PUBLIC WORKS/HYDROLOGY
L11/D15A

0000 0000 1225

L11/D15A

25×10 32×10

0000 0000 1226

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 29, 1994

Larry L. Parker, P.E.
Galloway, Romero & Assoc.
14202 East Evans Avenue
Aurora, Colorado 80014

RE: ENGINEER'S CERTIFICATION FOR DIAMOND SHAMROCK TRACT B (L-11/D15A)
RECEIVED AUGUST 17, 1994 FOR CERTIFICATE OF OCCUPANCY APPROVAL
ENGINEER'S STAMP DATED 7-19-94

Dear Mr. Parker:

Based on the information included in the submittal referenced above, City Hydrology releases a Permanent Certificate of Occupancy for this project.

If I can be of further assistance, you may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Andrew Garcia

WPHYD/7905/jpc

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

25×10 32×10

0000 0000 1227

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DIAMOND SHAMROCK ZONE ATLAS/DRNG. FILE #: L-11/2015A

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: SEE ATTACHED

CITY ADDRESS: 1100 COORS BLVD SW

ENGINEERING FIRM: GALLOWAY ROMERO & ASSOC CONTACT: LARRY L. PARKER
ADDRESS: 14202 E. EVANS AVE AURORA CO 80014 PHONE: (303) 745-7448

OWNER: DIAMOND SHAMROCK CONTACT: JIM REED
ADDRESS: 9702 BROCKBANK DALLAS TX 75220 PHONE: (214) 357-7386

ARCHITECT: GALLOWAY ROMERO & ASSOC CONTACT: LARRY L. PARKER
ADDRESS: 14202 E. EVANS AVE. AURORA CO 80014 PHONE: (303) 745-7448

SURVEYOR: SOUTHWEST SURVEYING CO CONTACT: FRANK WILSON
ADDRESS: 333 LOMAS BLVD NE ALBUQUERQUE NM PHONE: (505) 247-4444

CONTRACTOR: NUCKOLLS CONSTRUCTION CONTACT: DEAN JOHN
ADDRESS: 1705 W. KOENIG LANE AUSTIN TX 78756 PHONE: (512) 453-0313

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
✓ ENGINEER'S CERTIFICATION
____ OTHER

PRE-DESIGN MEETING:

____ YES
____ NO
____ COPY PROVIDED

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
NO. 4859
RAFAEL E. ROMERO

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
✓ CERTIFICATE OF OCCUPANCY APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ S.A.D. DRAINAGE REPORT
____ DRAINAGE REQUIREMENTS
____ OTHER _____ (SPECIFY)

DATE SUBMITTED: JULY 19, 94

BY: _____

AUG 17 1994

25×10 32×10

0000 0000 1228

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 26, 1994

Larry L. Parker, PLS
Galloway, Romero & Assoc.
14202 East Evans Avenue
Aurora, Colorado 80014

RE: ENGINEER'S CERTIFICATION FOR DIAMOND SHAMROCK TRACT B (L-11/D15A)
RECEIVED JULY 25, 1994 FOR CERTIFICATE OF OCCUPANCY APPROVAL
ENGINEER'S STAMP DATED 7-19-94

Dear Mr. Parker:

Based on the information included in the submittal referenced above, City Hydrology releases a Temporary Certificate of Occupancy for this project.

The following comments must be addressed before City Hydrology will accept the Engineer's Certification and approve a Permanent Certificate of Occupancy:

1. All modifications (both Building Permit & Work Order) to the Plan must be noted on the Plan.

2. The Certification must be signed with a black pen. Blue ink does not reproduce.

If you have any questions about this project, you may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Andrew Garcia

WPHYD/7905/jpc

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

25×10 32×10

0000 0000 1229

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DIAMOND SHAMROCK ZONE ATLAS/DRNG. FILE #: L-11

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: SEE ATTACHED

CITY ADDRESS: 1100 COORS BLVD SW

ENGINEERING FIRM: GALLOWAY ROMERO & ASSOC CONTACT: LARRY L. PARKER
ADDRESS: 14202 E. EVANS AVE AURORA CO 80014 PHONE: (303) 745-7448

OWNER: DIAMOND SHAMROCK CONTACT: JIM REED
ADDRESS: 9702 BROCKBANK DALLAS TX 75220 PHONE: (214) 357-7386

ARCHITECT: GALLOWAY ROMERO & ASSOC CONTACT: LARRY L. PARKER
ADDRESS: 14202 E. EVANS AVE. AURORA CO 80014 PHONE: (303) 745-7448

SURVEYOR: SOUTHWEST SURVEYING CO CONTACT: FRANK WILSON
ADDRESS: 333 LOMAS BLVD NE ALBUQUERQUE NM PHONE: (505) 247-4444

CONTRACTOR: NUCKOLLS CONSTRUCTION CONTACT: DEAN JOHN
ADDRESS: 1705 W. KOENIG LANE AUSTIN TX 78756 PHONE: (512) 453-0313

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
✓ ENGINEER'S CERTIFICATION
___ OTHER

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D. APPROVAL
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
✓ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
___ OTHER _____ (SPECIFY)

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
NO. 4859
RAFAEL E. ROMERO

RECEIVED
JUL 25 1994
HYDROLOGY

DATE SUBMITTED: JULY 1994

BY: _____

25×10 32×10

0000 0000 1230

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 9, 1993

Larry Parker, PLS
Galloway, Romero & Assoc.
14202 East Evans Avenue
Aurora, Colorado 80014

RE: DRAINAGE REPORT FOR DIAMOND SHAMROCK TRACT B (L-11/D15A)
RECEIVED JULY 27, 1993 FOR BUILDING PERMIT APPROVAL
ENGINEER'S STAMP DATED 7-26-93

Dear Mr. Parker:

Based on the information included in the submittal referenced above, City Hydrology APPROVES this project for Building Permit.

Include a copy of the Grading Plan in the set of construction documents submitted to the "One Stop" for the Building Permit.

A Topsoil Disturbance Permit must be approved by the Environmental Health Division prior to construction.

Engineer's Certification of grades per DPM checklist must be approved before the Financial Guaranty will be released.

If you have any questions about this project, you may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

xc: Alan Martinez

WPHYD+7905;jpc

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E.
Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

25×10 32×10

0000 0000 1231

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DIAMOND SHAMROCK Inst B ZONE ATLAS/DRNG. FILE #: L-11/D15A

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: SEE ATTACHED

CITY ADDRESS: 3020 COORS BLVD SW

ENGINEERING FIRM: GALLOWAY ROMERO & ASSOC CONTACT: LARRY PARKER
14202 E. EVANS AVE
ADDRESS: AURORA CO 80014 PHONE: (303) 745-7448

OWNER: DIAMOND SHAMROCK CONTACT: JIM REED
9702 BROCKBANK
ADDRESS: DALLAS TX 75220 PHONE: (214) 357-7386

ARCHITECT: GALLOWAY ROMERO & ASSOC CONTACT: LARRY PARKER
14202 E. EVANS AVE
ADDRESS: AURORA CO 80014 PHONE: (303) 745-7448

SURVEYOR: SOUTHWEST SURVEYING CO CONTACT: FRANK WILSON

ADDRESS: 333 LOMAS BLVD NE PHONE: (505) 247-4444

CONTRACTOR: NOT SELECTED CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- X DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER

PRE-DESIGN MEETING:

- ___ YES
- X NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D. APPROVAL
- ___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- X BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY APPROVAL
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ S.A.D. DRAINAGE REPORT
- ___ DRAINAGE REQUIREMENTS
- ___ OTHER _____ (SPECIFY)

JUL 27

REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO NO. 4412 C. D. GALLOWAY

DATE SUBMITTED: 7-26-93

BY: C. D. Galloway

7905

25×10 32×10

0000 0000 1232

LEGAL DESCRIPTION

A CERTAIN TRACT OF LAND SITUATE WITHIN SECTION 26, T.10 N., R.2 E., N.M.P.M. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID TRACT HEREIN DESCRIBED BEING A POINT ON THE INTERSECTION OF THE SOUTH RIGHT OF WAY LINE OF BRIDGE BOULEVARD S.W. AND THE EAST RIGHT OF WAY LINE OF COORS BOULEVARD, S.W.; THENCE FROM SAID POINT OF BEGINNING S. 87°31'43" E. ALONG, ADJOINING AND ADJACENT TO SAID SOUTH RIGHT OF WAY LINE OF BRIDGE BOULEVARD S.W. 171.44 FEET TO THE NORTHEAST CORNER OF SAID TRACT HEREIN DESCRIBED; THENCE ALONG, ADJOINING AND ADJACENT TO THE PROPERTY RETAINED BY THE SELLER S. 17°37'27" W., LEAVING SAID SOUTH RIGHT OF WAY LINE 174.30 FEET TO THE SOUTHEAST CORNER OF SAID TRACT HEREIN DESCRIBED; THENCE N. 87°31'43" W., 209.70 FEET TO THE SOUTHWEST CORNER OF SAID TRACT HEREIN DESCRIBED, BEING A POINT ON THE EAST RIGHT OF WAY LINE OF COORS BOULEVARD S.W.; THENCE N. 17°37'27" E., ALONG, ADJOINING AND ADJACENT TO SAID EAST RIGHT OF WAYLINE 136.04 FEET TO A POINT OF CURVATURE; THENCE, CONTINUING ALONG, ADJOINING AND ADJACENT TO SAID EAST RIGHT OF WAY LINE ALONG A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 74°50'50", HAVING A RADIUS OF 50.00 FEET, AND AN ARC LENGHT OF 65.32 FEET (CHORD = N. 55° 02'52" E., 60.77 FEET) TO THE POINT OF BEGINNING OF SAID TRACT HEREIN DESCRIBED AND CONTAINING AN AREA OF 0.8035 ACRES, MORE OR LESS, (35,000.01 SQUARE FEET, MORE OR LESS). LEGAL DESCRIPTION PREPARED BY FRANKLIN E. WILSON, N.M.P.S. 6446.

25×10 32×10

0000 0000 1233

L-11-7
LANDS OF
HENNEY
DRAMBEGGER
SAN MATEO
GRANT
AVENUE
ATWOOD
GRANT
AVENUE
MAIN
STREET
GRANT
AVENUE
LANDS OF
MAIN
STREET
GRANT
AVENUE
GRANT
AVENUE
GRANT
AVENUE

0000 0000 1234

FINAL DRAINAGE REPORT
BRIDGE & COORS CORNERSTORE
BRIDGE BOULEVARD S.W. & COORS BOULEVARD S.W.
CITY OF ALBUQUERQUE, NEW MEXICO
MAY 1993
REVISED JULY 1993

Prepared For:

Diamond Shamrock Inc.
9702 Brockbank
Dallas, TX 75220
(214) 357-7386
Attn: Jim Reed

Prepared By:

Galloway, Romero & Associates, Inc.
14202 E. Evans Ave.
Aurora, CO 80014
(303) 745-7448
Attn: Larry L. Parker

RECEIVED
JUL 27 1993
HYDROLOGY DIVISION

REGISTERED PROFESSIONAL ENGINEER
STATE OF
No. 4412
NEW MEXICO
C. D. GALLOWAY
7/26/93

25×10 32×10

0000 0000 1235

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10 Year Developed	A.6
100 Year Developed	A.7
Swale, pipe and sidewalk culvert capacities	A.8
Grading and Developed Drainage Plan	Back pocket of this report

25× 32×

Introduction

The report is being prepared for Diamond Shamrock, Inc., the developer of the site, to fulfill the drainage requirements of the City of Albuquerque, New Mexico. The report analyzes onsite runoff from the minor (10 year frequency) and major (100 year frequency) storms and routes these flows through the site.

The 0.8035 acre site is part of Section 26, Township 10 North, Range 2 East of the New Mexico Principal Meridian, Bernalillo County, New Mexico. The site is bounded by Coors Boulevard S.W. on the west, by Bridge Boulevard S.W. on the north and by undeveloped, commercially zoned property on the east and south. Currently the site, and other land, is being replatted and will be annexed by the City of Albuquerque. The existing site is vacant and covered with native grasses and weeds. The site slopes downward from southwest to northeast at slopes ranging from 2 to 8 percent.

Design Criteria

This report was prepared using criteria as outlined in the City of Albuquerque's Development Process Manual, Chapter 22, "Drainage, Flood Control and Erosion Control." Runoff for the minor and major storms, 10 and 100 year frequency, respectively, was calculated using the rational method. Times of concentration, upland method, was calculated for the individual basins. Because the hydraulic lengths are short, all times were small and a minimum time of 10 minutes was used. Rainfall intensity values were taken from the 6-hour/100 year frequency chart and were adjusted by the appropriate factors for storm reduction and dimensionless rainfall.

Runoff calculations and applicable charts and graphs are included in the appendix of this report.

Developed Drainage

General Concept

A drainage management plan was prepared for the overall subdivision, of which the Diamond Shamrock site is a part, by Brasher Engineering, Inc., in March 1993. That plan established general drainage criteria to support the development of all tracts within the subdivision. The grading and drainage for the Diamond Shamrock site is consistent with this Drainage Management Plan.

The Flood Rate Insurance Map, Community Panel Number 350002 0033 shows the site as lying within a 100 year flood hazard zone. [redacted] At the writing of this report, FEMA has not yet revised its mapping to reflect current conditions.

A 10.6 acre feet regional detention pond, adjacent to the Arenal Canal, accepts runoff from the subdivision. Due to the closeness of this pond, onsite ponding is not provided.

25× 32×

Specific Details - Without Car Wash

The site is divided into three drainage basins, A through C. Basin A is a 0.053 acre basin, along the southerly portion of the site, that consists of landscaping and paving. The 10 and 100 year flow of 0.08 and 0.11 cfs, respectively, flows southerly and exits the site. A property line swale conveys these flows, as well as historic/proposed flows from the south, easterly and ultimately to the regional detention pond.

Basin B is a 0.600 acre basin that consists of landscaping, paving and roof areas. The 10 and 100 year runoff of 1.75 and 2.66 cfs, respectively, exits the site through the Bridge Boulevard curb cut.

Basin C is a 0.150 acre basin, along the easterly portion of the site that is entirely landscaped. The 10 and 100 year runoff of 0.16 and 0.24 cfs, respectively, flows to a swale along the easterly property line and then discharges into Bridge Boulevard through a 6 inch ductile iron pipe and a sidewalk culvert. The swale keeps runoff from flowing easterly onto the adjoining site and conforms with the drainage patterns established in the "Drainage Management Plan" by Brasher Engineering, Inc.

The total 100 year runoff of 3.02 cfs from the entire site is less than the 3.3 cfs estimated in the Brasher Engineering Report.

Specific Details - With Future Car Wash

The addition of the future car wash only affects basins B and C. Basin B increases from 0.600 acres to 0.618 acres. The 10 and 100 year runoff of 1.81 and 2.74 cfs, respectively, exits the site through the Bridge Boulevard curb cut.

Basin C has the largest drainage impact by the addition of the car wash. The basins area decreases but the addition of the building and associated drives increases the basins imperviousness. The 10 and 100 year runoff of 0.21 and 0.32 cfs, respectively, flows to the swale and into Bridge Boulevard through the 6 inch ductile iron pipe and the sidewalk culvert. The swale, outfall pipe and sidewalk culvert was sized using the 100 year flow from basin C with the car wash addition.

The total 100 year runoff of 3.18 cfs from the entire site is less than the 3.3 cfs estimated in the Brasher Engineering Report.

Conclusions

The drainage report and accompanying plan have been prepared under the criteria set forth in the City of Albuquerque's Development Process Manual's Chapter of "Drainage, Flood Control and Erosion Control." The grading and drainage is also consistent with the criteria and patterns established in the "Drainage Management Plan" by Brasher Engineering, Inc. Runoff from the minor and major storms are safely routed through the site.

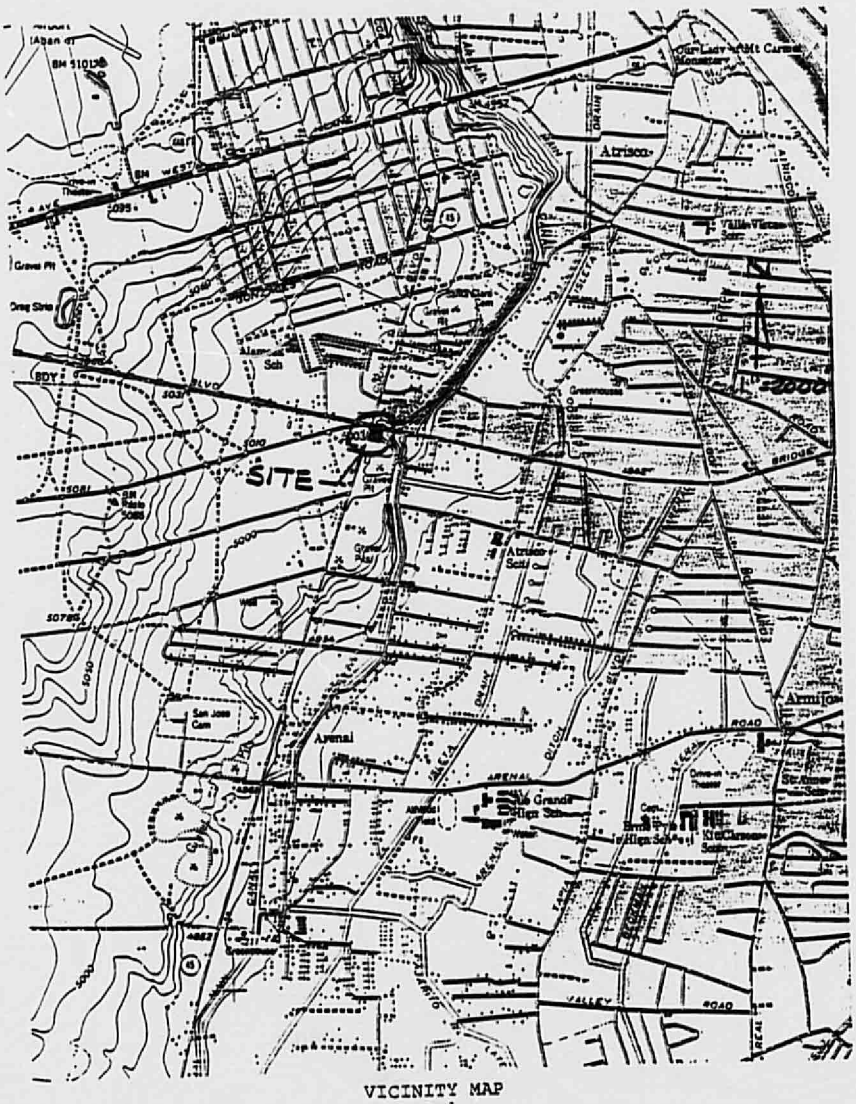
25×10 32×10

0000 0000 1238

APPENDIX A

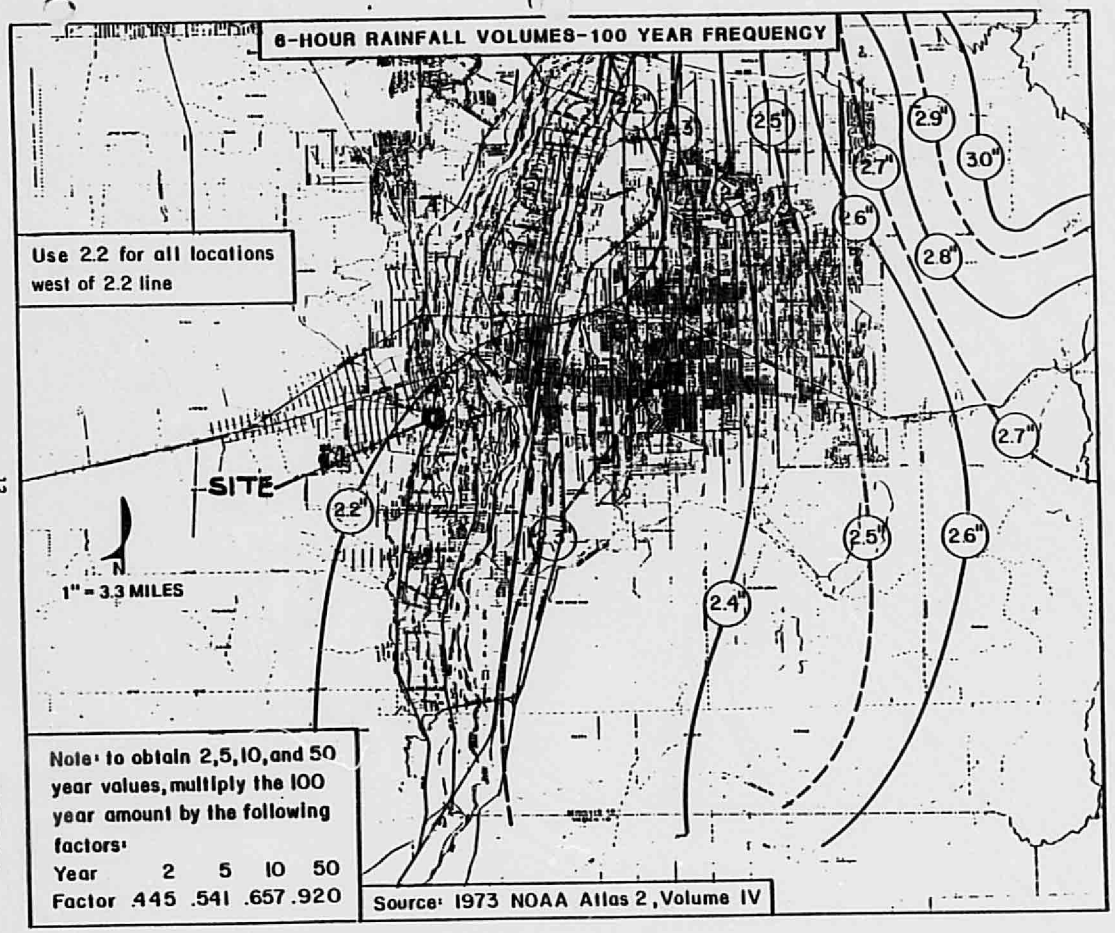
25×10 32×10

0000 0000 1239



VICINITY MAP
A-1

25×10 32×10



4-82

13

PLATE 22.2 D-1

A.2

22.2

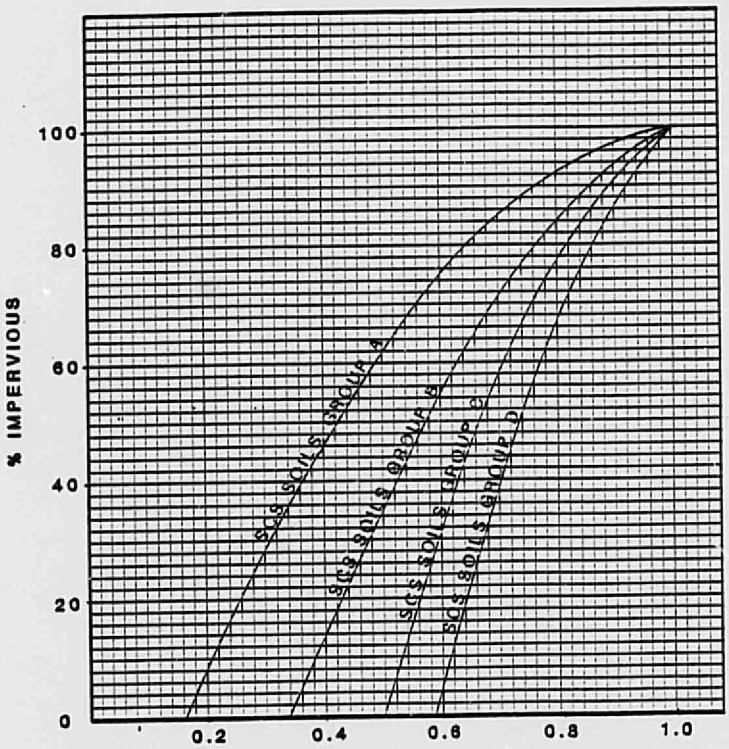
25×

32×

0000 0000 1241

DRAINAGE CRITERIA

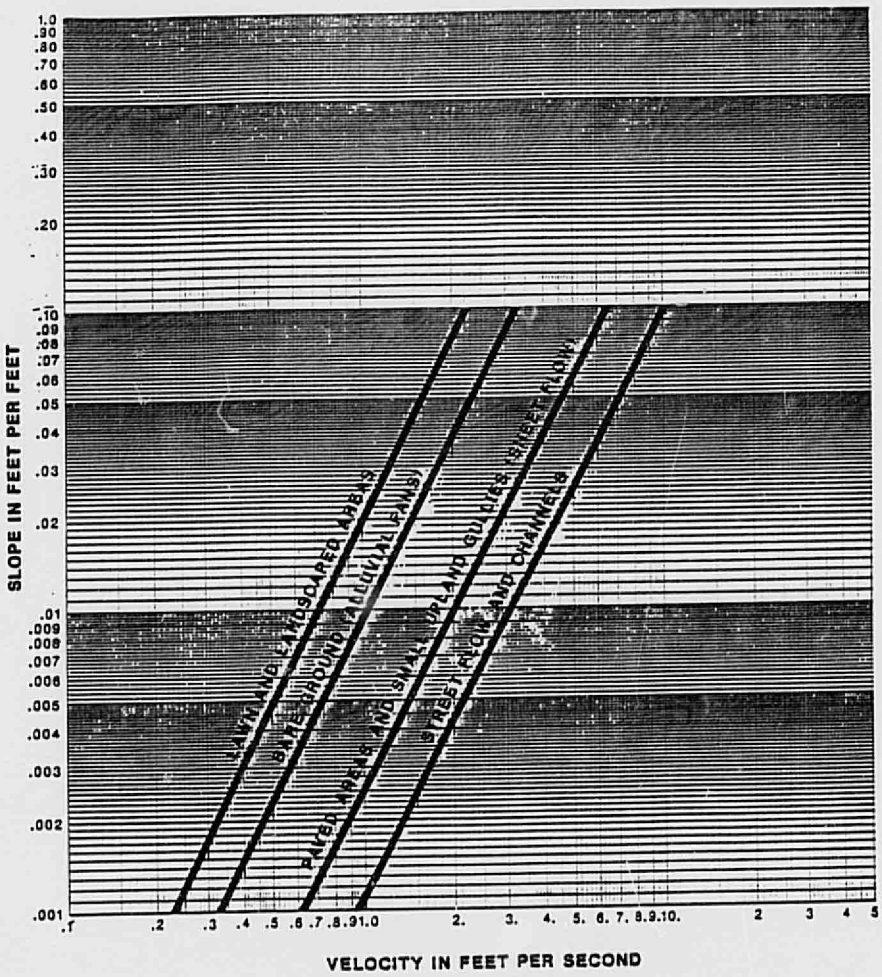
DETERMINATION OF RATIONAL FORMULA 'C' FACTOR



'C' FACTOR

25×10 32×10

0000 0000 1242



VELOCITIES FOR UPLAND METHOD OF ESTIMATING Tc

Plate 22.2 B-1

5/88

REF. SCS NEH-4

25×10 32×10

0000 0000 1243

PERCENT IMPERVIOUS FOR Zone 1 DEVELOPED BASINS

WITHOUT CAR WASH

BASIN	TOTAL AREA SF	PERVIOUS AREA SF	IMPERVIOUS AREA SF	PERCENT IMPERVIOUS	C FACTOR
A	2317	1726 .43	591 .93	25.5	0.56 0.45
B	26148	1070	25078	95.9	0.91 0.93
C	6535	6535	—	0.0	0.43 0.34

WITH CAR WASH

BASIN	TOTAL AREA SF	PERVIOUS AREA SF	IMPERVIOUS AREA SF	PERCENT IMPERVIOUS	C FACTOR
A	2317	1726	591	25.5	0.45
B	26898	1225	25673	95.5	0.93
C	5785	3668	2117	36.6	0.51

25×10 32×10

PROJECT DIAMOND SHAMROCK
LOCATION CORES & BRIDGE
DESIGN STORM 10 YR RECURRENCE INTERVAL
HISTORIC ☐ DEVELOPED ☒
COMPUTATIONS BY LLP DATE JULY 93
REVISED BY _____ DATE _____

RUNOFF COMPUTATIONS
(RATIONAL METHOD)

Galloway, Romero & Associates
Design Engineering Planning
14202 East Evans Avenue
Aurora, Colorado 80014
Tel. (303) 745-7448
Fax. (303) 745-7480

DESIGN POINT	AREA DESIGNATION	A (ACRES)	C	A • C	ΣA • C	TC (MIN)	I (IN/HR)	Q=(ΣA • C)=I CFS	SLOPE %	LENGTH L (FEET)	VEL V FPS	ΔT (MIN)	REMARKS
	10 Year WITHOUT CAR WASH												
													USE Tc = 10.0 MIN
													I = 2.16 (0.657) 2.21
													I = 3.14
	A	0.053	.56 0.45	0.024		10.0	3.14 ~~4.70~~ 3.14	0.09 ~~0.14~~ 0.08					
	B	0.600	.91 0.93	0.558		10.0	3.14 ~~4.70~~ 3.14	1.71 ~~2.57~~ 1.75					
	C	0.150	.43 0.34	0.051		10.0	~~4.70~~ 3.14	0.20 ~~0.24~~ 0.16					
	ΣA-C				0.633	10.0	~~4.70~~ 3.14	2.00 ~~2.97~~ 1.99					ENTIRE SITE

SHEET 1 OF 1

10 YEAR DEVELOPED WITHOUT CAR WASH

25 X ☐

32 X ☐

0000 0000 1249

PROJECT DIAMOND SHAMROCK
LOCATION COORS & BRIDGE
DESIGN STORM 100 YR RECURRENCE INTERVAL
HISTORIC ☐ DEVELOPED ☑
COMPUTATIONS BY LLP DATE JULY 93
REVISED BY _____ DATE _____

RUNOFF COMPUTATIONS
(RATIONAL METHOD)

Galloway, Romero & Associates
Design Engineering Planning
14202 East Evans Avenue
Aurora, Colorado 80014
Tel. (303) 745-7448
Fax. (303) 745-7480

DESIGN POINT	AREA DESIGNATION	A (ACRES)	C	A • C	ΣA • C	TC (MIN)	I (IN/HR)	Q= (ΣA • C)=I CFS	SLOPE %	LENGTH L (FEET)	VEL V FPS	ΔT (MIN)	REMARKS
				WITHOUT CARWASH									
													USE T_c = 10.0 MIN
													I = 2.16(2.21) = 4.77
	A	0.053	0.45	0.024		10.0	4.70 4.77	0.14 0.11					
	B	0.600	0.93	0.558		10.0	4.70 4.77	2.57 2.66					
	C	0.150	0.34	0.051		10.0	4.70 4.77	0.26 0.24					
	ΣA-C				0.633	10.0	4.70 4.77	2.97 3.02					

100 YEAR DEVELOPED

SHEET 1 of 1

25X ☐ 32X ☐

PROJECT DIAMOND SHAMROCK
LOCATION COORS & BRIDGE
DESIGN STORM 10 YR RECURRENCE INTERVAL
HISTORIC ☐ DEVELOPED ☑
COMPUTATIONS BY LLP DATE JULY 93
REVISED BY _____ DATE _____

RUNOFF COMPUTATIONS
(RATIONAL METHOD)

Galloway, Romero & Associates
Design Engineering Planning
14202 East Evans Avenue
Aurora, Colorado 80014
Tel. (303) 745-7448
Fax. (303) 745-7480

DESIGN POINT	AREA DESIGNATION	A (ACRES)	C	A • C	ΣA • C	TC (MIN)	I (IN/HR)	Q= (ΣA • C)=I CFS	SLOPE %	LENGTH L (FEET)	VEL V FPS	ΔT (MIN)	REMARKS
				WITH	FUTURE	E	CAR	WASH					
													USE T=10.0 MIN
													I=216 (0.657) 2.21
													I=3.14
	A	0.053	0.45	0.024		10.0	3.14	0.08					
	B	0.618	0.93	0.575		10.0	3.14	1.81					
	C	0.132	0.51	0.067		10.0	3.14	0.21					
	ΣA-C				0.6606	10.0	3.14	2.09					

10 YEAR DEVELOPED
WITH [illegible]

SHEET [illegible]

25 X ☐

32 X ☐

0000 0000 1248

PROJECT DIAMOND SHAMROCK
LOCATION COORS & BRIDGE
DESIGN STORM 100 YR RECURRENCE INTERVAL
HISTORIC ☐ DEVELOPED ☑
COMPUTATIONS BY LLP DATE JULY 93
REVISED BY _____ DATE _____

RUNOFF COMPUTATIONS
(RATIONAL METHOD)

Galloway, Romero & Associates
Design Engineering Planning
14202 East Evans Avenue
Aurora, Colorado 80014
Tel. (303) 745-7448
Fax. (303) 745-7480

DESIGN POINT	AREA DESIGNATION	A (ACRES)	C	A • C	ΣA • C	TC (MIN)	I (IN/HR)	Q= (ΣA • C)=I CFS	SLOPE %	LENGTH L (FEET)	VEL V FPS	ΔT (MIN)	REMARKS
				WITH	FUTURE		CAR	WASH					
													USE T_c = 10 MIN
													I=2.16(2.21)= 4.77
	A	0.053	0.45	0.024		10.0	4.77	0.11					
	B	0.618	0.93	0.575		10.0	4.77	2.74					
	C	0.132	0.51	0.067		10.0	4.77	0.32					
	ΣA-C				0.666	10.0	4.77	3.18					

100 YEAR DEVELOPED

SHEET 7.1

25 × 10

32 × 10

0000 0000 1297

0000 0000 1248

SWALE, PIPE & SIDEWALK CULVERT CAPACITIES

USE MANNINGS EQUATION

SWALE

$Q_{100} = 0.32$ CFS $n_{GRASS} = 0.035$ $S = 3.06\%$

$d = 0.25'$
$A = 0.1875$ FT^2
$W_P = 1.5811$ FT

$$Q = 1.486/0.035\,(0.1875)\left(\frac{0.1875}{1.5811}\right)^{2/3} 0.0306^{1/2}$$

$Q = 0.34$ CFS

PIPE (FLOWING FULL)

6" DI @ 0.80% $n = 0.013$

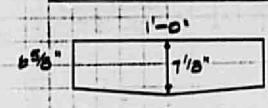
$A = 0.1963$ FT^2 $W_P = 1.5708$ FT

$$Q = 1.486/0.013\,(0.1963)\left(\frac{0.1963}{1.5708}\right)^{2/3} 0.008^{1/2}$$

$Q = 0.50$ CFS > 0.32 CFS OK

$Q = .60\,(.196)\sqrt{2(32.2)(.75)}$
$= 0.82$ cfs
$= .60\,(.196)\sqrt{2(32.2)(.25)}$
$= 0.47$ cfs

SIDEWALK CULVERT (FLOWING FULL)



$n = 0.017$ $S = 2.08\%$

$A = 0.5729$ FT^2 $W_P = 2.1076$ FT

$$Q = 1.486/0.017\,(0.5729)\left(\frac{0.5729}{2.1076}\right)^{2/3} 0.0208^{1/2}$$

$Q = 3.03$ CFS > 0.32 CFS OK.

$Q = 2.65\,(1.0)\,(.55)^{3/2} = 1.08$ cfs

25×10 32×10

0000 0000 1249

PLANS/PLATS ON FILE

FILE DESC: LII/DISA

PLANS/PLATS 1

25×10 32×10

0000 0000 1250