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

February 1, 2001

Guy Jackson, P.E.
BPLW
6200 Uptown Blvd NE
Albuquerque, NM 87110

RE: **Grading and Drainage Certification**
Office Bldg. for BF Goodrich/Cinco Bisco
(E-17/D016E) (Jefferson Plaza, East of Jefferson St., S. Of Osuna)
Engineer's Stamp dated 2/23/2000 and 4/17/2000
Engineers Certification dated 2/1/2001

Dear Mr. Jackson:

Based upon the information provided in your Engineers Certification submittal dated 2/1/2001, the above referenced site is approved for Permanent Certificate of Occupancy.

If I can be of further assistance, please contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Senior Civil Engineer, PWD

C: Vickie Chavez, COA
Teresa Martin,COA
file

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

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

May 5, 2000

Guy Jackson, PE
BPLW
6200 Uptown Blvd, Ste 400
Albuquerque, NM 87110

Re: BF Goodrich Drainage Report
Engineer's Stamp dated 2-23-00 & 4-17-00 (E17/D16E)

Dear Mr. Jackson,

Based upon the information provided in your resubmittal dated 4-27-00, the above referenced site is approved for Building Permit. A Grading Permit is inclusive of this approval.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions about my comments, you can contact me at 924-3986

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

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

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

April 10, 2000

Guy Jackson, PE
BPLW
6200 Uptown Blvd, Ste 400
Albuquerque, NM 87110

Re: BF Goodrich Drainage Report
Engineer's Stamp dated 2-23-00 (E17/D16)

Dear Mr. Jackson,

Based upon the information provided in your resubmittal dated 4-6-00, the above referenced site is approved for Building Permit.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions about my comments, you can contact me at 924-3986

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

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

SEE "AS-BUILT" INFORMATION BELOW

FUTURE 4' WIDE SIDEWALK BY OTHERS

STA. 1+48.07, CENTER POINT OF CUL-DE-SAC

CONSTRUCT 8" ASPHALT CURB FROM BEGINNING OF CUL-DE-SAC TO CUTOFF WALL

STA. 0+95.42 ℄ BEGIN CONSTRUCTION

ARTERIAL PAVING PER COA STD. DWG 2408. SEE PAVEMENT DETAIL THIS SHEET

STA. ~~0+14.17~~ 2+40 BEGIN 4' SIDEW

TRACT B-1-A

LINE	DIRECTION	DISTANCE
L1	S62°56'47"W	154.40'
L2	N62°56'47"E	154.40'
L3	N89°47'15"W	~~426.67'~~ 422.89'
L4	N89°47'15"W	~~426.37'~~ 509.36'

CURVE	RADIUS	LENGTH	TANGENT
C1	0'	48.91'	31.84'
C2	0'	52.22'	35.59'
C3	450.00'	134.59'	67.80'
C4	410.00'	117.36'	59.09'
C5	410.00'	195.11'	99.44'
C6	450.00'	214.15'	109.14'
C7	25.00'	~~23.18'~~	~~12.50'~~
C8	~~25.00'~~	~~23.18'~~	~~12.50'~~
C9	50.00'	249.81'	37.50'
	60.00'	225.55'	N/A
		34.24'	20.41'

BUILD 25' TEMPORARY PAVEMENT SECTION FROM BEGINNING OF CUL-DE-SAC TO CUTOFF WALL.

FL 38.82

TEMPORARY PUBLIC FOUNDATION, WATER, SANITARY SEWER & DRAINAGE EASEMENT

FL 37.50

TRACT LINE

STA. 1+36.82, 30.00' LT. CENTER POINT OF CUL-DE-SAC

TC 39.43

FL 38.77

TC 39.15

STA. 2+10.29 TO STA. 2+60.29 50' TRANSITION FROM NO CROWN TO CROWN.

STA. 0+86.82, 30.00' LT. BEGIN CONST.

DELETE STORM INLET & 18" RCP FROM PLAN

FL 36.52

FL 36.77

TC 39.16

FL 38.51

STA. 2+09.62 BUILD 6"x24" PCC CUTOFF WALL AS PER C.O.A. STD. DWG. 2415

MANHOLE PER PLAN, EXCEPT INSTALL NEENAH R-2596 GRATE W/LID. INVERTS EL. 35.53. MOAP ASPHALT CURB AROUND MANHOLE FRAME.

CONSTRUCT 8" ASPHALT CURB FROM BEGINNING OF CUL-DE-SAC TO CUTOFF WALL.

FUTURE 4' SIDEWALK BY OTHERS

EXISTING GROUND AT CENTERLINE OF PROPOSED CONSTRUCTION

PROPOSED TOP OF CURB LT. & RT.

+1.53%

TEMPORARY PAVEMENT SECTION | PERMANENT PAVEMENT SECTION

5165 5160 5155 5150 5145 5140 5135 5130 5125

0+86.07, ℄ TC37.46

1+46.07, ℄ BUILD 1-4" DIA TYPE "L" MH FL 37.94

1+50.00, 20' LT. & RT. TC38.27

1+86.07, 30' LT. & RT. RETURN ASPHALT CURB TC38.82

2+00.00, 20' LT. & RT. TC39.04

2+06.07, 20' LT. & RT. RETURN - TC39.13

2+50.00, 20' LT. & RT. TC39.80

3+00.00, 20' LT. & RT. TC40.57

3+41.71, ℄ BUILD 1-4" DIA TYPE "L" MH FL 40.94

3+50.00, 20' LT. & RT. TC41.33

4+00.00, 20' LT. & RT. TC41.97 (LT.) & 42.04 (RT.)

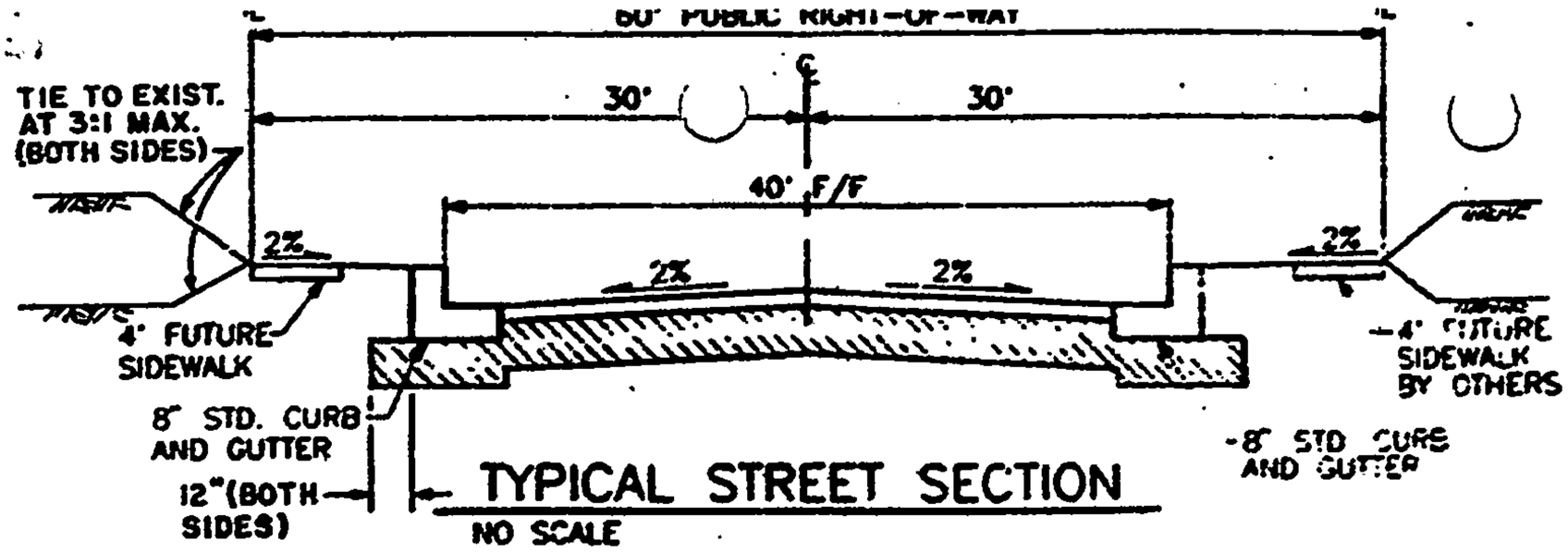
4+50.00, 20' LT. & RT. TC42.26

5+00.00, 20' LT. & RT. TC42.80 (LT.) & (RT.)

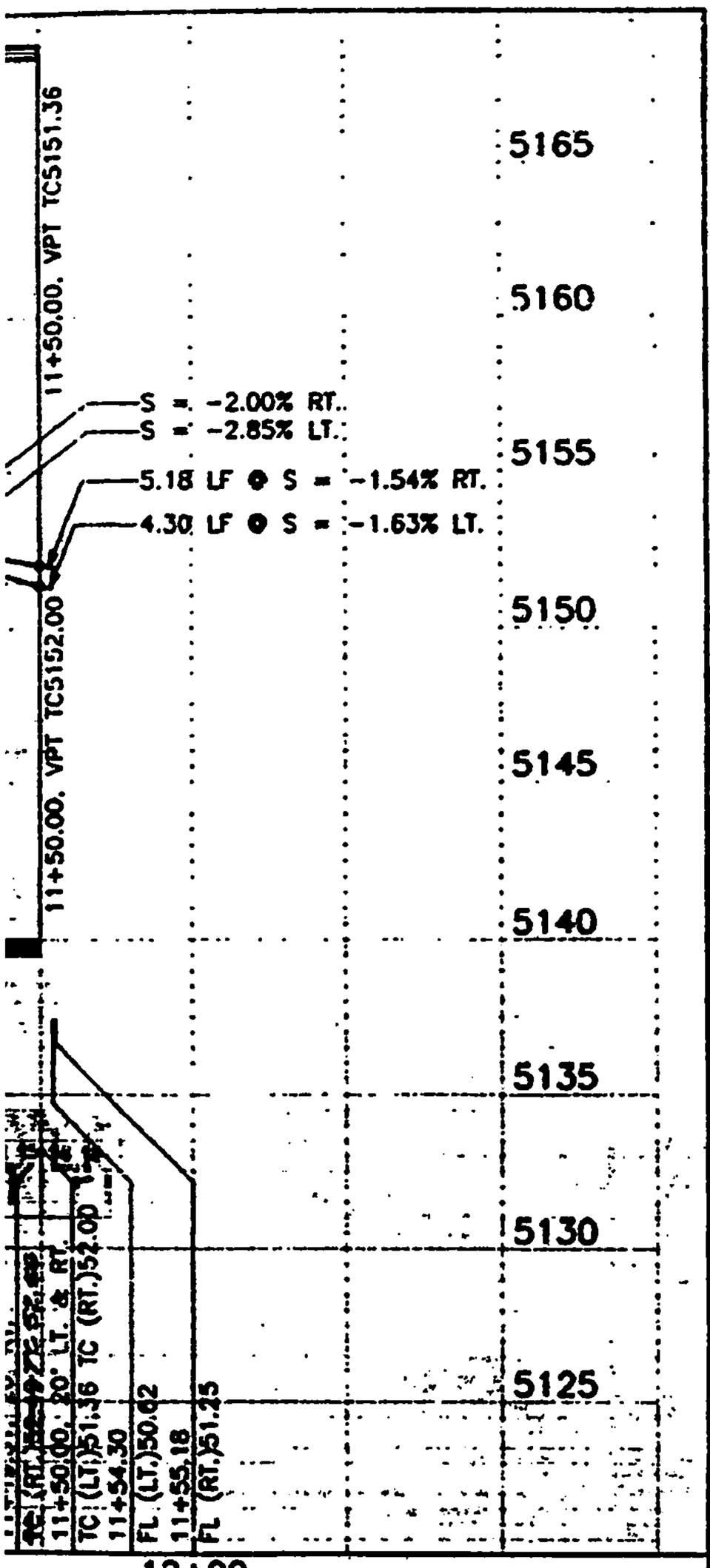
5+50.00, 20' LT. & RT. TC44.39

1+00 2+00 3+00 4+00 5+00

RECEIVED
APR 06 2000
PWD/DESIGN REV



TYPICAL STREET SECTION
NO SCALE



NOTE:
DURING THE CONSTRUCTION OF THE ABOVE PAVEMENT SECTION, IF A SOIL WHICH HAS AN R-VALUE LESS THAN 30 IS ENCOUNTERED, THAT SOIL SHALL, WITH CONSULTATION AND APPROVAL OF THE ENGINEER, BE REMOVED TO A MINIMUM DEPTH BELOW FINISH SUBGRADE ELEVATION, AND BE REPLACED WITH A SOIL HAVING AN R-VALUE EQUAL TO OR GREATER THAN 30.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
26-5115.90 0395

WILLIAM L. VREELAND NEW MEXICO 8131 REGISTERED PROFESSIONAL ENGINEER 9/5/95

RECORD DRAWING
DATE: 9/5/95

SURVEY INFORMATION
FIELD NOTES

NO.	BY

ENGINEER'S SEAL
2/20/95

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

DESIGNED BY	J.R.T., D.M.H	DATE: 2/20/95
DRAWN BY	M.E.S	DATE: 2/20/95
CHECKED BY	J.R.T	DATE: 2/20/95

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: GROUP NINE INDUSTRIAL PARK
JEFFERSON PLAZA
PAVING PLAN AND PROFILE

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	B.C. Gudeley	3-29-95	WATER	N/A RWK	2-28-95
TRANSPORTATION	[illegible]	2-22-95	WASTE WATER	N/A RWP	2-28-95
HYDROLOGY	N/A JAC	3-15-95			

SCALE: 1"=50' (HORIZ.) 1"=5' (VERT.)

DRAWING NO. 5115.90 | MAP NO. D-17 | SHEET 3 OF 7

BHI JOB NO. 94257.42

RECEIVED
APR 0 6 20..
PWD/DESIGN REVIEW

OF ALBUQUERQUE

DRAINAGE REPORT

FOR

BF GOODRICH
CINCO BISCO LIMITED

BY:

GUY C. JACKSON, PE
February 2000

BPLW ARCHITECTS & ENGINEERS, INC.

BPLW
Architects & Engineers, Inc.

The following items pertaining to the BF Goodrich Drainage Plan are contained herein: 1) Vicinity Map; 2) Flood Hazard Map 3) Calculations

Existing Conditions

As shown by the Vicinity Map, the site lies on Jefferson Plaza east of Jefferson St. NE and south of Osuna Rd. NE. The site is tract B-1-A-1 Group 9 Industrial Park. Bounded on the north by the Rust Tractor property and on the south by the Bear Arroyo Drainage Easement and the Girl Scouts of America. The western edge is bound by Interstate Industrial Tract (Unit 2) SP-78-333 3c. The eastern boundary meets with the Army Corps Of Engineers. Per the flood insurance rate maps 138 and 139 of 825 for Bernalillo County, dated September 1996, the site is not in a flood hazard zone area. However, it is adjacent to the Bear Arroyo Drainage Easement. The Bear Canyon Arroyo Channel Improvements for AMFACA, Reach 1, state that the maximum water surface elevation in the arroyo during the 100-year event is 5113.76 at station 15+00.

The grading plan shows existing contours at 1'-0" intervals, limit and character of the proposed improvements and also the existing conditions. As shown by this plan, the proposed construction consists of the construction of the BF Goodrich Industrial building, access road, public water, private sewer, parking, walkways, and landscaping.

All storm water runoff is presently flowing off site. The western third of the site, which contains proposed basins "C" and "D" and carries 2.19 cfs, sheet flows to the western edge of the property where it intersects a swale at the boundary with the adjacent property to the west. The runoff ponds in a shallow swale near the Bear Canyon Arroyo drainage easement, which drains south then west to and existing outfall into the Bear Canyon Arroyo. The runoff for the rest of the site, which consists of proposed Basins "A", "B", and "E" conveys 12.6 cfs, flows to the edge of the Rust Tractor property where it is intercepted by a berm. The runoff follows the berm until it reaches the swale at the eastern property edge where it ties in with the runoff from the rest of the site. Offsite flows do not flow on to the property due to the drainage patterns of the adjacent sites. All proposed basins are part of the single existing basin.

Proposed Conditions

In the proposed conditions the site is divided into five basins. Basin "A" (the access road) conveys 2.77 cfs of which 2.60 cfs will drain to the single type "A" storm drain located at the northwest corner of the basin at AP-3, where it will flow through an 18" pipe to the proposed manhole at AP-4. At this point it drains south and ties into the existing manhole located in the proposed cul-de-sac through an existing stub out. The remaining 0.17 cfs will bypass and continue to flow into Basin "B" to the west.

Basin "B" will generate 7.66 cfs of runoff which will add to the bypass from Basin "A" totaling 7.83 cfs and will drain to a type "D" single grate storm drain inlet along the eastern boundary of Basin "B" at AP-2. The runoff will flow south through an 18" pipe into the proposed manhole at AP-4 and continue south into the existing manhole in the proposed cul-de-sac.

Basin "C" will drain 2.81 cfs to a type "D" storm drain along the sites western boundary at AP-9, which will then flow into the mainline storm drain system from the Rust Tractor site and into the Bear Canyon Arroyo (AMAFCA). Basin "D" has two sub-basins. One of the storm drains only has runoff from the immediate vicinity of the

building, about 0.23 cfs at AP-5. This will be collected and discharged thru an 8" diameter PVC drain with a slotted grate cover into the storm drain system similar to Basin "C". The second storm drain inlet at AP-7 in this basin is a type "D" and carries 2.77 cfs; it too will drain into the main storm drain from the Rust Tractor site.

The main storm drain line located along the western property boundary was designed by CAMI for future flows from the Rust Tractor site with a proposed discharge of 23.0 cfs and a discharge capacity from the BF Goodrich site of 15 cfs. However the flow from the BF Goodrich site is only 6.04 cfs; therefore the mainline is capable of handling all of its runoff.

A berm and shallow settling basin will be created to collect the runoff from Basin "E". In the one hundred year rainfall event the peak flow is 7.90 cfs. A 24" standpipe that has six 2" orifices will regulate and convey this flow to the proposed manhole and then on to the existing manhole. It is designed to hold the ten-year storm without draining so that it can be used as a desiltation bed in order to keep an excessive amount of sediment from traveling, into the discharge pipe and into Bear Canyon Arroyo. Discussions with AMFCA were that the discharge was allowable with the appropriate license agreement.

Conclusions:

As stated above, offsite flows do not enter the site due to the drainage patterns of the adjacent sites.

The calculations contained in this report analyze the developed conditions for the 100-year 6-hour rainfall event. The procedure for 40 acre or smaller basins set by section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations there will be an additional runoff for the developed site of 11.95 or 12 cfs. Changing from an existing total runoff of 14.8 cfs to 26.82 cfs.

The existing manhole and pipe which were intended to drain all of tract B-1-A-1, were designed to carry 43.4 cfs as set forth in the "Drainage Management Plan" created by Bohannan Huston dated 1-17-95. The drainage from basins A, B, and E, which tie into the existing manhole, totals 21.01 cfs. This allows the adjacent property to be developed and to discharge an additional 22.35 cfs into the proposed 24" storm drain pipe located in the temporary desiltation bed in Basin "E". The 7.90 cfs from basin "E" will also be included in the future total discharge therefore giving 30.25 cfs available for the remaining development.

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BF Good Rich
Subject Analysis Pnts
Project # 99053 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐

Analysis Point 3

$Q_{STREET} = 2.77 cfs$

$S = 1.95\%$

$d = 0.28'$ from Plate D-3

$Q_{CAP} = 2.60$ from Plate D-5 (Use Type A single inlet)

$Q_{by\ pass} = Q_{street} - Q_{capacity}$

$Q_{BP} = 2.77 - 2.60 = 0.17 cfs$

Copies to:

Designing to Shape the Future

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BF GoodRich
Subject Analysis Points
Project # 99053 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐

Analysis point 2

$Q_{BasinB} = 7.66$

$Q_{BypassBasinA} = 0.17$

$Q_{Total} = 7.83$

Plate D-X → Equation for 4 sided Weir
Type D Single grate

$Q = 3.3Ph^{1.5} + 11(h-.83)^{1.5}$

$P = (18.85)2 + (35.5)2$
$= 108''$
$= 9'$

$7.83 = 3.3(9)(h)^{1.5} + 11(h-.83)^{1.5}$

$7.83^{2/3} = 29.7^{2/3}h + 11^{2/3}(h-.83)$

$3.94 = 9.59h + 4.94h - 4.05$

$8.048 = 14.536h$

$\underline{h = 0.55'}$

Copies to:

Designing to Shape the future

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BF Good Rich
Subject Analysis Point
Project # 99053 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐

Analysis Point 9

$Q_{Basin C} = 2.81$ $P = 9'$ → for calculation see page 2

Type D single grate use equation for a 4 sided weir from Plate d-x

$$Q = 3.3Ph^{3/2} + 11(h-.83)^{3/2}$$

$$2.81 = 29.7h^{3/2} + 11(h-.83)^{3/2}$$

$$2.81^{2/3} = 29.7^{2/3}h + 11^{2/3}(h-.83)$$

$$1.991 = 9.59h + 4.946h - 4.05$$

$$6.0966 = 14.54h$$

$$\underline{h = .42}$$

Copies to:

Designing to Shape the Future

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BFGoodrich
Subject Analysis point
Project # 99053 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐

Analysis point 5

$Q_{SUB\ BASIN\ D} = .23 cfs$

Use Orifice and Weir equations from Plate D-x

Orifice

$A = \pi R^2 = \pi (.33)^2 = .35$

$Q = .6A\sqrt{2gh}$

$.23 = (.6)(.35)\sqrt{2(32.2)h}$

$\sqrt{h} = .136$

$h = .0186' = .22''$

Weir =

$Q = 3.3 P h^{1.5}$ $P = 2.09$

$.23 = (3.3)(2.09)(h)^{3/2}$

$.033 = h^{1.5}$

$h = .104'$
$= 1.24''$

Copies to:

Designing to Shape the Future

BPLW

Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BF Goodrich

Subject Analysis Point

Project # 99052 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☐ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐ _____

Analysis Point 9

$Q_{BASIN D} = 2.77$

Use Type D Singe grate inlet
Use Equation for 4 sided weir from Plate D-X

$Q = 3.3Ph^{3/2} + 1.1(h-.83)^{3/2}$ P = 9.0' See page 2

$2.77^{2/3} = 9.59h + 4.946h - 4.105$

$6.077 = 14.54h$

$h = 0.418$

Copies to:

Designing to Shape the Future

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE, Suite 400, Albuquerque, NM 87110, (505) 881-2759
49 West First Street, Suite 100, Mesa, AZ 85201, (602) 827-2759
Martin Building, Suite 501, 215 North Stanton Street, El Paso, TX 79901, (915) 545-1665
2000 East La Mar, Suite 600, Arlington, TX 76006, (817) 588-3036

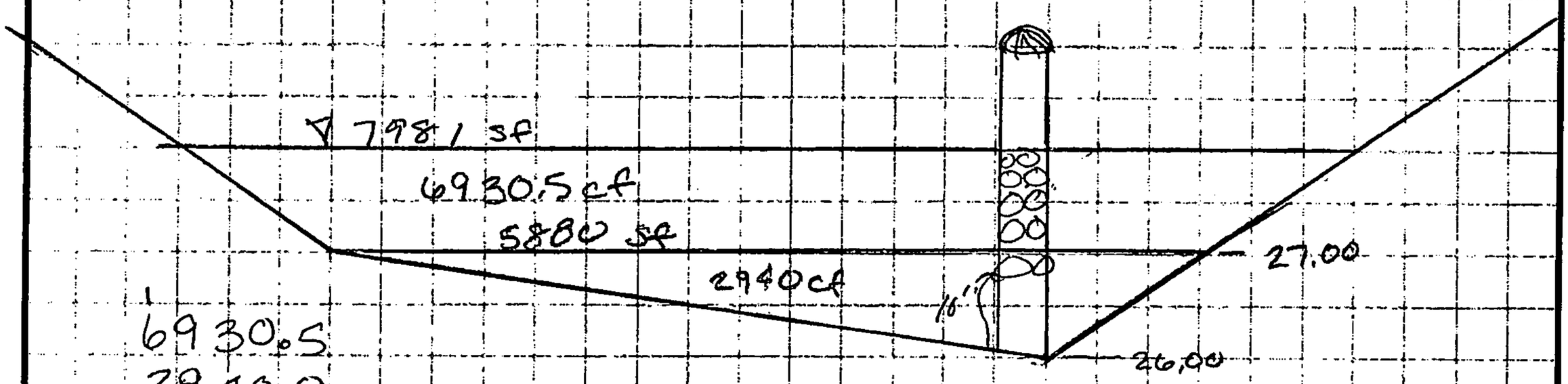
Project: BFGoodRich
Subject: Basin E
Project #: 99053 Date: 2/22/00 By: PDK

☐ Memorandum
☐ Telephone Record
☐ Note to the File
☐ Minutes of Meeting
☐ To be Typed
☐

Pond Volume + Stand Pipe Calculations

Basin E 100y-6h Excess Runoff from Hydraulic Calculation
→ .2237 acre-ft → 9744.37 cfs.

10year → .0562 acre-ft → 2448.07



6930.5
2940.0
9870.5 Volume provided = 9870.5 cf

Start 4" holes center at 27.00

Solve
$Q = .61 A\sqrt{2gh}$ for Q with h's of
1.167', 0.667', 0.167

Equation from Fundamentals of Fluid Mechanics; Munson, Young, Okiishi, Copy Right 1990

$Q = VA$ $V = \sqrt{2gh}$ p(125)

$C_c = .61$ p(126)

Copies to:

Designing to Shape the Future

BPLW
Architects & Engineers, Inc.

6200 Uptown Blvd. NE
Suite 400
Albuquerque, NM 87110
(505) 881-2759

49 West First Street
Suite 100
Mesa, AZ 85201
(602) 827-2759

Martin Building, Suite 501
215 North Stanton Street
El Paso, TX 79901
(915) 545-1665

2000 East La Mar
Suite 600
Arlington, TX 76006
(817) 588-3036

Project BF Goodrich
Subject Basin E Drainage
Project # 99053 Date 2/22/00 By PDK

- ☐ Memorandum
- ☐ Telephone Record
- ☒ Note to the File
- ☐ Minutes of Meeting
- ☐ To be Typed
- ☐ _____

$Q = .61 A\sqrt{2gh}$

$= (0.61)(.087)(8.02)\sqrt{h}$

$= .43\sqrt{h}$

Area of Hole $= \pi \left(\frac{2}{12}\right)^2$
$= 0.087$

$Q_{14}'' = .461$

$Q_8'' = .349$

$Q_2'' = .174$

$Q_T = .99$

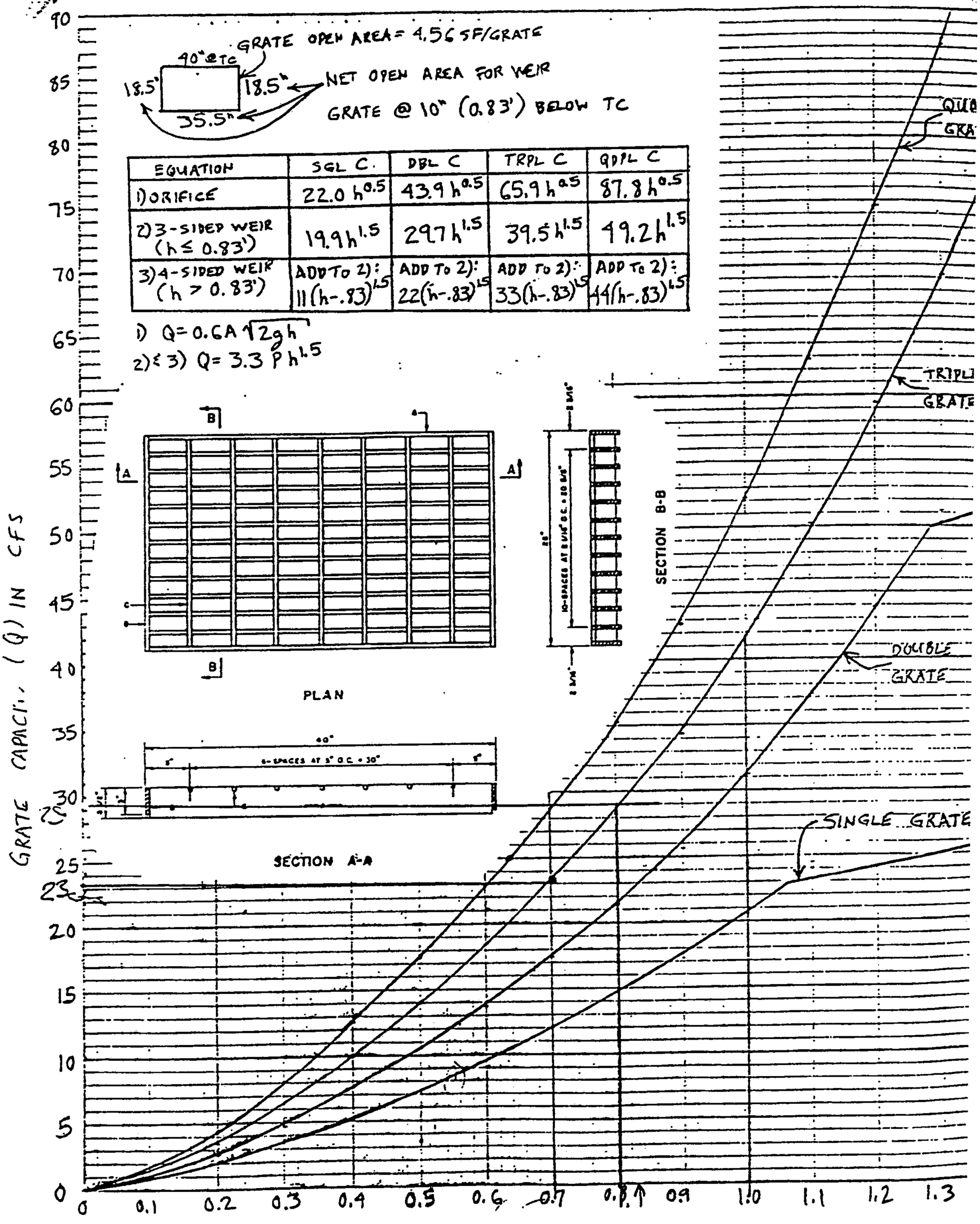
$.99 \times 8 = 7.93$ cfs

$7.93 > 7.90$ okay

Layers of holes @ 14", 8", & 2", 8 holes per layer

Copies to:

Designing to Shape the Future



EQUATION	SGL C.	DBL C	TRPL C	QDPL C
1) ORIFICE	$22.0\,h^{0.5}$	$43.9\,h^{0.5}$	$65.9\,h^{0.5}$	$87.8\,h^{0.5}$
2) 3-SIDED WEIR ($h \le 0.83'$)	$19.9\,h^{1.5}$	$29.7\,h^{1.5}$	$39.5\,h^{1.5}$	$49.2\,h^{1.5}$
3) 4-SIDED WEIR ($h > 0.83'$)	ADD TO 2): $11(h-.83)^{1.5}$	ADD TO 2): $22(h-.83)^{1.5}$	ADD TO 2): $33(h-.83)^{1.5}$	ADD TO 2): $44(h-.83)^{1.5}$

1) $Q = 0.6A\sqrt{2gh}$

2) & 3) $Q = 3.3\,P\,h^{1.5}$

Plate D-X

Drainage Summary

Project: BF GOODRICH
Project Numbe: 99053
Date: 02/10/00
By: Paula K

Site Location

Precipitaion Zone 2 Per Table A-1 COA DPM Section 22.2

Existing summary

Basin Name	Basin A	Basin B	Basin C	Basin D	Sub Basin D	Basin E
Soil Treatment (acres)						
Area "A"	1.33	1.82	0.63	0.67	0.10	4.98
Area "B"	0.00	0.00	0.00	0.00	0.00	0.00
Area "C"	0.00	0.00	0.00	0.00	0.00	0.00
Area "D"	0.00	0.00	0.00	0.00	0.00	0.00
Excess Runoff (acre-feet)						
100yr. 6hr.	0.03	0.08	0.03	0.03	0.0044	0.2200
10yr. 6hr.	0.01	0.02	0.01	0.01	0.00	0.05
2yr. 6hr.	0.00	0.00	0.00	0.00	0.00	0.00
100yr. 24hr.	0.03	0.08	0.03	0.03	0.00	0.22
Peak Discharge (cfs)						
100 yr.	1.05	2.84	0.98	1.05	0.16	7.77
10yr.	0.25	0.69	0.24	0.25	0.04	1.89
2yr.	0.00	0.00	0.00	0.00	0.00	0.00

Proposed summary

Basin Name	Basin A	Basin B	Basin C	Basin D	Sub Basin D	Basin E
Soil Treatment (acres)						
Area "A"	0.00	0.00	0.00	0.00	0.00	4.80
Area "B"	0.33	0.36	0.06	0.15	0.10	0.18
Area "C"	0.00	0.00	0.00	0.00	0.00	0.00
Area "D"	1.00	1.46	0.57	0.52	0.00	0.00
Excess Runoff (acre-feet)						
100yr. 6hr.	0.10	0.28	0.10	0.10	0.0065	0.2237
10yr. 6hr.	0.06	0.17	0.06	0.06	0.0023	0.0562
2yr. 6hr.	0.03	0.10	0.04	0.03	0.0002	0.0003
100yr. 24hr.	0.12	0.33	0.12	0.12	0.01	0.22
Peak Discharge (cfs)						
100 yr.	2.77	7.66	2.81	2.77	0.23	7.90
10yr.	1.76	4.91	1.84	1.76	0.10	2.00
2yr.	0.97	2.74	1.06	0.97	0.01	0.01

BPLW

Architects and Engineers

PROJECT **BF GOODRICH**
PROJECT NO. **99053.00**
DATE **02/10/00**
BY **Paula K**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Basin D**		
Precipitation Zone		**2**	
Land Area		**0.67**	acres
Excess Precipitation Volume			
	>>> **100-year 6-hour (design)**	**0.03**	**acre-ft.**
	10-year 6-hour	**0.01**	acre-ft.
	2-year 6-hour	**0.00**	acre-ft.
	100-year 24-hour	**0.03**	acre-ft.
Peak Discharge Rates (DPM)			
	>>> **Q100 (design)**	**1.05**	**cfs**
	Q10	**0.25**	cfs
	Q2	**0.00**	cfs
Peak Discharge Rates (DPM-Rational Method)			
	>>> **Q100 (design)**	**1.05**	**cfs**
	Q10	**0.25**	cfs
	Q2	**0.00**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Basin D	
>A.1	PRECIPITATION ZONE (from Table A-1)	2	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	**2.01**	inches
	100-YEAR STORM (P360)	**2.35**	inches
	100-YEAR STORM (P1440)	**2.75**	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	**1.57**	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	**1.02**	inches
>A.3	**LAND TREATMENTS (Ai)**		
	Treatment A	0.67	acres
	Treatment B	0.00	acres
	Treatment C	0.00	acres
	Treatment D	0.00	acres
	Total Area	**0.67**	acres
>A.4	**ABSTRACTIONS**	**See A.5**	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei)
from Table A-8

100-year 6-hour		
Treatment A	**0.53**	inches
Treatment B	**0.78**	inches
Treatment C	**1.13**	inches
Treatment D	**2.12**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.53**	inches
VOLUME V100:6h (E*A)	**0.03**	acre-ft.
	1,289.01	ft^3
10-year 6-hour		
Treatment A	**0.13**	inches
Treatment B	**0.28**	inches
Treatment C	**0.52**	inches
Treatment D	**1.34**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.13**	inches
VOLUME V10:6h (E*A)	**0.01**	acre-ft.
	316.17	ft^3
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.02**	inches
Treatment C	**0.15**	inches
Treatment D	**0.79**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.00**	inches
VOLUME V2:6h (E*A)	**0.00**	acre-ft.
	0.00	ft^3
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.03**	acre-ft.
	1,289.01	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi)
from Table A-9

100-year			
Treatment A		**1.56**	cfs/acre
Treatment B		**2.28**	cfs/acre
Treatment C		**3.14**	cfs/acre
Treatment D		**4.70**	cfs/acre
	Q100 (Sum Qi*Ai)	**1.05**	cfs
10-year			
Treatment A		**0.38**	cfs/acre
Treatment B		**0.95**	cfs/acre
Treatment C		**1.71**	cfs/acre
Treatment D		**3.14**	cfs/acre
	Q10 (Sum Qi*Ai)	**0.25**	cfs
2-year			
Treatment A		**0.00**	cfs/acre
Treatment B		**0.08**	cfs/acre
Treatment C		**0.60**	cfs/acre
Treatment D		**1.86**	cfs/acre
	Q2 (Sum Qi*Ai)	**0.00**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

Peak Intensity (I) 100-year	**5.05**
Peak Intensity (I) 10-year	**3.41**
Peak Intensity (I) 2-year	**2.04**

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year

Treatment A	**0.31**	cfs/acre
Treatment B	**0.45**	cfs/acre
Treatment C	**0.62**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**1.05**	cfs

10-year

Treatment A	**0.11**	cfs/acre
Treatment B	**0.28**	cfs/acre
Treatment C	**0.50**	cfs/acre
Treatment D	**0.92**	cfs/acre
Q10 (Sum Qi*I*Ai)	**0.25**	cfs

2-year

Treatment A	**0.00**	cfs/acre
Treatment B	**0.04**	cfs/acre
Treatment C	**0.29**	cfs/acre
Treatment D	**0.91**	cfs/acre
Q2 (Sum Qi*I*Ai)	**0.00**	cfs

BPLW

Architects and Engineers

PROJECT **BF GOODRICH**
PROJECT NO. **99053**
DATE **02/10/00**
BY **Paula K**

DPM Section 22.2 - Hydrology

Part A-Watersheds less than 40 acres.
January, 1993

INSTRUCTIONS

* Spread sheet requires three input areas (dark cells):
  - Location
  - >A.1 Precipitation Zone
  - >A.3 Land Treaments
* Values from the tables are automatically placed using "if" statements.
* Table values should be checked for correctness for each use.

SUMMARY

Location	**Basin D**		
Precipitation Zone		**2**	
Land Area		**0.67**	acres
Excess Precipitation Volume			
	>>> **100-year 6-hour (design)**	**0.10**	**acre-ft.**
	10-year 6-hour	**0.06**	acre-ft.
	2-year 6-hour	**0.03**	acre-ft.
	100-year 24-hour	**0.12**	acre-ft.
Peak Discharge Rates (DPM)			
	>>> **Q100 (design)**	**2.77**	**cfs**
	Q10	**1.76**	cfs
	Q2	**0.97**	cfs
Peak Discharge Rates (DPM-Rational Method)			
	>>> **Q100 (design)**	**2.76**	**cfs**
	Q10	**1.76**	cfs
	Q2	**0.97**	cfs

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS

	LOCATION	Basin D	
>A.1	PRECIPITATION ZONE (from Table A-1)	2	
>A.2	DEPTHS		
	(from Table A-2)		
	100-YEAR STORM (P60)	2.01	inches
	100-YEAR STORM (P360)	2.35	inches
	100-YEAR STORM (P1440)	2.75	inches
	10-YEAR (P360) (Calculated: P360*RPF10)	1.57	inches
	2-YEAR (P360) (Calculated: P360*RPF2)	1.02	inches
>A.3	LAND TREATMENTS (Ai)		
	Treatment A	0.00	acres
	Treatment B	0.15	acres
	Treatment C	0.00	acres
	Treatment D	0.52	acres
		0.000.000.00	
	Total Area	0.67	acres
		==========	
>A.4	ABSTRACTIONS	See A.5	

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.5 EXCESS PRECIPITATION 6 HOUR AND 24 HOUR (Ei)
from Table A-8

100-year 6-hour		
Treatment A	**0.53**	inches
Treatment B	**0.78**	inches
Treatment C	**1.13**	inches
Treatment D	**2.12**	inches
WEIGHTED E (Sum Ei*Ai/A)	**1.82**	inches
VOLUME V100:6h (E*A)	**0.10**	acre-ft.
	4,394.87	ft^3
10-year 6-hour		
Treatment A	**0.13**	inches
Treatment B	**0.28**	inches
Treatment C	**0.52**	inches
Treatment D	**1.34**	inches
WEIGHTED E (Sum Ei*Ai/A)	**1.10**	inches
VOLUME V10:6h (E*A)	**0.06**	acre-ft.
	2,661.90	ft^3
2-year 6-hour		
Treatment A	**0.00**	inches
Treatment B	**0.02**	inches
Treatment C	**0.15**	inches
Treatment D	**0.79**	inches
WEIGHTED E (Sum Ei*Ai/A)	**0.62**	inches
VOLUME V2:6h (E*A)	**0.03**	acre-ft.
	1,490.34	ft^3
100-year 24-hour		
VOLUME V100:24h (V100-6h+Ad*P1440-P360)/12)	**0.12**	acre-ft.
	5,143.96	ft^3

CALCULATIONS FOLLOW

INPUT AND CALCULATIONS (CON'T)

>A.6 PEAK DISCHARGE RATE FOR SMALL WATERSHEDS (Qi) from Table A-9		
100-year		
Treatment A	**1.56**	cfs/acre
Treatment B	**2.28**	cfs/acre
Treatment C	**3.14**	cfs/acre
Treatment D	**4.70**	cfs/acre
Q100 (Sum Qi*Ai)	**2.77**	cfs
10-year		
Treatment A	**0.38**	cfs/acre
Treatment B	**0.95**	cfs/acre
Treatment C	**1.71**	cfs/acre
Treatment D	**3.14**	cfs/acre
Q10 (Sum Qi*Ai)	**1.76**	cfs
2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.08**	cfs/acre
Treatment C	**0.60**	cfs/acre
Treatment D	**1.86**	cfs/acre
Q2 (Sum Qi*Ai)	**0.97**	cfs

CALCULATIONS FOLLOW

RATIONAL METHOD

PEAK INTENSITY (in/hr at tc=0.2 hour)
from Table A-10

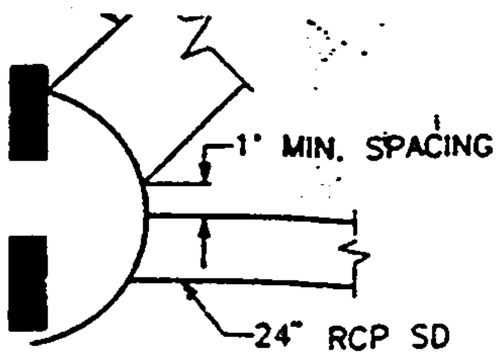
Peak Intensity (I) 100-year	**5.05**	
Peak Intensity (I) 10-year	**3.41**	
Peak Intensity (I) 2-year	**2.04**	

RATIONAL METHOD COEFFICIENT, C
from Table A-11

100-year		
Treatment A	**0.31**	cfs/acre
Treatment B	**0.45**	cfs/acre
Treatment C	**0.62**	cfs/acre
Treatment D	**0.93**	cfs/acre
Q100 (Sum Qi*I*Ai)	**2.76**	cfs

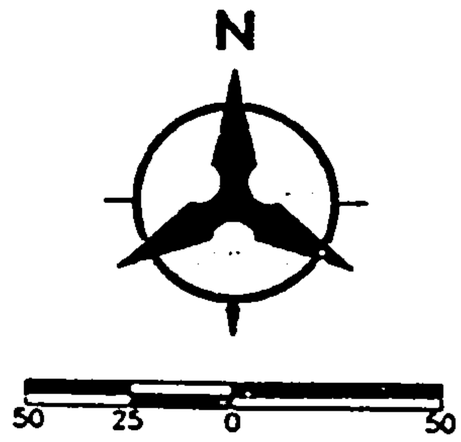
10-year		
Treatment A	**0.11**	cfs/acre
Treatment B	**0.28**	cfs/acre
Treatment C	**0.50**	cfs/acre
Treatment D	**0.92**	cfs/acre
Q10 (Sum Qi*I*Ai)	**1.76**	cfs

2-year		
Treatment A	**0.00**	cfs/acre
Treatment B	**0.04**	cfs/acre
Treatment C	**0.29**	cfs/acre
Treatment D	**0.91**	cfs/acre
Q2 (Sum Qi*I*Ai)	**0.97**	cfs



18" RCP SD
1' SPACING BETWEEN RAIN LINES

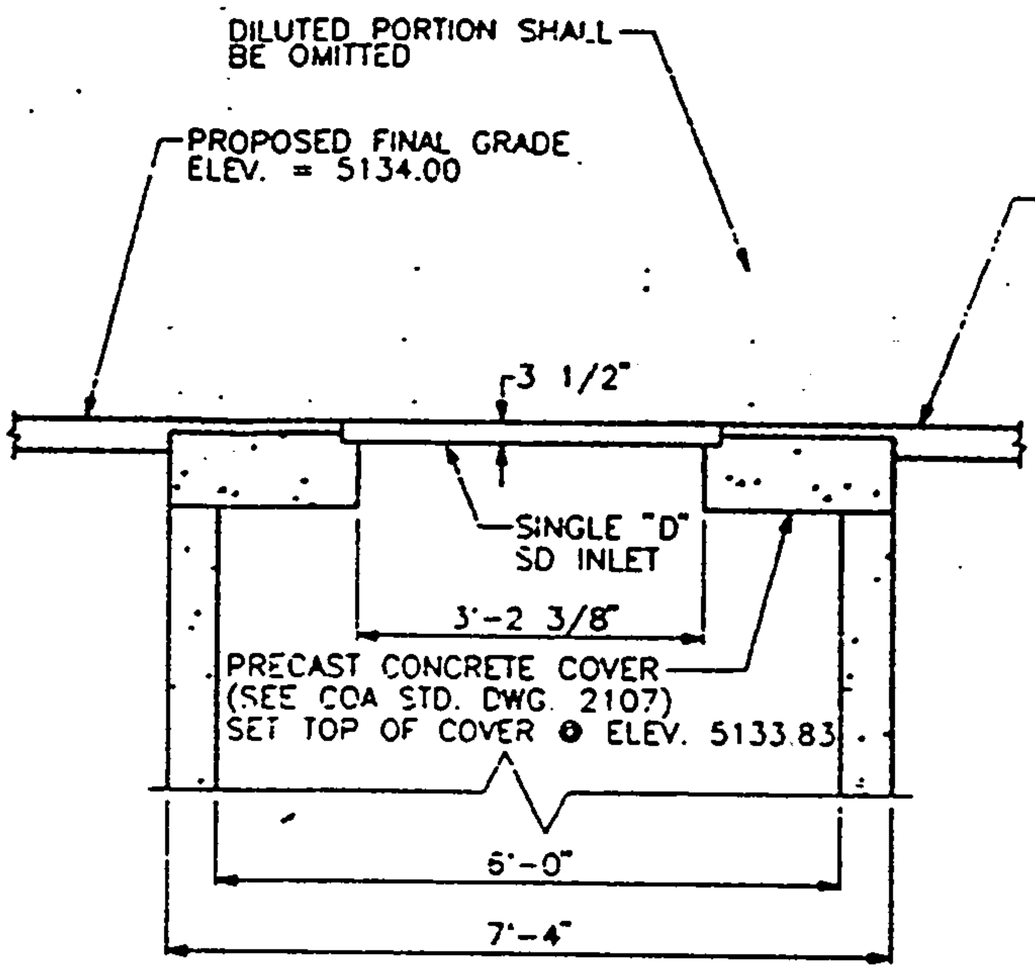
DETAIL – PLAN VIEW



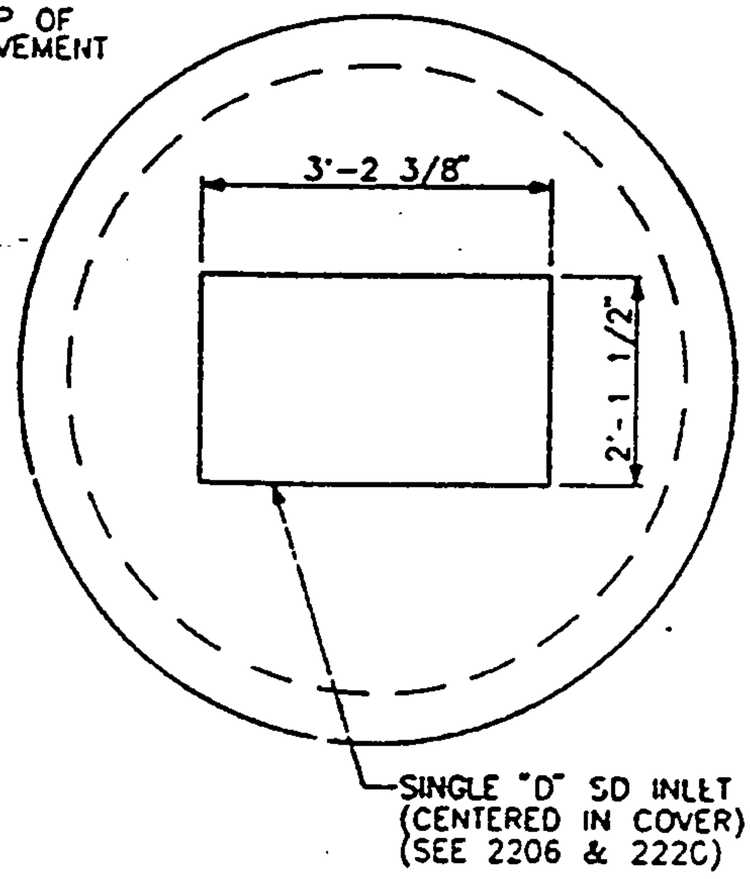
SCALE: 1" = 50' (HORIZ.)

WILLIAM L. VREELAND NEW MEXICO 8131 REGISTERED PROFESSIONAL ENGINEER 9/5/95

RECORD DRAWING
DATE: 9/5/95



PROFILE VIEW
(MODIFIED FROM COA STD. DWG. 2101)



PLAN VIEW OF CONC. COVER
(MODIFIED FROM COA STD. DWG. 2107 & 2206)

MODIFIED TYPE "C" MANHOLE DETAILS (MH #6)

NOT TO SCALE

NOTE: MH#6 COVER IS NON-STANDARD. CONTRACTOR SHALL PROVIDE SHOP DRWGS. OF COVER FOR APPROVAL BY ENGINEER PRIOR TO CONSTRUCTION.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	6	-	5	1	1	5	.	9	0		0	5	9	5

SURVEY INFORMATION
FIELD NOTES

NO.	BY

ENGINEER'S SEAL

JAMES B. TOTHILLER NEW MEXICO 9354 REGISTERED PROFESSIONAL ENGINEER 2/20/95

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

DESIGNED BY: J.R.T., D.M.H. DATE: 2/20/95
DRAWN BY: M.E.S. DATE: 2/20/95
CHECKED BY: J.R.T. DATE: 2/20/95

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: GROUP NINE INDUSTRIAL PARK
STORM DRAIN PLAN AND PROFILE

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[illegible]	3-29-95	WATER	N/A	2-28-95
TRANSPORTATION	[illegible]	2-27-95	WASTE WATER	N/A	2-28-95
HYDROLOGY	[illegible]	3-15-95			
AMAFCA					

SCALE: 1"=50' (HORIZ.) 1"=5' (VERT.)

DRAWING NO. 5115.90 | MAP NO. D-17 | SHEET 5 OF 7

BHI JOB NO. 94257.42

Y OF ALBUQUERQUE

EXISTING 72" RCP STORM DRAIN SLOPE = 0.0017 INV @ DROP STRUCTURE = 09.80

EXISTING DROP STRUCTURE

BEAR ARROYO DIVERSION CHANNEL (AMAFCA)

54" RCP SD

PC

S45°17'49"

EXISTING 8' WIDE BICYCLE PATH. SEE NOTE ON THIS SHEET FOR REMOVAL/ REPLACEMENT DURING CONSTRUCTION OF 54" RCP SD TO EXISTING 8' DIA. STORM DRAIN MANHOLE.

PT = 4+20.06

30 LF 24" RCP SD @ S = ~~20.00%~~ 5.0%
Q_{100} = 13.8 cfs
(CLASS III) ~~32.70~~
INV. (IN) = ~~32.70~~
PLUG PIPE W/ 24" CONCRETE PLUG

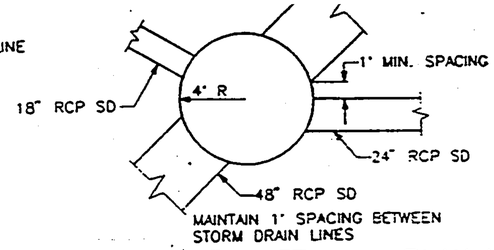
STA. 4+20.06, ℄ (MH #2) BUILD 1-8' DIA. TYPE "C" MH AS PER COA STD. DWG. 2101

5+00

6+00

STA. 7+13.59, ℄ STORM DRAIN = STA. 1+07.54, 10.00' RT. JEFFERSON PLAZA BUILD 1-8' DIA. TYPE "C" DROP MH (MH #3) AS PER COA STD. DWG. 2101 SEE DETAIL THIS SHEET.

TRACT LINE



MANHOLE #3 DETAIL - PLAN VI

NOT TO SCALE

5140
5135
5130
5125
5120
5115
5110
5105
5100

Q = 188.2 cfs
V = 11.5 fps

Q = 144.8 cfs
V = 9.1 fps

30.00 LF 24" RCP SD @ S = ~~6.2%~~ 5.0%

~~8.93 LF 18" RCP SD @ S = 20.00%~~

Q = 144.8 cfs
V = 11.5 fps

HGL

286.53 LF 48" RCP SD @ S = -1.06%

215 LF 54" RCP SD @ S = -0.20%

51.9 LF 54" RCP SD @ S = -0.31%

PUBLIC STORM DRAIN

PRIVATE STORM DRAIN

Q = 112.2 cfs
V = 8.9 fps

Q = 112.2 cfs
V = 8.9 fps

97.70 LF 48" RCP SD @ S = -1.13%

329.69 LF 48" SD @ S = -0.52%

MATCH LINE STA. 9+00.00 SEE SHEET 6 OF 7

DILUTED POR BE OMITTED

PROPOSED FINA ELEV. = 5134.

PRECAST CC (SEE COA S SET TOP OF

(MODIFIED F

MC

NOTE: MH#6 C CONTRACTO DRWGS. OF BY ENGINEE CONSTRUCT

STA. 1+00.00, ℄ EXISTING 8' DIA DIA STORM DRAIN MA RIM EL. = 5134.00 INV. 72" OUT 09.81 INV 54" IN 11.31

STA. 1+58.91, ℄ (MH #1) BUILD 1-8' DIA TYPE "C" MH RIM EL. = ~~5140.00~~ 5132.16 INV. 54" IN ~~11.31~~ INV. 24" OUT ~~11.41~~ INV. 24" IN ~~10.61~~ INV. 24" OUT ~~11.10~~ Q MV. = 12.34

STA. 4+20.06, ℄ (MH #2) BUILD 1-8' DIA. TYPE "C" MANHOLE RIM EL. = ~~5137.00~~ 5136.69 INV. 18" IN ~~13.40~~ INV. 24" OUT ~~11.10~~ INV. 24" IN ~~10.61~~ INV. 24" OUT ~~11.24~~ Q MV. = 12.45

STA. 7+13.59, ℄ (MH #3) BUILD 1-8' DIA. TYPE "C" MANHOLE RIM EL. = ~~5137.21~~ 5136.65 INV. 18" IN ~~15.60~~ INV. 18" OUT ~~16.60~~ INV. 24" IN ~~17.60~~ INV. 18" IN ~~28.10~~ Q MV. = 12.49

STA. 8+18.39, ℄ (MH #4) BUILD 1-8' DIA. TYPE "C" MH RIM EL. = ~~5138.00~~ 5138.73 INV. 18" IN ~~16.61~~ INV. 18" OUT ~~10.01~~ Q MV. = 12.45

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

26-511

CITY O

STORM DRAIN ℄ CURVE DATA

P.I. = 3+10.52, 8.70' LT.
Δ = 15°09'36"
D = 05°48'18"
T = 131.34'
L = 261.15'
R = 986.99'

TRACT B-1-A

MATCH LINE STA. 9+00.00
SEE SHEET 6 OF 7

TRACT C-3-D-1

TRACT C-3

1+00

2+00

3+00

4+00

5+00

6+00

7+00

8+00

~~20~~ LF 24" SD
AT S = ~~[illegible]~~
Q_{100} = 43.4 cfs
(CLASS ~~III~~ IV)

S = 1.0%

INV. (IN) = ~~32.50~~ 14.63
PLUG PIPE W/ 24" CONCRETE PLUG

STA. 1+00.00, ℄ EXIST. STORM DRAIN MANHOLE CONNECT NEW 54" RCP TO EXIST. MANHOLE

STA. 1+58.91, ℄ (MH #1)
BUILD 1-8' DIA. TYPE "C" MH AS PER COA STD. DWG. 2101

TRACT LINE

54" RCP SD

S60°00'00"W

60' PUBLIC DRAINAGE EASEMENT

PC = 1+58.91

54" RCP SD

77' RCP STORM
SLOPE = 0.0017
DROP STRUCTURE

EXISTING DROP STRUCTURE

BEAR ARROYO DIVERSION CHANNEL (AMAFCA)

EXISTING 8' WIDE BICYCLE PATH SEE NOTE ON THIS SHEET FOR REMOVAL/REPLACEMENT DURING CONSTRUCTION OF 54" RCP SD TO EXISTING 8' DIA. STORM DRAIN MANHOLE.

PT = 4+20.06

48" SD

S00°15'51"W
335.69'

STA. 8+18.29, ℄ (MH #4)
BUILD 1-6' DIA. TYPE "E" MH AS PER COA STD. DWG. 2101

STA. 0+96.07, ℄ JEFFERSON PLAZA
BUILD TYPE "C" SINGLE INLET

18" RCP SD (CLASS III)

18" RCP SD (CLASS III)

18" RCP SD (CLASS III)

398.23'

48" RCP SD

60' PUBLIC EASEMENT

S45°17'49"W

30 LF 24" RCP SD
S = ~~20.00%~~ 5.0%
Q_{100} = 13.8 cfs
(CLASS III) ~~32.70~~
INV. (IN) = ~~[illegible]~~
PLUG PIPE W/ 24" CONCRETE PLUG

STA. 4+20.06, ℄ (MH #2)
BUILD 1-8' DIA. TYPE "C" MH AS PER COA STD. DWG. 2101

TRACT LINE

STA. 2+20.00, 20.00' LT.
JEFFERSON PLAZA
BUILD TYPE "A" SINGLE INLET

TRACT LINE

ROW

10" WL
8" SAS

JEFFERSON PLAZA

ROW

24" RCP SD

STA. 2+00.00, 10.00' RT.
JEFFERSON PLAZA
BUILD 1-4' DIA. TYPE "E" MH

STA. 2+20.00, 20.00' RT.
JEFFERSON PLAZA
BUILD TYPE "A" SINGLE INLET

STA. 7+13.59, ℄ STORM DRAIN =
STA. 1+07.54, 10.00' RT. JEFFERSON PLAZA
BUILD 1-8' DIA. TYPE "C" DROP MH
(MH #3) AS PER COA STD. DWG. 2101
SEE DETAIL THIS SHEET.

TRACT LINE

48" RCP SD

1' MIN. SPACING

4' R

18" RCP SD

24" RCP SD

48" RCP SD

MAINTAIN 1' SPACING BETWEEN STORM DRAIN LINES

MANHOLE #3 DETAIL – PLAN VIEW

NOT TO SCALE

30 CO LF 24" RCP SD
S = ~~[illegible]~~ 5.0%

~~8.03 LF 15" RCP SD~~
~~S = 0.20 CFS~~

PUBLIC STORM DRAIN | PRIVATE STORM DRAIN

5140

5135

DILUTED PORTION SHALL BE OMITTED

PROPOSED FINAL GRADE ELEV. = 5134.00

3 1/2"

SINGLE