CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

June 10, 2016

Joel D. Hernandez, P.E.
Tierra West, LLC
5571 Midway Park Pl, NE
Albuquerque, NM, 87109

RE: Los Pastores Shopping Center
Grading and Drainage Plan & Report
Engineer's Stamp Date 5/1/16 (File: F19D013C)

Dear Mr. Hernandez:

Based upon the information provided in your submittal received 5-3-2016, the above-referenced plan is approved for ESC Grading Permit. The submittal was previously reviewed and is approved for Site Plan for Subdivision (DRB 6/1/16, #1010550).

We understand that the Erosion and Sediment Control Plan is about to be submitted. Be aware that the ESC Grading Permit will not be approved until the ESC Plan is approved by the Stormwater Quality Engineer.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Abiel Carrillo, P.E.
Principal Engineer, Planning Department
Development Review Services

Orig: Drainage file
CC: Curtis Cherne

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Los Pastores Shopping Center (NWC Montgomery & Wyoming) Building Permit #: _____ City Drainage #: _____

DRB#: _____ EPC#: 15EPC-40032 Work Order#: _____

Legal Description: Tract A-1 Redivision of TR A (Now Comprising TRS A1 & A2) Los Pastores Shopping Center

City Address: NWC Montgomery & Wyoming

Engineering Firm: Tierra West, LLC Contact: Joel Hernandez, PE

Address: 5571 Midway Park Place, NE

Phone#: 505.858.3100 Fax#: 505.858.1118 E-mail: joeldhernandez@tierrawestllc.com

Owner: W&M Company Contact: Bill Gunther

Address: 8220 La Mirada Rd. NE, Suite 300

Phone#: 505.296.4146 Fax#: 505.296.0907 E-mail: billg5469@aol.com

Architect: _____ Contact: _____

Address: _____

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

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

x HYDROLOGY/ DRAINAGE

_____ TRAFFIC/ TRANSPORTATION

_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN

X GRADING PLAN

_____ DRAINAGE MASTER PLAN

X DRAINAGE REPORT

_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ TRAFFIC IMPACT STUDY (TIS)

_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY

_____ PRELIMINARY PLAT APPROVAL

X SITE PLAN FOR SUB'D APPROVAL

_____ SITE PLAN FOR BLDG. PERMIT APPROVAL

_____ FINAL PLAT APPROVAL

_____ SIA/ RELEASE OF FINANCIAL GUARANTEE

_____ FOUNDATION PERMIT APPROVAL

X GRADING PERMIT APPROVAL

_____ SO-19 APPROVAL

_____ PAVING PERMIT APPROVAL

_____ GRADING/ PAD CERTIFICATION

_____ WORK ORDER APPROVAL

_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: _____ Yes X No

DATE SUBMITTED: 5/1/2016 By: Joel Hernandez

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

DRAINAGE MANAGEMENT PLAN

For

Los Pastores Shopping Center

NWC Wyoming and Montgomery
Albuquerque, New Mexico

Prepared by:

Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

May, 2016

I certify that this report was prepared under my supervision, and I am a registered Professional Engineer in the State of New Mexico in good standing.

Joel D. Hernandez, PE
NO. 17893

TW Job No. 2014052

TABLE OF CONTENTS

Appendices

Map Pockets

DRAINAGE MANAGEMENT PLAN

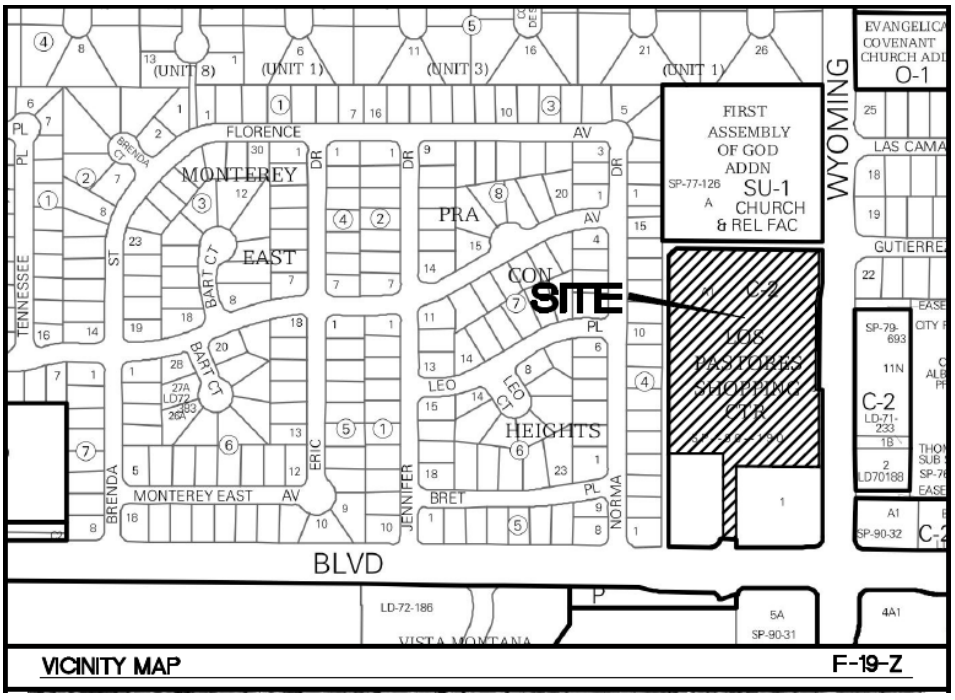
Introduction

The purpose of this submittal is to provide a Drainage Management Plan for Development Review Board (DRB) approval, and for rough grading approval of the Los Pastores Shopping Center. The overall project consists of a 6.45-acre site, most of which is undeveloped, with the exception of the McDonald's lease parcel. The development will consist of five new tracts/pad sites within a shopping center, along with associated parking, amenity areas, and landscaped areas. The existing McDonald's lease parcel will be platted as a separate tract, however, no changes or improvements are proposed within that property. A Site Development Plan for Building Permit for each individual pad site will require subsequent approval by EPC along with grading and drainage approval in general conformance with the drainage scheme outlined in this report.

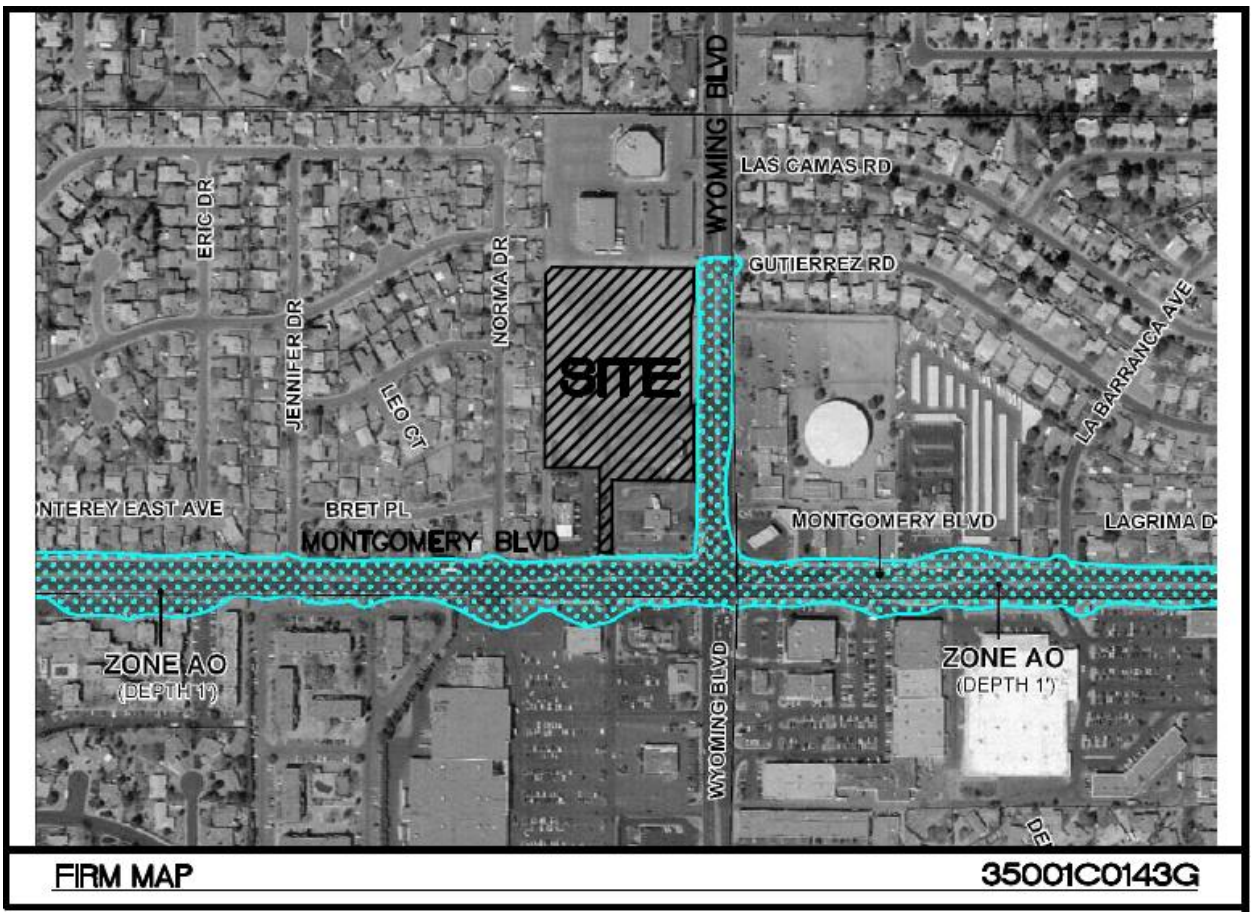
As shown in the vicinity map below, site is located on the northwest corner of Montgomery Boulevard NE and Wyoming Boulevard NE and encompasses Tract A-1, Redivision of Tract "A", Los Pastores Shopping Center. A portion of Tract 1 (corner parcel containing a Wells Fargo Bank building), is not a port of this request. The property is bound on the north by an adjacent unpaved public alley and an existing church; on the east by Wyoming Boulevard; on the south by Montgomery Boulevard and an existing Wells Fargo Bank; and on the west by an adjacent unpaved public alley and a residential subdivision.

The site lies within Precipitation Zone 3 according to Section 22.2 of the DPM. As shown in the FEMA Flood Map 35001C0143G on page 2, the site lies outside any flood hazard zone.

Vicinity Map



FEMA FIRMap



Pre-Developed Conditions

A leased parcel on the southwest portion of the site is developed with a McDonald's Restaurant and parking facilities, while the remaining portion of the property remain undeveloped with the exception of access driveways connecting access from Wyoming Blvd. The site appears to have been previously graded with a moderate to steep slopes on the east, a small slope on the west adjacent to the alley, and a shallow (<3 foot deep) detention/retention pond (existing pond) north of the McDonald's restaurant.

Surface runoff from the site generally flows from the northeast corner of the site toward the existing pond on the southwest portion of the undeveloped area which, in turn, outflows into the unpaved public alley (AP#1 Q=28.2 CFS) draining by surface flow onto Montgomery Boulevard. Offsite flows draining onto the site are limited to surface runoff from the undeveloped alley adjacent to the church on the north as well as from the northerly portion of the existing Wells Fargo Bank building which surface flows over the McDonald's parking lot and drains through a curb cut into the existing pond. No offsite flows drain onto the site from Wyoming Boulevard as they are contained in the roadway curb and gutter and conveyed into an existing public storm drain system.

Post-Developed Conditions

The drainage intent is to maintain drainage patterns and peak discharge rates matching historic, pre-development flows, which at Analysis Point (AP) #1 is 28.2 CFS. To accomplish this, the existing drainage pond will be enlarged and maintained in the same location until such time the pad develops, which will require the pond to be re-analyzed and reconfigured, if necessary. The grading and drainage scheme proposes to provide rough-graded pads within each proposed lot that will enable individual development of each lot, provided individual, privately maintained ponds or underground drainage storage structures are built with the development of each lot so as to not exceed pre-development peak flow rates. Paving improvements for the adjacent public alley and internal private access drives can also be constructed with this proposed grading and drainage scheme without exceeding historic flows. As designed, the post-developed flow rate at AP#1 would be 28.1 CFS as a result of the detention pond reconstruction.

Per the attached grading and drainage plan and as indicated on the Post-Developed Conditions Basin Map, the majority of site (except for the alley corresponding to Basin PR-2) will be routed through the proposed detention basin along with the existing flows from Basins EX-3 and EX-4 over which no changes are proposed. The detention pond is designed to retain the "first-flush" within the bottom foot of storage, then release flow through a triple-pipe culvert until the pond water elevation reaches the crest elevation (5421.0) of the concrete spillway. The concrete spillway is also designed as an emergency overflow capable of conveying the full 100-year storm (without accounting for pond attenuation), should the pipe culvert become clogged.

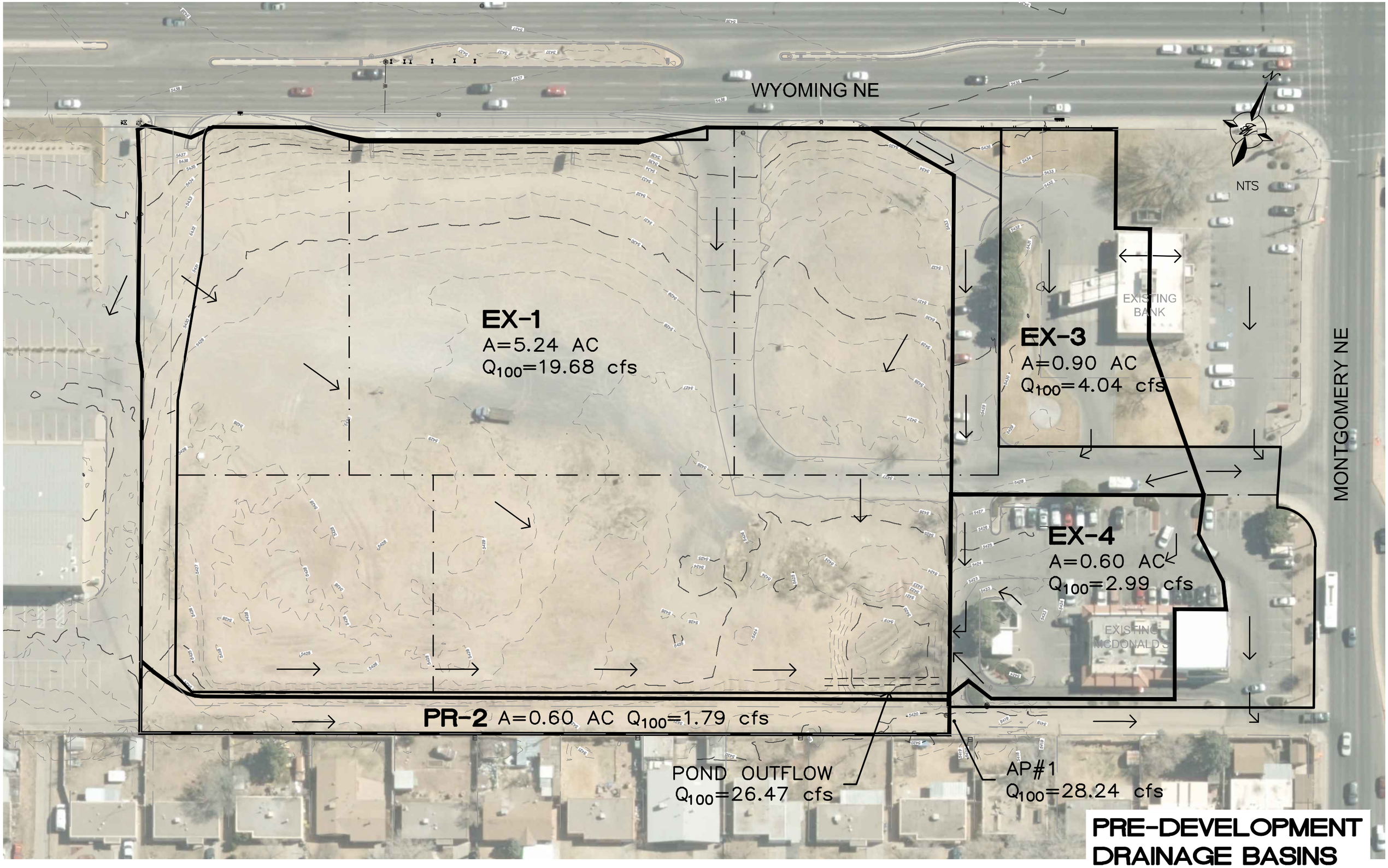
Refer to Appendix B (AHYMO Analysis) for pond sizing calculations.

First-Flush Water Quality Considerations

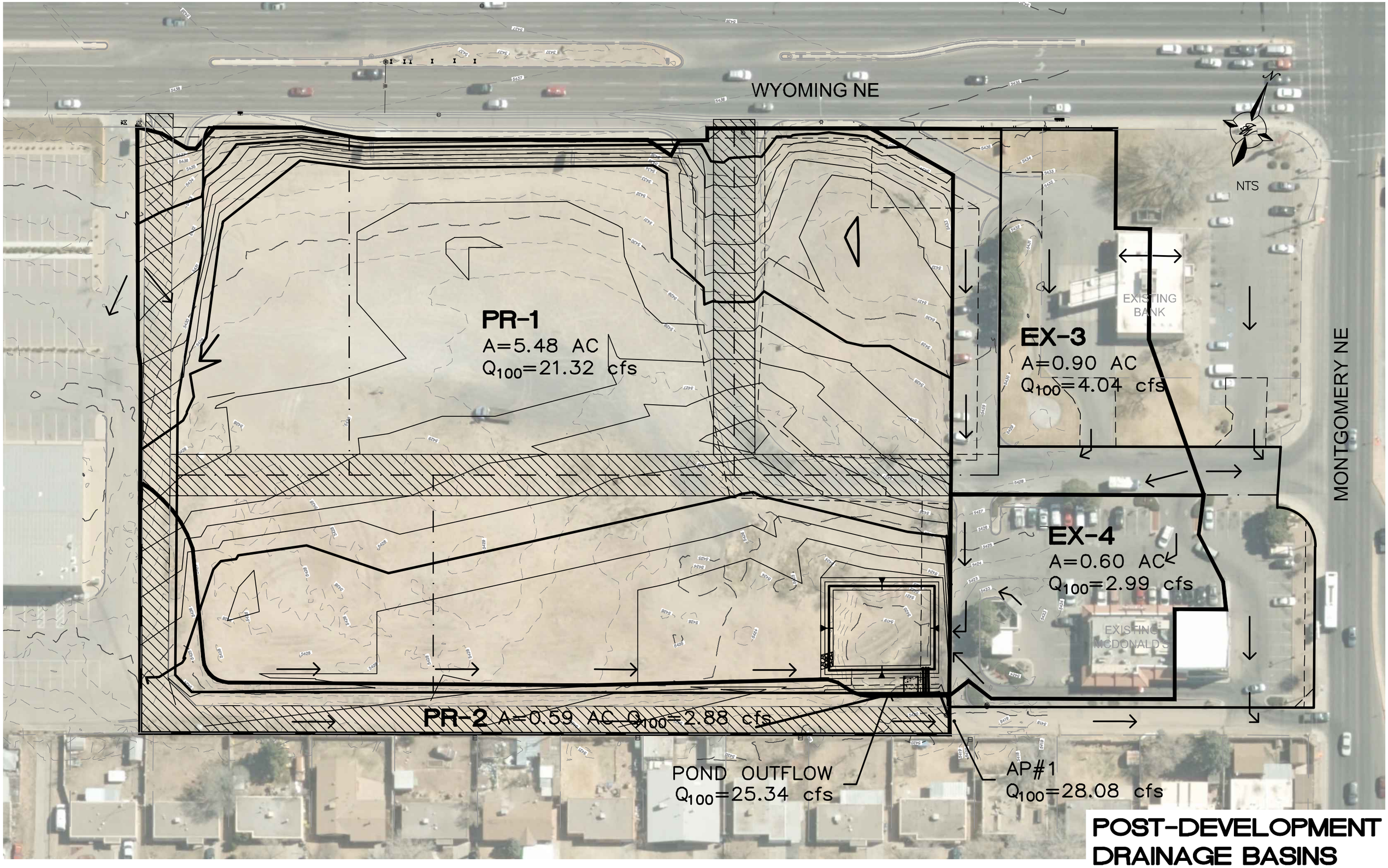
The pavement anticipated to be constructed in the rough grading phase would require a first-flush retention volume of 3,063 cubic-feet, all of which can be retained within the bottom foot of the detention pond which has a capacity of 3,762 cubic-feet as indicated in the Pond Volume Calculation sheet included in the Appendix. This volume is exclusive and separate from the detention volume calculations, as required by the Ordinance.

Conclusion

This Drainage Management Plan provides for grading and drainage elements which are capable of safely conveying the 100-Yr, 6-Hr storm and which meet City requirements. Furthermore, the plan as identified above will not negatively impact the current downstream conditions at Wyoming Boulevard. With this submittal, we request Drainage Report approval for both the Site Development Plan for Subdivision and for Rough Grading approval.



PRE-DEVELOPMENT DRAINAGE BASINS



POST-DEVELOPMENT DRAINAGE BASINS

APPENDIX A

HYDROLOGY

```
*****************************************************************
*             Los Pastores SC @ Wyoming& Mont, ABQ,NM           *
*****************************************************************
* 100-YEAR, 24-HR STORM  (UNDER EXIST CONDITIONS) W/ routing    *
*****************************************************************
*
START               TIME=0.0
*
*
RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                    RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                    RAIN DAY=3.10 IN DT=0.05 HR
*DEVELOPED CONDITIONS
*
*BASIN EX-1
*
COMPUTE NM HYD      ID=1 HYD NO=100.1 AREA=0.00818 SQ MI
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*
*
*BASIN EX-2
*
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PRINT HYD           ID=2 CODE=1
*
*
*BASIN EX-3
*
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*
*
*BASIN EX-4
*
COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00093 SQ MI
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*
*
*
*COMBINE EX-1, EX-3, AND EX-4
```

```
*
ADD HYD             ID=50 HYD NO=100.21 ID=1 ID=3
ADD HYD             ID=50 HYD NO=100.21 ID=50 ID=4
*
PRINT HYD           ID=50 CODE=1
**
*ROUTE BASINS EX-1, EX-3, AND EX-4 THROUGH EXIST DETENTION POND
ROUTE RESERVOIR     ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24
                    OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0100         0.0                 19.00
                    0.0100         0.0573              20.00
                    0.1000         0.0914              20.50
                    28.570         0.1366              21.00
*
*
PRINT HYD           ID=55  CODE=1
*
*
*COMBINE POND OUTFLOW WITH EX-2 FOR TOTAL AT AP#1
*
ADD HYD             ID=58 HYD NO=100.22 ID=2 ID=55
*
PRINT HYD           ID=58 CODE=1
*
*
FINISH
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TierraWest-SiteA99368577
             INPUT FILE = C:\Users\Joel\Desktop\AHYMO IN\Wyoming-Montgomery
exist.txt

    ************************************************************
    *             Los Pastores SC @ Wyoming& Mont, ABQ,NM          *
    ************************************************************
    * 100-YEAR, 24-HR STORM  (UNDER EXIST CONDITIONS) W/ routing    *
    ************************************************************
    *
    START               TIME=0.0
    *
    *
    RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                        RAIN DAY=3.10 IN DT=0.05 HR

                     24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                     DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
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                       0.0274  0.0368  0.0470  0.0575  0.0690  0.0807  0.0927
                       0.1052  0.1178  0.1320  0.1467  0.1627  0.1887  0.2196
                       0.2611  0.3081  0.3661  0.4435  0.5307  0.6811  0.9149
                       1.3155  1.5971  1.8192  1.9308  2.0287  2.0989  2.1549
                       2.2036  2.2393  2.2720  2.2991  2.3181  2.3331  2.3464
                       2.3590  2.3700  2.3804  2.3905  2.4002  2.4083  2.4129
                       2.4175  2.4219  2.4261  2.4303  2.4343  2.4383  2.4422
                       2.4459  2.4495  2.4531  2.4566  2.4601  2.4634  2.4667
                       2.4699  2.4731  2.4762  2.4792  2.4822  2.4851  2.4880
                       2.4909  2.4937  2.4965  2.4992  2.5019  2.5046  2.5072
                       2.5098  2.5124  2.5149  2.5175  2.5200  2.5224  2.5249
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                       2.5434  2.5456  2.5478  2.5500  2.5521  2.5542  2.5564
                       2.5584  2.5605  2.5626  2.5646  2.5666  2.5686  2.5706
                       2.5725  2.5745  2.5764  2.5783  2.5802  2.5821  2.5839
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                       2.6104  2.6121  2.6138  2.6155  2.6172  2.6190  2.6207
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                       2.6461  2.6478  2.6495  2.6512  2.6529  2.6545  2.6562
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2.7593	2.7609	2.7624	2.7640	2.7655	2.7671	2.7686
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2.8924	2.8938	2.8952	2.8965	2.8979	2.8993	2.9006
2.9020	2.9033	2.9047	2.9061	2.9074	2.9088	2.9101
2.9115	2.9128	2.9141	2.9155	2.9168	2.9182	2.9195
2.9208	2.9222	2.9235	2.9248	2.9262	2.9275	2.9288
2.9301	2.9314	2.9328	2.9341	2.9354	2.9367	2.9380
2.9393	2.9406	2.9419	2.9432	2.9445	2.9458	2.9471
2.9484	2.9497	2.9510	2.9523	2.9536	2.9549	2.9561
2.9574	2.9587	2.9600	2.9612	2.9625	2.9638	2.9651
2.9663	2.9676	2.9689	2.9701	2.9714	2.9726	2.9739
2.9751	2.9764	2.9776	2.9789	2.9801	2.9814	2.9826
2.9839	2.9851	2.9863	2.9876	2.9888	2.9900	2.9912
2.9925	2.9937	2.9949	2.9961	2.9974	2.9986	2.9998
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3.0178	3.0189	3.0201	3.0213	3.0225	3.0237	3.0248
3.0260	3.0272	3.0283	3.0295	3.0307	3.0318	3.0330
3.0341	3.0353	3.0364	3.0376	3.0387	3.0399	3.0410
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3.0501	3.0513	3.0524	3.0535	3.0546	3.0558	3.0569
3.0580	3.0591	3.0602	3.0613	3.0624	3.0635	3.0646
3.0658	3.0669	3.0680	3.0690	3.0701	3.0712	3.0723
3.0734	3.0745	3.0756	3.0767	3.0777	3.0788	3.0799
3.0810	3.0821	3.0831	3.0842	3.0853	3.0863	3.0874
3.0885	3.0895	3.0906	3.0916	3.0927	3.0937	3.0948
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*DEVELOPED CONDITIONS
*

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0.050000


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INCHES PER HOUR
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0.050000

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0.0082 SQ. MI.



    *
    *
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    *
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 P60 = 2.1400
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INCHES PER HOUR
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0.050000

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                                      PARTIAL HYDROGRAPH   100.20


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        PEAK DISCHARGE RATE =       1.79 CFS  AT   1.500 HOURS   BASIN AREA =
0.0009 SQ. MI.



    *
    *
    *BASIN EX-3
    *
    COMPUTE NM HYD      ID=3 HYD NO=100.3 AREA=0.00141 SQ MI
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 P60 = 2.1400
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INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.133656HR    TP =  0.133300HR    K/TP RATIO =  1.002670     SHAPE
CONSTANT, N =  3.520654
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 P60 = 2.1400
         AREA =     0.000437 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

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                                      PARTIAL HYDROGRAPH   100.30
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        PEAK DISCHARGE RATE =       4.04 CFS  AT   1.500 HOURS   BASIN AREA =
0.0014 SQ. MI.



    *
    *
    *BASIN EX-4
    *
    COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00093 SQ MI
                        PER A=0.00 PER B=6.00 PER C=00.0 PER D=94.0
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   3.4514    CFS   UNIT VOLUME =   0.9959       B =   526.28
 P60 = 2.1400
         AREA =     0.000874 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.133656HR    TP =  0.133300HR    K/TP RATIO =  1.002670     SHAPE
CONSTANT, N =  3.520654
         UNIT PEAK =  0.13472    CFS   UNIT VOLUME =   0.9008       B =   321.84
 P60 = 2.1400
         AREA =     0.000056 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=4 CODE=1

                                      PARTIAL HYDROGRAPH   100.40


        RUNOFF VOLUME =     2.74343 INCHES     =       0.1361 ACRE-FEET
        PEAK DISCHARGE RATE =       2.99 CFS  AT   1.500 HOURS   BASIN AREA =
0.0009 SQ. MI.



    *
    *
    *
    *COMBINE EX-1, EX-3, AND EX-4
```

```
*
ADD HYD                         ID=50 HYD NO=100.21 ID=1 ID=3

ADD HYD                         ID=50 HYD NO=100.21 ID=50 ID=4

*
PRINT HYD           ID=50 CODE=1
```

PARTIAL HYDROGRAPH 100.21

RUNOFF VOLUME = 1.66611 INCHES = 0.9348 ACRE-FEET
PEAK DISCHARGE RATE = 26.71 CFS AT 1.500 HOURS BASIN AREA = 0.0105 SQ. MI.

```
**
*ROUTE BASINS EX-1, EX-3, AND EX-4 THROUGH EXIST DETENTION POND
ROUTE RESERVOIR     ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24
                        OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                                0.0100         0.0                 19.00

                                0.0100         0.0573              20.00

                                0.1000         0.0914              20.50

                                28.570         0.1366              21.00
```

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	-Infinity	-Infinity	0.00
1.20	1.56	20.00	0.057	0.01
2.40	0.80	20.51	0.093	0.85
3.60	0.04	20.48	0.090	0.10
4.80	0.04	20.41	0.085	0.08
6.00	0.05	20.36	0.082	0.07
7.20	0.05	20.33	0.080	0.07
8.40	0.05	20.30	0.078	0.06
9.60	0.05	20.28	0.077	0.06
10.80	0.05	20.27	0.076	0.06
12.00	0.05	20.25	0.074	0.06
13.20	0.04	20.24	0.074	0.05
14.40	0.04	20.23	0.073	0.05

15.60	0.04	20.22	0.072	0.05
16.80	0.04	20.21	0.071	0.05
18.00	0.04	20.20	0.071	0.05
19.20	0.04	20.19	0.070	0.04
20.40	0.04	20.18	0.069	0.04
21.60	0.03	20.17	0.069	0.04
22.80	0.03	20.16	0.068	0.04
24.00	0.03	20.15	0.068	0.04
25.20	0.00	20.11	0.065	0.03
26.40	0.00	20.07	0.062	0.02
27.60	0.00	20.04	0.060	0.02
28.80	0.00	20.02	0.059	0.01
30.00	0.00	20.00	0.057	0.01
31.20	0.00	20.00	0.057	0.01
32.40	0.00	20.00	0.057	0.01
33.60	0.00	20.00	0.057	0.01
34.80	0.00	20.00	0.057	0.01
36.00	0.00	20.00	0.057	0.01
37.20	0.00	20.00	0.057	0.01
38.40	0.00	20.00	0.057	0.01
39.60	0.00	20.00	0.057	0.01
40.80	0.00	20.00	0.057	0.01
42.00	0.00	20.00	0.057	0.01
43.20	0.00	20.00	0.057	0.01
44.40	0.00	20.00	0.057	0.01
45.60	0.00	20.00	0.057	0.01
46.80	0.00	20.00	0.057	0.01
48.00	0.00	20.00	0.057	0.01
49.20	0.00	20.00	0.057	0.01
50.40	0.00	20.00	0.057	0.01
51.60	0.00	20.00	0.057	0.01
52.80	0.00	20.00	0.057	0.01
54.00	0.00	20.00	0.057	0.01
55.20	0.00	20.00	0.057	0.01
56.40	0.00	20.00	0.057	0.01
57.60	0.00	20.00	0.057	0.01
58.80	0.00	20.00	0.057	0.01
60.00	0.00	20.00	0.057	0.01
61.20	0.00	20.00	0.057	0.01
62.40	0.00	20.00	0.057	0.01
63.60	0.00	20.00	0.057	0.01
64.80	0.00	20.00	0.057	0.01
66.00	0.00	20.00	0.057	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
67.20	0.00	20.00	0.057	0.01

68.40	0.00	20.00	0.057	0.01
69.60	0.00	20.00	0.057	0.01
70.80	0.00	20.00	0.057	0.01
72.00	0.00	20.00	0.057	0.01
73.20	0.00	20.00	0.057	0.01
74.40	0.00	20.00	0.057	0.01
75.60	0.00	20.00	0.057	0.01
76.80	0.00	20.00	0.057	0.01
78.00	0.00	20.00	0.057	0.01
79.20	0.00	20.00	0.057	0.01
80.40	0.00	20.00	0.057	0.01
81.60	0.00	20.00	0.057	0.01
82.80	0.00	20.00	0.057	0.01
84.00	0.00	20.00	0.057	0.01
85.20	0.00	20.00	0.057	0.01
86.40	0.00	20.00	0.057	0.01
87.60	0.00	20.00	0.057	0.01
88.80	0.00	20.00	0.057	0.01
90.00	0.00	20.00	0.057	0.01
91.20	0.00	20.00	0.057	0.01
92.40	0.00	20.00	0.057	0.01
93.60	0.00	20.00	0.057	0.01
94.80	0.00	20.00	0.057	0.01
96.00	0.00	20.00	0.057	0.01
97.20	0.00	20.00	0.057	0.01
98.40	0.00	20.00	0.057	0.01
99.60	0.00	20.00	0.057	0.01
100.80	0.00	20.00	0.057	0.01
102.00	0.00	20.00	0.057	0.01
103.20	0.00	20.00	0.057	0.01
104.40	0.00	20.00	0.057	0.01
105.60	0.00	20.00	0.057	0.01
106.80	0.00	20.00	0.057	0.01
108.00	0.00	20.00	0.057	0.01
109.20	0.00	20.00	0.057	0.01
110.40	0.00	20.00	0.057	0.01
111.60	0.00	20.00	0.057	0.01
112.80	0.00	20.00	0.057	0.01
114.00	0.00	20.00	0.057	0.01
115.20	0.00	20.00	0.057	0.01
116.40	0.00	20.00	0.057	0.01
117.60	0.00	20.00	0.057	0.01
118.80	0.00	20.00	0.057	0.01
120.00	0.00	20.00	0.057	0.01
121.20	0.00	20.00	0.057	0.01
122.40	0.00	20.00	0.057	0.01
123.60	0.00	20.00	0.057	0.01
124.80	0.00	20.00	0.057	0.01

126.00	0.00	20.00	0.057	0.01
127.20	0.00	20.00	0.057	0.01
128.40	0.00	20.00	0.057	0.01
129.60	0.00	20.00	0.057	0.01
130.80	0.00	20.00	0.057	0.01
132.00	0.00	20.00	0.057	0.01
133.20	0.00	20.00	0.057	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
134.40	0.00	20.00	0.057	0.01
135.60	0.00	20.00	0.057	0.01
136.80	0.00	20.00	0.057	0.01
138.00	0.00	20.00	0.057	0.01
139.20	0.00	20.00	0.057	0.01
140.40	0.00	20.00	0.057	0.01
141.60	0.00	20.00	0.057	0.01
142.80	0.00	20.00	0.057	0.01
144.00	0.00	20.00	0.057	0.01
145.20	0.00	20.00	0.057	0.01
146.40	0.00	20.00	0.057	0.01
147.60	0.00	20.00	0.057	0.01
148.80	0.00	20.00	0.057	0.01
150.00	0.00	20.00	0.057	0.01
151.20	0.00	20.00	0.057	0.01
152.40	0.00	20.00	0.057	0.01
153.60	0.00	20.00	0.057	0.01
154.80	0.00	20.00	0.057	0.01
156.00	0.00	20.00	0.057	0.01
157.20	0.00	20.00	0.057	0.01
158.40	0.00	20.00	0.057	0.01
159.60	0.00	20.00	0.057	0.01
160.80	0.00	20.00	0.057	0.01
162.00	0.00	20.00	0.057	0.01
163.20	0.00	20.00	0.057	0.01
164.40	0.00	20.00	0.057	0.01
165.60	0.00	20.00	0.057	0.01
166.80	0.00	20.00	0.057	0.01
168.00	0.00	20.00	0.057	0.01
169.20	0.00	20.00	0.057	0.01
170.40	0.00	20.00	0.057	0.01
171.60	0.00	20.00	0.057	0.01
172.80	0.00	20.00	0.057	0.01
174.00	0.00	20.00	0.057	0.01
175.20	0.00	20.00	0.057	0.01
176.40	0.00	20.00	0.057	0.01
177.60	0.00	20.00	0.057	0.01

178.80	0.00	20.00	0.057	0.01
180.00	0.00	20.00	0.057	0.01
181.20	0.00	20.00	0.057	0.01
182.40	0.00	20.00	0.057	0.01
183.60	0.00	20.00	0.057	0.01
184.80	0.00	20.00	0.057	0.01
186.00	0.00	20.00	0.057	0.01
187.20	0.00	20.00	0.057	0.01
188.40	0.00	20.00	0.057	0.01
189.60	0.00	20.00	0.057	0.01
190.80	0.00	20.00	0.057	0.01
192.00	0.00	20.00	0.057	0.01
193.20	0.00	20.00	0.057	0.01
194.40	0.00	20.00	0.057	0.01
195.60	0.00	20.00	0.057	0.01
196.80	0.00	20.00	0.057	0.01
198.00	0.00	20.00	0.057	0.01
199.20	0.00	20.00	0.057	0.01

PEAK DISCHARGE = 26.469 CFS - PEAK OCCURS AT HOUR 1.55
MAXIMUM WATER SURFACE ELEVATION = 20.963
MAXIMUM STORAGE = 0.1333 AC-FT INCREMENTAL TIME= 0.050000HRS

*
*
PRINT HYD ID=55 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 1.81503 INCHES = 1.0183 ACRE-FEET
PEAK DISCHARGE RATE = 26.47 CFS AT 1.550 HOURS BASIN AREA = 0.0105 SQ. MI.

*
*
*COMBINE POND OUTFLOW WITH EX-2 FOR TOTAL AT AP#1
*
ADD HYD ID=58 HYD NO=100.22 ID=2 ID=55

*
PRINT HYD ID=58 CODE=1

PARTIAL HYDROGRAPH 100.22

RUNOFF VOLUME = 1.75447 INCHES = 1.0723 ACRE-FEET

AHYMO

PEAK DISCHARGE RATE = 28.24 CFS AT 1.550 HOURS BASIN AREA = 0.0115 SQ. MI.

=EXIST Q AT AP#1

*
*
FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 15:11:09

```
*****************************************************************
*             Los Pastores SC @ Wyoming& Mont, ABQ,NM           *
*****************************************************************
* 100-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS) W/ routing *
*****************************************************************
*
START               TIME=0.0
*
*
RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                    RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                    RAIN DAY=3.10 IN DT=0.05 HR
*DEVELOPED CONDITIONS
*
*BASIN PR-1
*
COMPUTE NM HYD      ID=1 HYD NO=100.1 AREA=0.00856 SQ MI
                    PER A=0.00 PER B=0.0 PER C=85.0 PER D=15.0
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=1 CODE=1
*
*
*BASIN PR-2
*
COMPUTE NM HYD      ID=2 HYD NO=100.2 AREA=0.00092 SQ MI
                    PER A=0.00 PER B=0.0 PER C=19.0 PER D=81.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=2 CODE=1
*
*
*BASIN EX-3
*
COMPUTE NM HYD      ID=3 HYD NO=100.3 AREA=0.00141 SQ MI
                    PER A=0.00 PER B=31.0 PER C=00.0 PER D=69.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=3 CODE=1
*
*
*BASIN EX-4
*
COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00093 SQ MI
                    PER A=0.00 PER B=6.00 PER C=00.0 PER D=94.0
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=4 CODE=1
*
*
*
*COMBINE PR-1, EX-3, AND EX-4
```

```
*
ADD HYD             ID=50 HYD NO=100.21 ID=1 ID=3
ADD HYD             ID=50 HYD NO=100.21 ID=50 ID=4
*
PRINT HYD           ID=50 CODE=1
**
*ROUTE BASINS PR-1, EX-3, AND EX-4 THROUGH PROPOSED DETENTION POND
ROUTE RESERVOIR     ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24
                    OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.0100         0.0                 19.50
                    0.4800         0.0497              20.00
                    4.8300         0.1041              20.50
                    6.6200         0.1634              21.00
                    20.820         0.2278              21.50
                    43.130         0.2974              22.00
*
*
PRINT HYD           ID=55  CODE=1
*
*
*COMBINE POND OUTFLOW WITH EX-2 FOR TOTAL AT AP#1
*
ADD HYD             ID=58 HYD NO=100.22 ID=2 ID=55
*
PRINT HYD           ID=58 CODE=1
*
*
FINISH
```

```
        AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
             RUN DATE (MON/DAY/YR) = 04/28/2016
             START TIME (HR:MIN:SEC) = 14:44:31     USER NO.=
TierraWest-SiteA99368577
             INPUT FILE = C:\Users\Joel\Desktop\AHYMO IN\Wyoming-Montgomery
proposed.txt

    ************************************************************
    *             Los Pastores SC @ Wyoming& Mont, ABQ,NM          *
    ************************************************************
    * 100-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS) W/ routing *
    ************************************************************
    *
    START               TIME=0.0
    *
    *
    RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                        RAIN DAY=3.10 IN DT=0.05 HR

                     24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                     DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                       0.0000  0.0031  0.0062  0.0096  0.0133  0.0171  0.0214
                       0.0274  0.0368  0.0470  0.0575  0.0690  0.0807  0.0927
                       0.1052  0.1178  0.1320  0.1467  0.1627  0.1887  0.2196
                       0.2611  0.3081  0.3661  0.4435  0.5307  0.6811  0.9149
                       1.3155  1.5971  1.8192  1.9308  2.0287  2.0989  2.1549
                       2.2036  2.2393  2.2720  2.2991  2.3181  2.3331  2.3464
                       2.3590  2.3700  2.3804  2.3905  2.4002  2.4083  2.4129
                       2.4175  2.4219  2.4261  2.4303  2.4343  2.4383  2.4422
                       2.4459  2.4495  2.4531  2.4566  2.4601  2.4634  2.4667
                       2.4699  2.4731  2.4762  2.4792  2.4822  2.4851  2.4880
                       2.4909  2.4937  2.4965  2.4992  2.5019  2.5046  2.5072
                       2.5098  2.5124  2.5149  2.5175  2.5200  2.5224  2.5249
                       2.5273  2.5296  2.5320  2.5343  2.5366  2.5389  2.5412
                       2.5434  2.5456  2.5478  2.5500  2.5521  2.5542  2.5564
                       2.5584  2.5605  2.5626  2.5646  2.5666  2.5686  2.5706
                       2.5725  2.5745  2.5764  2.5783  2.5802  2.5821  2.5839
                       2.5858  2.5876  2.5894  2.5912  2.5930  2.5948  2.5965
                       2.5983  2.6000  2.6017  2.6035  2.6052  2.6069  2.6086
                       2.6104  2.6121  2.6138  2.6155  2.6172  2.6190  2.6207
                       2.6224  2.6241  2.6258  2.6275  2.6292  2.6309  2.6326
                       2.6343  2.6360  2.6377  2.6394  2.6411  2.6428  2.6445
                       2.6461  2.6478  2.6495  2.6512  2.6529  2.6545  2.6562
                       2.6579  2.6595  2.6612  2.6629  2.6645  2.6662  2.6679
                       2.6695  2.6712  2.6728  2.6745  2.6761  2.6778  2.6794
```

2.6811	2.6827	2.6844	2.6860	2.6876	2.6893	2.6909
2.6925	2.6942	2.6958	2.6974	2.6990	2.7007	2.7023
2.7039	2.7055	2.7071	2.7087	2.7104	2.7120	2.7136
2.7152	2.7168	2.7184	2.7200	2.7216	2.7232	2.7248
2.7264	2.7279	2.7295	2.7311	2.7327	2.7343	2.7359
2.7374	2.7390	2.7406	2.7422	2.7437	2.7453	2.7469
2.7484	2.7500	2.7516	2.7531	2.7547	2.7562	2.7578
2.7593	2.7609	2.7624	2.7640	2.7655	2.7671	2.7686
2.7701	2.7717	2.7732	2.7747	2.7763	2.7778	2.7793
2.7808	2.7824	2.7839	2.7854	2.7869	2.7884	2.7899
2.7915	2.7930	2.7945	2.7960	2.7975	2.7990	2.8005
2.8020	2.8035	2.8050	2.8065	2.8079	2.8094	2.8109
2.8124	2.8139	2.8154	2.8168	2.8183	2.8198	2.8213
2.8227	2.8242	2.8257	2.8271	2.8286	2.8301	2.8315
2.8330	2.8344	2.8359	2.8373	2.8388	2.8402	2.8417
2.8431	2.8446	2.8460	2.8474	2.8489	2.8503	2.8517
2.8532	2.8546	2.8560	2.8574	2.8589	2.8603	2.8617
2.8631	2.8645	2.8659	2.8674	2.8688	2.8702	2.8716
2.8730	2.8744	2.8758	2.8772	2.8786	2.8800	2.8813
2.8827	2.8841	2.8855	2.8869	2.8883	2.8897	2.8910
2.8924	2.8938	2.8952	2.8965	2.8979	2.8993	2.9006
2.9020	2.9033	2.9047	2.9061	2.9074	2.9088	2.9101
2.9115	2.9128	2.9141	2.9155	2.9168	2.9182	2.9195
2.9208	2.9222	2.9235	2.9248	2.9262	2.9275	2.9288
2.9301	2.9314	2.9328	2.9341	2.9354	2.9367	2.9380
2.9393	2.9406	2.9419	2.9432	2.9445	2.9458	2.9471
2.9484	2.9497	2.9510	2.9523	2.9536	2.9549	2.9561
2.9574	2.9587	2.9600	2.9612	2.9625	2.9638	2.9651
2.9663	2.9676	2.9689	2.9701	2.9714	2.9726	2.9739
2.9751	2.9764	2.9776	2.9789	2.9801	2.9814	2.9826
2.9839	2.9851	2.9863	2.9876	2.9888	2.9900	2.9912
2.9925	2.9937	2.9949	2.9961	2.9974	2.9986	2.9998
3.0010	3.0022	3.0034	3.0046	3.0058	3.0070	3.0082
3.0094	3.0106	3.0118	3.0130	3.0142	3.0154	3.0166
3.0178	3.0189	3.0201	3.0213	3.0225	3.0237	3.0248
3.0260	3.0272	3.0283	3.0295	3.0307	3.0318	3.0330
3.0341	3.0353	3.0364	3.0376	3.0387	3.0399	3.0410
3.0422	3.0433	3.0445	3.0456	3.0467	3.0479	3.0490
3.0501	3.0513	3.0524	3.0535	3.0546	3.0558	3.0569
3.0580	3.0591	3.0602	3.0613	3.0624	3.0635	3.0646
3.0658	3.0669	3.0680	3.0690	3.0701	3.0712	3.0723
3.0734	3.0745	3.0756	3.0767	3.0777	3.0788	3.0799
3.0810	3.0821	3.0831	3.0842	3.0853	3.0863	3.0874
3.0885	3.0895	3.0906	3.0916	3.0927	3.0937	3.0948
3.0958	3.0969	3.0979	3.0990	3.1000		

*DEVELOPED CONDITIONS
*

```
    *BASIN PR-1
    *
    COMPUTE NM HYD      ID=1 HYD NO=100.1 AREA=0.00856 SQ MI
                        PER A=0.00 PER B=0.0 PER C=85.0 PER D=15.0
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   5.0693    CFS   UNIT VOLUME =   0.9971       B =   526.28
 P60 = 2.1400
         AREA =     0.001284 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.108912HR    TP =  0.133300HR    K/TP RATIO =  0.817047     SHAPE
CONSTANT, N =  4.373953
         UNIT PEAK =   20.708    CFS   UNIT VOLUME =    1.001       B =   379.38
 P60 = 2.1400
         AREA =     0.007276 SQ MI    IA =   0.35000 INCHES    INF =   0.83000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=1 CODE=1

                                      PARTIAL HYDROGRAPH   100.10


        RUNOFF VOLUME =     1.56994 INCHES     =       0.7167 ACRE-FEET
        PEAK DISCHARGE RATE =      21.32 CFS  AT   1.500 HOURS   BASIN AREA =
0.0086 SQ. MI.



    *
    *
    *BASIN PR-2
    *
    COMPUTE NM HYD      ID=2 HYD NO=100.2 AREA=0.00092 SQ MI
                        PER A=0.00 PER B=0.0 PER C=19.0 PER D=81.00
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   2.9421    CFS   UNIT VOLUME =   0.9951       B =   526.28
 P60 = 2.1400
```

```
         AREA =     0.000745 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.108912HR    TP =  0.133300HR    K/TP RATIO =  0.817047     SHAPE
CONSTANT, N =  4.373953
         UNIT PEAK =  0.49749    CFS   UNIT VOLUME =   0.9770       B =   379.38
 P60 = 2.1400
         AREA =     0.000175 SQ MI    IA =   0.35000 INCHES    INF =   0.83000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=2 CODE=1

                                       PARTIAL HYDROGRAPH   100.20


        RUNOFF VOLUME =     2.56372 INCHES     =       0.1258 ACRE-FEET
        PEAK DISCHARGE RATE =       2.88 CFS  AT   1.500 HOURS   BASIN AREA =
0.0009 SQ. MI.



    *
    *
    *BASIN EX-3
    *
    COMPUTE NM HYD      ID=3 HYD NO=100.3 AREA=0.00141 SQ MI
                        PER A=0.00 PER B=31.0 PER C=00.0 PER D=69.00
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   3.8411    CFS   UNIT VOLUME =   0.9966       B =   526.28
 P60 = 2.1400
         AREA =     0.000973 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.133656HR    TP =  0.133300HR    K/TP RATIO =  1.002670     SHAPE
CONSTANT, N =  3.520654
         UNIT PEAK =   1.0553    CFS   UNIT VOLUME =   0.9889       B =   321.84
 P60 = 2.1400
```

```
         AREA =     0.000437 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=3 CODE=1

                                      PARTIAL HYDROGRAPH   100.30


        RUNOFF VOLUME =     2.30020 INCHES     =       0.1730 ACRE-FEET
        PEAK DISCHARGE RATE =       4.04 CFS  AT   1.500 HOURS   BASIN AREA =
0.0014 SQ. MI.



    *
    *
    *BASIN EX-4
    *
    COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00093 SQ MI
                        PER A=0.00 PER B=6.00 PER C=00.0 PER D=94.0
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   3.4514    CFS   UNIT VOLUME =   0.9959       B =   526.28
 P60 = 2.1400
         AREA =     0.000874 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.133656HR    TP =  0.133300HR    K/TP RATIO =  1.002670     SHAPE
CONSTANT, N =  3.520654
         UNIT PEAK =  0.13472    CFS   UNIT VOLUME =   0.9008       B =   321.84
 P60 = 2.1400
         AREA =     0.000056 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=4 CODE=1

                                      PARTIAL HYDROGRAPH   100.40
```

RUNOFF VOLUME = 2.74343 INCHES = 0.1361 ACRE-FEET
PEAK DISCHARGE RATE = 2.99 CFS AT 1.500 HOURS BASIN AREA = 0.0009 SQ. MI.

*
*
*
*COMBINE PR-1, EX-3, AND EX-4
*
ADD HYD ID=50 HYD NO=100.21 ID=1 ID=3

ADD HYD ID=50 HYD NO=100.21 ID=50 ID=4

*
PRINT HYD ID=50 CODE=1

PARTIAL HYDROGRAPH 100.21

RUNOFF VOLUME = 1.76445 INCHES = 1.0257 ACRE-FEET
PEAK DISCHARGE RATE = 28.35 CFS AT 1.500 HOURS BASIN AREA = 0.0109 SQ. MI.

**
*ROUTE BASINS PR-1, EX-3, AND EX-4 THROUGH PROPOSED DETENTION POND
ROUTE RESERVOIR ID=55 HYD NO=200.1 INFLOW ID=50 CODE=24

OUTFLOW (CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0100	0.0	19.50
0.4800	0.0497	20.00
4.8300	0.1041	20.50
6.6200	0.1634	21.00
20.820	0.2278	21.50
43.130	0.2974	22.00

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

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

0.00	0.00	19.49	-0.001	0.00
1.20	1.96	19.73	0.023	0.22
2.40	0.89	20.16	0.067	1.88
3.60	0.05	19.81	0.031	0.30
4.80	0.05	19.65	0.015	0.15
6.00	0.07	19.59	0.009	0.10
7.20	0.07	19.57	0.007	0.08
8.40	0.07	19.57	0.007	0.07
9.60	0.06	19.56	0.006	0.07
10.80	0.06	19.56	0.006	0.07
12.00	0.06	19.56	0.006	0.06
13.20	0.06	19.55	0.005	0.06
14.40	0.06	19.55	0.005	0.06
15.60	0.06	19.55	0.005	0.06
16.80	0.05	19.55	0.005	0.06
18.00	0.05	19.55	0.005	0.05
19.20	0.05	19.54	0.004	0.05
20.40	0.05	19.54	0.004	0.05
21.60	0.05	19.54	0.004	0.05
22.80	0.04	19.54	0.004	0.05
24.00	0.04	19.54	0.004	0.04
25.20	0.00	19.51	0.001	0.02
26.40	0.00	19.50	0.000	0.01
27.60	0.00	19.50	0.000	0.01
28.80	0.00	19.50	0.000	0.01
30.00	0.00	19.50	0.000	0.01
31.20	0.00	19.50	0.000	0.01
32.40	0.00	19.50	0.000	0.01
33.60	0.00	19.50	0.000	0.01
34.80	0.00	19.50	0.000	0.01
36.00	0.00	19.50	0.000	0.01
37.20	0.00	19.50	0.000	0.01
38.40	0.00	19.50	0.000	0.01
39.60	0.00	19.50	0.000	0.01
40.80	0.00	19.50	0.000	0.01
42.00	0.00	19.50	0.000	0.01
43.20	0.00	19.50	0.000	0.01
44.40	0.00	19.50	0.000	0.01
45.60	0.00	19.50	0.000	0.01
46.80	0.00	19.50	0.000	0.01
48.00	0.00	19.50	0.000	0.01
49.20	0.00	19.50	0.000	0.01
50.40	0.00	19.50	0.000	0.01
51.60	0.00	19.50	0.000	0.01
52.80	0.00	19.50	0.000	0.01
54.00	0.00	19.50	0.000	0.01
55.20	0.00	19.50	0.000	0.01

56.40	0.00	19.50	0.000	0.01
57.60	0.00	19.50	0.000	0.01
58.80	0.00	19.50	0.000	0.01
60.00	0.00	19.50	0.000	0.01
61.20	0.00	19.50	0.000	0.01
62.40	0.00	19.50	0.000	0.01
63.60	0.00	19.50	0.000	0.01
64.80	0.00	19.50	0.000	0.01
66.00	0.00	19.50	0.000	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
67.20	0.00	19.50	0.000	0.01
68.40	0.00	19.50	0.000	0.01
69.60	0.00	19.50	0.000	0.01
70.80	0.00	19.50	0.000	0.01
72.00	0.00	19.50	0.000	0.01
73.20	0.00	19.50	0.000	0.01
74.40	0.00	19.50	0.000	0.01
75.60	0.00	19.50	0.000	0.01
76.80	0.00	19.50	0.000	0.01
78.00	0.00	19.50	0.000	0.01
79.20	0.00	19.50	0.000	0.01
80.40	0.00	19.50	0.000	0.01
81.60	0.00	19.50	0.000	0.01
82.80	0.00	19.50	0.000	0.01
84.00	0.00	19.50	0.000	0.01
85.20	0.00	19.50	0.000	0.01
86.40	0.00	19.50	0.000	0.01
87.60	0.00	19.50	0.000	0.01
88.80	0.00	19.50	0.000	0.01
90.00	0.00	19.50	0.000	0.01
91.20	0.00	19.50	0.000	0.01
92.40	0.00	19.50	0.000	0.01
93.60	0.00	19.50	0.000	0.01
94.80	0.00	19.50	0.000	0.01
96.00	0.00	19.50	0.000	0.01
97.20	0.00	19.50	0.000	0.01
98.40	0.00	19.50	0.000	0.01
99.60	0.00	19.50	0.000	0.01
100.80	0.00	19.50	0.000	0.01
102.00	0.00	19.50	0.000	0.01
103.20	0.00	19.50	0.000	0.01
104.40	0.00	19.50	0.000	0.01
105.60	0.00	19.50	0.000	0.01
106.80	0.00	19.50	0.000	0.01
108.00	0.00	19.50	0.000	0.01

109.20	0.00	19.50	0.000	0.01
110.40	0.00	19.50	0.000	0.01
111.60	0.00	19.50	0.000	0.01
112.80	0.00	19.50	0.000	0.01
114.00	0.00	19.50	0.000	0.01
115.20	0.00	19.50	0.000	0.01
116.40	0.00	19.50	0.000	0.01
117.60	0.00	19.50	0.000	0.01
118.80	0.00	19.50	0.000	0.01
120.00	0.00	19.50	0.000	0.01
121.20	0.00	19.50	0.000	0.01
122.40	0.00	19.50	0.000	0.01
123.60	0.00	19.50	0.000	0.01
124.80	0.00	19.50	0.000	0.01
126.00	0.00	19.50	0.000	0.01
127.20	0.00	19.50	0.000	0.01
128.40	0.00	19.50	0.000	0.01
129.60	0.00	19.50	0.000	0.01
130.80	0.00	19.50	0.000	0.01
132.00	0.00	19.50	0.000	0.01
133.20	0.00	19.50	0.000	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
134.40	0.00	19.50	0.000	0.01
135.60	0.00	19.50	0.000	0.01
136.80	0.00	19.50	0.000	0.01
138.00	0.00	19.50	0.000	0.01
139.20	0.00	19.50	0.000	0.01
140.40	0.00	19.50	0.000	0.01
141.60	0.00	19.50	0.000	0.01
142.80	0.00	19.50	0.000	0.01
144.00	0.00	19.50	0.000	0.01
145.20	0.00	19.50	0.000	0.01
146.40	0.00	19.50	0.000	0.01
147.60	0.00	19.50	0.000	0.01
148.80	0.00	19.50	0.000	0.01
150.00	0.00	19.50	0.000	0.01
151.20	0.00	19.50	0.000	0.01
152.40	0.00	19.50	0.000	0.01
153.60	0.00	19.50	0.000	0.01
154.80	0.00	19.50	0.000	0.01
156.00	0.00	19.50	0.000	0.01
157.20	0.00	19.50	0.000	0.01
158.40	0.00	19.50	0.000	0.01
159.60	0.00	19.50	0.000	0.01
160.80	0.00	19.50	0.000	0.01

162.00	0.00	19.50	0.000	0.01
163.20	0.00	19.50	0.000	0.01
164.40	0.00	19.50	0.000	0.01
165.60	0.00	19.50	0.000	0.01
166.80	0.00	19.50	0.000	0.01
168.00	0.00	19.50	0.000	0.01
169.20	0.00	19.50	0.000	0.01
170.40	0.00	19.50	0.000	0.01
171.60	0.00	19.50	0.000	0.01
172.80	0.00	19.50	0.000	0.01
174.00	0.00	19.50	0.000	0.01
175.20	0.00	19.50	0.000	0.01
176.40	0.00	19.50	0.000	0.01
177.60	0.00	19.50	0.000	0.01
178.80	0.00	19.50	0.000	0.01
180.00	0.00	19.50	0.000	0.01
181.20	0.00	19.50	0.000	0.01
182.40	0.00	19.50	0.000	0.01
183.60	0.00	19.50	0.000	0.01
184.80	0.00	19.50	0.000	0.01
186.00	0.00	19.50	0.000	0.01
187.20	0.00	19.50	0.000	0.01
188.40	0.00	19.50	0.000	0.01
189.60	0.00	19.50	0.000	0.01
190.80	0.00	19.50	0.000	0.01
192.00	0.00	19.50	0.000	0.01
193.20	0.00	19.50	0.000	0.01
194.40	0.00	19.50	0.000	0.01
195.60	0.00	19.50	0.000	0.01
196.80	0.00	19.50	0.000	0.01
198.00	0.00	19.50	0.000	0.01
199.20	0.00	19.50	0.000	0.01

PEAK DISCHARGE = 25.343 CFS - PEAK OCCURS AT HOUR 1.55
MAXIMUM WATER SURFACE ELEVATION = 21.601 <22.0, THEREFORE OK
MAXIMUM STORAGE = 0.2419 AC-FT INCREMENTAL TIME= 0.050000HRS

*
*
PRINT HYD ID=55 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 2.01257 INCHES = 1.1700 ACRE-FEET
PEAK DISCHARGE RATE = 25.34 CFS AT 1.550 HOURS BASIN AREA = 0.0109 SQ. MI.

```
    *
    *
    *COMBINE POND OUTFLOW WITH EX-2 FOR TOTAL AT AP#1
    *
    ADD HYD                         ID=58 HYD NO=100.22 ID=2 ID=55

    *
    PRINT HYD           ID=58 CODE=1

                                     PARTIAL HYDROGRAPH   100.22


        RUNOFF VOLUME =     2.05543 INCHES     =       1.2957 ACRE-FEET
        PEAK DISCHARGE RATE =      28.08 CFS  AT   1.550 HOURS   BASIN AREA =
0.0118 SQ. MI.
```

Q POST< Q PRE AT AP#1

```
    *
    *
    FINISH

        NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:44:31
```

APPENDIX B

HYDRAULICS

Worksheet for Broad Crested Weir - Existing Pond

Project Description

Solve For	Discharge

Input Data

Headwater Elevation		5421.00	ft
Crest Elevation		5420.50	ft
Tailwater Elevation		5420.00	ft
Crest Surface Type	Gravel		
Crest Breadth		5.00	ft
Crest Length		30.00	ft

Results

Discharge	28.57	ft^3/s
Headwater Height Above Crest	0.50	ft
Tailwater Height Above Crest	-0.50	ft
Weir Coefficient	2.69	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	2.69	US
Flow Area	15.00	ft^2
Velocity	1.90	ft/s
Wetted Perimeter	31.00	ft
Top Width	30.00	ft

Worksheet for V-Notch Weir - Stage-Q @El=5420.0 (PipeX3)

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	5420.00	ft
Crest Elevation	5419.67	ft
Tailwater Elevation	5419.50	ft
Coefficient of Discharge	0.60	
Angle	90.00	degrees

Results

Discharge	0.16	ft^3/s
Headwater Height Above Crest	0.33	ft
Tailwater Height Above Crest	-0.17	ft
Flow Area	0.11	ft^2
Velocity	1.47	ft/s
Wetted Perimeter	0.93	ft
Top Width	0.66	ft

Worksheet for V-Notch Weir - Stage-Q @El=5420.5 (PipeX3)

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	5420.50	ft
Crest Elevation	5419.67	ft
Tailwater Elevation	5419.50	ft
Coefficient of Discharge	0.60	
Angle	90.00	degrees

Results

Discharge	1.61	ft^3/s
Headwater Height Above Crest	0.83	ft
Tailwater Height Above Crest	-0.17	ft
Flow Area	0.69	ft^2
Velocity	2.34	ft/s
Wetted Perimeter	2.35	ft
Top Width	1.66	ft

Worksheet for Broad Crested Weir - Stage-Q 5421.5

Project Description

Solve For	Discharge

Input Data

Headwater Elevation		5421.50	ft
Crest Elevation		5421.00	ft
Tailwater Elevation		5419.00	ft
Crest Surface Type	Paved		
Crest Breadth		5.00	ft
Crest Length		9.80	ft

Results

Discharge	10.42	ft³/s
Headwater Height Above Crest	0.50	ft
Tailwater Height Above Crest	-2.00	ft
Weir Coefficient	3.01	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.01	US
Flow Area	4.90	ft²
Velocity	2.13	ft/s
Wetted Perimeter	10.80	ft
Top Width	9.80	ft

Worksheet for Broad Crested Weir - Stage-Q 5422.0

Project Description

Solve For	Discharge

Input Data

Headwater Elevation		5422.00	ft
Crest Elevation		5421.00	ft
Tailwater Elevation		5419.00	ft
Crest Surface Type	Paved		
Crest Breadth		5.00	ft
Crest Length		9.80	ft

Results

Discharge	30.04	ft³/s
Headwater Height Above Crest	1.00	ft
Tailwater Height Above Crest	-2.00	ft
Weir Coefficient	3.07	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.07	US
Flow Area	9.80	ft²
Velocity	3.07	ft/s
Wetted Perimeter	11.80	ft
Top Width	9.80	ft

Worksheet for Proposed Pond Culvert Pipe Capacity Check (Q/3)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.00500	ft/ft
Diameter	12	in
Discharge	1.46	ft³/s

Results

Normal Depth	0.47	ft
Flow Area	0.36	ft²
Wetted Perimeter	1.51	ft
Hydraulic Radius	0.24	ft
Top Width	1.00	ft
Critical Depth	0.51	ft
Percent Full	46.8	%
Critical Slope	0.00367	ft/ft
Velocity	4.05	ft/s
Velocity Head	0.25	ft
Specific Energy	0.72	ft
Froude Number	1.19	
Maximum Discharge	3.52	ft³/s
Discharge Full	3.27	ft³/s
Slope Full	0.00099	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	46.77	%
Downstream Velocity	Infinity	ft/s

Worksheet for Alley Street Capacity

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	2.88	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	100.25
0+05	100.00
0+20	100.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 100.25)	(0+20, 100.80)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.26	ft
Elevation Range	100.00 to 100.80 ft	
Flow Area	1.35	ft²
Wetted Perimeter	9.99	ft
Hydraulic Radius	0.14	ft
Top Width	9.96	ft
Normal Depth	0.26	ft
Critical Depth	0.27	ft
Critical Slope	0.00479	ft/ft
Velocity	2.13	ft/s

Worksheet for Proposed Berm Capacity (Basin PR-1)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00600	ft/ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Discharge	21.32	ft^3/s

Results

Normal Depth	0.66	ft
Flow Area	11.63	ft^2
Wetted Perimeter	35.23	ft
Hydraulic Radius	0.33	ft
Top Width	35.11	ft
Critical Depth	0.53	ft
Critical Slope	0.02056	ft/ft
Velocity	1.83	ft/s
Velocity Head	0.05	ft
Specific Energy	0.71	ft
Froude Number	0.56	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.66	ft
Critical Depth	0.53	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.02056	ft/ft

APPENDIX C

POND VOLUME CALCULATIONS

LOS PASTORES SHOPPING CENTER

Existing Conditions Basin Data Table

This table is based on the DPM Section 22.2, Zone: 3

BASIN	Area (SQ. FT)	Area (AC.)	Land Treatment Percentages A	B	C	D	Q(100) (cfs/ac.)	Q(100) (CFS)	V(100) (inches)	V(100) (CF)	Area (sq.mi.)
EXISTING CONDITIONS											
EX-1	228107	5.24	0.0%	0.0%	94.0%	6.0%	3.54	*18.56*	*1.35*	*25742*	*0.00818*
EX-2*	26192	0.60	0.0%	0.0%	100.0%	0.0%	3.45	*2.07*	*1.29*	*2816*	*0.00094*
EX-3	39284	0.90	0.0%	31.0%	0.0%	69.0%	4.27	*3.85*	*1.91*	*6264*	*0.00141*
EX-4	26012	0.60	0.0%	6.0%	0.0%	94.0%	4.87	*2.91*	*2.27*	*4928*	*0.00093*
TOTAL		**5.24**						***27.40***	***1.35***	***39750***	

Existing drainage areas are routed through the existing pond, except for public alley Basin EX-2.

Proposed Conditions Basin Data Table

BASIN	Area (SQ. FT)	Area (AC.)	Land Treatment Percentages A	B	C	D	Q(100) (cfs/ac.)	Q(100) (CFS)	V(100) (inches)	V(100) (CF)	Area (sq.mi.)	1ST FLUSH
PROPOSED CONDITIONS												
PR-1	238723	5.48	0.0%	0.0%	85.0%	15.0%	3.69	*20.20*	*1.45*	*28856*	*0.00856*	*1015*
PR-2	25620	0.59	0.0%	0.0%	19.0%	81.0%	4.72	*2.78*	*2.16*	*4605*	*0.00092*	*588*
EX-3	39284	0.90	0.0%	31.0%	0.0%	69.0%	4.27	*3.85*	*1.91*	*6264*	*0.00141*	*768*
EX-4	26012	0.60	0.0%	6.0%	0.0%	94.0%	4.87	*2.91*	*2.27*	*4928*	*0.00093*	*693*
TOTAL		**5.48**						***29.74***	***1.45***	***44653***		***3063***

Existing drainage areas are routed through the existing pond, except for public alley Basin EX-2.

POND VOLUME CALCULATIONS

EXISTING POND VOLUME CALCULATION AND STAGE-DISCHARGE						
ELEVATION (ft)	AREA (sf)	VOLUME (cf)	CUMULATIVE VOLUME (cf)	CUMULATIVE VOLUME (ac-ft)	Q out	
5419	1575	0	0		0	
5420	3106	2341	2341	0.0537	0	
5420.5	3462	1642	3983	0.0914	0	
5421	4411	1968	5951	0.1366	28.57	*

*SEE WEIR CALCULATION, FLOWMASTER WORKSHEET

PROPOSED VOLUME CALCULATION (FIRST-FLUSH ONLY, BELOW EL=5419.5)				
ELEVATION (ft)	AREA (sf)	VOLUME (cf)	CUMULATIVE VOLUME (cf)	
5418.5	3390	0	0	
5419.5	4133	3762	**3762**	Volume Provided>Volume Required=3063 cf, **OK**

PROPOSED POND VOLUME CALCULATION				
ELEVATION (ft)	AREA (sf)	VOLUME (cf)	CUMULATIVE VOLUME (cf)	CUMULATIVE VOLUME (ac-ft)
5419.5	4133	0	0	
5420.0	4531	2166	2166	0.0497
5420.5	4947	2370	4535.5	0.1041
5421.0	5382	2582	7117.75	0.1634
5421.5	5834	2804	9921.75	0.2278
5422.0	6304	3035	12956.25	0.2974

STAGE-DISCHARGE CALCULATIONS

PROPOSED DETENTION POND

STAGE, VOLUME, DISCHARGE

Orifice Elevation: 5420.2

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	$Q_{ORIFICE}$ (CFS)	$Q_{ORIFICE}$ (CFS)	NO. OF BARRELS	Q_{TOTAL} (CFS)	
5419.5	0	0	0.0000				
5420.0	-0.16	0.0497	0.0000	0.16	3	0.48	*
5420.5	0.34	0.1041	0.0000	1.61	3	4.83	*
5421.0	0.84	0.1634	2.2051	0.00	3	6.62	**
5421.5	1.34	0.2278	3.4660	10.42	3	20.82	***
5422.0	1.84	0.2974	4.3776	30.00	3	43.13	***

*WEIR FLOW THROUGH PIPE ONLY

**ORIFICE FLOW THROUGH PIPES ONLY

***ORIFICE FLOW THROUGH PIPES + OVERFLOW WEIR FLOW

Orifice Equation

Q = CA SQRT(2gH)

C = 0.6

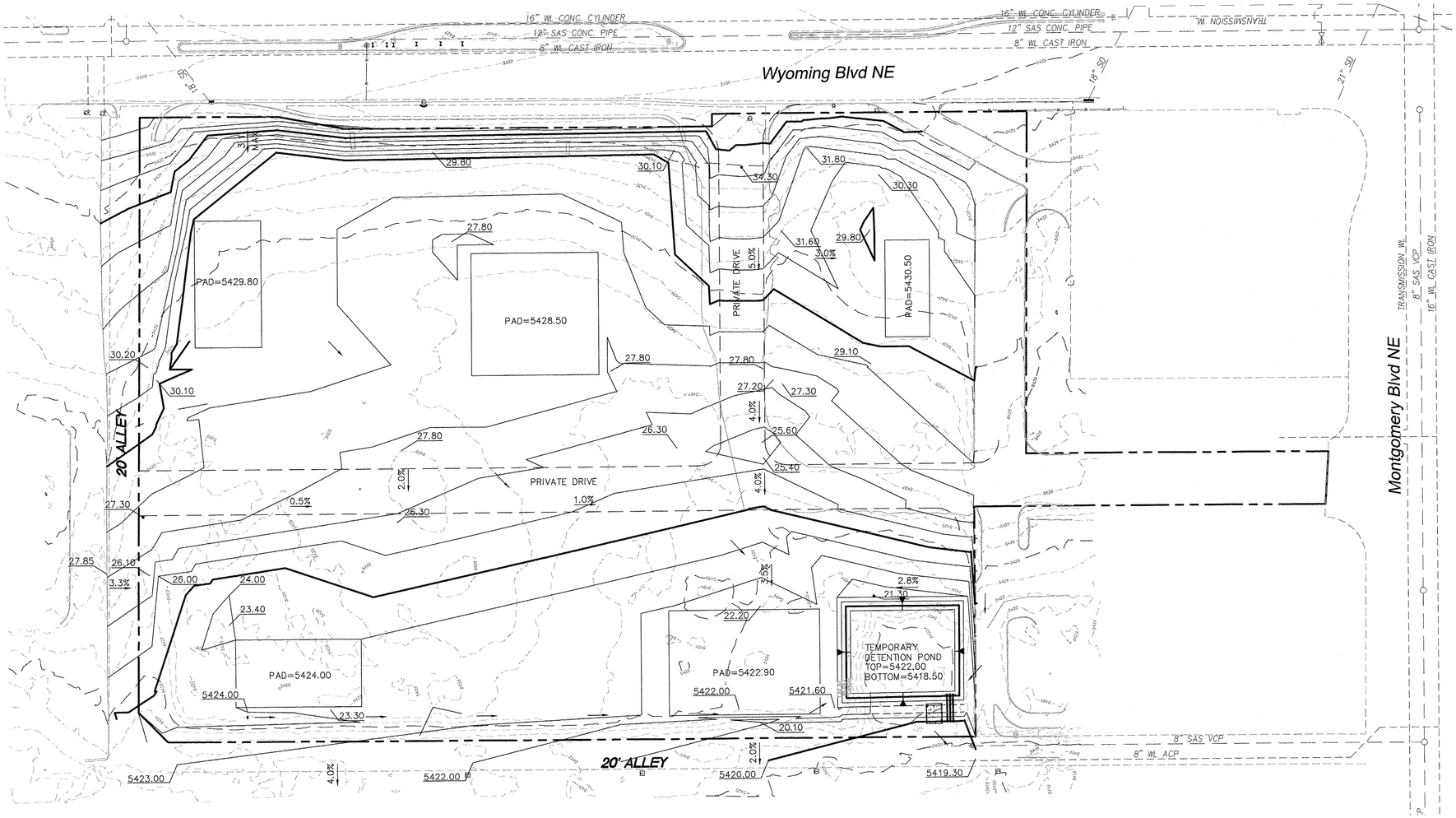
Diameter (i 12

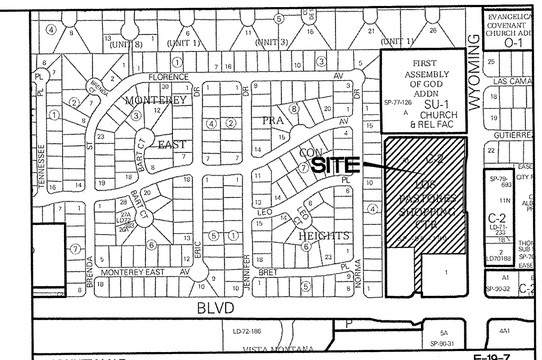
Area (ft^2)= 0.785

g = 32.2

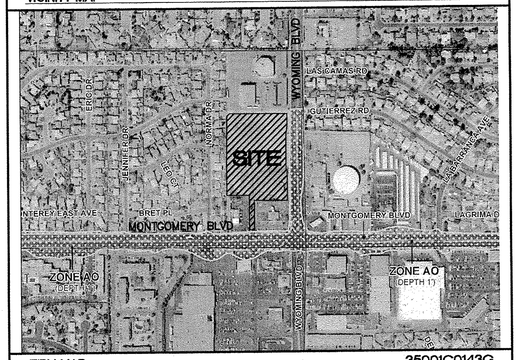
H (Ft) = Depth of water above center of orifice

Q (CFS)= Flow





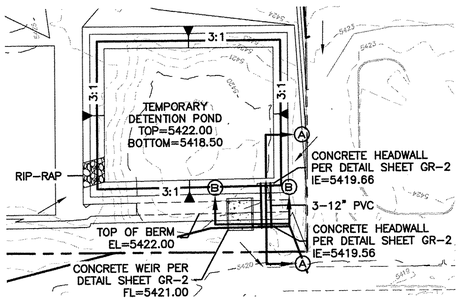
VICINITY MAP F-19-Z



FIRM MAP 35001C0143G

LEGEND

- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- SIDEWALK
- EXISTING CURB & GUTTER
- SINGLE CLEAN OUT
- DOUBLE CLEAN OUT
- EXISTING SD MANHOLE
- EXISTING SAS MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING POWER POLE
- EXISTING GAS VALVE
- U — EXISTING OVERHEAD UTILITIES
- EXISTING GAS
- EX. 8" SAS — EXISTING SANITARY SEWER LINE
- EX. WL — EXISTING WATER LINE
- EX. RCP — EXISTING STORM SEWER LINE
- 4900 — EXISTING INDEX CONTOUR
- EXISTING CONTOUR



POND DETAIL
NTS

GRAPHIC SCALE
40 0 20 40
(IN FEET)
1 inch = 40 ft.

CAUTION:
ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

ENGINEER'S SEAL
JOEL D. HERNANDEZ
NEW MEXICO
17893
5/11/16
PROFESSIONAL ENGINEER

JOEL D. HERNANDEZ
P.E. #17893

LOS PASTORES SHOPPING CENTER

GRADING PLAN

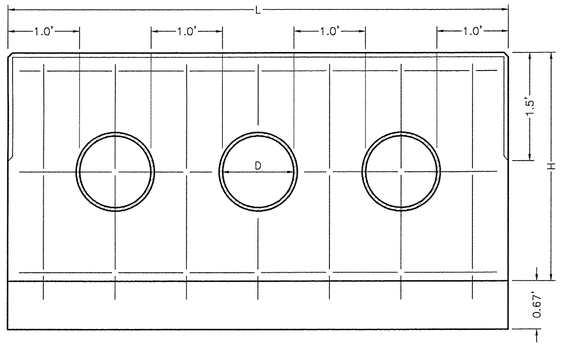
TIERRA WEST, LLC
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY: DY
DATE: 5/02/16
2014052-GR-1
SHEET # GR-1
JOB # 2014052

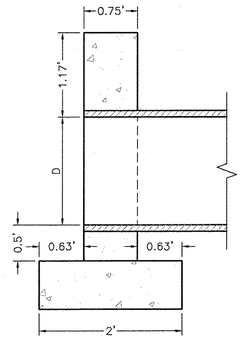
NOTES:

1. CONCRETE SHALL BE 4000 PSI.
2. ALL REINFORCING STEEL #4 BARS. ALL VERTICAL AND HORIZONTAL TIE BARS 18" MAXIMUM SPACING.

D	H	L
12"	2'-8"	7'-0"

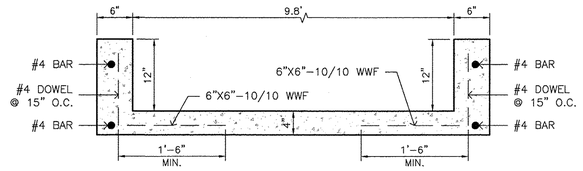


ELEVATION
NTS



SECTION
NTS

CONCRETE HEADWALL
NTS



SECTION B-B
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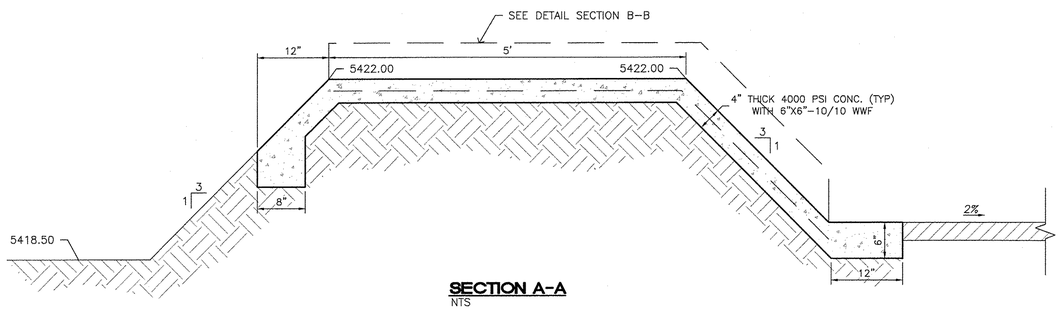

SECTION A-A
NTS

ENGINEER'S SEAL JOEL D. HERNANDEZ NEW MEXICO 17893 PROFESSIONAL ENGINEER JOEL D. HERNANDEZ P.E. #17893	LOS PASTORES SHOPPING CENTER GRADING DETAILS TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	DRAWN BY DY DATE 4/29/16 2014052-GR-2 SHEET # GR-2 JOB # 2014052