05CA031

DESIGN PLAN

FOR

JACKSON BOULEVARD DRAINAGE BASIN

FEBRUARY 23, 2005

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
3643
JERRY D.
FOSTER
SOUTH DAKOTA
2/23/05

PREPARED FOR:

CITY OF RAPID CITY

RAPID CITY, SOUTH DAKOTA

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February 23, 2005

Mr. Rich Wells P.E.
Project Manager
City of Rapid City
300 Sixth Street
Rapid City, SD 57701

RE: Design Plan for Jackson Boulevard Drainage Basin

Dear Mr. Wells:

Presented herewith is our DESIGN PLAN FOR JACKSON BOULEVARD DRAINAGE BASIN. The plan is a comprehensive basinwide design plan for stormwater management in the Jackson Boulevard Drainage Basin. It will provide guidance to the City, SDDOT, developers, and others in the basin. The plan presents design guidelines and data necessary for stormwater improvements in the basin.

Please be assured of our readiness to meet with City Officials to discuss the contents of the report. We are available to answer any questions and are prepared to proceed with the design of the recommended improvements if desired.

Thank you for the opportunity to be of service.

Respectfully submitted,

FMG, Inc.

Jerry D. Foster P.E.

cc: File 8459

DESIGN PLAN

FOR

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FEBRUARY 23, 2005

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INTRODUCTION

BACKGROUND

Proper management of urban drainage has historically been neglected as cities develop. Management has consisted of piecemeal planning, crisis control, expensive after the fact corrective solutions, and generally hoping the problem will go away or not happen again. Development has been allowed with little or no consideration given to basinwide impacts on flooding. Consequently severe and damaging flooding has occurred.

The City of Rapid City has recognized that this traditional method of urban drainage management is not appropriate. Rapid City views drainage control as a significant component of the urban infrastructure system rather than a problem that is simply tolerated. Consequently the City of Rapid City has implemented a program for comprehensive basinwide drainage design planning. This design plan was thus prepared by FMG, Inc., for the Jackson Boulevard Drainage Basin. It is one of many design plans prepared for drainage basins in and around the City of Rapid City.

OBJECTIVE

The purpose of this design plan is to define existing and future stormwater related problems in the study area and to present a conceptual design plan for control of the problems. This conceptual design plan is intended to provide stormwater guidance to the City, SDDOT, developers, and others in the basin.

DESIGN PLAN LIMITATIONS

It was beyond the scope of work to provide final engineering drawings suitable for construction. The design plan presented herein is conceptual and is intended to provide the general information necessary for the final working design of an efficient, planned system. The design plan is based on a practical hydraulic system which is suitable for further evaluation and implementation as the basin develops.

It is unlikely that the final design of any recommended improvement will exactly follow guidelines presented in this report; therefore, it will be necessary to make a final detailed technical analysis of the proposed improvements prior to their construction. Time lags play an important role in a planned basinwide system; thus, the final project design must include a computer analysis of the entire system even if individual element design flows are smaller than those proposed in this report. The computer models used in the design plan allow for updating or changing of the design plan.

Since the plan lends itself to updating or revisions, users of the plan are advised to contact the City of Rapid City to determine if this original document has been modified.

This design plan provides for only major drainages. Unless specifically addressed in the report, localized or minor drainage was beyond the scope of the study.

The design plan runoff/routing analysis is considered an approximation since storms rarely follow ideal patterns, and other factors such as ground cover, infiltration, and channel conditions may vary with time or from assumed conditions. The intent of a hydrologic runoff/routing analysis is to provide a reasonably dependable and consistent approximation of rainfall-runoff characteristics.

The design plan is based on a 100 year storm event. It should be noted that larger storms can and will occur in the basin.

BASIN DESCRIPTION

GENERAL BASIN DESCRIPTION

The Jackson Boulevard Drainage Basin is located in west Rapid City and is entirely within the City Limits. The Jackson Boulevard Drainage Basin is about 533 acres in size. Figure 1 shows the boundary of the Jackson Boulevard Drainage Basin. The complete drainage basin was subdivided into several smaller sub-basins as shown on Figure 2.

The sub-basins were grouped into separate tributaries areas for computer analysis. These tributaries are the Lower Tributary and the Upper Tributary. Separate computer models are used for each area. Attempts were made to combine all data into one model however a "bug" was discovered in the UDSWM95 software. The "bug" resulted in the combined model lagging flows by one time step at various locations due to the numerous diversion elements. Data sets were sent to the Urban Drainage District software developer in Denver. They were unable to resolve the problem and the only workaround for the "bug" was to separate the data into two models.

The Lower Tributary existing condition run still has a split flow time lag. Several changes to data sets were made in an attempt to eliminate this time lag. These attempts were all unsuccessful.

The Valley Floor Area is also within the study area. No computer modeling was done in the Valley Floor Area. Figure 3 shows the Lower Tributary, Upper Tributary, and Valley Floor Area.

Subdivision of a drainage basin allows flows to be calculated at various locations and then routed though a basin rather than simply assuming all runoff reaches the outlet simultaneously. There is no established rule for basin subdivision, and it is primarily based on specific project engineering needs and engineering judgment. Sub-basin boundaries were established following major flow patterns and unaccounted for sub-basin transfer may occur. Unless otherwise specified it is intended that sub-basin transfer will be prevented upon plan implementation; however, owing to map scale limitations, difficulties in establishing exact flow patterns, etc., some sub-basin transfer may still occur.

Basin boundaries were determined from aerial topography maps. It should be noted that contours shown on USGS quadrangle maps do not necessarily reflect all effects of urbanization and are misleading as to certain drainage boundaries.

LAND USE

In accordance with the City of Rapid City Drainage Criteria Manual this design plan is based on a fully developed drainage basin. The basin is nearly entirely developed therefore existing land use conditions were not modeled. The existing development generally consists of commercial, low to high density residential, medical, and open space type uses.

Much of the undeveloped area in the basin is judged as being too steep to support future development. Only a few small areas are judged as being possible for future development. Those areas that were judged as being suitable for possible future development were assumed to have land use types the same as adjacent existing development. Existing City park lands were assumed to remain as open space. Figure 4 shows the land use used in the analysis.

If significant changes in land use are proposed it will be necessary to remodel the basins involved to determine the effects of the changes. Increased imperviousness may require an increase in detention storage or other improvements such as larger channels or pipes. A significant decrease in imperviousness may allow for downsizing of improvements.

TOPOGRAPHY AND SPECIAL FEATURES

Basin topography is characteristic of the interface between foothills and plains. The lowest point in the basin is at about elevation 3234 feet and the maximum elevation is at about elevation 3790.

A significant portion of the Valley Floor area is subject to flooding from Rapid Creek. A FEMA floodplain exists for the Rapid Creek floodplain. Portions of the study area are protected from flooding by a federal levee and flood channel. FEMA floodplain maps are on file at the City of Rapid City Engineering Department

Various arterial roadways including West Main Street, Omaha Street, Mountain View Road, Jackson Boulevard, and Sheridan Lake Road are located in the study area. Some of these streets carry a significant amount of stormwater and are subject to flooding during minor runoff events. A proposed extension of Jackson Boulevard is also located in the study area.

Several major City utility lines are located in the area. The City of Rapid City Water Treatment Plant is located in the study area. Maps of City utilities are on file at the City of Rapid City Engineering Department.

EXISTING PROBLEMS

Several existing drainage problems exist in the basin. Some of these problems occur during minor runoff events. A partial description of some of the existing drainage problems is given below.

Most of the historic drainage routes and channels no longer exist. These flow areas have been filled, paved over, or otherwise eliminated. Streets, small ditches, and undersized pipes have been used to replace most of the historic systems. In many cases these replacement systems are undersized and the potential for flooding exists in various areas.

Several major streets are flooded to a level that significantly impairs traffic movement during minor runoff events. Some of these streets are Mountain View Road, West Main Street, Omaha Street, and Jackson Boulevard.

Several minor streets are flooded to a level that can significantly impair traffic movement or flood adjacent structures. Some of these streets are Lodge Street, Mountain View Drive, Janet Street, and Lance Street.

The significant flows carried on certain streets, along with expected curb overtopping, has the potential of flooding of adjacent structures.

Under existing conditions a significant amount of flow will be lost from the study area to the Downtown Drainage Basin. This flow is lost from the study area on West Main Street east of Jackson Boulevard. The Downtown Drainage Basin Design Plan does not account for any incoming flows from the Jackson Boulevard Drainage Basin.

The existing levee drainage system at the end of Jane Drive is undersized and ponding in this area will likely cause flooding of adjacent homes. Split flow from this pond area (Element 201) will be diverted to the rear of the Water Treatment Plant where only a small pipe exists.

Structure flooding may occur in the Element 202 metering pond area.

FLOODPLAIN

It was beyond the scope of work to establish floodplain boundaries or maps. Much of the Valley Floor area and parts of the Lower Tributary are in an existing FEMA floodplain. The existing ponding area at Elements 200 and 202 are also shown as a FEMA floodplain area. Maps of the FEMA floodplain are on file at the City of Rapid City.

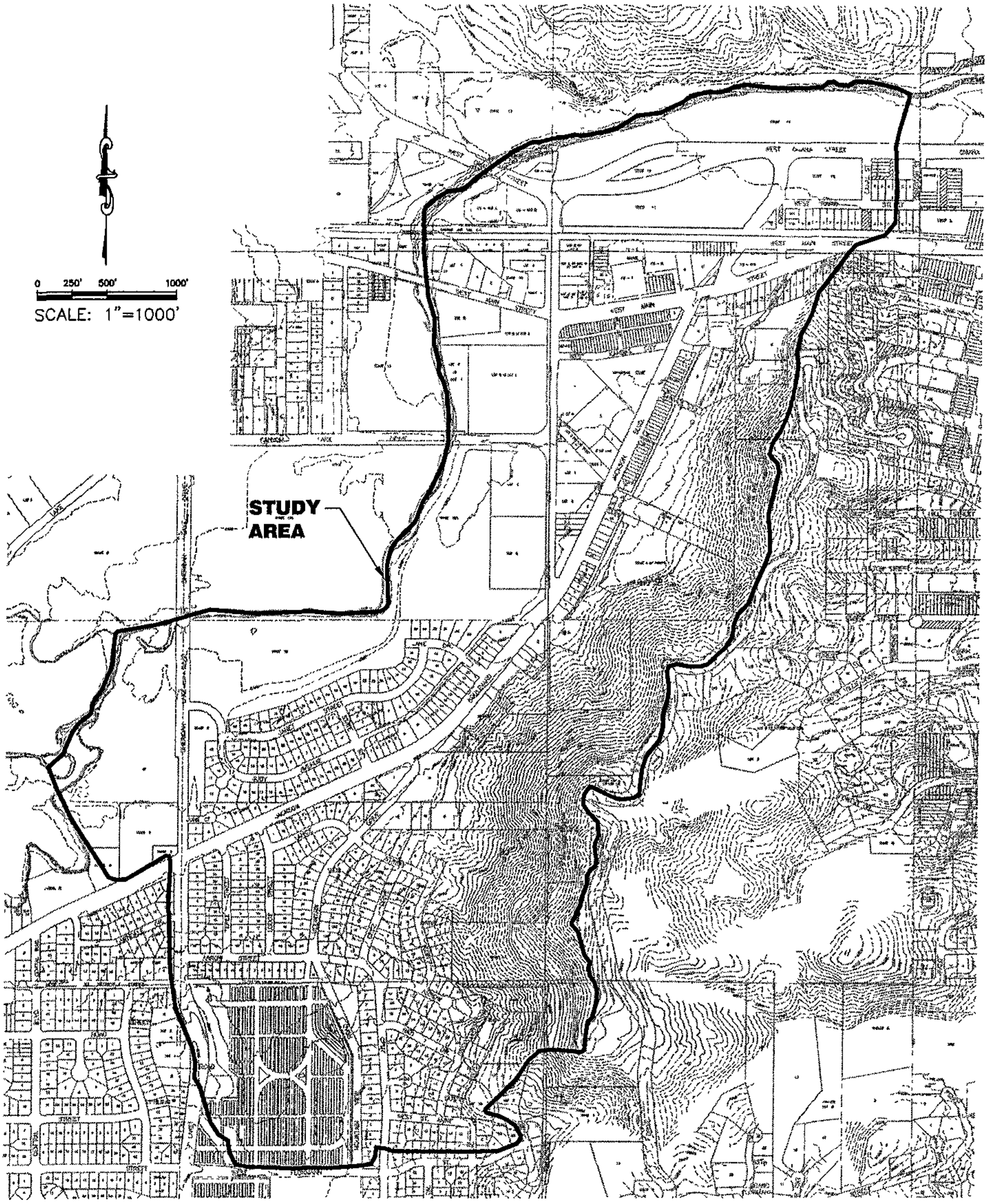

FIGURE 1 **JACKSON BOULEVARD DBDP** **RAPID CITY, SOUTH DAKOTA** FEBRUARY 2005	Sheet Title: STUDY AREA Location. BLACK HILLS MERIDIAN	Surveyed By: Date: Designed By: JDF Drawn By: MDS Checked By. JDF File Number: 8459\8459DRAN.DWG	**F M G, Inc.** 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222	Page Number 6

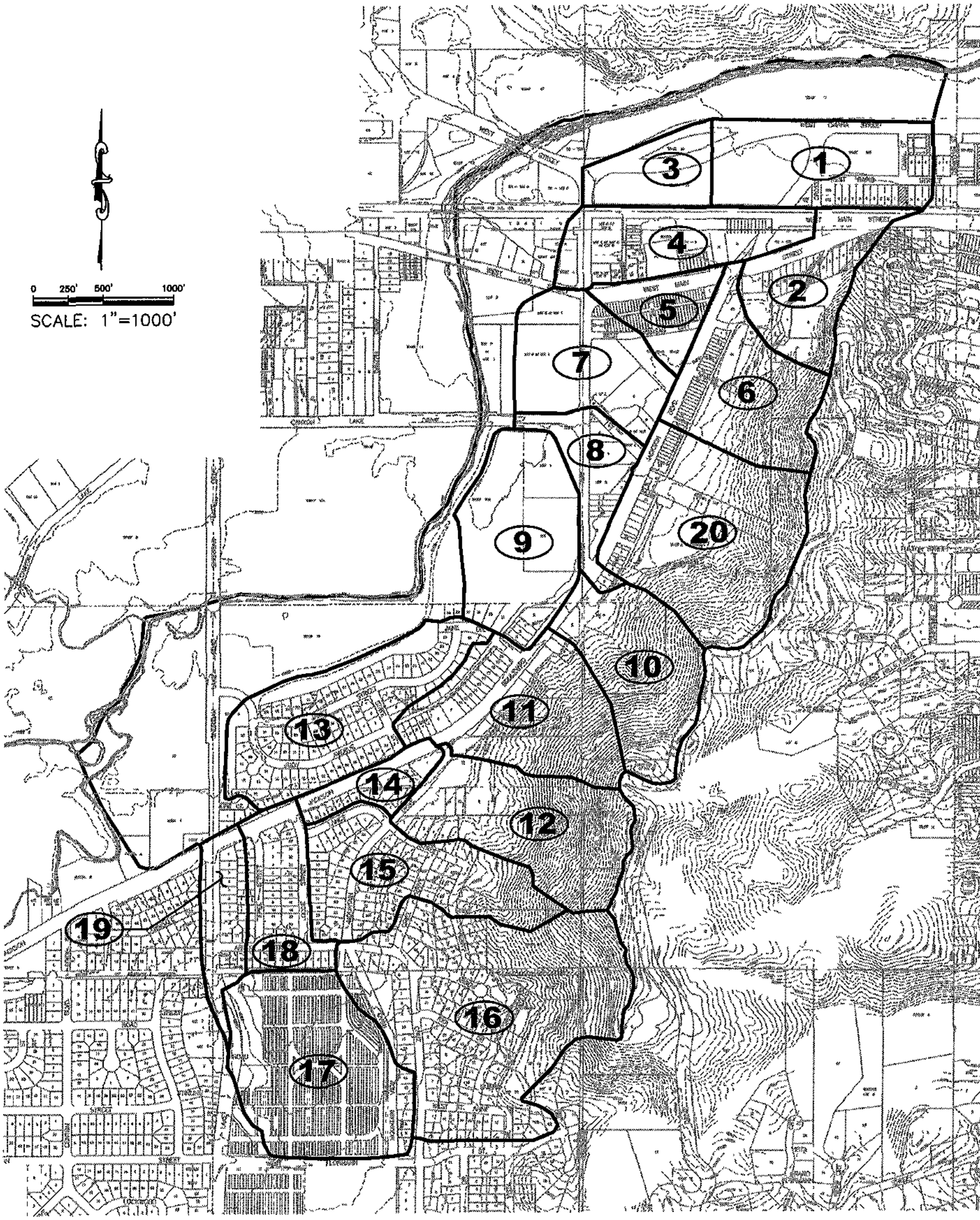

FIGURE 2

JACKSON BOULEVARD DBDP

RAPID CITY, SOUTH DAKOTA

FEBRUARY 2005

Sheet Title: SUB-BASINS	Surveyed By ____ Date ____	
	Designed By JDF Drawn By MDS Checked By JDF	
Location: BLACK HILLS MERIDIAN	File Number: 8459\8459DRAN.DWG	

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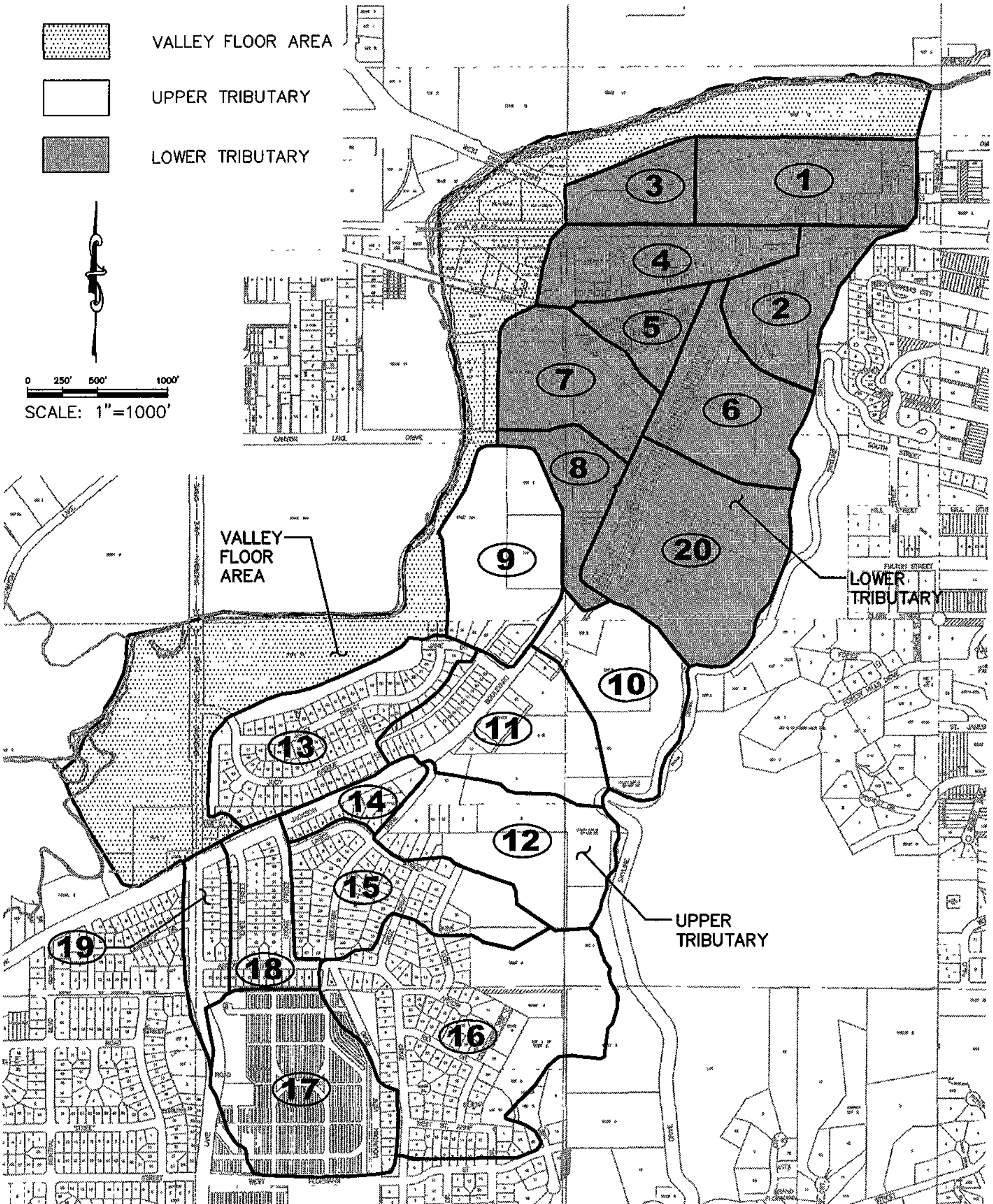

FIGURE 3

JACKSON BOULEVARD DBDP

RAPID CITY, SOUTH DAKOTA

FEBRUARY 2005

Sheet Title: TRIBUTARY MAP

Location: BLACK HILLS MERIDIAN

Surveyed By ____
Date ____
Designed By JDF
Drawn By MDS
Checked By JDF
File Number: 8459\8459DRAN.DWG

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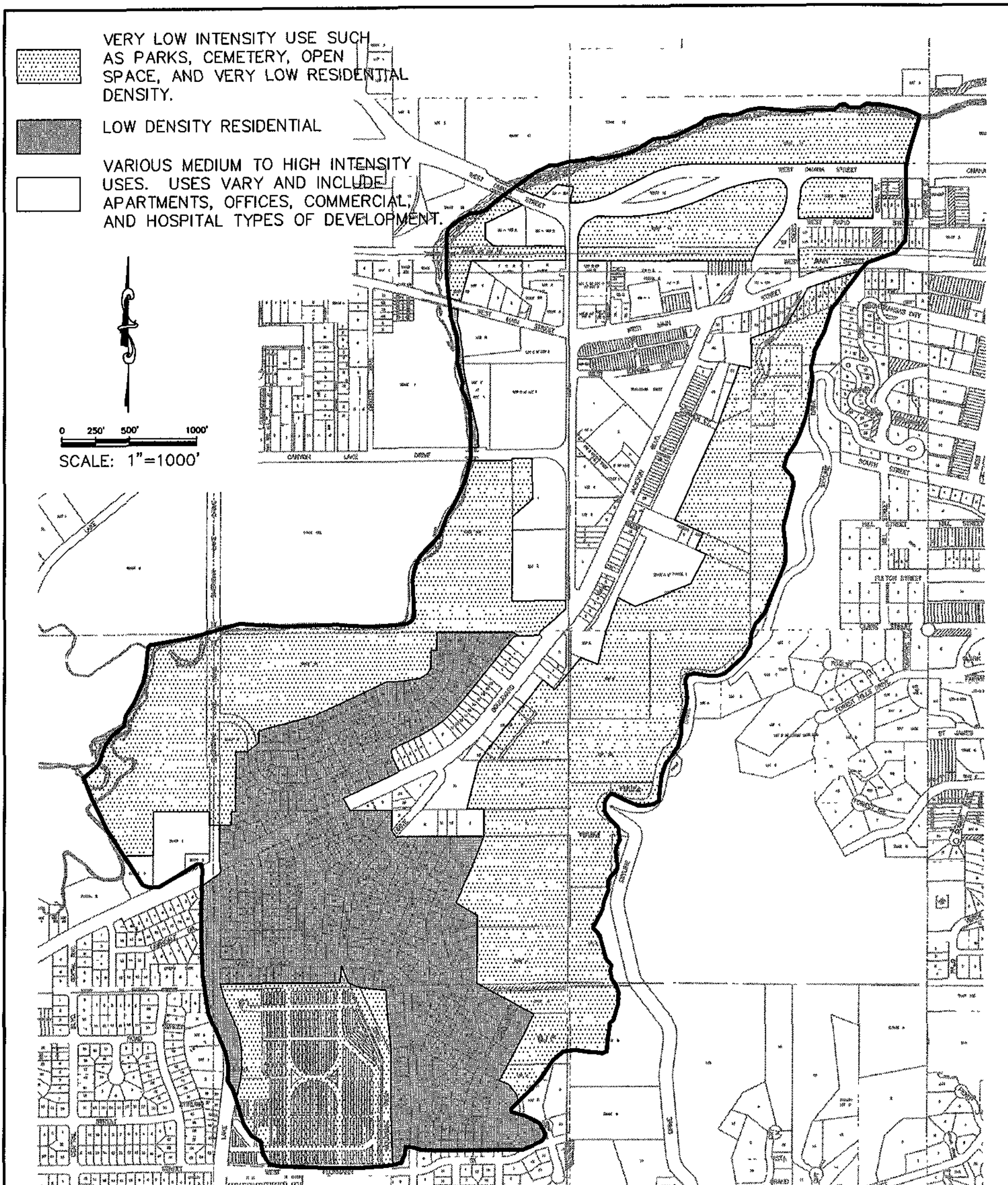

FIGURE 4

JACKSON BOULEVARD DBDP

RAPID CITY, SOUTH DAKOTA

FEBRUARY 2005

Sheet Title	LAND USE
Location	BLACK HILLS MERIDIAN
Surveyed By	
Date	
Designed By	JDF
Drawn By	MDS
Checked By	JDF
File Number	8459\8459DRAN.DWG

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DESIGN PLAN

GENERAL

Preparing the design plan involved completion of various tasks in an orderly process. The process involved sub-basin flow calculations, routing of the flows, problem identification, and evaluation of proposed solutions. A basinwide approach was used to determine effects of flows, problems, and improvements on the entire basin.

The entire basin was subdivided into numerous smaller basins with a network of hydraulic elements connecting the sub-basins. Flows were then calculated and routed using CUHPF95 and UDSWM95 computer models. After flows were calculated for various scenarios it was possible to identify problems and begin the design analysis.

After completion of the above steps, the analysis became a systematic evaluation of solutions. Evaluation of time lags between various points was an important part of the process. Economics, development needs, restrictions from existing infrastructure, and engineering judgment were included in the design plan evaluation and recommendation process.

The result of the above process is the JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN. This plan is not intended to be a final project design suitable for construction. Detailed survey, engineering analysis, and project design are necessary prior to implementation of any proposed improvement.

The design plan presented herein is conceptual and is intended to provide the general information necessary for the final design of a planned drainage system. It has been prepared within the limits of computer modeling to provide a functional drainage development guide. Rarely will a drainage basin respond and develop exactly as assumed; thus, this design is based on a practical hydraulic system. The plan is suitable for further evaluation as the basin develops, improvements become necessary, or various changes are requested.

Since the plan lends itself to updating or revisions, users of the plan are advised to check with the City of Rapid City to determine if this original document has been modified.

DESIGN PLAN OVERVIEW

In accordance with the City of Rapid City Drainage Criteria Manual, the design plan presented herein is based on a 100 year storm occurring in a fully developed basin. Ten year flows were also calculated to help in evaluation of problems and proposed improvements.

In general the improvements consist of new storm sewer systems or improvements to existing storm sewers. Improvements to metering dam systems are also included.

In nearly all cases where new or replacement storm sewer is recommend it will be necessary to install additional inlet capacity. It was beyond the scope of work to provide inlet design. In most cases inlets will be a major expense due to the lack of vertical roadway sags.

Pipe sizes given in this report are considered preliminary. During final design it will be necessary to verify street capacity, existing and proposed storm sewer capacity, and inlet capacity using flows described in the final report. Larger or smaller pipes may be necessary based on the outcome of final engineering design. Analysis of existing storm sewers was based on original design drawings and aerial photos with supplemental field surveys at certain locations.

Unless noted elsewhere in the report all street flow calculations assume standard sections with centerline crowns. Street grades were taken from aerial photos or original design drawings.

Unless otherwise noted in the report it was assumed that flooding in the study area would be nonconcurrent with flooding on Rapid Creek. This assumption is consistent with other DBDP's in Rapid City and is per instructions of the City of Rapid City.

Numerous plan summaries are given in figures and tables at the back of this chapter; however, the user is cautioned to refer to the INDIVIDUAL ELEMENT DESIGN section for a complete understanding of the design plan. The user should also be familiar with the HYDROLOGY and HYDRAULICS chapters. A summary of design plan recommendations and estimated costs of each element is given as Table 1; a summary of future condition peak flows for the sub-basins is given as Table 2; a summary of Lower Tributary hydraulic element peak routed flows with design plan conditions is given as Table 3, and a summary of Upper Tributary hydraulic element peak routed flows with design plan conditions is given as Table 4. A schematic of the design plan hydrologic routing network is shown on Figure 5. An overall improvement layout is shwon on Figure 6.

Design plan hydrographs for direct flow elements and detention ponds are included as Appendix A. CUHPF95 and UDSWM95 computer printouts are included as Appendix B – E. A 1"=200' drawing showing the overall recommend improvement layout and a 1"=200' drawing of the design plan routing schematic are included under separate cover.

COST ESTIMATE

Recommended design plan improvements are estimated to cost $3,224,000.00. The cost estimate is itemized by element on Table 1. A complete description of each recommended improvement is given in the INDIVIDUAL ELEMENT DESIGN section of this chapter.

The total cost estimate includes a 5% contingency and 25% engineering/administration costs. Cost estimates do not include costs of land or easement acquisition as it has been assumed that easements or right-of-way would be dedicated at no cost. Cost estimates for drainage improvements along existing streets assume the project is constructed concurrent with roadway reconstruction projects and thus include only those items associated with the drainage work and do not include pavement or utility relocation costs. Cost estimates will be substantially higher if the projects are constructed separately as drainage improvement projects.

INDIVIDUAL ELEMENT DESIGN

Following is a discussion of each element used in the proposed design plan. This section expands on the summarized information presented in the design plan overview. Included is a description of each proposed design plan element, special problems encountered, design data, recommendations, and other appropriate information.

Unless otherwise noted the flow and storage data given in the following narrative refers to the 100 year storm. The reader can refer to the various tables and computer printouts for 10 year flow information. Unless otherwise described, the following element discussion is based on full implementation of all design plan elements. The reader should also read the ADDITIONAL DESIGN RECOMMENDATIONS section of this chapter for additional overall design information.

The study area was grouped into the Lower Tributary, Upper Tributary, and Valley Floor Area. Refer to the BASIN DESCRIPTION section of this report for more information regarding this grouping.

"LOWER TRIBUTARY"

ELEMENT 1

Element 1 is the existing West Main Street storm sewer system with street overflow. Element 1 begins at Element 101 and ends at Element 305. No improvements are required. Optional improvements are possible.

The existing storm sewer system varies in size from 18" RCP at the upstream end to 30" RCP at the lower end. The 30" RCP has capacity for about 25 cfs.

Routed flow in Element 1 is 16 cfs. Element 1 also will carry flows from sub-basin 2. The total flow at the downstream end of Element 1 is 73 cfs as calculated at Element 101. The storm sewer and street have capacity for the 73 cfs. Element 1 and the added flow calculated at Element 101 continues east and enters the Downtown Drainage Basin. The Downtown Drainage Basin Design Plan does not account for these flows.

An optional improvement is possible to capture some of the flow lost to the Downtown Basin. This option consists of a 24" RCP from east of Cross Street back to the proposed Jackson Boulevard storm sewer discussed under Element 306. This pipe would intercept flows from the existing 24" RCP near Cross Street. The existing 24" RCP near the midpoint of Element 1 has capacity of about 15 cfs. If this optional pipe is installed it will be necessary to increase capacity of the proposed 48" RCP at Element 306.

Element 1 was UDSWM95 modeled as a 24" RCP with street overflow channel. The overflow section was modeled using recommended characteristics in the UDSWM95 manual.

ELEMENT 2

Element 2 is an existing 42" Arch RCP storm sewer beginning at Element 103 and ending at Element 104. The pipe is judged adequate and no improvements are necessary.

Pipe capacity is estimated at about 95 cfs; however, the pipe grade flattens out near the midpoint and the pipe will be surcharged. Because of this a certain amount of flow will exit from an area drain in the gravel parking area behind Fisher Furniture.

UDSWM95 does not model arch pipes therefore Element 2 was UDSWM95 modeled as a 60" RCP. Peak routed flow is 97 cfs.

ELEMENT 3

Element 3 represents an existing storm sewer system beginning at Element 102 and ending at Element 202. The storm sewer consists of two parallel pipes, a 36" RCP and 48" RCP. Improvements are recommended.

The entrance to the 48" pipe is a CMP under the railroad tracks. It is recommended the CMP be replaced with RCP to reduce headloss at the pipe entrance. It is also recommended that a flow balancing manhole between the pipes be constructed near the railroad tracks. Capacity of this system should be verified during construction of other new storm sewer systems in the area.

Peak flow to Element 3 from Element 202 is 137 cfs. An additional 15 cfs from Element 307 reaches the pipes just downstream of the railroad tracks. Total design flow is 152 cfs. The pipes will be flowing full, or close to full, from the Element 202 flow and the extra 15 cfs may not be carried in the Element 3 pipes. The 15 cfs will flow overland towards Omaha Street.

An option to reduce the amount of flow in Element 3 is an extra outlet pipe to Element 306 from Element 202. This option is discussed under Element 202. Some of the flow to Element 3 from Element 307 may also be reduced by optional discharge systems at Element 307.

UDSWM95 does not have the ability to model twin pipes therefore Element 3 was modeled as a single 72" RCP. Peak routed flow is 151 cfs.

ELEMENT 4

Element 4 represents an existing storm sewer system beginning at Element 102 and ending at Rapid Creek. The storm sewer consists of two parallel pipes, a 36" RCP and 48" RCP. No improvements to Element 4 are required. Installation of a storm sewer on Omaha Street to connect to Element 4 is recommended.

A new storm sewer system west of Element 4 to carry 10 year flows from sub-basin 3 is recommended. Recommended pipe size is an 18" RCP with capacity for about 5 cfs to 10 cfs.

Calculated 100 year flow at Element 4 is 168 cfs. Incoming flows from Element 3 (152 cfs) will likely fill the Element 4 pipe system and it is possible that the incoming flows from sub-basin 3 will actually bypass Element 4. It was judged acceptable to assume all flows will be carried by Element 4 rather than modeling a split flow system because (1) 100 year bypass flows are small, (2) 10 year flows are intercepted, (3) Omaha Street has adequate capacity for bypass flows, and (4) Omaha Street is also subject to 100 year flooding from Rapid Creek.

Options to reduce the amount of flow to Element 3 and thus to Element 4 are discussed under Element 3.

UDSWM95 does not have the ability to model twin pipes therefore Element 4 was modeled as a single 72" RCP. Peak routed flow is 168 cfs.

ELEMENT 5

Element 5 is an existing open channel used to carry Element 307 discharges to Element 3. No improvements are required other than general grading as required to blend to the Element 307 metering dam outlet.

Under existing conditions Element 5 is located on the south side of the railroad tracks. Under design plan conditions Element 5 is located north of the railroad tracks because of redirected Element 6 and new Element 307.

Element 5 was modeled as an open channel with a 5' bottom, 3:1 side slopes, an n value of 0.044, and an invert slope of 0.005 ft/ft. Peak routed flow is 15 cfs.

ELEMENT 6

Element 6 is an existing 30" RCP beginning at Element 105 and ending at Element 307. Element 6 provides the outfall system from the Mountain View Road and West Main Street intersection. Improvements are recommended.

The existing 30" RCP has capacity of about 45 cfs. This pipe is undersized and the Mountain View Road/West Main Street intersection experiences significant flooding. A preliminary study by SDDOT proposed a new 30" RCP be extended from the intersection west to Rapid Creek. In lieu of the SDDOT proposal it is recommended that the existing Element 6 30" RCP be upsized to a 42" RCP. This recommendation is made because (1) Rapid City is trying to minimize the addition of point discharges to Rapid Creek and (2) the 42" RCP will be discharged to Pond 307 which is a proposed "water quality" pond.

The 42" RCP should have capacity for about 90 cfs. This capacity exceeds the 10 year flow of 63 cfs at the intersection; however, this is needed in order to reduce 100 year flooding elsewhere. The 100 year flow at the intersection is 107 cfs; thus, about 17 cfs will still bypass the pipe system and flow to the east on West Main Street (Elements 7 & 8).

Element 6 currently discharges to the east on the south side of the railroad tracks. It is recommended that the outlet be redirected to cross the railroad tracks near this location. This will direct flows to Pond 307 and reduces flow to Pond 202.

Element 6 was UDSWM95 modeled as a 60" RCP because of the increased n value required for UDSWM95.

ELEMENT 7 AND ELEMENT 8

Elements 7 and 8 represent the existing West Main Street storm sewer and street overflow system. This system begins at Element 105 and ends at Element 104. No improvements are recommended.

Elements 7 and 8 also carry flow from sub-basin 5. The 10 year flow from sub-basin 5 is about 25 cfs. The existing 24" RCP pipe has capacity for about 15 cfs thus about 10 cfs will be on the street. Most of the surface flow will be in the southside parking lane although there will be an encroachment into the driving lane on the order of 6 feet. The encroachment may be more than 6' at intersections where the curb extends to the edge of the parking areas. Lane encroachment was judged acceptable. If the lane encroachment is determined not acceptable it will be necessary to replace the 24" RCP with a 30" RCP.

Element 7 was UDSWM95 modeled as a street with overflow. Element 8 was modeled as a 24" RCP with street overflow. Street and overflow sections were modeled using recommended characteristics in the UDSWM95 manual. Peak routed flow is 8 cfs.

ELEMENT 9

Element 9 is an existing storm sewer system with street overflow. Element 9 begins at Element 107 and ends at Element 105. Improvements are recommended.

The existing storm sewer along Element 9 is undersized and does not run full length. A larger storm sewer with additional length is recommended.

The storm sewer will carry most of the flow from sub-basin 7 in addition to the routed flows from Element 107. The 10 year flow from sub-basin 7 is 63 cfs and the 100 year flow from sub-basin 7 is 105 cfs. There is no 10 year routed flow from Element 107. The 100 year routed flow from Element 107 to Element 9 is 5 cfs.

The proposed pipe varies in size from a 36" RCP near the north end to an 18" RCP with 5 to 10 cfs near the south end. Recommended capacity is 65 cfs at the downstream end and 5 to 10 cfs at the upstream end.

Element 9 was UDSWM95 modeled as a 24" pipe with street overflow channel. The overflow section was modeled using recommended characteristics in the UDSWM95 manual.

ELEMENT 10

Element 10 is a 36" RCP constructed as part of the Canyon Lake Drive reconstruction project. Pipe capacity is about 50 cfs.

Incoming flows to Element 10 from Element 11 will be about 30 to 35 cfs. Inlets at the intersection of Canyon Lake Drive and Mountain View Road will pick up additional flow of about 20 cfs to fully utilize the 36" RCP capacity. Peak 100 year flow to the intersection is 55 cfs therefore a bypass of about 5 cfs will occur.

Element 10 was UDSWM95 modeled as a 48" RCP because of the increased n value required for UDSWM95. Peak routed flow is 51 cfs.

ELEMENT 11

Element 11 is an existing storm sewer system with street overflow. Improvements are recommended.

Element 11 does not carry routed flow but does carry flow from portions of sub-basin 8. The 10 year flow from sub-basin 8 is 32 cfs. It is recommended that a 24" RCP with inlets be installed along Element 11 to carry this 32 cfs. The 24" RCP will replace a 15" RCP that currently exists in the lower end of Element 11.

Under existing conditions it is possible that Element 11 will carry a certain amount of split flow from Element 108. That split flow was not modeled due to split flow modeling limitations discussed earlier in this section.

An alternate for "water quality" improvements would be to divert a portion of the Element 11 discharge to Upper Tributary Pond 200. This diversion would have to occur from Element 11 rather than Element 10 because of grades. This alternate has not been modeled.

ELEMENT 24

Element 24 is the existing Jackson Boulevard storm sewer system with street overflow. Element 24 begins at Element 122 and ends at sub-basin 20.

Improvements to the Jackson Boulevard storm sewer system are recommended between West Main Street and Mountain View Road. The existing pipes would be adequate (assuming additional inlets) for 10 year flows assuming a certain amount of lane encroachment is allowed. However; it is necessary to make improvements because of significant problems caused by 100 year flows.

The 100 year flow at Jackson Boulevard in this area is 203 cfs as calculated at Element 122. The roadway crown point is at the edge of the east parking lane and only minor flows can be carried on the east side. The west side of the street can carry about 20 cfs before the curb overtops causing flooding of adjacent structures. Some of those curb overtopping flows would continue to flow west though the "Safeway" parking lot area. Other west side street flows would flow onto Kansas City Street and an alley south of West Main Street. Vertical sags in Kansas City Street and the alley are then drained by storm sewer back to the Jackson Boulevard storm sewer.

Several buildings on the west side of Jackson Boulevard between West Main Street and Mountain View Road are lower than the street. These buildings will be subject to flooding from any flow not carried in a pipe or on Jackson Boulevard. As explained above Jackson Boulevard has very little surface flow capacity and it is therefore recommended that a new storm sewer system be installed with capacity for the 100 year storm.

A 48" RCP pipe is proposed on Jackson Boulevard from West Main Street to Valentine Street, 36" RCP from Valentine Street to Fulton Street, and 18" RCP from Fulton Street to Clark Street. Recommended capacity varies from 200 cfs at the downstream end to about 10 cfs at the upstream end.

The existing storm sewer is 36" from West Main Street to Shaver Street, 30" from Shaver Street to Valentine Street, and 18" from Valentine Street to Fulton Street. The proposed pipes are sized to replace the existing system.

Element 24 was UDSWM95 modeled 30" RCP with street overflow. The overflow section was modeled using recommended characteristics in the UDSWM95 manual.

ELEMENT 100

Element 100 is a direct flow element. It summarizes the flow from sub-basin 1. Peak 100 year flow is 54 cfs.

A new storm sewer system is proposed on Omaha Street in the vicinity of Element 100. A 24" RCP should begin near Canal Street and extend to Oskosh Street where it would be directed to Rapid Creek. The recommended pipe capacity is 15 to 20 cfs. The capacity of this pipe, combined with the Omaha Street pipe discussed under Element 306, should have capacity for at least the 10 year flow of 24 cfs from sub-basin 1.

ELEMENT 101

Element 101 is a direct flow element. It summarizes the flow from sub-basin 2 and Element 1. Flow calculated at Element 101 leaves the Jackson Boulevard basin and enters the Downtown Drainage Basin. Peak 100 year flow is 73 cfs.

Optional improvements to capture a portion of this flow and return it to the Jackson Boulevard basin are discussed under Elements 1 and 306.

ELEMENT 102

Element 102 is a direct flow element. It summarizes flow from sub-basin 3 and Element 3. Peak 100 year flow is 168 cfs.

A certain amount of split flow may occur at Element 102. This was not modeled and is discussed under Element 4.

ELEMENT 103

Element 103 is a direct flow element. It summarizes flow from sub-basin 4 and Element 2 to provide an inflow hydrograph to metering pond Element 202. Peak 100 year flow is 192 cfs.

ELEMENT 104

Element 104 is a direct flow/split flow element. Inflows from sub-basin 5, Element 8, and Element 122 are summarized at this location with outflow sent to Element 2 and Element 304.

Element 104 is used in combination with Element 304 and Element 305 to model the proposed split flows at the Jackson Boulevard and West Main Street intersection.

Peak 100 year inflow is 250 cfs. Peak 100 year outflow to Element 2 is 95 cfs. Peak 100 year outflow to Element 304 is 155 cfs.

Split flow data used to model Element 104 is given below. Equal flows to Element 2 and Element 304 were assumed until capacity of Element 2 is reached. Excess flow after capacity of Element 2 is reached was diverted to Element 304.

ELEMENT 104 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 2 (CFS)	TO ELEMENT 304 (CFS)
0	0	0
50	25	25
100	50	50
150	75	75
190	95	95
250	95	155
350	95	255
400	95	305

ELEMENT 105

Element 105 is a direct flow/split flow element. Inflows from sub-basin 7 and Element 9 are summarized at this location with outflow sent to Element 6 and Element 7.

Element 105 is used to model the proposed split flows at the West Main Street and Mountain View Road intersection.

Peak 100 year inflow is 107 cfs. Peak 100 year outflow to Element 6 is 90 cfs. Peak 100 year outflow to Element 7 is 17 cfs.

Split flow data used to model Element 105 is given below. Flow to Element 6 is based on the recommended capacity of the Element 6 42" RCP storm sewer. All flow that exceeds capacity of the Element 6 is diverted to Element 7.

ELEMENT 105 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 6 (CFS)	TO ELEMENT 7 (CFS)
0	0	0
90	90	0
100	90	10
200	90	110
250	90	160
300	90	210
350	90	260
400	90	310

ELEMENT 106

Element 106 is a direct flow element. It provides a final discharge summary to Rapid Creek at the Canyon Lake Drive bridge. Peak 100 year flow is 51 cfs.

ELEMENT 107

Element 107 is a direct flow/split flow element. Inflows from sub-basin 8 are summarized at this location with outflow sent to Element 9 and Element 10.

Element 107 is used to model the proposed split flows at the Canyon Lake Drive and Mountain View Road intersection.

Peak 100 year inflow is 55 cfs. Peak 100 year outflow to Element 9 is 5 cfs. Peak 100 year discharge to Element 10 is 50 cfs.

Split flow data used to model Element 107 is given below. Flow to Element 10 is based on the proposed capacity of the Element 10 storm sewer. All flow that exceeds capacity of the Element 10 is diverted to Element 9.

ELEMENT 107 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 9 (CFS)	TO ELEMENT 10 (CFS)
0	0	0
10	0	10
20	0	20
30	0	30
40	0	40
50	0	50
100	50	50
200	150	50

ELEMENT 122

Element 122 is a direct flow element. It summarizes flow from sub-basin 6 and Element 24 to provide an inflow hydrograph to Element 104

Element 122 models the Jackson Boulevard flow at the intersection with West Main Street. Peak 100 year flow is 203 cfs.

ELEMENT 202

Element 202 is an existing metering pond area created by the railroad embankment at Element 103. Improvements are recommended for the outlet system as described under Element 3. Optional improvements also are possible.

The 36" RCP and 48" RCP pipes modeled as Element 3 are the outlet system for this pond. Peak flow into Pond 202 is 192 cfs and peak flow out is 137 cfs. The 100 year water elevation is calculated at about elevation 3254 with 1.5 acre feet of storage. Improvements to the Element 3 system are recommended as discussed under Element 3.

Floor elevations of the adjacent storage building and furniture store east of Pond 202 are about elevation 3254. This is the same elevation as calculated water elevation thus no freeboard is available. As an option, a secondary outlet for Pond 202 could be provided to lower the water elevation. This secondary outlet could be (1) a pipe culvert through the railroad embankment at about elevation 3252 discharging onto the park/soccer field area, or (2) stubbing another pipe into the proposed Element 306 storm sewer. If option 2 is selected it may be necessary to upsize Element 306 downstream of the connection point.

Existing condition UDSWM95 calculations indicate that ponding will be at approximate elevation 3255. It should be noted that the Element 202 ponding area is shown on the FEMA floodplain maps as a 100 year Zone AE floodplain. The FEMA flood elevation is about 3256; therefore, the area will still be subject to flooding even with metering pond improvements

Stage/storage/discharge data for Element 202 is given below. The storage curve assumes most of the parking lot area behind the Fisher Furniture building is filled and not used for ponding.

STAGE/STORAGE/DISCHARGE DATA – ELEMENT 202

ELEVATION	STORAGE (AC-FT)	DISCHARGE (CFS)
3248.1	0	0
3250	0.0	30
3252	0.5	115
3254	2.5	160

Pond overflow would begin to occur at about elevation 3255. Overflows would be directed to Cross Street and then to West Main Street.

Element 202 discharge calculations assume the outlet pipes are acting as culverts between the pond and Rapid Creek. Records of these pipes are lacking in detail and it is recommended that system capacity be verified during design of any improvements in this area.

ELEMENT 304

Element 304 is a direct flow element. It is used in conjunction with Element 104 and Element 305 to model the proposed split flows at the Jackson Boulevard and West Main Street intersection.

Element 304 directly transfers flow from split flow Element 104 to split flow Element 305. Peak 100 year flow is 155 cfs.

ELEMENT 305

Element 305 is a direct flow/split flow element. It is used in conjunction with Element 104 and Element 304 to model the proposed split flows at the Jackson Boulevard and West Main Street intersection.

Element 305 splits flow to Element 1 and Element 306. Peak 100 year inflow is 155 cfs. Peak 100 year outflow to Element 1 is 35 cfs. Peak 100 year outflow to Element 306 is 120 cfs.

Split flow data used to model Element 305 is given below. Flow to Element 306 is based on the proposed capacity of the Element 306 storm sewer. All flow that exceeds capacity of the Element 306 is diverted to Element 1.

ELEMENT 305 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 1 (CFS)	TO ELEMENT 306 (CFS)
0	0	0
60	0	60
120	0	120
200	80	120
250	130	120

It should be noted that the west end of Element 1 (West Main Street) is a superelevated roadway section and was estimated to have capacity for about 30 to 40 cfs before curb overtopping occurs. This available roadway capacity was used to determine required capacity of the split to Element 306.

ELEMENT 306

Element 306 is a proposed storm sewer beginning at Element 305 and ending at Rapid Creek. The proposed storm sewer begins at the intersection of Jackson Boulevard and West Main Street, follows the proposed extension of Jackson Boulevard, crosses Omaha Street, and daylights near Rapid Creek.

Total 100 year flow at the Jackson Boulevard/West Main intersection is 250 cfs as calculated at Element 104. This flow will be carried by the existing Element 2 storm sewer (95 cfs), the proposed Element 306 storm sewer (120 cfs), and on West Main Street east of Jackson Boulevard (35 cfs).

Minimum capacity for the new Jackson Boulevard extension pipe should be 120 cfs. A preliminary design indicates a 48" RCP can be used. A flow equalization manhole or connecting pipes will be necessary to balance flows between Elements 2 and 306.

The proposed Jackson Boulevard pipe extension will have to cross several utility lines including a 30" water main, a 20" water main, and a 30" sanitary sewer. Flow lines of the 30" sewer, top of railroad track rail, and street elevations in this area were surveyed and it is judged that the 48" RCP can be constructed as recommended. The preliminary grade review indicates there is a certain amount of flexibility in the pipe design in the vicinity of the 30" water main. It is unknown if water main adjustments will be necessary although it is judged likely that adjustments to the 20" main in West Main Street will be required.

It will be necessary to increase the size of Element 306 if the optional pipe discussed under Element 1 is constructed.

A new storm sewer on Omaha Street west of, and connected to, Element 306 is also recommended. The recommend pipe is an 18" RCP with capacity for 10 to 15 cfs. This pipe carries a portion of the flows from sub-basin 1.

Another new storm sewer on Omaha Street is recommended east of Element 306. This storm sewer is discussed under Element 100.

ELEMENT 307

Element 307 is a recommended new metering dam west of the Omaha Street soccer field. This metering dam will receive flow from the redirected Element 6 storm sewer. It was assumed that the pond would also serve as a "water quality" pond and therefore only minor outflow has been assumed for the first 0.5 acre feet of storage (2' deep water quality storage).

Total storage depth at Element 307 for the 100 year storm is about 4' at 3.1 acre feet of storage. Bottom of pond will be at about elevation 3249 and top of dam is at about elevation 3253. An 18" RCP at flow line 3251 will drain those flows exceeding water quality capture volume. The pond will discharge to Element 5.

A certain amount of excavation will be necessary for the ponding area. It may be possible to reduce the pond elevation by allowing spillway discharge to the Soccer Field parking lot area during the 100 year storm. The 10 year storm fills to about elevation 3252 at 1.5 acre feet of storage.

Stage/storage/discharge data for Element 307 is given below.

STAGE/STORAGE/DISCHARGE DATA – ELEMENT 307

ELEVATION	STORAGE (AC-FT)	DISCHARGE (CFS)
3249	0	0
3250	0.1	0.1
3251	0.6	0.1
3252	1.2	12
3253	3.5	16

"UPPER TRIBUTARY"

ELEMENT 12

Element 12 is a proposed storm sewer with street overflow. It conveys the flow from sub-basin 12 to Element 13.

A 24" RCP storm sewer is recommended along the "east" side of Jackson Boulevard in the vicinity of the Mountain View Road intersection. The pipe will then cross Mountain View Road and be extended to the Element 13 channel.

The 24" RCP is sized for the 10 year flow of 18 cfs from sub-basin 10. The 100 year flow from sub-basin 10 is 51 cfs. The street system is tilted through this intersection. As a result any flows exceeding 18 cfs are assumed to cross Jackson Boulevard and enter the existing nursing home driveway or overtop rather than continue northward on Mountain View Road.

The flow routing into the driveway should be verified during future designs in this area. Additional inlets and pipe will be necessary if the flow pattern is not as assumed. It is possible the driveway mentioned above may be eliminated as part of future intersection improvements. If this occurs it will be necessary to add inlets and pipes to replace the driveway flow capacity.

Element 12 was UDSWM95 modeled as a 24" RCP with street overflow. Peak routed flow is 50 cfs.

ELEMENT 13

Element 13 is an existing open channel beginning at Element 200 and ending at the confluence of Elements 12 and 14. Improvements are recommended.

The existing channel is poorly defined and flows are expected to spread out over large areas. It is recommended that the channel be improved by construction a low flow channel. Flows exceeding this channel capacity will be allowed to spread over the adjacent areas.

The proposed low flow channel has a 10' bottom, 5:1 side slopes, and is 2' deep. At an invert slope of 0.5% the channel has capacity for slightly less than the 10 year flow.

Improvements to carry the 10 year flow under the North Water Plant Access Road are also recommended. The 10 year flow is on the order of 170 cfs and four 30" RCP culverts are recommended. Flows in excess of the 10 year flow will overtop the roadway.

Element 13 was UDSWM95 modeled as a low flow channel with overflow channel. The low flow channel was modeled with a 10' bottom, 5:1 side slopes, n value of 0.044, and an invert slope of 0.005 ft/ft. The overflow channel was modeled with a zero width bottom, 40:1 side slopes, n value of 0.044, and an invert slope of 0.005 ft/ft. Peak routed flow is 391 cfs. Peak 100 year design flow would be about 452 cfs as calculated at Element 110.

ELEMENT 14

Element 14 is an existing channel beginning at the Element 13 and ending at Element 111. Improvements are recommended.

Element 14 carries the flow from sub-basin 11 that is not intercepted by the Element 15 pipe. Required flow capacity for Element 14 is about 100 cfs. Refer to Element 15 for further discussion about this flow.

The 100 cfs design discharge flows from Jackson Boulevard to Jane Drive. The flow then is directed from Jane Drive to the Element 14 channel. The channel has a concrete trickle pan between Jane Drive and the south Water Plant Access Road. This reach of the Element 14 channel is judged to be adequate; however, capacity needs to be verified during design of adjacent improvements.

Improvements to the crossing of the south Water Plant Access Road are recommended. Twin 36" RCP culverts for 100 cfs are recommended at this crossing. It is recommended the pipes convey the entire flow because of undesirable overtopping characteristics in the area.

The short reach of channel downstream of the roadway crossing should be regraded to direct flows to the improved Element 13 channel. The recommended channel at this location is a 10' bottom with 5:1 side slopes.

Element 14 was UDSWM95 modeled with a 5' bottom, 4:1 side slopes, n value of 0.038, and an invert slope of 0.008 ft/ft. Peak modeled flow is 385 cfs. This flow is misleading since it includes flow from Element 15. The Element 15 pipe will likely be discharged downstream of Element 14 as discussed under Element 15.

ELEMENT 15

Element 15 is a proposed new storm sewer system. The pipe will begin near Mountain View Drive and the proposed outlet location is near the south Water Plant Access Road. In order to simplify calculations and because of optional outlet locations, the pipe was modeled as ending at Element 111 rather than in the recommended vicinity of the south Water Plant Access Road.

Element 15 is recommended as a 66" RCP with capacity of 275 cfs. The 66" pipe capacity is calculated by adding 175 cfs from the Element 23 48" RCP along Mountain View Road to 100 cfs from the Element 312 42" RCP. Various utilities, including 12" and 30" water mains, will be crossed by the 66" RCP.

Inlets should be installed along the 66" RCP in the sub-basin 11 reach. These inlets will be utilized for 10 year flows from sub-basin 11 and should be sized for about 35 cfs. These inlets will only be partially effective during the 100 year storm since the 66" pipe is full from upstream flows.

About 100 cfs from sub-basin 11 will remain as 100 year surface flow on Jackson Boulevard between Jane Drive and Mountain View Drive. Flow depth will be 6" to 8" near Jane Drive. No attempt was made to determine depths in the superelevated area near Mountain View Drive and it is possible that the flow will spread onto adjacent parking lots on the low side of the superelevated area.

Consideration could be given to routing the Jackson Boulevard 66" pipe down Jane Drive with the outlet directed to the alley (Element 14). The alternate route would likely require concrete lining of the channel in the alley as well as additional improvements to the south Water Plant Access Road. For simplification of modeling it is assumed Element 15 follows this alternate route to Element 14.

Element 15 was UDSWM95 modeled as a pipe with street overflow channel. The pipe was modeled as a 78" RCP because of the increased n value required for UDSWM95. The overflow section was modeled using recommended characteristics in the UDSWM95 manual. Peak routed flow is 279 cfs.

ELEMENT 16

Element 16 models surface flow on State Street, Janet Street, and Jane Drive beginning at Element 113 and ending at Element 311. Improvements are recommended for minor flows.

The 100 year flow diverted to State Street from Element 311 is about 75 cfs. This joins with a portion of the flow from sub-basin 13 on Janet Street. Flow depth on Janet Street will on the order of 6" to 9" above top of curb assuming a flow of 136 cfs as calculated at Element 113. This flow depth is judged acceptable based on an assumption that all structures are a minimum of 12" above the curb. It should also be noted that some of the flow calculated at Element 113 actually flows along the levee rather than along Element 16.

During wet years there is a "constant" base flow on Janet Street and Jane Drive due to sump pump discharge. It is recommended that an 18" RCP storm sewer system be installed in this segment of Element 16 to carry the sump pump discharge. The pipe will be discharged into the existing Element 200 outlet box. Because of "normal" water elevations in that box it is likely that the pipe outlet will be partially or completely submerged.

Element 16 was modeled as a street with overflow using recommended characteristics in the UDSWM95 manual. An averaged invert slope of 0.133 ft/ft was assumed. Peak routed flow is 63 cfs. The proposed 18" RCP was not used in UDSWM95 modeling since it will be partially filled by sump pump flows and is expected to be of such a flat grade that only incidental storm water flows will be carried.

ELEMENT 17

Element 17 is an existing 42" RCP storm sewer system along Jackson Boulevard. It begins at Element 114 and ends at Element 20. Under existing conditions this pipe is significantly undersized. Several other improvements are recommended that divert flow Element 17. As a result no improvements to Element 17 are required.

The existing pipe is at a very flat slope and has capacity for only 30 cfs. Note that the pipe flows in a direction that is opposite of surface flow on Jackson Boulevard.

The pipes draining the Lance Street vertical sag area currently connect to the Jackson Boulevard storm sewer system at the west end of Element 17. These pipes will be rerouted as discussed under Element 18.

Element 17 was UDSWM95 modeled as a 48" RCP because of the increased n value required for UDSWM95.

ELEMENT 18

Element 18 is the existing storm sewer system that drains the Lance Street sag to the Jackson Boulevard storm sewer system. It is modeled as beginning at the Lance Street sag (Element 119) and ending at Element 114.

These pipes currently connect to the Jackson Boulevard storm sewer system at the west end of Element 17. Element 18 is to be disconnected from Element 17 and reconnected to the proposed Element 312 storm sewer.

The Element 18 pipe system, a 24" RCP and 36" RCP, are estimated from preliminary calculations to have sufficient capacity. The pipes need to convey about 78 cfs which is the 100 year flow from sub-basin 12. Routes and connection points of these pipes are unknown. There are no design drawings or as-built drawings available that show this complete system. Capacity of this system should be verified during construction of other new storm sewer systems in the area.

Element 18 was USDWM95 modeled as a 48" RCP with an invert slope of 0.03 ft/ft and an n value of 0.016. Peak routed flow is 78 cfs.

The existing condition UDSWM95 model allows full 100 year flow through Element 18. This is "dummy" data to simplify modeling. Under existing conditions the Element 18 pipes do not actually have capacity for this flow. Localized structure and street flooding will occur. Overflows can also be expected along lot lines

ELEMENT 19

Element 19 routes Element 117 flow to Element 114 as surface flow on Jackson Boulevard. Under existing conditions Jackson Boulevard is subject to significant flooding. Other improvements are recommended that divert flow from Element 19. As a result no improvements to Element 19 are required.

Only minor flows will remain on Jackson Boulevard between Teepee Street and State Street during the 10 year storm. Some flows will be carried by the Element 17 and Element 20 storm sewer and is estimated that about 45 cfs, including sub-basin 14 flows, will remain on the street in a 100 year storm. Interception of Element 19 flows by Element 17 and Element 20 has not been modeled; rather, it was assumed during modeling that the all Element 19 flows reach Element 114 where flow is then diverted to Element 17. Gutter flow depth is estimated to be on the order of 6" to "9 for 45 cfs. This remaining surface flow converges with other surface flows (from sub-basin 12) at the intersection of State Street and Jackson Boulevard. These excess flows will then divert to the Element 16 street flow system.

As a safety factor it is recommended the existing berm remain on north side of Jackson Boulevard.

Element 19 was modeled as a street with overflow using recommended characteristics in the UDSWM95 manual. An invert slope 0.002 ft/ft was used. Peak routed flow is 62 cfs.

ELEMENT 20

Element 20 is an existing 42" RCP storm sewer system along Jackson Boulevard. It begins at Element 17 and ends at Element 116. Under existing conditions this pipe is significantly undersized. Other improvements are recommended that divert flow from Element 20. No improvements to Element 20 are required.

Proposed tributary storm sewers that will connect to Element 20 are discussed under Element 22.

The 42" RCP ranges in capacity from 30 cfs to about 55 cfs. The increased capacity begins just west of Teepee Street where the pipe grade changes from about 0.09% to about 0.30%. This additional pipe capacity is utilized by flows from sub-basin 19 as described under Element 21

Portions of Element 20 drain in a direction opposite of the Jackson Boulevard surface flow.

Element 20 was UDSWM95 modeled as a 60" RCP because of the increased n value required for UDSWM95. Peak routed flow is 30 cfs.

ELEMENT 21

Element 21 is an existing 42" RCP storm sewer system along Sheridan Lake Road. It begins at Element 116 and ends at Element 120. Under existing conditions this pipe is significantly undersized. Several other improvements are recommended that divert flow Element 21. No improvements are judged to be necessary.

The 42" RCP has capacity for about 55 cfs. Peak inflow to the pipe at Element 115 is 63 cfs. The 8 cfs not carried by the pipe will be diverted out of the study area at the intersection of Jackson Boulevard and Sheridan Lake Road. It was beyond the scope of the study to make recommendations for this diverted flow.

Element 21 was UDSWM95 modeled as a 60" RCP because of the increased n value required for UDSWM95.

ELEMENT 22

Element 22 is the existing Arrow Street and Lodge Street flow conveyance system. Element 22 models the surface flow on these streets beginning at Element 118 and ending at Element 117. Improvements are recommended.

The 48" RCP recommended for Element 23 has capacity for about 150 cfs compared to the inflow of 182 cfs. It is recommended the 32 cfs excess flow be directed to Arrow Street which then flows to Lodge Street. It is estimated this flow, combined with flow from sub-basin 18, will be about 6" deep on Lodge Street.

It is recommended that the intersection of Lodge Street and Lance Street be reconstructed such that flow is not allowed to flow east to the Lance Street sag.

It is also recommended that storm sewers be constructed on Lodge Street and Teepee Street. These pipes will connect to the Element 20 storm sewer. The pipes are used to intercept 10 year flows from sub-basin 18. The proposed pipe on Lodge Street is a 24" RCP with capacity for 15 to 20 cfs. The proposed pipe on Tepee Street is an 18" RCP with capacity for 10 to 15 cfs.

Element 22 was modeled as a street with overflow using recommended characteristics in the UDSWM95 manual. An invert slope of 0.019 ft/ft was used. Peak routed flow is 46 cfs.

ELEMENT 23

Element 23 is a proposed storm sewer system along Mountain View Drive between Jackson Boulevard and Arrow Street. Element 23 begins at Element 121 and ends at Element 118

A 48" RCP with capacity of 175 cfs is recommended from Jackson Boulevard to near Lance Street. A 48" RCP with capacity of 150 cfs is recommended from near Lance Street to Arrow Street. Capacity of this pipe, and the downstream pipes it connects to, exceed the 10 year flow in order to (1) reduce flooding along Lodge Street and Arrow Street, (2) reduce flooding along tilted Mountain View Drive between Arrow Street and Lance Street, (3) reduce flooding at the Lance Street sag, (4) reduce flooding in the Janet Street/Jane Street area below Jackson Boulevard, (5) reduce the amount of flow reaching the levee drainage system at Jane Drive, and (6) reduce flooding depths on Jackson Boulevard.

The increased pipe capacity beginning at Lance Street is not a result of required interception capacity at Lance Street; rather, it is a flow amount equaling the 10 year discharge from sub-basin 12. For the purposes of this analysis it was assumed that all flows from sub-basin 15 reach the Lance Street sag (Element 119) rather than being intercepted by Element 23. During final design, the proposed Mountain View Drive pipe capacity should be increased if any sub-basin 15 flows are captured.

As discussed above it is recommended that 30 cfs inlet capacity be provided to intercept the 10 year flows from sub-basin 12. Because of the tilted street system a significant amount of the excess sub-basin 12 flow will likely overtop the low side curb along Mountain View Drive. This overtopping flow will be reduced by the recommended improvements and could be further reduced under an alternate system as described under Element 312. Appropriate measures to protect against the overflow should be used in the event the area along the low side curb is redeveloped.

Element 23 was UDSWM95 modeled as a 72" RCP because of the increased n value required for UDSWM95. Peak routed flow is 150 cfs.

ELEMENT 25

Element 25 models surface flow on Jackson Boulevard between Element 121 and Element 114. Storm sewer improvements recommended with other elements reduce the flow reaching Element 25. No improvements to Element 25 are required.

Element 25 routes the sub-basin 12 flow that is not intercepted by the Element 15 & 23 storm sewer system. Some of this sub-basin 12 flow may overtop the Mountain View Drive curb as described under Element 23. Peak routed flow is 51 cfs.

Element 25 was modeled as a street with overflow using recommended characteristics in the UDSWM95 manual. An invert slope of 0.005 ft/ft was used.

ELEMENT 26

Element 26 is an 18" RCP storm sewer with overflow channel between Element 118 and Element 203 Element 26 carries the discharge from the Element 203 metering pond. No improvements are required.

The 18" RCP will be connected to the new Element 23 storm sewer.

Element 26 was UDSWM95 modeled as an 18" RCP with overflow channel. Peak routed flow is 46 cfs.

ELEMENT 108

Element 108 is a direct flow element. It summarizes flows from sub-basin 18 at the intersection of Mountain View Road and Jackson Boulevard. Peak 100 year flow is 51 cfs.

Under existing conditions there may be a certain amount of split flow at this element. Split flow would be lost from the Upper Tributary to the Lower Tributary. This possible split flow was not modeled due to modeling limitations explained under the BASIN DESCRIPTION section of this report. The intent of the Design Plan recommendations is that this possible split flow be eliminated.

ELEMENT 109

Element 109 is a direct flow element. It provides the final discharge to Rapid Creek from metering pond Element 200. Peak 100 year flow is 359 cfs.

ELEMENT 110

Element 110 is a direct flow element. It summarizes flows from sub-basin 9 and Element 13 to provide an inflow hydrograph to metering pond Element 200. Peak 100 year flow is 452 cfs

ELEMENT 111

Element 111 is a direct flow element. It summarizes flow from sub-basin 11 and Element 15. Peak 100 year flow is 374 cfs.

Actual design flow at Element 111 will not be as modeled. The Element 15 pipe will likely be discharged downstream of Element 14 as discussed under Element 15. See Elements 14 and Element 15 for additional discussion.

ELEMENT 112

Element 112 is a direct flow element. It provides the final discharge to Rapid Creek from metering pond Element 201. Peak 100 year flow is 133 cfs.

ELEMENT 113

Element 113 is a direct flow element. It summarizes flows from sub-basin 13 and Element 16 to provide an inflow hydrograph to metering pond Element 201. Peak 100 year flow is 136 cfs.

ELEMENT 114

Element 114 is a direct flow/split flow element. It is used in conjunction with Element 310 and Element 311 to model the proposed split flows at the Jackson Boulevard and State Street intersection area.

Inflows from sub-basin 14, Element 18, Element 19, and Element 25 are summarized at this location with outflow sent to Element 17 and Element 310.

Peak 100 year inflow is 204 cfs. Peak 100 year outflow to Element 17 is 30 cfs. Peak 100 year outflow to Element 310 is 174 cfs.

Split flow data used to model Element 114 is given below. Flow to Element 17 is based on pipe capacity of the 42" RCP storm sewer. All flow that exceeds capacity of Element 17 is diverted to Element 310. It was assumed that Element 17 would always have 30 cfs of flow because of other upstream inlets along that system.

ELEMENT 114 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 17 (CFS)	TO ELEMENT 310 (CFS)
0	0	0
30	30	0
100	30	70
400	30	370

ELEMENT 115

Element 115 is a direct flow/split flow element. Inflows from sub-basin 19 and Element 20 are summarized at this location with outflow sent to Element 21 and Element 116.

Element 115 models the proposed split flows at the Jackson Boulevard and Sheridan Lake Road intersection.

Peak 100 year inflow is 63. Peak 100 year outflow to Element 21 is 55 cfs. Peak 100 year outflow to Element 116 is 8 cfs.

Split flow data used to model Element 115 is given below. Flow to Element 21 is based on pipe capacity of the 42" RCP storm sewer. All flow that exceeds capacity of the Element 21 is diverted to Element 116. Note that Element 116 directs flow out of the study area as described under Element 21.

ELEMENT 115 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 116 (CFS)	TO ELEMENT 21 (CFS)
0	0	0
55	0	55
200	145	55
400	345	55

ELEMENT 116

Element 116 is a direct flow element. Flow calculated at Element 116 is split flow from Element 115. Existing street grades will divert this flow out westward of the study area. The 100 year diversion will be on the order of 8 to 10 cfs. It was beyond the scope of the study to make recommendations for this diverted flow.

ELEMENT 117

Element 117 is a direct flow element. It summarizes the flow from sub-basin 18 and Element 22. Peak 100 year flow is 67 cfs.

ELEMENT 118

Element 118 is a direct flow/split flow element. Inflows from sub-basin 16 and Element 26 are summarized at this location with outflow sent to Element 22 and Element 23.

Element 118 is used to model the proposed split flows at the Arrow Street and Mountain View Road intersection.

Peak 100 year inflow is 182 cfs. Peak 100 year outflow to Element 22 is 32 cfs. Peak 100 year outflow to Element 23 is 150 cfs.

Split flow data used to model Element 118 is given below. Element 23 flow is based on the recommended pipe discussed under Element 23. All flow that exceeds capacity of the Element 23 is diverted to Element 22.

ELEMENT 118 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 22 (CFS)	TO ELEMENT 23 (CFS)
0	0	0
50	0	50
150	0	150
200	50	150

ELEMENT 119

Element 119 is a direct flow element. It summarizes the flow from sub-basin 15 at the Lance Street vertical roadway sag. Peak 100 year flow is 78 cfs.

ELEMENT 120

Element 120 is a direct flow element. It provides the final discharge to Rapid Creek from Element 21. Peak 100 year flow is 55 cfs.

ELEMENT 121

Element 121 is a direct flow/split flow element. Inflows from sub-basin 12 and Element 23 are summarized at this location with outflow sent to Element 15 and Element 25.

Element 121 is used to model the proposed split flows at the Jackson Boulevard and Mountain View Road intersection.

Peak 100 year inflow is 224 cfs. Peak 100 year outflow to Element 15 is 175 cfs. Peak 100 year outflow to Element 25 is 49 cfs.

Split data used to model Element 121 is given below. Element 15 flow is based on the recommended pipe discussed under Element 15. All flow that exceeds capacity of Element 15 was assumed to be diverted to Element 25 and travel west on Jackson Boulevard. A certain amount of the flow diverted to Element 25 may actually travel east on Jackson Boulevard; however that flow is expected to be small due to the tilted Mountain View Drive and the geometry at the intersection with Jackson Boulevard. Any flow lost to the east was assumed to be within the limits of modeling accuracy and no attempt was made to model that loss.

ELEMENT 121 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 15 (CFS)	TO ELEMENT 25 (CFS)
0	0	0
175	175	0
200	175	25
250	175	75

ELEMENT 200

Element 200 is an existing metering dam created by the Rapid Creek Flood Protection Levee. No improvements are required. An option for improvements would be to modify the pond to serve as a "water quality" pond for minor runoff events.

The pond outlet is a double 4' x 4' RC box culvert. The culvert entrance is depressed below grade with the use of a large "area inlet" type structure. Culvert flow line is about elevation 3260.8 and crest of the 17' x 6' "area inlet" is 3264.8.

It was assumed Rapid Creek was at approximate 10 year flood elevation of 3265.0 for the purposes of determining outlet characteristics at this pond. Flap gates exist at the box culvert outlet to prevent Rapid Creek flows from entering the pond.

Peak inflow into this pond is about 452 cfs and peak outflow is about 359 cfs. Water surface elevation is calculated at about elevation 3270 with storage of 4.9 acre feet. Top of the levee at this location is about elevation 3278.5.

The Corps of Engineers O & M Manual for the levee uses 3269.6 for the 100 year flood elevation in this pond. FEMA floodplain maps show the ponding area as being in Zone AE with a 100 year flood elevation of 3270.

Overflow elevation of the pond is at about elevation 3271. Overflows would be onto Canyon Lake Drive near the entrance to the Regional Hospital West Unit. The overflow area is not designed as a spillway; however no improvements are judged necessary due to the characteristics of the overflow area.

Stage/storage/discharge data for Element 200 is given below.

STAGE/STORAGE/DISCHARGE DATA – ELEMENT 200

ELEVATION	STORAGE (AC-FT)	DISCHARGE (CFS)
3264.8	0	0
3266	0.1	0
3268	0.4	265
3270	5.7	375
3271	11.5	400

Element 11 includes discussion for an alternate "water quality" diversion to Pond 200. That alternate has not been modeled.

ELEMENT 201

Element 201 is a metering area at the end of Jane Drive created by the Rapid Creek Flood Protection Levee. Improvements are recommended to increase discharge capacity. Improvements are also recommended to a channel along the levee.

The current FEMA maps do not indicate this as a ponding area; however, the Corps of Engineers O&M Manual indicates it as such. The Corps design of the pond outlet assumed a drainage area approximating the size of sub-basin 13. That assumption is not valid because significant additional flows, even after upstream improvements, will reach the outlet.

The existing outlet system consists of twin 65" x 40" CM Arch Pipes. The pipe entrance is depressed below grade with the use of a large "area inlet" type structure. Flap gates exist at the pipe outlet.

Certain elevations were surveyed at Element 201 in December 1999. Water elevation in Rapid Creek and the "area inlet" box was at about elevation 3270.0. The "area inlet" flow line (pipe flow line) is at about elevation 3268 and crest of the "area inlet" is at 3271.2. During analysis of the outlet it was assumed that Rapid Creek was at the 10 year flood elevation of about 3273.1 or about 2 feet above the "area inlet" crest.

It is recommended that Pond 201 be improved by installing twin 48" RCP culverts through the levee. Flap gates will be required at the pipe outlet. Inlet flow line of the twin pipes is proposed at elevation 3271.

Peak inflow to Pond 201 is 136 cfs and peak outflow is 133 cfs. Water surface elevation is calculated at about elevation 3274.5 with 0.8 acre feet of storage.

Top of levee at this location is at about elevation 3282. Pond overflow can begin at about elevation 3275.0. Overflow would be north to the Water Plant rear parking area rather than over the levee. Under existing conditions, the water surface elevation will be at approximate elevation 3276.5. Note that a ponding elevation of 3275 is indicated in the Corps of Engineers O&M Manual.

Stage/storage/discharge data for Element 201 is given below.

STAGE/STORAGE/DISCHARGE DATA – ELEMENT 201

ELEVATION	STORAGE (AC-FT)	DISCHARGE (CFS)
3271.2	0	0
3274	0.4	30
3275	1.5	300

The channel along the levee west of the "area inlet" carries sump pump flows from adjacent homes. It is recommended that this channel be improved with a concrete pan in order to protect the toe of the levee.

ELEMENT 203

Element 203 is an existing ponding area in Mountain View Cemetery. The ponding area is created by an existing berm and 18" RCP. Improvements are recommended.

The 18" RCP will convey only low flows and high flows will spill out near the Cemetery entrance road. Flow line of the 18" RCP is at about elevation 3326.5 and overflow begins at about elevation 3329.5. It is recommended that the overflow area be regraded to function as a 25' wide weir.

Peak inflow is 55 cfs and peak outflow is 46 cfs. Water elevation is calculated at about elevation 3300 with storage of 1.4 acre foot. Top of the berm along the north side of cemetery is at about elevation 3301.

Stage/storage/discharge data for Element 203 is given below.

STAGE/STORAGE/DISCHARGE DATA – ELEMENT 203

ELEVATION	STORAGE (AC-FT)	DISCHARGE (CFS)
3326.5	0	0
3328.0	0.1	5
3329.5	0.9	11
3300.0	1.3	35
3331	2.1	135

It should be noted that gravesites are located in the ponding area. It is assumed this is acceptable because (1) this is an existing pond and (2) ponding is shallow and of short duration.

ELEMENT 310

Element 310 is a direct flow element. It is used in conjunction with Element 114 and Element 311 to model the proposed split flows at the Jackson Boulevard and Mountain View Road intersection area.

Element 310 directly transfers flow from split flow Element 114 to split flow Element 311. Peak 100 year flow is 174 cfs.

ELEMENT 311

Element 311 is a direct flow/split flow element. It is used in conjunction with Element 114 and Element 310 to model the proposed split flows at the Jackson Boulevard and State Street intersection area.

Element 311 splits flow to Element 16 and Element 312. Peak 100 year inflow is 174 cfs. Peak 100 year outflow to Element 16 is 74 cfs. Peak 100 year outflow to Element 312 is 100 cfs.

Split flow data used to model Element 311 is given below. Element 312 flow is based on the recommended pipe discussed under Element 312. All flow that exceeds capacity of the Element 312 is diverted to Element 16.

ELEMENT 311 SPLIT FLOW MODELING DATA

TOTAL Q (CFS)	TO ELEMENT 16 (CFS)	TO ELEMENT 312 (CFS)
0	0	0
100	0	100
250	150	100
400	300	100

ELEMENT 312

Element 312 is a proposed storm sewer beginning where the existing pipe system (Element 18) from the Lance Street vertical sag intersects with the Jackson Boulevard system and ending at Mountain View Drive. It is modeled as beginning at Element 311 and ending at Element 121.

Element 312 is recommended as a 42" RCP with pipe capacity varying from 80 cfs at the upstream end to 100 cfs at the lower end. Element 18, which carries about 75 to 80 cfs, will be connected to this 42" RCP. Inlets will be necessary on Jackson Boulevard near the State Street sag for about 20 cfs.

With the installation of the above improvements the existing 42" RCP (Elements 17 and 20) draining west on Jackson Boulevard is judged to be adequate.

Element 312 was UDSWM95 modeled as a 54" RCP because of the increased n value required for UDSWM95. Peak routed flow is 105 cfs.

An alternate to the 20 cfs increased capacity and inlets on Jackson Boulevard would be to add 20 cfs of capacity to the Element 23 pipe system between Jackson Boulevard and Lance Street. This alternate would also reduce the flow that is expected to overtop the low side curb on Mountain View Drive. Element 312 would then only be required to carry the 75 to 80 cfs from Element 18.

"VALLEY FLOOR AREA"

The "Valley Floor Area" is mostly Rapid Creek floodplain. No computer modeling was completed in this area. Based on a general review and discussions with City staff there are no known major improvements required for this area.

ADDITIONAL DESIGN RECOMMENDATIONS

1. Implementation Schedule

It was beyond the scope of the project to determine a complete detailed improvement schedule for the entire basin; however a generalized discussion of improvement scheduling follows.

Certain flooding problems already exist in the basin. Therefore implementation of the design plan should begin immediately. Simple economics dictate that complete plan implementation will take many years, thus priority should be given to projects that provide immediate benefit.

Projects that can be completed in conjunction with street projects, utility projects, and other basin improvement projects should be given priority. This suggestion is made since concurrent projects will be more economical than separate projects.

In areas where various storm sewer segments are recommended it is necessary to construct the lower segments first. Element 15 needs to be constructed before Elements 23 and 312. Element 306 needs to be constructed before Element 24.

It is recommended that Element 15, Element 23, Element 24, Element 306, and Element 312 be completed before any overlays of Jackson Boulevard. Existing flow capacity is inadequate and overlays without new storm sewers will compound the problems

2. Final Design Recommendations

As mentioned earlier it was beyond the scope of the project to provide final construction design plans and the recommendations given in the plan are conceptual in nature. It will be necessary to prepare final engineering plans for the improvements and the following recommendations are made for use during the final project design phase.

1. All improvements should be designed in accordance with proper engineering standards and in accordance with the Rapid City Drainage Criteria Manual.

2. If final detention pond curves are not practically identical to the plan recommended curves, it is necessary to perform a new computer analysis of the actual design to review basinwide impacts.

3. During final design, the conceptual sections, sizes, grades, etc., recommended in the design plan shall be checked for applicability to actual project requirements. Final design should include flow carrying characteristics, freeboard, constructability, economics, etc,. A new computer analysis using final design should be performed to review any basinwide impacts.

4. Detention pond freeboard and spillway requirements shall be determined at final design.

6. HEC-2 or HEC-RAS should be used to calculate water surface profiles for open channels. The water surface profiles should then be made a part of the subdivision plans.

7. Hydraulic gradelines should be calculated for all proposed and existing storm sewer systems during final design as judged necessary.

8. Unless otherwise mentioned all topographic data was taken from aerial photos. As such all topography and elevation data should be confirmed with field surveys prior to plan implementation or final design of recommended improvements.

9. In those locations where storm sewers are recommended the street capacity and pipe size shall be checked against additional surface flow requirements for 100 year events. If the street does not have capacity for the additional 100 year flows then the storm sewer should be increased in size as necessary.

10. Split flow data should be verified during final design of improvements.

11. The design plan should be adopted as part of the City's comprehensive plan.

12. The plan should be reviewed and updated on a regular basis as the basin develops.

TABLE 1

SUMMARY OF DESIGN PLAN

RECOMMENDED IMPROVEMENTS AND ESTIMATED COSTS

ELEMENT NUMBER	RECOMMENDED IMPROVEMENT	ESTIMATED COST
	"LOWER TRIBUTARY"	
1	No improvements. Optional improvement possible.	NA
2	No improvements.	NA
3	Improve 48" RCP inlet, construct flow balancing manhole.	$36,000.00
4	Construct 18" RCP storm sewer on Omaha Street to connect to Element 4. Construct Inlets.	$25,000.00
5	No improvements.	NA
6	Replace existing storm sewer with 42" RCP storm sewer. Construct Inlets.	$123,000.00
7	No improvements.	NA
8	No improvements. Optional improvements possible.	NA
9	Replace existing storm sewer with new RCP storm sewer. New pipe varies in size from 18" to 36". Construct Inlets.	$116,000.00
10	No Improvements.	NA
11	Replace existing storm sewer with 24" RCP storm sewer. Construct Inlets.	$96,000.00
24	Replace existing storm sewer with new RCP storm sewer. New pipe varies in size from 18" to 48". Construct Inlets.	$372,000.00
100	Construct 24" RCP storm sewer & inlets on Omaha Street.	$82,000.00
202	Improve outlet as described under Element 3. Optional outlet improvements possible.	NA
306	Construct 48" RCP storm sewer from West Main Street to Rapid Creek. Construct 18" storm sewer on Omaha Street.	$350,000.00
307	Construct metering dam.	$80,000.00
	SUBTOTAL FOR LOWER TRIBUTARY	$1,280,000.00

TABLE 1 CONTINUED

SUMMARY OF DESIGN PLAN

RECOMMENDED IMPROVEMENTS AND ESTIMATED COSTS

ELEMENT NUMBER	RECOMMENDED IMPROVEMENT	ESTIMATED COST
	"UPPER TRIBUTARY"	
12	Construct 24" RCP storm sewer and inlets.	$61,000.00
13	Improve channel and Water Plant Access Road crossing.	$67,000.00
14	Improve downstream segment of channel and improve Water Plant Access Road crossing.	$33,000.00
15	Construct 66" RCP storm sewer and inlets.	$357,000.00
16	Install 18" RCP storm sewer and inlets on Janet St. And Jane Dr.	$78,000.00
17	No improvements.	NA
18	Connect existing pipes to new Element 312 storm sewer	$5,000.00
19	No improvements.	NA
20	No improvements.	NA
21	No improvements.	NA
22	Improve street intersections for drainage control. Construct 24" RCP storm sewer on Lodge St and 18" RCP storm storm sewer on Teepee Street.	$90,000.00
23	Construct 48" RCP storm sewer and inlets.	$334,000.00
25	No improvements.	NA
26	No improvements.	NA
200	No improvements.	NA
201	Improve pond outlet by installing twin 48" RCP culverts and construct concrete pan along levee.	$63,000.00
203	Grade to improve pond overflow area. construct concrete pan along levee.	$5,000.00
312	Install 42" RCP storm sewer and inlets.	$107,000.00
	SUBTOTAL FOR UPPER TRIBUTARY	$1,200,000.00

TABLE 1 CONTINUED

SUMMARY OF DESIGN PLAN

RECOMMENDED IMPROVEMENTS AND ESTIMATED COSTS

RECOMMENDED IMPROVEMENT "VALLEY FLOOR AREA"	ESTIMATED COST
No improvements.	NA
SUBTOTAL VALLEY FLOOR AREA	$0.00
RECOMMENDED IMPROVEMENTS SUBTOTALS	
Lower Tributary	$1,280,000.00
Upper Tributary	$1,200,000.00
Valley Floor Area	$0.00
TOTAL	$2,480,000.00
5% CONTINGENCY	$124,000.00
25% ENGINEERING/ADMINISTRATION	$620,000.00
TOTAL COST OF DESIGN PLAN IMPROVEMENTS	$3,224,000.00

TABLE 2
SUB-BASIN PEAK FLOWS FOR JACKSON BOULEVARD DBDP
FUTURE LAND USE CONDITIONS

LOWER TRIBUTARY

SUB-BASIN NUMBER	AREA (SQ. MI.)	10 YEAR (CFS)	100 YEAR (CFS)
1	0.035	24	54
2	0.025	30	65
3	0.015	7	17
4	0.029	53	95
5	0.013	27	45
6	0.033	42	90
7	0.030	63	105
8	0.016	32	55
20	0.056	55	129

UPPER TRIBUTARY

SUB-BASIN NUMBER	AREA (SQ. MI.)	10 YEAR (CFS)	100 YEAR (CFS)
9	0.038	34	84
10	0.034	18	51
11	0.041	47	105
12	0.040	29	74
13	0.045	45	102
14	0.010	17	31
15	0.038	32	78
16	0.086	69	175
17	0.051	13	55
18	0.020	22	49
19	0.014	15	33

TABLE 3

LOWER TRIBUTARY HYDRAULIC ELEMENT PEAK FLOWS
DESIGN PLAN CONDITIONS
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

ELEMENT NUMBER	10 YEAR (CFS)	100 YEAR (CFS)
1*	0	16
2*	55	97
3*	101	151
4*	109	168
5*	13	15
6*	63	94
7*	0	8
8*	0	8
9*	0	2
10*	33	51
11*	0	0
24*	49	122
100	24	54
101	30	73
102	108	168
103	108	192
104	113	250
105	63	107
106	33	51
107	32	55
122	86	203
202	97	137
304	56	155
305	56	155
306	56	120
307	13	15

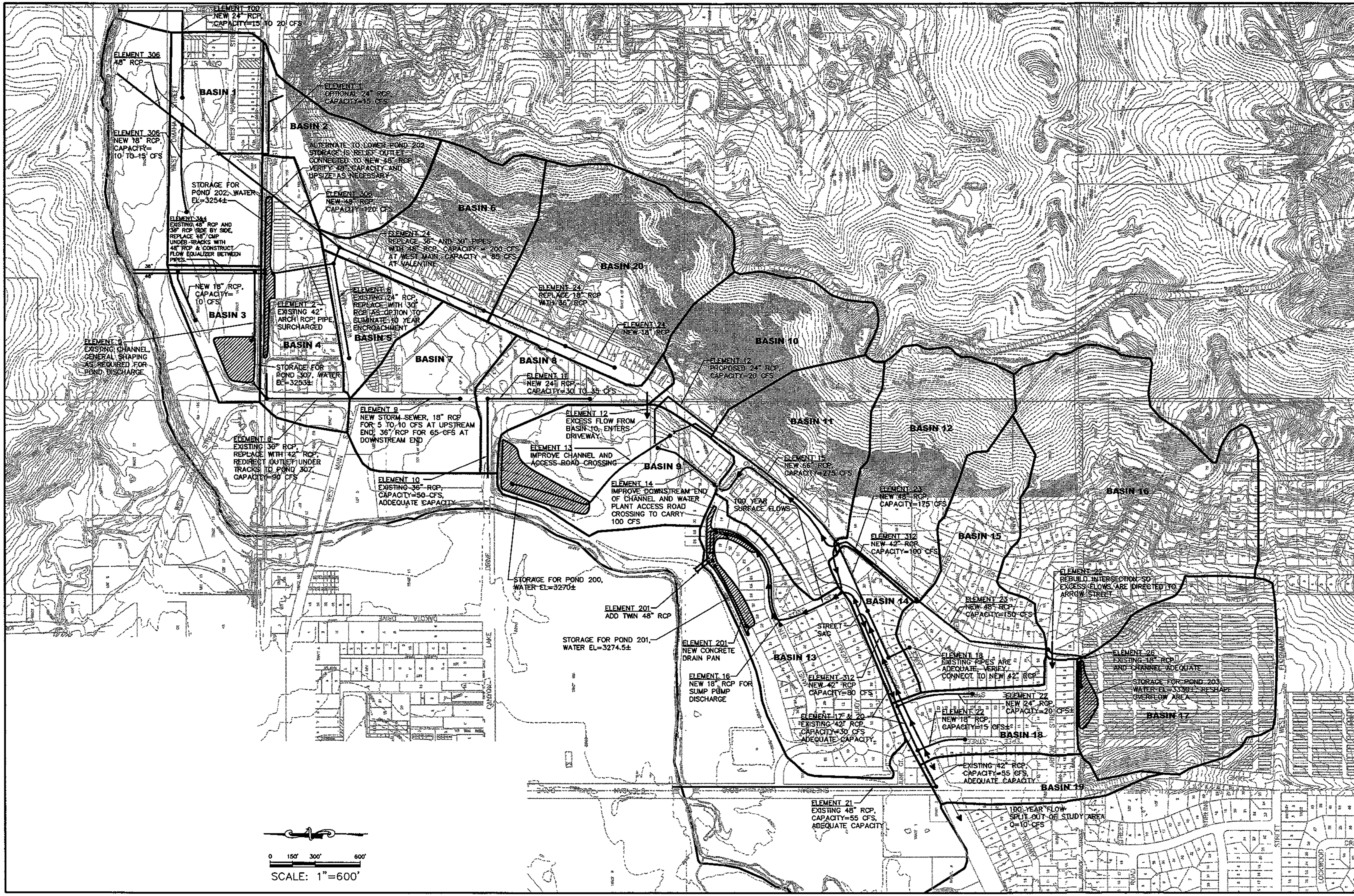
*Routed flow only. See Hydraulics Chapter or Appendixes for warning and explanation.

TABLE 4

UPPER TRIBUTARY HYDRAULIC ELEMENT PEAK FLOWS
DESIGN PLAN CONDITIONS
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

ELEMENT NUMBER	10 YEAR (CFS)	100 YEAR (CFS)
12*	18	50
13*	168	391
14*	169	385
15*	135	279
16*	0	63
17*	31	32
18*	32	78
19*	20	62
20*	30	30
21*	41	55
22*	0	26
23*	71	150
25*	0	51
26*	7	46
108	18	51
109	191	359
110	190	452
111	177	374
112	36	133
113	45	136
114	65	204
115	44	63
116	0	8
117	22	67
118	71	182
119	32	78
120	41	55
121	101	224
200	191	359
201	36	133
203	7	46
310	35	174
311	35	174
312	36	105

*Routed flow only. See Hydraulics Chapter or Appendixes for warning and explanation.



F M G, Inc.

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File Number 8459\8459DRAN.DWG

Location BLACK HILLS MERIDIAN

Surveyed By:
Date:

Designed By: JDF
Drawn By: MDS
Checked By: JDF

FEBRUARY 2005

FIGURE 6
JACKSON BOULEVARD DBDP
RAPID CITY, SOUTH DAKOTA

Revision / Date

Sheet Name: OVERALL IMPROVEMENT LAYOUT

Page Number **50**

HYDROLOGY

METHODOLOGY

Before any drainage design can be performed it is necessary to determine runoff peaks and volumes from the various sub-basins. Numerous methods of making these determinations are available varying from the simple rational method to very complex statistical methods.

In accordance with the City of Rapid City Drainage Criteria Manual the method used for runoff determination in this design plan is a computerized version of the Colorado Urban Hydrograph Procedure (CUHPF95). This model allows the design plan to be easily updated should the conditions change from those assumed in this study.

It should be noted that a runoff/routing analysis is only an approximation since storms rarely follow ideal patterns and other factors such as ground cover, infiltration, and channel conditions may vary with time or from assumed conditions. The intent of a runoff/routing analysis is to provide a reasonably dependable and consistent approximation of rainfall-runoff characteristics.

INPUT PARAMETERS

1. Storm Recurrence Interval and Rainfall

In accordance with the City of Rapid City Drainage Criteria Manual, the design plan presented in this report is based on the 100 year one-hour storm with fully developed land use conditions. The 100 year one-hour storm used in Rapid City is 2.95 inches per hour. The CUHPF95 model converts the one-hour rain to a two-hour design storm hyetograph totaling 3.41 inches of precipitation for use in the CUHPF95 runoff calculations.

Ten year flows were also calculated to help in evaluation of problems and proposed improvements. The 10 year one-hour storm is 1.86 inches per hour. The 10 year two-hour design storm hyetograph then calculated by CUHPF95 totals 2.15 inches of precipitation.

2. Sub-basin Characteristics

As previously mentioned the design plan is based on the anticipated future land use of the basin. Future land use is described in the BASIN DESCRIPTION section of the report.

The CUHPF95 program requires input of numerous parameters to represent sub-basin characteristics. The reader is referred to the program user's manual and the City of Rapid City Drainage Criteria Manual for a complete description of the input requirements. Input data was developed following guidelines in the manuals. Data sources included USGS topographic maps, 1"=200' aerial photos with 2 foot and 10 foot contours, SCS soil maps, field reconnaissance, engineering equations, and engineering judgment.

A complete listing of all data used for runoff analysis is included on the CUHPF95 printouts. Soils information is shown of Figure 6 at the rear of this chapter.

SUB-BASIN FLOWS

Peak sub-basin flows with future land use conditions for the 10 year and 100 year storms are given on Table 2 in the DESIGN PLAN chapter of this report. CUHPF95 computer printouts are located in the Appendices.

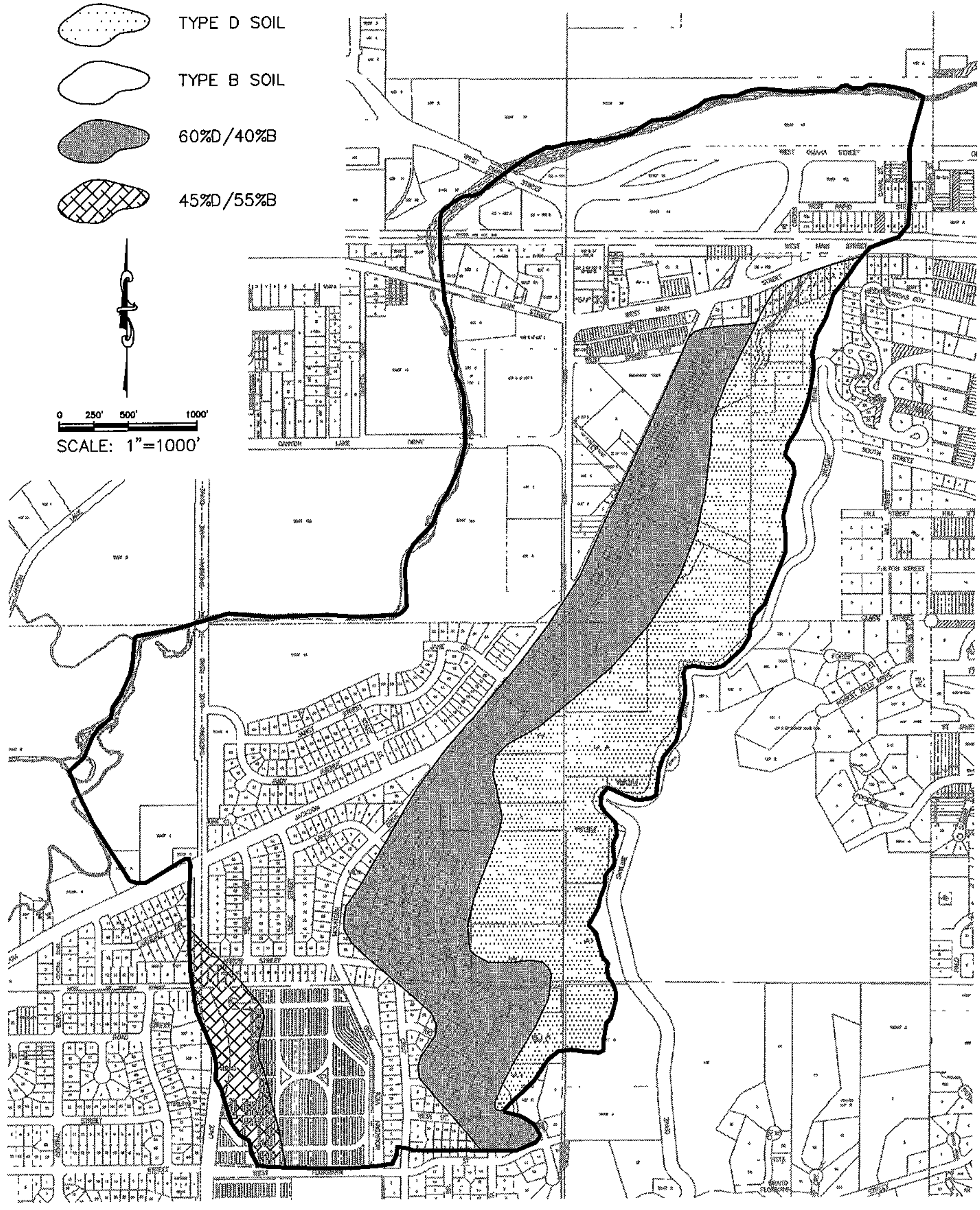

FIGURE 7

JACKSON BOULEVARD DBDP

RAPID CITY, SOUTH DAKOTA

FEBRUARY 2005

Sheet Title: SOILS

Location: BLACK HILLS MERIDIAN

Surveyed By ____
Date ____
Designed By JDF
Drawn By MDS
Checked By JDF

File Number: 8459\8459DRAN.DWG

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HYDRAULICS

METHODOLOGY

In order to use peak flows and sub-basin hydrographs effectively and arrive at a realistic determination of time varied flows it is necessary to account for basin hydraulic characteristics. This process involves routing and combining hydrographs. This is a key step in the design process as it is where various design options are proposed and basinwide results investigated.

Numerous methods are available for performing these calculations ranging from simple hand approximations to complex computer modeling. In accordance with the City of Rapid City Drainage Criteria Manual the method used for the hydraulic routing is a computer model known as the Urban Drainage Storm Water Management Model (UDSWM95). This model allows the design plan to be easily updated should conditions change from those assumed in the design.

HYDRAULIC ROUTING NETWORK

Prior to routing and calculating combined hydrographs it is necessary to conceptually represent the drainage system as a system of interconnected hydraulic elements. Hydraulic properties of each element are then characterized by various parameters. The next step is then routing of flows through the elements.

It should be noted that the drainage system subdivision could be taken to infinitesimal detail in theory; however, computation and manpower requirements become prohibitive. No established rule is available for this subdivision and it is primarily based on engineering needs and judgment. The hydraulic subdivision used in this design is judged to provide a sufficient number of elements for suitable modeling. The network allows for sub-basin inflow at sub-basin design points and provides hydraulic flow elements between tributary junctions, between design points, at road crossings, at detention ponds, and at other locations judged necessary.

As with sub-basin delineation the hydraulic routing system was established following major flow patterns and unaccounted for sub-basin transfer could occur.

The sub-basins were grouped into separate tributaries areas for computer analysis. These tributaries are the Lower Tributary and the Upper Tributary. Separate computer models are used for each area. Attempts were made to combine all data into one model however a "bug" was discovered in the UDSWM95 software. The "bug" resulted in the combined model lagging flows by one time step at various locations due to the numerous diversion elements. Data sets were sent to the Urban Drainage District software developer in Denver. They were unable to resolve the problem and the only workaround for the "bug" was to separate the data into two models.

The Lower Tributary existing condition run still has a split flow time lag. Several changes to data sets were made in an attempt to eliminate this time lag. These attempts were all unsuccessful.

The Valley Floor Area is also within the study area. No computer modeling was done in the Valley Floor Area. Figure 3 shows the Lower Tributary, Upper Tributary, and Valley Floor Area.

The schematic of the existing condition hydraulic system network is included as Figure 7 at the end of this chapter. The Design Plan hydraulic network schematic is included as Figure 5 in DESIGN PLAN chapter. The Design Plan hydraulic routing schematic is also included in the rear report packet on a 1" =-200' drawing.

INPUT PARAMETERS

The UDSWM95 model requires input of numerous parameters to represent hydraulic element characteristics. The reader is referred to the program user's manual and the City of Rapid City Drainage Criteria Manual for a detailed explanation of input requirements and methods.

Input parameters were determined following guidelines in the program user's manual and the Drainage Criteria Manual. Data sources included aerial contour maps, as-built drawings, field reconnaissance, limited field surveys, engineering equations, and engineering judgment.

Input data used with the UDSWM95 model is included on the computer printouts in the appendices. An explanation of the various flow element types shown on the schematics and methods used for characterizing them follows. A description of each individual element is included in the DESIGN PLAN part of the report.

1. Direct Sub-basin Inflow

These are not hydraulic elements but rather denote inflow into the system from the various sub-basins. The computer model assumes that the inflow enters the hydraulic network at the sub-basin design point. It ignores the possibility that a portion of the sub-basin inflow may enter the adjacent hydraulic element above the sub-basin design point. Inflows used for these elements are the calculated hydrographs determined in the HYDROLOGY chapter of this report.

2. Detention Pond Elements

This element type allows the program to account for effects of storage at detention ponds. The flow calculated by the program for the referenced element is the outflow. The inflow to these elements is provided by other types of routing elements as shown on the routing schematic.

Input required for detention pond elements consists of storage versus discharge data set. Data was determined from aerial contour maps, limited field surveys at certain ponds, and as-built engineering drawings. Design plan storage curves for expanded ponds or new ponds were developed using engineering judgment and were checked for reasonableness against existing ground contours.

Discharge curves were developed using applicable culvert discharge curves, storm sewer capacity, and standard engineering equations for orifices and weirs. Discharge curves assume unobstructed flow conditions.

Certain culverts, road crossings, and ponds were not modeled as detention pond elements, rather they were assumed simply to be a portion of the adjacent routing element. Modeling limitations, insignificant storage, minor flow lengths, and/or overtopping characteristics warranted this assumption.

3. Direct Flow And/Or Split Flow Elements

Direct flow elements are not true hydraulic conveyance elements, rather they serve to provide summarized hydrographs. They are included in this study to summarize upstream flows and to provide inflow hydrographs for other elements.

Certain direct flow elements were used as split flow elements. Split flow elements allow incoming flows to be discharged to two downstream elements. When two split flow elements are immediately connected it is necessary to use a "dummy" direct flow element between them. Data required for split flow elements is a table of total flow versus diverted flow. Existing condition surface flow splits at street intersections were modeled as being 50% to each street.

4. Flow Conveyance Elements

These elements are trapezoidal open channels, storm sewer pipes, or combinations thereof. Flow conveyance elements may have overflow sections.

Overflow conveyance elements are used at various locations. Overflow elements are the same as pipe or channel elements except that an additional trapezoidal channel is specified to accept flows exceeding the capacity of the initial channel section or pipe. Bottom width of the overflow section does not include the top width of the initial section and therefore may be zero. Depth data required by the program is depth of initial channel and combined depth of the initial channel and overflow section.

Roughness coefficients were selected to represent conditions as they exist in the field or assumed design coefficients for new facilities. Roughness coefficients were then increased by 25% for use in UDSWM95 flow routing in accordance with the program user's manual. Unobstructed flow was assumed in all UDSWM95 elements, including pipes, unless otherwise reflected in the n value.

During input preparation it was assumed that certain channels would essentially remain in existing condition unless changed specifically by the design plan. Natural channels change shapes and slopes infinitely through the elements thus it is necessary to approximate a natural channel as a trapezoid and assume it as typical throughout the length of the element.

It should be noted that the program routes only flows entering the upstream end of the open channel or pipe and ignores the possibility that any adjacent sub-basin flow may be entering. Due to this program limitation the user should exercise caution when using channel or pipe peak flows and hydrographs for design. Flows for design should be increased appropriately using engineering judgment to reflect incoming sub-basin flows.

Additionally the user should not use conveyance element flow depths since flows are calculated as normal depth and effects of backwater, changing sections, etc., are not accounted for. The UDSWM95 calculations do not provide a flood boundary analysis.

5. Flow Element Numbers

Each hydraulic element is identified with a unique number. Element numbers are separated into a set of ranges for specific identification of types. Numbers 1-99 are used to represent channel or pipe flow elements, 100 series numbers represent direct flow elements, 200 series numbers represent detention ponds, and 300 series numbers represent recommended new design plan facilities.

HYDRAULIC ELEMENT FLOWS

Routed flows were calculated at all elements using methods and parameters presented above. Flows were calculated for 10 year and 100 year storms.

Flows from the CUHPF95 model were initially routed with UDSWM95 using existing hydraulic conditions. This scenario provided the basis for problem identification and as a starting point for design planning.

The design process then consisted of numerous flow calculations using various design proposals. The result is the JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN as presented in the DESIGN PLAN section of this report.

Peak 10 year and 100 year flows for Lower Tributary existing hydraulic conditions are given on Table 5. Peak 10 year and 100 year flows for Upper Tributary existing hydraulic conditions are given on Table 6. Peak flows for design plan hydraulic conditions are given on Tables 3 and 4 in the DESIGN PLAN chapter of this report.

UDSWM95 printouts and hydrographs for direct flow elements and detention ponds are located in the Appendices

TABLE 5

LOWER TRIBUTARY HYDRAULIC ELEMENT PEAK FLOWS
EXISTING HYDRAULIC CONDITIONS
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

ELEMENT NUMBER	10 YEAR (CFS)	100 YEAR (CFS)
1*	13	165
2*	96	97
3*	114	128
4*	120	143
5*	45	45
6*	46	46
7*	13	57
8*	12	49
9*	0	2
10*	33	51
11*	0	0
24*	49	123
100	24	54
101	38	216
102	120	143
103	192	238
104	120	293
105	63	107
106	33	51
107	32	55
122	85	204
202	114	128

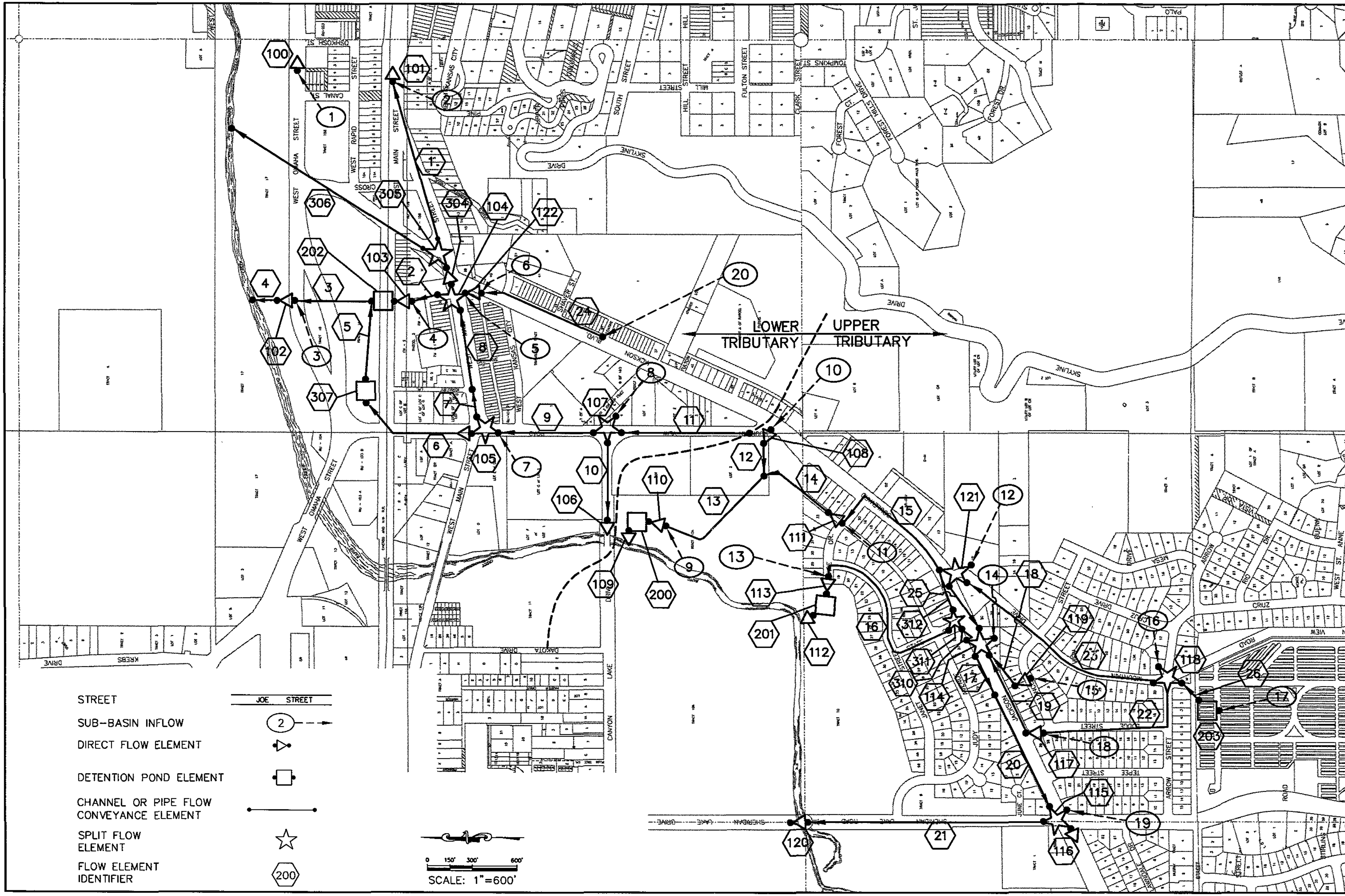
*Routed flow only. See Hydraulics Chapter or Appendixes for warning and explanation.

TABLE 6

UPPER TRIBUTARY HYDRAULIC ELEMENT PEAK FLOWS
EXISTING HYDRAULIC PLAN CONDITIONS
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

ELEMENT NUMBER	10 YEAR (CFS)	100 YEAR (CFS)
12*	18	50
13*	54	150
14*	56	133
15*	14	35
16*	106	320
17*	31	31
18*	65	167
19*	51	130
20*	30	30
21*	40	55
22*	34	90
23*	34	90
25*	15	37
26*	7	46
108	18	51
109	75	212
110	76	211
111	57	132
112	121	321
113	139	404
114	141	358
115	42	61
116	0	6
117	54	135
118	71	182
119	65	167
120	40	55
121	29	74
200	75	212
201	121	321
203	7	46

*Routed flow only. See Hydraulics Chapter or Appendixes for warning and explanation.



FMG, Inc.

3700 Sturgis Road
Rapid City, SD 57702-0317
(605) 342-4105 FAX (605) 342-4222

File Number: 8459\8459DRAN.DWG

Location: BLACK HILLS MERIDIAN

Surveyed By / Date:

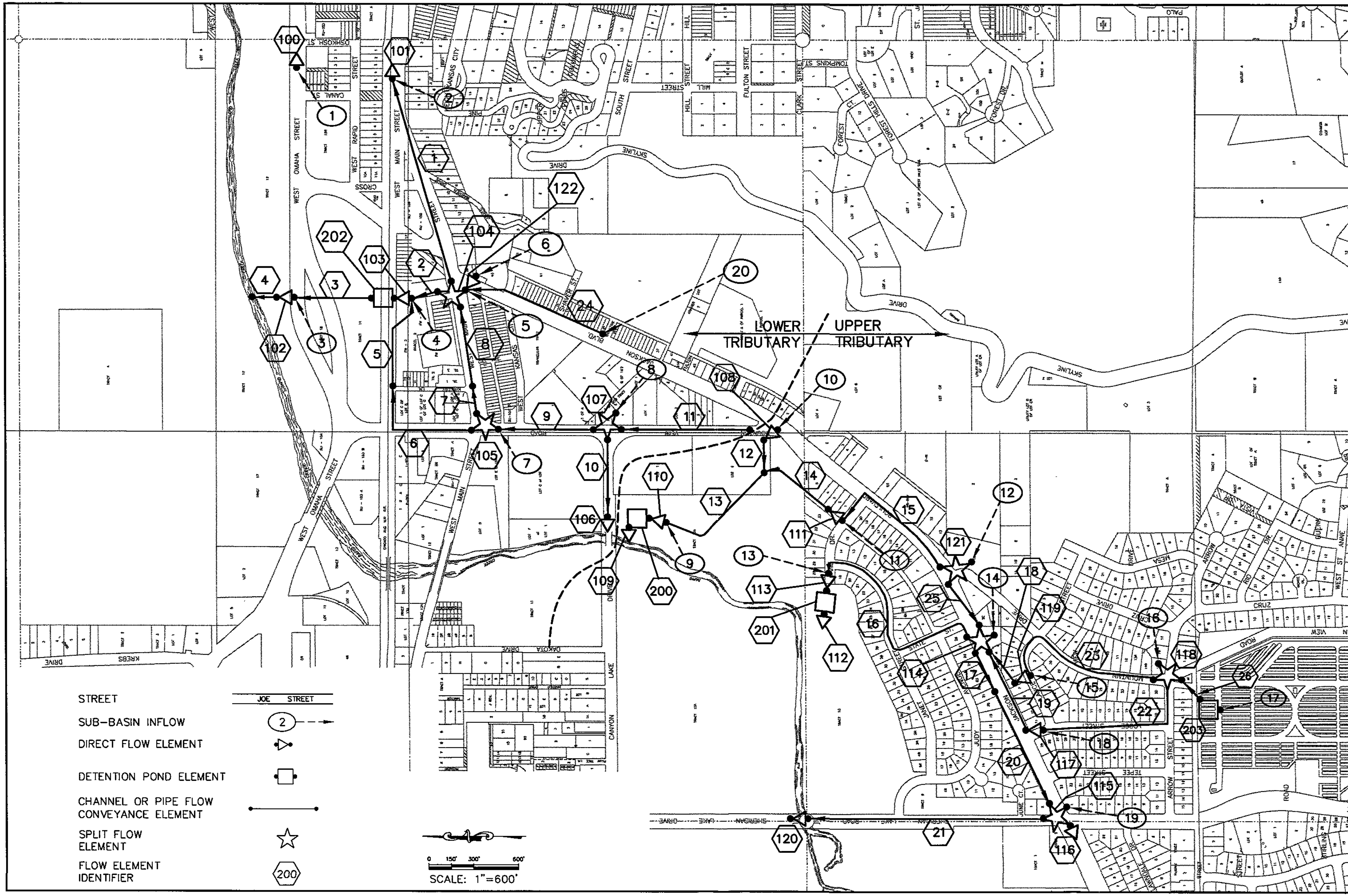
Designed By JDF
Drawn By MDS
Checked By JDF

FEBRUARY 2005

FIGURE 5
JACKSON BOULEVARD DBDP
RAPID CITY, SOUTH DAKOTA

Revision / Date

Sheet Name: DESIGN PLAN HYDROLOGIC SCHEMATIC



LOWER TRIBUTARY
UPPER TRIBUTARY
STREET
JOE STREET
SUB-BASIN INFLOW
DIRECT FLOW ELEMENT
DETENTION POND ELEMENT
CHANNEL OR PIPE FLOW CONVEYANCE ELEMENT
SPLIT FLOW ELEMENT
FLOW ELEMENT IDENTIFIER
SCALE: 1"=600'
FMG, Inc.
3700 Sturgis Road
Rapid City, SD 57702-0317
(605) 342-4105 FAX (605) 342-4222
File Number: 8459\8459DRAN.DWG
Location: BLACK HILLS MERIDIAN
Surveyed By:
Date
Designed By: JDF
Drawn By: MDS
Checked By: JDF
FEBRUARY 2006
FIGURE 8
JACKSON BOULEVARD DBDP
RAPID CITY, SOUTH DAKOTA
Revision / Date
Sheet Name:
EXISTING CONDITION HYDROLOGIC SCHEMATIC
Page Number

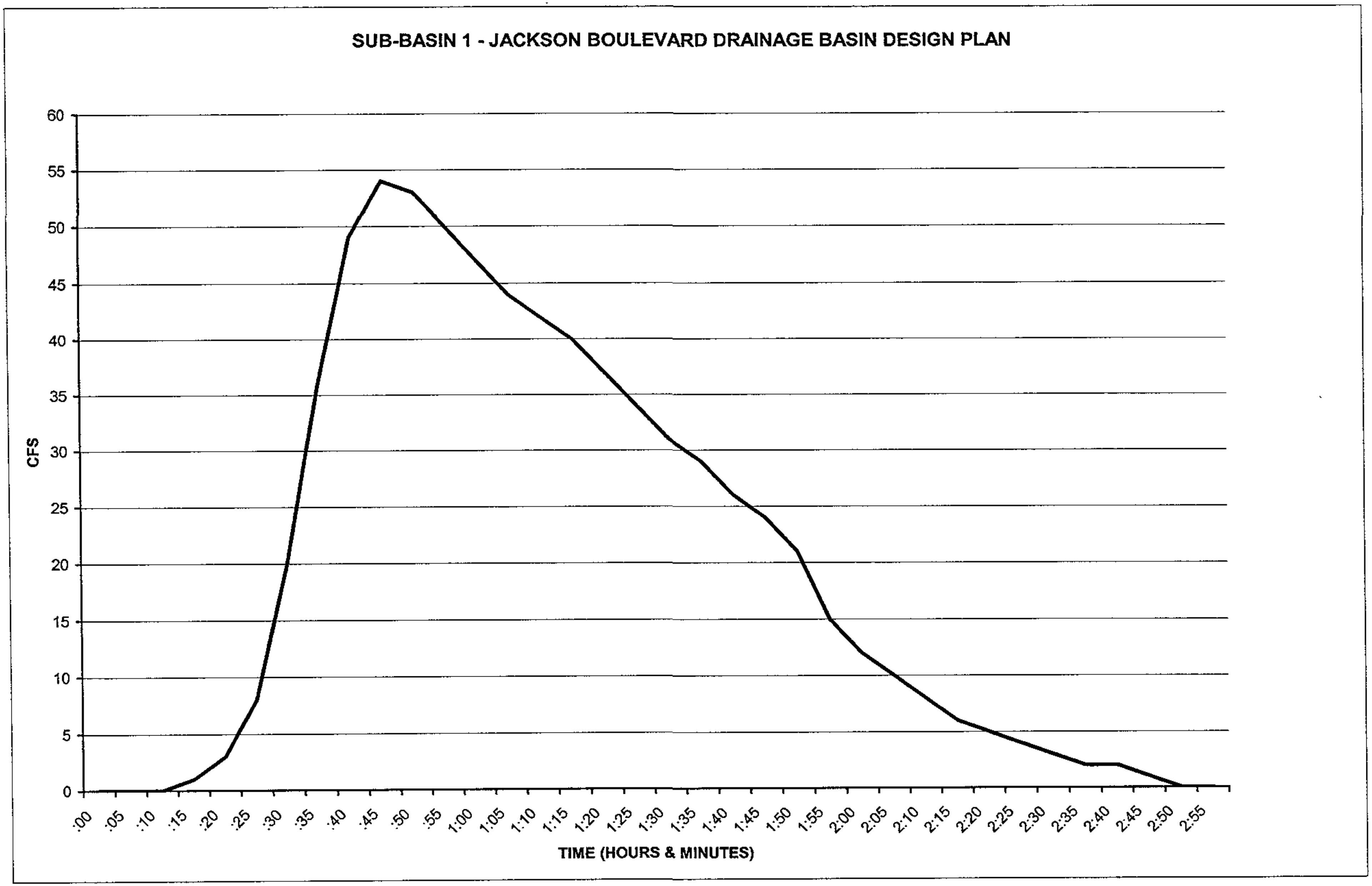
APPENDIX A

DESIGN PLAN HYDROGRAPHS

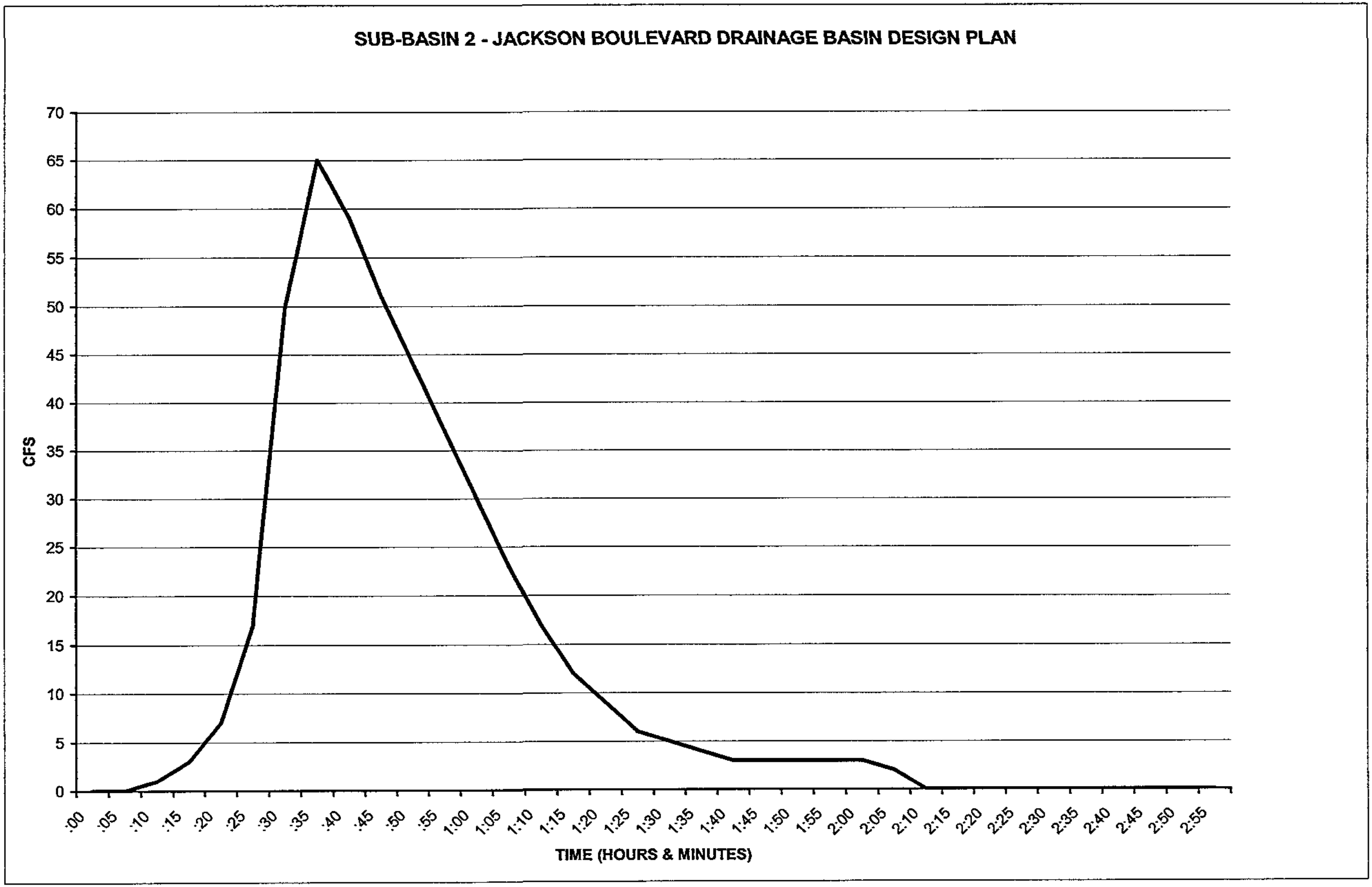
This appendix contains design plan hydrographs for sub-basins, direct flow elements and detention ponds. The hydrographs are for design plan conditions which are future land use and design plan hydraulic conditions. The hydrographs are in numerical order.

CAUTION STATEMENT

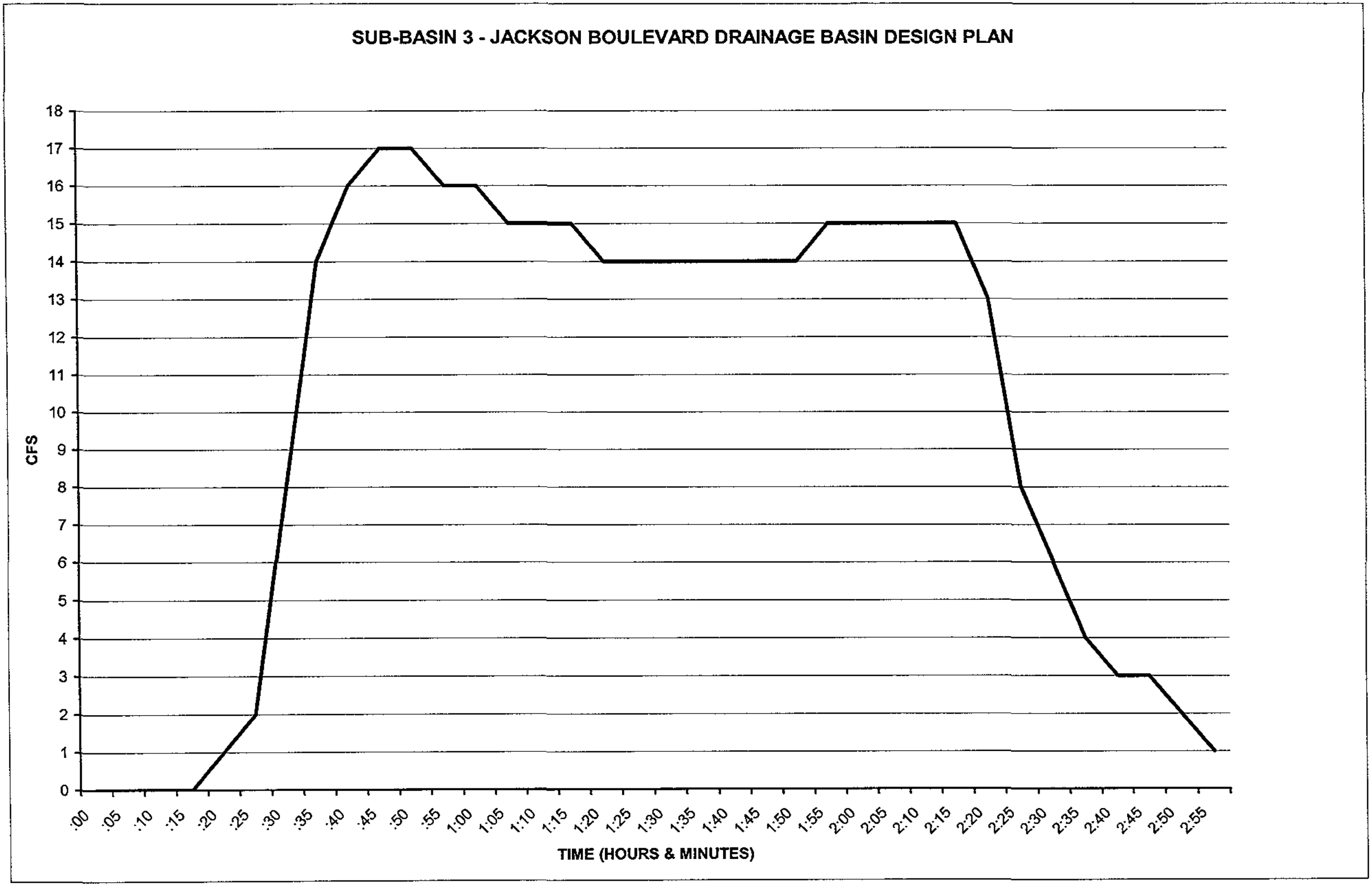
The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.



SUB-BASIN 1 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
60
55
50
45
40
35
30
25
20
15
10
5
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25 2:30 2:35 2:40 2:45 2:50 2:55
TIME (HOURS & MINUTES)

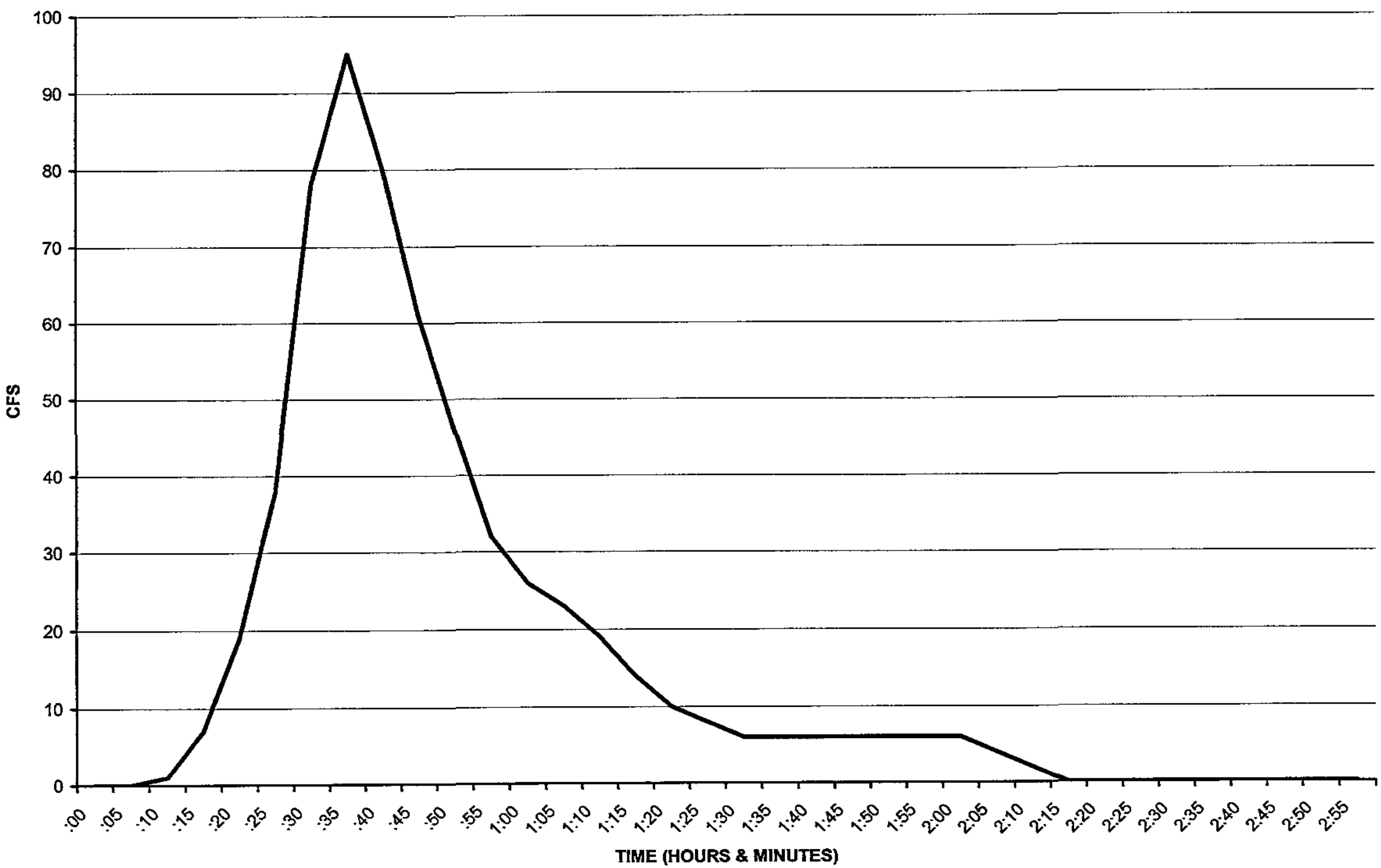


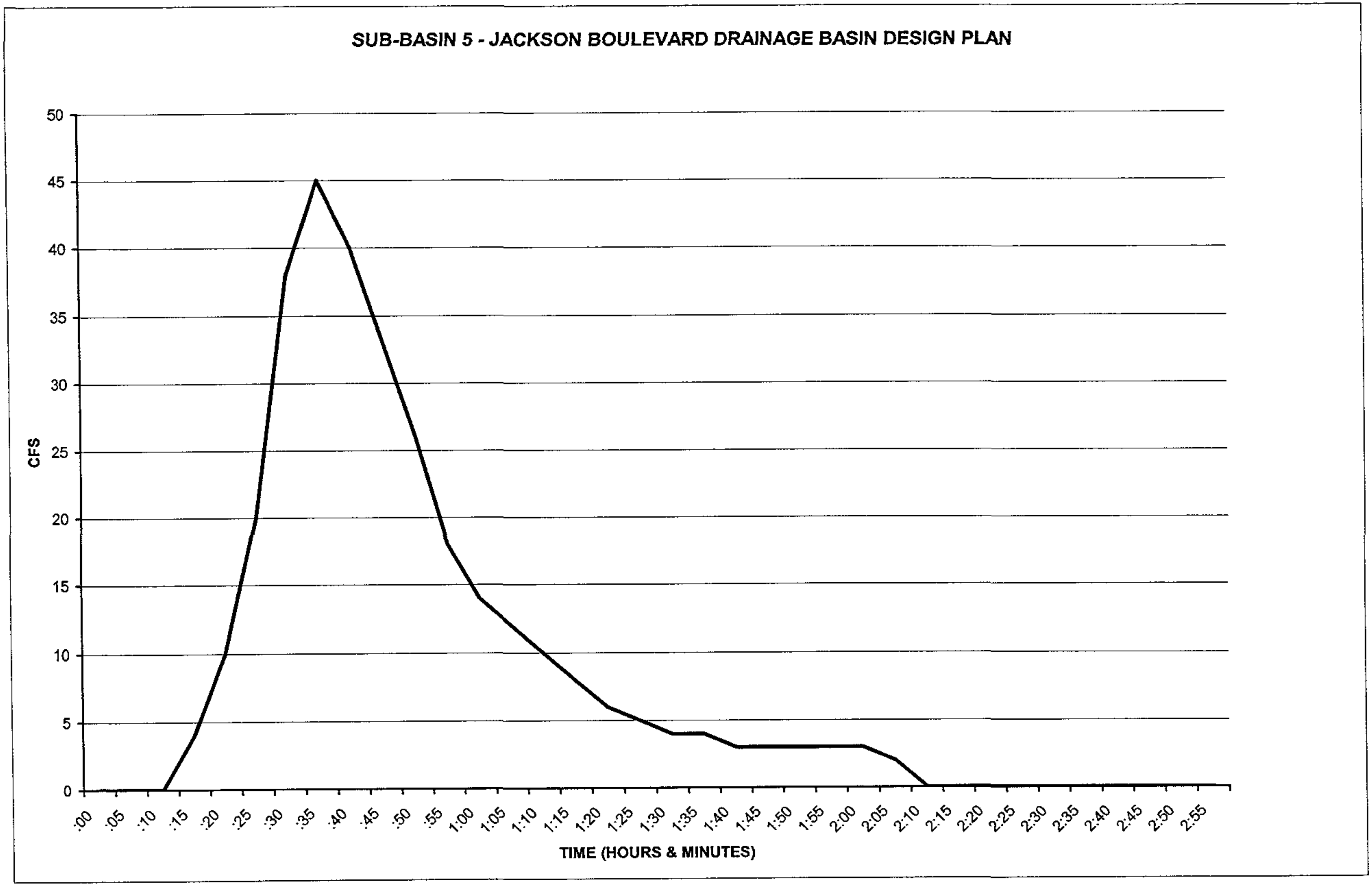
SUB-BASIN 2 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
2:55
TIME (HOURS & MINUTES)

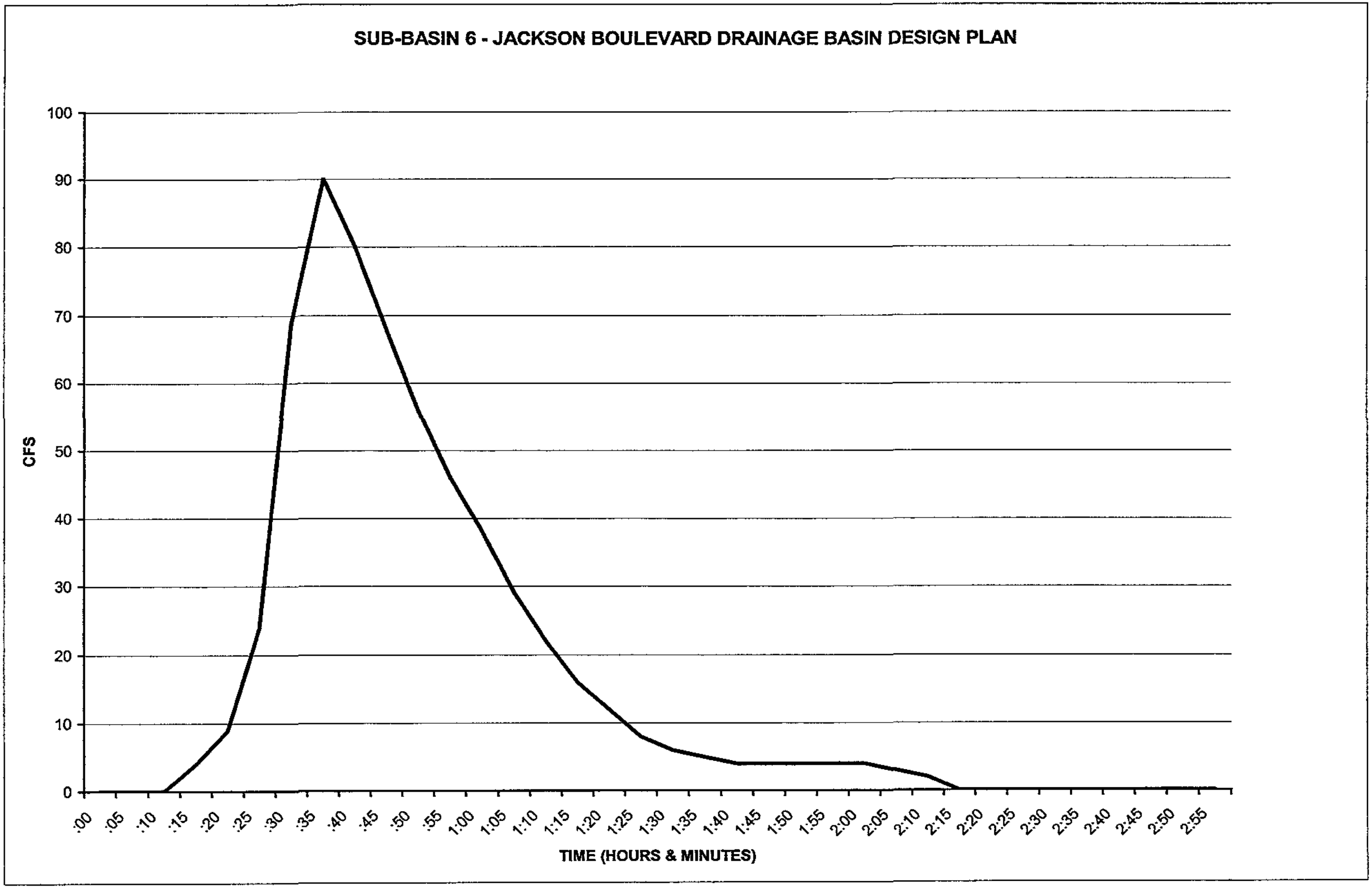


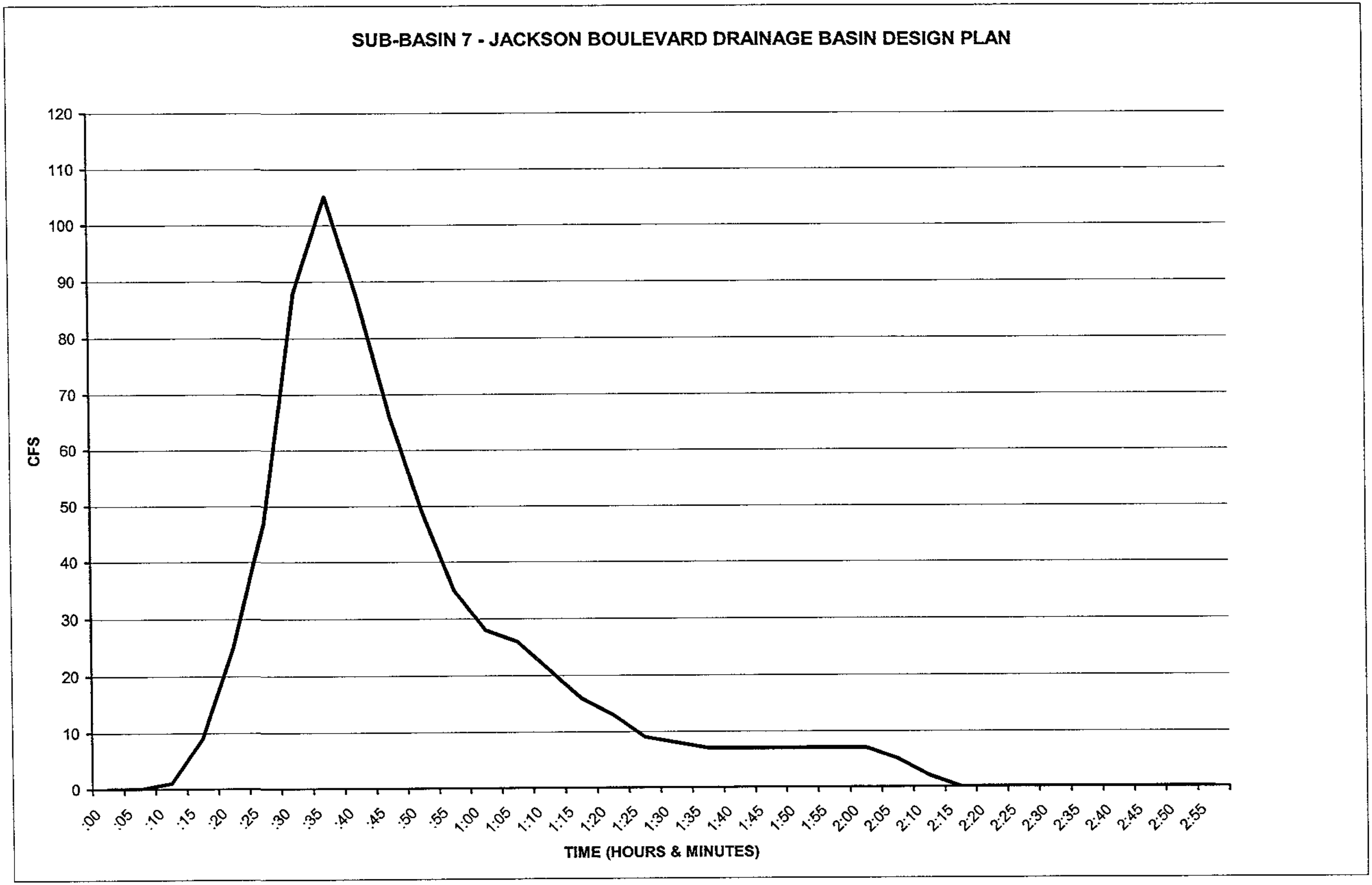
SUB-BASIN 3 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25 2:30 2:35 2:40 2:45 2:50 2:55
TIME (HOURS & MINUTES)

SUB-BASIN 4 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN



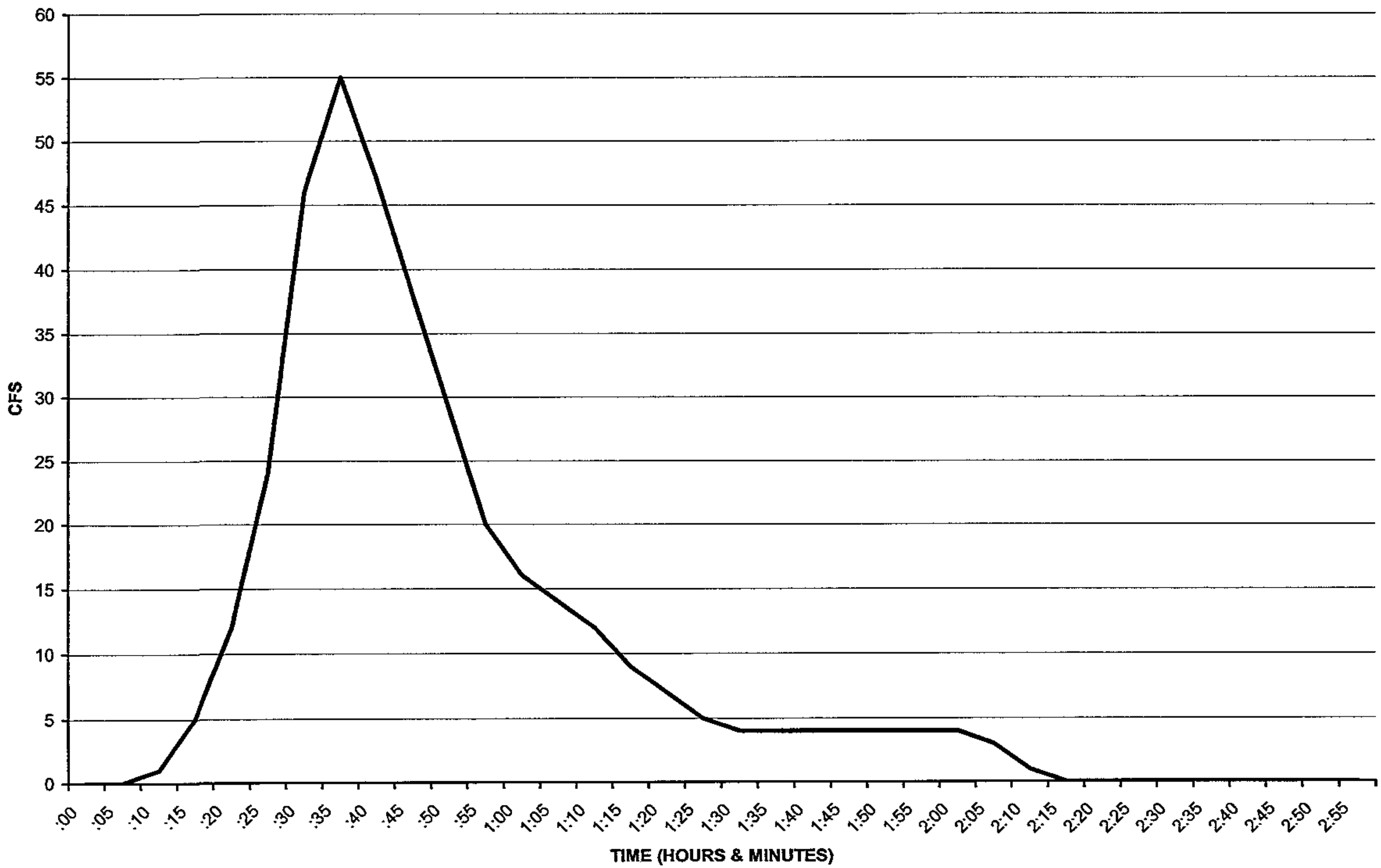

SUB-BASIN 5 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
5
10
15
20
25
30
35
40
45
50
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
2:55
TIME (HOURS & MINUTES)

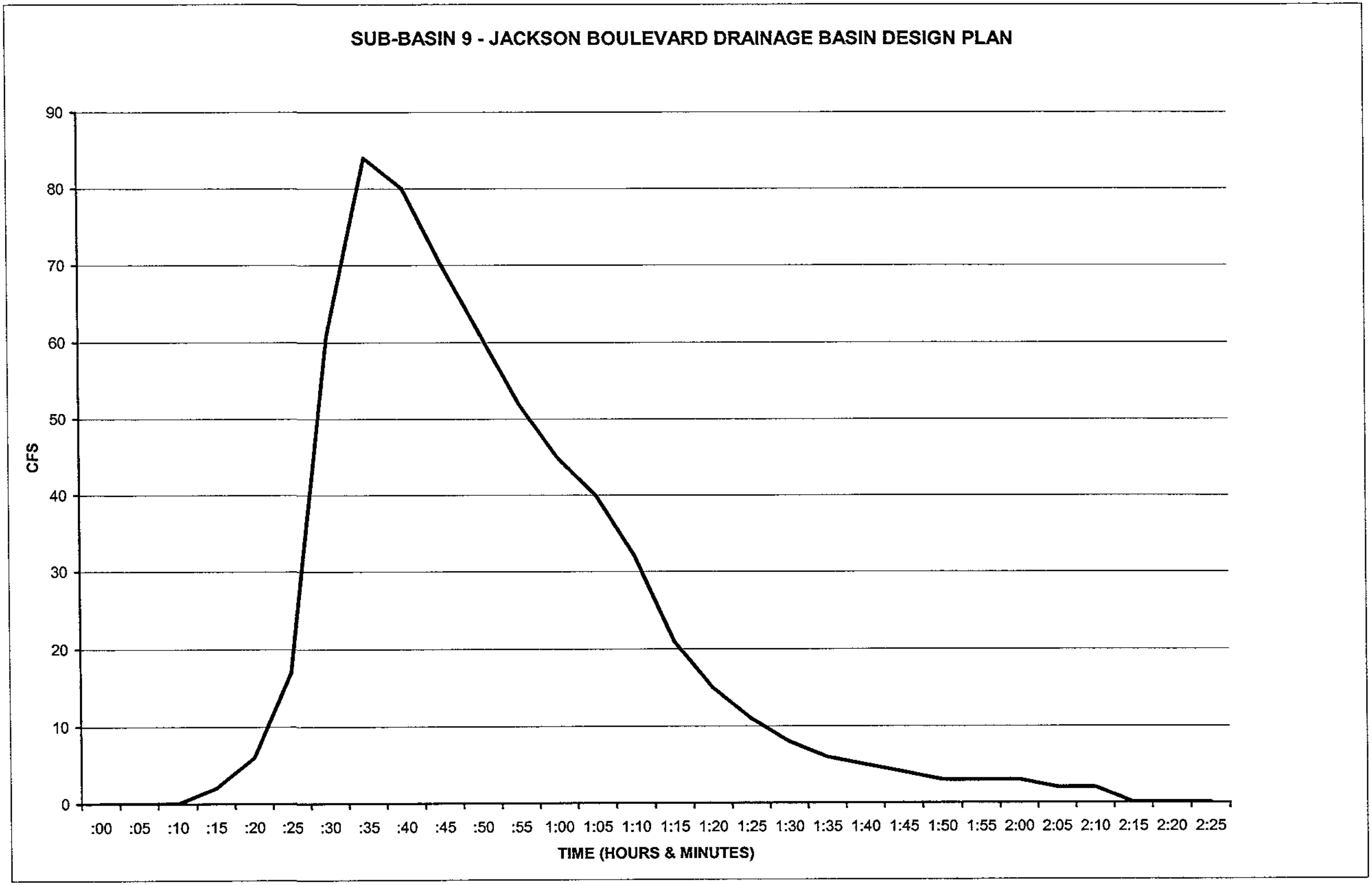

SUB-BASIN 6 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
100
90
80
70
60
50
40
30
20
10
0
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
2:55
TIME (HOURS & MINUTES)

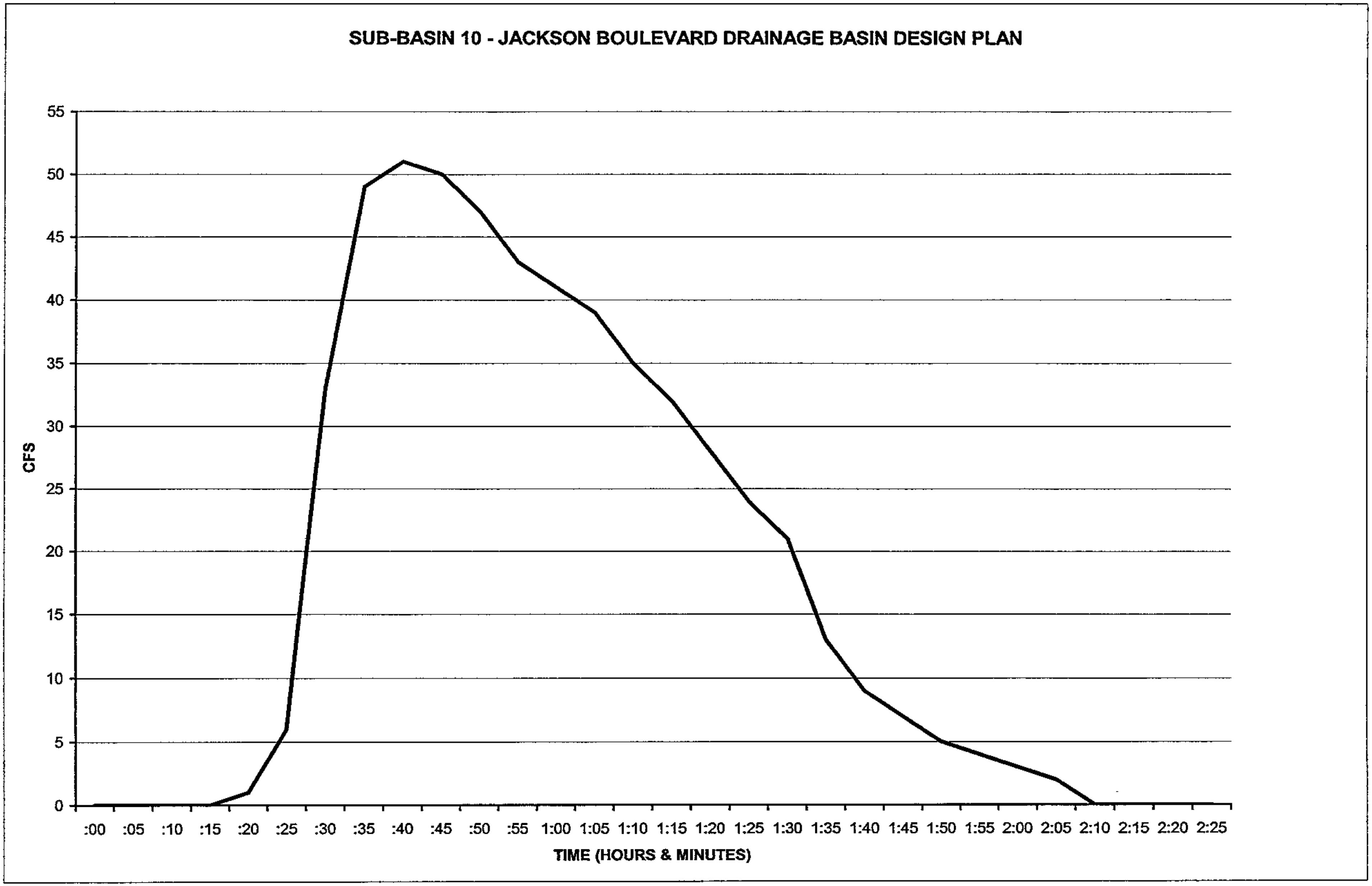


SUB-BASIN 7 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
10
20
30
40
50
60
70
80
90
100
110
120
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
2:55
TIME (HOURS & MINUTES)

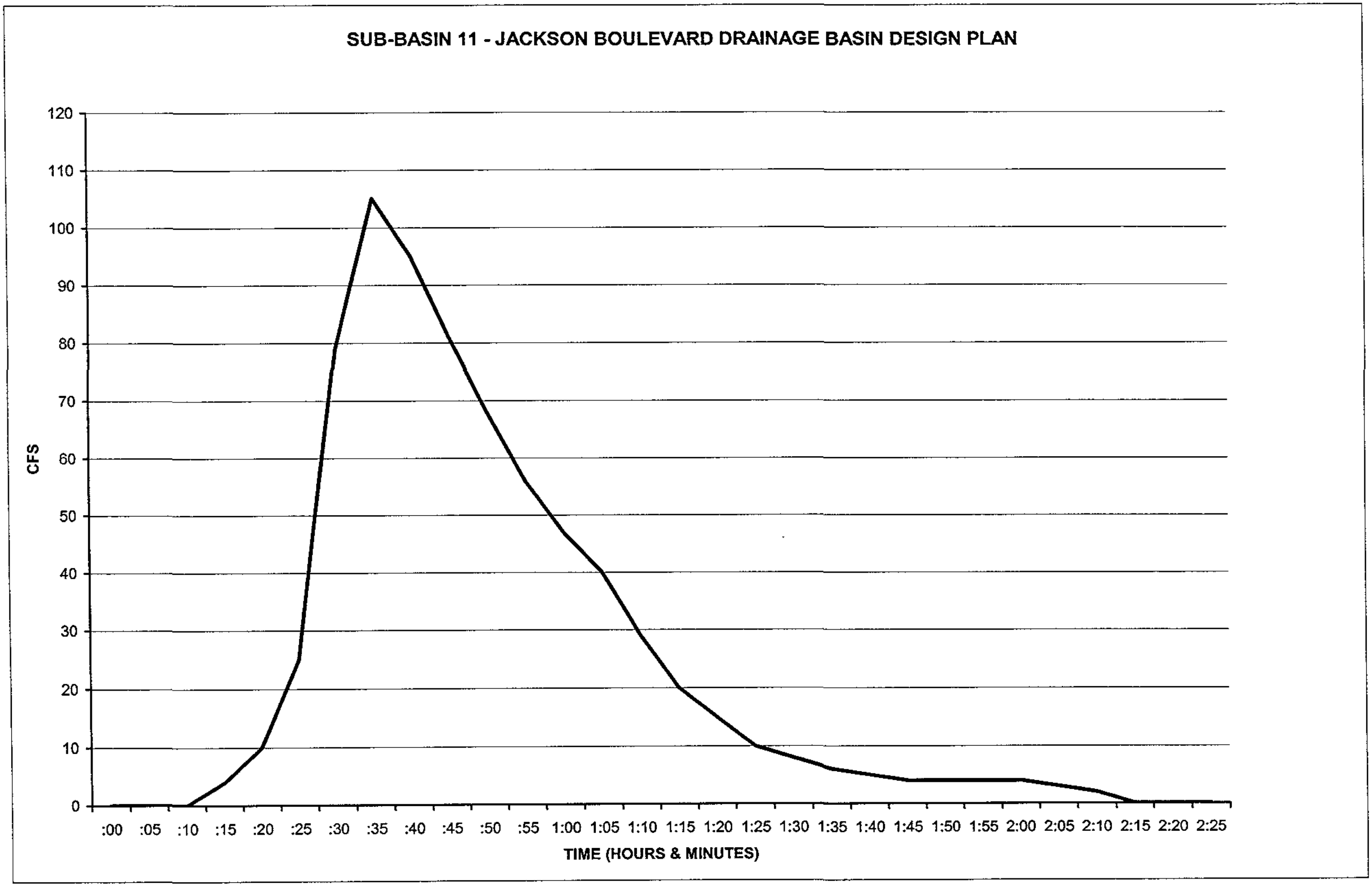
SUB-BASIN 8 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

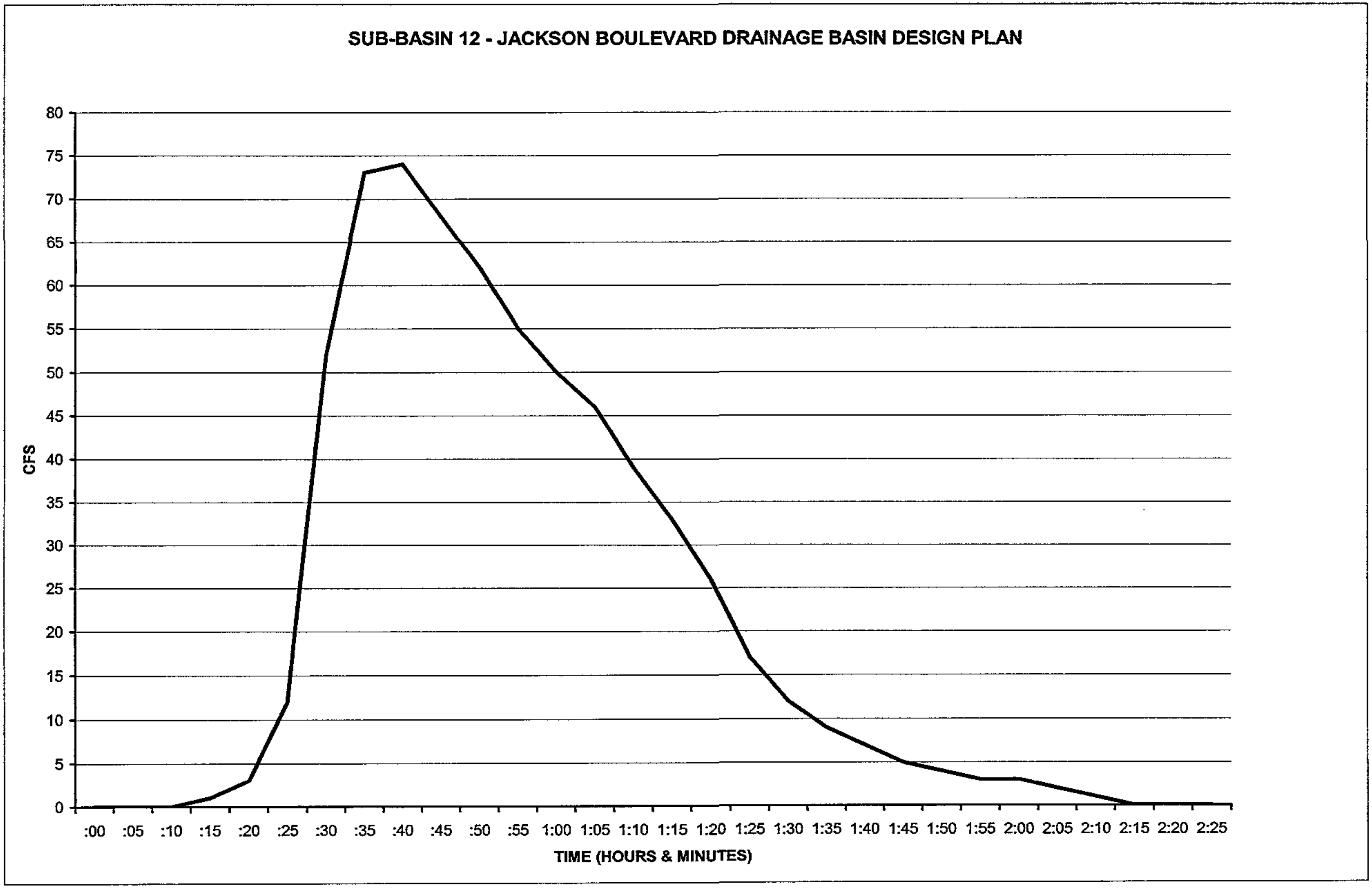


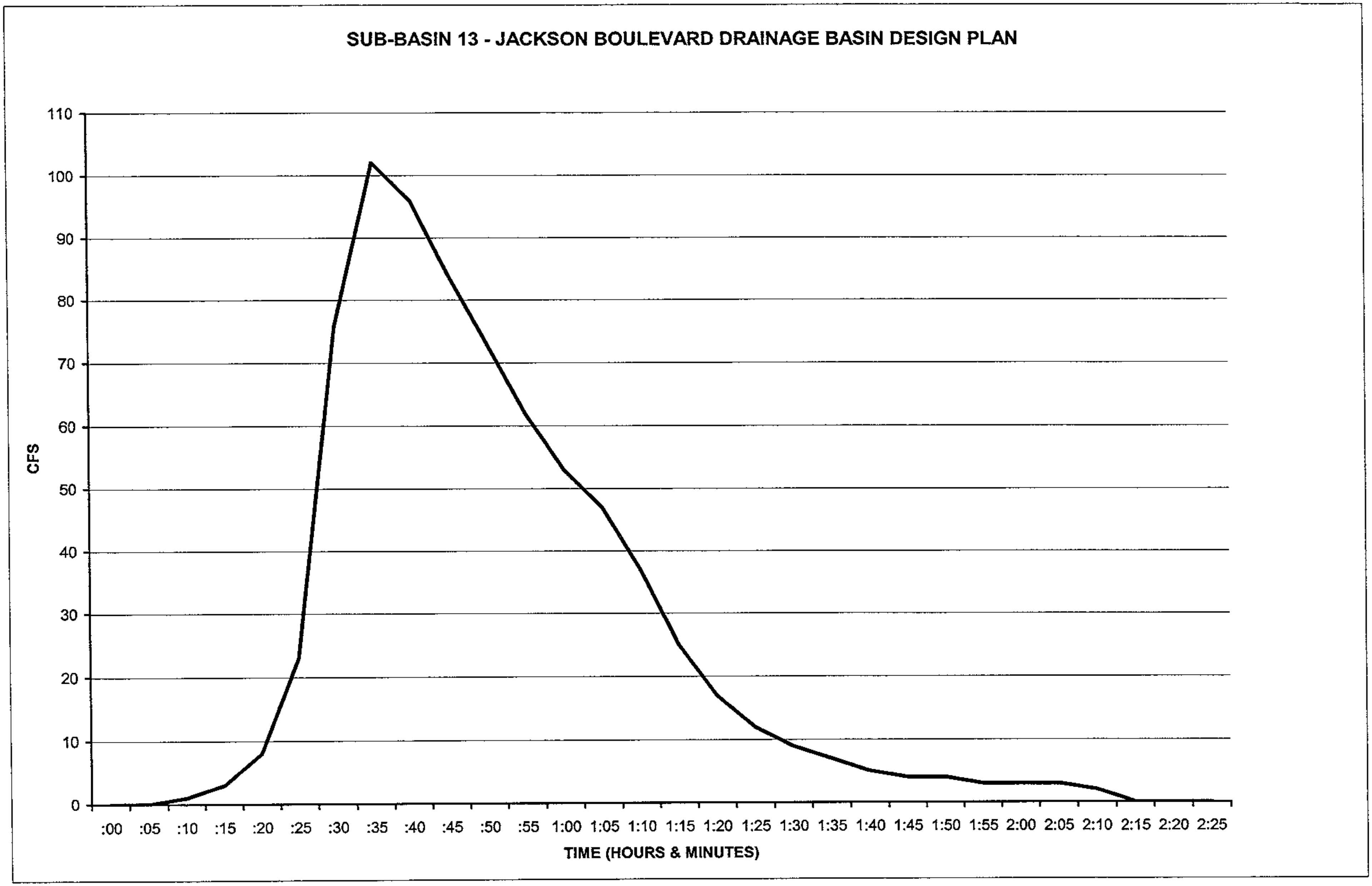

SUB-BASIN 9 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
90
80
70
60
50
40
30
20
10
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

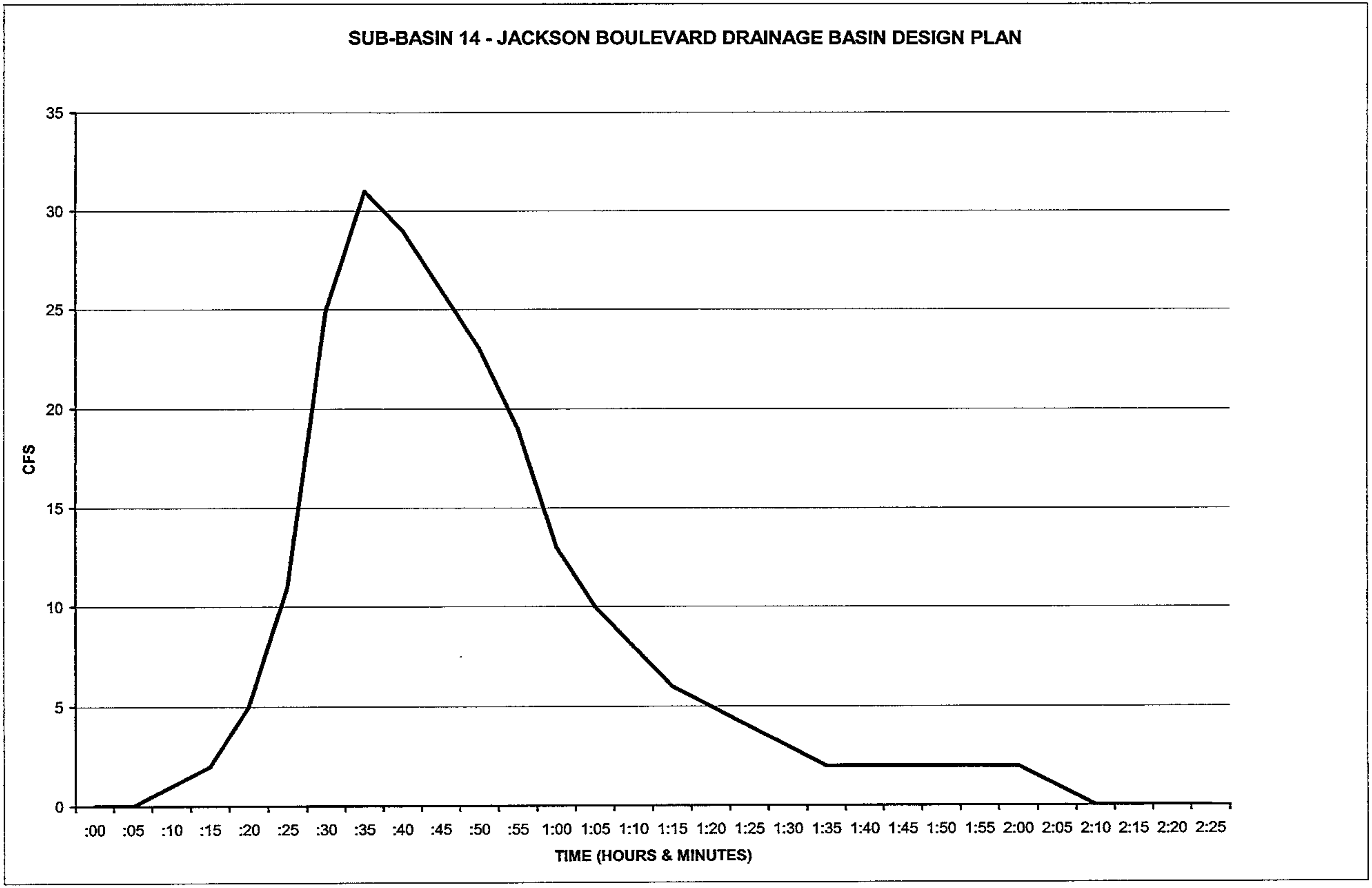


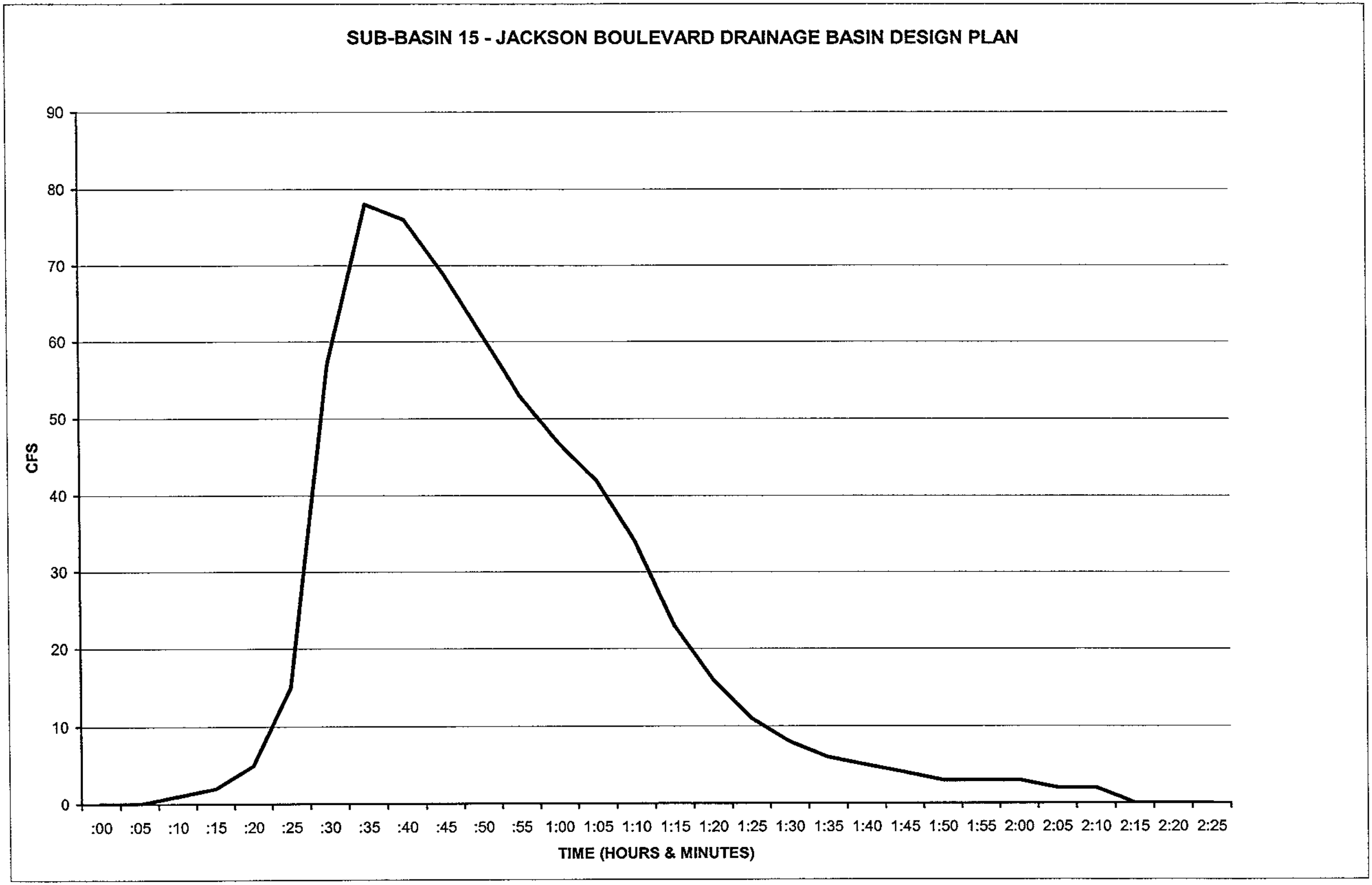
SUB-BASIN 10 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
5
10
15
20
25
30
35
40
45
50
55
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)


SUB-BASIN 11 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
10
20
30
40
50
60
70
80
90
100
110
120
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

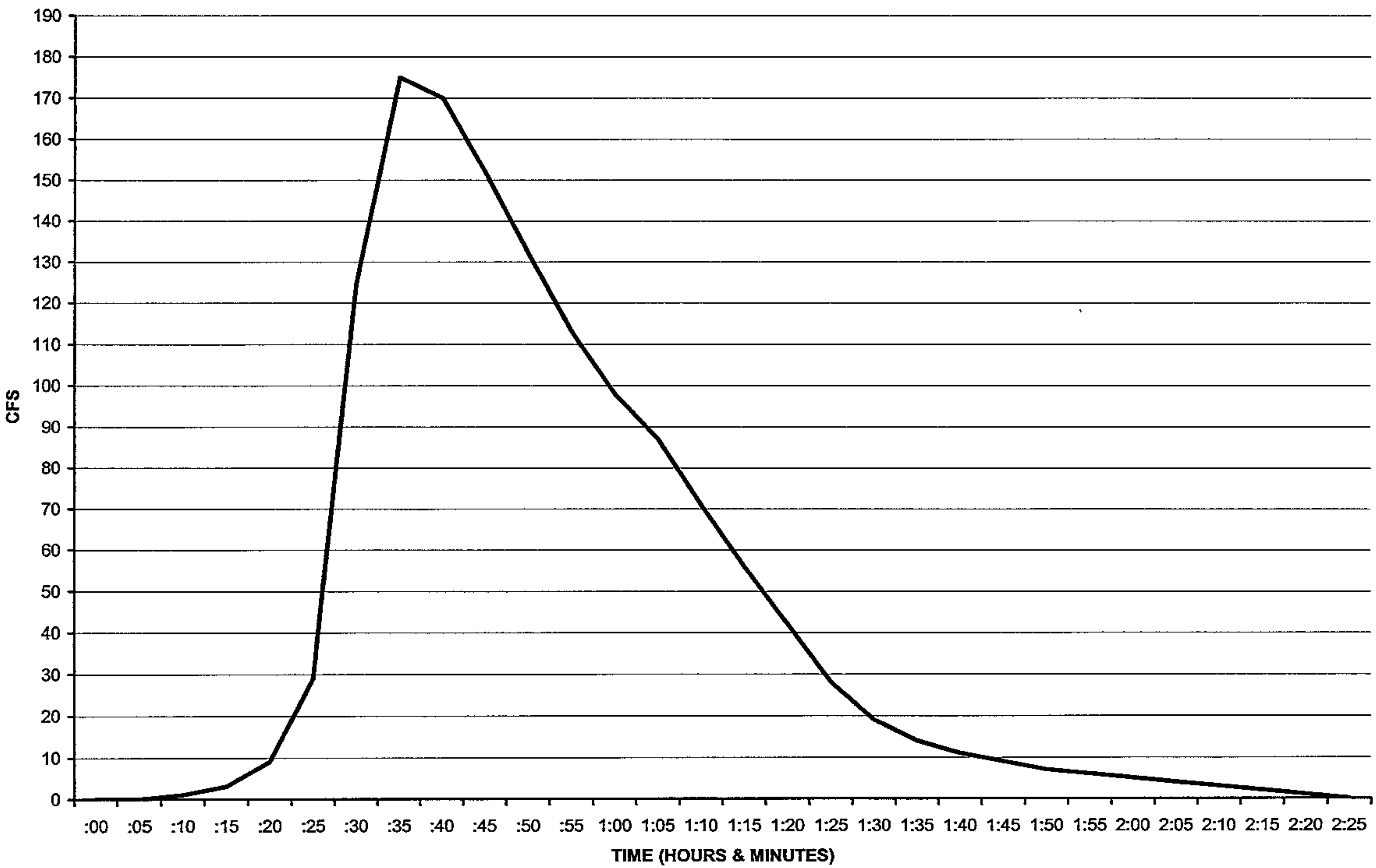

SUB-BASIN 12 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

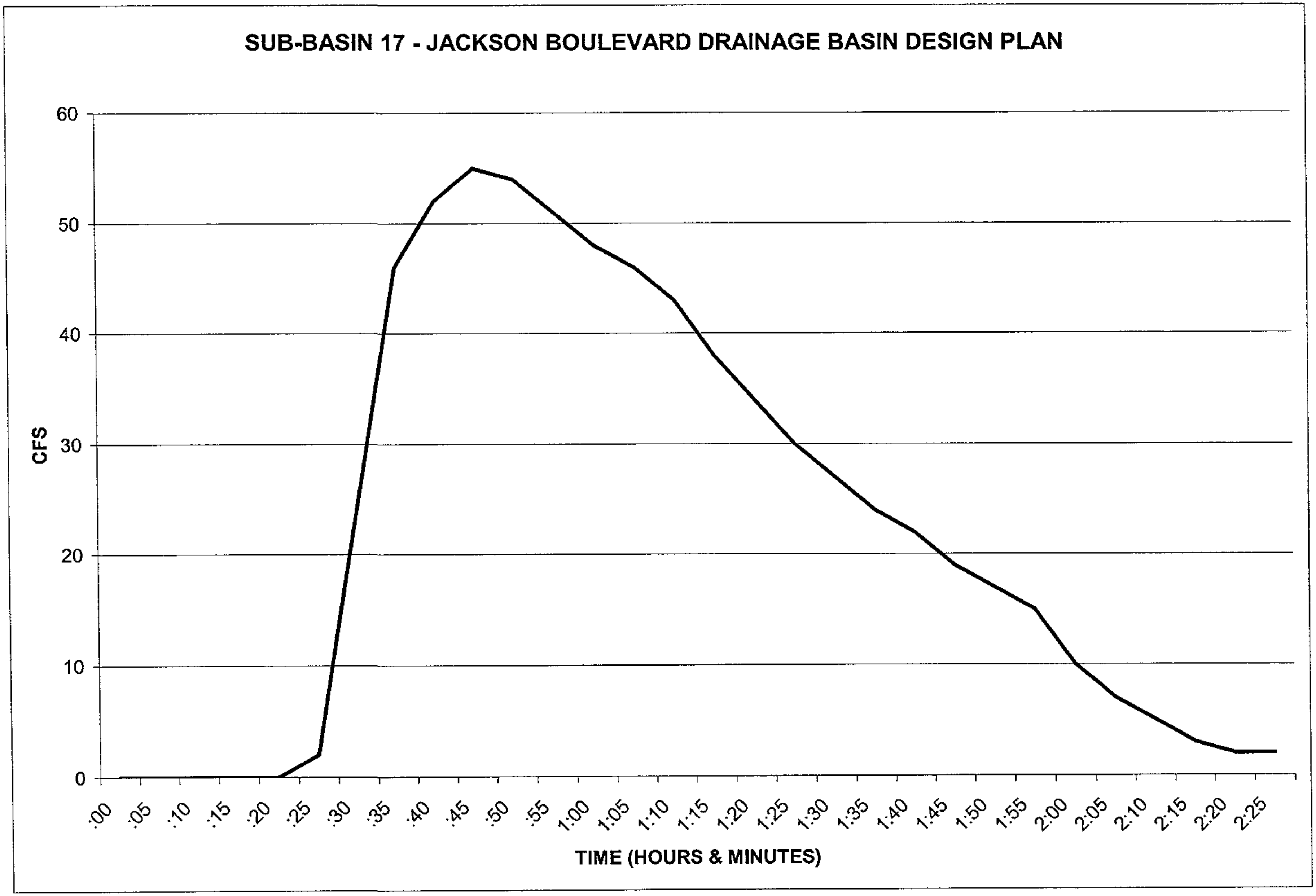

SUB-BASIN 13 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
110
100
90
80
70
60
50
40
30
20
10
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

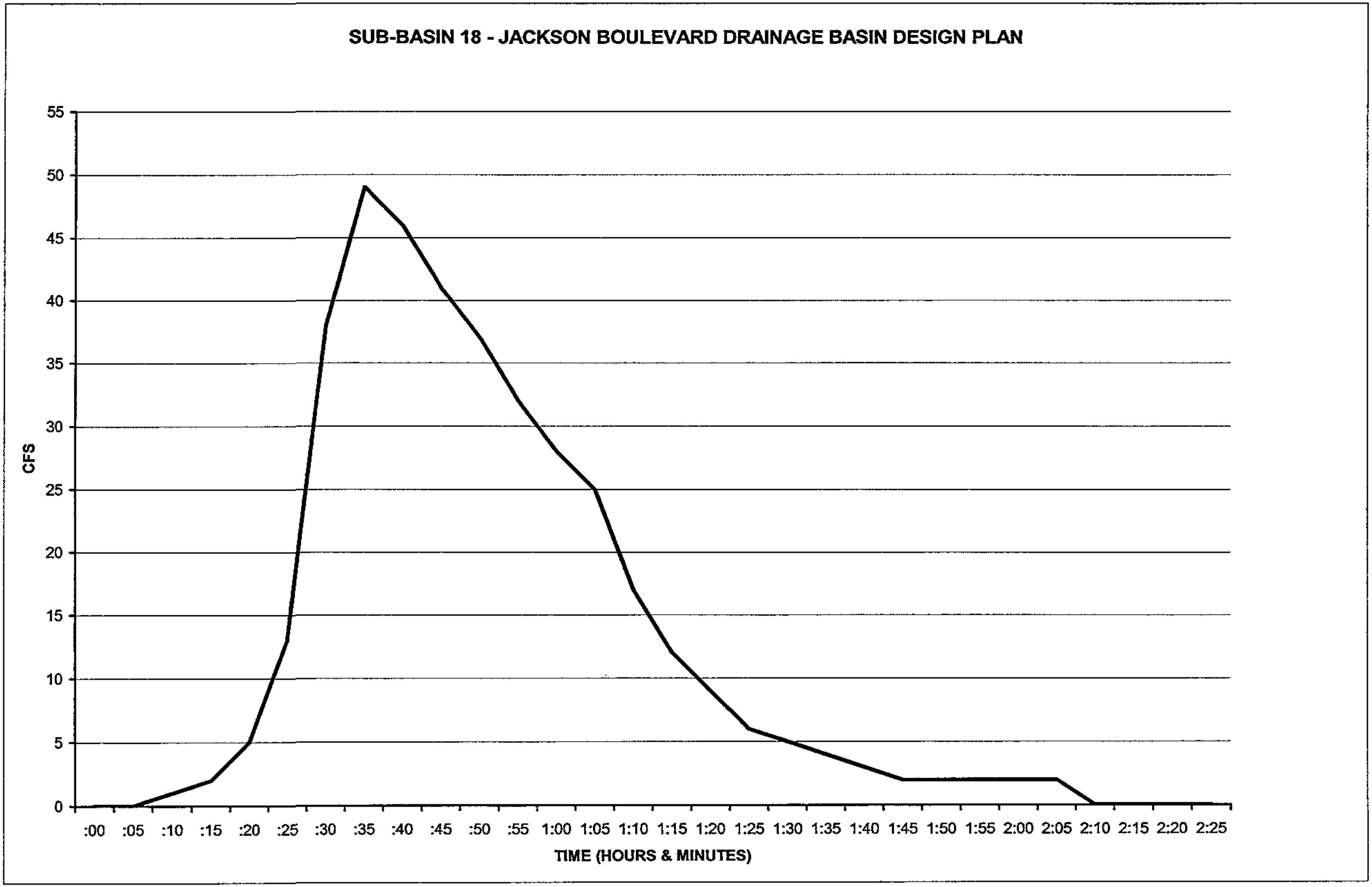

SUB-BASIN 14 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
35
30
25
20
15
10
5
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

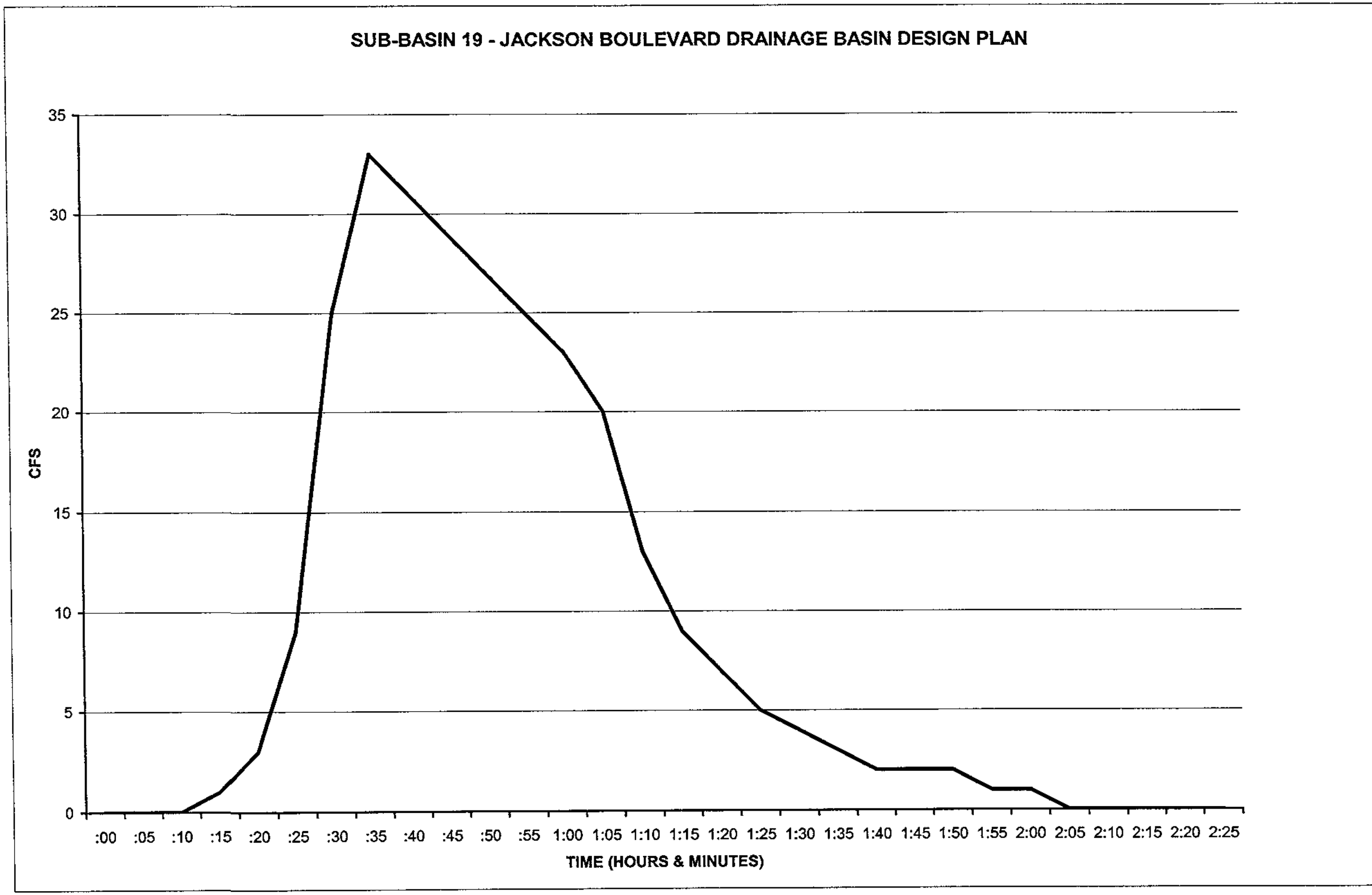

SUB-BASIN 15 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
90
80
70
60
50
40
30
20
10
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

SUB-BASIN 16 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

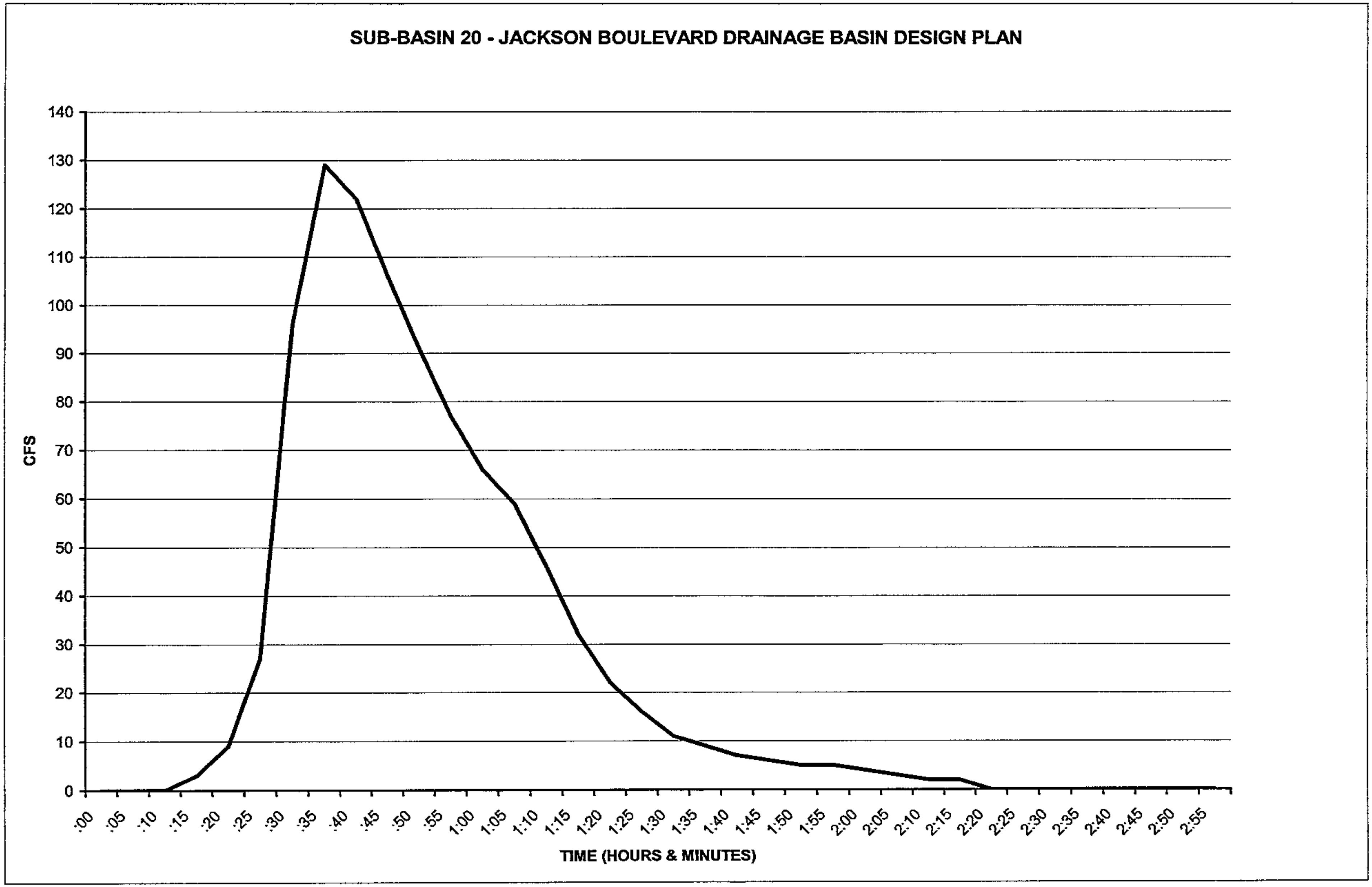


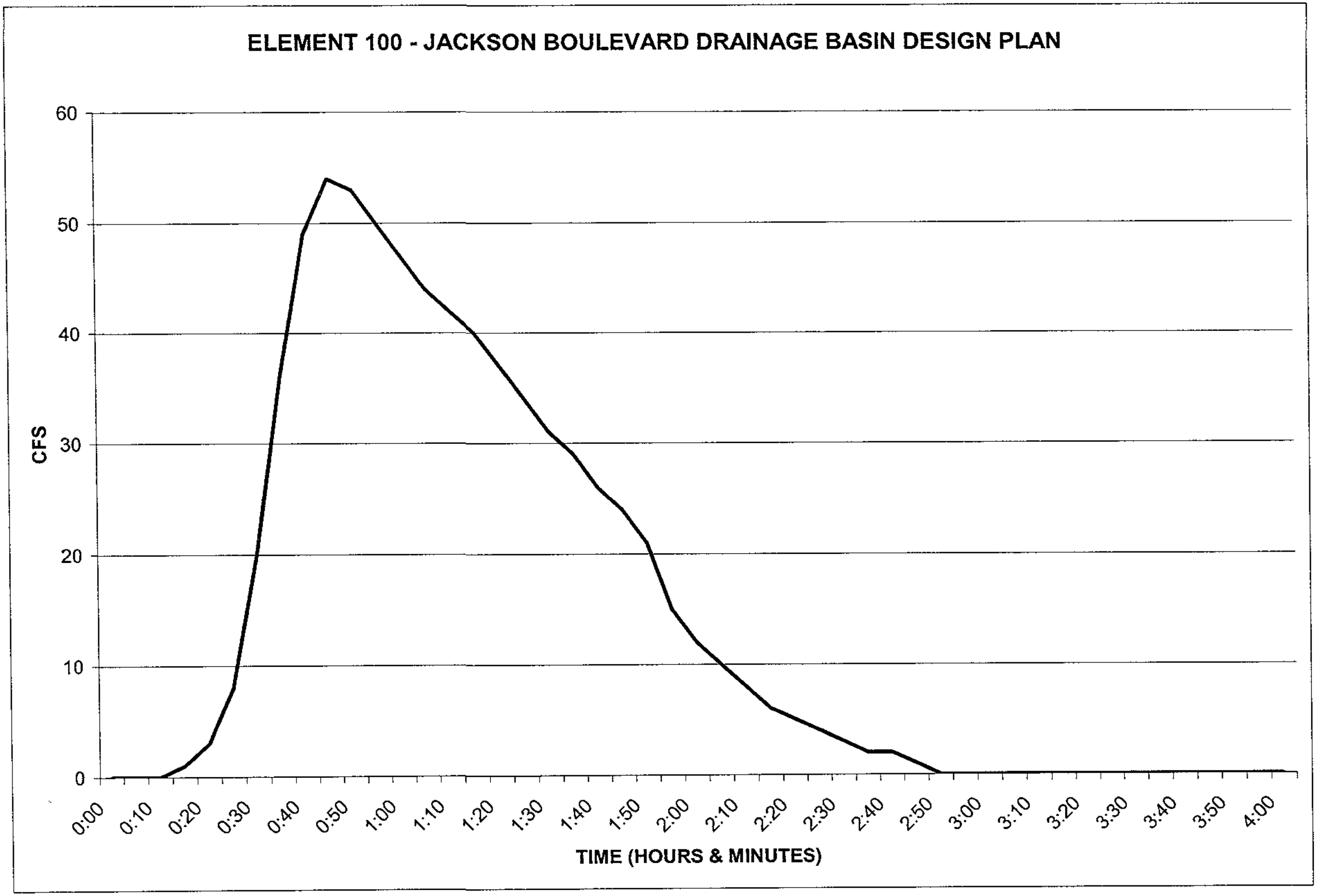

SUB-BASIN 17 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
10
20
30
40
50
60
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
TIME (HOURS & MINUTES)


SUB-BASIN 18 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
55
50
45
40
35
30
25
20
15
10
5
0
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

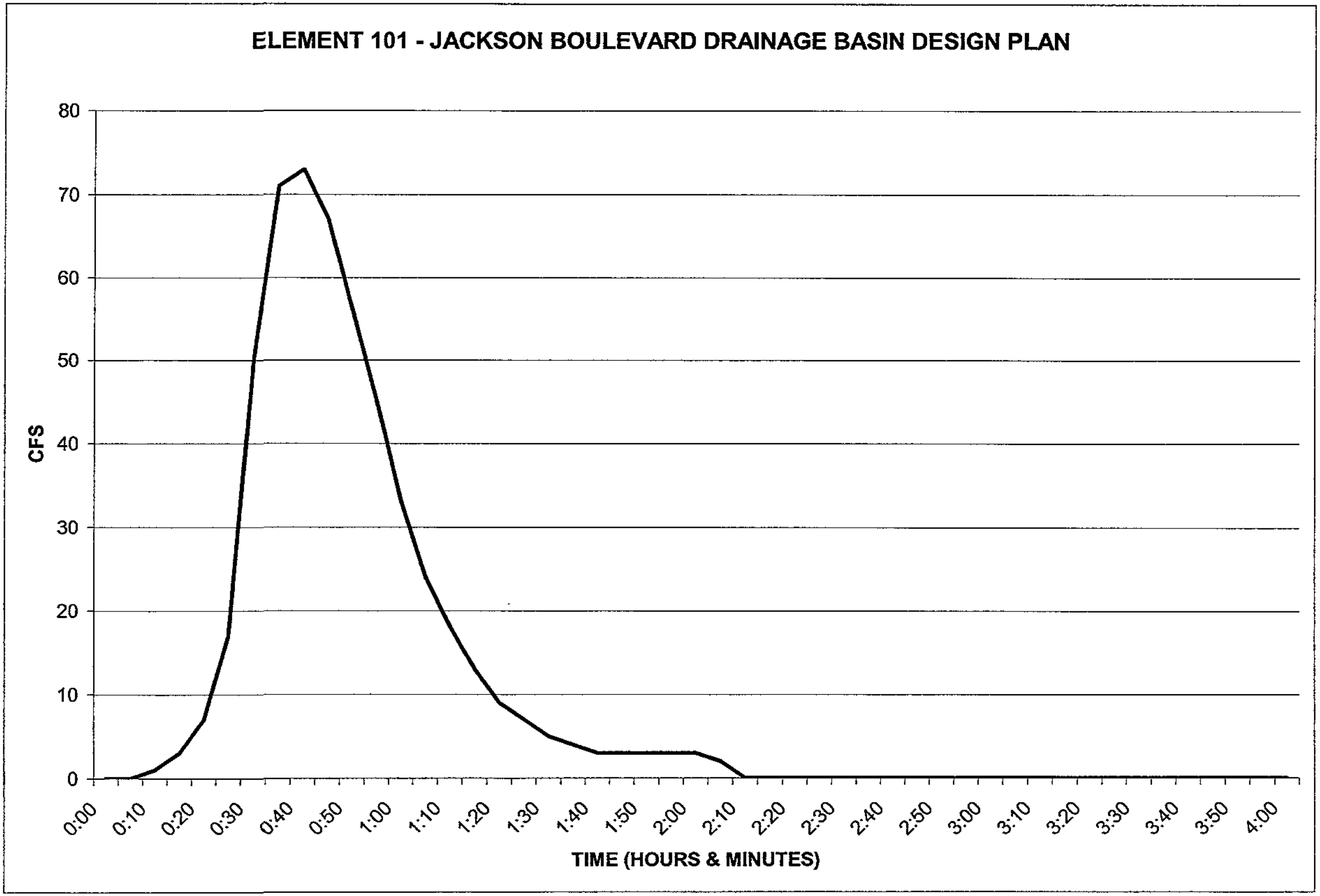


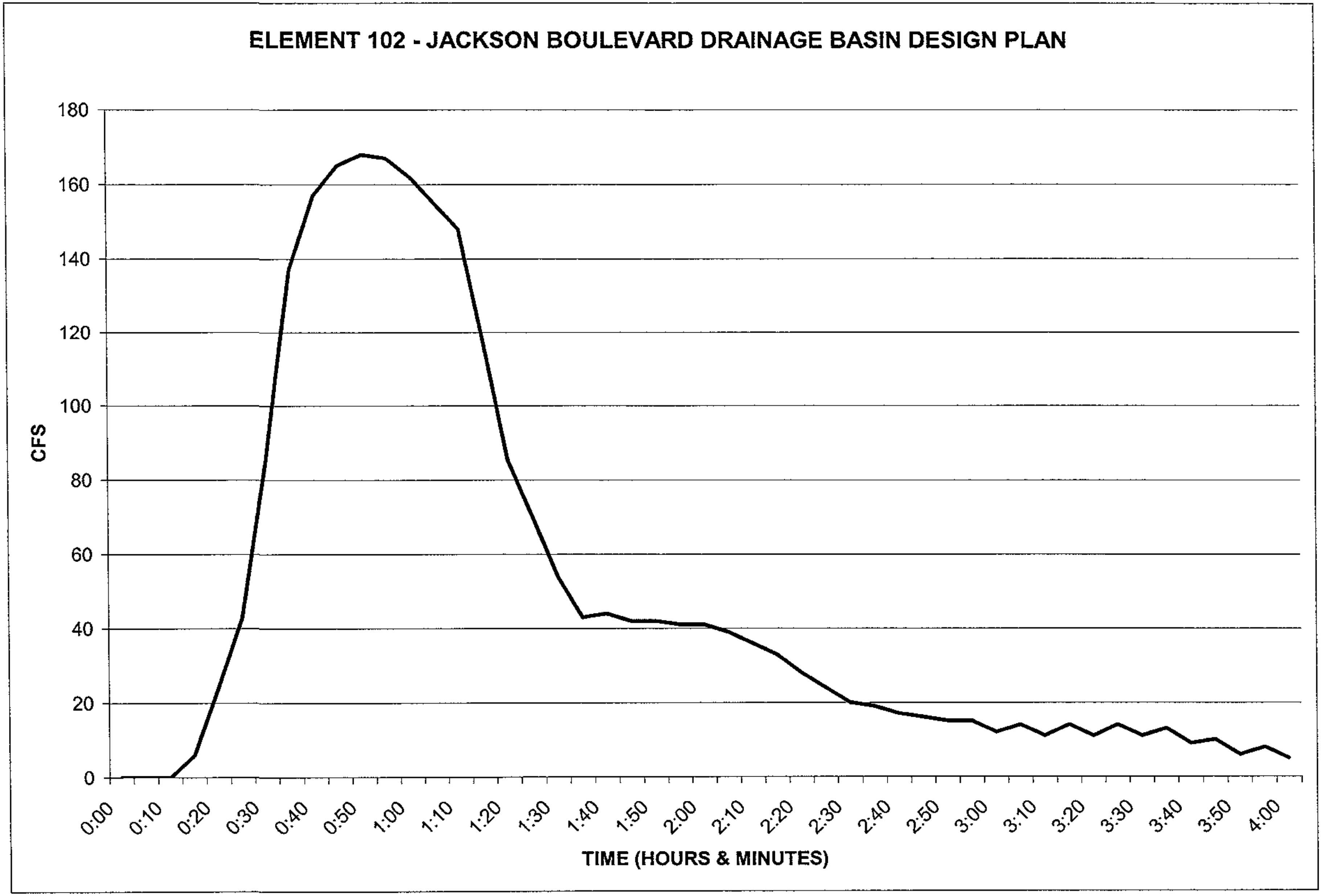
SUB-BASIN 19 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
35
30
25
20
15
10
5
0
CFS
:00 :05 :10 :15 :20 :25 :30 :35 :40 :45 :50 :55 1:00 1:05 1:10 1:15 1:20 1:25 1:30 1:35 1:40 1:45 1:50 1:55 2:00 2:05 2:10 2:15 2:20 2:25
TIME (HOURS & MINUTES)

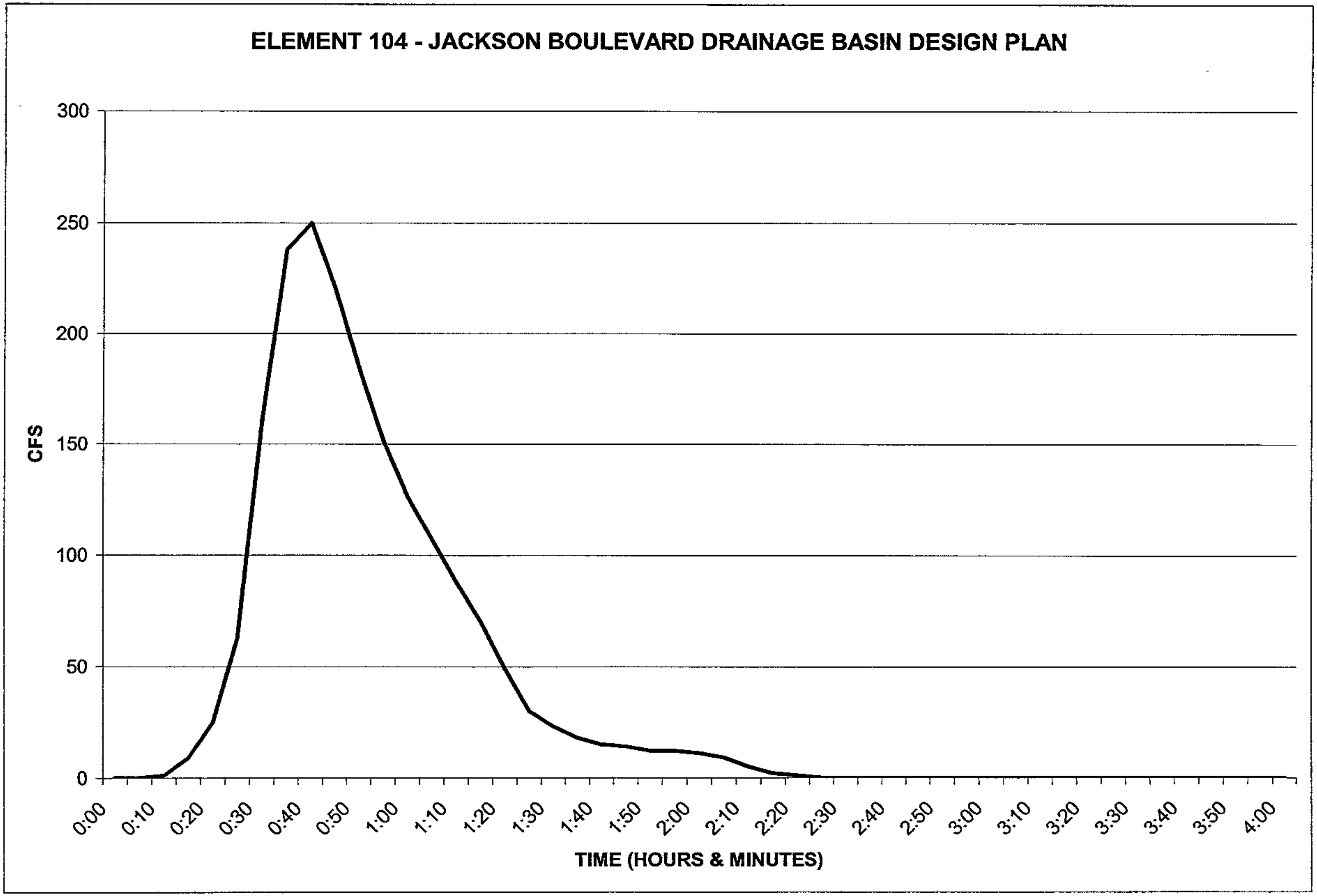

SUB-BASIN 20 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
:00
:05
:10
:15
:20
:25
:30
:35
:40
:45
:50
:55
1:00
1:05
1:10
1:15
1:20
1:25
1:30
1:35
1:40
1:45
1:50
1:55
2:00
2:05
2:10
2:15
2:20
2:25
2:30
2:35
2:40
2:45
2:50
2:55
TIME (HOURS & MINUTES)

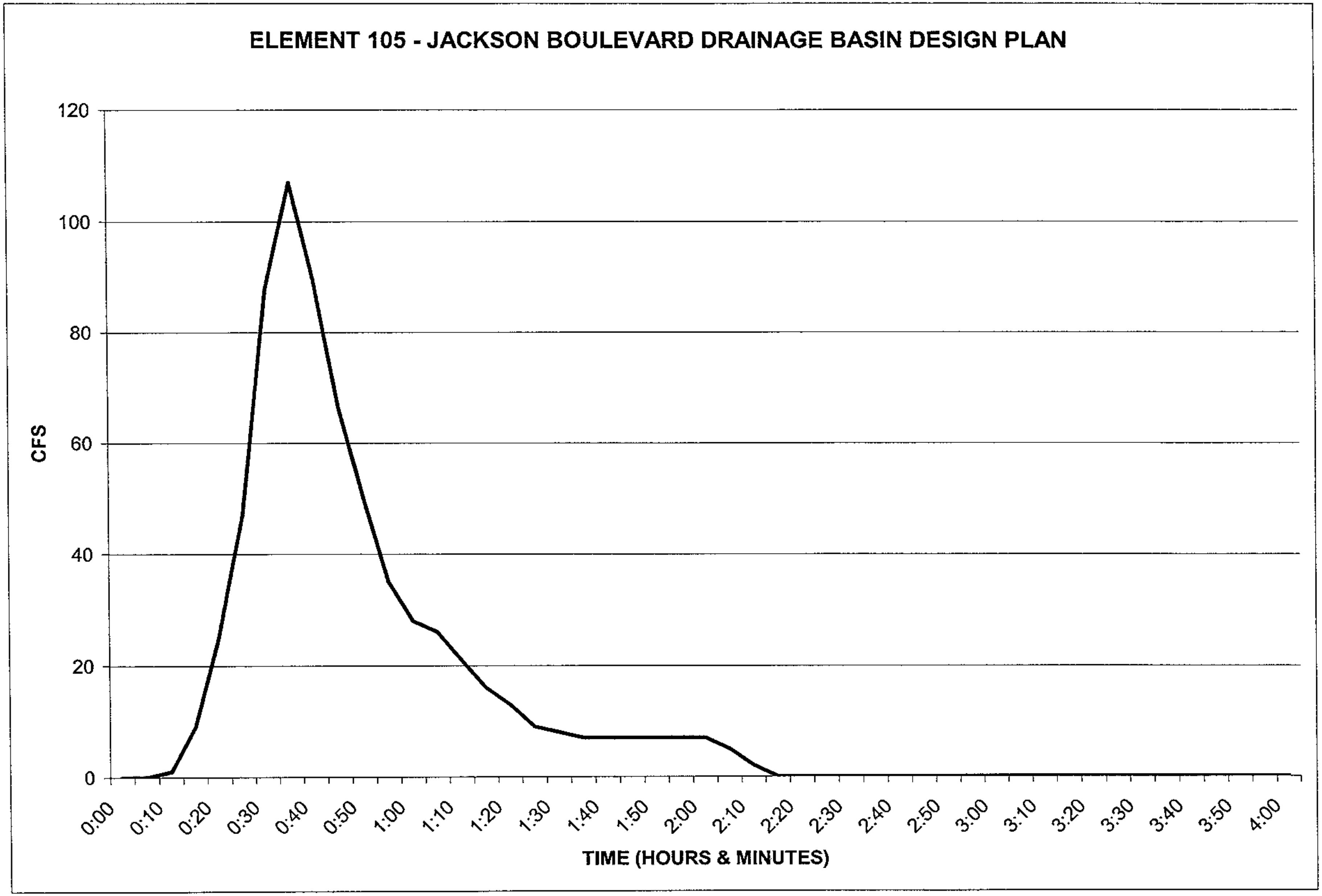


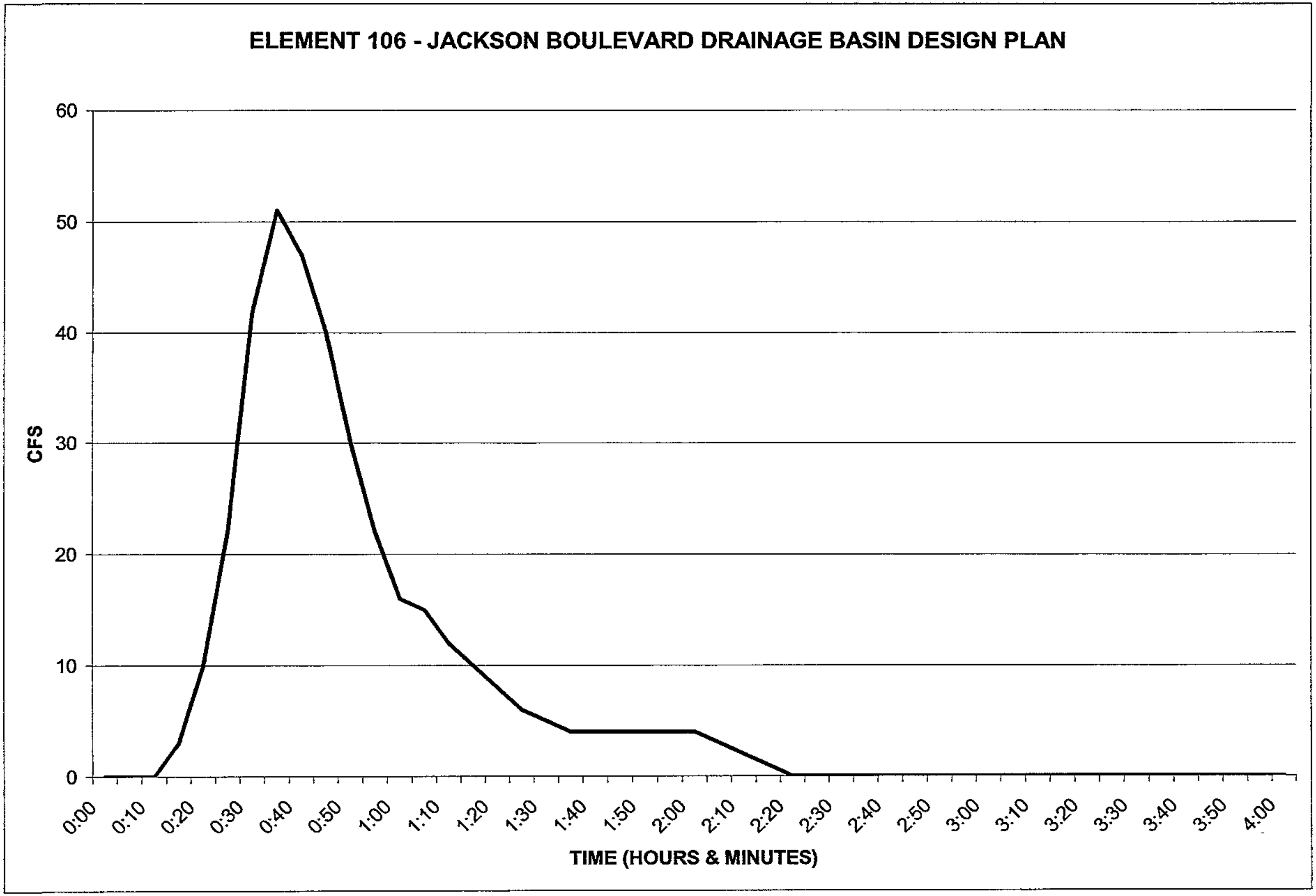
ELEMENT 100 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
60
50
40
30
20
10
0
CFS
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

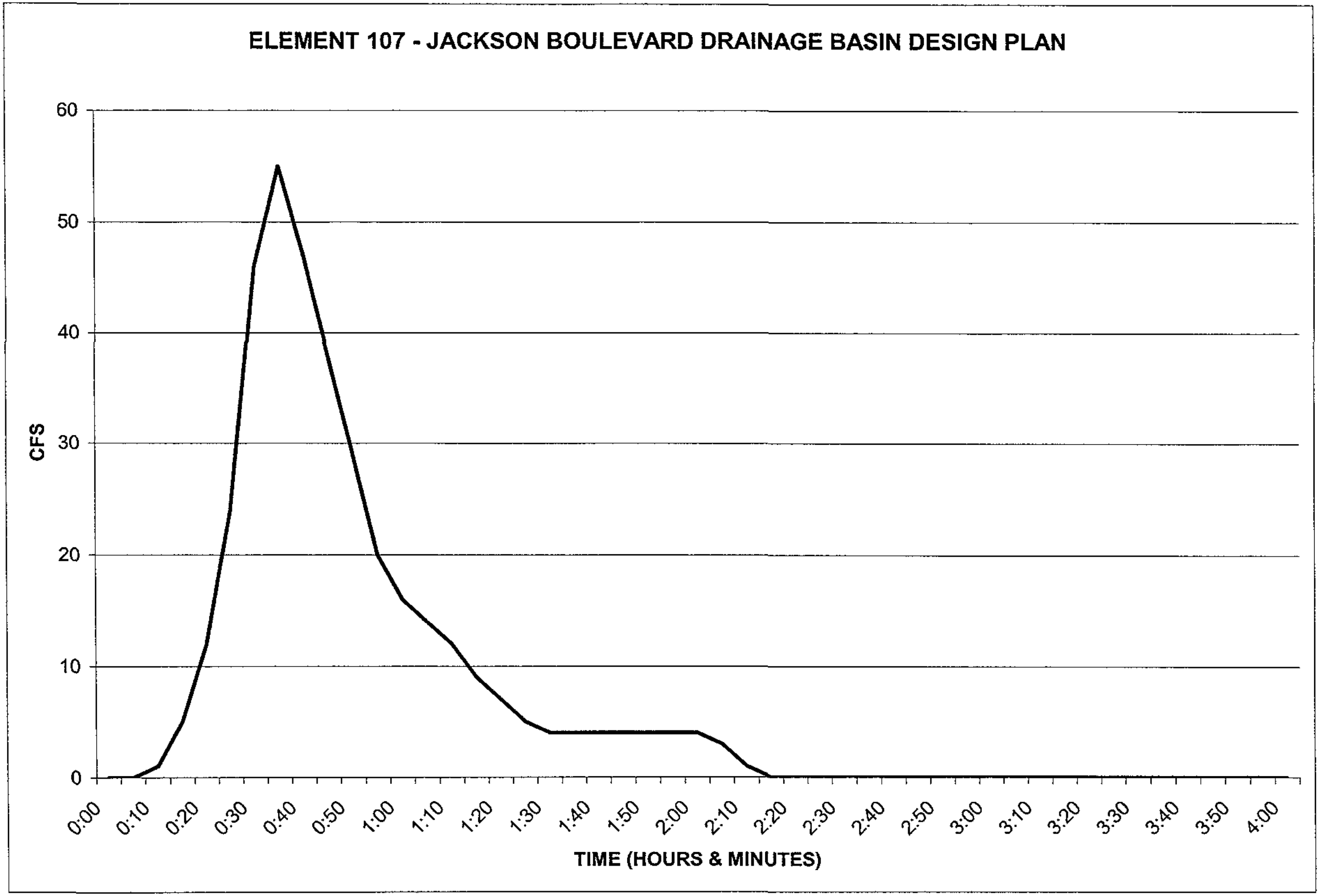

ELEMENT 101 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
80
70
60
50
40
30
20
10
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

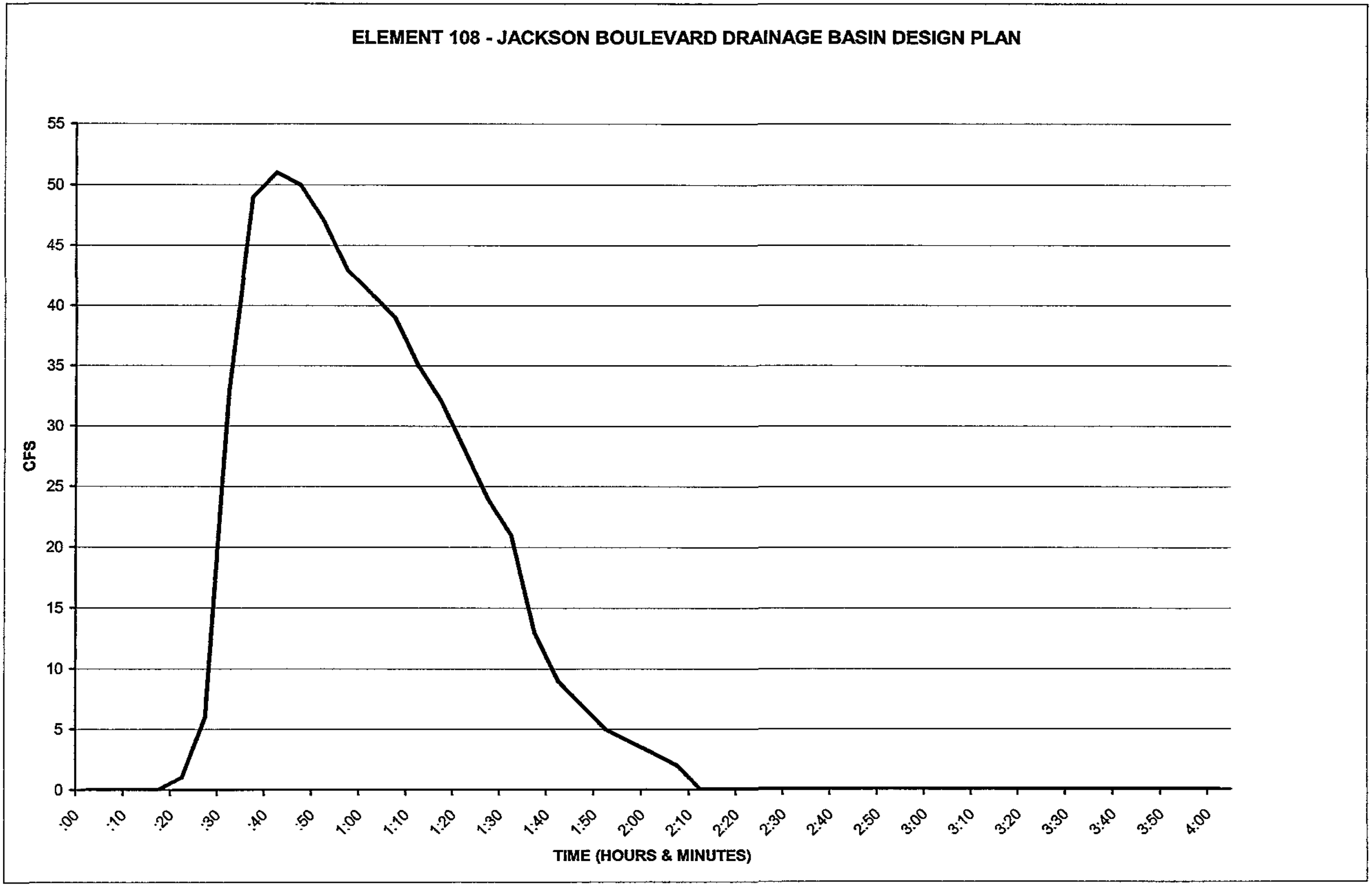

ELEMENT 102 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
180
160
140
120
100
80
60
40
20
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

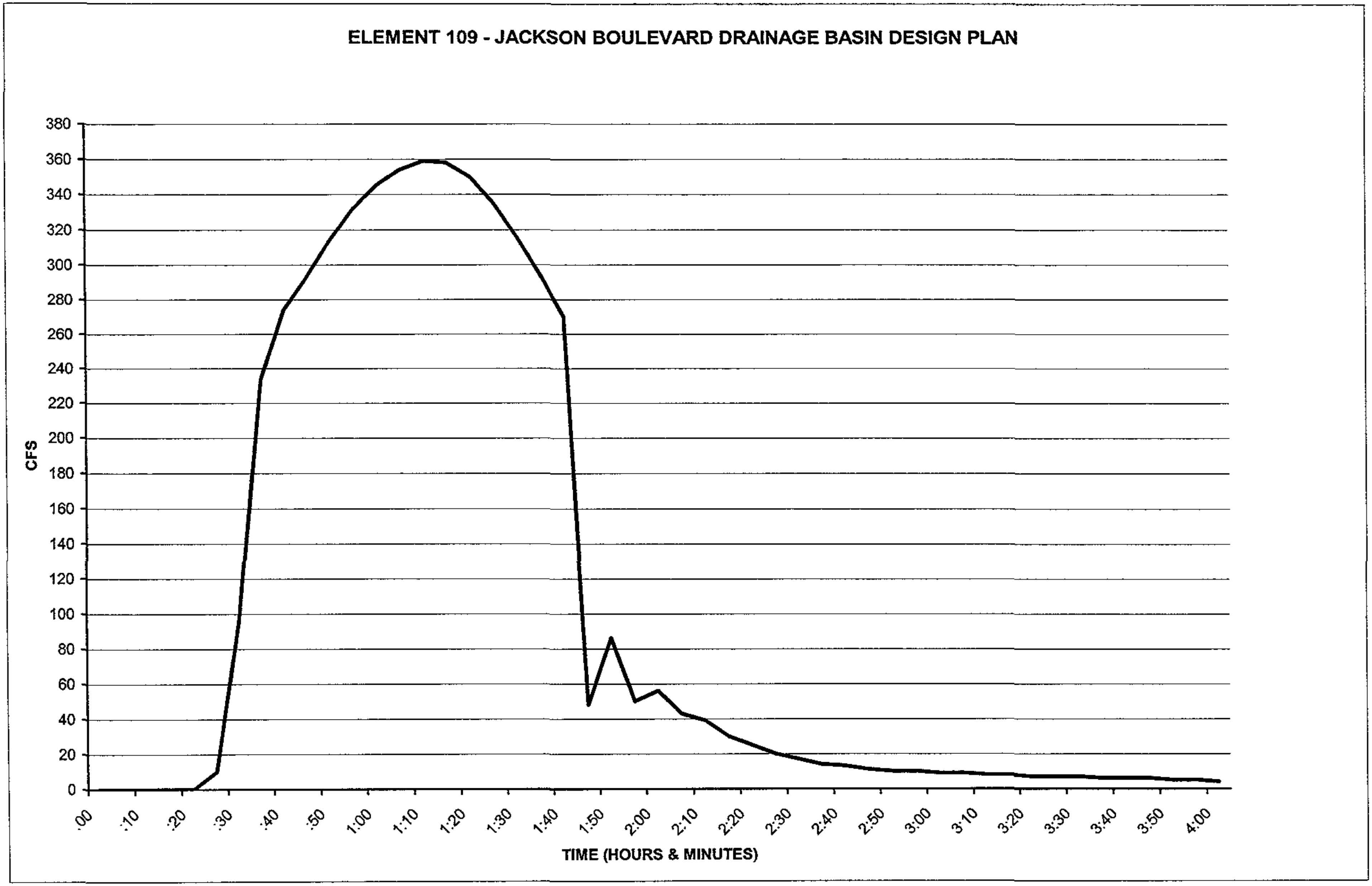

ELEMENT 104 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
300
250
200
150
100
50
0
CFS
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)


ELEMENT 105 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
0
20
40
60
80
100
120
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

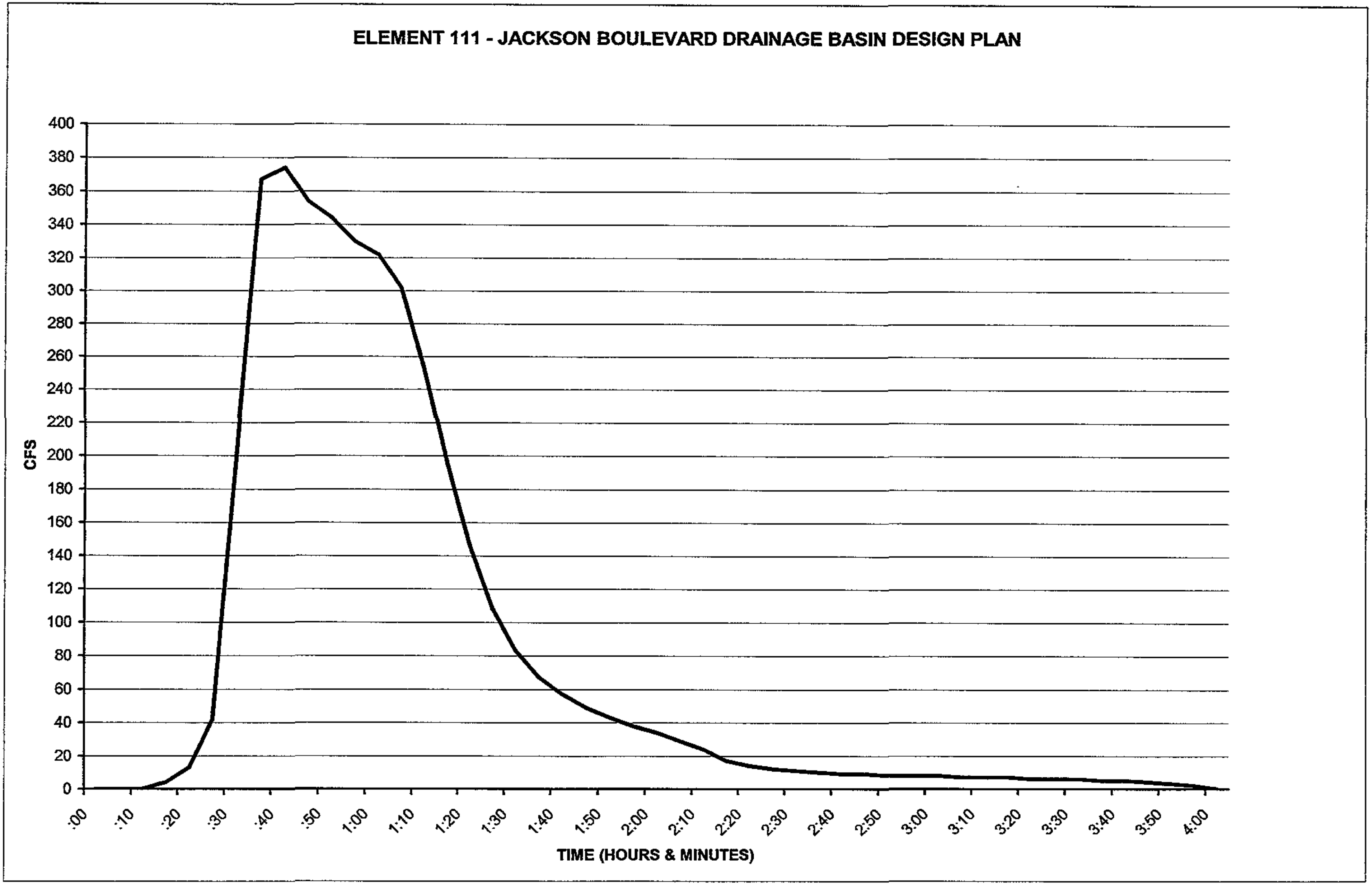

ELEMENT 106 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
60
50
40
30
20
10
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)


ELEMENT 107 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
60
50
40
30
20
10
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

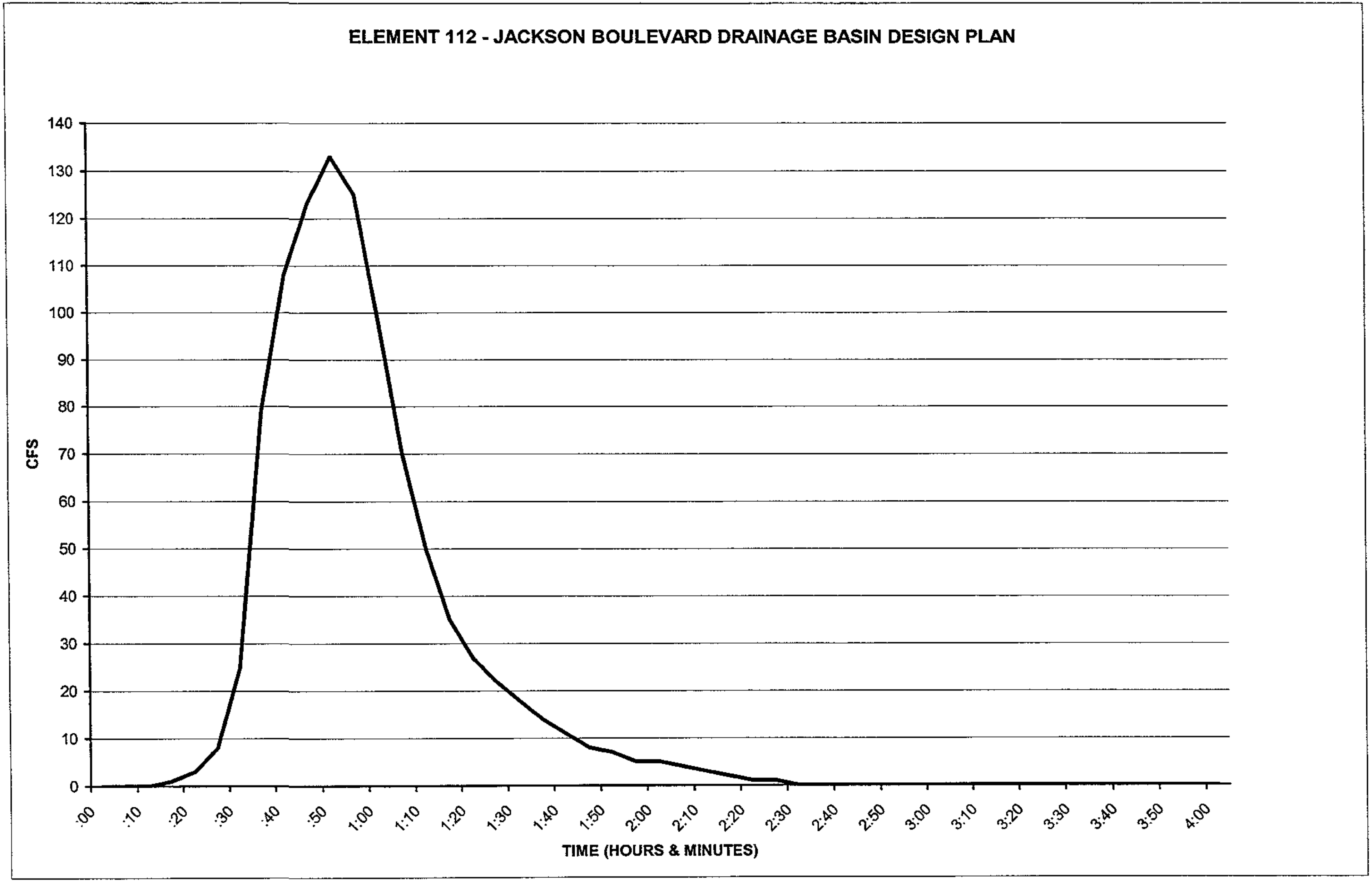

ELEMENT 108 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
55
50
45
40
35
30
25
20
15
10
5
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

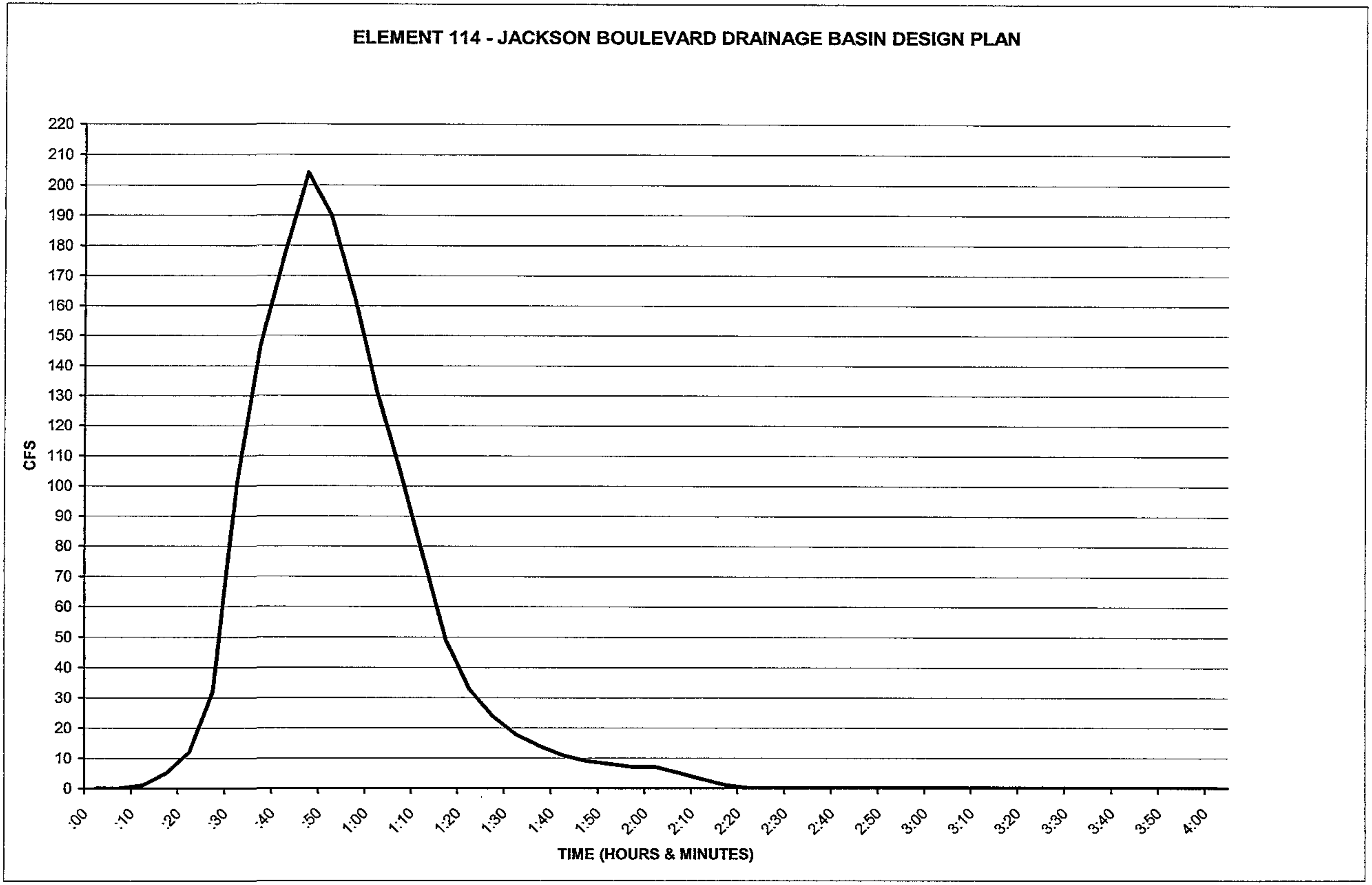


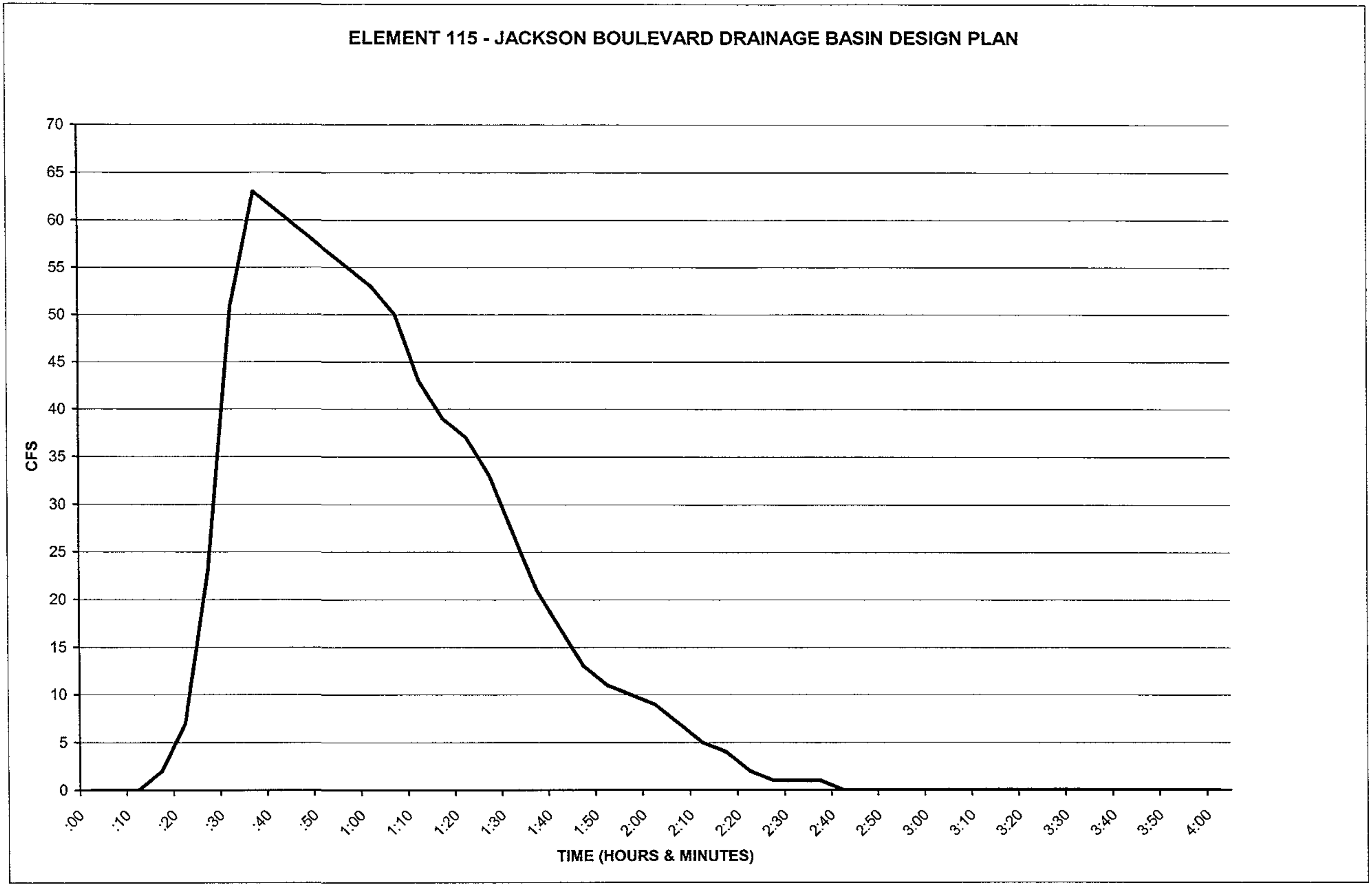
ELEMENT 109 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

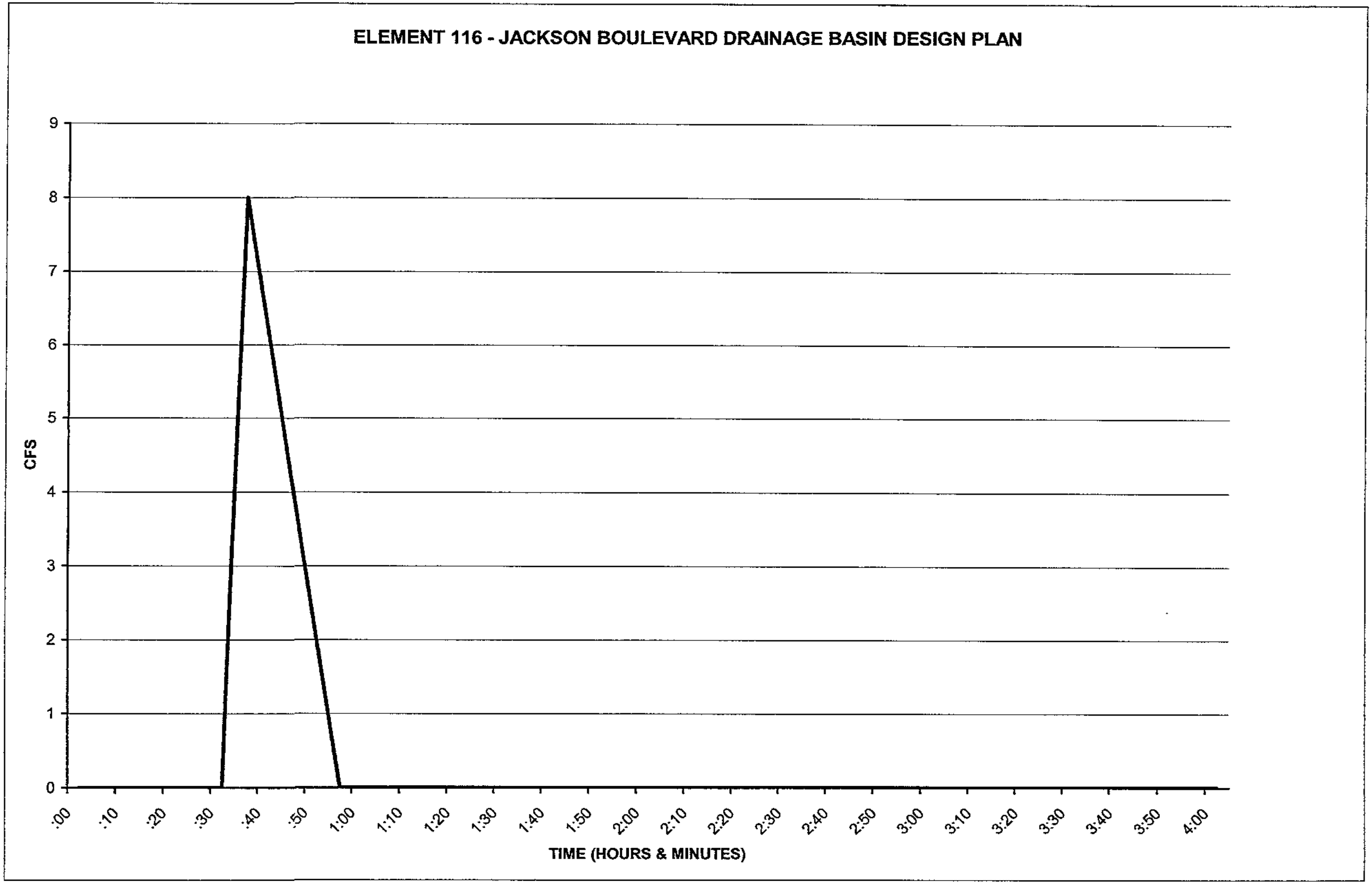


ELEMENT 111 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

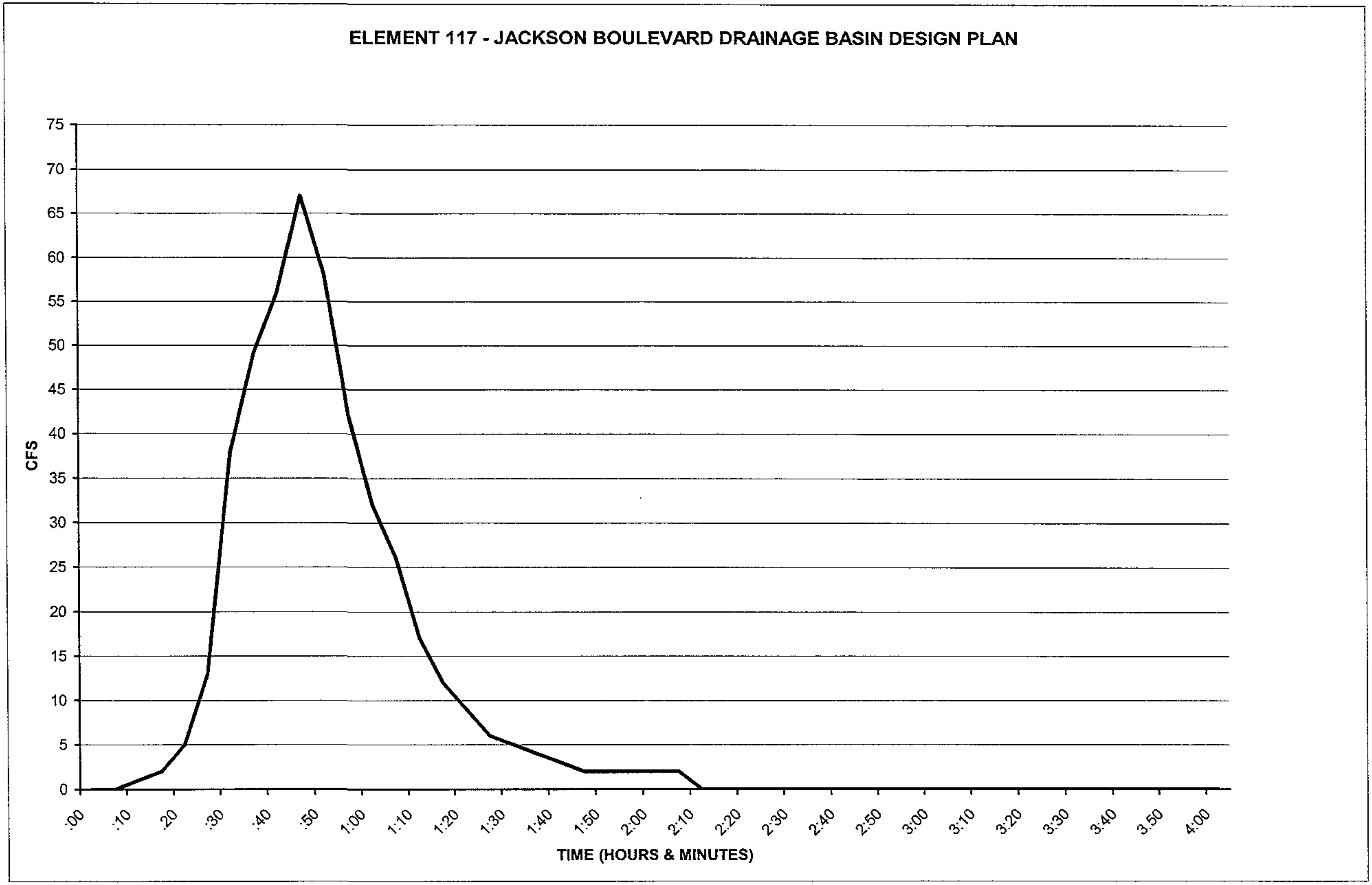

ELEMENT 112 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

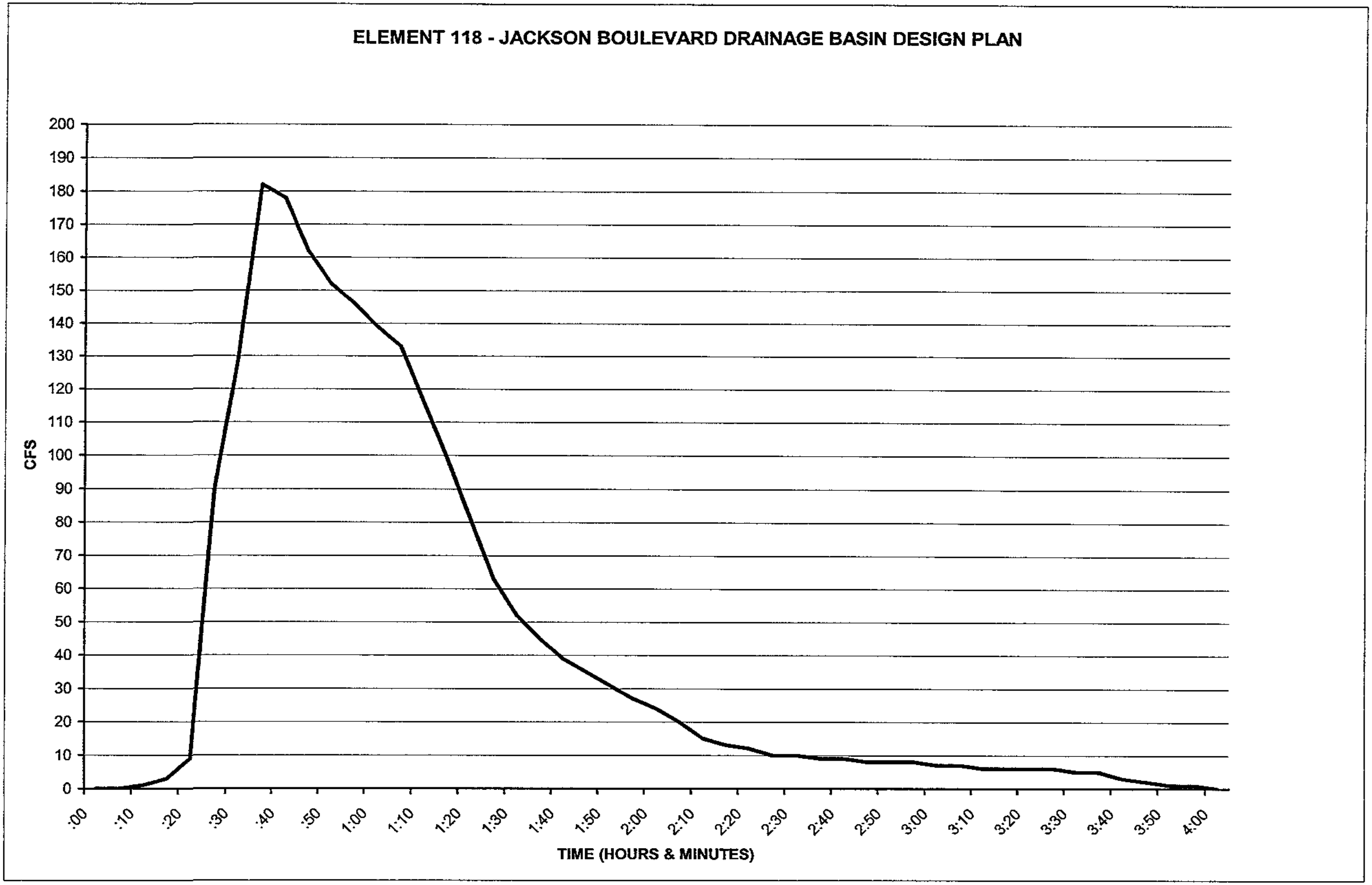

ELEMENT 114 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)


ELEMENT 115 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

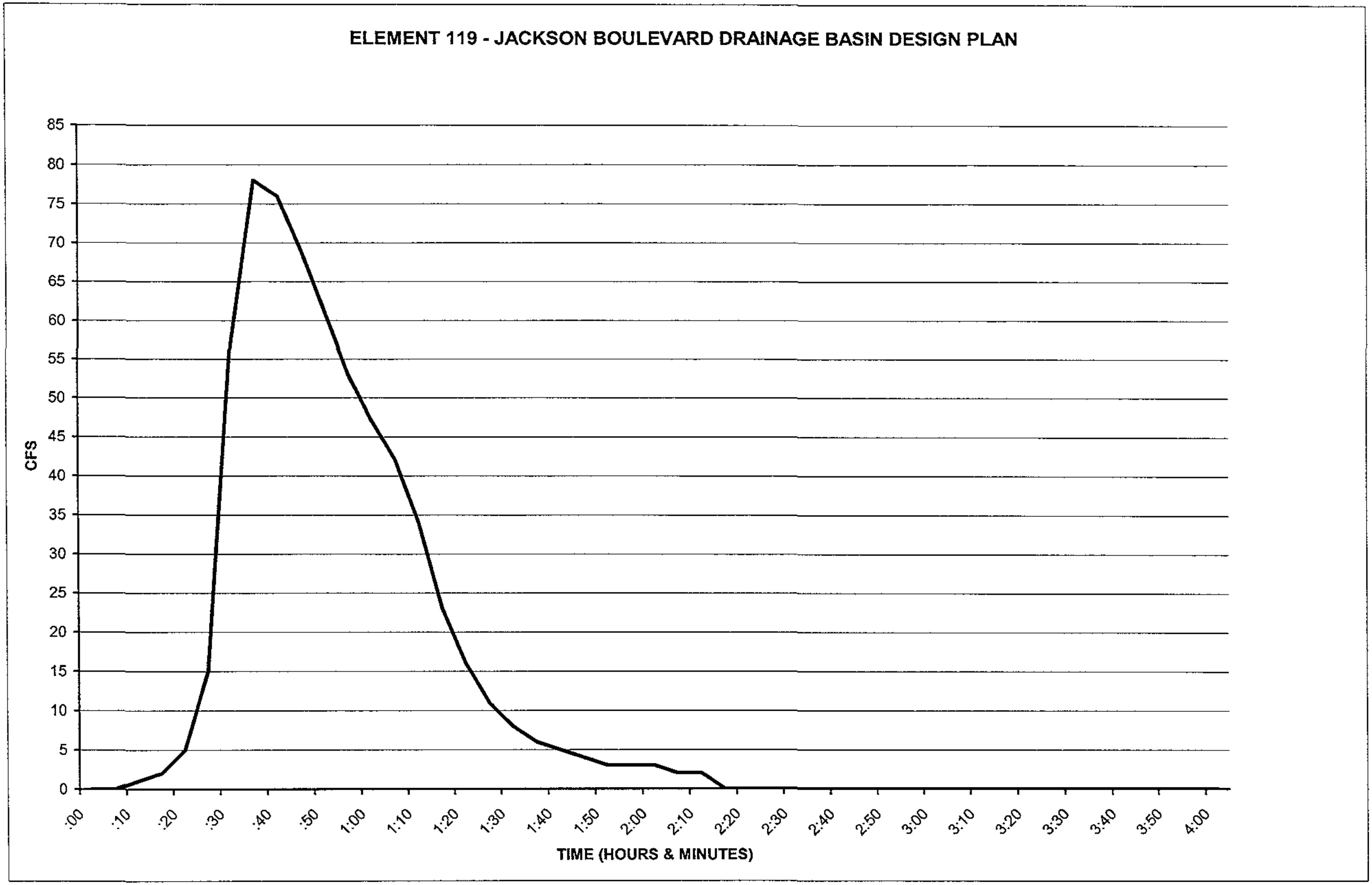


ELEMENT 116 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
9
8
7
6
5
4
3
2
1
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

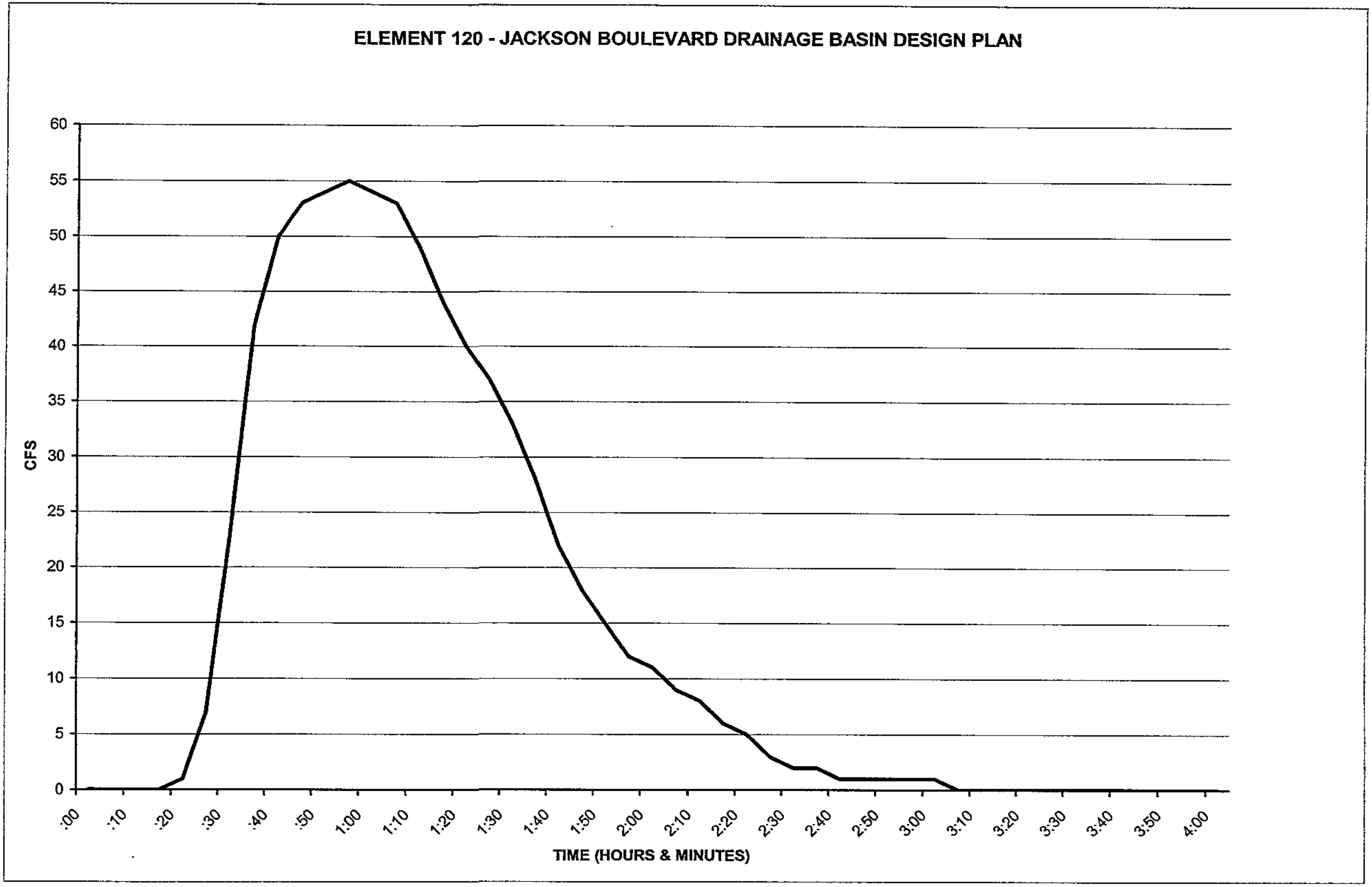

ELEMENT 117 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

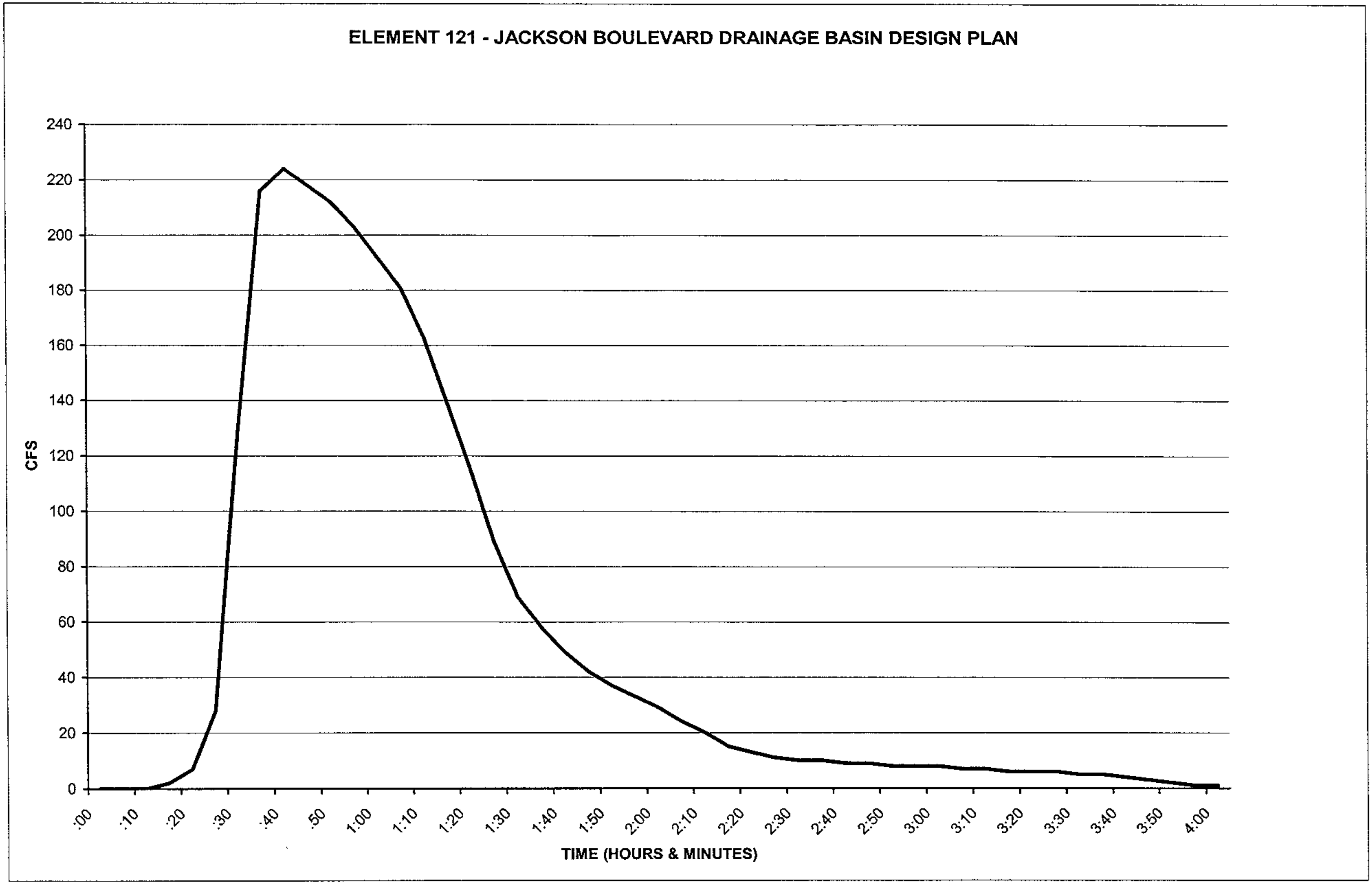


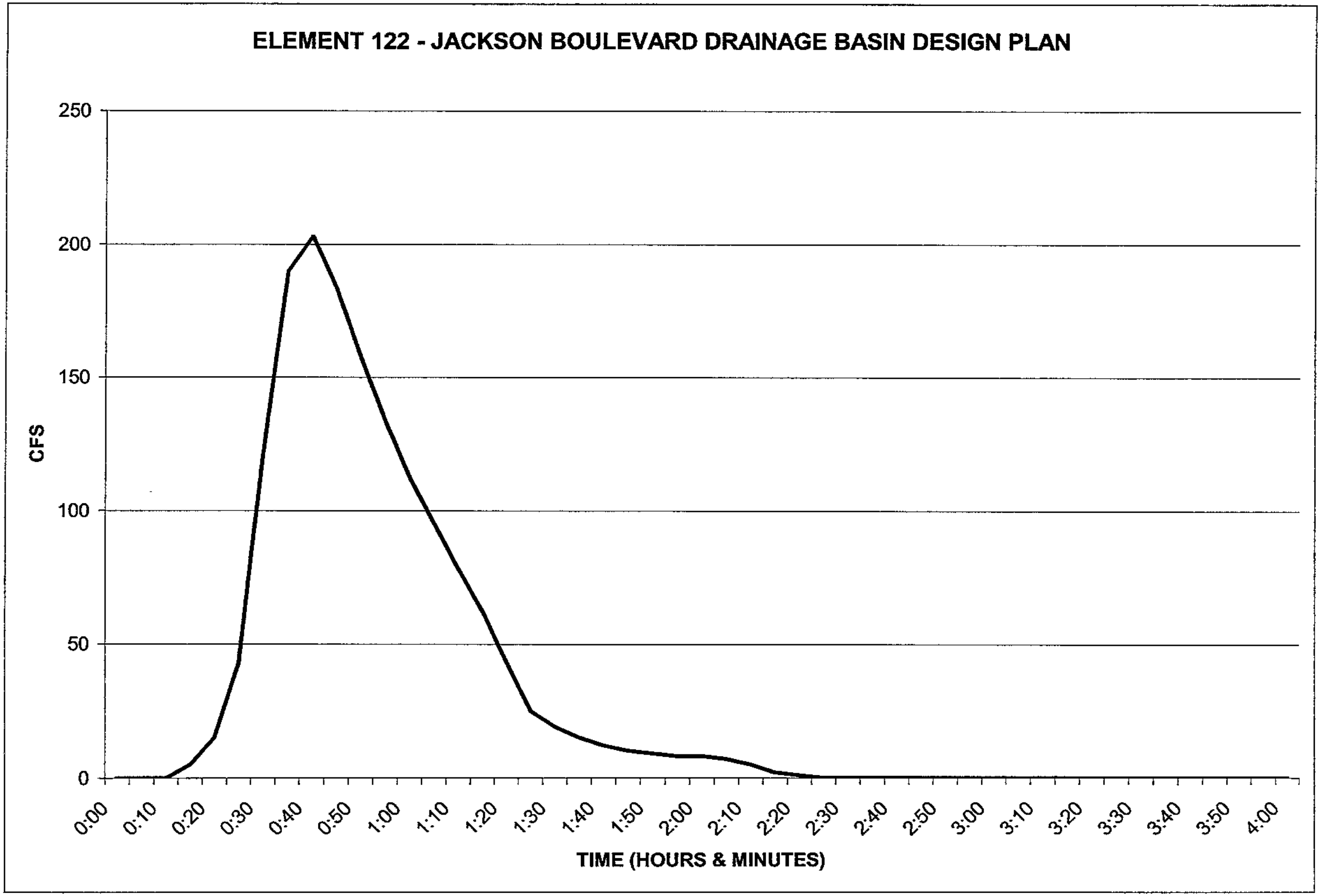
ELEMENT 118 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

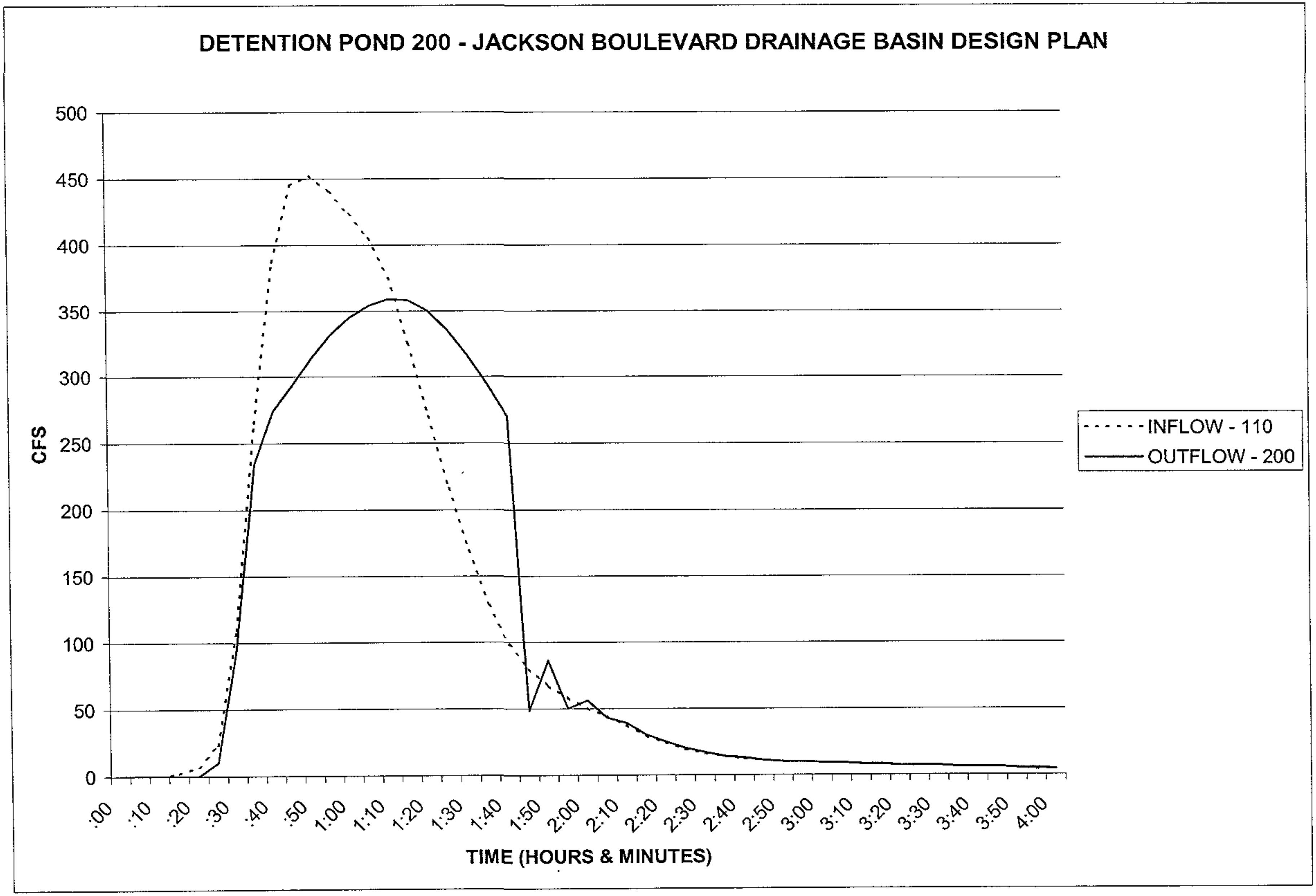


ELEMENT 119 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

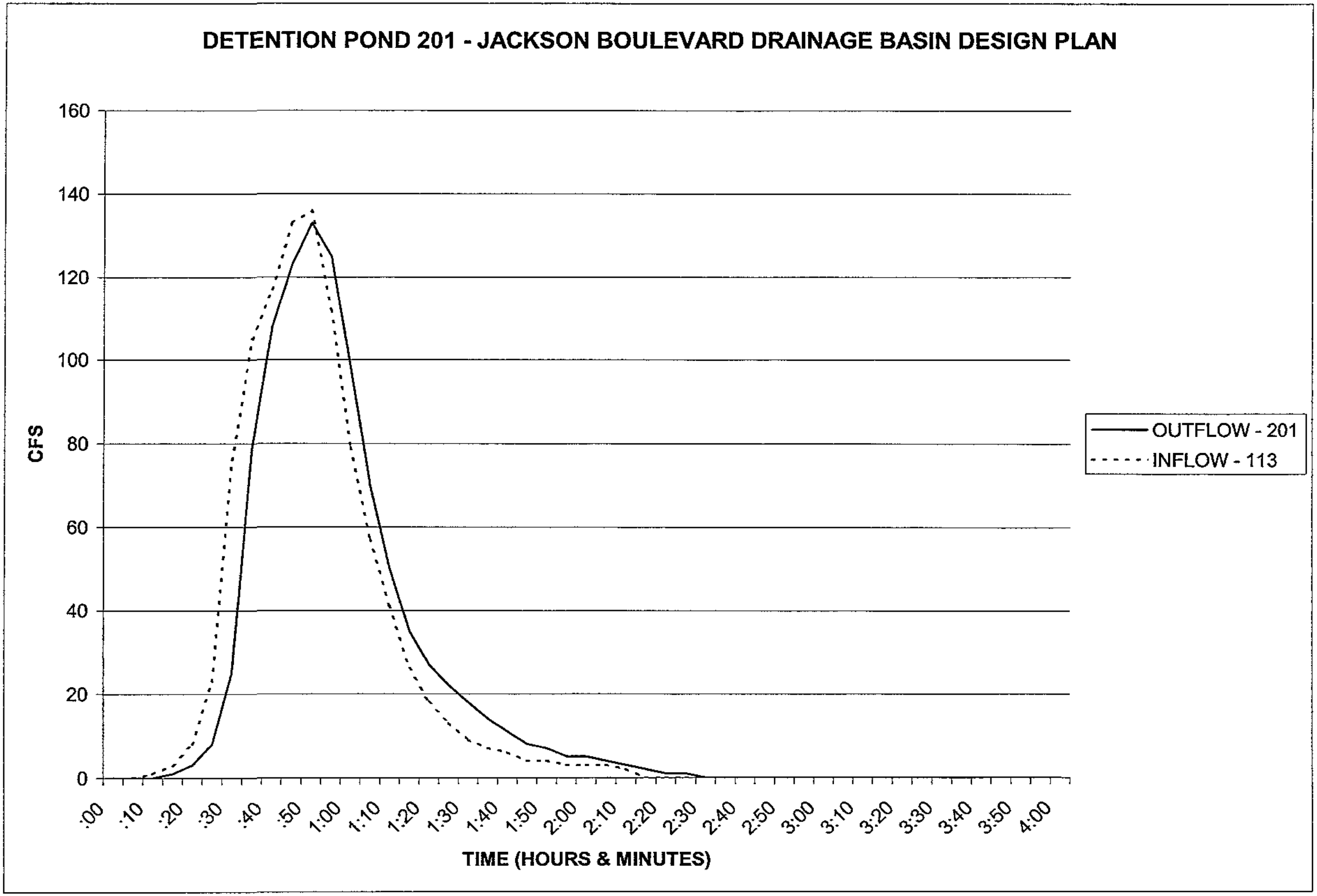

ELEMENT 120 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
60
55
50
45
40
35
30
25
20
15
10
5
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)


ELEMENT 121 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
240
220
200
180
160
140
120
100
80
60
40
20
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

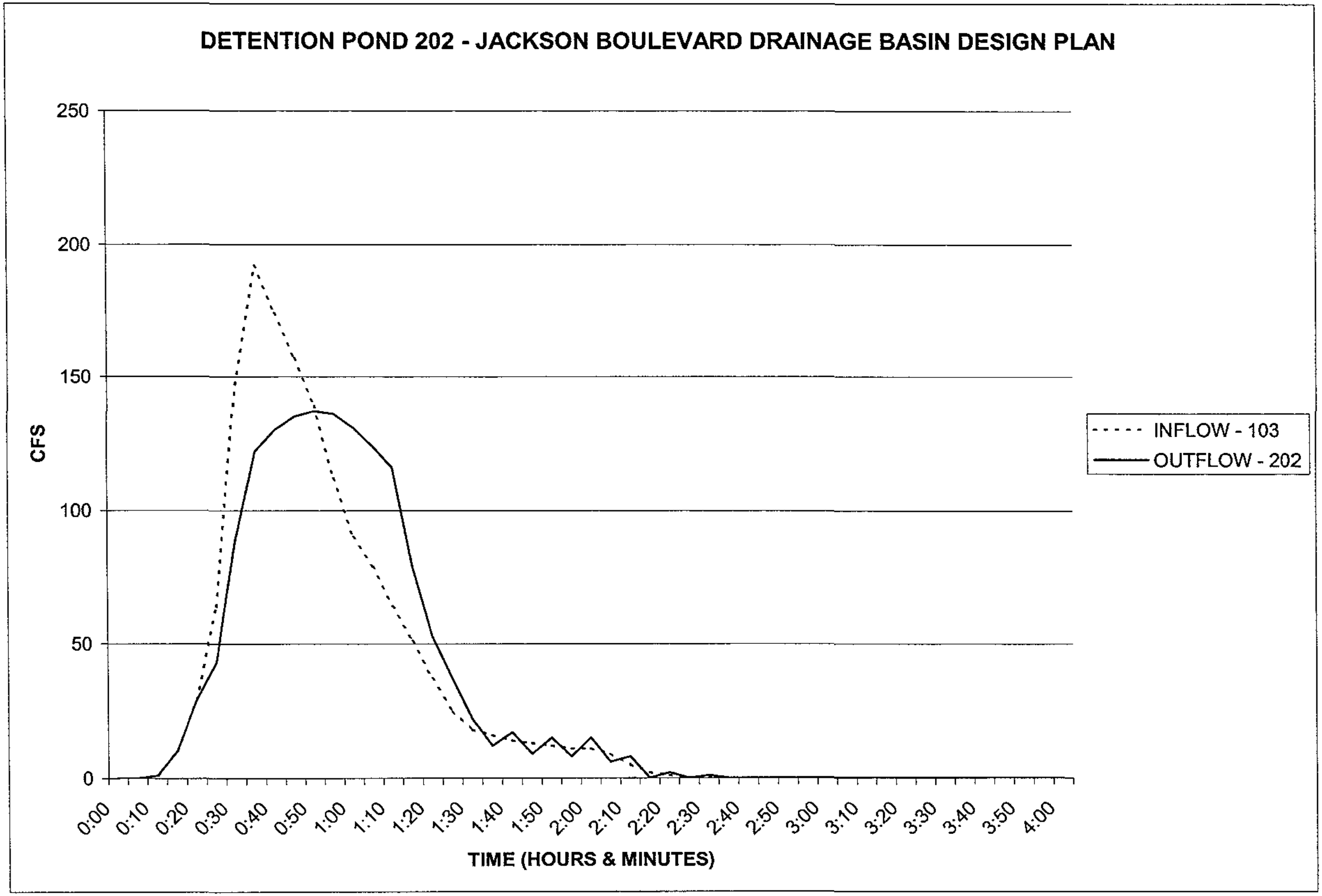

ELEMENT 122 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
250
200
150
100
50
0
CFS
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

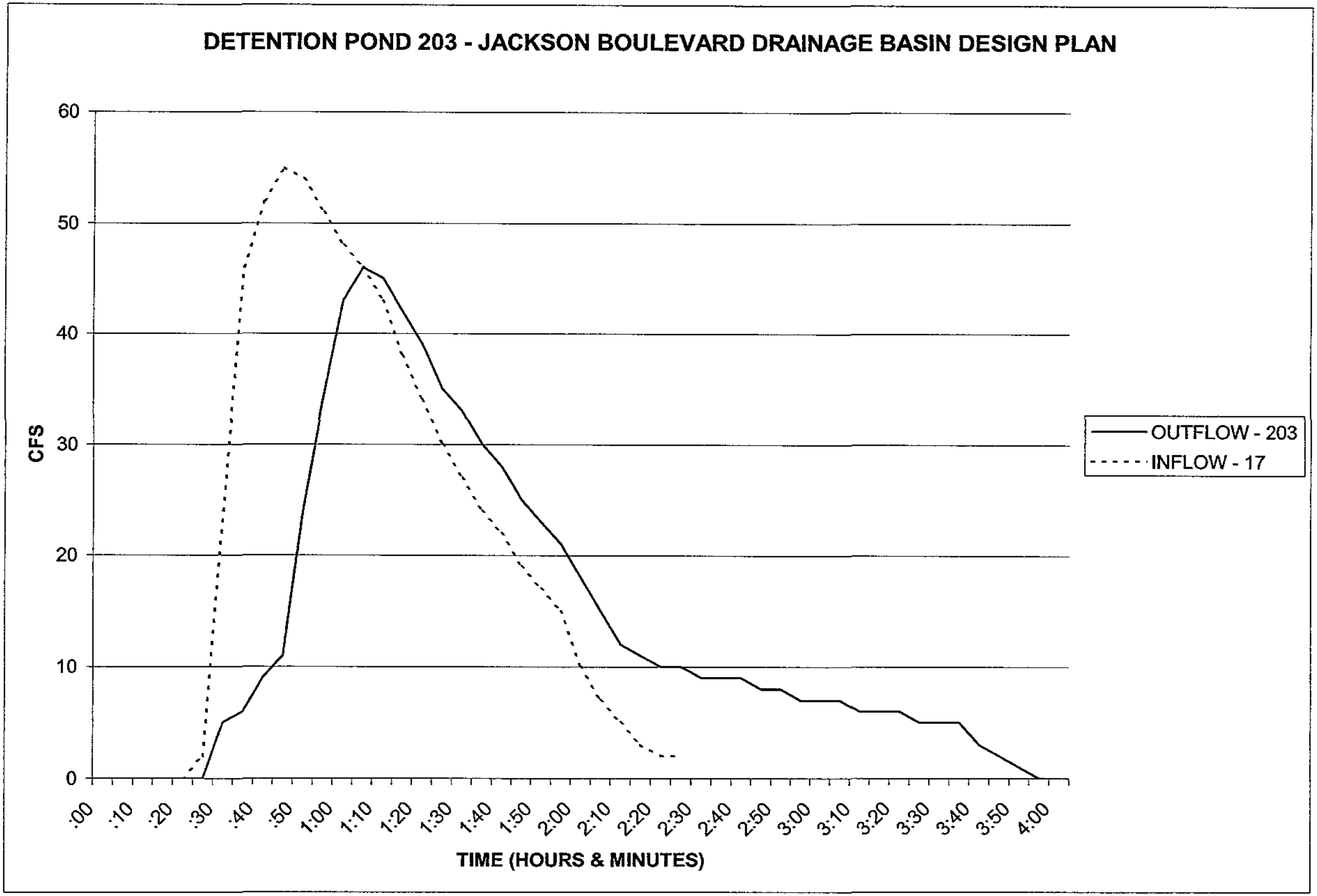


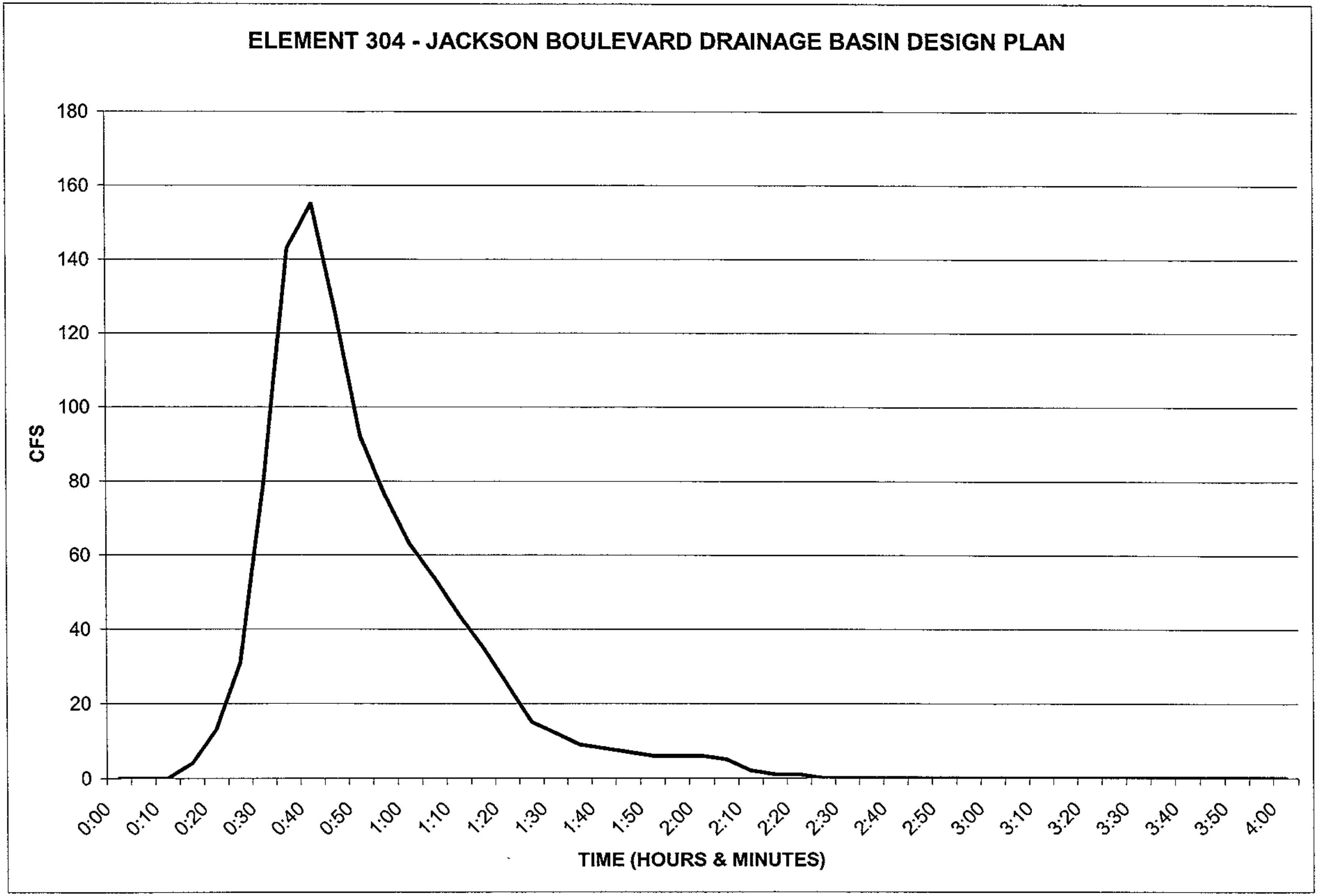
DETENTION POND 200 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
500
450
400
350
300
250
200
150
100
50
0
CFS
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)
INFLOW - 110
OUTFLOW - 200

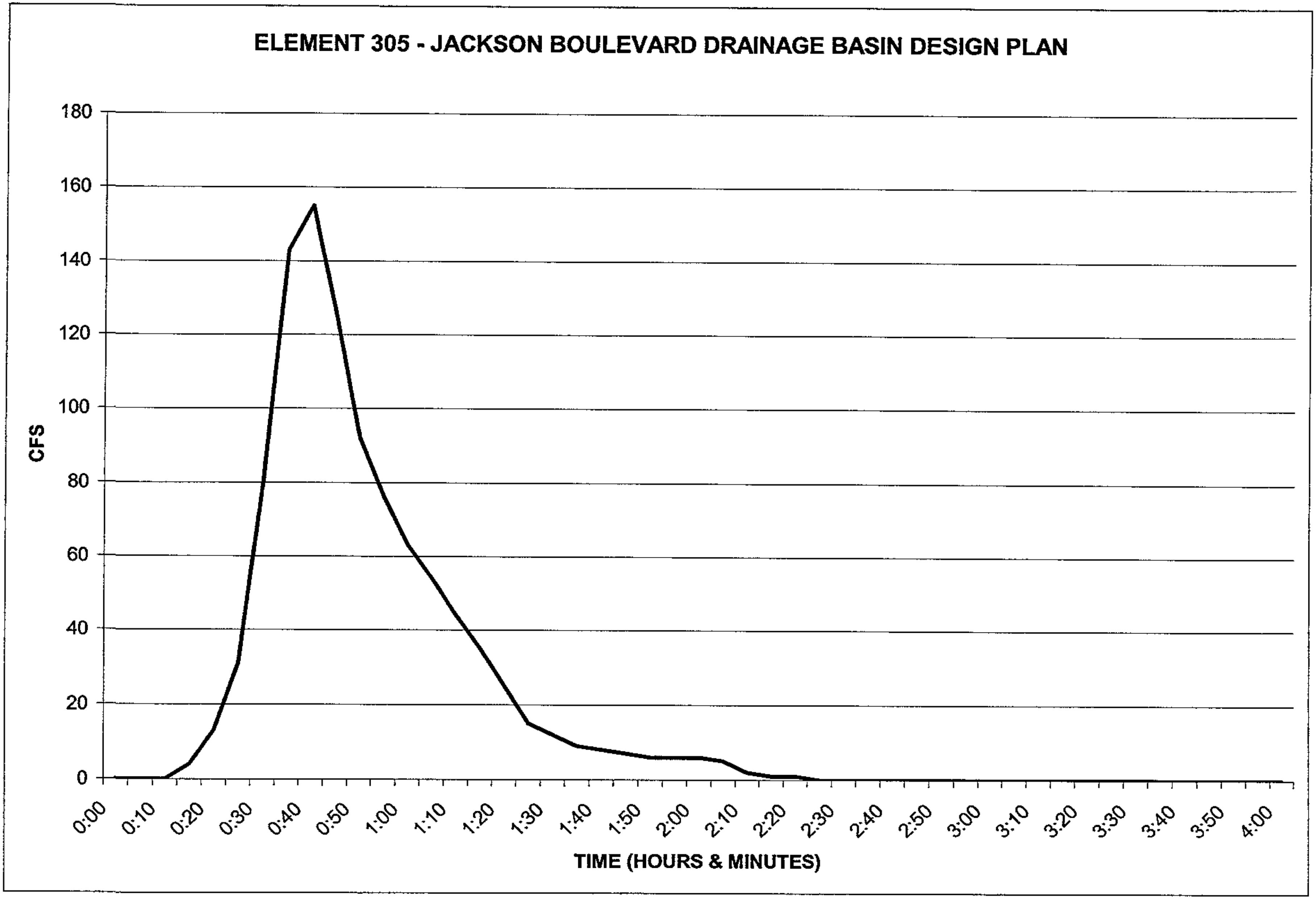


DETENTION POND 201 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
160
140
120
100
80
60
40
20
0
CFS
OUTFLOW - 201
INFLOW - 113
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)


DETENTION POND 202 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
250
200
150
100
50
0
CFS
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)
INFLOW - 103
OUTFLOW - 202

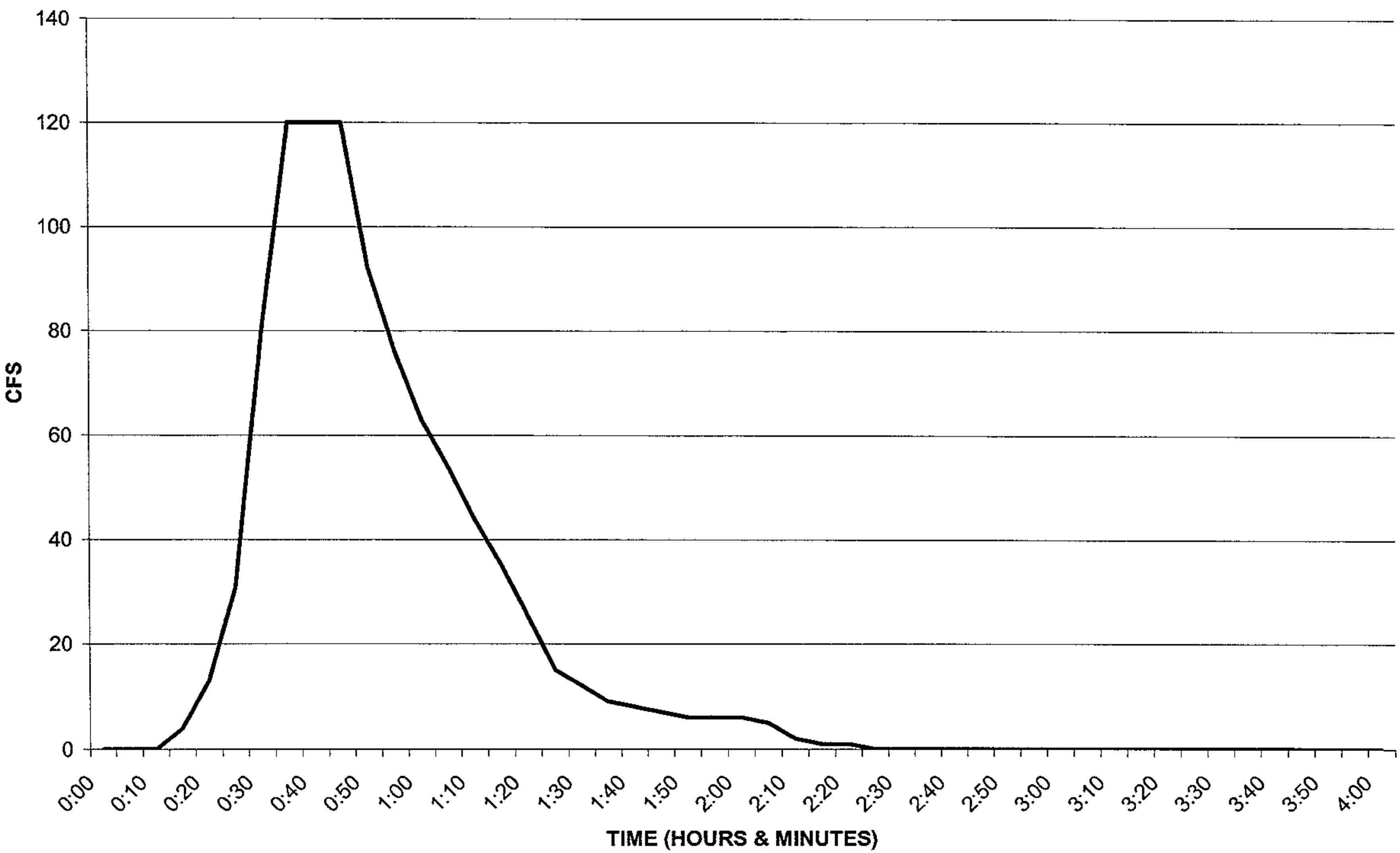

DETENTION POND 203 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
60
50
40
30
20
10
0
:00 :10 :20 :30 :40 :50 1:00 1:10 1:20 1:30 1:40 1:50 2:00 2:10 2:20 2:30 2:40 2:50 3:00 3:10 3:20 3:30 3:40 3:50 4:00
TIME (HOURS & MINUTES)
OUTFLOW - 203
INFLOW - 17

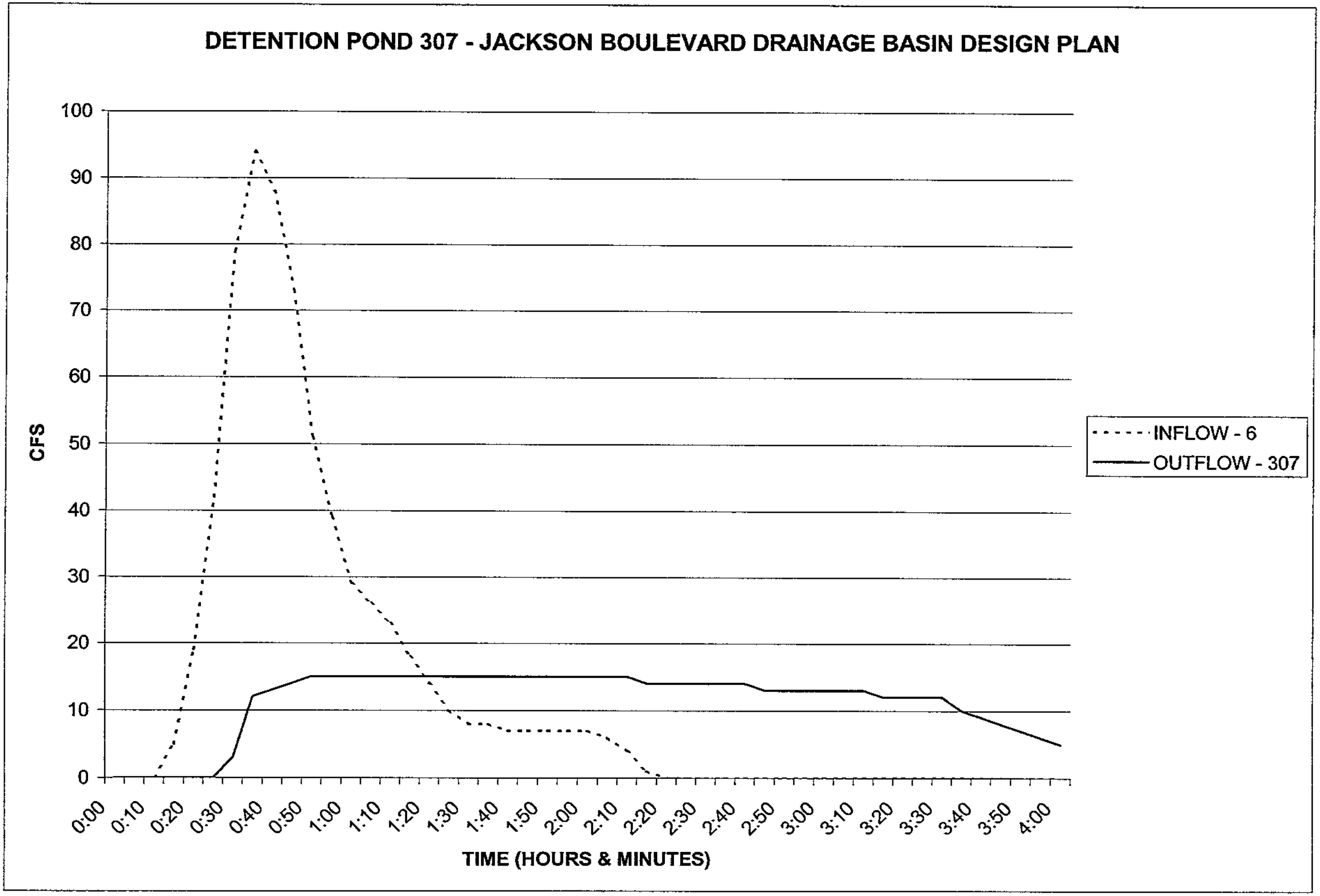

ELEMENT 304 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
180
160
140
120
100
80
60
40
20
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)



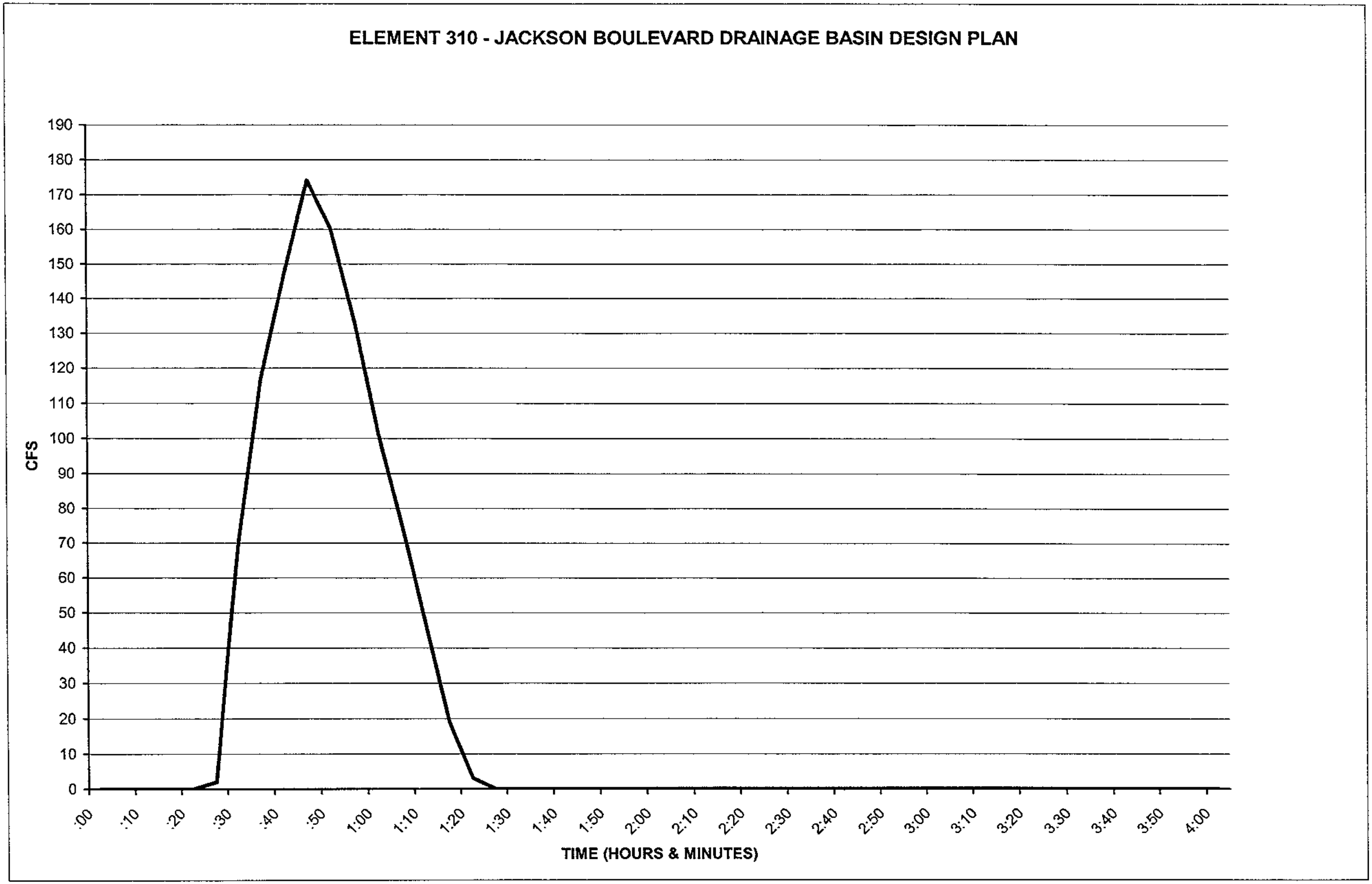
ELEMENT 305 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
180
160
140
120
100
80
60
40
20
0
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

ELEMENT 306 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN

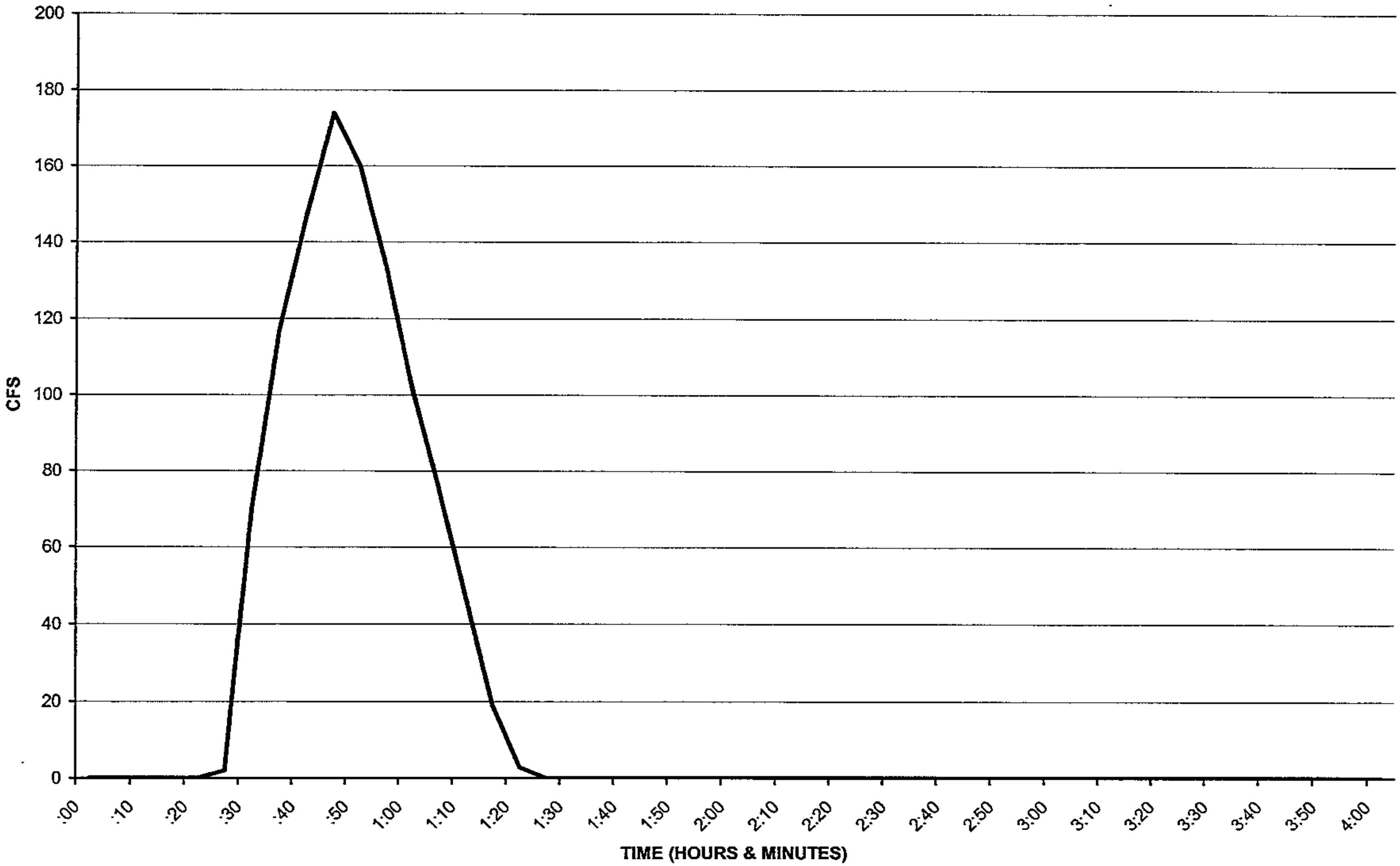


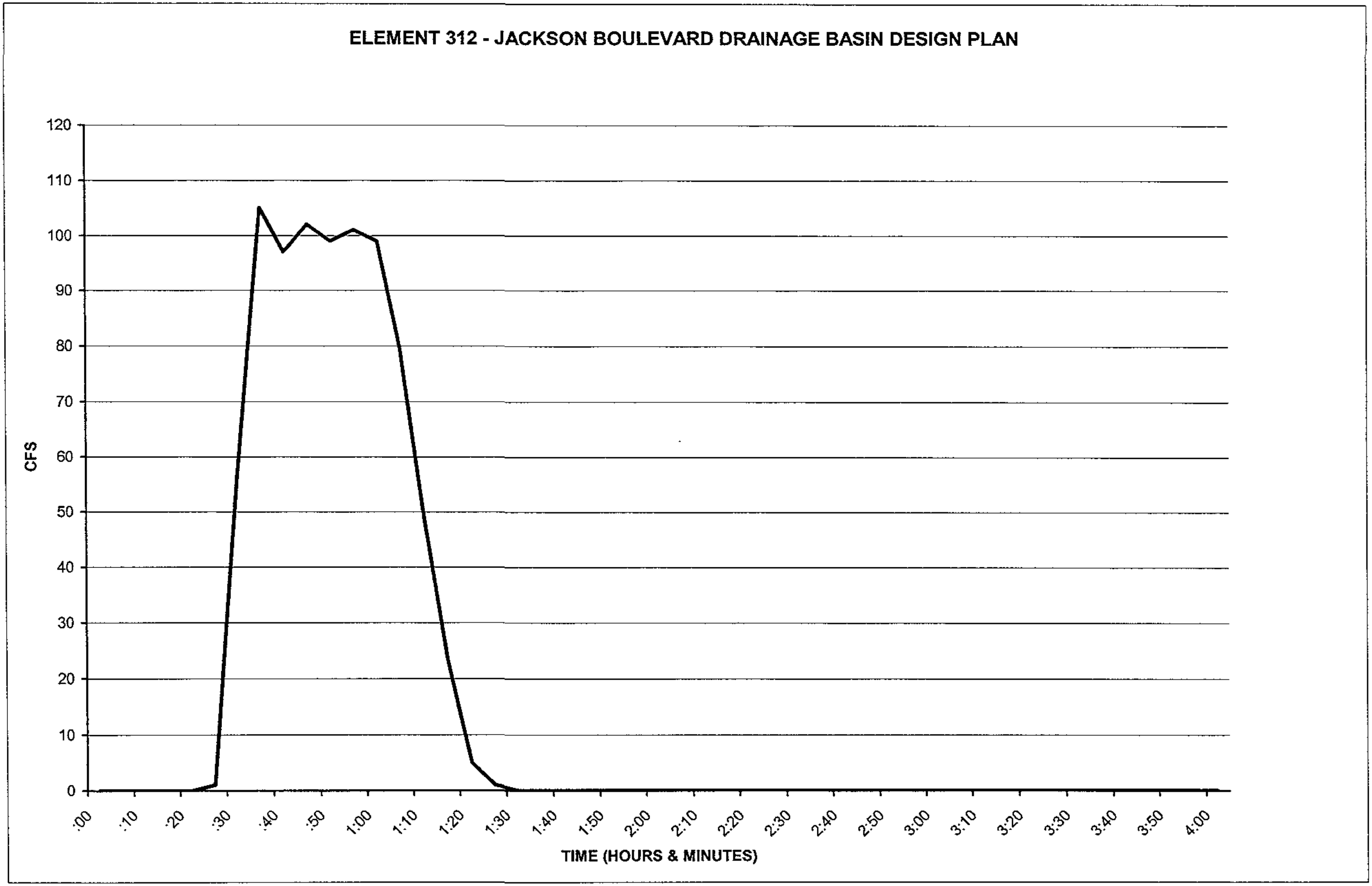


DETENTION POND 307 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
100
90
80
70
60
50
40
30
20
10
0
CFS
0:00
0:10
0:20
0:30
0:40
0:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)
INFLOW - 6
OUTFLOW - 307


ELEMENT 310 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

ELEMENT 311 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN




ELEMENT 312 - JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
CFS
120
110
100
90
80
70
60
50
40
30
20
10
0
:00
:10
:20
:30
:40
:50
1:00
1:10
1:20
1:30
1:40
1:50
2:00
2:10
2:20
2:30
2:40
2:50
3:00
3:10
3:20
3:30
3:40
3:50
4:00
TIME (HOURS & MINUTES)

APPENDIX B

DESIGN PLAN COMPUTER PRINTOUTS

LOWER TRIBUTARY

This appendix contains complete design plan computer printouts. Design plan printouts are for future land use and recommended design plan hydraulic conditions. Printouts for both the CUHPF95 and UDSWM95 models are included. 10 year and 100 year runs are included.

APPENDIX B

LOWER TRIBUTARY

CUHPF95 - 10 YR

FULLY DEVELOPED LAND USE CONDITIONS

```
 2      JACKSON BOULEVARD DBDP-LOWER TRIBUTARY
01  10 YR    10 1.86

 71    5.0    1  01  FUTURE CONDITIONS
0.035 0.35 0.15 55.0 .005  40. 0.60 0.10 4.50.0018 0.60
 71    5.0    2  02  FUTURE CONDITIONS
0.025 0.38 0.16 44.0 .011  15. 0.50 0.08 3.70.0018 0.55
 71    5.0    3  03  FUTURE CONDITIONS
0.015 0.22 0.10 30.0 .010  42. 0.40 0.10 4.50.0018 0.60
 71    5.0    4  04  FUTURE CONDITIONS
0.029 0.30 0.06 78.0 .009  13. 0.40 0.10 4.50.0018 0.60
 71    5.0    5  05  FUTURE CONDITIONS
0.013 0.18 0.09 95.0 .007  10. 0.40 0.10 4.50.0018 0.60
 71    5.0    6  06  FUTURE CONDITIONS
0.033 0.40 0.19 45.0 .029  13. 0.50 0.10 3.30.0018 0.52
 71    5.0    7  07  FUTURE CONDITIONS
0.030 0.23 0.09 95.0 .009  12. 0.40 0.10 4.50.0018 0.60
 71    5.0    8  08  FUTURE CONDIIIONS
0.016 0.27 0.09 92.0 .014  15. 0.40 0.10 4.50.0018 0.60
 71    5.0   20  20  FUTURE CONDITIONS
0.056 0.36 0.20 33.0 .038  12. 0.50 0.10 3.30.0018 0.52
E
```

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 1 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.35	.15	55.00	.0050	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.086	.402

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .24	D= .88

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
16.94	40.00	1068.12	37.38	1.87

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.97)

WIDTH AT 50 = 28. MIN. WIDTH AT 75 = 15. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .60 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	35.	19.	70.	10.
5.	11.	40.	17.	75.	9.
10.	27.	45.	16.	80.	8.
15.	37.	50.	14.	85.	8.
20.	36.	55.	13.	90.	0.
25.	28.	60.	12.	0.	0.
30.	23.	65.	11.	0.	0.

1 BASIN ID: 1 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	80.	.05	.024	17.

5.	.04	.000	0.	85.	.04	.017	16.
10.	.07	.003	0.	90.	.04	.017	15.
15.	.15	.070	1.	95.	.04	.017	14.
20.	.28	.128	3.	100.	.04	.017	13.
25.	.47	.269	9.	105.	.04	.017	11.
30.	.22	.182	17.	110.	.04	.017	9.
35.	.10	.074	22.	115.	.03	.015	8.
40.	.08	.053	24.	120.	.02	.011	7.
45.	.07	.045	23.	125.	.00	.000	6.
50.	.06	.035	21.	130.	.00	.000	5.
55.	.06	.035	20.	135.	.00	.000	4.
60.	.06	.035	19.	140.	.00	.000	4.
65.	.06	.035	18.	145.	.00	.000	3.
70.	.06	.035	17.	150.	.00	.000	3.
75.	.06	.035	17.	155.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.184 INCHES
VOLUME OF EXCESS PRECIP = 2.21 ACRE-FEET
PEAK Q = 24. CFS TIME OF PEAK = 40. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .60 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .55
I = 2.4 INCHES/HOUR
A = 22.4 ACRES
Q = 30. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 2 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.38	.16	44.00	.0110	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.091	.325

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .20	D= .82

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	2499.73	62.49	1.33

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.71)

WIDTH AT 50 = 12. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN.   MAX. IMPERVIOUS RET. = .08 IN.
INFILTRATION = 3.70 IN./HR.   DECAY = .00180/SECOND   FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	32.	30.	12.
5.	50.	20.	23.	35.	9.
10.	54.	25.	17.	40.	0.

1   BASIN ID: 2 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.032	7.
5.	.04	.000	0.	70.	.06	.032	7.
10.	.07	.009	0.	75.	.06	.032	6.
15.	.15	.052	3.	80.	.05	.020	6.
20.	.28	.097	8.	85.	.04	.014	5.
25.	.47	.297	22.	90.	.04	.014	4.
30.	.22	.185	30.	95.	.04	.014	4.
35.	.10	.072	26.	100.	.04	.014	3.
40.	.08	.050	21.	105.	.04	.014	3.
45.	.07	.042	18.	110.	.04	.014	3.
50.	.06	.032	15.	115.	.03	.012	3.
55.	.06	.032	12.	120.	.02	.008	2.
60.	.06	.032	9.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86)   EXCESS PRECIP. = 1.119 INCHES
VOLUME OF EXCESS PRECIP = 1.49 ACRE-FEET
PEAK Q = 30. CFS   TIME OF PEAK = 30. MIN.
INFILT.= 3.70 IN/HR   DECAY = .00180   FNINF = .55 IN/HR
MAX.PERV.RET.= .50 IN.   MAX.IMP.RET.= .08 IN.

RATIONAL FORMULA C = .52
I = 4.2 INCHES/HOUR
A = 16.0 ACRES
Q = 35. CFS

1   U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 3 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.22	.10	30.00	.0100	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)   COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)

.099 .212

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .16	D= .60

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.32	42.00	829.76	12.45	.80

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.39)

WIDTH AT 50 = 36. MIN. WIDTH AT 75 = 19. MIN. K50 = .20 K75 = .28

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	45.	6.	90.	7.
5.	6.	50.	6.	95.	7.
10.	12.	55.	6.	100.	7.
15.	12.	60.	6.	105.	7.
20.	10.	65.	7.	110.	7.
25.	9.	70.	7.	115.	7.
30.	8.	75.	7.	120.	0.
35.	7.	80.	7.	0.	0.
40.	6.	85.	7.	0.	0.

1 BASIN ID: 3 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	80.	.05	.013	6.
5.	.04	.000	0.	85.	.04	.008	6.
10.	.07	.001	0.	90.	.04	.008	6.
15.	.15	.026	0.	95.	.04	.008	6.
20.	.28	.075	1.	100.	.04	.008	6.
25.	.47	.284	3.	105.	.04	.008	6.
30.	.22	.173	6.	110.	.04	.008	6.
35.	.10	.061	7.	115.	.03	.007	6.
40.	.08	.040	7.	120.	.02	.004	6.
45.	.07	.032	6.	125.	.00	.000	6.
50.	.06	.022	6.	130.	.00	.000	6.
55.	.06	.023	6.	135.	.00	.000	6.
60.	.06	.023	6.	140.	.00	.000	4.
65.	.06	.023	6.	145.	.00	.000	2.
70.	.06	.023	6.	150.	.00	.000	2.
75.	.06	.024	6.	155.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME

** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

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TOTAL PRECIP. =  2.15 (1-HOUR RAIN =  1.86)      EXCESS PRECIP. =  .905  INCHES
VOLUME OF EXCESS PRECIP =      .72  ACRE-FEET
PEAK Q =     7. CFS       TIME OF PEAK =  35. MIN.
INFILT.= 4.50 IN/HR    DECAY = .00180    FNINF =  .60 IN/HR
MAX.PERV.RET.= .40 IN.     MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C =        .42
                 I =        2.4 INCHES/HOUR
                 A =        9.6 ACRES
                 Q =        10. CFS
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 4   -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.30	.06	78.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.078	.465

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .32	D= .99

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	3569.84	103.53	1.55

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.60)

WIDTH AT 50 =   8. MIN.   WIDTH AT 75 =   4. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN.   MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR.   DECAY = .00180/SECOND   FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	40.	30.	0.
5.	63.	20.	22.	0.	0.
10.	77.	25.	12.	0.	0.

1 BASIN ID: 4   -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.046	10.
5.	.04	.000	0.	70.	.06	.046	10.
10.	.07	.004	0.	75.	.06	.046	10.
15.	.15	.112	7.	80.	.05	.034	9.
20.	.28	.205	22.	85.	.04	.026	8.
25.	.47	.388	45.	90.	.04	.026	7.
30.	.22	.200	53.	95.	.04	.026	6.
35.	.10	.087	42.	100.	.04	.026	6.
40.	.08	.065	30.	105.	.04	.026	6.
45.	.07	.056	21.	110.	.04	.026	6.
50.	.06	.046	14.	115.	.03	.023	5.
55.	.06	.046	11.	120.	.02	.018	5.
60.	.06	.046	10.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.624 INCHES
VOLUME OF EXCESS PRECIP = 2.51 ACRE-FEET
PEAK Q = 53. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .75
I = 4.5 INCHES/HOUR
A = 18.6 ACRES
Q = 63. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 5 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.18	.09	95.00	.0070	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.437

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .38	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	10.00	3359.43	43.67	.69

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.51)

WIDTH AT 50 = 9. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	19.	30.	0.
5.	28.	20.	14.	0.	0.
10.	33.	25.	9.	0.	0.

1 BASIN ID: 5 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.054	6.
5.	.04	.000	0.	70.	.06	.054	6.
10.	.07	.005	0.	75.	.06	.054	6.
15.	.15	.138	4.	80.	.05	.042	5.
20.	.28	.252	12.	85.	.04	.032	5.
25.	.47	.429	23.	90.	.04	.032	4.
30.	.22	.209	27.	95.	.04	.032	4.
35.	.10	.096	23.	100.	.04	.032	3.
40.	.08	.073	17.	105.	.04	.032	3.
45.	.07	.065	13.	110.	.04	.032	3.
50.	.06	.054	8.	115.	.03	.029	3.
55.	.06	.054	6.	120.	.02	.022	3.
60.	.06	.054	6.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.876 INCHES
VOLUME OF EXCESS PRECIP = 1.30 ACRE-FEET
PEAK Q = 27. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .87
I = 5.0 INCHES/HOUR
A = 8.3 ACRES
Q = 36. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 6 -- BASIN COMMENT: FUTURE CONDITIONS

AREA LENGTH OF BASIN DIST TO CENTROID IMPERV. AREA SLOPE UNIT DURATION

(SQMI)	(MI)	(MI)	(PCT)	(FT/FT)	(MIN)
.03	.40	.19	45.00	.0290	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.091	.345

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .21	D= .83

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	2652.87	87.54	1.76

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.19)

WIDTH AT 50 = 11. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	43.	30.	13.
5.	68.	20.	29.	35.	9.
10.	74.	25.	20.	40.	0.

1 BASIN ID: 6 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.034	9.
5.	.04	.000	0.	70.	.06	.034	9.
10.	.07	.002	0.	75.	.06	.034	9.
15.	.15	.054	4.	80.	.05	.022	8.
20.	.28	.102	11.	85.	.04	.014	6.
25.	.47	.310	31.	90.	.04	.014	5.
30.	.22	.188	42.	95.	.04	.014	5.
35.	.10	.074	36.	100.	.04	.014	4.
40.	.08	.052	29.	105.	.04	.014	4.
45.	.07	.044	23.	110.	.04	.014	4.
50.	.06	.034	19.	115.	.03	.012	3.
55.	.06	.034	15.	120.	.02	.009	3.
60.	.06	.034	11.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.158 INCHES
VOLUME OF EXCESS PRECIP = 2.04 ACRE-FEET
PEAK Q = 42. CFS TIME OF PEAK = 30. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .54
I = 4.5 INCHES/HOUR
A = 21.1 ACRES
Q = 51. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 7 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.23	.09	95.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.496

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .38	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	12.00	3808.40	114.25	1.60

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.63)

WIDTH AT 50 = 8. MIN. WIDTH AT 75 = 4. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	42.	30.	0.
5.	64.	20.	22.	0.	0.
10.	83.	25.	12.	0.	0.

1 BASIN ID: 7 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.054	12.
5.	.04	.000	0.	70.	.06	.054	12.
10.	.07	.005	0.	75.	.06	.054	12.
15.	.15	.138	9.	80.	.05	.042	11.
20.	.28	.252	28.	85.	.04	.032	10.
25.	.47	.429	54.	90.	.04	.032	8.
30.	.22	.209	63.	95.	.04	.032	8.
35.	.10	.096	49.	100.	.04	.032	7.
40.	.08	.073	34.	105.	.04	.032	7.
45.	.07	.065	24.	110.	.04	.032	7.
50.	.06	.054	17.	115.	.03	.029	7.
55.	.06	.054	13.	120.	.02	.022	6.
60.	.06	.054	13.	125.	.00	.000	4.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.876 INCHES
VOLUME OF EXCESS PRECIP = 3.00 ACRE-FEET
PEAK Q = 63. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .87
I = 4.7 INCHES/HOUR
A = 19.2 ACRES
Q = 78. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 8 -- BASIN COMMENT: FUTURE CONDIIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.02	.27	.09	92.00	.0140	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.448

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .37	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	3438.46	55.02	.85

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.58)

WIDTH AT 50 = 9. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	23.	30.	0.
5.	35.	20.	15.	0.	0.
10.	41.	25.	10.	0.	0.

1 BASIN ID: 8 -- BASIN COMMENT: FUTURE CONDIIIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.053	7.
5.	.04	.000	0.	70.	.06	.053	7.
10.	.07	.005	0.	75.	.06	.053	7.
15.	.15	.133	5.	80.	.05	.041	6.
20.	.28	.244	14.	85.	.04	.031	5.
25.	.47	.421	28.	90.	.04	.031	5.
30.	.22	.208	32.	95.	.04	.031	4.
35.	.10	.095	27.	100.	.04	.031	4.
40.	.08	.072	20.	105.	.04	.031	4.
45.	.07	.063	14.	110.	.04	.031	4.
50.	.06	.053	10.	115.	.03	.028	4.
55.	.06	.053	7.	120.	.02	.021	3.
60.	.06	.053	7.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.832 INCHES
VOLUME OF EXCESS PRECIP = 1.56 ACRE-FEET
PEAK Q = 32. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .85
I = 4.2 INCHES/HOUR
A = 10.2 ACRES
Q = 37. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:12

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 20 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)

.06	.36	.20	33.00	.0380	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.097	.279

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .66

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	12.00	2145.53	120.15	2.99

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.11)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .44

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	49.	40.	14.
5.	102.	25.	36.	45.	10.
10.	107.	30.	26.	50.	0.
15.	71.	35.	19.	0.	0.

1 BASIN ID: 20 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.029	19.
5.	.04	.000	0.	70.	.06	.029	15.
10.	.07	.001	0.	75.	.06	.029	14.
15.	.15	.032	3.	80.	.05	.017	12.
20.	.28	.076	11.	85.	.04	.010	9.
25.	.47	.275	39.	90.	.04	.010	8.
30.	.22	.183	55.	95.	.04	.010	7.
35.	.10	.069	51.	100.	.04	.010	6.
40.	.08	.047	42.	105.	.04	.010	5.
45.	.07	.039	35.	110.	.04	.010	5.
50.	.06	.029	29.	115.	.03	.009	5.
55.	.06	.029	25.	120.	.02	.005	4.
60.	.06	.029	21.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

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TOTAL PRECIP. =  2.15 (1-HOUR RAIN =  1.86)     EXCESS PRECIP. =  .987  INCHES
VOLUME OF EXCESS PRECIP =   2.95  ACRE-FEET
PEAK Q =   55. CFS      TIME OF PEAK =  30. MIN.
INFILT.= 3.30 IN/HR    DECAY = .00180    FNINF =  .52 IN/HR
MAX.PERV.RET.= .50 IN.     MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C =        .46
                 I =       4.7 INCHES/HOUR
                 A =      35.8 ACRES
                 Q =       77. CFS
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1    U.D.F.C.D. CUHPF RUNOFF ANALYSIS    EXECUTED ON DATE            AT TIME

     CUHPF/PC VERSION 1.0 MODIFIED IN DEC 1993 TO WRITE OUTPUT
     FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT
     USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1
     JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

     NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUT FILE FOR THIS RUN OF CUHPF.
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APPENDIX B

LOWER TRIBUTARY

CUHPF95 - 100 YR

FULLY DEVELOPED LAND USE CONDITIONS

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 2      JACKSON BOULEVARD DBDP-LOWER TRIBUTARY
01 100 YR   100 2.95

 71    5.0    1  01  FUTURE CONDITIONS
0.035 0.35 0.15 55.0 .005  40. 0.60 0.10 4.50.0018 0.60
 71    5.0    2  02  FUTURE CONDITIONS
0.025 0.38 0.16 44.0 .011  15. 0.50 0.08 3.70.0018 0.55
 71    5.0    3  03  FUTURE CONDITIONS
0.015 0.22 0.10 30.0 .010  42. 0.40 0.10 4.50.0018 0.60
 71    5.0    4  04  FUTURE CONDITIONS
0.029 0.30 0.06 78.0 .009  13. 0.40 0.10 4.50.0018 0.60
 71    5.0    5  05  FUTURE CONDITIONS
0.013 0.18 0.09 95.0 .007  10. 0.40 0.10 4.50.0018 0.60
 71    5.0    6  06  FUTURE CONDITIONS
0.033 0.40 0.19 45.0 .029  13. 0.50 0.10 3.30.0018 0.52
 71    5.0    7  07  FUTURE CONDITIONS
0.030 0.23 0.09 95.0 .009  12. 0.40 0.10 4.50.0018 0.60
 71    5.0    8  08  FUTURE CONDIIIONS
0.016 0.27 0.09 92.0 .014  15. 0.40 0.10 4.50.0018 0.60
 71    5.0   20  20  FUTURE CONDITIONS
0.056 0.36 0.20 33.0 .038  12. 0.50 0.10 3.30.0018 0.52
E
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 1 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.35	.15	55.00	.0050	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.086	.402

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .24	D= .88

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
16.94	40.00	1068.12	37.38	1.87

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.97)

WIDTH AT 50 = 28. MIN. WIDTH AT 75 = 15. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .60 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	35.	19.	70.	10.
5.	11.	40.	17.	75.	9.
10.	27.	45.	16.	80.	8.
15.	37.	50.	14.	85.	8.
20.	36.	55.	13.	90.	0.
25.	28.	60.	12.	0.	0.
30.	23.	65.	11.	0.	0.

1 BASIN ID: 1 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	85.	.04	.017	34.

5.	.03	.000	0.	90.	.04	.017	31.
10.	.09	.008	0.	95.	.04	.017	29.
15.	.14	.062	1.	100.	.04	.017	26.
20.	.24	.108	3.	105.	.04	.017	24.
25.	.41	.226	8.	110.	.04	.017	21.
30.	.74	.644	20.	115.	.04	.017	15.
35.	.41	.375	36.	120.	.04	.017	12.
40.	.24	.204	49.	125.	.00	.000	10.
45.	.18	.154	54.	130.	.00	.000	8.
50.	.15	.120	53.	135.	.00	.000	6.
55.	.12	.092	50.	140.	.00	.000	5.
60.	.12	.092	47.	145.	.00	.000	4.
65.	.12	.092	44.	150.	.00	.000	3.
70.	.06	.035	42.	155.	.00	.000	2.
75.	.06	.035	40.	160.	.00	.000	2.
80.	.04	.017	37.	165.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.399 INCHES
VOLUME OF EXCESS PRECIP = 4.48 ACRE-FEET
PEAK Q = 54. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .60 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .70
I = 3.9 INCHES/HOUR
A = 22.4 ACRES
Q = 61. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 2 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.38	.16	44.00	.0110	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.091	.325

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .20	D= .82

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	2499.73	62.49	1.33

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.71)

WIDTH AT 50 = 12. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .08 IN.
INFILTRATION = 3.70 IN./HR. DECAY = .00180/SECOND FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	32.	30.	12.
5.	50.	20.	23.	35.	9.
10.	54.	25.	17.	40.	0.

1 BASIN ID: 2 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.090	23.
5.	.03	.000	0.	70.	.06	.032	17.
10.	.09	.013	1.	75.	.06	.032	12.
15.	.14	.047	3.	80.	.04	.014	9.
20.	.24	.081	7.	85.	.04	.014	6.
25.	.41	.210	17.	90.	.04	.014	5.
30.	.74	.688	50.	95.	.04	.014	4.
35.	.41	.374	65.	100.	.04	.014	3.
40.	.24	.203	59.	105.	.04	.014	3.
45.	.18	.152	51.	110.	.04	.014	3.
50.	.15	.118	44.	115.	.04	.014	3.
55.	.12	.089	37.	120.	.04	.014	3.
60.	.12	.089	30.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.339 INCHES
VOLUME OF EXCESS PRECIP = 3.12 ACRE-FEET
PEAK Q = 65. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.70 IN/HR DECAY = .00180 FNINF = .55 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .08 IN.

RATIONAL FORMULA C = .69
I = 6.7 INCHES/HOUR
A = 16.0 ACRES
Q = 73. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 3 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.22	.10	30.00	.0100	5.00

COEFFICIENT (REFLECTING TIME TO PEAK) COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)

.099 .212

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .16	D= .60

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
12.32	42.00	829.76	12.45	.80

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.39)

WIDTH AT 50 = 36. MIN. WIDTH AT 75 = 19. MIN. K50 = .20 K75 = .28

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	45.	6.	90.	7.
5.	6.	50.	6.	95.	7.
10.	12.	55.	6.	100.	7.
15.	12.	60.	6.	105.	7.
20.	10.	65.	7.	110.	7.
25.	9.	70.	7.	115.	7.
30.	8.	75.	7.	120.	0.
35.	7.	80.	7.	0.	0.
40.	6.	85.	7.	0.	0.

1 BASIN ID: 3 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	90.	.04	.009	14.
5.	.03	.000	0.	95.	.04	.009	14.
10.	.09	.003	0.	100.	.04	.009	14.
15.	.14	.023	0.	105.	.04	.009	14.
20.	.24	.054	1.	110.	.04	.009	14.
25.	.41	.197	2.	115.	.04	.009	15.
30.	.74	.680	8.	120.	.04	.009	15.
35.	.41	.365	14.	125.	.00	.000	15.
40.	.24	.193	16.	130.	.00	.000	15.
45.	.18	.143	17.	135.	.00	.000	15.
50.	.15	.109	17.	140.	.00	.000	13.
55.	.12	.080	16.	145.	.00	.000	8.
60.	.12	.081	16.	150.	.00	.000	6.
65.	.12	.081	15.	155.	.00	.000	4.
70.	.06	.023	15.	160.	.00	.000	3.
75.	.06	.023	15.	165.	.00	.000	3.
80.	.04	.008	14.	170.	.00	.000	2.

85.	.04	.009	14.	175.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.132 INCHES
VOLUME OF EXCESS PRECIP = 1.71 ACRE-FEET
PEAK Q = 17. CFS TIME OF PEAK = 50. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .63
I = 3.8 INCHES/HOUR
A = 9.6 ACRES
Q = 23. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 4 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.30	.06	78.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.078	.465

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .32	D= .99

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	3569.84	103.53	1.55

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.60)

WIDTH AT 50 = 8. MIN. WIDTH AT 75 = 4. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	40.	30.	0.
5.	63.	20.	22.	0.	0.
10.	77.	25.	12.	0.	0.

1 BASIN ID: 4 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.102	23.
5.	.03	.000	0.	70.	.06	.046	19.
10.	.09	.013	1.	75.	.06	.046	14.
15.	.14	.100	7.	80.	.04	.026	10.
20.	.24	.173	19.	85.	.04	.026	8.
25.	.41	.325	38.	90.	.04	.026	6.
30.	.74	.694	78.	95.	.04	.026	6.
35.	.41	.384	95.	100.	.04	.026	6.
40.	.24	.215	80.	105.	.04	.026	6.
45.	.18	.164	61.	110.	.04	.026	6.
50.	.15	.130	46.	115.	.04	.026	6.
55.	.12	.102	32.	120.	.04	.026	6.
60.	.12	.102	26.	125.	.00	.000	4.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.829 INCHES
VOLUME OF EXCESS PRECIP = 4.38 ACRE-FEET
PEAK Q = 95. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .83
I = 7.1 INCHES/HOUR
A = 18.6 ACRES
Q = 110. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 5 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.18	.09	95.00	.0070	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.437

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .38	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)

7.50	10.00	3359.43	43.67	.69

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.51)

WIDTH AT 50 = 9. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	19.	30.	0.
5.	28.	20.	14.	0.	0.
10.	33.	25.	9.	0.	0.

1 BASIN ID: 5 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.110	12.
5.	.03	.000	0.	70.	.06	.054	10.
10.	.09	.016	0.	75.	.06	.054	8.
15.	.14	.122	4.	80.	.04	.032	6.
20.	.24	.213	10.	85.	.04	.032	5.
25.	.41	.376	20.	90.	.04	.032	4.
30.	.74	.699	38.	95.	.04	.032	4.
35.	.41	.390	45.	100.	.04	.032	3.
40.	.24	.222	40.	105.	.04	.032	3.
45.	.18	.172	33.	110.	.04	.032	3.
50.	.15	.138	26.	115.	.04	.032	3.
55.	.12	.110	18.	120.	.04	.032	3.
60.	.12	.110	14.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 3.074 INCHES
VOLUME OF EXCESS PRECIP = 2.13 ACRE-FEET
PEAK Q = 45. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .90
I = 8.0 INCHES/HOUR
A = 8.3 ACRES
Q = 60. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 6 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.40	.19	45.00	.0290	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.091	.345

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .21	D= .83

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	2652.87	87.54	1.76

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.19)

WIDTH AT 50 = 11. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	43.	30.	13.
5.	68.	20.	29.	35.	9.
10.	74.	25.	20.	40.	0.

1 BASIN ID: 6 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.091	29.
5.	.03	.000	0.	70.	.06	.034	22.
10.	.09	.006	0.	75.	.06	.034	16.
15.	.14	.048	4.	80.	.04	.014	12.
20.	.24	.083	9.	85.	.04	.014	8.
25.	.41	.226	24.	90.	.04	.014	6.
30.	.74	.691	69.	95.	.04	.014	5.
35.	.41	.376	90.	100.	.04	.014	4.
40.	.24	.205	80.	105.	.04	.014	4.
45.	.18	.154	68.	110.	.04	.014	4.
50.	.15	.120	56.	115.	.04	.014	4.
55.	.12	.091	46.	120.	.04	.014	4.
60.	.12	.091	38.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.377 INCHES
VOLUME OF EXCESS PRECIP = 4.18 ACRE-FEET
PEAK Q = 90. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .70
I = 7.1 INCHES/HOUR
A = 21.1 ACRES
Q = 105. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 7 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.23	.09	95.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.496

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .38	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	12.00	3808.40	114.25	1.60

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.63)

WIDTH AT 50 = 8. MIN. WIDTH AT 75 = 4. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	42.	30.	0.
5.	64.	20.	22.	0.	0.
10.	83.	25.	12.	0.	0.

1 BASIN ID: 7 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.110	26.
5.	.03	.000	0.	70.	.06	.054	21.
10.	.09	.016	1.	75.	.06	.054	16.
15.	.14	.122	9.	80.	.04	.032	13.
20.	.24	.213	25.	85.	.04	.032	9.
25.	.41	.376	47.	90.	.04	.032	8.
30.	.74	.699	88.	95.	.04	.032	7.
35.	.41	.390	105.	100.	.04	.032	7.
40.	.24	.222	87.	105.	.04	.032	7.
45.	.18	.172	66.	110.	.04	.032	7.
50.	.15	.138	49.	115.	.04	.032	7.
55.	.12	.110	35.	120.	.04	.032	7.
60.	.12	.110	28.	125.	.00	.000	5.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 3.074 INCHES
VOLUME OF EXCESS PRECIP = 4.92 ACRE-FEET
PEAK Q = 105. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .90
I = 7.4 INCHES/HOUR
A = 19.2 ACRES
Q = 128. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 8 -- BASIN COMMENT: FUTURE CONDIIIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.02	.27	.09	92.00	.0140	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.074	.448

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .37	D= 1.00

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	3438.46	55.02	.85

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.58)

WIDTH AT 50 = 9. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	23.	30.	0.
5.	35.	20.	15.	0.	0.
10.	41.	25.	10.	0.	0.

1 BASIN ID: 8 -- BASIN COMMENT: FUTURE CONDIIIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.109	14.
5.	.03	.000	0.	70.	.06	.052	12.
10.	.09	.016	1.	75.	.06	.052	9.
15.	.14	.119	5.	80.	.04	.031	7.
20.	.24	.206	12.	85.	.04	.031	5.
25.	.41	.367	24.	90.	.04	.031	4.
30.	.74	.698	46.	95.	.04	.031	4.
35.	.41	.389	55.	100.	.04	.031	4.
40.	.24	.221	47.	105.	.04	.031	4.
45.	.18	.170	38.	110.	.04	.031	4.
50.	.15	.137	29.	115.	.04	.031	4.
55.	.12	.108	20.	120.	.04	.031	4.
60.	.12	.109	16.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 3.031 INCHES
VOLUME OF EXCESS PRECIP = 2.59 ACRE-FEET
PEAK Q = 55. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .89
I = 6.7 INCHES/HOUR
A = 10.2 ACRES
Q = 61. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 2/ 5/2000 AT TIME 8:13

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DBDP-LOWER TRIBUTARY

BASIN ID: 20 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.06	.36	.20	33.00	.0380	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.097	.279

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .66

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	12.00	2145.53	120.15	2.99

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.11)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .44

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	49.	40.	14.
5.	102.	25.	36.	45.	10.
10.	107.	30.	26.	50.	0.
15.	71.	35.	19.	0.	0.

1 BASIN ID: 20 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	70.	.06	.029	46.
5.	.03	.000	0.	75.	.06	.029	32.
10.	.09	.004	0.	80.	.04	.010	22.
15.	.14	.028	3.	85.	.04	.010	16.
20.	.24	.054	9.	90.	.04	.010	11.
25.	.41	.190	27.	95.	.04	.010	9.
30.	.74	.688	96.	100.	.04	.010	7.
35.	.41	.373	129.	105.	.04	.010	6.
40.	.24	.200	122.	110.	.04	.010	5.
45.	.18	.149	106.	115.	.04	.010	5.
50.	.15	.115	91.	120.	.04	.010	4.
55.	.12	.086	77.	125.	.00	.000	3.
60.	.12	.087	66.	130.	.00	.000	2.
65.	.12	.087	59.	135.	.00	.000	2.

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              * LESS ANY WATER QUALITY CAPTURE VOLUME
             ** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW


     TOTAL PRECIP. =  3.41 (1-HOUR RAIN =  2.95)      EXCESS PRECIP. = 2.211  INCHES
     VOLUME OF EXCESS PRECIP =   6.60  ACRE-FEET
     PEAK Q =  129. CFS      TIME OF PEAK =  35. MIN.
     INFILT.= 3.30 IN/HR    DECAY = .00180    FNINF =  .52 IN/HR
     MAX.PERV.RET.= .50 IN.     MAX.IMP.RET.= .10 IN.

     RATIONAL FORMULA C =        .65
                      I =       7.4 INCHES/HOUR
                      A =      35.8 ACRES
                      Q =      172. CFS

1    U.D.F.C.D. CUHPF RUNOFF ANALYSIS    EXECUTED ON DATE            AT TIME

     CUHPF/PC VERSION 1.0 MODIFIED IN DEC 1993 TO WRITE OUTPUT
     FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT
     USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1
     JACKSON BOULEVARD DBDP-LOWER TRIBUTARY



     NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUT FILE FOR THIS RUN OF CUHPF.
```

APPENDIX B

LOWER TRIBUTARY

UDSWM95 - 10 YR

DESIGN PLAN CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2    1    1    2
   3    4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB      10 YEAR
        48   0 0   5.0                                                              1
         1   100
         2   101
         3   102
         4   103
         5   104
         6   122
         7   105
         8   107
        20    24

    0    1   101     5      2.    1300.    .0026                      0.016        2
                            1.    1300.    .0020       20       20    0.020        5
    0    2   103     2      5.     500.    .0042                      0.016        5
    0    3   102     2      6.     550.    .0050                      0.016        6
    0    4           2      6.     300.    .0050                      0.016        6
    0    5     3     1      5.     450.    .0050        3        3    0.044        5
    0    6   307     2      5.     850.    .0120                      0.016        5
    0    7     8     4      .5     300.    .0015       12       12    0.016       .5
                            10     300.    .0015       20       20    0.020        5
    0    8   104     5      2.     700.    .0035                      0.016        2
                            1.     700.    .0025       20       20    0.020        5
    0    9   105     5      2.     900.    .0060                      0.016       2.
                            1.     900.    .0060       20       20    0.020        5
    0   10   106     2      4.     410.    .0050                      0.016        4
    0   11   107     5    1.25    1100.    .0073                      0.016     1.25
                             1    1100.    .0073       20       20    0.020        5
    0   24   122     5     2.5    1250.    .0140                      0.016      2.5
                             1    1250.    .0140       20       20    0.020        5
    0  100           3               1.
    0  101           3               1.
    0  102     4     3               1.
    0  103   202     3               1.
  304  104     2   8 3               1.
         0           0      50          25       100       50       150         75
       190          95     250         155       350      255       400        305
    6  105     7   8 3               1.
         0           0      90          90       100       90       200         90
       250          90     300          90       350       90       400         90
    0  106           3               1.
   10  107     9   8 3               1.
         0           0      10          10        20       20        30         30
        40          40      50          50       100       50       200         50
    0  122   104     3               1.
    0  202     3   4 2      .1       1.   .0100                      0.016       .1
         0           0       0          30        .5      115       2.5        160
       304   305     3               1.
  306  305     1   5 3               1.
         0           0      60         60        120      120       200        120
       250         120
       306           3               1.
       307     5   5 2      .1       1.   .0100                                  .1
         0           0     .05          .1       .55       .1       1.2         12
       3.5          16

   0
  26
   1    2    3    4    5    6    7    8    9   10   11   24  100  101  102  103
 104  105  106  107  122  202  304  305  306  307
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 9 SUBCATCHMENTS

TIME(HR/MIN)		1	2	3	4	5	6	7	8	20
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	15.	1.	3.	0.	7.	4.	4.	9.	5.	3.
0	20.	3.	8.	1.	22.	12.	11.	28.	14.	11.
0	25.	9.	22.	3.	45.	23.	31.	54.	28.	39.
0	30.	17.	30.	6.	53.	27.	42.	63.	32.	55.
0	35.	22.	26.	7.	42.	23.	36.	49.	27.	51.
0	40.	24.	21.	7.	30.	17.	29.	34.	20.	42.
0	45.	23.	18.	6.	21.	13.	23.	24.	14.	35.
0	50.	21.	15.	6.	14.	8.	19.	17.	10.	29.
0	55.	20.	12.	6.	11.	6.	15.	13.	7.	25.
1	0.	19.	9.	6.	10.	6.	11.	13.	7.	21.

1	5.	18.	7.	6.	10.	6.	9.	12.	7.	19.
1	10.	17.	7.	6.	10.	6.	9.	12.	7.	15.
1	15.	17.	6.	6.	10.	6.	9.	12.	7.	14.
1	20.	17.	6.	6.	9.	5.	8.	11.	6.	12.
1	25.	16.	5.	6.	8.	5.	6.	10.	5.	9.
1	30.	15.	4.	6.	7.	4.	5.	8.	5.	8.
1	35.	14.	4.	6.	6.	4.	5.	8.	4.	7.
1	40.	13.	3.	6.	6.	3.	4.	7.	4.	6.
1	45.	11.	3.	6.	6.	3.	4.	7.	4.	5.
1	50.	9.	3.	6.	6.	3.	4.	7.	4.	5.
1	55.	8.	3.	6.	5.	3.	3.	7.	4.	5.
2	0.	7.	2.	6.	5.	3.	3.	6.	3.	4.
2	5.	6.	2.	6.	3.	2.	2.	4.	2.	3.
2	10.	5.	0.	6.	2.	0.	0.	2.	0.	2.
2	15.	4.	0.	6.	0.	0.	0.	0.	0.	0.
2	20.	4.	0.	4.	0.	0.	0.	0.	0.	0.
2	25.	3.	0.	2.	0.	0.	0.	0.	0.	0.
2	30.	3.	0.	2.	0.	0.	0.	0.	0.	0.
2	35.	2.	0.	2.	0.	0.	0.	0.	0.	0.
2	40.	2.	0.	1.	0.	0.	0.	0.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP	WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	OVERBANK/SURCHARGE MANNING N	DEPTH (FT)	JK

```
    1      101      0      5    PIPE        2.0   1300.   .0026     .0    .0    .016     2.00      0
                                  OVERFLOW  1.0   1300.   .0026   20.0  20.0    .020     5.00
    2      103      0      2    PIPE        5.0    500.   .0042     .0    .0    .016     5.00      0
    3      102      0      2    PIPE        6.0    550.   .0050     .0    .0    .016     6.00      0
    4        0      0      2    PIPE        6.0    300.   .0050     .0    .0    .016     6.00      0
    5        3      0      1    CHANNEL     5.0    450.   .0050    3.0   3.0    .044     5.00      0
    6      307      0      2    PIPE        5.0    850.   .0120     .0    .0    .016     5.00      0
    7        8      0      4    CHANNEL      .5    300.   .0015   12.0  12.0    .016      .50      0
                                  OVERFLOW 10.0    300.   .0015   20.0  20.0    .020     5.00
    8      104      0      5    PIPE        2.0    700.   .0035     .0    .0    .016     2.00      0
                                  OVERFLOW  1.0    700.   .0035   20.0  20.0    .020     5.00
    9      105      0      5    PIPE        2.0    900.   .0060     .0    .0    .016     2.00      0
                                  OVERFLOW  1.0    900.   .0060   20.0  20.0    .020     5.00
   10      106      0      2    PIPE        4.0    410.   .0050     .0    .0    .016     4.00      0
   11      107      0      5    PIPE        1.3   1100.   .0073     .0    .0    .016     1.25      0
                                  OVERFLOW  1.0   1100.   .0073   20.0  20.0    .020     5.00
   24      122      0      5    PIPE        2.5   1250.   .0140     .0    .0    .016     2.50      0
                                  OVERFLOW  1.0   1250.   .0140   20.0  20.0    .020     5.00
  100        0      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  101        0      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  102        4      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  103      202      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  104        2      8      3                 .0      1.   .0010     .0    .0    .001    10.00    304
               DIVERSION TO GUTTER NUMBER 304 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    50.0    25.0   100.0    50.0   150.0    75.0   190.0    95.0   250.0   155.0
                 350.0   255.0   400.0   305.0
  105        7      8      3                 .0      1.   .0010     .0    .0    .001    10.00      6
               DIVERSION TO GUTTER NUMBER   6 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    90.0    90.0   100.0    90.0   200.0    90.0   250.0    90.0   300.0    90.0
                 350.0    90.0   400.0    90.0
  106        0      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  107        9      8      3                 .0      1.   .0010     .0    .0    .001    10.00     10
               DIVERSION TO GUTTER NUMBER  10 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    10.0    10.0    20.0    20.0    30.0    30.0    40.0    40.0    50.0    50.0
                 100.0    50.0   200.0    50.0
  122      104      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  202        3      4      2    PIPE         .1      1.   .0100     .0    .0    .016      .10      0
               RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                    .0      .0      .0    30.0      .5   115.0     2.5   160.0
  304      305      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  305        1      5      3                 .0      1.   .0010     .0    .0    .001    10.00    306
               DIVERSION TO GUTTER NUMBER 306 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    60.0    60.0   120.0   120.0   200.0   120.0   250.0   120.0
  306        0      0      3                 .0      1.   .0010     .0    .0    .001    10.00      0
  307        5      5      2    PIPE         .1      1.   .0100     .0    .0    .001      .10      0
               RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                    .0      .0      .1      .1      .6      .1     1.2    12.0     3.5    16.0
0TOTAL NUMBER OF GUTTERS/PIPES,  26
1

 JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
 DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB    10 YEAR
```

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A.(AC)
1	305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
2	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94.7
3	5	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
4	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122.9
5	307	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
7	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
9	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.2
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
24	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	35.8
100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22.4
101	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	16.0
102	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	122.9
103	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	113.3
104	8	122	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	94.7
105	9	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	29.4
106	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
107	11	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	10.2
122	24	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	57.0
202	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0

```
       305      304   0    0    0    0    0    0    0    0    0          0    0    0    0    0    0    0    0    0    0       .0
       306        0   0    0    0    0    0    0    0    0    0          0    0    0    0    0    0    0    0    0    0       .0
       307        6   0    0    0    0    0    0    0    0    0          0    0    0    0    0    0    0    0    0    0       .0
1
```

```
 JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
 DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB    10 YEAR


 HYDROGRAPHS ARE LISTED FOR THE FOLLOWING  26 CONVEYANCE ELEMENTS

         THE UPPER NUMBER IS DISCHARGE IN CFS
         THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
                    ( ) DENOTES DEPTH ABOVE INVERT IN FEET
                    (S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM.  DISCHARGE INCLUDES SPILLWAY OUTFLOW.
                    (I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
                    (D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
                    (O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

 TIME(HR/MIN)    1          2          3          4          5          6          7          8          9          10
                11         24        100        101        102        103        104        105        106        107
               122        202        304        305        306        307

   0    5.      0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
                 .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .0( )

                0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
                 .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .0(D)      .0(D)      .0( )      .0(D)

                0.         0.         0.         0.         0.         0.
                 .0( )      .0(S)      .0( )      .0(D)      .0( )      .0(S)

   0   10.      0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
                 .0( )      .1( )      .1( )      .0( )      .0( )      .1( )      .0( )      .0( )      .0( )      .1( )

                0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
                 .0( )      .0( )      .0( )      .0( )      .0( )      .0( )      .2(D)      .3(D)      .0( )      .2(D)

                0.         0.         0.         0.         0.         0.
                 .0( )      .0(S)      .0( )      .2(D)      .0( )      .0(S)

   0   15.      0.         2.         5.         3.         0.         4.         0.         0.         0.         3.
                 .0( )      .4( )      .6( )      .5( )      .0( )      .5( )      .0( )      .0( )      .0( )      .5( )

                0.         1.         1.         3.         5.         9.         9.         9.         3.         5.
                 .0( )      .3( )      .0( )      .0( )      .0( )      .0( )     4.5(D)     9.3(D)      .0( )     4.8(D)

                5.         9.         4.         4.         4.         0.
```

		.0( )	.0(S)	.0( )	4.5(D)	.0( )	.0(S)				
0	20.	0.	11.	25.	21.	0.	22.	0.	0.	0.	12.
		.0( )	1.0( )	1.3( )	1.2( )	.0( )	1.0( )	.0( )	.0( )	.0( )	1.0( )
		0.	7.	3.	8.	25.	33.	30.	28.	12.	14.
		.0( )	.7( )	.0( )	.0( )	.0( )	.0( )	14.8(D)	27.9(D)	.0( )	14.1(D)
		18.	31.	15.	15.	15.	0.				
		.0( )	.0(S)	.0( )	14.8(D)	.0( )	.1(S)				
0	25.	0.	34.	46.	47.	0.	48.	0.	0.	0.	25.
		.0( )	1.7( )	1.8( )	1.8( )	.1( )	1.5( )	.0( )	.0( )	.0( )	1.5( )
		0.	27.	9.	22.	49.	78.	81.	54.	25.	28.
		.0( )	1.5( )	.0( )	.0( )	.0( )	.0( )	40.4(D)	54.5(D)	.0( )	27.8(D)
		58.	49.	40.	40.	40.	0.				
		.0( )	.1(S)	.0( )	40.4(D)	.0( )	.3(S)				
0	30.	0.	55.	75.	76.	1.	63.	0.	0.	0.	33.
		.0( )	2.2( )	2.3( )	2.3( )	.2( )	1.8( )	.0( )	.0( )	.0( )	1.7( )
		0.	44.	17.	30.	80.	108.	113.	63.	33.	32.
		.0( )	2.7( )	.0( )	.0( )	.0( )	.0( )	56.4(D)	62.9(D)	.0( )	32.3(D)
		86.	82.	56.	56.	56.	3.				
		.0( )	.3(S)	.0( )	56.4(D)	.0( )	.7(S)				
0	35.	0.	55.	101.	106.	5.	53.	0.	0.	0.	28.
		.0( )	2.2( )	2.7( )	2.8( )	.5( )	1.6( )	.0( )	.0( )	.0( )	1.6( )
		0.	49.	22.	26.	108.	98.	108.	49.	28.	27.
		.0( )	2.8( )	.0( )	.0( )	.0( )	.0( )	54.1(D)	48.9(D)	.0( )	26.6(D)
		86.	97.	54.	54.	54.	10.				
		.0( )	.4(S)	.0( )	54.1(D)	.0( )	1.1(S)				
0	40.	0.	48.	101.	109.	10.	37.	0.	0.	0.	21.
		.0( )	2.1( )	2.7( )	2.8( )	.8( )	1.4( )	.0( )	.0( )	.0( )	1.4( )
		0.	48.	24.	21.	108.	78.	94.	34.	21.	20.
		.0( )	2.8( )	.0( )	.0( )	.0( )	.0( )	47.0(D)	34.0(D)	.0( )	19.9(D)
		77.	90.	47.	47.	47.	12.				
		.0( )	.4(S)	.0( )	47.0(D)	.0( )	1.3(S)				
0	45.	0.	41.	90.	98.	12.	26.	0.	0.	0.	15.
		.0( )	1.9( )	2.5( )	2.6( )	.9( )	1.1( )	.0( )	.0( )	.0( )	1.2( )
		0.	43.	23.	18.	97.	62.	80.	24.	15.	14.
		.0( )	2.6( )	.0( )	.0( )	.0( )	.0( )	39.8(D)	24.0(D)	.0( )	14.5(D)

		67. .0( )	76. .3(S)	40. .0( )	40. 39.8(D)	40. .0( )	13. 1.4(S)				
0	50.	0. .0( )	33. 1.7( )	75. 2.3( )	83. 2.4( )	13. .9( )	18. 1.0( )	0. .0( )	0. .0( )	0. .0( )	11. 1.0( )
		0. .0( )	35. 1.8( )	21. .0( )	15. .0( )	81. .0( )	47. .0( )	61. 30.7(D)	17. 16.5(D)	11. .0( )	10. 9.5(D)
		53. .0( )	60. .2(S)	31. .0( )	31. 30.7(D)	31. .0( )	13. 1.5(S)				
0	55.	0. .0( )	25. 1.4( )	61. 2.1( )	68. 2.2( )	13. .9( )	14. .8( )	0. .0( )	0. .0( )	0. .0( )	8. .8( )
		0. .0( )	26. 1.5( )	20. .0( )	12. .0( )	67. .0( )	36. .0( )	47. 23.7(D)	13. 13.5(D)	8. .0( )	7. 7.4(D)
		41. .0( )	46. .1(S)	24. .0( )	24. 23.7(D)	24. .0( )	13. 1.5(S)				
1	0.	0. .0( )	21. 1.3( )	51. 1.9( )	58. 2.0( )	13. .9( )	13. .8( )	0. .0( )	0. .0( )	0. .0( )	7. .8( )
		0. .0( )	23. 1.4( )	19. .0( )	9. .0( )	57. .0( )	31. .0( )	40. 19.9(D)	13. 12.6(D)	7. .0( )	7. 6.9(D)
		34. .0( )	37. .0(S)	20. .0( )	20. 19.9(D)	20. .0( )	13. 1.5(S)				
1	5.	0. .0( )	18. 1.2( )	45. 1.7( )	51. 1.9( )	13. .9( )	12. .8( )	0. .0( )	0. .0( )	0. .0( )	7. .8( )
		0. .0( )	20. 1.2( )	18. .0( )	7. .0( )	50. .0( )	28. .0( )	35. 17.4(D)	12. 12.2(D)	7. .0( )	7. 6.6(D)
		29. .0( )	31. .0(S)	17. .0( )	17. 17.4(D)	17. .0( )	13. 1.5(S)				
1	10.	0. .0( )	16. 1.2( )	41. 1.7( )	47. 1.8( )	13. .9( )	12. .8( )	0. .0( )	0. .0( )	0. .0( )	7. .8( )
		0. .0( )	17. 1.1( )	17. .0( )	7. .0( )	46. .0( )	26. .0( )	31. 15.6(D)	12. 12.1(D)	7. .0( )	7. 6.5(D)
		26. .0( )	27. .0(S)	16. .0( )	16. 15.6(D)	16. .0( )	13. 1.5(S)				
1	15.	0. .0( )	15. 1.1( )	37. 1.6( )	43. 1.7( )	13. .9( )	12. .8( )	0. .0( )	0. .0( )	0. .0( )	7. .8( )
		0. .0( )	14. 1.0( )	17. .0( )	6. .0( )	43. .0( )	24. .0( )	29. 14.3(D)	12. 12.1(D)	7. .0( )	7. 6.5(D)

		23.	23.	14.	14.	14.	13.				
		.0( )	.0(S)	.0( )	14.3(D)	.0( )	1.5(S)				
1	20.	0.	13.	36.	42.	13.	12.	0.	0.	0.	6.
		.0( )	1.0( )	1.6( )	1.7( )	.9( )	.8( )	.0( )	.0( )	.0( )	.7( )
		0.	12.	17.	6.	42.	22.	26.	11.	6.	6.
		.0( )	1.0( )	.0( )	.0( )	.0( )	.0( )	12.8(D)	11.3(D)	.0( )	6.1(D)
		20.	23.	13.	13.	13.	13.				
		.0( )	.0(S)	.0( )	12.8(D)	.0( )	1.5(S)				
1	25.	0.	11.	32.	39.	13.	10.	0.	0.	0.	6.
		.0( )	1.0( )	1.5( )	1.6( )	.9( )	.7( )	.0( )	.0( )	.0( )	.7( )
		0.	10.	16.	5.	38.	19.	22.	10.	6.	5.
		.0( )	.9( )	.0( )	.0( )	.0( )	.0( )	10.8(D)	9.7(D)	.0( )	5.3(D)
		17.	18.	11.	11.	11.	13.				
		.0( )	.0(S)	.0( )	10.8(D)	.0( )	1.5(S)				
1	30.	0.	9.	29.	35.	13.	9.	0.	0.	0.	5.
		.0( )	.9( )	1.4( )	1.5( )	.9( )	.7( )	.0( )	.0( )	.0( )	.7( )
		0.	9.	15.	4.	35.	16.	18.	8.	5.	5.
		.0( )	.8( )	.0( )	.0( )	.0( )	.0( )	9.0(D)	8.3(D)	.0( )	4.6(D)
		14.	17.	9.	9.	9.	13.				
		.0( )	.0(S)	.0( )	9.0(D)	.0( )	1.5(S)				
1	35.	0.	8.	27.	33.	13.	8.	0.	0.	0.	4.
		.0( )	.8( )	1.4( )	1.5( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	7.	14.	4.	33.	14.	16.	8.	4.	4.
		.0( )	.7( )	.0( )	.0( )	.0( )	.0( )	7.8(D)	7.6(D)	.0( )	4.2(D)
		12.	13.	8.	8.	8.	13.				
		.0( )	.0(S)	.0( )	7.8(D)	.0( )	1.5(S)				
1	40.	0.	7.	26.	32.	13.	7.	0.	0.	0.	4.
		.0( )	.8( )	1.3( )	1.5( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	6.	13.	3.	32.	13.	14.	7.	4.	4.
		.0( )	.7( )	.0( )	.0( )	.0( )	.0( )	7.0(D)	7.2(D)	.0( )	3.9(D)
		11.	14.	7.	7.	7.	12.				
		.0( )	.0(S)	.0( )	7.0(D)	.0( )	1.4(S)				
1	45.	0.	7.	25.	31.	12.	7.	0.	0.	0.	4.
		.0( )	.7( )	1.3( )	1.4( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	6.	11.	3.	31.	12.	13.	7.	4.	4.

		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	6.4(D)	7.1(D)	.0( )	3.8(D)
		10.	11.	6.	6.	6.	12.				
		.0( )	.0(S)	.0( )	6.4(D)	.0( )	1.4(S)				
1	50.	0.	6.	24.	31.	12.	7.	0.	0.	0.	4.
		.0( )	.7( )	1.3( )	1.4( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	9.	3.	31.	12.	12.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	6.1(D)	7.1(D)	.0( )	3.8(D)
		9.	13.	6.	6.	6.	12.				
		.0( )	.0(S)	.0( )	6.1(D)	.0( )	1.3(S)				
1	55.	0.	6.	24.	30.	12.	7.	0.	0.	0.	4.
		.0( )	.7( )	1.3( )	1.4( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	8.	3.	30.	11.	11.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	5.7(D)	6.9(D)	.0( )	3.7(D)
		8.	10.	6.	6.	6.	12.				
		.0( )	.0(S)	.0( )	5.7(D)	.0( )	1.3(S)				
2	0.	0.	5.	23.	29.	12.	6.	0.	0.	0.	3.
		.0( )	.7( )	1.2( )	1.4( )	.9( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	4.	7.	2.	29.	10.	10.	6.	3.	3.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	5.1(D)	6.2(D)	.0( )	3.4(D)
		7.	11.	5.	5.	5.	12.				
		.0( )	.0(S)	.0( )	5.1(D)	.0( )	1.3(S)				
2	5.	0.	4.	20.	27.	12.	5.	0.	0.	0.	3.
		.0( )	.6( )	1.2( )	1.4( )	.9( )	.5( )	.0( )	.0( )	.0( )	.5( )
		0.	3.	6.	2.	27.	7.	8.	4.	3.	2.
		.0( )	.5( )	.0( )	.0( )	.0( )	.0( )	3.8(D)	4.1(D)	.0( )	2.3(D)
		6.	6.	4.	4.	4.	12.				
		.0( )	.0(S)	.0( )	3.8(D)	.0( )	1.2(S)				
2	10.	0.	2.	17.	24.	12.	3.	0.	0.	0.	1.
		.0( )	.5( )	1.1( )	1.3( )	.9( )	.4( )	.0( )	.0( )	.0( )	.3( )
		0.	2.	5.	0.	23.	4.	2.	2.	1.	0.
		.0( )	.4( )	.0( )	.0( )	.0( )	.0( )	1.2(D)	1.9(D)	.0( )	.0(D)
		2.	5.	1.	1.	1.	12.				
		.0( )	.0(S)	.0( )	1.2(D)	.0( )	1.2(S)				
2	15.	0.	1.	13.	19.	11.	1.	0.	0.	0.	0.
		.0( )	.3( )	.9( )	1.1( )	.9( )	.2( )	.0( )	.0( )	.0( )	.1( )

		0. .0( )	1. .3( )	4. .0( )	0. .0( )	19. .0( )	1. .0( )	1. .6(D)	0. .0(D)	0. .0( )	0. .0(D)
		1. .0( )	0. .0(S)	1. .0( )	1. .6(D)	1. .0( )	11. 1.1(S)				
2	20.	0. .0( )	0. .2( )	11. .9( )	15. 1.0( )	10. .8( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
		0. .0( )	0. .2( )	4. .0( )	0. .0( )	15. .0( )	0. .0( )	0. .2(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	1. .0(S)	0. .0( )	0. .2(D)	0. .0( )	9. 1.0(S)				
2	25.	0. .0( )	0. .1( )	10. .8( )	13. .9( )	9. .8( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	12. .0( )	0. .0( )	0. .1(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .1(D)	0. .0( )	8. 1.0(S)				
2	30.	0. .0( )	0. .1( )	8. .8( )	11. .9( )	8. .7( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	10. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	7. .9(S)				
2	35.	0. .0( )	0. .1( )	8. .7( )	9. .8( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	9. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	6. .9(S)				
2	40.	0. .0( )	0. .1( )	7. .7( )	8. .8( )	6. .6( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	8. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	6. .8(S)				
2	45.	0. .0( )	0. .1( )	6. .6( )	5. .6( )	5. .6( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

		0. .0( )	0. .0( )	0. .0( )	0. .0( )	4. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	5. .8(S)				
2	50.	0. .0( )	0. .0( )	5. .6( )	6. .6( )	5. .5( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	7. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	4. .8(S)				
2	55.	0. .0( )	0. .0( )	5. .6( )	5. .6( )	4. .5( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	4. .8(S)				
3	0.	0. .0( )	0. .0( )	4. .5( )	4. .5( )	4. .5( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	5. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	3. .7(S)				
3	5.	0. .0( )	0. .0( )	4. .5( )	4. .5( )	3. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	3. .7(S)				
3	10.	0. .0( )	0. .0( )	3. .5( )	3. .5( )	3. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	5. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	3. .7(S)				
3	15.	0.	0.	3.	3.	3.	0.	0.	0.	0.	0.

		.0( )	.0( )	.5( )	.5( )	.4( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	2. .7(S)				
3	20.	0. .0( )	0. .0( )	2. .4( )	3. .4( )	2. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	4. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	2. .7(S)				
3	25.	0. .0( )	0. .0( )	2. .4( )	2. .4( )	2. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	2. .6(S)				
3	30.	0. .0( )	0. .0( )	2. .4( )	2. .4( )	2. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	2. .6(S)				
3	35.	0. .0( )	0. .0( )	2. .4( )	2. .4( )	2. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				
3	40.	0. .0( )	0. .0( )	2. .3( )	2. .3( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				

3	45.	0. .0( )	0. .0( )	1. .3( )	1. .3( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				
3	50.	0. .0( )	0. .0( )	1. .3( )	1. .3( )	1. .2( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				
3	55.	0. .0( )	0. .0( )	1. .3( )	1. .3( )	1. .2( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				
4	0.	0. .0( )	0. .0( )	1. .3( )	1. .3( )	1. .2( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	1. .6(S)				

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
11	0.	.0		0 0.
107	32.	(DIRECT FLOW)		0 30.
9	0.	.0		4 0.
105	63.	(DIRECT FLOW)		0 30.

24	49.	2.8		0	35.
7	0.	.0		0	0.
122	86.	(DIRECT FLOW)		0	30.
8	0.	.0		0	0.
104	113.	(DIRECT FLOW)		0	30.
2	55.	2.2		0	35.
6	63.	1.8		0	30.
103	108.	(DIRECT FLOW)		0	30.
307	13.	.1	1.5	1	0.
304	56.	(DIRECT FLOW)		0	30.
202	97.	.1	.4	0	35.
5	13.	.9		1	5.
305	56.	(DIRECT FLOW)		0	30.
3	101.	2.7		0	40.
10	33.	1.7		0	30.
1	0.	.0		0	0.
102	108.	(DIRECT FLOW)		0	40.
306	56.	(DIRECT FLOW)		0	30.
106	33.	(DIRECT FLOW)		0	30.
101	30.	(DIRECT FLOW)		0	30.
100	24.	(DIRECT FLOW)		0	40.
4	109.	2.8		0	40.

APPENDIX B

LOWER TRIBUTARY

UDSWM95 - 100 YR

DESIGN PLAN CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2   1   1   2
   3   4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB   100 YEAR
        48  0 0  5.0                                                           1
         1  100
         2  101
         3  102
         4  103
         5  104
         6  122
         7  105
         8  107
        20   24

    0    1  101    5      2.   1300.   .0026                   0.016       2
                          1.   1300.   .0020      20      20   0.020       5
    0    2  103    2      5.    500.   .0042                   0.016       5
    0    3  102    2      6.    550.   .0050                   0.016       6
    0    4         2      6.    300.   .0050                   0.016       6
    0    5    3    1      5.    450.   .0050       3       3   0.044       5
    0    6  307    2      5.    850.   .0120                   0.016       5
    0    7    8    4      .5    300.   .0015      12      12   0.016      .5
                          10    300.   .0015      20      20   0.020       5
    0    8  104    5      2.    700.   .0035                   0.016       2
                          1.    700.   .0025      20      20   0.020       5
    0    9  105    5      2.    900.   .0060                   0.016      2.
                          1.    900.   .0060      20      20   0.020       5
    0   10  106    2      4.    410.   .0050                   0.016       4
    0   11  107    5    1.25   1100.   .0073                   0.016    1.25
                           1   1100.   .0073      20      20   0.020       5
    0   24  122    5     2.5   1250.   .0140                   0.016     2.5
                           1   1250.   .0140      20      20   0.020       5
    0  100         3              1.
    0  101         3              1.
    0  102    4    3              1.
    0  103  202    3              1.
  304  104    2  8 3              1.
         0         0        50        25       100        50       150        75
       190        95       250       155       350       255       400       305
    6  105    7  8 3              1.
         0         0        90        90       100        90       200        90
       250        90       300        90       350        90       400        90
    0  106         3              1.
   10  107    9  8 3              1.
         0         0        10        10        20        20        30        30
        40        40        50        50       100        50       200        50
    0  122  104    3              1.
    0  202    3  4 2      .1      1.   .0100                   0.016      .1
         0         0         0        30        .5       115       2.5       160
       304  305    3              1.
  306  305    1  5 3              1.
         0         0        60        60       120       120       200       120
       250       120
       306         3              1.
       307    5  5 2      .1      1.   .0100                              .1
         0         0       .05        .1       .55        .1       1.2        12
       3.5        16

    0
   26
    1    2    3    4    5    6    7    8    9   10   11   24  100  101  102  103
  104  105  106  107  122  202  304  305  306  307
ENDPROGRAM
```

```
URBAN DRAINAGE STORM WATER MANAGEMENT MODEL -  32 BIT VERSION 1998
        REVISED BY UNIVERSITY OF COLORADO AT DENVER

 *** ENTRY MADE TO RUNOFF MODEL ***


 JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
 DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB   100 YEAR

0NUMBER OF TIME STEPS   48
0INTEGRATION TIME INTERVAL (MINUTES),    5.00

 25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1


 JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
 DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB   100 YEAR


 HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING   9 SUBCATCHMENTS
```

TIME(HR/MIN)		1	2	3	4	5	6	7	8	20
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	1.	0.	1.	0.	0.	1.	1.	0.
0	15.	1.	3.	0.	7.	4.	4.	9.	5.	3.
0	20.	3.	7.	1.	19.	10.	9.	25.	12.	9.
0	25.	8.	17.	2.	38.	20.	24.	47.	24.	27.
0	30.	20.	50.	8.	78.	38.	69.	88.	46.	96.
0	35.	36.	65.	14.	95.	45.	90.	105.	55.	129.
0	40.	49.	59.	16.	80.	40.	80.	87.	47.	122.
0	45.	54.	51.	17.	61.	33.	68.	66.	38.	106.
0	50.	53.	44.	17.	46.	26.	56.	49.	29.	91.
0	55.	50.	37.	16.	32.	18.	46.	35.	20.	77.
1	0.	47.	30.	16.	26.	14.	38.	28.	16.	66.

1	5.	44.	23.	15.	23.	12.	29.	26.	14.	59.
1	10.	42.	17.	15.	19.	10.	22.	21.	12.	46.
1	15.	40.	12.	15.	14.	8.	16.	16.	9.	32.
1	20.	37.	9.	14.	10.	6.	12.	13.	7.	22.
1	25.	34.	6.	14.	8.	5.	8.	9.	5.	16.
1	30.	31.	5.	14.	6.	4.	6.	8.	4.	11.
1	35.	29.	4.	14.	6.	4.	5.	7.	4.	9.
1	40.	26.	3.	14.	6.	3.	4.	7.	4.	7.
1	45.	24.	3.	14.	6.	3.	4.	7.	4.	6.
1	50.	21.	3.	14.	6.	3.	4.	7.	4.	5.
1	55.	15.	3.	15.	6.	3.	4.	7.	4.	5.
2	0.	12.	3.	15.	6.	3.	4.	7.	4.	4.
2	5.	10.	2.	15.	4.	2.	3.	5.	3.	3.
2	10.	8.	0.	15.	2.	0.	2.	2.	1.	2.
2	15.	6.	0.	15.	0.	0.	0.	0.	0.	2.
2	20.	5.	0.	13.	0.	0.	0.	0.	0.	0.
2	25.	4.	0.	8.	0.	0.	0.	0.	0.	0.
2	30.	3.	0.	6.	0.	0.	0.	0.	0.	0.
2	35.	2.	0.	4.	0.	0.	0.	0.	0.	0.
2	40.	2.	0.	3.	0.	0.	0.	0.	0.	0.
2	45.	1.	0.	3.	0.	0.	0.	0.	0.	0.
2	50.	0.	0.	2.	0.	0.	0.	0.	0.	0.
2	55.	0.	0.	1.	0.	0.	0.	0.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	MANNING N	OVERBANK/SURCHARGE DEPTH (FT)	JK
1	101	0	5	PIPE	2.0	1300.	.0026	.0	.0	.016	2.00	0
				OVERFLOW	1.0	1300.	.0026	20.0	20.0	.020	5.00	
2	103	0	2	PIPE	5.0	500.	.0042	.0	.0	.016	5.00	0
3	102	0	2	PIPE	6.0	550.	.0050	.0	.0	.016	6.00	0
4	0	0	2	PIPE	6.0	300.	.0050	.0	.0	.016	6.00	0
5	3	0	1	CHANNEL	5.0	450.	.0050	3.0	3.0	.044	5.00	0
6	307	0	2	PIPE	5.0	850.	.0120	.0	.0	.016	5.00	0
7	8	0	4	CHANNEL	.5	300.	.0015	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	300.	.0015	20.0	20.0	.020	5.00	
8	104	0	5	PIPE	2.0	700.	.0035	.0	.0	.016	2.00	0
				OVERFLOW	1.0	700.	.0035	20.0	20.0	.020	5.00	
9	105	0	5	PIPE	2.0	900.	.0060	.0	.0	.016	2.00	0
				OVERFLOW	1.0	900.	.0060	20.0	20.0	.020	5.00	
10	106	0	2	PIPE	4.0	410.	.0050	.0	.0	.016	4.00	0
11	107	0	5	PIPE	1.3	1100.	.0073	.0	.0	.016	1.25	0
				OVERFLOW	1.0	1100.	.0073	20.0	20.0	.020	5.00	
24	122	0	5	PIPE	2.5	1250.	.0140	.0	.0	.016	2.50	0
				OVERFLOW	1.0	1250.	.0140	20.0	20.0	.020	5.00	
100	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
101	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
102	4	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
103	202	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
104	2	8	3		.0	1.	.0010	.0	.0	.001	10.00	304
	DIVERSION TO GUTTER NUMBER 304 - TOTAL Q VS DIVERTED Q IN CFS											
	.0	.0	50.0	25.0	100.0	50.0	150.0	75.0	190.0	95.0	250.0	155.0
	350.0	255.0	400.0	305.0								
105	7	8	3		.0	1.	.0010	.0	.0	.001	10.00	6
	DIVERSION TO GUTTER NUMBER 6 - TOTAL Q VS DIVERTED Q IN CFS											
	.0	.0	90.0	90.0	100.0	90.0	200.0	90.0	250.0	90.0	300.0	90.0
	350.0	90.0	400.0	90.0								
106	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
107	9	8	3		.0	1.	.0010	.0	.0	.001	10.00	10
	DIVERSION TO GUTTER NUMBER 10 - TOTAL Q VS DIVERTED Q IN CFS											
	.0	.0	10.0	10.0	20.0	20.0	30.0	30.0	40.0	40.0	50.0	50.0
	100.0	50.0	200.0	50.0								
122	104	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
202	3	4	2	PIPE	.1	1.	.0100	.0	.0	.016	.10	0
	RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW											
	.0	.0	.0	30.0	.5	115.0	2.5	160.0				
304	305	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
305	1	5	3		.0	1.	.0010	.0	.0	.001	10.00	306
	DIVERSION TO GUTTER NUMBER 306 - TOTAL Q VS DIVERTED Q IN CFS											
	.0	.0	60.0	60.0	120.0	120.0	200.0	120.0	250.0	120.0		
306	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
307	5	5	2	PIPE	.1	1.	.0100	.0	.0	.001	.10	0
	RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW											
	.0	.0	.1	.1	.6	.1	1.2	12.0	3.5	16.0		

0TOTAL NUMBER OF GUTTERS/PIPES, 26
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A. (AC)
1	305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
2	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94.7
3	5	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
4	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122.9
5	307	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
7	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
9	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.2
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
24	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	35.8
100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22.4
101	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	16.0
102	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	122.9
103	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	113.3
104	8	122	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	94.7
105	9	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	29.4
106	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
107	11	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	10.2

122	24	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	57.0
202	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
305	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
306	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
307	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 26 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)	1	2	3	4	5	6	7	8	9	10
	11	24	100	101	102	103	104	105	106	107
	122	202	304	305	306	307				
0 5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0(D)	.0(D)	.0( )	.0(D)
	0.	0.	0.	0.	0.	0.				
	.0( )	.0(S)	.0( )	.0(D)	.0( )	.0(S)				
0 10.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	.0( )	.1( )	.1( )	.1( )	.0( )	.1( )	.0( )	.0( )	.0( )	.1( )
	0.	0.	0.	1.	0.	1.	1.	1.	0.	1.
	.0( )	.1( )	.0( )	.0( )	.0( )	.0( )	.5(D)	1.0(D)	.0( )	.5(D)
	0.	1.	0.	0.	0.	0.				
	.0( )	.0(S)	.0( )	.5(D)	.0( )	.0(S)				
0 15.	0.	2.	5.	4.	0.	5.	0.	0.	0.	3.

		.0( )	.4( )	.6( )	.5( )	.0( )	.5( )	.0( )	.0( )	.0( )	.5( )
		0.	1.	1.	3.	6.	10.	9.	9.	3.	5.
		.0( )	.3( )	.0( )	.0( )	.0( )	.0( )	4.4(D)	9.2(D)	.0( )	4.8(D)
		5.	10.	4.	4.	4.	0.				
		.0( )	.0(S)	.0( )	4.4(D)	.0( )	.0(S)				
0	20.	0.	10.	23.	20.	0.	19.	0.	0.	0.	10.
		.0( )	.9( )	1.2( )	1.2( )	.0( )	1.0( )	.0( )	.0( )	.0( )	1.0( )
		0.	6.	3.	7.	24.	29.	25.	25.	10.	12.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	12.7(D)	24.6(D)	.0( )	12.4(D)
		15.	29.	13.	13.	13.	0.				
		.0( )	.0(S)	.0( )	12.7(D)	.0( )	.1(S)				
0	25.	0.	26.	41.	41.	0.	42.	0.	0.	0.	22.
		.0( )	1.5( )	1.7( )	1.7( )	.1( )	1.4( )	.0( )	.0( )	.0( )	1.4( )
		0.	19.	8.	17.	43.	64.	63.	47.	22.	24.
		.0( )	1.2( )	.0( )	.0( )	.0( )	.0( )	31.5(D)	47.5(D)	.0( )	24.2(D)
		43.	43.	31.	31.	31.	0.				
		.0( )	.1(S)	.0( )	31.5(D)	.0( )	.3(S)				
0	30.	0.	69.	78.	79.	1.	79.	0.	0.	0.	42.
		.0( )	2.5( )	2.3( )	2.4( )	.2( )	2.0( )	.0( )	.0( )	.0( )	2.0( )
		0.	54.	20.	50.	85.	147.	161.	88.	42.	46.
		.0( )	2.9( )	.0( )	.0( )	.0( )	.0( )	80.3(D)	88.2(D)	.0( )	46.0(D)
		122.	89.	80.	80.	80.	3.				
		.0( )	.3(S)	.0( )	80.3(D)	.0( )	.7(S)				
0	35.	6.	97.	124.	134.	6.	94.	7.	3.	2.	51.
		1.2( )	3.1( )	3.0( )	3.2( )	.6( )	2.2( )	.6( )	.7( )	.5( )	2.3( )
		0.	100.	36.	71.	137.	192.	238.	107.	51.	55.
		.0( )	3.3( )	.0( )	.0( )	.0( )	.0( )	142.8(D)	90.0(D)	.0( )	50.0(D)
		190.	122.	143.	143.	120.	12.				
		.0( )	.8(S)	.0( )	120.0(D)	.0( )	1.3(S)				
0	40.	14.	94.	140.	156.	12.	88.	8.	8.	2.	47.
		2.4( )	3.0( )	3.3( )	3.5( )	.9( )	2.1( )	.6( )	1.3( )	.6( )	2.2( )
		0.	122.	49.	73.	157.	174.	250.	89.	47.	47.
		.0( )	3.4( )	.0( )	.0( )	.0( )	.0( )	155.3(D)	89.5(D)	.0( )	47.5(D)
		203.	130.	155.	155.	120.	13.				
		.0( )	1.2(S)	.0( )	120.0(D)	.0( )	1.8(S)				

0	45.	16.	95.	148.	164.	13.	73.	1.	5.	0.	40.
		2.4( )	3.1( )	3.4( )	3.6( )	.9( )	1.9( )	.2( )	.9( )	.3( )	2.0( )
		0.	115.	54.	67.	165.	157.	220.	66.	40.	38.
		.0( )	3.3( )	.0( )	.0( )	.0( )	.0( )	124.9(D)	66.4(D)	.0( )	38.0(D)
		183.	135.	125.	125.	120.	14.				
		.0( )	1.4(S)	.0( )	120.0(D)	.0( )	2.3(S)				
0	50.	12.	93.	151.	168.	14.	51.	0.	1.	0.	30.
		2.3( )	3.0( )	3.4( )	3.7( )	1.0( )	1.6( )	.1( )	.4( )	.2( )	1.7( )
		0.	101.	53.	56.	168.	139.	184.	50.	30.	29.
		.0( )	3.3( )	.0( )	.0( )	.0( )	.0( )	91.9(D)	49.5(D)	.0( )	29.4(D)
		157.	137.	92.	92.	92.	15.				
		.0( )	1.5(S)	.0( )	91.9(D)	.0( )	2.6(S)				
0	55.	8.	79.	151.	167.	15.	39.	0.	0.	0.	22.
		1.5( )	2.7( )	3.4( )	3.6( )	1.0( )	1.4( )	.1( )	.3( )	.1( )	1.4( )
		0.	87.	50.	45.	167.	112.	151.	35.	22.	20.
		.0( )	3.2( )	.0( )	.0( )	.0( )	.0( )	75.5(D)	35.4(D)	.0( )	20.4(D)
		133.	136.	76.	76.	76.	15.				
		.0( )	1.4(S)	.0( )	75.5(D)	.0( )	2.8(S)				
1	0.	3.	65.	146.	163.	15.	29.	0.	0.	0.	16.
		.8( )	2.4( )	3.4( )	3.6( )	1.0( )	1.2( )	.1( )	.2( )	.1( )	1.2( )
		0.	75.	47.	33.	162.	90.	126.	28.	16.	16.
		.0( )	3.1( )	.0( )	.0( )	.0( )	.0( )	63.2(D)	28.5(D)	.0( )	16.1(D)
		112.	131.	63.	63.	63.	15.				
		.0( )	1.2(S)	.0( )	63.2(D)	.0( )	2.9(S)				
1	5.	1.	56.	140.	156.	15.	26.	0.	0.	0.	15.
		.5( )	2.2( )	3.3( )	3.5( )	1.0( )	1.1( )	.1( )	.1( )	.1( )	1.1( )
		0.	65.	44.	24.	155.	79.	107.	26.	15.	14.
		.0( )	3.0( )	.0( )	.0( )	.0( )	.0( )	53.6(D)	25.9(D)	.0( )	14.4(D)
		95.	124.	54.	54.	54.	15.				
		.0( )	.9(S)	.0( )	53.6(D)	.0( )	3.0(S)				
1	10.	1.	46.	133.	149.	15.	23.	0.	0.	0.	12.
		.4( )	2.0( )	3.2( )	3.4( )	1.0( )	1.1( )	.0( )	.1( )	.1( )	1.0( )
		0.	56.	42.	18.	148.	64.	88.	21.	12.	12.
		.0( )	2.9( )	.0( )	.0( )	.0( )	.0( )	44.0(D)	21.3(D)	.0( )	11.8(D)
		78.	116.	44.	44.	44.	15.				
		.0( )	.6(S)	.0( )	44.0(D)	.0( )	3.1(S)				

1	15.	0.	37.	103.	121.	15.	18.	0.	0.	0.	10.
		.3( )	1.8( )	2.7( )	3.0( )	1.0( )	.9( )	.0( )	.1( )	.0( )	.9( )
		0.	45.	40.	13.	117.	51.	70.	16.	10.	9.
		.0( )	2.7( )	.0( )	.0( )	.0( )	.0( )	34.8(D)	16.3(D)	.0( )	9.2(D)
		62.	79.	35.	35.	35.	15.				
		.0( )	.3(S)	.0( )	34.8(D)	.0( )	3.1(S)				
1	20.	0.	27.	71.	87.	15.	14.	0.	0.	0.	8.
		.2( )	1.5( )	2.2( )	2.5( )	1.0( )	.8( )	.0( )	.1( )	.0( )	.8( )
		0.	31.	37.	9.	85.	37.	49.	13.	8.	7.
		.0( )	1.7( )	.0( )	.0( )	.0( )	.0( )	24.5(D)	12.5(D)	.0( )	7.1(D)
		43.	53.	25.	25.	25.	15.				
		.0( )	.1(S)	.0( )	24.5(D)	.0( )	3.1(S)				
1	25.	0.	17.	56.	71.	15.	10.	0.	0.	0.	6.
		.2( )	1.2( )	1.9( )	2.2( )	1.0( )	.7( )	.0( )	.1( )	.0( )	.7( )
		0.	17.	34.	7.	70.	25.	30.	9.	6.	5.
		.0( )	1.2( )	.0( )	.0( )	.0( )	.0( )	15.1(D)	9.5(D)	.0( )	5.4(D)
		25.	37.	15.	15.	15.	15.				
		.0( )	.0(S)	.0( )	15.1(D)	.0( )	3.1(S)				
1	30.	0.	12.	40.	56.	15.	8.	0.	0.	0.	5.
		.2( )	1.0( )	1.6( )	2.0( )	1.0( )	.6( )	.0( )	.1( )	.0( )	.6( )
		0.	13.	31.	5.	54.	18.	23.	8.	5.	4.
		.0( )	1.0( )	.0( )	.0( )	.0( )	.0( )	11.6(D)	7.9(D)	.0( )	4.4(D)
		19.	22.	12.	12.	12.	15.				
		.0( )	.0(S)	.0( )	11.6(D)	.0( )	3.0(S)				
1	35.	0.	10.	29.	44.	15.	8.	0.	0.	0.	4.
		.1( )	.9( )	1.4( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	10.	29.	4.	43.	16.	18.	7.	4.	4.
		.0( )	.9( )	.0( )	.0( )	.0( )	.0( )	9.2(D)	7.4(D)	.0( )	4.0(D)
		15.	12.	9.	9.	9.	15.				
		.0( )	.0(S)	.0( )	9.2(D)	.0( )	3.0(S)				
1	40.	0.	8.	30.	44.	15.	7.	0.	0.	0.	4.
		.1( )	.8( )	1.4( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	8.	26.	3.	44.	14.	15.	7.	4.	4.
		.0( )	.8( )	.0( )	.0( )	.0( )	.0( )	7.6(D)	7.1(D)	.0( )	3.8(D)
		12.	17.	8.	8.	8.	15.				

		.0( )	.0(S)	.0( )	7.6(D)	.0( )	2.9(S)				
1	45.	0.	7.	27.	43.	15.	7.	0.	0.	0.	4.
		.1( )	.8( )	1.4( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	6.	24.	3.	42.	13.	14.	7.	4.	4.
		.0( )	.7( )	.0( )	.0( )	.0( )	.0( )	6.8(D)	7.1(D)	.0( )	3.8(D)
		10.	9.	7.	7.	7.	15.				
		.0( )	.0(S)	.0( )	6.8(D)	.0( )	2.9(S)				
1	50.	0.	6.	27.	41.	15.	7.	0.	0.	0.	4.
		.1( )	.7( )	1.4( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	21.	3.	42.	12.	12.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	6.1(D)	7.1(D)	.0( )	3.8(D)
		9.	15.	6.	6.	6.	15.				
		.0( )	.0(S)	.0( )	6.1(D)	.0( )	2.8(S)				
1	55.	0.	6.	26.	42.	15.	7.	0.	0.	0.	4.
		.1( )	.7( )	1.3( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	15.	3.	41.	11.	12.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	5.9(D)	7.1(D)	.0( )	3.8(D)
		8.	8.	6.	6.	6.	15.				
		.0( )	.0(S)	.0( )	5.9(D)	.0( )	2.8(S)				
2	0.	0.	6.	26.	41.	15.	7.	0.	0.	0.	4.
		.1( )	.7( )	1.3( )	1.7( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	12.	3.	41.	11.	11.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	5.7(D)	7.1(D)	.0( )	3.8(D)
		8.	15.	6.	6.	6.	15.				
		.0( )	.0(S)	.0( )	5.7(D)	.0( )	2.7(S)				
2	5.	0.	5.	24.	40.	15.	6.	0.	0.	0.	3.
		.1( )	.7( )	1.3( )	1.6( )	1.0( )	.6( )	.0( )	.0( )	.0( )	.5( )
		0.	4.	10.	2.	39.	9.	9.	5.	3.	3.
		.0( )	.5( )	.0( )	.0( )	.0( )	.0( )	4.5(D)	5.1(D)	.0( )	2.8(D)
		7.	6.	5.	5.	5.	15.				
		.0( )	.0(S)	.0( )	4.5(D)	.0( )	2.7(S)				
2	10.	0.	3.	21.	36.	15.	4.	0.	0.	0.	2.
		.1( )	.5( )	1.2( )	1.6( )	1.0( )	.4( )	.0( )	.0( )	.0( )	.4( )
		0.	3.	8.	0.	36.	5.	5.	2.	2.	1.
		.0( )	.5( )	.0( )	.0( )	.0( )	.0( )	2.3(D)	2.4(D)	.0( )	1.5(D)

		5. .0( )	8. .0(S)	2. .0( )	2. 2.3(D)	2. .0( )	15. 2.6(S)				
2	15.	0. .1( )	2. .4( )	18. 1.1( )	33. 1.5( )	14. 1.0( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	1. .2( )
		0. .0( )	2. .4( )	6. .0( )	0. .0( )	33. .0( )	2. .0( )	2. 1.0(D)	0. .0(D)	1. .0( )	0. .0(D)
		2. .0( )	0. .0(S)	1. .0( )	1. 1.0(D)	1. .0( )	14. 2.5(S)				
2	20.	0. .1( )	1. .3( )	15. 1.0( )	29. 1.4( )	14. 1.0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
		0. .0( )	1. .3( )	5. .0( )	0. .0( )	28. .0( )	1. .0( )	1. .5(D)	0. .0(D)	0. .0( )	0. .0(D)
		1. .0( )	2. .0(S)	1. .0( )	1. .5(D)	1. .0( )	14. 2.4(S)				
2	25.	0. .0( )	0. .2( )	16. 1.0( )	24. 1.3( )	14. 1.0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
		0. .0( )	0. .2( )	4. .0( )	0. .0( )	24. .0( )	0. .0( )	0. .2(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .2(D)	0. .0( )	14. 2.3(S)				
2	30.	0. .0( )	0. .1( )	14. 1.0( )	20. 1.2( )	14. 1.0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	20. .0( )	0. .0( )	0. .1(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	1. .0(S)	0. .0( )	0. .1(D)	0. .0( )	14. 2.2(S)				
2	35.	0. .0( )	0. .1( )	14. 1.0( )	19. 1.1( )	14. 1.0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	19. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	14. 2.1(S)				
2	40.	0. .0( )	0. .1( )	14. 1.0( )	18. 1.1( )	14. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	17. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)

		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	14. 2.0(S)				
2	45.	0. .0( )	0. .1( )	14. 1.0( )	16. 1.0( )	14. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	1. .0( )	0. .0( )	16. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 2.0(S)				
2	50.	0. .0( )	0. .1( )	13. 1.0( )	16. 1.0( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	15. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 1.9(S)				
2	55.	0. .0( )	0. .0( )	13. 1.0( )	15. 1.0( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	15. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 1.8(S)				
3	0.	0. .0( )	0. .0( )	13. .9( )	12. .9( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	12. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 1.7(S)				
3	5.	0. .0( )	0. .0( )	13. .9( )	13. 1.0( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	14. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 1.6(S)				
3	10.	0. .0( )	0. .0( )	13. .9( )	13. .9( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0.	0.	0.	0.	11.	0.	0.	0.	0.	0.

		.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0(D)	.0(D)	.0( )	.0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	13. 1.5(S)				
3	15.	0. .0( )	0. .0( )	13. .9( )	13. .9( )	13. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	14. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	12. 1.4(S)				
3	20.	0. .0( )	0. .0( )	12. .9( )	12. .9( )	12. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	11. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	12. 1.3(S)				
3	25.	0. .0( )	0. .0( )	12. .9( )	12. .9( )	12. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	14. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	12. 1.3(S)				
3	30.	0. .0( )	0. .0( )	12. .9( )	12. .9( )	12. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	11. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	12. 1.2(S)				
3	35.	0. .0( )	0. .0( )	11. .9( )	11. .9( )	11. .8( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	13. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )	10. 1.1(S)				
3	40.	0. .0( )	0. .0( )	10. .8( )	10. .8( )	10. .8( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

```
          0.      0.      0.      0.      9.      0.      0.      0.      0.      0.
           .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

          0.      0.      0.      0.      0.      9.
           .0( )   .0(S)   .0( )   .0(D)   .0( )  1.0(S)

 3  45.   0.      0.      9.      9.      9.      0.      0.      0.      0.      0.
           .0( )   .0( )   .8( )   .8( )   .7( )   .0( )   .0( )   .0( )   .0( )   .0( )

          0.      0.      0.      0.     10.      0.      0.      0.      0.      0.
           .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

          0.      0.      0.      0.      0.      8.
           .0( )   .0(S)   .0( )   .0(D)   .0( )  1.0(S)

 3  50.   0.      0.      8.      8.      8.      0.      0.      0.      0.      0.
           .0( )   .0( )   .7( )   .7( )   .7( )   .0( )   .0( )   .0( )   .0( )   .0( )

          0.      0.      0.      0.      6.      0.      0.      0.      0.      0.
           .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

          0.      0.      0.      0.      0.      7.
           .0( )   .0(S)   .0( )   .0(D)   .0( )   .9(S)

 3  55.   0.      0.      7.      7.      7.      0.      0.      0.      0.      0.
           .0( )   .0( )   .7( )   .7( )   .6( )   .0( )   .0( )   .0( )   .0( )   .0( )

          0.      0.      0.      0.      8.      0.      0.      0.      0.      0.
           .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

          0.      0.      0.      0.      0.      6.
           .0( )   .0(S)   .0( )   .0(D)   .0( )   .9(S)

 4   0.   0.      0.      6.      6.      6.      0.      0.      0.      0.      0.
           .0( )   .0( )   .7( )   .7( )   .6( )   .0( )   .0( )   .0( )   .0( )   .0( )

          0.      0.      0.      0.      5.      0.      0.      0.      0.      0.
           .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

          0.      0.      0.      0.      0.      5.
           .0( )   .0(S)   .0( )   .0(D)   .0( )   .8(S)
1

 JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
 DESIGN PLAN CONVEYANCE SYSTEM-LOWER TRIB   100 YEAR


 *** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

   CONVEYANCE   PEAK      STAGE      STORAGE      TIME
```

ELEMENT	(CFS)	(FT)	(AC-FT)	(HR/MIN)	
11	0.	.0		0	0.
107	55.	(DIRECT FLOW)		0	35.
9	2.	.6		0	40.
105	107.	(DIRECT FLOW)		0	35.
24	122.	3.4		0	40.
7	8.	.6		0	40.
122	203.	(DIRECT FLOW)		0	40.
8	8.	1.3		0	40.
104	250.	(DIRECT FLOW)		0	40.
2	97.	3.1		0	35.
6	94.	2.2		0	35.
103	192.	(DIRECT FLOW)		0	35.
307	15.	.1	3.1	1	20.
304	155.	(DIRECT FLOW)		0	40.
202	137.	.1	1.5	0	50.
5	15.	1.0		1	20.
305	155.	(DIRECT FLOW)		0	40.
3	151.	3.4		0	50.
10	51.	2.3		0	35.
1	16.	2.4		0	45.
102	168.	(DIRECT FLOW)		0	50.
306	120.	(DIRECT FLOW)		0	35.
106	51.	(DIRECT FLOW)		0	35.
101	73.	(DIRECT FLOW)		0	40.
100	54.	(DIRECT FLOW)		0	45.
4	168.	3.7		0	50.

APPENDIX C

DESIGN PLAN COMPUTER PRINTOUTS

UPPER TRIBUTARY

This appendix contains complete design plan computer printouts. Design plan printouts are for future land use and recommended design plan hydraulic conditions. Printouts for both the CUHPF95 and UDSWM95 models are included. 10 year and 100 year runs are included.

APPENDIX C

UPPER TRIBUTARY

CUHPF95 - 10 YR

FULLY DEVELOPED LAND USE CONDITIONS

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 2      JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB
01  10 YR    10 1.86

 71    5.0     9  09  FUTURE CONDITIONS
0.038 0.33 0.18 35.0 .010  20. 0.50 0.10 4.50.0018 0.60
 71    5.0    10  10  FUTURE CONDITIONS
0.034 0.34 0.17 15.0 .054  11. 0.50 0.10 3.30.0018 0.52
 71    5.0    11  11  FUTURE CONDITIONS
0.041 0.30 0.15 40.0 .048  13. 0.50 0.10 3.60.0018 0.54
 71    5.0    12  12  FUTURE CONDITIONS
0.040 0.39 0.24 25.0 .057  13. 0.50 0.10 3.30.0018 0.52
 71    5.0    13  13  FUTURE CONDITIONS
0.045 0.35 0.22 33.0 .009  20. 0.40 0.07 4.50.0018 0.60
 71    5.0    14  14  FUTURE CONDITIONS
0.010 0.16 0.04 68.0 .012  15. 0.40 0.07 4.50.0018 0.60
 71    5.0    15  15  FUTURE CONDITIONS
0.038 0.33 0.11 31.0 .055  16. 0.50 0.07 3.90.0018 0.56
 71    5.0    16  16  FUTURE CONDITIONS
0.086 0.48 0.17 26.0 .043  16. 0.50 0.07 3.70.0018 0.55
 71    5.0    17  17  FUTURE CONDITIONS
0.051 0.40 0.19  7.0 .027  40. 0.60 0.10 4.40.0018 0.60
 71    5.0    18  18  FUTURE CONDITIONS
0.020 0.27 0.16 40.0 .014  14. 0.40 0.07 4.50.0018 0.60
 71    5.0    19  19  FUTURE CONDITIONS
0.014 0.29 0.11 40.0 .036  16. 0.40 0.07 4.50.0018 0.60
E
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 9 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.33	.18	35.00	.0100	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.096	.278

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .70

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.60	20.00	2092.89	79.53	2.03

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.98)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .43

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	34.	40.	10.
5.	67.	25.	25.	45.	8.
10.	72.	30.	19.	50.	0.
15.	48.	35.	14.	0.	0.

1 BASIN ID: 9 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.026	12.
5.	.04	.000	0.	70.	.06	.026	10.
10.	.07	.001	0.	75.	.06	.026	8.
15.	.15	.035	2.	80.	.05	.015	7.

20.	.28	.074	8.	85.	.04	.010	6.
25.	.47	.243	23.	90.	.04	.010	5.
30.	.22	.176	34.	95.	.04	.010	4.
35.	.10	.064	32.	100.	.04	.010	4.
40.	.08	.042	27.	105.	.04	.010	4.
45.	.07	.035	22.	110.	.04	.010	3.
50.	.06	.025	19.	115.	.03	.008	3.
55.	.06	.025	16.	120.	.02	.006	3.
60.	.06	.026	14.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

```
TOTAL PRECIP. =  2.15 (1-HOUR RAIN =  1.86)      EXCESS PRECIP. =  .914  INCHES
VOLUME OF EXCESS PRECIP =    1.85  ACRE-FEET
PEAK Q =    34. CFS       TIME OF PEAK =  30. MIN.
INFILT.= 4.50 IN/HR    DECAY = .00180    FNINF =  .60 IN/HR
MAX.PERV.RET.= .50 IN.     MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C =          .42
                 I =         3.7 INCHES/HOUR
                 A =        24.3 ACRES
                 Q =         38. CFS
```

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 10   -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.34	.17	15.00	.0540	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.118	.179

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .10	D= .30

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	11.00	1376.36	46.80	1.81

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.12)

WIDTH AT 50 = 22. MIN.   WIDTH AT 75 = 11. MIN. K50 = .21 K75 = .28

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN.   MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR.   DECAY = .00180/SECOND   FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	23.	50.	12.
5.	40.	30.	20.	55.	11.
10.	43.	35.	18.	60.	10.
15.	34.	40.	16.	65.	8.
20.	30.	45.	14.	70.	0.

1 BASIN ID: 10 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.022	12.
5.	.04	.000	0.	70.	.06	.022	12.
10.	.07	.000	0.	75.	.06	.022	11.
15.	.15	.007	0.	80.	.05	.009	10.
20.	.28	.033	2.	85.	.04	.004	9.
25.	.47	.216	10.	90.	.04	.004	6.
30.	.22	.175	18.	95.	.04	.004	4.
35.	.10	.061	18.	100.	.04	.004	3.
40.	.08	.039	17.	105.	.04	.004	3.
45.	.07	.031	16.	110.	.04	.004	3.
50.	.06	.021	14.	115.	.03	.003	2.
55.	.06	.022	13.	120.	.02	.002	2.
60.	.06	.022	13.	125.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .733 INCHES
VOLUME OF EXCESS PRECIP = 1.33 ACRE-FEET
PEAK Q = 18. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .34
I = 4.8 INCHES/HOUR
A = 21.8 ACRES
Q = 36. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 11 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.30	.15	40.00	.0480	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.323

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	2482.46	101.78	2.19

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.12)

WIDTH AT 50 = 12. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.60 IN./HR. DECAY = .00180/SECOND FNINFL = .54 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	36.	40.	8.
5.	82.	25.	24.	45.	0.
10.	87.	30.	17.	0.	0.
15.	53.	35.	11.	0.	0.

1 BASIN ID: 11 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.031	12.
5.	.04	.000	0.	70.	.06	.031	11.
10.	.07	.002	0.	75.	.06	.031	10.
15.	.15	.046	4.	80.	.05	.019	9.
20.	.28	.088	11.	85.	.04	.012	7.
25.	.47	.287	34.	90.	.04	.012	6.
30.	.22	.184	47.	95.	.04	.012	5.
35.	.10	.071	41.	100.	.04	.012	5.
40.	.08	.049	33.	105.	.04	.012	4.
45.	.07	.041	27.	110.	.04	.012	4.
50.	.06	.030	22.	115.	.03	.010	4.
55.	.06	.031	18.	120.	.02	.007	3.
60.	.06	.031	15.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.063 INCHES
VOLUME OF EXCESS PRECIP = 2.32 ACRE-FEET
PEAK Q = 47. CFS TIME OF PEAK = 30. MIN.
INFILT.= 3.60 IN/HR DECAY = .00180 FNINF = .54 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .49
I = 4.5 INCHES/HOUR

A = 26.2 ACRES
Q = 58. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 12 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.39	.24	25.00	.0570	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.104	.218

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .50

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	1677.36	67.09	2.13

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.50)

WIDTH AT 50 = 18. MIN. WIDTH AT 75 = 9. MIN. K50 = .25 K75 = .34

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	28.	50.	10.
5.	57.	30.	23.	55.	8.
10.	61.	35.	18.	60.	0.
15.	47.	40.	15.	0.	0.
20.	36.	45.	12.	0.	0.

1 BASIN ID: 12 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.026	15.

5.	.04	.000	0.	70.	.06	.026	13.
10.	.07	.001	0.	75.	.06	.026	12.
15.	.15	.018	1.	80.	.05	.013	9.
20.	.28	.059	4.	85.	.04	.008	7.
25.	.47	.250	19.	90.	.04	.008	6.
30.	.22	.179	29.	95.	.04	.008	5.
35.	.10	.065	29.	100.	.04	.008	4.
40.	.08	.043	26.	105.	.04	.008	4.
45.	.07	.036	23.	110.	.04	.008	3.
50.	.06	.025	20.	115.	.03	.006	3.
55.	.06	.026	18.	120.	.02	.004	2.
60.	.06	.026	16.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .874 INCHES
VOLUME OF EXCESS PRECIP = 1.87 ACRE-FEET
PEAK Q = 29. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .41
I = 4.5 INCHES/HOUR
A = 25.6 ACRES
Q = 47. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 13 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.05	.35	.22	33.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.097	.270

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .66

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	20.00	2076.29	93.43	2.40

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 7.77)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 8. MIN. K50 = .31 K75 = .42

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN.   MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR.   DECAY = .00180/SECOND   FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	40.	40.	12.
5.	80.	25.	30.	45.	9.
10.	84.	30.	22.	50.	0.
15.	57.	35.	16.	0.	0.

1 BASIN ID: 13 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.025	14.
5.	.04	.000	0.	70.	.06	.025	11.
10.	.07	.007	1.	75.	.06	.025	9.
15.	.15	.032	3.	80.	.05	.014	8.
20.	.28	.081	10.	85.	.04	.009	7.
25.	.47	.292	32.	90.	.04	.009	6.
30.	.22	.175	45.	95.	.04	.009	5.
35.	.10	.062	41.	100.	.04	.009	4.
40.	.08	.041	33.	105.	.04	.009	4.
45.	.07	.034	28.	110.	.04	.009	4.
50.	.06	.024	23.	115.	.03	.008	3.
55.	.06	.024	19.	120.	.02	.005	3.
60.	.06	.025	16.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86)   EXCESS PRECIP. = .956 INCHES
VOLUME OF EXCESS PRECIP = 2.29 ACRE-FEET
PEAK Q = 45. CFS   TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR   DECAY = .00180   FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN.   MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .44
I = 3.7 INCHES/HOUR
A = 28.8 ACRES
Q = 47. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 14 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.16	.04	68.00	.0120	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.081	.374

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .29	D= .94

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	2872.21	28.72	.53

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 3.74)

WIDTH AT 50 = 10. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	14.	30.	8.
5.	21.	20.	12.	35.	0.
10.	23.	25.	10.	0.	0.

1 BASIN ID: 14 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	60.	.06	.041	4.
5.	.04	.000	0.	65.	.06	.041	4.
10.	.07	.022	0.	70.	.06	.041	4.
15.	.15	.093	2.	75.	.06	.041	4.
20.	.28	.169	6.	80.	.05	.030	3.
25.	.47	.376	14.	85.	.04	.021	3.
30.	.22	.194	17.	90.	.04	.021	3.
35.	.10	.082	15.	95.	.04	.021	2.
40.	.08	.059	13.	100.	.04	.021	2.
45.	.07	.051	11.	105.	.04	.021	2.
50.	.06	.041	9.	110.	.04	.021	2.
55.	.06	.041	6.	115.	.03	.019	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.487 INCHES
VOLUME OF EXCESS PRECIP = .79 ACRE-FEET
PEAK Q = 17. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .69
I = 4.2 INCHES/HOUR

A = 6.4 ACRES
Q = 19. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 15 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.33	.11	31.00	.0550	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.099	.250

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .16	D= .62

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	1921.94	73.03	2.03

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.92)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 8. MIN. K50 = .29 K75 = .39

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 3.90 IN./HR. DECAY = .00180/SECOND FNINFL = .56 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	34.	40.	12.
5.	62.	25.	26.	45.	9.
10.	66.	30.	20.	50.	0.
15.	47.	35.	16.	0.	0.

1 BASIN ID: 15 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.026	13.
5.	.04	.000	0.	70.	.06	.026	10.

10.	.07	.007	0.	75.	.06	.026	8.
15.	.15	.028	2.	80.	.05	.014	7.
20.	.28	.069	6.	85.	.04	.009	6.
25.	.47	.248	22.	90.	.04	.009	5.
30.	.22	.178	32.	95.	.04	.009	4.
35.	.10	.065	31.	100.	.04	.009	4.
40.	.08	.043	26.	105.	.04	.009	3.
45.	.07	.035	23.	110.	.04	.009	3.
50.	.06	.025	19.	115.	.03	.008	3.
55.	.06	.026	17.	120.	.02	.005	2.
60.	.06	.026	15.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

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TOTAL PRECIP. =  2.15 (1-HOUR RAIN =  1.86)      EXCESS PRECIP. =  .910  INCHES
VOLUME OF EXCESS PRECIP =    1.84  ACRE-FEET
PEAK Q =    32. CFS       TIME OF PEAK =  30. MIN.
INFILT.= 3.90 IN/HR     DECAY = .00180     FNINF =  .56 IN/HR
MAX.PERV.RET.= .50 IN.      MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C =         .42
                 I =        4.1 INCHES/HOUR
                 A =       24.3 ACRES
                 Q =        42. CFS
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 16   -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.09	.48	.17	26.00	.0430	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.103	.251

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .52

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	1924.24	165.48	4.59

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.46)

WIDTH AT 50 = 16. MIN.   WIDTH AT 75 =   8. MIN. K50 = .29 K75 = .39

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN.   MAX. IMPERVIOUS RET. = .07 IN.

INFILTRATION = 3.70 IN./HR.   DECAY = .00180/SECOND   FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	56.	50.	12.
5.	141.	30.	41.	55.	9.
10.	150.	35.	31.	60.	0.
15.	107.	40.	23.	0.	0.
20.	76.	45.	17.	0.	0.

1   BASIN ID: 16 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	70.	.06	.025	23.
5.	.04	.000	0.	75.	.06	.025	21.
10.	.07	.005	1.	80.	.05	.012	17.
15.	.15	.020	3.	85.	.04	.008	13.
20.	.28	.059	12.	90.	.04	.008	10.
25.	.47	.238	45.	95.	.04	.008	9.
30.	.22	.176	69.	100.	.04	.008	8.
35.	.10	.063	67.	105.	.04	.008	7.
40.	.08	.042	57.	110.	.04	.008	6.
45.	.07	.034	48.	115.	.03	.006	6.
50.	.06	.024	40.	120.	.02	.004	5.
55.	.06	.024	34.	125.	.00	.000	3.
60.	.06	.024	29.	130.	.00	.000	2.
65.	.06	.025	26.	135.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86)   EXCESS PRECIP. = .850 INCHES
VOLUME OF EXCESS PRECIP =   3.90 ACRE-FEET
PEAK Q =   69. CFS   TIME OF PEAK = 30. MIN.
INFILT.= 3.70 IN/HR   DECAY = .00180   FNINF = .55 IN/HR
MAX.PERV.RET.= .50 IN.   MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C =   .39
I =   4.1 INCHES/HOUR
A =   55.0 ACRES
Q =   89. CFS

1   U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 17 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.05	.40	.19	7.00	.0270	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.137	.193

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .14

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
9.44	40.00	1066.06	54.37	2.72

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 8.18)

WIDTH AT 50 = 28. MIN. WIDTH AT 75 = 15. MIN. K50 = .20 K75 = .27

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .60 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.40 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	35.	25.	70.	12.
5.	38.	40.	23.	75.	10.
10.	54.	45.	20.	80.	9.
15.	43.	50.	18.	85.	8.
20.	41.	55.	16.	90.	7.
25.	35.	60.	15.	95.	0.
30.	29.	65.	13.	0.	0.

1 BASIN ID: 17 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.06	.012	9.
5.	.04	.000	0.	70.	.06	.013	9.
10.	.07	.000	0.	75.	.06	.013	9.
15.	.15	.001	0.	80.	.05	.003	8.
20.	.28	.003	0.	85.	.04	.001	7.
25.	.47	.055	2.	90.	.04	.001	7.
30.	.22	.151	9.	95.	.04	.001	6.
35.	.10	.048	13.	100.	.04	.001	5.
40.	.08	.028	13.	105.	.04	.001	5.
45.	.07	.021	13.	110.	.04	.001	4.
50.	.06	.011	12.	115.	.03	.001	4.
55.	.06	.012	11.	120.	.02	.000	2.
60.	.06	.012	10.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = .392 INCHES
VOLUME OF EXCESS PRECIP = 1.07 ACRE-FEET

PEAK Q = 13. CFS   TIME OF PEAK = 45. MIN.
INFILT.= 4.40 IN/HR   DECAY = .00180   FNINF = .60 IN/HR
MAX.PERV.RET.= .60 IN.   MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .18
I = 2.4 INCHES/HOUR
A = 32.6 ACRES
Q = 15. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 18 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.02	.27	.16	40.00	.0140	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.290

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	14.00	2229.05	44.58	1.07

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.95)

WIDTH AT 50 = 13. MIN.   WIDTH AT 75 = 7. MIN.   K50 = .33   K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN.   MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR.   DECAY = .00180/SECOND   FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	19.	40.	8.
5.	38.	25.	15.	45.	0.
10.	39.	30.	12.	0.	0.
15.	25.	35.	10.	0.	0.

1 BASIN ID: 18 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 10 YR

INCREMENT	TOTAL*	STORM**	INCREMENT	TOTAL*	STORM**

TIME (MIN.)	RAINFALL (IN)	EXCESS PRECIP	HYDROGRAPH (CFS)	TIME (MIN.)	RAINFALL (IN)	EXCESS PRECIP	HYDROGRAPH (CFS)
0.	.00	.000	0.	60.	.06	.028	9.
5.	.04	.000	0.	65.	.06	.028	7.
10.	.07	.011	0.	70.	.06	.028	5.
15.	.15	.046	2.	75.	.06	.028	5.
20.	.28	.095	6.	80.	.05	.017	4.
25.	.47	.310	17.	85.	.04	.012	4.
30.	.22	.179	22.	90.	.04	.012	3.
35.	.10	.066	20.	95.	.04	.012	3.
40.	.08	.045	17.	100.	.04	.012	3.
45.	.07	.037	15.	105.	.04	.012	2.
50.	.06	.027	13.	110.	.04	.012	2.
55.	.06	.028	11.	115.	.03	.010	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.062 INCHES
VOLUME OF EXCESS PRECIP = 1.13 ACRE-FEET
PEAK Q = 22. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .49
I = 4.4 INCHES/HOUR
A = 12.8 ACRES
Q = 27. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 19 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.29	.11	40.00	.0360	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.275

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	2112.93	29.58	.75

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.88)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .43

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	14.	40.	8.
5.	25.	25.	12.	45.	0.
10.	27.	30.	11.	0.	0.
15.	18.	35.	9.	0.	0.

1 BASIN ID: 19 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 10 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	60.	.06	.028	8.
5.	.04	.000	0.	65.	.06	.028	5.
10.	.07	.011	0.	70.	.06	.028	4.
15.	.15	.046	1.	75.	.06	.028	4.
20.	.28	.095	4.	80.	.05	.017	3.
25.	.47	.310	11.	85.	.04	.012	3.
30.	.22	.179	15.	90.	.04	.012	2.
35.	.10	.066	14.	95.	.04	.012	2.
40.	.08	.045	12.	100.	.04	.012	2.
45.	.07	.037	11.	105.	.04	.012	2.
50.	.06	.027	10.	110.	.04	.012	2.
55.	.06	.028	9.	115.	.03	.010	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 2.15 (1-HOUR RAIN = 1.86) EXCESS PRECIP. = 1.062 INCHES
VOLUME OF EXCESS PRECIP = .79 ACRE-FEET
PEAK Q = 15. CFS TIME OF PEAK = 30. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .49
I = 4.1 INCHES/HOUR
A = 9.0 ACRES
Q = 18. CFS

1 U.D.F.C.D. CUHPF RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPF/PC VERSION 1.0 MODIFIED IN DEC 1993 TO WRITE OUTPUT
FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT
USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUT FILE FOR THIS RUN OF CUHPF.

APPENDIX C

UPPER TRIBUTARY

CUHPF95 - 100 YR

FULLY DEVELOPED LAND USE CONDITIONS

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 2      JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB
01 100 YR   100 2.95

 71    5.0     9  09  FUTURE CONDITIONS
0.038 0.33 0.18 35.0 .010  20. 0.50 0.10 4.50.0018 0.60
 71    5.0    10  10  FUTURE CONDITIONS
0.034 0.34 0.17 15.0 .054  11. 0.50 0.10 3.30.0018 0.52
 71    5.0    11  11  FUTURE CONDITIONS
0.041 0.30 0.15 40.0 .048  13. 0.50 0.10 3.60.0018 0.54
 71    5.0    12  12  FUTURE CONDITIONS
0.040 0.39 0.24 25.0 .057  13. 0.50 0.10 3.30.0018 0.52
 71    5.0    13  13  FUTURE CONDITIONS
0.045 0.35 0.22 33.0 .009  20. 0.40 0.07 4.50.0018 0.60
 71    5.0    14  14  FUTURE CONDITIONS
0.010 0.16 0.04 68.0 .012  15. 0.40 0.07 4.50.0018 0.60
 71    5.0    15  15  FUTURE CONDITIONS
0.038 0.33 0.11 31.0 .055  16. 0.50 0.07 3.90.0018 0.56
 71    5.0    16  16  FUTURE CONDITIONS
0.086 0.48 0.17 26.0 .043  16. 0.50 0.07 3.70.0018 0.55
 71    5.0    17  17  FUTURE CONDITIONS
0.051 0.40 0.19  7.0 .027  40. 0.60 0.10 4.40.0018 0.60
 71    5.0    18  18  FUTURE CONDITIONS
0.020 0.27 0.16 40.0 .014  14. 0.40 0.07 4.50.0018 0.60
 71    5.0    19  19  FUTURE CONDITIONS
0.014 0.29 0.11 40.0 .036  16. 0.40 0.07 4.50.0018 0.60
E
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1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 9 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.33	.18	35.00	.0100	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.096	.278

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .70

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.60	20.00	2092.89	79.53	2.03

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.98)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .43

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	34.	40.	10.
5.	67.	25.	25.	45.	8.
10.	72.	30.	19.	50.	0.
15.	48.	35.	14.	0.	0.

1 BASIN ID: 9 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.083	40.
5.	.03	.000	0.	70.	.06	.025	32.
10.	.09	.004	0.	75.	.06	.025	21.
15.	.14	.032	2.	80.	.04	.010	15.

20.	.24	.055	6.	85.	.04	.010	11.
25.	.41	.171	17.	90.	.04	.010	8.
30.	.74	.667	61.	95.	.04	.010	6.
35.	.41	.367	84.	100.	.04	.010	5.
40.	.24	.196	80.	105.	.04	.010	4.
45.	.18	.145	70.	110.	.04	.010	3.
50.	.15	.111	61.	115.	.04	.010	3.
55.	.12	.083	52.	120.	.04	.010	3.
60.	.12	.083	45.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.138 INCHES
VOLUME OF EXCESS PRECIP = 4.33 ACRE-FEET
PEAK Q = 84. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .63
I = 5.8 INCHES/HOUR
A = 24.3 ACRES
Q = 88. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 10 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.03	.34	.17	15.00	.0540	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.118	.179

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .10	D= .30

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	11.00	1376.36	46.80	1.81

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.12)

WIDTH AT 50 = 22. MIN. WIDTH AT 75 = 11. MIN. K50 = .21 K75 = .28

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	23.	50.	12.
5.	40.	30.	20.	55.	11.
10.	43.	35.	18.	60.	10.
15.	34.	40.	16.	65.	8.
20.	30.	45.	14.	70.	0.

1 BASIN ID: 10 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.080	39.
5.	.03	.000	0.	70.	.06	.022	35.
10.	.09	.001	0.	75.	.06	.022	32.
15.	.14	.006	0.	80.	.04	.004	28.
20.	.24	.020	1.	85.	.04	.004	24.
25.	.41	.119	6.	90.	.04	.004	21.
30.	.74	.685	33.	95.	.04	.004	13.
35.	.41	.367	49.	100.	.04	.004	9.
40.	.24	.194	51.	105.	.04	.004	7.
45.	.18	.143	50.	110.	.04	.004	5.
50.	.15	.108	47.	115.	.04	.004	4.
55.	.12	.080	43.	120.	.04	.004	3.
60.	.12	.080	41.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.965 INCHES
VOLUME OF EXCESS PRECIP = 3.56 ACRE-FEET
PEAK Q = 51. CFS TIME OF PEAK = 40. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .58
I = 7.7 INCHES/HOUR
A = 21.8 ACRES
Q = 96. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 11 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.30	.15	40.00	.0480	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.323

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	2482.46	101.78	2.19

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.12)

WIDTH AT 50 = 12. MIN. WIDTH AT 75 = 6. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.60 IN./HR. DECAY = .00180/SECOND FNINFL = .54 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	36.	40.	8.
5.	82.	25.	24.	45.	0.
10.	87.	30.	17.	0.	0.
15.	53.	35.	11.	0.	0.

1 BASIN ID: 11 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.088	40.
5.	.03	.000	0.	70.	.06	.031	29.
10.	.09	.005	0.	75.	.06	.031	20.
15.	.14	.041	4.	80.	.04	.012	15.
20.	.24	.072	10.	85.	.04	.012	10.
25.	.41	.199	25.	90.	.04	.012	8.
30.	.74	.688	79.	95.	.04	.012	6.
35.	.41	.373	105.	100.	.04	.012	5.
40.	.24	.202	95.	105.	.04	.012	4.
45.	.18	.151	81.	110.	.04	.012	4.
50.	.15	.117	68.	115.	.04	.012	4.
55.	.12	.088	56.	120.	.04	.012	4.
60.	.12	.088	47.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.285 INCHES
VOLUME OF EXCESS PRECIP = 5.00 ACRE-FEET
PEAK Q = 105. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.60 IN/HR DECAY = .00180 FNINF = .54 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .67
I = 7.1 INCHES/HOUR

A = 26.2 ACRES
Q = 125. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 12 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.39	.24	25.00	.0570	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.104	.218

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .50

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	13.00	1677.36	67.09	2.13

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.50)

WIDTH AT 50 = 18. MIN. WIDTH AT 75 = 9. MIN. K50 = .25 K75 = .34

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.30 IN./HR. DECAY = .00180/SECOND FNINFL = .52 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	28.	50.	10.
5.	57.	30.	23.	55.	8.
10.	61.	35.	18.	60.	0.
15.	47.	40.	15.	0.	0.
20.	36.	45.	12.	0.	0.

1 BASIN ID: 12 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.084	46.

5.	.03	.000	0.	70.	.06	.026	39.
10.	.09	.002	0.	75.	.06	.026	33.
15.	.14	.016	1.	80.	.04	.008	26.
20.	.24	.040	3.	85.	.04	.008	17.
25.	.41	.159	12.	90.	.04	.008	12.
30.	.74	.687	52.	95.	.04	.008	9.
35.	.41	.370	73.	100.	.04	.008	7.
40.	.24	.198	74.	105.	.04	.008	5.
45.	.18	.146	68.	110.	.04	.008	4.
50.	.15	.112	62.	115.	.04	.008	3.
55.	.12	.083	55.	120.	.04	.008	3.
60.	.12	.084	50.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.102 INCHES
VOLUME OF EXCESS PRECIP = 4.48 ACRE-FEET
PEAK Q = 74. CFS TIME OF PEAK = 40. MIN.
INFILT.= 3.30 IN/HR DECAY = .00180 FNINF = .52 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .62
I = 7.1 INCHES/HOUR
A = 25.6 ACRES
Q = 113. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 13 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.05	.35	.22	33.00	.0090	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.097	.270

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .17	D= .66

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	20.00	2076.29	93.43	2.40

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 7.77)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 8. MIN. K50 = .31 K75 = .42

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN.   MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR.   DECAY = .00180/SECOND   FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	40.	40.	12.
5.	80.	25.	30.	45.	9.
10.	84.	30.	22.	50.	0.
15.	57.	35.	16.	0.	0.

1 BASIN ID: 13 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.082	47.
5.	.03	.000	0.	70.	.06	.024	37.
10.	.09	.010	1.	75.	.06	.024	25.
15.	.14	.028	3.	80.	.04	.009	17.
20.	.24	.059	8.	85.	.04	.009	12.
25.	.41	.207	23.	90.	.04	.009	9.
30.	.74	.681	76.	95.	.04	.009	7.
35.	.41	.366	102.	100.	.04	.009	5.
40.	.24	.195	96.	105.	.04	.009	4.
45.	.18	.144	84.	110.	.04	.009	4.
50.	.15	.110	73.	115.	.04	.009	3.
55.	.12	.082	62.	120.	.04	.009	3.
60.	.12	.082	53.	125.	.00	.000	3.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95)   EXCESS PRECIP. = 2.181 INCHES
VOLUME OF EXCESS PRECIP = 5.23 ACRE-FEET
PEAK Q = 102. CFS   TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR   DECAY = .00180   FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN.   MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .64
I = 5.8 INCHES/HOUR
A = 28.8 ACRES
Q = 107. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 14 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.16	.04	68.00	.0120	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.081	.374

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .29	D= .94

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	15.00	2872.21	28.72	.53

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 3.74)

WIDTH AT 50 = 10. MIN. WIDTH AT 75 = 5. MIN. K50 = .35 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	15.	14.	30.	8.
5.	21.	20.	12.	35.	0.
10.	23.	25.	10.	0.	0.

1 BASIN ID: 14 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.098	10.
5.	.03	.000	0.	70.	.06	.041	8.
10.	.09	.029	1.	75.	.06	.041	6.
15.	.14	.082	2.	80.	.04	.022	5.
20.	.24	.143	5.	85.	.04	.022	4.
25.	.41	.304	11.	90.	.04	.022	3.
30.	.74	.691	25.	95.	.04	.022	2.
35.	.41	.380	31.	100.	.04	.022	2.
40.	.24	.210	29.	105.	.04	.022	2.
45.	.18	.160	26.	110.	.04	.022	2.
50.	.15	.126	23.	115.	.04	.022	2.
55.	.12	.098	19.	120.	.04	.022	2.
60.	.12	.098	13.	125.	.00	.000	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.695 INCHES
VOLUME OF EXCESS PRECIP = 1.44 ACRE-FEET
PEAK Q = 31. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .79

I = 6.7 INCHES/HOUR
A = 6.4 ACRES
Q = 34. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 15 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.04	.33	.11	31.00	.0550	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.099	.250

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .16	D= .62

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	1921.94	73.03	2.03

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER,
REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.92)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 8. MIN. K50 = .29 K75 = .39

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 3.90 IN./HR. DECAY = .00180/SECOND FNINFL = .56 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	34.	40.	12.
5.	62.	25.	26.	45.	9.
10.	66.	30.	20.	50.	0.
15.	47.	35.	16.	0.	0.

1 BASIN ID: 15 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.084	42.

5.	.03	.000	0.	70.	.06	.026	34.
10.	.09	.009	1.	75.	.06	.026	23.
15.	.14	.025	2.	80.	.04	.009	16.
20.	.24	.048	5.	85.	.04	.009	11.
25.	.41	.162	15.	90.	.04	.009	8.
30.	.74	.684	57.	95.	.04	.009	6.
35.	.41	.369	78.	100.	.04	.009	5.
40.	.24	.197	76.	105.	.04	.009	4.
45.	.18	.146	69.	110.	.04	.009	3.
50.	.15	.112	61.	115.	.04	.009	3.
55.	.12	.083	53.	120.	.04	.009	3.
60.	.12	.084	47.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.136 INCHES
VOLUME OF EXCESS PRECIP = 4.33 ACRE-FEET
PEAK Q = 78. CFS TIME OF PEAK = 35. MIN.
INFILT.= 3.90 IN/HR DECAY = .00180 FNINF = .56 IN/HR
MAX.PERV.RET.= .50 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .63
I = 6.5 INCHES/HOUR
A = 24.3 ACRES
Q = 99. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 16 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.09	.48	.17	26.00	.0430	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.103	.251

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .14	D= .52

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	1924.24	165.48	4.59

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 6.46)

WIDTH AT 50 = 16. MIN. WIDTH AT 75 = 8. MIN. K50 = .29 K75 = .39

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .50 IN.   MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 3.70 IN./HR.   DECAY = .00180/SECOND   FNINFL = .55 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	25.	56.	50.	12.
5.	141.	30.	41.	55.	9.
10.	150.	35.	31.	60.	0.
15.	107.	40.	23.	0.	0.
20.	76.	45.	17.	0.	0.

1 BASIN ID: 16 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 ****   DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	70.	.06	.024	71.
5.	.03	.000	0.	75.	.06	.024	56.
10.	.09	.006	1.	80.	.04	.008	42.
15.	.14	.017	3.	85.	.04	.008	28.
20.	.24	.040	9.	90.	.04	.008	19.
25.	.41	.148	29.	95.	.04	.008	14.
30.	.74	.684	125.	100.	.04	.008	11.
35.	.41	.368	175.	105.	.04	.008	9.
40.	.24	.196	170.	110.	.04	.008	7.
45.	.18	.145	152.	115.	.04	.008	6.
50.	.15	.111	132.	120.	.04	.008	5.
55.	.12	.082	113.	125.	.00	.000	4.
60.	.12	.082	98.	130.	.00	.000	3.
65.	.12	.082	87.	135.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95)   EXCESS PRECIP. = 2.078 INCHES
VOLUME OF EXCESS PRECIP = 9.53 ACRE-FEET
PEAK Q = 175. CFS   TIME OF PEAK = 35. MIN.
INFILT.= 3.70 IN/HR   DECAY = .00180   FNINF = .55 IN/HR
MAX.PERV.RET.= .50 IN.   MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .61
I = 6.5 INCHES/HOUR
A = 55.0 ACRES
Q = 217. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS   EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 17 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.05	.40	.19	7.00	.0270	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)   COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)

.137 .193

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .07	D= .14

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
9.44	40.00	1066.06	54.37	2.72

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 8.18)

WIDTH AT 50 = 28. MIN. WIDTH AT 75 = 15. MIN. K50 = .20 K75 = .27

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .60 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 4.40 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	35.	25.	70.	12.
5.	38.	40.	23.	75.	10.
10.	54.	45.	20.	80.	9.
15.	43.	50.	18.	85.	8.
20.	41.	55.	16.	90.	7.
25.	35.	60.	15.	95.	0.
30.	29.	65.	13.	0.	0.

1 BASIN ID: 17 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	75.	.06	.012	38.
5.	.03	.000	0.	80.	.04	.001	34.
10.	.09	.000	0.	85.	.04	.001	30.
15.	.14	.001	0.	90.	.04	.001	27.
20.	.24	.002	0.	95.	.04	.001	24.
25.	.41	.040	2.	100.	.04	.001	22.
30.	.74	.567	24.	105.	.04	.001	19.
35.	.41	.356	46.	110.	.04	.001	17.
40.	.24	.184	52.	115.	.04	.001	15.
45.	.18	.133	55.	120.	.04	.001	10.
50.	.15	.099	54.	125.	.00	.000	7.
55.	.12	.070	51.	130.	.00	.000	5.
60.	.12	.070	48.	135.	.00	.000	3.
65.	.12	.071	46.	140.	.00	.000	2.
70.	.06	.012	43.	145.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 1.630 INCHES
VOLUME OF EXCESS PRECIP = 4.43 ACRE-FEET
PEAK Q = 55. CFS TIME OF PEAK = 45. MIN.
INFILT.= 4.40 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .60 IN. MAX.IMP.RET.= .10 IN.

RATIONAL FORMULA C = .48
I = 3.9 INCHES/HOUR
A = 32.6 ACRES
Q = 60. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 18 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.02	.27	.16	40.00	.0140	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.290

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	14.00	2229.05	44.58	1.07

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 5.95)

WIDTH AT 50 = 13. MIN. WIDTH AT 75 = 7. MIN. K50 = .33 K75 = .45

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	19.	40.	8.
5.	38.	25.	15.	45.	0.
10.	39.	30.	12.	0.	0.
15.	25.	35.	10.	0.	0.

1 BASIN ID: 18 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	65.	.12	.085	25.
5.	.03	.000	0.	70.	.06	.028	17.
10.	.09	.015	1.	75.	.06	.028	12.
15.	.14	.041	2.	80.	.04	.012	9.
20.	.24	.072	5.	85.	.04	.012	6.
25.	.41	.229	13.	90.	.04	.012	5.
30.	.74	.683	38.	95.	.04	.012	4.
35.	.41	.369	49.	100.	.04	.012	3.
40.	.24	.198	46.	105.	.04	.012	2.
45.	.18	.147	41.	110.	.04	.012	2.
50.	.15	.113	37.	115.	.04	.012	2.
55.	.12	.085	32.	120.	.04	.012	2.
60.	.12	.085	28.	125.	.00	.000	2.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.284 INCHES
VOLUME OF EXCESS PRECIP = 2.44 ACRE-FEET
PEAK Q = 49. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .67
I = 6.9 INCHES/HOUR
A = 12.8 ACRES
Q = 59. CFS

1 U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE 3/30/2000 AT TIME 13:53

CUHPF/PC RELEASE 2A (32-BIT VER) SEPTEMBER 10, 1998

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

BASIN ID: 19 -- BASIN COMMENT: FUTURE CONDITIONS

AREA (SQMI)	LENGTH OF BASIN (MI)	DIST TO CENTROID (MI)	IMPERV. AREA (PCT)	SLOPE (FT/FT)	UNIT DURATION (MIN)
.01	.29	.11	40.00	.0360	5.00

COEFFICIENT (REFLECTING TIME TO PEAK)	COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF)
.093	.275

THIS BASIN USES TRADITIONAL DRAINAGE PRACTICES

FRACTION OF PERVIOUS AREA RECEIVING IMPERVIOUS DRAINAGE (DEFAULT)	FRACTION OF IMPERVIOUS AREA DIRECTLY CONNECTED TO DRAINAGE SYSTEM (DEFAULT)
R= .19	D= .80

CALCULATED UNIT HYDROGRAPH

TIME TO PEAK (MIN)	TIME OF CONCENTRATION (MIN)	PEAK RATE OF RUNOFF (CFS/SQMI)	UNIT HYDROGRAPH PEAK (CFS)	VOLUME OF RUNOFF (AF)
7.50	16.00	2112.93	29.58	.75

*** NOTE : THE TIME TO PEAK IS CALCULATED BASED ON THE TIME OF CONCENTRATION PROVIDED BY THE USER, REPLACING THE ONE COMPUTED BY CUHPF (TP= 4.88)

WIDTH AT 50 = 14. MIN. WIDTH AT 75 = 7. MIN. K50 = .32 K75 = .43

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .07 IN.
INFILTRATION = 4.50 IN./HR. DECAY = .00180/SECOND FNINFL = .60 IN./HR.

TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH	TIME	UNIT HYDROGRAPH
0.	0.	20.	14.	40.	8.
5.	25.	25.	12.	45.	0.
10.	27.	30.	11.	0.	0.
15.	18.	35.	9.	0.	0.

1 BASIN ID: 19 -- BASIN COMMENT: FUTURE CONDITIONS

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100 YR

TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)	TIME (MIN.)	INCREMENT RAINFALL (IN)	TOTAL* EXCESS PRECIP	STORM** HYDROGRAPH (CFS)
0.	.00	.000	0.	60.	.12	.085	23.
5.	.03	.000	0.	65.	.12	.085	20.
10.	.09	.015	0.	70.	.06	.028	13.
15.	.14	.041	1.	75.	.06	.028	9.
20.	.24	.072	3.	80.	.04	.012	7.
25.	.41	.229	9.	85.	.04	.012	5.
30.	.74	.683	25.	90.	.04	.012	4.
35.	.41	.369	33.	95.	.04	.012	3.
40.	.24	.198	31.	100.	.04	.012	2.
45.	.18	.147	29.	105.	.04	.012	2.
50.	.15	.113	27.	110.	.04	.012	2.
55.	.12	.085	25.	115.	.04	.012	1.

* LESS ANY WATER QUALITY CAPTURE VOLUME
** INCLUDES ANY WATER QUALITY CAPTURE VOLUME RELEASE FLOW

TOTAL PRECIP. = 3.41 (1-HOUR RAIN = 2.95) EXCESS PRECIP. = 2.284 INCHES
VOLUME OF EXCESS PRECIP = 1.71 ACRE-FEET
PEAK Q = 33. CFS TIME OF PEAK = 35. MIN.
INFILT.= 4.50 IN/HR DECAY = .00180 FNINF = .60 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .07 IN.

RATIONAL FORMULA C = .67
I = 6.5 INCHES/HOUR
A = 9.0 ACRES
Q = 39. CFS

1 U.D.F.C.D. CUHPF RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPF/PC VERSION 1.0 MODIFIED IN DEC 1993 TO WRITE OUTPUT
FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT
USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN - UPPER TRIB

NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUT FILE FOR THIS RUN OF CUHPF.

APPENDIX C

UPPER TRIBUTARY

UDSWM95 - 10 YR

DESIGN PLAN CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
  2   1   1   2
  3   4
WATERSHED   1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR
        48  0 0  5.0                                                             1
         9  110
        10  108
        11  111
        12  121
        13  113
        14  114
        15  119
        16  118
        17  203
        18  117
        19  115

        12   13     5       2    300.   .0560                     0.016        2
                           10    300.   .0560       20       20   0.020        5
        13  110     4      10   1200.   .0050        5        5   0.044        2
                            0   1200.   .0050       40       40   0.044        5
        14   13     1       5    650.   .0080        4        4   0.038        6
        15  111     5     6.5   1050    .0050                     0.016      6.5
                           10   1050    .0100       20       20   0.020      7.5
        16  113     4      .5   1650    .0133       12       13   0.016       .5
                           10   1650    .0133       20       20   0.020        5
        17   20     2       4    200.   .0010                     0.016        4
        18  114     3       4    200.   .0300                     0.016        4
        19  114     4      .5    700.   .0020       12       12   0.016       .5
                           10    700.   .0020       20       20   0.020        5
        20  115     2       5    950.   .0010                     0.016        5
        21  120     2       5   1700.   .0014                     0.016        5
        22  117     4      .5   1350.   .0190       12       12   0.016       .5
                           10   1350.   .0190       20       20   0.020        5
        23  121     2       5   1700    .0080                     0.016        5
        25  114     4      .5    400.   .0050       12       12   0.016       .5
                           10    400.   .0050       20       20   0.020      2.5
        26  118     5     1.5    200.   .0060                     0.016      1.5
                           10    200.   .0060       20       20   0.020        5
       108   12     3              1.
       110  200     3              1.
       111   14     3              1.
       113  201     3              1.
   17  114  310   4 3              1.
         0          0      30          30       100        30       400        30
  116  115   21   4 3              1.
         0          0      55           0       200       145       400       345
       116          3              1.
       117   19     3              1.
   22  118   23   4 3              1.
         0          0      50          00       150         0       200        50
       119   18     3              1.
   25  121   15   4 3              1.
         0          0     175           0       200        25       250        75
       200  109   5 2      .1      1.   .0100                     0.016       .1
         0          0      .1          0.        .4       265       5.7       375
      11.5        400
       201  112   3 2      .1      1.   .0100                     0.016       .1
         0          0      .4          30       1.5       300
       203   26   5 2      .1      1.   .0100                     0.016       .1
         0          0     .07           5       .90        11       1.3        35 87
       2.1        135
       310  311     3              1.
   16  311  312   4 3              1.
         0          0     100           0       250       150       400       300
       312   15     2     4.5    400.   .0100                     0.016      4.5

   0
  34
  12   13   14   15   16   17   18   19   20   21   22   23   25   26  108  109
 110  111  112  113  114  115  116  117  118  119  120  121  200  201  203  310
 311  312
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 11 SUBCATCHMENTS

TIME(HR/MIN)		9	10	11	12	13	14	15	16	17	18	19
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
0	15.	2.	0.	4.	1.	3.	2.	2.	3.	0.	2.	1.
0	20.	8.	2.	11.	5.	10.	6.	6.	12.	0.	6.	4.
0	25.	23.	10.	34.	19.	32.	14.	22.	45.	2.	17.	11.
0	30.	34.	18.	47.	29.	45.	17.	32.	69.	9.	22.	15.
0	35.	32.	18.	41.	29.	41.	15.	31.	67.	13.	20.	14.

0	40.	27. 12.	17.	33.	26.	33.	13.	26.	57.	13.	17.
0	45.	22. 11.	16.	27.	23.	28.	11.	23.	48.	13.	15.
0	50.	19. 10.	14.	22.	20.	23.	9.	19.	40.	12.	13.
0	55.	16. 9.	13.	18.	18.	19.	6.	17.	34.	11.	11.
1	0.	14. 8.	13.	15.	16.	16.	4.	15.	29.	10.	9.
1	5.	12. 5.	12.	12.	15.	14.	4.	13.	26.	10.	7.
1	10.	10. 4.	12.	11.	13.	11.	4.	10.	23.	9.	5.
1	15.	8. 4.	11.	10.	12.	9.	4.	8.	21.	9.	5.
1	20.	7. 3.	10.	9.	9.	8.	3.	7.	17.	8.	4.
1	25.	6. 3.	9.	7.	7.	7.	3.	6.	13.	7.	4.
1	30.	5. 2.	6.	6.	6.	6.	3.	5.	10.	7.	3.
1	35.	4. 2.	4.	5.	5.	5.	2.	4.	9.	6.	3.
1	40.	4. 2.	3.	5.	4.	4.	2.	4.	8.	5.	3.
1	45.	4. 2.	3.	4.	4.	4.	2.	3.	7.	5.	2.
1	50.	3. 2.	3.	4.	3.	4.	2.	3.	6.	4.	2.
1	55.	3. 1.	2.	4.	3.	3.	2.	3.	6.	4.	2.
2	0.	3. 0.	2.	3.	2.	3.	2.	2.	5.	2.	2.
2	5.	2. 0.	1.	2.	2.	2.	0.	2.	3.	2.	0.

2	10.	0. 0.	0.	2.	0.	1.	0.	0.	2.	0.	0.
2	15.	0. 0.	0.	0.	0.	0.	0.	0.	2.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	MANNING N	OVERBANK/SURCHARGE DEPTH (FT)	JK
12	13	0	5	PIPE	2.0	300.	.0560	.0	.0	.016	2.00	0
				OVERFLOW	10.0	300.	.0560	20.0	20.0	.020	5.00	
13	110	0	4	CHANNEL	10.0	1200.	.0050	5.0	5.0	.044	2.00	0
				OVERFLOW	.0	1200.	.0050	40.0	40.0	.044	5.00	
14	13	0	1	CHANNEL	5.0	650.	.0080	4.0	4.0	.038	6.00	0
15	111	0	5	PIPE	6.5	1050.	.0050	.0	.0	.016	6.50	0
				OVERFLOW	10.0	1050.	.0050	20.0	20.0	.020	7.50	
16	113	0	4	CHANNEL	.5	1650.	.0133	12.0	13.0	.016	.50	0
				OVERFLOW	10.0	1650.	.0133	20.0	20.0	.020	5.00	
17	20	0	2	PIPE	4.0	200.	.0010	.0	.0	.016	4.00	0
18	114	0	3		4.0	200.	.0300	.0	.0	.016	4.00	0
19	114	0	4	CHANNEL	.5	700.	.0020	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	700.	.0020	20.0	20.0	.020	5.00	
20	115	0	2	PIPE	5.0	950.	.0010	.0	.0	.016	5.00	0
21	120	0	2	PIPE	5.0	1700.	.0014	.0	.0	.016	5.00	0
22	117	0	4	CHANNEL	.5	1350.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1350.	.0190	20.0	20.0	.020	5.00	
23	121	0	2	PIPE	5.0	1700.	.0080	.0	.0	.016	5.00	0
25	114	0	4	CHANNEL	.5	400.	.0050	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	400.	.0050	20.0	20.0	.020	2.50	
26	118	0	5	PIPE	1.5	200.	.0060	.0	.0	.016	1.50	0
				OVERFLOW	10.0	200.	.0060	20.0	20.0	.020	5.00	
108	12	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
110	200	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
111	14	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
113	201	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
114	310	4	3		.0	1.	.0010	.0	.0	.001	10.00	17
		DIVERSION TO GUTTER NUMBER 17 - TOTAL Q VS DIVERTED Q IN CFS										
		.0	.0	30.0 30.0	100.0	30.0	400.0	30.0				
115	21	4	3		.0	1.	.0010	.0	.0	.001	10.00	116
		DIVERSION TO GUTTER NUMBER 116 - TOTAL Q VS DIVERTED Q IN CFS										
		.0	.0	55.0 .0	200.0	145.0	400.0	345.0				
116	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
117	19	0	3		.0	1.	.0010	.0	.0	.001	10.00	0

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 118         23         4         3                          .0       1.     .0010        .0     .0        .001       10.00       22
                 DIVERSION TO GUTTER NUMBER  22 - TOTAL Q VS DIVERTED Q IN CFS
                       .0       .0      50.0      .0      150.0      .0     200.0    50.0
 119         18         0         3                          .0       1.     .0010        .0     .0        .001       10.00        0
 121         15         4         3                          .0       1.     .0010        .0     .0        .001       10.00       25
                 DIVERSION TO GUTTER NUMBER  25 - TOTAL Q VS DIVERTED Q IN CFS
                       .0       .0     175.0      .0      200.0     25.0    250.0    75.0
 200        109         5         2      PIPE                .1       1.     .0100        .0     .0        .016         .10        0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0       .0        .1      .0         .4    265.0      5.7   375.0     11.5   400.0
 201        112         3         2      PIPE                .1       1.     .0100        .0     .0        .016         .10        0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0       .0        .4    30.0        1.5    300.0
 203         26         5         2      PIPE                .1       1.     .0100        .0     .0        .016         .10        0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0       .0        .1     5.0         .9     11.0      1.3    35.0      2.1   135.0
 310        311         0         3                          .0       1.     .0010        .0     .0        .001       10.00        0
 311        312         4         3                          .0       1.     .0010        .0     .0        .001       10.00       16
                 DIVERSION TO GUTTER NUMBER  16 - TOTAL Q VS DIVERTED Q IN CFS
                       .0       .0     100.0      .0      250.0    150.0    400.0   300.0
 312         15         0         2      PIPE               4.5     400.     .0100        .0     .0        .016        4.50        0
0TOTAL NUMBER OF GUTTERS/PIPES,  31
1
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JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A. (AC)
12	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.8
13	12	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204.8
14	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	183.0
15	121	312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156.8
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
18	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24.3
19	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.8
20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
21	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.0

22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
23	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87.7
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
26	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.6
108	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	21.8
110	13	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	229.1
111	15	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	183.0
113	16	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	28.8
114	18	19	25	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	43.5
115	20	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	9.0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
117	22	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	12.8
118	26	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	87.7
119	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	24.3
121	23	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	113.3
200	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	229.1
201	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.8
203	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	32.6
310	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5
311	310	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5
312	311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 34 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)										
	12	13	14	15	16	17	18	19	20	21
	22	23	25	26	108	109	110	111	112	113
	114	115	116	117	118	119	120	121	200	201
	203	310	311	312						
0 5.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
	0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0(S)	0. .0(S)
	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
0 10.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .3( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )
	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )
	1. .9(D)	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0(S)	0. .0(S)
	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
0 15.	0. .1( )	0. .0( )	1. .2( )	0. .2( )	0. .0( )	4. .8( )	2. .0( )	0. .2( )	1. .3( )	0. .2( )
	0. .0( )	1. .2( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	4. .0( )	1. .0( )	3. .0( )
	5. 5.1(D)	2. .0(D)	0. .0( )	2. .0( )	3. .0(D)	2. .0( )	0. .0( )	2. .0(D)	0. .0(S)	1. .0(S)
	0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
0 20.	1. .2( )	1. .1( )	7. .5( )	4. .5( )	0. .0( )	13. 1.6( )	6. .0( )	2. .3( )	5. .9( )	2. .5( )
	0.	5.	0.	0.	2.	0.	8.	15.	3.	10.

		.0( )	.6( )	.0( )	.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		15.	8.	0.	6.	12.	6.	2.	9.	0.	3.
		14.7(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.0(S)	.0(S)
		0.	0.	0.	0.						
		.0(S)	.0( )	.0(D)	.0( )						
0	25.	9.	9.	36.	30.	0.	27.	22.	8.	15.	8.
		.6( )	.5( )	1.2( )	1.4( )	.0( )	2.6( )	.0( )	.5( )	1.6( )	1.1( )
		0.	24.	0.	0.	10.	19.	33.	63.	10.	32.
		.0( )	1.2( )	.0( )	.2( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		43.	26.	0.	17.	45.	22.	8.	43.	19.	10.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.1(S)	.1(S)
		1.	13.	13.	8.						
		.0(S)	.0( )	.0(D)	.7( )						
0	30.	18.	46.	105.	93.	0.	31.	32.	15.	26.	22.
		.9( )	1.3( )	2.0( )	2.5( )	.0( )	2.8( )	.0( )	.7( )	2.2( )	1.8( )
		0.	57.	0.	2.	18.	75.	80.	140.	22.	45.
		.0( )	1.9( )	.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		64.	41.	0.	22.	71.	32.	22.	86.	75.	22.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.3(S)
		3.	34.	34.	32.						
		.0(S)	.0( )	.0(D)	1.4( )						
0	35.	18.	112.	166.	135.	0.	29.	31.	20.	30.	35.
		.9( )	2.0( )	2.5( )	3.1( )	.0( )	2.7( )	.0( )	.7( )	2.3( )	2.3( )
		0.	71.	0.	5.	18.	131.	144.	177.	31.	41.
		.0( )	2.1( )	.0( )	.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		65.	44.	0.	20.	71.	31.	35.	101.	131.	31.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.4(S)
		5.	35.	35.	36.						
		.1(S)	.0( )	.0(D)	1.5( )						
0	40.	18.	160.	169.	127.	0.	30.	26.	19.	30.	40.
		.9( )	2.3( )	2.5( )	2.9( )	.0( )	2.8( )	.0( )	.7( )	2.3( )	2.5( )
		0.	67.	0.	6.	17.	183.	187.	160.	36.	33.
		.0( )	2.0( )	.0( )	1.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		58.	42.	0.	17.	62.	26.	40.	92.	183.	36.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.3(S)	.4(S)

		5. .1(S)	28. .0( )	28. .0(D)	28. 1.3( )						
0	45.	16. .8( )	168. 2.3( )	144. 2.3( )	107. 2.7( )	0. .0( )	30. 2.7( )	23. .0( )	17. .7( )	30. 2.3( )	41. 2.5( )
		0. .0( )	58. 1.9( )	0. .0( )	6. 1.1( )	16. .0( )	191. .0( )	190. .0( )	134. .0( )	31. .0( )	28. .0( )
		50. 30.0(D)	41. .0(D)	0. .0( )	15. .0( )	53. .0(D)	23. .0( )	41. .0( )	80. .0(D)	191. .3(S)	31. .4(S)
		6. .2(S)	20. .0( )	20. .0(D)	21. 1.1( )						
0	50.	15. .8( )	155. 2.3( )	120. 2.1( )	89. 2.4( )	0. .0( )	30. 2.7( )	19. .0( )	15. .7( )	30. 2.3( )	41. 2.5( )
		0. .0( )	50. 1.7( )	0. .0( )	6. 1.1( )	14. .0( )	178. .0( )	174. .0( )	111. .0( )	28. .0( )	23. .0( )
		43. 30.0(D)	40. .0(D)	0. .0( )	13. .0( )	46. .0(D)	19. .0( )	41. .0( )	70. .0(D)	178. .3(S)	28. .4(S)
		6. .2(S)	13. .0( )	13. .0(D)	14. .9( )						
0	55.	13. .8( )	135. 2.1( )	98. 2.0( )	73. 2.2( )	0. .0( )	30. 2.7( )	17. .0( )	13. .6( )	30. 2.3( )	40. 2.5( )
		0. .0( )	43. 1.6( )	0. .0( )	6. 1.2( )	13. .0( )	155. .0( )	151. .0( )	90. .0( )	25. .0( )	19. .0( )
		35. 30.0(D)	39. .0(D)	0. .0( )	11. .0( )	40. .0(D)	17. .0( )	40. .0( )	61. .0(D)	155. .3(S)	25. .3(S)
		6. .3(S)	5. .0( )	5. .0(D)	7. .6( )						
1	0.	13. .7( )	113. 2.0( )	81. 1.8( )	59. 2.0( )	0. .0( )	30. 2.7( )	15. .0( )	11. .6( )	30. 2.3( )	39. 2.5( )
		0. .0( )	38. 1.5( )	0. .0( )	7. 1.2( )	13. .0( )	130. .0( )	126. .0( )	74. .0( )	22. .0( )	16. .0( )
		30. 29.9(D)	38. .0(D)	0. .0( )	9. .0( )	36. .0(D)	15. .0( )	39. .0( )	54. .0(D)	130. .2(S)	22. .3(S)
		7. .3(S)	0. .0( )	0. .0(D)	1. .3( )						
1	5.	12. .7( )	96. 1.8( )	68. 1.6( )	51. 1.8( )	0. .0( )	27. 2.5( )	13. .0( )	9. .6( )	29. 2.3( )	37. 2.4( )

		0.	34.	0.	7.	12.	110.	108.	63.	19.	14.
		.0( )	1.4( )	.0( )	1.2( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		26.	34.	0.	7.	33.	13.	37.	49.	110.	19.
		25.7(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.3(S)
		7.	0.	0.	0.						
		.3(S)	.0( )	.0(D)	.0( )						
1	10.	12.	83.	60.	46.	0.	22.	10.	7.	25.	33.
		.7( )	1.7( )	1.5( )	1.7( )	.0( )	2.2( )	.0( )	.5( )	2.1( )	2.3( )
		0.	32.	0.	7.	12.	95.	93.	57.	16.	11.
		.0( )	1.4( )	.0( )	1.3( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		21.	29.	0.	5.	30.	10.	33.	45.	95.	16.
		20.9(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.2(S)
		7.	0.	0.	0.						
		.3(S)	.0( )	.0(D)	.0( )						
1	15.	11.	74.	55.	43.	0.	18.	8.	6.	21.	29.
		.7( )	1.6( )	1.5( )	1.7( )	.0( )	2.0( )	.0( )	.5( )	1.9( )	2.1( )
		0.	29.	0.	7.	11.	84.	82.	53.	14.	9.
		.0( )	1.3( )	.0( )	1.3( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		18.	25.	0.	5.	28.	8.	29.	42.	84.	14.
		18.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.2(S)
		7.	0.	0.	0.						
		.3(S)	.0( )	.0(D)	.0( )						
1	20.	10.	67.	50.	38.	0.	16.	7.	5.	18.	25.
		.7( )	1.5( )	1.4( )	1.6( )	.0( )	1.9( )	.0( )	.5( )	1.8( )	1.9( )
		0.	26.	0.	7.	10.	76.	75.	47.	12.	8.
		.0( )	1.3( )	.0( )	1.3( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		16.	21.	0.	4.	24.	7.	25.	36.	76.	12.
		15.8(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.2(S)
		7.	0.	0.	0.						
		.3(S)	.0( )	.0(D)	.0( )						
1	25.	9.	61.	43.	32.	0.	14.	6.	4.	16.	22.
		.6( )	1.5( )	1.3( )	1.4( )	.0( )	1.7( )	.0( )	.5( )	1.6( )	1.8( )
		0.	22.	0.	7.	9.	68.	67.	39.	10.	7.
		.0( )	1.2( )	.0( )	1.3( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		13.	18.	0.	4.	20.	6.	22.	29.	68.	10.

		13.3(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.2(S)	.1(S)
		7. .4(S)	0. .0( )	0. .0(D)	0. .0( )						
1	30.	6. .5( )	53. 1.4( )	36. 1.2( )	27. 1.3( )	0. .0( )	12. 1.5( )	5. .0( )	4. .4( )	13. 1.5( )	19. 1.7( )
		0. .0( )	19. 1.1( )	0. .0( )	7. 1.3( )	6. .0( )	59. .0( )	58. .0( )	33. .0( )	8. .0( )	6. .0( )
		11. 11.3(D)	16. .0(D)	0. .0( )	3. .0( )	17. .0(D)	5. .0( )	19. .0( )	25. .0(D)	59. .2(S)	8. .1(S)
		7. .4(S)	0. .0( )	0. .0(D)	0. .0( )						
1	35.	4. .4( )	45. 1.2( )	31. 1.1( )	23. 1.2( )	0. .0( )	10. 1.4( )	4. .0( )	3. .4( )	12. 1.4( )	17. 1.6( )
		0. .0( )	17. 1.0( )	0. .0( )	7. 1.3( )	4. .0( )	50. .0( )	49. .0( )	28. .0( )	7. .0( )	5. .0( )
		10. 9.9(D)	14. .0(D)	0. .0( )	3. .0( )	16. .0(D)	4. .0( )	17. .0( )	22. .0(D)	50. .2(S)	7. .1(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
1	40.	4. .4( )	38. 1.1( )	27. 1.1( )	20. 1.1( )	0. .0( )	9. 1.4( )	4. .0( )	3. .4( )	10. 1.3( )	15. 1.5( )
		0. .0( )	15. 1.0( )	0. .0( )	7. 1.3( )	3. .0( )	43. .0( )	42. .0( )	25. .0( )	6. .0( )	4. .0( )
		9. 8.9(D)	12. .0(D)	0. .0( )	3. .0( )	14. .0(D)	4. .0( )	15. .0( )	19. .0(D)	43. .1(S)	6. .1(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
1	45.	3. .4( )	33. 1.1( )	24. 1.0( )	19. 1.1( )	0. .0( )	8. 1.3( )	3. .0( )	3. .4( )	9. 1.2( )	13. 1.4( )
		0. .0( )	14. .9( )	0. .0( )	7. 1.3( )	3. .0( )	38. .0( )	37. .0( )	23. .0( )	5. .0( )	4. .0( )
		8. 8.0(D)	11. .0(D)	0. .0( )	2. .0( )	14. .0(D)	3. .0( )	13. .0( )	18. .0(D)	38. .1(S)	5. .1(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						

1	50.	3. .3( )	30. 1.0( )	22. 1.0( )	17. 1.1( )	0. .0( )	8. 1.2( )	3. .0( )	2. .4( )	8. 1.2( )	12. 1.3( )
		0. .0( )	13. .9( )	0. .0( )	7. 1.3( )	3. .0( )	33. .0( )	33. .0( )	21. .0( )	5. .0( )	4. .0( )
		7. 7.4(D)	10. .0(D)	0. .0( )	2. .0( )	13. .0(D)	3. .0( )	12. .0( )	17. .0(D)	33. .1(S)	5. .1(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
1	55.	2. .3( )	27. 1.0( )	21. .9( )	16. 1.0( )	0. .0( )	7. 1.2( )	3. .0( )	2. .3( )	8. 1.1( )	10. 1.2( )
		0. .0( )	13. .9( )	0. .0( )	7. 1.2( )	2. .0( )	30. .0( )	30. .0( )	20. .0( )	4. .0( )	3. .0( )
		7. 6.9(D)	9. .0(D)	0. .0( )	2. .0( )	12. .0(D)	3. .0( )	10. .0( )	16. .0(D)	30. .1(S)	4. .1(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
2	0.	2. .3( )	24. .9( )	19. .9( )	15. 1.0( )	0. .0( )	6. 1.1( )	2. .0( )	2. .3( )	7. 1.1( )	9. 1.2( )
		0. .0( )	12. .9( )	0. .0( )	6. 1.2( )	2. .0( )	28. .0( )	27. .0( )	18. .0( )	4. .0( )	3. .0( )
		6. 6.1(D)	7. .0(D)	0. .0( )	2. .0( )	11. .0(D)	2. .0( )	9. .0( )	14. .0(D)	28. .1(S)	4. .0(S)
		6. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
2	5.	2. .3( )	22. .9( )	17. .8( )	14. .9( )	0. .0( )	4. .9( )	2. .0( )	1. .3( )	6. 1.0( )	8. 1.1( )
		0. .0( )	11. .8( )	0. .0( )	6. 1.2( )	1. .0( )	25. .0( )	24. .0( )	16. .0( )	3. .0( )	2. .0( )
		3. 3.2(D)	6. .0(D)	0. .0( )	0. .0( )	10. .0(D)	2. .0( )	8. .0( )	13. .0(D)	25. .1(S)	3. .0(S)
		6. .2(S)	0. .0( )	0. .0(D)	0. .0( )						
2	10.	0. .1( )	20. .8( )	15. .8( )	11. .9( )	0. .0( )	1. .5( )	0. .0( )	1. .2( )	4. .8( )	6. 1.0( )
		0. .0( )	9. .8( )	0. .0( )	6. 1.1( )	0. .0( )	21. .0( )	20. .0( )	13. .0( )	3. .0( )	1. .0( )

		1. .7(D)	4. .0(D)	0. .0( )	0. .0( )	8. .0(D)	0. .0( )	6. .0( )	9. .0(D)	21. .1(S)	3. .0(S)
		6. .2(S)	0. .0( )	0. .0(D)	0. .0( )						
2	15.	0. .0( )	17. .7( )	11. .7( )	9. .8( )	0. .0( )	0. .3( )	0. .0( )	0. .2( )	2. .6( )	5. .8( )
		0. .0( )	8. .7( )	0. .0( )	6. 1.1( )	0. .0( )	17. .0( )	17. .0( )	9. .0( )	2. .0( )	0. .0( )
		0. .4(D)	2. .0(D)	0. .0( )	0. .0( )	7. .0(D)	0. .0( )	5. .0( )	8. .0(D)	17. .1(S)	2. .0(S)
		6. .2(S)	0. .0( )	0. .0(D)	0. .0( )						
2	20.	0. .0( )	14. .7( )	9. .6( )	7. .7( )	0. .0( )	0. .3( )	0. .0( )	0. .1( )	1. .5( )	4. .7( )
		0. .0( )	6. .6( )	0. .0( )	5. 1.0( )	0. .0( )	14. .0( )	14. .0( )	7. .0( )	1. .0( )	0. .0( )
		0. .3(D)	1. .0(D)	0. .0( )	0. .0( )	4. .0(D)	0. .0( )	4. .0( )	6. .0(D)	14. .1(S)	1. .0(S)
		5. .1(S)	0. .0( )	0. .0(D)	0. .0( )						
2	25.	0. .0( )	11. .6( )	7. .5( )	6. .6( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	1. .4( )	3. .6( )
		0. .0( )	6. .6( )	0. .0( )	5. 1.0( )	0. .0( )	12. .0( )	11. .0( )	6. .0( )	1. .0( )	0. .0( )
		0. .2(D)	1. .0(D)	0. .0( )	0. .0( )	7. .0(D)	0. .0( )	3. .0( )	6. .0(D)	12. .1(S)	1. .0(S)
		5. .1(S)	0. .0( )	0. .0(D)	0. .0( )						
2	30.	0. .0( )	9. .5( )	6. .5( )	5. .6( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	1. .3( )	2. .5( )
		0. .0( )	5. .6( )	0. .0( )	4. .9( )	0. .0( )	10. .0( )	9. .0( )	5. .0( )	0. .0( )	0. .0( )
		0. .1(D)	1. .0(D)	0. .0( )	0. .0( )	2. .0(D)	0. .0( )	2. .0( )	5. .0(D)	10. .1(S)	0. .0(S)
		4.	0.	0.	0.						

		.1(S)	.0( )	.0(D)	.0( )						
2	35.	0. .0( )	8. .5( )	5. .4( )	5. .6( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	0. .3( )	1. .5( )
		0. .0( )	4. .5( )	0. .0( )	3. .6( )	0. .0( )	8. .0( )	8. .0( )	5. .0( )	0. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	4. .0(D)	0. .0( )	1. .0( )	4. .0(D)	8. .1(S)	0. .0(S)
		2. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
2	40.	0. .0( )	7. .4( )	4. .4( )	4. .5( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .4( )
		0. .0( )	3. .4( )	0. .0( )	2. .5( )	0. .0( )	7. .0( )	7. .0( )	4. .0( )	0. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	1. .0( )	3. .0(D)	7. .1(S)	0. .0(S)
		1. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
2	45.	0. .0( )	6. .4( )	3. .4( )	3. .4( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .4( )
		0. .0( )	2. .3( )	0. .0( )	1. .4( )	0. .0( )	6. .0( )	6. .0( )	3. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	2. .0(D)	0. .0( )	1. .0( )	2. .0(D)	6. .1(S)	0. .0(S)
		1. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
2	50.	0. .0( )	5. .4( )	3. .3( )	2. .4( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )
		0. .0( )	1. .3( )	0. .0( )	1. .3( )	0. .0( )	5. .0( )	5. .0( )	2. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	1. .0( )	1. .0(D)	5. .1(S)	0. .0(S)
		1. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
2	55.	0. .0( )	4. .3( )	2. .3( )	1. .3( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )

		0. .0( )	1. .2( )	0. .0( )	0. .2( )	0. .0( )	4. .0( )	4. .0( )	1. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	0. .0( )	1. .0( )	1. .0(D)	4. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	0.	0. .0( )	3. .3( )	1. .2( )	1. .3( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .2( )	0. .3( )
		0. .0( )	1. .2( )	0. .0( )	0. .2( )	0. .0( )	3. .0( )	3. .0( )	1. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	3. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	5.	0. .0( )	3. .3( )	1. .2( )	1. .2( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .2( )	0. .0( )	0. .1( )	0. .0( )	3. .0( )	3. .0( )	1. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	3. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	10.	0. .0( )	2. .2( )	1. .2( )	1. .2( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	2. .0( )	2. .0( )	1. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	2. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	15.	0. .0( )	2. .2( )	1. .1( )	0. .2( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	2. .0( )	2. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	2. .1(S)	0. .0(S)

		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	20.	0. .0( )	1. .2( )	1. .1( )	0. .2( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	2. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	2. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	25.	0. .0( )	1. .2( )	0. .1( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	30.	0. .0( )	1. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	35.	0. .0( )	1. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	40.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.

		.0( )	.1( )	.1( )	.1( )	.0( )	.0( )	.0( )	.0( )	.1( )	.1( )
		0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	45.	0. .0( )	1. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	50.	0. .0( )	1. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	1. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	55.	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
4	0.	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.1(S)	.0(S)
0.	0.	0.	0.						
.0(S)	.0( )	.0(D)	.0( )						

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
22	0.	.0		0 0.
117	22.	(DIRECT FLOW)		0 30.
119	32.	(DIRECT FLOW)		0 30.
25	0.	.0		0 0.
19	20.	.7		0 35.
18	32.	(DIRECT FLOW)		0 30.
203	7.	.1	.4	1 25.
114	65.	(DIRECT FLOW)		0 35.
26	7.	1.3		1 30.
310	35.	(DIRECT FLOW)		0 35.
118	71.	(DIRECT FLOW)		0 35.
311	35.	(DIRECT FLOW)		0 35.
23	71.	2.1		0 35.
312	36.	1.5		0 35.
121	101.	(DIRECT FLOW)		0 35.
15	135.	3.1		0 35.
111	177.	(DIRECT FLOW)		0 35.
108	18.	(DIRECT FLOW)		0 35.
17	31.	2.8		0 30.
14	169.	2.5		0 40.
12	18.	.9		0 35.
20	30.	2.3		0 45.
16	0.	.0		0 0.
13	168.	2.3		0 45.
115	44.	(DIRECT FLOW)		0 35.
113	45.	(DIRECT FLOW)		0 30.
110	190.	(DIRECT FLOW)		0 45.
21	41.	2.5		0 45.
201	36.	.1	.4	0 40.
200	191.	.1	.3	0 45.
120	41.	(DIRECT FLOW)		0 45.
112	36.	(DIRECT FLOW)		0 40.
109	191.	(DIRECT FLOW)		0 45.
116	0.	(DIRECT FLOW)		0 0.

APPENDIX C

UPPER TRIBUTARY

UDSWM95 - 100 YR

DESIGN PLAN CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2   1   1   2
   3   4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR
        48  0 0  5.0                                                             1
         9  110
        10  108
        11  111
        12  121
        13  113
        14  114
        15  119
        16  118
        17  203
        18  117
        19  115

        12   13    5       2   300.   .0560                    0.016      2
                          10   300.   .0560     20       20    0.020      5
        13  110    4      10  1200.   .0050      5        5    0.044      2
                           0  1200.   .0050     40       40    0.044      5
        14   13    1       5   650.   .0080      4        4    0.038      6
        15  111    5     6.5  1050    .0050                    0.016    6.5
                          10  1050    .0100     20       20    0.020    7.5
        16  113    4      .5  1650    .0133     12       13    0.016     .5
                          10  1650    .0133     20       20    0.020      5
        17   20    2       4   200.   .0010                    0.016      4
        18  114    3       4   200.   .0300                    0.016      4
        19  114    4      .5   700.   .0020     12       12    0.016     .5
                          10   700.   .0020     20       20    0.020      5
        20  115    2       5   950.   .0010                    0.016      5
        21  120    2       5  1700.   .0014                    0.016      5
        22  117    4      .5  1350.   .0190     12       12    0.016     .5
                          10  1350.   .0190     20       20    0.020      5
        23  121    2       5  1700    .0080                    0.016      5
        25  114    4      .5   400.   .0050     12       12    0.016     .5
                          10   400.   .0050     20       20    0.020    2.5
        26  118    5     1.5   200.   .0060                    0.016    1.5
                          10   200.   .0060     20       20    0.020      5
       108   12    3             1.
       110  200    3             1.
       111   14    3             1.
       113  201    3             1.
   17  114  310  4 3             1.
         0         0      30          30       100       30       400       30
  116  115   21  4 3             1.
         0         0      55           0       200      145       400      345
       116         3             1.
       117   19    3             1.
   22  118   23  4 3             1.
         0         0      50          00       150        0       200       50
       119   18    3             1.
   25  121   15  4 3             1.
         0         0     175           0       200       25       250       75
       200  109  5 2     .1      1.   .0100                   0.016     .1
         0         0      .1          0.        .4      265       5.7      375
      11.5       400
       201  112  3 2     .1      1.   .0100                   0.016     .1
         0         0      .4          30       1.5      300
       203   26  5 2     .1      1.   .0100                   0.016     .1
         0         0     .07           5       .90       11       1.3       35 87
       2.1       135
       310  311    3             1.
   16  311  312  4 3             1.
         0         0     100           0       250      150       400      300
       312   15    2    4.5    400.   .0100                   0.016    4.5

   0
  34
  12   13   14   15   16   17   18   19   20   21   22   23   25   26  108  109
 110  111  112  113  114  115  116  117  118  119  120  121  200  201  203  310
 311  312
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 11 SUBCATCHMENTS

TIME(HR/MIN)		9	10	11	12	13	14	15	16	17	18	19
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	0.
0	15.	2.	0.	4.	1.	3.	2.	2.	3.	0.	2.	1.
0	20.	6.	1.	10.	3.	8.	5.	5.	9.	0.	5.	3.
0	25.	17.	6.	25.	12.	23.	11.	15.	29.	2.	13.	9.
0	30.	61.	33.	79.	52.	76.	25.	57.	125.	24.	38.	25.
0	35.	84.	49.	105.	73.	102.	31.	78.	175.	46.	49.	33.

0	40.	80.	51.	95.	74.	96.	29.	76.	170.	52.	46.	31.
0	45.	70.	50.	81.	68.	84.	26.	69.	152.	55.	41.	29.
0	50.	61.	47.	68.	62.	73.	23.	61.	132.	54.	37.	27.
0	55.	52.	43.	56.	55.	62.	19.	53.	113.	51.	32.	25.
1	0.	45.	41.	47.	50.	53.	13.	47.	98.	48.	28.	23.
1	5.	40.	39.	40.	46.	47.	10.	42.	87.	46.	25.	20.
1	10.	32.	35.	29.	39.	37.	8.	34.	71.	43.	17.	13.
1	15.	21.	32.	20.	33.	25.	6.	23.	56.	38.	12.	9.
1	20.	15.	28.	15.	26.	17.	5.	16.	42.	34.	9.	7.
1	25.	11.	24.	10.	17.	12.	4.	11.	28.	30.	6.	5.
1	30.	8.	21.	8.	12.	9.	3.	8.	19.	27.	5.	4.
1	35.	6.	13.	6.	9.	7.	2.	6.	14.	24.	4.	3.
1	40.	5.	9.	5.	7.	5.	2.	5.	11.	22.	3.	2.
1	45.	4.	7.	4.	5.	4.	2.	4.	9.	19.	2.	2.
1	50.	3.	5.	4.	4.	4.	2.	3.	7.	17.	2.	2.
1	55.	3.	4.	4.	3.	3.	2.	3.	6.	15.	2.	1.
2	0.	3.	3.	4.	3.	3.	2.	3.	5.	10.	2.	1.
2	5.	2.	2.	3.	2.	3.	1.	2.	4.	7.	2.	0.

2	10.	2. 0.	0.	2.	1.	2.	0.	2.	3.	5.	0.
2	15.	0. 0.	0.	0.	0.	0.	0.	0.	2.	3.	0.
2	20.	0. 0.	0.	0.	0.	0.	0.	0.	1.	2.	0.
2	25.	0. 0.	0.	0.	0.	0.	0.	0.	0.	2.	0.

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JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	OVERBANK/SURCHARGE MANNING N	DEPTH (FT)	JK
12	13	0	5	PIPE	2.0	300.	.0560	.0	.0	.016	2.00	0
				OVERFLOW	10.0	300.	.0560	20.0	20.0	.020	5.00	
13	110	0	4	CHANNEL	10.0	1200.	.0050	5.0	5.0	.044	2.00	0
				OVERFLOW	.0	1200.	.0050	40.0	40.0	.044	5.00	
14	13	0	1	CHANNEL	5.0	650.	.0080	4.0	4.0	.038	6.00	0
15	111	0	5	PIPE	6.5	1050.	.0050	.0	.0	.016	6.50	0
				OVERFLOW	10.0	1050.	.0050	20.0	20.0	.020	7.50	
16	113	0	4	CHANNEL	.5	1650.	.0133	12.0	13.0	.016	.50	0
				OVERFLOW	10.0	1650.	.0133	20.0	20.0	.020	5.00	
17	20	0	2	PIPE	4.0	200.	.0010	.0	.0	.016	4.00	0
18	114	0	3		4.0	200.	.0300	.0	.0	.016	4.00	0
19	114	0	4	CHANNEL	.5	700.	.0020	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	700.	.0020	20.0	20.0	.020	5.00	
20	115	0	2	PIPE	5.0	950.	.0010	.0	.0	.016	5.00	0
21	120	0	2	PIPE	5.0	1700.	.0014	.0	.0	.016	5.00	0
22	117	0	4	CHANNEL	.5	1350.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1350.	.0190	20.0	20.0	.020	5.00	
23	121	0	2	PIPE	5.0	1700.	.0080	.0	.0	.016	5.00	0
25	114	0	4	CHANNEL	.5	400.	.0050	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	400.	.0050	20.0	20.0	.020	2.50	
26	118	0	5	PIPE	1.5	200.	.0060	.0	.0	.016	1.50	0
				OVERFLOW	10.0	200.	.0060	20.0	20.0	.020	5.00	
108	12	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
110	200	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
111	14	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
113	201	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
114	310	4	3		.0	1.	.0010	.0	.0	.001	10.00	17

DIVERSION TO GUTTER NUMBER 17 - TOTAL Q VS DIVERTED Q IN CFS

```
                    .0      .0     30.0    30.0    100.0   30.0    400.0   30.0
  115        21      4       3                       .0      1.    .0010      .0    .0     .001    10.00    116
               DIVERSION TO GUTTER NUMBER 116 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0     55.0      .0    200.0  145.0    400.0  345.0
  116         0      0       3                       .0      1.    .0010      .0    .0     .001    10.00      0
  117        19      0       3                       .0      1.    .0010      .0    .0     .001    10.00      0
  118        23      4       3                       .0      1.    .0010      .0    .0     .001    10.00     22
               DIVERSION TO GUTTER NUMBER  22 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0     50.0      .0    150.0     .0    200.0   50.0
  119        18      0       3                       .0      1.    .0010      .0    .0     .001    10.00      0
  121        15      4       3                       .0      1.    .0010      .0    .0     .001    10.00     25
               DIVERSION TO GUTTER NUMBER  25 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    175.0      .0    200.0   25.0    250.0   75.0
  200       109      5       2     PIPE              .1      1.    .0100      .0    .0     .016      .10      0
               RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                    .0      .0       .1      .0       .4  265.0      5.7  375.0   11.5  400.0
  201       112      3       2     PIPE              .1      1.    .0100      .0    .0     .016      .10      0
               RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                    .0      .0       .4    30.0      1.5  300.0
  203        26      5       2     PIPE              .1      1.    .0100      .0    .0     .016      .10      0
               RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                    .0      .0       .1     5.0       .9   11.0      1.3   35.0    2.1  135.0
  310       311      0       3                       .0      1.    .0010      .0    .0     .001    10.00      0
  311       312      4       3                       .0      1.    .0010      .0    .0     .001    10.00     16
               DIVERSION TO GUTTER NUMBER  16 - TOTAL Q VS DIVERTED Q IN CFS
                    .0      .0    100.0      .0    250.0  150.0    400.0  300.0
  312        15      0       2     PIPE             4.5    400.    .0100      .0    .0     .016     4.50      0
0TOTAL NUMBER OF GUTTERS/PIPES,  31
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JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A.(AC)
12	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.8
13	12	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204.8
14	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	183.0
15	121	312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156.8
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
18	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24.3

19	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.8
20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
21	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
23	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87.7
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
26	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.6
108	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	21.8
110	13	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	229.1
111	15	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	183.0
113	16	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	28.8
114	18	19	25	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	43.5
115	20	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	9.0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
117	22	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	12.8
118	26	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	87.7
119	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	24.3
121	23	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	113.3
200	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	229.1
201	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.8
203	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	32.6
310	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5
311	310	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5
312	311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.5

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HYDROGRAPHS ARE LISTED FOR THE FOLLOWING  34 CONVEYANCE ELEMENTS

        THE UPPER NUMBER IS DISCHARGE IN CFS
        THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
                  ( ) DENOTES DEPTH ABOVE INVERT IN FEET
                  (S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM.  DISCHARGE INCLUDES SPILLWAY OUTFLOW.
                  (I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
                  (D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
                  (O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)   12        13        14        15        16        17        18        19        20        21
               22        23        25        26       108       109       110       111       112       113
              114       115       116       117       118       119       120       121       200       201
              203       310       311       312

  0    5.      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )

               0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )

               0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                .0(D)     .0(D)     .0( )     .0( )     .0(D)     .0( )     .0( )     .0(D)     .0(S)     .0(S)

               0.        0.        0.        0.
                .0(S)     .0( )     .0(D)     .0( )

  0   10.      0.        0.        0.        0.        0.        1.        1.        0.        0.        0.
                .0( )     .0( )     .0( )     .0( )     .0( )     .3( )     .0( )     .1( )     .1( )     .1( )

               0.        0.        0.        0.        0.        0.        0.        0.        0.        1.
                .0( )     .1( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )

               1.        0.        0.        1.        1.        1.        0.        0.        0.        0.
               1.2(D)     .0(D)     .0( )     .0( )     .0(D)     .0( )     .0( )     .0(D)     .0(S)     .0(S)

               0.        0.        0.        0.
                .0(S)     .0( )     .0(D)     .0( )

  0   15.      0.        0.        1.        0.        0.        4.        2.        1.        1.        0.
                .1( )     .0( )     .2( )     .2( )     .0( )     .9( )     .0( )     .2( )     .4( )     .2( )

               0.        1.        0.        0.        0.        0.        2.        4.        1.        3.
                .0( )     .2( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )

               5.        2.        0.        2.        3.        2.        0.        2.        0.        1.
               5.1(D)     .0(D)     .0( )     .0( )     .0(D)     .0( )     .0( )     .0(D)     .0(S)     .0(S)

               0.        0.        0.        0.
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		.0(S)	.0( )	.0(D)	.0( )						
0	20.	1. .2( )	1. .1( )	6. .5( )	3. .5( )	0. .0( )	11. 1.5( )	5. .0( )	2. .3( )	4. .8( )	1. .5( )
		0. .0( )	4. .5( )	0. .0( )	0. .1( )	1. .0( )	0. .0( )	7. .0( )	13. .0( )	3. .0( )	8. .0( )
		12. 12.4(D)	7. .0(D)	0. .0( )	5. .0( )	9. .0(D)	5. .0( )	1. .0( )	7. .0(D)	0. .0(S)	3. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
0	25.	5. .5( )	6. .4( )	24. 1.0( )	17. 1.0( )	0. .0( )	26. 2.5( )	15. .0( )	6. .5( )	14. 1.5( )	7. 1.0( )
		0. .0( )	16. 1.0( )	0. .0( )	0. .2( )	6. .0( )	10. .0( )	23. .0( )	42. .0( )	8. .0( )	23. .0( )
		32. 30.0(D)	23. .0(D)	0. .0( )	13. .0( )	30. .0(D)	15. .0( )	7. .0( )	28. .0(D)	10. .1(S)	8. .1(S)
		0. .0(S)	2. .0( )	2. .0(D)	1. .3( )						
0	30.	31. 1.2( )	49. 1.3( )	127. 2.2( )	122. 2.9( )	0. .0( )	32. 2.9( )	57. .0( )	18. .7( )	26. 2.2( )	23. 1.9( )
		0. .0( )	77. 2.2( )	0. .0( )	4. .8( )	33. .0( )	95. .0( )	109. .0( )	201. .0( )	25. .0( )	76. .0( )
		100. 30.0(D)	51. .0(D)	0. .0( )	38. .0( )	129. .0(D)	57. .0( )	23. .0( )	129. .0(D)	95. .2(S)	25. .3(S)
		5. .1(S)	70. .0( )	70. .0(D)	56. 1.8( )						
0	35.	48. 2.0( )	181. 2.4( )	315. 3.3( )	262. 4.7( )	4. .3( )	29. 2.7( )	78. .0( )	37. .9( )	30. 2.3( )	42. 2.6( )
		0. .0( )	144. 3.3( )	0. .0( )	7. 1.3( )	49. .0( )	234. .0( )	265. .0( )	367. .0( )	79. .0( )	105. .0( )
		147. 30.0(D)	63. 7.7(D)	8. .0( )	49. .0( )	182. 31.7(D)	78. .0( )	42. .0( )	216. 41.5(D)	234. .4(S)	79. .6(S)
		6. .3(S)	117. .0( )	117. 16.9(D)	105. 2.7( )						
0	40.	50. 2.1( )	307. 2.9( )	385. 3.6( )	279. 4.9( )	21. .6( )	30. 2.8( )	76. .0( )	50. 1.0( )	30. 2.3( )	50. 2.9( )

		11.	150.	22.	7.	51.	274.	387.	374.	108.	117.
		.4( )	3.4( )	.7( )	1.5( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		177.	61.	6.	56.	178.	76.	50.	224.	274.	108.
		30.0(D)	6.2(D)	.0( )	.0( )	27.9(D)	.0( )	.0( )	49.1(D)	.9(S)	.7(S)
		9.	147.	147.	97.						
		.6(S)	.0( )	46.7(D)	2.5( )						
0	45.	50.	375.	359.	273.	49.	30.	69.	60.	30.	53.
		2.1( )	3.1( )	3.5( )	4.9( )	.7( )	2.7( )	.0( )	1.1( )	2.3( )	3.0( )
		26.	150.	51.	10.	50.	293.	445.	354.	123.	133.
		.6( )	3.4( )	.9( )	1.7( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		204.	59.	4.	67.	162.	69.	53.	218.	293.	123.
		30.0(D)	4.0(D)	.0( )	.0( )	11.7(D)	.0( )	.0( )	43.1(D)	1.8(S)	.8(S)
		11.	174.	174.	102.						
		.9(S)	.0( )	74.5(D)	2.6( )						
0	50.	48.	391.	346.	276.	63.	30.	61.	62.	30.	54.
		2.0( )	3.1( )	3.4( )	4.9( )	.8( )	2.7( )	.0( )	1.1( )	2.3( )	3.0( )
		21.	150.	45.	20.	47.	314.	452.	344.	133.	136.
		.5( )	3.4( )	.8( )	1.8( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		190.	57.	2.	58.	152.	61.	54.	212.	314.	133.
		30.0(D)	2.0(D)	.0( )	.0( )	2.5(D)	.0( )	.0( )	36.8(D)	2.8(S)	.8(S)
		24.	160.	160.	99.						
		1.1(S)	.0( )	60.5(D)	2.6( )						
0	55.	44.	388.	335.	275.	50.	30.	53.	52.	30.	55.
		1.7( )	3.1( )	3.4( )	4.9( )	.7( )	2.7( )	.0( )	1.0( )	2.3( )	3.1( )
		10.	148.	39.	33.	43.	332.	440.	330.	125.	112.
		.4( )	3.3( )	.8( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		163.	55.	0.	42.	146.	53.	55.	203.	332.	125.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	28.4(D)	3.6(S)	.8(S)
		34.	133.	133.	101.						
		1.3(S)	.0( )	32.6(D)	2.6( )						
1	0.	41.	378.	324.	275.	26.	30.	47.	40.	30.	54.
		1.5( )	3.1( )	3.3( )	4.9( )	.6( )	2.7( )	.0( )	.9( )	2.3( )	3.0( )
		3.	142.	31.	41.	41.	345.	423.	322.	98.	79.
		.3( )	3.2( )	.7( )	2.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		131.	53.	0.	32.	139.	47.	54.	192.	345.	98.
		30.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	17.3(D)	4.3(S)	.7(S)

		43. 1.4(S)	101. .0( )	101. .8(D)	99. 2.6( )						
1	5.	40. 1.5( )	366. 3.0( )	309. 3.3( )	262. 4.7( )	10. .4( )	30. 2.7( )	42. .0( )	31. .9( )	30. 2.3( )	53. 3.0( )
		1. .2( )	136. 3.1( )	21. .7( )	46. 2.1( )	39. .0( )	354. .0( )	405. .0( )	302. .0( )	70. .0( )	57. .0( )
		105. 30.0(D)	50. .0(D)	0. .0( )	26. .0( )	133. .0(D)	42. .0( )	53. .0( )	181. 6.4(D)	354. 4.7(S)	70. .6(S)
		46. 1.4(S)	75. .0( )	75. .0(D)	79. 2.2( )						
1	10.	35. 1.4( )	343. 3.0( )	270. 3.1( )	225. 4.2( )	4. .3( )	30. 2.7( )	34. .0( )	24. .8( )	30. 2.3( )	49. 2.8( )
		1. .1( )	124. 2.9( )	11. .5( )	45. 2.1( )	35. .0( )	359. .0( )	375. .0( )	253. .0( )	50. .0( )	41. .0( )
		77. 30.0(D)	43. .0(D)	0. .0( )	17. .0( )	116. .0(D)	34. .0( )	49. .0( )	163. .0(D)	359. 4.9(S)	50. .5(S)
		45. 1.4(S)	47. .0( )	47. .0(D)	49. 1.7( )						
1	15.	32. 1.3( )	304. 2.9( )	215. 2.8( )	176. 3.6( )	2. .2( )	30. 2.7( )	23. .0( )	17. .7( )	30. 2.3( )	44. 2.7( )
		0. .1( )	106. 2.7( )	3. .3( )	43. 2.1( )	32. .0( )	358. .0( )	325. .0( )	196. .0( )	35. .0( )	26. .0( )
		49. 30.0(D)	39. .0(D)	0. .0( )	12. .0( )	99. .0(D)	23. .0( )	44. .0( )	139. .0(D)	358. 4.9(S)	35. .4(S)
		42. 1.4(S)	19. .0( )	19. .0(D)	23. 1.2( )						
1	20.	28. 1.2( )	255. 2.7( )	163. 2.5( )	132. 3.0( )	1. .2( )	30. 2.7( )	16. .0( )	13. .6( )	30. 2.3( )	40. 2.5( )
		0. .1( )	89. 2.4( )	0. .1( )	39. 2.0( )	28. .0( )	350. .0( )	270. .0( )	146. .0( )	27. .0( )	18. .0( )
		33. 30.0(D)	37. .0(D)	0. .0( )	9. .0( )	81. .0(D)	16. .0( )	40. .0( )	115. .0(D)	350. 4.5(S)	27. .4(S)
		39. 1.3(S)	3. .0( )	3. .0(D)	5. .5( )						
1	25.	24.	205.	122.	98.	1.	26.	11.	9.	28.	37.

		1.1( )	2.5( )	2.2( )	2.5( )	.1( )	2.5( )	.0( )	.6( )	2.3( )	2.4( )
		0.	72.	0.	36.	24.	335.	216.	108.	22.	13.
		.1( )	2.1( )	.1( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		24.	33.	0.	6.	63.	11.	37.	89.	335.	22.
		24.4(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	3.8(S)	.3(S)
		35.	0.	0.	1.						
		1.3(S)	.0( )	.0(D)	.2( )						
1	30.	21.	161.	93.	75.	0.	19.	8.	7.	24.	33.
		1.0( )	2.3( )	1.9( )	2.2( )	.1( )	2.0( )	.0( )	.5( )	2.0( )	2.2( )
		0.	58.	0.	33.	21.	316.	169.	83.	18.	9.
		.1( )	1.9( )	.1( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		18.	27.	0.	5.	52.	8.	33.	69.	316.	18.
		18.3(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	2.9(S)	.2(S)
		33.	0.	0.	0.						
		1.3(S)	.0( )	.0(D)	.0( )						
1	35.	14.	122.	74.	61.	0.	15.	6.	6.	18.	28.
		.8( )	2.1( )	1.7( )	2.0( )	.1( )	1.8( )	.0( )	.5( )	1.8( )	2.0( )
		0.	49.	0.	31.	13.	294.	128.	67.	14.	7.
		.0( )	1.7( )	.0( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		14.	21.	0.	4.	45.	6.	28.	58.	294.	14.
		14.1(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	1.8(S)	.2(S)
		30.	0.	0.	0.						
		1.2(S)	.0( )	.0(D)	.0( )						
1	40.	9.	94.	62.	52.	0.	12.	5.	4.	14.	22.
		.6( )	1.8( )	1.6( )	1.8( )	.1( )	1.5( )	.0( )	.4( )	1.6( )	1.8( )
		0.	42.	0.	28.	9.	270.	98.	57.	11.	6.
		.0( )	1.6( )	.0( )	1.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		11.	17.	0.	3.	39.	5.	22.	49.	270.	11.
		11.1(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.6(S)	.1(S)
		28.	0.	0.	0.						
		1.2(S)	.0( )	.0(D)	.0( )						
1	45.	7.	76.	53.	45.	0.	9.	4.	3.	12.	18.
		.5( )	1.6( )	1.5( )	1.7( )	.1( )	1.4( )	.0( )	.4( )	1.4( )	1.6( )
		0.	37.	0.	26.	7.	48.	80.	49.	8.	4.
		.0( )	1.5( )	.0( )	1.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )

		9. 9.0(D)	13. .0(D)	0. .0( )	2. .0( )	35. .0(D)	4. .0( )	18. .0( )	42. .0(D)	48. .2(S)	8. .1(S)
		25. 1.1(S)	0. .0( )	0. .0(D)	0. .0( )						
1	50.	5. .5( )	64. 1.5( )	46. 1.4( )	39. 1.6( )	0. .1( )	8. 1.2( )	3. .0( )	3. .4( )	9. 1.3( )	15. 1.5( )
		0. .0( )	33. 1.4( )	0. .0( )	23. 1.9( )	5. .0( )	86. .0( )	67. .0( )	43. .0( )	7. .0( )	4. .0( )
		8. 7.6(D)	11. .0(D)	0. .0( )	2. .0( )	31. .0(D)	3. .0( )	15. .0( )	37. .0(D)	86. .2(S)	7. .1(S)
		23. 1.1(S)	0. .0( )	0. .0(D)	0. .0( )						
1	55.	4. .4( )	54. 1.4( )	41. 1.3( )	34. 1.5( )	0. .1( )	7. 1.2( )	3. .0( )	2. .4( )	8. 1.2( )	12. 1.3( )
		0. .0( )	29. 1.3( )	0. .0( )	21. 1.9( )	4. .0( )	50. .0( )	58. .0( )	38. .0( )	5. .0( )	3. .0( )
		7. 7.1(D)	10. .0(D)	0. .0( )	2. .0( )	27. .0(D)	3. .0( )	12. .0( )	33. .0(D)	50. .2(S)	5. .1(S)
		21. 1.1(S)	0. .0( )	0. .0(D)	0. .0( )						
2	0.	3. .4( )	47. 1.3( )	36. 1.2( )	30. 1.4( )	0. .0( )	7. 1.2( )	3. .0( )	2. .3( )	7. 1.1( )	11. 1.2( )
		0. .0( )	26. 1.3( )	0. .0( )	19. 1.8( )	3. .0( )	56. .0( )	50. .0( )	34. .0( )	5. .0( )	3. .0( )
		7. 6.7(D)	9. .0(D)	0. .0( )	2. .0( )	24. .0(D)	3. .0( )	11. .0( )	29. .0(D)	56. .2(S)	5. .1(S)
		18. 1.0(S)	0. .0( )	0. .0(D)	0. .0( )						
2	5.	2. .3( )	41. 1.2( )	32. 1.1( )	26. 1.3( )	0. .0( )	6. 1.1( )	2. .0( )	2. .3( )	7. 1.1( )	9. 1.1( )
		0. .0( )	22. 1.2( )	0. .0( )	15. 1.8( )	2. .0( )	43. .0( )	44. .0( )	29. .0( )	4. .0( )	3. .0( )
		5. 5.5(D)	7. .0(D)	0. .0( )	2. .0( )	20. .0(D)	2. .0( )	9. .0( )	24. .0(D)	43. .1(S)	4. .1(S)
		15. 1.0(S)	0. .0( )	0. .0(D)	0. .0( )						

2	10.	0. .1( )	36. 1.1( )	27. 1.0( )	22. 1.2( )	0. .0( )	4. .8( )	2. .0( )	1. .3( )	5. 1.0( )	8. 1.0( )
		0. .0( )	18. 1.0( )	0. .0( )	12. 1.7( )	0. .0( )	39. .0( )	37. .0( )	24. .0( )	3. .0( )	2. .0( )
		3. 2.8(D)	5. .0(D)	0. .0( )	0. .0( )	15. .0(D)	2. .0( )	8. .0( )	20. .0(D)	39. .1(S)	3. .0(S)
		12. .9(S)	0. .0( )	0. .0(D)	0. .0( )						
2	15.	0. .0( )	29. 1.0( )	21. .9( )	17. 1.0( )	0. .0( )	1. .5( )	0. .0( )	1. .2( )	4. .8( )	6. .9( )
		0. .0( )	15. .9( )	0. .0( )	11. 1.7( )	0. .0( )	30. .0( )	29. .0( )	17. .0( )	2. .0( )	0. .0( )
		1. .7(D)	4. .0(D)	0. .0( )	0. .0( )	13. .0(D)	0. .0( )	6. .0( )	15. .0(D)	30. .1(S)	2. .0(S)
		11. .9(S)	0. .0( )	0. .0(D)	0. .0( )						
2	20.	0. .0( )	24. .9( )	16. .8( )	14. .9( )	0. .0( )	0. .3( )	0. .0( )	0. .2( )	2. .6( )	5. .8( )
		0. .0( )	13. .9( )	0. .0( )	10. 1.7( )	0. .0( )	25. .0( )	24. .0( )	14. .0( )	1. .0( )	0. .0( )
		0. .4(D)	2. .0(D)	0. .0( )	0. .0( )	12. .0(D)	0. .0( )	5. .0( )	13. .0(D)	25. .1(S)	1. .0(S)
		10. .8(S)	0. .0( )	0. .0(D)	0. .0( )						
2	25.	0. .0( )	19. .8( )	13. .7( )	12. .9( )	0. .0( )	0. .3( )	0. .0( )	0. .1( )	1. .5( )	3. .7( )
		0. .0( )	11. .8( )	0. .0( )	10. 1.7( )	0. .0( )	20. .0( )	19. .0( )	12. .0( )	1. .0( )	0. .0( )
		0. .2(D)	1. .0(D)	0. .0( )	0. .0( )	10. .0(D)	0. .0( )	3. .0( )	11. .0(D)	20. .1(S)	1. .0(S)
		10. .8(S)	0. .0( )	0. .0(D)	0. .0( )						
2	30.	0. .0( )	16. .7( )	12. .7( )	11. .8( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	1. .4( )	2. .6( )
		0.	10.	0.	10.	0.	17.	16.	11.	0.	0.

		.0( )	.8( )	.0( )	1.6( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		0. .2(D)	1. .0(D)	0. .0( )	0. .0( )	10. .0(D)	0. .0( )	2. .0( )	10. .0(D)	17. .1(S)	0. .0(S)
		9. .7(S)	0. .0( )	0. .0(D)	0. .0( )						
2	35.	0. .0( )	14. .7( )	11. .7( )	10. .8( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	1. .3( )	2. .5( )
		0. .0( )	10. .8( )	0. .0( )	9. 1.6( )	0. .0( )	14. .0( )	14. .0( )	10. .0( )	0. .0( )	0. .0( )
		0. .1(D)	1. .0(D)	0. .0( )	0. .0( )	9. .0(D)	0. .0( )	2. .0( )	10. .0(D)	14. .1(S)	0. .0(S)
		9. .6(S)	0. .0( )	0. .0(D)	0. .0( )						
2	40.	0. .0( )	12. .6( )	10. .6( )	9. .8( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	0. .3( )	1. .5( )
		0. .0( )	9. .7( )	0. .0( )	9. 1.6( )	0. .0( )	13. .0( )	12. .0( )	9. .0( )	0. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	9. .0(D)	0. .0( )	1. .0( )	9. .0(D)	13. .1(S)	0. .0(S)
		9. .6(S)	0. .0( )	0. .0(D)	0. .0( )						
2	45.	0. .0( )	11. .6( )	9. .6( )	9. .8( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .4( )
		0. .0( )	9. .7( )	0. .0( )	8. 1.6( )	0. .0( )	11. .0( )	11. .0( )	9. .0( )	0. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	8. .0(D)	0. .0( )	1. .0( )	9. .0(D)	11. .1(S)	0. .0(S)
		8. .5(S)	0. .0( )	0. .0(D)	0. .0( )						
2	50.	0. .0( )	10. .6( )	9. .6( )	8. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .4( )
		0. .0( )	8. .7( )	0. .0( )	8. 1.6( )	0. .0( )	10. .0( )	10. .0( )	8. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	8. .0(D)	0. .0( )	1. .0( )	8. .0(D)	10. .1(S)	0. .0(S)

		8. .4(S)	0. .0( )	0. .0(D)	0. .0( )						
2	55.	0. .0( )	10. .5( )	8. .6( )	8. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )
		0. .0( )	8. .7( )	0. .0( )	8. 1.6( )	0. .0( )	10. .0( )	10. .0( )	8. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	8. .0(D)	0. .0( )	1. .0( )	8. .0(D)	10. .1(S)	0. .0(S)
		7. .4(S)	0. .0( )	0. .0(D)	0. .0( )						
3	0.	0. .0( )	9. .5( )	8. .6( )	8. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )
		0. .0( )	8. .7( )	0. .0( )	7. 1.5( )	0. .0( )	9. .0( )	9. .0( )	8. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	7. .0(D)	0. .0( )	1. .0( )	8. .0(D)	9. .1(S)	0. .0(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
3	5.	0. .0( )	9. .5( )	8. .5( )	7. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .2( )	0. .3( )
		0. .0( )	7. .7( )	0. .0( )	7. 1.3( )	0. .0( )	9. .0( )	9. .0( )	7. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	7. .0(D)	0. .0( )	0. .0( )	7. .0(D)	9. .1(S)	0. .0(S)
		7. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
3	10.	0. .0( )	8. .5( )	7. .5( )	7. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	7. .6( )	0. .0( )	6. 1.2( )	0. .0( )	8. .0( )	8. .0( )	7. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	6. .0(D)	0. .0( )	0. .0( )	7. .0(D)	8. .1(S)	0. .0(S)
		6. .3(S)	0. .0( )	0. .0(D)	0. .0( )						
3	15.	0. .0( )	8. .5( )	7. .5( )	7. .7( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )

		0. .0( )	6. .6( )	0. .0( )	6. 1.1( )	0. .0( )	8. .0( )	8. .0( )	7. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	6. .0(D)	0. .0( )	0. .0( )	6. .0(D)	8. .1(S)	0. .0(S)
		6. .2(S)	0. .0( )	0. .0(D)	0. .0( )						
3	20.	0. .0( )	7. .5( )	7. .5( )	6. .6( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	6. .6( )	0. .0( )	6. 1.1( )	0. .0( )	7. .0( )	7. .0( )	6. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	6. .0(D)	0. .0( )	0. .0( )	6. .0(D)	7. .1(S)	0. .0(S)
		6. .2(S)	0. .0( )	0. .0(D)	0. .0( )						
3	25.	0. .0( )	7. .5( )	6. .5( )	6. .6( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	6. .6( )	0. .0( )	6. 1.0( )	0. .0( )	7. .0( )	7. .0( )	6. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	6. .0(D)	0. .0( )	0. .0( )	6. .0(D)	7. .1(S)	0. .0(S)
		5. .1(S)	0. .0( )	0. .0(D)	0. .0( )						
3	30.	0. .0( )	7. .4( )	6. .5( )	6. .6( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	5. .6( )	0. .0( )	5. 1.0( )	0. .0( )	7. .0( )	7. .0( )	6. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	5. .0(D)	0. .0( )	0. .0( )	5. .0(D)	7. .1(S)	0. .0(S)
		5. .1(S)	0. .0( )	0. .0(D)	0. .0( )						
3	35.	0. .0( )	6. .4( )	6. .5( )	5. .6( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	5. .6( )	0. .0( )	5. .9( )	0. .0( )	6. .0( )	6. .0( )	5. .0( )	0. .0( )	0. .0( )
		0.	0.	0.	0.	5.	0.	0.	5.	6.	0.

		.0(D)	.0(D)	.0( )	.0( )	.0(D)	.0( )	.0( )	.0(D)	.1(S)	.0(S)
		5. .1(S)	0. .0( )	0. .0(D)	0. .0( )						
3	40.	0. .0( )	6. .4( )	5. .4( )	5. .6( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .2( )
		0. .0( )	4. .5( )	0. .0( )	3. .7( )	0. .0( )	6. .0( )	6. .0( )	5. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	3. .0(D)	0. .0( )	0. .0( )	4. .0(D)	6. .1(S)	0. .0(S)
		3. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	45.	0. .0( )	6. .4( )	5. .4( )	4. .5( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	3. .4( )	0. .0( )	2. .5( )	0. .0( )	6. .0( )	6. .0( )	4. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	2. .0(D)	0. .0( )	0. .0( )	3. .0(D)	6. .1(S)	0. .0(S)
		2. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	50.	0. .0( )	5. .4( )	4. .4( )	3. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	2. .4( )	0. .0( )	1. .4( )	0. .0( )	5. .0( )	5. .0( )	3. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	0. .0( )	0. .0( )	2. .0(D)	5. .1(S)	0. .0(S)
		1. .0(S)	0. .0( )	0. .0(D)	0. .0( )						
3	55.	0. .0( )	4. .4( )	3. .3( )	2. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	1. .3( )	0. .0( )	1. .3( )	0. .0( )	5. .0( )	4. .0( )	2. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	0. .0( )	0. .0( )	1. .0(D)	5. .1(S)	0. .0(S)
		1. .0(S)	0. .0( )	0. .0(D)	0. .0( )						

4	0.	0. .0( )	4. .3( )	2. .3( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .1( )
		0. .0( )	1. .3( )	0. .0( )	0. .3( )	0. .0( )	4. .0( )	4. .0( )	1. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	1. .0(D)	4. .1(S)	0. .0(S)
		0. .0(S)	0. .0( )	0. .0(D)	0. .0( )						

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
DESIGN PLAN CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
22	26.	.6		0 45.
117	67.	(DIRECT FLOW)		0 45.
119	78.	(DIRECT FLOW)		0 35.
25	51.	.9		0 45.
19	62.	1.1		0 50.
18	78.	(DIRECT FLOW)		0 35.
203	46.	.1	1.4	1 5.
114	204.	(DIRECT FLOW)		0 45.
26	46.	2.1		1 5.
310	174.	(DIRECT FLOW)		0 45.
118	182.	(DIRECT FLOW)		0 35.
311	174.	(DIRECT FLOW)		0 45.
23	150.	3.4		0 40.
312	105.	2.7		0 35.
121	224.	(DIRECT FLOW)		0 40.
15	279.	4.9		0 40.
111	374.	(DIRECT FLOW)		0 40.
108	51.	(DIRECT FLOW)		0 40.
17	32.	2.9		0 30.
14	385.	3.6		0 40.
12	50.	2.1		0 40.
20	30.	2.3		0 45.
16	63.	.8		0 50.
13	391.	3.1		0 50.
115	63.	(DIRECT FLOW)		0 35.
113	136.	(DIRECT FLOW)		0 50.
110	452.	(DIRECT FLOW)		0 50.
21	55.	3.1		0 55.

201	133.	.1	.8	0	50.
200	359.	.1	4.9	1	10.
120	55.	(DIRECT FLOW)		0	55.
112	133.	(DIRECT FLOW)		0	50.
109	359.	(DIRECT FLOW)		1	10.
116	8.	(DIRECT FLOW)		0	35.

APPENDIX D

EXISTING CONDITION COMPUTER PRINTOUTS

LOWER TRIBUTARY

This appendix contains complete existing condition computer printouts. Existing condition printouts are for future land use and existing design plan hydraulic conditions. Printouts for UDSWM95 models are included for the 10 year and 100 year events. The future land use printouts for CUHPF95 are located in Appendix B.

APPENDIX D

LOWER TRIBUTARY

UDSWM95 - 10 YR

EXISTING CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2   1   1   2
   3   4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB     10 YEAR
        48   0 0  5.0                                                                  1
         1  100
         2  101
         3  102
         4  103
         5  104
         6  122
         7  105
         8  107
        20   24

    0    1  101     5      2.    1300.   .0026                          0.016       2
                           1.    1300.   .0020      20         20       0.020       5
    0    2  103     2      5.     500.   .0042                          0.016       5
    0    3  102     2      6.     550.   .0050                          0.016       6
    0    4          2      6.     300.   .0050                          0.016       6
    0    5  103     1      5.     530.   .0075       3          3       0.063       5
    0    6    5     2      3.     850.   .0120                          0.016       3
    0    7    8     4      .5     300.   .0015      12         12       0.016      .5
                           10     300.   .0015      20         20       0.020       5
    0    8  104     5      2.     700.   .0035                          0.016       2
                           1.     700.   .0025      20         20       0.020       5
    0    9  105     5      2.     900.   .0060                          0.016      2.
                           1.     900.   .0060      20         20       0.020       5
    0   10  106     2      4.     410.   .0050                          0.016       4
    0   11  107     5    1.25    1100.   .0073                          0.016    1.25
                           1     1100.   .0073      20         20       0.020       5
    0   24  122     5      2     1250.   .0140                          0.016       2
                           1     1250.   .0140      20         20       0.020       5
    0  100          3               1.
    0  101          3               1.
    0  102    4     3               1.
    0  103  202     3               1.
    1  104    2   8 3               1.
         0          0       50          0          95          0         100         5
       200        105      250        155         350        255         400       305
    6  105    7   8 3               1.
         0          0       45         45         100         45         200        45
       250         45      300         45         350         45         400        45
    0  106          3               1.
   10  107    9   8 3               1.
         0          0       10         10          20         20          30        30
        40         40       50         50         100         50         200        50
    0  122  104     3               1.
    0  202    3   5 2      .1       1.   .0100                          0.016      .1
         0          0        0         25          .5        100         3.5       125
       6.5       135.

    0
   22
    1    2    3    4    5    6    7    8    9   10   11   24  100  101  102  103
  104  105  106  107  122  202
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 9 SUBCATCHMENTS

TIME(HR/MIN)		1	2	3	4	5	6	7	8	20
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	15.	1.	3.	0.	7.	4.	4.	9.	5.	3.
0	20.	3.	8.	1.	22.	12.	11.	28.	14.	11.
0	25.	9.	22.	3.	45.	23.	31.	54.	28.	39.
0	30.	17.	30.	6.	53.	27.	42.	63.	32.	55.
0	35.	22.	26.	7.	42.	23.	36.	49.	27.	51.
0	40.	24.	21.	7.	30.	17.	29.	34.	20.	42.
0	45.	23.	18.	6.	21.	13.	23.	24.	14.	35.
0	50.	21.	15.	6.	14.	8.	19.	17.	10.	29.
0	55.	20.	12.	6.	11.	6.	15.	13.	7.	25.
1	0.	19.	9.	6.	10.	6.	11.	13.	7.	21.

1	5.	18.	7.	6.	10.	6.	9.	12.	7.	19.
1	10.	17.	7.	6.	10.	6.	9.	12.	7.	15.
1	15.	17.	6.	6.	10.	6.	9.	12.	7.	14.
1	20.	17.	6.	6.	9.	5.	8.	11.	6.	12.
1	25.	16.	5.	6.	8.	5.	6.	10.	5.	9.
1	30.	15.	4.	6.	7.	4.	5.	8.	5.	8.
1	35.	14.	4.	6.	6.	4.	5.	8.	4.	7.
1	40.	13.	3.	6.	6.	3.	4.	7.	4.	6.
1	45.	11.	3.	6.	6.	3.	4.	7.	4.	5.
1	50.	9.	3.	6.	6.	3.	4.	7.	4.	5.
1	55.	8.	3.	6.	5.	3.	3.	7.	4.	5.
2	0.	7.	2.	6.	5.	3.	3.	6.	3.	4.
2	5.	6.	2.	6.	3.	2.	2.	4.	2.	3.
2	10.	5.	0.	6.	2.	0.	0.	2.	0.	2.
2	15.	4.	0.	6.	0.	0.	0.	0.	0.	0.
2	20.	4.	0.	4.	0.	0.	0.	0.	0.	0.
2	25.	3.	0.	2.	0.	0.	0.	0.	0.	0.
2	30.	3.	0.	2.	0.	0.	0.	0.	0.	0.
2	35.	2.	0.	2.	0.	0.	0.	0.	0.	0.
2	40.	2.	0.	1.	0.	0.	0.	0.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	OVERBANK/SURCHARGE MANNING N	DEPTH (FT)	JK
1	101	0	5	PIPE	2.0	1300.	.0026	.0	.0	.016	2.00	0
				OVERFLOW	1.0	1300.	.0026	20.0	20.0	.020	5.00	

```
     2        103         0         2    PIPE           5.0     500.    .0042     .0    .0     .016      5.00     0
     3        102         0         2    PIPE           6.0     550.    .0050     .0    .0     .016      6.00     0
     4          0         0         2    PIPE           6.0     300.    .0050     .0    .0     .016      6.00     0
     5        103         0         1    CHANNEL        5.0     530.    .0075    3.0   3.0     .063      5.00     0
     6          5         0         2    PIPE           3.0     850.    .0120     .0    .0     .016      3.00     0
     7          8         0         4    CHANNEL         .5     300.    .0015   12.0  12.0     .016       .50     0
                                           OVERFLOW    10.0     300.    .0015   20.0  20.0     .020      5.00
     8        104         0         5    PIPE           2.0     700.    .0035     .0    .0     .016      2.00     0
                                           OVERFLOW     1.0     700.    .0035   20.0  20.0     .020      5.00
     9        105         0         5    PIPE           2.0     900.    .0060     .0    .0     .016      2.00     0
                                           OVERFLOW     1.0     900.    .0060   20.0  20.0     .020      5.00
    10        106         0         2    PIPE           4.0     410.    .0050     .0    .0     .016      4.00     0
    11        107         0         5    PIPE           1.3    1100.    .0073     .0    .0     .016      1.25     0
                                           OVERFLOW     1.0    1100.    .0073   20.0  20.0     .020      5.00
    24        122         0         5    PIPE           2.0    1250.    .0140     .0    .0     .016      2.00     0
                                           OVERFLOW     1.0    1250.    .0140   20.0  20.0     .020      5.00
   100          0         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   101          0         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   102          4         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   103        202         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   104          2         8         3                    .0       1.    .0010     .0    .0     .001     10.00     1
                  DIVERSION TO GUTTER NUMBER   1 - TOTAL Q VS DIVERTED Q IN CFS
                       .0      .0     50.0      .0     95.0      .0    100.0     5.0    200.0   105.0    250.0  155.0
                    350.0   255.0    400.0   305.0
   105          7         8         3                    .0       1.    .0010     .0    .0     .001     10.00     6
                  DIVERSION TO GUTTER NUMBER   6 - TOTAL Q VS DIVERTED Q IN CFS
                       .0      .0     45.0    45.0    100.0    45.0    200.0    45.0    250.0    45.0    300.0   45.0
                    350.0    45.0    400.0    45.0
   106          0         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   107          9         8         3                    .0       1.    .0010     .0    .0     .001     10.00    10
                  DIVERSION TO GUTTER NUMBER  10 - TOTAL Q VS DIVERTED Q IN CFS
                       .0      .0     10.0    10.0     20.0    20.0     30.0    30.0     40.0    40.0     50.0   50.0
                    100.0    50.0    200.0    50.0
   122        104         0         3                    .0       1.    .0010     .0    .0     .001     10.00     0
   202          3         5         2    PIPE            .1       1.    .0100     .0    .0     .016       .10     0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0      .0       .0    25.0       .5   100.0      3.5   125.0      6.5   135.0
0TOTAL NUMBER OF GUTTERS/PIPES,  22
1
```

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB   10 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A. (AC)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
2	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94.7

3	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
4	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122.9
5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
7	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
9	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.2
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
24	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	35.8
100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22.4
101	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	16.0
102	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	122.9
103	2	5	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	113.3
104	8	122	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	94.7
105	9	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	29.4
106	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
107	11	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	10.2
122	24	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	57.0
202	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3

ORDER OF TREE STRUCTURE (NGUT VALUE) DECREASES THROUGH DIVERSION FROM GUTTER 10 TO GUTTER 1 COMP THROUGH DIVERSION WILL LAG ONE TIME STEP UNLESS GUTTER CARDS ARE MODIFIED TO REVERSE DIVERSION.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 10 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 22 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:

```
                  ( ) DENOTES DEPTH ABOVE INVERT IN FEET
                  (S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM.  DISCHARGE INCLUDES SPILLWAY OUTFLOW.
                  (I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
                  (D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
                  (O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)    1        2        3        4        5        6        7        8        9        10
               11       24      100      101      102      103      104      105      106      107
              122      202

  0    5.      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
               .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

               0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
               .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0(D)    .0(D)    .0( )    .0(D)

               0.       0.
               .0( )    .0(S)

  0   10.      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
               .0( )    .1( )    .1( )    .0( )    .0( )    .1( )    .0( )    .0( )    .0( )    .1( )

               0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
               .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0(D)    .3(D)    .0( )    .2(D)

               0.       0.
               .0( )    .0(S)

  0   15.      0.       5.       7.       4.       1.       5.       0.       0.       0.       3.
               .0( )    .6( )    .7( )    .6( )    .2( )    .6( )    .0( )    .0( )    .0( )    .5( )

               0.       1.       1.       3.       7.      13.       9.       9.       3.       5.
               .0( )    .3( )    .0( )    .0( )    .0( )    .0( )    .0(D)   9.3(D)    .0( )   4.8(D)

               5.      13.
               .0( )    .0(S)

  0   20.      0.      24.      29.      26.       9.      22.       0.       0.       0.      12.
               .0( )   1.4( )   1.4( )   1.3( )    .8( )   1.3( )    .0( )    .0( )    .0( )   1.0( )

               0.       7.       3.       8.      30.      54.      30.      28.      12.      14.
               .0( )    .8( )    .0( )    .0( )    .0( )    .0( )    .0(D)  27.9(D)    .0( )  14.1(D)

              18.      35.
               .0( )    .1(S)

  0   25.      0.      68.      68.      66.      27.      41.       4.       1.       0.      25.
               .0( )   2.5( )   2.2( )   2.1( )   1.5( )   1.8( )    .5( )    .5( )    .0( )   1.5( )

               0.      24.       9.      22.      71.     140.      79.      54.      25.      28.
               .0( )   2.1( )    .0( )    .0( )    .0( )    .0( )    .0(D)  45.0(D)    .0( )  27.8(D)

              55.      77.
               .0( )    .3(S)
```

0	30.	5.	96.	101.	104.	42.	46.	13.	8.	0.	33.
		1.0( )	3.1( )	2.7( )	2.7( )	1.8( )	2.0( )	.7( )	1.3( )	.0( )	1.7( )
		0.	37.	17.	35.	107.	192.	114.	63.	33.	32.
		.0( )	2.4( )	.0( )	.0( )	.0( )	.0( )	19.1(D)	45.0(D)	.0( )	32.3(D)
		79.	103.								
		.0( )	.9(S)								
0	35.	12.	94.	108.	115.	45.	45.	11.	12.	0.	28.
		2.3( )	3.0( )	2.8( )	2.9( )	1.9( )	1.9( )	.6( )	1.9( )	.0( )	1.6( )
		0.	49.	22.	38.	114.	182.	120.	49.	28.	27.
		.0( )	2.6( )	.0( )	.0( )	.0( )	.0( )	24.5(D)	45.0(D)	.0( )	26.6(D)
		85.	108.								
		.0( )	1.4(S)								
0	40.	13.	95.	111.	116.	41.	38.	2.	7.	0.	21.
		2.3( )	3.1( )	2.8( )	2.9( )	1.8( )	1.7( )	.4( )	1.2( )	.0( )	1.4( )
		0.	47.	24.	34.	117.	167.	101.	34.	21.	20.
		.0( )	2.5( )	.0( )	.0( )	.0( )	.0( )	5.6(D)	34.0(D)	.0( )	19.9(D)
		76.	111.								
		.0( )	1.9(S)								
0	45.	10.	83.	114.	120.	33.	26.	0.	2.	0.	15.
		2.1( )	2.8( )	2.9( )	3.0( )	1.6( )	1.4( )	.2( )	.5( )	.0( )	1.2( )
		0.	41.	23.	28.	120.	137.	79.	24.	15.	14.
		.0( )	2.5( )	.0( )	.0( )	.0( )	.0( )	.0(D)	24.0(D)	.0( )	14.5(D)
		64.	114.								
		.0( )	2.1(S)								
0	50.	5.	65.	114.	120.	24.	18.	0.	1.	0.	11.
		1.0( )	2.4( )	2.9( )	3.0( )	1.4( )	1.1( )	.1( )	.3( )	.0( )	1.0( )
		0.	35.	21.	20.	120.	103.	63.	17.	11.	10.
		.0( )	2.4( )	.0( )	.0( )	.0( )	.0( )	.0(D)	16.5(D)	.0( )	9.5(D)
		54.	114.								
		.0( )	2.2(S)								
0	55.	2.	53.	113.	119.	17.	14.	0.	0.	0.	8.
		.6( )	2.2( )	2.9( )	3.0( )	1.2( )	1.0( )	.1( )	.2( )	.0( )	.8( )
		0.	30.	20.	14.	119.	82.	51.	13.	8.	7.
		.0( )	2.3( )	.0( )	.0( )	.0( )	.0( )	.0(D)	13.5(D)	.0( )	7.4(D)
		45.	113.								
		.0( )	2.0(S)								

1	0.	1.	45.	111.	117.	14.	13.	0.	0.	0.	7.
		.4( )	2.0( )	2.8( )	2.9( )	1.0( )	.9( )	.1( )	.2( )	.0( )	.8( )
		0.	26.	19.	10.	117.	69.	43.	13.	7.	7.
		.0( )	2.2( )	.0( )	.0( )	.0( )	.0( )	.0(D)	12.6(D)	.0( )	6.9(D)
		37.	111.								
		.0( )	1.8(S)								
1	5.	1.	39.	109.	114.	13.	12.	0.	0.	0.	7.
		.3( )	1.8( )	2.8( )	2.9( )	1.0( )	.9( )	.1( )	.1( )	.0( )	.8( )
		0.	23.	18.	8.	114.	62.	39.	12.	7.	7.
		.0( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0(D)	12.2(D)	.0( )	6.6(D)
		33.	108.								
		.0( )	1.5(S)								
1	10.	0.	34.	106.	112.	12.	12.	0.	0.	0.	7.
		.3( )	1.7( )	2.8( )	2.9( )	1.0( )	.9( )	.0( )	.1( )	.0( )	.8( )
		0.	18.	17.	7.	112.	56.	33.	12.	7.	7.
		.0( )	1.4( )	.0( )	.0( )	.0( )	.0( )	.0(D)	12.1(D)	.0( )	6.5(D)
		27.	106.								
		.0( )	1.2(S)								
1	15.	0.	29.	103.	109.	12.	12.	0.	0.	0.	7.
		.2( )	1.6( )	2.7( )	2.8( )	1.0( )	.9( )	.0( )	.1( )	.0( )	.8( )
		0.	14.	17.	7.	109.	51.	29.	12.	7.	7.
		.0( )	1.2( )	.0( )	.0( )	.0( )	.0( )	.0(D)	12.1(D)	.0( )	6.5(D)
		23.	103.								
		.0( )	.8(S)								
1	20.	0.	26.	97.	104.	12.	12.	0.	0.	0.	6.
		.2( )	1.5( )	2.6( )	2.7( )	1.0( )	.9( )	.0( )	.1( )	.0( )	.7( )
		0.	13.	17.	6.	103.	47.	26.	11.	6.	6.
		.0( )	1.1( )	.0( )	.0( )	.0( )	.0( )	.0(D)	11.3(D)	.0( )	6.1(D)
		20.	96.								
		.0( )	.5(S)								
1	25.	0.	23.	69.	79.	11.	10.	0.	0.	0.	6.
		.1( )	1.4( )	2.2( )	2.3( )	.9( )	.8( )	.0( )	.1( )	.0( )	.7( )
		0.	11.	16.	5.	75.	41.	22.	10.	6.	5.
		.0( )	1.0( )	.0( )	.0( )	.0( )	.0( )	.0(D)	9.7(D)	.0( )	5.3(D)
		17.	61.								
		.0( )	.2(S)								

1	30.	0. .1( )	19. 1.2( )	46. 1.8( )	53. 1.9( )	10. .9( )	9. .8( )	0. .0( )	0. .1( )	0. .0( )	5. .7( )
		0. .0( )	9. .9( )	15. .0( )	4. .0( )	52. .0( )	35. .0( )	18. .0(D)	8. 8.3(D)	5. .0( )	5. 4.6(D)
		14. .0( )	45. .1(S)								
1	35.	0. .1( )	16. 1.2( )	39. 1.6( )	46. 1.8( )	9. .8( )	8. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	7. .8( )	14. .0( )	4. .0( )	45. .0( )	31. .0( )	16. .0(D)	8. 7.6(D)	4. .0( )	4. 4.2(D)
		12. .0( )	37. .1(S)								
1	40.	0. .1( )	14. 1.1( )	32. 1.5( )	39. 1.6( )	8. .8( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	6. .7( )	13. .0( )	3. .0( )	38. .0( )	28. .0( )	14. .0(D)	7. 7.2(D)	4. .0( )	4. 3.9(D)
		11. .0( )	32. .0(S)								
1	45.	0. .1( )	13. 1.0( )	29. 1.4( )	35. 1.5( )	7. .7( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	6. .7( )	11. .0( )	3. .0( )	35. .0( )	26. .0( )	13. .0(D)	7. 7.1(D)	4. .0( )	4. 3.8(D)
		10. .0( )	29. .0(S)								
1	50.	0. .1( )	12. 1.0( )	27. 1.3( )	34. 1.5( )	7. .7( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	5. .7( )	9. .0( )	3. .0( )	33. .0( )	25. .0( )	12. .0(D)	7. 7.1(D)	4. .0( )	4. 3.8(D)
		9. .0( )	27. .0(S)								
1	55.	0. .1( )	12. 1.0( )	26. 1.3( )	32. 1.5( )	7. .7( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	5. .6( )	8. .0( )	3. .0( )	32. .0( )	24. .0( )	11. .0(D)	7. 6.9(D)	4. .0( )	4. 3.7(D)
		8. .0( )	25. .0(S)								

2	0.	0. .1( )	11. .9( )	24. 1.3( )	31. 1.4( )	7. .7( )	6. .7( )	0. .0( )	0. .0( )	0. .0( )	3. .6( )
		0. .0( )	4. .6( )	7. .0( )	2. .0( )	30. .0( )	22. .0( )	10. .0(D)	6. 6.2(D)	3. .0( )	3. 3.4(D)
		7. .0( )	23. .0(S)								
2	5.	0. .1( )	8. .8( )	19. 1.1( )	26. 1.3( )	6. .7( )	5. .6( )	0. .0( )	0. .0( )	0. .0( )	3. .5( )
		0. .0( )	3. .5( )	6. .0( )	2. .0( )	25. .0( )	18. .0( )	8. .0(D)	4. 4.1(D)	3. .0( )	2. 2.3(D)
		6. .0( )	17. .0(S)								
2	10.	0. .1( )	4. .6( )	13. .9( )	20. 1.2( )	5. .6( )	3. .4( )	0. .0( )	0. .0( )	0. .0( )	1. .3( )
		0. .0( )	2. .5( )	5. .0( )	0. .0( )	19. .0( )	10. .0( )	2. .0(D)	2. 1.9(D)	1. .0( )	0. .0(D)
		2. .0( )	11. .0(S)								
2	15.	0. .1( )	2. .4( )	6. .7( )	13. .9( )	3. .4( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
		0. .0( )	1. .3( )	4. .0( )	0. .0( )	12. .0( )	5. .0( )	1. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		1. .0( )	4. .0(S)								
2	20.	0. .0( )	1. .3( )	3. .5( )	8. .7( )	2. .3( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
		0. .0( )	0. .2( )	4. .0( )	0. .0( )	7. .0( )	2. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	3. .0(S)								
2	25.	0. .0( )	0. .2( )	2. .4( )	5. .6( )	1. .2( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	4. .0( )	1. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								

2	30.	0. .0( )	0. .1( )	1. .3( )	3. .5( )	1. .2( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	3. .0( )	1. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	2. .0(S)								
2	35.	0. .0( )	0. .1( )	1. .3( )	3. .4( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	40.	0. .0( )	0. .1( )	0. .2( )	2. .4( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	2. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	1. .0(S)								
2	45.	0. .0( )	0. .1( )	0. .2( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	50.	0. .0( )	0. .1( )	0. .1( )	0. .2( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	55.	0. .0( )	0. .1( )	0. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								

3	0.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	5.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	10.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	15.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	20.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	25.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								

```
3   30.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .1( )   .1( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
3   35.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .1( )   .1( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
3   40.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .1( )   .1( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
3   45.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .1( )   .1( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
3   50.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .1( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
3   55.      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0( )

             0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              .0( )   .0( )   .0( )   .0( )   .0( )   .0( )   .0(D)   .0(D)   .0( )   .0(D)

             0.      0.
              .0( )   .0(S)
```

```
 4    0.        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                 .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0( )

                0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
                 .0( )     .0( )     .0( )     .0( )     .0( )     .0( )     .0(D)     .0(D)     .0( )     .0(D)

                0.        0.
                 .0( )     .0(S)
```

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB   10 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
11	0.	.0		0 0.
107	32.	(DIRECT FLOW)		0 30.
9	0.	.0		4 0.
105	63.	(DIRECT FLOW)		0 30.
24	49.	2.6		0 35.
7	13.	.7		0 30.
122	85.	(DIRECT FLOW)		0 35.
8	12.	1.9		0 35.
6	46.	2.0		0 30.
104	120.	(DIRECT FLOW)		0 35.
5	45.	1.9		0 35.
2	96.	3.1		0 30.
103	192.	(DIRECT FLOW)		0 30.
202	114.	.1	2.2	0 50.
3	114.	2.9		0 50.
10	33.	1.7		0 30.
1	13.	2.3		0 40.
102	120.	(DIRECT FLOW)		0 50.
106	33.	(DIRECT FLOW)		0 30.
101	38.	(DIRECT FLOW)		0 35.
100	24.	(DIRECT FLOW)		0 40.
4	120.	3.0		0 45.

APPENDIX D

LOWER TRIBUTARY

UDSWM95 - 100 YR

EXISTING CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2   1   1   2
   3   4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB     100 YEAR
        48   0 0  5.0                                                            1
         1  100
         2  101
         3  102
         4  103
         5  104
         6  122
         7  105
         8  107
        20   24

    0    1  101     5       2.    1300.   .0026                       0.016       2
                            1.    1300.   .0020      20        20     0.020       5
    0    2  103     2       5.     500.   .0042                       0.016       5
    0    3  102     2       6.     550.   .0050                       0.016       6
    0    4          2       6.     300.   .0050                       0.016       6
    0    5  103     1       5.     530.   .0075       3         3     0.063       5
    0    6    5     2       3.     850.   .0120                       0.016       3
    0    7    8     4       .5     300.   .0015      12        12     0.016      .5
                            10     300.   .0015      20        20     0.020       5
    0    8  104     5       2.     700.   .0035                       0.016       2
                            1.     700.   .0025      20        20     0.020       5
    0    9  105     5       2.     900.   .0060                       0.016      2.
                            1.     900.   .0060      20        20     0.020       5
    0   10  106     2       4.     410.   .0050                       0.016       4
    0   11  107     5     1.25    1100.   .0073                       0.016    1.25
                             1    1100.   .0073      20        20     0.020       5
    0   24  122     5        2    1250.   .0140                       0.016       2
                             1    1250.   .0140      20        20     0.020       5
    0  100          3               1.
    0  101          3               1.
    0  102    4     3               1.
    0  103  202     3               1.
    1  104    2   8 3               1.
         0          0        50          0        95         0        100          5
       200        105       250        155       350       255        400        305
    6  105    7   8 3               1.
         0          0        45         45       100        45        200         45
       250         45       300         45       350        45        400         45
    0  106          3               1.
   10  107    9   8 3               1.
         0          0        10         10        20        20         30         30
        40         40        50         50       100        50        200         50
    0  122  104     3               1.
    0  202    3   5 2       .1      1.    .0100                       0.016      .1
         0          0         0         25        .5       100        3.5        125
       6.5       135.

    0
   22
    1    2    3    4    5    6    7    8    9   10   11   24  100  101  102  103
  104  105  106  107  122  202
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 9 SUBCATCHMENTS

TIME(HR/MIN)		1	2	3	4	5	6	7	8	20
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	1.	0.	1.	0.	0.	1.	1.	0.
0	15.	1.	3.	0.	7.	4.	4.	9.	5.	3.
0	20.	3.	7.	1.	19.	10.	9.	25.	12.	9.
0	25.	8.	17.	2.	38.	20.	24.	47.	24.	27.
0	30.	20.	50.	8.	78.	38.	69.	88.	46.	96.
0	35.	36.	65.	14.	95.	45.	90.	105.	55.	129.
0	40.	49.	59.	16.	80.	40.	80.	87.	47.	122.
0	45.	54.	51.	17.	61.	33.	68.	66.	38.	106.
0	50.	53.	44.	17.	46.	26.	56.	49.	29.	91.
0	55.	50.	37.	16.	32.	18.	46.	35.	20.	77.
1	0.	47.	30.	16.	26.	14.	38.	28.	16.	66.

1	5.	44.	23.	15.	23.	12.	29.	26.	14.	59.
1	10.	42.	17.	15.	19.	10.	22.	21.	12.	46.
1	15.	40.	12.	15.	14.	8.	16.	16.	9.	32.
1	20.	37.	9.	14.	10.	6.	12.	13.	7.	22.
1	25.	34.	6.	14.	8.	5.	8.	9.	5.	16.
1	30.	31.	5.	14.	6.	4.	6.	8.	4.	11.
1	35.	29.	4.	14.	6.	4.	5.	7.	4.	9.
1	40.	26.	3.	14.	6.	3.	4.	7.	4.	7.
1	45.	24.	3.	14.	6.	3.	4.	7.	4.	6.
1	50.	21.	3.	14.	6.	3.	4.	7.	4.	5.
1	55.	15.	3.	15.	6.	3.	4.	7.	4.	5.
2	0.	12.	3.	15.	6.	3.	4.	7.	4.	4.
2	5.	10.	2.	15.	4.	2.	3.	5.	3.	3.
2	10.	8.	0.	15.	2.	0.	2.	2.	1.	2.
2	15.	6.	0.	15.	0.	0.	0.	0.	0.	2.
2	20.	5.	0.	13.	0.	0.	0.	0.	0.	0.
2	25.	4.	0.	8.	0.	0.	0.	0.	0.	0.
2	30.	3.	0.	6.	0.	0.	0.	0.	0.	0.
2	35.	2.	0.	4.	0.	0.	0.	0.	0.	0.
2	40.	2.	0.	3.	0.	0.	0.	0.	0.	0.
2	45.	1.	0.	3.	0.	0.	0.	0.	0.	0.
2	50.	0.	0.	2.	0.	0.	0.	0.	0.	0.
2	55.	0.	0.	1.	0.	0.	0.	0.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	MANNING N	OVERBANK/SURCHARGE DEPTH (FT)	JK
1	101	0	5	PIPE	2.0	1300.	.0026	.0	.0	.016	2.00	0
				OVERFLOW	1.0	1300.	.0026	20.0	20.0	.020	5.00	
2	103	0	2	PIPE	5.0	500.	.0042	.0	.0	.016	5.00	0
3	102	0	2	PIPE	6.0	550.	.0050	.0	.0	.016	6.00	0
4	0	0	2	PIPE	6.0	300.	.0050	.0	.0	.016	6.00	0
5	103	0	1	CHANNEL	5.0	530.	.0075	3.0	3.0	.063	5.00	0
6	5	0	2	PIPE	3.0	850.	.0120	.0	.0	.016	3.00	0
7	8	0	4	CHANNEL	.5	300.	.0015	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	300.	.0015	20.0	20.0	.020	5.00	
8	104	0	5	PIPE	2.0	700.	.0035	.0	.0	.016	2.00	0
				OVERFLOW	1.0	700.	.0035	20.0	20.0	.020	5.00	
9	105	0	5	PIPE	2.0	900.	.0060	.0	.0	.016	2.00	0
				OVERFLOW	1.0	900.	.0060	20.0	20.0	.020	5.00	
10	106	0	2	PIPE	4.0	410.	.0050	.0	.0	.016	4.00	0
11	107	0	5	PIPE	1.3	1100.	.0073	.0	.0	.016	1.25	0
				OVERFLOW	1.0	1100.	.0073	20.0	20.0	.020	5.00	
24	122	0	5	PIPE	2.0	1250.	.0140	.0	.0	.016	2.00	0
				OVERFLOW	1.0	1250.	.0140	20.0	20.0	.020	5.00	
100	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
101	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
102	4	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
103	202	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
104	2	8	3		.0	1.	.0010	.0	.0	.001	10.00	1

DIVERSION TO GUTTER NUMBER 1 - TOTAL Q VS DIVERTED Q IN CFS

.0	.0	50.0	.0	95.0	.0	100.0	5.0	200.0	105.0	250.0	155.0
350.0	255.0	400.0	305.0								

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	L	R	MANNING N	DEPTH (FT)	JK
105	7	8	3		.0	1.	.0010	.0	.0	.001	10.00	6

DIVERSION TO GUTTER NUMBER 6 - TOTAL Q VS DIVERTED Q IN CFS

.0	.0	45.0	45.0	100.0	45.0	200.0	45.0	250.0	45.0	300.0	45.0
350.0	45.0	400.0	45.0								

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	L	R	MANNING N	DEPTH (FT)	JK
106	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
107	9	8	3		.0	1.	.0010	.0	.0	.001	10.00	10

DIVERSION TO GUTTER NUMBER 10 - TOTAL Q VS DIVERTED Q IN CFS

.0	.0	10.0	10.0	20.0	20.0	30.0	30.0	40.0	40.0	50.0	50.0
100.0	50.0	200.0	50.0								

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	L	R	MANNING N	DEPTH (FT)	JK
122	104	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
202	3	5	2	PIPE	.1	1.	.0100	.0	.0	.016	.10	0

RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW

.0	.0	.0	25.0	.5	100.0	3.5	125.0	6.5	135.0

0TOTAL NUMBER OF GUTTERS/PIPES, 22
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A. (AC)
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
2	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94.7
3	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3
4	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122.9
5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
7	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.4
9	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.2
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
24	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	35.8
100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22.4
101	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	16.0
102	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	122.9
103	2	5	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	113.3
104	8	122	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	94.7
105	9	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	29.4
106	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
107	11	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	10.2
122	24	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	57.0
202	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113.3

ORDER OF TREE STRUCTURE (NGUT VALUE) DECREASES THROUGH DIVERSION FROM GUTTER 10 TO GUTTER 1 COMP THROUGH DIVERSION WILL LAG ONE TIME STEP UNLESS GUTTER CARDS ARE MODIFIED TO REVERSE DIVERSION.
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 22 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER.

TIME(HR/MIN)	1	2	3	4	5	6	7	8	9	10
	11	24	100	101	102	103	104	105	106	107
	122	202								
0 5.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
	0. .0( )	0. .0(S)								
0 10.	0. .0( )	0. .2( )	0. .2( )	0. .1( )	0. .0( )	0. .2( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )
	0. .0( )	0. .1( )	0. .0( )	1. .0( )	0. .0( )	1. .0( )	1. .0(D)	1. 1.0(D)	0. .0( )	1. .5(D)
	0. .0( )	1. .0(S)								
0 15.	0. .0( )	5. .7( )	8. .7( )	5. .6( )	1. .2( )	5. .6( )	0. .0( )	0. .0( )	0. .0( )	3. .5( )
	0. .0( )	1. .3( )	1. .0( )	3. .0( )	8. .0( )	13. .0( )	9. .0(D)	9. 9.2(D)	3. .0( )	5. 4.8(D)
	5. .0( )	13. .0(S)								
0 20.	0. .0( )	21. 1.3( )	28. 1.4( )	25. 1.3( )	8. .8( )	20. 1.2( )	0. .0( )	0. .0( )	0. .0( )	10. 1.0( )
	0. .0( )	6. .7( )	3. .0( )	7. .0( )	28. .0( )	48. .0( )	25. .0(D)	25. 24.6(D)	10. .0( )	12. 12.4(D)
	15. .0( )	33. .1(S)								
0 25.	0. .0( )	54. 2.2( )	59. 2.0( )	57. 2.0( )	25. 1.4( )	40. 1.8( )	1. .2( )	0. .2( )	0. .0( )	22. 1.4( )

		0. .0( )	19. 1.4( )	8. .0( )	17. .0( )	61. .0( )	117. .0( )	63. .0(D)	47. 45.0(D)	22. .0( )	24. 24.2(D)
		42. .0( )	67. .3(S)								
0	30.	14. 2.4( )	91. 3.0( )	97. 2.6( )	100. 2.7( )	41. 1.8( )	47. 2.0( )	23. .8( )	11. 1.6( )	0. .0( )	42. 2.0( )
		0. .0( )	47. 2.5( )	20. .0( )	64. .0( )	105. .0( )	210. .0( )	165. 69.5(D)	88. 45.0(D)	42. .0( )	46. 46.0(D)
		116. .0( )	103. .8(S)								
0	35.	64. 3.0( )	97. 3.1( )	111. 2.8( )	124. 3.0( )	45. 1.9( )	44. 1.9( )	57. 1.1( )	29. 2.6( )	2. .5( )	51. 2.3( )
		0. .0( )	102. 2.9( )	36. .0( )	129. .0( )	124. .0( )	238. .0( )	266. 170.7(D)	107. 45.0(D)	51. .0( )	55. 50.0(D)
		192. .0( )	109. 1.6(S)								
0	40.	136. 3.4( )	94. 3.0( )	114. 2.9( )	129. 3.1( )	45. 1.9( )	45. 2.0( )	52. 1.1( )	49. 2.8( )	2. .6( )	47. 2.2( )
		0. .0( )	123. 2.9( )	49. .0( )	195. .0( )	130. .0( )	219. .0( )	293. 198.0(D)	89. 45.0(D)	47. .0( )	47. 47.5(D)
		204. .0( )	116. 2.4(S)								
0	45.	165. 3.5( )	95. 3.1( )	121. 3.0( )	137. 3.2( )	45. 1.9( )	45. 2.0( )	30. .9( )	43. 2.8( )	0. .3( )	40. 2.0( )
		0. .0( )	115. 2.9( )	54. .0( )	216. .0( )	138. .0( )	202. .0( )	258. 162.7(D)	66. 45.0(D)	40. .0( )	38. 38.0(D)
		182. .0( )	121. 3.1(S)								
0	50.	147. 3.5( )	95. 3.1( )	124. 3.0( )	141. 3.3( )	45. 1.9( )	45. 2.0( )	12. .7( )	26. 2.6( )	0. .2( )	30. 1.7( )
		0. .0( )	100. 2.8( )	53. .0( )	191. .0( )	141. .0( )	186. .0( )	208. 113.2(D)	50. 45.0(D)	30. .0( )	29. 29.4(D)
		157. .0( )	125. 3.5(S)								
0	55.	112. 3.3( )	95. 3.1( )	127. 3.1( )	143. 3.3( )	42. 1.8( )	39. 1.8( )	3. .4( )	14. 2.3( )	0. .1( )	22. 1.4( )

		0.	86.	50.	148.	143.	169.	164.	35.	22.	20.
		.0( )	2.8( )	.0( )	.0( )	.0( )	.0( )	68.8(D)	35.4(D)	.0( )	20.4(D)
		132.	126.								
		.0( )	3.9(S)								
1	0.	76.	95.	127.	143.	35.	30.	0.	5.	0.	16.
		3.1( )	3.1( )	3.1( )	3.3( )	1.6( )	1.5( )	.2( )	1.0( )	.1( )	1.2( )
		0.	74.	47.	107.	143.	155.	131.	28.	16.	16.
		.0( )	2.7( )	.0( )	.0( )	.0( )	.0( )	35.6(D)	28.5(D)	.0( )	16.1(D)
		112.	127.								
		.0( )	4.2(S)								
1	5.	48.	95.	128.	143.	29.	26.	0.	1.	0.	15.
		2.9( )	3.1( )	3.1( )	3.3( )	1.5( )	1.4( )	.1( )	.4( )	.1( )	1.1( )
		0.	65.	44.	71.	143.	147.	107.	26.	15.	14.
		.0( )	2.7( )	.0( )	.0( )	.0( )	.0( )	12.0(D)	25.9(D)	.0( )	14.4(D)
		94.	128.								
		.0( )	4.3(S)								
1	10.	28.	89.	128.	143.	25.	23.	0.	0.	0.	12.
		2.7( )	2.9( )	3.1( )	3.3( )	1.4( )	1.3( )	.1( )	.2( )	.1( )	1.0( )
		0.	55.	42.	44.	143.	133.	87.	21.	12.	12.
		.0( )	2.6( )	.0( )	.0( )	.0( )	.0( )	.0(D)	21.3(D)	.0( )	11.8(D)
		77.	128.								
		.0( )	4.4(S)								
1	15.	16.	71.	128.	142.	21.	18.	0.	0.	0.	10.
		2.4( )	2.6( )	3.1( )	3.3( )	1.3( )	1.1( )	.1( )	.2( )	.0( )	.9( )
		0.	43.	40.	29.	142.	106.	67.	16.	10.	9.
		.0( )	2.5( )	.0( )	.0( )	.0( )	.0( )	.0(D)	16.3(D)	.0( )	9.2(D)
		59.	128.								
		.0( )	4.3(S)								
1	20.	11.	52.	127.	142.	17.	14.	0.	0.	0.	8.
		2.2( )	2.1( )	3.1( )	3.3( )	1.1( )	1.0( )	.1( )	.1( )	.0( )	.8( )
		0.	32.	37.	20.	141.	79.	50.	13.	8.	7.
		.0( )	2.4( )	.0( )	.0( )	.0( )	.0( )	.0(D)	12.5(D)	.0( )	7.1(D)
		43.	127.								
		.0( )	4.1(S)								
1	25.	7.	40.	126.	140.	13.	10.	0.	0.	0.	6.
		1.3( )	1.8( )	3.1( )	3.3( )	1.0( )	.8( )	.0( )	.1( )	.0( )	.7( )

		0. .0( )	25. 2.2( )	34. .0( )	14. .0( )	140. .0( )	60. .0( )	38. .0(D)	9. 9.5(D)	6. .0( )	5. 5.4(D)
		33. .0( )	126. 3.7(S)								
1	30.	3. .7( )	29. 1.6( )	123. 3.0( )	138. 3.2( )	10. .9( )	8. .8( )	0. .0( )	0. .1( )	0. .0( )	5. .6( )
		0. .0( )	16. 1.3( )	31. .0( )	8. .0( )	137. .0( )	45. .0( )	26. .0(D)	8. 7.9(D)	5. .0( )	4. 4.4(D)
		23. .0( )	123. 3.2(S)								
1	35.	1. .5( )	20. 1.3( )	119. 3.0( )	133. 3.2( )	9. .8( )	8. .7( )	0. .0( )	0. .1( )	0. .0( )	4. .6( )
		0. .0( )	10. .9( )	29. .0( )	5. .0( )	133. .0( )	34. .0( )	18. .0(D)	7. 7.4(D)	4. .0( )	4. 4.0(D)
		15. .0( )	118. 2.7(S)								
1	40.	1. .4( )	16. 1.1( )	114. 2.9( )	129. 3.1( )	8. .8( )	7. .7( )	0. .0( )	0. .1( )	0. .0( )	4. .6( )
		0. .0( )	8. .8( )	26. .0( )	4. .0( )	128. .0( )	29. .0( )	15. .0(D)	7. 7.1(D)	4. .0( )	4. 3.8(D)
		12. .0( )	113. 2.1(S)								
1	45.	0. .3( )	14. 1.1( )	109. 2.8( )	124. 3.0( )	7. .7( )	7. .7( )	0. .0( )	0. .1( )	0. .0( )	4. .6( )
		0. .0( )	6. .7( )	24. .0( )	3. .0( )	124. .0( )	27. .0( )	14. .0(D)	7. 7.1(D)	4. .0( )	4. 3.8(D)
		10. .0( )	108. 1.5(S)								
1	50.	0. .2( )	13. 1.0( )	105. 2.7( )	119. 3.0( )	7. .7( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )
		0. .0( )	5. .7( )	21. .0( )	3. .0( )	119. .0( )	25. .0( )	12. .0(D)	7. 7.1(D)	4. .0( )	4. 3.8(D)
		9. .0( )	104. 1.0(S)								
1	55.	0. .2( )	12. 1.0( )	96. 2.6( )	111. 2.9( )	7. .7( )	7. .7( )	0. .0( )	0. .0( )	0. .0( )	4. .6( )

		0.	5.	15.	3.	110.	25.	12.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	.0(D)	7.1(D)	.0( )	3.8(D)
		8.	94.								
		.0( )	.5(S)								
2	0.	0.	12.	58.	78.	7.	7.	0.	0.	0.	4.
		.2( )	1.0( )	2.0( )	2.3( )	.7( )	.7( )	.0( )	.0( )	.0( )	.6( )
		0.	5.	12.	3.	73.	24.	11.	7.	4.	4.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	.0(D)	7.1(D)	.0( )	3.8(D)
		8.	46.								
		.0( )	.1(S)								
2	5.	0.	10.	30.	46.	7.	6.	0.	0.	0.	3.
		.1( )	.9( )	1.4( )	1.8( )	.7( )	.6( )	.0( )	.0( )	.0( )	.5( )
		0.	4.	10.	2.	45.	21.	9.	5.	3.	3.
		.0( )	.6( )	.0( )	.0( )	.0( )	.0( )	.0(D)	5.1(D)	.0( )	2.8(D)
		7.	30.								
		.0( )	.0(S)								
2	10.	0.	6.	21.	37.	5.	4.	0.	0.	0.	2.
		.1( )	.7( )	1.2( )	1.6( )	.6( )	.5( )	.0( )	.0( )	.0( )	.4( )
		0.	3.	8.	0.	36.	13.	5.	2.	2.	1.
		.0( )	.5( )	.0( )	.0( )	.0( )	.0( )	.0(D)	2.4(D)	.0( )	1.5(D)
		5.	17.								
		.0( )	.0(S)								
2	15.	0.	3.	7.	24.	3.	1.	0.	0.	0.	1.
		.1( )	.5( )	.7( )	1.3( )	.5( )	.3( )	.0( )	.0( )	.0( )	.2( )
		0.	2.	6.	0.	21.	6.	2.	0.	1.	0.
		.0( )	.4( )	.0( )	.0( )	.0( )	.0( )	.0(D)	.0(D)	.0( )	.0(D)
		2.	3.								
		.0( )	.0(S)								
2	20.	0.	1.	5.	17.	2.	0.	0.	0.	0.	0.
		.1( )	.4( )	.6( )	1.1( )	.3( )	.1( )	.0( )	.0( )	.0( )	.1( )
		0.	1.	5.	0.	18.	3.	1.	0.	0.	0.
		.0( )	.3( )	.0( )	.0( )	.0( )	.0( )	.0(D)	.0(D)	.0( )	.0(D)
		1.	7.								
		.0( )	.0(S)								
2	25.	0.	1.	3.	13.	1.	0.	0.	0.	0.	0.
		.1( )	.3( )	.5( )	1.0( )	.2( )	.1( )	.0( )	.0( )	.0( )	.1( )

		0. .0( )	0. .2( )	4. .0( )	0. .0( )	12. .0( )	2. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	30.	0. .1( )	0. .2( )	1. .3( )	7. .7( )	1. .2( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	3. .0( )	0. .0( )	7. .0( )	1. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	3. .0(S)								
2	35.	0. .1( )	0. .1( )	1. .3( )	6. .6( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	6. .0( )	1. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	40.	0. .1( )	0. .1( )	1. .2( )	4. .6( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	2. .0( )	0. .0( )	4. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	1. .0(S)								
2	45.	0. .1( )	0. .1( )	0. .2( )	3. .5( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .1( )	1. .0( )	0. .0( )	3. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	50.	0. .1( )	0. .1( )	0. .1( )	3. .4( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
2	55.	0. .0( )	0. .1( )	0. .1( )	2. .4( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

		0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	0.	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	5.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	10.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	15.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	20.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	25.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	30.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	35.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	40.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	45.	0. .0( )	0. .0( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	50.	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0(D)	0. .0(D)	0. .0( )	0. .0(D)
		0. .0( )	0. .0(S)								
3	55.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )

```
                0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0(D)    .0(D)    .0( )    .0(D)

                0.       0.
                 .0( )    .0(S)

   4    0.      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

                0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                 .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0(D)    .0(D)    .0( )    .0(D)

                0.       0.
                 .0( )    .0(S)

1
```

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM-LOWER TRIB 100 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
11	0.	.0		0 0.
107	55.	(DIRECT FLOW)		0 35.
9	2.	.6		0 40.
105	107.	(DIRECT FLOW)		0 35.
24	123.	2.9		0 40.
7	57.	1.1		0 35.
122	204.	(DIRECT FLOW)		0 40.
8	49.	2.8		0 40.
6	47.	2.0		0 30.
104	293.	(DIRECT FLOW)		0 40.
5	45.	1.9		0 35.
2	97.	3.1		0 35.
103	238.	(DIRECT FLOW)		0 35.
202	128.	.1	4.4	1 10.
3	128.	3.1		1 10.
10	51.	2.3		0 35.
1	165.	3.5		0 45.
102	143.	(DIRECT FLOW)		1 5.
106	51.	(DIRECT FLOW)		0 35.
101	216.	(DIRECT FLOW)		0 45.
100	54.	(DIRECT FLOW)		0 45.
4	143.	3.3		1 10.

APPENDIX E

EXISTING CONDITION COMPUTER PRINTOUTS

UPPER TRIBUTARY

This appendix contains complete existing condition computer printouts. Existing condition printouts are for future land use and existing design plan hydraulic conditions. Printouts for UDSWM95 models are included for the 10 year and 100 year events. Printouts for CUHPF95 with future land use conditions are located in Appendix C.

APPENDIX E

UPPER TRIBUTARY

UDSWM95 - 10 YR

EXISTING CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

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   2   1   1   2
   3   4
WATERSHED    1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR
        48   0 0  5.0                                                          1
         9  110
        10  108
        11  111
        12  121
        13  113
        14  114
        15  119
        16  118
        17  203
        18  117
        19  115

        12    13     4      .5     300.    .0560       12       12    0.016       .5
                            10     300.    .0560       20       20    0.020        5
        13   110     1      20    1200.    .0050       40       40    0.044        5
        14    13     1       5     650.    .0080        4        4    0.038        6
        15   111     4      .5    1050     .0100       12       12    0.016       .5
                            10    1050     .0100       20       20    0.020        5
        16   113     4      .5    1650     .0133       12       13    0.016       .5
                            10    1650     .0133       20       20    0.020        5
        17    20     2       4     200.    .0010                      0.016        4
        18   114     3       4     200.    .0300                      0.016        4
        19   114     4      .5     700.    .0020       12       12    0.016       .5
                            10     700.    .0020       20       20    0.020        5
        20   115     2       5     950.    .0010                      0.016        5
        21   120     2       5    1700.    .0014                      0.016        5
        22   117     4      .5    1350.    .0190       12       12    0.016       .5
                            10    1350.    .0190       20       20    0.020        5
        23   119     4      .5    1250     .0190       12       12    0.016       .5
                            10    1250     .0190       20       20    0.020        5
        25   114     4      .5     400.    .0050       12       12    0.016       .5
                            10     400.    .0050       20       20    0.020      2.5
        26   118     5     1.5     200.    .0060                      0.016      1.5
                            10     200.    .0060       20       20    0.020        5
       108    12     3                1.
       110   200     3                1.
       111    14     3                1.
       113   201     3                1.
   17  114    16   4 3                1.
         0           0       30          30       100       30        400          30
  116  115    21   4 3                1.
         0           0       55           0       200      145        400         345
       116           3                1.
       117    19     3                1.
   22  118    23   4 3                1.
         0           0       50          25       150       75        200         100
       119    18     3                1.
   25  121    15   4 3                1.
         0           0       50          25       100       50        200         100
       200   109   5 2      .1        1.  .0100                      0.016       .1
         0           0       .1          0.        .4      265        5.7         375
      11.5         400
       201   112   5 2      .1        1.   .0100                     0.016       .1
         0           0       .4           5       1.5      125        3.5         265
       7.5         455
       203    26   5 2      .1        1.   .0100                     0.016       .1
         0           0      .07           5       .90       11        1.3          35 87
       2.1         135

    0
   31
   12    13    14    15    16    17    18    19    20    21    22    23    25    26   108   109
  110   111   112   113   114   115   116   117   118   119   120   121   200   201   203
ENDPROGRAM
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URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 11 SUBCATCHMENTS

TIME(HR/MIN)		9	10	11	12	13	14	15	16	17	18	19
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
0	15.	2.	0.	4.	1.	3.	2.	2.	3.	0.	2.	1.
0	20.	8.	2.	11.	5.	10.	6.	6.	12.	0.	6.	4.
0	25.	23.	10.	34.	19.	32.	14.	22.	45.	2.	17.	11.
0	30.	34.	18.	47.	29.	45.	17.	32.	69.	9.	22.	15.
0	35.	32.	18.	41.	29.	41.	15.	31.	67.	13.	20.	14.

0	40.	27. 12.	17.	33.	26.	33.	13.	26.	57.	13.	17.
0	45.	22. 11.	16.	27.	23.	28.	11.	23.	48.	13.	15.
0	50.	19. 10.	14.	22.	20.	23.	9.	19.	40.	12.	13.
0	55.	16. 9.	13.	18.	18.	19.	6.	17.	34.	11.	11.
1	0.	14. 8.	13.	15.	16.	16.	4.	15.	29.	10.	9.
1	5.	12. 5.	12.	12.	15.	14.	4.	13.	26.	10.	7.
1	10.	10. 4.	12.	11.	13.	11.	4.	10.	23.	9.	5.
1	15.	8. 4.	11.	10.	12.	9.	4.	8.	21.	9.	5.
1	20.	7. 3.	10.	9.	9.	8.	3.	7.	17.	8.	4.
1	25.	6. 3.	9.	7.	7.	7.	3.	6.	13.	7.	4.
1	30.	5. 2.	6.	6.	6.	6.	3.	5.	10.	7.	3.
1	35.	4. 2.	4.	5.	5.	5.	2.	4.	9.	6.	3.
1	40.	4. 2.	3.	5.	4.	4.	2.	4.	8.	5.	3.
1	45.	4. 2.	3.	4.	4.	4.	2.	3.	7.	5.	2.
1	50.	3. 2.	3.	4.	3.	4.	2.	3.	6.	4.	2.
1	55.	3. 1.	2.	4.	3.	3.	2.	3.	6.	4.	2.
2	0.	3. 0.	2.	3.	2.	3.	2.	2.	5.	2.	2.
2	5.	2. 0.	1.	2.	2.	2.	0.	2.	3.	2.	0.

2	10.	0. 0.	0.	2.	0.	1.	0.	0.	2.	0.	0.
2	15.	0. 0.	0.	0.	0.	0.	0.	0.	2.	0.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	MANNING N	OVERBANK/SURCHARGE DEPTH (FT)	JK
12	13	0	4	CHANNEL	.5	300.	.0560	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	300.	.0560	20.0	20.0	.020	5.00	
13	110	0	1	CHANNEL	20.0	1200.	.0050	40.0	40.0	.044	5.00	0
14	13	0	1	CHANNEL	5.0	650.	.0080	4.0	4.0	.038	6.00	0
15	111	0	4	CHANNEL	.5	1050.	.0100	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1050.	.0100	20.0	20.0	.020	5.00	
16	113	0	4	CHANNEL	.5	1650.	.0133	12.0	13.0	.016	.50	0
				OVERFLOW	10.0	1650.	.0133	20.0	20.0	.020	5.00	
17	20	0	2	PIPE	4.0	200.	.0010	.0	.0	.016	4.00	0
18	114	0	3		4.0	200.	.0300	.0	.0	.016	4.00	0
19	114	0	4	CHANNEL	.5	700.	.0020	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	700.	.0020	20.0	20.0	.020	5.00	
20	115	0	2	PIPE	5.0	950.	.0010	.0	.0	.016	5.00	0
21	120	0	2	PIPE	5.0	1700.	.0014	.0	.0	.016	5.00	0
22	117	0	4	CHANNEL	.5	1350.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1350.	.0190	20.0	20.0	.020	5.00	
23	119	0	4	CHANNEL	.5	1250.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1250.	.0190	20.0	20.0	.020	5.00	
25	114	0	4	CHANNEL	.5	400.	.0050	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	400.	.0050	20.0	20.0	.020	2.50	
26	118	0	5	PIPE	1.5	200.	.0060	.0	.0	.016	1.50	0
				OVERFLOW	10.0	200.	.0060	20.0	20.0	.020	5.00	
108	12	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
110	200	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
111	14	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
113	201	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
114	16	4	3		.0	1.	.0010	.0	.0	.001	10.00	17
		DIVERSION TO GUTTER NUMBER 17 - TOTAL Q VS DIVERTED Q IN CFS										
		.0	.0	30.0 30.0	100.0	30.0	400.0	30.0				
115	21	4	3		.0	1.	.0010	.0	.0	.001	10.00	116
		DIVERSION TO GUTTER NUMBER 116 - TOTAL Q VS DIVERTED Q IN CFS										
		.0	.0	55.0 .0	200.0	145.0	400.0	345.0				
116	0	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
117	19	0	3		.0	1.	.0010	.0	.0	.001	10.00	0

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 118        23         4          3                        .0       1.    .0010      .0    .0      .001      10.00      22
                 DIVERSION TO GUTTER NUMBER  22 - TOTAL Q VS DIVERTED Q IN CFS
                       .0      .0      50.0    25.0    150.0    75.0    200.0   100.0
 119        18         0          3                        .0       1.    .0010      .0    .0      .001      10.00       0
 121        15         4          3                        .0       1.    .0010      .0    .0      .001      10.00      25
                 DIVERSION TO GUTTER NUMBER  25 - TOTAL Q VS DIVERTED Q IN CFS
                       .0      .0      50.0    25.0    100.0    50.0    200.0   100.0
 200       109         5          2      PIPE              .1       1.    .0100      .0    .0      .016        .10       0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0      .0        .1      .0       .4   265.0      5.7   375.0    11.5   400.0
 201       112         5          2      PIPE              .1       1.    .0100      .0    .0      .016        .10       0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0      .0        .4     5.0      1.5   125.0      3.5   265.0     7.5   455.0
 203        26         5          2      PIPE              .1       1.    .0100      .0    .0      .016        .10       0
                 RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                       .0      .0        .1     5.0       .9    11.0      1.3    35.0     2.1   135.0
0TOTAL NUMBER OF GUTTERS/PIPES,  28
1
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JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A.(AC)
12	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.8
13	12	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73.6
14	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51.8
15	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.6
16	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131.2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
18	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112.0
19	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.8
20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
21	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
23	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87.7

25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
26	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.6
108	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	21.8
110	13	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	97.9
111	15	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	51.8
113	16	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	160.0
114	18	19	25	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	131.2
115	20	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	9.0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
117	22	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	12.8
118	26	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	87.7
119	23	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	112.0
121	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	25.6
200	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97.9
201	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160.0
203	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	32.6

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 31 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH
(D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
(O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)										
	12	13	14	15	16	17	18	19	20	21
	22	23	25	26	108	109	110	111	112	113
	114	115	116	117	118	119	120	121	200	201

203

0	5.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0(S)	0. .0(S)
		0. .0(S)									
0	10.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .0( )	0. .0( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )
		1. 1.0(D)	0. .0(D)	0. .0( )	0. .0( )	1. .3(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0(S)	0. .0(S)
		0. .0(S)									
0	15.	0. .1( )	0. .0( )	1. .1( )	0. .1( )	0. .0( )	0. .3( )	3. .0( )	1. .2( )	0. .1( )	0. .1( )
		0. .1( )	0. .1( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	2. .0( )	4. .0( )	0. .0( )	3. .0( )
		6. 5.9(D)	1. .0(D)	0. .0( )	3. .0( )	3. 1.7(D)	3. .0( )	0. .0( )	1. .5(D)	0. .0(S)	0. .0(S)
		0. .0(S)									
0	20.	1. .1( )	0. .0( )	5. .5( )	1. .2( )	0. .0( )	4. .9( )	9. .0( )	3. .4( )	1. .4( )	1. .4( )
		2. .2( )	3. .2( )	1. .2( )	0. .1( )	2. .0( )	0. .0( )	8. .0( )	12. .0( )	1. .0( )	10. .0( )
		19. 19.3(D)	5. .0(D)	0. .0( )	8. .0( )	12. 5.9(D)	9. .0( )	1. .0( )	5. 2.3(D)	0. .0(S)	1. .1(S)
		0. .0(S)									
0	25.	9. .3( )	3. .2( )	22. .9( )	4. .3( )	9. .4( )	16. 1.9( )	33. .0( )	12. .6( )	6. 1.0( )	5. .8( )

		11. .4( )	12. .4( )	6. .4( )	0. .2( )	10. .0( )	14. .0( )	27. .0( )	38. .0( )	3. .0( )	41. .0( )
		65. 30.0(D)	17. .0(D)	0. .0( )	28. .0( )	45. 22.6(D)	33. .0( )	5. .0( )	19. 9.4(D)	14. .1(S)	3. .2(S)
		1. .0(S)									
0	30.	17. .4( )	15. .4( )	46. 1.4( )	10. .5( )	44. .7( )	29. 2.7( )	58. .0( )	31. .9( )	18. 1.8( )	15. 1.5( )
		25. .6( )	26. .6( )	12. .6( )	2. .6( )	18. .0( )	50. .0( )	49. .0( )	57. .0( )	24. .0( )	89. .0( )
		118. 30.0(D)	33. .0(D)	0. .0( )	48. .0( )	71. 35.4(D)	58. .0( )	15. .0( )	29. 14.5(D)	50. .2(S)	24. .6(S)
		3. .0(S)									
0	35.	18. .4( )	33. .6( )	56. 1.5( )	14. .5( )	88. .9( )	31. 2.8( )	65. .0( )	47. 1.0( )	27. 2.2( )	28. 2.0( )
		34. .6( )	34. .6( )	15. .6( )	5. .9( )	18. .0( )	60. .0( )	65. .0( )	55. .0( )	70. .0( )	128. .0( )
		141. 30.0(D)	41. .0(D)	0. .0( )	54. .0( )	71. 35.7(D)	65. .0( )	28. .0( )	29. 14.5(D)	60. .2(S)	70. 1.0(S)
		5. .1(S)									
0	40.	18. .4( )	47. .7( )	51. 1.4( )	14. .5( )	106. .9( )	30. 2.7( )	60. .0( )	51. 1.0( )	30. 2.3( )	36. 2.4( )
		33. .6( )	33. .6( )	14. .6( )	6. 1.1( )	17. .0( )	74. .0( )	74. .0( )	47. .0( )	105. .0( )	139. .0( )
		137. 30.0(D)	42. .0(D)	0. .0( )	50. .0( )	62. 31.0(D)	60. .0( )	36. .0( )	26. 12.9(D)	74. .2(S)	105. 1.3(S)
		5. .1(S)									
0	45.	16. .4( )	53. .7( )	43. 1.3( )	13. .5( )	101. .9( )	30. 2.7( )	52. .0( )	48. 1.0( )	30. 2.3( )	40. 2.5( )
		30. .6( )	29. .6( )	12. .6( )	6. 1.1( )	16. .0( )	75. .0( )	76. .0( )	39. .0( )	121. .0( )	129. .0( )
		123. 30.0(D)	41. .0(D)	0. .0( )	44. .0( )	53. 26.7(D)	52. .0( )	40. .0( )	23. 11.4(D)	75. .2(S)	121. 1.5(S)

		6. .2(S)									
0	50.	15. .4( )	54. .7( )	36. 1.2( )	11. .5( )	88. .9( )	30. 2.7( )	45. .0( )	43. 1.0( )	30. 2.3( )	40. 2.5( )
		26. .6( )	25. .6( )	11. .5( )	6. 1.1( )	14. .0( )	74. .0( )	73. .0( )	33. .0( )	120. .0( )	110. .0( )
		107. 30.0(D)	40. .0(D)	0. .0( )	38. .0( )	46. 22.9(D)	45. .0( )	40. .0( )	20. 10.0(D)	74. .2(S)	120. 1.5(S)
		6. .2(S)									
0	55.	14. .4( )	51. .7( )	30. 1.1( )	10. .5( )	72. .8( )	30. 2.7( )	39. .0( )	37. .9( )	30. 2.3( )	40. 2.5( )
		22. .5( )	22. .5( )	9. .5( )	6. 1.2( )	13. .0( )	68. .0( )	67. .0( )	28. .0( )	110. .0( )	92. .0( )
		91. 30.0(D)	39. .0(D)	0. .0( )	33. .0( )	40. 19.9(D)	39. .0( )	40. .0( )	18. 8.9(D)	68. .2(S)	110. 1.4(S)
		6. .3(S)									
1	0.	13. .4( )	48. .7( )	26. 1.0( )	9. .4( )	59. .8( )	30. 2.7( )	34. .0( )	32. .9( )	30. 2.3( )	39. 2.5( )
		20. .5( )	20. .5( )	8. .5( )	7. 1.2( )	13. .0( )	62. .0( )	61. .0( )	24. .0( )	95. .0( )	75. .0( )
		79. 30.0(D)	38. .0(D)	0. .0( )	29. .0( )	36. 17.9(D)	34. .0( )	39. .0( )	16. 8.0(D)	62. .2(S)	95. 1.2(S)
		7. .3(S)									
1	5.	12. .4( )	43. .7( )	22. 1.0( )	8. .4( )	48. .7( )	30. 2.7( )	30. .0( )	28. .8( )	30. 2.3( )	37. 2.4( )
		18. .5( )	18. .5( )	8. .5( )	7. 1.2( )	12. .0( )	56. .0( )	55. .0( )	20. .0( )	81. .0( )	62. .0( )
		70. 30.0(D)	35. .0(D)	0. .0( )	24. .0( )	33. 16.3(D)	30. .0( )	37. .0( )	15. 7.3(D)	56. .2(S)	81. 1.1(S)
		7. .3(S)									
1	10.	12.	39.	19.	7.	39.	30.	26.	24.	30.	36.

		.3( )	.6( )	.9( )	.4( )	.7( )	2.7( )	.0( )	.8( )	2.3( )	2.4( )
		16. .5( )	16. .5( )	7. .5( )	7. 1.3( )	12. .0( )	50. .0( )	49. .0( )	18. .0( )	67. .0( )	49. .0( )
		61. 30.0(D)	34. .0(D)	0. .0( )	21. .0( )	30. 15.1(D)	26. .0( )	36. .0( )	13. 6.7(D)	50. .2(S)	67. 1.0(S)
		7. .3(S)									
1	15.	11. .3( )	36. .6( )	17. .8( )	7. .4( )	31. .6( )	30. 2.7( )	23. .0( )	22. .8( )	30. 2.3( )	35. 2.3( )
		15. .5( )	15. .5( )	6. .4( )	7. 1.3( )	11. .0( )	45. .0( )	44. .0( )	17. .0( )	55. .0( )	40. .0( )
		55. 30.0(D)	34. .0(D)	0. .0( )	20. .0( )	28. 14.2(D)	23. .0( )	35. .0( )	12. 6.1(D)	45. .2(S)	55. .9(S)
		7. .3(S)									
1	20.	10. .3( )	33. .6( )	16. .8( )	6. .4( )	25. .6( )	30. 2.7( )	20. .0( )	20. .7( )	30. 2.3( )	34. 2.3( )
		13. .5( )	13. .5( )	5. .4( )	7. 1.3( )	10. .0( )	41. .0( )	40. .0( )	15. .0( )	45. .0( )	33. .0( )
		49. 30.0(D)	33. .0(D)	0. .0( )	18. .0( )	24. 11.9(D)	20. .0( )	34. .0( )	9. 4.7(D)	41. .1(S)	45. .8(S)
		7. .3(S)									
1	25.	9. .3( )	30. .6( )	14. .7( )	5. .3( )	18. .5( )	30. 2.7( )	17. .0( )	17. .7( )	30. 2.3( )	33. 2.3( )
		11. .4( )	11. .4( )	4. .4( )	7. 1.3( )	9. .0( )	36. .0( )	36. .0( )	12. .0( )	36. .0( )	25. .0( )
		41. 30.0(D)	33. .0(D)	0. .0( )	15. .0( )	20. 9.9(D)	17. .0( )	33. .0( )	7. 3.5(D)	36. .1(S)	36. .7(S)
		7. .4(S)									
1	30.	7. .3( )	26. .5( )	11. .7( )	4. .3( )	12. .5( )	30. 2.7( )	14. .0( )	15. .7( )	30. 2.3( )	33. 2.2( )
		10. .4( )	10. .4( )	3. .3( )	7. 1.3( )	6. .0( )	32. .0( )	31. .0( )	10. .0( )	28. .0( )	18. .0( )

	35. 30.0(D)	32. .0(D)	0. .0( )	13. .0( )	17. 8.7(D)	14. .0( )	33. .0( )	6. 2.8(D)	32. .1(S)	28. .6(S)
	7. .4(S)									
1 35.	4. .2( )	23. .5( )	9. .6( )	3. .3( )	6. .4( )	30. 2.7( )	13. .0( )	13. .6( )	30. 2.3( )	33. 2.2( )
	9. .4( )	8. .4( )	3. .3( )	7. 1.3( )	4. .0( )	28. .0( )	27. .0( )	8. .0( )	21. .0( )	11. .0( )
	31. 30.0(D)	32. .0(D)	0. .0( )	11. .0( )	16. 7.8(D)	13. .0( )	33. .0( )	5. 2.4(D)	28. .1(S)	21. .5(S)
	7. .3(S)									
1 40.	4. .2( )	20. .5( )	8. .6( )	2. .3( )	3. .3( )	30. 2.7( )	12. .0( )	12. .6( )	30. 2.3( )	32. 2.2( )
	8. .4( )	8. .4( )	2. .3( )	7. 1.3( )	3. .0( )	24. .0( )	23. .0( )	7. .0( )	14. .0( )	7. .0( )
	27. 27.4(D)	32. .0(D)	0. .0( )	10. .0( )	14. 7.2(D)	12. .0( )	32. .0( )	4. 2.0(D)	24. .1(S)	14. .5(S)
	7. .3(S)									
1 45.	3. .2( )	17. .4( )	7. .5( )	2. .2( )	1. .2( )	28. 2.6( )	11. .0( )	11. .6( )	29. 2.3( )	32. 2.2( )
	7. .4( )	7. .4( )	2. .3( )	7. 1.3( )	3. .0( )	21. .0( )	20. .0( )	7. .0( )	10. .0( )	5. .0( )
	25. 25.0(D)	31. .0(D)	0. .0( )	10. .0( )	14. 6.8(D)	11. .0( )	32. .0( )	4. 1.8(D)	21. .1(S)	10. .4(S)
	7. .3(S)									
1 50.	3. .2( )	15. .4( )	6. .5( )	2. .2( )	1. .2( )	25. 2.4( )	10. .0( )	10. .6( )	27. 2.2( )	31. 2.2( )
	7. .3( )	7. .3( )	2. .3( )	7. 1.3( )	3. .0( )	18. .0( )	18. .0( )	6. .0( )	7. .0( )	5. .0( )
	23. 23.2(D)	29. .0(D)	0. .0( )	9. .0( )	13. 6.5(D)	10. .0( )	31. .0( )	3. 1.6(D)	18. .1(S)	7. .4(S)
	7. .3(S)									

1	55.	2. .2( )	13. .4( )	6. .5( )	2. .2( )	1. .1( )	24. 2.3( )	9. .0( )	9. .6( )	25. 2.1( )	29. 2.1( )
		6. .3( )	6. .3( )	2. .3( )	7. 1.2( )	2. .0( )	16. .0( )	16. .0( )	6. .0( )	6. .0( )	4. .0( )
		22. 21.7(D)	26. .0(D)	0. .0( )	8. .0( )	12. 6.1(D)	9. .0( )	29. .0( )	3. 1.5(D)	16. .1(S)	6. .4(S)
		7. .3(S)									
2	0.	2. .2( )	11. .4( )	5. .5( )	1. .2( )	0. .1( )	22. 2.2( )	8. .0( )	8. .6( )	23. 2.0( )	26. 2.0( )
		6. .3( )	6. .3( )	1. .2( )	6. 1.2( )	2. .0( )	14. .0( )	14. .0( )	5. .0( )	5. .0( )	3. .0( )
		20. 19.8(D)	23. .0(D)	0. .0( )	8. .0( )	11. 5.6(D)	8. .0( )	26. .0( )	2. 1.2(D)	14. .1(S)	5. .4(S)
		6. .3(S)									
2	5.	2. .2( )	10. .3( )	5. .4( )	1. .2( )	0. .1( )	20. 2.1( )	7. .0( )	7. .5( )	21. 1.9( )	24. 1.9( )
		5. .3( )	5. .3( )	1. .2( )	6. 1.2( )	1. .0( )	12. .0( )	12. .0( )	4. .0( )	5. .0( )	2. .0( )
		16. 15.6(D)	21. .0(D)	0. .0( )	5. .0( )	10. 4.8(D)	7. .0( )	24. .0( )	2. .9(D)	12. .1(S)	5. .4(S)
		6. .2(S)									
2	10.	0. .1( )	9. .3( )	3. .4( )	1. .2( )	0. .1( )	16. 1.9( )	5. .0( )	6. .5( )	19. 1.8( )	22. 1.8( )
		5. .3( )	5. .3( )	1. .2( )	6. 1.1( )	0. .0( )	9. .0( )	9. .0( )	2. .0( )	5. .0( )	2. .0( )
		11. 11.3(D)	19. .0(D)	0. .0( )	5. .0( )	8. 4.2(D)	5. .0( )	22. .0( )	0. .0(D)	9. .1(S)	5. .4(S)
		6. .2(S)									
2	15.	0. .0( )	7. .3( )	2. .3( )	0. .1( )	0. .1( )	12. 1.6( )	4. .0( )	5. .5( )	15. 1.6( )	19. 1.7( )
		4.	4.	0.	6.	0.	7.	7.	0.	4.	0.

	.3( )	.3( )	.1( )	1.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
	9. 9.4(D)	15. .0(D)	0. .0( )	4. .0( )	7. 3.7(D)	4. .0( )	19. .0( )	0. .0(D)	7. .1(S)	4. .3(S)
	6. .2(S)									
2 20.	0. .0( )	6. .2( )	1. .2( )	0. .1( )	0. .1( )	10. 1.4( )	3. .0( )	4. .5( )	12. 1.4( )	16. 1.5( )
	3. .3( )	3. .3( )	0. .1( )	5. 1.0( )	0. .0( )	6. .0( )	6. .0( )	0. .0( )	4. .0( )	0. .0( )
	7. 7.4(D)	12. .0(D)	0. .0( )	3. .0( )	4. 1.9(D)	3. .0( )	16. .0( )	0. .0(D)	6. .1(S)	4. .3(S)
	5. .1(S)									
2 25.	0. .0( )	5. .2( )	1. .1( )	0. .1( )	0. .1( )	8. 1.3( )	3. .0( )	3. .4( )	10. 1.3( )	13. 1.4( )
	3. .2( )	3. .2( )	0. .0( )	5. 1.0( )	0. .0( )	5. .0( )	5. .0( )	0. .0( )	4. .0( )	0. .0( )
	6. 6.3(D)	10. .0(D)	0. .0( )	3. .0( )	7. 3.4(D)	3. .0( )	13. .0( )	0. .0(D)	5. .1(S)	4. .3(S)
	5. .1(S)									
2 30.	0. .0( )	4. .2( )	0. .1( )	0. .1( )	0. .0( )	6. 1.1( )	2. .0( )	3. .4( )	8. 1.2( )	11. 1.3( )
	2. .2( )	2. .2( )	0. .0( )	4. .9( )	0. .0( )	4. .0( )	4. .0( )	0. .0( )	3. .0( )	0. .0( )
	5. 5.5(D)	8. .0(D)	0. .0( )	2. .0( )	2. 1.2(D)	2. .0( )	11. .0( )	0. .0(D)	4. .1(S)	3. .3(S)
	4. .1(S)									
2 35.	0. .0( )	3. .2( )	0. .1( )	0. .1( )	0. .0( )	6. 1.1( )	2. .0( )	3. .4( )	7. 1.1( )	9. 1.1( )
	2. .2( )	2. .2( )	0. .0( )	3. .6( )	0. .0( )	3. .0( )	3. .0( )	0. .0( )	3. .0( )	0. .0( )
	4. 4.5(D)	7. .0(D)	0. .0( )	2. .0( )	4. 2.1(D)	2. .0( )	9. .0( )	0. .0(D)	3. .1(S)	3. .2(S)

		2. .0(S)									
2	40.	0. .0( )	2. .2( )	0. .1( )	0. .0( )	0. .0( )	5. 1.0( )	1. .0( )	2. .3( )	6. 1.0( )	8. 1.1( )
		1. .2( )	1. .2( )	0. .0( )	2. .5( )	0. .0( )	3. .0( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )
		3. 3.4(D)	6. .0(D)	0. .0( )	1. .0( )	0. .0(D)	1. .0( )	8. .0( )	0. .0(D)	3. .1(S)	3. .2(S)
		1. .0(S)									
2	45.	0. .0( )	2. .1( )	0. .1( )	0. .0( )	0. .0( )	4. .9( )	1. .0( )	2. .3( )	5. .9( )	7. 1.0( )
		1. .2( )	1. .2( )	0. .0( )	1. .4( )	0. .0( )	2. .0( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )
		2. 2.5(D)	5. .0(D)	0. .0( )	1. .0( )	2. 1.2(D)	1. .0( )	7. .0( )	0. .0(D)	2. .1(S)	3. .2(S)
		1. .0(S)									
2	50.	0. .0( )	2. .1( )	0. .0( )	0. .0( )	0. .0( )	3. .7( )	0. .0( )	1. .3( )	4. .8( )	5. .9( )
		1. .1( )	0. .1( )	0. .0( )	1. .3( )	0. .0( )	2. .0( )	2. .0( )	0. .0( )	2. .0( )	0. .0( )
		2. 1.7(D)	4. .0(D)	0. .0( )	1. .0( )	0. .0(D)	0. .0( )	5. .0( )	0. .0(D)	2. .1(S)	2. .2(S)
		1. .0(S)									
2	55.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	2. .6( )	0. .0( )	1. .2( )	3. .7( )	5. .8( )
		0. .1( )	0. .1( )	0. .0( )	0. .2( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		1. 1.3(D)	3. .0(D)	0. .0( )	0. .0( )	1. .5(D)	0. .0( )	5. .0( )	0. .0(D)	1. .1(S)	2. .2(S)
		0. .0(S)									
3	0.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .5( )	0. .0( )	1. .2( )	2. .6( )	4. .7( )

		0. .1( )	0. .1( )	0. .0( )	0. .2( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		1. .9(D)	2. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	4. .0( )	0. .0(D)	1. .1(S)	2. .2(S)
		0. .0(S)									
3	5.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .5( )	0. .0( )	1. .2( )	2. .6( )	3. .7( )
		0. .1( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		1. .7(D)	2. .0(D)	0. .0( )	0. .0( )	0. .2(D)	0. .0( )	3. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		0. .0(S)									
3	10.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .4( )	0. .0( )	0. .2( )	1. .5( )	2. .6( )
		0. .1( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		1. .5(D)	1. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	2. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		0. .0(S)									
3	15.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	1. .4( )	0. .0( )	0. .2( )	1. .4( )	2. .5( )
		0. .1( )	0. .1( )	0. .0( )	0. .1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		0. .4(D)	1. .0(D)	0. .0( )	0. .0( )	0. .1(D)	0. .0( )	2. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		0. .0(S)									
3	20.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	0. .3( )	0. .0( )	0. .1( )	1. .4( )	2. .5( )
		0. .1( )	0. .0( )	0. .0( )	0. .1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	1. .0( )	0. .0( )
		0.	1.	0.	0.	0.	0.	2.	0.	1.	1.

.3(D) .0(D) .0( ) .0( ) .0(D) .0( ) .0( ) .0(D) .1(S) .1(S)

0.
.0(S)

3 25. 0. 1. 0. 0. 0. 0. 0. 0. 1. 1.
.0( ) .1( ) .0( ) .0( ) .0( ) .3( ) .0( ) .1( ) .3( ) .5( )

0. 0. 0. 0. 0. 1. 1. 0. 1. 0.
.0( ) .0( ) .0( ) .1( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( )

0. 1. 0. 0. 0. 0. 1. 0. 1. 1.
.2(D) .0(D) .0( ) .0( ) .0(D) .0( ) .0( ) .0(D) .1(S) .1(S)

0.
.0(S)

3 30. 0. 0. 0. 0. 0. 0. 0. 0. 1. 1.
.0( ) .1( ) .0( ) .0( ) .0( ) .2( ) .0( ) .1( ) .3( ) .4( )

0. 0. 0. 0. 0. 0. 0. 0. 1. 0.
.0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( )

0. 1. 0. 0. 0. 0. 1. 0. 0. 1.
.2(D) .0(D) .0( ) .0( ) .0(D) .0( ) .0( ) .0(D) .1(S) .1(S)

0.
.0(S)

3 35. 0. 0. 0. 0. 0. 0. 0. 0. 0. 1.
.0( ) .1( ) .0( ) .0( ) .0( ) .2( ) .0( ) .1( ) .3( ) .4( )

0. 0. 0. 0. 0. 0. 0. 0. 1. 0.
.0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( )

0. 0. 0. 0. 0. 0. 1. 0. 0. 1.
.1(D) .0(D) .0( ) .0( ) .0(D) .0( ) .0( ) .0(D) .1(S) .1(S)

0.
.0(S)

3 40. 0. 0. 0. 0. 0. 0. 0. 0. 0. 1.
.0( ) .1( ) .0( ) .0( ) .0( ) .2( ) .0( ) .1( ) .3( ) .3( )

0. 0. 0. 0. 0. 0. 0. 0. 1. 0.
.0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( ) .0( )

0. 0. 0. 0. 0. 0. 1. 0. 0. 1.
.1(D) .0(D) .0( ) .0( ) .0(D) .0( ) .0( ) .0(D) .1(S) .1(S)

0.
.0(S)

3	45.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	1. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		0. .0(S)									
3	50.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .2( )	0. .0( )	0. .1( )	0. .2( )	1. .3( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	1. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		0. .0(S)									
3	55.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	0. .3( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		0. .1(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		0. .0(S)									
4	0.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .1( )	0. .0( )	0. .1( )	0. .2( )	0. .2( )
		0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		0. .0(D)	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .0( )	0. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		0. .0(S)									

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 10 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
203	7.	.1	.4	1 25.
26	7.	1.3		1 30.
118	71.	(DIRECT FLOW)		0 35.
22	34.	.6		0 35.
23	34.	.6		0 35.
121	29.	(DIRECT FLOW)		0 35.
117	54.	(DIRECT FLOW)		0 35.
119	65.	(DIRECT FLOW)		0 35.
15	14.	.5		0 40.
25	15.	.6		0 35.
19	51.	1.0		0 40.
18	65.	(DIRECT FLOW)		0 35.
111	57.	(DIRECT FLOW)		0 30.
108	18.	(DIRECT FLOW)		0 35.
17	31.	2.8		0 35.
114	141.	(DIRECT FLOW)		0 35.
14	56.	1.5		0 35.
12	18.	.4		0 35.
20	30.	2.3		0 50.
16	106.	.9		0 40.
13	54.	.7		0 50.
115	42.	(DIRECT FLOW)		0 40.
113	139.	(DIRECT FLOW)		0 40.
110	76.	(DIRECT FLOW)		0 45.
21	40.	2.5		0 50.
201	121.	.1	1.5	0 45.
200	75.	.1	.2	0 45.
120	40.	(DIRECT FLOW)		0 50.
112	121.	(DIRECT FLOW)		0 45.
109	75.	(DIRECT FLOW)		0 45.
116	0.	(DIRECT FLOW)		0 0.

APPENDIX E

UPPER TRIBUTARY

UDSWM95 - 100 YR

EXISTING CONDITIONS

CAUTION STATEMENT

The user is advised to use caution when using flow conveyance element (channels and pipes) peak flows and hydrographs given in this report. The UDSWM95 model assumes that all adjacent sub-basin flow enters the flow conveyance element at the sub-basin design point or the downstream end of the element. The flow conveyance element is simply routing the upstream incoming flow and ignoring the possibility that additional flow may be entering from the adjacent sub-basin. Due to this model limitation flow used for channel or pipe design should be increased appropriately using engineering judgment to reflect incoming sub-basin flow.

```
   2   1   1   2
   3   4
WATERSHED   1
JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR
        48  0 0  5.0                                                         1
         9  110
        10  108
        11  111
        12  121
        13  113
        14  114
        15  119
        16  118
        17  203
        18  117
        19  115

        12   13    4      .5    300.   .0560      12       12   0.016      .5
                          10    300.   .0560      20       20   0.020       5
        13  110    1      20   1200.   .0050      40       40   0.044       5
        14   13    1       5    650.   .0080       4        4   0.038       6
        15  111    4      .5   1050    .0100      12       12   0.016      .5
                          10   1050    .0100      20       20   0.020       5
        16  113    4      .5   1650    .0133      12       13   0.016      .5
                          10   1650    .0133      20       20   0.020       5
        17   20    2       4    200.   .0010                    0.016       4
        18  114    3       4    200.   .0300                    0.016       4
        19  114    4      .5    700.   .0020      12       12   0.016      .5
                          10    700.   .0020      20       20   0.020       5
        20  115    2       5    950.   .0010                    0.016       5
        21  120    2       5   1700.   .0014                    0.016       5
        22  117    4      .5   1350.   .0190      12       12   0.016      .5
                          10   1350.   .0190      20       20   0.020       5
        23  119    4      .5   1250    .0190      12       12   0.016      .5
                          10   1250    .0190      20       20   0.020       5
        25  114    4      .5    400.   .0050      12       12   0.016      .5
                          10    400.   .0050      20       20   0.020     2.5
        26  118    5     1.5    200.   .0060                    0.016     1.5
                          10    200.   .0060      20       20   0.020       5
       108   12    3              1.
       110  200    3              1.
       111   14    3              1.
       113  201    3              1.
   17  114   16  4 3              1.
         0         0      30          30     100       30      400        30
  116  115   21  4 3              1.
         0         0      55           0     200      145      400       345
       116         3              1.
       117   19    3              1.
   22  118   23  4 3              1.
         0         0      50          25     150       75      200       100
       119   18    3              1.
   25  121   15  4 3              1.
         0         0      50          25     100       50      200       100
       200  109  5 2      .1      1.  .0100                 0.016      .1
         0         0      .1          0.      .4      265      5.7       375
      11.5       400
       201  112  5 2      .1      1.  .0100                 0.016      .1
         0         0      .4           5     1.5      125      3.5       265
       7.5       455
       203   26  5 2      .1      1.  .0100                 0.016      .1
         0         0     .07           5     .90       11      1.3        35 87
       2.1       135

   0
  31
  12   13   14   15   16   17   18   19   20   21   22   23   25   26  108  109
 110  111  112  113  114  115  116  117  118  119  120  121  200  201  203
ENDPROGRAM
```

URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

0NUMBER OF TIME STEPS 48
0INTEGRATION TIME INTERVAL (MINUTES), 5.00

25.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

HYDROGRAPHS FROM CUHPF MODEL ARE LISTED FOR THE FOLLOWING 11 SUBCATCHMENTS

TIME(HR/MIN)		9	10	11	12	13	14	15	16	17	18	19
0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0	10.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	0.
0	15.	2.	0.	4.	1.	3.	2.	2.	3.	0.	2.	1.
0	20.	6.	1.	10.	3.	8.	5.	5.	9.	0.	5.	3.
0	25.	17.	6.	25.	12.	23.	11.	15.	29.	2.	13.	9.
0	30.	61.	33.	79.	52.	76.	25.	57.	125.	24.	38.	25.
0	35.	84.	49.	105.	73.	102.	31.	78.	175.	46.	49.	33.

0	40.	80. 31.	51.	95.	74.	96.	29.	76.	170.	52.	46.
0	45.	70. 29.	50.	81.	68.	84.	26.	69.	152.	55.	41.
0	50.	61. 27.	47.	68.	62.	73.	23.	61.	132.	54.	37.
0	55.	52. 25.	43.	56.	55.	62.	19.	53.	113.	51.	32.
1	0.	45. 23.	41.	47.	50.	53.	13.	47.	98.	48.	28.
1	5.	40. 20.	39.	40.	46.	47.	10.	42.	87.	46.	25.
1	10.	32. 13.	35.	29.	39.	37.	8.	34.	71.	43.	17.
1	15.	21. 9.	32.	20.	33.	25.	6.	23.	56.	38.	12.
1	20.	15. 7.	28.	15.	26.	17.	5.	16.	42.	34.	9.
1	25.	11. 5.	24.	10.	17.	12.	4.	11.	28.	30.	6.
1	30.	8. 4.	21.	8.	12.	9.	3.	8.	19.	27.	5.
1	35.	6. 3.	13.	6.	9.	7.	2.	6.	14.	24.	4.
1	40.	5. 2.	9.	5.	7.	5.	2.	5.	11.	22.	3.
1	45.	4. 2.	7.	4.	5.	4.	2.	4.	9.	19.	2.
1	50.	3. 2.	5.	4.	4.	4.	2.	3.	7.	17.	2.
1	55.	3. 1.	4.	4.	3.	3.	2.	3.	6.	15.	2.
2	0.	3. 1.	3.	4.	3.	3.	2.	3.	5.	10.	2.
2	5.	2. 0.	2.	3.	2.	3.	1.	2.	4.	7.	2.

2	10.	2. 0.	0.	2.	1.	2.	0.	2.	3.	5.	0.
2	15.	0. 0.	0.	0.	0.	0.	0.	0.	2.	3.	0.
2	20.	0. 0.	0.	0.	0.	0.	0.	0.	1.	2.	0.
2	25.	0. 0.	0.	0.	0.	0.	0.	0.	0.	2.	0.

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	OVERBANK/SURCHARGE MANNING N	DEPTH (FT)	JK
12	13	0	4	CHANNEL	.5	300.	.0560	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	300.	.0560	20.0	20.0	.020	5.00	
13	110	0	1	CHANNEL	20.0	1200.	.0050	40.0	40.0	.044	5.00	0
14	13	0	1	CHANNEL	5.0	650.	.0080	4.0	4.0	.038	6.00	0
15	111	0	4	CHANNEL	.5	1050.	.0100	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1050.	.0100	20.0	20.0	.020	5.00	
16	113	0	4	CHANNEL	.5	1650.	.0133	12.0	13.0	.016	.50	0
				OVERFLOW	10.0	1650.	.0133	20.0	20.0	.020	5.00	
17	20	0	2	PIPE	4.0	200.	.0010	.0	.0	.016	4.00	0
18	114	0	3		4.0	200.	.0300	.0	.0	.016	4.00	0
19	114	0	4	CHANNEL	.5	700.	.0020	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	700.	.0020	20.0	20.0	.020	5.00	
20	115	0	2	PIPE	5.0	950.	.0010	.0	.0	.016	5.00	0
21	120	0	2	PIPE	5.0	1700.	.0014	.0	.0	.016	5.00	0
22	117	0	4	CHANNEL	.5	1350.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1350.	.0190	20.0	20.0	.020	5.00	
23	119	0	4	CHANNEL	.5	1250.	.0190	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	1250.	.0190	20.0	20.0	.020	5.00	
25	114	0	4	CHANNEL	.5	400.	.0050	12.0	12.0	.016	.50	0
				OVERFLOW	10.0	400.	.0050	20.0	20.0	.020	2.50	
26	118	0	5	PIPE	1.5	200.	.0060	.0	.0	.016	1.50	0
				OVERFLOW	10.0	200.	.0060	20.0	20.0	.020	5.00	
108	12	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
110	200	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
111	14	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
113	201	0	3		.0	1.	.0010	.0	.0	.001	10.00	0
114	16	4	3		.0	1.	.0010	.0	.0	.001	10.00	17

DIVERSION TO GUTTER NUMBER 17 - TOTAL Q VS DIVERTED Q IN CFS

```
                 .0      .0      30.0    30.0     100.0    30.0     400.0    30.0
 115      21     4       3                         .0       1.      .0010     .0    .0     .001     10.00     116
              DIVERSION TO GUTTER NUMBER 116 - TOTAL Q VS DIVERTED Q IN CFS
                 .0      .0      55.0     .0      200.0   145.0     400.0   345.0
 116       0     0       3                         .0       1.      .0010     .0    .0     .001     10.00       0
 117      19     0       3                         .0       1.      .0010     .0    .0     .001     10.00       0
 118      23     4       3                         .0       1.      .0010     .0    .0     .001     10.00      22
              DIVERSION TO GUTTER NUMBER  22 - TOTAL Q VS DIVERTED Q IN CFS
                 .0      .0      50.0    25.0     150.0    75.0     200.0   100.0
 119      18     0       3                         .0       1.      .0010     .0    .0     .001     10.00       0
 121      15     4       3                         .0       1.      .0010     .0    .0     .001     10.00      25
              DIVERSION TO GUTTER NUMBER  25 - TOTAL Q VS DIVERTED Q IN CFS
                 .0      .0      50.0    25.0     100.0    50.0     200.0   100.0
 200     109     5       2       PIPE              .1       1.      .0100     .0    .0     .016       .10       0
              RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                 .0      .0        .1      .0        .4   265.0       5.7   375.0   11.5   400.0
 201     112     5       2       PIPE              .1       1.      .0100     .0    .0     .016       .10       0
              RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                 .0      .0        .4     5.0       1.5   125.0       3.5   265.0    7.5   455.0
 203      26     5       2       PIPE              .1       1.      .0100     .0    .0     .016       .10       0
              RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                 .0      .0        .1     5.0        .9    11.0       1.3    35.0    2.1   135.0
0TOTAL NUMBER OF GUTTERS/PIPES,  28
1
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JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A. (AC)
12	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.8
13	12	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73.6
14	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51.8
15	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.6
16	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131.2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
18	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112.0
19	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.8
20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0

21	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
23	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87.7
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
26	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.6
108	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	21.8
110	13	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	97.9
111	15	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	51.8
113	16	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	160.0
114	18	19	25	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	131.2
115	20	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	9.0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
117	22	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	12.8
118	26	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	87.7
119	23	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	112.0
121	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	25.6
200	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97.9
201	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160.0
203	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	32.6

1

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

HYDROGRAPHS ARE LISTED FOR THE FOLLOWING 31 CONVEYANCE ELEMENTS

THE UPPER NUMBER IS DISCHARGE IN CFS
THE LOWER NUMBER IS ONE OF THE FOLLOWING CASES:
( ) DENOTES DEPTH ABOVE INVERT IN FEET
(S) DENOTES STORAGE IN AC-FT FOR DETENTION DAM. DISCHARGE INCLUDES SPILLWAY OUTFLOW.
(I) DENOTES GUTTER INFLOW IN CFS FROM SPECIFIED INFLOW HYDROGRAPH

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            (D) DENOTES DISCHARGE IN CFS DIVERTED FROM THIS GUTTER
            (O) DENOTES STORAGE IN AC-FT FOR SURCHARGED GUTTER

TIME(HR/MIN)   12       13       14       15       16       17       18       19       20       21
               22       23       25       26      108      109      110      111      112      113
              114      115      116      117      118      119      120      121      200      201
              203

  0    5.      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

               0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

               0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                .0(D)    .0(D)    .0( )    .0( )    .0(D)    .0( )    .0( )    .0(D)    .0(S)    .0(S)

               0.
                .0(S)

  0   10.      0.       0.       0.       0.       0.       0.       1.       0.       0.       0.
                .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .1( )    .0( )    .0( )

               0.       0.       0.       0.       0.       0.       0.       0.       0.       1.
                .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

               1.       0.       0.       1.       1.       1.       0.       0.       0.       0.
               1.3(D)    .0(D)    .0( )    .0( )    .4(D)    .0( )    .0( )    .1(D)    .0(S)    .0(S)

               0.
                .0(S)

  0   15.      0.       0.       1.       0.       0.       1.       3.       1.       0.       0.
                .1( )    .0( )    .2( )    .1( )    .0( )    .3( )    .0( )    .2( )    .1( )    .2( )

               0.       1.       0.       0.       0.       0.       2.       4.       0.       3.
                .1( )    .1( )    .1( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

               6.       1.       0.       3.       3.       3.       0.       1.       0.       0.
               5.9(D)    .0(D)    .0( )    .0( )   1.7(D)    .0( )    .0( )    .5(D)    .0(S)    .0(S)

               0.
                .0(S)

  0   20.      1.       0.       5.       1.       0.       4.       7.       3.       1.       1.
                .1( )    .0( )    .4( )    .1( )    .0( )    .9( )    .0( )    .4( )    .4( )    .3( )

               2.       2.       1.       0.       1.       0.       6.      10.       1.       8.
                .2( )    .2( )    .2( )    .1( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

              16.       4.       0.       7.       9.       7.       1.       3.       0.       1.
              16.1(D)    .0(D)    .0( )    .0( )   4.5(D)    .0( )    .0( )   1.7(D)    .0(S)    .0(S)
```

		0. .0(S)									
0	25.	5. .2( )	2. .2( )	16. .8( )	3. .3( )	4. .3( )	14. 1.7( )	23. .0( )	9. .6( )	5. 1.0( )	4. .7( )
		7. .4( )	8. .4( )	4. .4( )	0. .2( )	6. .0( )	7. .0( )	19. .0( )	28. .0( )	2. .0( )	27. .0( )
		47. 30.0(D)	14. .0(D)	0. .0( )	20. .0( )	30. 14.8(D)	23. .0( )	4. .0( )	12. 6.2(D)	7. .1(S)	2. .2(S)
		0. .0(S)									
0	30.	29. .5( )	16. .4( )	59. 1.5( )	13. .5( )	54. .7( )	28. 2.6( )	92. .0( )	35. .9( )	16. 1.7( )	16. 1.5( )
		34. .6( )	35. .6( )	17. .6( )	4. .8( )	33. .0( )	69. .0( )	77. .0( )	92. .0( )	27. .0( )	130. .0( )
		169. 30.0(D)	41. .0(D)	0. .0( )	71. .0( )	129. 64.4(D)	92. .0( )	16. .0( )	52. 25.8(D)	69. .2(S)	27. .6(S)
		5. .1(S)									
0	35.	49. .6( )	55. .8( )	117. 2.1( )	27. .6( )	185. 1.1( )	31. 2.8( )	155. .0( )	87. 1.2( )	27. 2.2( )	35. 2.3( )
		74. .8( )	76. .8( )	34. .8( )	7. 1.3( )	49. .0( )	127. .0( )	139. .0( )	132. .0( )	126. .0( )	286. .0( )
		307. 30.0(D)	60. 4.7(D)	5. .0( )	123. .0( )	182. 90.9(D)	155. .0( )	35. .0( )	73. 36.4(D)	127. .2(S)	126. 1.5(S)
		6. .3(S)									
0	40.	50. .6( )	106. 1.0( )	133. 2.2( )	35. .7( )	295. 1.4( )	29. 2.7( )	167. .0( )	125. 1.4( )	30. 2.3( )	48. 2.8( )
		90. .8( )	90. .8( )	37. .8( )	7. 1.5( )	51. .0( )	179. .0( )	185. .0( )	131. .0( )	208. .0( )	391. .0( )
		358. 30.0(D)	61. 6.1(D)	6. .0( )	135. .0( )	178. 88.9(D)	167. .0( )	48. .0( )	74. 36.8(D)	179. .3(S)	208. 2.7(S)
		9. .6(S)									
0	45.	50. .6( )	139. 1.1( )	122. 2.2( )	35. .7( )	320. 1.4( )	30. 2.8( )	153. .0( )	130. 1.4( )	30. 2.3( )	53. 3.0( )

		85.	85.	35.	10.	50.	206.	209.	116.	277.	404.
		.8( )	.8( )	.8( )	1.7( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		344.	59.	4.	126.	162.	153.	53.	68.	206.	277.
		30.0(D)	3.7(D)	.0( )	.0( )	80.8(D)	.0( )	.0( )	34.1(D)	.3(S)	3.8(S)
		11.									
		.9(S)									
0	50.	47.	150.	107.	33.	300.	30.	139.	121.	30.	54.
		.6( )	1.2( )	2.0( )	.7( )	1.4( )	2.7( )	.0( )	1.4( )	2.3( )	3.0( )
		79.	78.	32.	20.	47.	212.	211.	101.	308.	373.
		.8( )	.8( )	.7( )	1.8( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		315.	57.	2.	115.	152.	139.	54.	62.	212.	308.
		30.0(D)	2.1(D)	.0( )	.0( )	76.2(D)	.0( )	.0( )	30.9(D)	.3(S)	4.4(S)
		24.									
		1.1(S)									
0	55.	44.	148.	92.	30.	273.	30.	128.	112.	30.	55.
		.6( )	1.2( )	1.9( )	.6( )	1.3( )	2.7( )	.0( )	1.4( )	2.3( )	3.1( )
		75.	75.	29.	33.	43.	202.	200.	86.	321.	334.
		.8( )	.8( )	.7( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		287.	55.	0.	107.	146.	128.	55.	55.	202.	321.
		30.0(D)	.0(D)	.0( )	.0( )	73.2(D)	.0( )	.0( )	27.6(D)	.3(S)	4.7(S)
		34.									
		1.3(S)									
1	0.	41.	138.	79.	27.	246.	30.	118.	104.	30.	54.
		.6( )	1.1( )	1.8( )	.6( )	1.3( )	2.7( )	.0( )	1.3( )	2.3( )	3.0( )
		72.	71.	26.	41.	41.	186.	183.	74.	320.	299.
		.8( )	.8( )	.7( )	2.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		261.	53.	0.	100.	139.	118.	54.	50.	186.	320.
		30.0(D)	.0(D)	.0( )	.0( )	69.6(D)	.0( )	.0( )	24.9(D)	.3(S)	4.7(S)
		43.									
		1.4(S)									
1	5.	39.	127.	69.	24.	223.	30.	110.	97.	30.	53.
		.5( )	1.1( )	1.7( )	.6( )	1.2( )	2.7( )	.0( )	1.3( )	2.3( )	3.0( )
		68.	68.	24.	46.	39.	169.	167.	65.	310.	270.
		.8( )	.8( )	.7( )	2.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		241.	50.	0.	93.	133.	110.	53.	46.	169.	310.

		30.0(D)	.0(D)	.0( )	.0( )	66.5(D)	.0( )	.0( )	22.9(D)	.3(S)	4.4(S)
		46.									
		1.4(S)									
1	10.	36.	115.	57.	22.	199.	30.	96.	87.	30.	49.
		.5( )	1.1( )	1.5( )	.6( )	1.2( )	2.7( )	.0( )	1.2( )	2.3( )	2.8( )
		63.	62.	21.	45.	35.	150.	146.	50.	294.	235.
		.7( )	.7( )	.6( )	2.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		212.	43.	0.	79.	116.	96.	49.	39.	150.	294.
		30.0(D)	.0(D)	.0( )	.0( )	57.9(D)	.0( )	.0( )	19.5(D)	.3(S)	4.1(S)
		45.									
		1.4(S)									
1	15.	32.	101.	45.	19.	167.	30.	77.	74.	30.	44.
		.5( )	1.0( )	1.3( )	.6( )	1.1( )	2.7( )	.0( )	1.2( )	2.3( )	2.7( )
		54.	54.	18.	43.	32.	127.	123.	39.	271.	191.
		.7( )	.7( )	.6( )	2.1( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		175.	39.	0.	66.	99.	77.	44.	33.	127.	271.
		30.0(D)	.0(D)	.0( )	.0( )	49.5(D)	.0( )	.0( )	16.3(D)	.2(S)	3.6(S)
		42.									
		1.4(S)									
1	20.	28.	87.	35.	16.	133.	30.	61.	62.	30.	40.
		.5( )	.9( )	1.2( )	.5( )	1.0( )	2.7( )	.0( )	1.1( )	2.3( )	2.5( )
		46.	45.	14.	39.	28.	105.	102.	30.	235.	150.
		.7( )	.7( )	.6( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		142.	37.	0.	54.	81.	61.	40.	26.	105.	235.
		30.0(D)	.0(D)	.0( )	.0( )	40.7(D)	.0( )	.0( )	12.9(D)	.2(S)	3.1(S)
		39.									
		1.3(S)									
1	25.	24.	75.	27.	12.	103.	30.	48.	51.	30.	38.
		.5( )	.9( )	1.0( )	.5( )	.9( )	2.7( )	.0( )	1.0( )	2.3( )	2.4( )
		37.	37.	10.	36.	24.	88.	85.	22.	195.	115.
		.6( )	.6( )	.5( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		113.	35.	0.	44.	63.	48.	38.	17.	88.	195.
		30.0(D)	.0(D)	.0( )	.0( )	31.7(D)	.0( )	.0( )	8.5(D)	.2(S)	2.5(S)
		35.									
		1.3(S)									

1	30.	21.	63.	20.	8.	77.	30.	38.	41.	30.	36.
		.4( )	.8( )	.9( )	.4( )	.8( )	2.7( )	.0( )	.9( )	2.3( )	2.4( )
		30.	30.	7.	33.	21.	73.	71.	16.	158.	86.
		.6( )	.6( )	.5( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		89.	34.	0.	35.	52.	38.	36.	12.	73.	158.
		30.0(D)	.0(D)	.0( )	.0( )	26.2(D)	.0( )	.0( )	5.9(D)	.2(S)	2.0(S)
		33.									
		1.3(S)									
1	35.	14.	52.	15.	6.	56.	30.	31.	34.	30.	34.
		.4( )	.7( )	.8( )	.4( )	.8( )	2.7( )	.0( )	.9( )	2.3( )	2.3( )
		25.	25.	5.	31.	13.	60.	58.	12.	126.	63.
		.6( )	.6( )	.4( )	2.0( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		73.	33.	0.	29.	45.	31.	34.	9.	60.	126.
		30.0(D)	.0(D)	.0( )	.0( )	22.6(D)	.0( )	.0( )	4.4(D)	.2(S)	1.5(S)
		30.									
		1.2(S)									
1	40.	9.	41.	11.	4.	42.	30.	27.	29.	30.	33.
		.3( )	.7( )	.7( )	.3( )	.7( )	2.7( )	.0( )	.8( )	2.3( )	2.3( )
		22.	22.	4.	28.	9.	48.	46.	9.	87.	47.
		.5( )	.5( )	.4( )	1.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		61.	32.	0.	25.	39.	27.	33.	7.	48.	87.
		30.0(D)	.0(D)	.0( )	.0( )	19.6(D)	.0( )	.0( )	3.3(D)	.2(S)	1.2(S)
		28.									
		1.2(S)									
1	45.	7.	33.	9.	3.	31.	30.	23.	25.	30.	33.
		.3( )	.6( )	.6( )	.3( )	.6( )	2.7( )	.0( )	.8( )	2.3( )	2.2( )
		19.	19.	3.	26.	7.	38.	37.	8.	62.	35.
		.5( )	.5( )	.3( )	1.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )
		52.	32.	0.	22.	35.	23.	33.	5.	38.	62.
		30.0(D)	.0(D)	.0( )	.0( )	17.3(D)	.0( )	.0( )	2.6(D)	.1(S)	.9(S)
		25.									
		1.1(S)									
1	50.	5.	27.	8.	3.	23.	30.	20.	21.	30.	32.
		.3( )	.5( )	.5( )	.3( )	.6( )	2.7( )	.0( )	.8( )	2.3( )	2.2( )
		17.	17.	2.	23.	5.	31.	30.	7.	45.	27.
		.5( )	.5( )	.3( )	1.9( )	.0( )	.0( )	.0( )	.0( )	.0( )	.0( )

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          46.      32.       0.      19.      31.      20.      32.       4.      31.      45.
          30.0(D)    .0(D)    .0( )    .0( )  15.4(D)    .0( )    .0( )  2.1(D)    .1(S)    .8(S)

          23.
           1.1(S)

1  55.     4.      22.       7.       2.      17.      30.      18.      19.      30.      32.
           .2( )    .5( )    .5( )    .3( )    .5( )  2.7( )    .0( )    .7( )  2.3( )  2.2( )

          15.      15.       2.      21.       4.      25.      25.       6.      33.      20.
           .5( )    .5( )    .3( )  1.9( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

          40.      31.       0.      17.      27.      18.      32.       3.      25.      33.
          30.0(D)    .0(D)    .0( )    .0( )  13.7(D)    .0( )    .0( )  1.7(D)    .1(S)    .7(S)

          21.
           1.1(S)

2   0.     3.      18.       6.       2.      11.      30.      16.      17.      30.      32.
           .2( )    .4( )    .5( )    .2( )    .5( )  2.7( )    .0( )    .7( )  2.3( )  2.2( )

          13.      13.       2.      19.       3.      22.      21.       6.      25.      15.
           .5( )    .5( )    .3( )  1.8( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

          36.      31.       0.      15.      24.      16.      32.       3.      22.      25.
          30.0(D)    .0(D)    .0( )    .0( )  12.0(D)    .0( )    .0( )  1.4(D)    .1(S)    .6(S)

          18.
           1.0(S)

2   5.     2.      15.       5.       1.       6.      30.      13.      15.      30.      31.
           .2( )    .4( )    .4( )    .2( )    .4( )  2.7( )    .0( )    .7( )  2.3( )  2.2( )

          11.      11.       1.      15.       2.      18.      17.       4.      18.       9.
           .4( )    .4( )    .2( )  1.8( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

          31.      30.       0.      13.      20.      13.      31.       2.      18.      18.
          30.0(D)    .0(D)    .0( )    .0( )   9.8(D)    .0( )    .0( )  1.0(D)    .1(S)    .5(S)

          15.
           1.0(S)

2  10.     0.      12.       4.       1.       3.      30.      11.      12.      30.      30.
           .1( )    .4( )    .4( )    .2( )    .3( )  2.7( )    .0( )    .6( )  2.3( )  2.1( )

           9.       9.       1.      12.       0.      14.      14.       3.      12.       5.
           .4( )    .4( )    .2( )  1.7( )    .0( )    .0( )    .0( )    .0( )    .0( )    .0( )

          24.      30.       0.       9.      15.      11.      30.       1.      14.      12.
          23.8(D)    .0(D)    .0( )    .0( )   7.6(D)    .0( )    .0( )    .7(D)    .1(S)    .5(S)

          12.
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		.9(S)									
2	15.	0. .0( )	10. .3( )	3. .3( )	1. .2( )	2. .2( )	25. 2.4( )	7. .0( )	10. .6( )	28. 2.3( )	30. 2.1( )
		7. .4( )	7. .4( )	0. .2( )	11. 1.7( )	0. .0( )	11. .0( )	10. .0( )	1. .0( )	7. .0( )	2. .0( )
		18. 17.6(D)	28. .0(D)	0. .0( )	7. .0( )	13. 6.4(D)	7. .0( )	30. .0( )	0. .0(D)	11. .1(S)	7. .4(S)
		11. .9(S)									
2	20.	0. .0( )	8. .3( )	1. .2( )	0. .1( )	1. .2( )	18. 2.0( )	6. .0( )	8. .6( )	23. 2.0( )	27. 2.0( )
		6. .3( )	6. .3( )	0. .1( )	10. 1.7( )	0. .0( )	8. .0( )	8. .0( )	0. .0( )	5. .0( )	1. .0( )
		15. 14.6(D)	23. .0(D)	0. .0( )	6. .0( )	12. 6.0(D)	6. .0( )	27. .0( )	0. .0(D)	8. .1(S)	5. .4(S)
		10. .8(S)									
2	25.	0. .0( )	6. .3( )	1. .2( )	0. .1( )	1. .1( )	15. 1.8( )	6. .0( )	7. .5( )	18. 1.8( )	23. 1.9( )
		6. .3( )	6. .3( )	0. .1( )	10. 1.7( )	0. .0( )	6. .0( )	6. .0( )	0. .0( )	4. .0( )	1. .0( )
		13. 12.7(D)	18. .0(D)	0. .0( )	6. .0( )	10. 5.0(D)	6. .0( )	23. .0( )	0. .0(D)	6. .1(S)	4. .4(S)
		10. .8(S)									
2	30.	0. .0( )	5. .2( )	0. .1( )	0. .1( )	0. .1( )	13. 1.6( )	5. .0( )	6. .5( )	15. 1.6( )	19. 1.7( )
		5. .3( )	5. .3( )	0. .0( )	10. 1.6( )	0. .0( )	5. .0( )	5. .0( )	0. .0( )	4. .0( )	0. .0( )
		11. 11.2(D)	15. .0(D)	0. .0( )	5. .0( )	10. 4.8(D)	5. .0( )	19. .0( )	0. .0(D)	5. .1(S)	4. .3(S)
		9. .7(S)									
2	35.	0. .0( )	4. .2( )	0. .1( )	0. .1( )	0. .1( )	11. 1.5( )	5. .0( )	6. .5( )	13. 1.5( )	16. 1.5( )

		5. .3( )	5. .3( )	0. .0( )	9. 1.6( )	0. .0( )	4. .0( )	4. .0( )	0. .0( )	4. .0( )	0. .0( )
		10. 10.3(D)	13. .0(D)	0. .0( )	5. .0( )	9. 4.6(D)	5. .0( )	16. .0( )	0. .0(D)	4. .1(S)	4. .3(S)
		9. .6(S)									
2	40.	0. .0( )	3. .2( )	0. .1( )	0. .1( )	0. .1( )	10. 1.5( )	5. .0( )	5. .5( )	11. 1.4( )	14. 1.4( )
		5. .3( )	5. .3( )	0. .0( )	9. 1.6( )	0. .0( )	3. .0( )	3. .0( )	0. .0( )	4. .0( )	0. .0( )
		10. 9.5(D)	11. .0(D)	0. .0( )	5. .0( )	9. 4.4(D)	5. .0( )	14. .0( )	0. .0(D)	3. .1(S)	4. .3(S)
		9. .6(S)									
2	45.	0. .0( )	2. .2( )	0. .1( )	0. .0( )	0. .1( )	10. 1.4( )	4. .0( )	5. .5( )	10. 1.3( )	12. 1.3( )
		4. .3( )	4. .3( )	0. .0( )	8. 1.6( )	0. .0( )	3. .0( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )
		9. 9.0(D)	10. .0(D)	0. .0( )	4. .0( )	8. 4.2(D)	4. .0( )	12. .0( )	0. .0(D)	3. .1(S)	3. .3(S)
		8. .5(S)									
2	50.	0. .0( )	2. .1( )	0. .1( )	0. .0( )	0. .1( )	9. 1.4( )	4. .0( )	4. .5( )	10. 1.3( )	11. 1.3( )
		4. .3( )	4. .3( )	0. .0( )	8. 1.6( )	0. .0( )	2. .0( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )
		9. 8.5(D)	10. .0(D)	0. .0( )	4. .0( )	8. 4.0(D)	4. .0( )	11. .0( )	0. .0(D)	2. .1(S)	3. .2(S)
		8. .4(S)									
2	55.	0. .0( )	2. .1( )	0. .0( )	0. .0( )	0. .1( )	9. 1.3( )	4. .0( )	4. .4( )	9. 1.2( )	10. 1.2( )
		4. .3( )	4. .3( )	0. .0( )	8. 1.6( )	0. .0( )	2. .0( )	2. .0( )	0. .0( )	3. .0( )	0. .0( )
		8. 8.1(D)	9. .0(D)	0. .0( )	4. .0( )	8. 3.8(D)	4. .0( )	10. .0( )	0. .0(D)	2. .1(S)	3. .2(S)

		7. .4(S)									
3	0.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	8. 1.3( )	4. .0( )	4. .4( )	9. 1.2( )	10. 1.2( )
		4. .3( )	4. .3( )	0. .0( )	7. 1.5( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	3. .0( )	0. .0( )
		8. 7.7(D)	9. .0(D)	0. .0( )	4. .0( )	7. 3.6(D)	4. .0( )	10. .0( )	0. .0(D)	1. .1(S)	3. .2(S)
		7. .3(S)									
3	5.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	8. 1.2( )	4. .0( )	4. .4( )	8. 1.2( )	9. 1.1( )
		4. .3( )	4. .3( )	0. .0( )	7. 1.3( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		7. 7.4(D)	8. .0(D)	0. .0( )	4. .0( )	7. 3.5(D)	4. .0( )	9. .0( )	0. .0(D)	1. .1(S)	2. .2(S)
		7. .3(S)									
3	10.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	7. 1.2( )	3. .0( )	4. .4( )	8. 1.2( )	8. 1.1( )
		3. .3( )	3. .3( )	0. .0( )	6. 1.2( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		7. 7.0(D)	8. .0(D)	0. .0( )	3. .0( )	6. 3.1(D)	3. .0( )	8. .0( )	0. .0(D)	1. .1(S)	2. .2(S)
		6. .3(S)									
3	15.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	7. 1.2( )	3. .0( )	3. .4( )	7. 1.1( )	8. 1.1( )
		3. .3( )	3. .3( )	0. .0( )	6. 1.1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		7. 6.6(D)	7. .0(D)	0. .0( )	3. .0( )	6. 3.1(D)	3. .0( )	8. .0( )	0. .0(D)	1. .1(S)	2. .2(S)
		6. .2(S)									
3	20.	0.	1.	0.	0.	0.	7.	3.	3.	7.	8.

		.0( )	.1( )	.0( )	.0( )	.0( )	1.2( )	.0( )	.4( )	1.1( )	1.1( )
		3. .3( )	3. .3( )	0. .0( )	6. 1.1( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		6. 6.3(D)	7. .0(D)	0. .0( )	3. .0( )	6. 2.9(D)	3. .0( )	8. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		6. .2(S)									
3	25.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	6. 1.1( )	3. .0( )	3. .4( )	7. 1.1( )	7. 1.0( )
		3. .2( )	3. .2( )	0. .0( )	6. 1.0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		6. 6.0(D)	7. .0(D)	0. .0( )	3. .0( )	6. 2.8(D)	3. .0( )	7. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		5. .1(S)									
3	30.	0. .0( )	1. .1( )	0. .0( )	0. .0( )	0. .0( )	6. 1.1( )	3. .0( )	3. .4( )	6. 1.0( )	7. 1.0( )
		3. .2( )	3. .2( )	0. .0( )	5. 1.0( )	0. .0( )	1. .0( )	1. .0( )	0. .0( )	2. .0( )	0. .0( )
		6. 5.7(D)	6. .0(D)	0. .0( )	3. .0( )	5. 2.6(D)	3. .0( )	7. .0( )	0. .0(D)	1. .1(S)	2. .1(S)
		5. .1(S)									
3	35.	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	6. 1.1( )	3. .0( )	3. .4( )	6. 1.0( )	7. 1.0( )
		3. .2( )	3. .2( )	0. .0( )	5. .9( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		5. 5.3(D)	6. .0(D)	0. .0( )	3. .0( )	5. 2.3(D)	3. .0( )	7. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		5. .1(S)									
3	40.	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	5. 1.0( )	2. .0( )	3. .4( )	6. 1.0( )	6. 1.0( )
		2. .2( )	2. .2( )	0. .0( )	3. .7( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )

		5. 4.7(D)	6. .0(D)	0. .0( )	2. .0( )	3. 1.5(D)	2. .0( )	6. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		3. .0(S)									
3	45.	0. .0( )	0. .1( )	0. .0( )	0. .0( )	0. .0( )	5. 1.0( )	2. .0( )	2. .3( )	5. 1.0( )	6. .9( )
		2. .2( )	2. .2( )	0. .0( )	2. .5( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		4. 3.7(D)	5. .0(D)	0. .0( )	2. .0( )	2. .9(D)	2. .0( )	6. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		2. .0(S)									
3	50.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	4. .9( )	1. .0( )	2. .3( )	5. .9( )	6. .9( )
		1. .2( )	1. .2( )	0. .0( )	1. .4( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		3. 2.7(D)	5. .0(D)	0. .0( )	1. .0( )	1. .6(D)	1. .0( )	6. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		1. .0(S)									
3	55.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	3. .8( )	1. .0( )	1. .3( )	4. .8( )	5. .9( )
		1. .1( )	1. .1( )	0. .0( )	1. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		2. 2.0(D)	4. .0(D)	0. .0( )	1. .0( )	1. .3(D)	1. .0( )	5. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		1. .0(S)									
4	0.	0. .0( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	2. .7( )	0. .0( )	1. .3( )	3. .7( )	4. .8( )
		0. .1( )	0. .1( )	0. .0( )	0. .3( )	0. .0( )	0. .0( )	0. .0( )	0. .0( )	1. .0( )	0. .0( )
		1. 1.4(D)	3. .0(D)	0. .0( )	0. .0( )	0. .2(D)	0. .0( )	4. .0( )	0. .0(D)	0. .1(S)	1. .1(S)
		0. .0(S)									

JACKSON BOULEVARD DRAINAGE BASIN DESIGN PLAN
EXISTING CONVEYANCE SYSTEM - UPPER TRIBUTARY - 100 YEAR

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
203	46.	.1	1.4	1 5.
26	46.	2.1		1 5.
118	182.	(DIRECT FLOW)		0 35.
22	90.	.8		0 40.
23	90.	.8		0 40.
121	74.	(DIRECT FLOW)		0 40.
117	135.	(DIRECT FLOW)		0 40.
119	167.	(DIRECT FLOW)		0 40.
15	35.	.7		0 45.
25	37.	.8		0 40.
19	130.	1.4		0 45.
18	167.	(DIRECT FLOW)		0 40.
111	132.	(DIRECT FLOW)		0 35.
108	51.	(DIRECT FLOW)		0 40.
17	31.	2.8		0 35.
114	358.	(DIRECT FLOW)		0 40.
14	133.	2.2		0 40.
12	50.	.6		0 40.
20	30.	2.3		0 50.
16	320.	1.4		0 45.
13	150.	1.2		0 50.
115	61.	(DIRECT FLOW)		0 40.
113	404.	(DIRECT FLOW)		0 45.
110	211.	(DIRECT FLOW)		0 50.
21	55.	3.1		0 55.
201	321.	.1	4.7	0 55.
200	212.	.1	.3	0 50.
120	55.	(DIRECT FLOW)		0 55.
112	321.	(DIRECT FLOW)		0 55.
109	212.	(DIRECT FLOW)		0 50.
116	6.	(DIRECT FLOW)		0 40.