Master Development Drainage Plan (MDDP) for
Gateway Vista
and Final Drainage Report for
Gateway Vista Filing No. 1

October 2001
Revised: December 2001
Revised: February 2002

Prepared for:

Hill Development Corporation
3324 Bishop Pine Point
Colorado Springs, CO 80904

Prepared by:

Rockwell-Minchow Consultants, Inc.
1873 Austin Bluffs Parkway
Colorado Springs, CO 80918
475-2575

Project #99-069

5797

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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/County for drainage reports and said 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.

Kent D. Rockwell, P.E.

Kent D. Rockwell, P.E.

COLORADO REGISTERED
KENT D. ROCKWELL
25086
2/9/02
PROFESSIONAL ENGINEER

DEVELOPER'S STATEMENT

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

HILL DEVELOPMENT CORPORATION

BY: Donald C. Hare DATE 11/26/01

Donald C. Hare

TITLE: Vice-President

ADDRESS: 3324 Bishop Pine Point
Colorado Springs, CO 80904

CITY OF COLORADO SPRINGS

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

For The CITY ENGINEER 2/15/02 DATE

Master Development Drainage Plan (MDDP) for
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GENERAL LOCATION AND DESCRIPTION

The Gateway Vista Development is located west of Mesa Road and east of 30th street, just south of the Garden of the Gods Club, and consists of approximately 56.803 acres. The site lies within Sections 34 and 35, Township 13 South, Range 67 West of the 6th P.M., El Paso County, Colorado (see Figure 1).

The site is bound on the north by Garden of the Gods Club, on the east by Mesa Road, on the south by Villa Sierra and on the west by open space/30th Street.

The entire site lies within the Camp Creek Drainage Basin and will be developed as single-family residential lots and paired unit patio homes. Existing ground cover consists of native grasses and vegetation.

Gateway Subdivision Filing No. 1 contains 18.658 acres.

REFERENCES

1. Camp Creek Drainage Study (October, 1964), prepared by United Western Engineers, Colorado Springs, CO.

2. Preliminary and Final Drainage Report and Plan, La Mesa Vista (June, 1994), Addenda (December, 1994); prepared by Leigh Whitehead and Associates, Colorado Springs, CO.

3. Drainage Report for La Posada Del Sol Subdivision (February, 1984), prepared by URS/NES, Colorado Springs, CO.

4. Amendment to the Drainage Report for Garden of the Gods Club Subdivision No. 1 Replat (December, 1994), prepared by Rockwell-Minchow Consultants, Inc., Colorado Springs, CO.

SOILS

According to the US Department of Agriculture Soil Conservation Services Soil Survey of El Paso County, Gateway Subdivision is underlain by the Ascalon Series (Soil 3) which is classified as a Hydrologic Group "B" soil and by the Chaseville/Midway Series (Soil 18) which is classified as a Hydrologic Group "A/D" soil, respectively (see Figure 2). Hydrologic Group "B" was used for runoff calculation purposes.

FLOOD PLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA), as depicted on Flood Insurance Rate Map (FIRM) 08041CO513 F & 08041CO726 F (March 1997), no portion of this site lies within a designated Flood Plain. See map in Appendix.

DRAINAGE DESIGN CRITERIA

The current City of Colorado Springs and El Paso County Drainage Criteria was used in the preparation of this report. The Rational Method was used to determine the runoff quantities as required for basins containing less than 100 acres. Peak runoff was determined for both the 5 year and 100 year frequency storms.

HISTORIC DRAINAGE ANALYSIS

This portion of the report analyzes the historic runoff quantities and patterns for the site. The area has been depicted on the Historic Drainage Plan by eight (8) basins. Following is a description of each basin and the proposed runoff patterns and drainage improvements.

Basin H-I encompasses 24.6 off-site acres on the east side of Mesa Road. Runoff rates of 32.0 cfs (5yr) and 64.9 (100yr) currently sheet flow to the existing roadside ditch and then travel to a low point near the south end of the basin. An existing 30" CMP crosses under Mesa Road, discharging to the southwest at this point.

Basin H-II contains 3.8 acres at the southeast end of the site. Runoff rates of 3.7 cfs (5yr) and 8.2 cfs (100yr) currently flow to a swale running to the south in the basin where an existing 2'x2' grated inlet collects a portion of the flows at DP #1. Runoff rates of 32.7 cfs (5yr) and 69.2 cfs (100yr) reach the design point. This compares to 11 cfs (5yr) and 34 cfs in the La Posada Del Sol Subdivision Drainage Report.

Basin H-III consists of 5.7 acres at the southeast end of the site. Runoff rates of 3.4 cfs (5yr) and 8.4 cfs (100yr) currently sheetflow onto Villa Sierra to the south.

Basin H-IV covers 8.0 acres at the north end of the site encompassing a large portion of the Garden of the Gods Club. Runoff rates of 18.0 cfs (5yr) and 36.4 cfs (100yr) are currently collected by a series of inlets and pipes discharging at the south end of the Basin via an existing 30" RCP.

Basin H-V covers 13.4 acres near the north end of the site encompassing a developed and undeveloped portion of the Garden of the Gods Club. Runoff rates of 19.8 cfs (5yr) and 46.4 cfs (100yr) currently sheetflow and shallow swale flow onto undeveloped land to the south (Basin VIII).

Basin H-VI encompasses 10.6 acres on the northwest end of the site. Runoff rates of 9.3 cfs (5yr) and 22.6 (100yr) currently sheetflow offsite to the west (to 30th street).

Basin H-VII contains 5.5 acres at the southwest end of the site. Runoff rates of 5.6 cfs (5yr) and 13.5 (100yr) currently sheetflow offsite to the west (to 30th street).

Basin H-VIII contains 41.8 acres covering a majority of the site. Runoff rates of 25.1 cfs (5yr) and 61.4 (100yr) currently travels as sheetflow and in shallow swales to the south, then offsite to the west at the south end of the Basin.

DEVELOPED DRAINAGE ANALYSIS

This portion of the report analyzes the developed runoff quantities and patterns for the site. The area has been depicted on the Developed Drainage Plan by twenty-eight (28) basins. This portion of the report also discusses the proposed improvements for the Mesa Road Improvements Project. Following is a description of the basins and the proposed runoff patterns and drainage improvements.

Basin I consists of 3.0 acres on the east side of Mesa Road at the extreme north end of the site, covering part of Kissing Camels Estates. Runoff rates of 5.5 cfs (5yr) and 11.3 (100yr) cfs will travel as street flow to a proposed 12' on-grade inlet. The inlet will collect 3.4 cfs (5yr)/5.3 cfs (100yr) and discharge to the west via a proposed 18" RCP. Bypass flows will continue into Basin IV. The inlet configuration and size may change with the actual roadway design.

Basin II covers 1.0 acres on the west side of Mesa Road at the extreme north end of the site. Runoff rates of 3.9 cfs (5yr) and 7.2 (100yr) cfs will travel as street flow to a proposed 10' on-grade inlet. The inlet will collect 2.4 cfs (5yr)/3.5 cfs (100yr) and discharge to the south via a proposed 24" RCP. Bypass flows will enter Basin VI.

Basin III covers 0.3 acres on the west side of Mesa Road in front of the Garden of the Gods Club at the north end of the site. Runoff rates of 1.2 cfs (5yr) and 2.2 (100yr) cfs will travel as street flow to a proposed 6' on-grade inlet. The inlet will collect 0.7 cfs (5yr)/1.1 cfs (100yr) and discharge to the south via a proposed 24" RCP. Bypass flows will enter Basin VI.

Basin IV contains 1.5 acres on the east side of Mesa Road across from the Garden of the Gods Club at the north end of the site. Runoff rates of 4.7 cfs (5yr) and 8.8 (100yr) cfs plus Basin I bypass flows will travel as street flow to a proposed 10' sump inlet. The inlet will collect all of the runoff and discharge to the southwest via a proposed 24" RCP.

Basin V encompasses 0.4 acres on the west side of Mesa Road in front of the Garden of the Gods Club at the north end of the site. Runoff rates of 1.6 cfs (5yr) and 2.9 (100yr) cfs will travel as street flow to a proposed 6' on-grade inlet. The inlet will collect 1.0 cfs (5yr)/1.4 cfs (100yr) and discharge to the south via a proposed 24" RCP. Bypass flows will enter Basin VIII.

The southwest corner of Mesa Road and Kissing Camels Drive where the pipes from Basins IV and V join is Design Point No. 1 (DP #1). Runoff rates of 13.3 cfs (5yr) and 25.6 (100yr) cfs will exit the design point via a proposed 30" RCP to the south.

Basin VI covers 8.0 acres at the north end of the site encompassing a large portion of the Garden of the Gods Club. Runoff rates of 18.0 cfs (5yr) and 36.4 cfs (100yr) are currently collected by a series of inlets and pipes discharging at the south end of the Basin via an existing 30" Private RCP. The 30" RCP will be re-routed into Gateway Vista with future construction on the south end of the Garden of the Gods Club.

Basin VII contains 3.9 acres at the northwest end of the site encompassing a portion of the existing and future Garden of the Gods Club. Runoff rates of 8.6 cfs (5yr) and 17.2 cfs (100yr) will be collected by future inlets and discharge to a proposed 30" Private RCP running south from Basin VI.

Basin VIII contains 7.4 acres at the northeast end of the site encompassing a portion of the existing and future Garden of the Gods Club. Runoff rates of 16.3 cfs (5yr) and 32.7 cfs (100yr) will be collected by future inlets and discharge to a proposed 30" RCP running southwest from Mesa Road.

The north end of Shove Chapel Drive where the pipes from DP #1 and Basin VI join is Design Point No. 2 (DP #2). Runoff rates of 46.5 cfs (5yr) and 94.2 (100yr) cfs will exit the design point via a proposed 36" Public RCP to the south.

Basin IX encompasses 5.4 acres in the north central portion of the site. Runoff rates of 6.9 cfs (5yr) and 16.6 (100yr) cfs will overland flow and then travel as street flow to a proposed 10' on-grade inlet. The inlet will collect 3.8 cfs (5yr)/6.2 cfs (100yr) and discharge to the southwest via a proposed 24" RCP. Bypass flows will enter Basin XIII.

Basin X covers 3.2 acres along Shove Chapel Drive at the northwest end of the site. Runoff rates of 3.9 cfs (5yr) and 8.6 (100yr) cfs will overland flow and then travel as street flow to a proposed 10' on-grade inlet. The inlet will collect 2.5 cfs (5yr)/4.3 cfs (100yr) and discharge to the south via a proposed 42" Public RCP. Bypass flows will enter Basin XV.

This inlet is Design Point No. 3 (DP #3). Runoff rates of 55.0 cfs (5yr) and 114.2 (100yr) cfs will exit the design point via a proposed 42" RCP to the south.

Basin XI contains 2.8 acres on the east side of Mesa Road south of Kissing Camels Drive. Runoff rates of 8.0 cfs (5yr) and 14.8 cfs (100yr) will travel south in Mesa Road to a pair of proposed 8' inlets connected by a 18" RCP and discharging to the west via a proposed 24" RCP. The inlet configuration and size may change with the actual roadway design.

Basin XII contains 2.5 acres on the west side of Mesa Road south of Kissing Camels Drive. Runoff rates of 3.2 cfs (5yr) and 7.7 cfs (100yr) will travel south in Mesa Road to a proposed 10' inlet where the inlet will collect 2.2 cfs (5yr)/4.5 cfs (100yr) cfs and discharge to the west via a proposed 24" RCP. Bypass flows will enter Basin XIII.

Basin XIII covers 5.6 acres at the northeast end of the site. Runoff rates of 7.3 cfs (5yr) and 15.9 (100yr) cfs plus bypass flows from Basin's IX & XII will overland flow and then travel as street flow to a proposed 10' sump inlet. The inlet will collect all of the runoff and discharge to the southwest via a proposed 30" Public RCP.

Basin XIV encompasses 1.5 acres along a spur street on the west side of the site. Runoff rates of 2.7 cfs (5yr) and 6.1 (100yr) cfs will overland flow and then travel as street flow to a proposed 4' sump inlet. The inlet will collect all of the runoff and discharge to the southeast via a proposed 18" Private RCP.

Design Point No. 4 (DP #4) is located where the 18" RCP from XIV and the 30" RCP from XIII join with the proposed 42" RCP in Shove Chapel Drive. Runoff rates of 71.1 cfs (5yr) and 145.5 (100yr) cfs will exit the design point via said 42" RCP to the south.

Basin XV contains 2.2 acres on the west side of Shove Chapel Drive near the main entrance to the site. Runoff rates of 2.5 cfs (5yr) and 5.6 cfs (100yr) plus bypass flows from Basin X will travel south to a proposed 8' on-grade inlet where 2.2 cfs (5yr)/3.7 cfs (100yr) will be collected and discharge to the south via a proposed 42" RCP.

Basin XVI contains 4.0 acres on the east side of Shove Chapel Drive near the main entrance to the site. Runoff rates of 5.7 cfs (5yr) and 12.6 cfs (100yr) will travel south to a proposed 8' on-grade where 2.7 cfs (5yr)/4.3 cfs (100yr) will be collected and discharge to the west via a proposed 18" RCP.

Design Point No. 5 (DP #5) is located where the 18" RCP from XVI and the inlet from XV join with the proposed 42" RCP in Shove Chapel Drive. Runoff rates of 75.3 cfs (5yr) and 154.4 (100yr) cfs will exit the design point via said 42" RCP to the south.

Basin XVII contains 5.1 acres on the east side of Mesa Road along Camelback Village and the water treatment plant. Runoff rates of 10.7 cfs (5yr) and 22.3 cfs (100yr) will travel to an existing 18"/24" CMP and roadside swale on the east side of Mesa Road, eventually reaching the existing 30" CMP crossing under Mesa Road to the west.

Basin XVIII contains 7.1 acres on the east side of Mesa Road along the Mesa Water Treatment Plant. Runoff rates of 12.8 cfs (5yr) and 26.0 cfs (100yr) will travel in Mesa Road to a proposed 12' sump inlet, where all of the runoff will be collected and discharge to the west via an existing 30" CMP.

Basin XIX covers 3.9 acres between Shove Chapel Drive and Mesa Road near the south entrance to the site. Runoff rates of 4.8 cfs (5yr) and 10.5 cfs (100yr) plus bypass flows from Basin XVI will travel to a proposed 8' sump inlet where all of the runoff will be collected and discharge to the west via a proposed 24" Public RCP to DP #6.

Design Point No. 6 (DP #6) is located where the 36" RCP from XIX and the 42" RCP from DP #5 join. Runoff rates of 80.1 cfs (5yr) and 161.2 (100yr) cfs will exit the design point via a proposed 48" Public RCP to the south.

Basin XX encompasses 5.6 acres on the west side of Shove Chapel Drive near the south entrance to the site. Runoff rates of 5.9 cfs (5yr) and 13.1 cfs (100yr) plus bypass flows from Basin XV will travel south to a proposed 8' sump inlet where all of the runoff will be collected and discharge to the south via a proposed 24" Private RCP connecting to the 48" RCP mentioned above.

Basin XXI contains 4.9 acres on the east side of Shove Chapel Drive next to La Mesa Vista. Runoff rates of 7.1 cfs (5yr) and 16.4 cfs (100yr) will travel overland, then in the street to a proposed 6' sump inlet. The inlet will collect all the runoff and discharge to the west via a proposed 18" Private RCP.

Basin XXII contains 3.9 acres on the west side of Shove Chapel Drive in the south central portion of the site. Runoff rates of 4.9 cfs (5yr) and 10.7 cfs (100yr) will travel overland, then in the street to a proposed 10' sump inlet. The inlet will collect all the runoff and discharge to the west via the proposed 48" RCP coming from DP #6.

Design Point No. 7 (DP #7) is located at the 10' inlet in Basin XXII. Runoff rates of 91.9 cfs (5yr) and 192.9 (100yr) cfs will exit the design point via a proposed 48" RCP to the south.

Basin XXIII covers 4.2 acres on the east side of Mesa Road encompassing a portion of the City Mesa Water Treatment Plant. Runoff rates of 6.7 cfs (5yr) and 14.1 cfs (100yr) will travel overland and in a swale to an existing 24" RCP. The 24" RCP crosses Mesa Road to the southwest to an existing 4' sump inlet, then discharges to an existing swale to the west via a 30" RCP.

Basin XXIV covers 3.3 acres on the west side of Mesa Road encompassing most of La Mesa Vista and some City owned open space. Runoff rates of 3.5 cfs (5yr) and 7.7 cfs (100yr) will travel to an existing swale running through the Basin at DP #8.

Design Point No. 8 (DP #8) is located at the outfall of Basin XXIV where a 36" RCP is proposed to collect the runoff in the existing swale. Runoff rates of 27.8 cfs (5yr) and 57.3 (100yr) cfs will exit the design point via a proposed 36" Public RCP to the southwest. This new pipe will divert the flows away from the swale and private facilities maintained by La Posada del Sol HOA.

Basin XXV encompasses 3.6 acres surrounding the south end of Shove Chapel Drive at the south end of the site. Runoff rates of 6.1 cfs (5yr) and 12.5 cfs (100yr) will travel to two (2) proposed 4' sump inlets that will discharge to the proposed 36" Public RCP from DP #8.

Design Point No. 9 (DP #9) is located at the outfall of Basin XXV, where a 36" RCP is proposed to continue to the northwest. Runoff rates of 31.7 cfs (5yr) and 66.4 (100yr) cfs will exit the design point via the 36" Public RCP.

Design Point No. 10 (DP #10) is located at the junction of the 36" RCP from DP #9 and the 48" RCP from DP #7. Runoff rates of 123.0 cfs (5yr) and 258.2 (100yr) cfs will exit the design point via a proposed 48" and 54"Public RCP to the southwest. The 48" and 54" pipes will parallel an existing water easement, cross 30th Street and parallel Water Street to the existing concrete lined channel in the middle of 31st Street. The outlet into the existing channel will provide for a concrete lining between the existing concrete side slopes.

A peak runoff rate of 1997 cfs (100yr) is shown at the Water Street crossing per the Camp Creek Drainage Study. This area was included in the overall study for Camp Creek. The Camp Creek study also showed residential development north of Chambers Street that is now park land which would reduce the peak runoff by a small amount at Water Street. The 1964 study also indicates that the street crossings at Water Street, Fontanero Street, and Bijou Street are undersized to convey the 100 year storm. The City of Colorado Springs has identified a public works project for the Camp Creek Channel, but no date has been determined for construction.

The channel has adequate capacity to carry the developed flows. Using simple addition of the flows of 1997cfs and 258cfs = 2255cfs for the total runoff at the outfall, the depth of water in the channel is just over 4 feet. This leaves approximately 2' of freeboard during the 100 year storm. Calculations are provided in the appendix. The existing channel consists of concrete side slopes and a natural earth bottom which has degraded over the years. The Gateway Vista outfall will consist of grouted rip-rap lining in the bottom of the channel and cutoff walls to hold the channel bottom in place. This will all be detailed on the storm sewer construction drawings to be reviewed and approved by the city prior to construction.

Basin XXVI contains 2.0 acres at the far south end of the site. Runoff rates of 2.9 cfs (5yr) and 6.7 cfs (100yr) will travel overland onto the existing apartment site to the south. This compares to historic runoff rates of 3.4 cfs (5yr) and 8.4 cfs (100yr) from Basin H-III. Water from downspouts will be directed toward the east as much as possible.

Basin XXVII covers 6.8 acres along the northwest end of the site, making up the rear yard of several proposed lots. Runoff rates of 9.3 cfs (5yr) and 20.8 cfs (100yr) will travel overland to the west. This compares to historic runoff rates of 9.3 cfs (5yr) and 22.6 cfs (100yr) from Basin H-VI. Water from downspouts will be directed toward the east as much as possible. This runoff discharges onto land owned by the same developer. The runoff eventually reaches 30th Street.

Basin XXVIII covers 7.8 acres along the southwest end of the site, making up the back of several proposed lots. Runoff rates of 10.6 cfs (5yr) and 23.9 cfs (100yr) will travel overland to the west. This compares to combined historic runoff rates of 30.7 cfs (5yr) and 74.9 cfs (100yr) from Basins H-VII + H-VIII.

Street capacities will not be exceeded within the proposed development under this drainage plan and report. On-site streets will be private residential and will be 28' fl-fl with Type 3 vertical curb & gutter. Mesa Road will have a median divided section, 17' fl-fl each side, with Type 3 vertical curb and gutter on the median and Type 1 vertical curb and gutter on the exterior.

This report and plan is to serve as a guide for the Gateway Development. Additional Drainage Reports will be required with each additional filing/plat submittal. Storm sewer layout and sizing may vary with actual layout and design.

The Lot Owner/Home Builder/Home Owner will be responsible for individual lot drainage.

PROPOSED FACILITIES (Construction Cost Estimate):

Following is a cost estimate of the proposed drainage facilities required for this development. All proposed public drainage facilities will be reimbursable, private facilities will be non-reimbursable.

Gateway Vista Filing No. 1 - Public:

2. 6' D-10-R Inlet	2 Ea. @ $3,100.00/Ea.	$ 6,200.00
3. 8' D-10-R Inlet	1 Ea. @ $3,450.00/Ea.	$ 3,450.00
4. 10' D-10-R Inlet	4 Ea. @ $3,750.00/Ea.	$ 15,000.00
6. 24" RCP	350 L.F. @ $32.00/L.F.	$ 11,200.00
2. 30" RCP	300 L.F. @ $40.00/L.F.	$ 12,000.00
8. 36" RCP	700 L.F. @ $51.00/L.F.	$ 35,700.00
9. 42" RCP	1150 L.F. @ $61.00/L.F.	$ 70,150.00
10. 48" RCP	1800 L.F. @ $71.00/L.F.	$ 127,800.00
11. 54" RCP	250 L.F. @ $109.00/L.F.	$ 27,250.00
12. Type I MH	8 Ea. @ $5,000.00/Ea.	$ 40,000.00
	Sub-total:	$ 348,750.00
	15% Engineering & Contingency:	$ 52,312.50
	TOTAL:	**$ 401,062.50**

Gateway Vista Filing No. 1 - Private:

1. 4' D-10-R Inlet	1 Ea. @ $2,850.00/Ea.	$ 2,850.00
2. 10' D-10-R Inlet	1 Ea. @ $3,750.00/Ea.	$ 3,750.00
3. 18" RCP	400 L.F. @ $26.00/L.F.	$ 10,400.00
	Sub-total:	$ 17,000.00
	15% Engineering & Contingency:	$ 2,550.00
	TOTAL:	**$ 19,550.00**

Remainder of Gateway Vista & Mesa Road Improvements - Public:

1. 4' D-10-R Inlet	1 Ea. @ $2,850.00/Ea.	$ 2,850.00
2. 6' D-10-R Inlet	3 Ea. @ $3,100.00/Ea.	$ 9,300.00
3. 8' D-10-R Inlet	3 Ea. @ $3,450.00/Ea.	$ 10,350.00
4. 10' D-10-R Inlet	3 Ea. @ $3,750.00/Ea.	$ 11,250.00
5. 12' D-10-R Inlet	1 Ea. @ $4,200.00/Ea.	$ 4,200.00
6. 18" RCP	300 L.F. @ $26.00/L.F.	$ 7,800.00
7. 24" RCP	1300 L.F. @ $32.00/L.F.	$ 41,600.00
8. 30" RCP	700 L.F. @ $40.00/L.F.	$ 28,000.00
9. 36" RCP	700 L.F. @ $51.00/L.F.	$ 35,700.00
10. 48" RCP	1050 L.F. @ $71.00/L.F.	$ 74,550.00
11. Type I MH	3 Ea. @ $5,000.00/Ea.	$ 15,000.00
12. Type II MH	4 Ea. @ $2,000.00/Ea.	$ 8,000.00
	Sub-total:	$ 248,600.00
	15% Engineering & Contingency:	$ 37,290.00
	TOTAL:	**$ 285,890.00**

Remainder of Gateway Vista & Mesa Road Improvements - Private:

1. 4' D-10-R Inlet	1 Ea. @ $2,850.00/Ea.	$ 2,850.00
2. 6' D-10-R Inlet	1 Ea. @ $3,100.00/Ea.	$ 3,100.00
3. 8' D-10-R Inlet	2 Ea. @ $3,450.00/Ea.	$ 6,900.00
4. 18" RCP	250 L.F. @ $26.00/L.F.	$ 6,500.00
5. 24" RCP	50 L.F. @ $32.00/L.F.	$ 1,600.00
6. 30" RCP	1000 L.F. @ $40.00/L.F.	$ 40,000.00
7. Type II MH	2 Ea. @ $2,000.00/Ea.	$ 4,000.00
	Sub-total:	$ 64,950.00
	15% Engineering & Contingency:	$ 9,742.50
	TOTAL:	**$ 74,692.50**

DRAINAGE FEES

The Gateway Vista Development is located within the Camp Creek Drainage Basin. The total area of the development to be platted/re-platted is approximately 56.803 acres. Of that acreage, 34.507 acres have not been previously platted. A portion of the site was previously platted as Garden of the God's Club Subdivision No. 1 Replat and Kissing Camel's Mesa Subdivision No. 1. The site will be platted with multiple plats as required for build-out. Drainage Reports will be completed for each additional filing at that time, with Fees calculated in individual reports. The 2002 Drainage, Bridge and Pond Fees are as follows: No fees will be paid due to the reimbursable facilities exceeding the fees.

Gateway Subdivision Filing No. 1 contains 18.658 acres. Of that acreage, 5.736 acres have not been previously platted.

Gateway Vista Filing No. 1:

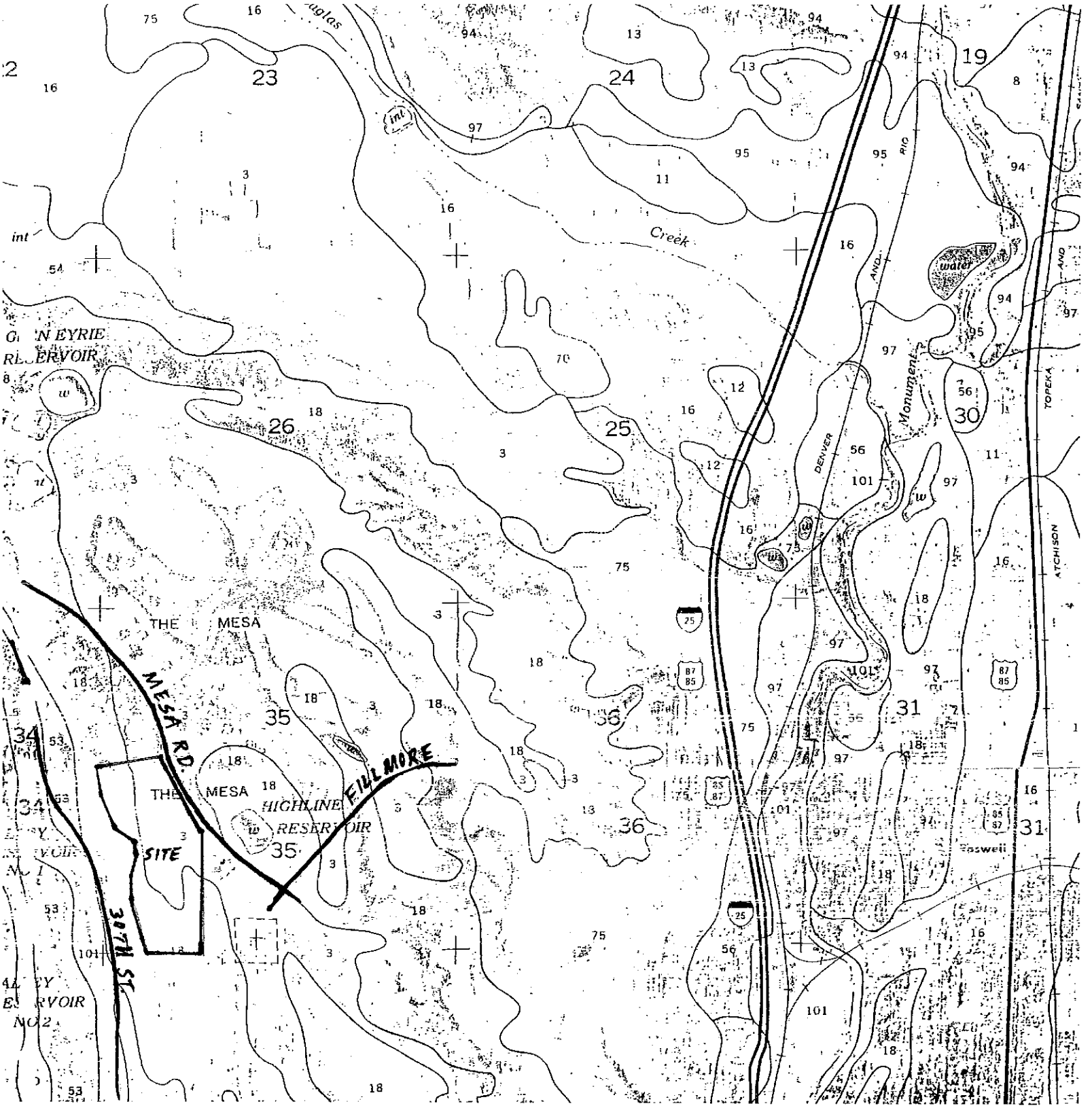
Drainage Fee:	$ 1,315.00/ac.x5.736ac =		$ 7,542.84

The remainder of Gateway Vista contains 38.145 acres. Of that acreage, 28.771 acres have not been previously platted.

Remainder of Gateway Vista:

Drainage Fee:	$ 1,315.00/ac.x28.771ac	=	$ 37,833.86

APPENDIX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FILLMORE
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RIO GRANDE
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ATCHISON TOPEKA
water
Pueblo
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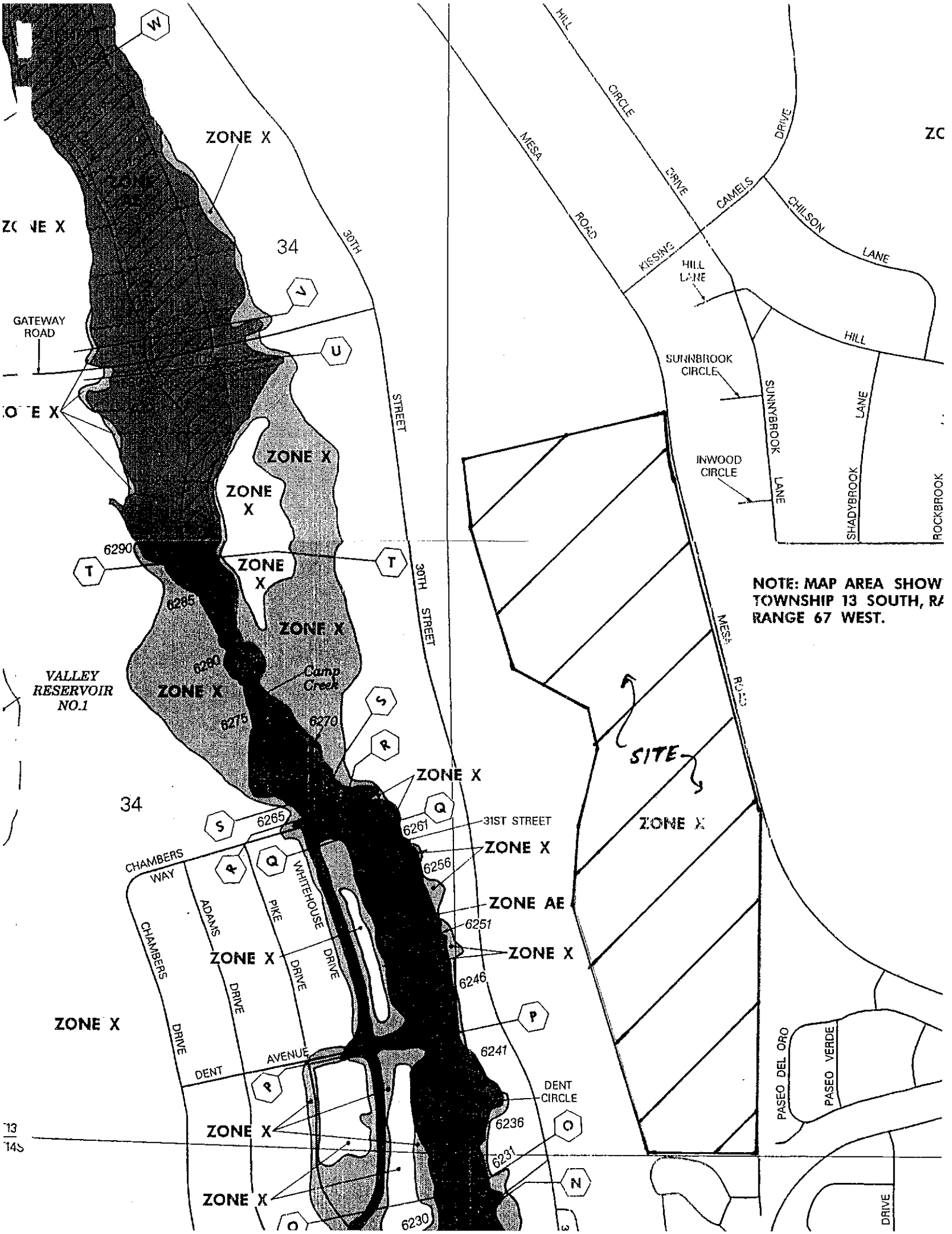
1" = 2000'

FIGURE 1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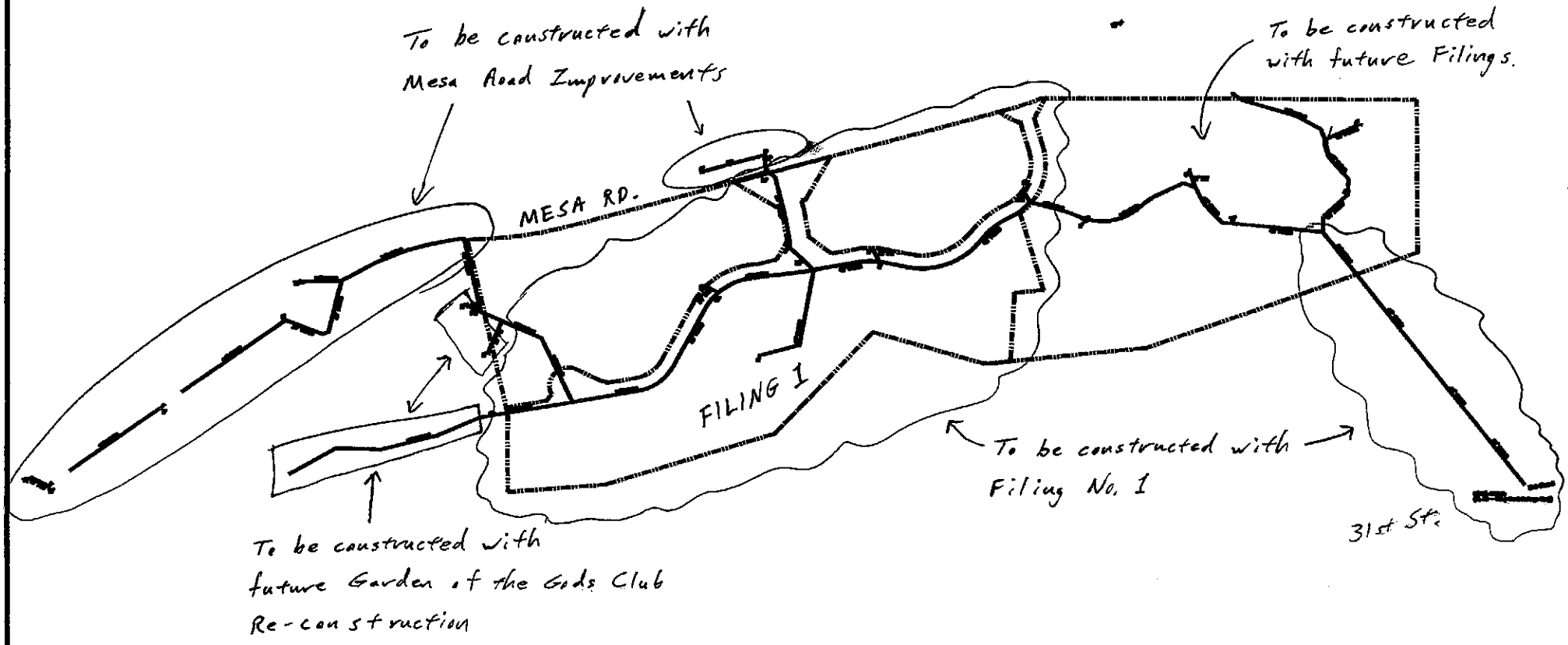
HILL CIRCLE DRIVE
CAMELS HILL DRIVE
CHILSON LANE
KISSING HILL LANE
HILL LANE
SUNNBROOK CIRCLE
SUNNYBROOK LANE
INWOOD CIRCLE
SHADYBROOK LANE
ROCKBROOK
GATEWAY ROAD
VALLEY RESERVOIR NO.1
Camp Creek
31ST STREET
CHAMBERS WAY
CHAMBERS DRIVE
ADAMS DRIVE
PIKE DRIVE
WHITEHOUSE DRIVE
DENT AVENUE
DENT CIRCLE
PASEO DEL ORO
PASEO VERDE
DRIVE
6290
6285
6280
6275
6270
6265
6261
6256
6251
6246
6241
6236
6231
6230
W
V
U
T
S
R
Q
P
O
N
NOTE: MAP AREA SHOW
TOWNSHIP 13 SOUTH, RA
RANGE 67 WEST.

STORM SEWER PHASING



NO SCALE

JOB NO. 00-000

FILE: 8X11H.DWG
DATE: 5/6/00

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

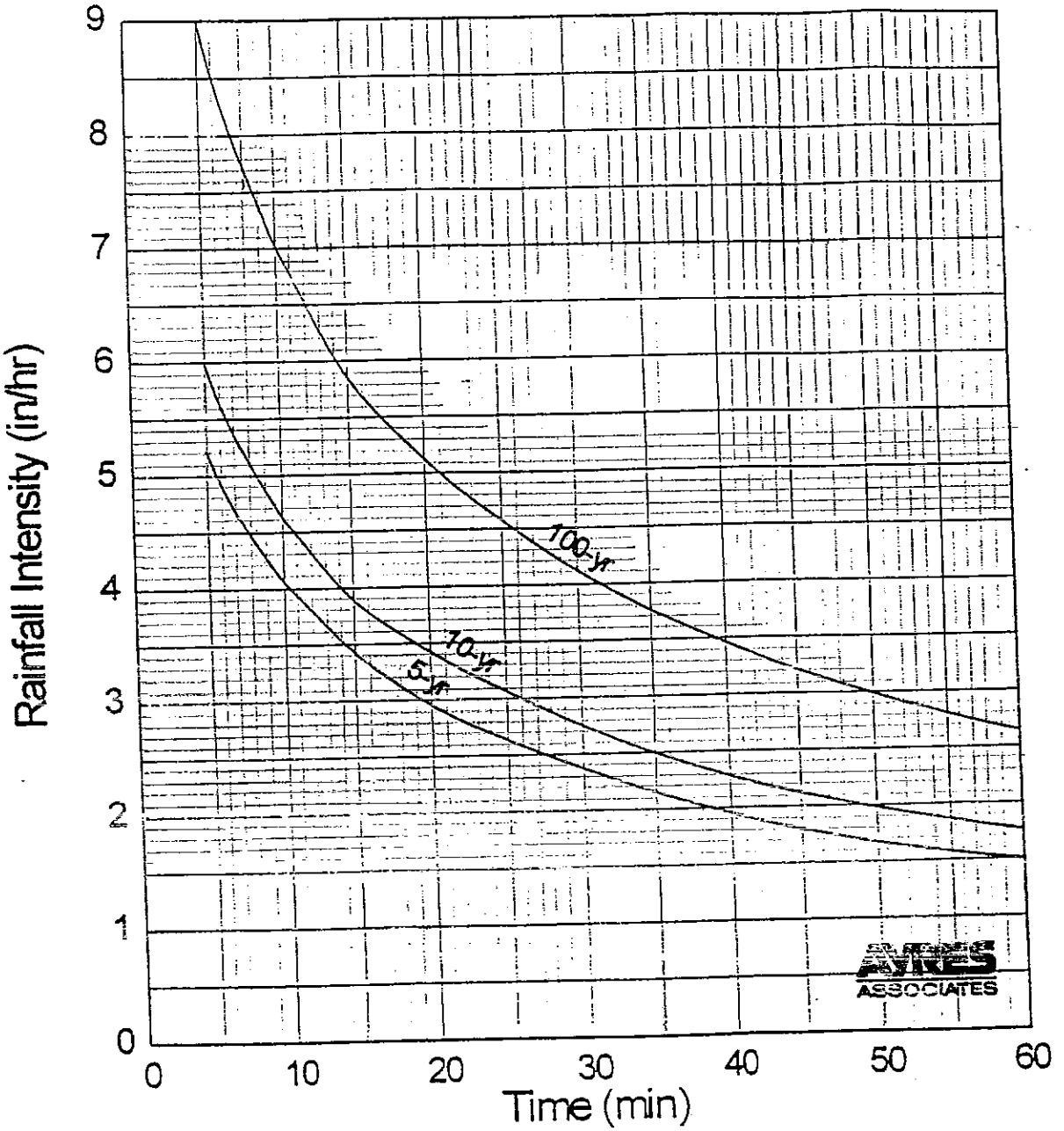
TABLE 5-1

RECOMMENDED AVERAGE RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS	"C" FREQUENCY 10 A&B*	10 C&D*	100 A&B*	100 C&D*
Business					
Commercial Areas	95	0.90	0.90	0.90	0.90
Neighborhood Areas	70	0.75	0.75	0.80	0.80
Residential					
1/8 Acre or less	65	0.60	0.70	0.70	0.80
1/4 Acre	40	0.50	0.60	0.60	0.70
1/3 Acre	30	0.40	0.50	0.55	0.60
1/2 Acre	25	0.35	0.45	0.45	0.55
1 Acre	20	0.30	0.40	0.40	0.50
Industrial					
Light Areas	80	0.70	0.70	0.80	0.80
Heavy Areas	90	0.80	0.80	0.90	0.90
Parks and Cemeteries	7	0.30	0.35	0.55	0.60
Playgrounds	13	0.30	0.35	0.60	0.65
Railroad Yard Areas	40	0.50	0.55	0.60	0.65
Undeveloped Areas					
Historic Flow Analysis- Greenbelts, Agricultural	2	0.15	0.25	0.20	0.30
Pasture/Meadow	0	0.25	0.30	0.35	0.45
Forest	0	0.10	0.15	0.15	0.20
Exposed Rock	100	0.90	0.90	0.95	0.95
Offsite Flow Analysis (when land use not defined)	45	0.55	0.60	0.65	0.70
Streets					
Paved	100	0.90	0.90	0.95	0.95
Gravel	80	0.80	0.80	0.85	0.85
Drive and Walks	100	0.90	0.90	0.95	0.95
Roofs	90	0.90	0.90	0.95	0.95
Lawns	0	0.25	0.30	0.35	0.45

* Hydrologic Soil Group

9/30/90

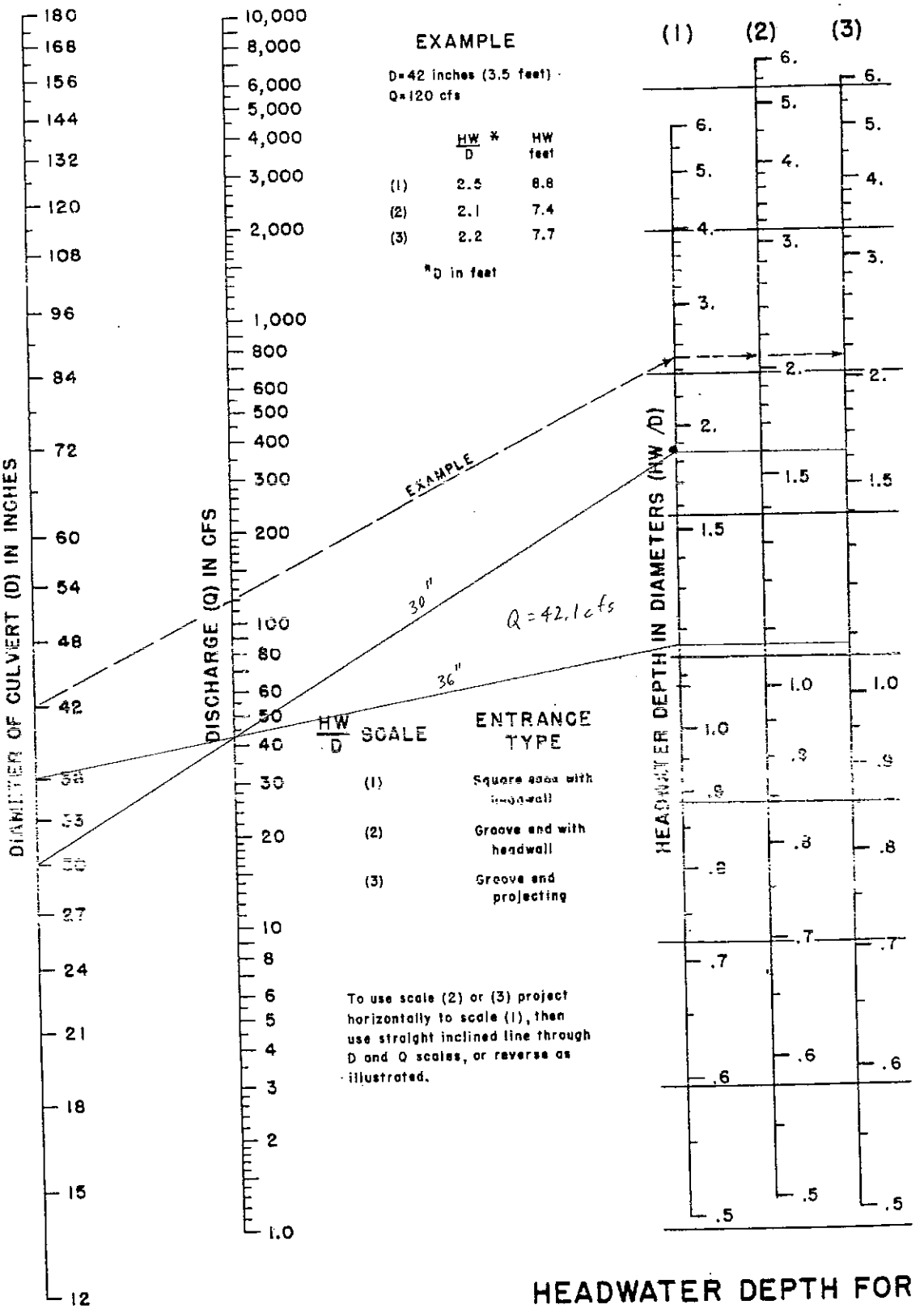


Interim Release October 12, 1994 , Rainfall Intensity Curves
City Of Colorado Springs Drainage Criteria Manual

CONCRETE PIPE
Capacity (Velocity)

0.5%		1%	2%	3%	4%	5%	6%	7%	8%
8.0	18"	11.3 (6.6)	16.0 (9.3)	19.6 (11.4)	22.6 (13.2)	25.3 (14.7)	27.7 (16.1)	29.9 (17.4)	32.0 (18.6)
17.2	24"	24.3 (8.1)	34.4 (11.2)	42.2 (13.7)	48.7 (15.8)	54.4 (17.6)	59.6 (19.3)	64.4 (20.9)	68.8 (22.3)
31.2	30"	44.1 (9.5)	62.4 (13.4)	76.4 (16.4)	88.2 (19.0)	98.7 (21.2)	108.1 (23.2)	116.8 (25.1)	124.8 (26.8)
50.7	36"	71.8 (10.3)	101.5 (14.6)	124.3 (17.8)	143.5 (20.6)	160.4 (23.0)	175.8 (25.2)	189.8 (27.2)	202.9 (29.1)
76.5	42"	108.2 (10.8)	153.1 (15.3)	187.5 (18.7)	216.5 (21.6)	242.0 (24.2)	265.1 (26.5)	286.3 (28.6)	306.1 (30.6)
109.3	48"	154.5 (11.2)	218.5 (15.8)	267.6 (19.4)	309.0 (22.4)	345.5 (25.0)	378.5 (27.4)	408.8 (29.6)	437.0 (31.6)
149.6	54"	211.5 (11.5)	299.2 (16.2)	366.4 (19.8)	423.1 (22.9)	473.0 (25.6)	518.2 (28.1)	559.7 (30.3)	598.3 (32.4)
198.1	60"	280.2 (11.7)	396.2 (16.5)	485.3 (20.2)	560.3 (23.3)	626.5 (26.1)	686.3 (28.6)	741.2 (30.9)	792.4 (33.0)
255.9	66"	361.2 (11.8)	510.9 (16.7)	625.7 (20.5)	722.5 (23.7)	807.8 (26.5)	884.8 (29.0)	955.7 (31.3)	1021.7 (33.5)
322.1	72"	455.6 (12.0)	644.3 (17.0)	789.1 (20.8)	911.1 (24.0)	1018.7 (26.8)	1115.9 (29.3)	1205.3 (31.7)	1288.6 (33.9)
485.9	84"	687.2	971.4	1190.3	1374.4				

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 283
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 31st STREET CHANNEL

Comment: RIP-RAP BOTTOM/CONCRETE SIDES

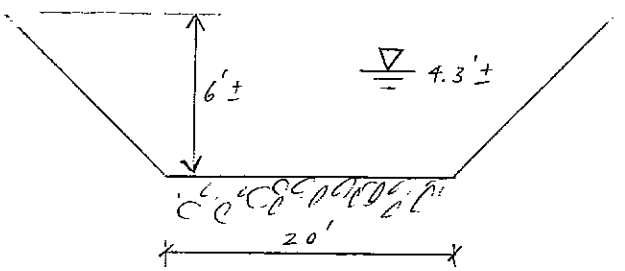
Solve For Depth

Given Input Data:

Bottom Width.....	20.00 ft
Left Side Slope..	1.50:1 (H:V)
Right Side Slope.	1.50:1 (H:V)
Manning's n.....	0.028
Channel Slope....	0.0300 ft/ft
Discharge.....	2255.00 cfs

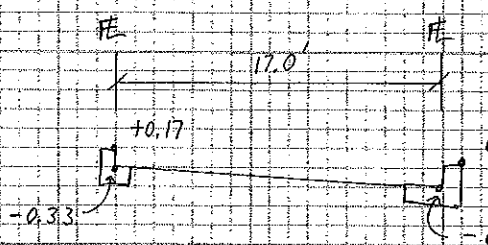
Computed Results:

Depth.....	4.28 ft
Velocity.....	19.93 fps
Flow Area.....	113.14 sf
Flow Top Width...	32.85 ft
Wetted Perimeter.	35.44 ft
Critical Depth...	6.23 ft
Critical Slope...	0.0077 ft/ft
Froude Number....	1.89 (flow is Supercritical)



Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Street Capacity - 1/2 Street (Mesa Road)



$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$

5yr - 6" @ ℄

100yr - Top of Type I C&G

$n = 0.016$, $R = A/P$, $A_5 = 6.03$, $A_{100} = 8.50$ ☐

$R_5 = 0.34$, $R_{100} = 0.48$

$Q_5 = 272.6\ S^{1/2}$ > Drainage Manual = $171.7\ S^{1/2}$ USE

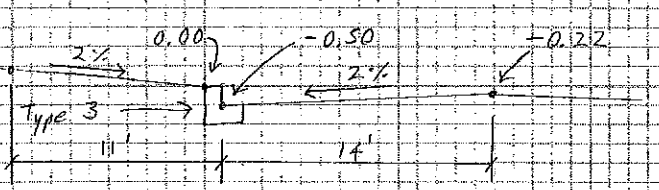
Use Manual = 34 cfs max @ 4 %

17.2 cfs @ 1.0 % min

$Q_{100} = 485.2\ S^{1/2}$

Q_{100} = 48.5 cfs @ 1.00 % min

Street Capacity = 1/2 Street (Pvt 28' F-F)



$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$

5yr = Crown / ℄

100yr = ℮ R.O.W.

$n = 0.016$, $R = A/P$, $A_5 = 1.96$, $A_{100} = 9.33$

$R_5 = 0.14$, $R_{100} = 0.37$

$Q_5 = 48.9\ S^{1/2}$

$Q_5 = 4.9$ cfs @ 1.0% min

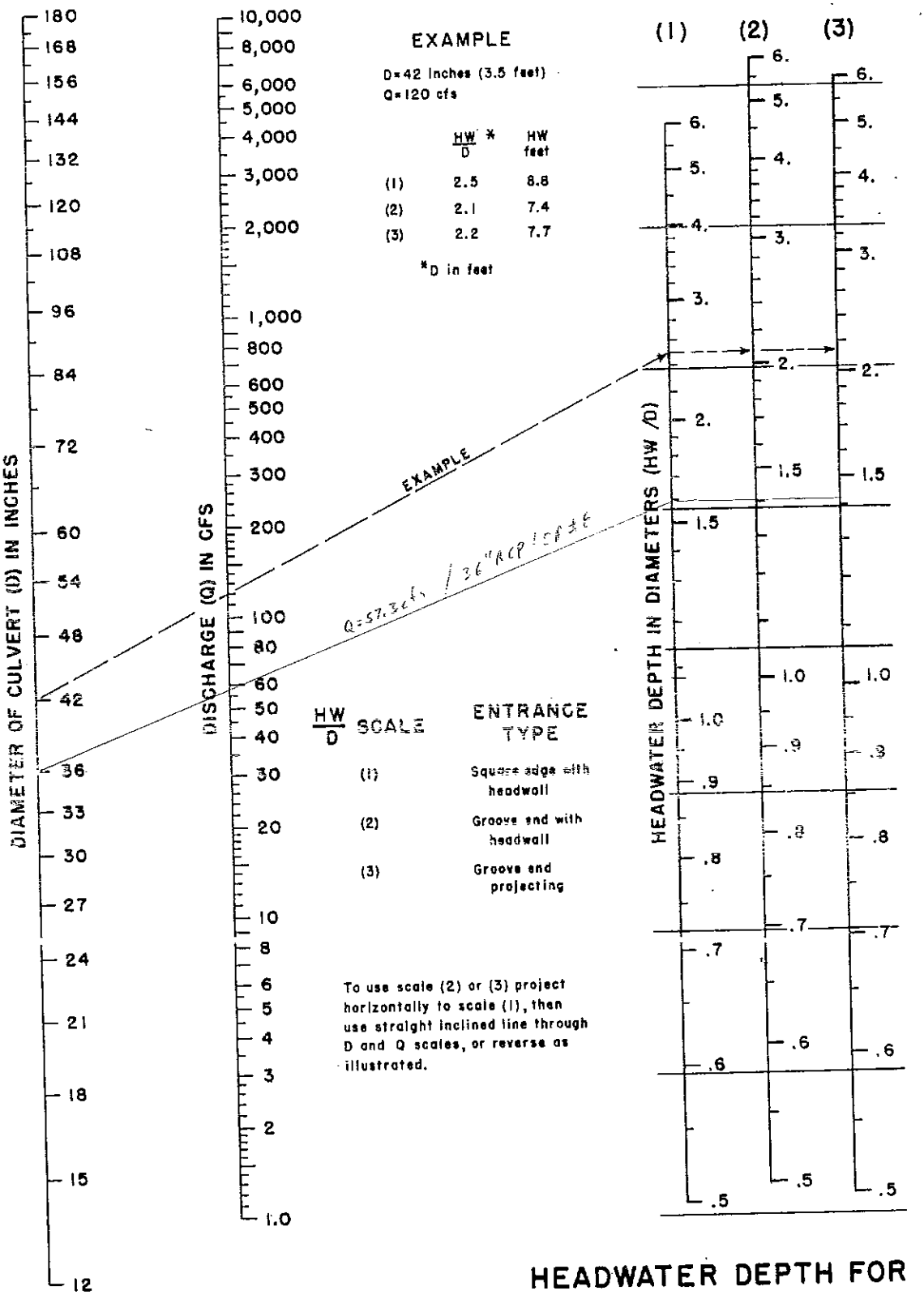
6.9 cfs @ 2.0%

$Q_{100} = 446.3\ S^{1/2}$

$Q_{100} = 44.6$ cfs @ 1.0% min

63.1 cfs @ 2.0%

CHART 1



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc	I	SOIL GROUP	DEV. TYPE	C	BASIN		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT	Min.					Q	Q_p	
I	Historic		24.6	Overland 100' @ 3%	Swale 5000' @ 3% - 4.5 fps	7.8 + 18.5 = 26.3	2.6 / 4.4	B	40% Imp	0.50 / 0.60	32.0 / 64.9		
II			3.8	Overland 300' @ 2.5%	Swale 700' @ 2% - 2.5 fps	17.9 + 4.7 = 22.6	2.8 / 4.8		25% Imp	0.35 / 0.45	3.7 / 8.2		
III			5.7	Overland 300' @ 2.0%	Swale 1200' @ 2% - 3.0 fps	21.9 + 6.7 = 28.6	2.4 / 4.2		prairie	0.25 / 0.35	3.4 / 8.4		
IV			8.0	Overland 125' @ 6%	Street 440' @ 2% - 3 fps Pipe 800' @ 2% - 10 fps	6.4 + 2.2 + 1.3 = 9.9	4.1 / 7.0		50% Imp	0.55 / 0.65	18.0 / 36.4		
V			13.4	Overland 100' @ 2%	Street & Swale 750' @ 3.5% 5 fps	10.4 + 2.5 = 12.9	3.7 / 6.3		30% Imp	0.40 / 0.55	19.8 / 46.4		
VI			10.6	Overland 300' @ 8%		13.9	3.5 / 6.0		prairie	0.25 / 0.35	9.3 / 22.3		
VII			5.5	Overland 100' @ 4%		10.0	4.1 / 7.0		Prairie	0.25 / 0.35	5.6 / 13.5		
VIII			41.8	Overland 300' @ 2.5%	Swale 2500' @ 3% 5 fps	20.3 + 8.4 = 28.7	2.4 / 4.2		prairie	0.25 / 0.35	25.1 / 61.4		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD $Q = CIA$

PAGE ___ OF ___

BRICKWELL ENGINEERING CONSULTANTS INC.

PROJECT: Gateway MDDP 99-069
BY: TDM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C.	BASIN		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Q_p	
I	Developed		3.0	Overland 100' 4%.	Street 1000' @ 3%. - 3fps	7.1 + 5.6 = 12.7	3.7 / 6.3		40% Imp	0.50 / 0.60	5.5 / 11.3		
II			1.0		Street	5.0	5.2 / 9.0		70% Imp	0.75 / 0.80	3.9 / 7.2		
III			0.3		Street	5.0	5.2 / 9.0		70% Imp	0.75 / 0.80	1.2 / 2.2		
IV			1.5	Overland 50' 2%.	Street 900' 3%. - 3fps	3.7 + 5.0 = 8.7	4.2 / 7.3		70% Imp	0.75 / 0.80	4.7 / 8.8		
V			0.4		Street	5.0	5.2 / 9.0		70% Imp	0.75 / 0.80	1.6 / 2.9		
VI			8.0	Same AS H IV		9.9	4.1 / 7.0		50% Imp	0.55 / 0.65	18.0 / 36.4		
VII			3.9	Overland 100' @ 2%.	Street/Swale 750' @ 3.5% 5 fps	8.2 + 2.5 = 10.7	4.0 / 6.8		50% Imp	0.55 / 0.65	8.6 / 17.2		
VIII			7.4	Same as VII		10.7	4.0 / 6.8		50% Imp	0.55 / 0.65	16.3 / 32.7		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD $Q=CIA$

PAGE ___ OF ___

ROCKVILLE PINCHOW

PROJECT: Gateway MODP 99-069
BY: TOM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C.	BA...		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Q_p	
IX			5.4	Overland 200' @ 4%	Street/Swale 600' @ 2%/2 fps	11.7 + 5.0 = 16.7	3.2 / 5.6		1/3 Ac	0.40 / 0.55	6.9 / 16.6		
X			3.2	Overland 100' @ 4%	Street 600' @ 2%/2 fps	8.9 + 5.0 = 13.9	3.5 / 6.0		1/2 Ac	0.35 / 0.45	3.9 / 8.6		
XI			2.8		Street 1100' @ 2% /2 fps	11.7	3.8 / 6.6		Mesa Rd + Commercial Beach Village 70% Imp	0.75 / 0.80	8.0 / 14.8		
XII			2.5	Overland 100' @ 4%	Street 1000' @ 2% /2 fps	8.3 + 8.3 = 16.6	3.2 / 5.6		1/3 Ac	0.40 / 0.55	3.2 / 7.7		
XIII			5.6	Overland 100' @ 4%	Street 450' @ 2% /2 fps	8.9 + 3.7 = 12.6	3.7 / 6.3		1/2 Ac	0.35 / 0.45	7.3 / 15.9		
XIV			1.5			5.0	5.2 / 9.0		1/2 Ac	0.35 / 0.45	2.7 / 6.1		
XV			2.2	Overland 150' @ 3%	Street 450' @ 2%/2 fps	11.9 + 3.7 = 15.6	3.3 / 5.7		1/2 Ac	0.35 / 0.45	2.5 / 5.6		
XVI			4.0	Overland 100' @ 6%	Street 300' 2 fps	7.2 + 2.5 = 9.7	4.1 / 7.0		1/2 Ac	0.35 / 0.45	5.7 / 12.6		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD Q=CIA

PAGE___ OF___

RUCKWELL MINCHOW CONSULTANTS, INC.

PROJECT: Gateway MDDP 99-069
BY: TOM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C.	BASIN		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Q_p	
XVII			5.1	Overland 100' 10%	Swale/Street 400' 2 fps	5.2 + 3.3 = 8.5	4.2 / 7.3		Treatment Plant 40% Imp	0.50 / 0.60	10.7 / 22.3		
XVIII			7.1	Overland 100' 10%	Street 1000' @ 2 fps	5.2 + 8.3 = 13.5	3.6 / 6.1		Treatment Plant 40% Imp	0.50 / 0.60	12.8 / 26.0		
XIX			3.9	Overland 150' 3%	Street 300' 2 fps	11.9 + 2.5 = 14.4	3.5 / 6.0		1/2 Ac	0.35 / 0.45	4.8 / 10.5		
XX			5.6	Overland 200' 3%	Street 700' 2 fps	13.8 + 5.8 = 19.6	3.0 / 5.2		1/2 Ac	0.35 / 0.45	5.9 / 13.1		
XXI			4.9	Overland 100' 2%	Street 400' 2 fps	10.4 + 3.3 = 13.7	3.6 / 6.1		1/3 Ac	0.40 / 0.55	7.1 / 16.4		
XXII			3.9	Overland 150' 3%	Street 200' 2 fps	11.9 + 1.7 = 13.6	3.6 / 6.1		1/2 Ac	0.35 / 0.45	4.9 / 10.7		
XXIII			4.2	Overland 300' 2.5%	Street/Swale 300' 2 fps	14.4 + 2.5 = 16.9	3.2 / 5.6		Treatment Plant 40% Imp	0.50 / 0.60	6.7 / 14.1		
XXIV			3.3	Overland 300' 2.5%	Swale 200' 2.5 fps	17.9 + 1.3 = 19.2	3.0 / 5.2		1/2 Ac	0.35 / 0.45	3.5 / 7.7		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD Q=CIA

PAGE___ OF___

ROCKVILLE PIKE ENGINEERING GROUP, INC.

PROJECT: Gateway MDOP 99-069
BY: TOM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C	RATIONAL METHOD		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Q_p	
XXV			3.6	Overland 150' 2.5%	street 500' 2.5%	10.9 + 4.2 / 15.1	3.4 / 5.8		1/4 Ac	0.50 / 0.60	6.1 / 12.5		
XXVI			2.0	Overland 200' @ 2.5%		13.7	3.6 / 6.1		1/3 Ac	0.40 / 0.55	2.9 / 6.7		
XXVII			6.8	Overland 150' 4%		10.9	3.9 / 6.8		1/2 Ac	0.35 / 0.45	9.3 / 20.8		
XXVIII			7.8	Overland 150' 4%		10.9	3.9 / 6.8		1/2 Ac	0.35 / 0.45	10.6 / 23.9		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD Q=CIA

PAGE___ OF___

ROCKWELL ENGINEERING CONSULTANTS, INC.

PROJECT: Gateway MODP 99-069
BY: TOM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C.	BASIN		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Qp	
H DP #1	I + II 87% 13%		28.4	I + Swale 800' ÷ 5 fps	= 26.3 + 2.7	29.0	2.4 / 4.2	B		0.48 / 0.58	32.7 / 69.2		
H DP #2	IV + V + VIII 13% 21% 66%		63.2		From VIII	28.7	2.4 / 4.2			0.32 / 0.43	48.5 / 114.1		
D DP #1	I + II + III + IV + V		6.2	(I) 12.7 + Pipe 1200' @ 10 fps	12.7 + 2.0	14.7	3.4 / 5.9			0.63 / 0.70	13.3 / 25.6		
D DP #2	DP #1 + VI + VII + VIII		25.5	DP #1 + Pipe 1200' @ 10 fps	14.7 + 2.0	16.7	3.2 / 5.6			0.57 / 0.66	46.5 / 94.2		
D DP #3	DP #2 + IX + X		34.1	DP #2 + Pipe 700' @ 10 fps	16.7 + 1.2	17.9	3.1 / 5.4			0.52 / 0.62	55.0 / 114.2		
D DP #4	DP #3 + XI + XII + XIII		45.0	DP #3 + Pipe 300' @ 10 fps	17.9 + .5	18.4	3.1 / 5.3			0.51 / 0.61	71.1 / 145.5		
D DP #5	DP #4 + XV + XVI		51.2	DP #4 + Pipe 300' @ 10 fps	18.4 + 0.5	18.9	3.0 / 5.2			0.49 / 0.58	75.3 / 154.4		
D DP #6	DP #5 + XVII + XVIII + XIX		54.5	DP #5 + Pipe 600' @ 10 fps	18.9 + 1.0	19.9	3.0 / 5.1			0.49 / 0.58	80.1 / 161.2		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD Q=CIA

PAGE___ OF___

PROJECT: Gateway MDDP 99-069
BY: TDM DATE: 10/5/01

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C.	BA...	...ET...	PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	Q_D	
D	DP#6 + ~~XX~~			DP#6 + Pipe			2.9			0.46	91.9		
DP#7	+ ~~XXI~~ + ~~XXII~~		68.9	500' @ 10 fps	19.9 + 0.8	20.7	5.0			0.56	192.9		
D	~~XXIII~~ +			~~XXIII~~ + Pipe			3.0			0.47	27.8		
DP # 8	~~XXIV~~		19.7	(swale 500' @ 8 fps	18.6 + 1.0	19.6	5.1			0.57	57.3		
D	DP#8 + ~~XXV~~			DP#8 + Pipe			2.9			0.47	31.7		
DP#9			23.3	600' @ 10 fps	19.6 + 1.0	20.6	5.0			0.57	66.4		
D	DP#7 +			DP#7 + Pipe			2.9			0.46	123.0		
DP#10	DP#9		92.2	300' @ 15 fps	20.6 + 0.5	21.1	5.0			0.56	258.2		

HYDROLOGIC COMPUTATION BASIC DATA
RATIONAL METHOD Q=CIA

PAGE___ OF___

KWILL ENGINEERING CONSULTANTS, INC.

PROJECT: Gateway MDOP 99-069
BY: TDM DATE: 10/5/01

INLET AT BASIN I

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	5.5	0.016	0.02	0.03

d= 0.22 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	11.3	0.016	0.02	0.03

d= 0.29 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	5.5	0.02	0.03

T=	11.12
F(w)=	2.14
L1=	18.32
L2=	11
L3=	39.26
Try L(l)=	12 ft
Q(l)=	0 IF L(l)<L2 3.4 IF L(l)>L2
Q(by)=	5.5 IF L(l)<L2 2.1 IF L(l)>L2

100 YEAR	Q	S(X)	S(O)
	11.3	0.02	0.03

T=	14.57
F(w)=	2.26
L1=	25.36
L2=	15.23
L3=	54.33
Try L(l)=	12 ft
Q(l)=	5.3 IF L(l)<L2 0 IF L(l)>L2
Q(by)=	6 IF L(l)<L2 11.3 IF L(l)>L2

INLET AT BASIN II

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	3.9	0.016	0.02	0.03

d= 0.2 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	7.2	0.016	0.02	0.03

d= 0.25 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	3.9	0.02	0.03

100 YEAR	Q	S(X)	S(O)
	7.2	0.02	0.03

T=	9.77	
F(w)=	2.08	
L1=	15.65	
L2=	9.4	
L3=	33.53	
Try L(I)=	10	ft
Q(I)=	0	IF L(I)<L2
	2.4	IF L(I)>L2
Q(by)=	3.9	IF L(I)<L2
	1.5	IF L(I)>L2

T=	12.3	
F(w)=	2.18	
L1=	20.65	
L2=	12.4	
L3=	44.24	
Try L(I)=	10	ft
Q(I)=	3.5	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	3.7	IF L(I)<L2
	7.2	IF L(I)>L2

INLET AT BASIN III

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	1.2	0.016	0.02	0.03

d= 0.13 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	2.2	0.016	0.02	0.03

d= 0.16 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	1.2	0.02	0.03

T=	6.28	
F(w)=	1.88	
L1=	9.09	
L2=	5.46	
L3=	19.48	
Try L(I)=	6	ft
Q(I)=	0	IF L(I)<L2
	0.7	IF L(I)>L2
Q(by)=	1.2	IF L(I)<L2
	0.5	IF L(I)>L2

100 YEAR	Q	S(X)	S(O)
	2.2	0.02	0.03

T=	7.89	
F(w)=	1.99	
L1=	12.09	
L2=	7.26	
L3=	25.91	
Try L(I)=	6	ft
Q(I)=	1.1	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	1.1	IF L(I)<L2
	2.2	IF L(I)>L2

INLET AT BASIN IV

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

	Q(cfs)	n	S(X)	S(O)
5 YEAR	5.6	0.016	0.02	0.02

d= 0.24 ft

	Q(cfs)	n	S(X)	S(O)
100 YEAR	10.9	0.016	0.02	0.02

d= 0.31 ft

Basin I Flow by IV

0.9 + 4.7 = 5.6

2.1 + 8.8 = 10.9

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	5.6	10	3

d= 0.18 ft

	Q	L(l)	w
100 YEAR	10.9	10	3

d= 0.37 ft

INLET AT BASIN V

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	1.6	0.016	0.02	0.02

d= 0.15 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	2.9	0.016	0.02	0.02

d= 0.19 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	1.6	0.02	0.02

T=	7.55
F(w)=	1.61
L1=	9.36
L2=	5.62
L3=	20.06
Try L(I)=	6 ft
Q(I)=	0 IF L(I)<L2 1 IF L(I)>L2
Q(by)=	1.6 IF L(I)<L2 0.6 IF L(I)>L2

100 YEAR	Q	S(X)	S(O)
	2.9	0.02	0.02

T=	9.44
F(w)=	1.69
L1=	12.28
L2=	7.38
L3=	26.32
Try L(I)=	6 ft
Q(I)=	1.4 IF L(I)<L2 0 IF L(I)>L2
Q(by)=	1.5 IF L(I)<L2 2.9 IF L(I)>L2

INLET AT BASIN IX

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	6.9	0.016	0.02	0.02

d= 0.26 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	16.6	0.016	0.02	0.02

d= 0.36 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	6.9	0.02	0.02

T=	13.06	
F(w)=	1.8	
L1=	18.1	
L2=	10.87	
L3=	38.79	
Try L(I)=	10	ft
Q(I)=	3.8	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	3.1	IF L(I)<L2
	6.9	IF L(I)>L2

100 YEAR	Q	S(X)	S(O)
	16.6	0.02	0.02

T=	18.15	
F(w)=	1.92	
L1=	26.83	
L2=	16.12	
L3=	57.5	
Try L(I)=	10	ft
Q(I)=	6.2	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	10.4	IF L(I)<L2
	16.6	IF L(I)>L2

INLET AT BASIN X

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	3.9	0.016	0.02	0.02

d= 0.21 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	8.6	0.016	0.02	0.02

d= 0.28 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	3.9	0.02	0.02

T=	10.55	
F(w)=	1.73	
L1=	14.05	
L2=	8.44	
L3=	30.11	
Try L(I)=	10	ft
Q(I)=	0	IF L(I)<L2
	2.5	IF L(I)>L2
Q(by)=	3.9	IF L(I)<L2
	1.4	IF L(I)>L2

100 YEAR	Q	S(X)	S(O)
	8.6	0.02	0.02

T=	14.19	
F(w)=	1.83	
L1=	20	
L2=	12.01	
L3=	42.85	
Try L(I)=	10	ft
Q(I)=	4.3	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	4.3	IF L(I)<L2
	8.6	IF L(I)>L2

INLET AT BASIN XII

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	3.2	0.016	0.02	0.013

d= 0.21 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	7.7	0.016	0.02	0.013

d= 0.3 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	3.2	0.02	0.013

T=	10.62	
F(w)=	1.39	
L1=	11.37	
L2=	6.83	
L3=	24.36	
Try L(l)=	10	ft
Q(l)=	0	IF L(l)<L2
	2.2	IF L(l)>L2
Q(by)=	3.2	IF L(l)<L2
	1	IF L(l)>L2

100 YEAR	Q	S(X)	S(O)
	7.7	0.02	0.013

T=	14.76	
F(w)=	1.49	
L1=	16.93	
L2=	10.17	
L3=	36.29	
Try L(l)=	10	ft
Q(l)=	4.5	IF L(l)<L2
	0	IF L(l)>L2
Q(by)=	3.2	IF L(l)<L2
	7.7	IF L(l)>L2

INLET AT BASIN XIII

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

	Q(cfs)	n	S(X)	S(O)
5 YEAR	11.4	0.016	0.02	0.02

d= 0.32 ft

	Q(cfs)	n	S(X)	S(O)
100 YEAR	29.5	0.016	0.02	0.02

d= 0.45 ft

Basin XII Flow by: 1.0 | Basin IX Flow by: 3.1 | XIII: 7.3 = 11.4

3.2 | 10.4 | 15.9 = 29.5

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	11.4	10	3

d= 0.39 ft

	Q	L(l)	w
100 YEAR	29.5	10	3

d= 0.82 ft

INLET AT BASIN XIV

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	2.7	0.016	0.02	0.02

d= 0.18 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	6.1	0.016	0.02	0.02

d= 0.25 ft

DEPTH AT SUMP INLET

	Q	L(I)	w
5 YEAR	2.7	4	3

d= 0.13 ft

	Q	L(I)	w
100 YEAR	6.1	4	3

d= 0.34 ft

INLET AT BASIN XV

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

Basin X Flow by

5 YEAR

Q(cfs)	n	S(X)	S(O)
3.9	0.016	0.02	0.02

d= 0.21 ft

5yr 2.5 + 1.4 = 3.9

100 YEAR

Q(cfs)	n	S(X)	S(O)
9.9	0.016	0.02	0.02

d= 0.3 ft

100yr 5.6 + 4.3 = 9.9

AT GRADE INLET

5 YEAR

Q	S(X)	S(O)
3.9	0.02	0.02

T=	10.55
F(w)=	1.73
L1=	14.05
L2=	8.44
L3=	30.11
Try L(I)=	8 ft
Q(I)=	2.2 IF L(I)<L2 0 IF L(I)>L2
Q(by)=	1.7 IF L(I)<L2 3.9 IF L(I)>L2

100 YEAR

Q	S(X)	S(O)
9.9	0.02	0.02

T=	14.96
F(w)=	1.85
L1=	21.31
L2=	12.8
L3=	45.67
Try L(I)=	8 ft
Q(I)=	3.7 IF L(I)<L2 0 IF L(I)>L2
Q(by)=	6.2 IF L(I)<L2 9.9 IF L(I)>L2

INLET AT BASIN XVI

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	5.7	0.016	0.02	0.02

d= 0.24 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	12.6	0.016	0.02	0.02

d= 0.33 ft

AT GRADE INLET

5 YEAR	Q	S(X)	S(O)
	5.7	0.02	0.02

T=	12.16	
F(w)=	1.78	
L1=	16.67	
L2=	10.01	
L3=	35.71	
Try L(I)=	8	ft
Q(I)=	2.7	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	3	IF L(I)<L2
	5.7	IF L(I)>L2

100 YEAR	Q	S(X)	S(O)
	12.6	0.02	0.02

T=	16.37	
F(w)=	1.88	
L1=	23.7	
L2=	14.23	
L3=	50.78	
Try L(I)=	8	ft
Q(I)=	4.3	IF L(I)<L2
	0	IF L(I)>L2
Q(by)=	8.3	IF L(I)<L2
	12.6	IF L(I)>L2

INLET AT BASIN XVIII

HIGH MEADOW AT SPRINGS RANCH MDDP
01-004
7/23/01

APPROACH GUTTER DEPTH

Q(cfs)	n	S(X)	S(O)
27.1	0.016	0.02	0.01

d= 0.5 ft

AT GRADE INLET

Q	S(X)	S(O)
27.1	0.02	0.01

T= 24.84

F(w)= 1.44

L1= 27.54

L2= 16.54

L3= 59.02

Try L(I)= 12 ft

Q(I)= 11.8 IF L(I)<L2
FALSE IF L(I)>L2

Q(by)= 15.3 IF L(I)<L2
27.1 IF L(I)>L2

INLET AT BASIN XIX

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

	Q(cfs)	n	S(X)	S(O)
5 YEAR	7.8	0.016	0.02	0.02

d= 0.27 ft

	Q(cfs)	n	S(X)	S(O)
100 YEAR	18.8	0.016	0.02	0.02

d= 0.38 ft

Basin XVI Flowby 3.0 + XIX 4.8 = 7.8

8.3 + 10.5 = 18.8

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	7.8	8	3

d= 0.31 ft

	Q	L(l)	w
100 YEAR	18.8	8	3

d= 0.65 ft

INLET AT BASIN XX

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

	Q(cfs)	n	S(X)	S(O)
5 YEAR	7.6	0.016	0.02	0.02

d= 0.27 ft

	Q(cfs)	n	S(X)	S(O)
100 YEAR	19.3	0.016	0.02	0.02

d= 0.38 ft

Basin XV Flow by XX

1.7 + 5.9 = 7.6

6.2 + 13.1 = 19.3

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	7.6	8	3

d= 0.3 ft

	Q	L(l)	w
100 YEAR	19.3	8	3

d= 0.66 ft

INLET AT BASIN XXI

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

	Q(cfs)	n	S(X)	S(O)
5 YEAR	7.1	0.016	0.02	0.02

d= 0.26 ft

	Q(cfs)	n	S(X)	S(O)
100 YEAR	16.4	0.016	0.02	0.02

d= 0.36 ft

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	7.1	6	3

d= 0.33 ft

	Q	L(l)	w
100 YEAR	16.4	6	3

d= 0.66 ft

INLET AT BASIN XXII

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	4.9	0.016	0.02	0.02

d= 0.23 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	10.7	0.016	0.02	0.02

d= 0.31 ft

DEPTH AT SUMP INLET

	Q	L(I)	w
5 YEAR	4.9	10	3

d= 0.15 ft

	Q	L(I)	w
100 YEAR	10.7	10	3

d= 0.37 ft

INLET AT BASIN XXV

GATEWAY VISTA MDDP
99-069
11/28/01

APPROACH GUTTER DEPTH

5 YEAR	Q(cfs)	n	S(X)	S(O)
	6.1	0.016	0.02	0.02

d= 0.25 ft

100 YEAR	Q(cfs)	n	S(X)	S(O)
	12.5	0.016	0.02	0.02

d= 0.33 ft

DEPTH AT SUMP INLET

	Q	L(l)	w
5 YEAR	6.1	4	3

d= 0.34 ft

	Q	L(l)	w
100 YEAR	12.5	4	3

d= 0.63 ft

There will be 2 - 4' Inlets in this Basin

INLET AT BASIN XXVII

HIGH MEADOW AT SPRINGS RANCH MDDP
01-004
7/23/01

APPROACH GUTTER DEPTH

Q(cfs)	n	S(X)	S(O)
8.8	0.016	0.02	0.01

d= 0.33 ft

AT GRADE INLET

Q	S(X)	S(O)
8.8	0.02	0.01

T= 16.3

F(w)= 1.33

L1= 16.69

L2= 10.03

L3= 35.77

Try L(I)= 8 ft

Q(I)= 4.2 IF L(I)<L2
FALSE IF L(I)>L2

Q(by)= 4.6 IF L(I)<L2
8.8 IF L(I)>L2

INLET AT BASIN XXXV

HIGH MEADOW AT SPRINGS RANCH MDDP
01-004
7/23/01

APPROACH GUTTER DEPTH

Q(cfs)	n	S(X)	S(O)
7.6	0.016	0.02	0.04

d= 0.24 ft

AT GRADE INLET

Q	S(X)	S(O)
7.6	0.02	0.04

T= 11.89

F(w)= 2.5

L1= 22.89

L2= 13.75

L3= 49.05

Try L(I)= 6 ft

Q(I)= 2 IF L(I)<L2
FALSE IF L(I)>L2

Q(by)= 5.6 IF L(I)<L2
7.6 IF L(I)>L2

INLET AT BASIN XXXVI

HIGH MEADOW AT SPRINGS RANCH MDDP
01-004
7/23/01

APPROACH GUTTER DEPTH

Q(cfs)	n	S(X)	S(O)
13.4	0.016	0.02	0.03

d= 0.31 ft

AT GRADE INLET

Q	S(X)	S(O)
13.4	0.02	0.03

T= 15.53

F(w)= 2.28

L1= 27.27

L2= 16.37

L3= 58.42

Try L(I)= 10 ft

Q(I)= 4.9 IF L(I)<L2
FALSE IF L(I)>L2

Q(by)= 8.5 IF L(I)<L2
13.4 IF L(I)>L2

INLET AT BASIN XXXVII

HIGH MEADOW AT SPRINGS RANCH MDDP
01-004
7/23/01

APPROACH GUTTER DEPTH

Q(cfs)	n	S(X)	S(O)
35.2	0.016	0.02	0.03

d= 0.45 ft

AT GRADE INLET

Q	S(X)	S(O)
35.2	0.02	0.03

T= 22.3

F(w)= 2.44

L1= 41.9

L2= 25.16

L3= 89.78

Try L(I)= 8 ft

Q(I)= 6.7 IF L(I)<L2
FALSE IF L(I)>L2

Q(by)= 28.5 IF L(I)<L2
35.2 IF L(I)>L2