CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

October 2, 2019

David Soule, P.E.
Rio Grande Engineering
PO Box 93924
Albuquerque, NM 87199

RE: **13501 Elena Gallegos NE**
Grading Plan Stamp Date: 9/12/19
Drainage File: E23D035

Dear Mr. Soule:

Based on the submittal received on 9/18/19, the grading plan is approved for Grading Permit.

Prior to Building Permit (For Information):

1. Engineer's Certification of the compacted pad and grades at property line (Pad Certification), per the DPM Chapter 22.7: *Engineer's Certification Checklist For Non-Subdivision* is required.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: 13501 elena gallegos Building Permit #:_____ Hydrology File #: _____

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: LOT 5 UNIT 1 THE HIGHLANDS AT HIGH DESERT

City Address: 13501 Elena Gallegos

Applicant: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: RIO GRANDE ENGINEERING Contact: DAVID SOULE

Address: PO BOX 93924 ALB NM 87199

Phone#: 505.321.9099 Fax#: 505.872.0999 E-mail: david@riograndeengineering.com

TYPE OF DEVELOPMENT: ___ PLAT X RESIDENCE ___ DRB SITE ___ ADMIN SITE

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

___ TRAFFIC/ TRANSPORTATION

TYPE OF SUBMITTAL:

___ ENGINEER/ARCHITECT CERTIFICATION

___ PAD CERTIFICATION

___ CONCEPTUAL G & D PLAN

X GRADING PLAN

___ DRAINAGE REPORT

___ DRAINAGE MASTER PLAN

___ FLOODPLAIN DEVELOPMENT PERMIT APPLIC

___ ELEVATION CERTIFICATE

___ CLOMR/LOMR

___ TRAFFIC CIRCULATION LAYOUT (TCL)

___ TRAFFIC IMPACT STUDY (TIS)

___ STREET LIGHT LAYOUT

___ OTHER (SPECIFY) _____

___ PRE-DESIGN MEETING?

IS THIS A RESUBMITTAL?: ___ Yes X No

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY

___ PRELIMINARY PLAT APPROVAL

___ SITE PLAN FOR SUB'D APPROVAL

___ SITE PLAN FOR BLDG. PERMIT APPROVAL

___ FINAL PLAT APPROVAL

___ SIA/ RELEASE OF FINANCIAL GUARANTEE

___ FOUNDATION PERMIT APPROVAL

___ GRADING PERMIT APPROVAL

___ SO-19 APPROVAL

___ PAVING PERMIT APPROVAL

___ GRADING/ PAD CERTIFICATION

___ WORK ORDER APPROVAL

___ CLOMR/LOMR

___ FLOODPLAIN DEVELOPMENT PERMIT

___ OTHER (SPECIFY) _____

DATE SUBMITTED: _____ By: _____

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED:_____

FEE PAID:_____

DRAINAGE REPORT

For

13503 Ellena Gallegos PL NE
Lot 5 Highlands at High Desert

Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

SEPTEMBER 2019

9/12/19

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map

PURPOSE

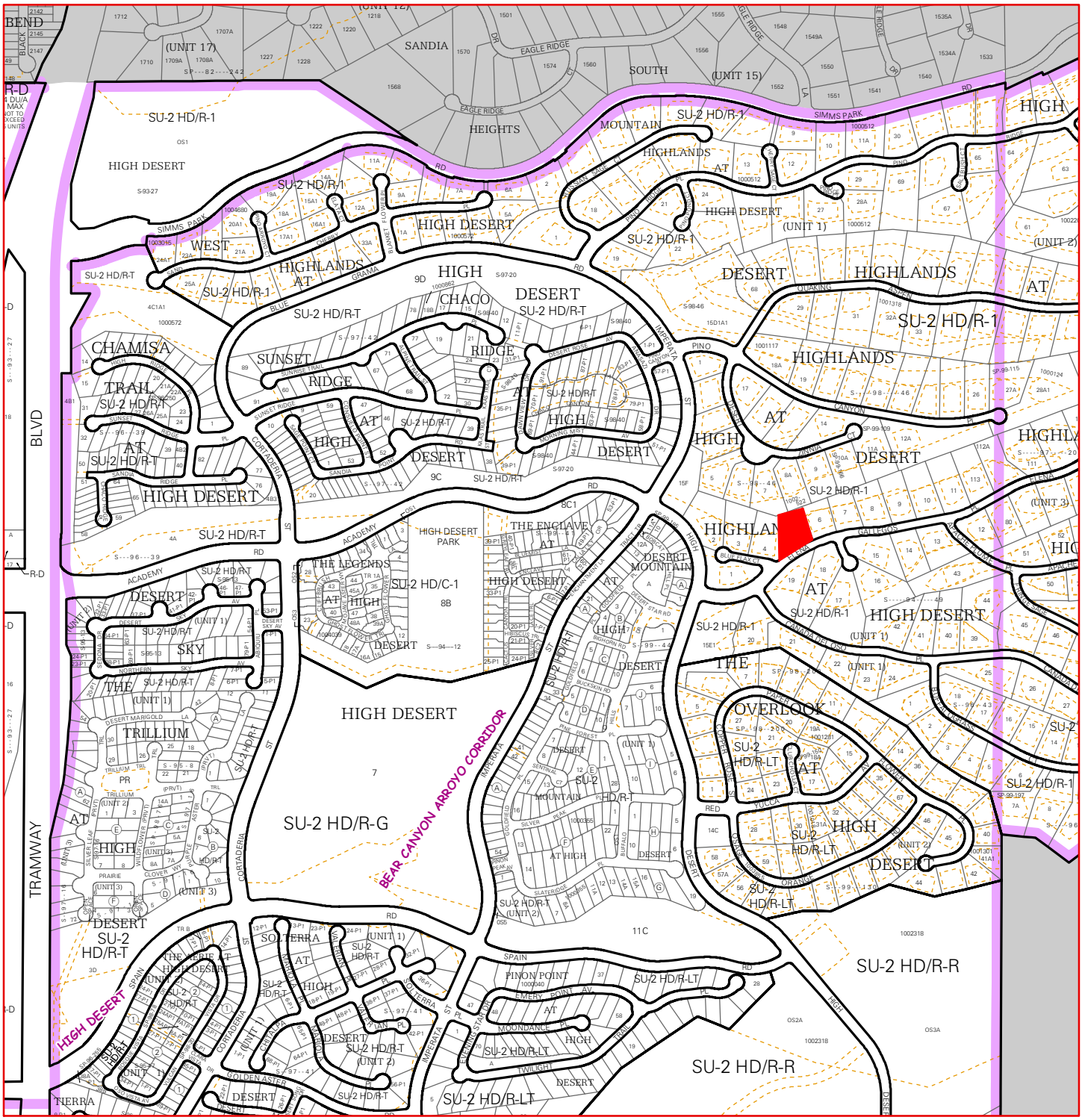
The purpose of this report is to provide the Drainage Management Plan for the subdivision of a 0.71 acre lot located in phase 1 of The Highlands. The plan shall conform to the Sustainability Guidelines for Estate lots in addition to the High Desert Master Drainage Plan and specifically the Highlands at High Desert grading plan. All historic drainage patterns shall be maintained. The developed flow shall not exceed existing flow rates for the 100-year, 6- hour event. The report shall demonstrate the project will not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 0.71 -acre parcel of land located on the north side of Elena Gallegos east of Blue Flax Court. The legal description of this site is lot 5 The Highlands at high desert phase 1. As shown on FIRM map35001C0161G, the entire site is located within Flood Zone X. The site is bound on the south by roadways. The site is impacted by minor upland flow. The site is an undeveloped site.

EXISTING CONDITIONS

The site is currently undeveloped. The site is impacted by 0.07 acres of upland flows. An upland flow of 0.22 cfs enters the site at the middle of the eastern boundary. This flow combines with the existing site flow and discharges at the west at a peak rate of 1.68 cfs.



For more current information and more details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 2/4/2010

PROPOSED CONDITIONS

The proposed improvements consist of new residential structure. The proposed site development will contain 3 basins. The northern Basin contains the developed portion of the lot that drains to the north. The basin generates 0.69 cfs which is captured by a detention pond. The peak flow is attenuated by the pond which captures 93 cubic feet for water quality and discharges a at a routed peak rate of 0.25cfs. The southern Basin contains the developed portion of the lot that drains south. The basin generates 0.64 cfs which is combined with the upldand flow and captured by a detention pond. The peak flow is attenuated by the pond which captures 60 cubic feet for water quality and discharges at a routed peak rate of 0.47 cfs. The remaining basin contains the undeveloped portion of the site that free discharges to both the southwest and south east and are not captured by the onsite ponds. This basin generates 0.67 cfs. The developed site as proposed will discharge at a peak rate of 1.32 cfs as compared to the 1.68 cfs it currently discharges. The site has been modeled using AHYMO.

SUMMARY AND RECOMMENDATIONS

This project is located within a fully designed basin of The Highlands drainage plan. The site has been designed to allow existing drainage patterns to remain. The site utilizes detention ponds to provide a peak flow rate of 1.32 CFS and captures 153 cubic feet for water quality, compared to the historical rate of 1.68 CFS. The site has been designed to conform to the Sustainability Guidelines for Estate lots in addition to the High Desert Master Drainage Plan. Since the lot area does exceed 1 acre, erosion and sediment Control Plan shall be required prior to any construction activity.

APPENDIX A

HYDRAULIC MODELING AND CALCULATIONS

BASIN DATA

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D	
			%	(acres)	%	(acres)	%	(acres)	%	(acres)
UPLAND	2890	0.066	20%	0.01327	19.0%	0.013	24.0%	0.01592	37%	0.025
TOTAL SITE	30898	0.709	80%	0.56746	12.0%	0.085	8.0%	0.05675	0%	0.000
NORTH BASIN	8405	0.193	4%	0.00772	20.0%	0.039	28.0%	0.05403	48%	0.093
SOUTH BASIN	7582	0.174	4%	0.00696	17.0%	0.030	24.0%	0.04177	55%	0.096
REMAININGS LOT	14911.00	0.342	80%	0.27385	12.0%	0.041	8.0%	0.02738	0%	0.000
TOTAL LOT	30898.00	0.709								

CABQMaps - Advanced Map Viewer 2.0

Side Panel Search I want to... Toolbar Map

Search... Sign in

Getting Around | Maps & Data Sources | Tasks

Tool Labels

Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Bookmarks — Navigation Tools

Print | Export | Share — Print and Share

Identify

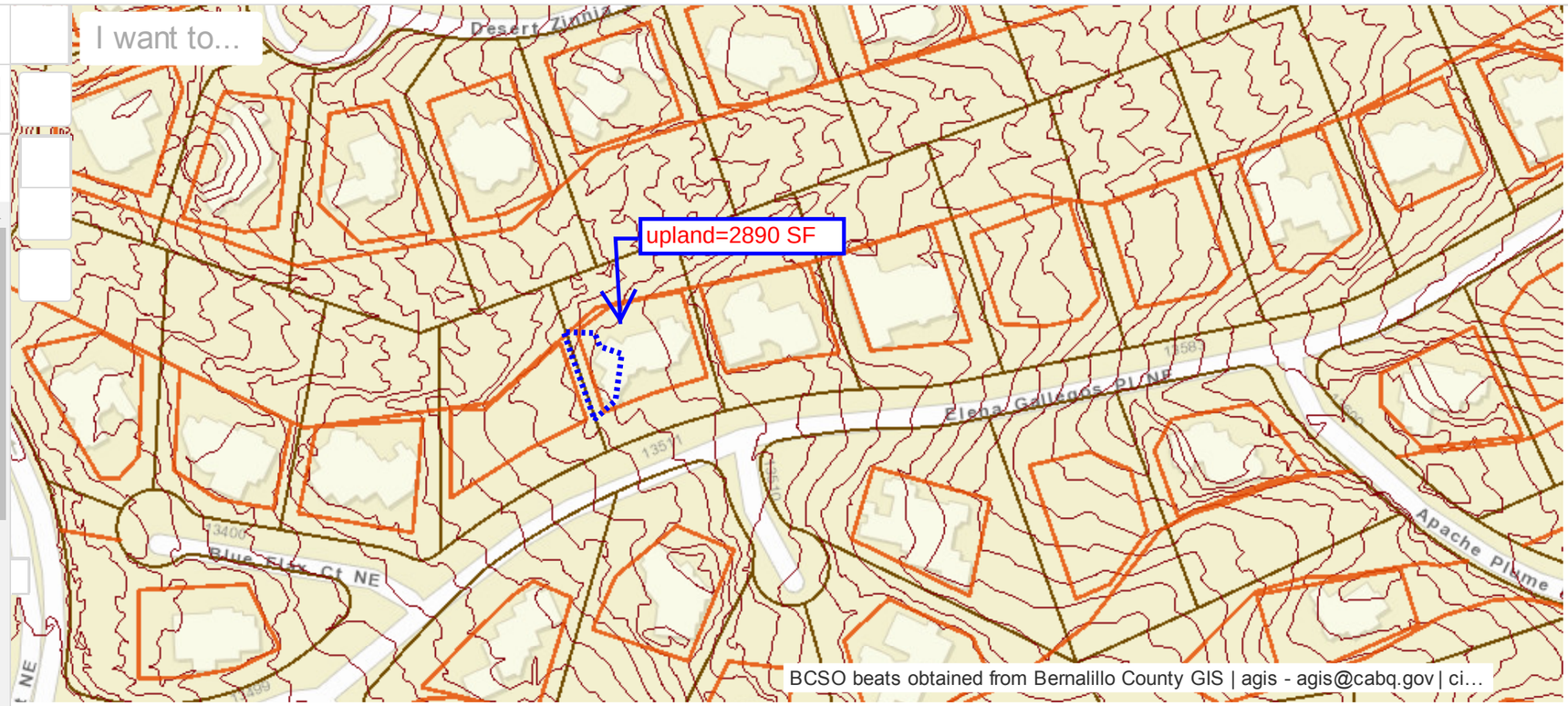
Layers

All Available Layers

Filter Layers... Filter

- Operational Layers
  - Parcels and Easements
    - Bernalillo County Parcels
    - City Parcels
    - Easements
  - Addresses
  - Streets
  - Building Footprints 2012
  - Albuquerque Layers
    - Planning Layers
      - Overlay Zones
      - Use Specific Standards
      - Development Standards
      - Administration and Enforcement

I want to...



Layers

World S…

0 100 200ft

STAGE/STORAGE VOLUME CALCULATIONS

NORTH POND

	ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME PER UNIT	VOLUME CUMULATIVI	VOLUME AC-FT	Q (CFS)
	76.40	0.00	39.00	0	0	0.000	0.00
OUTLET	77.00	0.00	272.00	93.30	93.3	0.0021	0.00
	78.00	1.00	559.00	415.50	508.80	0.012	0.24
	78.75	1.75	717.00	478.50	987.3	0.023	0.31

Orifice Equation

Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	3
Area (ft^2)=	0.049087385
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

south pond

	ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME PER UNIT	VOLUME CUMULATIVE	VOLUME AC-FT	Q (CFS)
	78.35	0.00	57.00	0	0	0.000	0.00
OUTLET	79.00	0.00	126.00	59.48	59.475	0.001	0.00
	80.00	1.00	375.00	250.50	309.975	0.007	0.42
	80.85	1.85	606.00	416.93	726.9	0.017	0.57

Orifice Equation

Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	4
Area (ft^2)=	0.087266463
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

```
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             RUN DATE (MON/DAY/YR) = 09/16/2019
             START TIME (HR:MIN:SEC) = 16:35:18     USER NO.=
RioGrandeSingleA41963517
             INPUT FILE =  Settings\Owner\Desktop\2019 JOBS\19138-13503 ellena
gallegos\pondrout091619.txt


    *S     AHYMO -  DETENTION-ELLENA GALLEGOS
    *S              POND ROUTING

    START               TIME=0.0  PUNCH CODE=0


    RAINFALL            TYPE=2
                        QUARTER=0.0    ONE= 1.85 IN
                        SIX=2.44 IN   DAY= 2.90 IN   DT = 0.05 HR



                    24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
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                      0.0000  0.0039  0.0080  0.0123  0.0170  0.0218  0.0273
                      0.0350  0.0473  0.0605  0.0742  0.0891  0.1041  0.1196
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                      1.9747  2.0056  2.0339  2.0573  2.0777  2.0966  2.1136
                      2.1297  2.1439  2.1574  2.1706  2.1833  2.1938  2.1997
                      2.2054  2.2110  2.2163  2.2216  2.2267  2.2317  2.2367
                      2.2414  2.2460  2.2506  2.2551  2.2595  2.2637  2.2679
                      2.2720  2.2761  2.2801  2.2839  2.2877  2.2915  2.2952
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                      2.3665  2.3694  2.3722  2.3750  2.3778  2.3805  2.3833
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                    2.8988  2.8991  2.8994  2.8997  2.9000

    *Basin DEVELOPED UPLAND
    COMPUTE NM HYD      ID=1  HYD NO=101  DA= .000104 SQ MI
                        PER A=20  PER B=19 PER C=24  PER D=37
                        TP=-.138 MASSRAIN=-1


         K =  0.075210HR    TP =  0.138000HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
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 P60 = 1.8500
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INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.136633HR    TP =  0.138000HR    K/TP RATIO =  0.990090     SHAPE
CONSTANT, N =  3.565951
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 P60 = 1.8500
         AREA =     0.000066 SQ MI    IA =   0.49048 INCHES    INF =   1.22333
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=1  CODE=3

                                        PARTIAL HYDROGRAPH   101.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW
TIME      FLOW           TIME      FLOW
          HRS       CFS             HRS       CFS            HRS       CFS
HRS       CFS             HRS       CFS
         0.000       0.0           1.800       0.1          3.600       0.0
5.400       0.0           7.200       0.0
         0.150       0.0           1.950       0.0          3.750       0.0
```

```
5.550       0.0          7.350       0.0
        0.300       0.0          2.100       0.0          3.900       0.0
5.700       0.0          7.500       0.0
        0.450       0.0          2.250       0.0          4.050       0.0
5.850       0.0          7.650       0.0
        0.600       0.0          2.400       0.0          4.200       0.0
6.000       0.0          7.800       0.0
        0.750       0.0          2.550       0.0          4.350       0.0
6.150       0.0          7.950       0.0
        0.900       0.0          2.700       0.0          4.500       0.0
6.300       0.0          8.100       0.0
        1.050       0.0          2.850       0.0          4.650       0.0
6.450       0.0          8.250       0.0
        1.200       0.0          3.000       0.0          4.800       0.0
6.600       0.0          8.400       0.0
        1.350       0.1          3.150       0.0          4.950       0.0
6.750       0.0
        1.500       0.2          3.300       0.0          5.100       0.0
6.900       0.0
        1.650       0.1          3.450       0.0          5.250       0.0
7.050       0.0

        RUNOFF VOLUME =     1.52965 INCHES     =       0.0085 ACRE-FEET
        PEAK DISCHARGE RATE =       0.22 CFS  AT   1.500 HOURS   BASIN AREA =
0.0001 SQ. MI.




    *TOTAL ONSITE Basin EXISTING
    COMPUTE NM HYD      ID=2  HYD NO=102  DA= .0011765 SQ MI
                        PER A=80  PER B=12 PER C=8  PER D=0
                        TP=-.138  MASSRAIN=-1


        K =  0.161048HR    TP =  0.138000HR    K/TP RATIO =  1.167014     SHAPE
CONSTANT, N =  3.038349
        UNIT PEAK =   2.4292    CFS   UNIT VOLUME =   0.9933       B =   284.94
 P60 = 1.8500
        AREA =     0.001176 SQ MI    IA =   0.60800 INCHES    INF =   1.55240
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=2  CODE=3

                                        PARTIAL HYDROGRAPH   102.00

        TIME      FLOW          TIME      FLOW          TIME      FLOW
TIME      FLOW          TIME      FLOW
         HRS       CFS           HRS       CFS           HRS       CFS
HRS       CFS           HRS       CFS
        0.000       0.0          0.750       0.0          1.500       1.4
2.250       0.1          3.000       0.0
        0.150       0.0          0.900       0.0          1.650       1.0
2.400       0.1          3.150       0.0
        0.300       0.0          1.050       0.0          1.800       0.4
2.550       0.0          3.300       0.0
        0.450       0.0          1.200       0.0          1.950       0.2
2.700       0.0          3.450       0.0
        0.600       0.0          1.350       0.2          2.100       0.1
2.850       0.0

        RUNOFF VOLUME =     0.71963 INCHES     =       0.0452 ACRE-FEET
```

PEAK DISCHARGE RATE = 1.46 CFS AT 1.550 HOURS BASIN AREA = 0.0012 SQ. MI.

*ADD OFFSITE AND EXISTING ONSITE

ADD HYD ID=3 HYD NO=103 ID I=1 ID II=2
PRINT HYD ID=3 CODE=3

PARTIAL HYDROGRAPH 103.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.800	0.5	3.600	0.0
0.150	0.0	1.950	0.2	3.750	0.0
0.300	0.0	2.100	0.1	3.900	0.0
0.450	0.0	2.250	0.1	4.050	0.0
0.600	0.0	2.400	0.1	4.200	0.0
0.750	0.0	2.550	0.0	4.350	0.0
0.900	0.0	2.700	0.0	4.500	0.0
1.050	0.0	2.850	0.0	4.650	0.0
1.200	0.0	3.000	0.0	4.800	0.0
1.350	0.2	3.150	0.0	4.950	0.0
1.500	1.7	3.300	0.0	5.100	0.0
1.650	1.1	3.450	0.0	5.250	0.0
5.400	0.0	7.200	0.0		
5.550	0.0	7.350	0.0		
5.700	0.0	7.500	0.0		
5.850	0.0	7.650	0.0		
6.000	0.0	7.800	0.0		
6.150	0.0	7.950	0.0		
6.300	0.0	8.100	0.0		
6.450	0.0	8.250	0.0		
6.600	0.0	8.400	0.0		
6.750	0.0				
6.900	0.0				
7.050	0.0				

RUNOFF VOLUME = 0.77450 INCHES = 0.0529 ACRE-FEET
PEAK DISCHARGE RATE = 1.68 CFS AT 1.550 HOURS BASIN AREA = 0.0013 SQ. MI.

*Basin NORTHERN DEVELOPED
COMPUTE NM HYD ID=4 HYD NO=104 DA= .0003016 SQ MI
PER A=4 PER B=20 PER C=28 PER D=48
TP=-.138 MASSRAIN=-1

K = 0.075210HR TP = 0.138000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.55209 CFS UNIT VOLUME = 0.9806 B = 526.28 P60 = 1.8500
AREA = 0.000145 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =

0.050000

K = 0.124263HR TP = 0.138000HR K/TP RATIO = 0.900453 SHAPE CONSTANT, N = 3.935600
UNIT PEAK = 0.39874 CFS UNIT VOLUME = 0.9705 B = 350.86 P60 = 1.8500
AREA = 0.000157 SQ MI IA = 0.43077 INCHES INF = 1.05615 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=4 CODE=3

PARTIAL HYDROGRAPH 104.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.500	0.0	9.000	0.0
13.500	0.0	18.000	0.0		
0.150	0.0	4.650	0.0	9.150	0.0
13.650	0.0	18.150	0.0		
0.300	0.0	4.800	0.0	9.300	0.0
13.800	0.0	18.300	0.0		
0.450	0.0	4.950	0.0	9.450	0.0
13.950	0.0	18.450	0.0		
0.600	0.0	5.100	0.0	9.600	0.0
14.100	0.0	18.600	0.0		
0.750	0.0	5.250	0.0	9.750	0.0
14.250	0.0	18.750	0.0		
0.900	0.0	5.400	0.0	9.900	0.0
14.400	0.0	18.900	0.0		
1.050	0.0	5.550	0.0	10.050	0.0
14.550	0.0	19.050	0.0		
1.200	0.1	5.700	0.0	10.200	0.0
14.700	0.0	19.200	0.0		
1.350	0.2	5.850	0.0	10.350	0.0
14.850	0.0	19.350	0.0		
1.500	0.7	6.000	0.0	10.500	0.0
15.000	0.0	19.500	0.0		
1.650	0.4	6.150	0.0	10.650	0.0
15.150	0.0	19.650	0.0		
1.800	0.2	6.300	0.0	10.800	0.0
15.300	0.0	19.800	0.0		
1.950	0.1	6.450	0.0	10.950	0.0
15.450	0.0	19.950	0.0		
2.100	0.1	6.600	0.0	11.100	0.0
15.600	0.0	20.100	0.0		
2.250	0.0	6.750	0.0	11.250	0.0
15.750	0.0	20.250	0.0		
2.400	0.0	6.900	0.0	11.400	0.0
15.900	0.0	20.400	0.0		
2.550	0.0	7.050	0.0	11.550	0.0
16.050	0.0	20.550	0.0		
2.700	0.0	7.200	0.0	11.700	0.0
16.200	0.0	20.700	0.0		
2.850	0.0	7.350	0.0	11.850	0.0
16.350	0.0	20.850	0.0		
3.000	0.0	7.500	0.0	12.000	0.0
16.500	0.0	21.000	0.0		
3.150	0.0	7.650	0.0	12.150	0.0
16.650	0.0	21.150	0.0		
3.300	0.0	7.800	0.0	12.300	0.0
16.800	0.0	21.300	0.0		

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        3.450       0.0          7.950       0.0         12.450       0.0
16.950       0.0         21.450       0.0
        3.600       0.0          8.100       0.0         12.600       0.0
17.100       0.0         21.600       0.0
        3.750       0.0          8.250       0.0         12.750       0.0
17.250       0.0         21.750       0.0
        3.900       0.0          8.400       0.0         12.900       0.0
17.400       0.0         21.900       0.0
        4.050       0.0          8.550       0.0         13.050       0.0
17.550       0.0
        4.200       0.0          8.700       0.0         13.200       0.0
17.700       0.0
        4.350       0.0          8.850       0.0         13.350       0.0
17.850       0.0

        RUNOFF VOLUME =     1.76961 INCHES     =       0.0285 ACRE-FEET
        PEAK DISCHARGE RATE =       0.69 CFS  AT   1.500 HOURS   BASIN AREA =
0.0003 SQ. MI.



    *  ROUTED THRU POND-NORTHERN PROPOSED

    * ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
    ROUTE RESERVOIR     ID=5   HYD NO=105   INFLOW=4   CODE=3
                        OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
                           0.00             0.002          77.00
                           0.24             0.012          78.00
                           0.31             0.023          78.75


      *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *

        TIME      INFLOW    ELEV      VOLUME    OUTFLOW
        (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

         0.00       0.00     77.00      0.002      0.00
         0.15       0.00     77.00      0.002      0.00
         0.30       0.00     77.00      0.002      0.00
         0.45       0.00     77.00      0.002      0.00
         0.60       0.00     77.00      0.002      0.00
         0.75       0.02     77.01      0.002      0.00
         0.90       0.03     77.03      0.002      0.01
         1.05       0.04     77.05      0.003      0.01
         1.20       0.07     77.10      0.003      0.02
         1.35       0.20     77.20      0.004      0.05
         1.50       0.69     77.65      0.008      0.16
         1.65       0.44     78.08      0.013      0.25
         1.80       0.19     78.12      0.014      0.25
         1.95       0.10     78.03      0.013      0.24
         2.10       0.07     77.87      0.011      0.21
         2.25       0.04     77.70      0.009      0.17
         2.40       0.03     77.56      0.008      0.13
         2.55       0.01     77.43      0.006      0.10
         2.70       0.01     77.33      0.005      0.08
         2.85       0.01     77.25      0.005      0.06
         3.00       0.01     77.19      0.004      0.05
         3.15       0.00     77.15      0.003      0.04
         3.30       0.00     77.11      0.003      0.03
         3.45       0.00     77.09      0.003      0.02
         3.60       0.00     77.07      0.003      0.02
         3.75       0.00     77.06      0.003      0.01
         3.90       0.00     77.05      0.002      0.01
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        4.05       0.00     77.04      0.002      0.01
        4.20       0.00     77.03      0.002      0.01
        4.35       0.00     77.03      0.002      0.01
        4.50       0.00     77.02      0.002      0.01
        4.65       0.00     77.02      0.002      0.01
        4.80       0.00     77.02      0.002      0.00
     PEAK DISCHARGE =        0.252 CFS - PEAK OCCURS AT HOUR    1.75
     MAXIMUM WATER SURFACE ELEVATION =       78.132
     MAXIMUM STORAGE =        0.0139 AC-FT      INCREMENTAL TIME=    0.050000HRS

    *Basin SOUTHERN DEVELOPED
    COMPUTE NM HYD      ID=6  HYD NO=106  DA= .0002719 SQ MI
                        PER A=4  PER B=17 PER C=24  PER D=55
                        TP=-.138 MASSRAIN=-1


         K =  0.075210HR    TP =  0.138000HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =  0.57030    CFS   UNIT VOLUME =   0.9806       B =   526.28
 P60 = 1.8500
         AREA =     0.000150 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.124806HR    TP =  0.138000HR    K/TP RATIO =  0.904390     SHAPE
CONSTANT, N =  3.917413
         UNIT PEAK =  0.30999    CFS   UNIT VOLUME =   0.9606       B =   349.63
 P60 = 1.8500
         AREA =     0.000122 SQ MI    IA =   0.43333 INCHES    INF =   1.06333
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=6  CODE=3

                                      PARTIAL HYDROGRAPH   106.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW
TIME      FLOW           TIME      FLOW
          HRS       CFS             HRS       CFS            HRS       CFS
HRS       CFS             HRS       CFS
         0.000       0.0          4.500       0.0          9.000       0.0
13.500       0.0          18.000       0.0
         0.150       0.0          4.650       0.0          9.150       0.0
13.650       0.0          18.150       0.0
         0.300       0.0          4.800       0.0          9.300       0.0
13.800       0.0          18.300       0.0
         0.450       0.0          4.950       0.0          9.450       0.0
13.950       0.0          18.450       0.0
         0.600       0.0          5.100       0.0          9.600       0.0
14.100       0.0          18.600       0.0
         0.750       0.0          5.250       0.0          9.750       0.0
14.250       0.0          18.750       0.0
         0.900       0.0          5.400       0.0          9.900       0.0
14.400       0.0          18.900       0.0
         1.050       0.0          5.550       0.0         10.050       0.0
14.550       0.0          19.050       0.0
         1.200       0.1          5.700       0.0         10.200       0.0
14.700       0.0          19.200       0.0
         1.350       0.2          5.850       0.0         10.350       0.0
14.850       0.0          19.350       0.0
         1.500       0.6          6.000       0.0         10.500       0.0
15.000       0.0          19.500       0.0
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1.650	0.4	6.150	0.0	10.650	0.0
15.150	0.0	19.650	0.0		
1.800	0.2	6.300	0.0	10.800	0.0
15.300	0.0	19.800	0.0		
1.950	0.1	6.450	0.0	10.950	0.0
15.450	0.0	19.950	0.0		
2.100	0.1	6.600	0.0	11.100	0.0
15.600	0.0	20.100	0.0		
2.250	0.0	6.750	0.0	11.250	0.0
15.750	0.0	20.250	0.0		
2.400	0.0	6.900	0.0	11.400	0.0
15.900	0.0	20.400	0.0		
2.550	0.0	7.050	0.0	11.550	0.0
16.050	0.0	20.550	0.0		
2.700	0.0	7.200	0.0	11.700	0.0
16.200	0.0	20.700	0.0		
2.850	0.0	7.350	0.0	11.850	0.0
16.350	0.0	20.850	0.0		
3.000	0.0	7.500	0.0	12.000	0.0
16.500	0.0	21.000	0.0		
3.150	0.0	7.650	0.0	12.150	0.0
16.650	0.0	21.150	0.0		
3.300	0.0	7.800	0.0	12.300	0.0
16.800	0.0	21.300	0.0		
3.450	0.0	7.950	0.0	12.450	0.0
16.950	0.0	21.450	0.0		
3.600	0.0	8.100	0.0	12.600	0.0
17.100	0.0	21.600	0.0		
3.750	0.0	8.250	0.0	12.750	0.0
17.250	0.0	21.750	0.0		
3.900	0.0	8.400	0.0	12.900	0.0
17.400	0.0	21.900	0.0		
4.050	0.0	8.550	0.0	13.050	0.0
17.550	0.0				
4.200	0.0	8.700	0.0	13.200	0.0
17.700	0.0				
4.350	0.0	8.850	0.0	13.350	0.0
17.850	0.0				

RUNOFF VOLUME = 1.88586 INCHES = 0.0273 ACRE-FEET
PEAK DISCHARGE RATE = 0.64 CFS AT 1.500 HOURS BASIN AREA = 0.0003 SQ. MI.

*ADD UPLAND TO SOUTH BASIN

ADD HYD ID=7 HYD NO=107 ID I=1 ID II=6
PRINT HYD ID=7 CODE=3

PARTIAL HYDROGRAPH 107.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.500	0.0	9.000	0.0
13.500	0.0	18.000	0.0		
0.150	0.0	4.650	0.0	9.150	0.0
13.650	0.0	18.150	0.0		
0.300	0.0	4.800	0.0	9.300	0.0
13.800	0.0	18.300	0.0		
0.450	0.0	4.950	0.0	9.450	0.0
13.950	0.0	18.450	0.0		
0.600	0.0	5.100	0.0	9.600	0.0

14.100	0.0	18.600	0.0				
0.750	0.0	5.250	0.0	9.750	0.0		
14.250	0.0	18.750	0.0				
0.900	0.0	5.400	0.0	9.900	0.0		
14.400	0.0	18.900	0.0				
1.050	0.0	5.550	0.0	10.050	0.0		
14.550	0.0	19.050	0.0				
1.200	0.1	5.700	0.0	10.200	0.0		
14.700	0.0	19.200	0.0				
1.350	0.3	5.850	0.0	10.350	0.0		
14.850	0.0	19.350	0.0				
1.500	0.9	6.000	0.0	10.500	0.0		
15.000	0.0	19.500	0.0				
1.650	0.5	6.150	0.0	10.650	0.0		
15.150	0.0	19.650	0.0				
1.800	0.2	6.300	0.0	10.800	0.0		
15.300	0.0	19.800	0.0				
1.950	0.1	6.450	0.0	10.950	0.0		
15.450	0.0	19.950	0.0				
2.100	0.1	6.600	0.0	11.100	0.0		
15.600	0.0	20.100	0.0				
2.250	0.0	6.750	0.0	11.250	0.0		
15.750	0.0	20.250	0.0				
2.400	0.0	6.900	0.0	11.400	0.0		
15.900	0.0	20.400	0.0				
2.550	0.0	7.050	0.0	11.550	0.0		
16.050	0.0	20.550	0.0				
2.700	0.0	7.200	0.0	11.700	0.0		
16.200	0.0	20.700	0.0				
2.850	0.0	7.350	0.0	11.850	0.0		
16.350	0.0	20.850	0.0				
3.000	0.0	7.500	0.0	12.000	0.0		
16.500	0.0	21.000	0.0				
3.150	0.0	7.650	0.0	12.150	0.0		
16.650	0.0	21.150	0.0				
3.300	0.0	7.800	0.0	12.300	0.0		
16.800	0.0	21.300	0.0				
3.450	0.0	7.950	0.0	12.450	0.0		
16.950	0.0	21.450	0.0				
3.600	0.0	8.100	0.0	12.600	0.0		
17.100	0.0	21.600	0.0				
3.750	0.0	8.250	0.0	12.750	0.0		
17.250	0.0	21.750	0.0				
3.900	0.0	8.400	0.0	12.900	0.0		
17.400	0.0	21.900	0.0				
4.050	0.0	8.550	0.0	13.050	0.0		
17.550	0.0						
4.200	0.0	8.700	0.0	13.200	0.0		
17.700	0.0						
4.350	0.0	8.850	0.0	13.350	0.0		
17.850	0.0						

RUNOFF VOLUME = 1.74310 INCHES = 0.0349 ACRE-FEET
PEAK DISCHARGE RATE = 0.87 CFS AT 1.500 HOURS BASIN AREA = 0.0004 SQ. MI.

* ROUTE THE UPLAND PLUS SOUTH BASIN THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR ID=8 HYD NO=108 INFLOW=7 CODE=3

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.00	0.001	79.00
0.42	0.007	80.00

0.57 0.017 80.85

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	79.00	0.001	0.00
0.15	0.00	79.00	0.001	0.00
0.30	0.00	79.00	0.001	0.00
0.45	0.00	79.00	0.001	0.00
0.60	0.00	79.00	0.001	0.00
0.75	0.02	79.01	0.001	0.01
0.90	0.03	79.05	0.001	0.02
1.05	0.05	79.08	0.001	0.03
1.20	0.09	79.13	0.002	0.05
1.35	0.26	79.27	0.003	0.11
1.50	0.87	79.97	0.007	0.41
1.65	0.55	80.30	0.011	0.47
1.80	0.24	80.21	0.009	0.46
1.95	0.13	79.89	0.006	0.37
2.10	0.08	79.50	0.004	0.21
2.25	0.04	79.29	0.003	0.12
2.40	0.03	79.17	0.002	0.07
2.55	0.01	79.10	0.002	0.04
2.70	0.01	79.06	0.001	0.02
2.85	0.01	79.03	0.001	0.01
3.00	0.01	79.02	0.001	0.01
3.15	0.01	79.02	0.001	0.01
3.30	0.01	79.02	0.001	0.01
3.45	0.01	79.01	0.001	0.01
3.60	0.00	79.01	0.001	0.01
3.75	0.00	79.01	0.001	0.01
3.90	0.00	79.01	0.001	0.00

PEAK DISCHARGE = 0.474 CFS - PEAK OCCURS AT HOUR 1.70
MAXIMUM WATER SURFACE ELEVATION = 80.307
MAXIMUM STORAGE = 0.0106 AC-FT INCREMENTAL TIME= 0.050000HRS

*Basin REMAINING ONSITE DEVELOPED
COMPUTE NM HYD ID=9 HYD NO=109 DA= .0005344 SQ MI
PER A=80 PER B=12 PER C=8 PER D=0
TP=-.138 MASSRAIN=-1

K = 0.161048HR TP = 0.138000HR K/TP RATIO = 1.167014 SHAPE CONSTANT, N = 3.038349
UNIT PEAK = 1.1034 CFS UNIT VOLUME = 0.9859 B = 284.94 P60 = 1.8500
AREA = 0.000534 SQ MI IA = 0.60800 INCHES INF = 1.55240 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=9 CODE=3

PARTIAL HYDROGRAPH 109.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.750	0.0	1.500	0.7
2.250	0.0	3.000	0.0		
0.150	0.0	0.900	0.0	1.650	0.5
2.400	0.0	3.150	0.0		

0.300	0.0	1.050	0.0	1.800	0.2
2.550	0.0				
0.450	0.0	1.200	0.0	1.950	0.1
2.700	0.0				
0.600	0.0	1.350	0.1	2.100	0.1
2.850	0.0				

RUNOFF VOLUME = 0.71963 INCHES = 0.0205 ACRE-FEET
PEAK DISCHARGE RATE = 0.67 CFS AT 1.550 HOURS BASIN AREA = 0.0005 SQ. MI.

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*ADD TOTAL DEVELOPED

ADD HYD             ID=10 HYD NO=110  ID I=5 ID II=9
PRINT HYD           ID=10  CODE=3
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PARTIAL HYDROGRAPH 110.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.500	0.0	9.000	0.0
13.500	0.0	18.000	0.0		
0.150	0.0	4.650	0.0	9.150	0.0
13.650	0.0	18.150	0.0		
0.300	0.0	4.800	0.0	9.300	0.0
13.800	0.0	18.300	0.0		
0.450	0.0	4.950	0.0	9.450	0.0
13.950	0.0	18.450	0.0		
0.600	0.0	5.100	0.0	9.600	0.0
14.100	0.0	18.600	0.0		
0.750	0.0	5.250	0.0	9.750	0.0
14.250	0.0	18.750	0.0		
0.900	0.0	5.400	0.0	9.900	0.0
14.400	0.0	18.900	0.0		
1.050	0.0	5.550	0.0	10.050	0.0
14.550	0.0	19.050	0.0		
1.200	0.0	5.700	0.0	10.200	0.0
14.700	0.0	19.200	0.0		
1.350	0.1	5.850	0.0	10.350	0.0
14.850	0.0	19.350	0.0		
1.500	0.8	6.000	0.0	10.500	0.0
15.000	0.0	19.500	0.0		
1.650	0.7	6.150	0.0	10.650	0.0
15.150	0.0	19.650	0.0		
1.800	0.4	6.300	0.0	10.800	0.0
15.300	0.0	19.800	0.0		
1.950	0.3	6.450	0.0	10.950	0.0
15.450	0.0	19.950	0.0		
2.100	0.3	6.600	0.0	11.100	0.0
15.600	0.0	20.100	0.0		
2.250	0.2	6.750	0.0	11.250	0.0
15.750	0.0	20.250	0.0		
2.400	0.2	6.900	0.0	11.400	0.0
15.900	0.0	20.400	0.0		
2.550	0.1	7.050	0.0	11.550	0.0
16.050	0.0	20.550	0.0		
2.700	0.1	7.200	0.0	11.700	0.0
16.200	0.0	20.700	0.0		
2.850	0.1	7.350	0.0	11.850	0.0
16.350	0.0	20.850	0.0		
3.000	0.1	7.500	0.0	12.000	0.0

16.500	0.0	21.000	0.0				
3.150	0.0	7.650	0.0	12.150	0.0		
16.650	0.0	21.150	0.0				
3.300	0.0	7.800	0.0	12.300	0.0		
16.800	0.0	21.300	0.0				
3.450	0.0	7.950	0.0	12.450	0.0		
16.950	0.0	21.450	0.0				
3.600	0.0	8.100	0.0	12.600	0.0		
17.100	0.0	21.600	0.0				
3.750	0.0	8.250	0.0	12.750	0.0		
17.250	0.0	21.750	0.0				
3.900	0.0	8.400	0.0	12.900	0.0		
17.400	0.0	21.900	0.0				
4.050	0.0	8.550	0.0	13.050	0.0		
17.550	0.0						
4.200	0.0	8.700	0.0	13.200	0.0		
17.700	0.0						
4.350	0.0	8.850	0.0	13.350	0.0		
17.850	0.0						

RUNOFF VOLUME = 1.09429 INCHES = 0.0488 ACRE-FEET
PEAK DISCHARGE RATE = 0.87 CFS AT 1.550 HOURS BASIN AREA = 0.0008 SQ. MI.

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    ADD HYD             ID=11 HYD NO=111  ID I=8 ID II=10
    PRINT HYD           ID=11  CODE=3
```

PARTIAL HYDROGRAPH 111.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.500	0.0	9.000	0.0
13.500	0.0	18.000	0.0		
0.150	0.0	4.650	0.0	9.150	0.0
13.650	0.0	18.150	0.0		
0.300	0.0	4.800	0.0	9.300	0.0
13.800	0.0	18.300	0.0		
0.450	0.0	4.950	0.0	9.450	0.0
13.950	0.0	18.450	0.0		
0.600	0.0	5.100	0.0	9.600	0.0
14.100	0.0	18.600	0.0		
0.750	0.0	5.250	0.0	9.750	0.0
14.250	0.0	18.750	0.0		
0.900	0.0	5.400	0.0	9.900	0.0
14.400	0.0	18.900	0.0		
1.050	0.0	5.550	0.0	10.050	0.0
14.550	0.0	19.050	0.0		
1.200	0.1	5.700	0.0	10.200	0.0
14.700	0.0	19.200	0.0		
1.350	0.2	5.850	0.0	10.350	0.0
14.850	0.0	19.350	0.0		
1.500	1.2	6.000	0.0	10.500	0.0
15.000	0.0	19.500	0.0		
1.650	1.2	6.150	0.0	10.650	0.0
15.150	0.0	19.650	0.0		
1.800	0.9	6.300	0.0	10.800	0.0
15.300	0.0	19.800	0.0		
1.950	0.7	6.450	0.0	10.950	0.0
15.450	0.0	19.950	0.0		
2.100	0.5	6.600	0.0	11.100	0.0
15.600	0.0	20.100	0.0		
2.250	0.3	6.750	0.0	11.250	0.0

15.750	0.0	20.250	0.0				
	2.400	0.2	6.900	0.0	11.400	0.0	
15.900	0.0	20.400	0.0				
	2.550	0.2	7.050	0.0	11.550	0.0	
16.050	0.0	20.550	0.0				
	2.700	0.1	7.200	0.0	11.700	0.0	
16.200	0.0	20.700	0.0				
	2.850	0.1	7.350	0.0	11.850	0.0	
16.350	0.0	20.850	0.0				
	3.000	0.1	7.500	0.0	12.000	0.0	
16.500	0.0	21.000	0.0				
	3.150	0.0	7.650	0.0	12.150	0.0	
16.650	0.0	21.150	0.0				
	3.300	0.0	7.800	0.0	12.300	0.0	
16.800	0.0	21.300	0.0				
	3.450	0.0	7.950	0.0	12.450	0.0	
16.950	0.0	21.450	0.0				
	3.600	0.0	8.100	0.0	12.600	0.0	
17.100	0.0	21.600	0.0				
	3.750	0.0	8.250	0.0	12.750	0.0	
17.250	0.0	21.750	0.0				
	3.900	0.0	8.400	0.0	12.900	0.0	
17.400	0.0	21.900	0.0				
	4.050	0.0	8.550	0.0	13.050	0.0	
17.550	0.0						
	4.200	0.0	8.700	0.0	13.200	0.0	
17.700	0.0						
	4.350	0.0	8.850	0.0	13.350	0.0	
17.850	0.0						

RUNOFF VOLUME = 1.29530 INCHES = 0.0837 ACRE-FEET
PEAK DISCHARGE RATE = 1.32 CFS AT 1.550 HOURS BASIN AREA = 0.0012 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 16:35:18

CAUTION:

EXISTING UTILITIES ARE NOT SHOWN. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATION TO DETERMINE THE ACTUAL LOCATION OF UTILITIES & OTHER IMPROVEMENTS.

EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN–OFF ON SITE DURING CONSTRUCTION.

3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT–OF–WAY.

4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

NOTES:

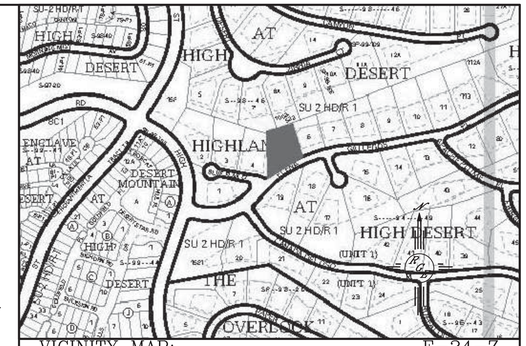
1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.

2. ALL ROOF DRAINS SHALL HAVE A SPLASH PAD AND 2' COBBLE SWALE THAT SHALL TIE TO MAIN COBBLES SWALES AROUND THE HOUSE PER DETAIL THIS SHEET..

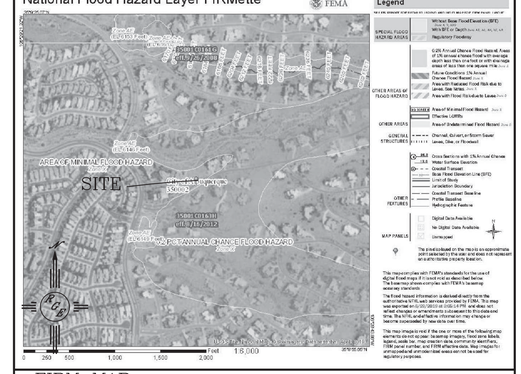
3. ALL DISTURBED AREAS SHALL BE RESEEDED WITH APPROVED HIGH DESERT MIX WITHIN 30 DAYS AFTER THE END OF DISTURBANCE.

4. ALL SLOPES SHALL BE 3:1 MAX. AND GRAVEL OR NATIVE SEEDING PRIOR TO CO.

5. SURVEY PROVIDED BY COMMUNITY SCIENCES CORPORATION, BASED UPON NAVD 1988 DATUM.



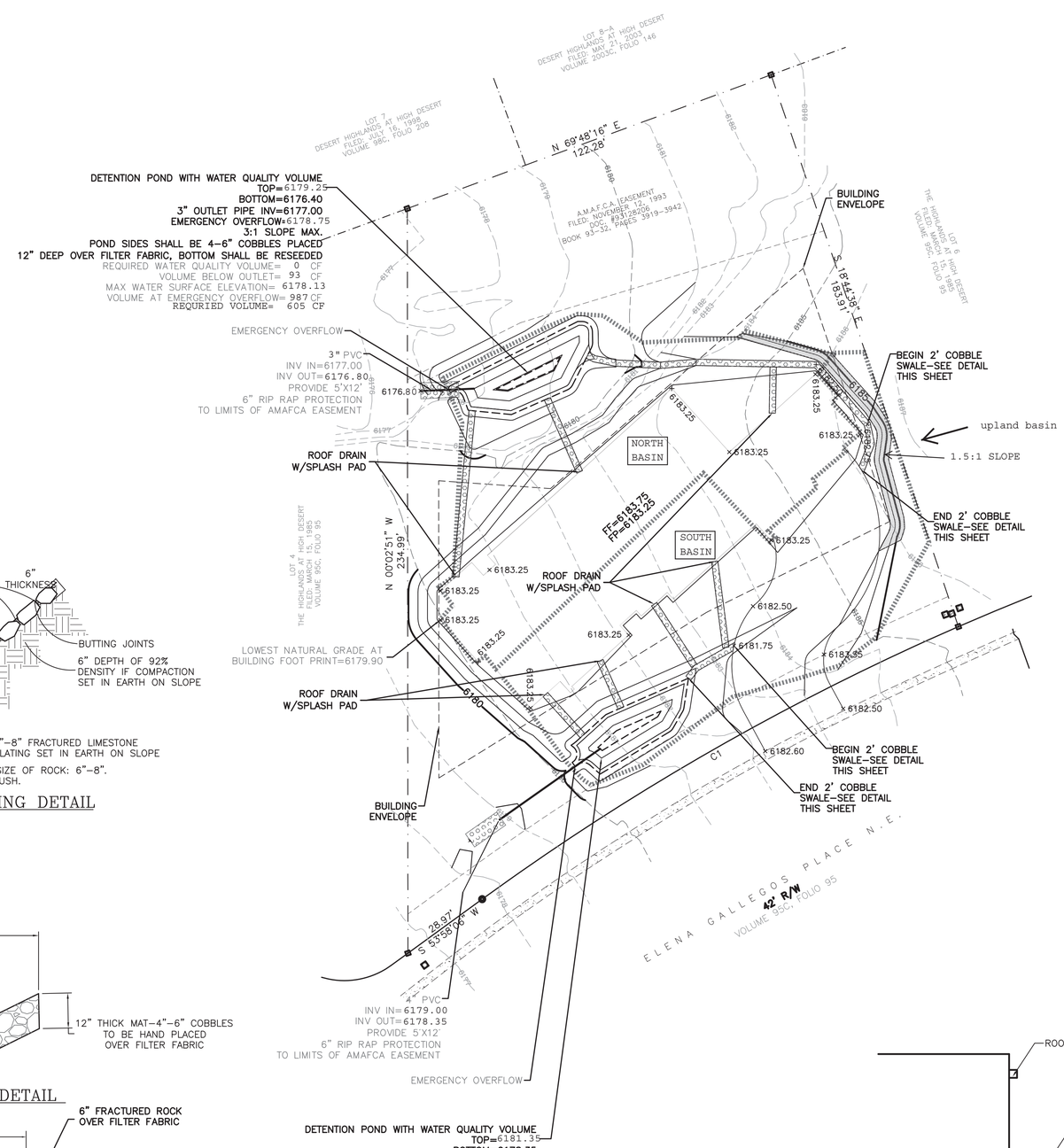
VICINITY MAP: E–24–Z

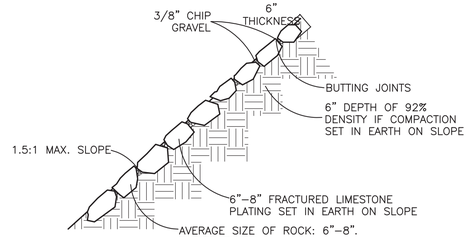


FIRM MAP:

LEGAL DESCRIPTION:

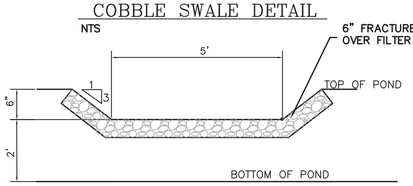
LOT 5, HIGHLANDS AT HIGH RESORT UNIT 1



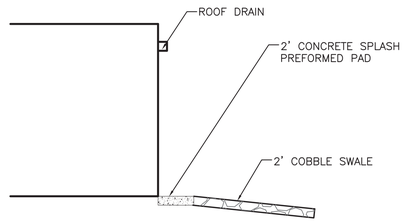


ROCK PLATING DETAIL
NTS

COBBLE SWALE DETAIL
NTS



EMERGENCY OVERFLOW DETAIL
NTS



ROOF DRAIN SPLASH PAD DETAIL
NTS

SCALE: 1"=20'

LEGEND

- XXXX — EXISTING CONTOUR
- XXXX — EXISTING INDEX CONTOUR
- XXXX — PROPOSED CONTOUR
- XXXX — PROPOSED INDEX CONTOUR
- SLOPE TIE
- XXXX EXISTING SPOT ELEVATION
- XXXX PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT–OF–WAY
- PROPOSED CURB AND GUTTER
- EXISTING EDGE OF ASPHALT
- 2' COBBLE SWALE–SEE DETAIL THIS SHEET
- BASIN LIMITS
- ROCK PLATING–SEE DETAIL THIS SHEET

ENGINEER'S SEAL
DAVID SOULE NEW MEXICO 14522 REGISTERED PROFESSIONAL ENGINEER
9/12/19
DAVID SOULE P.E. #14522

LOT 5 ELENA GALLEGOS

GRADING AND DRAINAGE PLAN

DRAWN BY WCWJ
DATE 9–10–19
2109073–LAYOUT–9–10–19
SHEET # —
JOB # 2109073

Rio Grande Engineering
1606 CENTRAL AVENUE SE
SUITE 201
ALBUQUERQUE, NM 87106
(505) 872–0999