0.00	0.01	0.007	O	|	|	|	|	0.04

60.000	0.00	0.01	0.007	O	|	|	|	|	0.04
60.083	0.00	0.01	0.007	O	|	|	|	|	0.04
60.167	0.00	0.01	0.007	O	|	|	|	|	0.04
60.250	0.00	0.01	0.007	O	|	|	|	|	0.04
60.333	0.00	0.01	0.007	O	|	|	|	|	0.04
60.417	0.00	0.01	0.007	O	|	|	|	|	0.04
60.500	0.00	0.01	0.007	O	|	|	|	|	0.04
60.583	0.00	0.01	0.007	O	|	|	|	|	0.04
60.667	0.00	0.01	0.007	O	|	|	|	|	0.04
60.750	0.00	0.01	0.007	O	|	|	|	|	0.04
60.833	0.00	0.01	0.007	O	|	|	|	|	0.03
60.917	0.00	0.01	0.007	O	|	|	|	|	0.03
61.000	0.00	0.01	0.006	O	|	|	|	|	0.03
61.083	0.00	0.01	0.006	O	|	|	|	|	0.03
61.167	0.00	0.01	0.006	O	|	|	|	|	0.03
61.250	0.00	0.01	0.006	O	|	|	|	|	0.03
61.333	0.00	0.01	0.006	O	|	|	|	|	0.03
61.417	0.00	0.01	0.006	O	|	|	|	|	0.03
61.500	0.00	0.01	0.006	O	|	|	|	|	0.03
61.583	0.00	0.01	0.006	O	|	|	|	|	0.03
61.667	0.00	0.01	0.006	O	|	|	|	|	0.03
61.750	0.00	0.01	0.006	O	|	|	|	|	0.03
61.833	0.00	0.01	0.006	O	|	|	|	|	0.03
61.917	0.00	0.01	0.006	O	|	|	|	|	0.03
62.000	0.00	0.01	0.006	O	|	|	|	|	0.03
62.083	0.00	0.01	0.006	O	|	|	|	|	0.03
62.167	0.00	0.01	0.006	O	|	|	|	|	0.03
62.250	0.00	0.01	0.005	O	|	|	|	|	0.03
62.333	0.00	0.01	0.005	O	|	|	|	|	0.03
62.417	0.00	0.01	0.005	O	|	|	|	|	0.03
62.500	0.00	0.01	0.005	O	|	|	|	|	0.03
62.583	0.00	0.01	0.005	O	|	|	|	|	0.03
62.667	0.00	0.01	0.005	O	|	|	|	|	0.03
62.750	0.00	0.01	0.005	O	|	|	|	|	0.03
62.833	0.00	0.01	0.005	O	|	|	|	|	0.03
62.917	0.00	0.01	0.005	O	|	|	|	|	0.03
63.000	0.00	0.01	0.005	O	|	|	|	|	0.03
63.083	0.00	0.01	0.005	O	|	|	|	|	0.03
63.167	0.00	0.01	0.005	O	|	|	|	|	0.03
63.250	0.00	0.01	0.005	O	|	|	|	|	0.03
63.333	0.00	0.01	0.005	O	|	|	|	|	0.03
63.417	0.00	0.01	0.005	O	|	|	|	|	0.02
63.500	0.00	0.01	0.005	O	|	|	|	|	0.02
63.583	0.00	0.01	0.005	O	|	|	|	|	0.02
63.667	0.00	0.01	0.005	O	|	|	|	|	0.02
63.750	0.00	0.01	0.005	O	|	|	|	|	0.02
63.833	0.00	0.01	0.004	O	|	|	|	|	0.02
63.917	0.00	0.01	0.004	O	|	|	|	|	0.02
64.000	0.00	0.01	0.004	O	|	|	|	|	0.02
64.083	0.00	0.01	0.004	O	|	|	|	|	0.02
64.167	0.00	0.01	0.004	O	|	|	|	|	0.02
64.250	0.00	0.01	0.004	O	|	|	|	|	0.02
64.333	0.00	0.01	0.004	O	|	|	|	|	0.02
64.417	0.00	0.01	0.004	O	|	|	|	|	0.02
64.500	0.00	0.01	0.004	O	|	|	|	|	0.02
64.583	0.00	0.01	0.004	O	|	|	|	|	0.02
64.667	0.00	0.01	0.004	O	|	|	|	|	0.02

64.750	0.00	0.01	0.004	O	|	|	|	0.02
64.833	0.00	0.01	0.004	O	|	|	|	0.02
64.917	0.00	0.01	0.004	O	|	|	|	0.02
65.000	0.00	0.01	0.004	O	|	|	|	0.02
65.083	0.00	0.01	0.004	O	|	|	|	0.02
65.167	0.00	0.01	0.004	O	|	|	|	0.02
65.250	0.00	0.01	0.004	O	|	|	|	0.02
65.333	0.00	0.01	0.004	O	|	|	|	0.02
65.417	0.00	0.01	0.004	O	|	|	|	0.02
65.500	0.00	0.01	0.004	O	|	|	|	0.02
65.583	0.00	0.01	0.004	O	|	|	|	0.02
65.667	0.00	0.01	0.004	O	|	|	|	0.02
65.750	0.00	0.01	0.003	O	|	|	|	0.02
65.833	0.00	0.01	0.003	O	|	|	|	0.02
65.917	0.00	0.01	0.003	O	|	|	|	0.02
66.000	0.00	0.01	0.003	O	|	|	|	0.02
66.083	0.00	0.01	0.003	O	|	|	|	0.02
66.167	0.00	0.01	0.003	O	|	|	|	0.02
66.250	0.00	0.01	0.003	O	|	|	|	0.02
66.333	0.00	0.01	0.003	O	|	|	|	0.02
66.417	0.00	0.01	0.003	O	|	|	|	0.02
66.500	0.00	0.00	0.003	O	|	|	|	0.02
66.583	0.00	0.00	0.003	O	|	|	|	0.02
66.667	0.00	0.00	0.003	O	|	|	|	0.02
66.750	0.00	0.00	0.003	O	|	|	|	0.02
66.833	0.00	0.00	0.003	O	|	|	|	0.02
66.917	0.00	0.00	0.003	O	|	|	|	0.02
67.000	0.00	0.00	0.003	O	|	|	|	0.02
67.083	0.00	0.00	0.003	O	|	|	|	0.02
67.167	0.00	0.00	0.003	O	|	|	|	0.02
67.250	0.00	0.00	0.003	O	|	|	|	0.02
67.333	0.00	0.00	0.003	O	|	|	|	0.01
67.417	0.00	0.00	0.003	O	|	|	|	0.01
67.500	0.00	0.00	0.003	O	|	|	|	0.01
67.583	0.00	0.00	0.003	O	|	|	|	0.01
67.667	0.00	0.00	0.003	O	|	|	|	0.01
67.750	0.00	0.00	0.003	O	|	|	|	0.01
67.833	0.00	0.00	0.003	O	|	|	|	0.01
67.917	0.00	0.00	0.003	O	|	|	|	0.01
68.000	0.00	0.00	0.003	O	|	|	|	0.01
68.083	0.00	0.00	0.003	O	|	|	|	0.01
68.167	0.00	0.00	0.003	O	|	|	|	0.01
68.250	0.00	0.00	0.003	O	|	|	|	0.01
68.333	0.00	0.00	0.002	O	|	|	|	0.01
68.417	0.00	0.00	0.002	O	|	|	|	0.01
68.500	0.00	0.00	0.002	O	|	|	|	0.01
68.583	0.00	0.00	0.002	O	|	|	|	0.01
68.667	0.00	0.00	0.002	O	|	|	|	0.01
68.750	0.00	0.00	0.002	O	|	|	|	0.01
68.833	0.00	0.00	0.002	O	|	|	|	0.01
68.917	0.00	0.00	0.002	O	|	|	|	0.01
69.000	0.00	0.00	0.002	O	|	|	|	0.01
69.083	0.00	0.00	0.002	O	|	|	|	0.01
69.167	0.00	0.00	0.002	O	|	|	|	0.01
69.250	0.00	0.00	0.002	O	|	|	|	0.01
69.333	0.00	0.00	0.002	O	|	|	|	0.01
69.417	0.00	0.00	0.002	O	|	|	|	0.01

69.500	0.00	0.00	0.002	O	|	|	|	|	0.01
69.583	0.00	0.00	0.002	O	|	|	|	|	0.01
69.667	0.00	0.00	0.002	O	|	|	|	|	0.01
69.750	0.00	0.00	0.002	O	|	|	|	|	0.01
69.833	0.00	0.00	0.002	O	|	|	|	|	0.01
69.917	0.00	0.00	0.002	O	|	|	|	|	0.01
70.000	0.00	0.00	0.002	O	|	|	|	|	0.01
70.083	0.00	0.00	0.002	O	|	|	|	|	0.01
70.167	0.00	0.00	0.002	O	|	|	|	|	0.01
70.250	0.00	0.00	0.002	O	|	|	|	|	0.01
70.333	0.00	0.00	0.002	O	|	|	|	|	0.01
70.417	0.00	0.00	0.002	O	|	|	|	|	0.01
70.500	0.00	0.00	0.002	O	|	|	|	|	0.01
70.583	0.00	0.00	0.002	O	|	|	|	|	0.01
70.667	0.00	0.00	0.002	O	|	|	|	|	0.01
70.750	0.00	0.00	0.002	O	|	|	|	|	0.01
70.833	0.00	0.00	0.002	O	|	|	|	|	0.01
70.917	0.00	0.00	0.002	O	|	|	|	|	0.01
71.000	0.00	0.00	0.002	O	|	|	|	|	0.01
71.083	0.00	0.00	0.002	O	|	|	|	|	0.01
71.167	0.00	0.00	0.002	O	|	|	|	|	0.01
71.250	0.00	0.00	0.002	O	|	|	|	|	0.01
71.333	0.00	0.00	0.002	O	|	|	|	|	0.01
71.417	0.00	0.00	0.002	O	|	|	|	|	0.01
71.500	0.00	0.00	0.002	O	|	|	|	|	0.01
71.583	0.00	0.00	0.002	O	|	|	|	|	0.01
71.667	0.00	0.00	0.002	O	|	|	|	|	0.01
71.750	0.00	0.00	0.002	O	|	|	|	|	0.01
71.833	0.00	0.00	0.002	O	|	|	|	|	0.01
71.917	0.00	0.00	0.002	O	|	|	|	|	0.01
72.000	0.00	0.00	0.002	O	|	|	|	|	0.01
72.083	0.00	0.00	0.002	O	|	|	|	|	0.01
72.167	0.00	0.00	0.002	O	|	|	|	|	0.01
72.250	0.00	0.00	0.001	O	|	|	|	|	0.01
72.333	0.00	0.00	0.001	O	|	|	|	|	0.01
72.417	0.00	0.00	0.001	O	|	|	|	|	0.01
72.500	0.00	0.00	0.001	O	|	|	|	|	0.01
72.583	0.00	0.00	0.001	O	|	|	|	|	0.01
72.667	0.00	0.00	0.001	O	|	|	|	|	0.01
72.750	0.00	0.00	0.001	O	|	|	|	|	0.01
72.833	0.00	0.00	0.001	O	|	|	|	|	0.01
72.917	0.00	0.00	0.001	O	|	|	|	|	0.01
73.000	0.00	0.00	0.001	O	|	|	|	|	0.01
73.083	0.00	0.00	0.001	O	|	|	|	|	0.01
73.167	0.00	0.00	0.001	O	|	|	|	|	0.01
73.250	0.00	0.00	0.001	O	|	|	|	|	0.01
73.333	0.00	0.00	0.001	O	|	|	|	|	0.01
73.417	0.00	0.00	0.001	O	|	|	|	|	0.01
73.500	0.00	0.00	0.001	O	|	|	|	|	0.01
73.583	0.00	0.00	0.001	O	|	|	|	|	0.01
73.667	0.00	0.00	0.001	O	|	|	|	|	0.01
73.750	0.00	0.00	0.001	O	|	|	|	|	0.01
73.833	0.00	0.00	0.001	O	|	|	|	|	0.01
73.917	0.00	0.00	0.001	O	|	|	|	|	0.01
74.000	0.00	0.00	0.001	O	|	|	|	|	0.01
74.083	0.00	0.00	0.001	O	|	|	|	|	0.01
74.167	0.00	0.00	0.001	O	|	|	|	|	0.01

74.250	0.00	0.00	0.001	O	|	|	|	|	0.01
74.333	0.00	0.00	0.001	O	|	|	|	|	0.01
74.417	0.00	0.00	0.001	O	|	|	|	|	0.01
74.500	0.00	0.00	0.001	O	|	|	|	|	0.01
74.583	0.00	0.00	0.001	O	|	|	|	|	0.01
74.667	0.00	0.00	0.001	O	|	|	|	|	0.01
74.750	0.00	0.00	0.001	O	|	|	|	|	0.01
74.833	0.00	0.00	0.001	O	|	|	|	|	0.01
74.917	0.00	0.00	0.001	O	|	|	|	|	0.01
75.000	0.00	0.00	0.001	O	|	|	|	|	0.01
75.083	0.00	0.00	0.001	O	|	|	|	|	0.01
75.167	0.00	0.00	0.001	O	|	|	|	|	0.01
75.250	0.00	0.00	0.001	O	|	|	|	|	0.01
75.333	0.00	0.00	0.001	O	|	|	|	|	0.01
75.417	0.00	0.00	0.001	O	|	|	|	|	0.01
75.500	0.00	0.00	0.001	O	|	|	|	|	0.01
75.583	0.00	0.00	0.001	O	|	|	|	|	0.01
75.667	0.00	0.00	0.001	O	|	|	|	|	0.01
75.750	0.00	0.00	0.001	O	|	|	|	|	0.00
75.833	0.00	0.00	0.001	O	|	|	|	|	0.00
75.917	0.00	0.00	0.001	O	|	|	|	|	0.00
76.000	0.00	0.00	0.001	O	|	|	|	|	0.00
76.083	0.00	0.00	0.001	O	|	|	|	|	0.00
76.167	0.00	0.00	0.001	O	|	|	|	|	0.00
76.250	0.00	0.00	0.001	O	|	|	|	|	0.00
76.333	0.00	0.00	0.001	O	|	|	|	|	0.00
76.417	0.00	0.00	0.001	O	|	|	|	|	0.00
76.500	0.00	0.00	0.001	O	|	|	|	|	0.00
76.583	0.00	0.00	0.001	O	|	|	|	|	0.00
76.667	0.00	0.00	0.001	O	|	|	|	|	0.00
76.750	0.00	0.00	0.001	O	|	|	|	|	0.00
76.833	0.00	0.00	0.001	O	|	|	|	|	0.00
76.917	0.00	0.00	0.001	O	|	|	|	|	0.00
77.000	0.00	0.00	0.001	O	|	|	|	|	0.00
77.083	0.00	0.00	0.001	O	|	|	|	|	0.00
77.167	0.00	0.00	0.001	O	|	|	|	|	0.00
77.250	0.00	0.00	0.001	O	|	|	|	|	0.00
77.333	0.00	0.00	0.001	O	|	|	|	|	0.00
77.417	0.00	0.00	0.001	O	|	|	|	|	0.00
77.500	0.00	0.00	0.001	O	|	|	|	|	0.00
77.583	0.00	0.00	0.001	O	|	|	|	|	0.00
77.667	0.00	0.00	0.001	O	|	|	|	|	0.00
77.750	0.00	0.00	0.001	O	|	|	|	|	0.00
77.833	0.00	0.00	0.001	O	|	|	|	|	0.00
77.917	0.00	0.00	0.001	O	|	|	|	|	0.00
78.000	0.00	0.00	0.001	O	|	|	|	|	0.00
78.083	0.00	0.00	0.001	O	|	|	|	|	0.00
78.167	0.00	0.00	0.001	O	|	|	|	|	0.00
78.250	0.00	0.00	0.001	O	|	|	|	|	0.00
78.333	0.00	0.00	0.001	O	|	|	|	|	0.00
78.417	0.00	0.00	0.001	O	|	|	|	|	0.00
78.500	0.00	0.00	0.001	O	|	|	|	|	0.00
78.583	0.00	0.00	0.001	O	|	|	|	|	0.00
78.667	0.00	0.00	0.001	O	|	|	|	|	0.00
78.750	0.00	0.00	0.001	O	|	|	|	|	0.00
78.833	0.00	0.00	0.001	O	|	|	|	|	0.00

```
****************************HYDROGRAPH DATA****************************
            Number of intervals =   946
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        0.432 (CFS)
            Total volume =       0.797 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------


JN3504
ROUTING
Q10-1HR

-----------------------------------------------------------------


Program License Serial Number 5016

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q10d1r110.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =    20
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        8.544 (CFS)
            Total volume =       0.317 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------
Total number of inflow hydrograph intervals = 20
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------
-----------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-----------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 2.1 4.27 6.41 8.54	Depth (Ft.)
0.083	0.16	0.00	0.001	O | | | | |	0.00
0.167	1.04	0.01	0.005	O I | | | |	0.02
0.250	1.56	0.02	0.013	O I | | | |	0.07
0.333	1.97	0.04	0.025	O I| | | |	0.13
0.417	2.19	0.06	0.039	O I | | |	0.21
0.500	2.38	0.09	0.055	O I | | |	0.29
0.583	2.70	0.11	0.071	O | I | | |	0.38
0.667	3.24	0.12	0.091	O | I | | |	0.47
0.750	3.94	0.12	0.115	O | I | | |	0.59
0.833	5.65	0.12	0.147	O | | I | |	0.75
0.917	8.54	0.12	0.195	O | | | | I	0.98
1.000	5.99	0.27	0.244	|O | | I | |	1.20
1.083	3.59	0.30	0.275	|O | I | | |	1.34
1.167	1.70	0.31	0.291	|O I | | | |	1.41
1.250	0.73	0.32	0.297	|OI | | | |	1.43
1.333	0.33	0.32	0.299	|O | | | |	1.44
1.417	0.16	0.32	0.298	IO | | | |	1.44
1.500	0.09	0.32	0.297	IO | | | |	1.43
1.583	0.03	0.31	0.295	IO | | | |	1.42
1.667	0.01	0.31	0.293	IO | | | |	1.42
1.750	0.00	0.31	0.291	IO | | | |	1.41
1.833	0.00	0.31	0.289	IO | | | |	1.40
1.917	0.00	0.31	0.287	IO | | | |	1.39
2.000	0.00	0.31	0.285	IO | | | |	1.38
2.083	0.00	0.30	0.282	IO | | | |	1.37
2.167	0.00	0.30	0.280	IO | | | |	1.36
2.250	0.00	0.30	0.278	IO | | | |	1.35
2.333	0.00	0.30	0.276	IO | | | |	1.34
2.417	0.00	0.30	0.274	IO | | | |	1.33
2.500	0.00	0.30	0.272	IO | | | |	1.33
2.583	0.00	0.29	0.270	IO | | | |	1.32
2.667	0.00	0.29	0.268	IO | | | |	1.31
2.750	0.00	0.29	0.266	IO | | | |	1.30
2.833	0.00	0.29	0.264	IO | | | |	1.29
2.917	0.00	0.29	0.262	IO | | | |	1.28

3.000	0.00	0.28	0.260	IO				1.27
3.083	0.00	0.28	0.258	IO				1.27
3.167	0.00	0.28	0.256	IO				1.26
3.250	0.00	0.28	0.254	IO				1.25
3.333	0.00	0.28	0.252	IO				1.24
3.417	0.00	0.28	0.251	IO				1.23
3.500	0.00	0.27	0.249	IO				1.22
3.583	0.00	0.27	0.247	IO				1.22
3.667	0.00	0.27	0.245	IO				1.21
3.750	0.00	0.27	0.243	IO				1.20
3.833	0.00	0.26	0.241	O				1.19
3.917	0.00	0.26	0.239	O				1.18
4.000	0.00	0.25	0.238	O				1.18
4.083	0.00	0.25	0.236	O				1.17
4.167	0.00	0.24	0.234	O				1.16
4.250	0.00	0.23	0.233	O				1.15
4.333	0.00	0.23	0.231	O				1.15
4.417	0.00	0.22	0.229	O				1.14
4.500	0.00	0.22	0.228	O				1.13
4.583	0.00	0.21	0.226	O				1.12
4.667	0.00	0.21	0.225	O				1.12
4.750	0.00	0.20	0.224	O				1.11
4.833	0.00	0.20	0.222	O				1.11
4.917	0.00	0.19	0.221	O				1.10
5.000	0.00	0.19	0.219	O				1.09
5.083	0.00	0.19	0.218	O				1.09
5.167	0.00	0.18	0.217	O				1.08
5.250	0.00	0.18	0.216	O				1.08
5.333	0.00	0.17	0.215	O				1.07
5.417	0.00	0.17	0.213	O				1.07
5.500	0.00	0.16	0.212	O				1.06
5.583	0.00	0.16	0.211	O				1.05
5.667	0.00	0.16	0.210	O				1.05
5.750	0.00	0.15	0.209	O				1.04
5.833	0.00	0.15	0.208	O				1.04
5.917	0.00	0.15	0.207	O				1.04
6.000	0.00	0.14	0.206	O				1.03
6.083	0.00	0.14	0.205	O				1.03
6.167	0.00	0.14	0.204	O				1.02
6.250	0.00	0.13	0.203	O				1.02
6.333	0.00	0.13	0.202	O				1.01
6.417	0.00	0.13	0.201	O				1.01
6.500	0.00	0.12	0.200	O				1.01
6.583	0.00	0.12	0.199	O				1.00
6.667	0.00	0.12	0.199	O				1.00
6.750	0.00	0.12	0.198	O				0.99
6.833	0.00	0.12	0.197	O				0.99
6.917	0.00	0.12	0.196	O				0.99
7.000	0.00	0.12	0.195	O				0.98
7.083	0.00	0.12	0.194	O				0.98
7.167	0.00	0.12	0.194	O				0.97
7.250	0.00	0.12	0.193	O				0.97
7.333	0.00	0.12	0.192	O				0.97
7.417	0.00	0.12	0.191	O				0.96
7.500	0.00	0.12	0.190	O				0.96
7.583	0.00	0.12	0.190	O				0.95
7.667	0.00	0.12	0.189	O				0.95

7.750	0.00	0.12	0.188	O	|	|	|	|	0.95
7.833	0.00	0.12	0.187	O	|	|	|	|	0.94
7.917	0.00	0.12	0.186	O	|	|	|	|	0.94
8.000	0.00	0.12	0.185	O	|	|	|	|	0.94
8.083	0.00	0.12	0.185	O	|	|	|	|	0.93
8.167	0.00	0.12	0.184	O	|	|	|	|	0.93
8.250	0.00	0.12	0.183	O	|	|	|	|	0.92
8.333	0.00	0.12	0.182	O	|	|	|	|	0.92
8.417	0.00	0.12	0.181	O	|	|	|	|	0.92
8.500	0.00	0.12	0.180	O	|	|	|	|	0.91
8.583	0.00	0.12	0.180	O	|	|	|	|	0.91
8.667	0.00	0.12	0.179	O	|	|	|	|	0.90
8.750	0.00	0.12	0.178	O	|	|	|	|	0.90
8.833	0.00	0.12	0.177	O	|	|	|	|	0.90
8.917	0.00	0.12	0.176	O	|	|	|	|	0.89
9.000	0.00	0.12	0.175	O	|	|	|	|	0.89
9.083	0.00	0.12	0.175	O	|	|	|	|	0.88
9.167	0.00	0.12	0.174	O	|	|	|	|	0.88
9.250	0.00	0.12	0.173	O	|	|	|	|	0.88
9.333	0.00	0.12	0.172	O	|	|	|	|	0.87
9.417	0.00	0.12	0.171	O	|	|	|	|	0.87
9.500	0.00	0.12	0.171	O	|	|	|	|	0.86
9.583	0.00	0.12	0.170	O	|	|	|	|	0.86
9.667	0.00	0.12	0.169	O	|	|	|	|	0.86
9.750	0.00	0.12	0.168	O	|	|	|	|	0.85
9.833	0.00	0.12	0.167	O	|	|	|	|	0.85
9.917	0.00	0.12	0.166	O	|	|	|	|	0.84
10.000	0.00	0.12	0.166	O	|	|	|	|	0.84
10.083	0.00	0.12	0.165	O	|	|	|	|	0.84
10.167	0.00	0.12	0.164	O	|	|	|	|	0.83
10.250	0.00	0.12	0.163	O	|	|	|	|	0.83
10.333	0.00	0.12	0.162	O	|	|	|	|	0.83
10.417	0.00	0.12	0.161	O	|	|	|	|	0.82
10.500	0.00	0.12	0.161	O	|	|	|	|	0.82
10.583	0.00	0.12	0.160	O	|	|	|	|	0.81
10.667	0.00	0.12	0.159	O	|	|	|	|	0.81
10.750	0.00	0.12	0.158	O	|	|	|	|	0.81
10.833	0.00	0.12	0.157	O	|	|	|	|	0.80
10.917	0.00	0.12	0.156	O	|	|	|	|	0.80
11.000	0.00	0.12	0.156	O	|	|	|	|	0.79
11.083	0.00	0.12	0.155	O	|	|	|	|	0.79
11.167	0.00	0.12	0.154	O	|	|	|	|	0.79
11.250	0.00	0.12	0.153	O	|	|	|	|	0.78
11.333	0.00	0.12	0.152	O	|	|	|	|	0.78
11.417	0.00	0.12	0.152	O	|	|	|	|	0.77
11.500	0.00	0.12	0.151	O	|	|	|	|	0.77
11.583	0.00	0.12	0.150	O	|	|	|	|	0.76
11.667	0.00	0.12	0.149	O	|	|	|	|	0.76
11.750	0.00	0.12	0.148	O	|	|	|	|	0.76
11.833	0.00	0.12	0.147	O	|	|	|	|	0.75
11.917	0.00	0.12	0.147	O	|	|	|	|	0.75
12.000	0.00	0.12	0.146	O	|	|	|	|	0.74
12.083	0.00	0.12	0.145	O	|	|	|	|	0.74
12.167	0.00	0.12	0.144	O	|	|	|	|	0.74
12.250	0.00	0.12	0.143	O	|	|	|	|	0.73
12.333	0.00	0.12	0.142	O	|	|	|	|	0.73
12.417	0.00	0.12	0.142	O	|	|	|	|	0.72

12.500	0.00	0.12	0.141	O	|	|	|	|	0.72
12.583	0.00	0.12	0.140	O	|	|	|	|	0.72
12.667	0.00	0.12	0.139	O	|	|	|	|	0.71
12.750	0.00	0.12	0.138	O	|	|	|	|	0.71
12.833	0.00	0.12	0.137	O	|	|	|	|	0.70
12.917	0.00	0.12	0.137	O	|	|	|	|	0.70
13.000	0.00	0.12	0.136	O	|	|	|	|	0.70
13.083	0.00	0.12	0.135	O	|	|	|	|	0.69
13.167	0.00	0.12	0.134	O	|	|	|	|	0.69
13.250	0.00	0.12	0.133	O	|	|	|	|	0.68
13.333	0.00	0.12	0.133	O	|	|	|	|	0.68
13.417	0.00	0.12	0.132	O	|	|	|	|	0.67
13.500	0.00	0.12	0.131	O	|	|	|	|	0.67
13.583	0.00	0.12	0.130	O	|	|	|	|	0.67
13.667	0.00	0.12	0.129	O	|	|	|	|	0.66
13.750	0.00	0.12	0.128	O	|	|	|	|	0.66
13.833	0.00	0.12	0.128	O	|	|	|	|	0.65
13.917	0.00	0.12	0.127	O	|	|	|	|	0.65
14.000	0.00	0.12	0.126	O	|	|	|	|	0.65
14.083	0.00	0.12	0.125	O	|	|	|	|	0.64
14.167	0.00	0.12	0.124	O	|	|	|	|	0.64
14.250	0.00	0.12	0.123	O	|	|	|	|	0.63
14.333	0.00	0.12	0.123	O	|	|	|	|	0.63
14.417	0.00	0.12	0.122	O	|	|	|	|	0.63
14.500	0.00	0.12	0.121	O	|	|	|	|	0.62
14.583	0.00	0.12	0.120	O	|	|	|	|	0.62
14.667	0.00	0.12	0.119	O	|	|	|	|	0.61
14.750	0.00	0.12	0.118	O	|	|	|	|	0.61
14.833	0.00	0.12	0.118	O	|	|	|	|	0.61
14.917	0.00	0.12	0.117	O	|	|	|	|	0.60
15.000	0.00	0.12	0.116	O	|	|	|	|	0.60
15.083	0.00	0.12	0.115	O	|	|	|	|	0.59
15.167	0.00	0.12	0.114	O	|	|	|	|	0.59
15.250	0.00	0.12	0.113	O	|	|	|	|	0.59
15.333	0.00	0.12	0.113	O	|	|	|	|	0.58
15.417	0.00	0.12	0.112	O	|	|	|	|	0.58
15.500	0.00	0.12	0.111	O	|	|	|	|	0.57
15.583	0.00	0.12	0.110	O	|	|	|	|	0.57
15.667	0.00	0.12	0.109	O	|	|	|	|	0.56
15.750	0.00	0.12	0.109	O	|	|	|	|	0.56
15.833	0.00	0.12	0.108	O	|	|	|	|	0.56
15.917	0.00	0.12	0.107	O	|	|	|	|	0.55
16.000	0.00	0.12	0.106	O	|	|	|	|	0.55
16.083	0.00	0.12	0.105	O	|	|	|	|	0.54
16.167	0.00	0.12	0.104	O	|	|	|	|	0.54
16.250	0.00	0.12	0.104	O	|	|	|	|	0.54
16.333	0.00	0.12	0.103	O	|	|	|	|	0.53
16.417	0.00	0.12	0.102	O	|	|	|	|	0.53
16.500	0.00	0.12	0.101	O	|	|	|	|	0.52
16.583	0.00	0.12	0.100	O	|	|	|	|	0.52
16.667	0.00	0.12	0.099	O	|	|	|	|	0.52
16.750	0.00	0.12	0.099	O	|	|	|	|	0.51
16.833	0.00	0.12	0.098	O	|	|	|	|	0.51
16.917	0.00	0.12	0.097	O	|	|	|	|	0.50
17.000	0.00	0.12	0.096	O	|	|	|	|	0.50
17.083	0.00	0.12	0.095	O	|	|	|	|	0.50
17.167	0.00	0.12	0.094	O	|	|	|	|	0.49

17.250	0.00	0.12	0.094	O	|	|	|	|	0.49
17.333	0.00	0.12	0.093	O	|	|	|	|	0.48
17.417	0.00	0.12	0.092	O	|	|	|	|	0.48
17.500	0.00	0.12	0.091	O	|	|	|	|	0.47
17.583	0.00	0.12	0.090	O	|	|	|	|	0.47
17.667	0.00	0.12	0.090	O	|	|	|	|	0.47
17.750	0.00	0.12	0.089	O	|	|	|	|	0.46
17.833	0.00	0.12	0.088	O	|	|	|	|	0.46
17.917	0.00	0.12	0.087	O	|	|	|	|	0.45
18.000	0.00	0.12	0.086	O	|	|	|	|	0.45
18.083	0.00	0.12	0.085	O	|	|	|	|	0.45
18.167	0.00	0.12	0.085	O	|	|	|	|	0.44
18.250	0.00	0.12	0.084	O	|	|	|	|	0.44
18.333	0.00	0.12	0.083	O	|	|	|	|	0.43
18.417	0.00	0.12	0.082	O	|	|	|	|	0.43
18.500	0.00	0.12	0.081	O	|	|	|	|	0.43
18.583	0.00	0.12	0.080	O	|	|	|	|	0.42
18.667	0.00	0.12	0.080	O	|	|	|	|	0.42
18.750	0.00	0.12	0.079	O	|	|	|	|	0.41
18.833	0.00	0.12	0.078	O	|	|	|	|	0.41
18.917	0.00	0.12	0.077	O	|	|	|	|	0.41
19.000	0.00	0.12	0.076	O	|	|	|	|	0.40
19.083	0.00	0.12	0.075	O	|	|	|	|	0.40
19.167	0.00	0.12	0.075	O	|	|	|	|	0.39
19.250	0.00	0.12	0.074	O	|	|	|	|	0.39
19.333	0.00	0.12	0.073	O	|	|	|	|	0.38
19.417	0.00	0.11	0.072	O	|	|	|	|	0.38
19.500	0.00	0.11	0.071	O	|	|	|	|	0.38
19.583	0.00	0.11	0.071	O	|	|	|	|	0.37
19.667	0.00	0.11	0.070	O	|	|	|	|	0.37
19.750	0.00	0.11	0.069	O	|	|	|	|	0.36
19.833	0.00	0.11	0.068	O	|	|	|	|	0.36
19.917	0.00	0.11	0.068	O	|	|	|	|	0.36
20.000	0.00	0.11	0.067	O	|	|	|	|	0.35
20.083	0.00	0.10	0.066	O	|	|	|	|	0.35
20.167	0.00	0.10	0.066	O	|	|	|	|	0.34
20.250	0.00	0.10	0.065	O	|	|	|	|	0.34
20.333	0.00	0.10	0.064	O	|	|	|	|	0.34
20.417	0.00	0.10	0.063	O	|	|	|	|	0.33
20.500	0.00	0.10	0.063	O	|	|	|	|	0.33
20.583	0.00	0.10	0.062	O	|	|	|	|	0.33
20.667	0.00	0.10	0.061	O	|	|	|	|	0.32
20.750	0.00	0.10	0.061	O	|	|	|	|	0.32
20.833	0.00	0.09	0.060	O	|	|	|	|	0.32
20.917	0.00	0.09	0.059	O	|	|	|	|	0.31
21.000	0.00	0.09	0.059	O	|	|	|	|	0.31
21.083	0.00	0.09	0.058	O	|	|	|	|	0.31
21.167	0.00	0.09	0.058	O	|	|	|	|	0.30
21.250	0.00	0.09	0.057	O	|	|	|	|	0.30
21.333	0.00	0.09	0.056	O	|	|	|	|	0.30
21.417	0.00	0.09	0.056	O	|	|	|	|	0.29
21.500	0.00	0.09	0.055	O	|	|	|	|	0.29
21.583	0.00	0.09	0.054	O	|	|	|	|	0.29
21.667	0.00	0.09	0.054	O	|	|	|	|	0.28
21.750	0.00	0.08	0.053	O	|	|	|	|	0.28
21.833	0.00	0.08	0.053	O	|	|	|	|	0.28
21.917	0.00	0.08	0.052	O	|	|	|	|	0.27

22.000	0.00	0.08	0.052	O	|	|	|	|	0.27
22.083	0.00	0.08	0.051	O	|	|	|	|	0.27
22.167	0.00	0.08	0.050	O	|	|	|	|	0.27
22.250	0.00	0.08	0.050	O	|	|	|	|	0.26
22.333	0.00	0.08	0.049	O	|	|	|	|	0.26
22.417	0.00	0.08	0.049	O	|	|	|	|	0.26
22.500	0.00	0.08	0.048	O	|	|	|	|	0.25
22.583	0.00	0.08	0.048	O	|	|	|	|	0.25
22.667	0.00	0.07	0.047	O	|	|	|	|	0.25
22.750	0.00	0.07	0.047	O	|	|	|	|	0.25
22.833	0.00	0.07	0.046	O	|	|	|	|	0.24
22.917	0.00	0.07	0.046	O	|	|	|	|	0.24
23.000	0.00	0.07	0.045	O	|	|	|	|	0.24
23.083	0.00	0.07	0.045	O	|	|	|	|	0.24
23.167	0.00	0.07	0.044	O	|	|	|	|	0.23
23.250	0.00	0.07	0.044	O	|	|	|	|	0.23
23.333	0.00	0.07	0.043	O	|	|	|	|	0.23
23.417	0.00	0.07	0.043	O	|	|	|	|	0.23
23.500	0.00	0.07	0.042	O	|	|	|	|	0.22
23.583	0.00	0.07	0.042	O	|	|	|	|	0.22
23.667	0.00	0.07	0.042	O	|	|	|	|	0.22
23.750	0.00	0.06	0.041	O	|	|	|	|	0.22
23.833	0.00	0.06	0.041	O	|	|	|	|	0.21
23.917	0.00	0.06	0.040	O	|	|	|	|	0.21
24.000	0.00	0.06	0.040	O	|	|	|	|	0.21
24.083	0.00	0.06	0.039	O	|	|	|	|	0.21
24.167	0.00	0.06	0.039	O	|	|	|	|	0.20
24.250	0.00	0.06	0.038	O	|	|	|	|	0.20
24.333	0.00	0.06	0.038	O	|	|	|	|	0.20
24.417	0.00	0.06	0.038	O	|	|	|	|	0.20
24.500	0.00	0.06	0.037	O	|	|	|	|	0.20
24.583	0.00	0.06	0.037	O	|	|	|	|	0.19
24.667	0.00	0.06	0.036	O	|	|	|	|	0.19
24.750	0.00	0.06	0.036	O	|	|	|	|	0.19
24.833	0.00	0.06	0.036	O	|	|	|	|	0.19
24.917	0.00	0.06	0.035	O	|	|	|	|	0.19
25.000	0.00	0.06	0.035	O	|	|	|	|	0.18
25.083	0.00	0.05	0.034	O	|	|	|	|	0.18
25.167	0.00	0.05	0.034	O	|	|	|	|	0.18
25.250	0.00	0.05	0.034	O	|	|	|	|	0.18
25.333	0.00	0.05	0.033	O	|	|	|	|	0.18
25.417	0.00	0.05	0.033	O	|	|	|	|	0.17
25.500	0.00	0.05	0.033	O	|	|	|	|	0.17
25.583	0.00	0.05	0.032	O	|	|	|	|	0.17
25.667	0.00	0.05	0.032	O	|	|	|	|	0.17
25.750	0.00	0.05	0.032	O	|	|	|	|	0.17
25.833	0.00	0.05	0.031	O	|	|	|	|	0.16
25.917	0.00	0.05	0.031	O	|	|	|	|	0.16
26.000	0.00	0.05	0.031	O	|	|	|	|	0.16
26.083	0.00	0.05	0.030	O	|	|	|	|	0.16
26.167	0.00	0.05	0.030	O	|	|	|	|	0.16
26.250	0.00	0.05	0.030	O	|	|	|	|	0.16
26.333	0.00	0.05	0.029	O	|	|	|	|	0.15
26.417	0.00	0.05	0.029	O	|	|	|	|	0.15
26.500	0.00	0.05	0.029	O	|	|	|	|	0.15
26.583	0.00	0.04	0.028	O	|	|	|	|	0.15
26.667	0.00	0.04	0.028	O	|	|	|	|	0.15

26.750	0.00	0.04	0.028	O	|	|	|	|	0.15
26.833	0.00	0.04	0.027	O	|	|	|	|	0.14
26.917	0.00	0.04	0.027	O	|	|	|	|	0.14
27.000	0.00	0.04	0.027	O	|	|	|	|	0.14
27.083	0.00	0.04	0.027	O	|	|	|	|	0.14
27.167	0.00	0.04	0.026	O	|	|	|	|	0.14
27.250	0.00	0.04	0.026	O	|	|	|	|	0.14
27.333	0.00	0.04	0.026	O	|	|	|	|	0.14
27.417	0.00	0.04	0.025	O	|	|	|	|	0.13
27.500	0.00	0.04	0.025	O	|	|	|	|	0.13
27.583	0.00	0.04	0.025	O	|	|	|	|	0.13
27.667	0.00	0.04	0.025	O	|	|	|	|	0.13
27.750	0.00	0.04	0.024	O	|	|	|	|	0.13
27.833	0.00	0.04	0.024	O	|	|	|	|	0.13
27.917	0.00	0.04	0.024	O	|	|	|	|	0.13
28.000	0.00	0.04	0.024	O	|	|	|	|	0.12
28.083	0.00	0.04	0.023	O	|	|	|	|	0.12
28.167	0.00	0.04	0.023	O	|	|	|	|	0.12
28.250	0.00	0.04	0.023	O	|	|	|	|	0.12
28.333	0.00	0.04	0.023	O	|	|	|	|	0.12
28.417	0.00	0.04	0.022	O	|	|	|	|	0.12
28.500	0.00	0.03	0.022	O	|	|	|	|	0.12
28.583	0.00	0.03	0.022	O	|	|	|	|	0.12
28.667	0.00	0.03	0.022	O	|	|	|	|	0.11
28.750	0.00	0.03	0.021	O	|	|	|	|	0.11
28.833	0.00	0.03	0.021	O	|	|	|	|	0.11
28.917	0.00	0.03	0.021	O	|	|	|	|	0.11
29.000	0.00	0.03	0.021	O	|	|	|	|	0.11
29.083	0.00	0.03	0.020	O	|	|	|	|	0.11
29.167	0.00	0.03	0.020	O	|	|	|	|	0.11
29.250	0.00	0.03	0.020	O	|	|	|	|	0.11
29.333	0.00	0.03	0.020	O	|	|	|	|	0.10
29.417	0.00	0.03	0.020	O	|	|	|	|	0.10
29.500	0.00	0.03	0.019	O	|	|	|	|	0.10
29.583	0.00	0.03	0.019	O	|	|	|	|	0.10
29.667	0.00	0.03	0.019	O	|	|	|	|	0.10
29.750	0.00	0.03	0.019	O	|	|	|	|	0.10
29.833	0.00	0.03	0.019	O	|	|	|	|	0.10
29.917	0.00	0.03	0.018	O	|	|	|	|	0.10
30.000	0.00	0.03	0.018	O	|	|	|	|	0.10
30.083	0.00	0.03	0.018	O	|	|	|	|	0.09
30.167	0.00	0.03	0.018	O	|	|	|	|	0.09
30.250	0.00	0.03	0.018	O	|	|	|	|	0.09
30.333	0.00	0.03	0.017	O	|	|	|	|	0.09
30.417	0.00	0.03	0.017	O	|	|	|	|	0.09
30.500	0.00	0.03	0.017	O	|	|	|	|	0.09
30.583	0.00	0.03	0.017	O	|	|	|	|	0.09
30.667	0.00	0.03	0.017	O	|	|	|	|	0.09
30.750	0.00	0.03	0.016	O	|	|	|	|	0.09
30.833	0.00	0.03	0.016	O	|	|	|	|	0.09
30.917	0.00	0.03	0.016	O	|	|	|	|	0.08
31.000	0.00	0.03	0.016	O	|	|	|	|	0.08
31.083	0.00	0.02	0.016	O	|	|	|	|	0.08
31.167	0.00	0.02	0.016	O	|	|	|	|	0.08
31.250	0.00	0.02	0.015	O	|	|	|	|	0.08
31.333	0.00	0.02	0.015	O	|	|	|	|	0.08
31.417	0.00	0.02	0.015	O	|	|	|	|	0.08

31.500	0.00	0.02	0.015	O	|	|	|	|	0.08
31.583	0.00	0.02	0.015	O	|	|	|	|	0.08
31.667	0.00	0.02	0.015	O	|	|	|	|	0.08
31.750	0.00	0.02	0.014	O	|	|	|	|	0.08
31.833	0.00	0.02	0.014	O	|	|	|	|	0.08
31.917	0.00	0.02	0.014	O	|	|	|	|	0.07
32.000	0.00	0.02	0.014	O	|	|	|	|	0.07
32.083	0.00	0.02	0.014	O	|	|	|	|	0.07
32.167	0.00	0.02	0.014	O	|	|	|	|	0.07
32.250	0.00	0.02	0.014	O	|	|	|	|	0.07
32.333	0.00	0.02	0.013	O	|	|	|	|	0.07
32.417	0.00	0.02	0.013	O	|	|	|	|	0.07
32.500	0.00	0.02	0.013	O	|	|	|	|	0.07
32.583	0.00	0.02	0.013	O	|	|	|	|	0.07
32.667	0.00	0.02	0.013	O	|	|	|	|	0.07
32.750	0.00	0.02	0.013	O	|	|	|	|	0.07
32.833	0.00	0.02	0.013	O	|	|	|	|	0.07
32.917	0.00	0.02	0.012	O	|	|	|	|	0.07
33.000	0.00	0.02	0.012	O	|	|	|	|	0.06
33.083	0.00	0.02	0.012	O	|	|	|	|	0.06
33.167	0.00	0.02	0.012	O	|	|	|	|	0.06
33.250	0.00	0.02	0.012	O	|	|	|	|	0.06
33.333	0.00	0.02	0.012	O	|	|	|	|	0.06
33.417	0.00	0.02	0.012	O	|	|	|	|	0.06
33.500	0.00	0.02	0.012	O	|	|	|	|	0.06
33.583	0.00	0.02	0.011	O	|	|	|	|	0.06
33.667	0.00	0.02	0.011	O	|	|	|	|	0.06
33.750	0.00	0.02	0.011	O	|	|	|	|	0.06
33.833	0.00	0.02	0.011	O	|	|	|	|	0.06
33.917	0.00	0.02	0.011	O	|	|	|	|	0.06
34.000	0.00	0.02	0.011	O	|	|	|	|	0.06
34.083	0.00	0.02	0.011	O	|	|	|	|	0.06
34.167	0.00	0.02	0.011	O	|	|	|	|	0.06
34.250	0.00	0.02	0.010	O	|	|	|	|	0.05
34.333	0.00	0.02	0.010	O	|	|	|	|	0.05
34.417	0.00	0.02	0.010	O	|	|	|	|	0.05
34.500	0.00	0.02	0.010	O	|	|	|	|	0.05
34.583	0.00	0.02	0.010	O	|	|	|	|	0.05
34.667	0.00	0.02	0.010	O	|	|	|	|	0.05
34.750	0.00	0.02	0.010	O	|	|	|	|	0.05
34.833	0.00	0.02	0.010	O	|	|	|	|	0.05
34.917	0.00	0.02	0.010	O	|	|	|	|	0.05
35.000	0.00	0.01	0.009	O	|	|	|	|	0.05
35.083	0.00	0.01	0.009	O	|	|	|	|	0.05
35.167	0.00	0.01	0.009	O	|	|	|	|	0.05
35.250	0.00	0.01	0.009	O	|	|	|	|	0.05
35.333	0.00	0.01	0.009	O	|	|	|	|	0.05
35.417	0.00	0.01	0.009	O	|	|	|	|	0.05
35.500	0.00	0.01	0.009	O	|	|	|	|	0.05
35.583	0.00	0.01	0.009	O	|	|	|	|	0.05
35.667	0.00	0.01	0.009	O	|	|	|	|	0.05
35.750	0.00	0.01	0.009	O	|	|	|	|	0.05
35.833	0.00	0.01	0.008	O	|	|	|	|	0.04
35.917	0.00	0.01	0.008	O	|	|	|	|	0.04
36.000	0.00	0.01	0.008	O	|	|	|	|	0.04
36.083	0.00	0.01	0.008	O	|	|	|	|	0.04
36.167	0.00	0.01	0.008	O	|	|	|	|	0.04

36.250	0.00	0.01	0.008	O					0.04
36.333	0.00	0.01	0.008	O					0.04
36.417	0.00	0.01	0.008	O					0.04
36.500	0.00	0.01	0.008	O					0.04
36.583	0.00	0.01	0.008	O					0.04
36.667	0.00	0.01	0.008	O					0.04
36.750	0.00	0.01	0.008	O					0.04
36.833	0.00	0.01	0.007	O					0.04
36.917	0.00	0.01	0.007	O					0.04
37.000	0.00	0.01	0.007	O					0.04
37.083	0.00	0.01	0.007	O					0.04
37.167	0.00	0.01	0.007	O					0.04
37.250	0.00	0.01	0.007	O					0.04
37.333	0.00	0.01	0.007	O					0.04
37.417	0.00	0.01	0.007	O					0.04
37.500	0.00	0.01	0.007	O					0.04
37.583	0.00	0.01	0.007	O					0.04
37.667	0.00	0.01	0.007	O					0.04
37.750	0.00	0.01	0.007	O					0.03
37.833	0.00	0.01	0.007	O					0.03
37.917	0.00	0.01	0.006	O					0.03
38.000	0.00	0.01	0.006	O					0.03
38.083	0.00	0.01	0.006	O					0.03
38.167	0.00	0.01	0.006	O					0.03
38.250	0.00	0.01	0.006	O					0.03
38.333	0.00	0.01	0.006	O					0.03
38.417	0.00	0.01	0.006	O					0.03
38.500	0.00	0.01	0.006	O					0.03
38.583	0.00	0.01	0.006	O					0.03
38.667	0.00	0.01	0.006	O					0.03
38.750	0.00	0.01	0.006	O					0.03
38.833	0.00	0.01	0.006	O					0.03
38.917	0.00	0.01	0.006	O					0.03
39.000	0.00	0.01	0.006	O					0.03
39.083	0.00	0.01	0.006	O					0.03
39.167	0.00	0.01	0.005	O					0.03
39.250	0.00	0.01	0.005	O					0.03
39.333	0.00	0.01	0.005	O					0.03
39.417	0.00	0.01	0.005	O					0.03
39.500	0.00	0.01	0.005	O					0.03
39.583	0.00	0.01	0.005	O					0.03
39.667	0.00	0.01	0.005	O					0.03
39.750	0.00	0.01	0.005	O					0.03
39.833	0.00	0.01	0.005	O					0.03
39.917	0.00	0.01	0.005	O					0.03
40.000	0.00	0.01	0.005	O					0.03
40.083	0.00	0.01	0.005	O					0.03
40.167	0.00	0.01	0.005	O					0.03
40.250	0.00	0.01	0.005	O					0.03
40.333	0.00	0.01	0.005	O					0.02
40.417	0.00	0.01	0.005	O					0.02
40.500	0.00	0.01	0.005	O					0.02
40.583	0.00	0.01	0.005	O					0.02
40.667	0.00	0.01	0.005	O					0.02
40.750	0.00	0.01	0.004	O					0.02
40.833	0.00	0.01	0.004	O					0.02
40.917	0.00	0.01	0.004	O					0.02

41.000	0.00	0.01	0.004	O					0.02
41.083	0.00	0.01	0.004	O					0.02
41.167	0.00	0.01	0.004	O					0.02
41.250	0.00	0.01	0.004	O					0.02
41.333	0.00	0.01	0.004	O					0.02
41.417	0.00	0.01	0.004	O					0.02
41.500	0.00	0.01	0.004	O					0.02
41.583	0.00	0.01	0.004	O					0.02
41.667	0.00	0.01	0.004	O					0.02
41.750	0.00	0.01	0.004	O					0.02
41.833	0.00	0.01	0.004	O					0.02
41.917	0.00	0.01	0.004	O					0.02
42.000	0.00	0.01	0.004	O					0.02
42.083	0.00	0.01	0.004	O					0.02
42.167	0.00	0.01	0.004	O					0.02
42.250	0.00	0.01	0.004	O					0.02
42.333	0.00	0.01	0.004	O					0.02
42.417	0.00	0.01	0.004	O					0.02
42.500	0.00	0.01	0.004	O					0.02
42.583	0.00	0.01	0.004	O					0.02
42.667	0.00	0.01	0.003	O					0.02
42.750	0.00	0.01	0.003	O					0.02
42.833	0.00	0.01	0.003	O					0.02
42.917	0.00	0.01	0.003	O					0.02
43.000	0.00	0.01	0.003	O					0.02
43.083	0.00	0.01	0.003	O					0.02
43.167	0.00	0.01	0.003	O					0.02
43.250	0.00	0.01	0.003	O					0.02
43.333	0.00	0.01	0.003	O					0.02
43.417	0.00	0.00	0.003	O					0.02
43.500	0.00	0.00	0.003	O					0.02
43.583	0.00	0.00	0.003	O					0.02
43.667	0.00	0.00	0.003	O					0.02
43.750	0.00	0.00	0.003	O					0.02
43.833	0.00	0.00	0.003	O					0.02
43.917	0.00	0.00	0.003	O					0.02
44.000	0.00	0.00	0.003	O					0.02
44.083	0.00	0.00	0.003	O					0.02
44.167	0.00	0.00	0.003	O					0.02
44.250	0.00	0.00	0.003	O					0.01
44.333	0.00	0.00	0.003	O					0.01
44.417	0.00	0.00	0.003	O					0.01
44.500	0.00	0.00	0.003	O					0.01
44.583	0.00	0.00	0.003	O					0.01
44.667	0.00	0.00	0.003	O					0.01
44.750	0.00	0.00	0.003	O					0.01
44.833	0.00	0.00	0.003	O					0.01
44.917	0.00	0.00	0.003	O					0.01
45.000	0.00	0.00	0.003	O					0.01
45.083	0.00	0.00	0.003	O					0.01
45.167	0.00	0.00	0.003	O					0.01
45.250	0.00	0.00	0.002	O					0.01
45.333	0.00	0.00	0.002	O					0.01
45.417	0.00	0.00	0.002	O					0.01
45.500	0.00	0.00	0.002	O					0.01
45.583	0.00	0.00	0.002	O					0.01
45.667	0.00	0.00	0.002	O					0.01

45.750	0.00	0.00	0.002	O					0.01
45.833	0.00	0.00	0.002	O					0.01
45.917	0.00	0.00	0.002	O					0.01
46.000	0.00	0.00	0.002	O					0.01
46.083	0.00	0.00	0.002	O					0.01
46.167	0.00	0.00	0.002	O					0.01
46.250	0.00	0.00	0.002	O					0.01
46.333	0.00	0.00	0.002	O					0.01
46.417	0.00	0.00	0.002	O					0.01
46.500	0.00	0.00	0.002	O					0.01
46.583	0.00	0.00	0.002	O					0.01
46.667	0.00	0.00	0.002	O					0.01
46.750	0.00	0.00	0.002	O					0.01
46.833	0.00	0.00	0.002	O					0.01
46.917	0.00	0.00	0.002	O					0.01
47.000	0.00	0.00	0.002	O					0.01
47.083	0.00	0.00	0.002	O					0.01
47.167	0.00	0.00	0.002	O					0.01
47.250	0.00	0.00	0.002	O					0.01
47.333	0.00	0.00	0.002	O					0.01
47.417	0.00	0.00	0.002	O					0.01
47.500	0.00	0.00	0.002	O					0.01
47.583	0.00	0.00	0.002	O					0.01
47.667	0.00	0.00	0.002	O					0.01
47.750	0.00	0.00	0.002	O					0.01
47.833	0.00	0.00	0.002	O					0.01
47.917	0.00	0.00	0.002	O					0.01
48.000	0.00	0.00	0.002	O					0.01
48.083	0.00	0.00	0.002	O					0.01
48.167	0.00	0.00	0.002	O					0.01
48.250	0.00	0.00	0.002	O					0.01
48.333	0.00	0.00	0.002	O					0.01
48.417	0.00	0.00	0.002	O					0.01
48.500	0.00	0.00	0.002	O					0.01
48.583	0.00	0.00	0.002	O					0.01
48.667	0.00	0.00	0.002	O					0.01
48.750	0.00	0.00	0.002	O					0.01
48.833	0.00	0.00	0.002	O					0.01
48.917	0.00	0.00	0.002	O					0.01
49.000	0.00	0.00	0.002	O					0.01
49.083	0.00	0.00	0.002	O					0.01
49.167	0.00	0.00	0.001	O					0.01
49.250	0.00	0.00	0.001	O					0.01
49.333	0.00	0.00	0.001	O					0.01
49.417	0.00	0.00	0.001	O					0.01
49.500	0.00	0.00	0.001	O					0.01
49.583	0.00	0.00	0.001	O					0.01
49.667	0.00	0.00	0.001	O					0.01
49.750	0.00	0.00	0.001	O					0.01
49.833	0.00	0.00	0.001	O					0.01
49.917	0.00	0.00	0.001	O					0.01
50.000	0.00	0.00	0.001	O					0.01
50.083	0.00	0.00	0.001	O					0.01
50.167	0.00	0.00	0.001	O					0.01
50.250	0.00	0.00	0.001	O					0.01
50.333	0.00	0.00	0.001	O					0.01
50.417	0.00	0.00	0.001	O					0.01

50.500	0.00	0.00	0.001	O	|	|	|	|	0.01
50.583	0.00	0.00	0.001	O	|	|	|	|	0.01
50.667	0.00	0.00	0.001	O	|	|	|	|	0.01
50.750	0.00	0.00	0.001	O	|	|	|	|	0.01
50.833	0.00	0.00	0.001	O	|	|	|	|	0.01
50.917	0.00	0.00	0.001	O	|	|	|	|	0.01
51.000	0.00	0.00	0.001	O	|	|	|	|	0.01
51.083	0.00	0.00	0.001	O	|	|	|	|	0.01
51.167	0.00	0.00	0.001	O	|	|	|	|	0.01
51.250	0.00	0.00	0.001	O	|	|	|	|	0.01
51.333	0.00	0.00	0.001	O	|	|	|	|	0.01
51.417	0.00	0.00	0.001	O	|	|	|	|	0.01
51.500	0.00	0.00	0.001	O	|	|	|	|	0.01
51.583	0.00	0.00	0.001	O	|	|	|	|	0.01
51.667	0.00	0.00	0.001	O	|	|	|	|	0.01
51.750	0.00	0.00	0.001	O	|	|	|	|	0.01
51.833	0.00	0.00	0.001	O	|	|	|	|	0.01
51.917	0.00	0.00	0.001	O	|	|	|	|	0.01
52.000	0.00	0.00	0.001	O	|	|	|	|	0.01
52.083	0.00	0.00	0.001	O	|	|	|	|	0.01
52.167	0.00	0.00	0.001	O	|	|	|	|	0.01
52.250	0.00	0.00	0.001	O	|	|	|	|	0.01
52.333	0.00	0.00	0.001	O	|	|	|	|	0.01
52.417	0.00	0.00	0.001	O	|	|	|	|	0.01
52.500	0.00	0.00	0.001	O	|	|	|	|	0.01
52.583	0.00	0.00	0.001	O	|	|	|	|	0.01
52.667	0.00	0.00	0.001	O	|	|	|	|	0.00
52.750	0.00	0.00	0.001	O	|	|	|	|	0.00
52.833	0.00	0.00	0.001	O	|	|	|	|	0.00
52.917	0.00	0.00	0.001	O	|	|	|	|	0.00
53.000	0.00	0.00	0.001	O	|	|	|	|	0.00
53.083	0.00	0.00	0.001	O	|	|	|	|	0.00
53.167	0.00	0.00	0.001	O	|	|	|	|	0.00
53.250	0.00	0.00	0.001	O	|	|	|	|	0.00
53.333	0.00	0.00	0.001	O	|	|	|	|	0.00
53.417	0.00	0.00	0.001	O	|	|	|	|	0.00
53.500	0.00	0.00	0.001	O	|	|	|	|	0.00
53.583	0.00	0.00	0.001	O	|	|	|	|	0.00
53.667	0.00	0.00	0.001	O	|	|	|	|	0.00
53.750	0.00	0.00	0.001	O	|	|	|	|	0.00
53.833	0.00	0.00	0.001	O	|	|	|	|	0.00
53.917	0.00	0.00	0.001	O	|	|	|	|	0.00
54.000	0.00	0.00	0.001	O	|	|	|	|	0.00
54.083	0.00	0.00	0.001	O	|	|	|	|	0.00
54.167	0.00	0.00	0.001	O	|	|	|	|	0.00
54.250	0.00	0.00	0.001	O	|	|	|	|	0.00
54.333	0.00	0.00	0.001	O	|	|	|	|	0.00
54.417	0.00	0.00	0.001	O	|	|	|	|	0.00
54.500	0.00	0.00	0.001	O	|	|	|	|	0.00
54.583	0.00	0.00	0.001	O	|	|	|	|	0.00
54.667	0.00	0.00	0.001	O	|	|	|	|	0.00
54.750	0.00	0.00	0.001	O	|	|	|	|	0.00
54.833	0.00	0.00	0.001	O	|	|	|	|	0.00
54.917	0.00	0.00	0.001	O	|	|	|	|	0.00
55.000	0.00	0.00	0.001	O	|	|	|	|	0.00
55.083	0.00	0.00	0.001	O	|	|	|	|	0.00
55.167	0.00	0.00	0.001	O	|	|	|	|	0.00

```
55.250    0.00    0.00      0.001  O       |       |       |       |     0.00
55.333    0.00    0.00      0.001  O       |       |       |       |     0.00
55.417    0.00    0.00      0.001  O       |       |       |       |     0.00
55.500    0.00    0.00      0.001  O       |       |       |       |     0.00
55.583    0.00    0.00      0.001  O       |       |       |       |     0.00
55.667    0.00    0.00      0.001  O       |       |       |       |     0.00
55.750    0.00    0.00      0.001  O       |       |       |       |     0.00

     ****************************HYDROGRAPH DATA****************************
                Number of intervals =   669
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =        0.318 (CFS)
                Total volume =       0.316 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     ***********************************************************************

     ----------------------------------------------------------------------
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------


JN3504
ROUTING
Q10-24HR

-----------------------------------------------------------------


Program License Serial Number 5016

-----------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q10d1r2410.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =   296
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        2.394 (CFS)
            Total volume =       1.386 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------
Total number of inflow hydrograph intervals = 296
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------
-----------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-----------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	0.6	1.20	1.80	2.39	Depth (Ft.)
0.083	0.01	0.00	0.000	O					0.00
0.167	0.07	0.00	0.000	O					0.00
0.250	0.11	0.00	0.001	OI					0.01
0.333	0.13	0.00	0.002	OI					0.01
0.417	0.17	0.00	0.003	O I					0.01
0.500	0.18	0.01	0.004	O I					0.02
0.583	0.19	0.01	0.005	O I					0.03
0.667	0.20	0.01	0.006	O I					0.03
0.750	0.20	0.01	0.008	O I					0.04
0.833	0.20	0.01	0.009	O I					0.05
0.917	0.24	0.02	0.010	O I					0.05
1.000	0.25	0.02	0.012	O I					0.06
1.083	0.25	0.02	0.014	O I					0.07
1.167	0.23	0.02	0.015	O I					0.08
1.250	0.21	0.03	0.016	O I					0.09
1.333	0.20	0.03	0.018	O I					0.09
1.417	0.20	0.03	0.019	O I					0.10
1.500	0.20	0.03	0.020	O I					0.11
1.583	0.20	0.03	0.021	O I					0.11
1.667	0.20	0.04	0.022	O I					0.12
1.750	0.20	0.04	0.023	O I					0.12
1.833	0.21	0.04	0.025	O I					0.13
1.917	0.24	0.04	0.026	O I					0.14
2.000	0.25	0.04	0.027	O I					0.14
2.083	0.26	0.05	0.029	O I					0.15
2.167	0.26	0.05	0.030	O I					0.16
2.250	0.26	0.05	0.032	O I					0.17
2.333	0.27	0.05	0.033	O I					0.17
2.417	0.27	0.05	0.035	O I					0.18
2.500	0.27	0.06	0.036	O I					0.19
2.583	0.27	0.06	0.037	O I					0.20
2.667	0.30	0.06	0.039	O I					0.21
2.750	0.32	0.06	0.041	O I					0.21
2.833	0.33	0.07	0.043	O I					0.22
2.917	0.33	0.07	0.044	O I					0.23

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3.000    0.33    0.07      0.046  O   I   |        |        |        |      0.24
3.083    0.33    0.08      0.048  |O  I   |        |        |        |      0.25
3.167    0.33    0.08      0.050  |O  I   |        |        |        |      0.26
3.250    0.33    0.08      0.051  |O  I   |        |        |        |      0.27
3.333    0.33    0.08      0.053  |O  I   |        |        |        |      0.28
3.417    0.33    0.09      0.055  |O  I   |        |        |        |      0.29
3.500    0.33    0.09      0.056  |O  I   |        |        |        |      0.30
3.583    0.33    0.09      0.058  |O  I   |        |        |        |      0.31
3.667    0.33    0.09      0.060  |O  I   |        |        |        |      0.31
3.750    0.33    0.10      0.061  |O  I   |        |        |        |      0.32
3.833    0.34    0.10      0.063  |O  I   |        |        |        |      0.33
3.917    0.37    0.10      0.065  |O  I   |        |        |        |      0.34
4.000    0.39    0.11      0.067  |O   I  |        |        |        |      0.35
4.083    0.39    0.11      0.069  |O   I  |        |        |        |      0.36
4.167    0.40    0.11      0.071  |O   I  |        |        |        |      0.37
4.250    0.40    0.11      0.073  |O   I  |        |        |        |      0.38
4.333    0.40    0.12      0.074  |O   I  |        |        |        |      0.39
4.417    0.44    0.12      0.077  |O   I  |        |        |        |      0.40
4.500    0.45    0.12      0.079  |O    I |        |        |        |      0.41
4.583    0.46    0.12      0.081  |O    I |        |        |        |      0.43
4.667    0.46    0.12      0.083  |O    I |        |        |        |      0.44
4.750    0.46    0.12      0.086  |O    I |        |        |        |      0.45
4.833    0.47    0.12      0.088  |O    I |        |        |        |      0.46
4.917    0.50    0.12      0.091  |O    I |        |        |        |      0.47
5.000    0.52    0.12      0.093  |O    I |        |        |        |      0.49
5.083    0.51    0.12      0.096  |O    I |        |        |        |      0.50
5.167    0.45    0.12      0.099  |O    I |        |        |        |      0.51
5.250    0.42    0.12      0.101  |O   I  |        |        |        |      0.52
5.333    0.42    0.12      0.103  |O   I  |        |        |        |      0.53
5.417    0.44    0.12      0.105  |O   I  |        |        |        |      0.54
5.500    0.45    0.12      0.107  |O    I |        |        |        |      0.55
5.583    0.47    0.12      0.110  |O    I |        |        |        |      0.57
5.667    0.50    0.12      0.112  |O    I |        |        |        |      0.58
5.750    0.52    0.12      0.115  |O    I |        |        |        |      0.59
5.833    0.52    0.12      0.118  |O     I|        |        |        |      0.61
5.917    0.53    0.12      0.120  |O     I|        |        |        |      0.62
6.000    0.53    0.12      0.123  |O     I|        |        |        |      0.63
6.083    0.54    0.12      0.126  |O     I|        |        |        |      0.65
6.167    0.57    0.12      0.129  |O     I|        |        |        |      0.66
6.250    0.59    0.12      0.132  |O     I|        |        |        |      0.68
6.333    0.59    0.12      0.135  |O     I|        |        |        |      0.69
6.417    0.60    0.12      0.139  |O     I|        |        |        |      0.71
6.500    0.60    0.12      0.142  |O     I|        |        |        |      0.73
6.583    0.60    0.12      0.145  |O      I        |        |        |      0.74
6.667    0.63    0.12      0.149  |O      I        |        |        |      0.76
6.750    0.65    0.12      0.152  |O      I        |        |        |      0.78
6.833    0.66    0.12      0.156  |O      I        |        |        |      0.79
6.917    0.66    0.12      0.160  |O      I        |        |        |      0.81
7.000    0.66    0.12      0.163  |O      I        |        |        |      0.83
7.083    0.66    0.12      0.167  |O      I        |        |        |      0.85
7.167    0.66    0.12      0.171  |O      I        |        |        |      0.87
7.250    0.66    0.12      0.175  |O      I        |        |        |      0.88
7.333    0.67    0.12      0.178  |O      I        |        |        |      0.90
7.417    0.70    0.12      0.182  |O      |I       |        |        |      0.92
7.500    0.72    0.12      0.186  |O      |I       |        |        |      0.94
7.583    0.73    0.12      0.191  |O      |I       |        |        |      0.96
7.667    0.77    0.12      0.195  |O      | I      |        |        |      0.98
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7.750	0.78	0.12	0.199	O	I			1.00
7.833	0.80	0.14	0.204	O	I			1.02
7.917	0.83	0.15	0.209	O	I			1.04
8.000	0.85	0.17	0.213	O	I			1.06
8.083	0.87	0.18	0.218	O	I			1.09
8.167	0.94	0.20	0.223	O	I			1.11
8.250	0.97	0.22	0.228	O	I			1.13
8.333	0.98	0.24	0.233	O	I			1.15
8.417	0.99	0.25	0.238	O	I			1.18
8.500	0.99	0.27	0.243	O	I			1.20
8.583	1.00	0.27	0.248	O	I			1.22
8.667	1.03	0.28	0.253	O	I			1.24
8.750	1.05	0.28	0.259	O	I			1.27
8.833	1.06	0.29	0.264	O	I			1.29
8.917	1.10	0.29	0.269	O	I			1.31
9.000	1.12	0.30	0.275	O	I			1.34
9.083	1.13	0.30	0.281	O	I			1.36
9.167	1.20	0.31	0.287	O	I			1.39
9.250	1.24	0.31	0.293	O	I			1.41
9.333	1.26	0.32	0.299	O	I			1.44
9.417	1.29	0.32	0.306	O	I			1.47
9.500	1.31	0.33	0.312	O	I			1.50
9.583	1.33	0.34	0.319	O	I			1.53
9.667	1.36	0.34	0.326	O	I			1.56
9.750	1.38	0.35	0.333	O	I			1.59
9.833	1.39	0.35	0.340	O	I			1.62
9.917	1.43	0.36	0.348	O	I			1.65
10.000	1.45	0.36	0.355	O	I			1.68
10.083	1.41	0.37	0.362	O	I			1.71
10.167	1.20	0.37	0.369	O	I			1.73
10.250	1.08	0.37	0.374	O	I			1.76
10.333	1.04	0.38	0.379	O	I			1.78
10.417	1.01	0.38	0.383	O	I			1.79
10.500	1.00	0.38	0.388	O	I			1.81
10.583	1.03	0.38	0.392	O	I			1.83
10.667	1.19	0.39	0.397	O	I			1.85
10.750	1.27	0.39	0.403	O	I			1.87
10.833	1.30	0.39	0.409	O	I			1.90
10.917	1.32	0.40	0.415	O	I			1.92
11.000	1.32	0.40	0.422	O	I			1.95
11.083	1.32	0.41	0.428	O	I			1.97
11.167	1.29	0.41	0.434	O	I			2.00
11.250	1.27	0.41	0.440	O	I			2.02
11.333	1.27	0.42	0.446	O	I			2.04
11.417	1.26	0.42	0.452	O	I			2.07
11.500	1.26	0.42	0.458	O	I			2.09
11.583	1.25	0.42	0.463	O	I			2.11
11.667	1.19	0.43	0.469	O	I			2.13
11.750	1.15	0.43	0.474	O	I			2.15
11.833	1.15	0.43	0.479	O	I			2.17
11.917	1.17	0.43	0.484	O	I			2.19
12.000	1.19	0.43	0.489	O	I			2.21
12.083	1.23	0.44	0.494	O	I			2.23
12.167	1.46	0.44	0.501	O	I			2.25
12.250	1.57	0.44	0.508	O	I			2.28
12.333	1.63	0.45	0.516	O	I			2.31
12.417	1.68	0.45	0.524	O	I			2.34

12.500	1.71	0.45	0.533		O		I		2.37
12.583	1.74	0.46	0.542		O		I		2.40
12.667	1.82	0.46	0.551		O		I		2.44
12.750	1.87	0.47	0.560		O		I		2.47
12.833	1.89	0.47	0.570		O		I		2.51
12.917	1.94	0.47	0.580		O		I		2.55
13.000	1.97	0.48	0.590		O		I		2.59
13.083	2.01	0.48	0.600		O		I		2.62
13.167	2.21	0.49	0.612		O		I		2.66
13.250	2.32	0.49	0.624		O		I		2.71
13.333	2.36	0.49	0.637		O		I		2.75
13.417	2.38	0.50	0.650		O		I		2.80
13.500	2.39	0.50	0.663		O		I		2.84
13.583	2.32	0.50	0.675		O		I		2.89
13.667	1.91	0.51	0.687		O		I		2.93
13.750	1.69	0.51	0.695		O		I		2.96
13.833	1.60	0.52	0.703		O		I		2.98
13.917	1.56	0.58	0.710		O		I		3.01
14.000	1.54	0.75	0.716		O		I		3.03
14.083	1.56	0.89	0.721		O		I		3.05
14.167	1.71	1.02	0.726		O		I		3.06
14.250	1.79	1.15	0.731		O		I		3.08
14.333	1.82	1.26	0.735		O		I		3.09
14.417	1.80	1.36	0.738		O		I		3.10
14.500	1.78	1.43	0.741		O		I		3.11
14.583	1.78	1.49	0.743		O		I		3.12
14.667	1.78	1.54	0.745		O		I		3.13
14.750	1.78	1.58	0.747		O		I		3.13
14.833	1.77	1.62	0.748		O		I		3.13
14.917	1.74	1.64	0.749		O		I		3.14
15.000	1.72	1.66	0.749		O				3.14
15.083	1.71	1.67	0.749		O				3.14
15.167	1.66	1.67	0.750		O				3.14
15.250	1.64	1.67	0.750		O		I		3.14
15.333	1.63	1.66	0.749		O		I		3.14
15.417	1.59	1.65	0.749		O		I		3.14
15.500	1.57	1.64	0.749		O		I		3.14
15.583	1.53	1.62	0.748		O		I		3.14
15.667	1.39	1.60	0.747		O		I		3.13
15.750	1.32	1.55	0.745		O		I		3.13
15.833	1.29	1.51	0.744		O		I		3.12
15.917	1.27	1.47	0.742		O		I		3.12
16.000	1.27	1.44	0.741		O		I		3.11
16.083	1.18	1.40	0.740		O		I		3.11
16.167	0.70	1.32	0.737		O		I		3.10
16.250	0.45	1.19	0.732		O		I		3.08
16.333	0.35	1.05	0.727		O		I		3.07
16.417	0.30	0.93	0.723		O		I		3.05
16.500	0.28	0.82	0.719		O		I		3.04
16.583	0.27	0.72	0.715		O		I		3.02
16.667	0.23	0.64	0.712		O		I		3.01
16.750	0.21	0.57	0.710		O		I		3.01
16.833	0.21	0.52	0.707		O		I		3.00
16.917	0.20	0.52	0.705		O		I		2.99
17.000	0.20	0.52	0.703		O		I		2.98
17.083	0.21	0.52	0.701		O		I		2.98
17.167	0.27	0.51	0.699		O		I		2.97

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17.250    0.31    0.51      0.698  |   I O |       |       |       |     2.97
17.333    0.32    0.51      0.696  |   I O |       |       |       |     2.96
17.417    0.33    0.51      0.695  |   I O |       |       |       |     2.96
17.500    0.33    0.51      0.694  |   I O |       |       |       |     2.95
17.583    0.33    0.51      0.692  |   I O |       |       |       |     2.95
17.667    0.33    0.51      0.691  |   I O |       |       |       |     2.94
17.750    0.33    0.51      0.690  |   I O |       |       |       |     2.94
17.833    0.33    0.51      0.689  |   I O |       |       |       |     2.93
17.917    0.29    0.51      0.687  |  I  O |       |       |       |     2.93
18.000    0.28    0.51      0.686  |  I  O |       |       |       |     2.92
18.083    0.27    0.51      0.684  |  I  O |       |       |       |     2.92
18.167    0.27    0.51      0.683  |  I  O |       |       |       |     2.91
18.250    0.27    0.51      0.681  |  I  O |       |       |       |     2.91
18.333    0.27    0.51      0.679  |  I  O |       |       |       |     2.90
18.417    0.27    0.51      0.678  |  I  O |       |       |       |     2.90
18.500    0.27    0.50      0.676  |  I  O |       |       |       |     2.89
18.583    0.26    0.50      0.674  |  I  O |       |       |       |     2.88
18.667    0.23    0.50      0.673  |  I  O |       |       |       |     2.88
18.750    0.21    0.50      0.671  | I   O |       |       |       |     2.87
18.833    0.20    0.50      0.669  | I   O |       |       |       |     2.86
18.917    0.16    0.50      0.666  | I   O |       |       |       |     2.86
19.000    0.15    0.50      0.664  |I    O |       |       |       |     2.85
19.083    0.15    0.50      0.661  |I    O |       |       |       |     2.84
19.167    0.17    0.50      0.659  | I   O |       |       |       |     2.83
19.250    0.19    0.50      0.657  | I   O |       |       |       |     2.82
19.333    0.20    0.50      0.655  | I   O |       |       |       |     2.82
19.417    0.23    0.50      0.653  |  I  O |       |       |       |     2.81
19.500    0.25    0.50      0.651  |  I  O |       |       |       |     2.80
19.583    0.25    0.50      0.649  |  I  O |       |       |       |     2.80
19.667    0.23    0.50      0.648  |  I  O |       |       |       |     2.79
19.750    0.21    0.50      0.646  | I   O |       |       |       |     2.78
19.833    0.20    0.50      0.644  | I   O |       |       |       |     2.78
19.917    0.16    0.49      0.642  | I   O |       |       |       |     2.77
20.000    0.15    0.49      0.639  |I    O |       |       |       |     2.76
20.083    0.15    0.49      0.637  |I    O |       |       |       |     2.75
20.167    0.17    0.49      0.635  | I   O |       |       |       |     2.74
20.250    0.19    0.49      0.632  | I   O |       |       |       |     2.74
20.333    0.19    0.49      0.630  | I   O |       |       |       |     2.73
20.417    0.20    0.49      0.628  | I   O |       |       |       |     2.72
20.500    0.20    0.49      0.626  | I   O |       |       |       |     2.71
20.583    0.20    0.49      0.624  | I   O |       |       |       |     2.71
20.667    0.20    0.49      0.622  | I   O |       |       |       |     2.70
20.750    0.20    0.49      0.620  | I   O |       |       |       |     2.69
20.833    0.19    0.49      0.618  | I   O |       |       |       |     2.69
20.917    0.16    0.49      0.616  | I   O |       |       |       |     2.68
21.000    0.15    0.49      0.614  |I    O |       |       |       |     2.67
21.083    0.14    0.49      0.612  |I    O |       |       |       |     2.66
21.167    0.17    0.48      0.609  | I   O |       |       |       |     2.65
21.250    0.19    0.48      0.607  | I   O |       |       |       |     2.65
21.333    0.19    0.48      0.605  | I   O |       |       |       |     2.64
21.417    0.16    0.48      0.603  | I   O |       |       |       |     2.63
21.500    0.14    0.48      0.601  |I    O |       |       |       |     2.62
21.583    0.14    0.48      0.598  |I    O |       |       |       |     2.62
21.667    0.17    0.48      0.596  | I   O |       |       |       |     2.61
21.750    0.19    0.48      0.594  | I   O |       |       |       |     2.60
21.833    0.19    0.48      0.592  | I   O |       |       |       |     2.59
21.917    0.16    0.48      0.590  | I   O |       |       |       |     2.59
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22.000	0.14	0.48	0.588	|I	O |	|	|	2.58
22.083	0.14	0.48	0.586	|I	O |	|	|	2.57
22.167	0.17	0.48	0.583	| I	O |	|	|	2.56
22.250	0.19	0.47	0.581	| I	O |	|	|	2.55
22.333	0.19	0.47	0.579	| I	O |	|	|	2.55
22.417	0.16	0.47	0.577	| I	O |	|	|	2.54
22.500	0.14	0.47	0.575	|I	O |	|	|	2.53
22.583	0.14	0.47	0.573	|I	O |	|	|	2.52
22.667	0.14	0.47	0.570	|I	O |	|	|	2.51
22.750	0.13	0.47	0.568	|I	O |	|	|	2.50
22.833	0.13	0.47	0.566	|I	O |	|	|	2.49
22.917	0.13	0.47	0.564	|I	O |	|	|	2.49
23.000	0.13	0.47	0.561	|I	O |	|	|	2.48
23.083	0.13	0.46	0.559	|I	O |	|	|	2.47
23.167	0.13	0.46	0.557	|I	O |	|	|	2.46
23.250	0.13	0.46	0.554	|I	O |	|	|	2.45
23.333	0.13	0.46	0.552	|I	O |	|	|	2.44
23.417	0.13	0.46	0.550	|I	O |	|	|	2.43
23.500	0.13	0.46	0.548	|I	O |	|	|	2.43
23.583	0.13	0.46	0.545	|I	O |	|	|	2.42
23.667	0.13	0.46	0.543	|I	O |	|	|	2.41
23.750	0.13	0.46	0.541	|I	O |	|	|	2.40
23.833	0.13	0.46	0.539	|I	O |	|	|	2.39
23.917	0.13	0.45	0.536	|I	O |	|	|	2.38
24.000	0.13	0.45	0.534	|I	O |	|	|	2.38
24.083	0.12	0.45	0.532	|I	O |	|	|	2.37
24.167	0.06	0.45	0.530	I	O |	|	|	2.36
24.250	0.02	0.45	0.527	I	O |	|	|	2.35
24.333	0.01	0.45	0.524	I	O |	|	|	2.34
24.417	0.00	0.45	0.521	I	O |	|	|	2.33
24.500	0.00	0.45	0.518	I	O |	|	|	2.31
24.583	0.00	0.45	0.515	I	O |	|	|	2.30
24.667	0.00	0.44	0.512	I	O |	|	|	2.29
24.750	0.00	0.44	0.508	I	O |	|	|	2.28
24.833	0.00	0.44	0.505	I	O |	|	|	2.27
24.917	0.00	0.44	0.502	I	O |	|	|	2.26
25.000	0.00	0.44	0.499	I	O |	|	|	2.25
25.083	0.00	0.44	0.496	I	O |	|	|	2.23
25.167	0.00	0.44	0.493	I	O |	|	|	2.22
25.250	0.00	0.43	0.490	I	O |	|	|	2.21
25.333	0.00	0.43	0.487	I	O |	|	|	2.20
25.417	0.00	0.43	0.484	I	O |	|	|	2.19
25.500	0.00	0.43	0.481	I	O |	|	|	2.18
25.583	0.00	0.43	0.478	I	O |	|	|	2.17
25.667	0.00	0.43	0.476	I	O |	|	|	2.16
25.750	0.00	0.43	0.473	I	O |	|	|	2.14
25.833	0.00	0.43	0.470	I	O |	|	|	2.13
25.917	0.00	0.42	0.467	I	O |	|	|	2.12
26.000	0.00	0.42	0.464	I	O |	|	|	2.11
26.083	0.00	0.42	0.461	I	O |	|	|	2.10
26.167	0.00	0.42	0.458	I	O |	|	|	2.09
26.250	0.00	0.42	0.455	I	O |	|	|	2.08
26.333	0.00	0.42	0.452	I	O |	|	|	2.07
26.417	0.00	0.42	0.449	I	O |	|	|	2.06
26.500	0.00	0.42	0.446	I	O |	|	|	2.05
26.583	0.00	0.41	0.444	I	O |	|	|	2.04
26.667	0.00	0.41	0.441	I	O |	|	|	2.03

26.750	0.00	0.41	0.438	I	O				2.01
26.833	0.00	0.41	0.435	I	O				2.00
26.917	0.00	0.41	0.432	I	O				1.99
27.000	0.00	0.41	0.429	I	O				1.98
27.083	0.00	0.41	0.427	I	O				1.97
27.167	0.00	0.40	0.424	I	O				1.96
27.250	0.00	0.40	0.421	I	O				1.95
27.333	0.00	0.40	0.418	I	O				1.94
27.417	0.00	0.40	0.416	I	O				1.92
27.500	0.00	0.40	0.413	I	O				1.91
27.583	0.00	0.40	0.410	I	O				1.90
27.667	0.00	0.39	0.407	I	O				1.89
27.750	0.00	0.39	0.405	I	O				1.88
27.833	0.00	0.39	0.402	I	O				1.87
27.917	0.00	0.39	0.399	I	O				1.86
28.000	0.00	0.39	0.397	I	O				1.85
28.083	0.00	0.39	0.394	I	O				1.84
28.167	0.00	0.38	0.391	I	O				1.83
28.250	0.00	0.38	0.389	I	O				1.82
28.333	0.00	0.38	0.386	I	O				1.80
28.417	0.00	0.38	0.383	I	O				1.79
28.500	0.00	0.38	0.381	I	O				1.78
28.583	0.00	0.38	0.378	I	O				1.77
28.667	0.00	0.37	0.376	I	O				1.76
28.750	0.00	0.37	0.373	I	O				1.75
28.833	0.00	0.37	0.371	I	O				1.74
28.917	0.00	0.37	0.368	I	O				1.73
29.000	0.00	0.37	0.365	I	O				1.72
29.083	0.00	0.37	0.363	I	O				1.71
29.167	0.00	0.36	0.360	I	O				1.70
29.250	0.00	0.36	0.358	I	O				1.69
29.333	0.00	0.36	0.355	I	O				1.68
29.417	0.00	0.36	0.353	I	O				1.67
29.500	0.00	0.36	0.350	I	O				1.66
29.583	0.00	0.36	0.348	I	O				1.65
29.667	0.00	0.36	0.345	I	O				1.64
29.750	0.00	0.35	0.343	I	O				1.63
29.833	0.00	0.35	0.341	I	O				1.62
29.917	0.00	0.35	0.338	I	O				1.61
30.000	0.00	0.35	0.336	I	O				1.60
30.083	0.00	0.35	0.333	I	O				1.59
30.167	0.00	0.35	0.331	I	O				1.58
30.250	0.00	0.34	0.329	I	O				1.57
30.333	0.00	0.34	0.326	I	O				1.56
30.417	0.00	0.34	0.324	I	O				1.55
30.500	0.00	0.34	0.322	I	O				1.54
30.583	0.00	0.34	0.319	I	O				1.53
30.667	0.00	0.33	0.317	I	O				1.52
30.750	0.00	0.33	0.315	I	O				1.51
30.833	0.00	0.33	0.312	I	O				1.50
30.917	0.00	0.33	0.310	I	O				1.49
31.000	0.00	0.33	0.308	I	O				1.48
31.083	0.00	0.32	0.306	I	O				1.47
31.167	0.00	0.32	0.303	I	O				1.46
31.250	0.00	0.32	0.301	I	O				1.45
31.333	0.00	0.32	0.299	I	O				1.44
31.417	0.00	0.32	0.297	I	O				1.43

31.500	0.00	0.31	0.295	I	O				1.42
31.583	0.00	0.31	0.292	I	O				1.41
31.667	0.00	0.31	0.290	I	O				1.40
31.750	0.00	0.31	0.288	I	O				1.39
31.833	0.00	0.31	0.286	I	O				1.39
31.917	0.00	0.31	0.284	I	O				1.38
32.000	0.00	0.30	0.282	I	O				1.37
32.083	0.00	0.30	0.280	I	O				1.36
32.167	0.00	0.30	0.278	I	O				1.35
32.250	0.00	0.30	0.276	I	O				1.34
32.333	0.00	0.30	0.274	I	O				1.33
32.417	0.00	0.29	0.272	I	O				1.32
32.500	0.00	0.29	0.270	I	O				1.31
32.583	0.00	0.29	0.268	I	O				1.31
32.667	0.00	0.29	0.266	I	O				1.30
32.750	0.00	0.29	0.264	I	O				1.29
32.833	0.00	0.29	0.262	I	O				1.28
32.917	0.00	0.28	0.260	I	O				1.27
33.000	0.00	0.28	0.258	I	O				1.26
33.083	0.00	0.28	0.256	I	O				1.25
33.167	0.00	0.28	0.254	I	O				1.25
33.250	0.00	0.28	0.252	I	O				1.24
33.333	0.00	0.28	0.250	I	O				1.23
33.417	0.00	0.27	0.248	I	O				1.22
33.500	0.00	0.27	0.246	I	O				1.21
33.583	0.00	0.27	0.244	I	O				1.21
33.667	0.00	0.27	0.242	I	O				1.20
33.750	0.00	0.26	0.241	I	O				1.19
33.833	0.00	0.26	0.239	I	O				1.18
33.917	0.00	0.25	0.237	I	O				1.17
34.000	0.00	0.24	0.235	I	O				1.17
34.083	0.00	0.24	0.234	I	O				1.16
34.167	0.00	0.23	0.232	I	O				1.15
34.250	0.00	0.23	0.231	I	O				1.14
34.333	0.00	0.22	0.229	I	O				1.14
34.417	0.00	0.22	0.227	I	O				1.13
34.500	0.00	0.21	0.226	I	O				1.12
34.583	0.00	0.21	0.225	I	O				1.12
34.667	0.00	0.20	0.223	I	O				1.11
34.750	0.00	0.20	0.222	I	O				1.10
34.833	0.00	0.19	0.220	I	O				1.10
34.917	0.00	0.19	0.219	I	O				1.09
35.000	0.00	0.18	0.218	I	O				1.09
35.083	0.00	0.18	0.217	I	O				1.08
35.167	0.00	0.18	0.215	I	O				1.07
35.250	0.00	0.17	0.214	I	O				1.07
35.333	0.00	0.17	0.213	I	O				1.06
35.417	0.00	0.16	0.212	I	O				1.06
35.500	0.00	0.16	0.211	I	O				1.05
35.583	0.00	0.16	0.210	I	O				1.05
35.667	0.00	0.15	0.209	I	O				1.04
35.750	0.00	0.15	0.208	I	O				1.04
35.833	0.00	0.15	0.207	I	O				1.03
35.917	0.00	0.14	0.206	I	O				1.03
36.000	0.00	0.14	0.205	I	O				1.03
36.083	0.00	0.14	0.204	I	O				1.02
36.167	0.00	0.13	0.203	I	O				1.02

36.250	0.00	0.13	0.202	IO				1.01
36.333	0.00	0.13	0.201	IO				1.01
36.417	0.00	0.12	0.200	IO				1.00
36.500	0.00	0.12	0.199	IO				1.00
36.583	0.00	0.12	0.198	IO				1.00
36.667	0.00	0.12	0.198	IO				0.99
36.750	0.00	0.12	0.197	IO				0.99
36.833	0.00	0.12	0.196	IO				0.99
36.917	0.00	0.12	0.195	IO				0.98
37.000	0.00	0.12	0.194	IO				0.98
37.083	0.00	0.12	0.193	IO				0.97
37.167	0.00	0.12	0.193	IO				0.97
37.250	0.00	0.12	0.192	IO				0.97
37.333	0.00	0.12	0.191	IO				0.96
37.417	0.00	0.12	0.190	IO				0.96
37.500	0.00	0.12	0.189	IO				0.95
37.583	0.00	0.12	0.188	IO				0.95
37.667	0.00	0.12	0.188	IO				0.95
37.750	0.00	0.12	0.187	IO				0.94
37.833	0.00	0.12	0.186	IO				0.94
37.917	0.00	0.12	0.185	IO				0.93
38.000	0.00	0.12	0.184	IO				0.93
38.083	0.00	0.12	0.184	IO				0.93
38.167	0.00	0.12	0.183	IO				0.92
38.250	0.00	0.12	0.182	IO				0.92
38.333	0.00	0.12	0.181	IO				0.91
38.417	0.00	0.12	0.180	IO				0.91
38.500	0.00	0.12	0.179	IO				0.91
38.583	0.00	0.12	0.179	IO				0.90
38.667	0.00	0.12	0.178	IO				0.90
38.750	0.00	0.12	0.177	IO				0.89
38.833	0.00	0.12	0.176	IO				0.89
38.917	0.00	0.12	0.175	IO				0.89
39.000	0.00	0.12	0.174	IO				0.88
39.083	0.00	0.12	0.174	IO				0.88
39.167	0.00	0.12	0.173	IO				0.88
39.250	0.00	0.12	0.172	IO				0.87
39.333	0.00	0.12	0.171	IO				0.87
39.417	0.00	0.12	0.170	IO				0.86
39.500	0.00	0.12	0.169	IO				0.86
39.583	0.00	0.12	0.169	IO				0.86
39.667	0.00	0.12	0.168	IO				0.85
39.750	0.00	0.12	0.167	IO				0.85
39.833	0.00	0.12	0.166	IO				0.84
39.917	0.00	0.12	0.165	IO				0.84
40.000	0.00	0.12	0.164	IO				0.84
40.083	0.00	0.12	0.164	IO				0.83
40.167	0.00	0.12	0.163	IO				0.83
40.250	0.00	0.12	0.162	IO				0.82
40.333	0.00	0.12	0.161	IO				0.82
40.417	0.00	0.12	0.160	IO				0.82
40.500	0.00	0.12	0.160	IO				0.81
40.583	0.00	0.12	0.159	IO				0.81
40.667	0.00	0.12	0.158	IO				0.80
40.750	0.00	0.12	0.157	IO				0.80
40.833	0.00	0.12	0.156	IO				0.80
40.917	0.00	0.12	0.155	IO				0.79

41.000	0.00	0.12	0.155	IO				0.79
41.083	0.00	0.12	0.154	IO				0.78
41.167	0.00	0.12	0.153	IO				0.78
41.250	0.00	0.12	0.152	IO				0.78
41.333	0.00	0.12	0.151	IO				0.77
41.417	0.00	0.12	0.150	IO				0.77
41.500	0.00	0.12	0.150	IO				0.76
41.583	0.00	0.12	0.149	IO				0.76
41.667	0.00	0.12	0.148	IO				0.76
41.750	0.00	0.12	0.147	IO				0.75
41.833	0.00	0.12	0.146	IO				0.75
41.917	0.00	0.12	0.145	IO				0.74
42.000	0.00	0.12	0.145	IO				0.74
42.083	0.00	0.12	0.144	IO				0.73
42.167	0.00	0.12	0.143	IO				0.73
42.250	0.00	0.12	0.142	IO				0.73
42.333	0.00	0.12	0.141	IO				0.72
42.417	0.00	0.12	0.141	IO				0.72
42.500	0.00	0.12	0.140	IO				0.71
42.583	0.00	0.12	0.139	IO				0.71
42.667	0.00	0.12	0.138	IO				0.71
42.750	0.00	0.12	0.137	IO				0.70
42.833	0.00	0.12	0.136	IO				0.70
42.917	0.00	0.12	0.136	IO				0.69
43.000	0.00	0.12	0.135	IO				0.69
43.083	0.00	0.12	0.134	IO				0.69
43.167	0.00	0.12	0.133	IO				0.68
43.250	0.00	0.12	0.132	IO				0.68
43.333	0.00	0.12	0.131	IO				0.67
43.417	0.00	0.12	0.131	IO				0.67
43.500	0.00	0.12	0.130	IO				0.67
43.583	0.00	0.12	0.129	IO				0.66
43.667	0.00	0.12	0.128	IO				0.66
43.750	0.00	0.12	0.127	IO				0.65
43.833	0.00	0.12	0.126	IO				0.65
43.917	0.00	0.12	0.126	IO				0.65
44.000	0.00	0.12	0.125	IO				0.64
44.083	0.00	0.12	0.124	IO				0.64
44.167	0.00	0.12	0.123	IO				0.63
44.250	0.00	0.12	0.122	IO				0.63
44.333	0.00	0.12	0.122	IO				0.62
44.417	0.00	0.12	0.121	IO				0.62
44.500	0.00	0.12	0.120	IO				0.62
44.583	0.00	0.12	0.119	IO				0.61
44.667	0.00	0.12	0.118	IO				0.61
44.750	0.00	0.12	0.117	IO				0.60
44.833	0.00	0.12	0.117	IO				0.60
44.917	0.00	0.12	0.116	IO				0.60
45.000	0.00	0.12	0.115	IO				0.59
45.083	0.00	0.12	0.114	IO				0.59
45.167	0.00	0.12	0.113	IO				0.58
45.250	0.00	0.12	0.112	IO				0.58
45.333	0.00	0.12	0.112	IO				0.58
45.417	0.00	0.12	0.111	IO				0.57
45.500	0.00	0.12	0.110	IO				0.57
45.583	0.00	0.12	0.109	IO				0.56
45.667	0.00	0.12	0.108	IO				0.56

45.750	0.00	0.12	0.107	IO				0.56
45.833	0.00	0.12	0.107	IO				0.55
45.917	0.00	0.12	0.106	IO				0.55
46.000	0.00	0.12	0.105	IO				0.54
46.083	0.00	0.12	0.104	IO				0.54
46.167	0.00	0.12	0.103	IO				0.53
46.250	0.00	0.12	0.103	IO				0.53
46.333	0.00	0.12	0.102	IO				0.53
46.417	0.00	0.12	0.101	IO				0.52
46.500	0.00	0.12	0.100	IO				0.52
46.583	0.00	0.12	0.099	IO				0.51
46.667	0.00	0.12	0.098	IO				0.51
46.750	0.00	0.12	0.098	IO				0.51
46.833	0.00	0.12	0.097	IO				0.50
46.917	0.00	0.12	0.096	IO				0.50
47.000	0.00	0.12	0.095	IO				0.49
47.083	0.00	0.12	0.094	IO				0.49
47.167	0.00	0.12	0.093	IO				0.49
47.250	0.00	0.12	0.093	IO				0.48
47.333	0.00	0.12	0.092	IO				0.48
47.417	0.00	0.12	0.091	IO				0.47
47.500	0.00	0.12	0.090	IO				0.47
47.583	0.00	0.12	0.089	IO				0.47
47.667	0.00	0.12	0.088	IO				0.46
47.750	0.00	0.12	0.088	IO				0.46
47.833	0.00	0.12	0.087	IO				0.45
47.917	0.00	0.12	0.086	IO				0.45
48.000	0.00	0.12	0.085	IO				0.45
48.083	0.00	0.12	0.084	IO				0.44
48.167	0.00	0.12	0.084	IO				0.44
48.250	0.00	0.12	0.083	IO				0.43
48.333	0.00	0.12	0.082	IO				0.43
48.417	0.00	0.12	0.081	IO				0.42
48.500	0.00	0.12	0.080	IO				0.42
48.583	0.00	0.12	0.079	IO				0.42
48.667	0.00	0.12	0.079	IO				0.41
48.750	0.00	0.12	0.078	IO				0.41
48.833	0.00	0.12	0.077	IO				0.40
48.917	0.00	0.12	0.076	IO				0.40
49.000	0.00	0.12	0.075	IO				0.40
49.083	0.00	0.12	0.074	IO				0.39
49.167	0.00	0.12	0.074	IO				0.39
49.250	0.00	0.11	0.073	IO				0.38
49.333	0.00	0.11	0.072	IO				0.38
49.417	0.00	0.11	0.071	IO				0.38
49.500	0.00	0.11	0.070	IO				0.37
49.583	0.00	0.11	0.070	IO				0.37
49.667	0.00	0.11	0.069	IO				0.36
49.750	0.00	0.11	0.068	IO				0.36
49.833	0.00	0.11	0.067	IO				0.36
49.917	0.00	0.11	0.067	IO				0.35
50.000	0.00	0.10	0.066	IO				0.35
50.083	0.00	0.10	0.065	IO				0.34
50.167	0.00	0.10	0.065	IO				0.34
50.250	0.00	0.10	0.064	IO				0.34
50.333	0.00	0.10	0.063	IO				0.33
50.417	0.00	0.10	0.063	IO				0.33

50.500	0.00	0.10	0.062	IO				0.33
50.583	0.00	0.10	0.061	IO				0.32
50.667	0.00	0.10	0.061	IO				0.32
50.750	0.00	0.09	0.060	IO				0.32
50.833	0.00	0.09	0.059	IO				0.31
50.917	0.00	0.09	0.059	IO				0.31
51.000	0.00	0.09	0.058	IO				0.31
51.083	0.00	0.09	0.057	IO				0.30
51.167	0.00	0.09	0.057	IO				0.30
51.250	0.00	0.09	0.056	IO				0.30
51.333	0.00	0.09	0.055	IO				0.29
51.417	0.00	0.09	0.055	IO				0.29
51.500	0.00	0.09	0.054	IO				0.29
51.583	0.00	0.08	0.054	IO				0.28
51.667	0.00	0.08	0.053	IO				0.28
51.750	0.00	0.08	0.053	IO				0.28
51.833	0.00	0.08	0.052	IO				0.27
51.917	0.00	0.08	0.051	IO				0.27
52.000	0.00	0.08	0.051	IO				0.27
52.083	0.00	0.08	0.050	IO				0.26
52.167	0.00	0.08	0.050	IO				0.26
52.250	0.00	0.08	0.049	IO				0.26
52.333	0.00	0.08	0.049	IO				0.26
52.417	0.00	0.08	0.048	IO				0.25
52.500	0.00	0.08	0.048	IO				0.25
52.583	0.00	0.07	0.047	O				0.25
52.667	0.00	0.07	0.047	O				0.25
52.750	0.00	0.07	0.046	O				0.24
52.833	0.00	0.07	0.046	O				0.24
52.917	0.00	0.07	0.045	O				0.24
53.000	0.00	0.07	0.045	O				0.23
53.083	0.00	0.07	0.044	O				0.23
53.167	0.00	0.07	0.044	O				0.23
53.250	0.00	0.07	0.043	O				0.23
53.333	0.00	0.07	0.043	O				0.22
53.417	0.00	0.07	0.042	O				0.22
53.500	0.00	0.07	0.042	O				0.22
53.583	0.00	0.07	0.041	O				0.22
53.667	0.00	0.06	0.041	O				0.22
53.750	0.00	0.06	0.040	O				0.21
53.833	0.00	0.06	0.040	O				0.21
53.917	0.00	0.06	0.040	O				0.21
54.000	0.00	0.06	0.039	O				0.21
54.083	0.00	0.06	0.039	O				0.20
54.167	0.00	0.06	0.038	O				0.20
54.250	0.00	0.06	0.038	O				0.20
54.333	0.00	0.06	0.038	O				0.20
54.417	0.00	0.06	0.037	O				0.20
54.500	0.00	0.06	0.037	O				0.19
54.583	0.00	0.06	0.036	O				0.19
54.667	0.00	0.06	0.036	O				0.19
54.750	0.00	0.06	0.036	O				0.19
54.833	0.00	0.06	0.035	O				0.18
54.917	0.00	0.05	0.035	O				0.18
55.000	0.00	0.05	0.034	O				0.18
55.083	0.00	0.05	0.034	O				0.18
55.167	0.00	0.05	0.034	O				0.18

55.250	0.00	0.05	0.033	O	|	|	|	|	0.18
55.333	0.00	0.05	0.033	O	|	|	|	|	0.17
55.417	0.00	0.05	0.033	O	|	|	|	|	0.17
55.500	0.00	0.05	0.032	O	|	|	|	|	0.17
55.583	0.00	0.05	0.032	O	|	|	|	|	0.17
55.667	0.00	0.05	0.032	O	|	|	|	|	0.17
55.750	0.00	0.05	0.031	O	|	|	|	|	0.16
55.833	0.00	0.05	0.031	O	|	|	|	|	0.16
55.917	0.00	0.05	0.031	O	|	|	|	|	0.16
56.000	0.00	0.05	0.030	O	|	|	|	|	0.16
56.083	0.00	0.05	0.030	O	|	|	|	|	0.16
56.167	0.00	0.05	0.030	O	|	|	|	|	0.16
56.250	0.00	0.05	0.029	O	|	|	|	|	0.15
56.333	0.00	0.05	0.029	O	|	|	|	|	0.15
56.417	0.00	0.05	0.029	O	|	|	|	|	0.15
56.500	0.00	0.04	0.028	O	|	|	|	|	0.15
56.583	0.00	0.04	0.028	O	|	|	|	|	0.15
56.667	0.00	0.04	0.028	O	|	|	|	|	0.15
56.750	0.00	0.04	0.027	O	|	|	|	|	0.14
56.833	0.00	0.04	0.027	O	|	|	|	|	0.14
56.917	0.00	0.04	0.027	O	|	|	|	|	0.14
57.000	0.00	0.04	0.026	O	|	|	|	|	0.14
57.083	0.00	0.04	0.026	O	|	|	|	|	0.14
57.167	0.00	0.04	0.026	O	|	|	|	|	0.14
57.250	0.00	0.04	0.026	O	|	|	|	|	0.13
57.333	0.00	0.04	0.025	O	|	|	|	|	0.13
57.417	0.00	0.04	0.025	O	|	|	|	|	0.13
57.500	0.00	0.04	0.025	O	|	|	|	|	0.13
57.583	0.00	0.04	0.025	O	|	|	|	|	0.13
57.667	0.00	0.04	0.024	O	|	|	|	|	0.13
57.750	0.00	0.04	0.024	O	|	|	|	|	0.13
57.833	0.00	0.04	0.024	O	|	|	|	|	0.13
57.917	0.00	0.04	0.024	O	|	|	|	|	0.12
58.000	0.00	0.04	0.023	O	|	|	|	|	0.12
58.083	0.00	0.04	0.023	O	|	|	|	|	0.12
58.167	0.00	0.04	0.023	O	|	|	|	|	0.12
58.250	0.00	0.04	0.023	O	|	|	|	|	0.12
58.333	0.00	0.04	0.022	O	|	|	|	|	0.12
58.417	0.00	0.03	0.022	O	|	|	|	|	0.12
58.500	0.00	0.03	0.022	O	|	|	|	|	0.11
58.583	0.00	0.03	0.022	O	|	|	|	|	0.11
58.667	0.00	0.03	0.021	O	|	|	|	|	0.11
58.750	0.00	0.03	0.021	O	|	|	|	|	0.11
58.833	0.00	0.03	0.021	O	|	|	|	|	0.11
58.917	0.00	0.03	0.021	O	|	|	|	|	0.11
59.000	0.00	0.03	0.020	O	|	|	|	|	0.11
59.083	0.00	0.03	0.020	O	|	|	|	|	0.11
59.167	0.00	0.03	0.020	O	|	|	|	|	0.11
59.250	0.00	0.03	0.020	O	|	|	|	|	0.10
59.333	0.00	0.03	0.020	O	|	|	|	|	0.10
59.417	0.00	0.03	0.019	O	|	|	|	|	0.10
59.500	0.00	0.03	0.019	O	|	|	|	|	0.10
59.583	0.00	0.03	0.019	O	|	|	|	|	0.10
59.667	0.00	0.03	0.019	O	|	|	|	|	0.10
59.750	0.00	0.03	0.019	O	|	|	|	|	0.10
59.833	0.00	0.03	0.018	O	|	|	|	|	0.10
59.917	0.00	0.03	0.018	O	|	|	|	|	0.10

60.000	0.00	0.03	0.018	O	|	|	|	|	0.09
60.083	0.00	0.03	0.018	O	|	|	|	|	0.09
60.167	0.00	0.03	0.018	O	|	|	|	|	0.09
60.250	0.00	0.03	0.017	O	|	|	|	|	0.09
60.333	0.00	0.03	0.017	O	|	|	|	|	0.09
60.417	0.00	0.03	0.017	O	|	|	|	|	0.09
60.500	0.00	0.03	0.017	O	|	|	|	|	0.09
60.583	0.00	0.03	0.017	O	|	|	|	|	0.09
60.667	0.00	0.03	0.016	O	|	|	|	|	0.09
60.750	0.00	0.03	0.016	O	|	|	|	|	0.09
60.833	0.00	0.03	0.016	O	|	|	|	|	0.08
60.917	0.00	0.03	0.016	O	|	|	|	|	0.08
61.000	0.00	0.02	0.016	O	|	|	|	|	0.08
61.083	0.00	0.02	0.016	O	|	|	|	|	0.08
61.167	0.00	0.02	0.015	O	|	|	|	|	0.08
61.250	0.00	0.02	0.015	O	|	|	|	|	0.08
61.333	0.00	0.02	0.015	O	|	|	|	|	0.08
61.417	0.00	0.02	0.015	O	|	|	|	|	0.08
61.500	0.00	0.02	0.015	O	|	|	|	|	0.08
61.583	0.00	0.02	0.015	O	|	|	|	|	0.08
61.667	0.00	0.02	0.014	O	|	|	|	|	0.08
61.750	0.00	0.02	0.014	O	|	|	|	|	0.08
61.833	0.00	0.02	0.014	O	|	|	|	|	0.07
61.917	0.00	0.02	0.014	O	|	|	|	|	0.07
62.000	0.00	0.02	0.014	O	|	|	|	|	0.07
62.083	0.00	0.02	0.014	O	|	|	|	|	0.07
62.167	0.00	0.02	0.013	O	|	|	|	|	0.07
62.250	0.00	0.02	0.013	O	|	|	|	|	0.07
62.333	0.00	0.02	0.013	O	|	|	|	|	0.07
62.417	0.00	0.02	0.013	O	|	|	|	|	0.07
62.500	0.00	0.02	0.013	O	|	|	|	|	0.07
62.583	0.00	0.02	0.013	O	|	|	|	|	0.07
62.667	0.00	0.02	0.013	O	|	|	|	|	0.07
62.750	0.00	0.02	0.013	O	|	|	|	|	0.07
62.833	0.00	0.02	0.012	O	|	|	|	|	0.07
62.917	0.00	0.02	0.012	O	|	|	|	|	0.06
63.000	0.00	0.02	0.012	O	|	|	|	|	0.06
63.083	0.00	0.02	0.012	O	|	|	|	|	0.06
63.167	0.00	0.02	0.012	O	|	|	|	|	0.06
63.250	0.00	0.02	0.012	O	|	|	|	|	0.06
63.333	0.00	0.02	0.012	O	|	|	|	|	0.06
63.417	0.00	0.02	0.011	O	|	|	|	|	0.06
63.500	0.00	0.02	0.011	O	|	|	|	|	0.06
63.583	0.00	0.02	0.011	O	|	|	|	|	0.06
63.667	0.00	0.02	0.011	O	|	|	|	|	0.06
63.750	0.00	0.02	0.011	O	|	|	|	|	0.06
63.833	0.00	0.02	0.011	O	|	|	|	|	0.06
63.917	0.00	0.02	0.011	O	|	|	|	|	0.06
64.000	0.00	0.02	0.011	O	|	|	|	|	0.06
64.083	0.00	0.02	0.011	O	|	|	|	|	0.06
64.167	0.00	0.02	0.010	O	|	|	|	|	0.05
64.250	0.00	0.02	0.010	O	|	|	|	|	0.05
64.333	0.00	0.02	0.010	O	|	|	|	|	0.05
64.417	0.00	0.02	0.010	O	|	|	|	|	0.05
64.500	0.00	0.02	0.010	O	|	|	|	|	0.05
64.583	0.00	0.02	0.010	O	|	|	|	|	0.05
64.667	0.00	0.02	0.010	O	|	|	|	|	0.05

64.750	0.00	0.02	0.010	O	|	|	|	|	0.05
64.833	0.00	0.02	0.010	O	|	|	|	|	0.05
64.917	0.00	0.01	0.009	O	|	|	|	|	0.05
65.000	0.00	0.01	0.009	O	|	|	|	|	0.05
65.083	0.00	0.01	0.009	O	|	|	|	|	0.05
65.167	0.00	0.01	0.009	O	|	|	|	|	0.05
65.250	0.00	0.01	0.009	O	|	|	|	|	0.05
65.333	0.00	0.01	0.009	O	|	|	|	|	0.05
65.417	0.00	0.01	0.009	O	|	|	|	|	0.05
65.500	0.00	0.01	0.009	O	|	|	|	|	0.05
65.583	0.00	0.01	0.009	O	|	|	|	|	0.05
65.667	0.00	0.01	0.009	O	|	|	|	|	0.04
65.750	0.00	0.01	0.008	O	|	|	|	|	0.04
65.833	0.00	0.01	0.008	O	|	|	|	|	0.04
65.917	0.00	0.01	0.008	O	|	|	|	|	0.04
66.000	0.00	0.01	0.008	O	|	|	|	|	0.04
66.083	0.00	0.01	0.008	O	|	|	|	|	0.04
66.167	0.00	0.01	0.008	O	|	|	|	|	0.04
66.250	0.00	0.01	0.008	O	|	|	|	|	0.04
66.333	0.00	0.01	0.008	O	|	|	|	|	0.04
66.417	0.00	0.01	0.008	O	|	|	|	|	0.04
66.500	0.00	0.01	0.008	O	|	|	|	|	0.04
66.583	0.00	0.01	0.008	O	|	|	|	|	0.04
66.667	0.00	0.01	0.008	O	|	|	|	|	0.04
66.750	0.00	0.01	0.007	O	|	|	|	|	0.04
66.833	0.00	0.01	0.007	O	|	|	|	|	0.04
66.917	0.00	0.01	0.007	O	|	|	|	|	0.04
67.000	0.00	0.01	0.007	O	|	|	|	|	0.04
67.083	0.00	0.01	0.007	O	|	|	|	|	0.04
67.167	0.00	0.01	0.007	O	|	|	|	|	0.04
67.250	0.00	0.01	0.007	O	|	|	|	|	0.04
67.333	0.00	0.01	0.007	O	|	|	|	|	0.04
67.417	0.00	0.01	0.007	O	|	|	|	|	0.04
67.500	0.00	0.01	0.007	O	|	|	|	|	0.04
67.583	0.00	0.01	0.007	O	|	|	|	|	0.04
67.667	0.00	0.01	0.007	O	|	|	|	|	0.03
67.750	0.00	0.01	0.007	O	|	|	|	|	0.03
67.833	0.00	0.01	0.006	O	|	|	|	|	0.03
67.917	0.00	0.01	0.006	O	|	|	|	|	0.03
68.000	0.00	0.01	0.006	O	|	|	|	|	0.03
68.083	0.00	0.01	0.006	O	|	|	|	|	0.03
68.167	0.00	0.01	0.006	O	|	|	|	|	0.03
68.250	0.00	0.01	0.006	O	|	|	|	|	0.03
68.333	0.00	0.01	0.006	O	|	|	|	|	0.03
68.417	0.00	0.01	0.006	O	|	|	|	|	0.03
68.500	0.00	0.01	0.006	O	|	|	|	|	0.03
68.583	0.00	0.01	0.006	O	|	|	|	|	0.03
68.667	0.00	0.01	0.006	O	|	|	|	|	0.03
68.750	0.00	0.01	0.006	O	|	|	|	|	0.03
68.833	0.00	0.01	0.006	O	|	|	|	|	0.03
68.917	0.00	0.01	0.006	O	|	|	|	|	0.03
69.000	0.00	0.01	0.006	O	|	|	|	|	0.03
69.083	0.00	0.01	0.005	O	|	|	|	|	0.03
69.167	0.00	0.01	0.005	O	|	|	|	|	0.03
69.250	0.00	0.01	0.005	O	|	|	|	|	0.03
69.333	0.00	0.01	0.005	O	|	|	|	|	0.03
69.417	0.00	0.01	0.005	O	|	|	|	|	0.03

69.500	0.00	0.01	0.005	O	|	|	|	|	0.03
69.583	0.00	0.01	0.005	O	|	|	|	|	0.03
69.667	0.00	0.01	0.005	O	|	|	|	|	0.03
69.750	0.00	0.01	0.005	O	|	|	|	|	0.03
69.833	0.00	0.01	0.005	O	|	|	|	|	0.03
69.917	0.00	0.01	0.005	O	|	|	|	|	0.03
70.000	0.00	0.01	0.005	O	|	|	|	|	0.03
70.083	0.00	0.01	0.005	O	|	|	|	|	0.03
70.167	0.00	0.01	0.005	O	|	|	|	|	0.03
70.250	0.00	0.01	0.005	O	|	|	|	|	0.02
70.333	0.00	0.01	0.005	O	|	|	|	|	0.02
70.417	0.00	0.01	0.005	O	|	|	|	|	0.02
70.500	0.00	0.01	0.005	O	|	|	|	|	0.02
70.583	0.00	0.01	0.005	O	|	|	|	|	0.02
70.667	0.00	0.01	0.004	O	|	|	|	|	0.02
70.750	0.00	0.01	0.004	O	|	|	|	|	0.02
70.833	0.00	0.01	0.004	O	|	|	|	|	0.02
70.917	0.00	0.01	0.004	O	|	|	|	|	0.02
71.000	0.00	0.01	0.004	O	|	|	|	|	0.02
71.083	0.00	0.01	0.004	O	|	|	|	|	0.02
71.167	0.00	0.01	0.004	O	|	|	|	|	0.02
71.250	0.00	0.01	0.004	O	|	|	|	|	0.02
71.333	0.00	0.01	0.004	O	|	|	|	|	0.02
71.417	0.00	0.01	0.004	O	|	|	|	|	0.02
71.500	0.00	0.01	0.004	O	|	|	|	|	0.02
71.583	0.00	0.01	0.004	O	|	|	|	|	0.02
71.667	0.00	0.01	0.004	O	|	|	|	|	0.02
71.750	0.00	0.01	0.004	O	|	|	|	|	0.02
71.833	0.00	0.01	0.004	O	|	|	|	|	0.02
71.917	0.00	0.01	0.004	O	|	|	|	|	0.02
72.000	0.00	0.01	0.004	O	|	|	|	|	0.02
72.083	0.00	0.01	0.004	O	|	|	|	|	0.02
72.167	0.00	0.01	0.004	O	|	|	|	|	0.02
72.250	0.00	0.01	0.004	O	|	|	|	|	0.02
72.333	0.00	0.01	0.004	O	|	|	|	|	0.02
72.417	0.00	0.01	0.004	O	|	|	|	|	0.02
72.500	0.00	0.01	0.004	O	|	|	|	|	0.02
72.583	0.00	0.01	0.003	O	|	|	|	|	0.02
72.667	0.00	0.01	0.003	O	|	|	|	|	0.02
72.750	0.00	0.01	0.003	O	|	|	|	|	0.02
72.833	0.00	0.01	0.003	O	|	|	|	|	0.02
72.917	0.00	0.01	0.003	O	|	|	|	|	0.02
73.000	0.00	0.01	0.003	O	|	|	|	|	0.02
73.083	0.00	0.01	0.003	O	|	|	|	|	0.02
73.167	0.00	0.01	0.003	O	|	|	|	|	0.02
73.250	0.00	0.01	0.003	O	|	|	|	|	0.02
73.333	0.00	0.00	0.003	O	|	|	|	|	0.02
73.417	0.00	0.00	0.003	O	|	|	|	|	0.02
73.500	0.00	0.00	0.003	O	|	|	|	|	0.02
73.583	0.00	0.00	0.003	O	|	|	|	|	0.02
73.667	0.00	0.00	0.003	O	|	|	|	|	0.02
73.750	0.00	0.00	0.003	O	|	|	|	|	0.02
73.833	0.00	0.00	0.003	O	|	|	|	|	0.02
73.917	0.00	0.00	0.003	O	|	|	|	|	0.02
74.000	0.00	0.00	0.003	O	|	|	|	|	0.02
74.083	0.00	0.00	0.003	O	|	|	|	|	0.02
74.167	0.00	0.00	0.003	O	|	|	|	|	0.01

74.250	0.00	0.00	0.003	O					0.01
74.333	0.00	0.00	0.003	O					0.01
74.417	0.00	0.00	0.003	O					0.01
74.500	0.00	0.00	0.003	O					0.01
74.583	0.00	0.00	0.003	O					0.01
74.667	0.00	0.00	0.003	O					0.01
74.750	0.00	0.00	0.003	O					0.01
74.833	0.00	0.00	0.003	O					0.01
74.917	0.00	0.00	0.003	O					0.01
75.000	0.00	0.00	0.003	O					0.01
75.083	0.00	0.00	0.003	O					0.01
75.167	0.00	0.00	0.002	O					0.01
75.250	0.00	0.00	0.002	O					0.01
75.333	0.00	0.00	0.002	O					0.01
75.417	0.00	0.00	0.002	O					0.01
75.500	0.00	0.00	0.002	O					0.01
75.583	0.00	0.00	0.002	O					0.01
75.667	0.00	0.00	0.002	O					0.01
75.750	0.00	0.00	0.002	O					0.01
75.833	0.00	0.00	0.002	O					0.01
75.917	0.00	0.00	0.002	O					0.01
76.000	0.00	0.00	0.002	O					0.01
76.083	0.00	0.00	0.002	O					0.01
76.167	0.00	0.00	0.002	O					0.01
76.250	0.00	0.00	0.002	O					0.01
76.333	0.00	0.00	0.002	O					0.01
76.417	0.00	0.00	0.002	O					0.01
76.500	0.00	0.00	0.002	O					0.01
76.583	0.00	0.00	0.002	O					0.01
76.667	0.00	0.00	0.002	O					0.01
76.750	0.00	0.00	0.002	O					0.01
76.833	0.00	0.00	0.002	O					0.01
76.917	0.00	0.00	0.002	O					0.01
77.000	0.00	0.00	0.002	O					0.01
77.083	0.00	0.00	0.002	O					0.01
77.167	0.00	0.00	0.002	O					0.01
77.250	0.00	0.00	0.002	O					0.01
77.333	0.00	0.00	0.002	O					0.01
77.417	0.00	0.00	0.002	O					0.01
77.500	0.00	0.00	0.002	O					0.01
77.583	0.00	0.00	0.002	O					0.01
77.667	0.00	0.00	0.002	O					0.01
77.750	0.00	0.00	0.002	O					0.01
77.833	0.00	0.00	0.002	O					0.01
77.917	0.00	0.00	0.002	O					0.01
78.000	0.00	0.00	0.002	O					0.01
78.083	0.00	0.00	0.002	O					0.01
78.167	0.00	0.00	0.002	O					0.01
78.250	0.00	0.00	0.002	O					0.01
78.333	0.00	0.00	0.002	O					0.01
78.417	0.00	0.00	0.002	O					0.01
78.500	0.00	0.00	0.002	O					0.01
78.583	0.00	0.00	0.002	O					0.01
78.667	0.00	0.00	0.002	O					0.01
78.750	0.00	0.00	0.002	O					0.01
78.833	0.00	0.00	0.002	O					0.01
78.917	0.00	0.00	0.002	O					0.01

79.000	0.00	0.00	0.002	O	|	|	|	|	0.01
79.083	0.00	0.00	0.001	O	|	|	|	|	0.01
79.167	0.00	0.00	0.001	O	|	|	|	|	0.01
79.250	0.00	0.00	0.001	O	|	|	|	|	0.01
79.333	0.00	0.00	0.001	O	|	|	|	|	0.01
79.417	0.00	0.00	0.001	O	|	|	|	|	0.01
79.500	0.00	0.00	0.001	O	|	|	|	|	0.01
79.583	0.00	0.00	0.001	O	|	|	|	|	0.01
79.667	0.00	0.00	0.001	O	|	|	|	|	0.01
79.750	0.00	0.00	0.001	O	|	|	|	|	0.01
79.833	0.00	0.00	0.001	O	|	|	|	|	0.01
79.917	0.00	0.00	0.001	O	|	|	|	|	0.01
80.000	0.00	0.00	0.001	O	|	|	|	|	0.01
80.083	0.00	0.00	0.001	O	|	|	|	|	0.01
80.167	0.00	0.00	0.001	O	|	|	|	|	0.01
80.250	0.00	0.00	0.001	O	|	|	|	|	0.01
80.333	0.00	0.00	0.001	O	|	|	|	|	0.01
80.417	0.00	0.00	0.001	O	|	|	|	|	0.01
80.500	0.00	0.00	0.001	O	|	|	|	|	0.01
80.583	0.00	0.00	0.001	O	|	|	|	|	0.01
80.667	0.00	0.00	0.001	O	|	|	|	|	0.01
80.750	0.00	0.00	0.001	O	|	|	|	|	0.01
80.833	0.00	0.00	0.001	O	|	|	|	|	0.01
80.917	0.00	0.00	0.001	O	|	|	|	|	0.01
81.000	0.00	0.00	0.001	O	|	|	|	|	0.01
81.083	0.00	0.00	0.001	O	|	|	|	|	0.01
81.167	0.00	0.00	0.001	O	|	|	|	|	0.01
81.250	0.00	0.00	0.001	O	|	|	|	|	0.01
81.333	0.00	0.00	0.001	O	|	|	|	|	0.01
81.417	0.00	0.00	0.001	O	|	|	|	|	0.01
81.500	0.00	0.00	0.001	O	|	|	|	|	0.01
81.583	0.00	0.00	0.001	O	|	|	|	|	0.01
81.667	0.00	0.00	0.001	O	|	|	|	|	0.01
81.750	0.00	0.00	0.001	O	|	|	|	|	0.01
81.833	0.00	0.00	0.001	O	|	|	|	|	0.01
81.917	0.00	0.00	0.001	O	|	|	|	|	0.01
82.000	0.00	0.00	0.001	O	|	|	|	|	0.01
82.083	0.00	0.00	0.001	O	|	|	|	|	0.01
82.167	0.00	0.00	0.001	O	|	|	|	|	0.01
82.250	0.00	0.00	0.001	O	|	|	|	|	0.01
82.333	0.00	0.00	0.001	O	|	|	|	|	0.01
82.417	0.00	0.00	0.001	O	|	|	|	|	0.01
82.500	0.00	0.00	0.001	O	|	|	|	|	0.01
82.583	0.00	0.00	0.001	O	|	|	|	|	0.00
82.667	0.00	0.00	0.001	O	|	|	|	|	0.00
82.750	0.00	0.00	0.001	O	|	|	|	|	0.00
82.833	0.00	0.00	0.001	O	|	|	|	|	0.00
82.917	0.00	0.00	0.001	O	|	|	|	|	0.00
83.000	0.00	0.00	0.001	O	|	|	|	|	0.00
83.083	0.00	0.00	0.001	O	|	|	|	|	0.00
83.167	0.00	0.00	0.001	O	|	|	|	|	0.00
83.250	0.00	0.00	0.001	O	|	|	|	|	0.00
83.333	0.00	0.00	0.001	O	|	|	|	|	0.00
83.417	0.00	0.00	0.001	O	|	|	|	|	0.00
83.500	0.00	0.00	0.001	O	|	|	|	|	0.00
83.583	0.00	0.00	0.001	O	|	|	|	|	0.00
83.667	0.00	0.00	0.001	O	|	|	|	|	0.00

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83.750    0.00    0.00      0.001  O       |       |       |       |     0.00
83.833    0.00    0.00      0.001  O       |       |       |       |     0.00
83.917    0.00    0.00      0.001  O       |       |       |       |     0.00
84.000    0.00    0.00      0.001  O       |       |       |       |     0.00
84.083    0.00    0.00      0.001  O       |       |       |       |     0.00
84.167    0.00    0.00      0.001  O       |       |       |       |     0.00
84.250    0.00    0.00      0.001  O       |       |       |       |     0.00
84.333    0.00    0.00      0.001  O       |       |       |       |     0.00
84.417    0.00    0.00      0.001  O       |       |       |       |     0.00
84.500    0.00    0.00      0.001  O       |       |       |       |     0.00
84.583    0.00    0.00      0.001  O       |       |       |       |     0.00
84.667    0.00    0.00      0.001  O       |       |       |       |     0.00
84.750    0.00    0.00      0.001  O       |       |       |       |     0.00
84.833    0.00    0.00      0.001  O       |       |       |       |     0.00
84.917    0.00    0.00      0.001  O       |       |       |       |     0.00
85.000    0.00    0.00      0.001  O       |       |       |       |     0.00
85.083    0.00    0.00      0.001  O       |       |       |       |     0.00
85.167    0.00    0.00      0.001  O       |       |       |       |     0.00
85.250    0.00    0.00      0.001  O       |       |       |       |     0.00
85.333    0.00    0.00      0.001  O       |       |       |       |     0.00
85.417    0.00    0.00      0.001  O       |       |       |       |     0.00
85.500    0.00    0.00      0.001  O       |       |       |       |     0.00
85.583    0.00    0.00      0.001  O       |       |       |       |     0.00
85.667    0.00    0.00      0.001  O       |       |       |       |     0.00

     ****************************HYDROGRAPH DATA****************************
                Number of intervals =  1028
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =        1.669 (CFS)
                Total volume =       1.385 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     ***********************************************************************

     ----------------------------------------------------------------------
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------


JN3504
ROUTING
Q100-1HR

-----------------------------------------------------------------


Program License Serial Number 5016

-----------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q100d1r1100.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =    20
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =       13.514 (CFS)
            Total volume =       0.518 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------
Total number of inflow hydrograph intervals = 20
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------
-----------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-----------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 3.4 6.76 10.14 13.51	Depth (Ft.)
0.083	0.28	0.00	0.001	O | | | | |	0.01
0.167	1.81	0.01	0.008	O I | | | |	0.04
0.250	2.71	0.04	0.023	O I | | | |	0.12
0.333	3.38	0.07	0.044	O I| | | |	0.23
0.417	3.74	0.11	0.068	O I | | |	0.36
0.500	4.04	0.12	0.094	O |I | | |	0.49
0.583	4.52	0.12	0.123	O | I | | |	0.63
0.667	5.36	0.12	0.156	O | I | | |	0.79
0.750	6.43	0.12	0.196	O | I| | |	0.98
0.833	9.07	0.27	0.248	O | | I | |	1.22
0.917	13.51	0.34	0.323	O | | | I |	1.55
1.000	9.59	0.39	0.400	O | | I | |	1.86
1.083	5.87	0.42	0.451	O | I | | |	2.06
1.167	2.78	0.43	0.478	|O I | | | |	2.16
1.250	1.19	0.43	0.488	|OI | | | |	2.20
1.333	0.53	0.44	0.491	|O | | | |	2.21
1.417	0.27	0.43	0.491	IO | | | |	2.21
1.500	0.14	0.43	0.489	IO | | | |	2.21
1.583	0.04	0.43	0.487	IO | | | |	2.20
1.667	0.01	0.43	0.484	IO | | | |	2.19
1.750	0.00	0.43	0.481	IO | | | |	2.18
1.833	0.00	0.43	0.478	IO | | | |	2.17
1.917	0.00	0.43	0.476	IO | | | |	2.16
2.000	0.00	0.43	0.473	IO | | | |	2.14
2.083	0.00	0.43	0.470	IO | | | |	2.13
2.167	0.00	0.42	0.467	IO | | | |	2.12
2.250	0.00	0.42	0.464	IO | | | |	2.11
2.333	0.00	0.42	0.461	O | | | |	2.10
2.417	0.00	0.42	0.458	O | | | |	2.09
2.500	0.00	0.42	0.455	O | | | |	2.08
2.583	0.00	0.42	0.452	O | | | |	2.07
2.667	0.00	0.42	0.449	O | | | |	2.06
2.750	0.00	0.42	0.446	O | | | |	2.05
2.833	0.00	0.41	0.444	O | | | |	2.04
2.917	0.00	0.41	0.441	O | | | |	2.03

3.000	0.00	0.41	0.438	O	|	|	|	|	2.01
3.083	0.00	0.41	0.435	O	|	|	|	|	2.00
3.167	0.00	0.41	0.432	O	|	|	|	|	1.99
3.250	0.00	0.41	0.429	O	|	|	|	|	1.98
3.333	0.00	0.41	0.427	O	|	|	|	|	1.97
3.417	0.00	0.40	0.424	O	|	|	|	|	1.96
3.500	0.00	0.40	0.421	O	|	|	|	|	1.95
3.583	0.00	0.40	0.418	O	|	|	|	|	1.94
3.667	0.00	0.40	0.416	O	|	|	|	|	1.92
3.750	0.00	0.40	0.413	O	|	|	|	|	1.91
3.833	0.00	0.40	0.410	O	|	|	|	|	1.90
3.917	0.00	0.39	0.407	O	|	|	|	|	1.89
4.000	0.00	0.39	0.405	O	|	|	|	|	1.88
4.083	0.00	0.39	0.402	O	|	|	|	|	1.87
4.167	0.00	0.39	0.399	O	|	|	|	|	1.86
4.250	0.00	0.39	0.397	O	|	|	|	|	1.85
4.333	0.00	0.39	0.394	O	|	|	|	|	1.84
4.417	0.00	0.38	0.391	O	|	|	|	|	1.83
4.500	0.00	0.38	0.389	O	|	|	|	|	1.82
4.583	0.00	0.38	0.386	O	|	|	|	|	1.80
4.667	0.00	0.38	0.383	O	|	|	|	|	1.79
4.750	0.00	0.38	0.381	O	|	|	|	|	1.78
4.833	0.00	0.38	0.378	O	|	|	|	|	1.77
4.917	0.00	0.37	0.376	O	|	|	|	|	1.76
5.000	0.00	0.37	0.373	O	|	|	|	|	1.75
5.083	0.00	0.37	0.371	O	|	|	|	|	1.74
5.167	0.00	0.37	0.368	O	|	|	|	|	1.73
5.250	0.00	0.37	0.365	O	|	|	|	|	1.72
5.333	0.00	0.37	0.363	O	|	|	|	|	1.71
5.417	0.00	0.36	0.360	O	|	|	|	|	1.70
5.500	0.00	0.36	0.358	O	|	|	|	|	1.69
5.583	0.00	0.36	0.355	O	|	|	|	|	1.68
5.667	0.00	0.36	0.353	O	|	|	|	|	1.67
5.750	0.00	0.36	0.350	O	|	|	|	|	1.66
5.833	0.00	0.36	0.348	O	|	|	|	|	1.65
5.917	0.00	0.36	0.345	O	|	|	|	|	1.64
6.000	0.00	0.35	0.343	O	|	|	|	|	1.63
6.083	0.00	0.35	0.341	O	|	|	|	|	1.62
6.167	0.00	0.35	0.338	O	|	|	|	|	1.61
6.250	0.00	0.35	0.336	O	|	|	|	|	1.60
6.333	0.00	0.35	0.333	O	|	|	|	|	1.59
6.417	0.00	0.35	0.331	O	|	|	|	|	1.58
6.500	0.00	0.34	0.329	O	|	|	|	|	1.57
6.583	0.00	0.34	0.326	O	|	|	|	|	1.56
6.667	0.00	0.34	0.324	O	|	|	|	|	1.55
6.750	0.00	0.34	0.322	O	|	|	|	|	1.54
6.833	0.00	0.34	0.319	O	|	|	|	|	1.53
6.917	0.00	0.33	0.317	O	|	|	|	|	1.52
7.000	0.00	0.33	0.315	O	|	|	|	|	1.51
7.083	0.00	0.33	0.312	O	|	|	|	|	1.50
7.167	0.00	0.33	0.310	O	|	|	|	|	1.49
7.250	0.00	0.33	0.308	O	|	|	|	|	1.48
7.333	0.00	0.32	0.306	O	|	|	|	|	1.47
7.417	0.00	0.32	0.303	O	|	|	|	|	1.46
7.500	0.00	0.32	0.301	O	|	|	|	|	1.45
7.583	0.00	0.32	0.299	O	|	|	|	|	1.44
7.667	0.00	0.32	0.297	O	|	|	|	|	1.43

7.750	0.00	0.31	0.295	O	|	|	|	|	1.42
7.833	0.00	0.31	0.292	O	|	|	|	|	1.41
7.917	0.00	0.31	0.290	O	|	|	|	|	1.40
8.000	0.00	0.31	0.288	O	|	|	|	|	1.39
8.083	0.00	0.31	0.286	O	|	|	|	|	1.39
8.167	0.00	0.31	0.284	O	|	|	|	|	1.38
8.250	0.00	0.30	0.282	O	|	|	|	|	1.37
8.333	0.00	0.30	0.280	O	|	|	|	|	1.36
8.417	0.00	0.30	0.278	O	|	|	|	|	1.35
8.500	0.00	0.30	0.276	O	|	|	|	|	1.34
8.583	0.00	0.30	0.274	O	|	|	|	|	1.33
8.667	0.00	0.29	0.272	O	|	|	|	|	1.32
8.750	0.00	0.29	0.270	O	|	|	|	|	1.31
8.833	0.00	0.29	0.268	O	|	|	|	|	1.31
8.917	0.00	0.29	0.266	O	|	|	|	|	1.30
9.000	0.00	0.29	0.264	O	|	|	|	|	1.29
9.083	0.00	0.29	0.262	O	|	|	|	|	1.28
9.167	0.00	0.28	0.260	O	|	|	|	|	1.27
9.250	0.00	0.28	0.258	O	|	|	|	|	1.26
9.333	0.00	0.28	0.256	O	|	|	|	|	1.25
9.417	0.00	0.28	0.254	O	|	|	|	|	1.25
9.500	0.00	0.28	0.252	O	|	|	|	|	1.24
9.583	0.00	0.28	0.250	O	|	|	|	|	1.23
9.667	0.00	0.27	0.248	O	|	|	|	|	1.22
9.750	0.00	0.27	0.246	O	|	|	|	|	1.21
9.833	0.00	0.27	0.244	O	|	|	|	|	1.21
9.917	0.00	0.27	0.242	O	|	|	|	|	1.20
10.000	0.00	0.26	0.241	O	|	|	|	|	1.19
10.083	0.00	0.26	0.239	O	|	|	|	|	1.18
10.167	0.00	0.25	0.237	O	|	|	|	|	1.17
10.250	0.00	0.24	0.235	O	|	|	|	|	1.17
10.333	0.00	0.24	0.234	O	|	|	|	|	1.16
10.417	0.00	0.23	0.232	O	|	|	|	|	1.15
10.500	0.00	0.23	0.231	O	|	|	|	|	1.14
10.583	0.00	0.22	0.229	O	|	|	|	|	1.14
10.667	0.00	0.22	0.227	O	|	|	|	|	1.13
10.750	0.00	0.21	0.226	O	|	|	|	|	1.12
10.833	0.00	0.21	0.225	O	|	|	|	|	1.12
10.917	0.00	0.20	0.223	O	|	|	|	|	1.11
11.000	0.00	0.20	0.222	O	|	|	|	|	1.10
11.083	0.00	0.19	0.220	O	|	|	|	|	1.10
11.167	0.00	0.19	0.219	O	|	|	|	|	1.09
11.250	0.00	0.18	0.218	O	|	|	|	|	1.09
11.333	0.00	0.18	0.217	O	|	|	|	|	1.08
11.417	0.00	0.18	0.215	O	|	|	|	|	1.07
11.500	0.00	0.17	0.214	O	|	|	|	|	1.07
11.583	0.00	0.17	0.213	O	|	|	|	|	1.06
11.667	0.00	0.16	0.212	O	|	|	|	|	1.06
11.750	0.00	0.16	0.211	O	|	|	|	|	1.05
11.833	0.00	0.16	0.210	O	|	|	|	|	1.05
11.917	0.00	0.15	0.209	O	|	|	|	|	1.04
12.000	0.00	0.15	0.208	O	|	|	|	|	1.04
12.083	0.00	0.15	0.207	O	|	|	|	|	1.03
12.167	0.00	0.14	0.206	O	|	|	|	|	1.03
12.250	0.00	0.14	0.205	O	|	|	|	|	1.03
12.333	0.00	0.14	0.204	O	|	|	|	|	1.02
12.417	0.00	0.13	0.203	O	|	|	|	|	1.02

12.500	0.00	0.13	0.202	O	|	|	|	|	1.01
12.583	0.00	0.13	0.201	O	|	|	|	|	1.01
12.667	0.00	0.12	0.200	O	|	|	|	|	1.00
12.750	0.00	0.12	0.199	O	|	|	|	|	1.00
12.833	0.00	0.12	0.198	O	|	|	|	|	1.00
12.917	0.00	0.12	0.198	O	|	|	|	|	0.99
13.000	0.00	0.12	0.197	O	|	|	|	|	0.99
13.083	0.00	0.12	0.196	O	|	|	|	|	0.99
13.167	0.00	0.12	0.195	O	|	|	|	|	0.98
13.250	0.00	0.12	0.194	O	|	|	|	|	0.98
13.333	0.00	0.12	0.193	O	|	|	|	|	0.97
13.417	0.00	0.12	0.193	O	|	|	|	|	0.97
13.500	0.00	0.12	0.192	O	|	|	|	|	0.97
13.583	0.00	0.12	0.191	O	|	|	|	|	0.96
13.667	0.00	0.12	0.190	O	|	|	|	|	0.96
13.750	0.00	0.12	0.189	O	|	|	|	|	0.95
13.833	0.00	0.12	0.188	O	|	|	|	|	0.95
13.917	0.00	0.12	0.188	O	|	|	|	|	0.95
14.000	0.00	0.12	0.187	O	|	|	|	|	0.94
14.083	0.00	0.12	0.186	O	|	|	|	|	0.94
14.167	0.00	0.12	0.185	O	|	|	|	|	0.93
14.250	0.00	0.12	0.184	O	|	|	|	|	0.93
14.333	0.00	0.12	0.184	O	|	|	|	|	0.93
14.417	0.00	0.12	0.183	O	|	|	|	|	0.92
14.500	0.00	0.12	0.182	O	|	|	|	|	0.92
14.583	0.00	0.12	0.181	O	|	|	|	|	0.91
14.667	0.00	0.12	0.180	O	|	|	|	|	0.91
14.750	0.00	0.12	0.179	O	|	|	|	|	0.91
14.833	0.00	0.12	0.179	O	|	|	|	|	0.90
14.917	0.00	0.12	0.178	O	|	|	|	|	0.90
15.000	0.00	0.12	0.177	O	|	|	|	|	0.89
15.083	0.00	0.12	0.176	O	|	|	|	|	0.89
15.167	0.00	0.12	0.175	O	|	|	|	|	0.89
15.250	0.00	0.12	0.174	O	|	|	|	|	0.88
15.333	0.00	0.12	0.174	O	|	|	|	|	0.88
15.417	0.00	0.12	0.173	O	|	|	|	|	0.88
15.500	0.00	0.12	0.172	O	|	|	|	|	0.87
15.583	0.00	0.12	0.171	O	|	|	|	|	0.87
15.667	0.00	0.12	0.170	O	|	|	|	|	0.86
15.750	0.00	0.12	0.169	O	|	|	|	|	0.86
15.833	0.00	0.12	0.169	O	|	|	|	|	0.86
15.917	0.00	0.12	0.168	O	|	|	|	|	0.85
16.000	0.00	0.12	0.167	O	|	|	|	|	0.85
16.083	0.00	0.12	0.166	O	|	|	|	|	0.84
16.167	0.00	0.12	0.165	O	|	|	|	|	0.84
16.250	0.00	0.12	0.164	O	|	|	|	|	0.84
16.333	0.00	0.12	0.164	O	|	|	|	|	0.83
16.417	0.00	0.12	0.163	O	|	|	|	|	0.83
16.500	0.00	0.12	0.162	O	|	|	|	|	0.82
16.583	0.00	0.12	0.161	O	|	|	|	|	0.82
16.667	0.00	0.12	0.160	O	|	|	|	|	0.82
16.750	0.00	0.12	0.160	O	|	|	|	|	0.81
16.833	0.00	0.12	0.159	O	|	|	|	|	0.81
16.917	0.00	0.12	0.158	O	|	|	|	|	0.80
17.000	0.00	0.12	0.157	O	|	|	|	|	0.80
17.083	0.00	0.12	0.156	O	|	|	|	|	0.80
17.167	0.00	0.12	0.155	O	|	|	|	|	0.79

17.250	0.00	0.12	0.155	O	|	|	|	|	0.79
17.333	0.00	0.12	0.154	O	|	|	|	|	0.78
17.417	0.00	0.12	0.153	O	|	|	|	|	0.78
17.500	0.00	0.12	0.152	O	|	|	|	|	0.78
17.583	0.00	0.12	0.151	O	|	|	|	|	0.77
17.667	0.00	0.12	0.150	O	|	|	|	|	0.77
17.750	0.00	0.12	0.150	O	|	|	|	|	0.76
17.833	0.00	0.12	0.149	O	|	|	|	|	0.76
17.917	0.00	0.12	0.148	O	|	|	|	|	0.76
18.000	0.00	0.12	0.147	O	|	|	|	|	0.75
18.083	0.00	0.12	0.146	O	|	|	|	|	0.75
18.167	0.00	0.12	0.145	O	|	|	|	|	0.74
18.250	0.00	0.12	0.145	O	|	|	|	|	0.74
18.333	0.00	0.12	0.144	O	|	|	|	|	0.73
18.417	0.00	0.12	0.143	O	|	|	|	|	0.73
18.500	0.00	0.12	0.142	O	|	|	|	|	0.73
18.583	0.00	0.12	0.141	O	|	|	|	|	0.72
18.667	0.00	0.12	0.141	O	|	|	|	|	0.72
18.750	0.00	0.12	0.140	O	|	|	|	|	0.71
18.833	0.00	0.12	0.139	O	|	|	|	|	0.71
18.917	0.00	0.12	0.138	O	|	|	|	|	0.71
19.000	0.00	0.12	0.137	O	|	|	|	|	0.70
19.083	0.00	0.12	0.136	O	|	|	|	|	0.70
19.167	0.00	0.12	0.136	O	|	|	|	|	0.69
19.250	0.00	0.12	0.135	O	|	|	|	|	0.69
19.333	0.00	0.12	0.134	O	|	|	|	|	0.69
19.417	0.00	0.12	0.133	O	|	|	|	|	0.68
19.500	0.00	0.12	0.132	O	|	|	|	|	0.68
19.583	0.00	0.12	0.131	O	|	|	|	|	0.67
19.667	0.00	0.12	0.131	O	|	|	|	|	0.67
19.750	0.00	0.12	0.130	O	|	|	|	|	0.67
19.833	0.00	0.12	0.129	O	|	|	|	|	0.66
19.917	0.00	0.12	0.128	O	|	|	|	|	0.66
20.000	0.00	0.12	0.127	O	|	|	|	|	0.65
20.083	0.00	0.12	0.126	O	|	|	|	|	0.65
20.167	0.00	0.12	0.126	O	|	|	|	|	0.65
20.250	0.00	0.12	0.125	O	|	|	|	|	0.64
20.333	0.00	0.12	0.124	O	|	|	|	|	0.64
20.417	0.00	0.12	0.123	O	|	|	|	|	0.63
20.500	0.00	0.12	0.122	O	|	|	|	|	0.63
20.583	0.00	0.12	0.122	O	|	|	|	|	0.62
20.667	0.00	0.12	0.121	O	|	|	|	|	0.62
20.750	0.00	0.12	0.120	O	|	|	|	|	0.62
20.833	0.00	0.12	0.119	O	|	|	|	|	0.61
20.917	0.00	0.12	0.118	O	|	|	|	|	0.61
21.000	0.00	0.12	0.117	O	|	|	|	|	0.60
21.083	0.00	0.12	0.117	O	|	|	|	|	0.60
21.167	0.00	0.12	0.116	O	|	|	|	|	0.60
21.250	0.00	0.12	0.115	O	|	|	|	|	0.59
21.333	0.00	0.12	0.114	O	|	|	|	|	0.59
21.417	0.00	0.12	0.113	O	|	|	|	|	0.58
21.500	0.00	0.12	0.112	O	|	|	|	|	0.58
21.583	0.00	0.12	0.112	O	|	|	|	|	0.58
21.667	0.00	0.12	0.111	O	|	|	|	|	0.57
21.750	0.00	0.12	0.110	O	|	|	|	|	0.57
21.833	0.00	0.12	0.109	O	|	|	|	|	0.56
21.917	0.00	0.12	0.108	O	|	|	|	|	0.56

22.000	0.00	0.12	0.107	O	|	|	|	|	0.56
22.083	0.00	0.12	0.107	O	|	|	|	|	0.55
22.167	0.00	0.12	0.106	O	|	|	|	|	0.55
22.250	0.00	0.12	0.105	O	|	|	|	|	0.54
22.333	0.00	0.12	0.104	O	|	|	|	|	0.54
22.417	0.00	0.12	0.103	O	|	|	|	|	0.53
22.500	0.00	0.12	0.103	O	|	|	|	|	0.53
22.583	0.00	0.12	0.102	O	|	|	|	|	0.53
22.667	0.00	0.12	0.101	O	|	|	|	|	0.52
22.750	0.00	0.12	0.100	O	|	|	|	|	0.52
22.833	0.00	0.12	0.099	O	|	|	|	|	0.51
22.917	0.00	0.12	0.098	O	|	|	|	|	0.51
23.000	0.00	0.12	0.098	O	|	|	|	|	0.51
23.083	0.00	0.12	0.097	O	|	|	|	|	0.50
23.167	0.00	0.12	0.096	O	|	|	|	|	0.50
23.250	0.00	0.12	0.095	O	|	|	|	|	0.49
23.333	0.00	0.12	0.094	O	|	|	|	|	0.49
23.417	0.00	0.12	0.093	O	|	|	|	|	0.49
23.500	0.00	0.12	0.093	O	|	|	|	|	0.48
23.583	0.00	0.12	0.092	O	|	|	|	|	0.48
23.667	0.00	0.12	0.091	O	|	|	|	|	0.47
23.750	0.00	0.12	0.090	O	|	|	|	|	0.47
23.833	0.00	0.12	0.089	O	|	|	|	|	0.47
23.917	0.00	0.12	0.088	O	|	|	|	|	0.46
24.000	0.00	0.12	0.088	O	|	|	|	|	0.46
24.083	0.00	0.12	0.087	O	|	|	|	|	0.45
24.167	0.00	0.12	0.086	O	|	|	|	|	0.45
24.250	0.00	0.12	0.085	O	|	|	|	|	0.45
24.333	0.00	0.12	0.084	O	|	|	|	|	0.44
24.417	0.00	0.12	0.084	O	|	|	|	|	0.44
24.500	0.00	0.12	0.083	O	|	|	|	|	0.43
24.583	0.00	0.12	0.082	O	|	|	|	|	0.43
24.667	0.00	0.12	0.081	O	|	|	|	|	0.42
24.750	0.00	0.12	0.080	O	|	|	|	|	0.42
24.833	0.00	0.12	0.079	O	|	|	|	|	0.42
24.917	0.00	0.12	0.079	O	|	|	|	|	0.41
25.000	0.00	0.12	0.078	O	|	|	|	|	0.41
25.083	0.00	0.12	0.077	O	|	|	|	|	0.40
25.167	0.00	0.12	0.076	O	|	|	|	|	0.40
25.250	0.00	0.12	0.075	O	|	|	|	|	0.40
25.333	0.00	0.12	0.074	O	|	|	|	|	0.39
25.417	0.00	0.12	0.074	O	|	|	|	|	0.39
25.500	0.00	0.11	0.073	O	|	|	|	|	0.38
25.583	0.00	0.11	0.072	O	|	|	|	|	0.38
25.667	0.00	0.11	0.071	O	|	|	|	|	0.38
25.750	0.00	0.11	0.070	O	|	|	|	|	0.37
25.833	0.00	0.11	0.070	O	|	|	|	|	0.37
25.917	0.00	0.11	0.069	O	|	|	|	|	0.36
26.000	0.00	0.11	0.068	O	|	|	|	|	0.36
26.083	0.00	0.11	0.067	O	|	|	|	|	0.36
26.167	0.00	0.11	0.067	O	|	|	|	|	0.35
26.250	0.00	0.10	0.066	O	|	|	|	|	0.35
26.333	0.00	0.10	0.065	O	|	|	|	|	0.34
26.417	0.00	0.10	0.065	O	|	|	|	|	0.34
26.500	0.00	0.10	0.064	O	|	|	|	|	0.34
26.583	0.00	0.10	0.063	O	|	|	|	|	0.33
26.667	0.00	0.10	0.063	O	|	|	|	|	0.33

26.750	0.00	0.10	0.062	O	|	|	|	|	0.33
26.833	0.00	0.10	0.061	O	|	|	|	|	0.32
26.917	0.00	0.10	0.061	O	|	|	|	|	0.32
27.000	0.00	0.09	0.060	O	|	|	|	|	0.32
27.083	0.00	0.09	0.059	O	|	|	|	|	0.31
27.167	0.00	0.09	0.059	O	|	|	|	|	0.31
27.250	0.00	0.09	0.058	O	|	|	|	|	0.31
27.333	0.00	0.09	0.057	O	|	|	|	|	0.30
27.417	0.00	0.09	0.057	O	|	|	|	|	0.30
27.500	0.00	0.09	0.056	O	|	|	|	|	0.30
27.583	0.00	0.09	0.055	O	|	|	|	|	0.29
27.667	0.00	0.09	0.055	O	|	|	|	|	0.29
27.750	0.00	0.09	0.054	O	|	|	|	|	0.29
27.833	0.00	0.08	0.054	O	|	|	|	|	0.28
27.917	0.00	0.08	0.053	O	|	|	|	|	0.28
28.000	0.00	0.08	0.053	O	|	|	|	|	0.28
28.083	0.00	0.08	0.052	O	|	|	|	|	0.27
28.167	0.00	0.08	0.051	O	|	|	|	|	0.27
28.250	0.00	0.08	0.051	O	|	|	|	|	0.27
28.333	0.00	0.08	0.050	O	|	|	|	|	0.26
28.417	0.00	0.08	0.050	O	|	|	|	|	0.26
28.500	0.00	0.08	0.049	O	|	|	|	|	0.26
28.583	0.00	0.08	0.049	O	|	|	|	|	0.26
28.667	0.00	0.08	0.048	O	|	|	|	|	0.25
28.750	0.00	0.08	0.048	O	|	|	|	|	0.25
28.833	0.00	0.07	0.047	O	|	|	|	|	0.25
28.917	0.00	0.07	0.047	O	|	|	|	|	0.25
29.000	0.00	0.07	0.046	O	|	|	|	|	0.24
29.083	0.00	0.07	0.046	O	|	|	|	|	0.24
29.167	0.00	0.07	0.045	O	|	|	|	|	0.24
29.250	0.00	0.07	0.045	O	|	|	|	|	0.23
29.333	0.00	0.07	0.044	O	|	|	|	|	0.23
29.417	0.00	0.07	0.044	O	|	|	|	|	0.23
29.500	0.00	0.07	0.043	O	|	|	|	|	0.23
29.583	0.00	0.07	0.043	O	|	|	|	|	0.22
29.667	0.00	0.07	0.042	O	|	|	|	|	0.22
29.750	0.00	0.07	0.042	O	|	|	|	|	0.22
29.833	0.00	0.07	0.041	O	|	|	|	|	0.22
29.917	0.00	0.06	0.041	O	|	|	|	|	0.22
30.000	0.00	0.06	0.040	O	|	|	|	|	0.21
30.083	0.00	0.06	0.040	O	|	|	|	|	0.21
30.167	0.00	0.06	0.040	O	|	|	|	|	0.21
30.250	0.00	0.06	0.039	O	|	|	|	|	0.21
30.333	0.00	0.06	0.039	O	|	|	|	|	0.20
30.417	0.00	0.06	0.038	O	|	|	|	|	0.20
30.500	0.00	0.06	0.038	O	|	|	|	|	0.20
30.583	0.00	0.06	0.038	O	|	|	|	|	0.20
30.667	0.00	0.06	0.037	O	|	|	|	|	0.20
30.750	0.00	0.06	0.037	O	|	|	|	|	0.19
30.833	0.00	0.06	0.036	O	|	|	|	|	0.19
30.917	0.00	0.06	0.036	O	|	|	|	|	0.19
31.000	0.00	0.06	0.036	O	|	|	|	|	0.19
31.083	0.00	0.06	0.035	O	|	|	|	|	0.18
31.167	0.00	0.05	0.035	O	|	|	|	|	0.18
31.250	0.00	0.05	0.034	O	|	|	|	|	0.18
31.333	0.00	0.05	0.034	O	|	|	|	|	0.18
31.417	0.00	0.05	0.034	O	|	|	|	|	0.18

31.500	0.00	0.05	0.033	O	|	|	|	|	0.18
31.583	0.00	0.05	0.033	O	|	|	|	|	0.17
31.667	0.00	0.05	0.033	O	|	|	|	|	0.17
31.750	0.00	0.05	0.032	O	|	|	|	|	0.17
31.833	0.00	0.05	0.032	O	|	|	|	|	0.17
31.917	0.00	0.05	0.032	O	|	|	|	|	0.17
32.000	0.00	0.05	0.031	O	|	|	|	|	0.16
32.083	0.00	0.05	0.031	O	|	|	|	|	0.16
32.167	0.00	0.05	0.031	O	|	|	|	|	0.16
32.250	0.00	0.05	0.030	O	|	|	|	|	0.16
32.333	0.00	0.05	0.030	O	|	|	|	|	0.16
32.417	0.00	0.05	0.030	O	|	|	|	|	0.16
32.500	0.00	0.05	0.029	O	|	|	|	|	0.15
32.583	0.00	0.05	0.029	O	|	|	|	|	0.15
32.667	0.00	0.05	0.029	O	|	|	|	|	0.15
32.750	0.00	0.04	0.028	O	|	|	|	|	0.15
32.833	0.00	0.04	0.028	O	|	|	|	|	0.15
32.917	0.00	0.04	0.028	O	|	|	|	|	0.15
33.000	0.00	0.04	0.027	O	|	|	|	|	0.14
33.083	0.00	0.04	0.027	O	|	|	|	|	0.14
33.167	0.00	0.04	0.027	O	|	|	|	|	0.14
33.250	0.00	0.04	0.026	O	|	|	|	|	0.14
33.333	0.00	0.04	0.026	O	|	|	|	|	0.14
33.417	0.00	0.04	0.026	O	|	|	|	|	0.14
33.500	0.00	0.04	0.026	O	|	|	|	|	0.13
33.583	0.00	0.04	0.025	O	|	|	|	|	0.13
33.667	0.00	0.04	0.025	O	|	|	|	|	0.13
33.750	0.00	0.04	0.025	O	|	|	|	|	0.13
33.833	0.00	0.04	0.025	O	|	|	|	|	0.13
33.917	0.00	0.04	0.024	O	|	|	|	|	0.13
34.000	0.00	0.04	0.024	O	|	|	|	|	0.13
34.083	0.00	0.04	0.024	O	|	|	|	|	0.13
34.167	0.00	0.04	0.024	O	|	|	|	|	0.12
34.250	0.00	0.04	0.023	O	|	|	|	|	0.12
34.333	0.00	0.04	0.023	O	|	|	|	|	0.12
34.417	0.00	0.04	0.023	O	|	|	|	|	0.12
34.500	0.00	0.04	0.023	O	|	|	|	|	0.12
34.583	0.00	0.04	0.022	O	|	|	|	|	0.12
34.667	0.00	0.03	0.022	O	|	|	|	|	0.12
34.750	0.00	0.03	0.022	O	|	|	|	|	0.11
34.833	0.00	0.03	0.022	O	|	|	|	|	0.11
34.917	0.00	0.03	0.021	O	|	|	|	|	0.11
35.000	0.00	0.03	0.021	O	|	|	|	|	0.11
35.083	0.00	0.03	0.021	O	|	|	|	|	0.11
35.167	0.00	0.03	0.021	O	|	|	|	|	0.11
35.250	0.00	0.03	0.020	O	|	|	|	|	0.11
35.333	0.00	0.03	0.020	O	|	|	|	|	0.11
35.417	0.00	0.03	0.020	O	|	|	|	|	0.11
35.500	0.00	0.03	0.020	O	|	|	|	|	0.10
35.583	0.00	0.03	0.020	O	|	|	|	|	0.10
35.667	0.00	0.03	0.019	O	|	|	|	|	0.10
35.750	0.00	0.03	0.019	O	|	|	|	|	0.10
35.833	0.00	0.03	0.019	O	|	|	|	|	0.10
35.917	0.00	0.03	0.019	O	|	|	|	|	0.10
36.000	0.00	0.03	0.019	O	|	|	|	|	0.10
36.083	0.00	0.03	0.018	O	|	|	|	|	0.10
36.167	0.00	0.03	0.018	O	|	|	|	|	0.10

36.250	0.00	0.03	0.018	O	|	|	|	|	0.09
36.333	0.00	0.03	0.018	O	|	|	|	|	0.09
36.417	0.00	0.03	0.018	O	|	|	|	|	0.09
36.500	0.00	0.03	0.017	O	|	|	|	|	0.09
36.583	0.00	0.03	0.017	O	|	|	|	|	0.09
36.667	0.00	0.03	0.017	O	|	|	|	|	0.09
36.750	0.00	0.03	0.017	O	|	|	|	|	0.09
36.833	0.00	0.03	0.017	O	|	|	|	|	0.09
36.917	0.00	0.03	0.016	O	|	|	|	|	0.09
37.000	0.00	0.03	0.016	O	|	|	|	|	0.09
37.083	0.00	0.03	0.016	O	|	|	|	|	0.08
37.167	0.00	0.03	0.016	O	|	|	|	|	0.08
37.250	0.00	0.02	0.016	O	|	|	|	|	0.08
37.333	0.00	0.02	0.016	O	|	|	|	|	0.08
37.417	0.00	0.02	0.015	O	|	|	|	|	0.08
37.500	0.00	0.02	0.015	O	|	|	|	|	0.08
37.583	0.00	0.02	0.015	O	|	|	|	|	0.08
37.667	0.00	0.02	0.015	O	|	|	|	|	0.08
37.750	0.00	0.02	0.015	O	|	|	|	|	0.08
37.833	0.00	0.02	0.015	O	|	|	|	|	0.08
37.917	0.00	0.02	0.014	O	|	|	|	|	0.08
38.000	0.00	0.02	0.014	O	|	|	|	|	0.08
38.083	0.00	0.02	0.014	O	|	|	|	|	0.07
38.167	0.00	0.02	0.014	O	|	|	|	|	0.07
38.250	0.00	0.02	0.014	O	|	|	|	|	0.07
38.333	0.00	0.02	0.014	O	|	|	|	|	0.07
38.417	0.00	0.02	0.013	O	|	|	|	|	0.07
38.500	0.00	0.02	0.013	O	|	|	|	|	0.07
38.583	0.00	0.02	0.013	O	|	|	|	|	0.07
38.667	0.00	0.02	0.013	O	|	|	|	|	0.07
38.750	0.00	0.02	0.013	O	|	|	|	|	0.07
38.833	0.00	0.02	0.013	O	|	|	|	|	0.07
38.917	0.00	0.02	0.013	O	|	|	|	|	0.07
39.000	0.00	0.02	0.013	O	|	|	|	|	0.07
39.083	0.00	0.02	0.012	O	|	|	|	|	0.07
39.167	0.00	0.02	0.012	O	|	|	|	|	0.06
39.250	0.00	0.02	0.012	O	|	|	|	|	0.06
39.333	0.00	0.02	0.012	O	|	|	|	|	0.06
39.417	0.00	0.02	0.012	O	|	|	|	|	0.06
39.500	0.00	0.02	0.012	O	|	|	|	|	0.06
39.583	0.00	0.02	0.012	O	|	|	|	|	0.06
39.667	0.00	0.02	0.011	O	|	|	|	|	0.06
39.750	0.00	0.02	0.011	O	|	|	|	|	0.06
39.833	0.00	0.02	0.011	O	|	|	|	|	0.06
39.917	0.00	0.02	0.011	O	|	|	|	|	0.06
40.000	0.00	0.02	0.011	O	|	|	|	|	0.06
40.083	0.00	0.02	0.011	O	|	|	|	|	0.06
40.167	0.00	0.02	0.011	O	|	|	|	|	0.06
40.250	0.00	0.02	0.011	O	|	|	|	|	0.06
40.333	0.00	0.02	0.011	O	|	|	|	|	0.06
40.417	0.00	0.02	0.010	O	|	|	|	|	0.05
40.500	0.00	0.02	0.010	O	|	|	|	|	0.05
40.583	0.00	0.02	0.010	O	|	|	|	|	0.05
40.667	0.00	0.02	0.010	O	|	|	|	|	0.05
40.750	0.00	0.02	0.010	O	|	|	|	|	0.05
40.833	0.00	0.02	0.010	O	|	|	|	|	0.05
40.917	0.00	0.02	0.010	O	|	|	|	|	0.05

41.000	0.00	0.02	0.010	O	|	|	|	|	0.05
41.083	0.00	0.02	0.010	O	|	|	|	|	0.05
41.167	0.00	0.01	0.009	O	|	|	|	|	0.05
41.250	0.00	0.01	0.009	O	|	|	|	|	0.05
41.333	0.00	0.01	0.009	O	|	|	|	|	0.05
41.417	0.00	0.01	0.009	O	|	|	|	|	0.05
41.500	0.00	0.01	0.009	O	|	|	|	|	0.05
41.583	0.00	0.01	0.009	O	|	|	|	|	0.05
41.667	0.00	0.01	0.009	O	|	|	|	|	0.05
41.750	0.00	0.01	0.009	O	|	|	|	|	0.05
41.833	0.00	0.01	0.009	O	|	|	|	|	0.05
41.917	0.00	0.01	0.009	O	|	|	|	|	0.04
42.000	0.00	0.01	0.008	O	|	|	|	|	0.04
42.083	0.00	0.01	0.008	O	|	|	|	|	0.04
42.167	0.00	0.01	0.008	O	|	|	|	|	0.04
42.250	0.00	0.01	0.008	O	|	|	|	|	0.04
42.333	0.00	0.01	0.008	O	|	|	|	|	0.04
42.417	0.00	0.01	0.008	O	|	|	|	|	0.04
42.500	0.00	0.01	0.008	O	|	|	|	|	0.04
42.583	0.00	0.01	0.008	O	|	|	|	|	0.04
42.667	0.00	0.01	0.008	O	|	|	|	|	0.04
42.750	0.00	0.01	0.008	O	|	|	|	|	0.04
42.833	0.00	0.01	0.008	O	|	|	|	|	0.04
42.917	0.00	0.01	0.008	O	|	|	|	|	0.04
43.000	0.00	0.01	0.007	O	|	|	|	|	0.04
43.083	0.00	0.01	0.007	O	|	|	|	|	0.04
43.167	0.00	0.01	0.007	O	|	|	|	|	0.04
43.250	0.00	0.01	0.007	O	|	|	|	|	0.04
43.333	0.00	0.01	0.007	O	|	|	|	|	0.04
43.417	0.00	0.01	0.007	O	|	|	|	|	0.04
43.500	0.00	0.01	0.007	O	|	|	|	|	0.04
43.583	0.00	0.01	0.007	O	|	|	|	|	0.04
43.667	0.00	0.01	0.007	O	|	|	|	|	0.04
43.750	0.00	0.01	0.007	O	|	|	|	|	0.04
43.833	0.00	0.01	0.007	O	|	|	|	|	0.04
43.917	0.00	0.01	0.007	O	|	|	|	|	0.03
44.000	0.00	0.01	0.007	O	|	|	|	|	0.03
44.083	0.00	0.01	0.006	O	|	|	|	|	0.03
44.167	0.00	0.01	0.006	O	|	|	|	|	0.03
44.250	0.00	0.01	0.006	O	|	|	|	|	0.03
44.333	0.00	0.01	0.006	O	|	|	|	|	0.03
44.417	0.00	0.01	0.006	O	|	|	|	|	0.03
44.500	0.00	0.01	0.006	O	|	|	|	|	0.03
44.583	0.00	0.01	0.006	O	|	|	|	|	0.03
44.667	0.00	0.01	0.006	O	|	|	|	|	0.03
44.750	0.00	0.01	0.006	O	|	|	|	|	0.03
44.833	0.00	0.01	0.006	O	|	|	|	|	0.03
44.917	0.00	0.01	0.006	O	|	|	|	|	0.03
45.000	0.00	0.01	0.006	O	|	|	|	|	0.03
45.083	0.00	0.01	0.006	O	|	|	|	|	0.03
45.167	0.00	0.01	0.006	O	|	|	|	|	0.03
45.250	0.00	0.01	0.006	O	|	|	|	|	0.03
45.333	0.00	0.01	0.005	O	|	|	|	|	0.03
45.417	0.00	0.01	0.005	O	|	|	|	|	0.03
45.500	0.00	0.01	0.005	O	|	|	|	|	0.03
45.583	0.00	0.01	0.005	O	|	|	|	|	0.03
45.667	0.00	0.01	0.005	O	|	|	|	|	0.03

45.750	0.00	0.01	0.005	O	|	|	|	|	0.03
45.833	0.00	0.01	0.005	O	|	|	|	|	0.03
45.917	0.00	0.01	0.005	O	|	|	|	|	0.03
46.000	0.00	0.01	0.005	O	|	|	|	|	0.03
46.083	0.00	0.01	0.005	O	|	|	|	|	0.03
46.167	0.00	0.01	0.005	O	|	|	|	|	0.03
46.250	0.00	0.01	0.005	O	|	|	|	|	0.03
46.333	0.00	0.01	0.005	O	|	|	|	|	0.03
46.417	0.00	0.01	0.005	O	|	|	|	|	0.03
46.500	0.00	0.01	0.005	O	|	|	|	|	0.02
46.583	0.00	0.01	0.005	O	|	|	|	|	0.02
46.667	0.00	0.01	0.005	O	|	|	|	|	0.02
46.750	0.00	0.01	0.005	O	|	|	|	|	0.02
46.833	0.00	0.01	0.005	O	|	|	|	|	0.02
46.917	0.00	0.01	0.004	O	|	|	|	|	0.02
47.000	0.00	0.01	0.004	O	|	|	|	|	0.02
47.083	0.00	0.01	0.004	O	|	|	|	|	0.02
47.167	0.00	0.01	0.004	O	|	|	|	|	0.02
47.250	0.00	0.01	0.004	O	|	|	|	|	0.02
47.333	0.00	0.01	0.004	O	|	|	|	|	0.02
47.417	0.00	0.01	0.004	O	|	|	|	|	0.02
47.500	0.00	0.01	0.004	O	|	|	|	|	0.02
47.583	0.00	0.01	0.004	O	|	|	|	|	0.02
47.667	0.00	0.01	0.004	O	|	|	|	|	0.02
47.750	0.00	0.01	0.004	O	|	|	|	|	0.02
47.833	0.00	0.01	0.004	O	|	|	|	|	0.02
47.917	0.00	0.01	0.004	O	|	|	|	|	0.02
48.000	0.00	0.01	0.004	O	|	|	|	|	0.02
48.083	0.00	0.01	0.004	O	|	|	|	|	0.02
48.167	0.00	0.01	0.004	O	|	|	|	|	0.02
48.250	0.00	0.01	0.004	O	|	|	|	|	0.02
48.333	0.00	0.01	0.004	O	|	|	|	|	0.02
48.417	0.00	0.01	0.004	O	|	|	|	|	0.02
48.500	0.00	0.01	0.004	O	|	|	|	|	0.02
48.583	0.00	0.01	0.004	O	|	|	|	|	0.02
48.667	0.00	0.01	0.004	O	|	|	|	|	0.02
48.750	0.00	0.01	0.004	O	|	|	|	|	0.02
48.833	0.00	0.01	0.003	O	|	|	|	|	0.02
48.917	0.00	0.01	0.003	O	|	|	|	|	0.02
49.000	0.00	0.01	0.003	O	|	|	|	|	0.02
49.083	0.00	0.01	0.003	O	|	|	|	|	0.02
49.167	0.00	0.01	0.003	O	|	|	|	|	0.02
49.250	0.00	0.01	0.003	O	|	|	|	|	0.02
49.333	0.00	0.01	0.003	O	|	|	|	|	0.02
49.417	0.00	0.01	0.003	O	|	|	|	|	0.02
49.500	0.00	0.01	0.003	O	|	|	|	|	0.02
49.583	0.00	0.00	0.003	O	|	|	|	|	0.02
49.667	0.00	0.00	0.003	O	|	|	|	|	0.02
49.750	0.00	0.00	0.003	O	|	|	|	|	0.02
49.833	0.00	0.00	0.003	O	|	|	|	|	0.02
49.917	0.00	0.00	0.003	O	|	|	|	|	0.02
50.000	0.00	0.00	0.003	O	|	|	|	|	0.02
50.083	0.00	0.00	0.003	O	|	|	|	|	0.02
50.167	0.00	0.00	0.003	O	|	|	|	|	0.02
50.250	0.00	0.00	0.003	O	|	|	|	|	0.02
50.333	0.00	0.00	0.003	O	|	|	|	|	0.02
50.417	0.00	0.00	0.003	O	|	|	|	|	0.01

50.500	0.00	0.00	0.003	O	|	|	|	|	0.01
50.583	0.00	0.00	0.003	O	|	|	|	|	0.01
50.667	0.00	0.00	0.003	O	|	|	|	|	0.01
50.750	0.00	0.00	0.003	O	|	|	|	|	0.01
50.833	0.00	0.00	0.003	O	|	|	|	|	0.01
50.917	0.00	0.00	0.003	O	|	|	|	|	0.01
51.000	0.00	0.00	0.003	O	|	|	|	|	0.01
51.083	0.00	0.00	0.003	O	|	|	|	|	0.01
51.167	0.00	0.00	0.003	O	|	|	|	|	0.01
51.250	0.00	0.00	0.003	O	|	|	|	|	0.01
51.333	0.00	0.00	0.003	O	|	|	|	|	0.01
51.417	0.00	0.00	0.002	O	|	|	|	|	0.01
51.500	0.00	0.00	0.002	O	|	|	|	|	0.01
51.583	0.00	0.00	0.002	O	|	|	|	|	0.01
51.667	0.00	0.00	0.002	O	|	|	|	|	0.01
51.750	0.00	0.00	0.002	O	|	|	|	|	0.01
51.833	0.00	0.00	0.002	O	|	|	|	|	0.01
51.917	0.00	0.00	0.002	O	|	|	|	|	0.01
52.000	0.00	0.00	0.002	O	|	|	|	|	0.01
52.083	0.00	0.00	0.002	O	|	|	|	|	0.01
52.167	0.00	0.00	0.002	O	|	|	|	|	0.01
52.250	0.00	0.00	0.002	O	|	|	|	|	0.01
52.333	0.00	0.00	0.002	O	|	|	|	|	0.01
52.417	0.00	0.00	0.002	O	|	|	|	|	0.01
52.500	0.00	0.00	0.002	O	|	|	|	|	0.01
52.583	0.00	0.00	0.002	O	|	|	|	|	0.01
52.667	0.00	0.00	0.002	O	|	|	|	|	0.01
52.750	0.00	0.00	0.002	O	|	|	|	|	0.01
52.833	0.00	0.00	0.002	O	|	|	|	|	0.01
52.917	0.00	0.00	0.002	O	|	|	|	|	0.01
53.000	0.00	0.00	0.002	O	|	|	|	|	0.01
53.083	0.00	0.00	0.002	O	|	|	|	|	0.01
53.167	0.00	0.00	0.002	O	|	|	|	|	0.01
53.250	0.00	0.00	0.002	O	|	|	|	|	0.01
53.333	0.00	0.00	0.002	O	|	|	|	|	0.01
53.417	0.00	0.00	0.002	O	|	|	|	|	0.01
53.500	0.00	0.00	0.002	O	|	|	|	|	0.01
53.583	0.00	0.00	0.002	O	|	|	|	|	0.01
53.667	0.00	0.00	0.002	O	|	|	|	|	0.01
53.750	0.00	0.00	0.002	O	|	|	|	|	0.01
53.833	0.00	0.00	0.002	O	|	|	|	|	0.01
53.917	0.00	0.00	0.002	O	|	|	|	|	0.01
54.000	0.00	0.00	0.002	O	|	|	|	|	0.01
54.083	0.00	0.00	0.002	O	|	|	|	|	0.01
54.167	0.00	0.00	0.002	O	|	|	|	|	0.01
54.250	0.00	0.00	0.002	O	|	|	|	|	0.01
54.333	0.00	0.00	0.002	O	|	|	|	|	0.01
54.417	0.00	0.00	0.002	O	|	|	|	|	0.01
54.500	0.00	0.00	0.002	O	|	|	|	|	0.01
54.583	0.00	0.00	0.002	O	|	|	|	|	0.01
54.667	0.00	0.00	0.002	O	|	|	|	|	0.01
54.750	0.00	0.00	0.002	O	|	|	|	|	0.01
54.833	0.00	0.00	0.002	O	|	|	|	|	0.01
54.917	0.00	0.00	0.002	O	|	|	|	|	0.01
55.000	0.00	0.00	0.002	O	|	|	|	|	0.01
55.083	0.00	0.00	0.002	O	|	|	|	|	0.01
55.167	0.00	0.00	0.002	O	|	|	|	|	0.01

55.250	0.00	0.00	0.002	O	|	|	|	|	0.01
55.333	0.00	0.00	0.001	O	|	|	|	|	0.01
55.417	0.00	0.00	0.001	O	|	|	|	|	0.01
55.500	0.00	0.00	0.001	O	|	|	|	|	0.01
55.583	0.00	0.00	0.001	O	|	|	|	|	0.01
55.667	0.00	0.00	0.001	O	|	|	|	|	0.01
55.750	0.00	0.00	0.001	O	|	|	|	|	0.01
55.833	0.00	0.00	0.001	O	|	|	|	|	0.01
55.917	0.00	0.00	0.001	O	|	|	|	|	0.01
56.000	0.00	0.00	0.001	O	|	|	|	|	0.01
56.083	0.00	0.00	0.001	O	|	|	|	|	0.01
56.167	0.00	0.00	0.001	O	|	|	|	|	0.01
56.250	0.00	0.00	0.001	O	|	|	|	|	0.01
56.333	0.00	0.00	0.001	O	|	|	|	|	0.01
56.417	0.00	0.00	0.001	O	|	|	|	|	0.01
56.500	0.00	0.00	0.001	O	|	|	|	|	0.01
56.583	0.00	0.00	0.001	O	|	|	|	|	0.01
56.667	0.00	0.00	0.001	O	|	|	|	|	0.01
56.750	0.00	0.00	0.001	O	|	|	|	|	0.01
56.833	0.00	0.00	0.001	O	|	|	|	|	0.01
56.917	0.00	0.00	0.001	O	|	|	|	|	0.01
57.000	0.00	0.00	0.001	O	|	|	|	|	0.01
57.083	0.00	0.00	0.001	O	|	|	|	|	0.01
57.167	0.00	0.00	0.001	O	|	|	|	|	0.01
57.250	0.00	0.00	0.001	O	|	|	|	|	0.01
57.333	0.00	0.00	0.001	O	|	|	|	|	0.01
57.417	0.00	0.00	0.001	O	|	|	|	|	0.01
57.500	0.00	0.00	0.001	O	|	|	|	|	0.01
57.583	0.00	0.00	0.001	O	|	|	|	|	0.01
57.667	0.00	0.00	0.001	O	|	|	|	|	0.01
57.750	0.00	0.00	0.001	O	|	|	|	|	0.01
57.833	0.00	0.00	0.001	O	|	|	|	|	0.01
57.917	0.00	0.00	0.001	O	|	|	|	|	0.01
58.000	0.00	0.00	0.001	O	|	|	|	|	0.01
58.083	0.00	0.00	0.001	O	|	|	|	|	0.01
58.167	0.00	0.00	0.001	O	|	|	|	|	0.01
58.250	0.00	0.00	0.001	O	|	|	|	|	0.01
58.333	0.00	0.00	0.001	O	|	|	|	|	0.01
58.417	0.00	0.00	0.001	O	|	|	|	|	0.01
58.500	0.00	0.00	0.001	O	|	|	|	|	0.01
58.583	0.00	0.00	0.001	O	|	|	|	|	0.01
58.667	0.00	0.00	0.001	O	|	|	|	|	0.01
58.750	0.00	0.00	0.001	O	|	|	|	|	0.01
58.833	0.00	0.00	0.001	O	|	|	|	|	0.00
58.917	0.00	0.00	0.001	O	|	|	|	|	0.00
59.000	0.00	0.00	0.001	O	|	|	|	|	0.00
59.083	0.00	0.00	0.001	O	|	|	|	|	0.00
59.167	0.00	0.00	0.001	O	|	|	|	|	0.00
59.250	0.00	0.00	0.001	O	|	|	|	|	0.00
59.333	0.00	0.00	0.001	O	|	|	|	|	0.00
59.417	0.00	0.00	0.001	O	|	|	|	|	0.00
59.500	0.00	0.00	0.001	O	|	|	|	|	0.00
59.583	0.00	0.00	0.001	O	|	|	|	|	0.00
59.667	0.00	0.00	0.001	O	|	|	|	|	0.00
59.750	0.00	0.00	0.001	O	|	|	|	|	0.00
59.833	0.00	0.00	0.001	O	|	|	|	|	0.00
59.917	0.00	0.00	0.001	O	|	|	|	|	0.00

60.000	0.00	0.00	0.001	O	|	|	|	|	0.00
60.083	0.00	0.00	0.001	O	|	|	|	|	0.00
60.167	0.00	0.00	0.001	O	|	|	|	|	0.00
60.250	0.00	0.00	0.001	O	|	|	|	|	0.00
60.333	0.00	0.00	0.001	O	|	|	|	|	0.00
60.417	0.00	0.00	0.001	O	|	|	|	|	0.00
60.500	0.00	0.00	0.001	O	|	|	|	|	0.00
60.583	0.00	0.00	0.001	O	|	|	|	|	0.00
60.667	0.00	0.00	0.001	O	|	|	|	|	0.00
60.750	0.00	0.00	0.001	O	|	|	|	|	0.00
60.833	0.00	0.00	0.001	O	|	|	|	|	0.00
60.917	0.00	0.00	0.001	O	|	|	|	|	0.00
61.000	0.00	0.00	0.001	O	|	|	|	|	0.00
61.083	0.00	0.00	0.001	O	|	|	|	|	0.00
61.167	0.00	0.00	0.001	O	|	|	|	|	0.00
61.250	0.00	0.00	0.001	O	|	|	|	|	0.00
61.333	0.00	0.00	0.001	O	|	|	|	|	0.00
61.417	0.00	0.00	0.001	O	|	|	|	|	0.00
61.500	0.00	0.00	0.001	O	|	|	|	|	0.00
61.583	0.00	0.00	0.001	O	|	|	|	|	0.00
61.667	0.00	0.00	0.001	O	|	|	|	|	0.00
61.750	0.00	0.00	0.001	O	|	|	|	|	0.00
61.833	0.00	0.00	0.001	O	|	|	|	|	0.00
61.917	0.00	0.00	0.001	O	|	|	|	|	0.00

```
****************************HYDROGRAPH DATA****************************
            Number of intervals =   743
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        0.435 (CFS)
            Total volume =       0.518 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 03/23/12

-----------------------------------------------------------------------


JN3504
ROUTING
Q100-24HR

-----------------------------------------------------------------------


Program License Serial Number 5016

-----------------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

            From study/file name: 3504q100d1r24100.rte
****************************HYDROGRAPH DATA****************************
            Number of intervals =   296
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        4.181 (CFS)
            Total volume =       2.379 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
-----------------------------------------------------------------------
Total number of inflow hydrograph intervals = 296
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
-----------------------------------------------------------------------
-----------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------------
-----------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
```

0.400	0.076	0.120	0.076	0.076
0.800	0.157	0.120	0.157	0.157
1.000	0.199	0.120	0.199	0.199
1.200	0.243	0.270	0.242	0.244
1.600	0.336	0.350	0.335	0.337
2.000	0.434	0.410	0.433	0.435
2.600	0.594	0.480	0.592	0.596
2.950	0.693	0.510	0.691	0.695
3.000	0.708	0.520	0.706	0.710
3.200	0.767	2.150	0.760	0.774
3.400	0.829	5.110	0.811	0.847
3.800	0.956	11.400	0.917	0.995
4.400	1.161	14.930	1.110	1.212
4.600	1.233	15.930	1.178	1.288

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	1.0	2.09	3.14	4.18	Depth (Ft.)
0.083	0.02	0.00	0.000	O	|	|	|	|	0.00
0.167	0.12	0.00	0.001	O	|	|	|	|	0.00
0.250	0.17	0.00	0.002	OI	|	|	|	|	0.01
0.333	0.20	0.00	0.003	OI	|	|	|	|	0.01
0.417	0.26	0.01	0.004	O I	|	|	|	|	0.02
0.500	0.30	0.01	0.006	O I	|	|	|	|	0.03
0.583	0.31	0.01	0.008	O I	|	|	|	|	0.04
0.667	0.31	0.02	0.010	O I	|	|	|	|	0.05
0.750	0.32	0.02	0.012	O I	|	|	|	|	0.06
0.833	0.33	0.02	0.014	O I	|	|	|	|	0.08
0.917	0.38	0.03	0.017	O I	|	|	|	|	0.09
1.000	0.40	0.03	0.019	O I	|	|	|	|	0.10
1.083	0.41	0.03	0.022	O I	|	|	|	|	0.11
1.167	0.36	0.04	0.024	O I	|	|	|	|	0.13
1.250	0.34	0.04	0.026	O I	|	|	|	|	0.14
1.333	0.33	0.04	0.028	O I	|	|	|	|	0.15
1.417	0.32	0.05	0.030	O I	|	|	|	|	0.16
1.500	0.32	0.05	0.032	O I	|	|	|	|	0.17
1.583	0.32	0.05	0.034	O I	|	|	|	|	0.18
1.667	0.32	0.06	0.036	O I	|	|	|	|	0.19
1.750	0.32	0.06	0.037	O I	|	|	|	|	0.20
1.833	0.33	0.06	0.039	O I	|	|	|	|	0.21
1.917	0.38	0.07	0.041	O I	|	|	|	|	0.22
2.000	0.40	0.07	0.044	O I	|	|	|	|	0.23
2.083	0.42	0.07	0.046	O I	|	|	|	|	0.24
2.167	0.42	0.08	0.048	O I	|	|	|	|	0.25
2.250	0.42	0.08	0.051	O I	|	|	|	|	0.27
2.333	0.42	0.08	0.053	O I	|	|	|	|	0.28
2.417	0.42	0.09	0.055	O I	|	|	|	|	0.29
2.500	0.42	0.09	0.058	O I	|	|	|	|	0.30
2.583	0.43	0.09	0.060	O I	|	|	|	|	0.32
2.667	0.48	0.10	0.062	O I	|	|	|	|	0.33
2.750	0.51	0.10	0.065	O I	|	|	|	|	0.34
2.833	0.52	0.11	0.068	O I	|	|	|	|	0.36
2.917	0.53	0.11	0.071	O I	|	|	|	|	0.37

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3.000    0.53    0.12      0.074  O   I   |        |        |        |      0.39
3.083    0.53    0.12      0.077  O   I   |        |        |        |      0.40
3.167    0.53    0.12      0.079  O   I   |        |        |        |      0.42
3.250    0.53    0.12      0.082  O   I   |        |        |        |      0.43
3.333    0.53    0.12      0.085  O   I   |        |        |        |      0.44
3.417    0.53    0.12      0.088  O   I   |        |        |        |      0.46
3.500    0.53    0.12      0.091  O   I   |        |        |        |      0.47
3.583    0.53    0.12      0.093  O   I   |        |        |        |      0.49
3.667    0.53    0.12      0.096  O   I   |        |        |        |      0.50
3.750    0.53    0.12      0.099  O   I   |        |        |        |      0.51
3.833    0.54    0.12      0.102  O   I   |        |        |        |      0.53
3.917    0.59    0.12      0.105  O   I   |        |        |        |      0.54
4.000    0.62    0.12      0.108  O   I   |        |        |        |      0.56
4.083    0.63    0.12      0.112  O   I   |        |        |        |      0.58
4.167    0.63    0.12      0.115  O   I   |        |        |        |      0.59
4.250    0.64    0.12      0.119  O   I   |        |        |        |      0.61
4.333    0.65    0.12      0.123  O   I   |        |        |        |      0.63
4.417    0.70    0.12      0.126  O    I  |        |        |        |      0.65
4.500    0.72    0.12      0.130  O    I  |        |        |        |      0.67
4.583    0.73    0.12      0.135  O    I  |        |        |        |      0.69
4.667    0.74    0.12      0.139  O    I  |        |        |        |      0.71
4.750    0.74    0.12      0.143  O    I  |        |        |        |      0.73
4.833    0.75    0.12      0.147  O    I  |        |        |        |      0.75
4.917    0.80    0.12      0.152  O     I |        |        |        |      0.78
5.000    0.83    0.12      0.157  O     I |        |        |        |      0.80
5.083    0.82    0.12      0.162  O     I |        |        |        |      0.82
5.167    0.73    0.12      0.166  O    I  |        |        |        |      0.84
5.250    0.67    0.12      0.170  O    I  |        |        |        |      0.86
5.333    0.66    0.12      0.174  O    I  |        |        |        |      0.88
5.417    0.70    0.12      0.178  O    I  |        |        |        |      0.90
5.500    0.73    0.12      0.182  O    I  |        |        |        |      0.92
5.583    0.75    0.12      0.186  O    I  |        |        |        |      0.94
5.667    0.80    0.12      0.191  O     I |        |        |        |      0.96
5.750    0.83    0.12      0.195  O     I |        |        |        |      0.98
5.833    0.84    0.12      0.200  O     I |        |        |        |      1.01
5.917    0.85    0.14      0.205  |O    I |        |        |        |      1.03
6.000    0.85    0.16      0.210  |O    I |        |        |        |      1.05
6.083    0.86    0.17      0.215  |O    I |        |        |        |      1.07
6.167    0.91    0.19      0.220  |O    I |        |        |        |      1.09
6.250    0.94    0.21      0.225  |O     I|        |        |        |      1.12
6.333    0.95    0.22      0.230  |O     I|        |        |        |      1.14
6.417    0.95    0.24      0.234  |O     I|        |        |        |      1.16
6.500    0.95    0.26      0.239  |O     I|        |        |        |      1.18
6.583    0.96    0.27      0.244  | O    I|        |        |        |      1.20
6.667    1.02    0.28      0.249  | O    I|        |        |        |      1.23
6.750    1.04    0.28      0.254  | O    I|        |        |        |      1.25
6.833    1.05    0.28      0.259  | O     I        |        |        |      1.27
6.917    1.06    0.29      0.265  | O     I        |        |        |      1.29
7.000    1.06    0.29      0.270  | O     I        |        |        |      1.32
7.083    1.06    0.30      0.275  | O     I        |        |        |      1.34
7.167    1.06    0.30      0.281  | O     I        |        |        |      1.36
7.250    1.06    0.31      0.286  | O     I        |        |        |      1.38
7.333    1.07    0.31      0.291  | O     I        |        |        |      1.41
7.417    1.12    0.32      0.296  | O     I        |        |        |      1.43
7.500    1.15    0.32      0.302  | O     I        |        |        |      1.45
7.583    1.17    0.33      0.308  | O     I        |        |        |      1.48
7.667    1.22    0.33      0.314  | O     |I       |        |        |      1.50
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 7.750    1.25    0.34      0.320  | O     |I      |       |       |     1.53
 7.833    1.27    0.34      0.326  | O     |I      |       |       |     1.56
 7.917    1.34    0.35      0.333  | O     | I     |       |       |     1.59
 8.000    1.37    0.35      0.340  | O     | I     |       |       |     1.62
 8.083    1.41    0.36      0.347  | O     | I     |       |       |     1.64
 8.167    1.54    0.36      0.355  | O     |  I    |       |       |     1.68
 8.250    1.61    0.37      0.363  | O     |   I   |       |       |     1.71
 8.333    1.63    0.37      0.372  | O     |   I   |       |       |     1.75
 8.417    1.65    0.38      0.380  | O     |   I   |       |       |     1.78
 8.500    1.66    0.38      0.389  | O     |   I   |       |       |     1.82
 8.583    1.67    0.39      0.398  | O     |   I   |       |       |     1.85
 8.667    1.73    0.39      0.407  |  O    |    I  |       |       |     1.89
 8.750    1.77    0.40      0.416  |  O    |    I  |       |       |     1.93
 8.833    1.79    0.40      0.426  |  O    |    I  |       |       |     1.97
 8.917    1.86    0.41      0.435  |  O    |     I |       |       |     2.01
 9.000    1.90    0.42      0.446  |  O    |     I |       |       |     2.04
 9.083    1.94    0.42      0.456  |  O    |     I |       |       |     2.08
 9.167    2.07    0.42      0.467  |  O    |      I|       |       |     2.12
 9.250    2.14    0.43      0.478  |  O    |       I       |       |     2.17
 9.333    2.18    0.43      0.490  |  O    |       I       |       |     2.21
 9.417    2.25    0.44      0.503  |  O    |       |I      |       |     2.26
 9.500    2.29    0.45      0.515  |  O    |       |I      |       |     2.30
 9.583    2.32    0.45      0.528  |  O    |       |I      |       |     2.35
 9.667    2.39    0.46      0.541  |  O    |       | I     |       |     2.40
 9.750    2.43    0.46      0.555  |  O    |       | I     |       |     2.45
 9.833    2.46    0.47      0.568  |  O    |       | I     |       |     2.50
 9.917    2.53    0.47      0.582  |  O    |       |  I    |       |     2.56
10.000    2.56    0.48      0.596  |  O    |       |  I    |       |     2.61
10.083    2.50    0.48      0.610  |  O    |       |  I    |       |     2.66
10.167    2.08    0.49      0.623  |  O    |      I|       |       |     2.70
10.250    1.85    0.49      0.633  |  O    |     I |       |       |     2.74
10.333    1.77    0.49      0.642  |  O    |    I  |       |       |     2.77
10.417    1.72    0.50      0.651  |  O    |    I  |       |       |     2.80
10.500    1.71    0.50      0.659  |  O    |    I  |       |       |     2.83
10.583    1.76    0.50      0.667  |  O    |    I  |       |       |     2.86
10.667    2.06    0.51      0.677  |  O    |      I|       |       |     2.89
10.750    2.22    0.51      0.688  |  O    |       I       |       |     2.93
10.833    2.29    0.51      0.700  |  O    |       |I      |       |     2.97
10.917    2.32    0.64      0.712  |   O   |       |I      |       |     3.01
11.000    2.33    0.93      0.723  |      O|       |I      |       |     3.05
11.083    2.33    1.17      0.732  |       O       |I      |       |     3.08
11.167    2.27    1.37      0.739  |       | O     |I      |       |     3.10
11.250    2.24    1.52      0.744  |       |  O    |I      |       |     3.12
11.333    2.23    1.65      0.749  |       |   O   |I      |       |     3.14
11.417    2.23    1.75      0.752  |       |    O  |I      |       |     3.15
11.500    2.23    1.83      0.755  |       |     O |I      |       |     3.16
11.583    2.20    1.90      0.758  |       |     O I       |       |     3.17
11.667    2.08    1.94      0.759  |       |     OI|       |       |     3.17
11.750    2.02    1.96      0.760  |       |     OI|       |       |     3.18
11.833    2.00    1.97      0.760  |       |      O|       |       |     3.18
11.917    2.05    1.98      0.761  |       |      O|       |       |     3.18
12.000    2.08    1.99      0.761  |       |      O|       |       |     3.18
12.083    2.17    2.02      0.762  |       |      OI       |       |     3.18
12.167    2.61    2.08      0.765  |       |      O|  I    |       |     3.19
12.250    2.84    2.22      0.768  |       |       O    I  |       |     3.20
12.333    2.94    2.41      0.772  |       |       | O   I |       |     3.22
12.417    3.05    2.58      0.776  |       |       |  O   I|       |     3.23
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12.500	3.10	2.72	0.779			O I		3.24
12.583	3.15	2.83	0.781			O I		3.25
12.667	3.28	2.94	0.784			O I		3.25
12.750	3.35	3.05	0.786			O I		3.26
12.833	3.39	3.14	0.788			OI		3.27
12.917	3.47	3.22	0.789			O I		3.27
13.000	3.51	3.30	0.791			OI		3.28
13.083	3.58	3.37	0.793			O I		3.28
13.167	3.90	3.47	0.795			O I		3.29
13.250	4.07	3.62	0.798			O I		3.30
13.333	4.13	3.75	0.801			O I		3.31
13.417	4.17	3.87	0.803			O I		3.32
13.500	4.18	3.95	0.805			O I		3.32
13.583	4.06	4.00	0.806			OI		3.33
13.667	3.39	3.92	0.804			I O		3.32
13.750	3.04	3.72	0.800			I O		3.31
13.833	2.90	3.51	0.795			I O		3.29
13.917	2.83	3.33	0.792			I O		3.28
14.000	2.80	3.18	0.789			I O		3.27
14.083	2.83	3.08	0.786			I O		3.26
14.167	3.07	3.04	0.786			O		3.26
14.250	3.20	3.07	0.786			OI		3.26
14.333	3.24	3.11	0.787			OI		3.26
14.417	3.21	3.14	0.788			O		3.27
14.500	3.18	3.16	0.788			O		3.27
14.583	3.18	3.16	0.788			O		3.27
14.667	3.17	3.17	0.788			O		3.27
14.750	3.17	3.17	0.788			O		3.27
14.833	3.16	3.17	0.788			O		3.27
14.917	3.10	3.16	0.788			IO		3.27
15.000	3.07	3.14	0.788			IO		3.27
15.083	3.05	3.12	0.787			O		3.27
15.167	2.98	3.09	0.787			IO		3.26
15.250	2.95	3.05	0.786			IO		3.26
15.333	2.92	3.02	0.785			IO		3.26
15.417	2.85	2.98	0.784			IO		3.26
15.500	2.82	2.94	0.784			IO		3.25
15.583	2.76	2.90	0.783			IO		3.25
15.667	2.51	2.82	0.781			I O		3.25
15.750	2.38	2.72	0.779			I O		3.24
15.833	2.32	2.61	0.777			I O		3.23
15.917	2.30	2.53	0.775			I O		3.23
16.000	2.29	2.46	0.774			IO		3.22
16.083	2.12	2.39	0.772			I O		3.22
16.167	1.24	2.19	0.768		I	O		3.20
16.250	0.77	1.97	0.760	I		O		3.18
16.333	0.59	1.74	0.752	I	O			3.15
16.417	0.49	1.54	0.745	I	O			3.12
16.500	0.46	1.35	0.738	I	O			3.10
16.583	0.43	1.19	0.732	I	O			3.08
16.667	0.37	1.06	0.727	I	O			3.07
16.750	0.34	0.93	0.723	I	O			3.05
16.833	0.33	0.83	0.719	I	O			3.04
16.917	0.32	0.74	0.716	I	O			3.03
17.000	0.32	0.67	0.713	I	O			3.02
17.083	0.34	0.61	0.711	I	O			3.01
17.167	0.44	0.57	0.710	I	O			3.01

17.250	0.49	0.55	0.709	IO				3.00
17.333	0.51	0.54	0.709	IO				3.00
17.417	0.52	0.54	0.709	O				3.00
17.500	0.53	0.54	0.709	O				3.00
17.583	0.53	0.54	0.709	O				3.00
17.667	0.53	0.53	0.709	O				3.00
17.750	0.53	0.53	0.708	O				3.00
17.833	0.52	0.53	0.708	IO				3.00
17.917	0.47	0.53	0.708	IO				3.00
18.000	0.44	0.52	0.708	O				3.00
18.083	0.43	0.52	0.707	O				3.00
18.167	0.43	0.52	0.707	O				3.00
18.250	0.43	0.52	0.706	O				2.99
18.333	0.43	0.52	0.705	O				2.99
18.417	0.43	0.52	0.705	O				2.99
18.500	0.42	0.52	0.704	O				2.99
18.583	0.42	0.52	0.703	O				2.98
18.667	0.36	0.52	0.703	IO				2.98
18.750	0.34	0.52	0.701	IO				2.98
18.833	0.32	0.51	0.700	IO				2.97
18.917	0.26	0.51	0.699	IO				2.97
19.000	0.23	0.51	0.697	I O				2.96
19.083	0.23	0.51	0.695	I O				2.96
19.167	0.28	0.51	0.693	IO				2.95
19.250	0.30	0.51	0.692	IO				2.94
19.333	0.32	0.51	0.690	IO				2.94
19.417	0.37	0.51	0.689	IO				2.94
19.500	0.40	0.51	0.688	O				2.93
19.583	0.41	0.51	0.688	O				2.93
19.667	0.36	0.51	0.687	IO				2.93
19.750	0.34	0.51	0.686	IO				2.92
19.833	0.32	0.51	0.684	IO				2.92
19.917	0.26	0.51	0.683	IO				2.91
20.000	0.23	0.51	0.681	I O				2.91
20.083	0.23	0.51	0.679	I O				2.90
20.167	0.28	0.51	0.677	IO				2.89
20.250	0.30	0.50	0.676	IO				2.89
20.333	0.31	0.50	0.675	IO				2.88
20.417	0.32	0.50	0.673	IO				2.88
20.500	0.32	0.50	0.672	IO				2.88
20.583	0.32	0.50	0.671	IO				2.87
20.667	0.32	0.50	0.669	IO				2.87
20.750	0.32	0.50	0.668	IO				2.86
20.833	0.31	0.50	0.667	IO				2.86
20.917	0.26	0.50	0.665	I O				2.85
21.000	0.23	0.50	0.664	I O				2.85
21.083	0.23	0.50	0.662	I O				2.84
21.167	0.28	0.50	0.660	IO				2.83
21.250	0.30	0.50	0.659	IO				2.83
21.333	0.30	0.50	0.657	IO				2.82
21.417	0.26	0.50	0.656	I O				2.82
21.500	0.23	0.50	0.654	I O				2.81
21.583	0.23	0.50	0.652	I O				2.81
21.667	0.28	0.50	0.650	IO				2.80
21.750	0.30	0.50	0.649	IO				2.79
21.833	0.30	0.50	0.648	IO				2.79
21.917	0.26	0.50	0.646	I O				2.78

22.000	0.23	0.50	0.644	|I O	|	|	|	2.78
22.083	0.23	0.49	0.643	|I O	|	|	|	2.77
22.167	0.28	0.49	0.641	| IO	|	|	|	2.77
22.250	0.30	0.49	0.639	| IO	|	|	|	2.76
22.333	0.30	0.49	0.638	| IO	|	|	|	2.76
22.417	0.26	0.49	0.637	|I O	|	|	|	2.75
22.500	0.23	0.49	0.635	|I O	|	|	|	2.74
22.583	0.22	0.49	0.633	|I O	|	|	|	2.74
22.667	0.22	0.49	0.631	|I O	|	|	|	2.73
22.750	0.21	0.49	0.629	|I O	|	|	|	2.72
22.833	0.21	0.49	0.627	|I O	|	|	|	2.72
22.917	0.21	0.49	0.625	|I O	|	|	|	2.71
23.000	0.21	0.49	0.624	|I O	|	|	|	2.70
23.083	0.21	0.49	0.622	|I O	|	|	|	2.70
23.167	0.21	0.49	0.620	|I O	|	|	|	2.69
23.250	0.21	0.49	0.618	|I O	|	|	|	2.68
23.333	0.21	0.49	0.616	|I O	|	|	|	2.68
23.417	0.21	0.49	0.614	|I O	|	|	|	2.67
23.500	0.21	0.49	0.612	|I O	|	|	|	2.66
23.583	0.21	0.48	0.610	|I O	|	|	|	2.66
23.667	0.21	0.48	0.608	|I O	|	|	|	2.65
23.750	0.21	0.48	0.607	|I O	|	|	|	2.64
23.833	0.21	0.48	0.605	|I O	|	|	|	2.64
23.917	0.21	0.48	0.603	|I O	|	|	|	2.63
24.000	0.21	0.48	0.601	|I O	|	|	|	2.62
24.083	0.19	0.48	0.599	|I O	|	|	|	2.62
24.167	0.09	0.48	0.597	I O	|	|	|	2.61
24.250	0.04	0.48	0.594	I O	|	|	|	2.60
24.333	0.02	0.48	0.591	I O	|	|	|	2.59
24.417	0.01	0.48	0.588	I O	|	|	|	2.58
24.500	0.00	0.48	0.584	I O	|	|	|	2.56
24.583	0.00	0.47	0.581	I O	|	|	|	2.55
24.667	0.00	0.47	0.578	I O	|	|	|	2.54
24.750	0.00	0.47	0.575	I O	|	|	|	2.53
24.833	0.00	0.47	0.571	I O	|	|	|	2.52
24.917	0.00	0.47	0.568	I O	|	|	|	2.50
25.000	0.00	0.47	0.565	I O	|	|	|	2.49
25.083	0.00	0.47	0.562	I O	|	|	|	2.48
25.167	0.00	0.46	0.559	I O	|	|	|	2.47
25.250	0.00	0.46	0.555	I O	|	|	|	2.45
25.333	0.00	0.46	0.552	I O	|	|	|	2.44
25.417	0.00	0.46	0.549	I O	|	|	|	2.43
25.500	0.00	0.46	0.546	I O	|	|	|	2.42
25.583	0.00	0.46	0.543	I O	|	|	|	2.41
25.667	0.00	0.46	0.539	I O	|	|	|	2.40
25.750	0.00	0.45	0.536	I O	|	|	|	2.38
25.833	0.00	0.45	0.533	I O	|	|	|	2.37
25.917	0.00	0.45	0.530	I O	|	|	|	2.36
26.000	0.00	0.45	0.527	I O	|	|	|	2.35
26.083	0.00	0.45	0.524	I O	|	|	|	2.34
26.167	0.00	0.45	0.521	I O	|	|	|	2.33
26.250	0.00	0.45	0.518	I O	|	|	|	2.31
26.333	0.00	0.45	0.515	I O	|	|	|	2.30
26.417	0.00	0.44	0.512	I O	|	|	|	2.29
26.500	0.00	0.44	0.509	I O	|	|	|	2.28
26.583	0.00	0.44	0.505	I O	|	|	|	2.27
26.667	0.00	0.44	0.502	I O	|	|	|	2.26

26.750	0.00	0.44	0.499	I	O				2.25
26.833	0.00	0.44	0.496	I	O				2.23
26.917	0.00	0.44	0.493	I	O				2.22
27.000	0.00	0.43	0.490	I	O				2.21
27.083	0.00	0.43	0.487	I	O				2.20
27.167	0.00	0.43	0.484	I	O				2.19
27.250	0.00	0.43	0.481	I	O				2.18
27.333	0.00	0.43	0.479	I	O				2.17
27.417	0.00	0.43	0.476	I	O				2.16
27.500	0.00	0.43	0.473	I	O				2.14
27.583	0.00	0.43	0.470	I	O				2.13
27.667	0.00	0.42	0.467	I	O				2.12
27.750	0.00	0.42	0.464	I	O				2.11
27.833	0.00	0.42	0.461	I	O				2.10
27.917	0.00	0.42	0.458	I	O				2.09
28.000	0.00	0.42	0.455	I	O				2.08
28.083	0.00	0.42	0.452	I	O				2.07
28.167	0.00	0.42	0.449	I	O				2.06
28.250	0.00	0.42	0.447	I	O				2.05
28.333	0.00	0.41	0.444	I	O				2.04
28.417	0.00	0.41	0.441	I	O				2.03
28.500	0.00	0.41	0.438	I	O				2.01
28.583	0.00	0.41	0.435	I	O				2.00
28.667	0.00	0.41	0.432	I	O				1.99
28.750	0.00	0.41	0.429	I	O				1.98
28.833	0.00	0.41	0.427	I	O				1.97
28.917	0.00	0.40	0.424	I	O				1.96
29.000	0.00	0.40	0.421	I	O				1.95
29.083	0.00	0.40	0.418	I	O				1.94
29.167	0.00	0.40	0.416	I	O				1.92
29.250	0.00	0.40	0.413	I	O				1.91
29.333	0.00	0.40	0.410	I	O				1.90
29.417	0.00	0.39	0.407	I	O				1.89
29.500	0.00	0.39	0.405	I	O				1.88
29.583	0.00	0.39	0.402	I	O				1.87
29.667	0.00	0.39	0.399	I	O				1.86
29.750	0.00	0.39	0.397	I	O				1.85
29.833	0.00	0.39	0.394	I	O				1.84
29.917	0.00	0.38	0.391	I	O				1.83
30.000	0.00	0.38	0.389	I	O				1.82
30.083	0.00	0.38	0.386	I	O				1.80
30.167	0.00	0.38	0.383	I	O				1.79
30.250	0.00	0.38	0.381	I	O				1.78
30.333	0.00	0.38	0.378	I	O				1.77
30.417	0.00	0.37	0.376	I	O				1.76
30.500	0.00	0.37	0.373	I	O				1.75
30.583	0.00	0.37	0.371	I	O				1.74
30.667	0.00	0.37	0.368	I	O				1.73
30.750	0.00	0.37	0.365	I	O				1.72
30.833	0.00	0.37	0.363	I	O				1.71
30.917	0.00	0.36	0.360	I	O				1.70
31.000	0.00	0.36	0.358	I	O				1.69
31.083	0.00	0.36	0.355	I	O				1.68
31.167	0.00	0.36	0.353	I	O				1.67
31.250	0.00	0.36	0.350	I	O				1.66
31.333	0.00	0.36	0.348	I	O				1.65
31.417	0.00	0.36	0.346	I	O				1.64

31.500	0.00	0.35	0.343	I O				1.63
31.583	0.00	0.35	0.341	I O				1.62
31.667	0.00	0.35	0.338	I O				1.61
31.750	0.00	0.35	0.336	I O				1.60
31.833	0.00	0.35	0.333	I O				1.59
31.917	0.00	0.35	0.331	I O				1.58
32.000	0.00	0.34	0.329	I O				1.57
32.083	0.00	0.34	0.326	I O				1.56
32.167	0.00	0.34	0.324	I O				1.55
32.250	0.00	0.34	0.322	I O				1.54
32.333	0.00	0.34	0.319	I O				1.53
32.417	0.00	0.33	0.317	I O				1.52
32.500	0.00	0.33	0.315	I O				1.51
32.583	0.00	0.33	0.312	I O				1.50
32.667	0.00	0.33	0.310	I O				1.49
32.750	0.00	0.33	0.308	I O				1.48
32.833	0.00	0.32	0.306	I O				1.47
32.917	0.00	0.32	0.303	I O				1.46
33.000	0.00	0.32	0.301	I O				1.45
33.083	0.00	0.32	0.299	I O				1.44
33.167	0.00	0.32	0.297	I O				1.43
33.250	0.00	0.31	0.295	I O				1.42
33.333	0.00	0.31	0.293	I O				1.41
33.417	0.00	0.31	0.290	I O				1.40
33.500	0.00	0.31	0.288	I O				1.39
33.583	0.00	0.31	0.286	I O				1.39
33.667	0.00	0.31	0.284	I O				1.38
33.750	0.00	0.30	0.282	I O				1.37
33.833	0.00	0.30	0.280	I O				1.36
33.917	0.00	0.30	0.278	I O				1.35
34.000	0.00	0.30	0.276	I O				1.34
34.083	0.00	0.30	0.274	I O				1.33
34.167	0.00	0.29	0.272	I O				1.32
34.250	0.00	0.29	0.270	I O				1.31
34.333	0.00	0.29	0.268	I O				1.31
34.417	0.00	0.29	0.266	I O				1.30
34.500	0.00	0.29	0.264	I O				1.29
34.583	0.00	0.29	0.262	I O				1.28
34.667	0.00	0.28	0.260	I O				1.27
34.750	0.00	0.28	0.258	I O				1.26
34.833	0.00	0.28	0.256	I O				1.25
34.917	0.00	0.28	0.254	I O				1.25
35.000	0.00	0.28	0.252	I O				1.24
35.083	0.00	0.28	0.250	I O				1.23
35.167	0.00	0.27	0.248	I O				1.22
35.250	0.00	0.27	0.246	I O				1.21
35.333	0.00	0.27	0.244	I O				1.21
35.417	0.00	0.27	0.243	I O				1.20
35.500	0.00	0.26	0.241	I O				1.19
35.583	0.00	0.26	0.239	IO				1.18
35.667	0.00	0.25	0.237	IO				1.17
35.750	0.00	0.24	0.235	IO				1.17
35.833	0.00	0.24	0.234	IO				1.16
35.917	0.00	0.23	0.232	IO				1.15
36.000	0.00	0.23	0.231	IO				1.14
36.083	0.00	0.22	0.229	IO				1.14
36.167	0.00	0.22	0.228	IO				1.13

36.250	0.00	0.21	0.226	IO				1.12
36.333	0.00	0.21	0.225	IO				1.12
36.417	0.00	0.20	0.223	IO				1.11
36.500	0.00	0.20	0.222	IO				1.10
36.583	0.00	0.19	0.220	IO				1.10
36.667	0.00	0.19	0.219	IO				1.09
36.750	0.00	0.18	0.218	IO				1.09
36.833	0.00	0.18	0.217	IO				1.08
36.917	0.00	0.18	0.215	IO				1.07
37.000	0.00	0.17	0.214	IO				1.07
37.083	0.00	0.17	0.213	IO				1.06
37.167	0.00	0.16	0.212	IO				1.06
37.250	0.00	0.16	0.211	IO				1.05
37.333	0.00	0.16	0.210	IO				1.05
37.417	0.00	0.15	0.209	IO				1.04
37.500	0.00	0.15	0.208	IO				1.04
37.583	0.00	0.15	0.207	IO				1.03
37.667	0.00	0.14	0.206	IO				1.03
37.750	0.00	0.14	0.205	IO				1.03
37.833	0.00	0.14	0.204	IO				1.02
37.917	0.00	0.13	0.203	IO				1.02
38.000	0.00	0.13	0.202	O				1.01
38.083	0.00	0.13	0.201	O				1.01
38.167	0.00	0.12	0.200	O				1.00
38.250	0.00	0.12	0.199	O				1.00
38.333	0.00	0.12	0.198	O				1.00
38.417	0.00	0.12	0.198	O				0.99
38.500	0.00	0.12	0.197	O				0.99
38.583	0.00	0.12	0.196	O				0.99
38.667	0.00	0.12	0.195	O				0.98
38.750	0.00	0.12	0.194	O				0.98
38.833	0.00	0.12	0.193	O				0.97
38.917	0.00	0.12	0.193	O				0.97
39.000	0.00	0.12	0.192	O				0.97
39.083	0.00	0.12	0.191	O				0.96
39.167	0.00	0.12	0.190	O				0.96
39.250	0.00	0.12	0.189	O				0.95
39.333	0.00	0.12	0.188	O				0.95
39.417	0.00	0.12	0.188	O				0.95
39.500	0.00	0.12	0.187	O				0.94
39.583	0.00	0.12	0.186	O				0.94
39.667	0.00	0.12	0.185	O				0.93
39.750	0.00	0.12	0.184	O				0.93
39.833	0.00	0.12	0.184	O				0.93
39.917	0.00	0.12	0.183	O				0.92
40.000	0.00	0.12	0.182	O				0.92
40.083	0.00	0.12	0.181	O				0.91
40.167	0.00	0.12	0.180	O				0.91
40.250	0.00	0.12	0.179	O				0.91
40.333	0.00	0.12	0.179	O				0.90
40.417	0.00	0.12	0.178	O				0.90
40.500	0.00	0.12	0.177	O				0.89
40.583	0.00	0.12	0.176	O				0.89
40.667	0.00	0.12	0.175	O				0.89
40.750	0.00	0.12	0.174	O				0.88
40.833	0.00	0.12	0.174	O				0.88
40.917	0.00	0.12	0.173	O				0.88

41.000	0.00	0.12	0.172	O	|	|	|	|	0.87
41.083	0.00	0.12	0.171	O	|	|	|	|	0.87
41.167	0.00	0.12	0.170	O	|	|	|	|	0.86
41.250	0.00	0.12	0.169	O	|	|	|	|	0.86
41.333	0.00	0.12	0.169	O	|	|	|	|	0.86
41.417	0.00	0.12	0.168	O	|	|	|	|	0.85
41.500	0.00	0.12	0.167	O	|	|	|	|	0.85
41.583	0.00	0.12	0.166	O	|	|	|	|	0.84
41.667	0.00	0.12	0.165	O	|	|	|	|	0.84
41.750	0.00	0.12	0.165	O	|	|	|	|	0.84
41.833	0.00	0.12	0.164	O	|	|	|	|	0.83
41.917	0.00	0.12	0.163	O	|	|	|	|	0.83
42.000	0.00	0.12	0.162	O	|	|	|	|	0.82
42.083	0.00	0.12	0.161	O	|	|	|	|	0.82
42.167	0.00	0.12	0.160	O	|	|	|	|	0.82
42.250	0.00	0.12	0.160	O	|	|	|	|	0.81
42.333	0.00	0.12	0.159	O	|	|	|	|	0.81
42.417	0.00	0.12	0.158	O	|	|	|	|	0.80
42.500	0.00	0.12	0.157	O	|	|	|	|	0.80
42.583	0.00	0.12	0.156	O	|	|	|	|	0.80
42.667	0.00	0.12	0.155	O	|	|	|	|	0.79
42.750	0.00	0.12	0.155	O	|	|	|	|	0.79
42.833	0.00	0.12	0.154	O	|	|	|	|	0.78
42.917	0.00	0.12	0.153	O	|	|	|	|	0.78
43.000	0.00	0.12	0.152	O	|	|	|	|	0.78
43.083	0.00	0.12	0.151	O	|	|	|	|	0.77
43.167	0.00	0.12	0.150	O	|	|	|	|	0.77
43.250	0.00	0.12	0.150	O	|	|	|	|	0.76
43.333	0.00	0.12	0.149	O	|	|	|	|	0.76
43.417	0.00	0.12	0.148	O	|	|	|	|	0.76
43.500	0.00	0.12	0.147	O	|	|	|	|	0.75
43.583	0.00	0.12	0.146	O	|	|	|	|	0.75
43.667	0.00	0.12	0.146	O	|	|	|	|	0.74
43.750	0.00	0.12	0.145	O	|	|	|	|	0.74
43.833	0.00	0.12	0.144	O	|	|	|	|	0.74
43.917	0.00	0.12	0.143	O	|	|	|	|	0.73
44.000	0.00	0.12	0.142	O	|	|	|	|	0.73
44.083	0.00	0.12	0.141	O	|	|	|	|	0.72
44.167	0.00	0.12	0.141	O	|	|	|	|	0.72
44.250	0.00	0.12	0.140	O	|	|	|	|	0.71
44.333	0.00	0.12	0.139	O	|	|	|	|	0.71
44.417	0.00	0.12	0.138	O	|	|	|	|	0.71
44.500	0.00	0.12	0.137	O	|	|	|	|	0.70
44.583	0.00	0.12	0.136	O	|	|	|	|	0.70
44.667	0.00	0.12	0.136	O	|	|	|	|	0.69
44.750	0.00	0.12	0.135	O	|	|	|	|	0.69
44.833	0.00	0.12	0.134	O	|	|	|	|	0.69
44.917	0.00	0.12	0.133	O	|	|	|	|	0.68
45.000	0.00	0.12	0.132	O	|	|	|	|	0.68
45.083	0.00	0.12	0.131	O	|	|	|	|	0.67
45.167	0.00	0.12	0.131	O	|	|	|	|	0.67
45.250	0.00	0.12	0.130	O	|	|	|	|	0.67
45.333	0.00	0.12	0.129	O	|	|	|	|	0.66
45.417	0.00	0.12	0.128	O	|	|	|	|	0.66
45.500	0.00	0.12	0.127	O	|	|	|	|	0.65
45.583	0.00	0.12	0.126	O	|	|	|	|	0.65
45.667	0.00	0.12	0.126	O	|	|	|	|	0.65

45.750	0.00	0.12	0.125	O	|	|	|	|	0.64
45.833	0.00	0.12	0.124	O	|	|	|	|	0.64
45.917	0.00	0.12	0.123	O	|	|	|	|	0.63
46.000	0.00	0.12	0.122	O	|	|	|	|	0.63
46.083	0.00	0.12	0.122	O	|	|	|	|	0.62
46.167	0.00	0.12	0.121	O	|	|	|	|	0.62
46.250	0.00	0.12	0.120	O	|	|	|	|	0.62
46.333	0.00	0.12	0.119	O	|	|	|	|	0.61
46.417	0.00	0.12	0.118	O	|	|	|	|	0.61
46.500	0.00	0.12	0.117	O	|	|	|	|	0.60
46.583	0.00	0.12	0.117	O	|	|	|	|	0.60
46.667	0.00	0.12	0.116	O	|	|	|	|	0.60
46.750	0.00	0.12	0.115	O	|	|	|	|	0.59
46.833	0.00	0.12	0.114	O	|	|	|	|	0.59
46.917	0.00	0.12	0.113	O	|	|	|	|	0.58
47.000	0.00	0.12	0.112	O	|	|	|	|	0.58
47.083	0.00	0.12	0.112	O	|	|	|	|	0.58
47.167	0.00	0.12	0.111	O	|	|	|	|	0.57
47.250	0.00	0.12	0.110	O	|	|	|	|	0.57
47.333	0.00	0.12	0.109	O	|	|	|	|	0.56
47.417	0.00	0.12	0.108	O	|	|	|	|	0.56
47.500	0.00	0.12	0.107	O	|	|	|	|	0.56
47.583	0.00	0.12	0.107	O	|	|	|	|	0.55
47.667	0.00	0.12	0.106	O	|	|	|	|	0.55
47.750	0.00	0.12	0.105	O	|	|	|	|	0.54
47.833	0.00	0.12	0.104	O	|	|	|	|	0.54
47.917	0.00	0.12	0.103	O	|	|	|	|	0.54
48.000	0.00	0.12	0.103	O	|	|	|	|	0.53
48.083	0.00	0.12	0.102	O	|	|	|	|	0.53
48.167	0.00	0.12	0.101	O	|	|	|	|	0.52
48.250	0.00	0.12	0.100	O	|	|	|	|	0.52
48.333	0.00	0.12	0.099	O	|	|	|	|	0.51
48.417	0.00	0.12	0.098	O	|	|	|	|	0.51
48.500	0.00	0.12	0.098	O	|	|	|	|	0.51
48.583	0.00	0.12	0.097	O	|	|	|	|	0.50
48.667	0.00	0.12	0.096	O	|	|	|	|	0.50
48.750	0.00	0.12	0.095	O	|	|	|	|	0.49
48.833	0.00	0.12	0.094	O	|	|	|	|	0.49
48.917	0.00	0.12	0.093	O	|	|	|	|	0.49
49.000	0.00	0.12	0.093	O	|	|	|	|	0.48
49.083	0.00	0.12	0.092	O	|	|	|	|	0.48
49.167	0.00	0.12	0.091	O	|	|	|	|	0.47
49.250	0.00	0.12	0.090	O	|	|	|	|	0.47
49.333	0.00	0.12	0.089	O	|	|	|	|	0.47
49.417	0.00	0.12	0.088	O	|	|	|	|	0.46
49.500	0.00	0.12	0.088	O	|	|	|	|	0.46
49.583	0.00	0.12	0.087	O	|	|	|	|	0.45
49.667	0.00	0.12	0.086	O	|	|	|	|	0.45
49.750	0.00	0.12	0.085	O	|	|	|	|	0.45
49.833	0.00	0.12	0.084	O	|	|	|	|	0.44
49.917	0.00	0.12	0.084	O	|	|	|	|	0.44
50.000	0.00	0.12	0.083	O	|	|	|	|	0.43
50.083	0.00	0.12	0.082	O	|	|	|	|	0.43
50.167	0.00	0.12	0.081	O	|	|	|	|	0.42
50.250	0.00	0.12	0.080	O	|	|	|	|	0.42
50.333	0.00	0.12	0.079	O	|	|	|	|	0.42
50.417	0.00	0.12	0.079	O	|	|	|	|	0.41

50.500	0.00	0.12	0.078	O	|	|	|	|	0.41
50.583	0.00	0.12	0.077	O	|	|	|	|	0.40
50.667	0.00	0.12	0.076	O	|	|	|	|	0.40
50.750	0.00	0.12	0.075	O	|	|	|	|	0.40
50.833	0.00	0.12	0.074	O	|	|	|	|	0.39
50.917	0.00	0.12	0.074	O	|	|	|	|	0.39
51.000	0.00	0.12	0.073	O	|	|	|	|	0.38
51.083	0.00	0.11	0.072	O	|	|	|	|	0.38
51.167	0.00	0.11	0.071	O	|	|	|	|	0.38
51.250	0.00	0.11	0.071	O	|	|	|	|	0.37
51.333	0.00	0.11	0.070	O	|	|	|	|	0.37
51.417	0.00	0.11	0.069	O	|	|	|	|	0.36
51.500	0.00	0.11	0.068	O	|	|	|	|	0.36
51.583	0.00	0.11	0.068	O	|	|	|	|	0.36
51.667	0.00	0.11	0.067	O	|	|	|	|	0.35
51.750	0.00	0.10	0.066	O	|	|	|	|	0.35
51.833	0.00	0.10	0.065	O	|	|	|	|	0.34
51.917	0.00	0.10	0.065	O	|	|	|	|	0.34
52.000	0.00	0.10	0.064	O	|	|	|	|	0.34
52.083	0.00	0.10	0.063	O	|	|	|	|	0.33
52.167	0.00	0.10	0.063	O	|	|	|	|	0.33
52.250	0.00	0.10	0.062	O	|	|	|	|	0.33
52.333	0.00	0.10	0.061	O	|	|	|	|	0.32
52.417	0.00	0.10	0.061	O	|	|	|	|	0.32
52.500	0.00	0.09	0.060	O	|	|	|	|	0.32
52.583	0.00	0.09	0.059	O	|	|	|	|	0.31
52.667	0.00	0.09	0.059	O	|	|	|	|	0.31
52.750	0.00	0.09	0.058	O	|	|	|	|	0.31
52.833	0.00	0.09	0.057	O	|	|	|	|	0.30
52.917	0.00	0.09	0.057	O	|	|	|	|	0.30
53.000	0.00	0.09	0.056	O	|	|	|	|	0.30
53.083	0.00	0.09	0.056	O	|	|	|	|	0.29
53.167	0.00	0.09	0.055	O	|	|	|	|	0.29
53.250	0.00	0.09	0.054	O	|	|	|	|	0.29
53.333	0.00	0.08	0.054	O	|	|	|	|	0.28
53.417	0.00	0.08	0.053	O	|	|	|	|	0.28
53.500	0.00	0.08	0.053	O	|	|	|	|	0.28
53.583	0.00	0.08	0.052	O	|	|	|	|	0.27
53.667	0.00	0.08	0.051	O	|	|	|	|	0.27
53.750	0.00	0.08	0.051	O	|	|	|	|	0.27
53.833	0.00	0.08	0.050	O	|	|	|	|	0.26
53.917	0.00	0.08	0.050	O	|	|	|	|	0.26
54.000	0.00	0.08	0.049	O	|	|	|	|	0.26
54.083	0.00	0.08	0.049	O	|	|	|	|	0.26
54.167	0.00	0.08	0.048	O	|	|	|	|	0.25
54.250	0.00	0.08	0.048	O	|	|	|	|	0.25
54.333	0.00	0.07	0.047	O	|	|	|	|	0.25
54.417	0.00	0.07	0.047	O	|	|	|	|	0.25
54.500	0.00	0.07	0.046	O	|	|	|	|	0.24
54.583	0.00	0.07	0.046	O	|	|	|	|	0.24
54.667	0.00	0.07	0.045	O	|	|	|	|	0.24
54.750	0.00	0.07	0.045	O	|	|	|	|	0.24
54.833	0.00	0.07	0.044	O	|	|	|	|	0.23
54.917	0.00	0.07	0.044	O	|	|	|	|	0.23
55.000	0.00	0.07	0.043	O	|	|	|	|	0.23
55.083	0.00	0.07	0.043	O	|	|	|	|	0.23
55.167	0.00	0.07	0.042	O	|	|	|	|	0.22

55.250	0.00	0.07	0.042	O	|	|	|	|	0.22
55.333	0.00	0.07	0.041	O	|	|	|	|	0.22
55.417	0.00	0.06	0.041	O	|	|	|	|	0.22
55.500	0.00	0.06	0.040	O	|	|	|	|	0.21
55.583	0.00	0.06	0.040	O	|	|	|	|	0.21
55.667	0.00	0.06	0.040	O	|	|	|	|	0.21
55.750	0.00	0.06	0.039	O	|	|	|	|	0.21
55.833	0.00	0.06	0.039	O	|	|	|	|	0.20
55.917	0.00	0.06	0.038	O	|	|	|	|	0.20
56.000	0.00	0.06	0.038	O	|	|	|	|	0.20
56.083	0.00	0.06	0.038	O	|	|	|	|	0.20
56.167	0.00	0.06	0.037	O	|	|	|	|	0.20
56.250	0.00	0.06	0.037	O	|	|	|	|	0.19
56.333	0.00	0.06	0.036	O	|	|	|	|	0.19
56.417	0.00	0.06	0.036	O	|	|	|	|	0.19
56.500	0.00	0.06	0.036	O	|	|	|	|	0.19
56.583	0.00	0.06	0.035	O	|	|	|	|	0.19
56.667	0.00	0.05	0.035	O	|	|	|	|	0.18
56.750	0.00	0.05	0.034	O	|	|	|	|	0.18
56.833	0.00	0.05	0.034	O	|	|	|	|	0.18
56.917	0.00	0.05	0.034	O	|	|	|	|	0.18
57.000	0.00	0.05	0.033	O	|	|	|	|	0.18
57.083	0.00	0.05	0.033	O	|	|	|	|	0.17
57.167	0.00	0.05	0.033	O	|	|	|	|	0.17
57.250	0.00	0.05	0.032	O	|	|	|	|	0.17
57.333	0.00	0.05	0.032	O	|	|	|	|	0.17
57.417	0.00	0.05	0.032	O	|	|	|	|	0.17
57.500	0.00	0.05	0.031	O	|	|	|	|	0.16
57.583	0.00	0.05	0.031	O	|	|	|	|	0.16
57.667	0.00	0.05	0.031	O	|	|	|	|	0.16
57.750	0.00	0.05	0.030	O	|	|	|	|	0.16
57.833	0.00	0.05	0.030	O	|	|	|	|	0.16
57.917	0.00	0.05	0.030	O	|	|	|	|	0.16
58.000	0.00	0.05	0.029	O	|	|	|	|	0.15
58.083	0.00	0.05	0.029	O	|	|	|	|	0.15
58.167	0.00	0.05	0.029	O	|	|	|	|	0.15
58.250	0.00	0.04	0.028	O	|	|	|	|	0.15
58.333	0.00	0.04	0.028	O	|	|	|	|	0.15
58.417	0.00	0.04	0.028	O	|	|	|	|	0.15
58.500	0.00	0.04	0.027	O	|	|	|	|	0.14
58.583	0.00	0.04	0.027	O	|	|	|	|	0.14
58.667	0.00	0.04	0.027	O	|	|	|	|	0.14
58.750	0.00	0.04	0.026	O	|	|	|	|	0.14
58.833	0.00	0.04	0.026	O	|	|	|	|	0.14
58.917	0.00	0.04	0.026	O	|	|	|	|	0.14
59.000	0.00	0.04	0.026	O	|	|	|	|	0.13
59.083	0.00	0.04	0.025	O	|	|	|	|	0.13
59.167	0.00	0.04	0.025	O	|	|	|	|	0.13
59.250	0.00	0.04	0.025	O	|	|	|	|	0.13
59.333	0.00	0.04	0.025	O	|	|	|	|	0.13
59.417	0.00	0.04	0.024	O	|	|	|	|	0.13
59.500	0.00	0.04	0.024	O	|	|	|	|	0.13
59.583	0.00	0.04	0.024	O	|	|	|	|	0.13
59.667	0.00	0.04	0.024	O	|	|	|	|	0.12
59.750	0.00	0.04	0.023	O	|	|	|	|	0.12
59.833	0.00	0.04	0.023	O	|	|	|	|	0.12
59.917	0.00	0.04	0.023	O	|	|	|	|	0.12

60.000	0.00	0.04	0.023	O	|	|	|	|	0.12
60.083	0.00	0.04	0.022	O	|	|	|	|	0.12
60.167	0.00	0.03	0.022	O	|	|	|	|	0.12
60.250	0.00	0.03	0.022	O	|	|	|	|	0.11
60.333	0.00	0.03	0.022	O	|	|	|	|	0.11
60.417	0.00	0.03	0.021	O	|	|	|	|	0.11
60.500	0.00	0.03	0.021	O	|	|	|	|	0.11
60.583	0.00	0.03	0.021	O	|	|	|	|	0.11
60.667	0.00	0.03	0.021	O	|	|	|	|	0.11
60.750	0.00	0.03	0.020	O	|	|	|	|	0.11
60.833	0.00	0.03	0.020	O	|	|	|	|	0.11
60.917	0.00	0.03	0.020	O	|	|	|	|	0.11
61.000	0.00	0.03	0.020	O	|	|	|	|	0.10
61.083	0.00	0.03	0.020	O	|	|	|	|	0.10
61.167	0.00	0.03	0.019	O	|	|	|	|	0.10
61.250	0.00	0.03	0.019	O	|	|	|	|	0.10
61.333	0.00	0.03	0.019	O	|	|	|	|	0.10
61.417	0.00	0.03	0.019	O	|	|	|	|	0.10
61.500	0.00	0.03	0.019	O	|	|	|	|	0.10
61.583	0.00	0.03	0.018	O	|	|	|	|	0.10
61.667	0.00	0.03	0.018	O	|	|	|	|	0.10
61.750	0.00	0.03	0.018	O	|	|	|	|	0.09
61.833	0.00	0.03	0.018	O	|	|	|	|	0.09
61.917	0.00	0.03	0.018	O	|	|	|	|	0.09
62.000	0.00	0.03	0.017	O	|	|	|	|	0.09
62.083	0.00	0.03	0.017	O	|	|	|	|	0.09
62.167	0.00	0.03	0.017	O	|	|	|	|	0.09
62.250	0.00	0.03	0.017	O	|	|	|	|	0.09
62.333	0.00	0.03	0.017	O	|	|	|	|	0.09
62.417	0.00	0.03	0.016	O	|	|	|	|	0.09
62.500	0.00	0.03	0.016	O	|	|	|	|	0.09
62.583	0.00	0.03	0.016	O	|	|	|	|	0.08
62.667	0.00	0.03	0.016	O	|	|	|	|	0.08
62.750	0.00	0.02	0.016	O	|	|	|	|	0.08
62.833	0.00	0.02	0.016	O	|	|	|	|	0.08
62.917	0.00	0.02	0.015	O	|	|	|	|	0.08
63.000	0.00	0.02	0.015	O	|	|	|	|	0.08
63.083	0.00	0.02	0.015	O	|	|	|	|	0.08
63.167	0.00	0.02	0.015	O	|	|	|	|	0.08
63.250	0.00	0.02	0.015	O	|	|	|	|	0.08
63.333	0.00	0.02	0.015	O	|	|	|	|	0.08
63.417	0.00	0.02	0.014	O	|	|	|	|	0.08
63.500	0.00	0.02	0.014	O	|	|	|	|	0.08
63.583	0.00	0.02	0.014	O	|	|	|	|	0.07
63.667	0.00	0.02	0.014	O	|	|	|	|	0.07
63.750	0.00	0.02	0.014	O	|	|	|	|	0.07
63.833	0.00	0.02	0.014	O	|	|	|	|	0.07
63.917	0.00	0.02	0.014	O	|	|	|	|	0.07
64.000	0.00	0.02	0.013	O	|	|	|	|	0.07
64.083	0.00	0.02	0.013	O	|	|	|	|	0.07
64.167	0.00	0.02	0.013	O	|	|	|	|	0.07
64.250	0.00	0.02	0.013	O	|	|	|	|	0.07
64.333	0.00	0.02	0.013	O	|	|	|	|	0.07
64.417	0.00	0.02	0.013	O	|	|	|	|	0.07
64.500	0.00	0.02	0.013	O	|	|	|	|	0.07
64.583	0.00	0.02	0.012	O	|	|	|	|	0.07
64.667	0.00	0.02	0.012	O	|	|	|	|	0.06

64.750	0.00	0.02	0.012	O	|	|	|	|	0.06
64.833	0.00	0.02	0.012	O	|	|	|	|	0.06
64.917	0.00	0.02	0.012	O	|	|	|	|	0.06
65.000	0.00	0.02	0.012	O	|	|	|	|	0.06
65.083	0.00	0.02	0.012	O	|	|	|	|	0.06
65.167	0.00	0.02	0.011	O	|	|	|	|	0.06
65.250	0.00	0.02	0.011	O	|	|	|	|	0.06
65.333	0.00	0.02	0.011	O	|	|	|	|	0.06
65.417	0.00	0.02	0.011	O	|	|	|	|	0.06
65.500	0.00	0.02	0.011	O	|	|	|	|	0.06
65.583	0.00	0.02	0.011	O	|	|	|	|	0.06
65.667	0.00	0.02	0.011	O	|	|	|	|	0.06
65.750	0.00	0.02	0.011	O	|	|	|	|	0.06
65.833	0.00	0.02	0.011	O	|	|	|	|	0.06
65.917	0.00	0.02	0.010	O	|	|	|	|	0.05
66.000	0.00	0.02	0.010	O	|	|	|	|	0.05
66.083	0.00	0.02	0.010	O	|	|	|	|	0.05
66.167	0.00	0.02	0.010	O	|	|	|	|	0.05
66.250	0.00	0.02	0.010	O	|	|	|	|	0.05
66.333	0.00	0.02	0.010	O	|	|	|	|	0.05
66.417	0.00	0.02	0.010	O	|	|	|	|	0.05
66.500	0.00	0.02	0.010	O	|	|	|	|	0.05
66.583	0.00	0.02	0.010	O	|	|	|	|	0.05
66.667	0.00	0.01	0.009	O	|	|	|	|	0.05
66.750	0.00	0.01	0.009	O	|	|	|	|	0.05
66.833	0.00	0.01	0.009	O	|	|	|	|	0.05
66.917	0.00	0.01	0.009	O	|	|	|	|	0.05
67.000	0.00	0.01	0.009	O	|	|	|	|	0.05
67.083	0.00	0.01	0.009	O	|	|	|	|	0.05
67.167	0.00	0.01	0.009	O	|	|	|	|	0.05
67.250	0.00	0.01	0.009	O	|	|	|	|	0.05
67.333	0.00	0.01	0.009	O	|	|	|	|	0.05
67.417	0.00	0.01	0.009	O	|	|	|	|	0.05
67.500	0.00	0.01	0.008	O	|	|	|	|	0.04
67.583	0.00	0.01	0.008	O	|	|	|	|	0.04
67.667	0.00	0.01	0.008	O	|	|	|	|	0.04
67.750	0.00	0.01	0.008	O	|	|	|	|	0.04
67.833	0.00	0.01	0.008	O	|	|	|	|	0.04
67.917	0.00	0.01	0.008	O	|	|	|	|	0.04
68.000	0.00	0.01	0.008	O	|	|	|	|	0.04
68.083	0.00	0.01	0.008	O	|	|	|	|	0.04
68.167	0.00	0.01	0.008	O	|	|	|	|	0.04
68.250	0.00	0.01	0.008	O	|	|	|	|	0.04
68.333	0.00	0.01	0.008	O	|	|	|	|	0.04
68.417	0.00	0.01	0.008	O	|	|	|	|	0.04
68.500	0.00	0.01	0.007	O	|	|	|	|	0.04
68.583	0.00	0.01	0.007	O	|	|	|	|	0.04
68.667	0.00	0.01	0.007	O	|	|	|	|	0.04
68.750	0.00	0.01	0.007	O	|	|	|	|	0.04
68.833	0.00	0.01	0.007	O	|	|	|	|	0.04
68.917	0.00	0.01	0.007	O	|	|	|	|	0.04
69.000	0.00	0.01	0.007	O	|	|	|	|	0.04
69.083	0.00	0.01	0.007	O	|	|	|	|	0.04
69.167	0.00	0.01	0.007	O	|	|	|	|	0.04
69.250	0.00	0.01	0.007	O	|	|	|	|	0.04
69.333	0.00	0.01	0.007	O	|	|	|	|	0.04
69.417	0.00	0.01	0.007	O	|	|	|	|	0.03

69.500	0.00	0.01	0.007	O	|	|	|	|	0.03
69.583	0.00	0.01	0.006	O	|	|	|	|	0.03
69.667	0.00	0.01	0.006	O	|	|	|	|	0.03
69.750	0.00	0.01	0.006	O	|	|	|	|	0.03
69.833	0.00	0.01	0.006	O	|	|	|	|	0.03
69.917	0.00	0.01	0.006	O	|	|	|	|	0.03
70.000	0.00	0.01	0.006	O	|	|	|	|	0.03
70.083	0.00	0.01	0.006	O	|	|	|	|	0.03
70.167	0.00	0.01	0.006	O	|	|	|	|	0.03
70.250	0.00	0.01	0.006	O	|	|	|	|	0.03
70.333	0.00	0.01	0.006	O	|	|	|	|	0.03
70.417	0.00	0.01	0.006	O	|	|	|	|	0.03
70.500	0.00	0.01	0.006	O	|	|	|	|	0.03
70.583	0.00	0.01	0.006	O	|	|	|	|	0.03
70.667	0.00	0.01	0.006	O	|	|	|	|	0.03
70.750	0.00	0.01	0.006	O	|	|	|	|	0.03
70.833	0.00	0.01	0.005	O	|	|	|	|	0.03
70.917	0.00	0.01	0.005	O	|	|	|	|	0.03
71.000	0.00	0.01	0.005	O	|	|	|	|	0.03
71.083	0.00	0.01	0.005	O	|	|	|	|	0.03
71.167	0.00	0.01	0.005	O	|	|	|	|	0.03
71.250	0.00	0.01	0.005	O	|	|	|	|	0.03
71.333	0.00	0.01	0.005	O	|	|	|	|	0.03
71.417	0.00	0.01	0.005	O	|	|	|	|	0.03
71.500	0.00	0.01	0.005	O	|	|	|	|	0.03
71.583	0.00	0.01	0.005	O	|	|	|	|	0.03
71.667	0.00	0.01	0.005	O	|	|	|	|	0.03
71.750	0.00	0.01	0.005	O	|	|	|	|	0.03
71.833	0.00	0.01	0.005	O	|	|	|	|	0.03
71.917	0.00	0.01	0.005	O	|	|	|	|	0.03
72.000	0.00	0.01	0.005	O	|	|	|	|	0.02
72.083	0.00	0.01	0.005	O	|	|	|	|	0.02
72.167	0.00	0.01	0.005	O	|	|	|	|	0.02
72.250	0.00	0.01	0.005	O	|	|	|	|	0.02
72.333	0.00	0.01	0.005	O	|	|	|	|	0.02
72.417	0.00	0.01	0.004	O	|	|	|	|	0.02
72.500	0.00	0.01	0.004	O	|	|	|	|	0.02
72.583	0.00	0.01	0.004	O	|	|	|	|	0.02
72.667	0.00	0.01	0.004	O	|	|	|	|	0.02
72.750	0.00	0.01	0.004	O	|	|	|	|	0.02
72.833	0.00	0.01	0.004	O	|	|	|	|	0.02
72.917	0.00	0.01	0.004	O	|	|	|	|	0.02
73.000	0.00	0.01	0.004	O	|	|	|	|	0.02
73.083	0.00	0.01	0.004	O	|	|	|	|	0.02
73.167	0.00	0.01	0.004	O	|	|	|	|	0.02
73.250	0.00	0.01	0.004	O	|	|	|	|	0.02
73.333	0.00	0.01	0.004	O	|	|	|	|	0.02
73.417	0.00	0.01	0.004	O	|	|	|	|	0.02
73.500	0.00	0.01	0.004	O	|	|	|	|	0.02
73.583	0.00	0.01	0.004	O	|	|	|	|	0.02
73.667	0.00	0.01	0.004	O	|	|	|	|	0.02
73.750	0.00	0.01	0.004	O	|	|	|	|	0.02
73.833	0.00	0.01	0.004	O	|	|	|	|	0.02
73.917	0.00	0.01	0.004	O	|	|	|	|	0.02
74.000	0.00	0.01	0.004	O	|	|	|	|	0.02
74.083	0.00	0.01	0.004	O	|	|	|	|	0.02
74.167	0.00	0.01	0.004	O	|	|	|	|	0.02

74.250	0.00	0.01	0.004	O	|	|	|	|	0.02
74.333	0.00	0.01	0.003	O	|	|	|	|	0.02
74.417	0.00	0.01	0.003	O	|	|	|	|	0.02
74.500	0.00	0.01	0.003	O	|	|	|	|	0.02
74.583	0.00	0.01	0.003	O	|	|	|	|	0.02
74.667	0.00	0.01	0.003	O	|	|	|	|	0.02
74.750	0.00	0.01	0.003	O	|	|	|	|	0.02
74.833	0.00	0.01	0.003	O	|	|	|	|	0.02
74.917	0.00	0.01	0.003	O	|	|	|	|	0.02
75.000	0.00	0.01	0.003	O	|	|	|	|	0.02
75.083	0.00	0.00	0.003	O	|	|	|	|	0.02
75.167	0.00	0.00	0.003	O	|	|	|	|	0.02
75.250	0.00	0.00	0.003	O	|	|	|	|	0.02
75.333	0.00	0.00	0.003	O	|	|	|	|	0.02
75.417	0.00	0.00	0.003	O	|	|	|	|	0.02
75.500	0.00	0.00	0.003	O	|	|	|	|	0.02
75.583	0.00	0.00	0.003	O	|	|	|	|	0.02
75.667	0.00	0.00	0.003	O	|	|	|	|	0.02
75.750	0.00	0.00	0.003	O	|	|	|	|	0.02
75.833	0.00	0.00	0.003	O	|	|	|	|	0.02
75.917	0.00	0.00	0.003	O	|	|	|	|	0.01
76.000	0.00	0.00	0.003	O	|	|	|	|	0.01
76.083	0.00	0.00	0.003	O	|	|	|	|	0.01
76.167	0.00	0.00	0.003	O	|	|	|	|	0.01
76.250	0.00	0.00	0.003	O	|	|	|	|	0.01
76.333	0.00	0.00	0.003	O	|	|	|	|	0.01
76.417	0.00	0.00	0.003	O	|	|	|	|	0.01
76.500	0.00	0.00	0.003	O	|	|	|	|	0.01
76.583	0.00	0.00	0.003	O	|	|	|	|	0.01
76.667	0.00	0.00	0.003	O	|	|	|	|	0.01
76.750	0.00	0.00	0.003	O	|	|	|	|	0.01
76.833	0.00	0.00	0.003	O	|	|	|	|	0.01
76.917	0.00	0.00	0.002	O	|	|	|	|	0.01
77.000	0.00	0.00	0.002	O	|	|	|	|	0.01
77.083	0.00	0.00	0.002	O	|	|	|	|	0.01
77.167	0.00	0.00	0.002	O	|	|	|	|	0.01
77.250	0.00	0.00	0.002	O	|	|	|	|	0.01
77.333	0.00	0.00	0.002	O	|	|	|	|	0.01
77.417	0.00	0.00	0.002	O	|	|	|	|	0.01
77.500	0.00	0.00	0.002	O	|	|	|	|	0.01
77.583	0.00	0.00	0.002	O	|	|	|	|	0.01
77.667	0.00	0.00	0.002	O	|	|	|	|	0.01
77.750	0.00	0.00	0.002	O	|	|	|	|	0.01
77.833	0.00	0.00	0.002	O	|	|	|	|	0.01
77.917	0.00	0.00	0.002	O	|	|	|	|	0.01
78.000	0.00	0.00	0.002	O	|	|	|	|	0.01
78.083	0.00	0.00	0.002	O	|	|	|	|	0.01
78.167	0.00	0.00	0.002	O	|	|	|	|	0.01
78.250	0.00	0.00	0.002	O	|	|	|	|	0.01
78.333	0.00	0.00	0.002	O	|	|	|	|	0.01
78.417	0.00	0.00	0.002	O	|	|	|	|	0.01
78.500	0.00	0.00	0.002	O	|	|	|	|	0.01
78.583	0.00	0.00	0.002	O	|	|	|	|	0.01
78.667	0.00	0.00	0.002	O	|	|	|	|	0.01
78.750	0.00	0.00	0.002	O	|	|	|	|	0.01
78.833	0.00	0.00	0.002	O	|	|	|	|	0.01
78.917	0.00	0.00	0.002	O	|	|	|	|	0.01

79.000	0.00	0.00	0.002	O	|	|	|	|	0.01
79.083	0.00	0.00	0.002	O	|	|	|	|	0.01
79.167	0.00	0.00	0.002	O	|	|	|	|	0.01
79.250	0.00	0.00	0.002	O	|	|	|	|	0.01
79.333	0.00	0.00	0.002	O	|	|	|	|	0.01
79.417	0.00	0.00	0.002	O	|	|	|	|	0.01
79.500	0.00	0.00	0.002	O	|	|	|	|	0.01
79.583	0.00	0.00	0.002	O	|	|	|	|	0.01
79.667	0.00	0.00	0.002	O	|	|	|	|	0.01
79.750	0.00	0.00	0.002	O	|	|	|	|	0.01
79.833	0.00	0.00	0.002	O	|	|	|	|	0.01
79.917	0.00	0.00	0.002	O	|	|	|	|	0.01
80.000	0.00	0.00	0.002	O	|	|	|	|	0.01
80.083	0.00	0.00	0.002	O	|	|	|	|	0.01
80.167	0.00	0.00	0.002	O	|	|	|	|	0.01
80.250	0.00	0.00	0.002	O	|	|	|	|	0.01
80.333	0.00	0.00	0.002	O	|	|	|	|	0.01
80.417	0.00	0.00	0.002	O	|	|	|	|	0.01
80.500	0.00	0.00	0.002	O	|	|	|	|	0.01
80.583	0.00	0.00	0.002	O	|	|	|	|	0.01
80.667	0.00	0.00	0.002	O	|	|	|	|	0.01
80.750	0.00	0.00	0.002	O	|	|	|	|	0.01
80.833	0.00	0.00	0.001	O	|	|	|	|	0.01
80.917	0.00	0.00	0.001	O	|	|	|	|	0.01
81.000	0.00	0.00	0.001	O	|	|	|	|	0.01
81.083	0.00	0.00	0.001	O	|	|	|	|	0.01
81.167	0.00	0.00	0.001	O	|	|	|	|	0.01
81.250	0.00	0.00	0.001	O	|	|	|	|	0.01
81.333	0.00	0.00	0.001	O	|	|	|	|	0.01
81.417	0.00	0.00	0.001	O	|	|	|	|	0.01
81.500	0.00	0.00	0.001	O	|	|	|	|	0.01
81.583	0.00	0.00	0.001	O	|	|	|	|	0.01
81.667	0.00	0.00	0.001	O	|	|	|	|	0.01
81.750	0.00	0.00	0.001	O	|	|	|	|	0.01
81.833	0.00	0.00	0.001	O	|	|	|	|	0.01
81.917	0.00	0.00	0.001	O	|	|	|	|	0.01
82.000	0.00	0.00	0.001	O	|	|	|	|	0.01
82.083	0.00	0.00	0.001	O	|	|	|	|	0.01
82.167	0.00	0.00	0.001	O	|	|	|	|	0.01
82.250	0.00	0.00	0.001	O	|	|	|	|	0.01
82.333	0.00	0.00	0.001	O	|	|	|	|	0.01
82.417	0.00	0.00	0.001	O	|	|	|	|	0.01
82.500	0.00	0.00	0.001	O	|	|	|	|	0.01
82.583	0.00	0.00	0.001	O	|	|	|	|	0.01
82.667	0.00	0.00	0.001	O	|	|	|	|	0.01
82.750	0.00	0.00	0.001	O	|	|	|	|	0.01
82.833	0.00	0.00	0.001	O	|	|	|	|	0.01
82.917	0.00	0.00	0.001	O	|	|	|	|	0.01
83.000	0.00	0.00	0.001	O	|	|	|	|	0.01
83.083	0.00	0.00	0.001	O	|	|	|	|	0.01
83.167	0.00	0.00	0.001	O	|	|	|	|	0.01
83.250	0.00	0.00	0.001	O	|	|	|	|	0.01
83.333	0.00	0.00	0.001	O	|	|	|	|	0.01
83.417	0.00	0.00	0.001	O	|	|	|	|	0.01
83.500	0.00	0.00	0.001	O	|	|	|	|	0.01
83.583	0.00	0.00	0.001	O	|	|	|	|	0.01
83.667	0.00	0.00	0.001	O	|	|	|	|	0.01

83.750	0.00	0.00	0.001	O	|	|	|	|	0.01
83.833	0.00	0.00	0.001	O	|	|	|	|	0.01
83.917	0.00	0.00	0.001	O	|	|	|	|	0.01
84.000	0.00	0.00	0.001	O	|	|	|	|	0.01
84.083	0.00	0.00	0.001	O	|	|	|	|	0.01
84.167	0.00	0.00	0.001	O	|	|	|	|	0.01
84.250	0.00	0.00	0.001	O	|	|	|	|	0.01
84.333	0.00	0.00	0.001	O	|	|	|	|	0.00
84.417	0.00	0.00	0.001	O	|	|	|	|	0.00
84.500	0.00	0.00	0.001	O	|	|	|	|	0.00
84.583	0.00	0.00	0.001	O	|	|	|	|	0.00
84.667	0.00	0.00	0.001	O	|	|	|	|	0.00
84.750	0.00	0.00	0.001	O	|	|	|	|	0.00
84.833	0.00	0.00	0.001	O	|	|	|	|	0.00
84.917	0.00	0.00	0.001	O	|	|	|	|	0.00
85.000	0.00	0.00	0.001	O	|	|	|	|	0.00
85.083	0.00	0.00	0.001	O	|	|	|	|	0.00
85.167	0.00	0.00	0.001	O	|	|	|	|	0.00
85.250	0.00	0.00	0.001	O	|	|	|	|	0.00
85.333	0.00	0.00	0.001	O	|	|	|	|	0.00
85.417	0.00	0.00	0.001	O	|	|	|	|	0.00
85.500	0.00	0.00	0.001	O	|	|	|	|	0.00
85.583	0.00	0.00	0.001	O	|	|	|	|	0.00
85.667	0.00	0.00	0.001	O	|	|	|	|	0.00
85.750	0.00	0.00	0.001	O	|	|	|	|	0.00
85.833	0.00	0.00	0.001	O	|	|	|	|	0.00
85.917	0.00	0.00	0.001	O	|	|	|	|	0.00
86.000	0.00	0.00	0.001	O	|	|	|	|	0.00
86.083	0.00	0.00	0.001	O	|	|	|	|	0.00
86.167	0.00	0.00	0.001	O	|	|	|	|	0.00
86.250	0.00	0.00	0.001	O	|	|	|	|	0.00
86.333	0.00	0.00	0.001	O	|	|	|	|	0.00
86.417	0.00	0.00	0.001	O	|	|	|	|	0.00
86.500	0.00	0.00	0.001	O	|	|	|	|	0.00
86.583	0.00	0.00	0.001	O	|	|	|	|	0.00
86.667	0.00	0.00	0.001	O	|	|	|	|	0.00
86.750	0.00	0.00	0.001	O	|	|	|	|	0.00
86.833	0.00	0.00	0.001	O	|	|	|	|	0.00
86.917	0.00	0.00	0.001	O	|	|	|	|	0.00
87.000	0.00	0.00	0.001	O	|	|	|	|	0.00
87.083	0.00	0.00	0.001	O	|	|	|	|	0.00
87.167	0.00	0.00	0.001	O	|	|	|	|	0.00
87.250	0.00	0.00	0.001	O	|	|	|	|	0.00
87.333	0.00	0.00	0.001	O	|	|	|	|	0.00
87.417	0.00	0.00	0.001	O	|	|	|	|	0.00

```
****************************HYDROGRAPH DATA****************************
            Number of intervals =  1049
            Time interval =    5.0 (Min.)
            Maximum/Peak flow rate =        4.000 (CFS)
            Total volume =       2.378 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************
```

Appendix H

Hydrology and Hydrologic Report for Parcel Map 24032

(For Reference)

HYDROLOGY and HYDROLOGIC REPORT
FOR
PARCEL MAP 24032

RIVERSIDE COUNTY, CALIFORNIA

RECEIVED
OCT 22 1990
RIVERSIDE
AND WATER CONSERVATION
SUBDIVISION SECTION

REGISTERED PROFESSIONAL ENGINEER
PAUL S. STEVENS
No. 43008
Exp. 3-31-92
CIVIL
STATE OF CALIFORNIA

PREPARED BY: PAUL S. STEVENS
PROJECT MANAGER

THE KEITH COMPANIES/BUTTERFIELD
565 CHANEY STREET, SUITE "F"
LAKE ELSINORE, CA 92330
(714) 674-1481
DATED: AUGUST 28, 1990

0009-JMF-80021-REPORTS

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	PURPOSE OF HYDROLOGY STUDY	1
III.	DESCRIPTION OF WATERSHED AREA	1
IV.	DESIGN ASSUMPTION	1
V.	METHODOLOGY - RATIONAL METHOD	2

APPENDICES

(A) LOCATION U.S.G.S.

(B) R.C.F.C. & WCD LETTER DATED MARCH 1, 1990

(C) THE KEITH COMPANY LETTER TO R.C.F.C. & WCD DATED FEBRUARY 3, 1989

(D) Q DESIGN FACTOR PER ROBERT J. CULLEN R.C.F.C. & WCD

(E) CITY OF LOS ANGELES STORM INDEX FOR MAGNITUDE FREQUENCY CONVERSION

(F) Q100 & Q10 BASED UPON Q DESIGN FACTOR

(G) STORM DRAIN HYDRAULIC ANALYSIS:
CHANNEL SECTIONS
MAINLINE "F"

(H) STORM DRAIN HYDRAULIC ANALYSIS: LATERALS
LATERAL STORM DRAIN AT STA 8 + 37.42 (NORTH)
LATERAL STORM DRAIN AT STA 8 + 37.42 (SOUTH)
LATERAL STORM DRAIN AT STA 19 + 50.87
LATERAL STORM DRAIN AT STA 20 + 30.00
LATERAL STORM DRAIN AT STA 23 + 69.69
LATERAL STORM DRAIN AT STA 29 + 46.05 (WEST)
LATERAL STORM DRAIN AT STA 29 + 46.05 (EAST)
LATERAL STORM DRAIN AT STA 3 + 18.00 (ORANGE STREET)

(I) INTERIM INLET CAPACITIES
STREET STA 68 + 42.72, BUNDY CANYON ROAD

(J) CATCH BASIN INLET CAPACITIES
STA 10 + 76.50, ORANGE STREET
STA 13 + 50.00, ORANGE STREET
STA 7 + 92.00 & 8 + 13.00, SELLERS STREET

(K) HYDRAULIC CALCULATIONS N.E.C. BUNDY CANYON AND ORANGE STREET, LAKE ELSINORE, CA, PREPARED BY TAIT & ASSOCIATES

(L) ON-SITE Q10 AND Q100 HYDROLOGY

(M) HYDRAULIC CAPACITIES
DRIVEWAY @ STA 11 + 52.27, ORANGE STREET
DRIVEWAY @ STA 14 + 20.00, ORANGE STREET
DRIVEWAY @ STA 16 + 70.00, ORANGE STREET

(N) HYDROLOGY MAP

I. INTRODUCTION

The Sedco M.D.P. line "F" Stage 2 is a drainage study for a portion of the Sedco Basin which encompasses a portion of lots 20, 30 and 31 of Sedco Tract No. 1 as shown by maps on files in Book 10 pages 58 through 75, inclusive, of maps, records of Riverside County, California. This study was prepared in accordance with the Riverside County Flood Control and Water Conservation District.

II. PURPOSE OF HYDROLOGY STUDY

The purpose of this study is to design and construct a storm drain system starting from approximately 850 feet upstream of Interstate 15 along the north side of bundy Canyon Road, connect to the existing 60 inch diameter freeway culvert, connect at the outlet and continue west crossing the site. The system will then continue across Orange Street enter offsite property through a proposed easement and outlet into the Lake Elsinore High School site approximately 660 feet downstream from Orange Street.

III. DESCRIPTION OF THE WATERSHED AREA

The overall drainage area, see appendix A, is approximately 600 ± acres. The type of development within the watershed consists of undeveloped rural, single family residences, and commercial. The Watershed is located Northeast and Southwest of the intersection of the I-15 Freeway and Bundy Canyon Road. The topography slopes and drains naturally to the Southwest through an existing 60" and 72" culvert and enters the Lake Elsinore High School and ultimately drains to Lake Elsinore through the Sedco Basin.

IV. DESIGN ASSUMPTIONS

The design flows draining to Bundy Canyon were determined using Gable, Cook and Becklund 3 hour 100 year unit hydrograph, see appendix C. The design flows of Q100 down stream of the system outlet for line "F" Stage 1 shown on sheet 2 of 7, Tract 23284 were determined by using a factor of 1.74 cfs/acre per Robert J. Cullen, see appendix D. This factor is applied to only areas upstream of existing 60" Caltrans culvert. Areas downstream utilize the RCFC & WCD Rational Method.

The 240 cfs at the system outlet for line "F" Stage 1, considers all tributary flows upstream for both street and storm drain.

Q100 will be carried by both the mainline storm drain and Bundy Canyon Road east of the I-15 freeway. Surface flows are assumed not to cross over the centerline of Bundy Canyon Road. The existing 24" CMP will be sand filled and plugged to prevent any flows to cross under Bundy Canyon Road.

Q10 was determined by applying a percentage factor to the Q100 as given by Robert Cullen. This factor was determined by using the City of Los Angeles storm index for magnitude - frequency conversion (See Appendix E).

The design assumptions of Gable, Cook and Becklunds Tract 23284 are presented below because the design of line "F" which this project is proposing to tie into is based upon the Q's that are generated by the entire watershed draining to Bundy Canyon Road through this Tract.

1. The maximum outflow the entire watershed draining to Bundy Canyon using the 3 hour 100 year unit hydrograph routed thru the retention basin is 239 cfs. The peak outflow from the retention basin is 73 cfs. This means that the outflow from the tracts using the 3 hour unit hydrograph is 166 cfs (230-73).

2. The maximum 100 year outflow for the tracts using the rational methods is 220 cfs.

3. The design of Line "F" is based upon 73 cfs from the retention basin and a prorated Q picked up at each catch basin. This pro-ration is the onsite flow by unit hydrograph divided by onsite flow by rational method 166/220 = 0.75.

4. The catch basins and connector pipes are designed for the Q's that reach the catch basin based on the rational method.

V. METHODOLOGY - RATIONAL METHOD

RATIONAL METHOD:

The conversion of rural land to urban land changes a watershed's response to precipitation and increases the volume of storm runoff associated with it. This, of course, is the result of the increase in impervious area caused by the construction of roads, sidewalks, parking driveways and buildings. The effect of development is reduced infiltration and increased travel time, which significantly increases peak discharges for a storm event within the watershed. A Stormwater Management Plan employs the commonly used and accepted method known as the "Rational Method" as the basis for its design. The values for peak runoff "Q" were obtained by solving the Rational Formula, which is Q = CIA where:

Q= The peak runoff (cfs) from a given area

C= The runoff coefficient representing the ratio of runoff to rainfall

I= The <u>average</u> rainfall intensity (in./hr.), lasting for a critical period of time, Tc.

A= Drainage area, acres.

The rationale for the method lies in the concept whereby application of a steady and uniform rainfall intensity will cause runoff to reach its maximum rate when all parts of the drainage area are contributing to the outflow at the point of discharge. The condition is met after the elapsed time, Tc (the time of concentration) which usually is taken as the time for water to flow from the most remote part of the drainage area to the point of discharge or outlet.

<u>TIME OF CONCENTRATION</u>

TC: The Time of Concentration for the drainage area is the sum of overland flow time, the flow time in paved areas, the flow time in earthen channels and/or storm drain pipes.

<u>INTENSITY:</u>

I: The rainfall intensity was derived from the Intensity-Duration curve for Riverside County, California, where duration is equal to the time of concentration.

<u>AREA</u>

A: The individual drainage areas contributing to the system.

<u>COEFFICIENTS</u>

C: Specific runoff coefficients were used based on the development density within the drainage areas using RCFC & WCD Development Standards.

The study terms of reference required the system be designed for a 100-year frequency storm and Mannings Equation was used to determine the pipe size required. The equations used are:

$$Q = \frac{1.486}{n} AR^{2/3} S^{1/2}$$

$$V = \frac{1.484}{n} R^{2/3} S^{1/2}$$

Where: n = Coefficient of Roughness (0.03) - Earthen Channel

n = Coefficient of Roughness (0.013) - Concrete Pipe

A = Area of Pipe (square ft.)

R = Hydraulic Radius

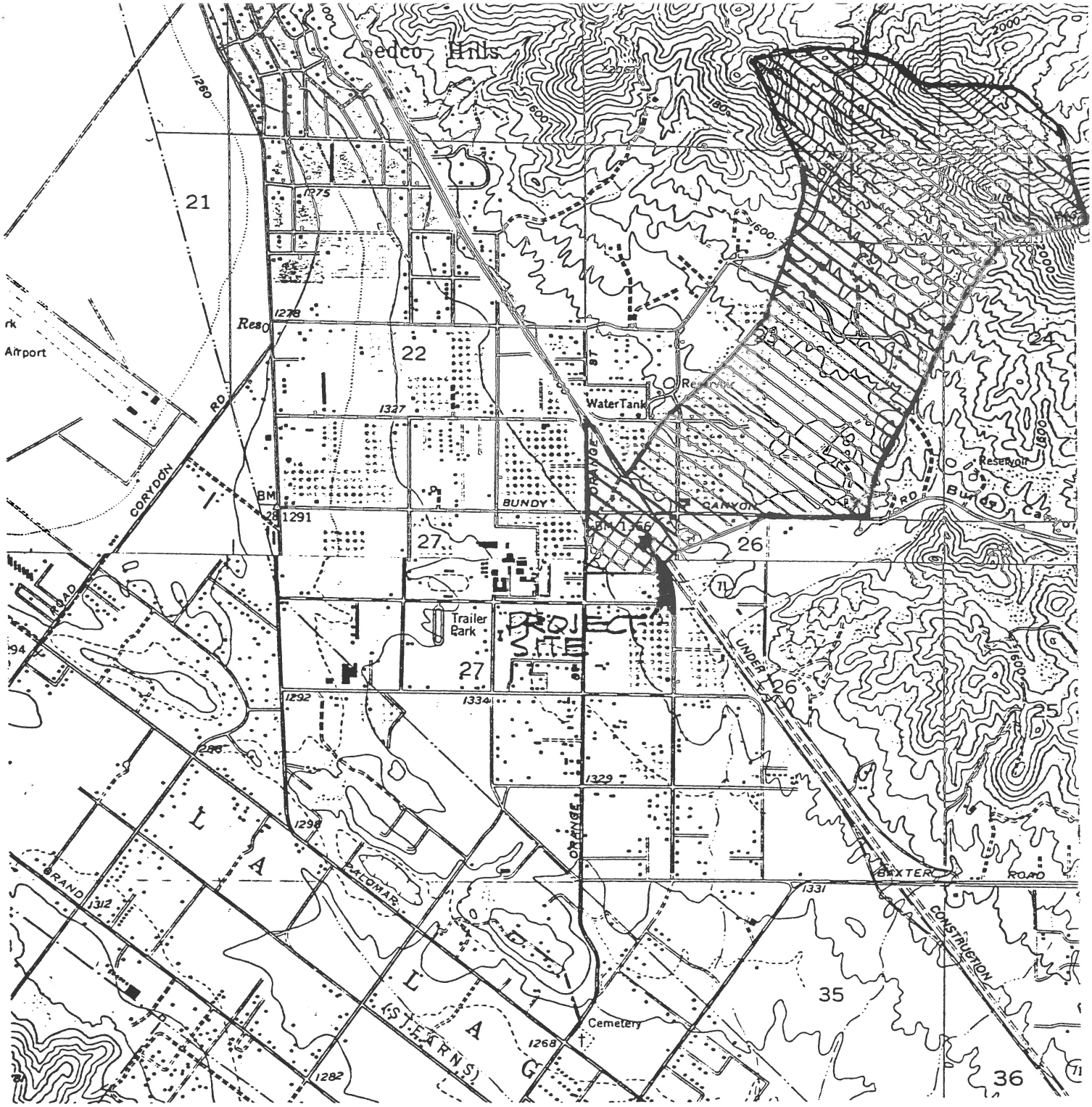
S = Slope (ft./sec.)

V = Velocity (ft./sec.)

Q = Discharge Flow rate (cubic feet per sec.)

APPENDIX A

LOCATION U.S.G.S.


Sedco Hills
21
22
24
26
27
25
35
36
Airport
Res
WaterTank
Reservoir
BUNDY
CANYON
ORANGE
CORYDON
RD
ROAD
Trailer Park
PROJECT SITE
UNDER
CONSTRUCTION
BAXTER
ROAD
BRAND
PALOMAR
(ST. TERNS)
LAGUNA
Cemetery
BM 1291
BM 1266
1275
1278
1327
1292
1334
1329
1298
1312
1331
1268
1282
1260
1600
1800
2000

U.S.G.S MAP

APPENDIX B

R.C.F.C. & W. C. D. LETTER DATED MARCH 1, 1989

NETH L. EDWARDS
CHIEF ENGINEER

1995 MARKET STREET
P. O. BOX 1033
TELEPHONE (714) 787-2015

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RIVERSIDE, CALIFORNIA 92502

March 1, 1989

Riverside County
Planning Department
County Administrative Center
Riverside, California

Attention: Regional Team No. 4

Ladies and Gentlemen:

Re: Conditional Use Permit 3009
Amended No. 2
Revised Report

This is a proposal to construct a mini-storage facility in the Sedco area, on the northeast corner of Canyon Drive and Orange Street.

The site is subject to storm runoff with an estimated 100 year flow rate of about 240 cfs from the freeway culverts to the northeast. These flows are discharged from Tracts now under construction about 850 feet upstream of Interstate 15 along the north side of Bundy Canyon Road. Because of the poorly defined drainage patterns, the 240 cfs may reach this site through 72-inch diameter freeway culvert to the northeast or may flow across the development (Plot Plan 10459) to the north via another 60-inch diameter freeway culvert further northeast. In order not to construct redundant drainage facilities, the applicant proposes to construct a storm drain system starting from about 850 feet upstream of Interstate 15 along the north side of Bundy Canyon Road, connected to the 60-inch diameter freeway culvert, and crossing the property to the north as shown on Exhibit "F" to pick up these flows. A 6 foot high blockwall has been proposed along the project's eastern boundary. This wall will block the local tributary flows from the east. Provision should be made to accept the offsite tributary flows into the site.

Following are the District's recommendations:

1. The offsite drainage facilities as shown on the Exhibit "F" should be designed to effectively collect and convey the 100 year flows which are tributary to this property at the north side of Bundy Canyon Road. Adequate inlet structures and catch basins should be provided to positively collect all the tributary flows at this point. Building permits should not be issued until the commencement of the construction of the above drainage facilities. If the above facilities can not be designed to hydraulically function properly, additional facilities will be required to carry the extra flows to an adequate outlet.

2. Provision should be made to accept the local offsite tributary flows from the east into this property.

3. Onsite drainage facilities located outside of road right of way should be contained within drainage easements. Drainage easements shall be kept free of buildings and obstructions.

4. Offsite drainage facilities should be located within publicly dedicated drainage easements obtained from the affected property owners. The documents should be recorded and a copy submitted to the District prior to the issuance of permits.

5. Drainage facilities outletting sump conditions should be designed to convey the tributary 100 year storm flows. Additional emergency escape should also be provided.

6. The property's street and lot grading should be designed in a manner that perpetuates the existing natural drainage patterns with respect to tributary drainage area, outlet points and outlet conditions, otherwise, a drainage easement should be obtained from the affected property owners for the release of concentrated or diverted storm flows. A copy of the recorded drainage easement should be submitted to the District for review prior to the issuance of permits.

7. Development of this property should be coordinated with the development of adjacent properties to ensure that watercourses remain unobstructed and stormwaters are not diverted from one watershed to another. This may require the construction of temporary drainage facilities or offsite construction and grading.

8. Evidence of a viable maintenance mechanism should be submitted to the District and County for review and approval prior to issuance of permits.

9. A copy of the improvement plans and grading plans along with supporting hydrologic and hydraulic calculations should be submitted to the District for review and approval prior to the issuance of grading or building permits.

Questions concerning this matter may be referred to Robert Chiang of this office at 714/787-2333.

Very truly yours,

KENNETH L. EDWARDS
Chief Engineer

JOHN H. KASHUBA
Senior Civil Engineer

cc: Butterfield Engineering
& Surveying

RC:bab

APPENDIX C

THE KEITH CO. LETTER TO RCFC & WCD

DATED FEBRUARY 3, 1989

BUTTERFIELD ENGINEERING & SURVEYING
A Division of The Keith Companies
Planning • Civil Engineering • Environmental Services • Architecture • Landscape Architecture • Land Surveying

Job No 8002
Corresp. Contract
Survey Design
Initials

February 3, 1989

Riverside County Flood Control
and Water Conservation District
P. O. Box 1033
Riverside, CA 92502-1033

Att.: Robert J. Cullen
Ref.: Storm Drain Improvement Plan, proposed by Butterfield Engineering and Surveys, for offsite Bundy Canyon Road, onsite plot plan 10459, and offsite Parcel Map 10211.

Dear Robert:

This letter is to recapitulate what transpired in our meeting, Wednesday, January 25, 1989.

1. In the design of the mainline storm drain improvements for the above referenced project, Butterfield Engineering and Surveys is to utilize the yield factor of 1.74 C.F.S./Acre generated by Riverside County Flood Control and Water Conservation District (see attached sheet).

2. In the design of the inlet structures and laterals, both on and offsite, the rational method will be applied.

3. All surface flows that are not included in the proposed improvements by Butterfield Engineering and Surveys that tie into Line "F", stage 1, of Sedco M.D.P., will be considered downstream either at the existing 60" or the 72" culverts that outlet onto Plot Plan 10459 and Conditional Use Permit 3009 respectively.

If you have any questions or comments regarding this project, please call me at (714) 674-1481.

Very truly yours,

Paul S. Stevens

Paul S. Stevens,
BUTTERFIELD Engineering and Surveys, The Keith Companies

PSS:nt
Encl.:
87 2165

APPENDIX D

Q - DESIGN FACTOR PER ROBERT J. CULLEN

R.C.F.C. & W.C.D.

$$166 \text{ CFS} / .149 \text{ sq mi} \times 640 = 1.74 \text{ CFS/ACRE}$$

- PER SEDCO BASIN + GCB TRACT MAPS

- 166 CFS FROM HYDROGRAPH IN SEDCO BASIN BACK-UP IN PLANNING HYDROLOGY FILES ZONE-3.

BC 1-25-88

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

ROBERT J. CULLEN
ASSISTANT CIVIL ENGINEER

TELEPHONE:
(714) 787-2886

1995 MARKET STREET
P.O. BOX 1033
RIVERSIDE, CALIFORNIA 92502-1033

APPENDIX E

CITY OF LOS ANGELES STORM DRAIN INDEX

CITY OF LOS ANGELES STORM INDEX
FOR MAGNITUDE - FREQUENCY CONVERSIONS

FREQUENCY	PERCENT
1 YEAR	42.8
5	65.9
10	76.2
25	89.8
50	100.0
100	110.8

GIVEN STORM	1	5	10	25	50	100
1	1	1.54	1.780	2.098	2.336	2.612
5	.649	1	1.156	1.368	1.517	1.697
10	.562	.865	1	1.178	1.312	1.407
25	.477	.734	.849	1	1.114	1.245
50	.428	.659	.762	.898	1	1.118
100	.383	.589	.682	.803	.894	1

CORPS OF ENGINEERS STANDARD PROJECT STORM: ASSUME IT TO BE EQUAL TO A 100-YEAR FREQUENCY STORM. USING THE CITY OF LOS ANGELES STORM INDEX CONVERT TO THE DESIRED FREQUENCY.

APPENDIX F

Q100 & Q10 BASED UPON Q DESIGN FACTOR

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. 1 of 2 Sheets

PROJECT BUNDY CANYON SHOPPING CENTER

Calculated by FERMIN 1/30/90 DATE

FREQUENCY Q100

Checked by ---------- DATE

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
A-1		6.7			11.7								1.74 CFS/ACRE TO BE APPLIED TO ALL TRIBUTARY AREAS SEE APPENDIX 'D'
A-2		7.4			12.9								
B-2		10.1			17.6								
C-1		1.95			3.4								
D-1		1.4			2.4								
E-1		1.6			2.8								
F-1		1.0			1.7								
F-2		0.4			0.7								
F-3		0.9			1.6								
F-4		0.60			1.0								
F-5		0.80			1.4								
G		8.1			26.4								SEE APPENDIX L
H		3.7			12.1								
J		19.7			50.6								SEE APPENDIX K TRIBUTARY Q @ SITE NORTHEAST OF THE BUNDY CANYON & ORANGE ST

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. 2 of 2 Sheets

PROJECT BUNDY CANYON SHOPPING CENTER

Calculated by FERMIN 1/30/89 DATE

FREQUENCY Q10

Checked by ---------- DATE

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	v FPS	L FT.	T MIN.	ΣT	REMARKS
A-1		6.7			8.0								Q10 IS DETERMINED
A-2		7.4			8.8								FROM THE CITY
B-2		10.1			12.0								OF LOS ANGELES
C-1		1.95			2.3								STORM INDEX FOR
D-1		1.4			1.7								MAGNITUDE
E-1		1.6			1.9								
F1		1.0			1.2								
F-2		0.4			0.5								
F-3		0.9			1.1								
F-4		0.60			0.7								
F5		0.80			1.0								
G		8.1			16.1								SEE APPENDIX L
H		3.7			7.9								
J		19.7			33.0								

APPENDIX G

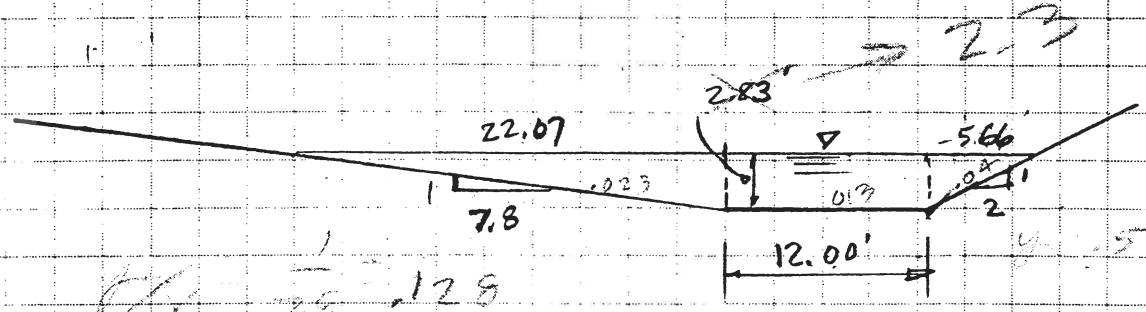
STORM DRAIN HYDRAULIC ANALYSIS

CHANNEL SECTION AT STA 0 + 30.00
CHANNEL SECTION AT STA 0 + 80.00
LINE "F", STA 1 + 21.09 TO 35 + 73.27

BUTTERFIELD ENGINEERING & SURVEYING
565 Chaney Street, Suite F, Lake Elsinore, CA 92330

JOB NO: _____
DATE _____
CALCULATED BY _____
SHEET _____ OF _____

CHANNEL CAPACITY @ STA. 0+43.00



DEPTH = 2.85'
n = 0.030
GRADE = 0.005

$$\text{AREA} = \left(\frac{22.07 \times 2.83}{2}\right) + \left(12.00 \times 2.83\right) + \left(\frac{2.83 \times 5.66}{2}\right)$$

$$= 73.20 \text{ SQ. FT.}$$

$$P = \sqrt{(22.07)^2 + (2.83)^2} + 12.00 + \sqrt{2.83^2 + 5.66^2}$$

$$= 40.58 \text{ FT}$$

$$R = 73.20 / 40.58 = 1.80$$

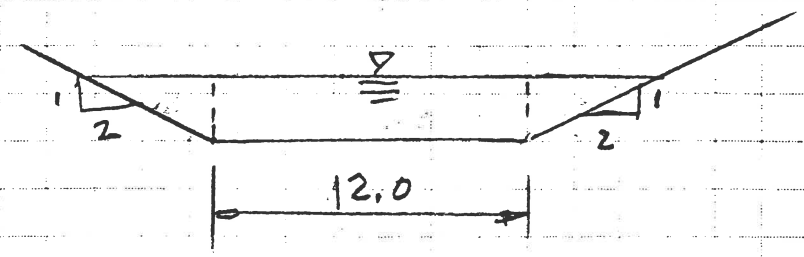
$$V = \frac{1.486}{0.030} \times (1.80)^{2/3} \times (0.005)^{1/2} = 5.29$$

$$Q = 73.20 \times 5.29 = 386 \text{ CFS}$$

BUTTERFIELD ENGINEERING & SURVEYING
• Planning • Civil Engineering • Architecture • Landscape Architecture • Land Surveying • Construction Management
565 Chaney Street, Suite F, Lake Elsinore, CA 92330

JOB NO: _____
DATE _____
CALCULATED BY _____
SHEET _____ OF _____

CHANNEL CAPACITY @ STA 0+70.00



DEPTH = 3.32'
n = ~~0.030~~ .04
GRADE = 0.005

$$\text{AREA} = \left(\left(\frac{3.32 \times 6.64}{2}\right) \times 2\right) \left(12.00 \times 3.32\right)$$

$= 61.88$ SQ. FT

$$P = \sqrt{(3.32)^2 + (6.64)^2} + 12.00 + \sqrt{(3.32)^2 + (6.64)^2}$$

$= 26.85$ FT

$R = 61.88 / 26.85 = 2.31$

$$V = \frac{1.486}{0.030} \times (2.31)^{2/3} \times (.0052)^{1/2} = 6.23 \text{ FPS}$$

$Q = 63.26 \times 6.11 = 386$ CFS

STORM DRAIN ANALYSIS PLUS

Original version by Los Angeles County Public Works
Portions Copyrighted by CIVILSOFT, 1986, 1987, 1989

Version 1.20
Serial Number 07010204

Oct 15, 1990 11: 9: 5

Input file : a:80021f.dat
Output file: a:80021f.out

INPUT FILE LISTING

```
T1 BUNDY CANYON STORM DRAIN - Q=100
T2 ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
T3 FILENAME : 80021F.DAT
SO    121.091335.00 72      .030                1341.00
R     156.431335.14 72      .013                                45.0
R     226.431335.42 72      .013
R     261.771335.56 72      .013                                45.0
R     497.671336.51 72      .013
JX    502.331336.53 72      .013
R     837.421341.22 72      .013
JX    848.981342.40 60 36 36.013    50.60   39.61343.381343.38 30.0  30.0
R     913.621343.87 60      .013                                       5.71
R    1273.581352.08 60      .013                                       5.14
JX   1278.241352.25 60      .013
R    1419.191359.30 60      .013                                44.87
R    1422.051359.44 60      .013
JX   1426.711359.67 60      .013
R    1458.231364.65 60      .013
JX   1466.811366.00 60 24   .014     2.6        1365.44        49.6
R    1481.001366.35 60      .024                                     26.4
JX   1482.0 1366.40 60 18   .024     0.7        1367.8         80.0
JX   1559.0 1368.40 60 18   .024     1.7        1373.4         90.0
R    1600.001369.46 60      .024
R    1948.491378.52 60      .024
JX   1957.651379.23 54 60 30.014    27.00    2.81378.561380.30 54.38 45.0
JX   2030.001383.17 54 18   .013     3.4        1384.90        45.0
R    2127.671388.48 54      .013
JX   2132.331388.76 54      .013
R    2282.551394.05 54      .013
R    2314.021395.16 54      .013                                19.77
R    2369.691397.12 54      .013
JX   2379.851397.48 54 30   .013    43.6        1398.12        30.0
R    2870.751410.24 54      .013
JX   2875.411410.57 54      .013
R    2946.061411.70 54      .013                                89.95
JX   2956.721412.31 48 36 36.013    28.0    28.01412.451412.45 30.00 30.00
R    3019.271412.99 48      .013
R    3271.941415.74 48      .013
JX   3276.611415.77 48      .013
R    3559.271421.90 48      .013
JX   3573.271423.20 36 24   .013    62.2        1423.93        17.27
SH                  36
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	5	0	.00															
CD	4	5	0	.00															
CD	18	4			1.50														
CD	21	4			1.75														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	72	4			6.00														

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(99) ,Y(99)
PTS	1	4	.00 5.00	20.00 .00	25.00 .00	35.00 5.00			
PTS	4	4	.00 6.00	9.00 .00	15.00 .00	24.00 6.00			

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	121.09	1335.00	72	1341.00

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	156.43	1335.14	72	.013	.00	45.00	.00	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	226.43	1335.42	72	.013	.00	.00	.00	0

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	261.77	1335.56	72	.013	.00	45.00	.00	0

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	497.67	1336.51	72	.013	.00	.00	.00	0

ELEMENT NO 6 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	502.33	1336.53	72	0	0	.013	.0	.0	.00	.00	.00	.00

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	837.42	1341.22	72	.013	.00	.00	.00	0

ELEMENT NO 8 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	848.98	1342.40	60	36	36	.013	50.6	39.6	1343.38	1343.38	30.00	30.00

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	913.62	1343.87	60	.013	.00	.00	5.71	0

ELEMENT NO 10 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1273.58	1352.08	60	.013	.00	.00	5.14	0

ELEMENT NO 11 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1278.24	1352.25	60	0	0	.013	.0	.0	.00	.00	.00	.00

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 12 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1419.19	1359.30	60	.013	.00	44.87	.00	0

ELEMENT NO 13 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1422.05	1359.44	60	.013	.00	.00	.00	0

ELEMENT NO 14 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	1426.71	1359.67	60	0	0	.013	.0	.0	.00	.00	.00	.00

ELEMENT NO 15 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1458.23	1364.65	60	.013	.00	.00	.00	0

ELEMENT NO 16 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	1466.81	1366.00	60	24	0	.014	2.6	.0	1365.44	.00	49.60	.00

ELEMENT NO 17 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1481.00	1366.35	60	.024	.00	.00	26.40	0

ELEMENT NO 18 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	1482.00	1366.40	60	18	0	.024	.7	.0	1367.80	.00	80.00	.00

ELEMENT NO 19 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	1559.00	1368.40	60	18	0	.024	1.7	.0	1373.40	.00	90.00	.00

ELEMENT NO 20 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1600.00	1369.46	60	.024	.00	.00	.00	0

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 21 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1948.49	1378.52	60	.024	.00	.00	.00	0

ELEMENT NO 22 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	1957.65	1379.23	54	60	30	.014	27.0	2.8	1378.56	1380.30	54.38	45.00

ELEMENT NO 23 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	2030.00	1383.17	54	18	0	.013	3.4	.0	1384.90	.00	45.00	.00

ELEMENT NO 24 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2127.67	1388.48	54	.013	.00	.00	.00	0

ELEMENT NO 25 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	2132.33	1388.76	54	0	0	.013	.0	.0	.00	.00	.00	.00

ELEMENT NO 26 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2282.55	1394.05	54	.013	.00	.00	.00	0

ELEMENT NO 27 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2314.02	1395.16	54	.013	.00	19.77	.00	0

ELEMENT NO 28 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2369.69	1397.12	54	.013	.00	.00	.00	0

ELEMENT NO 29 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	2379.85	1397.48	54	30	0	.013	43.6	.0	1398.12	.00	30.00	.00

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 30 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2870.75	1410.24	54	.013	.00	.00	.00	0

ELEMENT NO 31 IS A JUNCTION * * * * * * *

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	2875.41	1410.57	54	0	0	.013	.0	.0	.00	.00	.00	.00

ELEMENT NO 32 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	2946.06	1411.70	54	.013	.00	89.95	.00	0

ELEMENT NO 33 IS A JUNCTION * * * * * * *

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	2956.72	1412.31	48	36	36	.013	28.0	28.0	1412.45	1412.45	30.00	30.00

ELEMENT NO 34 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	3019.27	1412.99	48	.013	.00	.00	.00	0

ELEMENT NO 35 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	3271.94	1415.74	48	.013	.00	.00	.00	0

ELEMENT NO 36 IS A JUNCTION * * * * * * *

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	3276.61	1415.77	48	0	0	.013	.0	.0	.00	.00	.00	.00

ELEMENT NO 37 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	3559.27	1421.90	48	.013	.00	.00	.00	0

ELEMENT NO 38 IS A JUNCTION * * * * * * *

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA	3573.27	1423.20	36	24	0	.013	62.2	.0	1423.93	.00	17.27	.00

ELEMENT NO 39 IS A SYSTEM HEADWORKS * *

	STATION	INVERT	SECT	W S ELEV
U/S DATA	3573.27	1423.20	36	.00

WATER SURFACE PROFILE - ELEMENT CARD LISTING

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
121.09	1335.00	6.00	1341.00	386.0	13.65	2.90	1343.90	.00	5.27		6.00	.00	.00	0	.00
35.34	.00396					.00831	.29			6.00			.00		
156.43	1335.14	6.56	1341.70	386.0	13.65	2.90	1344.60	.00	5.27		6.00	.00	.00	0	.00
70.00	.00400					.00831	.58			6.00			.00		
226.43	1335.42	6.86	1342.28	386.0	13.65	2.90	1345.18	.00	5.27		6.00	.00	.00	0	.00
35.34	.00396					.00831	.29			6.00			.00		
261.77	1335.56	7.43	1342.99	386.0	13.65	2.90	1345.88	.00	5.27		6.00	.00	.00	0	.00
235.90	.00403					.00831	1.96			6.00			.00		
497.67	1336.51	8.44	1344.95	386.0	13.65	2.90	1347.84	.00	5.27		6.00	.00	.00	0	.00
JUNCT STR	.00430					.00831	.04						.00		
502.33	1336.53	8.46	1344.99	386.0	13.65	2.90	1347.88	.00	5.27		6.00	.00	.00	0	.00
300.18	.01400					.00831	2.49			3.95			.00		
802.51	1340.73	6.75	1347.48	386.0	13.65	2.90	1350.38	.00	5.27		6.00	.00	.00	0	.00
HYDRAULIC JUMP													.00		
802.51	1340.73	3.93	1344.66	386.0	19.68	6.02	1350.68	.00	5.27		6.00	.00	.00	0	.00
34.91	.01400					.01424	.50			3.95			.00		
837.42	1341.22	3.93	1345.15	386.0	19.69	6.03	1351.17	.00	5.27		6.00	.00	.00	0	.00
JUNCT STR	.10208					.01982	.23						.00		
848.98	1342.40	3.12	1345.52	295.8	22.96	8.19	1353.71	.00	4.65		5.00	.00	.00	0	.00
64.64	.02274					.02587	1.67			3.24			.00		
913.62	1343.87	3.08	1346.95	295.8	23.29	8.43	1355.38	.00	4.65		5.00	.00	.00	0	.00
9.98	.02281					.02642	.26			3.24			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
923.60	1344.10	3.08	1347.17	295.8	23.35	8.47	1355.64	.00	4.65		5.00	.00	.00	0	.00
134.46	.02281					.02822	3.79			3.24			.00		
1058.06	1347.16	2.96	1350.12	295.8	24.49	9.32	1359.44	.00	4.65		5.00	.00	.00	0	.00
89.96	.02281					.03190	2.87			3.24			.00		
1148.01	1349.22	2.84	1352.06	295.8	25.68	10.25	1362.31	.00	4.65		5.00	.00	.00	0	.00
68.95	.02281					.03611	2.49			3.24			.00		
1216.97	1350.79	2.73	1353.52	295.8	26.93	11.27	1364.80	.00	4.65		5.00	.00	.00	0	.00
56.61	.02281					.04091	2.32			3.24			.00		
1273.58	1352.08	2.63	1354.71	295.8	28.25	12.40	1367.11	.00	4.65		5.00	.00	.00	0	.00
JUNCT STR	.03649					.04356	.20						.00		
1278.24	1352.25	2.63	1354.88	295.8	28.29	12.44	1367.31	.00	4.65		5.00	.00	.00	0	.00
47.25	.05002					.04277	2.02			2.52			.00		
1325.49	1354.61	2.66	1357.27	295.8	27.86	12.06	1369.33	.00	4.65		5.00	.00	.00	0	.00
93.70	.05002					.03943	3.69			2.52			.00		
1419.19	1359.30	2.76	1362.06	295.8	26.56	10.96	1373.03	.00	4.65		5.00	.00	.00	0	.00
.00	.05002					.03697	.00			2.52			.00		
1419.19	1359.30	2.76	1362.06	295.8	26.56	10.96	1373.03	.00	4.65		5.00	.00	.00	0	.00
2.86	.04891					.03689	.11			2.54			.00		
1422.05	1359.44	2.77	1362.21	295.8	26.51	10.92	1373.13	.00	4.65		5.00	.00	.00	0	.00
JUNCT STR	.04938					.03665	.17						.00		
1426.71	1359.67	2.78	1362.45	295.8	26.43	10.85	1373.30	.00	4.65		5.00	.00	.00	0	.00
JUNCT STR	.04938					.03650	.00						.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1426.71	1359.67	2.78	1362.45	295.8	26.43	10.85	1373.30	.00	4.65		5.00	.00	.00	0	.00
3.17	.15799					.03555	.11			1.83			.00		
1429.88	1360.17	2.82	1362.99	295.8	25.90	10.42	1373.41	.00	4.65		5.00	.00	.00	0	.00
6.65	.15799					.03259	.22			1.83			.00		
1436.53	1361.22	2.93	1364.16	295.8	24.69	9.48	1373.63	.00	4.65		5.00	.00	.00	0	.00
5.75	.15799					.02882	.17			1.83			.00		
1442.28	1362.13	3.05	1365.18	295.8	23.54	8.61	1373.80	.00	4.65		5.00	.00	.00	0	.00
4.95	.15799					.02553	.13			1.83			.00		
1447.23	1362.91	3.18	1366.09	295.8	22.45	7.83	1373.92	.00	4.65		5.00	.00	.00	0	.00
4.26	.15799					.02265	.10			1.83			.00		
1451.49	1363.59	3.32	1366.90	295.8	21.40	7.12	1374.02	.00	4.65		5.00	.00	.00	0	.00
3.65	.15799					.02014	.07			1.83			.00		
1455.14	1364.16	3.46	1367.62	295.8	20.41	6.47	1374.09	.00	4.65		5.00	.00	.00	0	.00
3.09	.15799					.01796	.06			1.83			.00		
1458.23	1364.65	3.62	1368.27	295.8	19.46	5.88	1374.15	.00	4.65		5.00	.00	.00	0	.00
JUNCT STR	.15734					.01618	.14						.00		
1466.81	1366.00	4.64	1370.64	293.2	15.42	3.70	1374.34	.00	4.64		5.00	.00	.00	0	.00
8.23	.02466					.04003	.33			5.00			.00		
1475.04	1366.20	5.00	1371.20	293.2	14.93	3.47	1374.67	.00	4.64		5.00	.00	.00	0	.00
5.96	.02466					.04294	.26			5.00			.00		
1481.00	1366.35	5.11	1371.46	293.2	14.93	3.47	1374.93	.00	4.64		5.00	.00	.00	0	.00
JUNCT STR	.05005					.04309	.04						.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION / L/ELEM	INVERT ELEV / SO	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD / SF AVE	ENERGY GRD.EL. / HF	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL / ZR	NO PIER	AVBPR
1482.00	1366.40	5.14	1371.54	292.5	14.90	3.45	1374.99	.00	4.64		5.00	.00	.00	0	.00
JUNCT STR	.02597					.04274	3.29						.00		
1559.00	1368.40	6.51	1374.91	290.8	14.81	3.41	1378.32	.00	4.63		5.00	.00	.00	0	.00
41.00	.02585					.04249	1.74			5.00			.00		
1600.00	1369.46	7.19	1376.65	290.8	14.81	3.41	1380.06	.00	4.63		5.00	.00	.00	0	.00
348.49	.02600					.04249	14.81			5.00			.00		
1948.49	1378.52	12.94	1391.46	290.8	14.81	3.41	1394.87	.00	4.63		5.00	.00	.00	0	.00
JUNCT STR	.07751					.01744	.16						.00		
1957.65	1379.23	12.39	1391.62	261.0	16.41	4.19	1395.80	.00	4.31		4.50	.00	.00	0	.00
JUNCT STR	.05446					.01739	1.26						.00		
2030.00	1383.17	9.91	1393.08	257.6	16.20	4.08	1397.16	.00	4.30		4.50	.00	.00	0	.00
73.33	.05437					.01716	1.26			2.41			.00		
2103.33	1387.16	7.19	1394.34	257.6	16.20	4.08	1398.42	.00	4.30		4.50	.00	.00	0	.00
HYDRAULIC JUMP													.00		
2103.33	1387.16	2.84	1389.99	257.6	24.38	9.24	1399.23	.00	4.30		4.50	.00	.00	0	.00
24.34	.05437					.03134	.76			2.41			.00		
2127.67	1388.48	2.93	1391.41	257.6	23.52	8.60	1400.01	.00	4.30		4.50	.00	.00	0	.00
JUNCT STR	.06009					.02957	.14						.00		
2132.33	1388.76	2.95	1391.71	257.6	23.29	8.43	1400.14	.00	4.30		4.50	.00	.00	0	.00
JUNCT STR	.06009					.02921	.00						.00		
2132.33	1388.76	2.95	1391.71	257.6	23.29	8.43	1400.14	.00	4.30		4.50	.00	.00	0	.00
33.98	.03522					.02863	.97			2.77			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2166.31	1389.96	2.99	1392.95	257.6	22.91	8.16	1401.11	.00	4.30		4.50	.00	.00	0	.00
70.19	.03522					.02651	1.86			2.77			.00		
2236.50	1392.43	3.13	1395.55	257.6	21.85	7.42	1402.97	.00	4.30		4.50	.00	.00	0	.00
46.05	.03522					.02365	1.09			2.77			.00		
2282.55	1394.05	3.27	1397.32	257.6	20.83	6.74	1404.06	.00	4.30		4.50	.00	.00	0	.00
31.47	.03527					.02121	.67			2.77			.00		
2314.02	1395.16	3.41	1398.57	257.6	19.90	6.15	1404.73	.00	4.30		4.50	.00	.00	0	.00
.00	.03527					.02011	.00			2.77			.00		
2314.02	1395.16	3.41	1398.57	257.6	19.90	6.15	1404.73	.00	4.30		4.50	.00	.00	0	.00
3.96	.03521					.01996	.08			2.77			.00		
2317.97	1395.30	3.44	1398.74	257.6	19.77	6.07	1404.81	.00	4.30		4.50	.00	.00	0	.00
23.28	.03521					.01884	.44			2.77			.00		
2341.26	1396.12	3.61	1399.73	257.6	18.85	5.52	1405.25	.00	4.30		4.50	.00	.00	0	.00
16.94	.03521					.01709	.29			2.77			.00		
2358.20	1396.72	3.80	1400.52	257.6	17.97	5.02	1405.54	.00	4.30		4.50	.00	.00	0	.00
11.49	.03521					.01573	.18			2.77			.00		
2369.69	1397.12	4.03	1401.15	257.6	17.13	4.56	1405.72	.00	4.30		4.50	.00	.00	0	.00
JUNCT STR	.03543					.02032	.21						.00		
2379.85	1397.48	2.73	1400.21	214.0	21.24	7.01	1407.22	.00	4.12		4.50	.00	.00	0	.00
263.67	.02599					.02414	6.36			2.71			.00		
2643.52	1404.33	2.83	1407.16	214.0	20.32	6.42	1413.58	.00	4.12		4.50	.00	.00	0	.00
103.43	.02599					.02150	2.22			2.71			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100

ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27

FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2746.96	1407.02	2.95	1409.97	214.0	19.37	5.83	1415.80	.00	4.12		4.50	.00	.00	0	.00
58.44	.02599					.01911	1.12			2.71			.00		
2805.40	1408.54	3.08	1411.62	214.0	18.47	5.30	1416.92	.00	4.12		4.50	.00	.00	0	.00
38.48	.02599					.01702	.65			2.71			.00		
2843.87	1409.54	3.21	1412.75	214.0	17.61	4.82	1417.58	.00	4.12		4.50	.00	.00	0	.00
26.88	.02599					.01521	.41			2.71			.00		
2870.75	1410.24	3.36	1413.60	214.0	16.79	4.38	1417.98	.00	4.12		4.50	.00	.00	0	.00
JUNCT STR	.07081					.01355	.06						.00		
2875.41	1410.57	3.55	1414.12	214.0	15.89	3.92	1418.05	.00	4.12		4.50	.00	.00	0	.00
JUNCT STR	.07081					.01273	.00						.00		
2875.41	1410.57	3.55	1414.12	214.0	15.89	3.92	1418.05	.00	4.12		4.50	.00	.00	0	.00
31.17	.01599					.01235	.39			3.22			.00		
2906.58	1411.07	3.67	1414.73	214.0	15.43	3.70	1418.43	.00	4.12		4.50	.00	.00	0	.00
29.25	.01599					.01147	.34			3.22			.00		
2935.84	1411.54	3.87	1415.41	214.0	14.71	3.36	1418.77	.00	4.12		4.50	.00	.00	0	.00
10.22	.01599					.01064	.11			3.22			.00		
2946.06	1411.70	4.12	1415.82	214.0	14.02	3.06	1418.88	.00	4.12		4.50	.00	.00	0	.00
JUNCT STR	.05723					.01120	.12						.00		
2956.72	1412.31	5.47	1417.78	158.0	12.57	2.46	1420.23	.00	3.65		4.00	.00	.00	0	.00
62.55	.01087					.01210	.76			3.52			.00		
3019.27	1412.99	5.54	1418.53	158.0	12.57	2.46	1420.99	.00	3.65		4.00	.00	.00	0	.00
252.67	.01088					.01210	3.06			3.52			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
ALONG MAINLINE FROM STA. 1+21.09 - 35+73.27
FILENAME : 80021F.DAT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
3271.94	1415.74	5.85	1421.59	158.0	12.57	2.46	1424.05	.00	3.65		4.00	.00	.00	0	.00
JUNCT STR	.00643					.01210	.06						.00		
3276.61	1415.77	5.88	1421.65	158.0	12.57	2.46	1424.10	.00	3.65		4.00	.00	.00	0	.00
109.01	.02169					.01210	1.32			2.58			.00		
3385.62	1418.13	4.83	1422.97	158.0	12.57	2.46	1425.42	.00	3.65		4.00	.00	.00	0	.00
HYDRAULIC JUMP													.00		
3385.62	1418.13	2.68	1420.81	158.0	17.68	4.86	1425.67	.00	3.65		4.00	.00	.00	0	.00
43.22	.02169					.01924	.83			2.58			.00		
3428.84	1419.07	2.70	1421.77	158.0	17.49	4.76	1426.53	.00	3.65		4.00	.00	.00	0	.00
83.71	.02169					.01796	1.50			2.58			.00		
3512.56	1420.89	2.82	1423.71	158.0	16.68	4.32	1428.03	.00	3.65		4.00	.00	.00	0	.00
46.71	.02169					.01603	.75			2.58			.00		
3559.27	1421.90	2.95	1424.85	158.0	15.90	3.93	1428.78	.00	3.65		4.00	.00	.00	0	.00
JUNCT STR	.09285					.01655	.23						.00		
3573.27	1423.20	2.88	1426.08	95.8	13.74	2.94	1429.01	.00	2.88		3.00	.00	.00	0	.00

APPENDIX H

STORM DRAIN HYDRAULIC ANALYSIS

LATERAL STORM DRAIN AT STA 8 + 37.42 (NORTH)

LATERAL STORM DRAIN AT STA 8 + 37.42 (SOUTH)

LATERAL STORM DRAIN AT STA 19 + 50.87

LATERAL STORM DRAIN AT STA 20 + 30.00

LATERAL STORM DRAIN AT STA 23 + 69.69

LATERAL STORM DRAIN AT STA 29 + 46.05 (WEST)

LATERAL STORM DRAIN AT STA 29 + 46.05 (EAST)

LATERAL STORM DRAIN AT STA 3 + 18.00 (ORANGE STREET)

TORM DRAIN ANALYSIS PLUS

Original version by Los Angeles County Public Works
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Version 1.20
erial Number 07010204

Sep 5, 1990 15: 7:23

nput file : A:80021F1.DAT
Output file: A:80021F1.OUT

INPUT FILE LISTING

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T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL F1  @ STA 8+37.42 (NORTH)
 3 **  FILENAME-80021F1.DAT **
SO      5.501343.38 36                        1345.52
9      11.581343.68 36      .013
       50.761345.58 36      .013                            49.89
      296.621357.47 36      .013
JX    302.121359.32  1      .013
      337.431361.03  1      .013                            90.09
      402.251361.29  1      .013
SH                   1
```

SP

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	36	4			3.00														
CD	1	3	0	.00	1.50	5.00	.00	.00	.00										

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                5.50 1343.38   36                                  1345.52

ELEMENT NO   2 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                RADIUS  ANGLE  ANG PT  MAN H
                               11.58 1343.68   36              .013                  .00    .00     .00      0

ELEMENT NO   3 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                RADIUS  ANGLE  ANG PT  MAN H
                               50.76 1345.58   36              .013                  .00  49.89     .00      0

ELEMENT NO   4 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                RADIUS  ANGLE  ANG PT  MAN H
                              296.62 1357.47   36              .013                  .00    .00     .00      0

ELEMENT NO   5 IS A JUNCTION          *         *     *     *                *                *              *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                              302.12 1359.32    1     0     0  .013      .0       .0      .00      .00    .00     .00

ELEMENT NO   6 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                RADIUS  ANGLE  ANG PT  MAN H
                              337.43 1361.03    1              .013                  .00  90.09     .00      0

ELEMENT NO   7 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                RADIUS  ANGLE  ANG PT  MAN H
                              402.25 1361.29    1              .013                  .00    .00     .00      0

ELEMENT NO   8 IS A SYSTEM HEADWORKS                *                     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                              402.25 1361.29    1                                     .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL F1 @ STA 8+37.42 (NORTH)
** FILENAME-80021F1.DAT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
5.50	1343.38	1.22	1344.60	50.6	18.79	5.48	1350.08	.00	2.32		3.00	.00	.00	0	.00
6.08	.04935					.04798	.29			1.21			.00		
11.58	1343.68	1.22	1344.90	50.6	18.79	5.48	1350.38	.00	2.32		3.00	.00	.00	0	.00
.00	.04935					.04798	.00			1.21			.00		
11.58	1343.68	1.22	1344.90	50.6	18.79	5.48	1350.38	.00	2.32		3.00	.00	.00	0	.00
39.18	.04849					.04783	1.87			1.21			.00		
50.76	1345.58	1.22	1346.80	50.6	18.74	5.46	1352.26	.00	2.32		3.00	.00	.00	0	.00
.00	.04849					.04767	.00			1.21			.00		
50.76	1345.58	1.22	1346.80	50.6	18.74	5.46	1352.26	.00	2.32		3.00	.00	.00	0	.00
88.08	.04836					.04674	4.12			1.21			.00		
138.84	1349.84	1.23	1351.07	50.6	18.47	5.30	1356.37	.00	2.32		3.00	.00	.00	0	.00
81.64	.04836					.04301	3.51			1.21			.00		
220.48	1353.79	1.28	1355.07	50.6	17.61	4.82	1359.89	.00	2.32		3.00	.00	.00	0	.00
36.89	.04836					.03778	1.39			1.21			.00		
257.36	1355.57	1.33	1356.90	50.6	16.79	4.38	1361.28	.00	2.32		3.00	.00	.00	0	.00
23.06	.04836					.03321	.77			1.21			.00		
280.42	1356.69	1.38	1358.06	50.6	16.01	3.98	1362.04	.00	2.32		3.00	.00	.00	0	.00
16.20	.04836					.02920	.47			1.21			.00		
296.62	1357.47	1.43	1358.90	50.6	15.26	3.62	1362.52	.00	2.32		3.00	.00	.00	0	.00
JUNCT STR	.33636					.02610	.14						.00		
302.12	1359.32	.79	1360.11	50.6	12.82	2.55	1362.66	.00	1.47		1.50	5.00	.00	0	.00
JUNCT STR	.33636					.02487	.00						.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL F1 @ STA 8+37.42 (NORTH)
** FILENAME-80021F1.DAT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
302.12	1359.32	.79	1360.11	50.6	12.82	2.55	1362.66	.00	1.47		1.50	5.00	.00	0	.00
.47	.04843					.02478	.01			.63			.00		
302.59	1359.34	.79	1360.13	50.6	12.79	2.54	1362.68	.00	1.47		1.50	5.00	.00	0	.00
7.58	.04843					.02304	.17			.63			.00		
310.18	1359.71	.83	1360.54	50.6	12.20	2.31	1362.85	.00	1.47		1.50	5.00	.00	0	.00
5.96	.04843					.01997	.12			.63			.00		
316.14	1360.00	.87	1360.87	50.6	11.63	2.10	1362.97	.00	1.47		1.50	5.00	.00	0	.00
4.78	.04843					.01732	.08			.63			.00		
320.91	1360.23	.91	1361.14	50.6	11.09	1.91	1363.05	.00	1.47		1.50	5.00	.00	0	.00
3.87	.04843					.01503	.06			.63			.00		
324.78	1360.42	.96	1361.37	50.6	10.57	1.74	1363.11	.00	1.47		1.50	5.00	.00	0	.00
3.14	.04843					.01305	.04			.63			.00		
327.92	1360.57	1.00	1361.57	50.6	10.08	1.58	1363.15	.00	1.47		1.50	5.00	.00	0	.00
2.55	.04843					.01134	.03			.63			.00		
330.47	1360.69	1.05	1361.75	50.6	9.61	1.44	1363.18	.00	1.47		1.50	5.00	.00	0	.00
2.05	.04843					.00986	.02			.63			.00		
332.52	1360.79	1.10	1361.90	50.6	9.16	1.30	1363.20	.00	1.47		1.50	5.00	.00	0	.00
1.62	.04843					.00857	.01			.63			.00		
334.14	1360.87	1.16	1362.03	50.6	8.74	1.19	1363.22	.00	1.47		1.50	5.00	.00	0	.00
1.25	.04843					.00746	.01			.63			.00		
335.39	1360.93	1.21	1362.15	50.6	8.33	1.08	1363.22	.00	1.47		1.50	5.00	.00	0	.00
.92	.04843					.00650	.01			.63			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL F1 @ STA 8+37.42 (NORTH)
** FILENAME-80021F1.DAT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
336.32	1360.98	1.27	1362.25	50.6	7.94	.98	1363.23	.00	1.47		1.50	5.00	.00	0	.00
.63	.04843					.00567	.00			.63			.00		
336.95	1361.01	1.34	1362.34	50.6	7.57	.89	1363.23	.00	1.47		1.50	5.00	.00	0	.00
.36	.04843					.00494	.00			.63			.00		
337.31	1361.02	1.40	1362.43	50.6	7.22	.81	1363.24	.00	1.47		1.50	5.00	.00	0	.00
.12	.04843					.00431	.00			.63			.00		
337.43	1361.03	1.47	1362.50	50.6	6.88	.74	1363.24	.00	1.47		1.50	5.00	.00	0	.00
.00	.00401					.00401	.00			1.47			.00		
337.43	1361.03	1.47	1362.50	50.6	6.88	.74	1363.24	.00	1.47		1.50	5.00	.00	0	.00
64.82	.00401					.00401	.26			1.47			.00		
402.25	1361.29	1.47	1362.76	50.6	6.88	.74	1363.50	.00	1.47		1.50	5.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Sep 5, 1990 15: 8:34

Input file : A:80021F2.DAT
Output file: A:80021F2.OUT

INPUT FILE LISTING

```
T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL @ STA 8+37.42 (SOUTH)
T3 **  FILENAME - 80021F2.OUT ***
SO      5.501343.38 36                          1345.52
R      33.401343.47 36      .013
R      80.971343.62 36      .013                              60.57
R     316.921344.38 36      .013
JX    325.081345.74 21 24   .013    27.5         1344.88       30.0
R     582.841346.56 21      .013
R     617.211346.67 21      .013                              43.76
NE                  1
SH                  1
```

SP

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	3	0	.00	3.94	14.00	.00	.00	.00										
CD	21	4			1.75														
CD	24	4			2.00														
CD	36	4			3.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
E  MENT NO   1 IS A SYSTEM OUTLET     *        *    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                5.50 1343.38   36                                 1345.52

:  MENT NO   2 IS A REACH            *        *    *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                               33.40 1343.47   36            .013                           .00    .00     .00     0

ELEMENT NO   3 IS A REACH            *        *    *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                               80.97 1343.62   36            .013                           .00  60.57     .00     0

ELEMENT NO   4 IS A REACH            *        *    *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                              316.92 1344.38   36            .013                           .00    .00     .00     0

EMENT NO   5 IS A JUNCTION           *        *    *    *              *                *              *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2  N      Q3      Q4   INVERT-3 INVERT-4  PHI 3   PHI 4
                              325.08 1345.74   21    24     0  .013    27.5      .0  1344.88     .00  30.00     .00

 EMENT NO   6 IS A REACH            *        *    *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                              582.84 1346.56   21            .013                           .00    .00     .00     0

 EMENT NO   7 IS A REACH            *        *    *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                              617.21 1346.67   21            .013                           .00  43.76     .00     0

ELEMENT NO   8 IS A  WALL  ENTRANCE                 *
                U/S DATA   STATION    INVERT  SECT           FP
                              617.21 1346.67    1            .500

ELEMENT NO   9 IS A SYSTEM HEADWORKS                *                    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                              617.21 1346.67    1                                     .00
0 EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

: WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL @ STA 8+37.42 (SOUTH)
** FILENAME - 80021F2.OUT ***

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
5.50	1343.38	2.14	1345.52	39.6	7.34	.84	1346.36	.00	2.05		3.00	.00	.00	0	.00
16.71	.00323					.00454	.08			2.60			.00		
22.21	1343.43	2.24	1345.67	39.6	7.00	.76	1346.43	.00	2.05		3.00	.00	.00	0	.00
11.19	.00323					.00421	.05			2.60			.00		
33.40	1343.47	2.27	1345.74	39.6	6.89	.74	1346.48	.00	2.05		3.00	.00	.00	0	.00
47.57	.00315					.00396	.19			2.65			.00		
80.97	1343.62	2.37	1345.99	39.6	6.61	.68	1346.67	.00	2.05		3.00	.00	.00	0	.00
161.60	.00322					.00361	.58			2.60			.00		
242.57	1344.14	2.50	1346.64	39.6	6.30	.62	1347.25	.00	2.05		3.00	.00	.00	0	.00
70.74	.00322					.00341	.24			2.60			.00		
313.31	1344.37	2.52	1346.89	39.6	6.25	.61	1347.49	.00	2.05		3.00	.00	.00	0	.00
HYDRAULIC JUMP													.00		
313.31	1344.37	1.65	1346.02	39.6	9.96	1.54	1347.56	.00	2.05		3.00	.00	.00	0	.00
3.61	.00322					.01046	.04			2.60			.00		
316.92	1344.38	1.63	1346.01	39.6	10.06	1.57	1347.59	.00	2.05		3.00	.00	.00	0	.00
JUNCT STR	.16667					.00891	.07						.00		
325.08	1345.74	1.30	1347.04	12.1	6.33	.62	1347.66	.00	1.30		1.75	.00	.00	0	.00
1.50	.00318					.00685	.01			1.75			.00		
326.58	1345.74	1.36	1347.10	12.1	6.04	.57	1347.67	.00	1.30		1.75	.00	.00	0	.00
5.86	.00318					.00618	.04			1.75			.00		
332.43	1345.76	1.43	1347.19	12.1	5.75	.51	1347.71	.00	1.30		1.75	.00	.00	0	.00
13.60	.00318					.00562	.08			1.75			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL @ STA 8+37.42 (SOUTH)
** FILENAME - 80021F2.OUT ***

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
346.03	1345.81	1.51	1347.31	12.1	5.49	.47	1347.78	.00	1.30		1.75	.00	.00	0	.00
27.69	.00318					.00522	.14			1.75			.00		
373.73	1345.89	1.61	1347.50	12.1	5.23	.43	1347.93	.00	1.30		1.75	.00	.00	0	.00
50.23	.00318					.00539	.27			1.75			.00		
423.95	1346.05	1.75	1347.80	12.1	5.03	.39	1348.20	.00	1.30		1.75	.00	.00	0	.00
158.89	.00318					.00577	.92			1.75			.00		
582.84	1346.56	2.17	1348.73	12.1	5.03	.39	1349.12	.00	1.30		1.75	.00	.00	0	.00
.00	.00318					.00583	.00			1.75			.00		
582.84	1346.56	2.17	1348.73	12.1	5.03	.39	1349.12	.00	1.30		1.75	.00	.00	0	.00
34.37	.00320					.00583	.20			1.75			.00		
617.21	1346.67	2.32	1348.99	12.1	5.03	.39	1349.38	.00	1.30		1.75	.00	.00	0	.00
WALL ENTRANCE													.00		
617.21	1346.67	3.10	1349.77	12.1	.28	.00	1349.77	.00	.28		3.94	14.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Sep 5, 1990 15:10:42

Input file : A:80021F3.DAT
Output file: A:80021F3.OUT

INPUT FILE LISTING

```
T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL STORM DRAIN @ STA. 19+50.87
T3 FILENAME    ** 80021F3.DAT **
SO      0.001378.56 60                          1391.62
JX      1.001378.61 60 24   .024     2.40       1378.56        45.0
R     155.201387.06 60      .024
WE                  1
SH                  1
```

SP

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	2	0	.00	6.50	6.50			.00										
CD	24	4			2.00														
CD	60	4			5.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                .00 1378.56   60                                  1391.62

ELEMENT NO   2 IS A JUNCTION          *         *     *     *                 *                 *              *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3      Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               1.00 1378.61   60    24     0  .024     2.4      .0  1378.56     .00  45.00     .00

ELEMENT NO   3 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                                RADIUS  ANGLE  ANG PT  MAN H
                             155.20 1387.06   60             .024                                   .00    .00     .00     0

ELEMENT NO   4 IS A  WALL  ENTRANCE                 *
                U/S DATA   STATION    INVERT  SECT             FP
                             155.20 1387.06    1             .500

ELEMENT NO   5 IS A SYSTEM HEADWORKS                *                     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                             155.20 1387.06    1                                       .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL STORM DRAIN @ STA. 19+50.87
FILENAME ** 80021F3.DAT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
.00	1378.56	13.06	1391.62	27.0	1.38	.03	1391.65	.00	1.44		5.00	.00	.00	0	.00
JUNCT STR	.04993					.00034	.00						.00		
1.00	1378.61	13.02	1391.63	24.6	1.25	.02	1391.65	.00	1.37		5.00	.00	.00	0	.00
147.14	.05480					.00030	.04			.92			.00		
148.14	1386.67	5.00	1391.67	24.6	1.25	.02	1391.70	.00	1.37		5.00	.00	.00	0	.00
7.06	.05480					.00028	.00			.92			.00		
155.20	1387.06	4.61	1391.67	24.6	1.30	.03	1391.70	.00	1.37		5.00	.00	.00	0	.00
WALL ENTRANCE													.00		
155.20	1387.06	4.64	1391.70	24.6	.81	.01	1391.71	.00	.76		6.50	6.50	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Oct 15, 1990 11:21:34

Input file : a:80021f4.dat
Output file: a:80021f4.out

INPUT FILE LISTING

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T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL STORM DRAIN @ STA. 20+30.00
T3 FILENAME    ** 80021F4.DAT **
SO      6.361384.90 18                          1393.08
R      38.361390.50 18      .013
WE                  1
SH                  1
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	2	0	.00	6.00	10.00			.00										
CD	18	4			1.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET      *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                6.36 1384.90   18                                  1393.08

ELEMENT NO   2 IS A REACH              *         *     *
                U/S DATA   STATION    INVERT  SECT            N                          RADIUS  ANGLE  ANG PT  MAN H
                               38.36 1390.50   18            .013                           .00    .00     .00      0

ELEMENT NO   3 IS A  WALL  ENTRANCE                    *
                U/S DATA   STATION    INVERT  SECT           FP
                               38.36 1390.50    1            .500

ELEMENT NO   4 IS A SYSTEM HEADWORKS                   *                    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                               38.36 1390.50    1                                     .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL STORM DRAIN @ STA. 20+30.00
FILENAME ** 80021F4.DAT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
6.36	1384.90	8.18	1393.08	3.4	1.92	.06	1393.14	.00	.70	1.50	.00	.00	0	.00
32.00	.17500					.00105	.03		.28			.00		
38.36	1390.50	2.61	1393.11	3.4	1.92	.06	1393.17	.00	.70	1.50	.00	.00	0	.00
WALL ENTRANCE												.00		
38.36	1390.50	2.73	1393.23	3.4	.12	.00	1393.23	.00	.15	6.00	10.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Oct 15, 1990 11:22:27

Input file : a:80021f5.dat
Output file: a:80021f5.out

INPUT FILE LISTING

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T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL STORM DRAIN @ STA. 23+69.69
T3 ** FILENAME -  80021F5.OUT **
SO      4.501398.12 30      .013                1400.21
R      15.001400.10 30      .013
WE                  54
SH                  54
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	30	4			2.50														
CD	54	4			4.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET      *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                4.50 1398.12   30                                  1400.21

ELEMENT NO   2 IS A REACH              *         *     *
                U/S DATA   STATION    INVERT  SECT            N                   RADIUS  ANGLE  ANG PT  MAN H
                                15.00 1400.10   30            .013                    .00    .00     .00      0

ELEMENT NO   3 IS A  WALL  ENTRANCE                    *
                U/S DATA   STATION    INVERT  SECT            FP
                                15.00 1400.10   54            .500

ELEMENT NO   4 IS A SYSTEM HEADWORKS                   *                    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                15.00 1400.10   54                                     .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL STORM DRAIN @ STA. 23+69.69
** FILENAME - 80021F5.OUT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
4.50	1398.12	1.36	1399.48	43.6	16.03	3.99	1403.47	.00	2.20		2.50	.00	.00	0	.00
1.81	.18857					.03258	.06			.84			.00		
6.31	1398.46	1.40	1399.86	43.6	15.35	3.66	1403.53	.00	2.20		2.50	.00	.00	0	.00
1.73	.18857					.02893	.05			.84			.00		
8.03	1398.79	1.46	1400.25	43.6	14.63	3.33	1403.58	.00	2.20		2.50	.00	.00	0	.00
1.49	.18857					.02559	.04			.84			.00		
9.53	1399.07	1.52	1400.59	43.6	13.95	3.03	1403.61	.00	2.20		2.50	.00	.00	0	.00
1.28	.18857					.02266	.03			.84			.00		
10.81	1399.31	1.58	1400.89	43.6	13.30	2.75	1403.64	.00	2.20		2.50	.00	.00	0	.00
1.09	.18857					.02010	.02			.84			.00		
11.89	1399.51	1.65	1401.16	43.6	12.68	2.50	1403.66	.00	2.20		2.50	.00	.00	0	.00
.92	.18857					.01786	.02			.84			.00		
12.81	1399.69	1.72	1401.41	43.6	12.09	2.27	1403.68	.00	2.20		2.50	.00	.00	0	.00
.75	.18857					.01592	.01			.84			.00		
13.56	1399.83	1.80	1401.63	43.6	11.53	2.07	1403.69	.00	2.20		2.50	.00	.00	0	.00
.60	.18857					.01424	.01			.84			.00		
14.15	1399.94	1.88	1401.82	43.6	10.99	1.88	1403.70	.00	2.20		2.50	.00	.00	0	.00
.45	.18857					.01279	.01			.84			.00		
14.60	1400.03	1.97	1402.00	43.6	10.48	1.71	1403.71	.00	2.20		2.50	.00	.00	0	.00
.29	.18857					.01157	.00			.84			.00		
14.89	1400.08	2.08	1402.16	43.6	10.00	1.55	1403.71	.00	2.20		2.50	.00	.00	0	.00
.11	.18857					.01059	.00			.84			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
LATERAL STORM DRAIN @ STA. 23+69.69
** FILENAME - 80021F5.OUT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
15.00	1400.10	2.20	1402.30	43.6	9.53	1.41	1403.71	.00	2.20	2.50	.00	.00	0	.00
WALL ENTRANCE												.00		
15.00	1400.10	4.14	1404.24	43.6	2.85	.13	1404.37	.00	1.90	4.50	.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Oct 11, 1990 16:17:32

Input file : A:80021F6.DAT
Output file: A:80021F6.OUT

INPUT FILE LISTING

```
T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL STORM DRAIN @ STA. 29+46.05 WEST ( SELLERS ROAD)
T3 ** FILENAME -  80021F6.OUT **
SO      4.501412.45 36      .013                1417.78
R      29.001414.84 36      .013
WE                  1
SH                  1
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	3	0	.00	5.50	28.00	.00	.00	.00										
CD	36	4			3.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                               4.50 1412.45   36                                   1417.78

ELEMENT NO   2 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS  ANGLE  ANG PT  MAN H
                               29.00 1414.84   36              .013                           .00    .00     .00     0

ELEMENT NO   3 IS A  WALL  ENTRANCE                   *
                U/S DATA   STATION    INVERT  SECT             FP
                               29.00 1414.84    1              .500

ELEMENT NO   4 IS A SYSTEM HEADWORKS                  *                    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                               29.00 1414.84    1                                     .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100

LATERAL STORM DRAIN @ STA. 29+46.05 WEST (SELLERS ROAD)

** FILENAME - 80021F6.OUT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
4.50	1412.45	5.33	1417.78	28.0	3.96	.24	1418.02	.00	1.71		3.00	.00	.00	0	.00
24.32	.09755					.00175	.04			.74			.00		
28.82	1414.82	3.00	1417.82	28.0	3.96	.24	1418.07	.00	1.71		3.00	.00	.00	0	.00
.18	.09755					.00169	.00			.74			.00		
29.00	1414.84	2.98	1417.82	28.0	3.96	.24	1418.07	.00	1.71		3.00	.00	.00	0	.00
WALL ENTRANCE													.00		
29.00	1414.84	3.47	1418.31	28.0	.29	.00	1418.31	.00	.31		5.50	28.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

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Version 1.20
Serial Number 07010204

Oct 11, 1990 16:19:57

Input file : A:80021F7.DAT
Output file: A:80021F7.OUT

INPUT FILE LISTING

```
T1 BUNDY CANYON STORM DRAIN - Q=100
T2 LATERAL STORM DRAIN @ STA. 29+46.05 EAST ( SELLERS ROAD )
T3 FILENAME    ** 80021F7.OUT **
SO      4.501412.45 36      .013                1417.78
R      53.001415.42 36      .013
WE                  1
SH                  1
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	3	0	.00	5.50	28.00	.00	.00	.00										
CD	30	4			2.50														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET      *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                              4.50 1412.45   36                                   1417.78

ELEMENT NO   2 IS A REACH              *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS  ANGLE  ANG PT  MAN H
                              53.00 1415.42   36              .013                            .00    .00     .00     0

ELEMENT NO   3 IS A  WALL  ENTRANCE                    *
                U/S DATA   STATION    INVERT  SECT             FP
                              53.00 1415.42    1              .500

ELEMENT NO   4 IS A SYSTEM HEADWORKS                   *                    *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                              53.00 1415.42    1                                      .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100

LATERAL STORM DRAIN @ STA. 29+46.05 EAST (SELLERS ROAD)

FILENAME ** B0021F7.OUT **

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
4.50	1412.45	5.33	1417.78	28.0	3.96	.24	1418.02	.00	1.71		3.00	.00	.00	0	.00
39.18	.06124					.00175	.07			.83			.00		
43.68	1414.85	3.00	1417.85	28.0	3.96	.24	1418.09	.00	1.71		3.00	.00	.00	0	.00
4.25	.06124					.00164	.01			.83			.00		
47.93	1415.11	2.72	1417.83	28.0	4.15	.27	1418.10	.00	1.71		3.00	.00	.00	0	.00
2.25	.06124					.00160	.00			.83			.00		
50.18	1415.25	2.56	1417.81	28.0	4.36	.30	1418.10	.00	1.71		3.00	.00	.00	0	.00
1.74	.06124					.00173	.00			.83			.00		
51.92	1415.35	2.43	1417.78	28.0	4.57	.32	1418.11	.00	1.71		3.00	.00	.00	0	.00
1.08	.06124					.00187	.00			.83			.00		
53.00	1415.42	2.34	1417.76	28.0	4.73	.35	1418.11	.00	1.71		3.00	.00	.00	0	.00
WALL ENTRANCE													.00		
53.00	1415.42	2.96	1418.38	28.0	.34	.00	1418.38	.00	.31		5.50	28.00	.00	0	.00

STORM DRAIN ANALYSIS PLUS

Original version by Los Angeles County Public Works
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Version 1.20
Serial Number 07010204

Sep 5, 1990 15: 9:46

Input file : A:80021F2A.DAT
Output file: A:80021F2A.OUT

INPUT FILE LISTING

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T1 BUNDY CANYON STORM DRAIN - Q=100
T2 SUB-LATERAL @ STA 3+18.00 (ORANGE STREET)
T3 **  FN - 80021F2A.OUT ***
SO      2.601344.88 24      .013                1347.04
R      25.001347.36 24      .013
WE                   1
SH                   1
```

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	3	0	.00	4.00	21.00	.00	.00	.00										
CD	24	4			2.00														

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                2.60 1344.88   24                                  1347.04

ELEMENT NO   2 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS  ANGLE  ANG PT  MAN H
                               25.00 1347.36   24             .013                            .00    .00     .00     0

ELEMENT NO   3 IS A  WALL  ENTRANCE                 *
                U/S DATA   STATION    INVERT  SECT             FP
                               25.00 1347.36    1             .500

ELEMENT NO   4 IS A SYSTEM HEADWORKS                *                     *
                U/S DATA   STATION    INVERT  SECT                                W S ELEV
                               25.00 1347.36    1                                     .00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC
```

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100

SUB-LATERAL @ STA 3+18.00 (ORANGE STREET)

** FN - 80021F2A.OUT ***

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
2.60	1344.88	1.09	1345.97	27.5	15.72	3.84	1349.81	.00	1.82	2.00	.00	.00	0	.00
2.60	1344.88	1.09	1345.97	27.5	15.72	3.84	1349.81	.00	1.82	2.00	.00	.00	0	.00
1.43	.11071					.04361	.06		.83			.00		
4.03	1345.04	1.10	1346.14	27.5	15.49	3.73	1349.87	.00	1.82	2.00	.00	.00	0	.00
4.20	.11071					.04028	.17		.83			.00		
8.23	1345.50	1.15	1346.65	27.5	14.77	3.39	1350.04	.00	1.82	2.00	.00	.00	0	.00
3.48	.11071					.03559	.12		.83			.00		
11.71	1345.89	1.19	1347.08	27.5	14.08	3.08	1350.16	.00	1.82	2.00	.00	.00	0	.00
2.93	.11071					.03150	.09		.83			.00		
14.64	1346.21	1.24	1347.45	27.5	13.43	2.80	1350.26	.00	1.82	2.00	.00	.00	0	.00
2.45	.11071					.02791	.07		.83			.00		
17.09	1346.48	1.29	1347.78	27.5	12.80	2.55	1350.32	.00	1.82	2.00	.00	.00	0	.00
2.04	.11071					.02478	.05		.83			.00		
19.13	1346.71	1.35	1348.06	27.5	12.21	2.32	1350.37	.00	1.82	2.00	.00	.00	0	.00
1.71	.11071					.02206	.04		.83			.00		
20.84	1346.90	1.41	1348.31	27.5	11.64	2.11	1350.41	.00	1.82	2.00	.00	.00	0	.00
1.40	.11071					.01969	.03		.83			.00		
22.24	1347.05	1.47	1348.53	27.5	11.10	1.91	1350.44	.00	1.82	2.00	.00	.00	0	.00
1.12	.11071					.01764	.02		.83			.00		
23.36	1347.18	1.54	1348.72	27.5	10.58	1.74	1350.46	.00	1.82	2.00	.00	.00	0	.00
.85	.11071					.01590	.01		.83			.00		

WATER SURFACE PROFILE LISTING

BUNDY CANYON STORM DRAIN - Q=100
SUB-LATERAL @ STA 3+18.00 (ORANGE STREET)
** FN - 80021F2A.OUT ***

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
24.21	1347.27	1.62	1348.89	27.5	10.09	1.58	1350.47	.00	1.82	2.00	.00	.00	0	.00
.57	.11071					.01445	.01		.83			.00		
24.78	1347.34	1.71	1349.04	27.5	9.62	1.44	1350.48	.00	1.82	2.00	.00	.00	0	.00
.22	.11071					.01336	.00		.83			.00		
25.00	1347.36	1.82	1349.18	27.5	9.17	1.31	1350.48	.00	1.82	2.00	.00	.00	0	.00
WALL ENTRANCE												.00		
25.00	1347.36	3.78	1351.14	27.5	.35	.00	1351.14	.00	.38	4.00	21.00	.00	0	.00

APPENDIX I

INTERIM INLET CAPACITIES

STREET STA 68 + 42.72, BUNDY CANYON ROAD

INLET CAPACITY @ BUNDY CANYON ST. STA 68+42.72 (INLET TYPE X)

Using 54"Ø Grate with 1/2" Bars @ 2" Clear Space

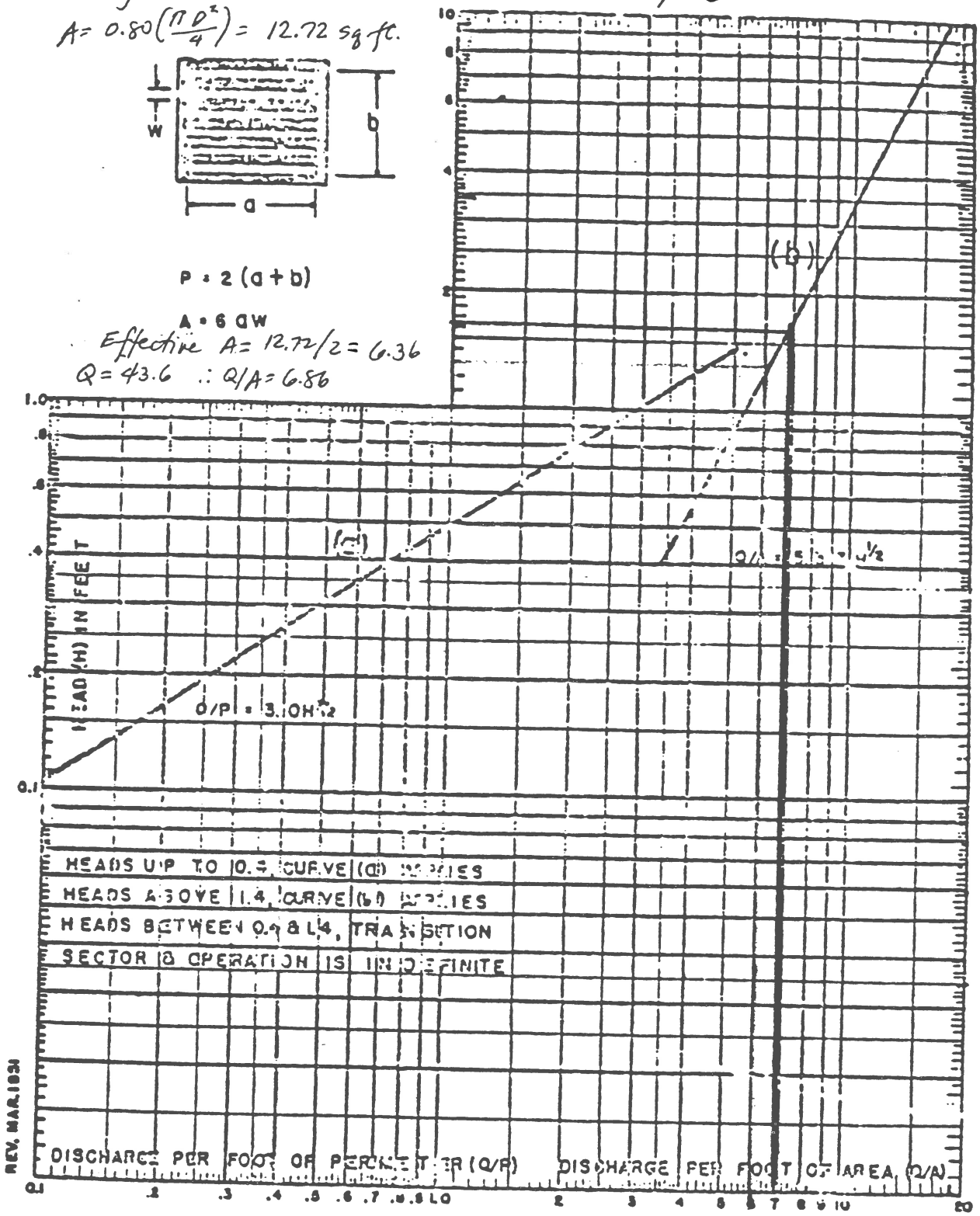
$A = 0.80\left(\frac{\pi D^2}{4}\right) = 12.72$ sq ft.

$P = 2(a + b)$

$A = 6\,aW$

Effective $A = 12.72/2 = 6.36$

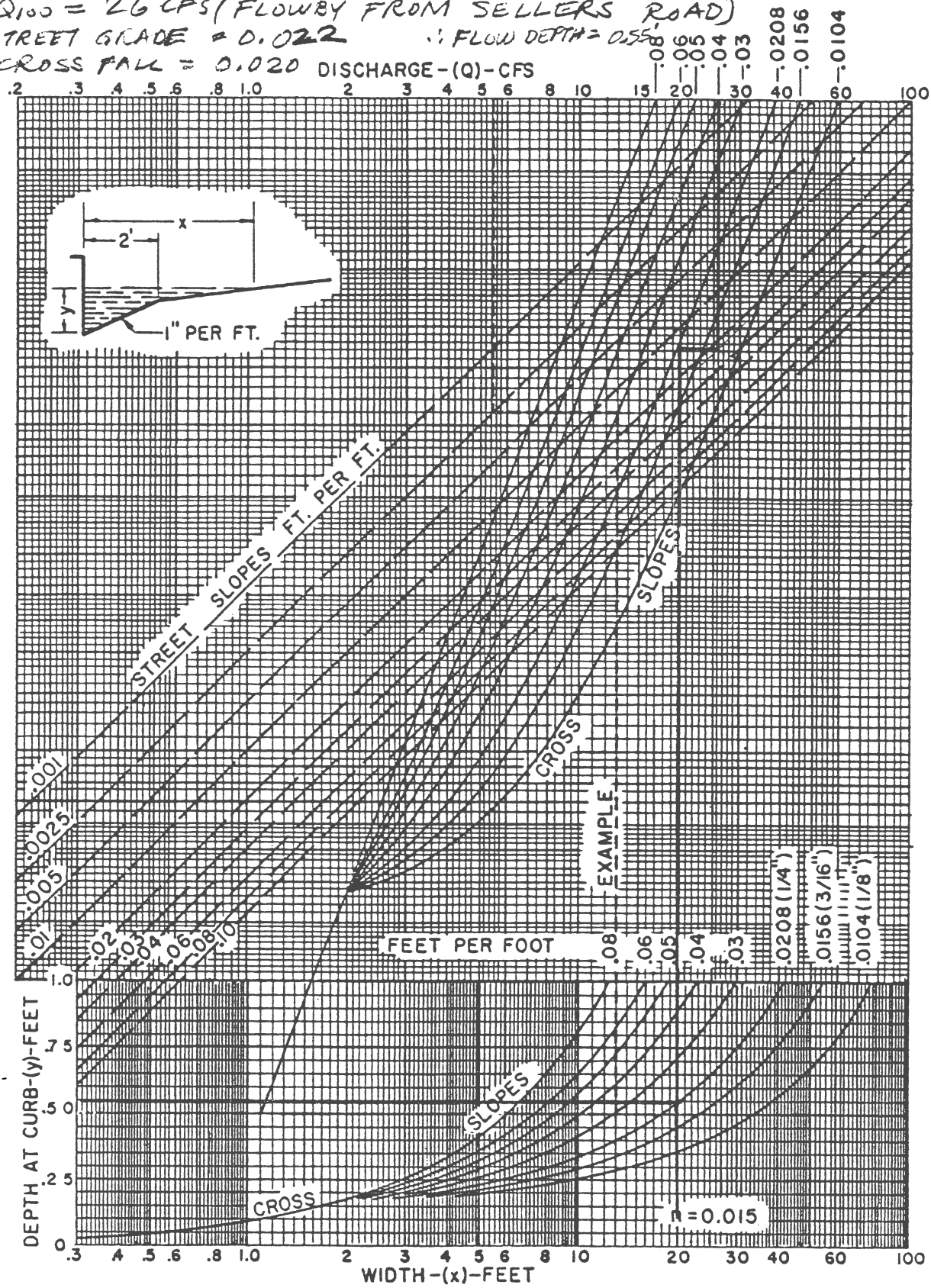
$Q = 43.6 \therefore Q/A = 6.86$



INLET CAPACITY OF GRATE AT SAG

Plate 2.6-0658

STEET CAPACITY @ BUNDY CANYON ROAD
Q_{100} = 26 CFS (FLOWBY FROM SELLERS ROAD)
STREET GRADE = 0.022 ∴ FLOW DEPTH = 0.55'
CROSS FALL = 0.020



FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

Plate 2.6-0681

CAPACITY @ CONCRETE SWALE @ BUNDY CANYON

Created Revised
28-Aug-90 28-Aug-90 07:04

MANNING'S EQUATION Rec/Trap/Tria

ıits (ft)	= FEET		Area (sq ft)	=	3.49
ɜpth (ft)	= <1.32>	<---	Velocity (ft/s)	=	12.48
ɔischarge (cfs)	= <43.6>		Froude Number	=	2.71
ınning's n	= <.013>		Critical Depth (ft)	=	1.97
ʿlope(decimal)	= <.024>		Normal Depth (ft)	=	1.32
ɔttom Width(ft)	= <0>		Hydraulic Radius (ft)	=	0.59
			Depth to Centroid(ft)	=	0.44
ɔide Slope	= <2>		Top Width (ft)	=	5.29
			Specific Force	=	18.45

APPENDIX J

CATCH BASIN INLET CAPACITIES

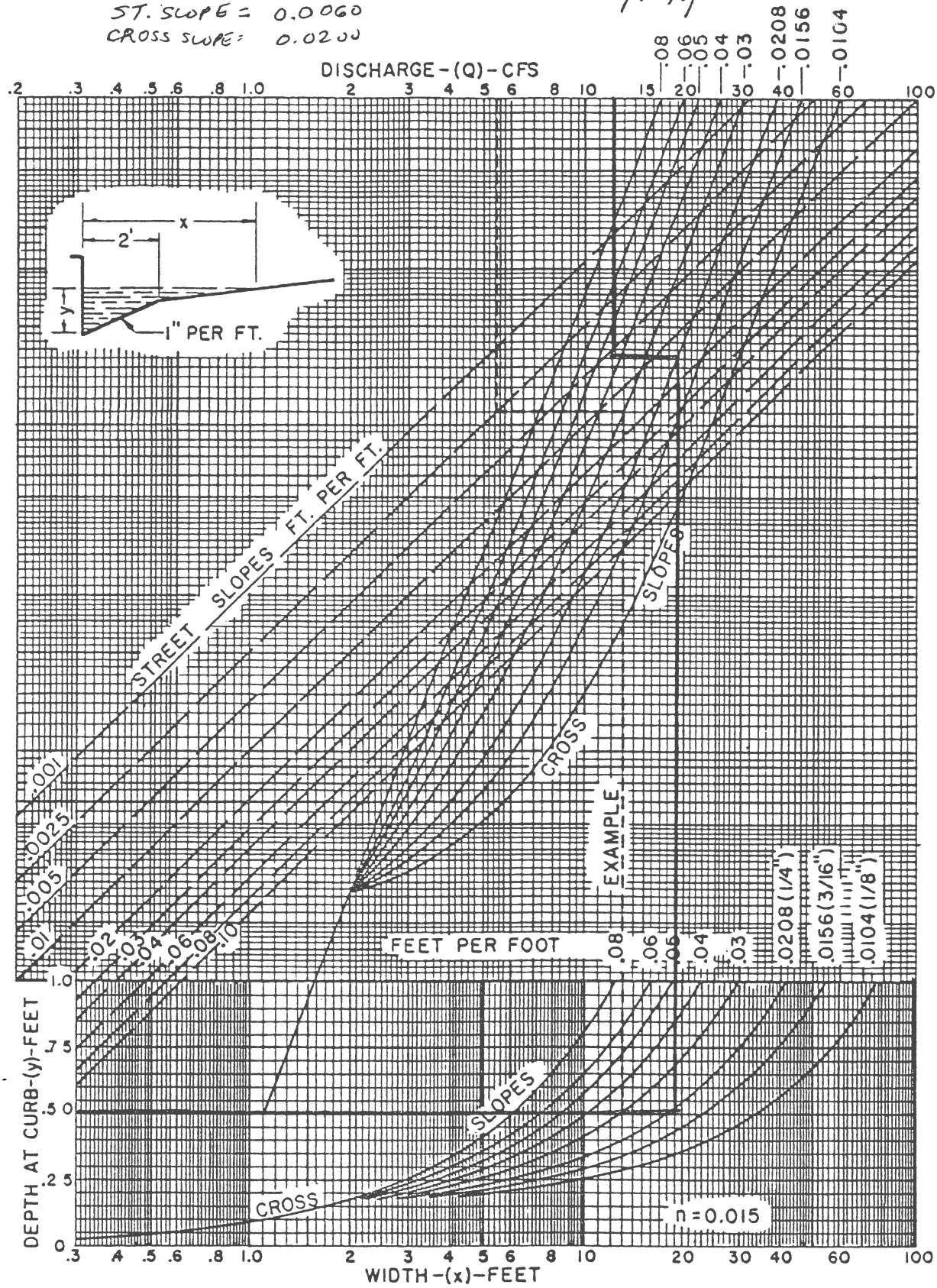
STA 10 + 76.50, ORANGE STREET

STA 13 + 50.00, ORANGE STREET

STA 7 + 92.00 & 8 + 13.00, SELLERS STREET

Given: Q_{100} = 12.1 CFS
ST. SLOPE = 0.0060
CROSS SLOPE = 0.0200

Unknown: Depth, y = 0.50' = 6"

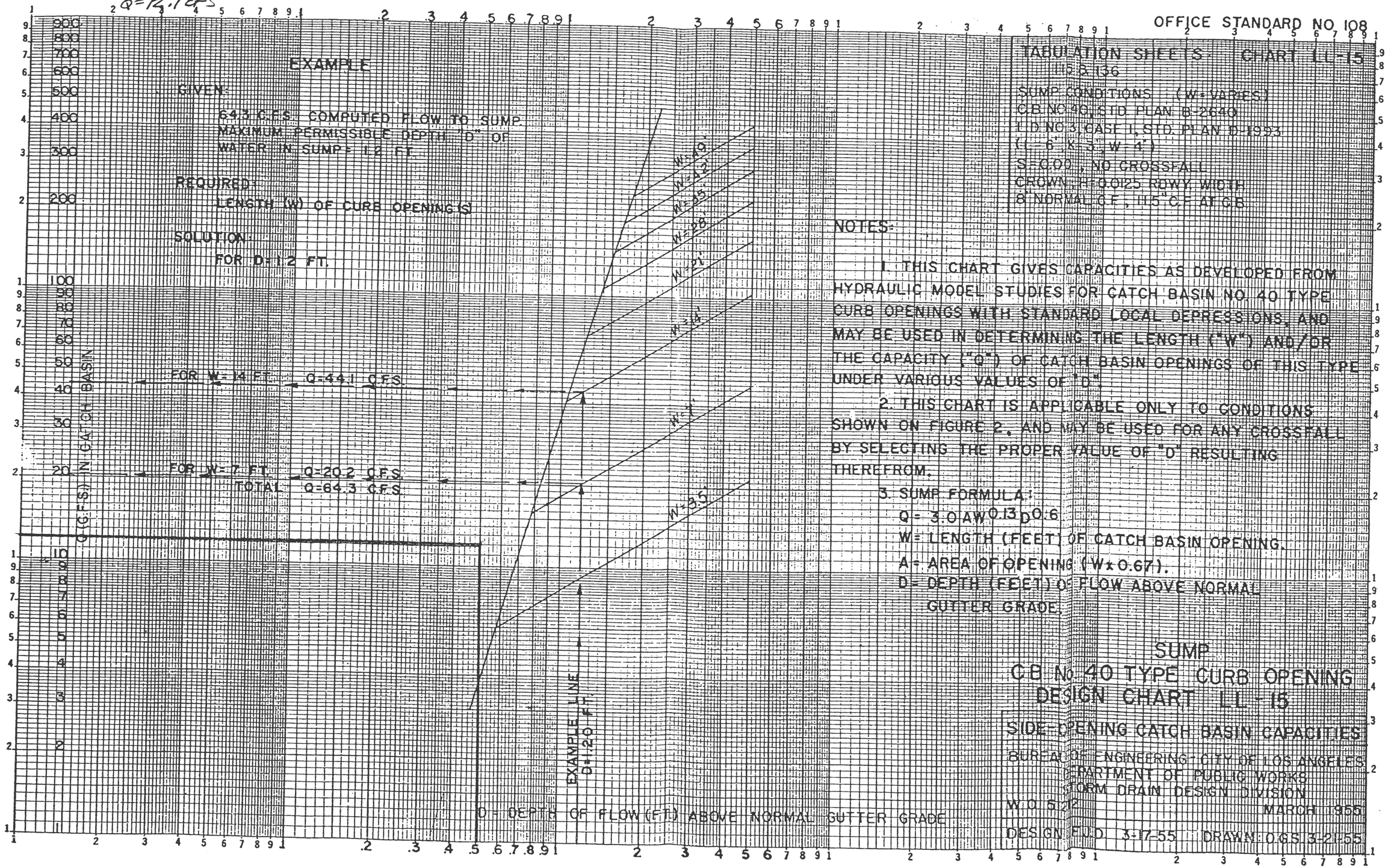


FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

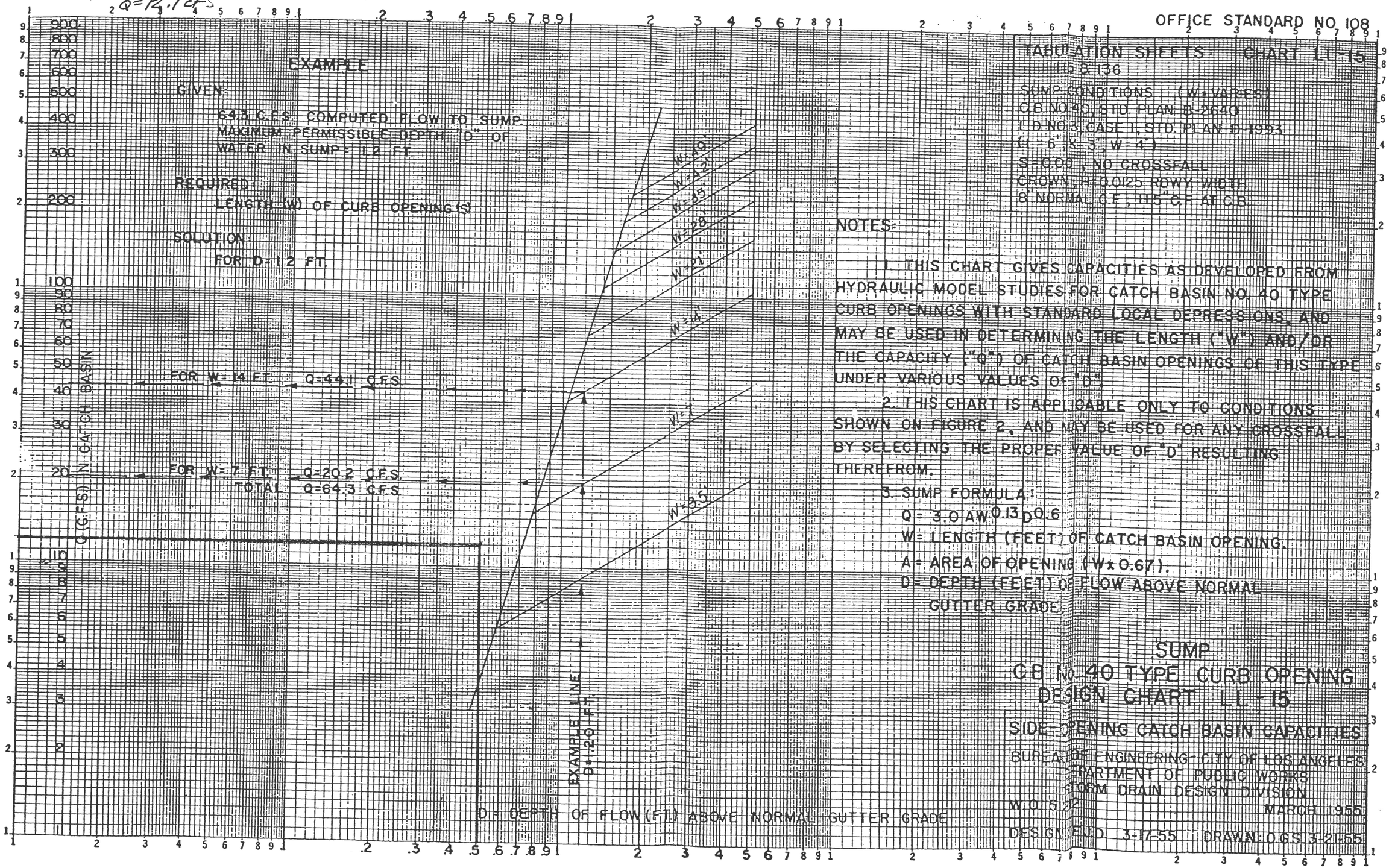
Plate 2.6-0681

CURB INLET CAPACITY
ORANGE STREET STA. 10+76.50
SUMP CONDITION
FLOW DEPTH = 0.50' USE W=14'
Q=12.1 CFS



CURB INLET CAPACITY
ORANGE STREET STA. 10+76.50
SUMP CONDITION
FLOW DEPTH = 0.50' USE W=14'
Q=12.1 CFS

OFFICE STANDARD NO. 108



EXAMPLE

GIVEN:

64.3 C.F.S. COMPUTED FLOW TO SUMP.
MAXIMUM PERMISSIBLE DEPTH "D" OF WATER IN SUMP = 1.2 FT.

REQUIRED:

LENGTH (W) OF CURB OPENING (S)

SOLUTION:

FOR D=1.2 FT.

FOR W=14 FT. Q=44.1 C.F.S.
FOR W=7 FT. Q=20.2 C.F.S.
TOTAL Q=64.3 C.F.S.

TABULATION SHEETS CHART LL-15
116 & 136

SUMP CONDITIONS (W=VARIES)
C.B. NO. 40, STD. PLAN B-2640
I.D. NO. 3, CASE I, STD. PLAN B-1993
(L=6' X 3', W=4')
S=0.00, NO CROSSFALL
CROWN, H=0.0125 ROWY WIDTH
8" NORMAL G.F., 11.5" G.F. AT C.B.

NOTES:

1. THIS CHART GIVES CAPACITIES AS DEVELOPED FROM HYDRAULIC MODEL STUDIES FOR CATCH BASIN NO. 40 TYPE CURB OPENINGS WITH STANDARD LOCAL DEPRESSIONS, AND MAY BE USED IN DETERMINING THE LENGTH ("W") AND/OR THE CAPACITY ("Q") OF CATCH BASIN OPENINGS OF THIS TYPE UNDER VARIOUS VALUES OF "D".

2. THIS CHART IS APPLICABLE ONLY TO CONDITIONS SHOWN ON FIGURE 2, AND MAY BE USED FOR ANY CROSSFALL BY SELECTING THE PROPER VALUE OF "D" RESULTING THEREFROM.

3. SUMP FORMULA:

$Q = 3.0 A W^{0.13} D^{0.6}$

W = LENGTH (FEET) OF CATCH BASIN OPENING.
A = AREA OF OPENING (W x 0.67).
D = DEPTH (FEET) OF FLOW ABOVE NORMAL GUTTER GRADE.

SUMP
C.B. NO. 40 TYPE CURB OPENING
DESIGN CHART LL-15

SIDE-OPENING CATCH BASIN CAPACITIES

BUREAU OF ENGINEERING - CITY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
STORM DRAIN DESIGN DIVISION

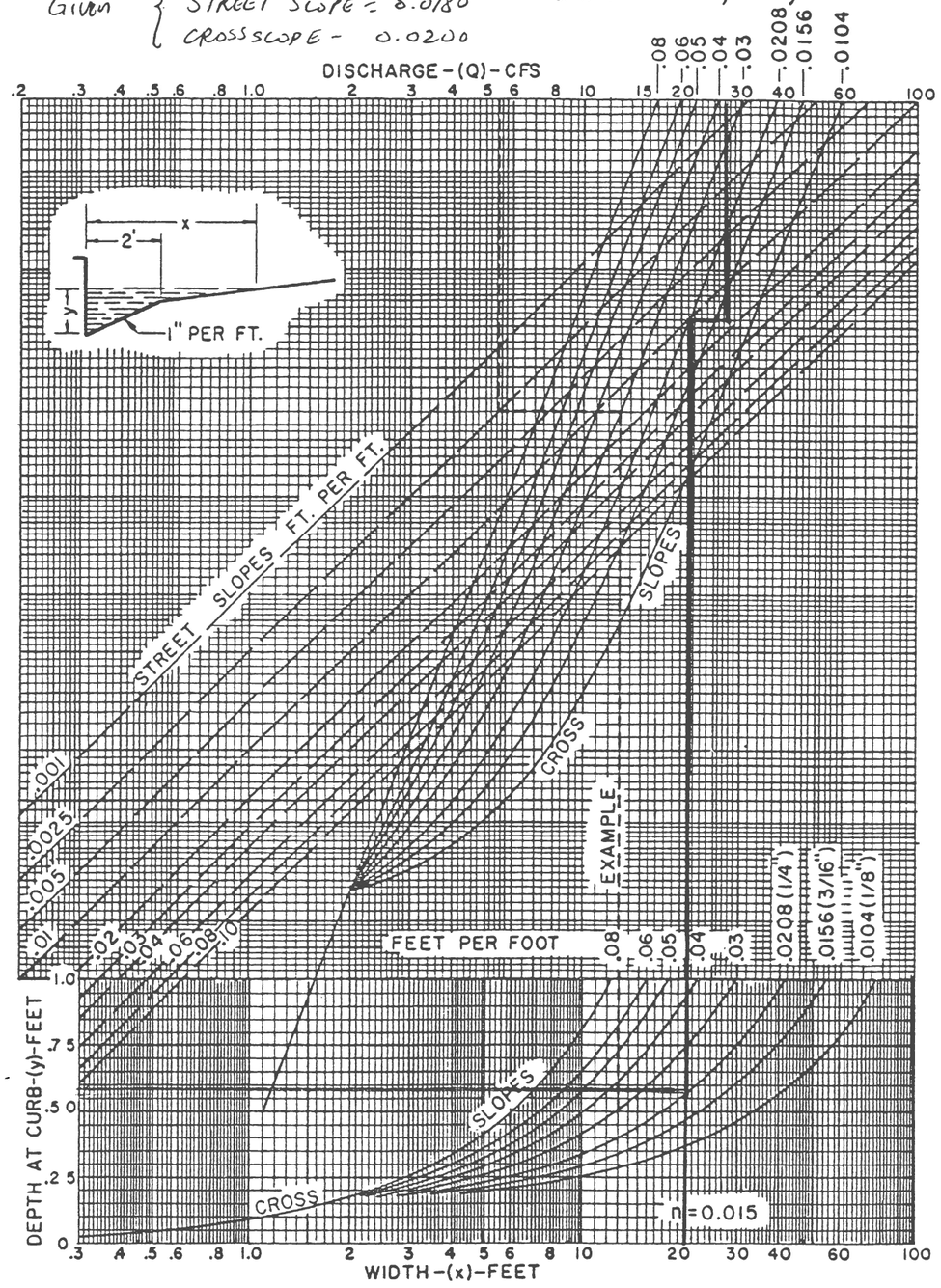
W.O. 6122 MARCH 1955

DESIGNED 3-17-55 DRAWN O.G.S. 3-21-55

STREET CAPACITY (ORANGE ST. IST 30.00)

Given { Q_{100} = 27.5 CFS
STREET SLOPE = 0.0180
CROSSSLOPE = 0.0200

Unknown: Depth y = 0.58' = 7"

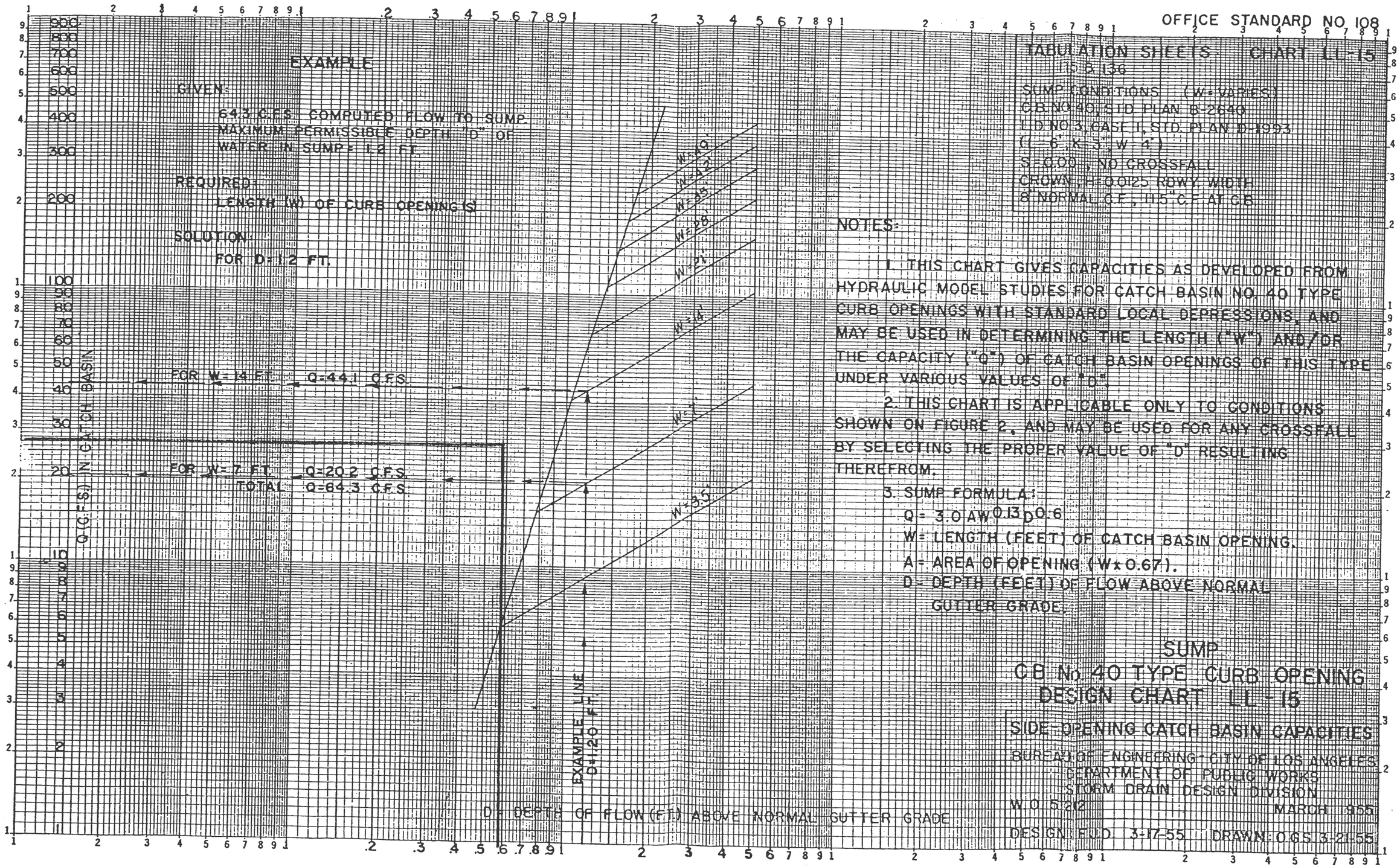


FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

Plate 2.6-0681

CURB INLET CAPACITY
ORANGE STREET STA. 13+50.00
SUMP CONDITION Q = 27.50 CFS
FLOW DEPTH = 0.58' USE: W = 21'



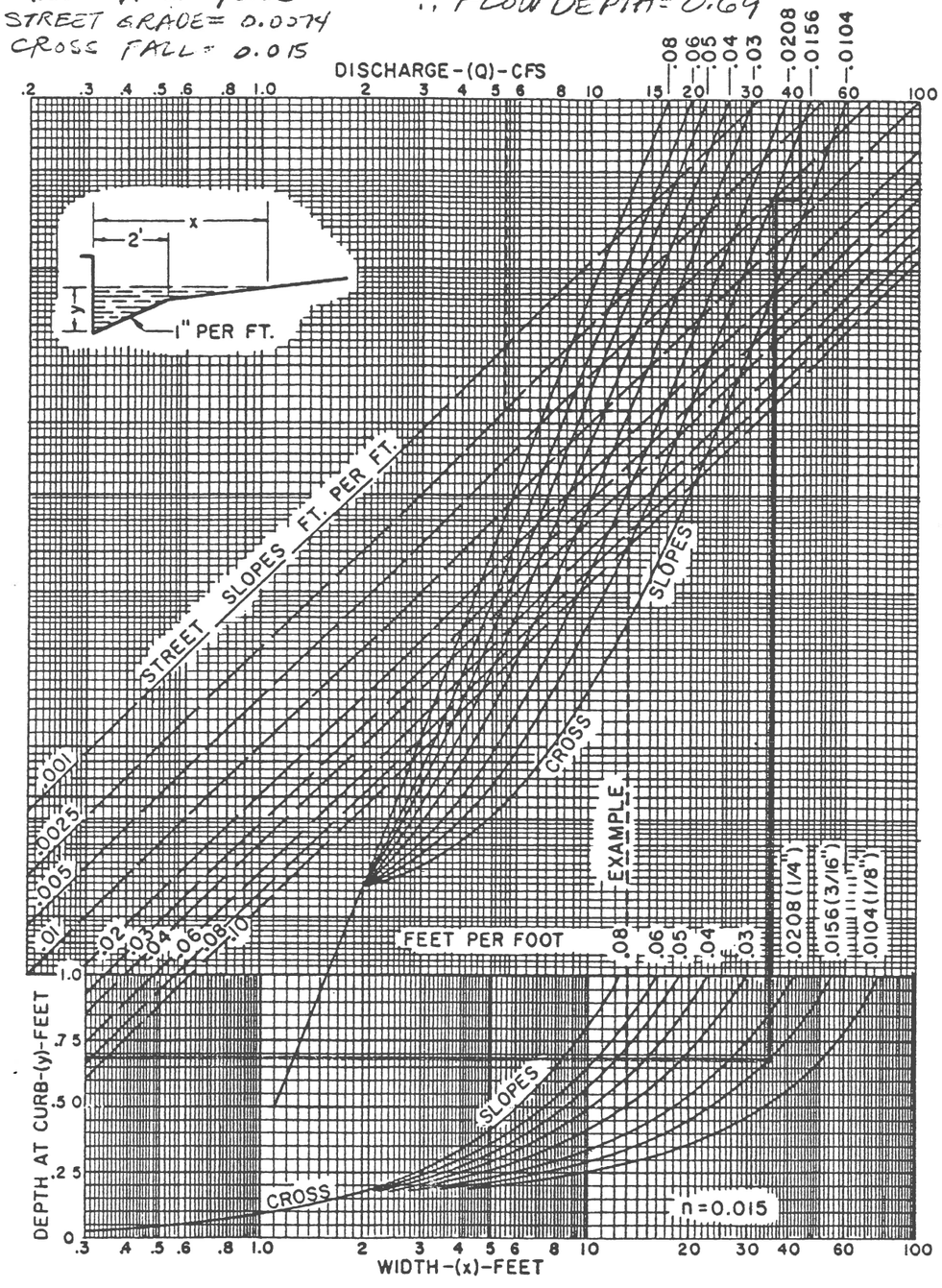
STREET CAPACITY @ SELLERS ROAD

Q_{100} = 41 CFS/SIDE

STREET GRADE = 0.0074

CROSS FALL = 0.015

∴ FLOW DEPTH = 0.69'

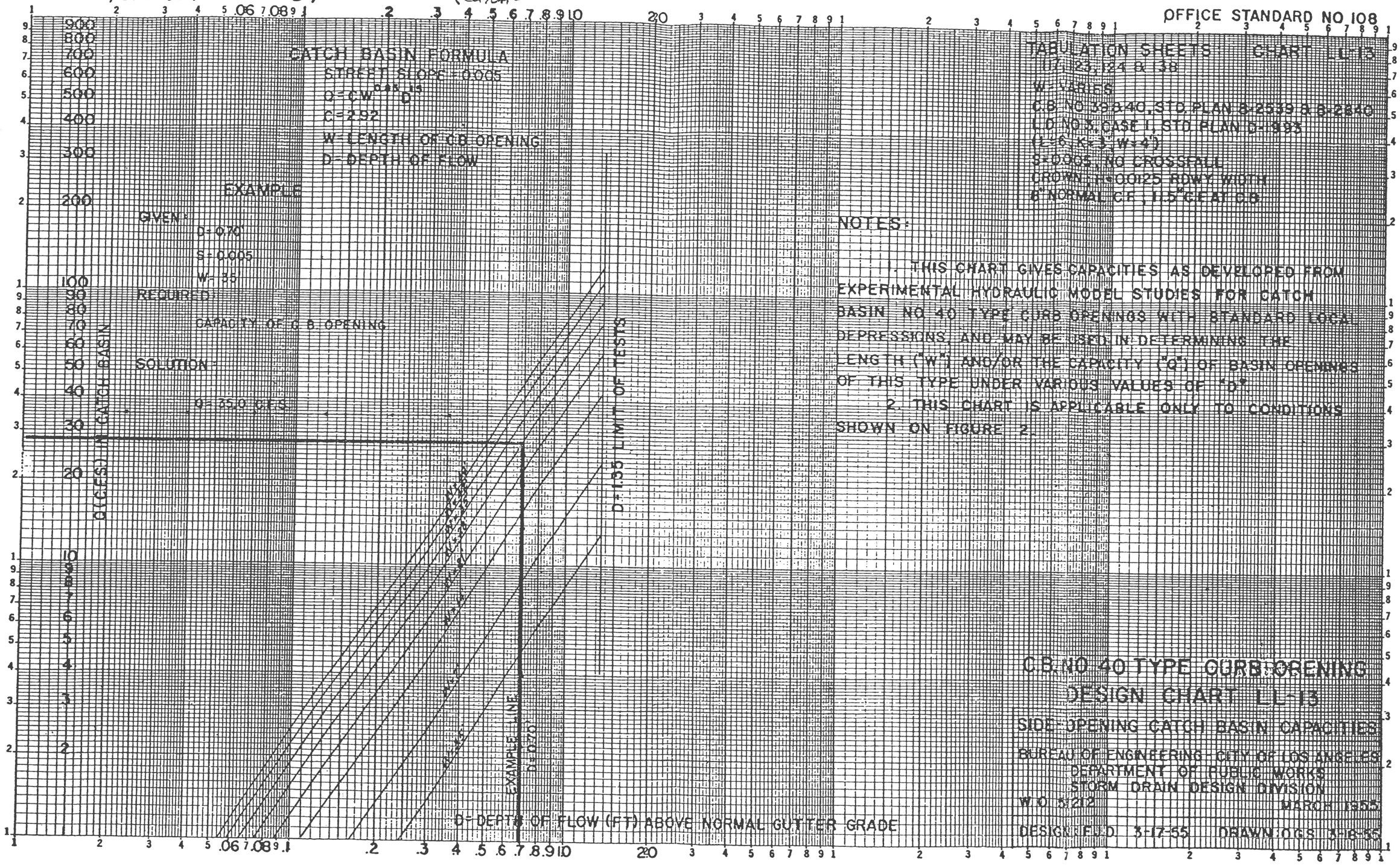


FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

Plate 2.6-0681

CATCH BASIN CAPACITY @ SELLERS ROAD
STA 7+92.00 & 8+13.00 (TYPICAL BOTH SIDES)
STREET SLOPE = 0.0074 USING W = 28'
FLOW DEPTH = 0.69' Q CATCH = 28 CFS



APPENDIX K

HYDRAULIC CALCULATIONS N.E.C.

BUNDY CANYON & ORANGE STREET, LAKE ELSINORE

BY

TAIT & ASSOCIATES

TAIT & ASSOCIATES, INC.

Consulting Engineers

HYDROLOGY CALCULATIONS

N.E.C. BUNDY CANYON & ORANGE STREET
ELSINORE, CALIFORNIA

AR 430

ARCO PETROLEUM PRODUCTS CO.

BY
TAIT & ASSOCIATES, INC.
800 N. ECKHOFF STREET
ORANGE, CA 92668
634-4800

PREPARED BY:

R. STEVEN KING
ENGINEERING DESIGNER

REGISTERED PROFESSIONAL ENGINEER
DAVID J. MacARTHUR
No. 12502
EXP. 3-31-93
CIVIL
STATE OF CALIFORNIA

CHECKED BY:

TOM HANEK
ENGINEERING ASSISTANT

DAVID J. MacARTHUR, P.E.

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. 4 of 2 Sheet

PROJECT BUNDY CYN. RD., ELSINORE

FREQUENCY 100 YR

Calculated by RSK 6-23-8 DATE

Checked by [illegible] DATE

DRAINAGE AREA	Soil & Development	A Acres	I In/hr	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
									H=42	985	11.6	11.6	INITIAL AREA (PLATE [illegible]
A-1	B SF ¼AC	7.43	3.30	.79	19.4	19.4	.017	24" RCP	9.8	180.	0.3	11.9	N. BND GUTTER 1 15
A-2	" "	1.81	3.25	.79	4.7	24.1	.10	24" RCP	20.3	96	0.1	12.0	N. BND LANES, 1 15
A-3	"	1.5[illegible]	[illegible].24	.79	3.9	28.0	.10	24" RCP	21.2	120	0.1	12.1	S. BND LANES, 1 15
A-4	LINE A-1, SE [illegible] BELOW				1.7	29.7	—	—	—	—	—	12.1	" " "
A-5	B SF ¼AC	1.95	3.24	.79	5.0	34.7	.055	30" RCP	18.0	250	0.2	12.3	S. BND OFF RAMP 1 15
A-6	" "	3.12	3.20	.79	7.9	42.6	.020	36" RCP	13.0	290	0.4	12.7	BUNDY & ORANGE ST
A-7	" "	3.19	3.17	.79	8.0	50.6							
LINE A-1							H=22			200	5.2	5.2	INITIAL AREA (PLATE [illegible]
A-4	B SF ¼AC	0.64	4.81	.82	2.5	2.5	.138	24" RCP	8.9	160	0.3	5.5	
	ADJUST Q FOR T_c = 12.0 MIN.					Q = 2.5 X 3.24/3.77 = 1.7 CFS							

NOTES:

1) INTENSITY DATA PER STD. ELSINORE - WILDOMAR AREA. PLATE D-4.1

2) RUNOFF COEFFICIENTS PER STD. [illegible] "B" PLATE D-5.2

PLAT

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

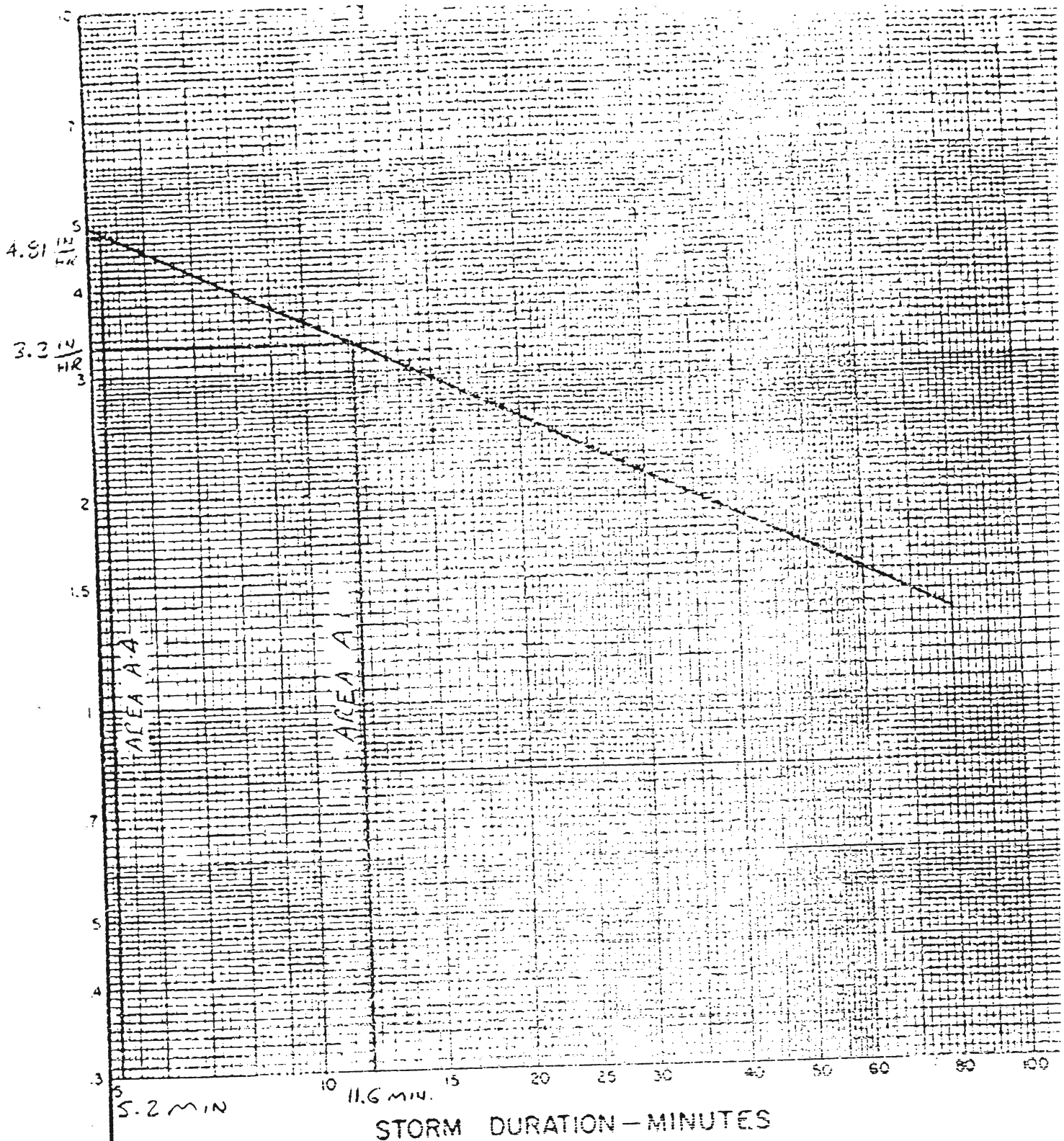
0 FEET 5000

HYDROLOGIC SOILS GROUP M

FOR

ELSINORE

PLATE



RCFC & WCD

HYDROLOGY MANUAL

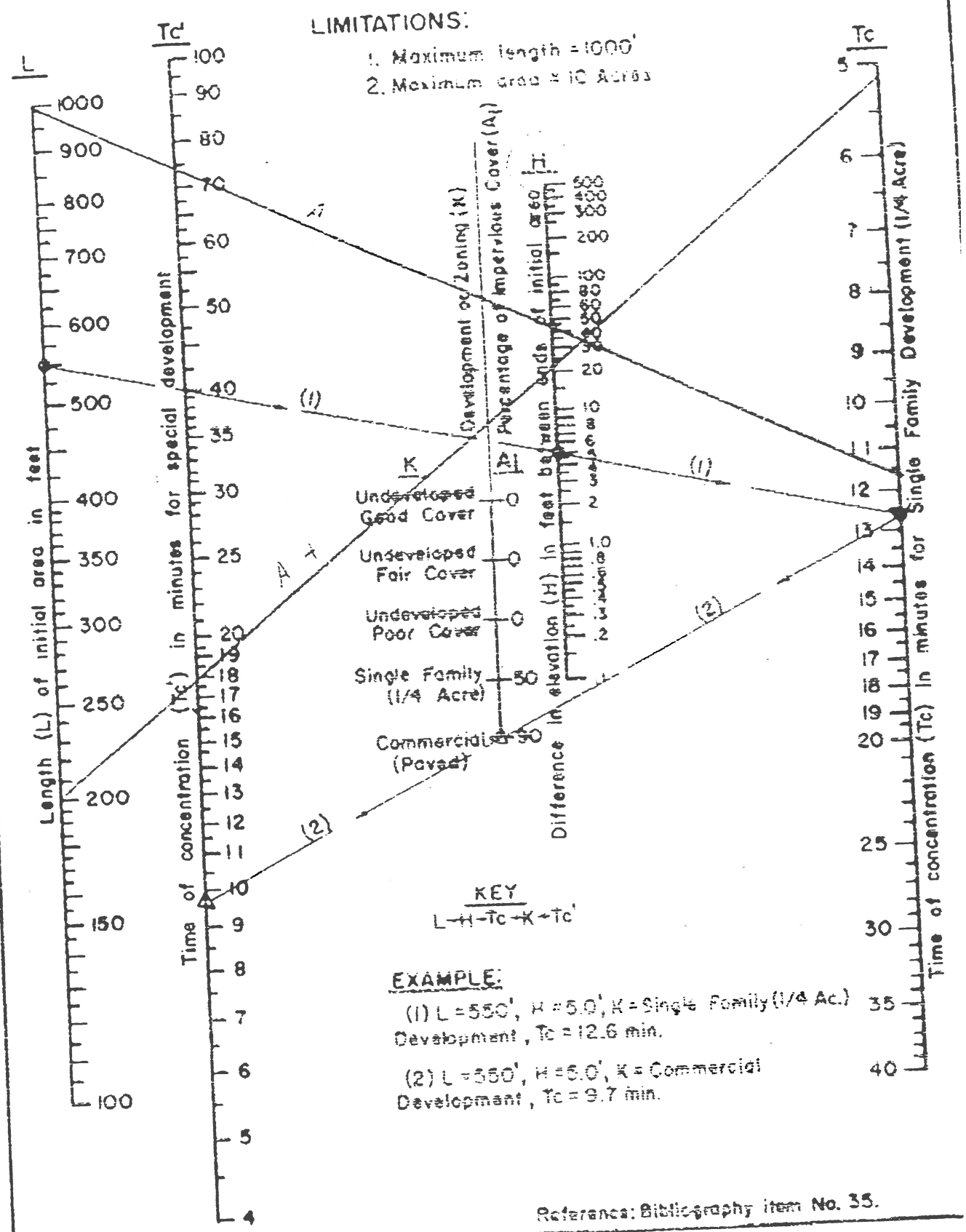
INTENSITY – DURATION CURVES

ELSINORE - WILDOMAR

RAINFALL INTENSITY—INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE - WILDOMAR		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.58	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.98	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

STANDARD
INTENSITY-DURATION
CURVES DATA



LIMITATIONS:

1. Maximum length = 1000'
2. Maximum area = 10 Acres

KEY

L → H → Tc → K → Tc'

EXAMPLE:

(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.

(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.

Reference: Bibliography item No. 35.

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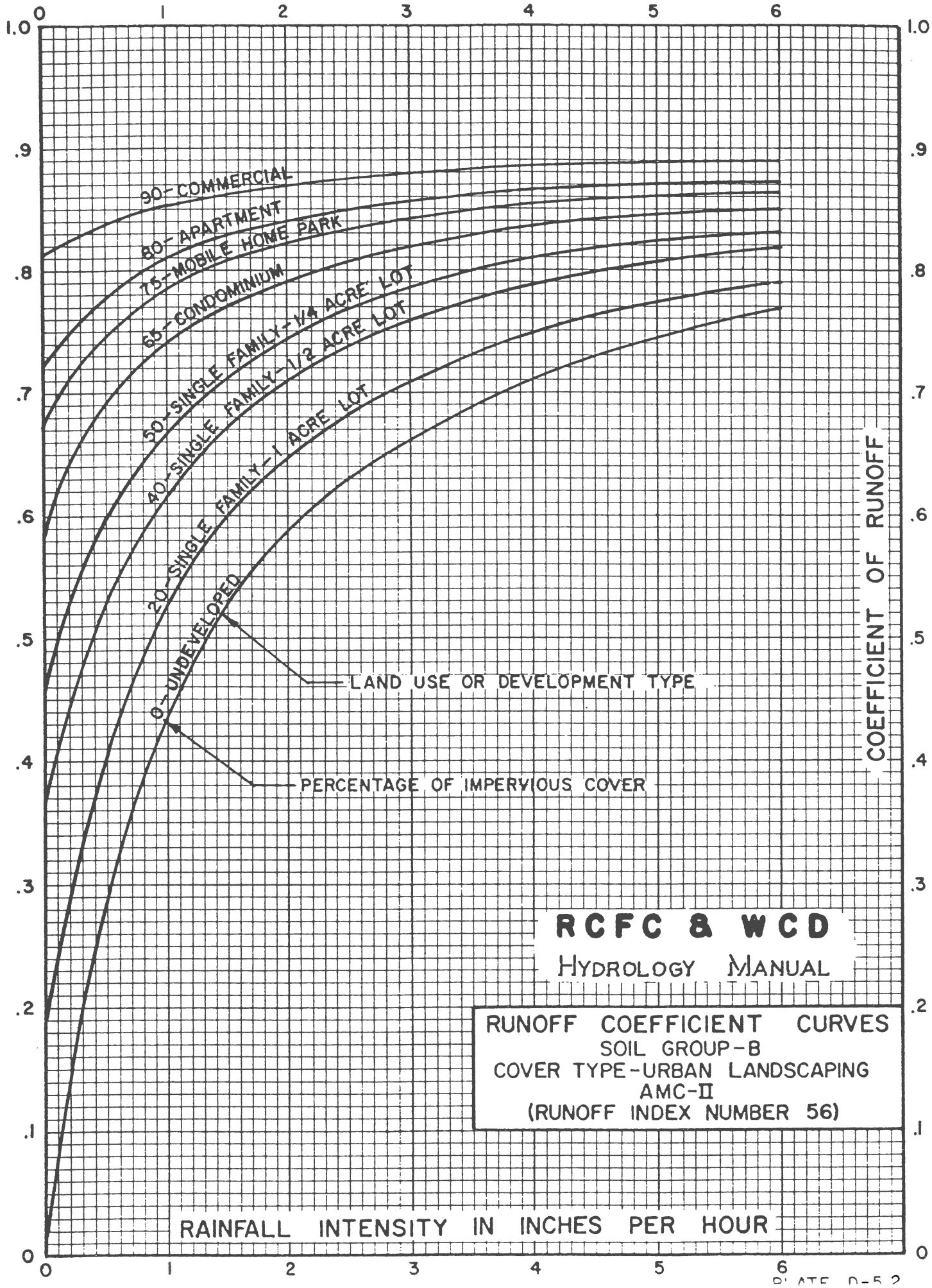
HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

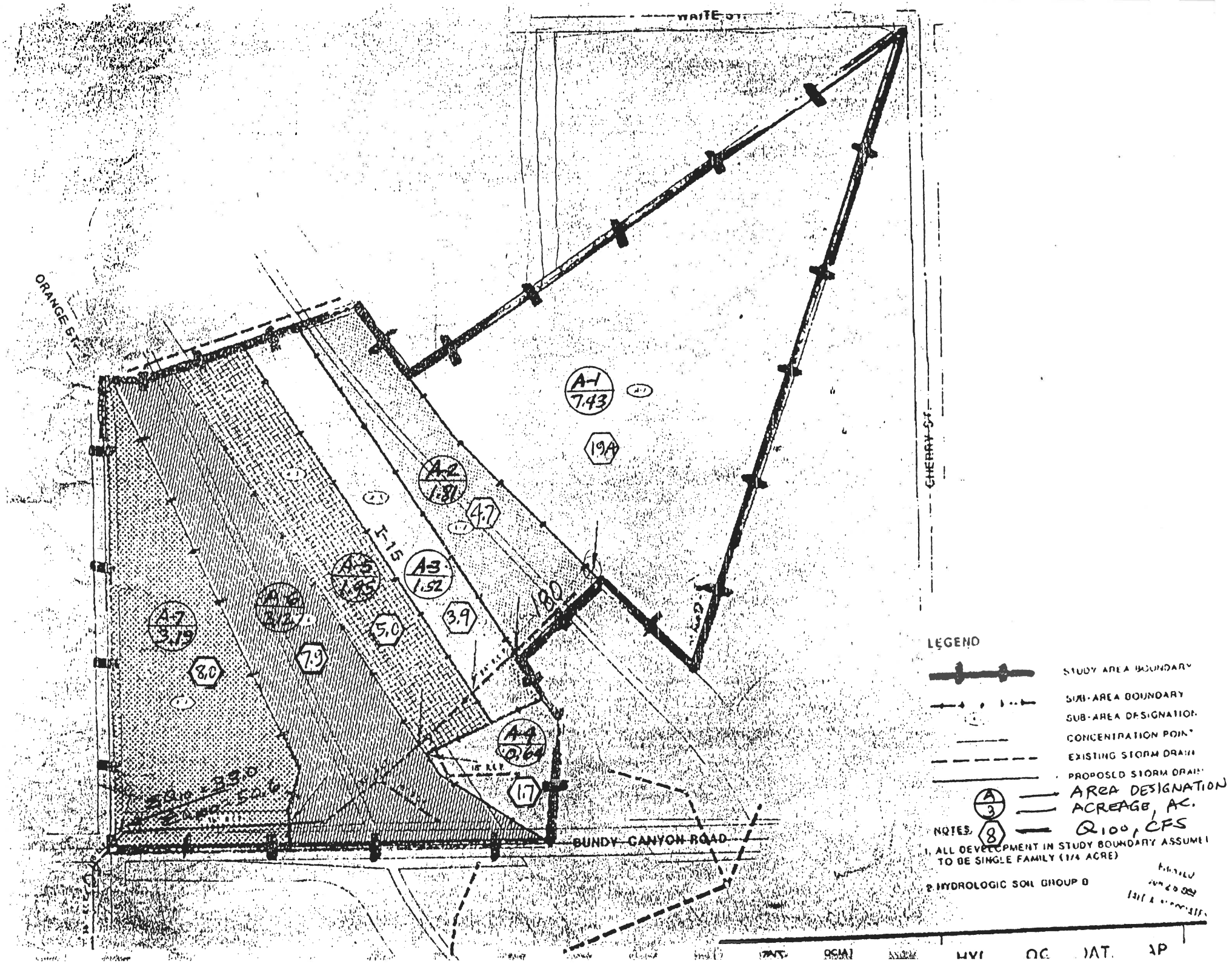
PLATE D-3



RCFC & WCD

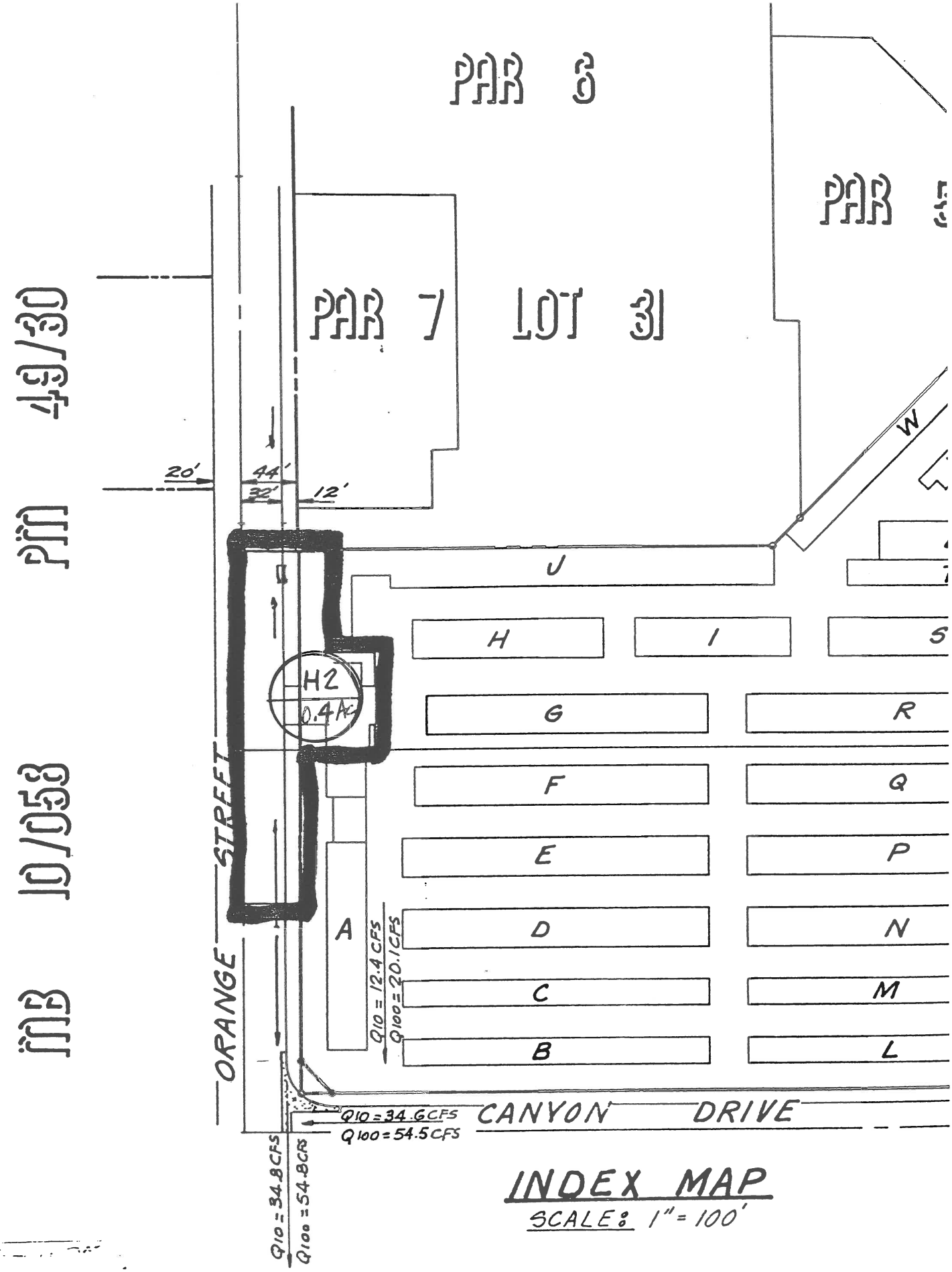
HYDROLOGY MANUAL

RUNOFF COEFFICIENT CURVES
SOIL GROUP-B
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 56)


WAITE ST.
ORANGE ST.
CHERRY ST.
I-15
BUNDY CANYON ROAD
A-1
7.43
19.4
A-2
1.81
4.7
A-3
1.52
3.9
A-4
0.64
1.7
A-5
1.95
5.0
A-6
3.12
7.9
A-7
3.19
8.0
LEGEND
STUDY AREA BOUNDARY
SUB-AREA BOUNDARY
SUB-AREA DESIGNATION
CONCENTRATION POINT
EXISTING STORM DRAIN
PROPOSED STORM DRAIN
AREA DESIGNATION
ACREAGE, AC.
Q100, CFS
NOTES:
1. ALL DEVELOPMENT IN STUDY BOUNDARY ASSUMED TO BE SINGLE FAMILY (1/4 ACRE)
2. HYDROLOGIC SOIL GROUP B

APPENDIX L

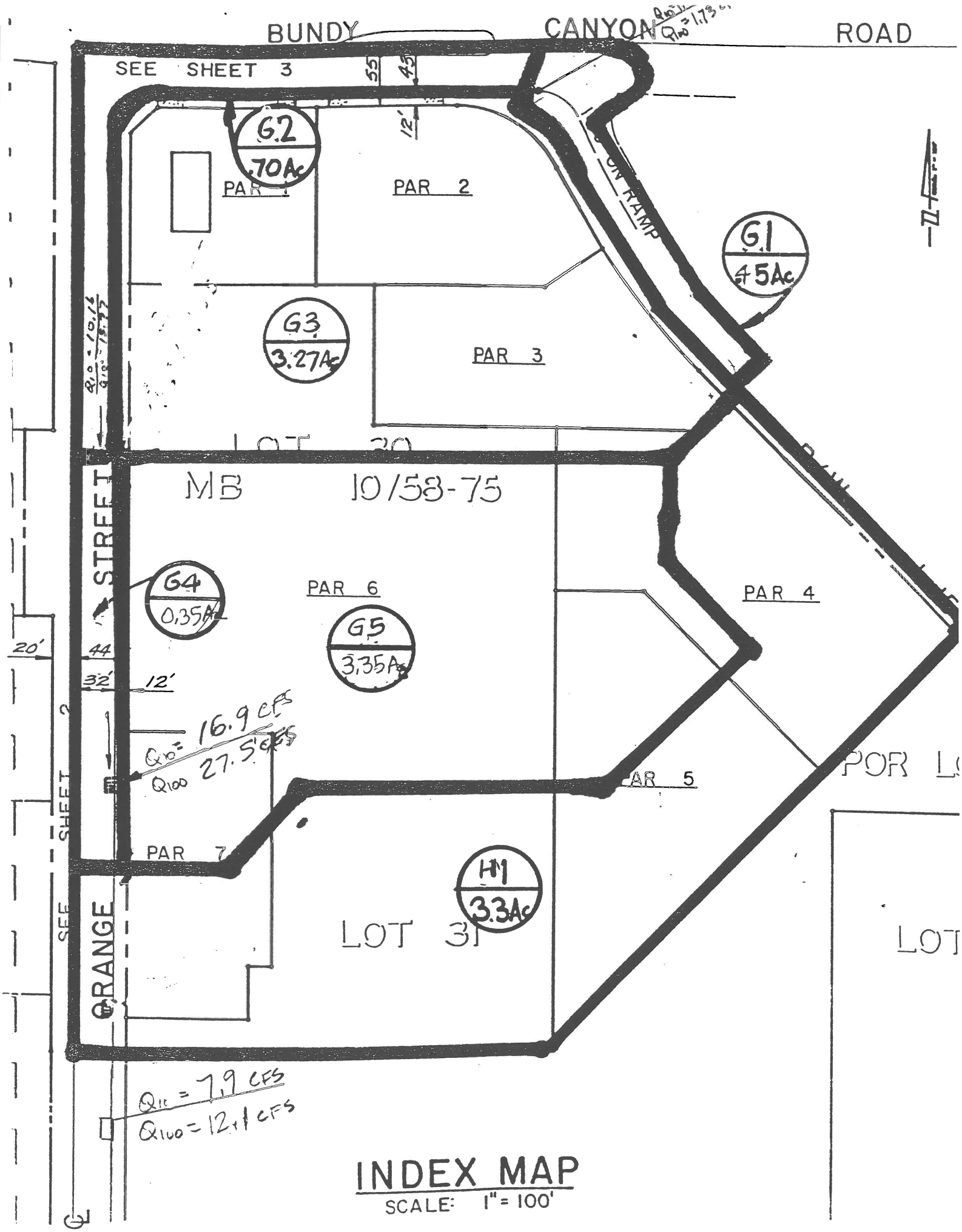
ONSITE Q10 & Q100 HYDROLOGY



INDEX MAP

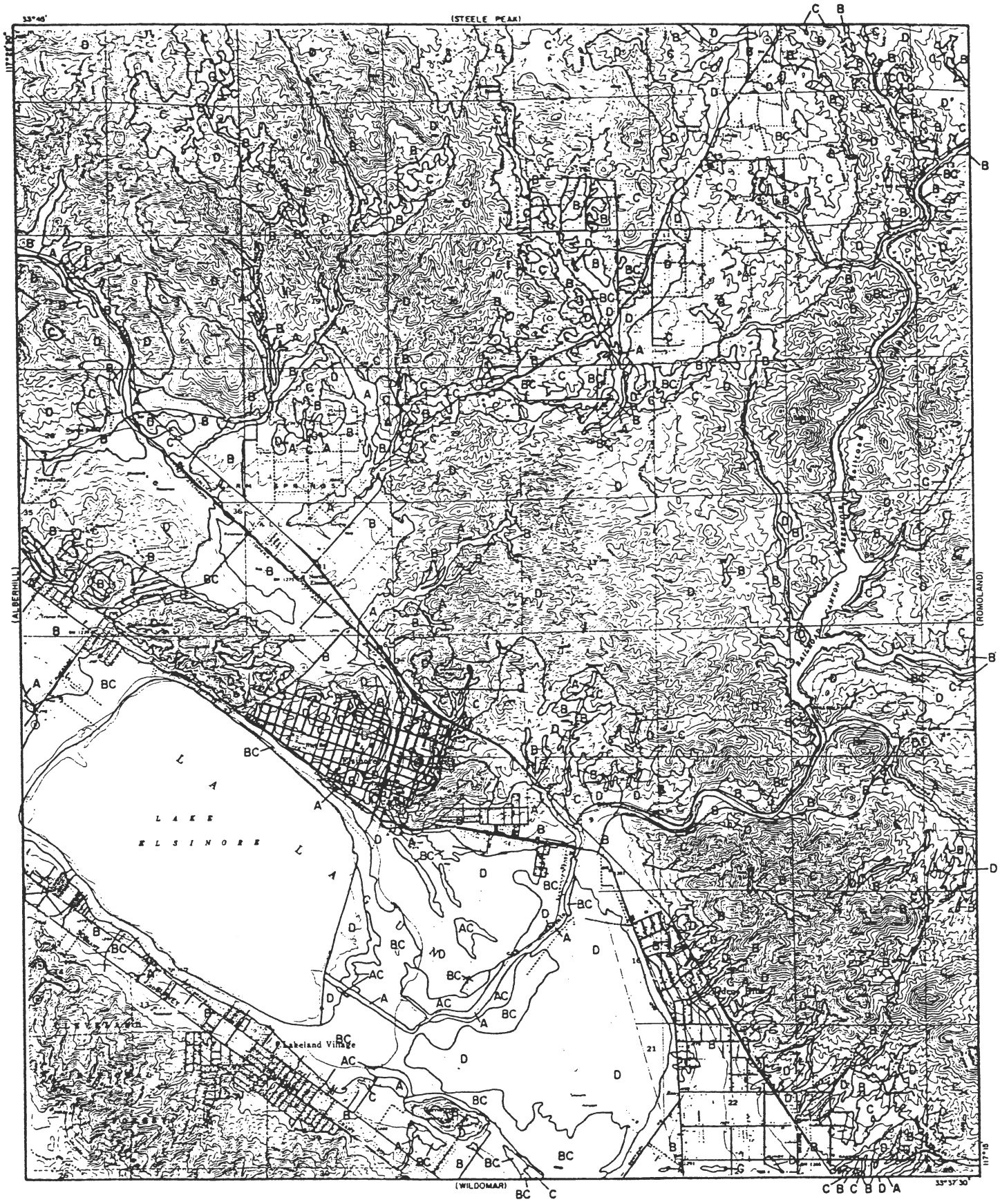
SCALE: 1" = 100'

MB 10/058 PM 49/30



INDEX MAP

SCALE: 1" = 100'



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

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HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ELSINORE

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT BUNDY CANYON SHOPPING CENTER

Calculated by _____ DATE _____

FREQUENCY 100-YR

Checked by _____ DATE _____

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
G-1	D-COMM	0.45	4.37	0.88	1.73				H=7	320	6.5	6.5	Initial Sub Area Soil B
G-2	D-COMM	0.70	3.44	0.88	2.12	1.73	0.022	TRIAL	2.7	680	4.2	10.7	Bundy Canyon Plate D-7.1
						3.85							
G-3	D-COMM	3.27	4.05	0.90	11.92				12.1	490	7.60	10.7	Initial Sub Area On Site
						11.92							
G-4	D-COMM	0.35	3.25	0.88	1.00	15.77			4.4	350	1.3	12.0	
						16.77							
G-5	D-COMM	3.7	3.88	0.89	12.8				H=14	600	8.3	8.3	Initial Sub Area On Site
						12.8							
	CONFLUENCE												
		$Q_F = Q_A + Q_C \frac{T_A}{T_C}$				$= 16.77 + 12.8\left(\frac{3.25}{3.88}\right) = 27.50$							
H-1	D-COMM	3.3	3.67	0.89	10.8				H=15	750	9.3	9.3	Initial Sub Area On Site
H-2	D-COMM	0.4	4.27	0.88	1.50	10.8			H=2	225	6.8	6.8	Initial Sub Area Off-site
						1.50							
	Adjust	$Q_T = Q_D + Q_E \frac{T_A}{T_E} =$				$10.8 + 1.50\left(\frac{3.67}{4.27}\right) = 12.10$							

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT BUNDY CANYON SHOPPING CENTER

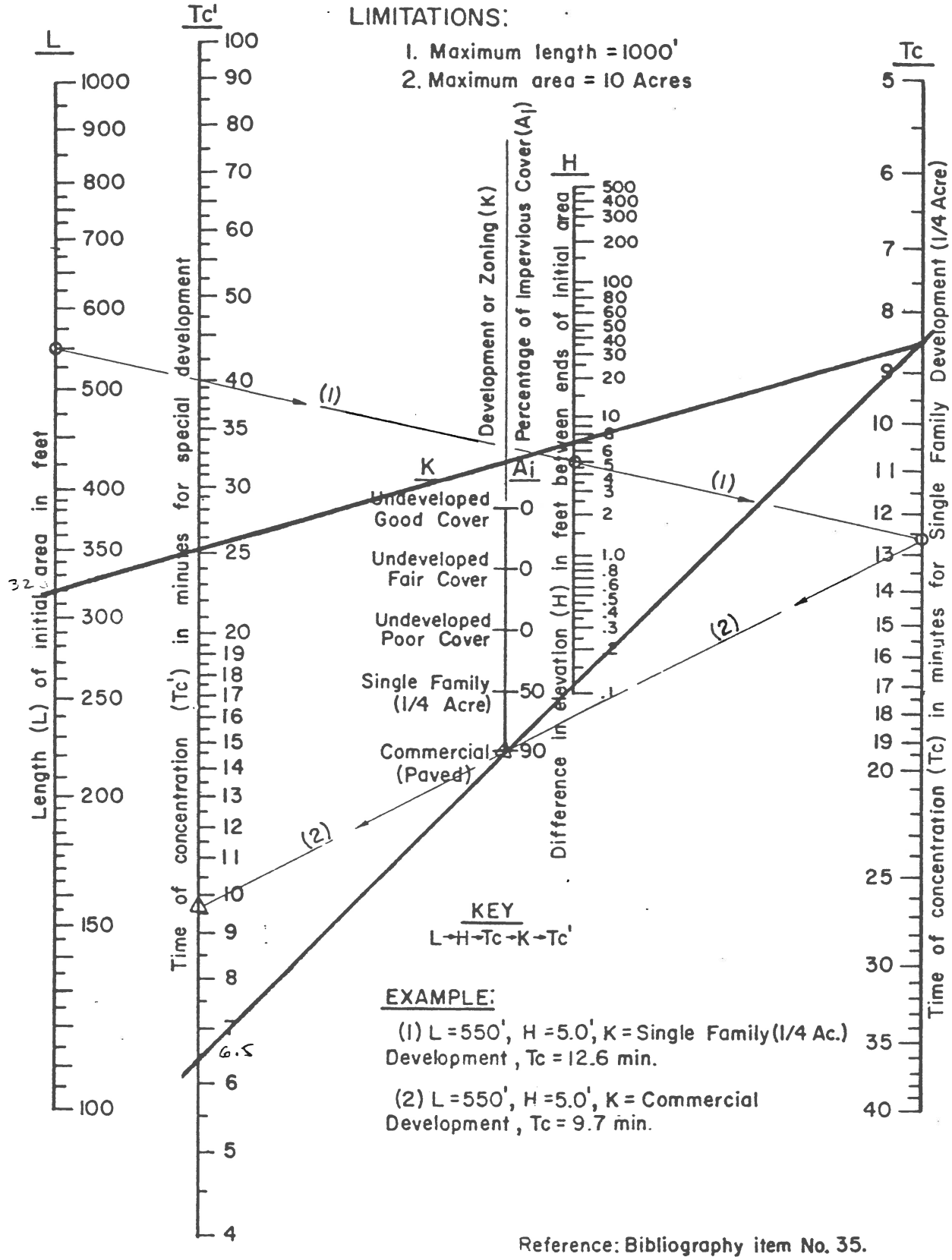
FREQUENCY 10-YR

Calculated by ---------- DATE ----

Checked by ---------- DATE ----

DRAINAGE AREA	Soil & Development	A Acres	I In/hr.	C	ΔQ CFS	ΣQ CFS	SLOPE	SECTION	V FPS	L FT.	T MIN.	ΣT	REMARKS
G-1	D-COMM	0.45	2.85	0.87	1.12				H=7	320	6.5		
G-2	D-COMM	0.70	2.18	0.87	1.33	1.12	0.019	TRIANG	2.4	686	4.8	6.5	Initial Sub-Area Soil-B
						2.45						11.30	Bundy Canyon Plate D-7.1
G-3	D-COMM	3.27	2.65	0.89	7.71			H=	12.1	490	7.60		
						7.71						11.30	Initial Sub Area on Site
G-4	D-COMM	0.35	2.06	0.87	0.63	10.16			4.0	350	1.46		
						10.79						12.76	
G-5	D-COMM	3.35	2.53	0.87	7.54				H=14	600	8.3		
						7.54						8.3	Initial Sub Area On Site
	CONFLUENCE												
			$Q_T = Q_A + Q_C \frac{T_A}{T_C}$			$= 10.79 + 7.54\left(\frac{12.06}{12.53}\right)$				$= 16.93$			
H-1	D-COMM	3.3	2.43	0.89	7.1				H=15	750	9.3		
H-2	D-COM	0.4	2.79	0.87	0.97	7.1			H=2	225	6.8	9.3	Initial Sub Area - Onsite
						0.97						6.8	Initial Sub Area Off-site
	Adjust		$Q_T = Q_D + Q_E \frac{T_D}{T_E}$			$= 7.1 + 0.97\left(\frac{2.90}{2.79}\right) =$				7.90			

AREA G-1



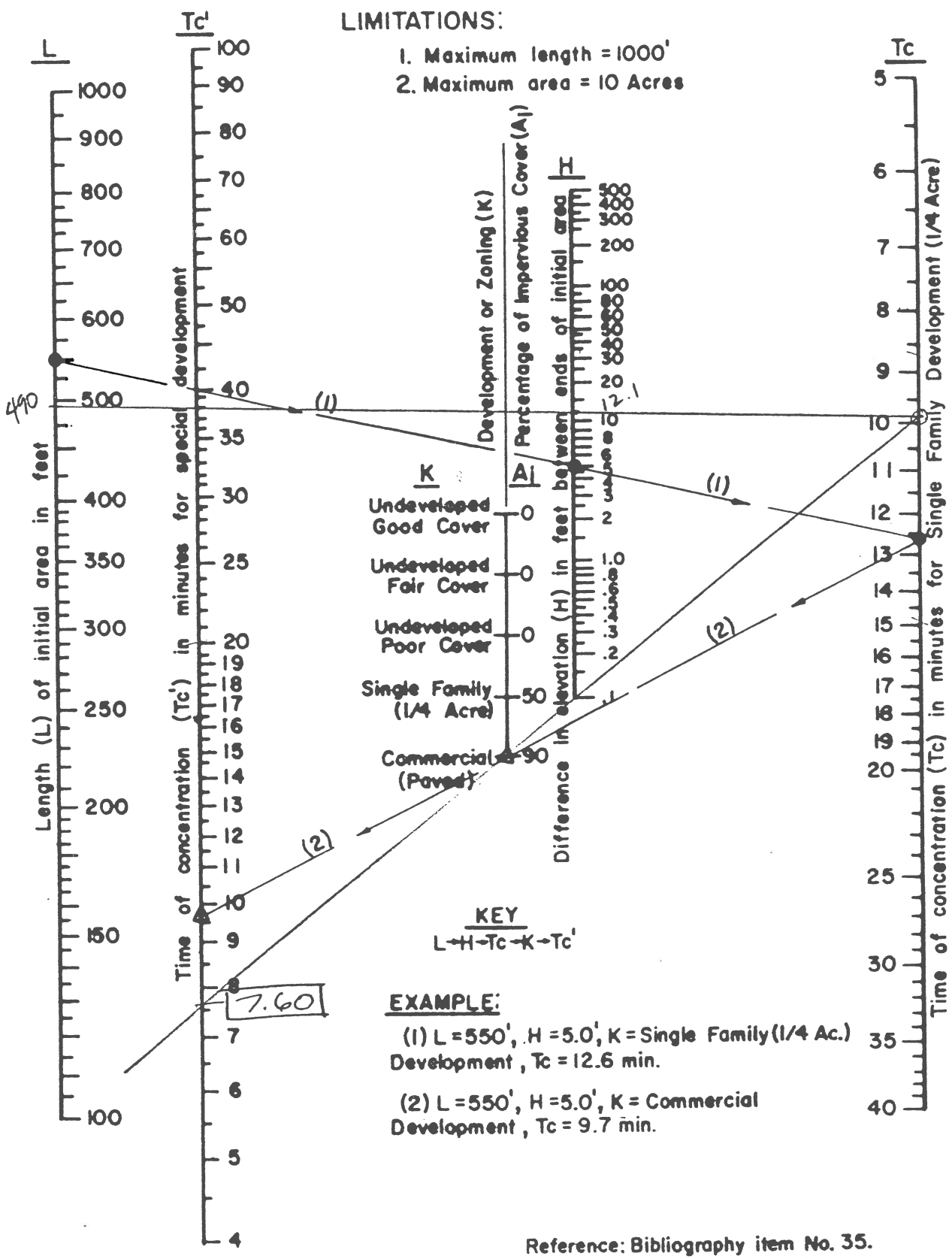
Reference: Bibliography item No. 35.

RCFC & WCD

HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

AREA G-3



Reference: Bibliography item No. 35.

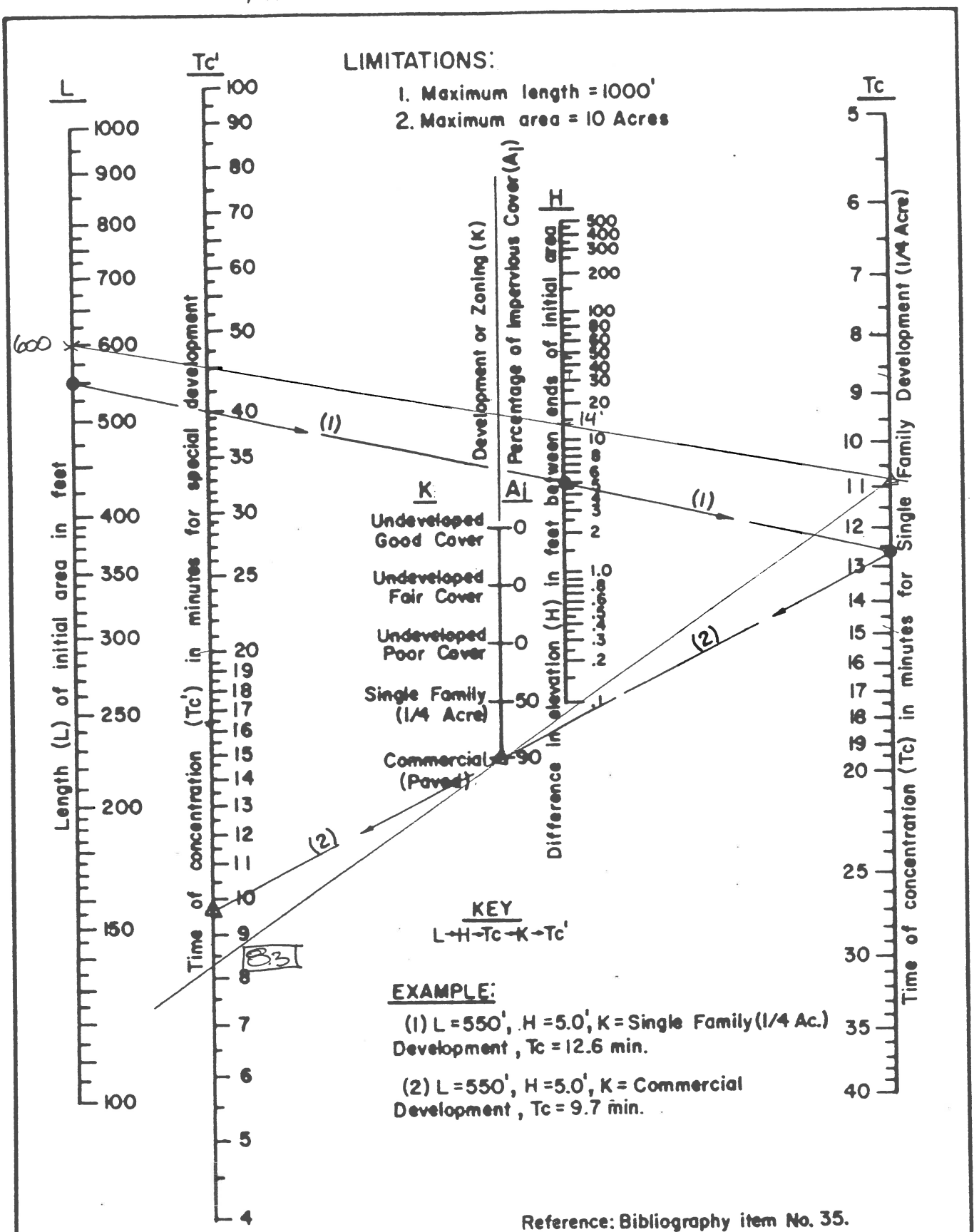
RCFC & WCD

HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

PLATE D-3

AREA G-5



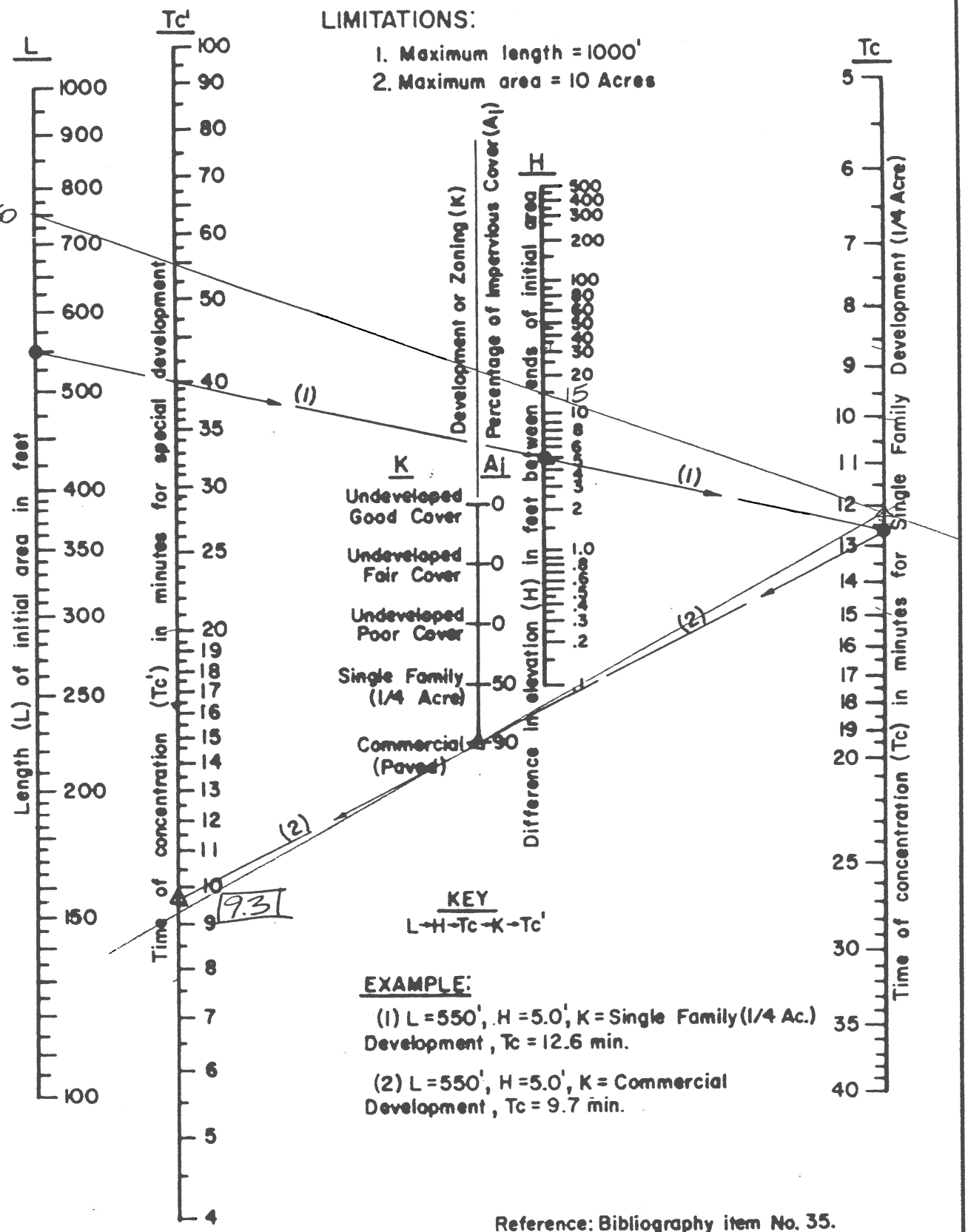
Reference: Bibliography item No. 35.

RCFC & WCD

HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

AREA H1



LIMITATIONS:

1. Maximum length = 1000'
2. Maximum area = 10 Acres

KEY

L→H→Tc→K→Tc'

EXAMPLE:

(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.

(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.

Reference: Bibliography item No. 35.

RCFC & WCD

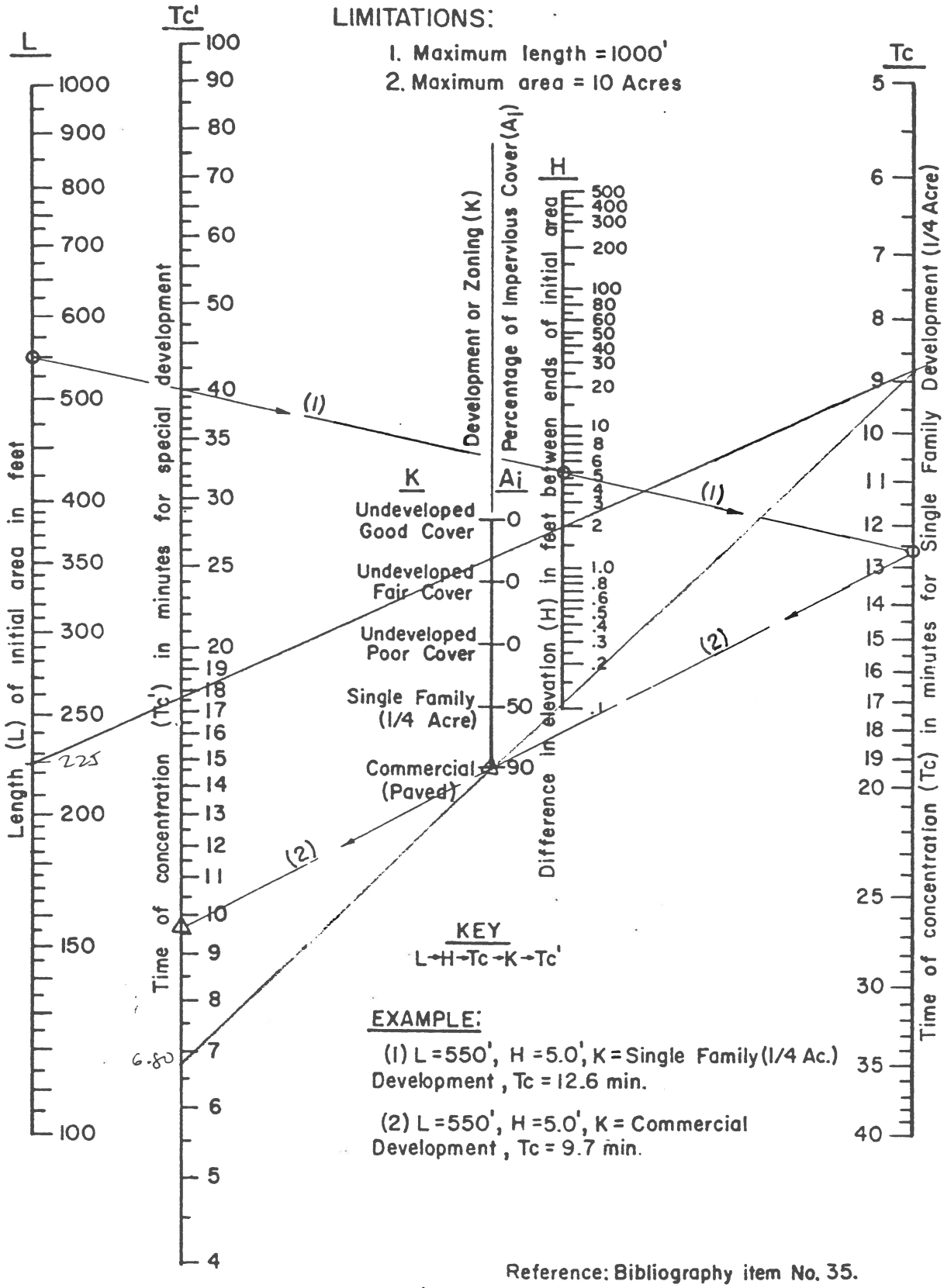
HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

AREA - H-2

LIMITATIONS:

1. Maximum length = 1000'
2. Maximum area = 10 Acres



KEY

L→H→Tc→K→Tc'

EXAMPLE:

(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.

(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.

Reference: Bibliography item No. 35.

RCFC & WCD

HYDROLOGY MANUAL

TIME OF CONCENTRATION FOR INITIAL SUBAREA

RAINFALL INTENSITY—INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE - WILDOMAR		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.56	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.98	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

6.8 2.79 3.23 4.27 4.94
6.5 2.85 3.37 4.37 4.53
7.6 2.65 2.75 4.05 4.21
8.3 2.53 2.56 3.88 3.95
9.3 2.40 2.44 3.67 3.73

RCFC & WCD
HYDROLOGY MANUAL

STANDARD INTENSITY—DURATION CURVES DATA

PLATE D-4.1 (2 of 6)

APPENDIX M

HYDRAULIC CAPACITIES

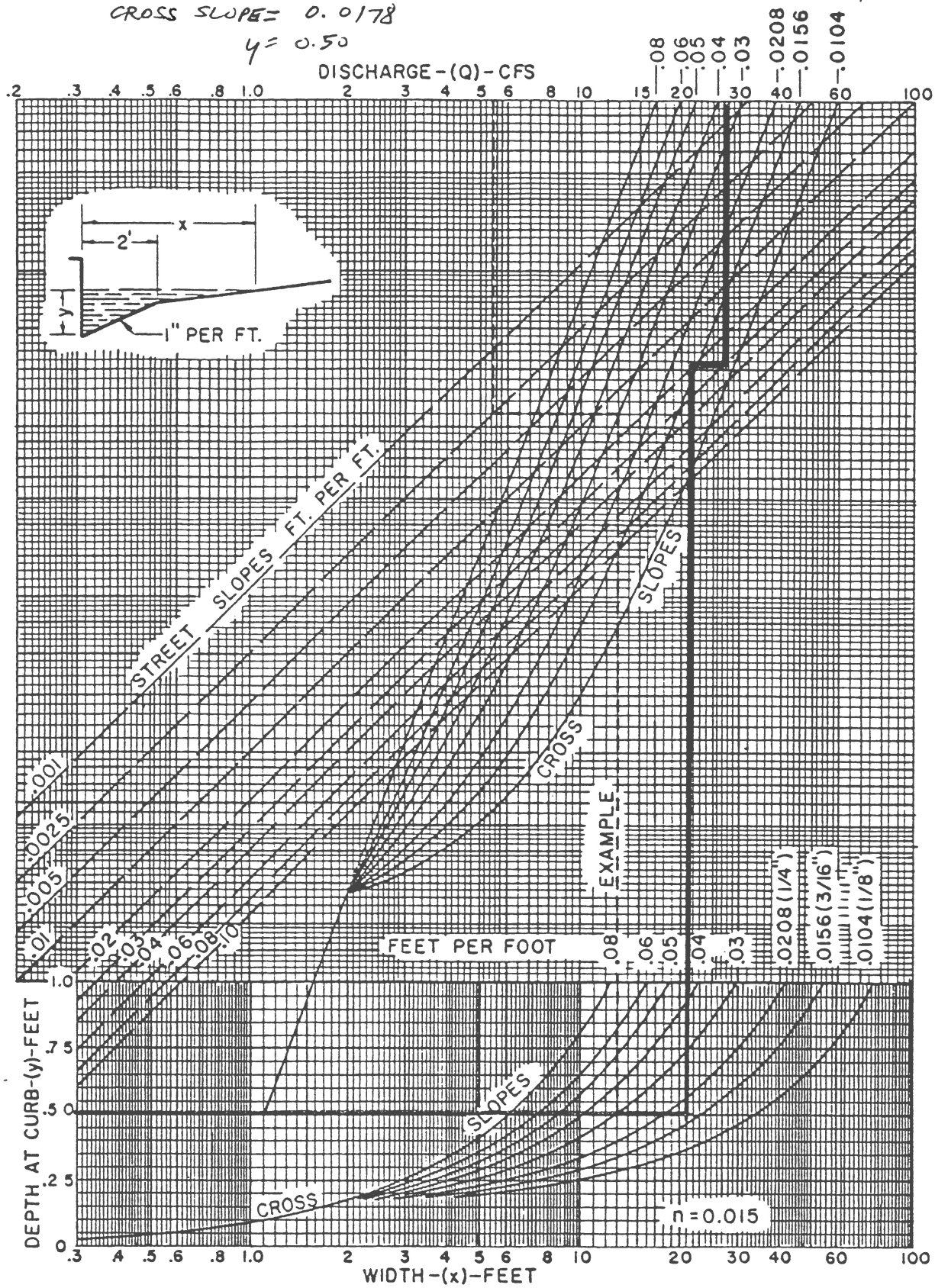
DRIVEWAY @ STA 11 + 52.27, ORANGE STREET
DRIVEWAY @ STA 14 + 20.00, ORANGE STREET
DRIVEWAY @ STA 16 + 70.00, ORANGE STREET

HYDRAULIC CAPACITY @ DRIVEWAY, ORANGE ST, STA 11+52.27

GIVEN: STREET SLOPE = 0.0300 From Plate: Q = 21 CFS > 3.77 (Q ACTUAL) OK

CROSS SLOPE = 0.0178

y = 0.50



FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

Plate 2.6-0681

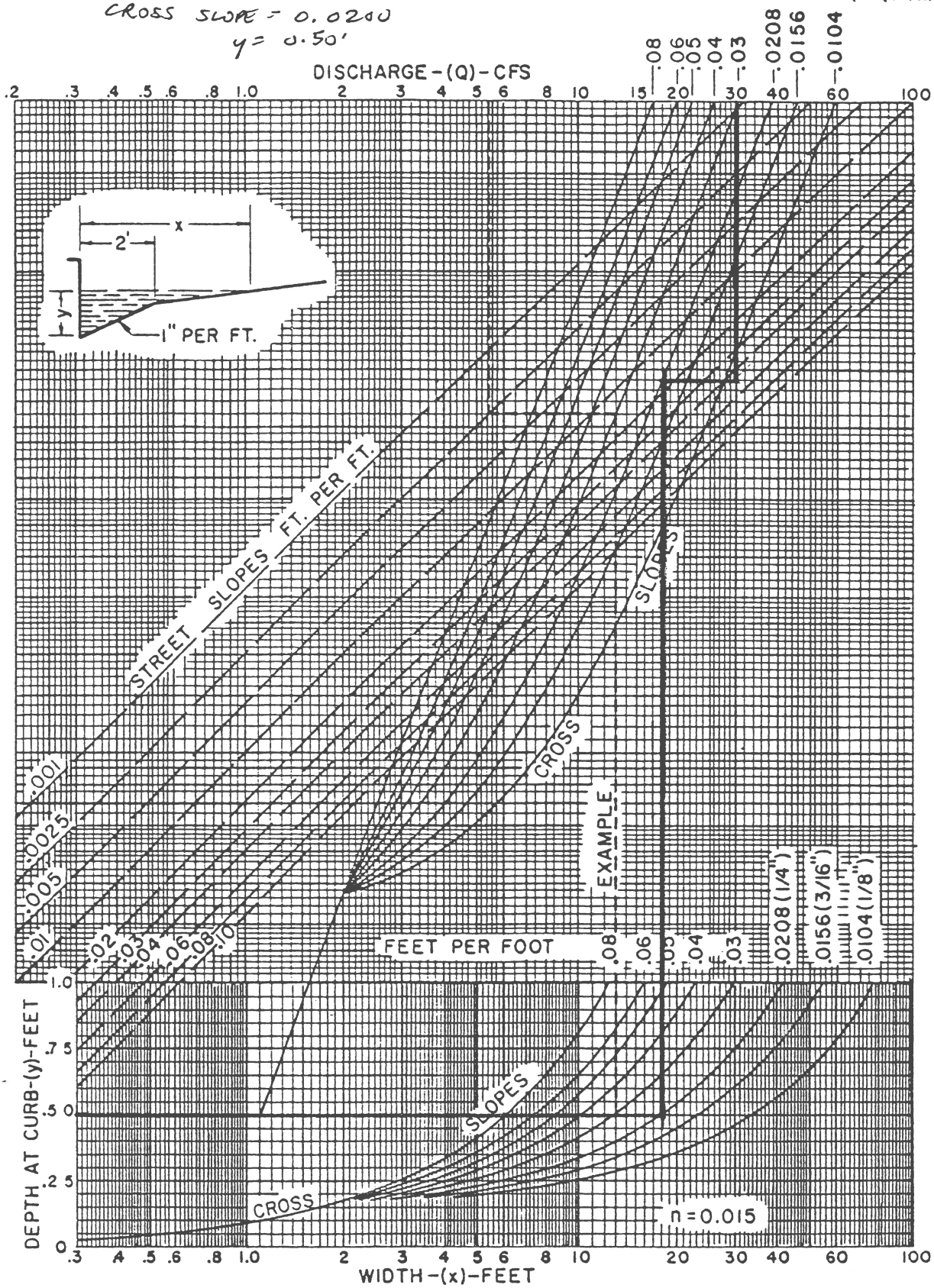
HYDRAULIC CAPACITY @ DRIVEWAY, ORANGE STA 14+20.00

GIVEN: STREET SLOPE = 0.0463 From Plate: Q = 30 CFS > 3.77 (Q_{ACTUAL})

CROSS SLOPE = 0.0200

y = 0.50'

6/5



FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

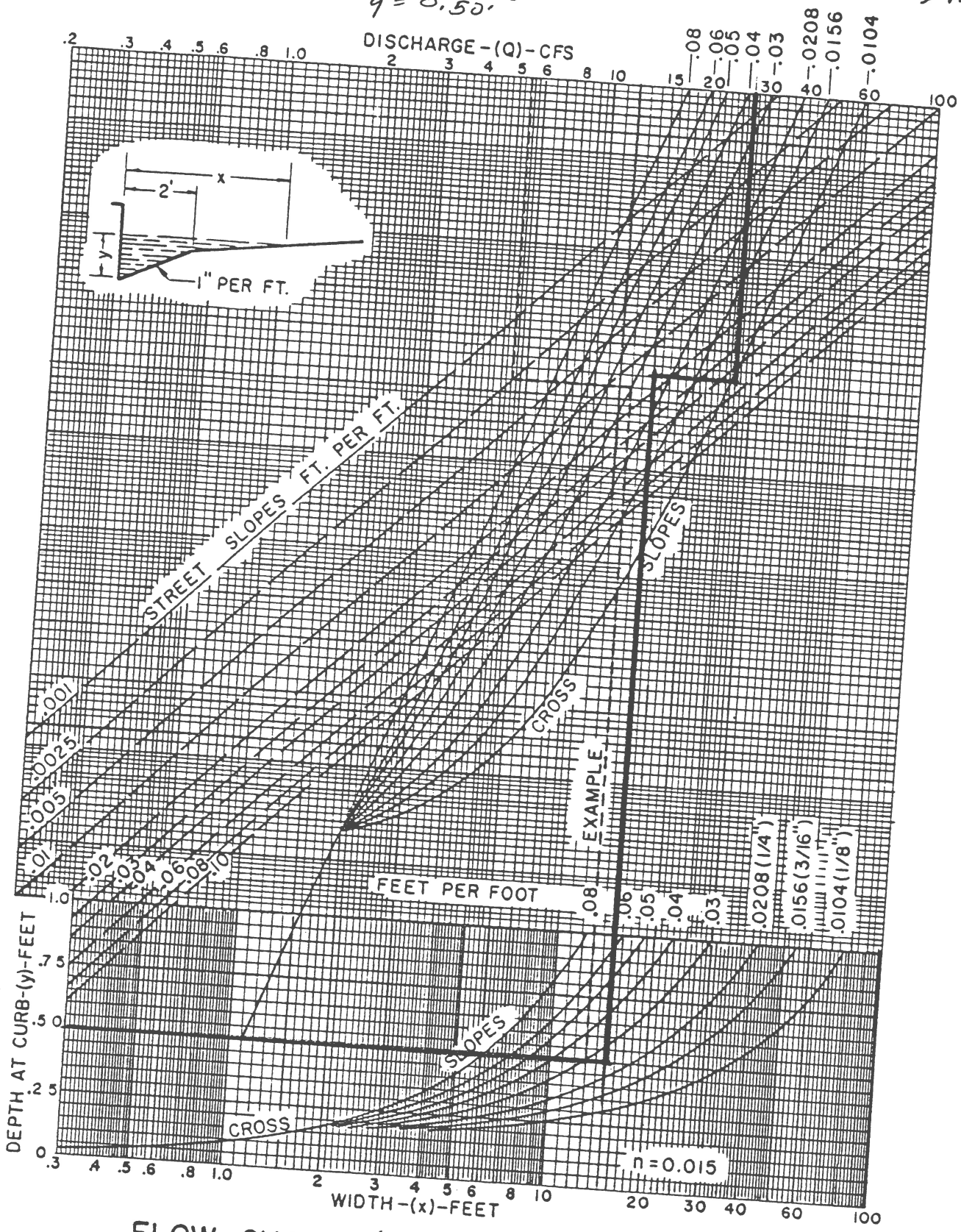
Plate 2.6-0681

HYDRAULIC CAPACITY @ DRIVEWAY, ORANGE STA 16+70.00

GIVEN: STREET SLOPE = 0.0363 From Plate: Q = 27 CFS > 11.92/Q ok

CROSS SLOPE = 0.0256

y = 0.50'



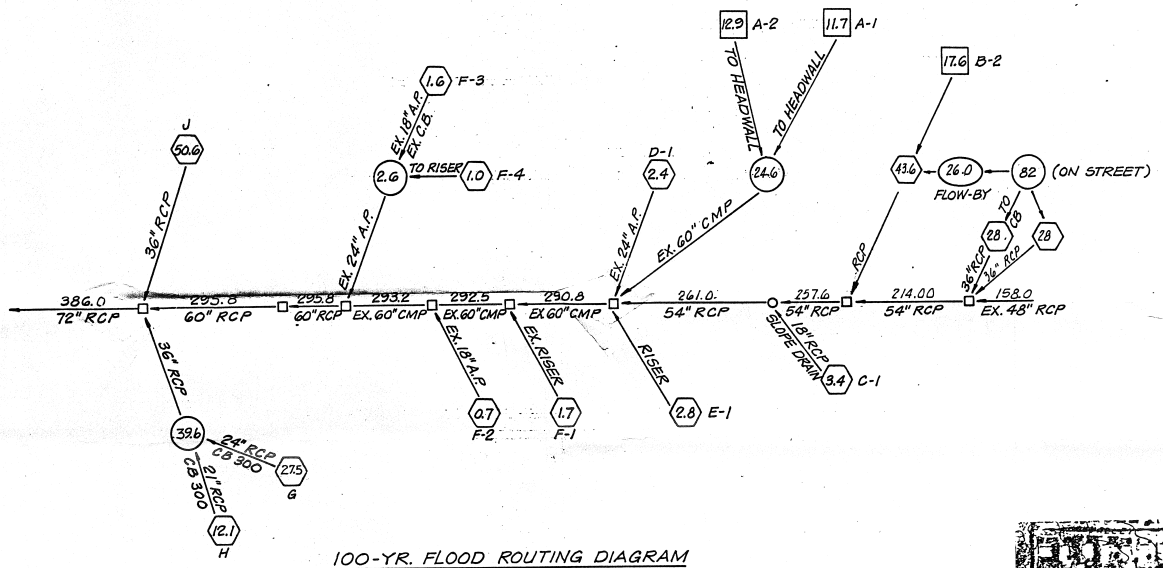
FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

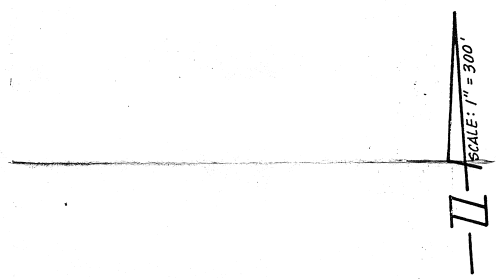
Plate 2.6-0681

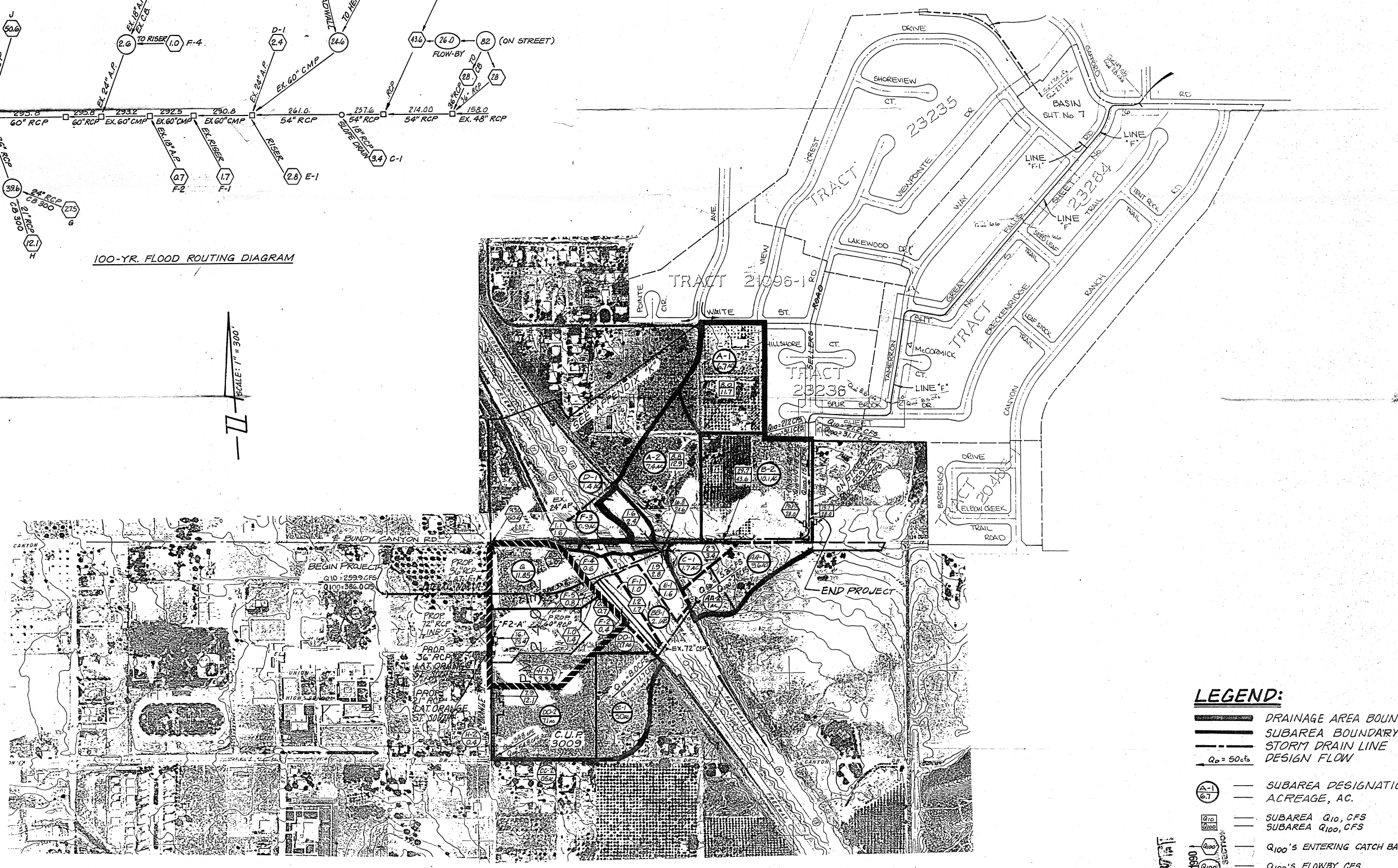
APPENDIX N

HYDROLOGY MAP



100-YR. FLOOD ROUTING DIAGRAM





LEGEND:

- DRAINAGE AREA BOUNDARY
- SUBAREA BOUNDARY
- STORM DRAIN LINE
- $Q_D = 50$ cfs — DESIGN FLOW
- SUBAREA DESIGNATION
- ACREAGE, AC.
- SUBAREA Q_{10}, CFS
- SUBAREA Q_{100}, CFS
- Q_{100}'S ENTERING CATCH BASIN/INLETS, CFS
- Q_{100}'S FLOWBY, CFS

RECEIVED OCT 22 1990 RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT ENGINEERING SECTION

No. 33192 REGISTERED CIVIL ENGINEER

Paul L. Steven 6-6-90

BUTTERFIELD ENGINEERING & SURVEYING
A DIVISION OF THE KEITH COMPANIES

PLANNING CIVIL ENGINEERING ENVIRONMENTAL SERVICES
ARCHITECTURE LANDSCAPE ARCHITECTURE LAND SURVEYING

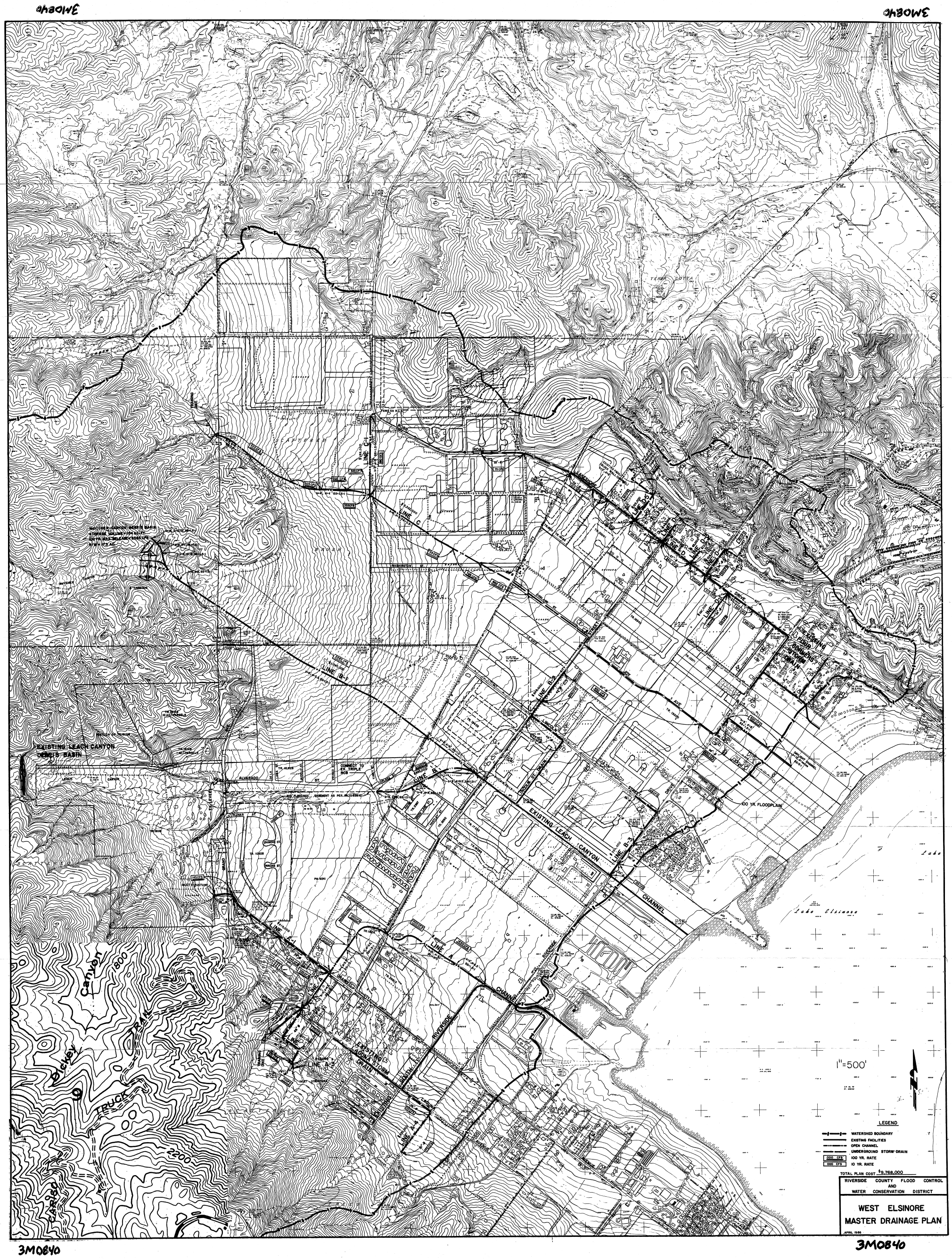
P.O. BOX 1049, LAKE ELSINORE, CA 92330
620 WEST GRAHAM AVE. (714) 674-1481

HYDROLOGY MAP
SEDCO MDP
LINE "F" - STAGE 2

PROJECT No.	80021
DRAWING No.	
SHEET No.	1 OF 1

OCT 10 1990

3M0840



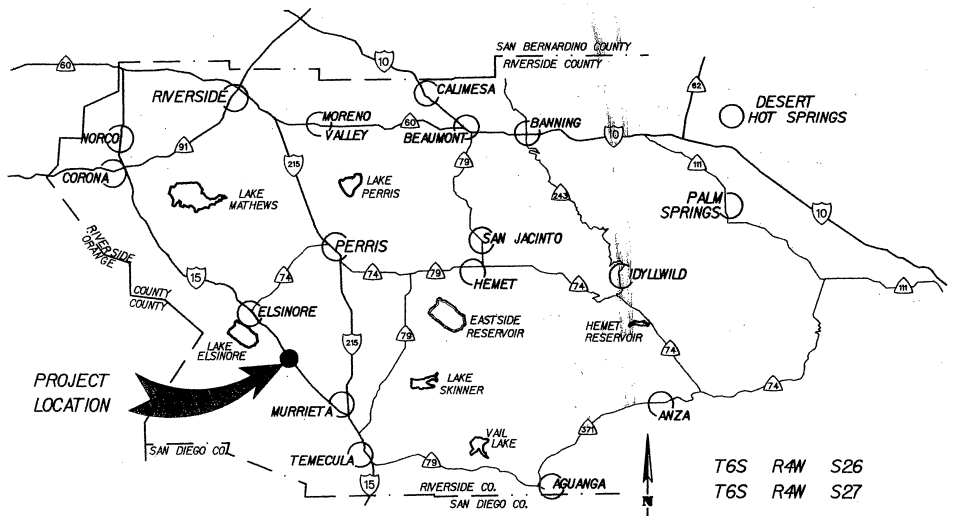
3M0840

Appendix I

Storm Drain Plan for Construction of SEDCO MDP Line “F” Stage 2

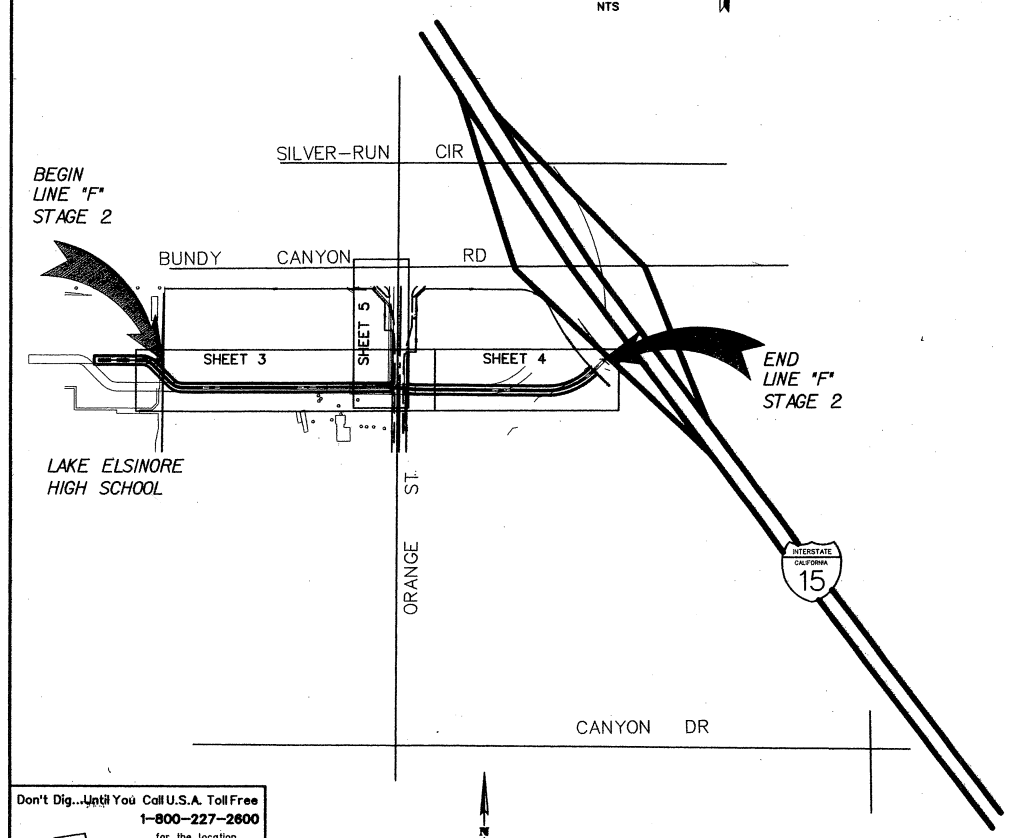
(For Reference)

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT



VICINITY MAP

NTS



INDEX MAP

NTS

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.

TWO WORKING DAYS BEFORE YOU DIG

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S M.O.U. STANDARD SPECIFICATIONS DATED SEPTEMBER 1984, AND DESIGN MANUAL STANDARD DRAWINGS DATED APRIL 2004.
2. AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL. CONTACT ED LOTZ AT 951/955-1266. AFTER THE PERMIT IS ISSUED THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. CONTACT DALE ANDERSON AT 951/955-1288. THE DISTRICT MUST BE NOTIFIED TWENTY DAYS (20) PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON U.S.C. & G.S DATUM.
8. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
9. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
10. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
11. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
12. PIPE BEDDING SHALL CONFORM TO RCFC&WCD STD. DWG. NO. M815 EXCEPT FOR COVER <2 FEET. FOR COVER <2 FEET, CONCRETE SLURRY (2000 PSI - 2 SACK) SHALL BE USED. THE ENTIRE TRENCH SHALL BE SLURRY EXTENDING 4 INCHES MINIMUM AND 12 INCHES MAXIMUM ABOVE THE TOP OF PIPE.
13. NOT USED
14. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
15. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS SPECIFIED.
16. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
17. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
18. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
19. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
20. APPROVAL OF THESE PLANS BY THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
21. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
22. OWNERSHIP AND MAINTENANCE OF FLOOD CONTROL IMPROVEMENTS ARE:

SEDCO MDP LINE "F" STAGE 2	RCFC & WCD
SEDCO MDP 36" LATERAL "G"	R.C. TRANSPORTATION DEPARTMENT
24" RCP & 60" CSP	CALTRANS

23. THIS PROJECT IS BONDED AND TO BE INSPECTED BY TRANSPORTATION PERMIT DIVISION OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT UNDER IP 050108

INDEX

	SHEET NO.:
TITLE SHEET	1
NOTES	2
PLAN & PROFILE - LINE "F"	3-4
PLAN & PROFILE - ORANGE ST. LATERAL	5
SECTIONS & DETAILS	6
STANDARD DETAILS	7-12

R.C.F.C. & W.C.D. STANDARD DRAWINGS

CB 110	CONCRETE DROP INLET
MH 253	MANHOLE NO. 3
MH 255	MANHOLE FRAME AND COVER (NON-ROCKING)
MH 257	MANHOLE SHAFT
MH 259	STANDARD DROP STEP
M 806	PIPE SUPPORT ACCROSS TRENCH
M 811	SIGNS AND MARKERS
M 814	ABBREVIATIONS AND SYMBOLS
M 815	BEDDING AND PAY LINES
M 816	CONCRETE PIPE BULKHEAD

APWA STANDARD PLANS

221-1	PIPE ANCHORS AND BACKFILL STABILIZERS
308-1	MONOLITIC CATCH BASIN CONNECTION, SIDE CONNECTION
320-1	MANHOLE PIPE TO PIPE MAIN LINE 36" OR LARGER
322-1	MANHOLE PIPE TO PIPE
332-1	JUNCTION STRUCTURE PIPE TO PIPE
340-1	TRANSITION STRUCTURE PIPE TO PIPE
380-2	CONCRETE COLLAR FOR RCP 12" TROUGH 72"

CALTRANS STANDARDS

T3	TEMPORARY RAILING TYPE K

SURVEY INFORMATION

BASIS OF BEARING IS THE CENTERLINE OF CANYON DRIVE; BEING N89°33'02"W PER P.M. 37/81

BENCH MARK:
STAMPING: E-7-70 (RIVERSIDE COUUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70. ELEVATION 1345.285 FEET (NAVD29)

RECEIVED JUN 13 2006 BY:

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33950 Exp. 06/30/08 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK

STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70. ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY:
WHEELER & GRAY
CONSULTING ENGINEERS
650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
Tel. No. 626-432-5850 Fax No. 626-432-5858
ENGINEER, RCE# DATE: 6-7-06

REGISTERED PROFESSIONAL ENGINEER MARY K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

SEDCO MDP
LINE "F" STAGE 2
TITLE SHEET

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 1 OF 12

3564

GENERAL NOTES

1. NO CONCRETE SHALL BE PLACED UNTIL THE FORMS AND REINFORCING STEEL HAVE BEEN PLACED, INSPECTED AND APPROVED BY THE PROJECT INSPECTOR.
2. ALL UNDERGROUND WORK SHALL BE COMPLETED PRIOR TO PAVING OF STREETS.
3. LOCATION OF UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS PER AVAILABLE RECORDS.CONTRACTOR IS RESPONSIBLE, AT HIS EXPENSE, FOR VERIFYING THE ACTURAL LOCATION AND ELEVATION IN THE FIELD. THE CONTRACTOR SHALL CALL USA AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATING.
4. THE WALLS AND FACES OF ALL EXCAVATIONS GREATER THAN (5) FEET IN DEPTH SHALL BE EFFECTIVELY GUARDED BY A SHORING SYSTEM, SLOPING OF THE GROUND OR OTHER APPROVED METHODS. TRENCHES LESS THAN FIVE (5) FEET IN DEPTH SHALL ALSO BE GUARDED WHEN EXAMINATION INDICATES GROUND MOVEMENT MAY BE EXPECTED.
5. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM EXCAVATION OR TRENCH WORK AS DESCRIBED IN NOTE #4 ABOVE FROM CAL OSHA.
6. ALL MANHOLES SHALL BE CONSTRUCTED 6" BELOW PAVEMENT GRADE AND BROUGHT TO FINISHED GRADE BY THE PAVING CONTRACTOR AFTER PAVEMENT IS CONSTRUCTED. IN AREAS WHERE THERE WILL BE NO PAVING, MANHOLES SHALL BE CONSTRUCTED TO 6" ABOVE FINISH GROUND.
7. ALL STORM DRAIN INSTALLATIONS AND CONNECTIONS SHALL BE MADE PER MANUFACTURER'S SUGGESTED METHOD UNLESS OTHERWISE SPECIFIED ON THE PLANS.
8. IF DURING CONSTRUCTION GROUNDWATER IS ENCOUNTERED, CONTRACTOR SHALL PROVIDE AND INSTALL A SYSTEM TO DEWATER SAID AREA, AT HIS OWN EXPENSE AND APPROVED BY THE OWNER AGENCY.
9. NO BACKFILL SHALL TAKE PLACE WITHOUT PRIOR APPROVAL OF WORK BY THE PROJECT INSPECTOR.
10. THE CONTRACTOR SHALL NOT DISTURB EXISTING MONUMENTS OR BENCH MARKS NOTED ON THE PLANS OR FOUND DURING CONSTRUCTION WITHOUT PRIOR NOTIFICATION TO THE ENGINEER. REMOVAL AND REPLACEMENT OF SUCH SHALL BE DONE BY A STATE OF CALIFORNIA LICENSED LAND SURVEYOR. SURVEY MONUMENTS WHICH ARE DESTROYED AS A RESULT OF THIS CONSTRUCTION SHALL BE REPLACED AT CONTRACTOR'S EXPENSE. CONSTRACTOR SHALL NOTIFY THE ENGINEER ONE-WEEK PRIOR TO CONSTRUCTION AND INSURE THAT TIES OF MONUMENTS ARE ESTABLISHED AND REPLACED BY A STATE OF CALIFORNIA LICENSED LAND SURVEYOR.
11. THE CONTRACTOR SHALL MARK-UP A SET RECORD OF PROJECT PLANS WITH ALL CHANGES AND PROVIDE TO THE ENGINEER OF RECORD. ENGINEER OF RECORD SHALL BE RESPONSIBLE TO PROVIDE RECORD DRAWINGS TO THE OWNER AGENCY PRIOR TO ACCEPTANCE OF THE PROJECT.
12. CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL AT ALL TIMES. ALL TRAFFIC CONTROL DEVICES SHALL BE IN PLACE TO THE SATISFACTION OF THE PROJECT INSPECTOR, PRIOR TO START OF WORK. ORANGE STREET MUST BE RETURNED TO TWO-WAY TRAFFIC BY THE END OF EACH WORKDAY.
13. OPEN TRENCHES SHALL NOT BE ALLOWED. AT THE END OF THE WORKDAY UNLESS SECURED BY STEEL PLATES, FENCING OR K-RAIL TO THE SATISFACTION OF THE PROJECT INSPECTOR.
14. CONTRACTOR SHALL BE REQUIRED TO FULFILL ALL THE NPDES PURSUANT REQUIREMENTS.
15. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCY FOUND IN THE CONTRACT PLANS AND SPECIFICATIONS. ANY DESIGN CHANGES MUST BE APPROVED BY PROJECT INSPECTOR AND ENGINEER OF RECORD PRIOR TO CONSTRUCTION.
16. THE CONSTRACTORS SHALL NOTIFY ALL UTILITIES COMPANIES AND AGENCIES PRIOR TO EXCAVATION IN AND AROUND THEIR FACILITIES OR WITHIN THEIR RIGHT OF WAY.
17. THE CONTRACTOR SHALL PROVIDE ACCESS TO LOCAL RESIDENTS AND EMERGENCY SERVICE PERSONNEL AND VEHICLES AT ALL TIMES.
18. THE CONTRACTOR SHALL NOT STORE ANY MATERIAL OR EQUIPMENT IN PUBLIC RIGHT OF WAY WITHOUT WRITTEN APPROVAL FROM THE OWNER AGENCY.
19. SURVEY STAKES SHALL BE REVIEWED AND APPROVED BY THE OWNER ONCE TO ENABLE CONTRACTOR TO CONSTRUCT WORK. CONTRACTOR IS RESPONSIBLE FOR PROTECTING SURVEY STAKES TO CONSTRUCT THE IMPROVEMENTS. IF SURVEY CONTROL STAKES ARE LOST THEY WILL BE REPLACED AT THE CONTRACTORS EXPENSE.
20. SOIL STERILIZING REQUIRED UNDER ALL AC PAVEMENT.
21. IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE PROJECT INSPECTOR AND ENGINEER OF RECORD PRIOR TO PROCEEDING.
22. DUST SHALL BE CONTROLLED BY WATERING DURING ALL CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL DETERMINE HORIZONTAL AND VERTICAL ALIGNMENT OF ALL EXISTING FACILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DIFFERENCES OR CONFLICTS WITH CONSTRUCTION DOCUMENTS.
24. MEASURES SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT ADJACENT PROPERTY AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL ENSURE THAT NO MUD, SILT OR DEBRIS IS CARRIED ONTO OR IMPACTS ADJACENT PROPERTY AS A RESULT OF THEIR OPERATIONS. ANY IMPACTS TO ADJACENT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT CONTRACTOR'S EXPENSE. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER OF RECORD FOR SUCH REPAIR.
25. THE CONTRACTOR SHALL CONDUCT CONSTRUCTION OPERATIONS IN SUCH MANNER THAT STORM OR OTHER WATER MAY PROCEED UNINTERRUPTED ALONG THE NATURAL DRAINAGE COURSE. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER OF RECORD PRIOR TO ALTERING ANY DRAINAGE COURSE.
26. CONTRACTOR SHALL PROTECT RUNOFF WATER FROM POLLUTION BY FUELS, OILS, BITUMENS, OR ANY HARMFUL MATERIALS.
27. CONTRACTOR SHALL IMPLEMENT EROSION CONTROL MEASURES AS NECESSARY TO PROTECT GRADING OPERATIONS AND ADJACENT PROPERTY. EROSION CONTROL SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE PROJECT STORM WATER POLLUTION PROTECTION PLAN (SWPPP).
28. THE CONTRACTOR SHALL RESTORE OR REPLACE IN KIND (OR BETTER) ALL EXISTING IMPROVEMENTS INTENDED TO REMAIN UNDISTURBED DURING CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO STREETS, LANDSCAPING, FENCING, GRADING, AND SIGNS.
29. TYPE AND LOCATION OF UNDERGROUND UTILITIES SHOWN ON PLANS IS NOT GUARANTEE OF ACCURACY OR ALL-INCLUSIVE. CONTRACTOR IS RESPONSIBLE FOR DETERMINATION TO THE TYPE AND LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES AS NECESSARY TO CONSTRUCT PROJECT AND AVOID DAMAGE.
30. CONTRACTOR SHALL POTHOLE AND LOCATE ALL EXISTING UNDERGROUND UTILITIES TO DETERMINE THEIR DEPTH AND LOCATION PRIOR TO CONSTRUCTION.

ENGINEERS NOTICE TO CONTRACTOR

THE EXISTENCE AND APPROXIMATE LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF ENGINEERS KNOWLEDGE, THERE ARE NO EXISTING UTILITIES OR STRUCTURES EXPECT AS SHOWN ON THESE PLANS. THE ENGINEER NEITHER ASSUMES ANY LIABILITY AS TO THE EXACT LOCATION OF SAID LINES NOR FOR UTILITIES OR IRRIGATION LINES WHOSE LOCATIONS ARE NOT SHOWN. THE CONTRACTORS SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY AND IRRIGATION COMPANIES PRIOR TO EXCAVATION TO DETERMINE EXACT LOCATION OF ALL LINES AFFECTING THIS WORK, WHETHER OR NOT SHOWN HEREON, AND FOR ANY DAMAGE OR PROTECTION OF THESE LINES.

THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICES ALERT (U.S.A. PHONE 1-800-227-2600) AT LEAST. TWO WORKING DAYS BEFORE CONSTRUCTION PERMIT SHALL NOT BE VALID UNTIL APPLICANT HAS AN INQUIRE IDENTIFICATION NUMBER ISSUED BY U.S.A.

REINFORCED CONCRETE PIPE (RCP) AND MANHOLE NOTES

1. ALL PIPE LENGTHS ARE MEASURED ALONG HORIZONTAL PROJECTIONS UNLESS OTHERWISE SHOWN.
2. FOR ALL TRENCH EXCAVATIONS, SHORING SHALL BE PROVIDED IN ACCORDANCE WITH STATE OF CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (CAL-OSHA).
3. ALL PIPE BACKFILL MUST BE COMPACTED TO 90% RELATIVE COMPACTION AS DETERMINED BY CAL TEST 231-216. FILLED SAMPLING SHALL BE IN ACCORDANCE WITH TEST 231-216 ALL BACKFILL SHALL BE FREE OF ORGANIC MATERIAL.
4. WIDTH OF MANHOLE STRUCTURES MAY INCREASE TO MEET PIPE ENDS AT OPTION OF CONTRACTOR, PROVIDING ADEQUATE REINFORCING STEEL IS UTILIZED. ANY CHANGE IN MANHOLES MUST BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
5. FLOOR OF MANHOLE STRUCTURES SHALL BE STEEL TROWELLED TO SPRING LINE.
6. BODY OF MANHOLE STRUCTURES SHALL BE POURED IN ONE CONTINUOUS OPERATION TO THE SPRING LINE WITH A LONGITUDINAL KEYWAY.
7. RCP SHALL COMPLY WITH ALL ASTM AND RCFC&WCD STANDARDS.
8. STATIONS SHOWN ON THE DRAWINGS FOR THE RCP ARE ALONG CENTER LINE OF PIPE IN PLAN AND ON A LINE NORMAL TO CENTER LINE IN PROFILE.
9. HIGH STRENGTH RCP SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL REQUIREMENTS FOR REGULAR RCP WITH 5000 PSI (34.5 MPA) COMPRESSIVE STRENGTH AND AN ADDITIONAL 1-1/2" CONCRETE COVER OVER REINFORCING STEEL.

RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT

GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER OR CONTRACTOR TO APPLY TO THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN COUNTY ROADWAY RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT. ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM COUNTY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION. PHONE: (951) 955-6790.
3. ALL WORK WITHIN COUNTY ROADWAY RIGHT-OF-WAY SHALL CONFORM TO THE REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, LATEST EDITION, COUNTY ORDINANCE NO. 461 AND SUBSEQUENT AMENDMENTS.
4. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO APPLY TO THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN THE STATE RIGHT-OF-WAY.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR DEVELOPER TO INSTALL AND MAINTAIN ALL CONSTRUCTION, REGULATORY, GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.
6. EXISTING STORM DRAIN CULVERTS, WHETHER TO BE CONNECTED TO, EXTENDED, ADJUSTED, OR DRAINED TO OR FROM; MUST BE REPAIRED AND/OR CLEANED TO MAKE THEM FUNCTIONAL AND ACCEPTABLE AS DIRECTED BY THE TRANSPORTATION DEPARTMENT.

SEAL-COUNTY
REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33950 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK
STAMPING: E-7-70 (RIVERSIDE COUNTY)
352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

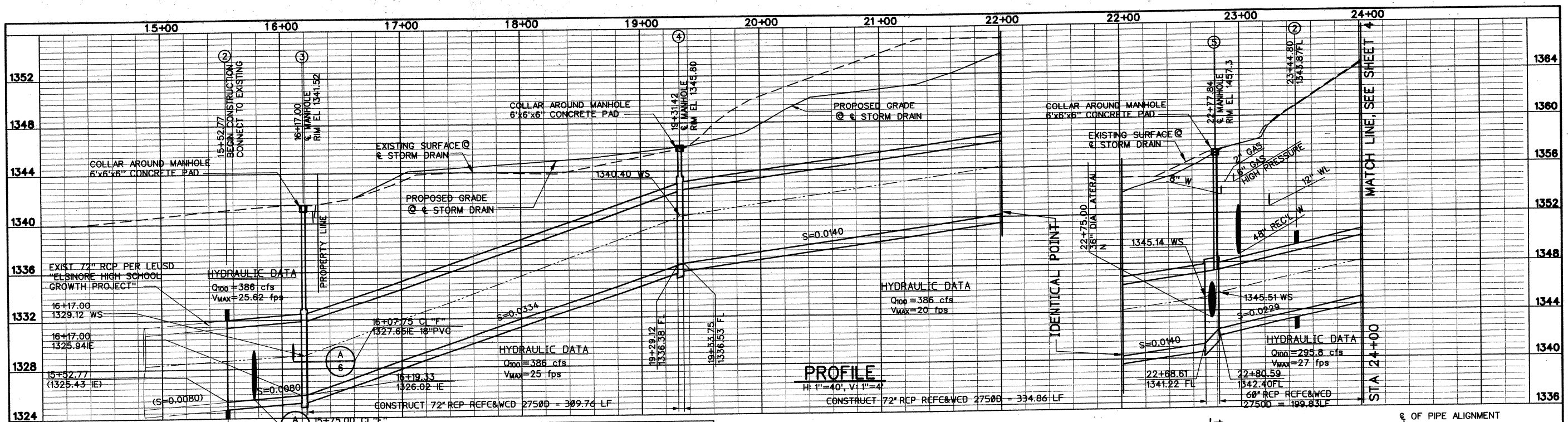
APPROVED BY:
WHEELER & GRAY
650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
PH. 626-432-5850 Fax No. 626-432-5858
ENGINEER, RCE 6-7-06 DATE:
REGISTERED PROFESSIONAL ENGINEER MARK K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

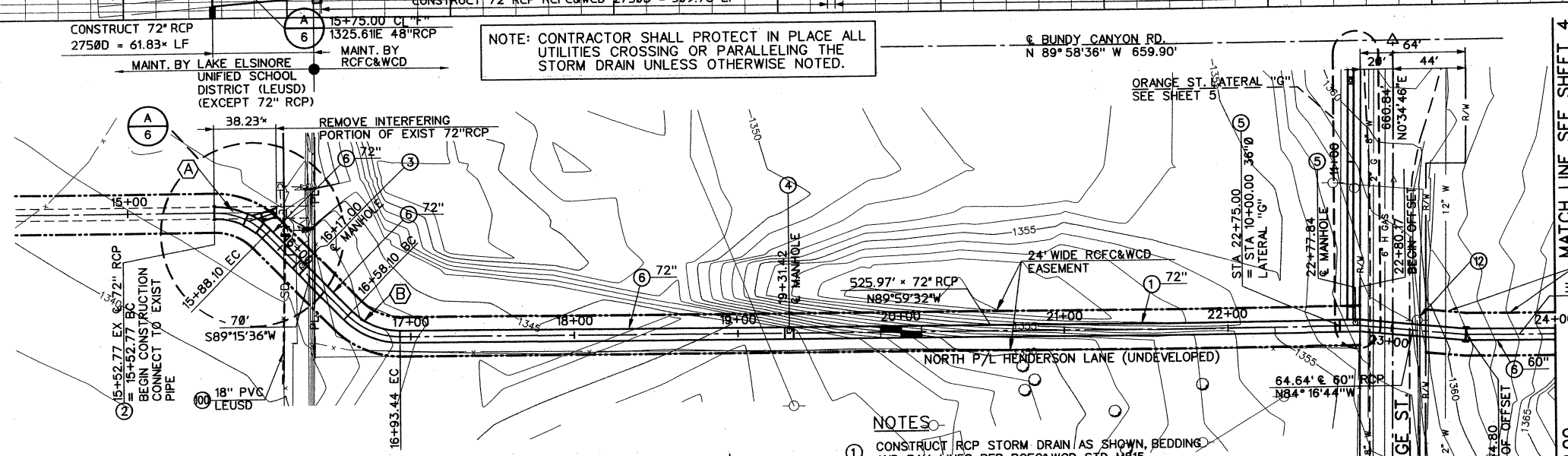
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

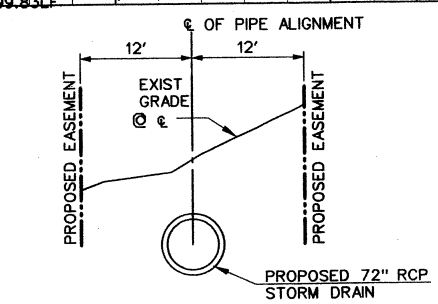
SEDCO MDP
LINE "F" STAGE 2
NOTES

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 2 OF 12



NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.





SECTION AT STA 20+00 LOOKING DOWNSTREAM

10' 0 10'
1"=10'

PLAN

40' 0 40'

Ⓐ ℄ CURVE DATA
- Δ = 45° 00' 00"
- R = 45.00'
- L = 35.34'
- T = 18.64'
- BC = STA 15+52.77
- EC = STA 15+88.10

Ⓑ ℄ CURVE DATA
- Δ = 45° 00' 00"
- R = 45.00'
- L = 35.34'
- T = 18.64'
- BC = STA 16+58.10
- EC = STA 16+93.44

NOTES

1. CONSTRUCT RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD STD M815
2. CONSTRUCT CONCRETE COLLAR PER APWA STANDARD PLAN 380-2
3. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 320-1 STA 16+17.00 D_1 =72",D_2 =72", F=11", L=5.5', P=5"
4. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 320-1 STA 19+31.42 D_1 =72",D_2 =72", F=11", L=5.5', P=5"
5. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA 322-1 STA 22+77.84 ORANGE ST. LATERAL "G" NORTH: A=90° 0'0", B=36", C=5',D_1 =60", D_2 =72", ELEV R=1343.60, ELEV S=1343.44
6. CONSTRUCT HIGH STRENGTH RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD M815, SEE NOTES ON SHEET 2.

(12) EXISTING UTILITY POLE TO RELOCATED BY OTHERS. CONTRACTOR TO COORDINATE WITH THE UTILITY COMPANY

(13) CONSTRUCT CONCRETE JUNCTION STRUCTURE PER APWA STD PLAN 332-1 CASE 1 WITH CONCRETE BACKFILL

(20) CONSTRUCT CONCRETE TRANSITION STRUCTURE PIPE TO PIPE PER APWA STANDARD PLAN 340-1 TO DIMENSIONS SHOWN ON THE DETAIL

(21) CONNECT 48" RCP TO EXIST MANHOLE PER APWA STANDARD PLAN 308-1 MONOLITHIC SIDE CONNECTION

(50) REMOVE EXISTING IMPROVEMENTS

(51) REMOVE AND RECONSTRUCT EXISTING IMPROVEMENT

(100) PROTECT IN PLACE EXISTING IMPROVEMENT

SEAL-COUNTY
REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33950 Exp. 06/30/08 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT 08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK

STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70. ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY
250 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107 Tel. No. 626-432-5850 Fax No. 626-432-5858
ENGINEER/ARCE — DATE: 6-7-06

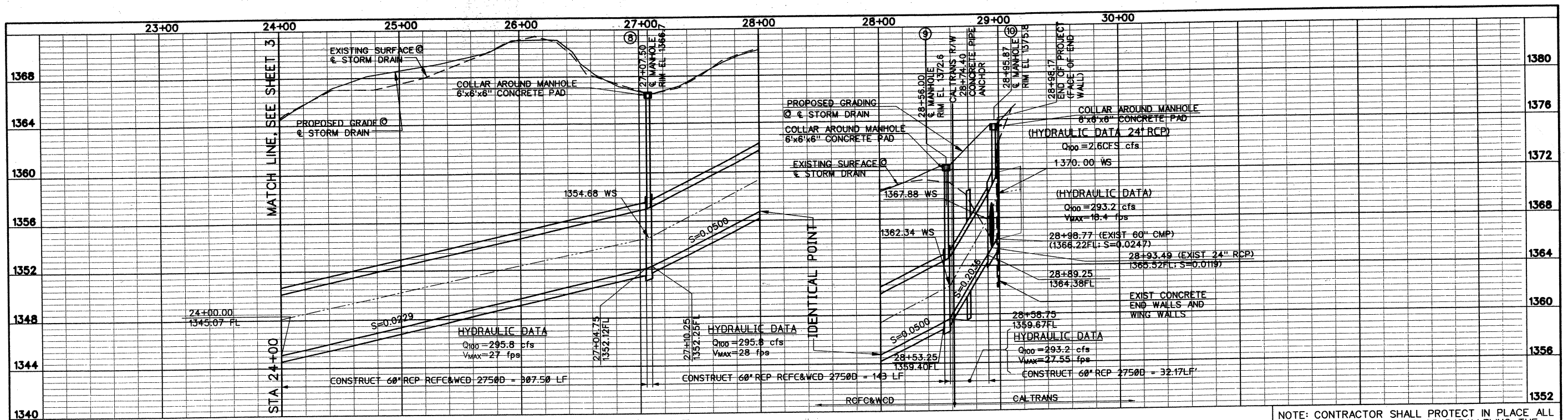
REGISTERED PROFESSIONAL ENGINEER MARK R. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: — PLANNING ENGINEER — DATE:
APPROVED BY: — CHIEF ENGINEER — DATE:

COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN — DATE:
RECOMMENDED — DATE:

SEDCO MDP
LINE "F" STAGE 2
STA 15+52.77 TO STA 24+00.00

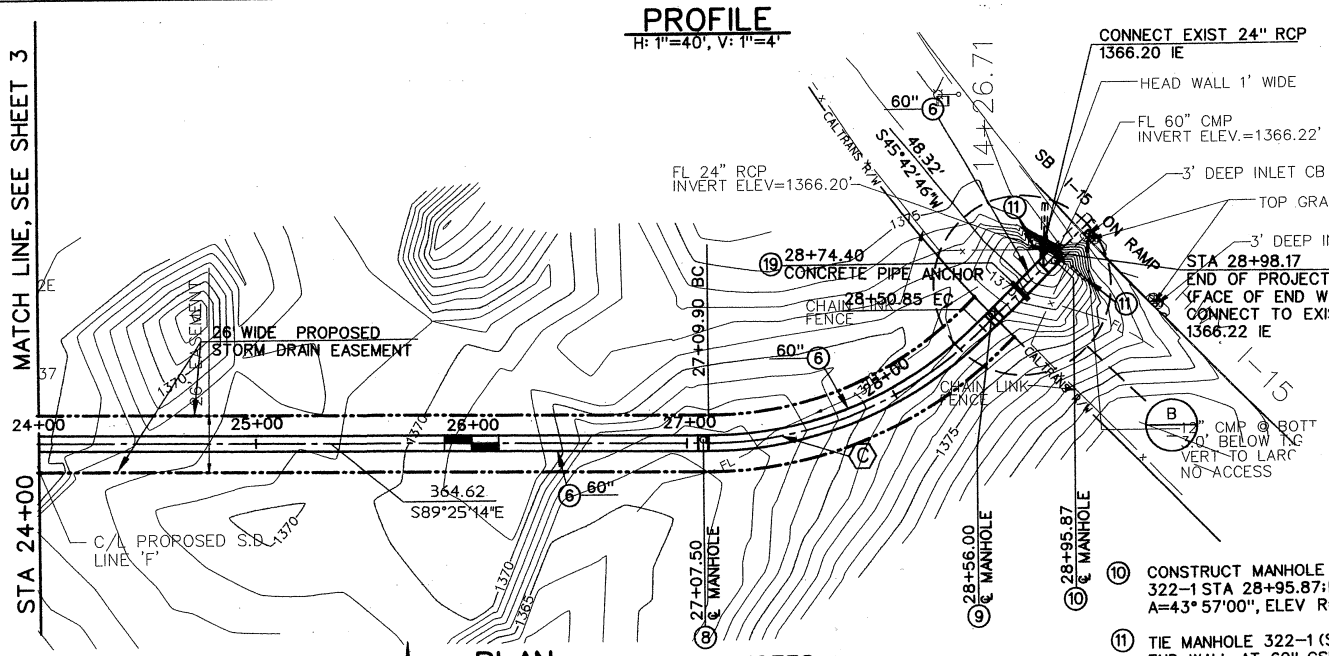
PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 3 OF 12



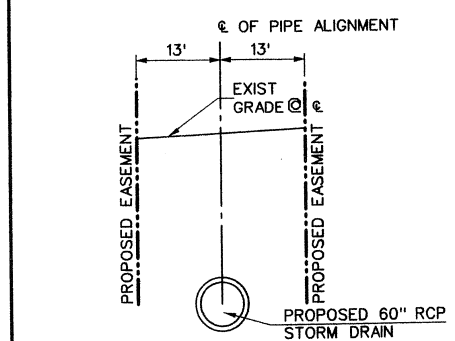
PROFILE

H: 1"=40', V: 1"=4'

NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.

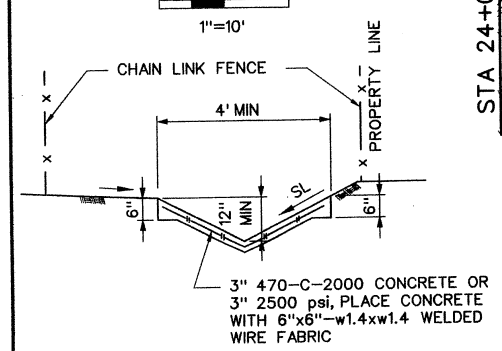


PLAN



SECTION AT STA 26+00 LOOKING DOWNSTREAM

10' 0 10'
1"=10'



BROW DITCH DETAIL (D/3)

NO SCALE

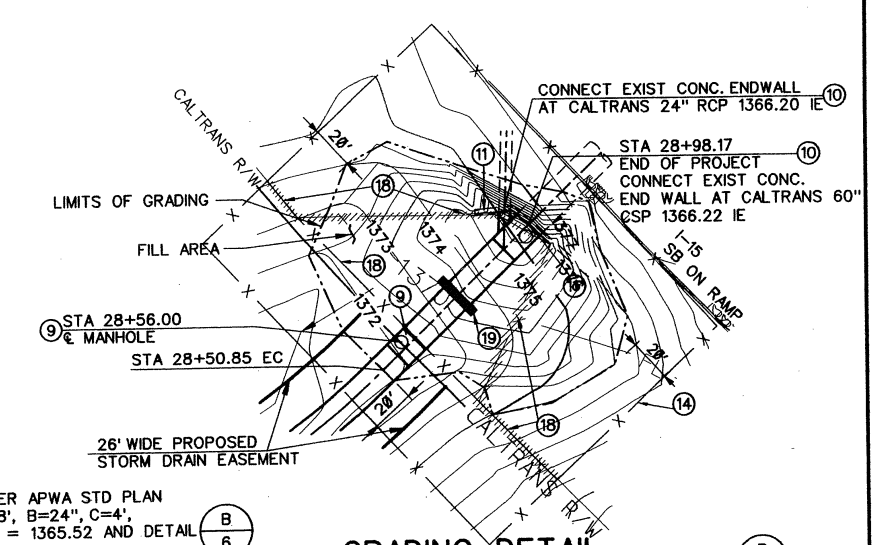
℄ CURVE DATA

Δ = 44° 52' 00"
R = 180.00'
L = 140.95'
T = 74.31'
BC = STA 27+09.90
EC = STA 28+50.85

40' 0 40'

NOTES

1. CONSTRUCT RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC & WCD STD M815
6. CONSTRUCT HIGH STRENGTH RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD M815, SEE NOTES ON SHEET 2.
8. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 320-1 STA 27+07.50: D_1=60", D_2=60", F=9½", L=5.5', P=5"
9. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 320-1 28+56.00: D_1=60", D_2=60", F=9½", L=5.5', P=5"
10. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 322-1 STA 28+95.87: D_1=60", D_2=60", L=8', B=24", C=4', A=43° 57'00", ELEV R=1365.57 ELEV S = 1365.52 AND DETAIL (B/6)
11. TIE MANHOLE 322-1 (SEE 10 ABOVE) TO EXIST CONC. END WALL AT 60" CSP AND 24" RCP WITH #3 BARS, 6" EMBEDMENT @ 12" O.C. ALL SIDES PER DETAIL (B/6)
14. TEMPORARY CONSTRUCTION FENCE SHALL BE INSTALLED AROUND AREA OF WORK WITHIN CALTANS R/W AND REMOVED IMMEDIATELY AFTER WORK HAS BEEN COMPLETED.
18. REMOVE INTERFERING PORTIONS OF FENCE ONLY AFTER TEMPORARY FENCE INSTALLED. REPLACE WITH NEW FENCE AT CALTRANS R/W ONCE CONSTRUCTION IS COMPLETE.
19. CONSTRUCT REINFORCE CONCRETE PIPE ANCHOR PER APWA STD PLAN 221-1, L=16'



GRADING DETAIL (B/–)

CALTRANS ENCROACHMENT PERMIT 08-05-N-DD-0379

BENCH MARK	REVISIONS	ENGINEER	RCFC/LEUSD	DESIGNED BY: M. KINSLER
STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70. ELEVATION 1345.285 FEET (NAVD29)	REF. / DESCRIPTION	APPR. / DATE	APPR. / DATE	DRAWN BY: J. GALURA; DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY, 250 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107, PHONE NO. 626-432-5850, Fax No. 626-432-5858
ENGINEER, RCE — DATE: 6-7-06
REGISTERED PROFESSIONAL ENGINEER — MARK K. KINSLER — No. C44025 — Exp. 06/30/07 — CIVIL — STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER — DATE:
APPROVED BY: CHIEF ENGINEER — DATE:

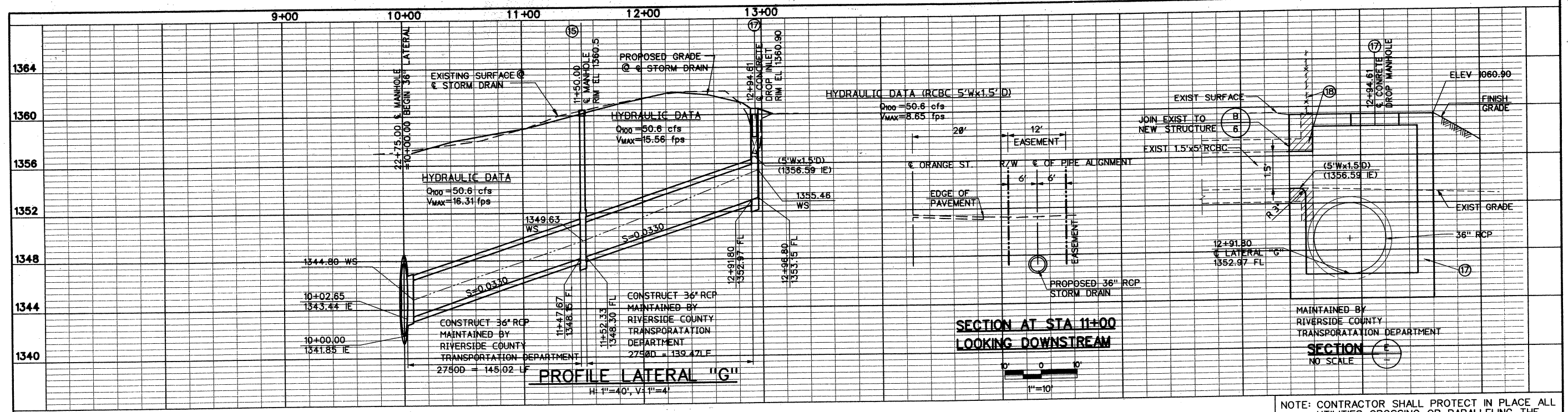
MS 4033 IP 050108

SEDCO MDP

LINE "F" STAGE 2

STA 24+00.00 TO STA 28+98.17±

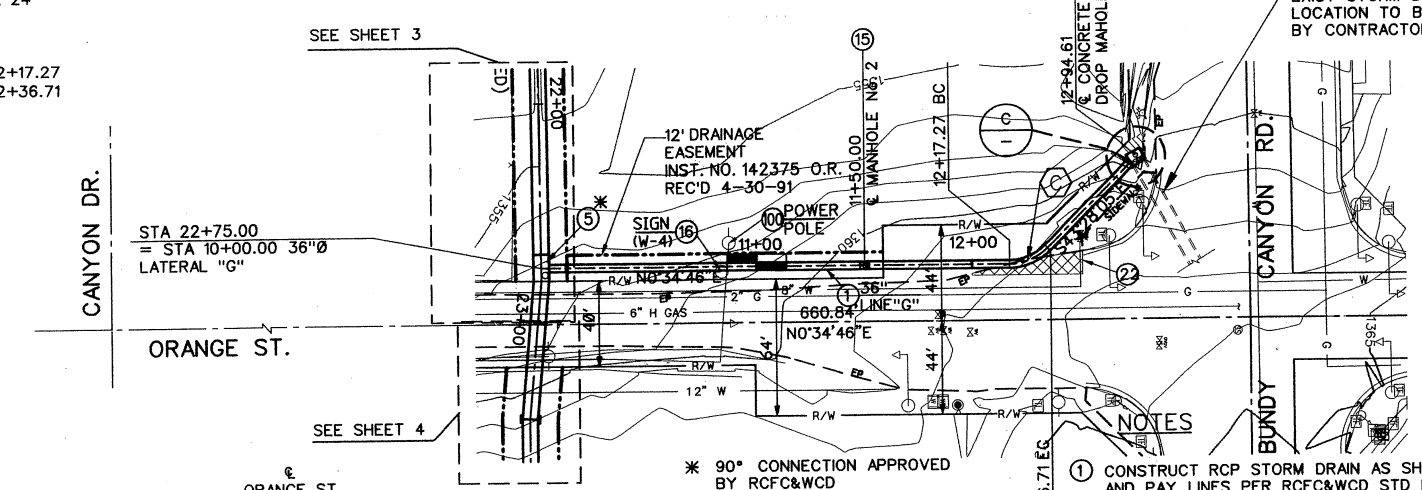
PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 4 OF 12



NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.

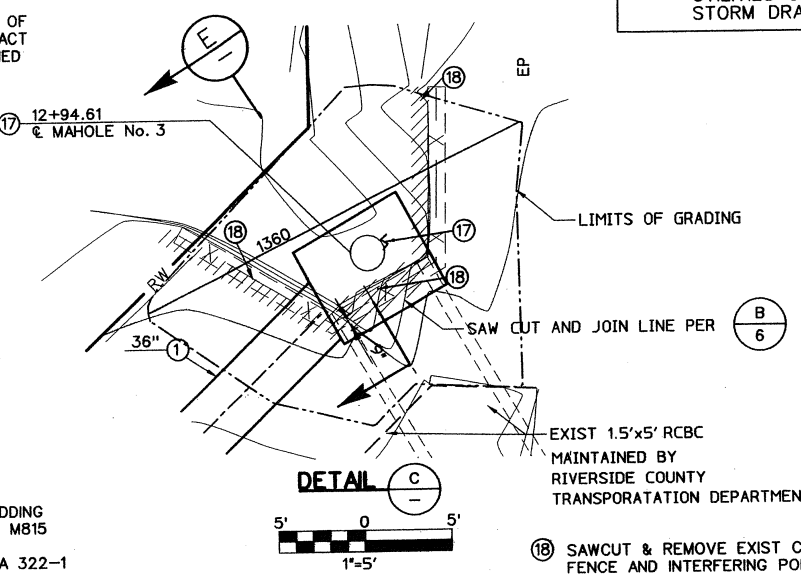
Ⓒ ℄ CURVE DATA

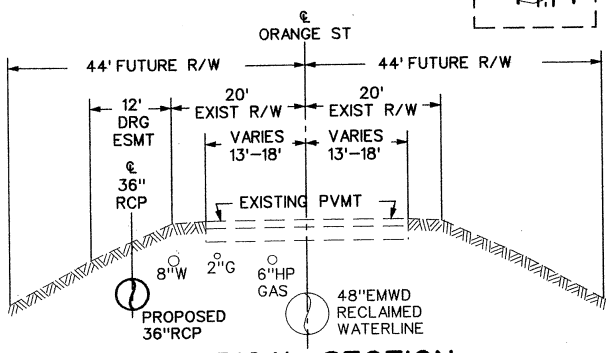
Δ = 45° 32' 24"
R = 25.00'
L = 19.44'
T = 10.49'
BC = STA 12+17.27
EC = STA 12+36.71



LATERAL "G"
PLAN

40' 0 40'





TYPICAL SECTION
N.T.S.

LEGEND

- REMOVE EXIST CONC STRUCTURE AS SHOWN
- REMOVE AND REPLACE EXIST PAVEMENT AS SHOWN

NOTES

1. CONSTRUCT RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD STD DWG NO M815
5. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA 322-1 SEE SHEET 7 OF 9
6. CONSTRUCT HIGH STRENGTH RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD M815, SEE NOTES ON SHEET 2.
7. CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD DWG NO M816
15. CONSTRUCT MANHOLE PIPE TO PIPE PER APWA STD PLAN 320-1 STA 11+50.00 D_1 =36",D_2 =36", L=5.50', F=6", P=5", SEE SHEET 7 OF 9
16. RELOCATE EXIST SIGN (W-4: WARNING-ROAD NARROWS), ON NEW SIGN POST AND FOOTING PER RCFC&WCD STD DWG NO M811
17. CONSTRUCT MODIFIED CONCRETE DROP MANHOLE PER RCFC&WCD STD DWG NO. CB110 STA 12+93.97 H=1.5, V=3.5', W=5.58', T=8", A=4.5' ORIENT SIDE OPENING TO EXISTING RCBC; TIE IN WITH #3 BARS, 12" EMBEDMENT @ 12" O.C. ALL SIDES PER DETAIL B/6 MODIFIED MANHOLE SHAFT PER MANHOLE No. 3 RCFC & WCD STD DWG NO. MH253
18. SAWCUT & REMOVE EXIST CONCRETE ENDWALL, CHAIN LINK FENCE AND INTERFERING PORTIONS OF RCBC
22. SAWCUT & REMOVE INTERFERING PORTIONS OF EXISTING PAVEMENT SECTION. REPLACE WITH 6" AC PAVEMENT OR AS DIRECTED BY RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT.

SEAL-COUNTY: REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33950 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK

STAMPING: E-7-70 (RIVERSIDE COUNTY)
352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY
260 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
Tel. No. 626-432-5850 Fax No. 626-432-5858
ENGINEER, RCE — DATE: 6-7-06

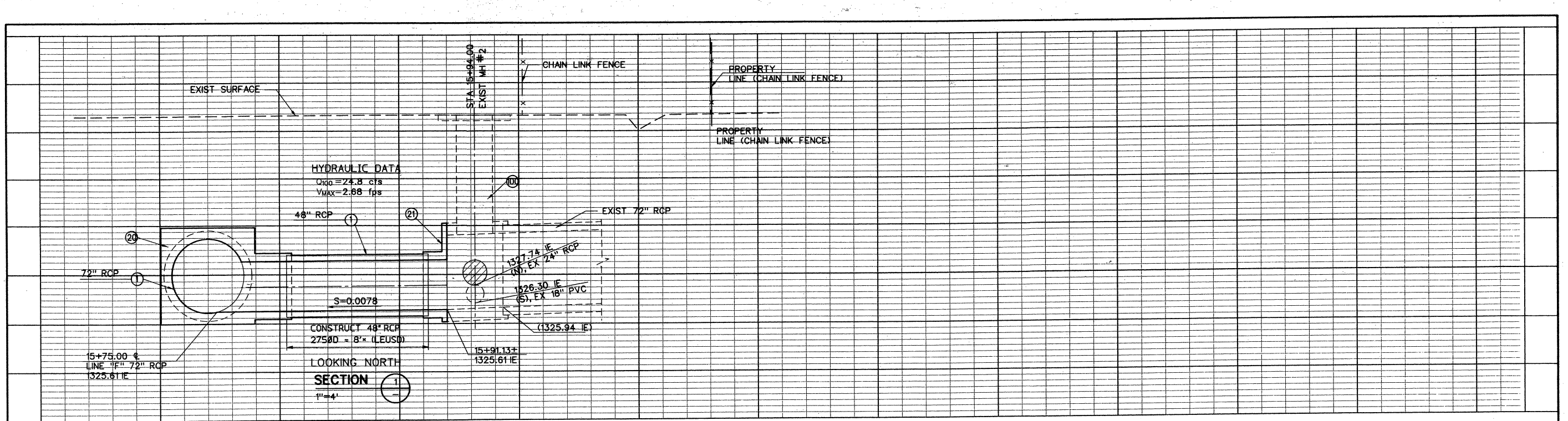
REGISTERED PROFESSIONAL ENGINEER MARY K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

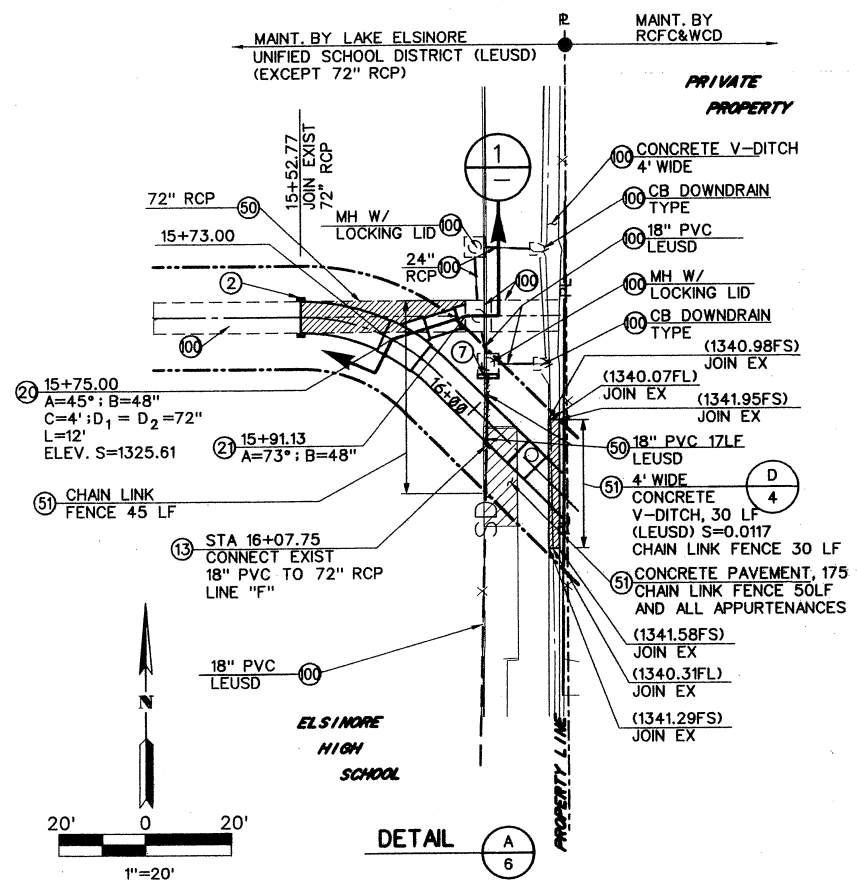
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

SEDCO MDP
36" LATERAL "G"
STA 10+00.00 TO STA 12+96.80

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 5 OF 12





NOTES

SEE SHEETS 1 THROUGH 5 FOR MAINTENANCE OF FACILITIES

(1) CONSTRUCT RCP STORM DRAIN AS SHOWN, BEDDING AND PAY LINES PER RCFC&WCD STD M815

(7) CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD DWG NO M816

(13) CONSTRUCT CONCRETE JUNCTION STRUCTURE PER APWA STD PLAN 332-1 CASE 1 WITH CONCRETE BACKFILL

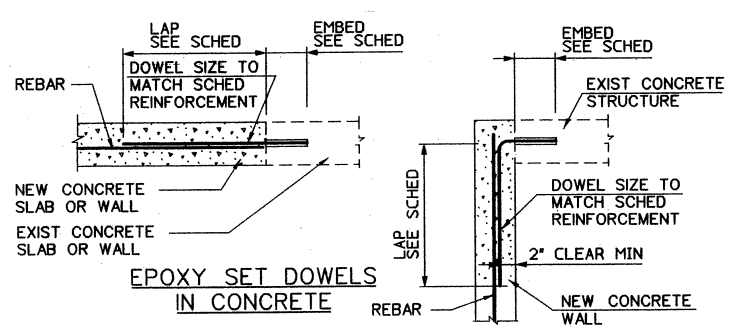
(20) CONSTRUCT CONCRETE TRANSITION STRUCTURE PIPE TO PIPE PER APWA STANDARD PLAN 340-1 TO DIMENSIONS SHOWN ON THE DETAIL

(21) CONNECT 48" RCP TO EXIST MANHOLE PER APW STANDARD PLAN 308-1 MONOLITHIC SIDE CONNECTION WITH #3 BARS, 6" EMBEDMENT @ 12" O.C. ALL SIDES AND DETAIL B 6

(50) REMOVE EXISTING IMPROVEMENTS

(51) REMOVE AND RECONSTRUCT EXISTING IMPROVEMENT

(100) PROTECT IN PLACE EXISTING IMPROVEMENT



EPOXY SET DOWELS IN CONCRETE

DETAIL B 6

EPOXY SET DOWELS IN CONCRETE

1. MATERALS:
   A. DOWELS: AS SPECIFIED UNDER REINFORCING STEEL.
   B. EPOXY SYSTEM: COVERT INJECTION ADHESIVE ANCHOR SYSTEM (CIA-GEL EPOXY), OR SIKADUR INJECTION GEL BY SIKA CORPORATION, OR SIMPSON APPROVAL EQUAL.
   C. CONFORM TO MANUFACTURER'S WRITTEN INSTRUCTIONS. ADEQUATE MIXING IS CRITICAL TO PERFORMANCE OF EPOXY SYSTEMS.
2. DRILLING HOLES: TO DEPTH AND DIAMETER INDICATED ON DRAWINGS, OR WHERE NOT SHOWN, TO HOLE SIZES INDICATED ON SCHEDULE BELOW, WHICH ARE BASED ON DEVELOPING THE FULL TENSILE STRENGTH OF THE BAR FOR CORRECTLY INSTALLED DOWELS. DRILL USING ROCK BITS TO PRODUCE CLEAN, ROUGH HOLES WITH NO DRILLING DUST EMBEDDED IN HOLE SIDES.

SCHEDULE OF HOLE SIZES

REBAR OR ALL THREADED ROD	HOLE DEPTH & DIAMETER	REBAR OR ALL THREADED ROD	HOLE DEPTH & DIAMETER (UNO)
#3	4-1/2"x1/2" DIA	#6	10"x1" DIA
#4	6-1/2x5/8" DIA	#7	11"x1-1/8" DIA
#5	8"x3/4" DIA	#8	12x1-1/4" DIA

3. INSTALL EPOXY IN HOLES , WHETHER THEY BE OVERHEAD, HORIZONTAL, OR DOWN HAND PER MANUFACTURER'S RECOMMENDATIONS, SO AS TO DEVELOP BAR CAPACITY.
4. TESTING: PROOF TESTING REQUIRED FOR 33% OF DOWELS SET, ONE TEST FOR EVERY 3 DOWELS SET FOR THE WORK. TEST CRITERIA IS TO BE 80 PERCENT OF THE YIELD STRENGTH OF THE BAR TESTED, WITHOUT INDICATION OF ANY LOOSENING OR OUTWARD MOVEMENT OF THE DOWEL AND NO CRACKING OR SPALLING OF THE CONCRETE IN WHICH THE DOWEL IS SET. DOWELS FAILING THE PROOF TEST SHALL REQUIRE ANOTHER DOWEL TO BE SET AND TESTED.

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

BENCH MARK

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ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS	ENGINEER		RCFC/LEUSD	
	DESCRIPTION	APPR.	DATE	APPR.	DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY
650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
Ph. 626-432-5850 Fax No. 626-432-5858
ENGINEER, RCE — DATE: 6-7-06

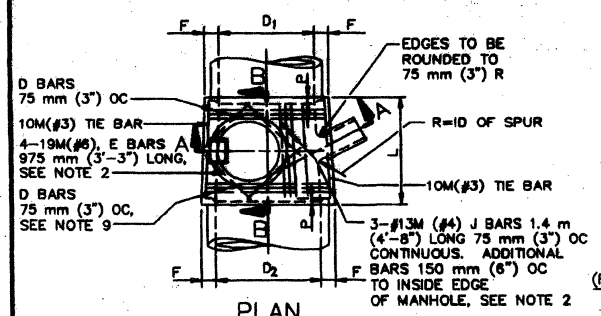
REGISTERED PROFESSIONAL ENGINEER MARK K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: — PLANNING ENGINEER — DATE:
APPROVED BY: — CHIEF ENGINEER — DATE:

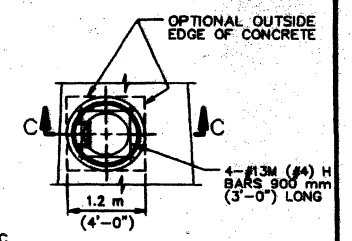
MS 4033 IP 050108

SEDCO MDP
LINE "F" STAGE 2
SECTIONS & DETAILS

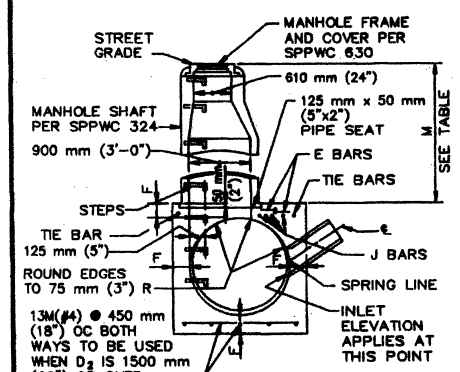
PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 6 OF 12



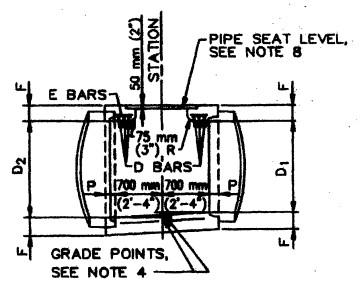
PLAN
(SHAFT NOT SHOWN)



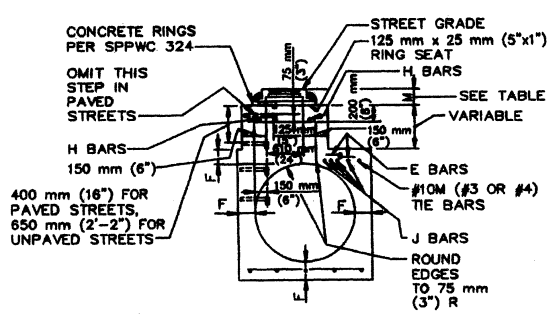
DETAIL "N"
(RINGS AND COVER NOT SHOWN)
(SEE NOTE 1)



SECTION A–A



SECTION B–B



SECTION C–C

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996

MANHOLE PIPE TO PIPE MAIN LINE ID=900 mm (36") OR LARGER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC 320-1

SHEET 1 OF 4

STRUCTURAL DATA							
B	t	C BARS	D&E BARS	B	t	C BARS	D&E BARS
300 mm (12")	115 mm (4")	#13M @ 150 mm (#4 @ 6")	#16M (#5)	1050 mm (42")	190 mm (7 1/2")	#16M @ 150 mm (#5 @ 6")	#19M (#6)
375 mm (15")	115 mm (4 1/4")			1125 mm (45")	190 mm (7 3/4")		
450 mm (18")	115 mm (4 1/2")			1200 mm (48")	215 mm (8")		
525 mm (21")	140 mm (5")			1275 mm (51")	215 mm (8 1/2")		
600 mm (24")	140 mm (5 1/4")			1350 mm (54")	240 mm (9")		
675 mm (27")	140 mm (5 1/2")			1425 mm (57")	240 mm (9 1/4")		
750 mm (30")	165 mm (6")			1500 mm (60")	240 mm (9 1/2")		
825 mm (33")	165 mm (6 1/4")			1575 mm (63")	260 mm (10")		
900 mm (36")	165 mm (6 1/2")			1650 mm (66")	260 mm (10 1/4")		
975 mm (39")	190 mm (7")			1725 mm (69")	280 mm (10 3/4")		
				1800 mm (72")	280 mm (11")		
FOR B GREATER THAN 1800 mm (72") SEE PLANS							

NOTES

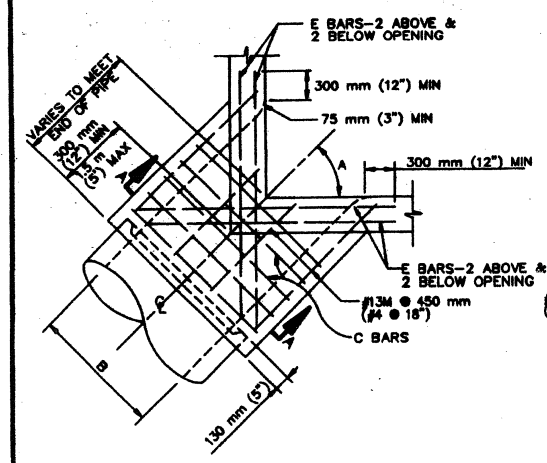
1. REINFORCING STEEL SHALL BE 40 mm (1-1/2") CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 50 mm (2") CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 75 mm (3").
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
   (A) PIPES INLET OR OUTLET THROUGH CORNER OF CATCH BASIN
   (B) ANGLE A FOR PIPES THROUGH 750 mm (30") IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

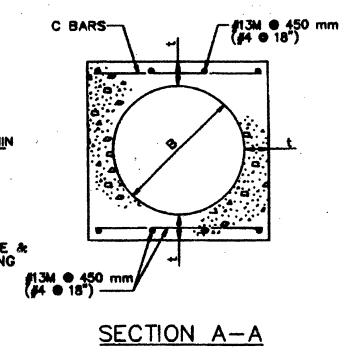
MONOLITHIC CATCH BASIN CONNECTION

STANDARD PLAN METRIC 308-1

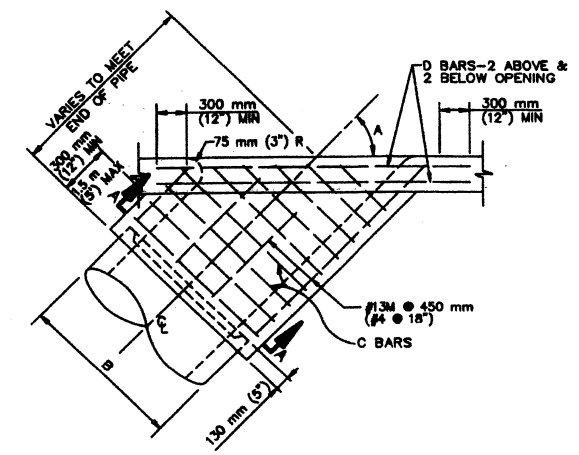
SHEET 2 OF 2



PLAN
CORNER CONNECTION



SECTION A–A



PLAN
SIDE CONNECTION

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC., GREENBOOK COMMITTEE 1994 REV. 1996

MONOLITHIC CATCH BASIN CONNECTION

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC 308-1

SHEET 1 OF 2

SEAL-COUNTY: REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33958 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK
STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE
	REVISIONS	ENGINEER		RCFC/LEUSD	

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY CONSULTING ENGINEERS, 650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107, Tel. No. 626-432-5850, Fax No. 626-432-5858
ENGINEER/RCE — DATE: 6-7-06

REGISTERED PROFESSIONAL ENGINEER MARK K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

SEDCO MDP
LINE "F" STAGE 2
STANDARD DETAILS

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 7 OF 12

B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTERLINE OF THE LATERAL ENTERS THE MANHOLE.

C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 750 mm (30").

13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.

14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.

15. WHERE A MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.

16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.

17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.

18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
326 MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER
328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
329 PRESSURE MANHOLE SHAFT 914 mm (36") WITHOUT REDUCER
630 610 mm (24") MANHOLE FRAME AND COVER
633 914 mm (36") MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE TO PIPE
MAIN LINE ID = 900 mm (36") OR LARGER

STANDARD PLAN METRIC 320-1
SHEET 4 OF 4

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 867 mm (2'-10 1/2") FOR PAVED STREETS OR 1060 mm (3'-6") FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER D_1 IS 1200 mm (48") OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.

2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D_1 IS 1200 mm (48") OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.

3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
A. D_2=2400 mm (96") OR LESS, L=1.7 m (5'-6"), P=130 mm (5")
B. D_2 OVER 2400 mm (96"), L=1.8 m (6'-0"), P=210 mm (8")
L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 150 mm (6") OC.

4. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.

5. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 40 mm (1 1/2") CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.

6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.

7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.

8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON SHEET 2.

9. D BARS SHALL BE #13M (#4) FOR D_2=975 mm (39") OR LESS, #16M (#5) FOR D_2= 1050 mm (42") TO 2100 mm (84") INCLUSIVE AND #19M (#6) FOR D_2= 2250 mm (90") OR OVER.

10. CENTERLINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.

11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 350 mm (14") TO 375 mm (15") OC. THE LOWEST STEP SHALL NOT BE MORE THAN 600 mm (24") ABOVE THE INVERT.

12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
A. MAIN LINE = 900 mm (36") INSIDE DIAMETER OR LARGER. EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 900 mm (36") TO 1050 mm (42") INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 825 mm (33") OR LESS SPPWC 321 SHALL BE USED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE TO PIPE
MAIN LINE ID = 900 mm (36") OR LARGER

STANDARD PLAN METRIC 320-1
SHEET 3 OF 4

TABLE OF VALUES FOR F	
D_2	F
900 mm (36")	185 mm (8 1/2")
975 mm (39")	180 mm (7")
1050 mm (42")	190 mm (7 1/2")
1125 mm (45")	195 mm (7 3/4")
1200 mm (48")	205 mm (8")
1275 mm (51")	215 mm (8 1/2")
1350 mm (54")	230 mm (9")
1425 mm (57")	235 mm (9 1/4")
1500 mm (60")	240 mm (9 1/2")
1575 mm (63")	255 mm (10")
1650 mm (66")	260 mm (10 1/4")
1725 mm (69")	275 mm (10 3/4")
1800 mm (72")	280 mm (11")
1950 mm (78")	300 mm (11 3/4")
2100 mm (84")	320 mm (12 1/2")
2250 mm (90")	335 mm (13 1/4")
2400 mm (96")	355 mm (14")
2550 mm (102")	395 mm (15 1/2")
2700 mm (108")	405 mm (16")
2850 mm (114")	420 mm (16 1/2")
3000 mm (120")	430 mm (17")
3150 mm (126")	430 mm (17")
3300 mm (132")	445 mm (17 1/2")
3450 mm (138")	445 mm (17 1/2")
3600 mm (144")	455 mm (18")

TABLE OF VALUES FOR M (SEE NOTE 1)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
A-A		867 mm (2'-10 1/2")		1060 mm (3'-6")
C-C	282 mm (11")	217 mm (8 1/2")	410 mm (16")	380 mm (15")

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE TO PIPE
MAIN LINE ID = 900 mm (36") OR LARGER

STANDARD PLAN METRIC 320-1
SHEET 2 OF 4

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33958 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK
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ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESCRIPTION

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY:
WHEELER & GRAY
CONSULTING ENGINEERS
650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
Tel No. 626-432-5850 Fax No. 626-432-5859
ENGINEER, RCE
6-7-06
DATE:

REGISTERED PROFESSIONAL ENGINEER MARY K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY:
PLANNING ENGINEER
DATE:
APPROVED BY:
CHIEF ENGINEER
DATE:

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY:
KHALED A. OTHMAN
DATE:
RECOMMENDED
DATE:

SEDCO MDP
LINE "F" STAGE 2
STANDARD DETAILS

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 8 OF 12

NOTES

1. VALUES FOR A, B, C, D_1 D_2 ELEVATION R AND ELEVATION S ARE SHOWN ON THE PLANS. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.

2. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 867 mm (2'-10 1/2") FOR PAVED STREETS OR 1060 mm (3'-6") FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER D_1 IS 1200 mm (48") OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 3.

3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTERLINE OF STORM DRAIN WHEN DIAMETER D_1 IS 1200 mm(48") OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.

4. LENGTH OF MANHOLE MAY BE INCREASED AT OPTION TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.

5. P SHALL BE 125 mm (5") FOR D_2=2400 mm (96") OR LESS AND 200 mm (8") FOR D_2 OVER 2400 mm (96").

6. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 40 mm (1 1/2") CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.

7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.

8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.

9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES OF F SHOWN ON TABLE, SHEET 1.

10. IF LATERALS ENTER ON BOTH SIDES OF MANHOLE, SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL.

11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 350 mm (14") TO 375 mm (15") OC. THE LOWEST STEP SHALL NOT BE MORE THAN 600 mm (24") ABOVE THE INVERT.

12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:

    A. THIS STANDARD PLAN IS USED WHEN SPPWC 320 IS INADEQUATE. MAIN LINE = 900 mm (36") INSIDE DIAMETER OR LARGER.

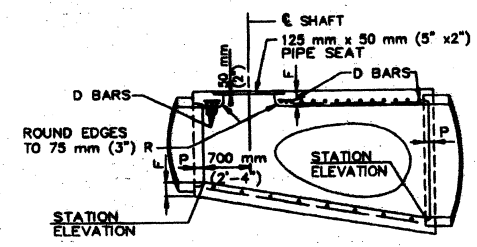
    B. LATERAL = 300 mm (12") TO 3600 mm (144") INSIDE DIAMETER; HOWEVER, THE INSIDE DIAMETER SHALL NOT EXCEED THE INSIDE DIAMETER OF THE MAIN LINE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE TO PIPE (LARGE SIDE INLET)

STANDARD PLAN METRIC 322-1

SHEET 3 OF 4



LONGITUDINAL SECTION

TABLE OF BARS SIZES		
D_1 OR B	A & B	D OR F
300 mm (12")-975 mm (38")	#16M @ 75 mm (#5 @ 3")	#13M @ 150 mm (#4 @ 6")
1050 mm (42")-2100 mm (84")	#19M @ 75 mm (#6 @ 3")	#16M @ 150 mm (#5 @ 6")
2250 mm (90")-3600 mm (144")	#22M @ 75 mm (#7 @ 3")	#19M @ 150 mm (#6 @ 6")

TABLE OF VALUES FOR M (SEE NOTE 2)				
SECTION	PAVED STREET		UNPAVED STREET	
	MAX	MIN	MAX	MIN
N-M-P-O		867 mm (2'-10 1/2")		1060 mm (3'-6")
C-C	282 mm (11")	217 mm (8 1/2")	410 mm (16")	380 mm (15")

TABLE OF VALUES FOR F	
D_2	F
900 mm (36")	165 mm (6 1/2")
975 mm (38")	180 mm (7")
1050 mm (42")	190 mm (7 1/2")
1125 mm (45")	195 mm (7 3/4")
1200 mm (48")	205 mm (8")
1275 mm (51")	215 mm (8 1/2")
1350 mm (54")	230 mm (9")
1425 mm (57")	235 mm (9 1/4")
1500 mm (60")	240 mm (9 1/2")
1575 mm (63")	255 mm (10")
1650 mm (66")	260 mm (10 1/4")
1725 mm (69")	275 mm (10 3/4")
1800 mm (72")	280 mm (11")
1950 mm (78")	300 mm (11 3/4")
2100 mm (84")	320 mm (12 1/2")
2250 mm (90")	335 mm (13 1/4")
2400 mm (96")	355 mm (14")
2550 mm (102")	385 mm (15 1/2")
2700 mm (108")	405 mm (16")
2850 mm (114")	420 mm (16 1/2")
3000 mm (120")	430 mm (17")
3150 mm (126")	430 mm (17")
3300 mm (132")	445 mm (17 1/2")
3450 mm (138")	445 mm (17 1/2")
3600 mm (144")	455 mm (18")

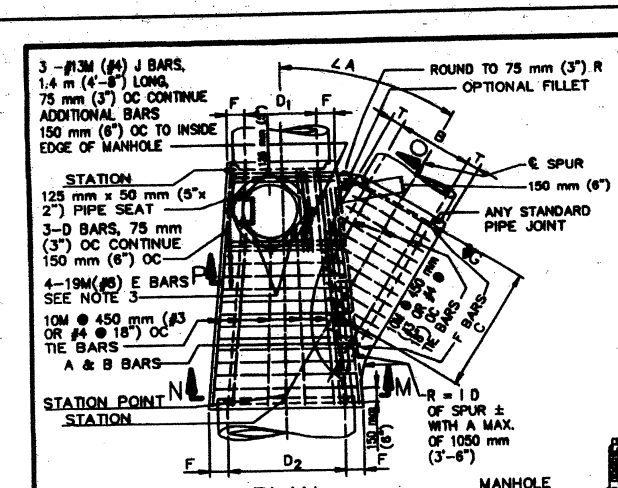
TABLE OF VALUES FOR T	
B	T
300 mm (12")	100 mm (4")
375 mm (15")	110 mm (4 1/4")
450 mm (18")	115 mm (4 1/2")
525 mm (21")	125 mm (5")
600 mm (24")	135 mm (5 1/4")
675 mm (27")	140 mm (5 1/2")
750 mm (30")	150 mm (6")
825 mm (33")	160 mm (6 1/4")
900 mm (36")	165 mm (6 1/2")
975 mm (38")	180 mm (7")
1050 mm (42")	190 mm (7 1/2")
1125 mm (45")	195 mm (7 3/4")
1200 mm (48")	205 mm (8")
1275 mm (51")	215 mm (8 1/2")
1350 mm (54")	230 mm (9")
1425 mm (57")	235 mm (9 1/4")
1500 mm (60")	240 mm (9 1/2")
1575 mm (63")	255 mm (10")
1650 mm (66")	260 mm (10 1/4")
1725 mm (69")	275 mm (10 3/4")
1800 mm (72")	280 mm (11")
1950 mm (78")	300 mm (11 3/4")
2100 mm (84")	320 mm (12 1/2")
2250 mm (90")	335 mm (13 1/4")
2400 mm (96")	355 mm (14")
2550 mm (102")	385 mm (15 1/2")
2700 mm (108")	405 mm (16")
2850 mm (114")	420 mm (16 1/2")
3000 mm (120")	430 mm (17")
3150 mm (126")	430 mm (17")
3300 mm (132")	445 mm (17 1/2")
3450 mm (138")	445 mm (17 1/2")
3600 mm (144")	455 mm (18")

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE TO PIPE (LARGE SIDE INLET)

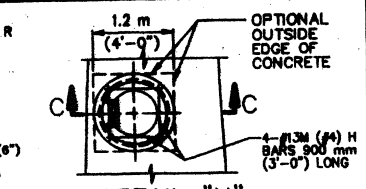
STANDARD PLAN METRIC 322-1

SHEET 2 OF 4



PLAN

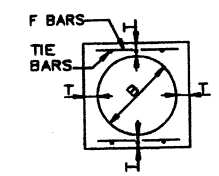
(SHAFT NOT SHOWN)



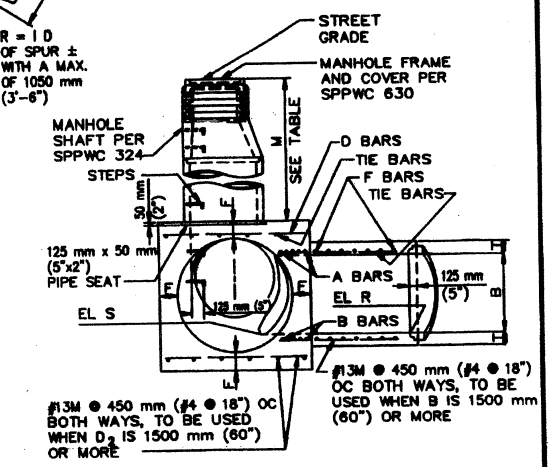
DETAIL "N"

(RINGS AND COVER NOT SHOWN)

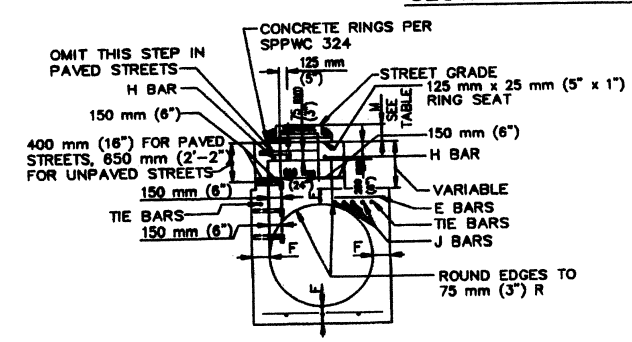
SEE NOTE 2



SECTION G-G



SECTION N-M-P-O



SECTION C-C

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1968 REV. 1988

MANHOLE PIPE TO PIPE (LARGE SIDE INLET)

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC 322-1

SHEET 1 OF 4

SEAL-COUNTY: REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33958 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT 08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK

STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY CONSULTING ENGINEERS, 650 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107, Tel. No. 626-432-5850, Fax No. 626-432-5858
ENGINEER OF RCE: 6-7-06 DATE:

REGISTERED PROFESSIONAL ENGINEER MARK K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

SEDCO MDP
LINE "F" STAGE 2
STANDARD DETAILS

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 9 OF 12

NOTES

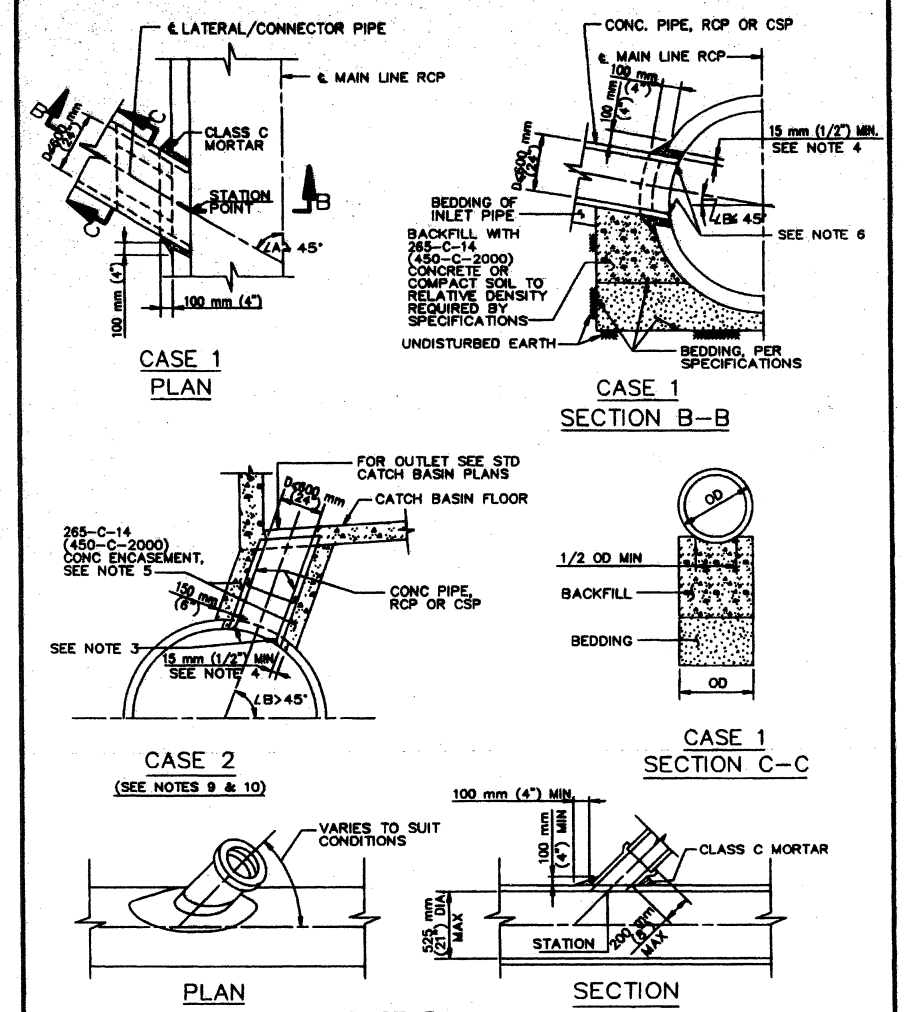
CASE 1 AND CASE 2

1. IF ANGLE A IS LESS THAN 45° OR IF D IS LARGER THAN 600 mm (24"), THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
2. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED ONE-HALF THE INSIDE DIAMETER OF THE MAIN LINE.
3. THE INLET PIPE SHALL ENTER THE MAIN LINE RADIALLY. IF THE INLET PIPE CANNOT ENTER RADIALLY, THEN ANOTHER STANDARD STRUCTURE SHALL BE SPECIFIED.
4. THE SIZE OF THE OPENING INTO THE MAIN LINE SHALL BE THE OUTSIDE DIAMETER OF THE INLET PIPE PLUS 30 mm (1") MINIMUM TO 75 mm (3") MAXIMUM.
5. ALL CONNECTOR PIPES FOR CASE 2 SHALL BE ENCASED IN CONCRETE IF LAID WITHIN THE MAIN LINE EXCAVATED TRENCH OR IF LAID ON FILL WHICH HAS NOT BEEN DENSIFIED.
6. BURN OR CHIP END OF CONNECTOR PIPE FLUSH WITH INNER SURFACE OF MAIN LINE. ROUND EDGE OF CONCRETE PIPE OR RCP.
7. ALL CSP AND FITTINGS SHALL BE GALVANIZED.
8. STATION SPECIFIED ON THE PLANS APPLIES AT THE INTERSECTION OF THE INSIDE WALL OF MAIN LINE AND THE CENTERLINE OF INLET PIPE.
9. CASE 2 SHALL NOT BE USED TO CONNECT TO THE FLOOR OF A GRATING CATCH BASIN WHERE THE GRATE WILL BE SUBJECT TO VEHICLE TRAFFIC.
10. FOR CASE 2, NOT MORE THAN 3.5 m (12') OF INLET PIPE SHALL BE LOCATED WITHIN THE MAIN LINE EXCAVATED TRENCH.

CASE 3

11. CONNECTIONS TO PIPES 525 mm (21") OR LESS IN DIAMETER WITHOUT JUNCTION STRUCTURES OR PRECAST Y BRANCHES SHALL BE MADE WITH SADDLES.
12. THE OUTSIDE DIAMETER OF THE INLET PIPE SHALL NOT EXCEED ONE-HALF THE INSIDE DIAMETER OF THE MAIN LINE.
13. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN LINE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTOR PIPE.
14. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
15. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASES 1 AND 2.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN METRIC
JUNCTION STRUCTURE – PIPE TO PIPE (ID ≤600 mm (24"))	332-1
	SHEET 2 OF 2



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1994 REV. 1999	JUNCTION STRUCTURE – PIPE TO PIPE (ID ≤600 mm (24"))	STANDARD PLAN METRIC 332-1
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 328.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

324	MANHOLE SHAFT – WITH ECCENTRIC REDUCER
326	MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER
328	PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
329	PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER
630	610 mm (24") MANHOLE FRAME AND COVER
633	914 mm (36") MANHOLE FRAME AND COVER
635	STEEL STEP
636	POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN METRIC
MANHOLE PIPE TO PIPE (LARGE SIDE INLET)	322-1
	SHEET 4 OF 4

SEAL–COUNTY: REGISTERED PROFESSIONAL ENGINEER KHALED A. OTHMAN No. C33958 Exp. 06/30/06 CIVIL STATE OF CALIFORNIA

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

BENCH MARK
STAMPING: E-7-70 (RIVERSIDE COUNTY)
352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

REF.	REVISIONS	ENGINEER		RCFC/LEUSD	
	DESCRIPTION	APPR.	DATE	APPR.	DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

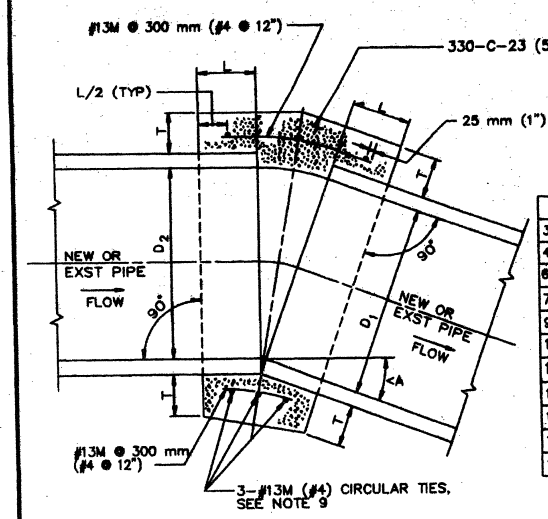
APPROVED BY:
WHEELER & GRAY
650 N. SIERRA MADRE VILLA; SUITE 300, PASADENA, CA. 91107
Tel. No. 626-432-5850 Fax No. 626-432-5858
ENGINEER RCE 6-7-06 DATE:
REGISTERED PROFESSIONAL ENGINEER MARK K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:

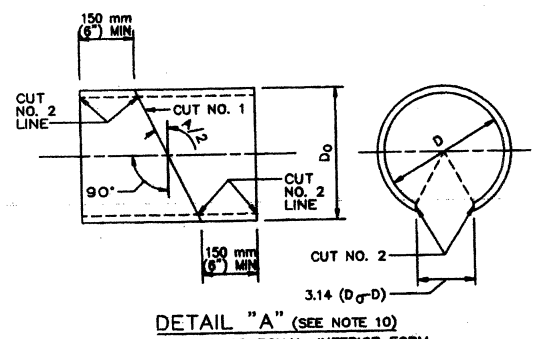
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: KHALED A. OTHMAN DATE:
RECOMMENDED DATE:

SEDCO MDP
LINE "F" STAGE 2
STANDARD DETAILS

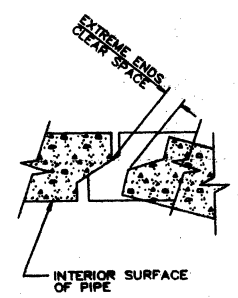
PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 10 OF 12



D	L	T
300 mm (12")	300 mm (12")	100 mm (4")
450 mm (18")	300 mm (12")	125 mm (5")
600 mm (24")	300 mm (12")	150 mm (6")
750 mm (30")	450 mm (18")	175 mm (7")
900 mm (36")	450 mm (18")	225 mm (9")
1050 mm (42")	450 mm (18")	225 mm (9")
1200 mm (48")	450 mm (18")	250 mm (10")
1425 mm (57")	450 mm (18")	250 mm (10")
1500 mm (60")	525 mm (21")	275 mm (11")
1650 mm (66")	525 mm (21")	275 mm (11")
1800 mm (72")	600 mm (24")	300 mm (12")



DETAIL "A" (SEE NOTE 10)
SONO-TUBE, OR EQUAL, INTERIOR FORM



DETAIL "B"
TYPICAL JOINT FOR
REINFORCED CONCRETE PIPE

CUT NO. 1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.
CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (Do-D) WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 1997, 1999

CONCRETE COLLAR FOR RCP 300 mm (12") THROUGH 1800 mm (72")

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC **380-3**
SHEET 1 OF 2

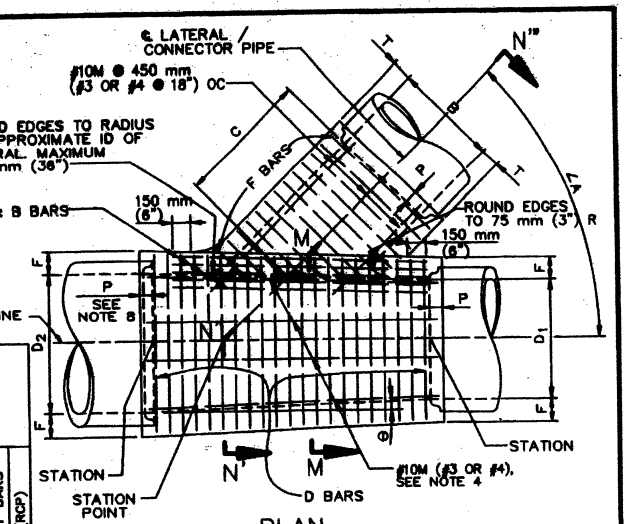
NOTES

1. THE HORIZONTAL ANGLE OF CONVERGENCE OR DIVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. VALUES FOR A, B, C, D_1 AND D_2 ARE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S ARE SHOWN WHEN REQUIRED BY NOTE 10.
3. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.
4. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A 615 M (A 615), GRADE 300 (40), AND SHALL TERMINATE 40 mm (1 1/2") CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN. LONGITUDINAL BARS SHALL BE #10M @ 450 mm (#3 OR #4 @ 18") OC OR LESS.
5. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
6. TRANSITION STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT LONGITUDINAL KEYWAY.
7. THE LENGTH OF THE STRUCTURE MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET RCP ENDS, USING D BARS, LONGITUDINAL AND BOTTOM REINFORCEMENT IN EXTENDED PORTION OF SAME DIAMETER AND SPACING AS SPECIFIED IN THE TABLE, BUT ANY CHANGE IN THE LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.
8. EMBEDMENT P SHALL BE AS SPECIFIED IN THE TABLE, UNLESS OTHERWISE SHOWN ON THE PLANS.
9. WHEN THERE IS NO SPUR REQUIRED, A & B BARS SHALL BE OMITTED.
10. WHEN ELEVATION R AND ELEVATION S ARE NOT SHOWN ON PLANS, INLET PIPE SHALL ENTER MAIN LINE RADIALLY. WHEN INLET PIPE ENTERS MAIN LINE OTHER THAN RADIALLY, ELEVATION S SHALL BE SHOWN ON PLANS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO CATCH BASIN OR GRADE BREAK IN INLET LINE. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE CONSTRUCTION OF INLET PIPE.
11. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 7.5 m (25'). IF THE COVER EXCEEDS 7.5 m (25') A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PLANS.

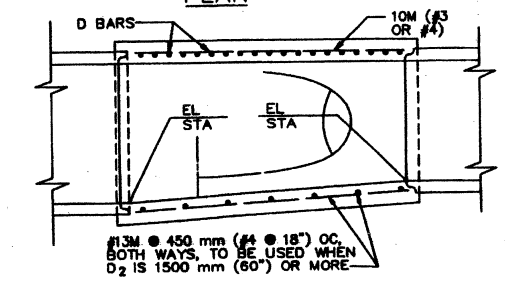
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

TRANSITION STRUCTURE PIPE TO PIPE

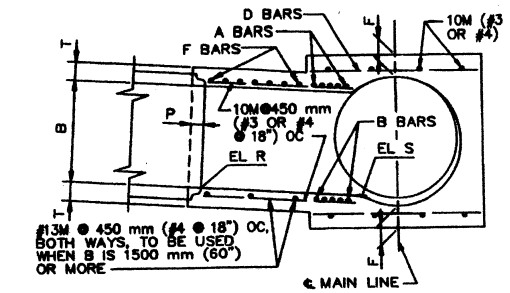
STANDARD PLAN METRIC **340-1**
SHEET 2 OF 2



PLAN



LONGITUDINAL SECTION



SECTION N'-N"-N"
PROJECTED ON M-M-N'"

TABLE

FOR DIMENSIONS AND BAR SIZES

D_2 OR B (mm)	(INCHES)	F OR T (mm)	(INCHES)	A OR B BARS	D OR F BARS	P (RCP)
300	12	110	4	#13M @ 75 mm (#4@3") OC	#13M @ 150 mm (#4@6") OC	125 mm (5")
375	15	110	4 1/4			
450	18	120	4 1/2			
525	21	130	5			
600	24	140	5 1/4			
675	27	140	5 1/2			
750	30	160	6			
825	33	160	6 1/4			
900	36	170	6 1/2			
975	39	180	7			
1050	42	190	7 1/2			
1125	45	200	7 3/4			
1200	48	210	8			
1275	51	220	8 1/2			
1350	54	230	9			
1425	57	240	9 1/4			
1500	60	250	9 1/2			
1575	63	260	10			
1650	66	260	10 1/4	#19M @ 75 mm (#6@3") OC	#19M @ 150 mm (#6@6") OC	200 mm (8")
1725	69	280	10 3/4			
1800	72	280	11			
1950	78	300	11 3/4			
2100	84	320	12 1/2			
2250	90	340	13 1/4			
2400	96	360	14			
2550	102	400	15 1/2			
2700	108	410	16			
2850	114	420	16 1/2			
3000	120	440	17			
3150	126	440	17			
3300	132	450	17 1/2			
3450	138	450	17 1/2			
3600	144	460	18			

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1999

TRANSITION STRUCTURE PIPE TO PIPE

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC **340-1**
SHEET 1 OF 2

CALTRANS ENCROACHMENT PERMIT
08-05-N-DD-0379

MS 4033 IP 050108

SEDCO MDP
LINE "F" STAGE 2
STANDARD DETAILS

PROJECT NO. 3-0-00141
DRAWING NO. 3-191
SHEET NO. 11 OF 12

BENCH MARK
STAMPING: E-7-70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET; 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E-7-70.
ELEVATION 1345.285 FEET (NAVD29)

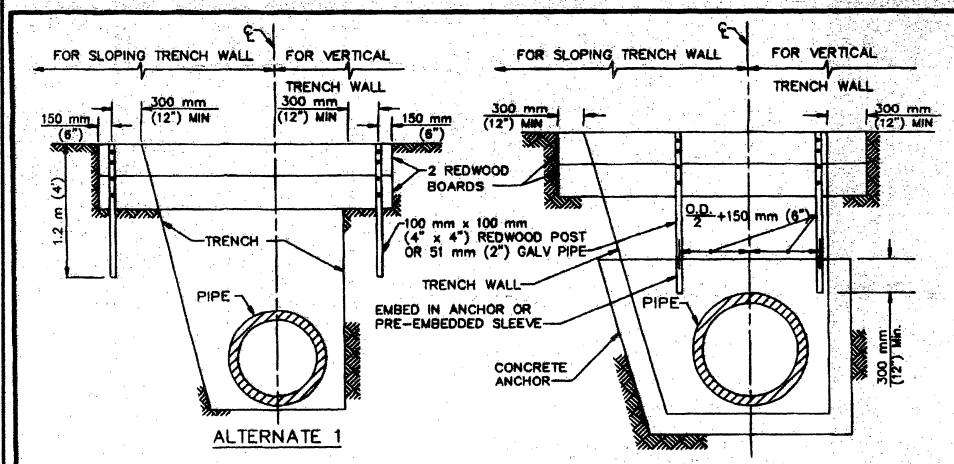
REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/LEUSD APPR.	RCFC/LEUSD DATE

DESIGNED BY: M. KINSLER
DRAWN BY: J. GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY: WHEELER & GRAY
2615 PLUMAS STREET
850 N. SIERRA MADRE VILLA, SUITE 300, PASADENA, CA. 91107
Phone No. 626-432-5850 Fax No. 626-432-5858
ENGINEER, RCE — DATE: 6-7-06

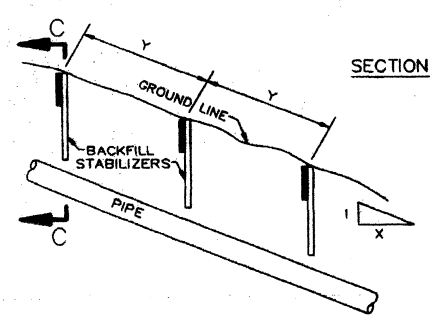
REGISTERED PROFESSIONAL ENGINEER MARY K. KINSLER No. C44025 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:
APPROVED BY: CHIEF ENGINEER DATE:



ALTERNATE 1

ALTERNATE 2



SECTION C–C

ELEVATION

BACKFILL STABILIZERS

TABLE B

GROUND SLOPE X:1	TABLE B Y (MAX)
1:1	1.5 m (5')
1 1/2:1	2.75 m (9')
2:1	3.65 m (12')
2 1/2:1	4.9 m (16')
3:1	6.0 m (20')

NOTES:

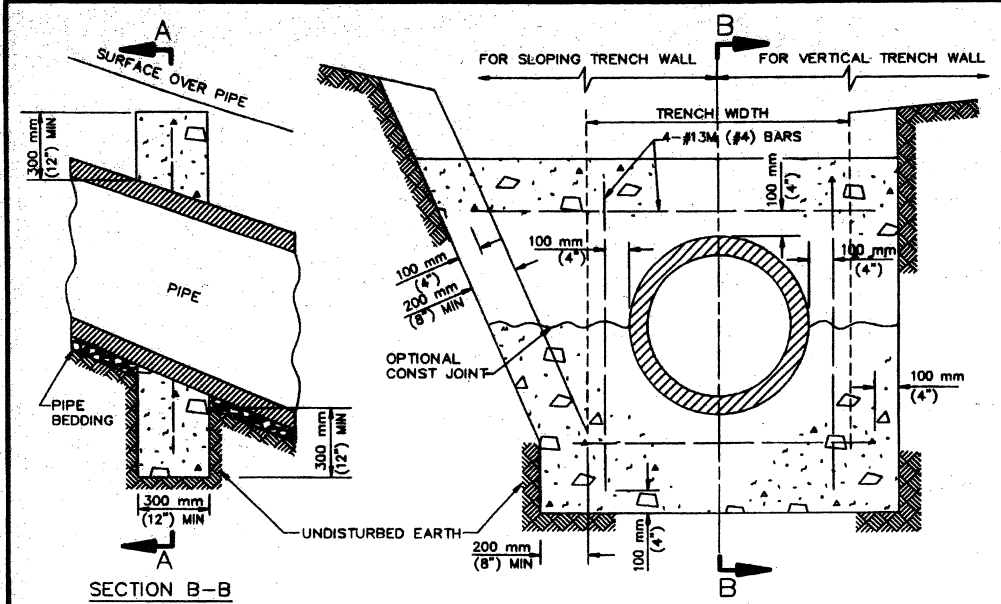
1. REDWOOD BOARDS SHALL BE 50 x 300 mm (2" x 12") WHERE DEPTH OF COVER OVER PIPE PERMITS, OTHERWISE USE 50 x 250 mm (2" x 10").
2. REDWOOD BOARDS SHALL BE PLACED ON THE HIGH GROUND SIDE OF THE POSTS.
3. EACH REDWOOD BOARD SHALL BE FASTENED BY USING 2–16d NAILS TO EACH REDWOOD POST OR A 10 mm (3/8") BOLT AND NUT WITH WASHERS TO EACH GALVANIZED PIPE. ALL HARDWARE SHALL BE GALVANIZED.
4. TRENCH BACKFILL SHALL BE CONSOLIDATED BY MECHANICAL COMPACTION. IN LIEU OF MECHANICALLY COMPACTION, SOIL CEMENT MAY BE USED; HOWEVER, THE TOP 300 mm (12") OF BACKFILL SHALL BE NATIVE SOIL, MECHANICALLY COMPACTED.
5. SPACING OF STABILIZERS FOR GROUND SLOPES BETWEEN VALUES SHOWN IN TABLE "B" MAY BE PROPORTIONED.
6. THE CONTRACTOR MAY, AT ITS OPTION, SUBSTITUTE DOUGLAS FIR FOR THE REDWOOD PROVIDED IT HAS BEEN TREATED WITH PRESERVATIVES.

STABILIZERS

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

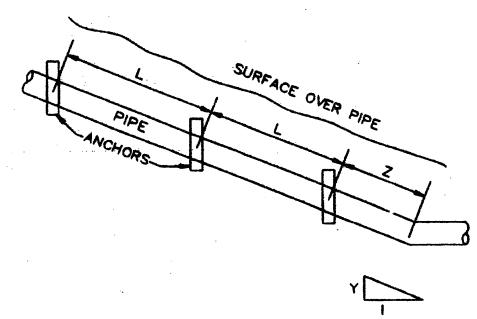
PIPE ANCHORS AND BACKFILL STABILIZERS

STANDARD PLAN METRIC 221–1 SHEET 2 OF 2



SECTION B–B

SECTION A–A



ELEVATION

PIPE ANCHORS

TABLE A

PIPE SLOPE(%) Y:1(100)	L DISTANCE (MAX)	Z DISTANCE (MAX)
100	3.65 m (12')	1.20 m (4')
67	4.25 m (14')	2.40 m (8')
50	4.90 m (16')	3.65 m (12')
40	5.50 m (18')	5.50 m (18')
33	6.00 m (20')	6.00 m (20')

NOTES:

1. ANCHORS SHALL BE CLASS 265–C–14 (450–C–2000) CONCRETE.
2. FOR CLAY PIPE, ANCHORS SHALL NOT BE PLACED WITHIN 150 mm (6") OF THE PIPE JOINT.
3. TRENCH SHALL BE BACKFILL PER NOTE 4 ON SHEET 2.
4. SPACING OF ANCHORS FOR PIPE SLOPES BETWEEN VALUES SHOWN IN TABLE "A" MAY BE PROPORTIONED.

ANCHORS

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996

PIPE ANCHORS AND BACKFILL STABILIZERS

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN METRIC 221–1 SHEET 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 25 mm (1"), BUT IS LESS THAN 75 mm (3") A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306–1.2.4.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 75 mm (3"), BUT LESS THAN 150 mm (6"), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 150 mm (6") OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. $D=D_1$ OR D_2, WHICHEVER IS GREATER.
   B. WHEN D_1 IS EQUAL TO OR LESS THAN D_2, JOIN INVERTS AND WHEN D_1 IS GREATER THAN D_2, JOIN SOFFITS.
5. FOR PIPE LARGER THAN 1800 mm (72") SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 M (A 615) GRADE 300 (40).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 525 mm (21") AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 75 mm (3") OR LARGER.

CIRCULAR TIES:

PIPE DIAMETER	NO. OF CIRCULAR TIES
525 mm (21") OR LESS	3
600 mm (24") TO 750 mm (30")	3
825 mm (33") TO 1425 mm (57")	4
1500 mm (60") TO 1800 mm (72")	5

WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 75 mm (3"), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 150 mm (6") O.C.

10. WHERE THE PIPE IS 525 mm (21") OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO–TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 600 mm (24") OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

CONCRETE COLLAR FOR RCP 300 mm (12") THROUGH 1800 mm (72")

STANDARD PLAN METRIC 380–3 SHEET 2 OF 2

CALTRANS ENCROACHMENT PERMIT
08–05–N–DD–0379

MS 4033 IP 050108

SEDCO MDP

LINE "F" STAGE 2

STANDARD DETAILS

PROJECT NO. 3–0–00141

DRAWING NO. 3–191

SHEET NO. 12 OF 12

BENCH MARK

STAMPING: E–7–70 (RIVERSIDE COUNTY) 352.0 FEET NORTH OF THE INTERSECTION OF ORANGE STREET AND WALNUT ST., 61.0 FEET EAST OF THE CENTER OF ORANGE STREET, 5.0 FEET WEST OF POWER POLE #212290, 1.0 FEET EAST OF A MARKER POST, A BRASS DISK SET IN THE TOP OF A CONCRETE POST, AND MARKED E–7–70. ELEVATION 1345.285 FEET (NAVD29)

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DESIGNED BY: M. KINSLER
DRAWN BY: J.GALURA
DATE REVISED: FEB. 21, 2006

APPROVED BY:
WHEELER & GRAY
CONSULTING ENGINEERS
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PH. No. 626–432–5850 Fax No. 626–432–5858
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Appendix D

Educational Materials

FLEXSTORM OPERATION & MAINTENANCE PLAN

FLEXSTORM INLET FILTERS™

Installation Instructions:

1. Remove the grate from the casting or concrete drainage structure.
2. Clean the ledge (lip) of the casting frame or drainage structure to ensure it is free of stone and dirt.
3. Drop in the FLEXSTORM Inlet Filter through the clear opening and be sure the suspension hangers rest firmly on the inside ledge (lip) of the casting.
4. Replace the grate and confirm it is elevated no more than 1/8", which is the thickness of the steel hangers.

Frequency of Inspections:

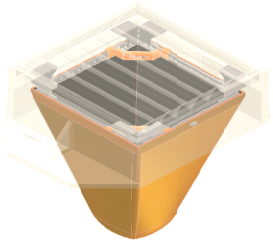
1. Construction site inspection should occur following each ½" or more rain event.
2. Post Construction inspections should occur three times per year (every four months) in areas with mild year round rainfall and four times per year (every three months Feb-Nov) in areas with summer rains before and after the winter snowfall season.
3. Industrial application site inspections (loading ramps, wash racks, maintenance facilities) should occur on a regularly scheduled basis no less than three times per year.

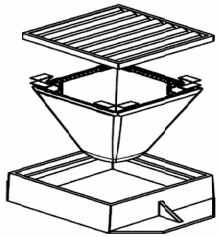
Maintenance Guidelines:

1. Empty the sediment bag if more than half filled with sediment and debris, or as directed by the Engineer.
2. Remove the grate, engage the lifting bars or handles with the FLEXSTORM Removal Tool, and lift from the drainage structure.
3. Dispose of the sediment or debris as directed by the Engineer or Maintenance Contract in accordance with EPA guidelines.
4. As an alternative, an industrial vacuum may be used to collect the accumulated sediment.
5. Remove any caked on silt from the sediment bag and reverse flush the bag with medium spray for optimal filtration.
6. Replace the bag if torn or punctured to ½" diameter or greater on the lower half of the bag.
7. Post Construction PC Bags maint: At 50% saturation, the average 2' x 2' Adsorb-it lined PC filter will retain approx 75 oz (4.2 lbs) of oil and should be serviced or replaced. It can be centrifuged or passed through a wringer to recover the oils, and the fabric reused with 85% to 90% efficacy. It may also be recycled for its fuel value through waste to energy incineration.
8. MyCelx Skimmer Pouches: The skimmers start yellow in color and will gradually turn brown as they become saturated, indicating time for replacement. Each MyCelx skimmer pouch will absorb approximately 89 oz (5 lbs) of oil before requiring replacement.
9. Dispose of all oil contaminated products in accordance with EPA guidelines.

Sediment Bag Replacement:

1. Remove the bag by loosening or cutting off the clamping band.
2. Take the new sediment bag, which is equipped with a stainless steel worm drive clamping band, and use a screw driver to tighten the bag around the frame channel.
3. Ensure the bag is secure and that there is no slack around the perimeter of the band.



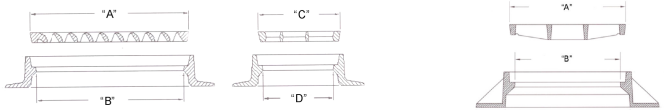


STRUCTURE ID#/LOCATION:

DATE	TASK PERFORMED	INSPECTOR

1. INDENTIFY YOUR FRAME STYLE, SIZE, AND MATERIAL

STYLE	FRAME STYLE AND SIZE	Frame P/N:
ROUND	Small Round (up to 20.0" dia grates (A) dim)	62SRD
	Med Round (20.1" - 26.0" dia grates (A) up to 25" dia openings (B))	62MRD
	Large Round (26.1' - 32.0" dia grates (A) up to 30" openings (B))	62LRD
	XL Round (32.1" dia - 39" dia grates (A) up to 37" dia openings (B))	62XLRD
RECT/ SQUARE	Small Rect / Square (up to 16" (B) x 15" (D) openings or 64" perimeter)	62SSQ
	Med Rect / Square (up to 24" (B) x 24" (D) openings or 96" perimeter)	62MSQ
	Large Rect / Square (up to 36" (B) x 24" (D) openings or 120" perimeter)	62LSQ
	XL Rect / Square (side by side 2 pc set to fit up to 48" (E) x 36" (D) openings)	62XLSQ
COMBO INLETS	Small Rect / Square (ref Rect sizing; shipped with Magnetic Curb Flaps)	62SCB
	Med Rect / Square (ref Rect sizing; shipped with Magnetic Curb Flaps)	62MCB
	Large Rect / Square (ref Rect sizing; shipped with Magnetic Curb Flaps)	62LCB
	XL Rect / Square (ref Rect sizing; shipped with Magnetic Curb Flaps)	62XLCB
NYLOPLAST	12" diameter Nyloplast castings (Stainless Steel Framing standard)	6212NY
	15" diameter Nyloplast castings (Stainless Steel Framing standard)	6215NY
	18"diameter Nyloplast castings (Stainless Steel Framing standard)	6218NY
	24" diameter Nyloplast castings (Stainless Steel Framing standard)	6224NY
	30" diameter Nyloplast castings (Stainless Steel Framing standard)	6230NY
WALL MOUNT	Open Throat Gutters - Curb Opening Size	
	Up to 4' (1 Filter and Mounting Hardware)	62WM1
	Between 4' and 8' (2 Filters and Mounting Hardware)	62WM2
	Between 8' and 12 (3 Filters and Mounting Hardware)	62WM3
	Between 12' and 15' (4 Filters and Mounting Hardware)	62WM4
UPGRADED FRAMING MATERIAL OPTIONS (STANDARD IS ZINC PLATED)		SUFFIX
CHROME PLATED FRAMING FOR HIGH SALT EXPOSURE		- CHR
STAINLESS STEEL FRAMING FOR HIGH SALT AND/OR CHEMICAL EXPOSURE		- SS



2. SELECT YOUR FILTER BAG PART NUMBER

FLEXSTORM FILTER BAGS	(22" depth) STD Bag P/N	(12" depth) Short Bag P/N	Clean Water Flow Rate (GPM/SqFt)	Min A.O.S. (US Sieve)
FX: Standard Woven Bag	FX	FX-S	200	40
FX+: Woven w/ MyCelx	FXP	FXP-S	200	40
FXO: Woven w/ Oil Boom	FXO	FXO-S	200	40
PC: Post Construction Bag	PC	PC-S	137	140
PC+: PC Bag w/ MyCelx	PCP	PCP-S	137	140
LL: Litter and Leaf Bag	LL	LL-S	High	3.5
IL: IDOT Non-Woven Bag	IL	IL-S	145	70

3. CREATE YOUR FLEXSTORM INLET FILTER PART NUMBER

		-	
Frame P/N from Step 1.	Filter Bag P/N from Step 2.		Framing Material

SPECIFICATIONS FOR STANDARD BAGS BY NOMINAL SIZE

Nominal Bag Size	Solids Storage (CuFt)	Filtered Flow Rate at 50% Max: FX (Woven)	PC (Post Constr)	IL (Non Woven)	* PC Oil Retent (Oz)	**PCP Oil Retent (Oz)
Small	1.6	1.2	0.8	0.9	66	155
Medium	2.1	1.8	1.2	1.3	96	185
Large	3.8	2.2	1.5	1.6	120	209
XL	4.2	3.6	2.4	2.6	192	370

* PC filter bag at 50% max adsorption capacity

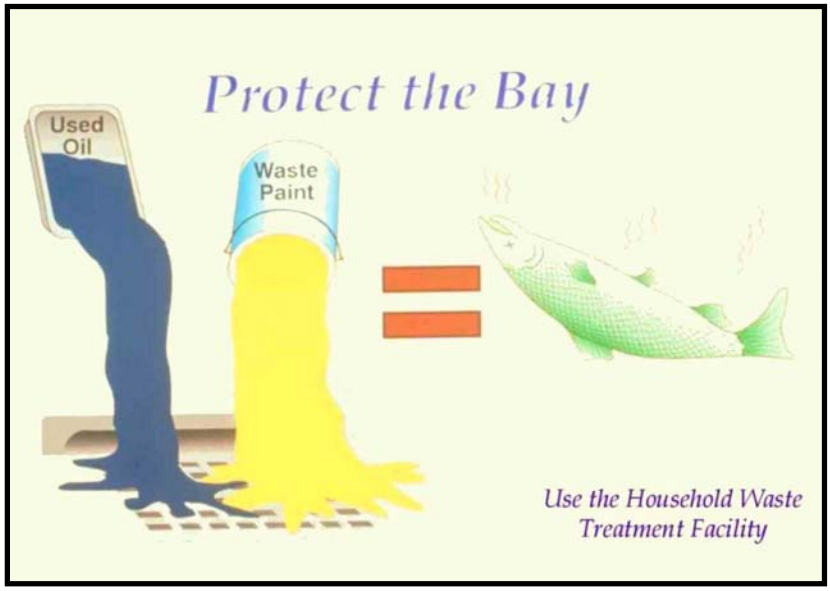
** PC filter bag at 50% capacity and MyCelx skimmer at 100% capacity

ALL PRODUCTS MANUFACTURED
BY INLET & PIPE PROTECTION, INC
DISTRIBUTED BY ADS
WWW.INLETFILTERS.COM
(866) 287-8655 PH
(630) 355-3477 FX
INFO@INLETFILTERS.COM

SIZE	DWG NO	REV
C	FLEXSTORM_OPN&MAINT	

SCALE | SHEET 1 OF 1

Non-Stormwater Discharges SC-10



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

CASQA
California Stormwater Quality Association

Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

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- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

■ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

■ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

■ If consistent illegal dumping is observed at the facility:

- Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
- Landscaping and beautification efforts may also discourage illegal dumping.
- Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

■ Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

■ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

■ Routine maintenance:

- Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain*.

- Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes

  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

Training

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Outdoor Loading/Unloading SC-30

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.

Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a deadend.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all and ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Have an emergency spill cleanup plan readily available.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.

Other Considerations (Limitations and Regulations)

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

Requirements

Costs

Costs should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

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The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Outdoor Liquid Container Storage SC-31

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwaters with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, kerosene, oils, greases, lubricants and other distilled, blended and refined products derived from crude petroleum. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Pollution Prevention

- Educate employees about pollution prevention measures and goals.
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- Try to keep chemicals in their original containers, and keep them well labeled.

Suggested Protocols

General

- Develop an operations plan that describes procedures for loading and/or unloading. Refer to SC-30 – Outdoor

Loading/Unloading of Materials for more detailed BMP information pertaining to loading and unloading of liquids.

- Protect materials from rainfall, run-on, runoff, and wind dispersal:
  - Cover the storage area with a roof.
  - Minimize stormwater run-on by enclosing the area or building a berm around it.
  - Use a "doghouse" structure for storage of liquid containers.
  - Use covered dumpsters for waste product containers.
- Employ safeguards against accidental releases:
  - Provide overflow protection devices to warn operator or automatic shut down transfer pumps.
  - Provide protection guards (bollards) around tanks and piping to prevent damage from a vehicle or forklift.
  - Provide clear tagging or labeling, and restrict access to valves to reduce human error.
- Berm or surround tank or container with secondary containment system, including dikes, liners, vaults, or double walled tanks.
- Be aware and ready to address the fact that some municipalities require secondary containment areas to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- Contact the appropriate regulatory agency regarding environmental compliance for facilities with "spill ponds" designed to intercept, treat, and/or divert spills.
- Have registered and specifically trained professional engineers identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.

Storage Areas

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guardrails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism-caused contamination.
- Place tight-fitting lids on all containers.
- Enclose or cover the containers where they are stored.

- Raise the containers off the ground by use of pallet or similar method, with provisions for spill control.
- Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.
- Place drip pans or absorbent materials beneath all mounted container taps, and at all potential drip and spill locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- Ensure that any underground or aboveground storage tanks are designed and managed in accordance with applicable regulations, identified as a potential pollution source, and have secondary containment such as a berm or dike with an impervious surface.

Inspection

- Provide regular inspections:
  - Inspect storage areas regularly for leaks or spills.
  - Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
  - Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
  - Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
  - Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
  - Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
  - New or secondary containers must be labeled with the product name and hazards.

Training

- Train employee (e.g., fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees in proper storage measures.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Prevent operator errors by using engineering safeguards and thus reducing accidental releases of pollutants.
- Store and maintain appropriate spill cleanup materials in a location near the tank storage area and known to all.

Other Considerations

- Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.
- All specific standards set by Federal and State laws concerning the storage of oil and hazardous materials must be met.
- Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code.
- Storage of oil and hazardous materials must meet specific Federal and State standards including:
  - Spill Prevention Control and Countermeasure Plan (SPCC) Plan
  - Secondary containment
  - Integrity and leak detection monitoring
  - Emergency preparedness plans

Requirements

Costs

Costs will vary depending on the size of the facility and the necessary controls, such as berms or safeguards against accidental controls.

Maintenance

- Conduct weekly inspection.
- Sweep and clean the storage area regularly if it is paved, do not hose down the area to a storm drain.

Supplemental Information

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Further Detail of the BMP

Aboveground Tank Leak and Spill Control

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills,
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10% of the volume of all of the containers or 110% of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator

Maintenance is critical to preventing leaks and spills. Conduct routine weekly inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa

- Inspect new tank or container installation visually for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently release accumulated stormwater during the wet season.
- Have periodic integrity testing conducted by a qualified professional.

Container Management

- To limit the possibility of stormwater pollution, containers used to store dangerous waste or other liquids should be kept inside the building unless this is impractical due to site constraints. If the containers are placed outside, the following procedures should be employed:
  - Dumpsters used to store items awaiting transfer to a landfill should be placed in a lean-to structure or otherwise covered. Dumpsters shall be kept in good condition without corrosion or leaky seams.
  - Garbage dumpsters shall be replaced if they are deteriorating to the point where leakage is occurring. Dumpsters should be kept undercover to prevent the entry of stormwater. Employees should be made aware of the importance of keeping the dumpsters covered and free from leaks.
  - Waste container drums should be kept in an area such as a service bay. If drums are kept outside, they must be stored in a lean-to type structure, shed or walk-in container to keep rainfall from reaching the drums.

Dikes

One of the best protective measures against contamination of stormwater is diking. Containment dikes are berms or retaining walls that are designed to hold spills. Diking is an effective pollution prevention measure for above ground storage tanks and railcar or tank truck loading and unloading areas. The dike surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater side of the dike area. Diking can be used in any industrial or municipal facility, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

- For single-wall tanks, containment dikes should be large enough to hold the contents of the storage tank for the facility plus rain water.
- For trucks, diked areas should be capable of holding an amount equal to the volume of the tank truck compartment. Diked construction material should be strong enough to safely hold spilled materials.
- Dike materials can consist of earth, concrete, synthetic materials, metal, or other impervious materials.
- Strong acids or bases may react with metal containers, concrete, and some plastics.

- Where strong acids or bases or stored, alternative dike materials should be considered. More active organic chemicals may need certain special liners for dikes.
- Dikes may also be designed with impermeable materials to increase containment capabilities.
- Dikes should be inspected during or after significant storms or spills to check for washouts or overflows.
- Regular checks of containment dikes to insure the dikes are capable of holding spills should be conducted.
- Inability of a structure to retain stormwater, dike erosion, soggy areas, or changes in vegetation indicate problems with dike structures. Damaged areas should be patched and stabilized immediately.
- Earthen dikes may require special maintenance of vegetation such as mulching and irrigation.

Curbing

Curbing is a barrier that surrounds an area of concern. Curbing is similar to containment diking in the way that it prevents spills and leaks from being released into the environment. Curbing is usually small scaled and does not contain large spills like diking. Curbing is common at many facilities in small areas where handling and transfer of liquid materials occur. Curbing can redirect contaminated stormwater away from the storage area. It is useful in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, curbing materials can include earth, concrete, synthetic materials, metal, or other impenetrable materials.

- Spilled materials should be removed immediately from curbed areas to allow space for future spills.
- Curbs should have manually-controlled pump systems rather than common drainage systems for collection of spilled materials.
- The curbed area should be inspected regularly to clear clogging debris.
- Maintenance should also be conducted frequently to prevent overflow of any spilled materials as curbed areas are designed only for smaller spills.
- Curbing has the following advantages:
  - Excellent run-on control
  - Inexpensive
  - Ease of installment
  - Provides option to recycle materials spilled in curb areas
  - Common industry practice

Examples

The "doghouse" design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successfully at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Outdoor Storage of Raw Materials SC-33

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. To prevent or reduce the discharge of pollutants to stormwater from material delivery and storage, pollution prevention and source control measures must be implemented, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing stormwater run-on and runoff, and training employees and subcontractors.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Emphasize employee education for successful BMP implementation.
- Minimize inventory of raw materials.
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.

- Try to keep chemicals in their original containers and keep them well labeled.

Suggested Protocols

General

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof and bermed or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene or hypalon should be used over all materials stored outside.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring. (Applicable to small stockpiles only).
- Implement erosion control practices at the perimeter of your site and at any catch basins to prevent erosion of the stockpiled material off-site, if the stockpiles are so large that they cannot feasibly be covered and contained.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.
- Minimize stormwater run-on by enclosing the area or building a berm around it.
- Keep storage areas clean and dry.
- Slope paved areas should be sloped in a manner that minimize pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps or store indoors.

Raw Material Containment

- Curbing should be placed along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas.
- Tanks should be bermed or surrounded by a secondary containment system.
- The area inside the curb should slope to a drain. Liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Inspection

- Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.
- Check berms, curbing, containment for repair and patching.

Training

- Train employees well in proper material storage.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.

Other Considerations

- Storage sheds often must meet building and fire code requirements. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code and the National Electric Code.
- Space limitations may preclude storing some materials indoors.
- Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain. Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.

Requirements

Costs

Costs will vary depending on the size of the facility and the necessary controls. They should be low except where large areas may have to be covered.

Maintenance

- Accurate and up-to-date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage areas.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.

- Keep outdoor storage areas in good condition (e.g., repair roofs, floors, etc., to limit releases to runoff).

Supplemental Information

Further Detail of the BMP

Raw Material Containment

Paved areas should be sloped in a manner that minimizes pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5% is recommended.

- Curbing should be placed along the perimeter of the area to prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from stockpile areas.
- The storm drainage system should be designed to minimize use of catch basins in the interior of the area as they tend to rapidly fill with manufacturing material.
- The area should be sloped to drain stormwater to the perimeter where it can be collected or to internal drainage alleyways where material is not stockpiled.
- If the raw material, by-product, or product is a liquid, more information for outside storage of liquids can be found under SC31, Outdoor Liquid Container Storage.

Supplemental Information

Examples

The "doghouse" design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successively at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

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The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Waste Handling & Disposal SC-34

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Approach

Pollution Prevention

- Accomplish reduction in the amount of waste generated using the following source controls:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.

Run-on/Runoff Prevention

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.

- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff in pollution prevention measures and proper disposal methods.
- Train employees and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

Other Considerations (Limitations and Regulations)

Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

Capital and O&M costs for these programs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

Minimize runoff of polluted stormwater from land application by:

- Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, and there is a closed drainage system

- Avoiding application of waste to the site when it is raining or when the ground is saturated with water
- Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site
- Maintaining adequate barriers between the land application site and the receiving waters (planted strips are particularly good)
- Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins
- Performing routine maintenance to ensure the erosion control or site stabilization measures are working

Examples

The port of Long Beach has a state-of-the-art database for identifying potential pollutant sources, documenting facility management practices, and tracking pollutants.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Solid Waste Container Best Management Practices – Fact Sheet On-Line Resources – Environmental Health and Safety. Harvard University. 2002.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

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Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

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- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Outdoor Material Storage Areas SD-34

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutant
- Collect and Convey

Description

Proper design of outdoor storage areas for materials reduces opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Materials may be in the form of raw products, by-products, finished products, and waste products. The type of pollutants associated with the materials will vary depending on the type of commercial or industrial activity.

Approach

Outdoor storage areas require a drainage approach different from the typical infiltration/detention strategy. In outdoor storage areas, infiltration is discouraged. Containment is encouraged. Preventative measures include enclosures, secondary containment structures and impervious surfaces.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Some materials are more of a concern than others. Toxic and hazardous materials must be prevented from coming in contact with stormwater. Non-toxic or non-hazardous materials do not have to be prevented from stormwater contact. However, these materials may have toxic effects on receiving waters if allowed to be discharged with stormwater in significant quantities. Accumulated material on an impervious surface could result in significant impact on the rivers or streams that receive the runoff.

Material may be stored in a variety of ways, including bulk piles, containers, shelving, stacking, and tanks. Stormwater contamination may be prevented by eliminating the possibility of stormwater contact with the material storage areas either through diversion, cover, or capture of the stormwater. Control measures may also include minimizing the storage area. Design

requirements for material storage areas are governed by Building and Fire Codes, and by current City or County ordinances and zoning requirements. Control measures are site specific, and must meet local agency requirements.

Designing New Installations

Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural or treatment BMPS should be considered:

- Materials with the potential to contaminate stormwater should be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the stormwater conveyance system, or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area should be paved and sufficiently impervious to contain leaks and spills.
- The storage area should slope towards a dead-end sump to contain spills and direct runoff from downspouts/roofs should be directed away from storage areas.
- The storage area should have a roof or awning that extends beyond the storage area to minimize collection of stormwater within the secondary containment area. A manufactured storage shed may be used for small containers.

Note that the location(s) of installations of where these preventative measures will be employed must be included on the map or plans identifying BMPs.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permits.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Infiltration Basin TC-11

Maintenance Concerns, Objectives, and Goals

- Vector Control
- Clogged soil or outlet structures
- Vegetation/Landscape Maintenance
- Groundwater contamination
- Accumulation of metals
- Aesthetics

General Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

Inspection/Maintenance Considerations

Infiltration basins perform better in well-drained permeable soils. Infiltration basins in areas of low permeability can clog within a couple years, and require more frequent inspections and maintenance. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration system.

Scarification or other disturbance should only be performed when there are actual signs of clogging or significant loss of infiltrative capacity, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a light tractor. This BMP may require groundwater monitoring. Basins cannot be put into operation until the upstream tributary area is stabilized.

Targeted Constituents

✓	Sediment	■
✓	Nutrients	■
✓	Trash	■
✓	Metals	■
✓	Bacteria	■
✓	Oil and Grease	■
✓	Organics	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Clogged infiltration basins with surface standing water can become a breeding area for mosquitoes and midges. Maintenance efforts associated with infiltration basins should include frequent inspections to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.

Inspection Activities	Suggested Frequency
■ Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. ■ Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary.	Post construction
■ Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of riprap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition	Semi-annual and after extreme events
Maintenance Activities	**Suggested Frequency**
■ Factors responsible for clogging should be repaired immediately. ■ Weed once monthly during the first two growing seasons.	Post construction
■ Stabilize eroded banks. ■ Repair undercut and eroded areas at inflow and outflow structures. ■ Maintain access to the basin for regular maintenance activities. ■ Mow as appropriate for vegetative cover species. ■ Monitor health of vegetation and replace as necessary. ■ Control mosquitoes as necessary. ■ Remove litter and debris from infiltration basin area as required.	Standard maintenance (as needed)
■ Mow and remove grass clippings, litter, and debris. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons. ■ Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
■ Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. ■ Seed or sod to restore ground cover. ■ Disc or otherwise aerate bottom. ■ Dethatch basin bottom.	3-5 year maintenance

Additional Information

In most cases, sediment from an infiltration basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children. Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

Light equipment, which will not compact the underlying soil, should be used to remove the top layer of sediment. The remaining soil should be tilled and revegetated as soon as possible.

Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor. This also prevents smearing of the basin floor.

References

King County, Stormwater Pollution Control Manual – Best Management Practices for Businesses. July, 1995 Available at: ftp://dnr metrokc.gov/wlr/dss/spcm/SPCM.HTM

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Drain Insert MP-52

General Description

Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one or more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

Inspection/Maintenance Considerations

Washout problems increase with rain intensity. Susceptibility of accumulated sediments to be re-suspended at low flow rates, can be corrected with an energy dissipater between gate and treatment areas.

Inspection Activities	Suggested Frequency
■ Inspect for sediment buildup and proper functioning.	At the beginning of the wet season and after significant storms
■ Verify that stormwater enters the unit and does not leak around the perimeter.	After construction.
Maintenance Activities	**Suggested Frequency**
■ Remove sediment as needed.	At the beginning of the wet season and as necessary

Maintenance Concerns, Objectives, and Goals

■ Sediment Removal

Targeted Constituents

✓ Sediment
✓ Nutrients
✓ Trash
✓ Metals
Bacteria
✓ Oil and Grease
✓ Organics

Removal Effectiveness

See New Development and Redevelopment Handbook-Section 5.

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Appendix E

Soils Report

(NONE)

Appendix F

Treatment Control BMP Sizing Calculations and Design Details

Worksheet 1

Design Procedure for BMP Design Volume

85th percentile runoff event

Designer: KEVIN RICHER
Company: LAND DEVELOPMENT DESIGN COMPANY, LLC
Date: 2/2/12
Project: PARCEL 1 & 2, TPM No. 30522
Location: WILDOMAR, CA

1. Create Unit Storage Volume Graph a. Site location (Township, Range, and Section). b. Slope value from the Design Volume Curve in **Appendix A**. c. Plot this value on the Unit Storage Volume Graph shown on **Figure 2.** d. Draw a straight line form this point to the origin, to create the graph	T 6S &R 4W Section 26 Slope = 1.15 Is this graph attached? Yes ☑ No ☐	*(1)* *(2)*
2. Determine Runoff Coefficient a. Determine total impervious area b. Determine total tributary area c. Determine Impervious fraction i = *(5)* / *(6)* d. Use *(7)* in **Figure 1** to find Runoff OR $C = .858i^3 - .78i^2 + .774i + .04$	$A_{impervious}$ = 0.45 acres A_{total} = 2.31 acres i = 0.81 C = 0.61	*(5)* *(6)* *(7)* *(8)*
3. Determine 85% Unit Storage Volume a. Use *(8)* in **Figure 2** Draw a Vertical line from *(8)* to the graph, then a Horizontal line to the desired V_u value.	V_u = 0.70 in-acre / acre	*(9)*
4. Determine Design Storage Volume a. V_{BMP} = *(9)* x *(6)* [in- acres] b. V_{BMP} = *(10)* / 12 [ft- acres] c. V_{BMP} = *(11)* x 43560 [ft^3]	V_{BMP} = 1.62 in-acre V_{BMP} = 0.135 ft-acre V_{BMP} = 5,881 ft^3	*(10)* *(11)* *(12)*

Notes:

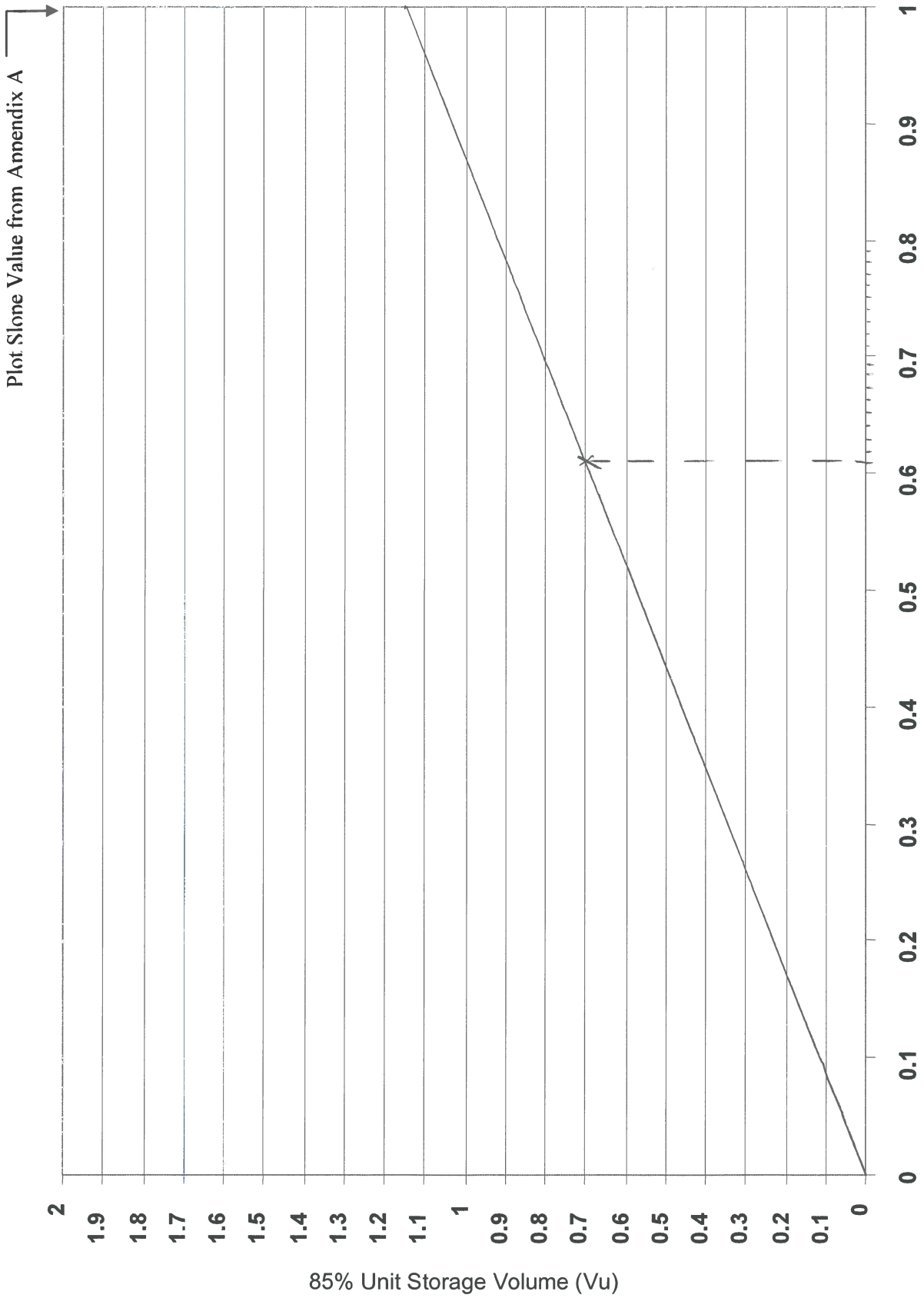


Figure 2 Unit Storage Volume Graph

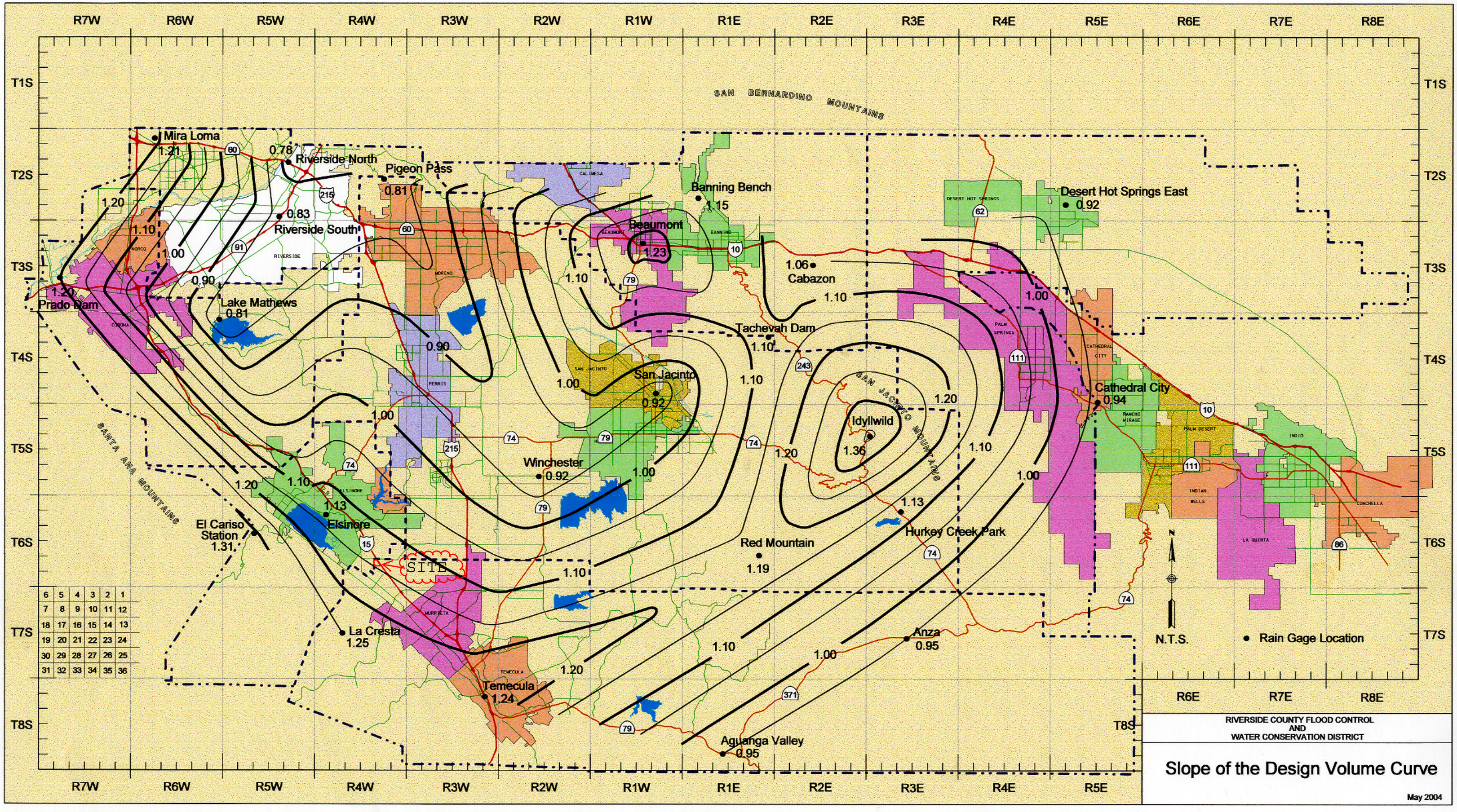
Worksheet 4

Design Procedure Form for Infiltration Basin

Designer: KEVIN RICHER
Company: LAND DEVELOPMENT DESIGN COMPANY, LLC
Date: 2/2/12
Project: PARCEL 1 & 2, TPM NO. 30522
Location: WILDOMAR, CA

1. Determine Design Storage Volume (Use Worksheet 1) a. Total Tributary Area (maximum 50) b. Design Storage Volume, V_{BMP}	A_{total} = 2.31 acres V_{BMP} = 5,881 ft^3
2. Maximum Allowable Depth (D_m) a. Site infiltration rate (I) b. Minimum drawdown time (48 hrs) c. Safety factor (s) d. D_m = [(t) x (I)]/[12s]	I = 2.0 in/hr t = 48 hrs s = 10 D_m = 0.80 ft
3. Basin Surface Area $A_m = V_{BMP} / D_m$	A_m = 7,352 ft^2
4. Vegetation (check type used or describe "other")	✓ Native Grasses ____ Irrigated Turf Grass ____ Other

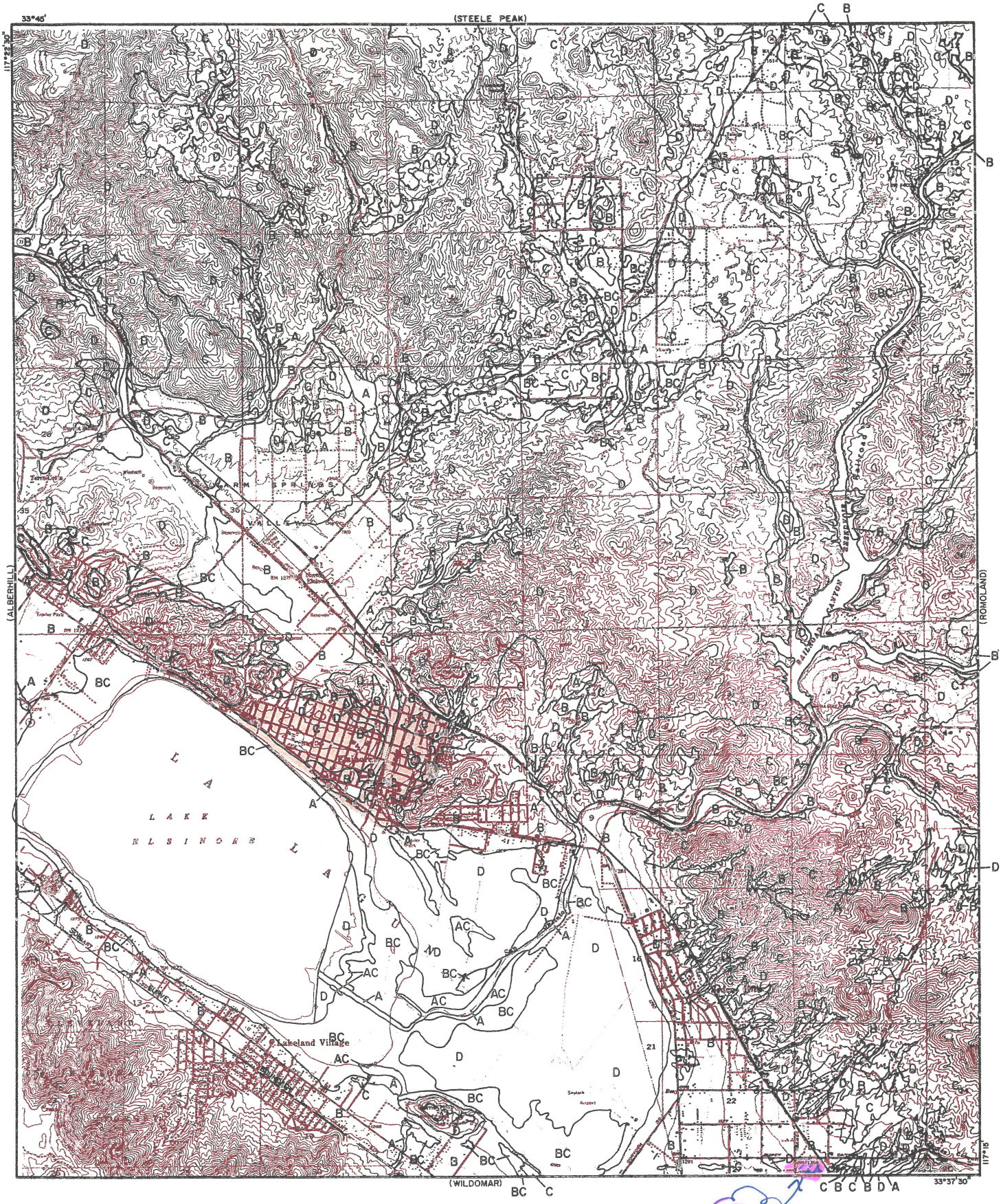
Notes:



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Slope of the Design Volume Curve

May 2004



SITE

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ELSINORE

PLATE C-1.41

Appendix G

AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS AND/OR OTHER MECHANISMS FOR ENSURING ONGOING OPERATION, MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC WQMP

(NOT INCLUDED)

Appendix H

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS

(NONE)

Appendix I

Inspection Form
("Record of BMP Implementation, Maintenance, and Inspection")

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Referenced in Section VI of WQMP)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Appendix J

Completed Inspection Forms
(“Record of BMP Implementation, Maintenance, and Inspection”)