MASTER DEVELOPMENT DRAINAGE PLAN
for
POWERS AUTOPARK

PRELIMINARY AND FINAL DRAINAGE REPORT
for
POWERS AUTOPARK FILING NO. 1 & 2
(Includes Carlin Dodge and Faricy Boys)

OCTOBER, 2001

Prepared for:

Development Management, Inc.
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Project# 98-072

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DRAINAGE PLAN STATEMENTS

ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City of Colorado Springs for drainage reports, and said drainage report is in conformity with the Master Plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

COLORADO REGISTERED KENT D. ROCKWELL 25086 PROFESSIONAL ENGINEER 10/12/01

Kent D. Rockwell, P.E.

DEVELOPER'S STATEMENT

I, the developer, have read and will comply with all the requirements specified in this drainage report and plan.

Development Management, Inc.

BY: _____ DATE 10/11/01
Kent Petre

TITLE: President

ADDRESS: 4065 Sinton Road, Suite 200
Colorado Springs, CO 80907

CITY OF COLORADO SPRINGS

Filed in accordance with Section 15-3-906 of the code of the City of Colorado Springs, 1980, as amended.

_____
CITY ENGINEER

Oct 12, 2001
DATE

MASTER DEVELOPMENT DRAINAGE PLAN
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PURPOSE

The purpose of this Drainage Report is to identify the existing and proposed runoff patterns, major drainageways and drainage facilities tributary to the proposed Powers Autopark located at the southeast corner of Austin Bluffs Parkway and Woodmen Road.

SUMMARY OF DATA

The sources of information used in the development of this study are listed below:

1. City of Colorado Springs and El Paso County "Drainage Criteria Manual", October 1987, revised November 1991.

2. Soil Survey for El Paso County, Colorado, U.S. Department of Agriculture, Soil Conservation Service, June, 1980.

3. "Flood Insurance Studies for Colorado Springs and El Paso County, Colorado", prepared by the Federal Emergency Management Agency (FEMA), March, 1997.

4. "Cottonwood Creek Drainage Basin Planning Study" by URS Consultants, Inc., June, 1994.

5. "Cottonwood Creek Drainage Basin Planning Study" by Ayres Associates, Oct., 1996.

6. "Wagon Trails Subdivision Master Development Drainage Report" by Rockwell-Minchow Consultants, Inc., 1998.

GENERAL LOCATION AND DESCRIPTION

The Powers Autopark site is located southeast of the Austin Bluffs Parkway and Woodmen Road intersection and extends southerly to Bridle Pass Drive and easterly to Duryea Drive. The entire Autopark area consists of approximately 80 acres. The site is located within the City of Colorado Springs, El Paso County, Colorado, encompassing portions of Sections 11 & 12, Township 13 South, Range 66 West of the 6th P.M. (see Vicinity Map - Figure 1).

The drainage analysis presented in this report also includes the area south of Woodmen between Duryea Drive and Powers Boulevard. The area east of Duryea is planned for additional commercial development. The entire area to be analyzed lies within the Cottonwood Creek Drainage Basin.

Powers Autopark Filing No. 1 consists of Test Drive, a portion of New Car Drive and 2 lots just southeast of the Woodmen and Test Car intersection. Faricy Boys will be constructed on Lot 1 and Lot 2 of Filing No. 1. Powers Autopark Filing No. 2 consists of a single lot just southeast of the Woodmen Road and Austin Bluffs Parkway intersection. Carlin Dodge will be constructed within Filing No. 2. Filing No. 1 encompasses 15.312 acres and Filing No. 2 encompasses 11.846 acres. Test Drive runs north and south between Woodmen Road and Bridle Pass Drive. New Car Drive runs east and west parallel to Woodmen Road.

SOILS

According to the Soil Survey of El Paso County Area, Colorado, prepared by the U.S. Department of Agriculture Soil Conservation Service, the soils within the Autopark and tributary areas fall under the Blakeland & Stapleton Series (Soils 8 & 83). These soils are classified under Hydrologic Groups "A & B". Hydrologic Group "B" was used for calculation purposes.

Existing ground cover consists of well-established native grasses over the entire studied area.

CLIMATE

This area of El Paso County can be described as the foothills, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry, and summers relatively warm and dry. Precipitation ranges from 12 to 14 inches per year, with the majority of this moisture occurring in the spring and summer in the form of rainfall. Thunderstorms are common during the summer months.

FLOODPLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel #08041C0528 F none of the site lies in a designated floodplain

DRAINAGE CRITERIA

The current City of Colorado Springs/El Paso County Drainage Criteria was utilized in this report. Peak runoff quantities were determined using the Rational Method for both the 5 year and 100 year storms.

DRAINAGE CHARACTERISTICS

The surrounding area consists of gently rolling hills of well-established native grasses with slopes of 1-10%. The area generally slopes from east to west toward Austin Bluffs Parkway. A storm sewer system was constructed along the south side of Woodmen Road to accommodate the flows generated from this area.

A 66" reinforced concrete pipe (RCP) crosses under the roadway from north to south just west of the Powers Blvd. intersection, having a capacity of 210 cfs. A 60" RCP (capacity 145 cfs) crosses under Powers from east to west just south of the Woodmen intersection. The outfall for these two pipes is at the southwest corner of the Powers and Woodmen Road intersection. A major pipe system was constructed along the south side of Woodmen Road to collect and rout this runoff to Cottonwood Creek just west of Austin Bluffs Parkway. This system was sized to accommodate the flows from the area directly south of Woodmen Road.

DEVELOPED DRAINAGE BASIN DESCRIPTIONS

A brief description of each developed drainage basin for the site and related off-site areas is provided in this section of the report. Proposed drainage conditions and facilities are described. A summary of developed peak runoff for the basins is depicted on the Drainage Plan provided in the appendix. All proposed drainage facilities are approximate in size and may vary with actual layout and design.

Off-site Basin OS-1 consists of the area northeast of the Powers and Woodmen Road intersection. Basin OS-1 generates developed runoff quantities of Q_{100} = 210 cubic feet per second (cfs) according to the URS study. An existing 66" RCP crosses under Woodmen Road and Powers Boulevard from northeast to southwest.

Basin OS-2, located at the southeast corner of Powers and Woodmen Road, generates developed runoff quantities of 145 cfs during the100 year storm per the URS study. An existing 60" RCP crosses under Powers Boulevard from east to west just south of Woodmen Road. Runoff within these pipes are conveyed westerly within the recently completed storm sewer system along the south side of Woodmen Road.

(The flows generated from Basins OS-1 and OS-2 are based on previous reports, anticipated land uses, approximate drainage areas and capacity of existing pipes. Exact determination of these flows will be based on future development of this area. Nevertheless, the Rational Method was utilized to simulate approximate runoff quantities for these areas. The approximated runoff coefficients, areas, and associated flows were utilized in this report to determine approximate downstream flows within the existing 60" and 66" RCP's along the south side of Woodmen Road.)

A 60" RCP was constructed along the south side of Woodmen Road from Powers Boulevard to a point 1100 feet to the west, as part of the Woodmen Road improvements constructed in 1999 to accommodate the flows generated from Basin OS-1, OS-2 and the area south of Woodmen Road. This system will remain in place and convey additional runoff generated from the Powers Autopark.

The drainage analysis of the area south of Woodmen Road from Test Drive to Powers Boulevard is only conceptual at this time (Basins I to XIV). A more refined drainage report will be prepared once more detailed information is available for this area.

Basin I consists of 13.43 acres just southwest of the Powers and Woodmen Road intersection. This basin generates runoff rates of 44.1 cfs during the 5 year storm and 82.0 cfs during the 100 year storm. Runoff from this basin flows generally from east to west. It is anticipated at this time, that these flows will reach the southwest corner of this basin.

Runoff rates of Q_5 = 49.0 cfs and Q_{100} = 94.0 cfs generated from Basin II will reach the northwest corner of this basin and combine with the flows from Basin I. The total flows reaching this point are 86 cfs during the 5 year storm and 158 cfs during the 100 year storm.

Exact location of future inlets within these basins will be determined once development plans are prepared. A 36" RCP is currently stubbed into Basin I from the Woodmen Road drainage system. The 42" RCP will be extended to the southeast into Basins I and II to collect future developed runoff.

Basin D-10 covers 18.5 acres at the northwest corner of Woodmen Road and Powers Boulevard. Runoff quantities of 55.5 cfs during the 5 year storm and 102.1 cfs during the 100 year storm are generated from this basin. These flows travel to the southwest where a 42" RCP is stubbed into the basin from Woodmen Road. A 48" RCP crosses under Woodmen Road from north to south and enters the 66" RCP along the south side of Woodmen Road.

Basin D-11, consisting of the north half of Woodmen Road generates runoff quantities of Q_5 = 6.7 cfs and Q_{100} = 13.0 cfs. The runoff travels westerly as street flow to an existing 16' on-grade inlet. The inlet collects runoff quantities of 4.5 cfs during the 5 year storm and 7.5 cfs during the 100 year storm. The collected flows discharge to the existing 48" RCP crossing Woodmen Road. The bypass flows of 2.2 cfs during the 5 year storm and 5.5 cfs during the 100 year storm enters Basin D-15 as street flow. As stated above, the 48" RCP crossing Woodmen to the south ties into the existing 66" RCP along the south side of Woodmen Road.

Basin D-12 generates runoff quantities of Q_5 = 6.3 cfs and Q_{100} = 12.3 cfs. These flows travel westerly as street flow to an existing 16' on-grade inlet at the west end of Basin D-12. The inlet collects runoff quantities of 4.2 cfs during the 5 year storm and 7.3 cfs during the 100 year storm. These flows discharge to the existing 66" RCP mentioned above. Flows of 2.1 cfs and 5.0 cfs bypassing this inlet during the 5 year and 100 year storms, respectively, enter Basin D-16 as street flow.

The total flows generated from Basin D-10, D-11, D-12, OS-1, OS-2, I and II (approximately 312 cfs during the 5 year storm and 580 cfs during the 100 year storm) are conveyed westerly at Design Point #1 within the existing 66" RCP paralleling Woodmen Road.

Basin III is located west of Basin II and consists of 10.92 acres. This basin generates runoff rates of 35.8 cfs during the 5 year storm and 66.7 cfs during the 100 year storm. These flows discharge to the northwest toward future New Car Drive. A 30" RCP will be extended to the northwest corner of this basin within New Car Drive to collect the flows generated from this basin. The 30" RCP will continue westerly within New Car Drive to Duryea Drive. Depending on future site plans, inlets may or may not be required within New Car Drive.

Basin IV is located northeast of the Bridle Pass Drive and Duryea Drive. This 8.77 acre basin generates runoff quantities of Q_5 = 29.5 cfs and Q_{100} = 56.6 cfs. A 30" RCP will be stubbed into this basin from the Duryea and New Car Drive intersection to collect these flows.

A 16' sump inlet will be installed at the southeast corner of the Duryea and New Car Drive intersection to collect any street flows reaching New Car Drive from Basins III and IV. (The inlet was sized based on a maximum of 13 cfs reaching this inlet from each side during the 5 year storm). A 36" RCP will be extended northerly from this inlet along the east side of Duryea Drive to Woodmen Road to convey the combined flows of Q_5 = 59.9 cfs and Q_{100} = 111.8 cfs to Design Point #2.

Basin D-14 is located north of Woodmen Road just east of Duryea Drive. Runoff rates of 7.0 cfs during the 5 year storm and 12.5 cfs during the 100 year storm are generated from this basin. It is anticipated that a curb line will be constructed within this basin just north of Woodmen Road once this basin is developed. The future curb line will direct runoff to the west to an existing 24" RCP stubbed into the western site of this basin.

Basin D-15 consists of the north half of Woodmen Road from Duryea Drive to a point approximately 1,200 feet to the east. Runoff rates of Q_5 = 7.2 cfs and Q_{100} = 13.3 cfs are generated from Basin D-15. The street flows which bypassed the inlet at the west end of Basin D-11 enter this basin. Flow rates of 9.4 cfs and 18.8 cfs reach the existing inlet at the west end of Basin D-15. The existing 16" inlet will collect 5.6 cfs and 8.2 cfs during the 5 year and 100 year storms, respectively. The remaining flows (Q_5 = 3.8 cfs and Q_{100} = 10.6 cfs) bypassing this inlet will enter Duryea as street flow.

The collected flows from Basin D-14 and D-15 will be conveyed southerly within the existing 30" RCP crossing Woodmen Road from north to south. The 30" RCP conveys the collected flows to the existing 66" RCP along the south side of Woodmen Road.

Basin D-16 is located just south of Basin D-15. This basin generates runoff rates of 6.7 cfs during the 5 year storm and 12.4 cfs during the 100 year storm. Additional flows from Basin D-12 enter this basin. The total street flows approaching the existing 16' inlet just east of Duryea are 8.8 cfs and 17.4 cfs during the 5 year and 100 year storms, respectively. The 16' inlet will collect 5.3 during the 5 year storm and 7.9 cfs during the 100 year storm. The remaining flows(Q_5 = 3.5 cfs and Q_{100} = 9.5 cfs) will bypass this inlet and flow southerly in Duryea Drive (Basin V).

The area south of Woodmen Road, north of New Car Drive and east of Duryea comprises Basin V. Runoff quantities of Q_5 = 39.3 cfs and Q_{100} = 74.2 cfs are generated from this 11.99 acre basin. Total flows of Q_5 = 96.3 cfs and Q_{100} = 171.6 cfs generated from Basin III, IV, and V reach Design Point #3.

An existing 42" RCP is stubbed into this basin at the southeast corner of Duryea Drive and Woodmen Road (Design Point #3). The 42" RCP will collect the majority of the flows reaching Design Point #3. A 20' sump inlet will be installed just south of Woodmen Road within the Duryea Drive median to collect street flows reaching Duryea Drive from Basin V and Basin D-16. The 36" RCP conveying flows from Basins III and IV will tie into this 42" RCP. A 24" RCP will convey flows from the median inlet to the inlet within Basin VI.

Basin VI consists of the west half of Duryea Drive between Woodmen Road and New Car Drive. This 0.55 acre basin generates runoff rates of 2.4 cfs during the 5 year storm and 4.4 cfs during the 100 year storm. These flows will reach a proposed 4' inlet along the west side of Duryea just south of Woodmen Road. The 24" RCP from the median inlet will be extended through this inlet and tie into the existing 66" RCP.

Runoff rates of 492 cfs during the 5 year storm and 731 cfs during the 100 year storm reach Design Point #4. These flow rates will be conveyed westerly within the existing 66" RCP which has a normal flow capacity of 760 cfs.

The north half of Bridle Pass Drive from Test Drive to a point approximately 1,800 feet east comprises Basin VII. Runoff rates of Q_5 = 12.0 cfs and Q_{100} = 22.8 cfs are generated from this 5.60 acre basin. Bridle Pass Drive with a minimum slope of 1.6 % and a corresponding 5 year storm street capacity of 21.9 cfs has adequate capacity to convey these flows. Once these flows reach the Test Drive and Bridle Pass Drive intersection, they continue northerly within the east side of Test Drive to a proposed 20' inlet at the southeast corner of Test Drive and New Car Drive. The combined flows from Basins VII and X reach this inlet. The approach flows reaching this inlet will be limited to 13 cfs during the 5 year storm and 26 cfs during the 100 year storm from each direction. Future development of the adjacent pad sites will have to adhere to these street capacity limitations and collect flows prior to them reaching the street.

The 6.49 acres just northwest of the Bridle Pass Drive and Duryea Drive intersection comprise Basin VIII. Runoff rates of $Q_5 = 23.9$ cfs and $Q_{100} = 44.7$ cfs are generated from this basin. Runoff generated from this basin flows toward New Car Drive and combines with flows generated from Basin XIV. New Car Drive has a 5 year street capacity of 34 cfs per side. This is adequate capacity to convey the combined flows from Basin VIII and XIV to Design Point #5 ($Q_5 = 27.7$ cfs and $Q_{100} = 51.4$). However, as described below, a 24" RCP will be stubbed into Basin VIII to collect these flows due to limited downstream street capacity

Basin XIV consists of the south half of New Car Drive from Duryea Drive to a point approximately 800' to the west. This 1.29 acre basin generates runoff rates of $Q_5 = 4.8$ cfs and $Q_{100} = 8.7$ cfs. As stated above, runoff from Basin VIII combines with the flows from Basin XIV. The total street flow from these two basins are 27.7 cfs and 51.4 cfs during the 5 year and 100 year storms, respectively.

Basin IX, consisting of 5.36 acres, generates runoff rates of 20.6 cfs and 37.8 cfs during the 5 year and 100 year storms, respectively. These flows also discharge northwesterly toward New Car Drive and enter Basin X. A 24" RCP will also be stubbed into this basin from the southeast corner of Test Drive and New Car Drive to collect the flows generated from Basin IX.

The south half of New Car Drive adjacent to Basin IX comprises Basin X. Basin X generates runoff rates of $Q_5 = 3.3$ cfs and $Q_{100} = 6.1$ cfs. The combined flows of $Q_5 = 44.8$ cfs and $Q_{100} = 84.7$ cfs from Basin VII, VIII, IX, X and XIV reach Design Point #6. A 20' sump inlet will be installed at the southeast corner of the Test Drive and New Car Drive intersection. The allowable approach flows reaching this inlet from each direction is 13 cfs during the 5 year storm. Basins X and XIV generates approximately 50% of the allowable approach flow. Therefore, as stated above, a 24" RCP will be stubbed into the northwest corner of Basin VIII to collect a portion of the flows generated from this basin prior to reaching New Car Drive.

New Car Drive has a 5 year street capacity of approximately 34 cfs during the 5 year storm. This is adequate to convey the combined flows from Basins VIII and XIV. However, once flows from IX are added to these flows, the street capacity is exceeded. Therefore, a inlet will need to be placed at Design Point #5. (The exact storm sewer locations may vary once more detailed development information is available for this area).

Likewise, a 24" RCP will be installed at the northeast corner of Basin IX to collect flows generated from that Basin. A 36" RCP will convey the total flows of $Q_5 = 44.8$ cfs and $Q_{100} = 84.7$ cfs reaching Design Point #6 from Basins VII, VIII, IX, X, and XIV to the existing 60" RCP extended to the Duryea and Woodmen Road intersection.

Basin XI is located at the southwest corner of Woodmen Road and Duryea Drive. This basin generates runoff rates of 18.6 cfs during the 5 year storm and 34.3 cfs during the 100 year storm. These flows are directed toward Woodmen Road. It is anticipated that the development of this area will include curb and inlets internal to this basin which will allow for the collection of this flow prior to reaching Woodmen Road. A 24" RCP will be stubbed into the northwest corner of this basin to collect these flows. The 24" RCP could parallel the existing 66" RCP or tie directly into the 66" RCP at the northwest corner of this basin.

The 6.29 acres directly west of Basin XI comprises Basin XII. Runoff rates of Q_5 = 22.6 cfs and Q_{100} = 42.2 cfs generated from this basin flow westerly toward Test Drive. An existing 48"RCP and an existing 60" RCP are stubbed out southerly from the existing system along Woodmen Road. At this point, the 48" RCP will act as the outfall storm sewer for flows collected from Basins XI and XII (Q_5= 39.9 cfs and Q_{100} = 74.1 cfs at Design Point #7).

Basin XIII consists of the north half of New Car Drive between Duryea Drive and Test Drive along with the east half of Test Drive. This basin generates runoff rates of 9.6 cfs and 17.8 cfs during the 5 year and 100 year storms, respectively. These flows reach the southeast corner of the Woodmen Road and Test Drive intersection.

Basin D-18 consists of the north half of Woodmen Road between Duryea Drive and Test Drive. Runoff rates of 6.1 cfs and 11.7 cfs are generated from this basin during the 5 year and 100 year storms, respectively. An existing 16' on-grade inlet along the north side of Woodmen Road collects runoff rates of 4.0 cfs during the 5 year storm and 6.5 cfs during the 100 year storm. The bypass flows of 2.1 cfs during the 5 year storm and 5.2 cfs during the 100 year storm will enter the east half of Test Drive as street flow. The collected flows will discharge directly to the existing 8' x 6' concrete box culvert crossing under Woodmen Road.

Basin D-19 will develop runoff quantities of Q_5 = 8.3 cfs and Q_{100} = 15.9 cfs from the south side of Woodmen Road. The runoff will travel to westerly as street flow within Woodmen Road. An existing 16' inlet will collect 5.7 cfs during the 5 year storm and 8.4 cfs during the 100 year storm. Runoff rates of Q_5 = 2.6 cfs and Q_{100} = 7.5 cfs bypassing this inlet will reach the proposed 10' inlet within Test Drive just south of Woodmen Road within the Test Drive median. This inlet will collect the flows from Basin XIII and the bypass flows from Basin D-19. Collected flows will discharge to the existing 66" RCP in Woodmen Road.

The west half of Test Drive between Woodmen Road and New Car Drive comprises Basin XV. Runoff generated from this basin flows northerly within the west half of Test Drive to the south side of Woodmen Road. A 4' sump inlet will collect the runoff rates of 2.1 cfs and 3.9 cfs generated from this basin during the 5 year and 100 year storms, respectively. These flows will discharge to an 18" RCP and then into directly to the 60" RCP extended from Woodmen Road.

Total flows reaching Design Point # 9 are 454 cfs during the 5 year storm and 850 cfs during the 100 year storm. The 8' x 6' box culvert has a normal flow capacity of 1,390 cfs.

The north half of New Car Drive from Test to the proposed cul-de-sac approximately 900 feet to the west comprises Basin XVI. This basin generates runoff rates of Q_5 = 4.3 cfs and Q_{100} = 8.0 cfs. The flows reach the west end of the proposed cul-de-sac as street flow where a proposed 10' inlet will collect these flows.

Basin XVII consists of the south half of New Car Drive and the area to the south of New Car Drive. This 8.36 acre basin generates runoff rates of 30.1 cfs and 56.1 cfs during the 5 year and 100 year storms, respectively. These flows are also directed toward the New Car Drive cul-de-sac; however, due to limited street capacity of New Car Drive, a 30" RCP will be extended into this basin to collect the appropriate amount of flows. Depending on future development of this basin, inlets may have to be installed along New Car Drive.

Approximately 8.64 acres located south of New Car Drive comprises Basin XVIII. The runoff rates of Q_5 = 28.3 and cfs and Q_{100} = 53.5 cfs generated from this basin flow westerly toward Austin Bluffs Parkway. These flows will be collected within internal parking lots and piped within a 36" RCP northerly to the future Carlin Dodge site.

Basin XIX, consisting of 9.30 acres south of Basin XVIII, generates runoff rates of 31.2 cfs during the 5 year storm and 60.0 cfs during the 100 year storm. These flows will also discharge to the south to the existing 30" RCP. These flows were anticipated in the Wagon Trails Subdivision Master Development Drainage Plan.

POWERS AUTOPARK FILING NO. 1 & 2
(Faricy Boys and Carlin Dodge)

Basins "F" and "C" are drainage basins within the proposed Faricy Boys and Carlin Dodge sites, respectively. These basins depict the actual proposed development of these two sites.

The proposed Faricy Boys site consists of approximately 10 acres at the northwest corner of the Test Drive and New Car Drive intersection. Basin F-1 consists of 3.92 acres at the east end of the Faricy Boys site and generates runoff rates of Q_5 = 17.7 cfs and Q_{100} = 32.5 cfs. Two 10' sump inlets will be installed at the low point of this basin to collect these flows. A 30" RCP will convey these flows northerly around the proposed building and then westerly. A 24" RCP stub will be extended easterly from the 30" RCP to collect flows from Basin F-5 and future expansion.

Basin F-2 is located in the southwest portion of the Faricy site and generates runoff rates of 12.8 cfs during the 5 year storm and 23.3 cfs during the 100 year storm. An 8' sump inlet will be installed at the southwest corner of the Faricy site to collect these flows. A 24" RCP will convey these flows westerly to the proposed system in the New Car Drive.

The combined flows (Q_5 = 45.7 cfs and Q_{100} = 81.7 cfs) from Basins XVI, XVII and F-2 will be conveyed westerly through the proposed Carlin Dodge site within a 36" RCP (Design Point #10).

Approximately 0.66 acres along the westerly boundary line of the Faricy site comprises Basin F-3. A 4' sump inlet will collect the runoff rates of Q_5 = 3.0 cfs and Q_{100} = 5.5 cfs generated from Basin F-3.

Runoff rates of Q_5 = 8.1 cfs and Q_{100} = 14.7 cfs are generated from Basin F-4 which is located in the northwest corner of the Faricy site. An 8' sump inlet will collect these flows along the north side of the site. A 24" RCP will convey these flows southerly to the proposed inlet within Basin F-3.

Basin F-5 is located at the northeast corner of the Faricy site. This 1 acre basin generates runoff rates of 4.5 cfs during the 5 year storm and 8.3 cfs during the 100 year storm. The previously mentioned 24" RCP stubbed from Basin F-1 will collect these flows. Total flows of Q_5 = 33.3 cfs and Q_{100} = 61.0 cfs generated from Basins F-1, F-3, F-4, and F-5 will be conveyed westerly through the proposed Carlin site within a 30" RCP.

The proposed Carlin Dodge site is located at the southeast corner of Austin Bluffs Parkway and Woodmen Road directly west of the Faricy site. The drainage across the Carlin site is defined by 5 developed basins. Basin C-1 consists of 3.06 acres along Carlin's east boundary line and generates runoff rates of 12.9 cfs during the 5 year storm and 24.0 cfs during the 100 year storm. Two 8' sump inlets will collect these flows on the east side of the proposed Carlin site. A 24" RCP will convey the flows northerly. This pipe will discharge into the 30" pipe conveying flows from Basins F-1, F-3, F-4 and F-5. The pipe will be upsized to a 36" RCP at the connection point of these two pipes.

Basin C-2 consists of the northeast corner of the Carlin site. This 3.65 acre basin generates runoff rates of 16.7 cfs during the 5 year storm and 30.6 cfs during the 100 year storm. A 10' sump inlet will be constructed in the northwest corner of this basin to collect these flows.

Runoff rates of $Q_5 = 7.9$ cfs and $Q_{100} = 14.7$ cfs are generated from the 2.32 acre Basin C-3. These flows will discharge to a proposed 4' inlet to be installed just east of Austin Bluffs Parkway.

Basin C-4 consists of 0.74 acres at the Austin Bluffs Parkway entrance to the Carlin site. The runoff rates of 3.3 cfs and 6.1 cfs generated from this basin during the 5 year and 100 year storms, respectively, will discharge directly to Austin Bluffs Parkway and combine with the flows generated from Basin D-28.

The southwestern 1.75 acres of the Carlin site comprises Basin C-5. Runoff rates of $Q_5 = 6.4$ cfs and $Q_{100} = 11.8$ cfs, generated from this basin, will be collected within an additional 4' sump inlet to be installed at the northwest corner of this basin. The combined flows of $Q_5 = 34.5$ cfs and $Q_{100} = 65.1$ cfs (Design Point #12) generated from Basins C-5 and XVIII will be conveyed northerly within a 36" RCP to the southeast corner of the Austin Bluffs Parkway and Woodmen Road intersection.

Flows from Design Points #10 and #12 combine at Design Point #13 where the total flows are $Q_5 = 84.4$ cfs and $Q_{100} = 159$ cfs. These flows will be conveyed northerly within a 42" RCP.

An existing 54" RCP will convey the combined flows from Basins F-1, F-3, F-4, F-5, C-1, C-2, C-3, C-4, XVI, XVII and F-2 under Austin Bluffs Parkway to Cottonwood Creek.

Faricy and Carlin dealerships (Filings 1 & 2) will enter into a private maintenance agreement which will address maintenance of the storm sewer extending from Faricy's lot into Carlin's lot. This will be recorded prior to final approval of the storm sewer.

Basin D-25 will develop runoff quantities of 5.3 cfs during the 5 year storm and 10.0 cfs during the 100 year storm. The runoff will travel as street flow to the west to an existing 16' on-grade inlet. The inlet will collect runoff quantities of 3.4 cfs and 6.6 cfs during the 5 year and 100 year storms. The collected flows discharge to the west into an existing 30" RCP. The bypass flows of 1.4cfs during the 5 year storm and 3.4 cfs during the 100 year storm enters Basin D-28 as street flow.

Basin D-28 will generate runoff quantities of $Q_5 = 5.4$ cfs and $Q_{100} = 10.2$ cfs. Additional flows 3.3 cfs during the 5 year storm and 6.1 cfs during the 100 year storm will enter this basin from Basin C-4. The runoff will travel as street flow to the north to an existing 16' sump inlet at the southeast corner of Austin Bluffs and Woodmen.

DRAINAGE FACILITIES CONSTRUCTION COST ESTIMATE

Filing No. 1 Drainage Facilities (Public Non-Reimbursable)

Item	Quantity	Unit Cost	Extended Cost
24" RCP	290 LF	$ 30/LF	$ 8,700.00
30" RCP	330 LF	$ 40/LF	$ 13,200.00
36" RCP	1,430 LF	$ 50/LF	$ 71,500.00
42" RCP	450 LF	$ 60/LF	$ 27,000.00
Type I MH	3 EA	$ 5,000/EA	$ 15,000.00
Type II MH	1 EA	$ 2,500/EA	$ 2,500.00
4' D-10-R	1 EA	$ 2,500/EA	$ 2,500.00
10' D-10-R	2 EA	$ 4,000/EA	$ 8,000.00
15' D-10-R	1 EA	$ 6,000/EA	$ 6,000.00
20' D-10-R	1 EA	$ 7,000/EA	$ 7,000.00
		Sub-total	$ 161,400.00
		15% Engineering & Contingency	$ 24,210.00
		Total	**$ 185,610.00**

Lot 1 (Carlin) Drainage Facilities (Private Non-Reimbursable)

Item	Quantity	Unit Cost	Extended Cost
24" RCP	210 LF	$ 30/LF	$ 6,300.00
30" RCP	160 LF	$ 40/LF	$ 6,400.00
36" RCP	500 LF	$ 50/LF	$ 25,000.00
Type I MH	2 EA	$ 5,000/EA	$ 10,000.00
Type II MH	2 EA	$ 2,500/EA	$ 5,000.00
4' D-10-R	1 EA	$ 2,500/EA	$ 2,500.00
8' D-10-R	2 EA	$ 3,500/EA	$ 7,000.00
10' D-10-R	1 EA	$ 4,000/EA	$ 8,000.00
		Sub-total	$ 70,200.00
		15% Engineering & Contingency	$ 10,530.00
		Total	**$ 80,730.00**

Lot 2 & 3 (Faricy) Drainage Facilities (Private Non-Reimbursable)

Item	Quantity	Unit Cost	Extended Cost
24" RCP	500 LF	$ 30/LF	$ 15,000.00
30" RCP	530 LF	$ 40/LF	$ 21,200.00
Type II MH	2 EA	$ 2,500/EA	$ 5,000.00
4' D-10-R	1 EA	$ 2,500/EA	$ 2,500.00
8' D-10-R	2 EA	$ 3,500/EA	$ 7,000.00
10' D-10-R	3 EA	$ 4,000/EA	$ 12,000.00
2' x 2' Area Inlets	2 EA	$ 2,000/EA	$ 4,000.00
		Sub-total	$ 66,700.00
		15% Engineering & Contingency	$ 10,005.00
		Total	**$ 76,705.00**

Future Filings Drainage Facilities (Public Non-Reimbursable)

Item	Quantity	Unit Cost	Extended Cost
24" RCP	1,250 LF	$ 30/LF	$ 37,500.00
30" RCP	900 LF	$ 40/LF	$ 36,000.00
36" RCP	450 LF	$ 50/LF	$ 22,500.00
Type I MH	4 EA	$ 5,000/EA	$ 20,000.00
Type II MH	3 EA	$ 2,500/EA	$ 7,500.00
4' D-10-R	1 EA	$ 2,500/EA	$ 2,500.00
15' D-10-R	4 EA	$ 6,000/EA	$ 24,000.00
16' D-10-R	1 EA	$ 6,300/EA	$ 6,300.00
20' D-10-R	1 EA	$ 5,500/EA	$ 5,5000.00
		Sub-total	$ 161,800.00
		15% Engineering & Contingency	$ 24,270.00
		Total	**$ 186,070.00**

DRAINAGE, BRIDGE AND POND FEES

The Powers Autopark is within the Cottonwood Creek Drainage Basin. Powers Autopark Filing No. 1 consists of the following:

i) Test Drive from Woodmen Road to Bridle Pass Drive
ii) New Car Drive from Test Drive westerly to the New Car Drive cul-de-sac
iii) Lots 1 and 2 (Faricy site)-southwest corner of Woodmen Road and Test Drive.

The 2001 Drainage and Bridge Fees for this site are listed below.

	ACRES	$/ACRE	TOTAL	
DRAINAGE FEE ($7,400.00/ACRE				
Capitol Improvement Portion	15.312	$5,462.00	$ 83,634.14	
Land Portion	15.312	$1,547.00	$ 23,687.66	
Cash Portion	15.312	$ 391.00	$ 5,986.99	
BRIDGE FEE	15.312	$ 637.00	$ 9,753.74	
			$123,062.53	

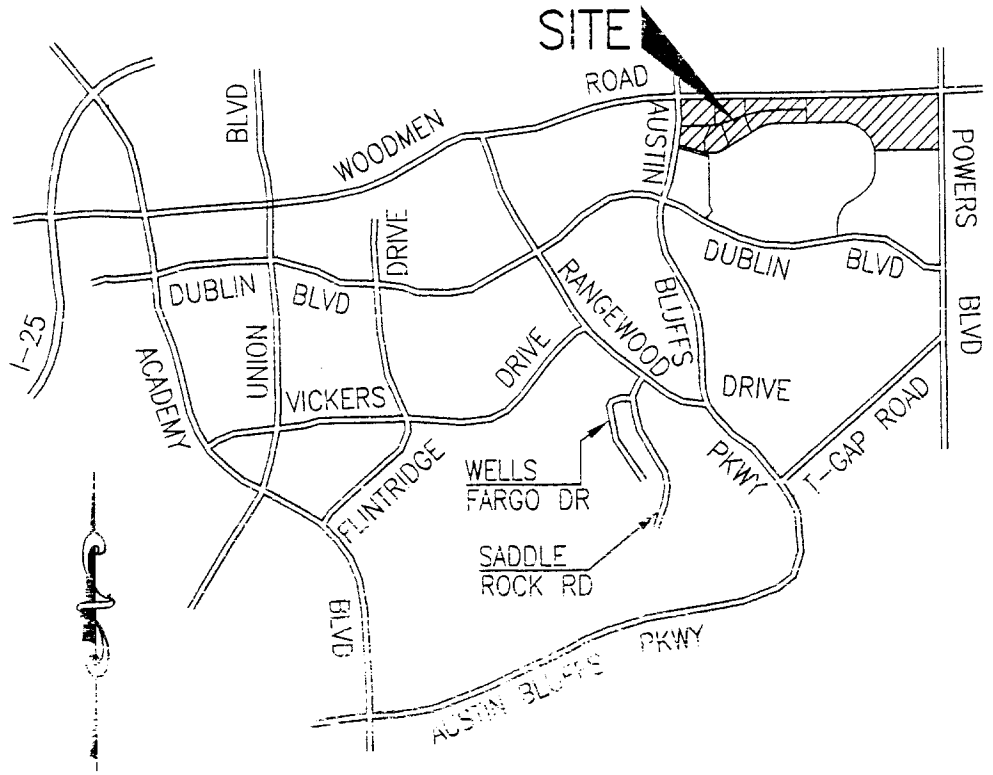
Powers Autopark Filing No. 2 consists of the following:

iv) Lot 1 (Carlin site)-southeast corner of Woodmen Road and Austin Bluffs Parkway

The 2001 Drainage and Bridge Fees for this site are listed below.

	ACRES	$/ACRE	TOTAL	
DRAINAGE FEE ($7,400.00/ACRE				
Capitol Improvement Portion	11.846	$5,462.00	$ 64,702.85	
Land Portion	11.846	$1,547.00	$ 18,325.76	
Cash Portion	11.846	$ 391.00	$ 4,631.79	
BRIDGE FEE	11.846	$ 637.00	$ 7,545.90	
			$ 95,206.30	

APPENDIX



Vicinity Map

NOT TO SCALE

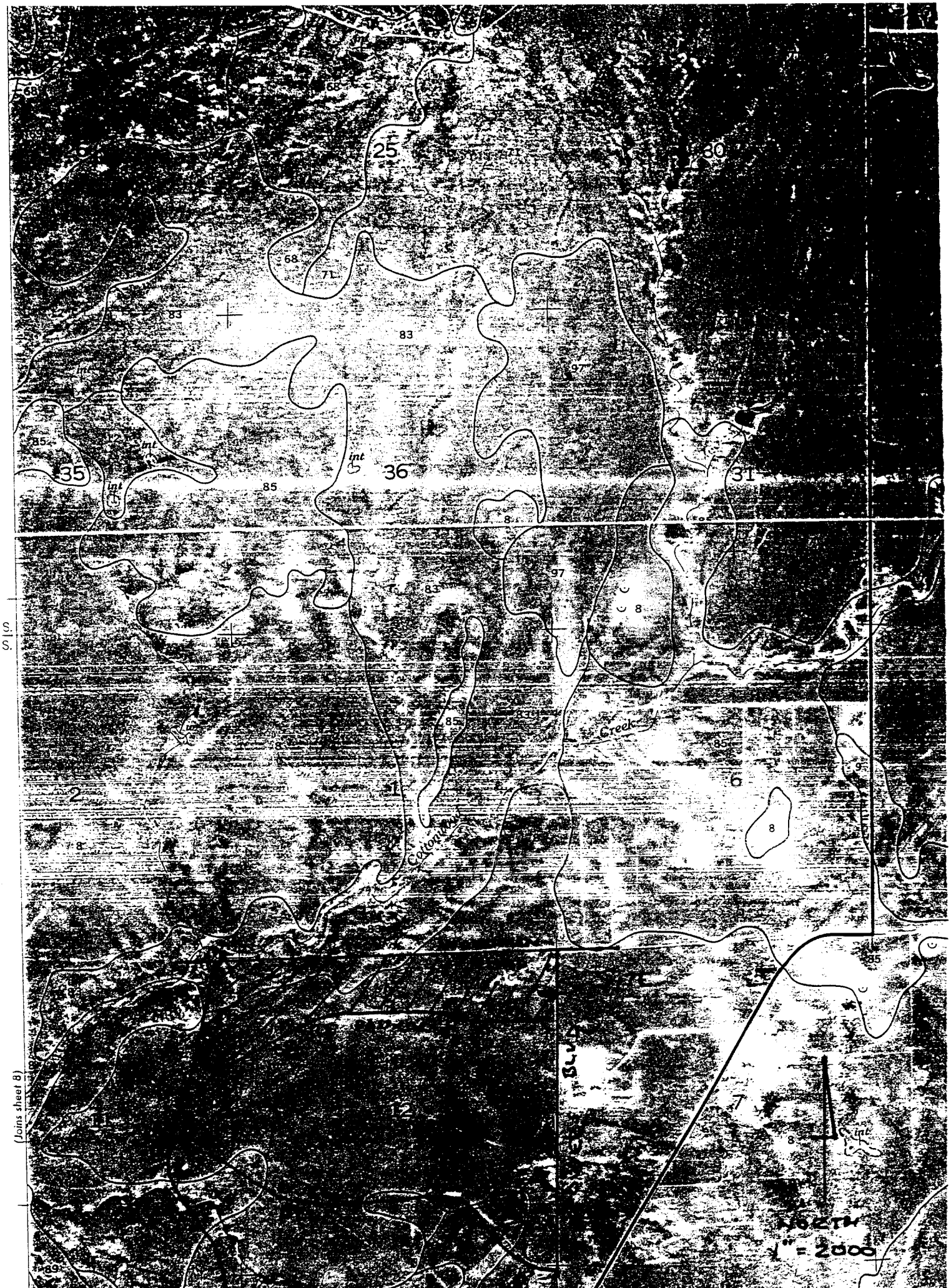
FIGURE 1

FILE: 98072BAS.DWG

JOB NO. 98-072

DATE: 4/26/01

ROCKWELL MINCHOW CONSULTANTS, INC.
ENGINEERING • SURVEYING
1873 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 475-2575 • FAX (719) 475-9223


T. 12 S.
T. 13 S.
25
30
36
31
35
1
2
6
12
Creek
NORTH
1" = 2000'
(Joins sheet 8)

Hydrology

Location: OS-1
Area: 48.5 Ac
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Commercial	0.95	0.95	85 %
Landscape	0.25	0.35	15 %

Composite: C5 0.89 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: 20 min

Intensity, I (inches/hr) from Fig 5-1

I5: 3.0 in/hr I100 5 in/hr

Peak Flow: Q = CIA in cfs

Q5 116 cfs Q100: 212 cfs

Hydrology

Location: OS-2
Area: 36.7 Ac
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Commercial	0.90	0.95	85 %
Landscape	0.25	0.35	15 %

Composite: C5 0.89 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: 25 min

Intensity, I (inches/hr) from Fig 5-1

I5: 2.7 in/hr I100 4.6 in/hr

Peak Flow: Q = CIA in cfs

Q5 79.3 cfs Q100: 145 cfs

Hydrology

Location: I
Area: 13.43 Ac.
Soil or Land Use: A

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
LANDSCAPING	0.25	0.35	15%
STREET / BUILDING	0.90	0.75	85%

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1250	3.5%	3.7	5.6

T_c Total: 9.8

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 44.1 cfs Q100: 82.0 cfs

Hydrology

Location: II
Area: 14.57 Ac.
Soil or Land Use: A

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1050	3.5%	3.7	4.7

T_c Total: 8.9

Intensity, I (inches/hr) from Fig 5-1

I5: 4.6 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 49.0 cfs Q100: 94.0 cfs

Hydrology

Location: III
Area: 10.92 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1200	3.5%	3.7	5.4

T_c Total: 9.6

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 35.8 cfs Q100: 62.1 cfs

Hydrology

Location: IV
Area: 8.77 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1050	3.5%	3.7	4.7

T_c Total: 8.9

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 7.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 29.5 cfs Q100 56.6 cfs

Hydrology

Location: V
Area: 11.99 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.6
GUTTER FLOW	1150	3.5%	3.7	5.2

T_c Total: 9.9

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 39.3 cfs Q100: 71.2 cfs

Hydrology

Location: VI
Area: 0.55 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.94 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	15	4%		3.9
GUTTER FLOW	300'	3.5%	3.7	1.4

T_c Total: 5.3

Intensity, I (inches/hr) from Fig 5-1

I5: 5.1 in/hr I100 8.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 2.4 cfs Q100: 4.4 cfs

Hydrology

Location: VII
Area: 5 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	75%
LANDSCAPING	0.25	0.35	25%

Composite: C5 0.74 C100 0.80 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	70	20%		5
STREET	3050	3%	3.4	15

T_c Total: 20

Intensity, I (inches/hr) from Fig 5-1

I5: 2.9 in/hr I100 5 in/hr

Peak Flow: Q = CIA in cfs

Q5 12.02 cfs Q100: 27.8 cfs

Hydrology

Location: VIII
Area: 6.99 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	30%		3.7
STREET	700	3.5%	3.7	3.2

T_c Total: 6.9

Intensity, I (inches/hr) from Fig 5-1

I5: 4.6 in/hr I100 8 in/hr

Peak Flow: Q = CIA in cfs

Q5 23.9 cfs Q100: 44.7 cfs

Hydrology

Location: TX
Area: 5.30 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	30%		3.7
GUTTER FLOW	600	3.5%	3.7	2.7

T_c Total: 6.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 8.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 20.6 cfs Q100: 37.8 cfs

Hydrology

Location: X
Area: 0.83 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.93	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.89 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	5	4%		3.9
GUTTER FLOW	550	5%	4.5	2.0

T_c Total: 5.9

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 8.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 3.3 cfs Q100: 6.1 cfs

Hydrology

Location: X1
Area: 5.05 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.1
GUTTER FLOW	605	3%	3.4	2.9

T_c Total: 7.1

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 18.6 cfs Q100: 34.2 cfs

Hydrology

Location: X11
Area: 6.29 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.85 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	650	3%	3.4	3.2

T_c Total: 7.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.8 in/hr

Peak Flow: Q = CIA in cfs

Q5 22.6 cfs Q100: 42.2 cfs

Hydrology

Location: XIII
Area: 3.44 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.89 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	15	4%		3.9
STREET	1700	4%	4.2	7.1

T_c Total: 11.0

Intensity, I (inches/hr) from Fig 5-1

I5: 3.4 in/hr I100 6.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 9.6 cfs Q100: 17.8 cfs

Hydrology

Location: XIV
Area: 1.29 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.89 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	15	4%		3.9
STREET	1000	4.2%	4.1	4.1

T_c Total: 8.0

Intensity, I (inches/hr) from Fig 5-1

I5: 4.4 in/hr I100 7.6 in/hr

Peak Flow: Q = CIA in cfs

Q5 4.8 cfs Q100 8.7 cfs

Hydrology

Location: XV
Area: 0.53 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.89 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	15	4%		3.9
STREET	500	3.3%	3.5	2.4

T_c Total: 6.3

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 8.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 2.1 cfs Q100: 3.9 cfs

Hydrology

Location: XVI
Area: 1.20 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	90%
LANDSCAPING	0.25	0.35	10%

Composite: C5 0.84 C100 0.89 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	15	4%		3.9
STREET	900	3.3	3.5	4.3

T_c Total: 8.2

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 4.3 cfs Q100 8.0 cfs

Hydrology

Location: XIII
Area: 8.36 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	650	3%	3.4	3.2

T_c Total: 7.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 20.1 cfs Q100: 56.1 cfs

Hydrology

Location: XIII
Area: 8.64 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1000	2.8%	3.2	5.2

T_c Total: 9.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 28.3 cfs Q100: 53.5 cfs

Hydrology

Location: XIX
Area: 9.30 Ac
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 0.80 C100 0.36 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	20%		4.2
GUTTER FLOW	1000	3.5	3.5	4.8

T_c Total: 9.0

Intensity, I (inches/hr) from Fig 5-1

I5: 4.2 in/hr I100 7.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 31.2 cfs Q100: 60.0 cfs

Hydrology

Location: _____
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 C100 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: _____ in/hr I100 _____ in/hr

Peak Flow: Q = CIA in cfs

Q5 _____ cfs Q100: _____ cfs

Hydrology

Location: F-1
Area: 3.92 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
ASPHALT	3.72	0.90	0.95	95%
LANDSCAPING	0.20	0.25	0.35	5%

Composite: C5 0.87 C100 0.92 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	16%		1.0
GUTTER FLOW	300	2%	2.8	1.8

T_c Total: USE 5 min

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 17.7 cfs Q100: 32.3 cfs

Hydrology

Location: F-2
Area: 2.32 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
ASPHALT/BLDG	0.90	0.95	95%
LANDSCAPING	0.25	0.35	5%

Composite: C5 0.87 C100 0.92 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	4%		1.7
GUTTER FLOW	300	2%	2.8	1.8

T_c Total: USE 5 min

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 12.8 cfs Q100: 23.3 cfs

Hydrology

Location: F-3
Area: 0.66 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Asphalt/Bldg	0.90	0.95	97%
Landscaping	0.25	0.35	3%

Composite: C5 0.88 C100 0.93 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	200	3.5		3.5

T_c Total: Use 5.0

Intensity, I (inches/hr) from Fig 5-1

I5: ≤ 2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 3.0 cfs Q100: 5.5 cfs

Hydrology

Location: F-4
Area: 1.78 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Asphalt/Bldg	0.90	0.95	95%
Landscaping	0.25	0.35	5%

Composite: C5 0.87 C100 0.92 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	300	3.5		4.3

T_c Total: Use 5.0

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 8.1 cfs Q100 14.7 cfs

Hydrology

Location: F-5
Area: 1.01 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
ASPHALT	0.90	0.95	93%
LANDSCAPING	0.25	0.35	7%

Composite: C5 0.85 C100 0.91 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	300	2.5%		4

T_c Total: MAX 5 *

Intensity, I (inches/hr) from Fig 5-1

I5: ≤ 4 in/hr I100 9 in/hr

Peak Flow: Q = CIA in cfs

Q5 4.5 cfs Q100: 8.3 cfs

Hydrology

Location: _____
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 C100 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: _____ in/hr I100 _____ in/hr

Peak Flow: Q = CIA in cfs

Q5 _____ cfs Q100: _____ cfs

Hydrology

Location: C-1
Area: 3.06 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
Asphalt/Bldg	2.63	0.90	0.95	86%
Landscaping	0.43	0.25	0.35	14%

Composite: C5 0.81 C100 0.87 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
Overland	30	33%		2.75
Gutter Flow	200	3.5%	3.7	0.90

T_c Total: Use 5 min

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 12.9 cfs Q100: 24.0 cfs

Hydrology

Location: C-2
Area: 3.65 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Asphalt/Bldg	0.90	0.95	97%
Landscaping	0.25	0.35	3%

Composite: C5 0.88 C100 0.93 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
Overland	300	3%		4.5

T_c Total: Use 5 min

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5: 16.7 cfs Q100 30.6 cfs

Hydrology

Location: C-3
Area: 2.32 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
ASPHALT	0.90	0.95	96%
LANDSCAPING	0.25	0.35	4%

Composite: C5 0.87 C100 0.93 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	50	3%		7.8
GUTTER FLOW	600	3%	3.4	2.9

T_c Total: 10.7

Intensity, I (inches/hr) from Fig 5-1

I5: 3.9 in/hr I100 6.3 in/hr

Peak Flow: Q = CIA in cfs

Q5 7.9 cfs Q100: 14.7 cfs

Hydrology

Location: C-4
Area: 0.74 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
ASPHALT	0.90	0.95	95%
LANDSCAPING	0.25	0.35	5%

Composite: C5 0.87 C100 0.92 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	300	3%		4.5

T_c Total: Use 5.0

Intensity, I (inches/hr) from Fig 5-1

I5: 5.2 in/hr I100 9.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 3.3 cfs Q100: 6.1 cfs

Hydrology

Location: C-5
Area: 1.75 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
ASPHALT	0.90	0.95	93%
LANDSCAPING	0.25	0.35	7%

Composite: C5 0.85 C100 0.91 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	30	2%		6.9
GUTTER FLOW	350	3.5	3.7	1.6

T_c Total: 8.5

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 7.4 in/hr

Peak Flow: Q = CIA in cfs

Q5 6.4 cfs Q100: 11.8 cfs

Hydrology

Location: _____
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 C100 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: _____ in/hr I100 _____ in/hr

Peak Flow: Q = CIA in cfs

Q5 _____ cfs Q100 _____ cfs

Hydrology

Location: D-10
Area: 12.2 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
Neighborhood Roads	0.75	0.80	

Composite: C5 0.75 C100 0.80 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
overland	300	5%		10.7
Street	900	4%	4.0	3.8

T_c Total: 15 ?

Intensity, I (inches/hr) from Fig 5-1

I5: 4.0 in/hr I100 6.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 5.2 cfs Q100: 12.1 cfs

Hydrology

Location: D-11
Area: 2.32 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.93	0.95	60%
LANDSCAPING	0.25	0.55	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
overland	25'	2%		3.1
STREET	1200		4.0	4.6

T_c Total: 7.7

Intensity, I (inches/hr) from Fig 5-1

I5: 4.2 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 6.7 cfs Q100: 13.0 cfs

Hydrology

Location: D-12
Area: 2.20 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.35	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	1000	4%	4.5	4.5

T_c Total: 7.5

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 6.5 cfs Q100: 12.3 cfs

Hydrology

Location: D-16
Area: 2.52 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.85	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	1100	4%	4.5	4.4

T_c Total: 7.5

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 6.7 cfs Q100: 12.4 cfs

Hydrology

Location: D-14
Area: 2.4 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
NEIGHBORHOOD BDY	0.75	0.85	

Composite: C5 0.75 C100 0.85 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	300	4%		7.2
STREET	900		4.0	4.5

T_c Total: 11.8

Intensity, I (inches/hr) from Fig 5-1

I5: 3.9 in/hr I100 6.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 7.0 cfs Q100: 12.1 cfs

Hydrology

Location: D-15
Area: 2.5 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.35	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	300	4%		3.1
STREET	900		4.0	4.6

T_c Total: 7.7

Intensity, I (inches/hr) from Fig 5-1

I5: 4.3 in/hr I100 7.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 7.4 cfs Q100: 13.3 cfs

Hydrology

Location: D-18
Area: 2.11 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.35	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	1150	4.7%	4.4	4.4

T_c Total: 7.5

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.8 in/hr

Peak Flow: Q = CIA in cfs

Q5 6.1 cfs Q100: 11.7 cfs

Hydrology

Location: D-19
Area: 2.88 Ac.
Soil or Land Use:

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	
LANDSCAPING	0.25	0.35	

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	1150	4.7%	4.4	4.4

T_c Total: 7.5

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.8 in/hr

Peak Flow: Q = CIA in cfs

Q5 8.3 cfs Q100: 15.9 cfs

Hydrology

Location: D-2
Area: 2.31 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.35	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	1220	1%	2.0	10.0

T_c Total: 13.1

Intensity, I (inches/hr) from Fig 5-1

I5: 3.6 in/hr I100 6.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 5.3 cfs Q100: 10.0 cfs

Hydrology

Location: D-2B
Area: 1.71 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area
STREET	0.90	0.95	60%
LANDSCAPING	0.25	0.35	40%

Composite: C5 0.64 C100 0.71 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OVERLAND	20	2%		3.1
STREET	500	2%	2.3	3.0

T_c Total: 6.1

Intensity, I (inches/hr) from Fig 5-1

I5: 4.9 in/hr I100 8.4 in/hr

Peak Flow: Q = CIA in cfs

Q5 5.4 cfs Q100: 10.2 cfs

Hydrology

Location: DP # 1
Area: 136.02 Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
OS-1	48.5	0.80	0.86	35%
OS-2	36.7	0.80	0.86	27%
I	13.43	0.80	0.86	10%
II	14.27	0.80	0.86	11%
D-11	13.5	0.75	0.84	10%
D-10	2.44	0.64	0.78	1.5%
D-12	2.23	0.64	0.78	1.5%

Composite: C5 0.79 C100 0.85 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
OS-				20.0
Pipe	1200	20	1.0	

T_c Total: 21.0

Intensity, I (inches/hr) from Fig 5-1

I5: 2.9 in/hr I100 5.0 in/hr

Peak Flow: Q = CIA in cfs

Q5 311.6 cfs Q100: 578.1 cfs

Hydrology

Location: DP # 2
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
III	10.92	0.80	0.86	
IV	877	0.80	0.86	
	1969			

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
III				9.6
Pipe	1700	16	1.8	

T_c Total: 11.4

Intensity, I (inches/hr) from Fig 5-1

I5: 3.8 in/hr I100 6.6 in/hr

Peak Flow: Q = CIA in cfs

Q5 59.9 cfs Q100 111.8 cfs

Hydrology

Location: DP # 2
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP # 2	19.09	0.80	0.86	
V	11.79	0.8	0.86	
	31.68			

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
DP # 2				15.49
Pipe	450	16.0	0.5	

T_c Total: 16.9

Intensity, I (inches/hr) from Fig 5-1

I5: 3.8 in/hr I100 6.3 in/hr

Peak Flow: Q = CIA in cfs

Q5 96.3 cfs Q100: 171.6 cfs

Hydrology

Location: DP # 4
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP # 1	136.62	0.79	0.85	77.5%
DP # 3	31.68	0.80	0.86	18.1%
VI	0.55	0.64	0.69	0.3%
D-14	2.40	0.75	0.80	1.4%
D-15	2.50	0.64	0.71	1.4%
D-16	2.32	0.64	0.71	1.3%
	175.47			

Composite: C5 0.79 C100 0.85 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
DP # 1				21.0
Pipe Flow	1205	20	1.0	

T_c Total: 22.0

Intensity, I (inches/hr) from Fig 5-1

I5: 2.8 in/hr I100 4.9 in/hr

Peak Flow: Q = CIA in cfs

Q5 492.1 cfs Q100: 730.8 cfs

Hydrology

Location: DP #5
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
VIII	6.49	0.80	0.86	83%
XIV	1.29	0.84	0.89	17%
	7.78			

Composite: C5 0.81 C100 0.87 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
				8.0

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: 4.4 in/hr I100 7.6 in/hr

Peak Flow: Q = CIA in cfs

Q5 27.7 cfs Q100: 51.1 cfs

Hydrology

Location: DP #6
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP #5	7.78	0.81	0.87	40%
IX	5.36	0.80	0.86	27%
X	0.80	0.84	0.89	4%
VII	5.60	0.74	0.80	29%
	19.54			

Composite: C5 0.79 C100 0.85 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
VII				20.0

T_c Total: 20.0

Intensity, I (inches/hr) from Fig 5-1

I5: 2.9 in/hr I100 5.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 44.8 cfs Q100 84.7 cfs

Hydrology

Location: DP # 7
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
XI	5.05	0.80	0.86	
XII	6.29	0.80	0.86	
	11.34			

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
XI				7.1
P/A Flow	600	10	1.2	

T_c Total: 8.1

Intensity, I (inches/hr) from Fig 5-1

I5: 4.4 in/hr I100 7.6 in/hr

Peak Flow: Q = CIA in cfs

Q5 39.9 cfs Q100: 74.1 cfs

Hydrology

Location: DP # 8
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP #6	19.54	0.79	0.85	57%
DP #7	11.34	0.80	0.86	33%
XIII	2.94	0.84	0.89	8%
XV	0.83	0.84	0.89	2%
	34.85			

Composite: C5 0.80 C100 0.86 100%

Time of Concentration: T_c, in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
DP #6				20.0
P/A Flow	600'	20	0.3	

T_c Total: 20.5

Intensity, I (inches/hr) from Fig 5-1

I5: 2.9 in/hr I100 5.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 79.7 cfs Q100 147.7 cfs

Hydrology

Location: DP #1
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP #1	1.75	0.79	0.85	82.5%
DP #8	3.43	0.83	0.86	16.1%
0.19	2.85	0.61	0.71	1.4%
	212			

Composite: C5 0.79 C100 0.85 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
DP #1				23'
Pipe from	200'	20		1'

T_c Total: 23'

Intensity, I (inches/hr) from Fig 5-1

I5: 2.7 in/hr I100 4" in/hr

Peak Flow: Q = CIA in cfs

Q5 4.53 cfs Q100: 8.1 cfs

Hydrology

Location: _____
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 C100 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: _____ in/hr I100 _____ in/hr

Peak Flow: Q = CIA in cfs

Q5 _____ cfs Q100: _____ cfs

Hydrology

Location: DP #15
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
XVI	1.20	0.84	0.89	10%
XVII	8.30	0.86	0.90	67%
F-2	2.82	0.87	0.91	23%
	12.32			

Composite: C5 0.86 C100 0.90 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
XVII				7.4
PIPE FLOW	400		10	0.7

T_c Total: 7.8

Intensity, I (inches/hr) from Fig 5-1

I5: 4.5 in/hr I100 7.5 in/hr

Peak Flow: Q = CIA in cfs

Q5 47.7 cfs Q100: 81.0 cfs

Hydrology

Location: DP #1
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
F-1	2.42	0.87	0.92	53%
F-3	0.42	0.88	0.93	9%
F-4	1.78	0.87	0.92	39%
F-5	1.01	0.86	0.91	14%
	4.63			

Composite: C5 0.87 C100 0.92 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: 5

Intensity, I (inches/hr) from Fig 5-1

I5: 5.4 in/hr I100 7 in/hr

Peak Flow: Q = CIA in cfs

Q5 33.8 cfs Q100: 61.5 cfs

Hydrology

Location: DP 1
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone		C5	C100	%Area
C-5	1.75	0.85	0.91	17 %
Xuti	8.64	0.9	0.96	83 %
	10.39			

Composite: C5 0.81 C100 0.87 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
Xuti				9.4

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 34.2 cfs Q100: 69.1 cfs

Hydrology

Location: DP 2
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone		C5	C100	%Area
DP 1	12.50	0.82	0.88	47.3 %
DP 2	10.39	0.81	0.87	41.4 %
C-3	2.50	0.87	0.93	9.3 %
	25.39			

Composite: C5 0.82 C100 0.88 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
				9.4

T_c Total: 9.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.2 in/hr

Peak Flow: Q = CIA in cfs

Q5 84.7 cfs Q100: 157.1 cfs

Hydrology

Location: DP # 14
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	Area	C5	C100	%Area
DP # 14	25.09	0.82	0.86	64 %
DP # 1	7.57	0.81	0.86	19 %
C 1	3.00	0.81	0.87	8 %
C 2	3.00	0.83	0.88	9 %
	38.66			

Composite: C5 0.85 C100 0.89 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c
				9.4
Pipe (new)	400			0.7

T_c Total: 9.4

Intensity, I (inches/hr) from Fig 5-1

I5: 4.1 in/hr I100 7.1 in/hr

Peak Flow: Q = CIA in cfs

Q5 145.5 cfs Q100: 247.3 cfs

Hydrology

Location: _____
Area: _____ Ac.
Soil or Land Use: _____

Runoff Coefficient, C:

Area Zone	C5	C100	%Area

Composite: C5 C100 100%

Time of Concentration: T_c in minutes:

Travel Type	L(ft)	s%	v(fps)	T_c

T_c Total: _____

Intensity, I (inches/hr) from Fig 5-1

I5: _____ in/hr I100 _____ in/hr

Peak Flow: Q = CIA in cfs

Q5 _____ cfs Q100 _____ cfs

POWERS AUTOPARK

INLET D-11

Q5 =	6.7	Q100 =	13.0
SL =	0.033	SO =	0.02

5 YEAR		100 YEAR	
T	11.76	T	15.08
FW	2.27	FW	2.38
L1	20.5	L1	27.7
L2	12.3	L2	16.6
L3	44.0	L3	59.3

Li = 16.00

5 YR Q =	6.7	100 YR Q	13
5 YR Qi =	4.5	100 YR Qi	7.5
5 YR Qfb =	2.2	100 YR Qfb	5.5

POWERS AUTOPARK

INLET D-12

Q5 =	6.3	Q100 =	12.3
SL =	0.033	SO =	0.02

5 YEAR		100 YEAR	
T	11.49	T	14.77
FW	2.26	FW	2.37
L1	20.0	L1	27.0
L2	12.0	L2	16.2
L3	42.8	L3	57.8

Li = 16.00

5 YR Q =	6.3	100 YR Q	12.3
5 YR Qi =	4.2	100 YR Qi	7.3
5 YR Qfb =	2.1	100 YR Qfb	5.0

POWERS AUTOPARK

Sump Inlet IV

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		13	26	s(x)=	0.02
	d =	0.43	0.56	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		15	30	L=	16
	d(max)=	0.29	0.57		

POWERS AUTOPARK

INLET D-15

Q5 =	9.4	Q100 =	18.8
SL =	0.05	SO =	0.02

5 YEAR		100 YEAR	
T	12.35	T	16.02
FW	2.82	FW	2.97
L1	26.8	L1	36.6
L2	16.1	L2	22.0
L3	57.5	L3	78.4

Li = 16.00

5 YR Q =	9.4	100 YR Q	18.8
5 YR Qi =	5.6	100 YR Qi	8.2
5 YR Qfb =	3.8	100 YR Qfb	10.6

POWERS AUTOPARK

INLET D-16

Q5 =	8.8	Q100 =	17.4
SL =	0.05	SO =	0.02

5 YEAR		100 YEAR	
T	12.05	T	15.56
FW	2.81	FW	2.95
L1	26.0	L1	35.4
L2	15.6	L2	21.2
L3	55.8	L3	75.7

Li = 16.00

5 YR Q =	8.8	100 YR Q	17.4
5 YR Qi =	5.3	100 YR Qi	7.9
5 YR Qfb =	3.5	100 YR Qfb	9.5

POWERS AUTOPARK

Sump Inlet	V	5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		13	26	s(x)=	0.02
	d =	0.43	0.56	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		16.5	35.5		
				L=	20
	d(max)=	0.26	0.57		

POWERS AUTOPARK

Sump Inlet VI

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		2.4	4.4	s(x)=	0.02
	d =	0.23	0.29	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		2.4	4.4	L=	4
	d(max)=	0.03	0.17		

POWERS AUTOPARK

Sump Inlet VII

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		13	26	s(x)=	0.02
	d =	0.43	0.56	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		26	52		
				L=	20
	d(max)=	0.43	0.78		

POWERS AUTOPARK

INLET D-18

	Q5 =	6.1	Q100 =	11.7
	SL =	0.0465	SO =	0.02

5 YEAR		100 YEAR	
T	10.65	T	13.59
FW	2.64	FW	2.77
L1	21.6	L1	29.0
L2	13.0	L2	17.4
L3	46.4	L3	62.2

	Li =	16.00		
	5 YR Q =	6.1	100 YR Q	11.7
	5 YR Qi =	4.0	100 YR Qi	6.5
	5 YR Qfb =	2.1	100 YR Qfb	5.2

POWERS AUTOPARK

INLET D-19

	Q5 =	9.4	Q100 =	18.8
	SL =	0.0465	SO =	0.02

5 YEAR			100 YEAR	
T	12.52		T	16.24
FW	2.73		FW	2.87
L1	26.3		L1	35.9
L2	15.8		L2	21.5
L3	56.3		L3	76.9

	Li =	16.00		
	5 YR Q =	8.3	100 YR Q	15.9
	5 YR Qi =	5.7	100 YR Qi	8.4
	5 YR Qfb =	2.6	100 YR Qfb	7.5

POWERS AUTOPARK

Sump Inlet XIII

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		9.6	17.8	s(x)=	0.02
	d =	0.38	0.48	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		12.2	25.3		
				L=	10
	d(max)=	0.33	0.65		

POWERS AUTOPARK

Sump Inlet XVI

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		13	26	s(x)=	0.02
	d =	0.43	0.56	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		17.3	34	L=	10
	d(max)=	0.47	0.82		

POWERS AUTOPARK

Sump Inlet F-1

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		10.6	19.5	s(x)=	0.02
	d =	0.40	0.50	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		17.7	32.5		
				L=	10
	d(max)=	0.48	0.79		

POWERS AUTOPARK

Sump Inlet F-2

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		12.8	23.3	s(x)=	0.02
	d =	0.43	0.53	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		12.8	23.3	L=	8
	d(max)=	0.40	0.68		

POWERS AUTOPARK

Sump Inlet F-3

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		3	5.5	s(x)=	0.02
	d =	0.25	0.31	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		3	5.5	L=	4
	d(max)=	0.08	0.23		

POWERS AUTOPARK

Sump Inlet F-4

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		8.1	14.7	s(x)=	0.02
	d =	0.36	0.45	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		8.1	14.7	L=	4
	d(max)=	0.36	0.63		

POWERS AUTOPARK

Sump Inlet C-1

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		6.5	12	s(x)=	0.02
	d =	0.33	0.42	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		12.9	24	L=	8
	d(max)=	0.41	0.70		

POWERS AUTOPARK

Sump Inlet C-2

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		8.4	15.3	s(x)=	0.02
	d =	0.36	0.46	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		16.7	30.6		
				L=	10
	d(max)=	0.45	0.76		

POWERS AUTOPARK

Sump Inlet C-3

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		7.9	14.7	s(x)=	0.02
	d =	0.36	0.45	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		7.9	14.7		
				L=	4
	d(max)=	0.35	0.63		

POWERS AUTOPARK

Sump Inlet C-5

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		6.4	11.8	s(x)=	0.02
	d =	0.33	0.41	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		6.4	11.8		
				L=	4
	d(max)=	0.28	0.52		

POWERS AUTOPARK

INLET D-25

	Q5 =	5.3	Q100 =	10.0
	SL =	0.02	SO =	0.02

5 YEAR			100 YEAR	
T	11.83		T	15.01
FW	1.77		FW	1.85
L1	16.1		L1	21.4
L2	9.7		L2	12.9
L3	34.5		L3	45.9
	Li =	16.00		
	5 YR Q =	5.3	100 YR Q	10.0
	5 YR Qi =	3.9	100 YR Qi	6.6
	5 YR Qfb =	1.4	100 YR Qfb	3.4

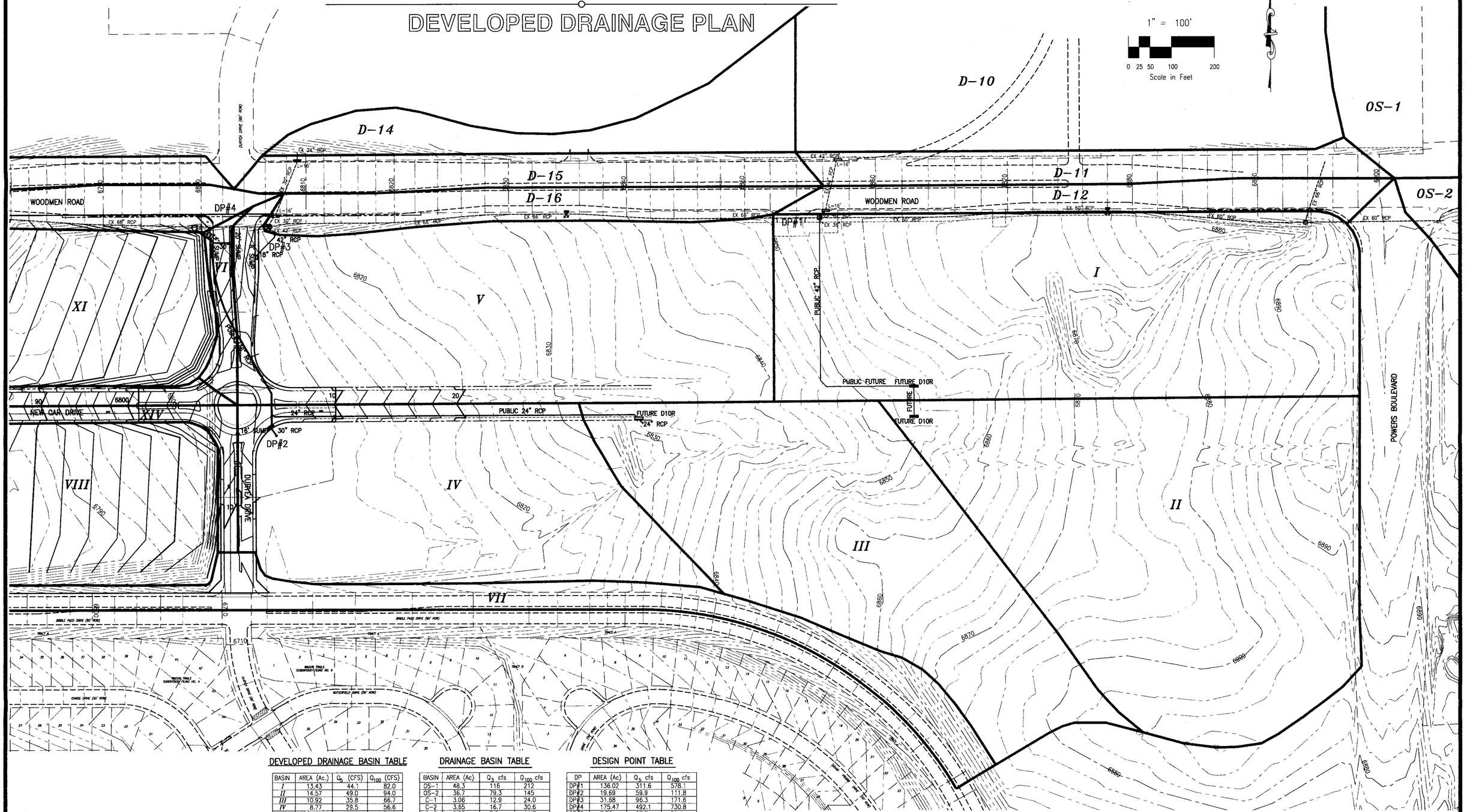
POWERS AUTOPARK

Sump Inlet D-28

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		8.7	16.3	s(x)=	0.02
	d =	0.37	0.47	s(l)=	0.005
				n=	0.016
TOTAL FLOWS		10.1	19.7		
				L=	16
	d(max)=	0.17	0.39		

POWERS AUTOPARK DEVELOPMENT

DEVELOPED DRAINAGE PLAN



DEVELOPED DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
I	13.43	44.1	82.0
II	14.57	49.0	94.0
III	10.92	35.8	66.7
IV	8.77	29.5	56.6
V	11.99	39.3	74.2
VI	0.55	2.4	4.4
VII	5.60	12.02	22.8
VIII	6.49	23.9	44.7
IX	5.36	20.6	37.8
X	0.80	3.3	6.1
XI	5.05	18.6	34.3
XII	6.29	22.6	42.2
XIII	2.94	9.6	17.8
XIV	1.29	4.8	8.7
XV	0.53	2.1	3.9
XVI	1.20	4.3	8.0
XVII	8.36	30.1	56.1
XVIII	8.64	28.3	53.5
XIX	9.30	31.2	60.0

DRAINAGE BASIN TABLE

BASIN	AREA (Ac)	Q_5 cfs	Q_{100} cfs
OS-1	48.3	116	212
OS-2	36.7	79.3	145
C-1	3.06	12.9	24.0
C-2	3.65	16.7	30.6
C-3	2.32	7.9	14.7
C-4	0.74	3.3	6.1
C-5	1.75	6.4	11.8
D-10	18.0	55.5	102.1
D-11	2.32	6.7	13.0
D-12	2.20	6.3	12.3
D-14	2.40	7.0	12.5
D-15	2.50	7.2	13.3
D-16	2.32	6.7	12.4
D-18	2.11	6.1	11.7
D-19	2.88	8.3	15.9
D-25	2.31	5.3	10.0
D-28	1.71	5.4	10.2
F-1	3.92	17.7	32.5
F-2	2.82	12.8	23.3
F-3	0.66	3.0	5.5
F-4	1.78	8.1	14.7
F-5	1.01	4.5	8.3

DESIGN POINT TABLE

DP	AREA (Ac)	Q_5 cfs	Q_{100} cfs
DP#1	136.02	311.6	578.1
DP#2	19.69	59.9	111.8
DP#3	31.68	96.3	171.6
DP#4	175.47	492.1	730.8
DP#5	7.78	27.7	51.4
DP#6	19.54	44.8	84.7
DP#7	11.34	39.9	74.1
DP#8	34.35	79.7	147.7
DP#9	212.70	453.7	849.7
DP#10	12.38	45.7	81.7
DP#11	7.37	33.3	61.0
DP#12	10.39	34.5	65.1
DP#13	25.09	84.4	159.0
DP#14	39.17	133.3	247.5

FILE: 98072-DP.DWG 10/12/01

ROCKWELL MINCHOW CONSULTANTS, INC.
ENGINEERING • SURVEYING
1873 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 475-2575 • FAX (719) 475-9223

TITLE : POWERS AUTOPARK DEVELOPMENT
DEVEOPED DRAINAGE PLAN

SCALE :	1"=100'	DRAWN BY :	KC
DATE :	10/12/01	CHECKED BY :	KDR

98-072
JOB NO.

EXHIBIT 1
SHEET 1

POWERS AUTOPARK DEVELOPMENT

DEVELOPED DRAINAGE PLAN

1" = 100'

0 25 50 100 200

Scale in Feet

WOODMEN ROAD

AUSTIN BLUFFS PARKWAY

NEW CAR DRIVE

PUBLIC 30' RCP

TEST DRIVE

DURHAM DRIVE

BRIDLE PASS DRIVE (50' ROW)

CHASE DRIVE (50' ROW)

AUTUMN RUN DRIVE (50' ROW)

BROOK TRAILS SUBDIVISION FILING NO. 1

BROOK TRAILS SUBDIVISION FILING NO. 2

BROOK TRAILS SUBDIVISION FILING NO. 3

BROOK TRAILS SUBDIVISION FILING NO. 4

BROOK TRAILS SUBDIVISION FILING NO. 5

LOT 1 FILING NO. 2 (CARLIN)

LOT 2 FILING NO. 1 (FARICY)

LOT 1 FILING NO. 1 (FARICY)

NOT PLATTED RECEPTION NO. 98194372

DP#1 DP#2 DP#3 DP#4 DP#5 DP#6 DP#7 DP#8 DP#9 DP#10 DP#11 DP#12 DP#13 DP#14

C-1 C-2 C-3 C-4 C-5

D-18 D-19 D-25 D-28

F-1 F-2 F-3 F-4 F-5

I II III IV V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII XIX

EXHIBIT 1
SHEET 2
FILE: 98072-DP.DWG 10/12/01

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ENGINEERING • SURVEYING
1873 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 475-2575 • FAX (719) 475-9223

TITLE :	POWERS AUTOPARK DEVELOPMENT DEVEOPED DRAINAGE PLAN		
SCALE :	1"=100'	DRAWN BY : KC	98-072
DATE :	10/12/01	CHECKED BY : KDR	JOB NO.

POWERS AUTOPARK DEVELOPMENT

DEVELOPED DRAINAGE PLAN

1" = 50'

0 25 50 100

Scale in Feet

WOODMEN ROAD (ROW VARIES)
BOOK 2839, PAGE 255

WOODMEN ROAD (ROW VARIES)
BOOK 2839, PAGE 256

AUSTIN BLUFFS PARKWAY (DEED)
(ROW VARIES)
RECEPTION NO. 97104688

TEST DRIVE (ROW VARIES)

D-25

D-28

F-5

F-4

F-1

F-3

F-2

C-2

C-1

C-3

C-4

C-5

XV

XVI

DP#14

DP#11

DP#13

DP#12

DP#10

DP#6

LOT 1
FILING NO. 2
(CARLIN)

LOT 2
FILING NO. 1
(FARICY)

LOT 1
FILING NO. 1
(FARICY)

NEW CAR DRIVE (60' ROW)

FF=6718.5

FF=6733.75

FF=6720.50

EXHIBIT 1
SHEET 3
FILE: 98072-DP.DWG 10/12/01

ROCKWELL MINCHOW CONSULTANTS, INC.
ENGINEERING - SURVEYING
1873 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 475-2075 • FAX (719) 475-0293

TITLE :	POWERS AUTOPARK DEVELOPMENT DEVELOPED DRAINAGE PLAN		
SCALE : 1"=50'	DRAWN BY : KC	98-072	
DATE : 10/12/01	CHECKED BY : KDR	JOB NO.	