City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 15, 2002

Larry Read, P.E.
Larry Read & Assoc.
4800 Juan Tabo NE Suite C
Albuquerque, New Mexico 87111

RE: FIRE STATION NO. 20 (C-19/D23)
~~(8300 Wyoming Blvd NE)~~ (7520 Corona NE)
ENGINEERS CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
ENGINEERS STAMP DATED 12/22/1999 Rev. 2/22/2000
ENGINEERS CERTIFICATION DATED 2/14/2002

Dear Mr. Read:

Based upon the information provided in your Engineers Certification submittal dated 2/1/2002, the above referenced site is approved for Permanent Certificate of Occupancy.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin

Teresa A. Martin
Hydrology Plan Checker
Public Works Department

BUB

C: Vickie Chavez, COA
approval file
drainage file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

PROJECT TITLE: CDA FIRE STATION #20 ZONE MAP/DRG. FILE #: C19/D23
DRB #: _____ EPC#: _____ WORK ORDER#: 6042.91

LEGAL DESCRIPTION: LOTS 14-19, BLOCK 6, UNIT 3, TRACT 2 WAA
CITY ADDRESS: 8300 WYOMING BLVD NE

ENGINEERING FIRM: LARRY READ & ASSOC. INC. CONTACT: LARRY READ
ADDRESS: 4800 JUAN TABO NE SUITE C PHONE: 237-1842
CITY, STATE: ALBUQUERQUE, NM 87111 ZIP CODE: 87111

OWNER: CITY OF ALBUQUERQUE FIRE & POLICE CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: RHODE MAY KELLER MCNAMARA CONTACT: DON MAY
ADDRESS: 400 GOLD SW SUITE 1100 PHONE: 243-5454
CITY, STATE: ALBUQUERQUE NM 87103 ZIP CODE: 87103

SURVEYOR: _____ CONTACT: _____
ADDRESS _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:
- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- ✓ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEERS CERTIFICATION (TCL)
- ____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:
- ____ SIA / FINANCIAL GUARANTEE RELEASE
- ____ 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 (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
- ____ YES
- ____ NO
- ____ COPY PROVIDED

RECEIVED
FEB 14 2002
HYDROLOGY SECTION

DATE SUBMITTED: 2-14-2002 BY: Paul M. Wellman for Larry Read

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or

City of Albuquerque

March 8, 2000

Larry Read, P.E.
Larry Read & Associates
Post Office Box 90233
Albuquerque, New Mexico 87199

RE: Grading and Drainage Plan for Fire Station # 20, Lots 14 - 19, Block 6, Unit 3, NAA, (C19/D23), Engineer's Stamp Dated 2/28/00.

Dear Mr. Read:

Based on the information provided, the above referenced Grading and Drainage plan dated February 28, 2000 is approved for Building Permit release.

Please attach a copy of this approved plan to the set of construction drawings for Building Permit sign-off.

As you are aware, the Engineer's Certification is required prior to release of the Certificate of Occupancy for this site.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Whitney Reierson, City Hydrology
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 28, 2000

Larry Read, P.E.
Larry Read & Associates
Post Office Box 90233
Albuquerque, New Mexico 87199

RE: Grading and Drainage Plan for Fire Station # 20, Lots 14 - 19, Block 6, Unit 3, NAA, (C19/D23), Engineer's Stamp Dated 12/22/99.

Dear Mr. Read:

It is not clear what approval you were seeking with your submittal of January 3, 2000. As previously stated in my letter of November 22, 1999, the plans for the Fire Station cannot be approved for Building Permit release until my previous comments are addressed. The street grades for both Wyoming and Corona must be designated **on the plan** by the top of curb elevations and/or flow line elevations. Without this information, these plans are not approved.

If you have any questions, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Whitney Reierson, City Hydrology
File

City of Albuquerque

November 22, 1999

Larry Read, P.E.
Larry Read & Associates
Post Office Box 90233
Albuquerque, New Mexico 87199

RE: Grading and Drainage Plan for Fire Station # 20, Lots 14 - 19, Block 6, Unit 3, NAA, (C19/D23) Submitted for Building Permit Approval, Engineer's Stamp Dated 10/25/99.

Dear Mr. Read:

The above referenced submittal of October 27, 1999 did not address my previous comments. Prior to approval for Building Permit release, please address the following:

1. It was my understanding that an AMAFCA easement was required for the portion of the site that is within the FEMA floodplain. Please show the limits of the AMAFCA easement on the plan. This easement must be in place prior to Building Permit release. AMAFCA approval is also required for any construction within this easement. The existing fence must be moved out of the FEMA floodplain, unless it is allowed by AMAFCA.

2. Prior to Building Permit release, the proposed street grades for both Wyoming and Corona must be designated **on the plan** by top of curb elevations and/or flow line elevations. The plan must also show a water block at the Corona entrance.

It is unclear why the entire drainage report was resubmitted. This is not necessary unless the drainage concepts and calculations have changed. If you have any questions, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Lisa Manwill, Albuquerque Metropolitan Arroyo Flood Control Authority
Whitney Reierson, City Hydrology
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 8, 1999

Larry Read, P.E.
Larry Read & Associates
Post Office Box 90233
Albuquerque, New Mexico 87199

RE: Conceptual Drainage Report and Grading and Drainage Plan for Fire Station # 20, Lots 14 - 19, Block 6, Unit 3, NAA, (C19/D23) Submitted for Site Development Plan Approval, Engineer's Stamp Dated 4/26/99.

Dear Mr. Read:

Based on the information provided in the submittals of April 27, 1999 and June 7, 1999, the above referenced plan is approved for Site Development Plan approval by the DRB.

An AMAFCA easement is required for the portion of the site that is within the existing FEMA floodplain. Please show the limits of the AMAFCA easement on the plan. This easement must be in place prior to Building Permit release, or Final Plat sign-off. AMAFCA approval is also required for any construction within this easement.

Prior to Building Permit release, the proposed street grades for both Wyoming and Corona must be designated on the plan by either top of curb or flow line elevations. The plan must also show a water block at the Corona entrance, since it appears that Basin B will drain onto Corona without this water block.

As you stated in your letter, the required road improvements must be complete prior to issuance of the Certificate of Occupancy for this site.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Fred Aguirre, DRB-99-39
File

DRAINAGE REPORT

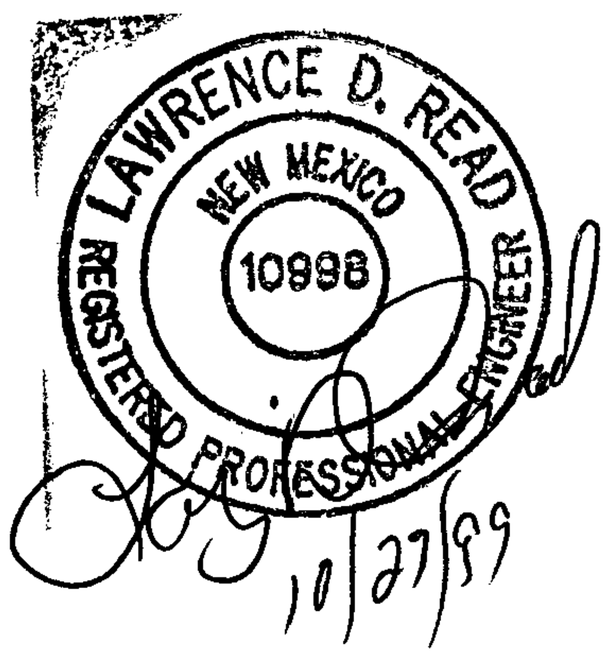
for

FIRE STATION NUMBER 20

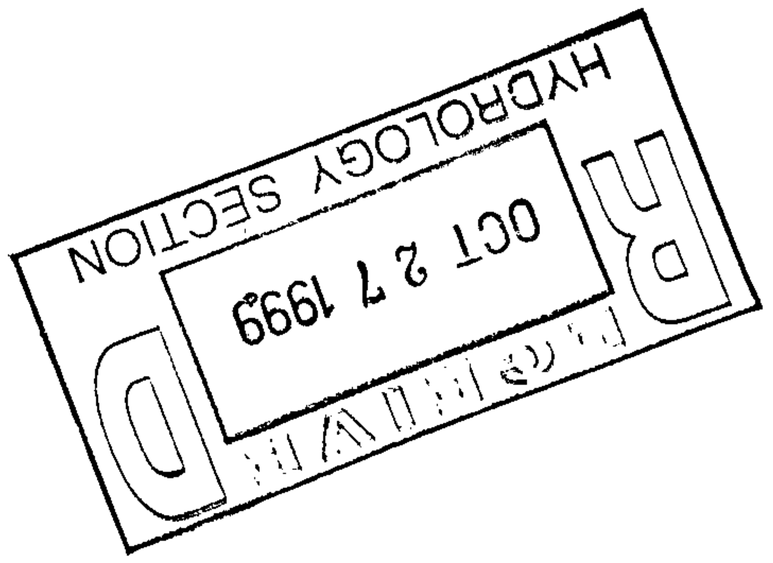
Wyoming Blvd. NE and Corona Ave. NE

Albuquerque, New Mexico

October 18, 1999



PREPARED BY
LARRY D. READ, PE
12836 Lomas Blvd., NE Suite B
ALBUQUERQUE, NEW MEXICO 87112
(505) 237-8421



DRAINAGE REPORT

for

FIRE STATION NUMBER 20

Wyoming Blvd. NE and Corona Ave. NE

Albuquerque, New Mexico

October 18, 1999

LOCATION & DESCRIPTION

This facility is proposed to be sited on the southwest corner of Wyoming Blvd. NE and Corona Ave. NE in the Domingo Baca Park. The site and the park are currently undeveloped. The City of Albuquerque Fire Department and City of Albuquerque Police Department are proposing to construct a 14,000 square foot facility to be used as Fire Station #20 and Police District 4 Substation. In addition to the building, this 4.8 acres site will include almost 37,500 square feet of paved parking to serve both departments and to provide public parking for the park when it is developed..

EXISTING DRAINAGE CONDITIONS

The existing site is vegetated with high desert type grasses and weeds and slopes toward the west at approximately 3.5%. The existing drainage from onsite runoff is a combination of shallow sheet flow with the beginning of minor channels that convey the runoff west into the end of the unimproved North Domingo Baca Arroyo and the Lower Domingo Baca Dam just east of Louisiana Blvd. between Carmel Ave. and Corona Ave.. In addition to the on-site runoff, the North Wyoming Storm Drain System outlets into the center of this site via a 60" RCP Storm Drain. The North Wyoming Storm Drain System collects all runoff from the developed areas north and east of the site. Along the southern edge of the site is the North Domingo Baca Arroyo. The Window G channel that collects runoff from the developed subdivisions east of Wyoming is soil cement lined east of Wyoming Blvd. and for a distance of about 120 feet west of Wyoming. The channel ends at the North Domingo Baca Arroyo that spreads and meanders across the park land south of this project site west toward the Lower Domingo Baca Dam.

OFFSITE DRAINAGE

As discussed above, this project site will not be affected by runoff from the developed land to the north and east due to the relocation of the outfall from the North Wyoming Storm Drain System. This site is also protected from runoff from the developed land east southeast of the site by the existing Window G Channel. Although this channel ends into the North Domingo Baca Arroyo on the west side of Wyoming (which is not improved along the south boundary of this site) the runoff is sufficiently channelized that there is only a small portion of the southeast corner of the site impacted by floodplain as shown on the Floodplain Map - Figure 2. Note that this figure is a copy of the Floodplain Map revised via LOMR dated April 24, 1999. In addition to the copy of the floodplain map, AGIS has provided an electronic copy of the floodplain overlain on the Zone Atlas Map and included as Figure 3. Note that the revised Floodplain Map was digitized an integrated into Figure 3 to reflect current conditions.

Offsite drainage basins have been delineated on the Offsite Drainage Basin Map included in Appendix B. The basins used for this analysis are those down stream of existing inlets and are the lower end of the drainage basins delineated in the North Albuquerque Acres Drainage Master Plan, December 1998 (copy in Appendix B). The land treatments and percentages used are consistent with a fully constructed six lane arterial roadway per the City of Albuquerque DPM. The land treatments used in the NAA Master Plan are consistent with large developed residential development. This reports assumes that the existing storm drainage facilities were properly designed and near total interception has been achieved.

MASTER PLAN

In addition to the design analyses/master plan prepared for the design of the North Wyoming Storm Drain System, a drainage master plan has been prepared for the La Cueva Neighborhood Sector Development Plan. This report is in Draft form as of December 1998. Section 9 of the report detailing Facility Planning for Drainage has been included in Appendix D of this report for reference. This document covers several hundred acres of the North Albuquerque Area and is general in nature but does include a summary of planned improvements. There are no planned improvements affecting this site indicated in the Sector Development Plan.

PARK PROPOSED ACTIONS

This project is a portion of the proposed development of the Domingo Baca Park Master plan. The park development is proposing to replat and rezone the entire block into one parcel. As part of the replat, the existing right-of-way for Anaheim Ave. between Wyoming Blvd. and Louisiana Blvd. will be vacated. Additionally, the combined parcel will be rezoned as appropriate to Park and City facility usage. A bubble diagram of the proposed development plan has been included in Appendix D for reference. As indicated on the Preliminary Park Development Plan in Appendix D, the North Domingo Baca

Arroyo will be improved from the existing soil cement Window G Channel at the east side of this site, west to the beginning of the existing sediment and detention facilities for the Lower Domingo Baca Dam.

PROPOSED CONDITIONS

Preparation of this site for construction will require considerable earthwork and several drainage patterns will be affected as follows:

- The undeveloped site sheet flows west into the Lower Domingo Baca Dam. The development of this facility (onsite Drainage Basin B) will divert a portion of the developed flows north into Corona Avenue. This diversion is necessary to comply with the Fire Department's the slope requirements for their large equipment.

- Developed runoff from all Onsite Basins will be intercepted in various onsite inlets, shown on the Grading Plan, and routed south in a storm drain to discharge into the main channel portion of the Domingo Baca Arroyo. Note that this discharge and the discharge from the rerouted North Wyoming Storm Drain System are considered temporary until the Domingo Baca Arroyo is channelized and stabilized as part of the Domingo Baca Park Construction. The proposed 24" storm drain will discharge just west of the rerouted 60" North Wyoming Storm Drain and will be provided with a separated riprap lined plunge pool.

- The existing 60" RCP discharge from the North Wyoming Storm Drain System will be rerouted south along Wyoming Blvd. from the northeast corner of the site and discharged into the North Domingo Baca Arroyo west of the end of the improved soil cement channel. The North Wyoming Storm Drain relocation has been designed by Easterling and Associates (COA Project No. 6201.91) and is in the process of being constructed by PWD on-call contractors.

Wyoming Blvd., along it's frontage with this site, will be improved as part of this project. Ruonff has been calculated for all offsite basins affecting this site. The offsite drainage map is included in Appendix B along with the calculations of runoff peak flow rates, depth calculations in the street, and storm inlet interception rates. The offsite basins reflected in the map in Appendix B represent only the portion of the offsite drainage basin below existing storm inlets. This report assumes that the existing inlets were sized to intercept the majority of the developed flows reaching the inlets. The proposed land treatments used in this report are in accordance with Section 22.2 of the City of Albuquerque Development Process Manual for fully developed conditions. Percentage of each land treatment used in this report is representative of a fully developed, six land arterial roadway section. Preliminary plan and profile sheets, included in Appendix E show the preliminary proposed curb profiles and inlet locations. Note that the 100-year flow depth in Wyoming from both north and south are less than 0.5 feet deep and runoff

does not cross the median or crown. Therefore, the only new storm inlets proposed for construction with this project are at the southwest corner of Wyoming and Corona. Since the 24' proposed pavement (in accordance with the City of Albuquerque DMP) construction will not connect to the existing pavement on Wyoming, it is proposed that the east edge of the new pavement will be curbed with extruded curb. The runoff from the west side of the existing pavement section will continue to flow west, over the new extruded curb, into the new pavement section, and into the two proposed new inlets at the southwest corner of Wyoming and Corona (ie. the construction of this portion of Wyoming will not block runoff from the west half of the existing roadway section) Runoff from the east half of the existing roadway section will continue to follow the east curb and gutter north to the existing inlet at the southeast corner of Wyoming and Corona. Typical roadway sections for Wyoming are included in Appendix E for reference.

The north half of Corona Ave has been constructed along the entire frontage of this site. Preliminary plan and profile sheets of the proposed south curb line have been included in Appendix E. This project will construct the south half of Corona along the site's frontage. The proposed construction of the south side of Corona will match the existing north side in both profile grade and section. Runoff calculations and offsite drainage basin map are included in Appendix B. Connection of the new south curb and gutter to the existing extruded curb at the west end of the site is proposed to be made with an extruded curb taper. Due to the slope of Corona, the runoff will follow the taper curb and continue west in inside the remaining extruded curb to the existing storm inlet approximately 1500 feet west of Wyoming on the south side of Corona (ie. no temporary drainage facilities are required to connect the full roadway section constructed by this project to the existing temporary section west of this site).

FLOOD PLAIN STATUS

FIRM Panel 350001C0137D and 141D were revised per the Letter of Map Revision approved by the Federal Emergency Management Agency via letter dated April 24, 1998. A copy of this letter and revised map have been included in Appendix G for reference. As shown on the revised FIRM Panel 350001C0141 D and 141D, effective April 24,1998, no portion of the proposed building or parking areas are included in a 100-year floodplain. The proposed building site is included in a Zone X. A small portion of the south portion of the site is included in a Zone AO (Depth 1). This floodplain is not within the proposed development area.

METHODOLOGY

The hydrology for this project was analyzed using the January 1993 revision of the City of Albuquerque Development Process Manual, Section 22.2 as follows:

The specific values used for this analysis are as follows:

-Precipitation Zone 3

-Design Storm 100-year, 6-hour duration
i = 2.60 inches (t_c = 0.2 hours)

The AHYMO computer model of the runoff volumes and peak flow rates are included in the Appendix B for reference.

MAP LEGEND

Revised 100-Year Floodplain

APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 141 OF 825

SEE MAP INDEX FOR PANELS NOT PRINTED

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0141	D
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0141	D

REVISED TO REFLECT LOMR DATED APR 24 1998

MAP NUMBER
35001C0141 D

EFFECTIVE DATE:
SEPTEMBER 20, 1996

Federal Emergency Management Agenc

THIS AREA WAS REVISED BY LOMR DATED MARCH 25, 1998

BERNALILLO COUNTY UNINCORPORATED AREAS 350001

CITY OF ALBUQUERQUE 350002

ZONE X

ZONE AO (DEPTH 1)

Tributary to North Arroyo De Domingo Baca

North Arroyo De Domingo Baca

ZONE A

100-YEAR FLOOD CONTAINED IN CHANNEL

REVISED AREA

ZONE BREAK

ZONE AO (DEPTH 1)

ZONE X

BERNALILLO COUNTY UNINCORPORATED AREAS 350001

ZONE AO (DEPTH 1)

CORPORATE LIMITS

Culvert

Detention Pond

SIGNAL AVENUE

WILSHIRE AVENUE

CORONA AVENUE

CARMEL AVENUE

HOLLY AVENUE

ANAHEIM AVENUE

BOULEVARD

WYOMING

JULIAN ROBLES STREET

HELEN HARDIN STREET

GORDON SNIDOW COURT

SANDOVAL STREET

JEAN PARRISH COURT

CURT WALTERS COURT

D REED COURT

WILSON HURLEY PLACE

MANUAL CIA PLACE

JOSEPH SHARP STREET

TIERRA ALEGRE DR

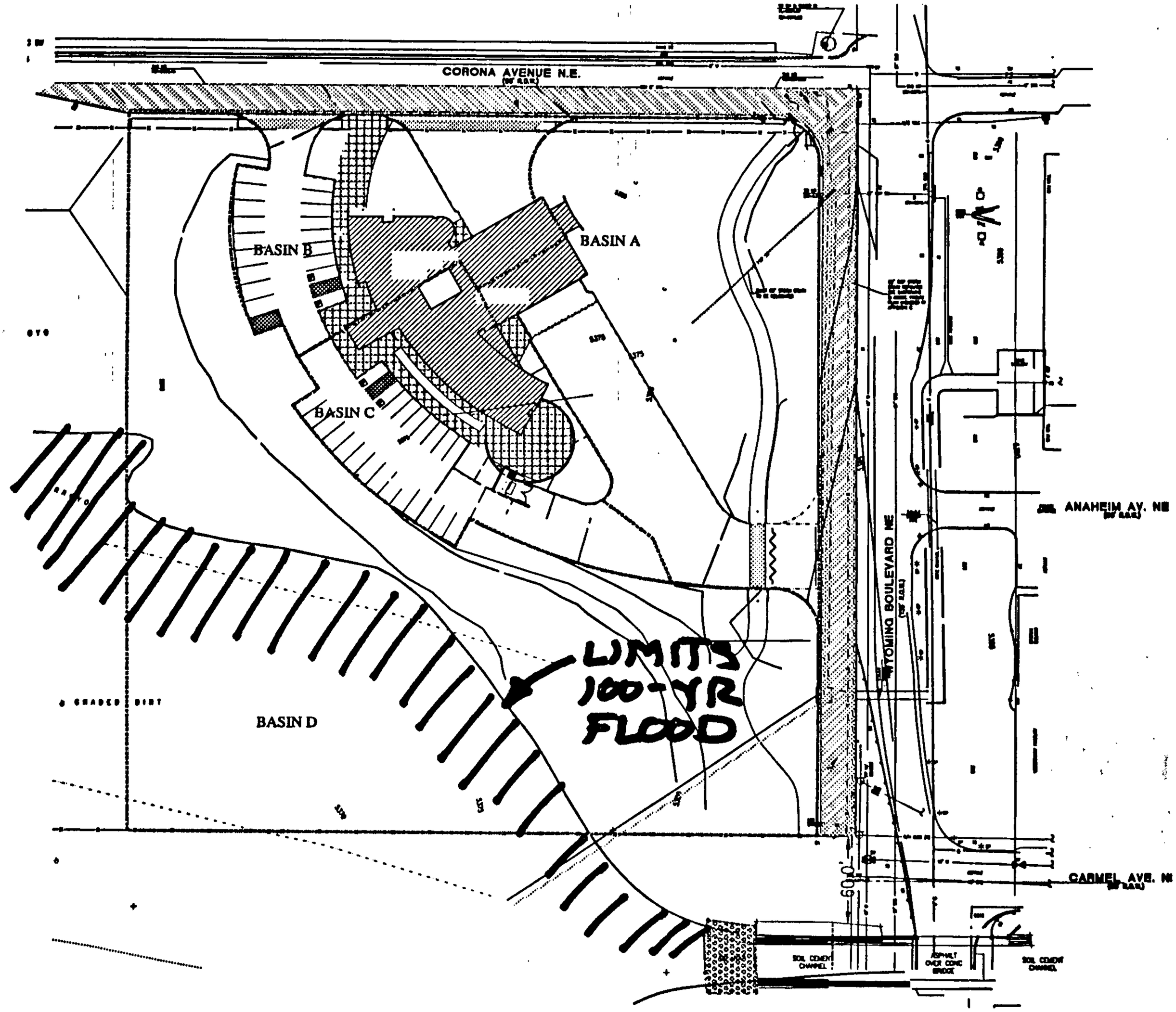
TIERRA SERENA DRIVE

TIERRA BONITA PLACE

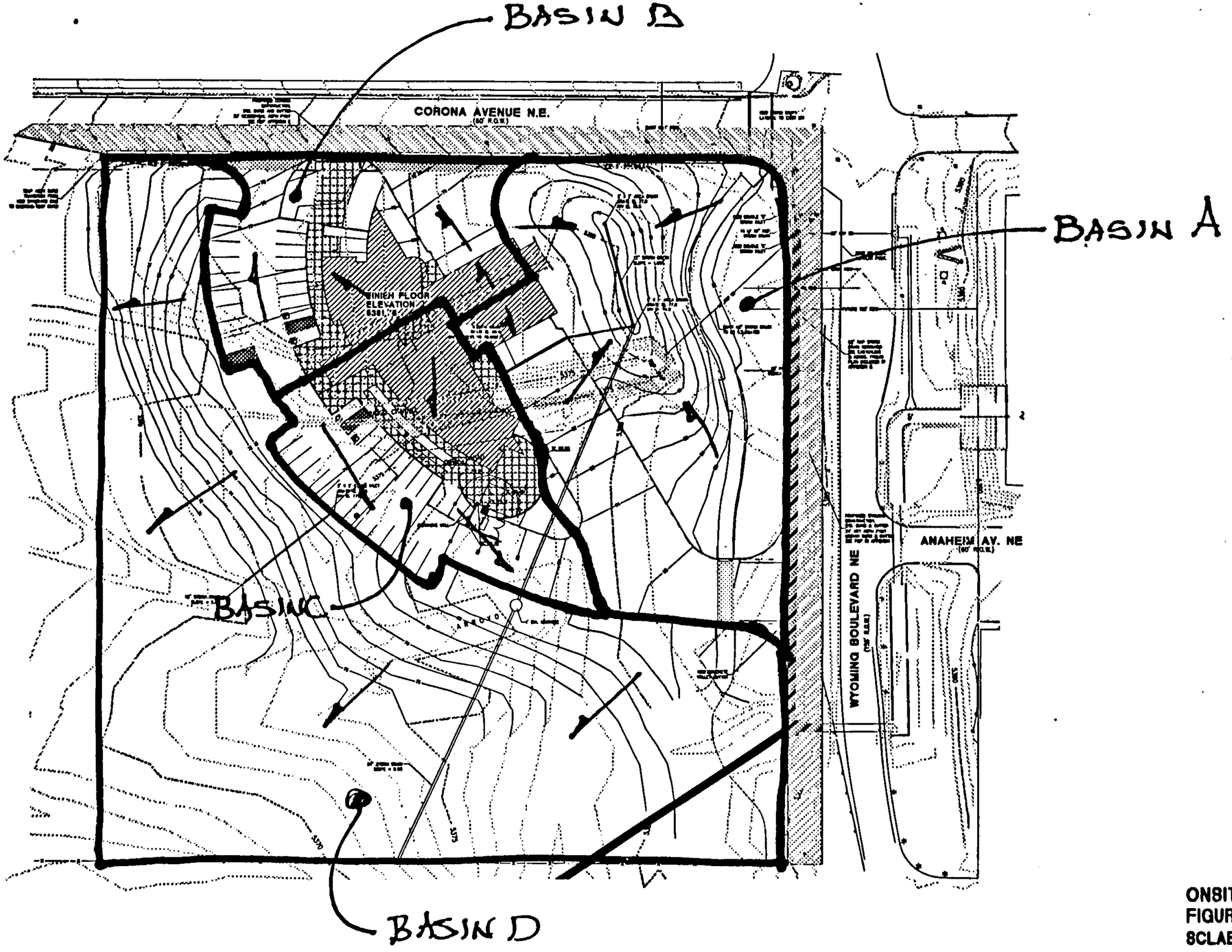
BARSTOW STREET

RM17

FIGURE 2



100-YR FLOODPLAIN
FIGURE 3
1" = 100'



ONSITE DRAINAGE BASINS
FIGURE 4
SCLAE 1"=100'

DATE: _____ By: _____ Pg: ___ of ___

ON-SITE DRAINAGE CALCULATIONS

ZONE 3 (SECTION 22.1, FIGURE A-1)

TOTAL AREA - EXISTING CONDITIONS

A = 4.802 acres

Q_{100} = 4.802 * 1.87 cfs/acre = 8.98 cfs

FLOW SHEET FLOWS WEST INTO THE WINDOW 6 CHANNEL

Q_{10} = .66 * 8.98 = 5.98 cfs

V_{100} = 4.802 * 0.64 $\left(\frac{43560}{12}\right)$ = 11,505 cf

V_{10} = .66 * 11,505 = 7,662 cf

DEVELOPED CONDITIONS

BASIN A

TOTAL AREA = 56,160 sf ⇒ 1.29 ac

A_D = 14,105 sf ⇒ 0.3238 ac

A_C = 42,055 sf ⇒ 0.9655 ac

Q_{100} = 0.3238 * 5.02 + 0.9655 * 3.45 = 4.96 cfs

Q_{10} = .66 * 4.96 = 3.27 cfs

V_{100} = (0.3238 * 2.36 + 0.9655 * 1.29) $\frac{43560}{12}$

= 7295 cf

V_{100} = .66 * 7295 = 4815 cf

Q OUTFALL CAP = 32 cfs → Q_{100} = 4.96 cfs OK

DATE: _____ By: _____ Pg: ___ of ___

BASIN B

TOTAL AREA = 25,200 sf ⇒ 0.5785 ac

A_D = 24,120 sf ⇒ 0.5537 ac

A_C = 1080 sf ⇒ 0.025 ac

Q_{100} = 0.5785 * 5.02 + 0.025 * 3.45 = 2.99 cfs

Q_{10} = .66 * 2.99 = 1.97 cfs

V_{100} = (.5785 * 2.36 + .025 * 1.29) $\frac{43560}{12}$

= 5073 cf

V_{10} = .66 * 5073 = 3348 cf

BASIN C

TOTAL AREA = 34,080 sf ⇒ 0.7824 sf

CONSIDER ALL TYPE D SOIL

Q_{100} = .7824 * 5.02 = 3.93 cfs

Q_{10} = .66 * 3.93 = 2.59 cfs

V_{100} = .7824 * 1.29 * 43560 / 12 = 3664 cf

V_{10} = .66 * 3664 = 2418 cf

DATE: _____ By: _____ Pg. ___ of ___

BASIN D

TOTAL AREA - 93,735 sf ⇒ 2.15 ac

CONSIDER ALL TYPE B SINCE IT WILL HAVE BEEN GRADED.

$Q_{100} = 2.15 * 5.02 = 10.79$ cfs

$Q_{10} = 10.79 * .66 = 7.12$ cfs

$V_{100} = 2.15 * 2.36 * 43560 / 12 = 18,419$ cf

$V_{10} = 18,419 * .66 = 12,156$ cf

TOTAL INCREASE DUE TO DEVELOPMENT ON-SITE

EXISTING	Q_{100} = 8.98 cfs	V_{100} = 15,565 cf	
DEVELOPED			
BASIN A	4.96 cfs	7295 cf	
BASIN B	2.99 cfs	5073 cf	
BASIN C	3.93 cfs	3669 cf	
BASIN D	10.79 cfs	18,419 cf	
INCREASE	13.69 cfs	22,996 cf	

BASIN B OUTFALL - FROM INLET TO BASIN C
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\firesta2.fm2
Worksheet	Main Outfall from Bowl
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.006000	ft/ft
Diameter	12.00	in

Results		
Depth	1.00	ft
Discharge	2.76	cfs
Flow Area	0.79	ft²
Wetted Perimeter	3.14	ft
Top Width	0.00	ft
Critical Depth	0.71	ft
Percent Full	100.00	
Critical Slope	0.008184	ft/ft
Velocity	3.51	ft/s
Velocity Head	0.19	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	2.97	cfs
Full Flow Capacity	2.76	cfs
Full Flow Slope	0.006000	ft/ft

BASIN OUTFALL - FROM INLET TO MANHOLE
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\firesta2.fm2
Worksheet	Main Outfall from Bowl
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000	ft/ft
Diameter	18.00	in

Results		
Depth	1.50	ft
Discharge	7.43	cfs
Flow Area	1.77	ft²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.06	ft
Percent Full	100.00	
Critical Slope	0.007032	ft/ft
Velocity	4.20	ft/s
Velocity Head	0.27	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	7.99	cfs
Full Flow Capacity	7.43	cfs
Full Flow Slope	0.005000	ft/ft

OUTFALL FROM MANHOLE TO ARROYO
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\firesta2.fm2
Worksheet	Main Outfall from Bowl
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000	ft/ft
Diameter	24.00	in

Results		
Depth	2.00	ft
Discharge	16.00	cfs
Flow Area	3.14	ft²
Wetted Perimeter	6.28	ft
Top Width	0.00	ft
Critical Depth	1.44	ft
Percent Full	100.00	
Critical Slope	0.006612	ft/ft
Velocity	5.09	ft/s
Velocity Head	0.40	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	17.21	cfs
Full Flow Capacity	16.00	cfs
Full Flow Slope	0.005000	ft/ft

CORONADO AIRPORT

(1822 cfs)
AP 312.9

NORTH CAMINO

312.0

(1829 cfs)
AP 305.29

8

CORONADO AIRPORT

AP 311.99
(803 cfs)

SANDIA RESERVATION

(283 cfs)
AP 310.9

311.0

ELENA DR

AP 309
(149 cfs)

VENICE

AP 308.9
(258 cfs)

309.0

204.1

7

310.0

BEVERLY HILLS

308.0

SAN DIEGO

(312 cfs)
AP 204.92

204.4

AP 207.9
(222 cfs)

307.0

MUNICIPAL LIMITS

ALDRENCE

204.3

AP 204.90
(988 cfs)

204.0

GLENDALE

EL CAMINO

(824 cfs)
AP 203.39

203.3

6

AP 113.99
(3906 cfs)

113.0

MODESTO

AMAFCA EASEMENTS

LA CUEVA

EAGLE ROCK

EAGLE ROCK SUBD

116.1

OAKLAND

QUAIL SPRINGS

112.1

(3128 cfs)
AP 112.90

LA CUEVA CHANNEL

(3094 cfs)
AP 111.99

111.1

112.2

111.3

931.0

APS PROPERTY
LA CUEVA HIGH SCHOOL

929.0

924.4

AMAFCA PROPERTY

924.2

924.3

117.4

934.1

FALCON RIDGE

932.1

932.2

932.3

925.3

VINEYARD ESTATES

939.6

SITE

AMAFCA PROPERTY
LOWER NORTH DOMINGO BACA DAM

(2340 cfs)
AP 930.86

932.4

925.4

925.1

APS PROPERTY
MID-SCHOOL

AP 930.87
(204 cfs)

940.2

960.0

NORTH DOMINGO BACA

935.0

AP 930.99
(1869 cfs)

926.2

WINDOW "G"

930.0

926.0

AP 926.99
(1745 cfs)

NORTH DOMING

LOUISIANA

WYOMING

BARSTOW

937.0

WINDOW "G"

PASEO DEL NORTE

TABLE A-6

NORTH DOMINGO BACA EXISTING CONDITION

Sub-basin	Area (acres)	10-yr Vol (ac-ft)	10-yr Qp (cfs)	100-yr Vol (ac-ft)	100-yr Qp (cfs)
922	.0210	0.665	16.25	1.398	32.59
922.1	.0070	0.180	4.91	.394	11.18
922.2	.0148	0.781	21.04	1.396	35.69
922.3	.0415	2.190	58.97	3.913	100.3
923.0	.0070	0.158	4.92	.370	11.32
924.1	.0190	0.233	7.75	.733	24.11
924.2	.0070	0.136	3.99	.335	10.16
924.3	.0270	1.593	41.20	2.753	68.50
924.4	.0172	0.358	10.81	.862	26.21
925.1	.0640	3.766	96.60	6.547	162.20
925.2	.0140	0.169	5.62	.536	17.65
925.3	.0105	0.614	15.82	1.063	26.43
925.4	.0370	2.246	58.52	3.887	96.45
926.0	.0375	1.326	36.64	2.624	72.25
926.1	.0120	0.408	12.54	.836	24.21
929.0	.0240	1.658	41.00	2.752	65.77
930.0	.0850	4.874	125.30	8.468	211.88
931.0	.0605	3.619	62.04	6.185	104.39
932.1	.0073	0.450	11.58	.766	19.08
932.2	.0073	0.450	11.46	.766	18.89
932.3	.0313	1.928	49.09	3.284	80.93
932.4	.0574	3.605	91.59	6.135	150.03
934.1	.0468	2.303	61.41	4.148	107.84

TABLE A-6 (cont.)

NORTH DOMINGO BACA EXISTING CONDITION

Sub-basin	Area (acres)	10-yr Vol (ac-ft)	10-yr Qp (cfs)	100-yr Vol (ac-ft)	100-yr Qp (cfs)
935.0	.1100	1.668	53.54	4.640	151.68
937.0	.0352	0.680	20.09	1.680	51.06
939.14	.0112	0.714	18.32	1.203	29.58
939.16	.0128	0.700	18.24	1.219	30.89
940.0	.0141	0.771	20.09	1.343	34.02
940.1	.0070	0.479	11.73	.791	18.82
940.2	.0156	0.853	22.23	1.486	37.64
942.1	.0469	2.362	62.18	4.197	108.16
942.2	.1031	5.193	121.03	9.227	212.49
943.1	.0120	0.793	19.85	1.322	31.97
943.2	.0130	0.230	6.74	.582	17.86
960.0	.0075	0.418	11.02	.727	18.46

Lateral Erosion Setback

AMAFCA Sediment and Erosion Design Guide, (RCE 11/94)

Assumptions:

1. Wide rectangular channel
2. Uniform Flow
3. Manning's n=0.035
4. width/depth ratio, F=(W/D)=40

Flow Characteristics:

input--> **Q100= 1869 cfs**

input--> **S= 0.032 ft/ft**

Dominant Discharge, Qd = 374 cfs

Critical slope, Sc -- Equation 3.80:

Sc = 0.037 Qd^-0.133 = 0.017

Dominant channel width, Wd.

Supercritical flow	Wd = 4.6 Qd^0.4 =	49.18	feet
Subcritical flow	Wd =2.46 Qd^(0.375)S^(-0.188)	43.32	feet
	use-->	49.18	feet

Meander wave length and unconstrained bend length -- Equation 3.74:

for Qd<200 cfs	fee/Wd = 10	10	feet
for 200<Qd<2000 cfs	fee/Wd = 0.8 + 4*log Qp =	11.09	feet
for Qd>2000 cfs	fee/Wd = 14	14	feet
	use-->	11.09	feet

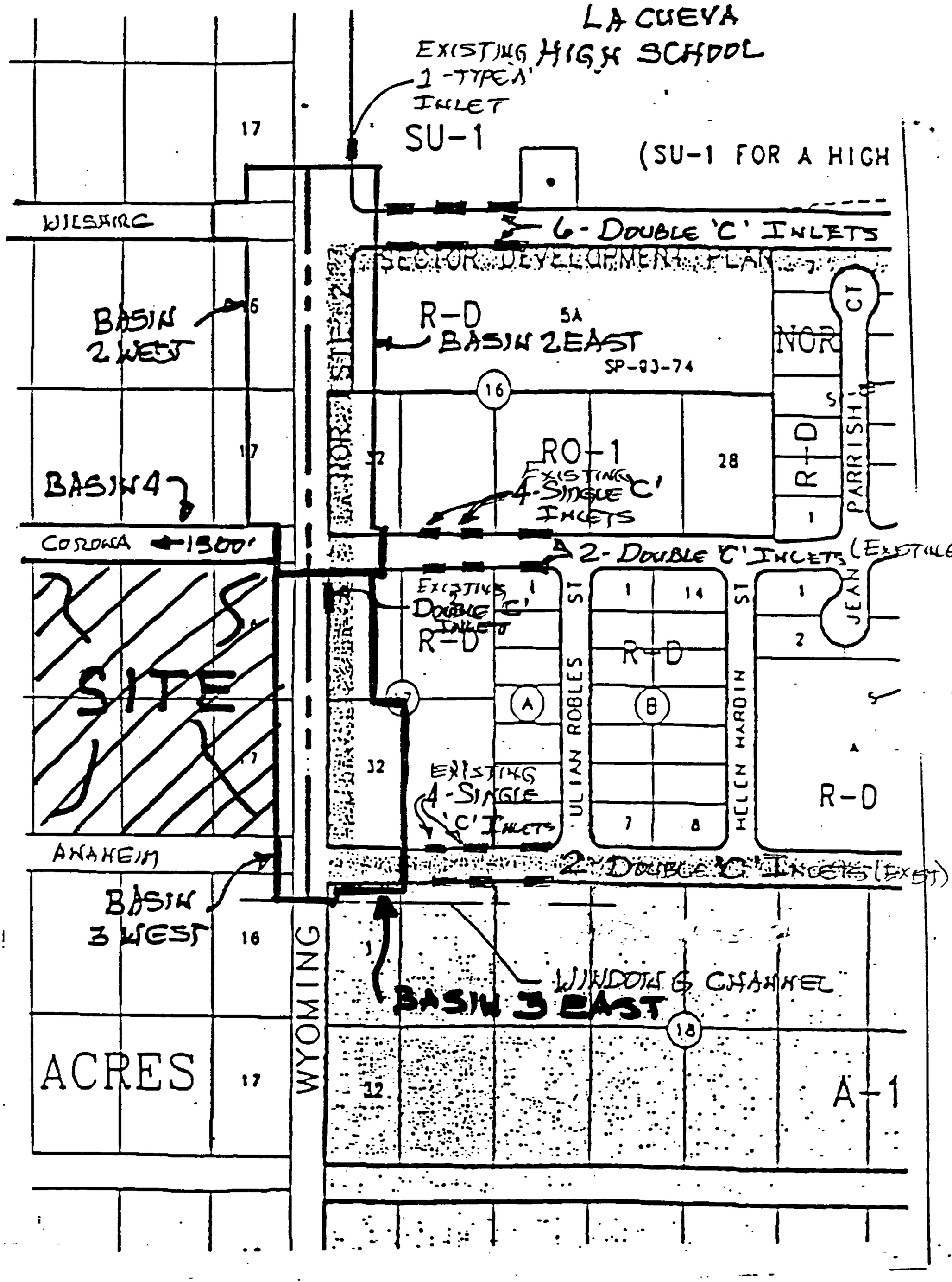
Maximum deviation of a channel from a straight line -- Equation 3.75

for Qd<200 cfs	Delta max = 2.5 Wd	122.96	feet
for 200<Qd<2000 cfs	Delta max = [0.2+log(Qd)]Wd	136.37	feet
for Qd>2000 cfs	Delta max = 3.5 Wd	172.14	feet
	use-->	136.37	feet

Maximum deviation of a channel from a straight line -- Equation 3.81

for Qd<200 cfs	Delta max = (11.5 Qd^0.4)	122.96	feet
for 200<Qd<2000 cfs	Delta max =[0.92+4.6log(Qd)]Qd^0.4	136.37	feet
for Qd>2000 cfs	Delta max = 16.1 Qd^0.4	172.14	feet
	use-->	136.37	feet

Delta max represents the bankline setback (BSB),
The centerline setback is BSB+1/2Wd **Centerline Setback --> 160.96 feet**



OFFSITE DRAINAGE BASINS
SCALE 1=200"

DATE: _____ By: _____ Pg: ___ of ___

OFFSITE RUNOFF

ASSUMPTIONS:

1. ALL EXISTING STORM INLET SYSTEMS ARE DESIGNED FOR 100% INTERCEPTION.

2. WYOMING SECTION (FUTURE)

- FULL FUTURE ROW = 196'
6'SW + 3 - 12' LANES + 28' MEDIAN + 3 - 12' LANES + 6'SW

D = 6 + 36 = 42'

C = 28/2 = 14' (NON-PAVED MEDIAN)

CALCULATIONS:

BASIN 2 WEST

A = 0.57 ac

A_D = 42 * 455' (WYOMING) + 40' * 40' (ASHCROFT) = 0.48 ac

A_C = 0.57 - 0.48 = 0.09 ac

ZONE 3 (PER DPM SECTION 22.2 - FIGURE A-1)

Q_{100} (D) = 0.48 * (5.02 cfs/acre) = 2.41 cfs

Q_{100} (C) = 0.09 * (3.45 cfs/acre) = 0.31 cfs

TOTAL Q_{100} = 2.72 cfs

D = 0.20' (SEE RATING TABLE NEXT PAGE)

FLOW DEPTH IN WYOMING FROM BASIN 2WEST
Worksheet for Irregular Channel

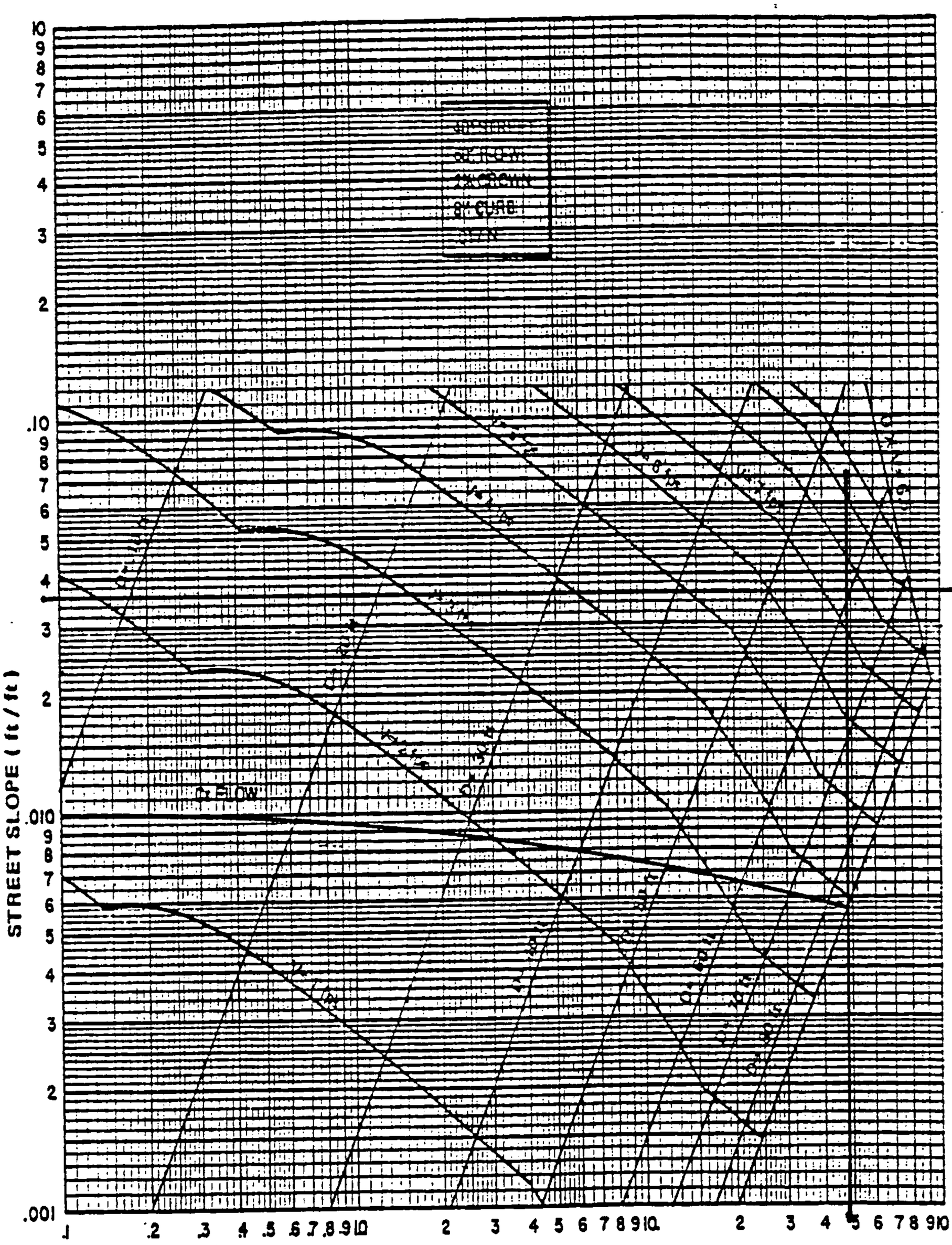
Project Description	
Project File	a:\fire sta.fm2
Worksheet	WYOMING CAPACITY - NORTH OF CORONA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.020342 ft/ft	
Elevation range: 98.77 ft to 100.00 ft.		
Discharge	2.72	cfs

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	52.63	0.017
28.00	99.44			
28.63	98.77			
52.63	99.25			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	98.97	ft
Flow Area	1.02	ft²
Wetted Perimeter	10.28	ft
Top Width	10.19	ft
Height	0.20	ft
Critical Depth	99.00	ft
Critical Slope	0.008705	ft/ft
Velocity	2.67	ft/s
Velocity Head	0.11	ft
Specific Energy	99.08	ft
Froude Number	1.49	
Flow is supercritical.		

STREET CAPACITY

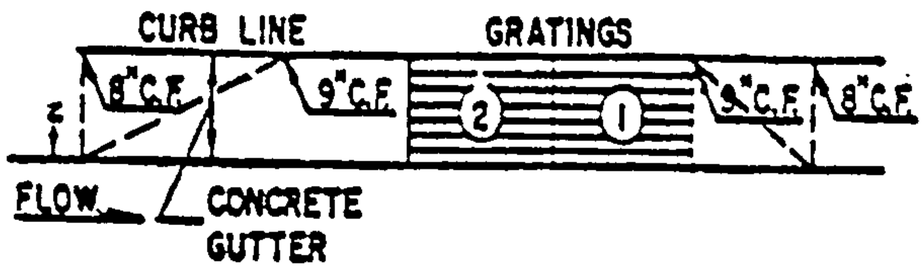


$Q_{100} = 4.9 cfs$

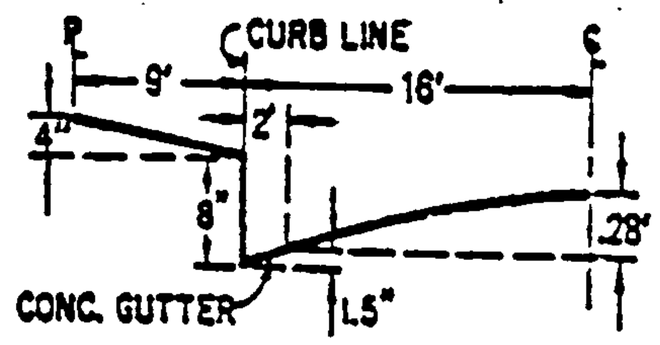
$d = 0.54' < 0.67 of$

PLATE 22.3 D-3

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

S = 3.6%
d = 0.94'
Q_i = 11 cfs Q_{100} = 4.9 cfs OK

PLATE 22.3 D-6

CORONA AVENUE

EXISTING CAPACITY - WITHOUT FS-20

S = 3.6%

D = 1473' WYOMING TO EXISTING INLET - SOUTH SIDE OF CORONA @ MURRELET DRIVE (FALCON RIDGE SUBDIVISION)

W (NORTH) - STREET - 20' D = 26/30 = .87

SIDEWALK - 6' C - = .13

DIRT - 4'

W (SOUTH) - STREET - 4' D = 1.0

SIDEWALK - NONE

DIRT - NONE - LAND SLOPES SOUTH AWAY FROM STREET

Q_{100} (NORTH) = 5.02 * 1.019 * .87 + 3.45 * 1.019 * .13 = 4.9cfs

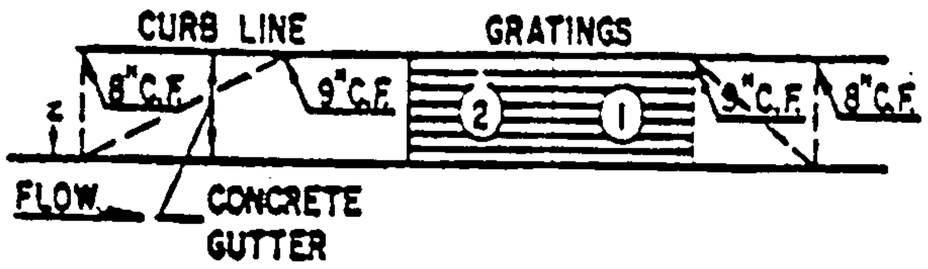
A = 1473 * 30 = 44,190 (1.014ac)

Q_{100} (SOUTH) = 5.02 * 0.135 * 1 = 0.68 cfs

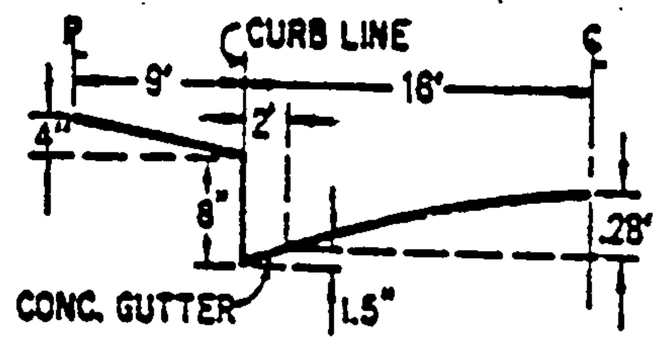
A = 1473 * 4 = 5892sf (0.135ac)

NOTE: Q_{100} (SOUTH) = Q_{100} (NORTH) = 4.9cfs for FULLY CONSTRUCTED SECTION.

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

$D = 99.41 - 99.13$
$= 0.28'$

$S = 3.6\%$

$Q_1 = 5.3$ cfs

$Q_{BY} = 8.26 - 5.3$
$= 2.96$ cfs

No Good

PLATE 22.3 D-6

CORONA TEMP SECTION W/4' TEMP PVMT
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA - EXISTING SECTION W/4' TEMP PVMT
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.036000 ft/ft			
Elevation range: 99.13 ft to 100.12 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
66.00	100.12	66.00	100.00	0.017
66.01	99.45			
70.00	99.53			
90.00	99.13			
90.01	99.80			
100.00	100.00			
Discharge	8.57	cfs		

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.41	ft
Flow Area	1.95	ft²
Wetted Perimeter	14.23	ft
Top Width	13.95	ft
Height	0.28	ft
Critical Depth	99.51	ft
Critical Slope	0.007834	ft/ft
Velocity	4.40	ft/s
Velocity Head	0.30	ft
Specific Energy	99.71	ft
Froude Number	2.08	
Flow is supercritical.		

FLOW IN SOUTH CURB = 0.35 cfs

FLOW IN NORTH CURB =

8.57 - 0.35 = 8.26 cfs

CORONA FULL SECTION W/BASIN B
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA AVE FULL SECTION
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.036000 ft/ft

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
40.00	100.00	40.00	100.00	0.017
50.00	99.80			
50.01	99.13			
70.00	99.53			
90.00	99.13			
90.01	99.80			
100.00	100.00			

Discharge 12.79 cfs

$Q_{100} = 4.9 + 4.9 + 2.99$ (BASIN B)
$= 12.79$ cfs

MAX DEPTH = $99.38 - 99.13 = 0.25'$
$< .87$ OK

Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.38	ft
Flow Area	3.13	ft²
Wetted Perimeter	25.50	ft
Top Width	25.00	ft
Height	0.25	ft
Critical Depth	99.46	ft
Critical Slope	0.007863	ft/ft
Velocity	4.09	ft/s
Velocity Head	0.26	ft
Specific Energy	99.64	ft
Froude Number	2.04	
Flow is supercritical.		
Flow is divided.		

— < CROWN DEPTH FLOW NOT EVENCY SPLIT.

EXIST CORONA SOUTH - TEMP SECTION
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA SOUTH - EXIST
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.036000	ft/ft
Water Surface Elevation	99.41	ft

Elevation range: 99.33 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
4.00	100.00	4.00	8.01	0.017
4.01	99.33			
8.01	99.41			

Results		
Wtd. Mannings Coefficient	0.017	
Discharge	0.31	cfs
Flow Area	0.16	ft²
Wetted Perimeter	4.08	ft
Top Width	4.00	ft
Height	0.08	ft
Critical Depth	99.43	ft
Critical Slope	0.011376	ft/ft
Velocity	1.91	ft/s
Velocity Head	0.06	ft
Specific Energy	99.47	ft
Froude Number	1.69	

Flow is supercritical.

Q_{100} = 0.68 cfs

.68 - .31 - 0.37 spills to North w/o FS-20

(BASIN B)

Q_{100} = 0.68 + 2.99 = 3.67 cfs with FS-20 BASIN B

3.67 - .31 = 3.36 cfs spills to NORTH.

100-YR FLOW DEPTH - CORONA NORTH
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	HALF CORONA AVE SECTION
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.035000 ft/ft

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
70.00	100.00	70.00	100.00	0.017
80.00	99.80			
80.01	99.13			
100.00	99.53			

Discharge 4.90 cfs

Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.36	ft
Flow Area	1.29	ft²
Wetted Perimeter	11.60	ft
Top Width	11.37	ft
Height	0.23	ft
Critical Depth	99.43	ft
Critical Slope	0.008147	ft/ft
Velocity	3.79	ft/s
Velocity Head	0.22	ft
Specific Energy	99.58	ft
Froude Number	1.98	

Flow is supercritical.

— SINCE CROWN ELEV 99.53
THERE IS NO SPILL TO SOUTH

EXIST CORONA SOUTH - TEMP SECTION
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA SOUTH - EXIST
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.036000 ft/ft

Elevation range: 99.33 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
4.00	100.00	4.00	8.01	0.017
4.01	99.33			
8.01	99.41			

Discharge 0.68 cfs

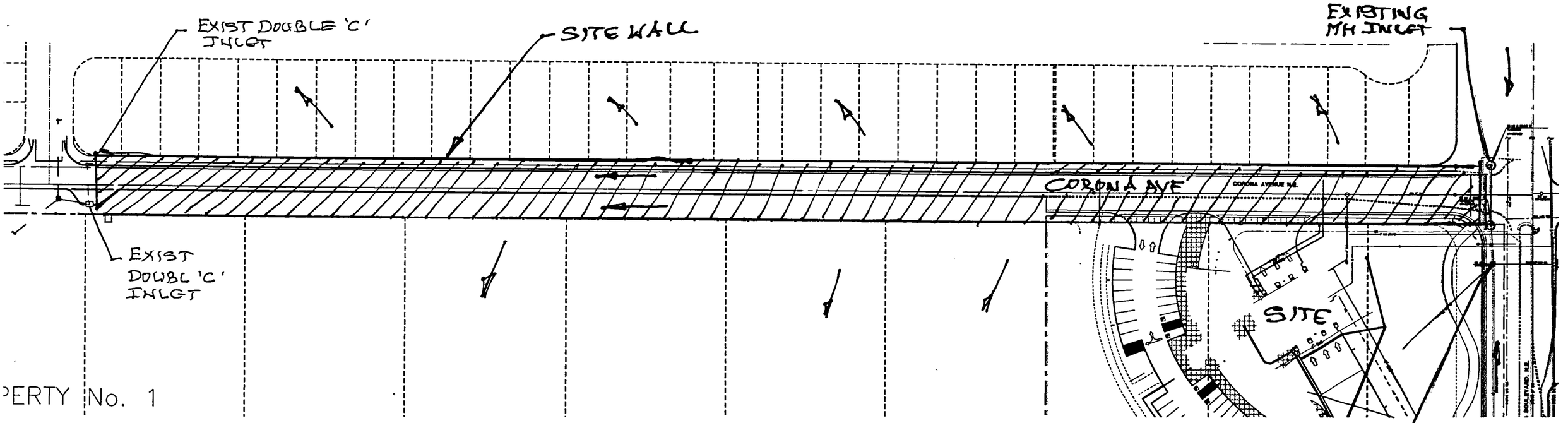
Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.43	ft
Flow Area	0.26	ft²
Wetted Perimeter	4.13	ft
Top Width	4.00	ft
Height	0.10	ft
Critical Depth	99.47	ft
Critical Slope	0.009772	ft/ft
Velocity	2.62	ft/s
Velocity Head	0.11	ft
Specific Energy	99.54	ft
Froude Number	1.81	

Flow is supercritical.

Water elevation exceeds lowest end station by 0.02 ft.

— SPILL TO NORTH
CROWN @ 99.41

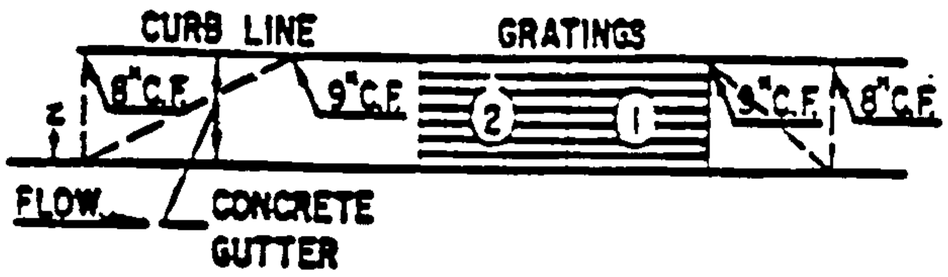


PERTY No. 1

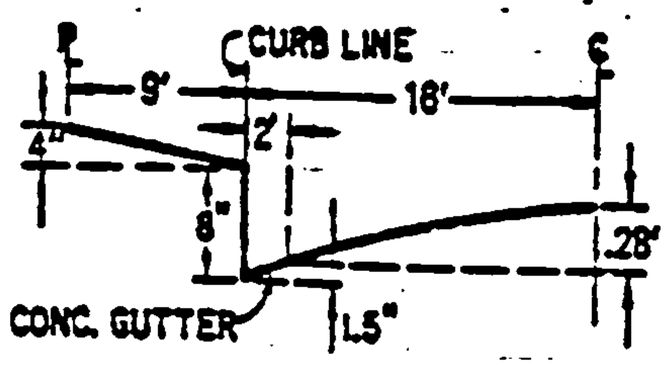
SUPPLEMENTAL ANALYSIS
BASIN 4 (OFFSITE

SCALE 1" = 300'

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

d = 0.20'
S = 2.03%
Q_i = 1.4 cfs
Q_{100} = 2.7 cfs
Use 2 - Double 'C' Inlets

PLATE 22.3 D-6

BASIN 2 WEST

DATE: _____ By: _____ Pg: ___ of ___

BASIN 2EAST

A = 0.85 ac

A_O = 42'*455' + 40'*40' + 40'*35' = 0.51 ac
(WYOMING) (WISCONSIN) (COLORADO)

A_C = 0.85 - 0.51 = 0.34 ac

$Q_{100}(O)$ = 0.51 * 5.02 = 2.56 cfs

$Q_{100}(C)$ = 0.34 * 3.45 = 1.17 cfs

TOTAL Q_{100} = 3.73 ac

D = 0.23' (SEE WORKSHEET NEXT PAGE)

FLOW DEPTH IN WYOMING FROM BASIN 2EAST
Worksheet for Irregular Channel

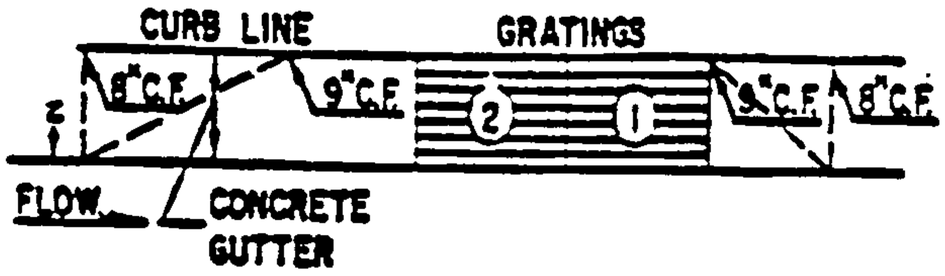
Project Description	
Project File	a:\fire sta.fm2
Worksheet	WYOMING CAPACITY - NORTH OF CORONA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.020342 ft/ft	
Elevation range: 98.77 ft to 100.00 ft.		
Discharge	3.73	cfs

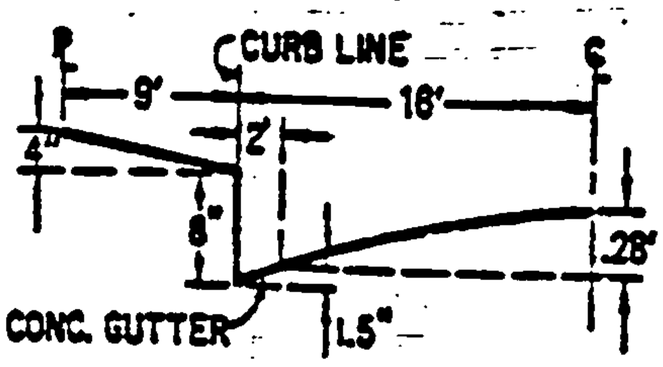
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	52.63	0.017
28.00	99.44			
28.63	98.77			
52.63	99.25			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.00	ft
Flow Area	1.29	ft²
Wetted Perimeter	11.57	ft
Top Width	11.47	ft
Height	0.23	ft
Critical Depth	99.04	ft
Critical Slope	0.008345	ft/ft
Velocity	2.89	ft/s
Velocity Head	0.13	ft
Specific Energy	99.12	ft
Froude Number	1.52	
Flow is supercritical.		

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

$d = 0.23'$

$s = 2.03\%$

$Q_i = 2.1$ cfs

$Q_{100} = 3.73$ cfs

Use 2 - Double C Inlets

PLATE 22.3 D-6

BASIN 2EAST

DATE: _____ By: _____ Pg: ___ of ___

BASIN 3 WEST

A = 0.34 ac

A_D = 24 * 365 + 6 * 365 + 40 * 30 = 0.28 ac
(GRASS/SHRUB) (HAY-SHR) (ANAHEIM)

A_C = 0.34 - 0.28 = 0.06 ac

$Q_{100}(D)$ = 0.28 * 5.02 = 1.41 cfs

$Q_{100}(C)$ = 0.06 * 3.45 = 0.21 cfs

TOTAL Q_{100} = 1.62 cfs

D = 0.29' SEE WORKSHEET NEXT PAGE

FLOW DEPTH IN WYOMING FROM BASIN 3WEST
Worksheet for Irregular Channel

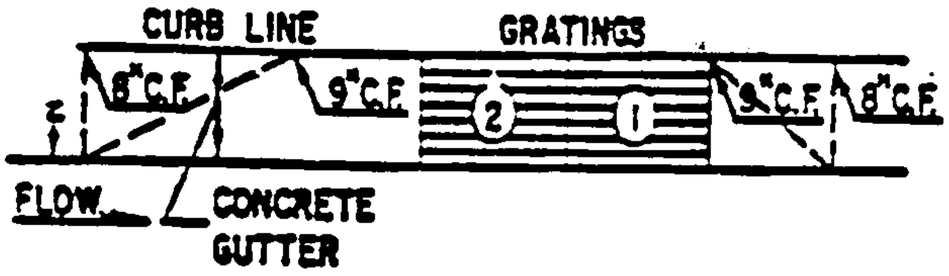
Project Description	
Project File	a:\fire sta.fm2
Worksheet	WYOMING CAPACITY - NORTH OF CORONA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.008580 ft/ft	
Elevation range: 98.77 ft to 100.00 ft.		
Discharge	1.62	cfs

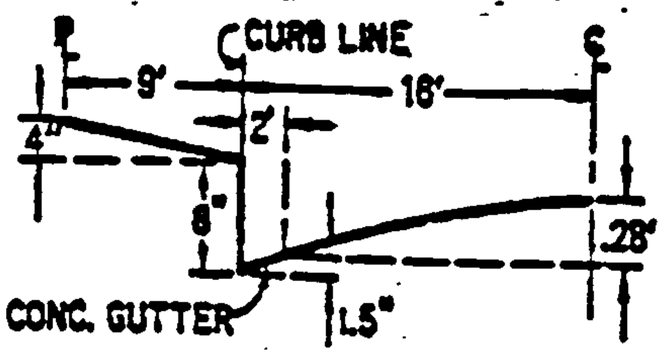
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	52.63	0.017
28.00	99.44			
28.63	98.77			
52.63	99.25			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	98.96	ft
Flow Area	0.95	ft²
Wetted Perimeter	9.95	ft
Top Width	9.86	ft
Height	0.19	ft
Critical Depth	98.96	ft
Critical Slope	0.009327	ft/ft
Velocity	1.70	ft/s
Velocity Head	0.04	ft
Specific Energy	99.01	ft
Froude Number	0.96	
Flow is subcritical.		

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

$d = 0.19'$

$s = 0.858\%$

$Q_i = 1.0$ cfs

$Q_{100} = 1.62$ cfs

Use 2 - Double C Inlets

MIN $Q_i = 1$ cfs

PLATE 22.3 D-6

BASIN 3 WEST

DATE: _____ BY: _____ PG: ___ OF ___

BASIN 3EAST

A = 1.18 acre

A_D = 24 * 365 + 6 * 365 + 40 * 330 + 40 x 30 = 0.58 ac
(WYOMING) (WY-SLR) (AWAFGCM) (JUCSAN)

A_C = 1.18 − 0.58 = 0.60 ac

Q_{100} (D) = 0.58 * 5.02 = 2.91 cfs

Q_{100} (C) = 0.60 * 3.45 = 2.07 cfs

TOTAL Q_{100} = 4.98 cfs

D = 0.29' (SEE WORKSHEET NEXT PAGE

FLOW DEPTH IN WYOMING FROM BASIN 3EAST
Worksheet for Irregular Channel

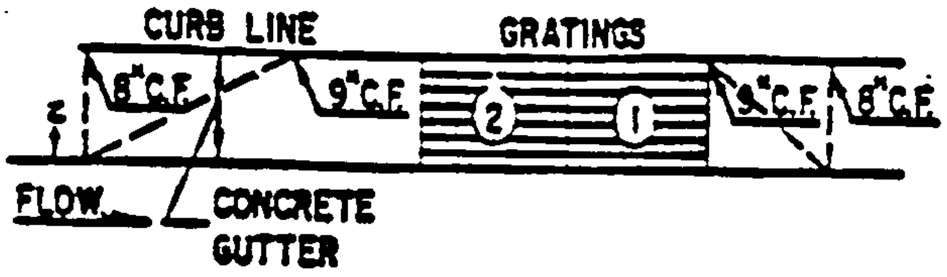
Project Description	
Project File	a:\fire sta.fm2
Worksheet	WYOMING CAPACITY - NORTH OF CORONA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.008580 ft/ft	
Elevation range: 98.77 ft to 100.00 ft.		
Discharge	4.98	cfs

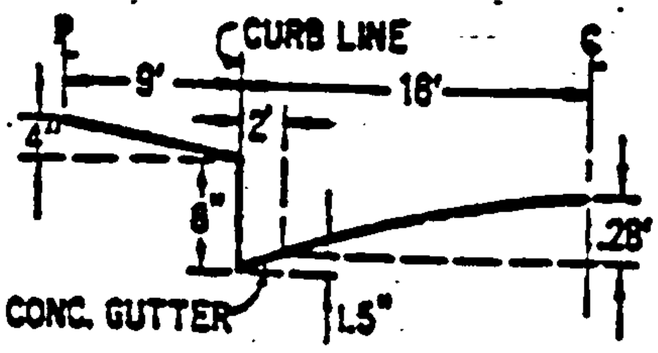
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	52.63	0.017
28.00	99.44			
28.63	98.77			
52.63	99.25			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.06	ft
Flow Area	2.22	ft²
Wetted Perimeter	15.16	ft
Top Width	15.03	ft
Height	0.29	ft
Critical Depth	99.07	ft
Critical Slope	0.008030	ft/ft
Velocity	2.25	ft/s
Velocity Head	0.08	ft
Specific Energy	99.14	ft
Froude Number	1.03	
Flow is supercritical.		

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

$d = 0.29'$

$S = 0.858\%$

$Q_i = 1.6$ cfs

$Q_{100} = 4.98$ cfs

Use 3 - Double 'C' Inlets

PLATE 22.3 D-6

BASIN 3EAST

DATE: _____ BY: _____ PG: ___ OF ___

BASIN 4 CORONA AVE.

1/2 STREET CALCULATIONS CONCENTRATION POINT @ EXISTING INLET

A = 1500 x 30 = 1.033ac.

A_D = 1500 x 24 = 0.83ac

A_C = 1500 x 6 = 0.21ac

(D) Q_{100} = 0.83 x 5.02 = 4.2 cfs

(C) Q_{100} = 0.21 x 3.45 = 0.72 cfs

Q_{100} TOTAL = 4.92 cfs

d = 0.29' (SEE SPREAD SHEET ATTACHED)

EXISTING DOUBLE 'C' INLET CAPACITY = 4.7 CFS (PER DPM, PC 22.3 D-6)

S = 3.5%

CORONA AVE. CAPACITY & DEPTH AT Q100
Worksheet for Irregular Channel

Project Description	
Project File	a:\fire sta.fm2
Worksheet	CORONA AVE. CAPACITY
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.025547	ft/ft

Elevation range: 99.13 ft to 100.00 ft.

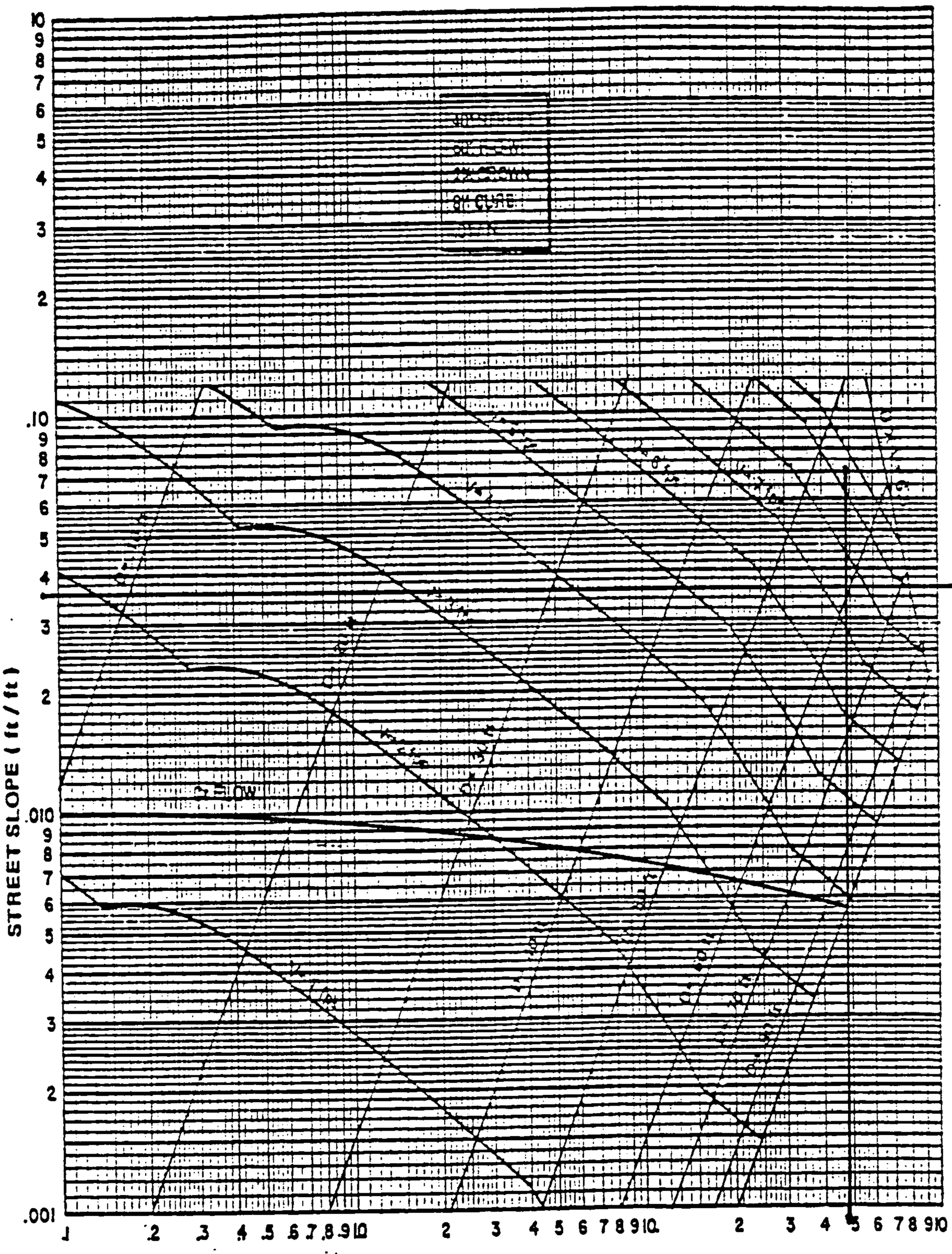
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	30.00	0.017
10.00	99.80			
10.10	99.13			
30.00	99.53			

Discharge	4.92	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.37	ft
Flow Area	1.46	ft²
Wetted Perimeter	12.27	ft
Top Width	12.06	ft
Height	0.24	ft
Critical Depth	99.43	ft
Critical Slope	0.008113	ft/ft
Velocity	3.38	ft/s
Velocity Head	0.18	ft
Specific Energy	99.55	ft
Froude Number	1.71	

Flow is supercritical.

STREET CAPACITY



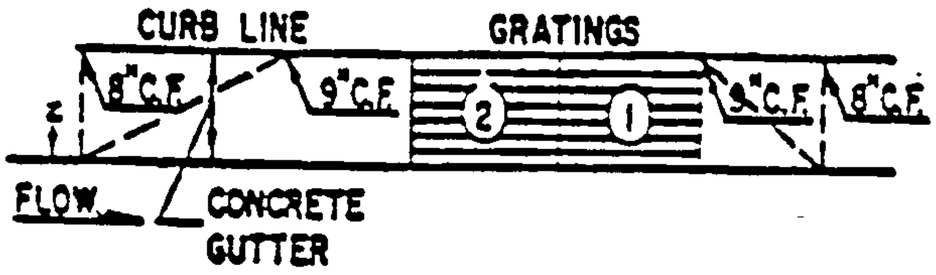
· ONE HALF STREET FLOWS (cfs)

$Q_{100} = 4.9 cfs$

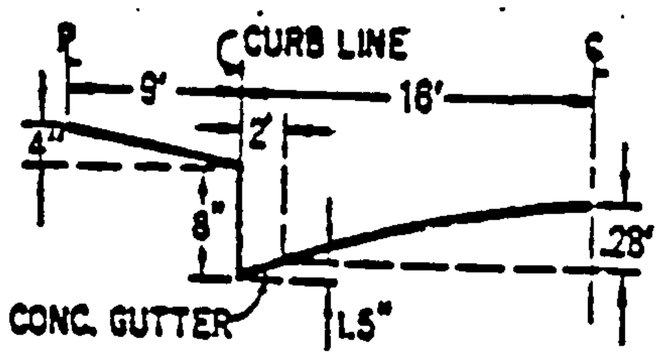
$d = 0.54' < 0.67 of$

PLATE 22.3 D-3

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

S = 3.6%
d = 0.94'
Q_i = 11 cfs Q_{100} = 4.9 cfs OK

CORONA AVENUE

EXISTING CAPACITY - WITHOUT FS-20

S = 3.6%

D = 1473' WYOMING TO EXISTING INLET - SOUTH SIDE OF CORONA @ MURRELET DRIVE (FALCON RIDGE SUBDIVISION)

W (NORTH) - STREET - 20' D = 26/30 = .87

SIDEWALK - 6' C- = .13

DIRT - 4'

W (SOUTH) - STREET - 4' D = 1.0

SIDEWALK - NONE

DIRT - NONE - LAND SLOPES SOUTH AWAY FROM STREET

Q100 (NORTH) = 5.02 * 1.01 * .87 + 3.45 * 1.01 * .13 = 4.9

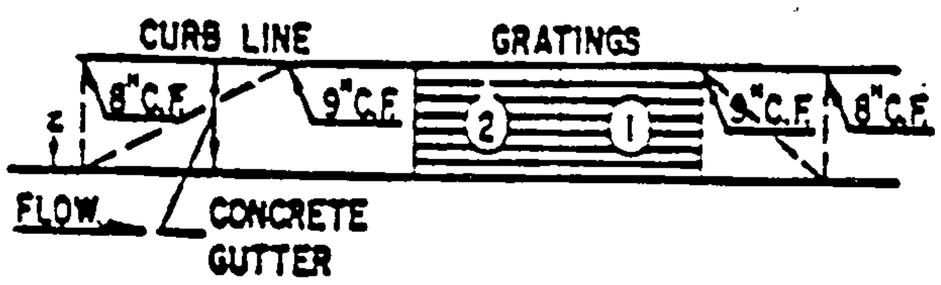
A = 1473 * 30 = 44,190 (1.01 ac)

Q100 (SOUTH) = 5.02 * 0.135 * 1 = 0.68 cfs

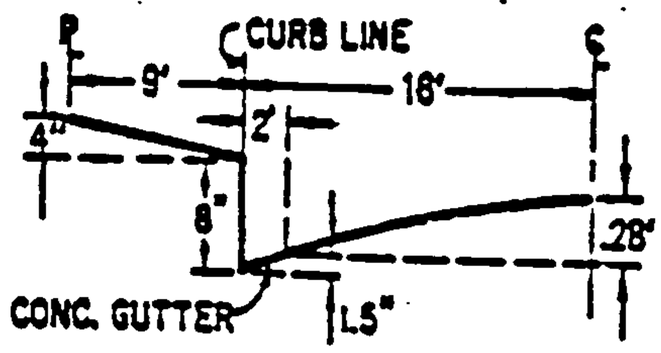
A = 1473 * 4 = 5892 sf (0.135 ac)

NOTE: Q100 (SOUTH) = Q100 (NORTH) = 4.9 cfs FOR FULLY CONSTRUCTED SECTION.

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

$D = 99.41 - 99.13$
$= 0.28'$

$S = 3.6\%$

$Q_1 = 5.3$ cfs

$Q_{BY} = 8.26 - 5.3$
$= 2.96$ cfs

No Good

PLATE 22.3 D-6

CORONA TEMP SECTION W/4' TEMP PVMT
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA - EXISTING SECTION W/4' TEMP PVMT
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.036000	ft/ft

Elevation range: 99.13 ft to 100.12 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
66.00	100.12	66.00	100.00	0.017
66.01	99.45			
70.00	99.53			
90.00	99.13			
90.01	99.80			
100.00	100.00			

Discharge	8.57	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.41	ft
Flow Area	1.95	ft²
Wetted Perimeter	14.23	ft
Top Width	13.95	ft
Height	0.28	ft
Critical Depth	99.51	ft
Critical Slope	0.007834	ft/ft
Velocity	4.40	ft/s
Velocity Head	0.30	ft
Specific Energy	99.71	ft
Froude Number	2.08	
Flow is supercritical.		

FLOW IN SOUTH CURB = 0.35 cfs

FLOW IN NORTH CURB =

8.57 - 0.35 = 8.26 cfs

CORONA FULL SECTION W/BASIN B
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA AVE FULL SECTION
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.036000 ft/ft

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
40.00	100.00	40.00	100.00	0.017
50.00	99.80			
50.01	99.13			
70.00	99.53			
90.00	99.13			
90.01	99.80			
100.00	100.00			

Discharge 12.79 cfs

$Q_{100} = 4.9 + 4.9 + 2.99$ (BASIN B)
$= 12.79$ cfs

MAX DEPTH $= 99.38 - 99.13 = 0.25'$
$< .87$ OK

Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.38	ft
Flow Area	3.13	ft²
Wetted Perimeter	25.50	ft
Top Width	25.00	ft
Height	0.25	ft
Critical Depth	99.46	ft
Critical Slope	0.007863	ft/ft
Velocity	4.09	ft/s
Velocity Head	0.26	ft
Specific Energy	99.64	ft
Froude Number	2.04	

Flow is supercritical.

Flow is divided.

— < CROWN DEPTH FLOW NOT EVENLY SPLIT.

EXIST CORONA SOUTH - TEMP SECTION
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA SOUTH - EXIST
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.036000	ft/ft
Water Surface Elevation	99.41	ft

Elevation range: 99.33 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
4.00	100.00	4.00	8.01	0.017
4.01	99.33			
8.01	99.41			

Results		
Wtd. Mannings Coefficient	0.017	
Discharge	0.31	cfs
Flow Area	0.16	ft²
Wetted Perimeter	4.08	ft
Top Width	4.00	ft
Height	0.08	ft
Critical Depth	99.43	ft
Critical Slope	0.011376	ft/ft
Velocity	1.91	ft/s
Velocity Head	0.06	ft
Specific Energy	99.47	ft
Froude Number	1.69	
Flow is supercritical.		

$Q_{100} = 0.68$ cfs

.68 - .31 - 0.37 spills to north w/o FS-20

(BASIN B)

$Q_{100} = 0.68 + 2.99 = 3.67$ cfs w/ th FS-20 BASIN B

3.67 - .31 = 3.36 cfs spills to NORTH.

100-YR FLOW DEPTH - CORONA NORTH
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	HALF CORONA AVE SECTION
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data

Channel Slope 0.035000 ft/ft

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
70.00	100.00	70.00	100.00	0.017
80.00	99.80			
80.01	99.13			
100.00	99.53			

Discharge 4.90 cfs

Results

Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.36	ft
Flow Area	1.29	ft²
Wetted Perimeter	11.60	ft
Top Width	11.37	ft
Height	0.23	ft
Critical Depth	99.43	ft
Critical Slope	0.008147	ft/ft
Velocity	3.79	ft/s
Velocity Head	0.22	ft
Specific Energy	99.58	ft
Froude Number	1.98	

Flow is supercritical.

— SINCE CROWN ECEV 99.53
THERE IS NO SPILL TO SOUTH

EXIST CORONA SOUTH - TEMP SECTION
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\fs20-cor.fm2
Worksheet	CORONA SOUTH - EXIST
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.036000 ft/ft	
Elevation range: 99.33 ft to 100.00 ft.		
Station (ft)	Elevation (ft)	Start Station / End Station / Roughness
4.00	100.00	4.00 / 8.01 / 0.017
4.01	99.33	
8.01	99.41	
Discharge	0.68 cfs	

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.43	ft
Flow Area	0.26	ft²
Wetted Perimeter	4.13	ft
Top Width	4.00	ft
Height	0.10	ft
Critical Depth	99.47	ft
Critical Slope	0.009772	ft/ft
Velocity	2.62	ft/s
Velocity Head	0.11	ft
Specific Energy	99.54	ft
Froude Number	1.81	
Flow is supercritical.		
Water elevation exceeds lowest end station by 0.02 ft.		

— SPILL TO NORTH
CROWN @ 99.41

L. Blair

Federal Emergency Management Agency

Washington, D.C. 20472

MAYOR'S OFFICE
98 MAY -4 AM 8:52

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 98-06-990P

The Honorable Martin J. Chavez
Mayor, City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103-1293

Community: City of Albuquerque,
New Mexico
Community No.: 350002
Panel Affected: 35001C0141 D
Effective Date of APR 2 4 1998
This Revision:

102-D-A

Dear Mayor Chavez:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Bernalillo County, New Mexico and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 11, 1998, Ms. Susan M. Calongne, P.E., City/County Floodplain Administrator, City of Albuquerque/Bernalillo County, requested that FEMA revise the FIRM to show the effects of channelization along the North Arroyo de Domingo Baca from just downstream of Wyoming Boulevard to just downstream of Barstow Street. The channel is soil cement-lined, with a 24-foot bottom width and 1:1 side slopes. Although the effective FIRM shows portions of the channel within the unincorporated areas of Bernalillo County, these areas were annexed by the City of Albuquerque on June 7, 1996. This request follows up on a Conditional Letter of Map Revision issued on March 6, 1997.

All data required to complete our review of this request were submitted with letters from Ms. Calongne.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the elevations and floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along North Arroyo de Domingo Baca from just downstream of Wyoming Boulevard to just downstream of Barstow Street. As a result of the modifications, the base flood is contained in the channel and the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, decreased. The modifications are shown on the enclosed annotated copy of FIRM Panel(s) 35001C0141 D. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated September 20, 1996.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

RECEIVED
MAY - 6 1998
PUBLIC WORKS DEPT.
ADMINISTRATION

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)*	Modified BFE (feet)*
Approximately 1,000 feet upstream of Wyoming Boulevard	1	None
Approximately 1,000 feet downstream of Barstow Street	1	None

*Depth in feet above ground rounded to the nearest whole foot

Public notification of the modified BFEs will be given in the *Albuquerque Journal* on or about May 21 and May 28, 1998. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Albuquerque Journal*, a citizen may request that FEMA reconsider the determination made by this LOMR. Any request for reconsideration must be based on scientific or technical data. All interested parties are on notice that, until the 90-day period elapses, the determination to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in Denton, Texas, at (940) 898-5127. If you have any technical questions regarding this LOMR, please contact Mr. Alan Johnson of our staff in Washington, DC, either by telephone at (202) 646-3403 or by facsimile at (202) 646-4596.

Sincerely,

Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosure(s)

cc: Ms. Susan M. Calongne, P.E.
City/County Floodplain Administrator
City of Albuquerque/Bernalillo County

Mr. John Kelly, P.E.
Acting Executive Engineer
Albuquerque Metropolitan Arroyo
Flood Control Authority

Mr. Jeffrey G. Mortensen, P.E.
President
Jeff Mortensen & Associates, Inc.