CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

September 20, 2016

Scott J. Steffen, P.E.
Bohannan Huston, Inc.
7500 Jefferson St NE Courtyard 1
Albuquerque, NM, 87109

RE: **Taos II @ The Trails**
Grading and Drainage Plan & Report
Stamp Date 7-13-16 (File:C09D00G1)

Dear Mr. Steffen:

Based upon the information provided in your submittal received 7-14-2016, the above referenced Grading and Drainage Plan & Report is approved for Preliminary Plat with the following conditions:

1. The Work Order Set will need to include sufficient survey information to show that the tie in to the existing Hearthstone Roadway section is completed with a smooth transition.
2. If the project is phased, the Work Order Set will be expected to include temporary/desiltation ponds where needed.
3. Forward a copy of any correspondence related to the permission for grading that will be needed for the perched access road from Oakridge St. on the adjacent property prior to Hydrology's sign off of the DRC Set.
4. The DRC Set will need to include enough survey information at the West end of Hearthstone to ensure that a smooth transition to the existing road.

Prior to approval for Grading Permit, the following items will need to be addressed. Segments of the existing Grading and Drainage Plan & Report can be replaced where needed:

1. Consolidate the discrepancy with the allowable discharge as described by the Update to the Amendment to the Drainage Master Plan, by RESPEC and Thompson Engineering, dated 9-14-2016. The allowable discharge on Table 7 is approximately 52 cfs, and the subdivision is proposed to discharge approximately 58 cfs. Although the discrepancy might not be significant, Pond F5, (the outfall for Taos II), will not have much freeboard to work with.

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Albuquerque

New Mexico 87103

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2. The improvements referenced on the Infrastructure List need to be shown on the Grading Plan:

    a. The Improvements related to Ponds F, F5 and D. The orifice plate can be included by reference or as a specific note/exhibit of the improvements required.

    b. The outfall conditions into Pond F5. Note that the Drainage Master Plan elevations are based on NGVD 29 datum.

3. It is not clear where the wall drain detail will be used since it appears that all lots drain to the roadway. Any planned rear-lot ponding would require an easement.

4. An approved ESC Plan will be required.

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

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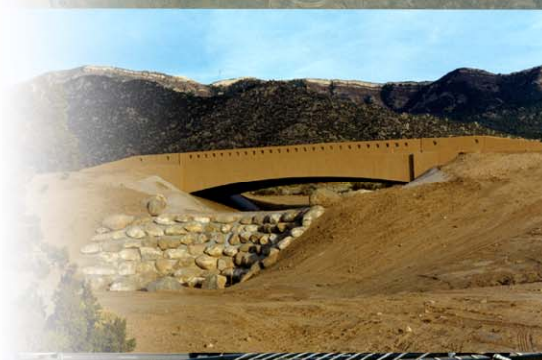
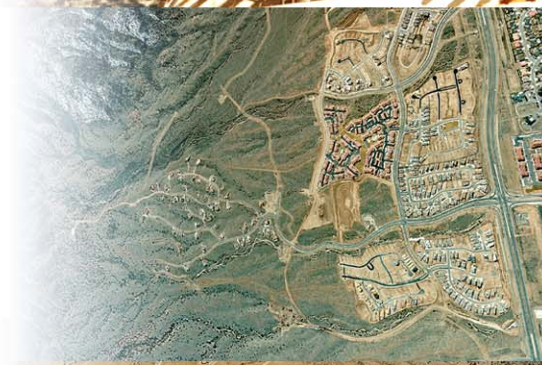
Sincerely,

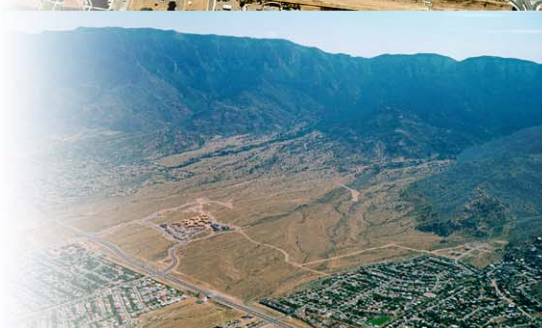
Abiel Carrillo, P.E.
Principal Engineer, Planning Dept.
Development Review Services

Orig: Drainage file

DRAINAGE REPORT FOR TAOS II AT THE TRAILS SUBDIVISION





JULY 2016

Prepared for:
Real Capital Solutions
371 Centennial Parkway – Suite 200
Louisville, CO 80027

Prepared by:

Bohannan Huston

Engineering
Spatial Data
Advanced Technologies

DRAINAGE REPORT
FOR
TAOS II @ THE TRAILS
SUBDIVISION

JULY 13, 2016

Prepared for:

REAL CAPITAL SOLUTIONS

371 CENTENNIAL PARKWAY, SUITE 200

LOUISVILLE, CO 80027

Prepared by:

BOHANNAN HUSTON, INC.

COURTYARD I

7500 JEFFERSON STREET NE

ALBUQUERQUE, NM 87109

Prepared By:

Scott J. Steffen 7/13/16

Scott J. Steffen, P.E. Date
Vice President

Bohannan Huston

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EXHIBITS

I. PURPOSE

This report establishes a drainage management plan for Taos II at the Trails. The proposed development consists of 109 single family detached residential lots on approximately 17.4 acres. This project is located within the Volcano Trails Sector Plan area, in northwest Albuquerque, east of The Trails Heritage Unit 2 and west of Tract 2 The Trails Unit 2. Taos II at the Trails is in the Trails Units 1-3 Drainage Master Plan (DMP) area and has free discharge of developed flows to Pond F5. Flows from Pond F5 are conveyed through an existing 42-inch storm drain that runs through the Sierra at the Trails subdivision, ultimately reaching the Trails storm drain outfall in Universe Boulevard. The Trails drainage outfall is to the Boca Negra Dam through a storm drain in Universe Boulevard. Discharge to the Boca Negra Dam is limited by the Trails Universe storm drain capacity. Flows in excess of the storm drain capacity surge to detention ponds east of Universe Boulevard. This report is submitted in support of grading approval and preliminary plat approval by the DRB.

II. CONCEPTS AND METHODOLOGIES

Drainage conditions were analyzed utilizing the 100-year, 24-hour storm event (P_{60}=1.84 in, P_{360}=2.20 in, P_{1440}=2.66 in), in accordance with the City of Albuquerque DPM. The use of the 24-hour storm event is consistent with the Trails Units 1-3 DMP. The Arid-lands Hydrologic Model (AHYMO) was utilized to determine peak flow rates for design of the storm drainage improvements within the project. The results are included in Appendix A. Street capacity and storm drain inlet calculations supporting this study are located in Appendix B.

The following document was referenced in the preparation of this report:

- *Update to the Amendment to the Drainage Master Plan for the Trails Units 1, 2, and 3* prepared by Respec, Inc., dated July 2016.

III. SITE LOCATION AND CHARACTERISTICS

Taos II at the Trails is currently undeveloped with grades ranging from one percent to three percent. The site generally slopes from west to east. It is bounded by Paseo Del Norte Blvd to the north, Tract 2 at the Trails Unit 2 to the east, Heritage at the Trails Unit 2 to the west and Tract OS-3 to the south. Access to Taos II will be from Hearthstone Road through the Heritage subdivision and from Oakridge Street through Tract 2 at the Trails.

IV. DEVELOPED HYDRAULIC AND HYDROLOGIC CONDITIONS

Taos II at the Trails is a proposed single-family residential development with 109 lots on 17.4 acres. Proposed street and lot configurations are shown on the *Preliminary Plat*, **Exhibit 1.** Taos II at the Trails, is represented by Basin D5, F6, and F8 in the Trails Units 1-3 DMP. The DMP allows for full discharge of developed flows from Taos II at the Trails to the storm drain southeast of the development.

The percent impervious land treatment for the proposed conditions is determined from Table A-5 of the DPM, Section 22.2. The composite percent impervious land treatment value used in the Trails DMP AHYMO analysis that encompasses Taos II is 59.0%. The composite percent impervious land treatment for Taos II at the Trails' (D varies between 42-60% for sub basins) is 58.9%.

A. OFFSITE FLOWS

Limited offsite flows reach Taos II at the Trails. No flows reach the site from Paseo del Norte (PdN) to the north, as the site is higher in elevation than Paseo del Norte. DMP Basin J10 (14.3 cfs) identifies the flows in PdN across the Taos II frontage for the full build out scenario for PdN. The DMP identifies storm drain and inlet requirements for PdN (see Exhibit 5). A single inlet is required in PdN at the Taos II east boundary. There is no storm drain required in PdN across the Taos frontage. PdN is currently only 2 lanes wide with no permanent curb and gutter or storm drain improvements. Construction of PdN improvements across existing Trails subdivision frontage has been deferred so that the PdN can be built as a single project in lieu of piece meal construction with the development each Tract. This same approach holds for Taos II.

No flows reach the site from the east as Taos II at the Trails is greater in elevation than Tract 2. There is no flow from the south as Taos II is higher in elevation than Tract OS-3. Flow enters Taos II at the Trails in Hearthstone Road from the Heritage subdivision to the west. Existing inlets in Heritage at the east end of Hearthstone Road capture 8 cfs from Basin H1 (13.4 cfs), with the remaining 5.4 cfs of flow continuing into Taos II as bypass flow in Hearthstone Road. This 5.4 cfs was analyzed in the street hydraulic and storm drain analyses for Taos II at the Trails.

B. ONSITE FLOWS

Developed flows from Taos II at the Trails will be directed to Pond F5 utilizing the proposed street network combined with the proposed storm drain system (see Basin Map for basin locations and the Grading Plan for storm drain and inlet locations). Flows from Taos II will combine with flows from Basins F5 and F7 per the Amended DMP. Pond F5 grading is

shown on the Taos II Grading Plan (Exhibit 3). The total runoff from Taos II at the Trails is 53.5 cfs. This is slightly less than the combined Basin D5, D6, and F8 runoff (58.3 cfs) in the Trails Units 1-3 DMP. The difference is due to DMP Basin D5 including the portion of Pond D in Tract OS-3, which is not included in the Taos II analysis. The Amended DMP reduces the size of Pond D. The revised Pond D grading is shown on the Taos II Grading Plan (Exhibit 3).

Basin 1 (8.8 cfs), Basin 2 (15.8 cfs), Basin 3 (6.4 cfs), and Basin 5 (3.6 cfs) drain to a low point in Red Stone Road at AP#1. Basin 4 (18.9 cfs) drains to a low point in Red Stone Road at point AP#2. The storm drain inlets at the low points in Red Stone Road are in a sump condition and have capacity that is greater than two times the one-hundred year flow. The roadway high points are below the right-of-way elevations at the low point in the street. The Pond F5 serves as an emergency overflow for both points AP#1 and AP #2. See Exhibit 4 for storm drain capacity calculations.

A summary of the developed onsite flows is presented in the table below.

Table 1 – Taos II at the Trails Onsite Proposed Conditions

Basin Data Table

100 Year – 6 Hour Storm						
Basin ID	Area (AC.)	LAND TREATMENT				Q(100) (CFS)
		A	B	C	D	
1	2.8	0.0%	20.0%	20.0%	60.0%	**8.8**
2	5.0	0.0%	19.5%	19.5%	61.0%	**15.8**
3	2.1	0.0%	20.5%	20.5%	59.0%	**6.4**
4	6.1	0.0%	20.0%	20.0%	60.0%	**18.9**
5	1.3	0.0%	29.0%	29.0%	42.0%	**3.6**

C. FIRST FLUSH REQUIREMENTS

This project is required to meet the first flush requirements of the new City Drainage Ordinance. The first flush requirement will be met with on lot ponding and is calculated as 0.34 in. (0.44 in. - 0.1 in. initial abstraction) times the roof area that can drain to the on lot pond (taken as one half the pad area). There are two pad sizes, 30 feet x 85 feet and 35 feet x 85 feet, in this project with a first flush requirement of 36 and 42 cubic feet respectively.

First flush will be accommodated by a combination of ponding between the back of curb and sidewalk, supplemented by onsite front yard ponding on each lot. 30 cubic-feet per

lot can be stored in the landscape strip between the sidewalk and curb within the Right-of-Way. As a result, a maximum of 12 cubic-feet per lot of ponding (42 cubic-feet required minus 30 cubic-feet) is needed within the lot itself. This on-lot storage can be accomplished by a small bermed pond at the low side of each lot in front of the pad and consists of either an 8-inch or 12-inch berm. This on-lot front yard pond will be constructed as part of the landscaping by the building contractor.

V. CONCLUSION

This report provides a detailed study of the developed runoff and street capacities for the proposed Taos II at the Trails Subdivision. Included is the preliminary plat, proposed conditions basin map, grading plan, and all necessary hydrologic and hydraulic analyses. The proposed drainage plan for Taos II at the Trails can be safely conveyed by the existing and proposed improvements in this drainage plan. This drainage plan maintains the overall drainage pattern of the area, is consistent with the Trails Units 1-3 DMP and allows for the safe management of storm runoff in the fully developed condition as well as interim conditions.

APPENDICES

APPENDIX A: DEVELOPED CONDITIONS AHYMO SUMMARY, OUTPUT, AND INPUT FILES

APPENDIX B: STREET HYDRAULICS AND STORM DRAIN INLET ANALYSIS

APPENDIX A

DEVELOPED CONDITIONS AHYMO SUMMARY, OUTPUT, AND INPUT FILES

Bohannan Huston

DEVELOPED CONDITIONS AHYMO SUMMARY FILE

Bohannan Huston

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 AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                        - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =06/30/2016
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                  HYDROGRAPH   ID   ID         AREA     DISCHARGE    VOLUME      RUNOFF    PEAK     PER
COMMAND       IDENTIFICATION   NO.  NO.      (SQ MI)     (CFS)      (AC-FT)    (INCHES)  (HOURS)    ACRE     NOTATION

*S  TAOS II AT THE TRAILS SUBDIVISION DRAINAGE BASIN (D) PROPOSED
*S  100 YEAR - 24 HOUR STORM
*S
START                                                                                                          TIME=       .00
LOCATION                      DEFAULT
RAINFALL  TYPE= 2                                                                                              RAIN24=   2.660
*S
*S                    **********************
*S                    *COMPUTE ONSITE BASINS*
*s                    **********************
*S
*S
*S
*S COMPUTE BASIN 1**************************************************
COMPUTE NM HYD          1.00   -     1        .00439        8.77        .416      1.77627    1.500    3.123 PER IMP=  60.00
*S COMPUTE BASIN 2**************************************************
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*S DIVIDE BASIN HERITAGE
DIVIDE HYD          BYPASS.D    6   20        .00524        5.39        .451      1.61328    1.400    1.608
                      POND.D  and   21        .00179        8.00        .154      1.61328    1.500    6.993
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ADD HYD               TEMP.A  2& 3  10        .01108       22.18       1.054      1.78305    1.500    3.128
*S ADD BASINS DIVIDE H1 AND 1 TO CREATE TEMP B *********************************
ADD HYD               TEMP.B 20& 1  11        .00963       14.16        .866      1.68756    1.500    2.299
*S ADD BASINS TEMP A AND TEMP B TO CREATE TEMP C *******************************
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ADD HYD                 AP.1 12& 5  14        .02267       39.96       2.076      1.71645    1.500    2.754
*S
FINISH
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DEVELOPED CONDITIONS AHYMO OUTPUT FILE

Bohannan Huston

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*S  100 YEAR - 24 HOUR STORM
*S
*  REVISED 2005 AHYMO TO REFLECT UPDATED LAND TREATMENTS
*
*
*CONVERT TO NMHYMO
START                 TIME=0.0 HR  PUNCH CODE=0
*****************************************************
LOCATION            NM
     Soil infiltration values (LAND FACTORS) for this location are not available.
     The following default values were used.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
           A            0.65                  1.67
           B            0.50                  1.25
           C            0.35                  0.83
           D            0.10                  0.04

*
*****************************************************
*
*****************************************************
*100 YEAR - 24 HOUR
RAINFALL              TYPE=2  RAIN QUARTER=0
                           RAIN ONE=1.84 IN  RAIN SIX=2.20 IN
                           RAIN DAY=2.66 IN  DT=0.10 HRS


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               DT =    .100000 HOURS       END TIME =    24.000000 HOURS
                  .0000   .0060   .0124   .0193   .0266   .0347   .0435
                  .0532   .0640   .0764   .0908   .1071   .1906   .4476
                  .9796  1.3314  1.5028  1.6393  1.7527  1.8488  1.9308
                 1.9485  1.9639  1.9776  1.9899  2.0013  2.0117  2.0215
                 2.0306  2.0393  2.0475  2.0553  2.0627  2.0698  2.0766
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                 2.1566  2.1610  2.1652  2.1694  2.1734  2.1774  2.1814
                 2.1852  2.1890  2.1927  2.1964  2.2000  2.2039  2.2078
                 2.2117  2.2155  2.2193  2.2231  2.2268  2.2305  2.2342
                 2.2379  2.2416  2.2452  2.2488  2.2524  2.2559  2.2595
                 2.2630  2.2665  2.2700  2.2734  2.2768  2.2802  2.2836
                 2.2870  2.2903  2.2937  2.2970  2.3002  2.3035  2.3068
                 2.3100  2.3132  2.3164  2.3196  2.3227  2.3259  2.3290
                 2.3321  2.3352  2.3383  2.3413  2.3444  2.3474  2.3504
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                 2.4493  2.4518  2.4543  2.4568  2.4593  2.4618  2.4643
                 2.4667  2.4692  2.4716  2.4740  2.4765  2.4789  2.4813
                 2.4837  2.4860  2.4884  2.4908  2.4931  2.4955  2.4978
                 2.5001  2.5024  2.5047  2.5070  2.5093  2.5116  2.5139
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                 2.5617  2.5638  2.5659  2.5680  2.5700  2.5721  2.5741
                 2.5762  2.5782  2.5803  2.5823  2.5843  2.5863  2.5883
                 2.5903  2.5923  2.5943  2.5963  2.5982  2.6002  2.6022
                 2.6041  2.6061  2.6080  2.6099  2.6119  2.6138  2.6157
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                 2.6438  2.6456  2.6474  2.6492  2.6510  2.6528  2.6546
                 2.6564  2.6582  2.6600

*S
*S                    **********************
*S                    *COMPUTE ONSITE BASINS*
*s                    **********************
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*S
*S
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     AREA =      .004800 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
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    PEAK DISCHARGE RATE =      15.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0079 SQ. MI.



*
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     AREA =      .005690 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .118524HR    TP =   .133300HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989065
     UNIT PEAK =   10.086    CFS   UNIT VOLUME =    1.006       B =   354.44      P60 = 1.8400
     AREA =      .003793 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD           ID=4   CODE=1

                                    OUTFLOW HYDROGRAPH REACH     4.00


    RUNOFF VOLUME =     1.77627 INCHES     =        .8984 ACRE-FEET
    PEAK DISCHARGE RATE =      18.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*
PUNCH HYD           ID=4
*
*S COMPUTE BASIN 5****************************************************
COMPUTE NM HYD      ID=5 HYD=5  AREA=0.001969  PER A=0 PER B=29
                         PER C=29 PER D=42  TP=-0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   3.2650    CFS   UNIT VOLUME =    1.027       B =   526.28      P60 = 1.8400
     AREA =      .000827 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .118524HR    TP =   .133300HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989065
     UNIT PEAK =   3.0366    CFS   UNIT VOLUME =    1.004       B =   354.44      P60 = 1.8400
     AREA =      .001142 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD           ID=5   CODE=1

                                    OUTFLOW HYDROGRAPH REACH     5.00


    RUNOFF VOLUME =     1.48295 INCHES     =        .1557 ACRE-FEET
    PEAK DISCHARGE RATE =       3.62 CFS  AT   1.500 HOURS   BASIN AREA =   .0020 SQ. MI.


*
*S COMPUTE BASIN H1***************************************************
COMPUTE NM HYD      ID=6 HYD=H1  AREA=0.007025  PER A=0 PER B=25
                         PER C=25 PER D=50  TP=-0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   13.868    CFS   UNIT VOLUME =    1.029       B =   526.28      P60 = 1.8400
     AREA =      .003513 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .118524HR    TP =   .133300HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989065
     UNIT PEAK =   9.3396    CFS   UNIT VOLUME =    1.006       B =   354.44      P60 = 1.8400
     AREA =      .003513 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD           ID=6  CODE=1
```

```
                                        HYDROGRAPH FROM AREA H1


    RUNOFF VOLUME =     1.61332 INCHES     =        .6045 ACRE-FEET
    PEAK DISCHARGE RATE =      13.39 CFS  AT   1.500 HOURS   BASIN AREA =   .0070 SQ. MI.



*
*S DIVIDE BASIN HERITAGE
**************************************************
DIVIDE HYD              ID=6 Q=5.39 ID=20 HYD NO=BYPASS.D
                                          ID=21 HYD NO=POND.D
PRINT HYD            ID=20   CODE=1

                                        HYDROGRAPH FROM AREA BYPASS.D


    RUNOFF VOLUME =     1.61328 INCHES     =        .4506 ACRE-FEET
    PEAK DISCHARGE RATE =       5.39 CFS  AT   1.400 HOURS   BASIN AREA =   .0052 SQ. MI.



PRINT HYD            ID=21   CODE=1

                                        HYDROGRAPH FROM AREA POND.D


    RUNOFF VOLUME =     1.61328 INCHES     =        .1538 ACRE-FEET
    PEAK DISCHARGE RATE =       8.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0018 SQ. MI.



*
*S ADD BASINS 2 AND 3 TO CREATE TEMP A *********************************
ADD HYD             ID=10 HYD=TEMP.A ID I=2 II=3
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA TEMP.A


    RUNOFF VOLUME =     1.78305 INCHES     =       1.0537 ACRE-FEET
    PEAK DISCHARGE RATE =      22.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0111 SQ. MI.



*
```

```
*S ADD BASINS DIVIDE H1 AND 1 TO CREATE TEMP B *********************************
ADD HYD             ID=11 HYD=TEMP.B ID I=20 II=1
PRINT HYD            ID=11 CODE=1

                                        HYDROGRAPH FROM AREA TEMP.B


    RUNOFF VOLUME =     1.68756 INCHES     =        .8664 ACRE-FEET
    PEAK DISCHARGE RATE =      14.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0096 SQ. MI.


*
```

```
*S ADD BASINS TEMP A AND TEMP B TO CREATE TEMP C ******************************
ADD HYD             ID=12 HYD=TEMP.C ID I=10 II=11
PRINT HYD            ID=12 CODE=1

                                        HYDROGRAPH FROM AREA TEMP.C


    RUNOFF VOLUME =     1.73866 INCHES     =       1.9200 ACRE-FEET
    PEAK DISCHARGE RATE =      36.35 CFS  AT   1.500 HOURS   BASIN AREA =   .0207 SQ. MI.



*
*S ADD BASINS TEMP C AND 5 TO CREATE AP.1 *********************************
ADD HYD             ID=14 HYD=AP.1 ID I=12 II=5
PRINT HYD            ID=14 CODE=1

                                        HYDROGRAPH FROM AREA AP.1


    RUNOFF VOLUME =     1.71645 INCHES     =       2.0757 ACRE-FEET
    PEAK DISCHARGE RATE =      39.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0227 SQ. MI.



*
PUNCH HYD            ID=14
*S
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:03:45
```

DEVELOPED CONDITIONS AHYMO INPUT FILE

Bohannan Huston

```
*S  TAOS II AT THE TRAILS SUBDIVISION DRAINAGE BASIN (D) PROPOSED
*S  100 YEAR - 24 HOUR STORM
*S
*  REVISED 2005 AHYMO TO REFLECT UPDATED LAND TREATMENTS
*
*
*CONVERT TO NMHYMO
START                 TIME=0.0 HR  PUNCH CODE=0
*****************************************************
LOCATION   NM
*
*****************************************************
*
*****************************************************
*100 YEAR - 24 HOUR
RAINFALL              TYPE=2  RAIN QUARTER=0
                 RAIN ONE=1.84 IN  RAIN SIX=2.20 IN
                 RAIN DAY=2.66 IN  DT=0.10 HRS

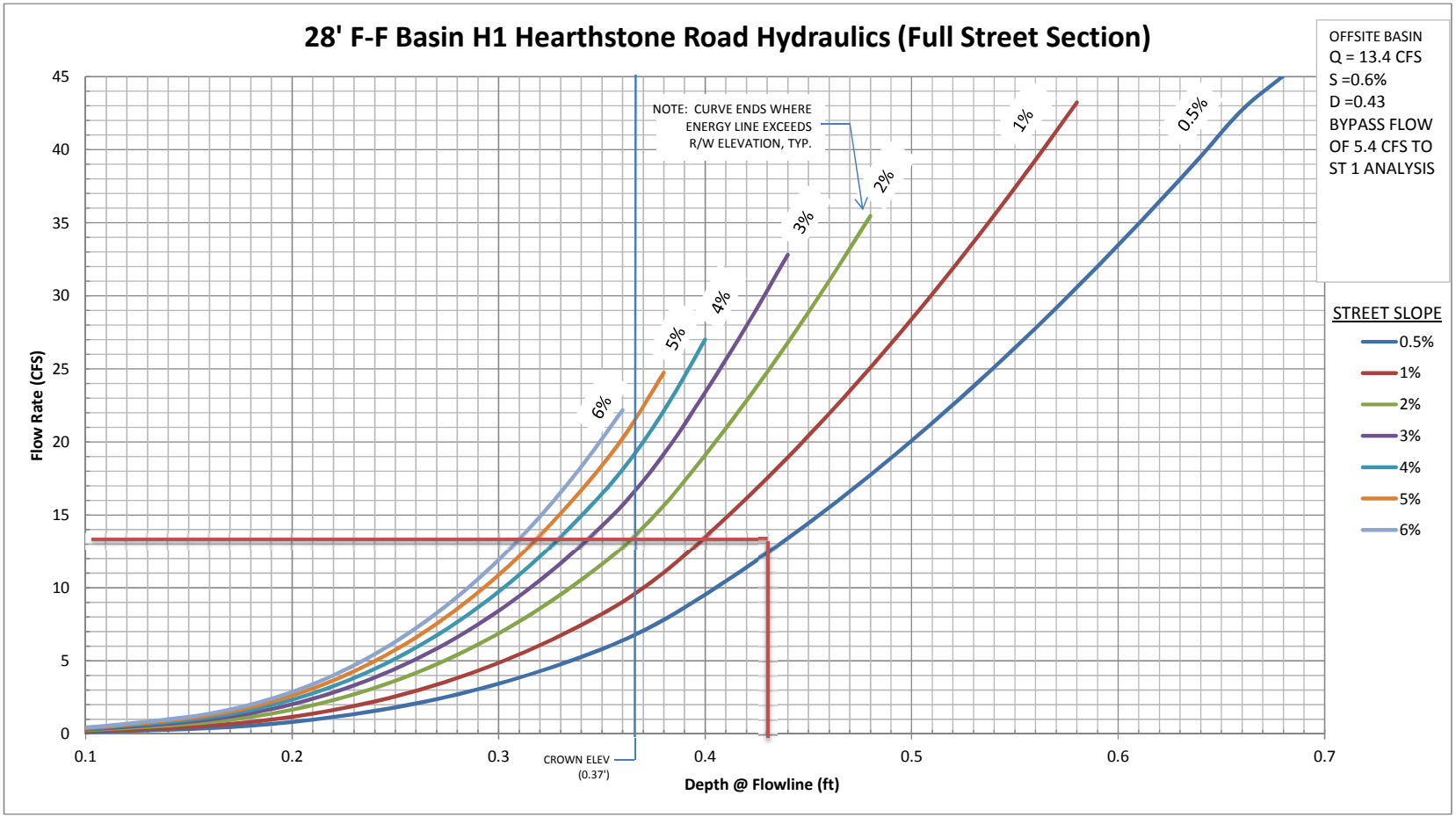
*S
*S                    ***********************
*S                    *COMPUTE ONSITE BASINS*
*s                    ***********************
*S
*S
*S
*S COMPUTE BASIN 1
*****************************************************
*
COMPUTE NM HYD       ID=1 HYD=1  AREA=0.004389  PER A=0 PER B=20
               PER C=20 PER D=60  TP=-0.1333  RAINFALL=-1
PRINT HYD       ID=1   CODE=1
*
*S COMPUTE BASIN 2
*****************************************************
COMPUTE NM HYD      ID=2 HYD=2  AREA=0.007869  PER A=0 PER B=19.5
               PER C=19.5 PER D=61  TP=-0.1333  RAINFALL=-1
PRINT HYD       ID=2   CODE=1
*
*S COMPUTE BASIN 3
*****************************************************
COMPUTE NM HYD      ID=3 HYD=3  AREA=0.003211  PER A=0 PER B=20.5
               PER C=20.5 PER D=59  TP=-0.1333  RAINFALL=-1
PRINT HYD       ID=3   CODE=1
*
*S COMPUTE BASIN 4
*****************************************************
COMPUTE NM HYD      ID=4 HYD=4  AREA=0.009483  PER A=0 PER B=20
               PER C=20 PER D=60  TP=-0.1333  RAINFALL=-1
```

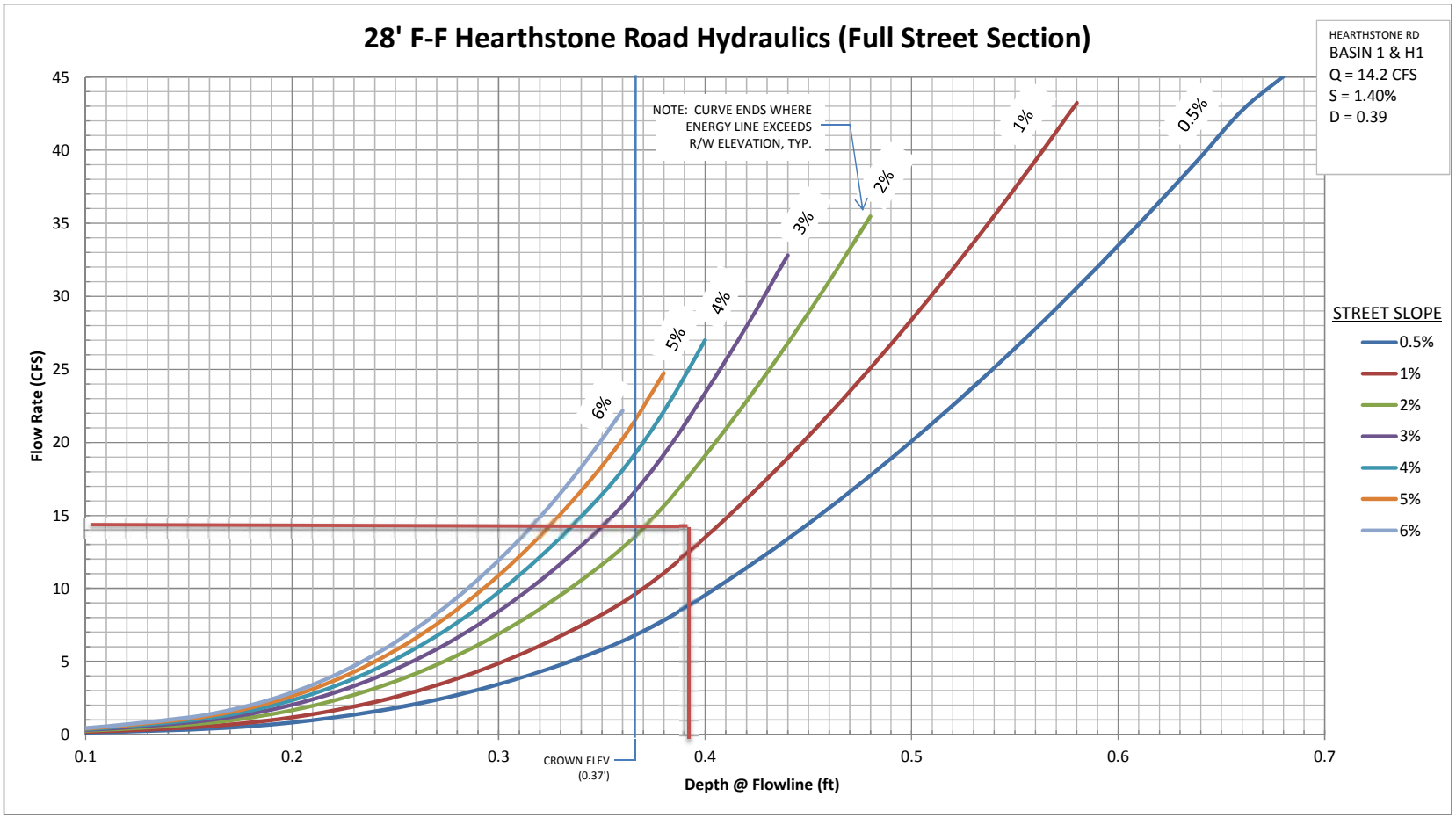
```
PRINT HYD        ID=4   CODE=1
*
PUNCH HYD        ID=4
*
*S COMPUTE BASIN 5
**************************************************
COMPUTE NM HYD      ID=5 HYD=5  AREA=0.001969  PER A=0 PER B=29
               PER C=29 PER D=42  TP=-0.1333  RAINFALL=-1
PRINT HYD        ID=5   CODE=1
*
*S COMPUTE BASIN H1
**************************************************
COMPUTE NM HYD      ID=6 HYD=H1  AREA=0.007025  PER A=0 PER B=25
               PER C=25 PER D=50  TP=-0.1333  RAINFALL=-1
PRINT HYD        ID=6  CODE=1
*
*S DIVIDE BASIN HERITAGE
**************************************************
DIVIDE HYD          ID=6 Q=5.39 ID=20 HYD NO=BYPASS.D
                           ID=21 HYD NO=POND.D
PRINT HYD        ID=20   CODE=1
PRINT HYD        ID=21   CODE=1
*
*S ADD BASINS 2 AND 3 TO CREATE TEMP A
**********************************
ADD HYD             ID=10 HYD=TEMP.A ID I=2 II=3
PRINT HYD            ID=10 CODE=1
*
*S ADD BASINS DIVIDE H1 AND 1 TO CREATE TEMP B
**********************************
ADD HYD             ID=11 HYD=TEMP.B ID I=20 II=1
PRINT HYD            ID=11 CODE=1
*
*S ADD BASINS TEMP A AND TEMP B TO CREATE TEMP C
**********************************
ADD HYD             ID=12 HYD=TEMP.C ID I=10 II=11
PRINT HYD            ID=12 CODE=1
*
*S ADD BASINS TEMP C AND 5 TO CREATE AP.1
**********************************
ADD HYD             ID=14 HYD=AP.1 ID I=12 II=5
PRINT HYD            ID=14 CODE=1
*
PUNCH HYD        ID=14
*S
FINISH
```

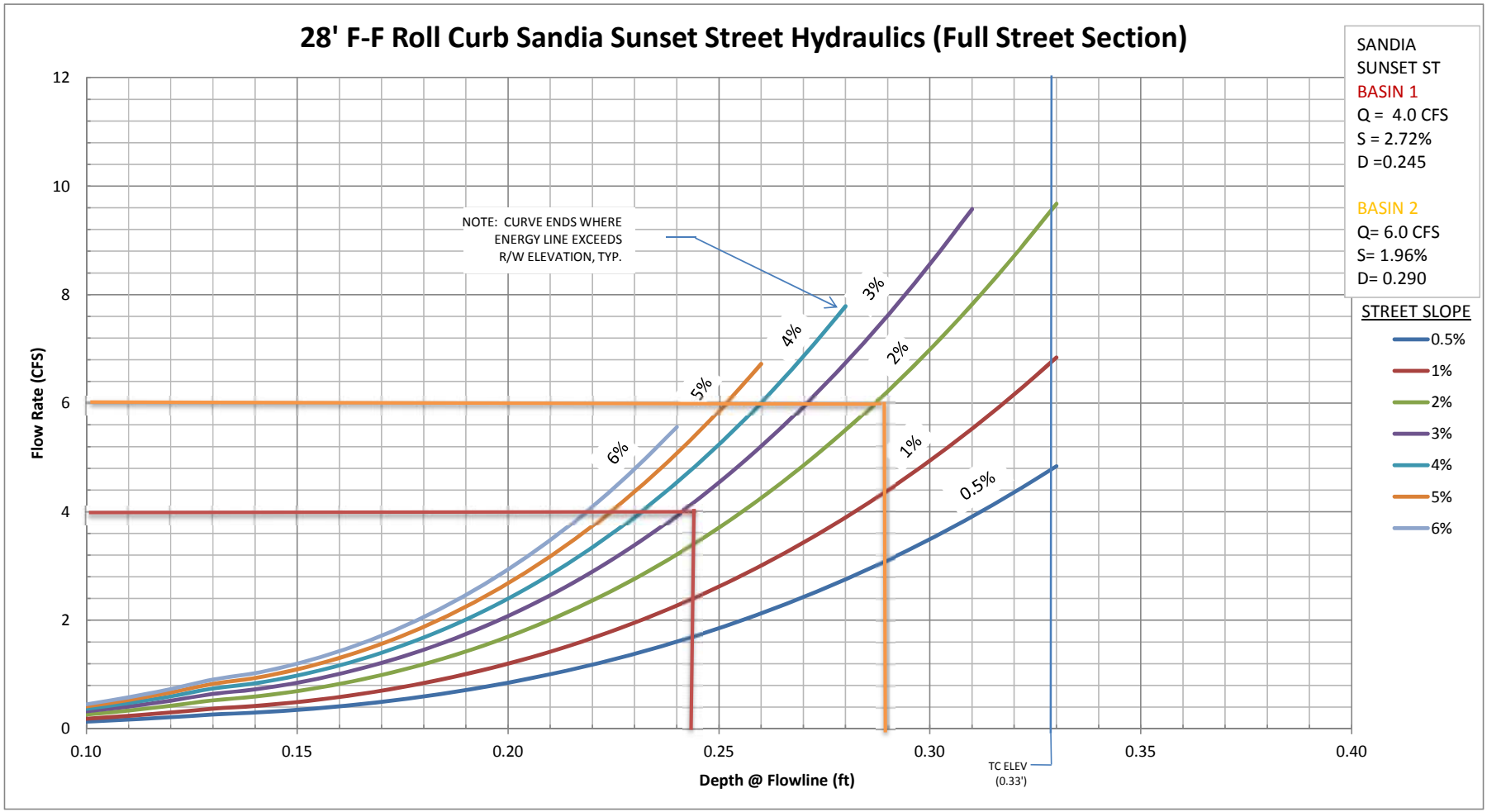
APPENDIX B

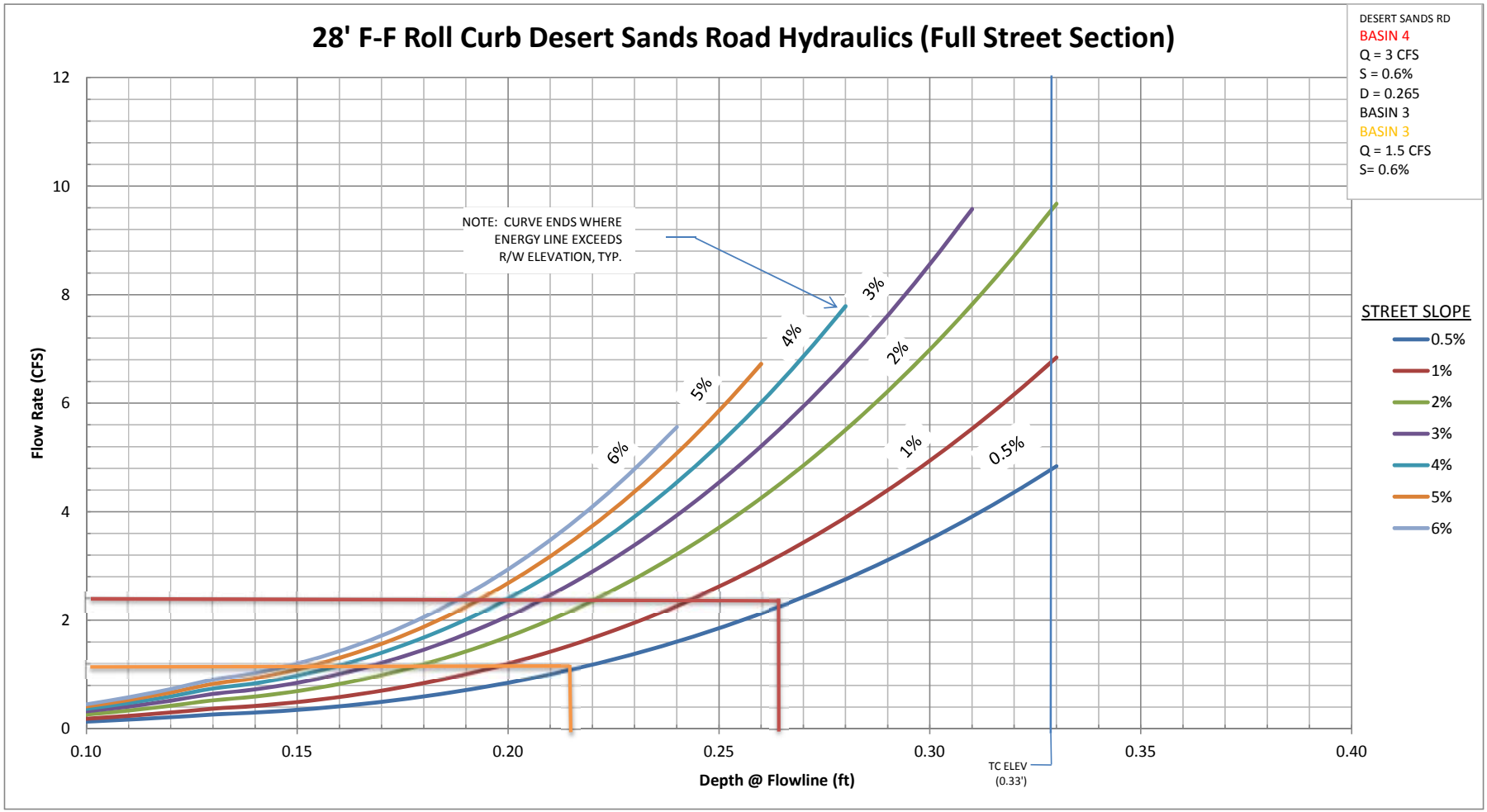
STREET HYDRAULICS AND STORM DRAIN INLET ANALYSIS

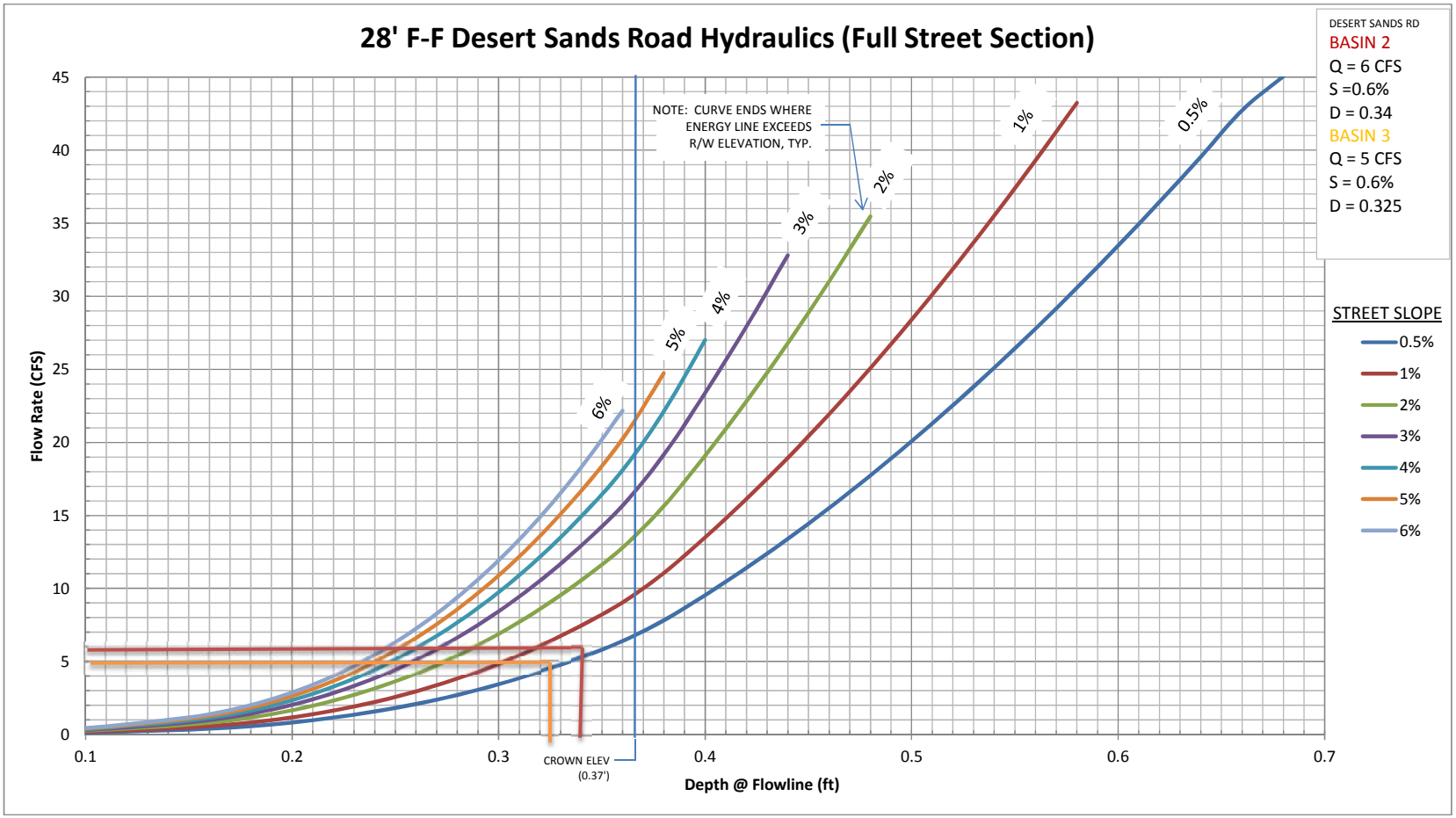
Bohannan Huston

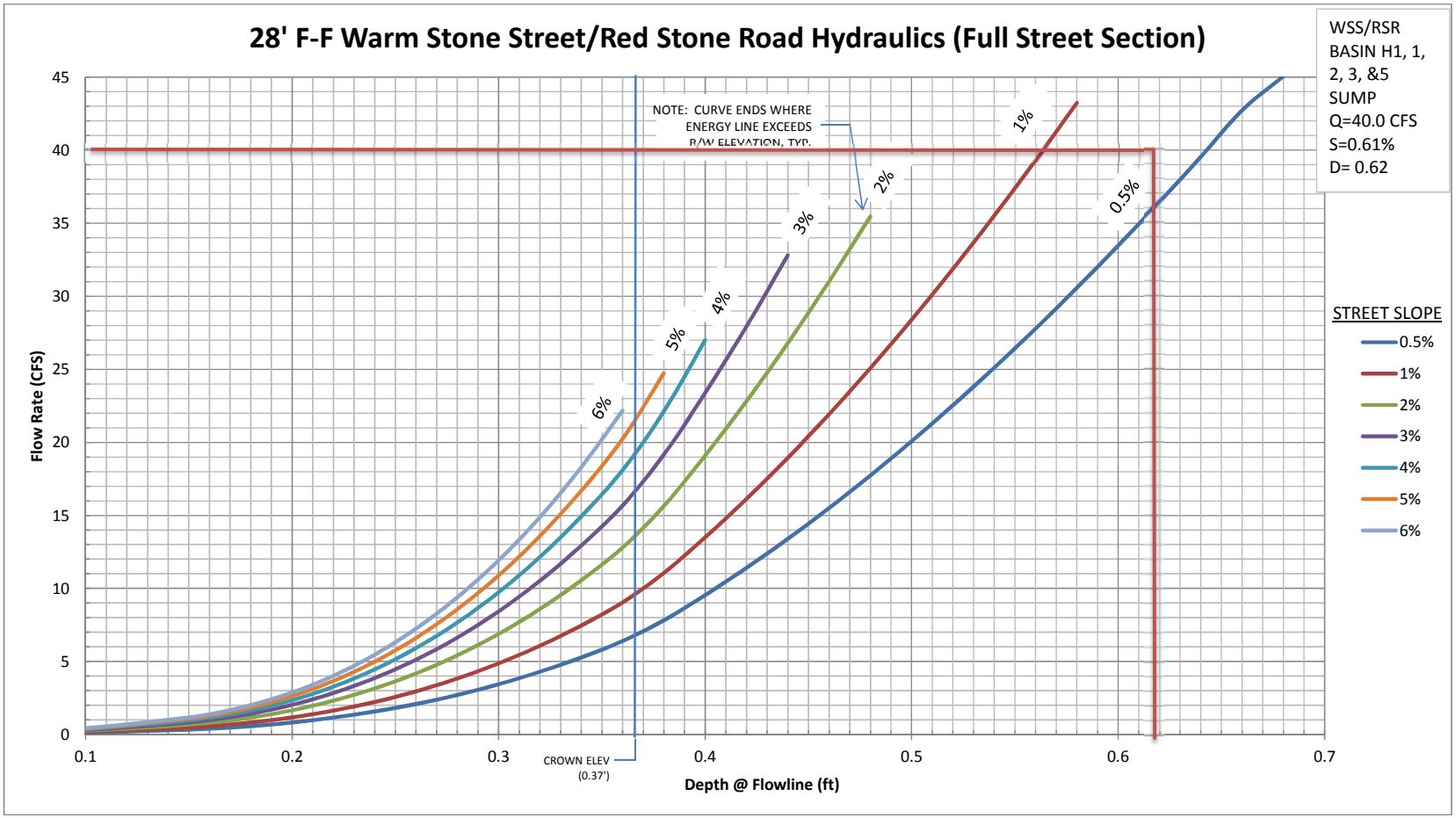

28' F-F Basin H1 Hearthstone Road Hydraulics (Full Street Section)
OFFSITE BASIN
Q = 13.4 CFS
S =0.6%
D =0.43
BYPASS FLOW
OF 5.4 CFS TO
ST 1 ANALYSIS
NOTE: CURVE ENDS WHERE
ENERGY LINE EXCEEDS
R/W ELEVATION, TYP.
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%
Flow Rate (CFS)
Depth @ Flowline (ft)
CROWN ELEV
(0.37')
0
5
10
15
20
25
30
35
40
45
0.1
0.2
0.3
0.4
0.5
0.6
0.7

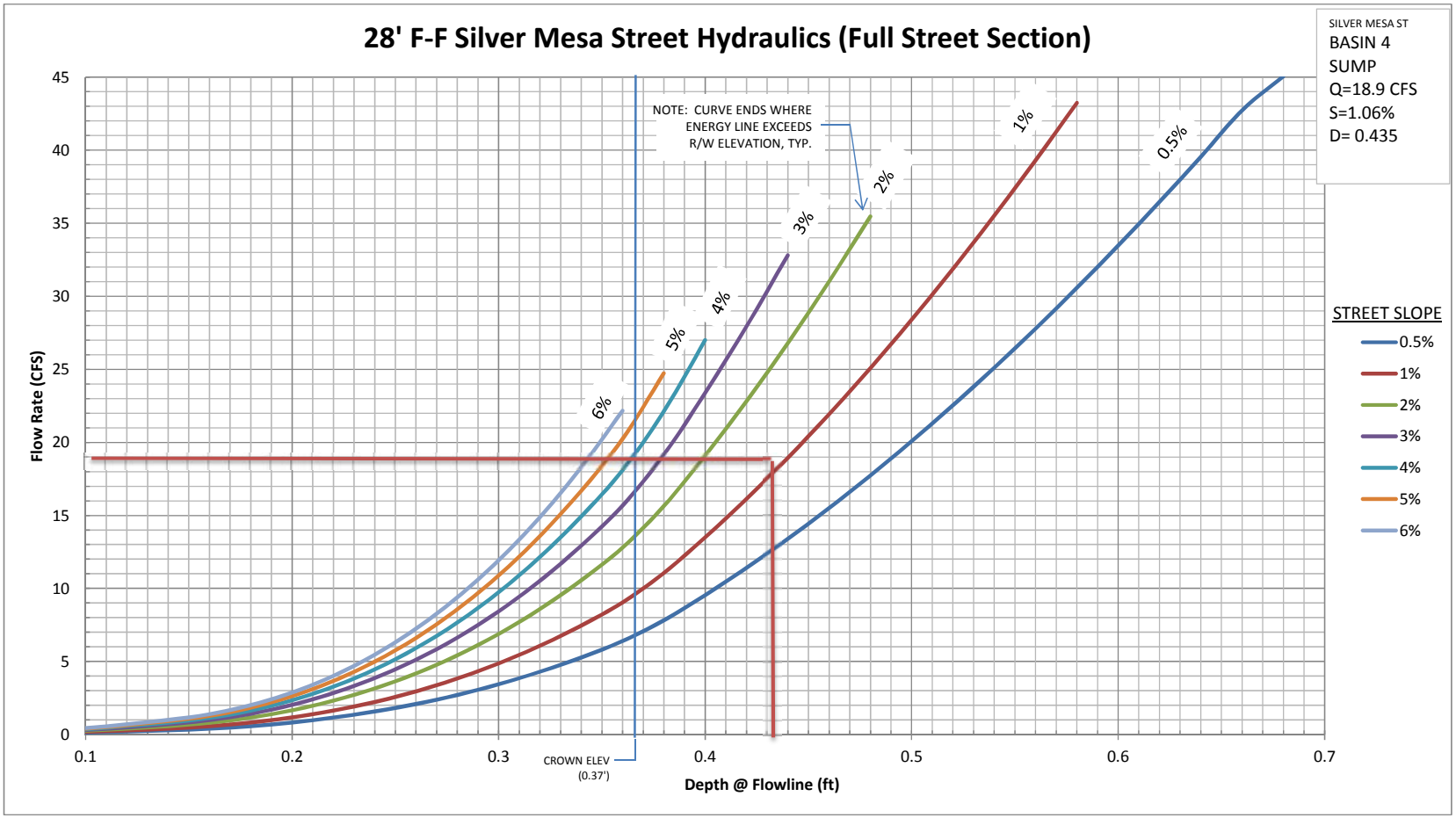

28' F-F Hearthstone Road Hydraulics (Full Street Section)
HEARTHSTONE RD
BASIN 1 & H1
Q = 14.2 CFS
S = 1.40%
D = 0.39
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
0.5%
1%
2%
3%
4%
5%
6%
STREET SLOPE
Flow Rate (CFS)
Depth @ Flowline (ft)
CROWN ELEV (0.37')
0
5
10
15
20
25
30
35
40
45
0.1
0.2
0.3
0.4
0.5
0.6
0.7


28' F-F Roll Curb Sandia Sunset Street Hydraulics (Full Street Section)
SANDIA
SUNSET ST
BASIN 1
Q = 4.0 CFS
S = 2.72%
D =0.245
BASIN 2
Q= 6.0 CFS
S= 1.96%
D= 0.290
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
Flow Rate (CFS)
Depth @ Flowline (ft)
TC ELEV (0.33')
0
2
4
6
8
10
12
0.10
0.15
0.20
0.25
0.30
0.35
0.40


28' F-F Roll Curb Desert Sands Road Hydraulics (Full Street Section)
DESERT SANDS RD
BASIN 4
Q = 3 CFS
S = 0.6%
D = 0.265
BASIN 3
BASIN 3
Q = 1.5 CFS
S= 0.6%
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%
Flow Rate (CFS)
Depth @ Flowline (ft)
TC ELEV (0.33')
0
2
4
6
8
10
12
0.10
0.15
0.20
0.25
0.30
0.35
0.40

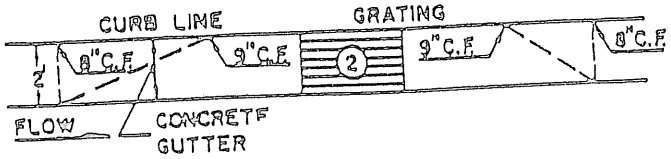

28' F-F Desert Sands Road Hydraulics (Full Street Section)
DESERT SANDS RD
BASIN 2
Q = 6 CFS
S =0.6%
D = 0.34
BASIN 3
Q = 5 CFS
S = 0.6%
D = 0.325
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
0.5%
1%
2%
3%
4%
5%
6%
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%
Flow Rate (CFS)
0
5
10
15
20
25
30
35
40
45
0.1
0.2
0.3
0.4
0.5
0.6
0.7
CROWN ELEV (0.37')
Depth @ Flowline (ft)


28' F-F Warm Stone Street/Red Stone Road Hydraulics (Full Street Section)
WSS/RSR
BASIN H1, 1, 2, 3, &5
SUMP
Q=40.0 CFS
S=0.61%
D= 0.62
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
CROWN ELEV (0.37')
Flow Rate (CFS)
Depth @ Flowline (ft)
0
5
10
15
20
25
30
35
40
45
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.5%
1%
2%
3%
4%
5%
6%
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%

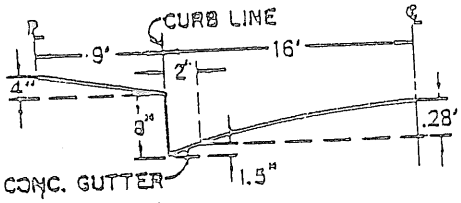

28' F-F Silver Mesa Street Hydraulics (Full Street Section)
SILVER MESA ST
BASIN 4
SUMP
Q=18.9 CFS
S=1.06%
D= 0.435
NOTE: CURVE ENDS WHERE ENERGY LINE EXCEEDS R/W ELEVATION, TYP.
Flow Rate (CFS)
Depth @ Flowline (ft)
CROWN ELEV (0.37')
0.5%
1%
2%
3%
4%
5%
6%
STREET SLOPE
0.5%
1%
2%
3%
4%
5%
6%
0
5
10
15
20
25
30
35
40
45
0.1
0.2
0.3
0.4
0.5
0.6
0.7

Basin H1 to Street 1
Q = 13.14 CFS
S = 0.60 %
D = 0.43
IC = 4 CFS.

GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

60" WING 40"@ TC

18.5" | 35.5" | 18.5"

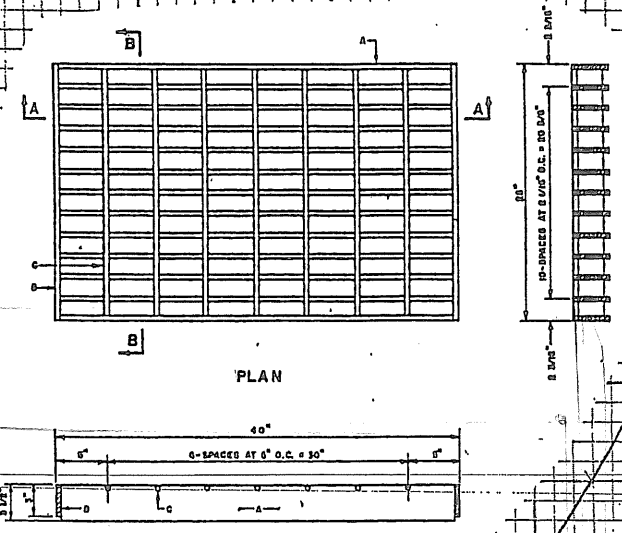
NET OPEN AREA

GRATE @ 10" (0.83') BELOW TC

EQUATION	SGL A	DBL A	TRPL A	QDPL A
1) ORIFICE	$22.0\,h^{0.5} + 16.5\,h^{1.5}$	$43.9\,h^{0.5} + 16.5\,h^{1.5}$	$65.9\,h^{0.5} + 16.5\,h^{1.5}$	$87.8\,h^{0.5} + 16.5\,h^{1.5}$
2) 3-SIDED WEIR ($h \le 0.83'$)	$36.4\,h^{1.5}$	$46.2\,h^{1.5}$	$56.0\,h^{1.5}$	$65.7\,h^{1.5}$
3) 4-SIDED WEIR ($h > 0.83'$)	ADD TO 2): $11(h-.83)^{1.5}$	ADD TO 2): $22(h-.83)^{1.5}$	ADD TO 2): $33(h-.83)^{1.5}$	ADD TO 2): $44(h-.83)^{1.5}$

1) $Q = 0.6A\sqrt{2gh} + 3.3(5')h^{1.5}$

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



GRATE CAPACITY (Q) IN CFS

TRIPLE GRATE

DOUBLE GRATE

SINGLE GRATE

TC 0.83'

HEAD (h) IN FEET

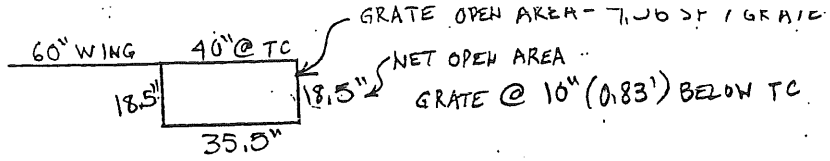
BOHANNAN-HUSTON INC.

AP #1

PROJECT NAME INDUSTRIAL TRAILS SHEET ____ OF ____

PROJECT NO. Q = 200 cfs/mile BY JPK DATE 4/9/92

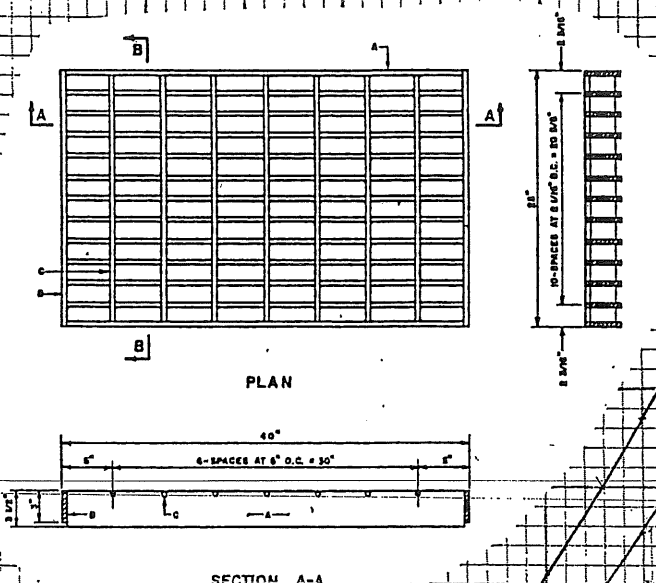
SUBJECT RATING CURVE FOR TYPE R INLETS CH'D ____ DATE ____



EQUATION	SGL A	DBL A	TRPL A	QDPL A
1) ORIFICE	$22.0\,h^{0.5} + 16.5\,h^{1.5}$	$43.9\,h^{0.5} + 16.5\,h^{1.5}$	$65.9\,h^{0.5} + 16.5\,h^{1.5}$	$87.8\,h^{0.5} + 16.5\,h^{1.5}$
2) 3-SIDED WEIR ($h \le 0.83'$)	$36.4\,h^{1.5}$	$46.2\,h^{1.5}$	$56.0\,h^{1.5}$	$65.7\,h^{1.5}$
3) 4-SIDED WEIR ($h > 0.83'$)	ADD TO 2): $11(h-.83)^{1.5}$	ADD TO 2): $22(h-.83)^{1.5}$	ADD TO 2): $33(h-.83)^{1.5}$	ADD TO 2): $44(h-.83)^{1.5}$

1) $Q = 0.6A\sqrt{2gh} + 3.3(5')h^{1.5}$

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



BOHANNAN-HUSTON INC.

PROJECT NAME TADOT I-40 INC TRAILS SHEET ____ OF ____

PROJECT NO. Q=9.45 CFS / INLET BY JPK DATE 4/9/92

SUBJECT RATING CURVE FOR TYPE A INLETS CH'D ____ DATE ____

EXHIBITS

EXHIBIT 1: PRELIMINARY PLAT

EXHIBIT 2: BASIN MAP

EXHIBIT 3: GRADING PLAN

EXHIBIT 4: STORM DRAIN CAPACITY CALCULATIONS

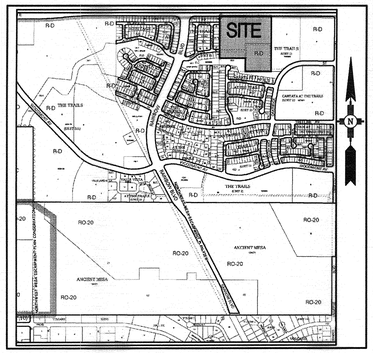
EXHIBIT 5: SUPPLEMENTAL EXHIBITS FROM TRAILS UNITS 1-3 DMP

EXHIBIT 1

PRELIMINARY PLAT

Bohannan Huston

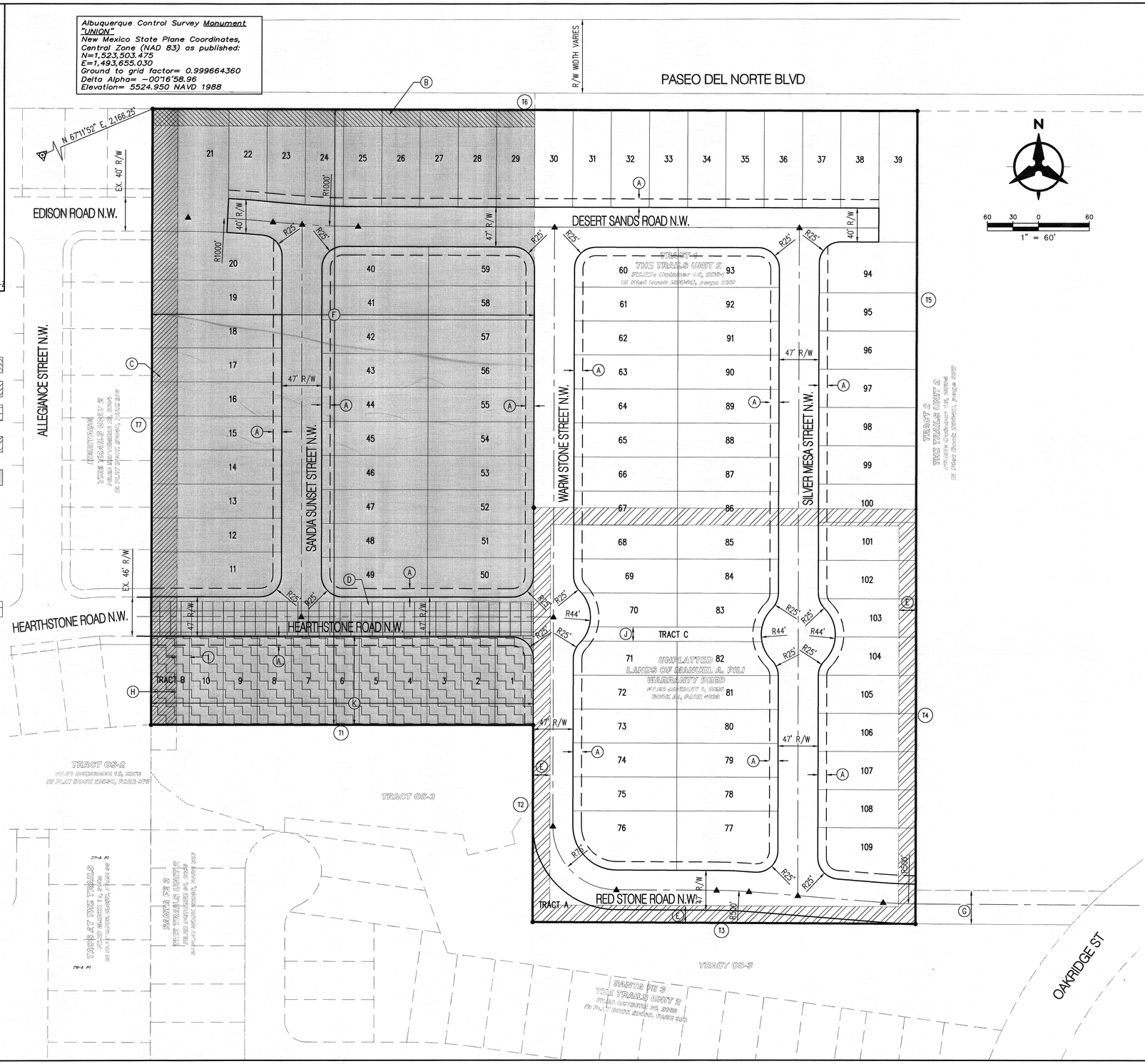
PRELIMINARY PLAT FOR
TAOS II AT THE TRAILS
LOTS 1–109 AND TRACTS A–C
JULY 2016



VICINITY MAP

NOT TO SCALE ZONE ATLAS C-09-Z

Albuquerque Control Survey Monument "UNION"
New Mexico State Plane Coordinates, Central Zone (NAD 83) as published:
N=1,523,503.475
E=1,493,655.030
Ground to grid factor= 0.999664360
Delta Alpha= -00°16'58.96
Elevation= 5524.950 NAVD 1988



N

60 30 0 60

1" = 60'

KEYED NOTES

(A) 10' PUBLIC UTILITY EASEMENT, GRANTED BY PLAT.

(B) PORTION OF EXISTING 40' SLOPE EASEMENT, TO BE VACATED BY PLAT.

(C) EXISTING 30' PRIVATE TEMPORARY SLOPE EASEMENT, TO BE VACATED BY PLAT.

(D) EXISTING 40' PRIVATE ACCESS AND PUBLIC DRAINAGE AND UTILITY EASEMENT. TO BE VACATED BY PLAT.

(E) EXISTING 20' PUBLIC EASEMENT FOR GENERAL PUBLIC ROAD PURPOSES AND PLACEMENT, MAINTENANCE AND OPERATION OF PUBLIC UTILITIES, TO BE VACATED BY PLAT.

(F) EXISTING BLANKET DRAINAGE EASEMENT, TO BE VACATED BY PLAT.

(G) EXISTING 40' PRIVATE ACCESS AND PUBLIC DRAINAGE UTILITY EASEMENT.

(H) 25' SEWER AND WATER EASEMENT GRANTED TO THE ABCWUA BY THIS PLAT.

(I) 20' STORM DRAIN EASEMENT GRANTED TO THE CITY OF ALBUQUERQUE BY THIS PLAT

(J) PUBLIC PEDESTRIAN ACCESS EASEMENT

(K) PORTION OF AN EXISTING PUBLIC DRAINAGE EASEMENT TO BE VACATED BY THIS PLAT.

BOUNDARY TANGENT TABLE		
ID	BEARING	LENGTH
T1	S89°55'02"E	449.85'
T2	S00°08'08"W	232.61'
T3	S89°43'58"E	450.20'
T4	N00°06'45"E	489.04'
T5	N00°06'45"E	469.12'
T6	N89°48'21"W	900.05'
T7	S00°06'04"W	725.85'

LEGEND

- SUBDIVISION BOUNDARY LINE
- NEW LOT LINE
- ADJOINING PROPERTY LINE
- ▲ CENTERLINE MONUMENT TO BE INSTALLED
- △ CITY OF ALBUQUERQUE SURVEY CONTROL MONUMENT

LEGAL DESCRIPTION

Tract 1 at The Trails Unit 2, City of Albuquerque, Bernalillo County, New Mexico, as the same is shown and designated on the plat entitled "BULK PLAT OF THE THE TRAILS UNIT 2 WITHIN THE TOWN OF ALAMEDA GRANT IN PROJECTED SECTION 16, TOWNSHIP 11 NORTH, RANGE 2 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO", filed in the office of the County Clerk of Bernalillo County, New Mexico, on October 18, 2004, in Plat Book 2004C, Page 332, as Document No. 2004146566 and Lands of Manuel Pili, Warranty Deed filed January 1, 2000, Book A1, Page 4899.

GENERAL NOTES

1. EXISTING ZONING: SU-2, VTRD, TRAILS RESIDENTIAL DEVELOPING AREA
   PROPOSED ZONING: SU-2, VTRD, TRAILS RESIDENTIAL DEVELOPING AREA
2. PROPOSED ACREAGE: 17.39 AC
   NUMBER OF LOTS: 109
   NUMBER OF TRACTS: 2
   PROPOSED DENSITY: 6.27 DU/AC
3. MIN. LOT DIMENSIONS: 40' X 103'
   MINIMUM LOT AREA: 4,120 SQFT
4. ALL STREETS, UTILITIES, AND STORM DRAIN IMPROVEMENTS ARE TO BE PUBLIC AND TO BE DEDICATED TO THE CITY OF ALBUQUERQUE FOR MAINTENANCE.
5. LOT SETBACKS SHALL CONFORM TO THE VOLCANO TRAILS SECTOR DEVELOPMENT PLAN.
6. NO LOTS SHALL HAVE DIRECT ACCESS TO PASEO DEL NORTE BLVD,
7. TRACTS A–C TO BE OWNED AND MAINTAINED BY THE TRAILS COMMUNITY ASSOCIATION, INC.

SITE DATA

ZONE ATLAS NO.	C-09-Z
ZONING	SU-2, VTRD
MILES OF FULL WIDTH STREETS CREATED	0.77 MILES
NO. OF EXISTING TRACTS	2
NO. OF LOTS CREATED	109
NO. OF HOA TRACTS CREATED	3

SURVEY NOTES:

1. ALL BOUNDARY CORNERS SHOWN (●) ARE FOUND REBAR W\CAP.
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS (▲) AND WILL BE MARKED BY (4") ALUMINUM CAP STAMPED "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION MARKED, DO NOT DISTURB PLS 9750".
3. THE SUBDIVISION BOUNDARY WILL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN.
4. BASIS OF BEARINGS WILL BE NEW MEXICO STATE PLANE BEARINGS.
5. DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, TANGENCY STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.

APPROVED

Susan M. Richardson P.S. 7/14/16
CITY SURVEYOR DATE

Sharon K. Eshima
SHARON K. ESHIMA DATE
MANAGER, RCS–TRAILS TRACT 1, LLC

Bohannan Huston
www.bhinc.com 800.877.5332

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July 08, 2016 – 10:33am

EXHIBIT 2

BASIN MAP

Bohannan Huston

ONSITE BASIN MAP
TAOS II AT THE TRAILS SUBDIVISION

BASIN J11

PASEO DEL NORTE

BASIN J10

BASIN 3
AREA=2.1 AC
Q=6.4 CFS
A=0.0, B=20.5,
C=20.5, D=59.0

EDISON ROAD N.W.

DESERT SANDS ROAD N.W.

BATTLE CREEK STREET N.W.

ALLEGIANCE STREET N.W.

SANDIA SUNSET STREET N.W.

WARM STONE STREET N.W.

SILVER MESA STREET N.W.

BASIN 2
AREA=5.0 AC
Q=15.8 CFS
A=0.0, B=19.5,
C=19.5, D=61.0

BASIN H1
AREA=4.5 AC
Q=13.4 CFS
A=0.0, B=25.0,
C=25.0, D=50.0

BASIN 1
AREA=2.8 AC
Q=8.8 CFS
A=0.0, B=20.0,
C=20.0, D=60.0

BASIN 4
AREA=6.1 AC
Q=18.9 CFS
A=0.0, B=20.0,
C=20.0, D=60.0

Q=5.4 CFS

HEARTHSTONE ROAD N.W.

TRACT B

TRACT C

BASIN 5
AREA=1.3 AC
Q=3.6 CFS
A=0.0, B=29.0,
C=29.0, D=42.0

AP #1
Q=40.0 CFS

TRACT A

RED STONE ROAD N.W.

AP #2
Q=18.9 CFS

TRACT DS-2

ALAMILLO ROAD N.W.

RIO GALISTEO PLACE N.W.

LEGEND

- BASIN BOUNDARY
- FLOW ARROW
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN

N

60 30 0 60
1" = 60'

Bohannan Huston

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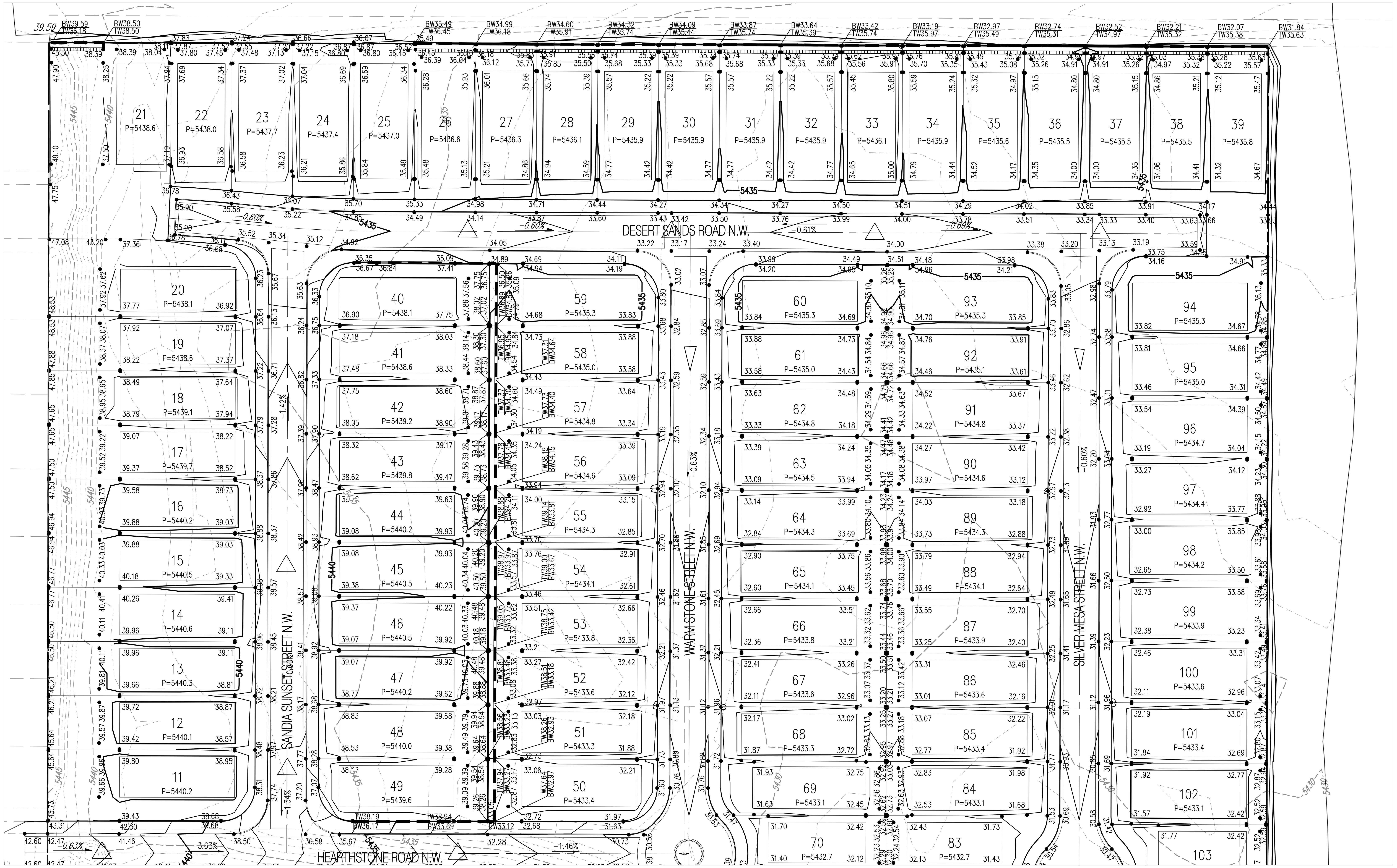
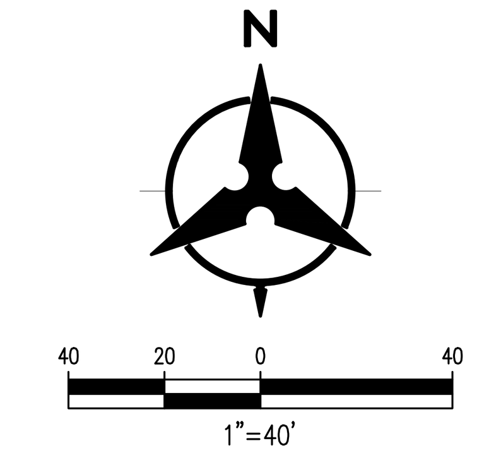
EXHIBIT 3

GRADING PLAN

Bohannan Huston





GENERAL NOTES

1. CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.

2. THE CONTRACTOR IS TO REFER TO EARTHWORK SPECIFICATION AS NOTED IN THE SOILS REPORT.

3. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE, AND FEDERAL DUST CONTROL MEASURES & REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.

4. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AS PER DETAIL, SHEET 3B, AND WETTING THE SOIL TO KEEP IT FROM BLOWING.

5. ALL SPOT ELEVATIONS ARE TO FLOWLINE UNLESS OTHERWISE NOTED.

6. BOULDERS GREATER THAN 3 FEET IN DIAMETER EXCAVATED DURING GRADING ACTIVITIES SHALL BE STOCKPILED AND DISPOSED OF AT THE DISCRETION OF THE OWNER.

7. ALL WALLS SHOWN ARE TO BE PLACED ALONG PROPERTY LINE. WALLS ARE SHOWN OFFSET FOR VISUAL PURPOSE ONLY.

LEGEND

• 91.62	PROPOSED SPOT ELEVATION
× 92.46	EXISTING SPOT ELEVATION (GRND & TC)
	EXISTING CURB & GUTTER
	PROPOSED MOUNTABLE CURB & GUTTER
	PROPOSED STANDARD CURB & GUTTER
5470	EXISTING CONTOUR W/ INDEX ELEVATION
	FLOW ARROW
	PROPOSED RETAINING WALL
	PROPOSED SLOPE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN INLET
	HIGH POINT

AS-BUILT INFORMATION

CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICROFILM INFORMATION

RECORDED BY	DATE
NO.	

BENCH MARKS

ACS BRASS TABLET STAMPED "7-C10"
GEOGRAPHIC POSITION (NAD 83)
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
X = 1,499,200.29 Y = 1,521,838.43
GROUND-TO-GRID FACTOR = 0.999667290
$\Delta\alpha$ = -00°16'20"
NAVD 1988 ELEVATION = 5425.21

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

SCOTT J. STEFFEN
NEW MEXICO
14604
REGISTERED PROFESSIONAL ENGINEER
7/13/16

No.	Date	REMARKS	By

REVISIONS

DESIGN

Designed By: SJS DATE:07/2016
Drawn By: BJG DATE:07/2016
Checked By: SJS DATE:07/2016

No.	Date				

Designed By: SJS
Drawn By: BJG
Checked By: SJS

Bohannan Huston
www.bhinc.com 800.877.5332

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TAOS II AT THE TRAILS
GRADING PLAN

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
XXXXXX	C-09-Z	1	3

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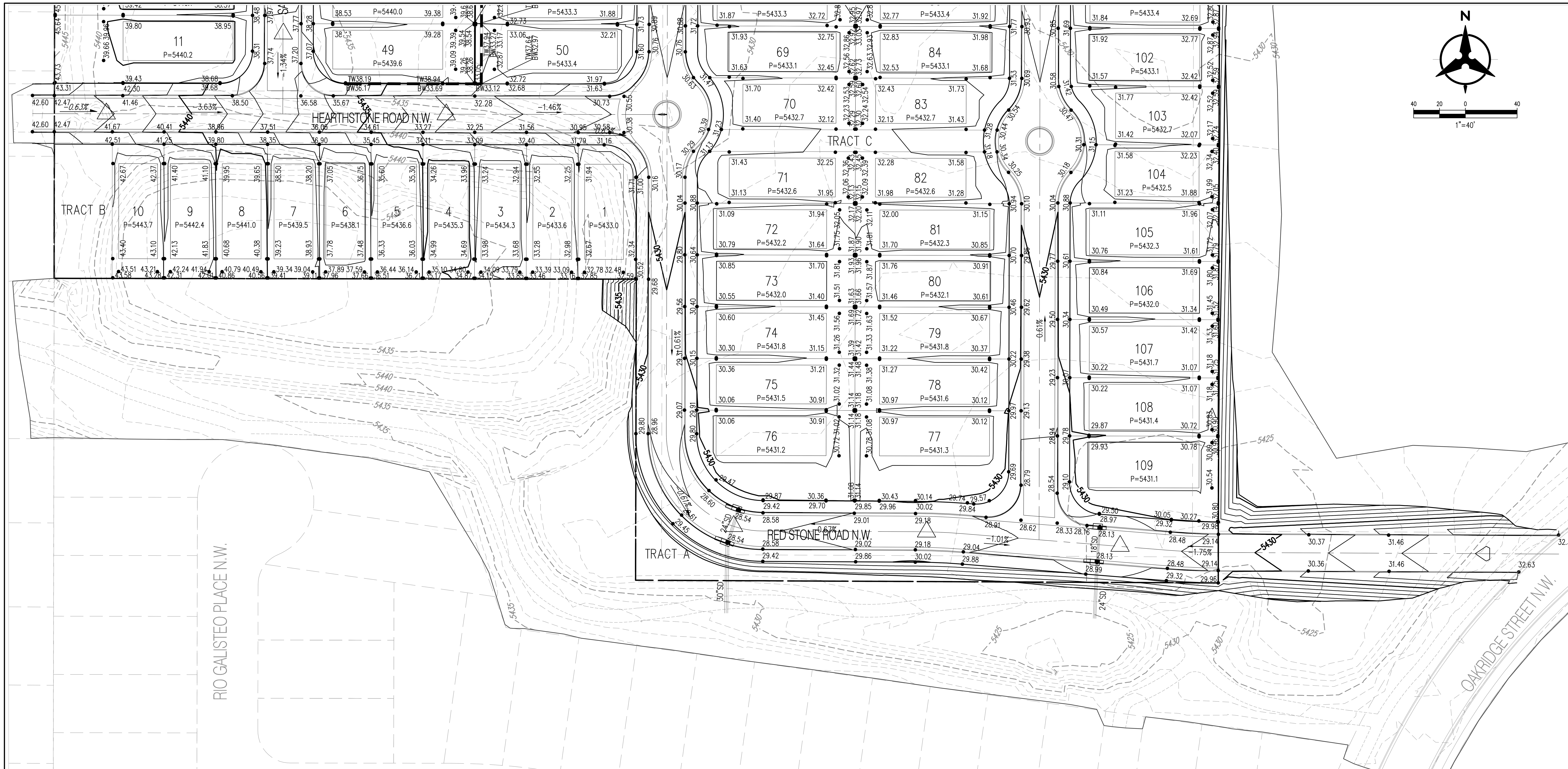

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LEGEND

Symbol	Description
• 91.62	PROPOSED SPOT ELEVATION
× 92.46	EXISTING SPOT ELEVATION (GRND & TC)
	EXISTING CURB & GUTTER
	PROPOSED MOUNTABLE CURB & GUTTER
	PROPOSED STANDARD CURB & GUTTER
5470	EXISTING CONTOUR W/ INDEX ELEVATION
	FLOW ARROW
	PROPOSED RETAINING WALL
	PROPOSED SLOPE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN INLET
	HIGH POINT

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AS-BUILT INFORMATION

CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICROFILM INFORMATION

RECORDED BY	DATE
NO.	

BENCH MARKS

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NAVD 1988 ELEVATION = 5425.21

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By: SJS DATE:07/2016
Drawn By: BJG DATE:07/2016
Checked By: SJS DATE:07/2016

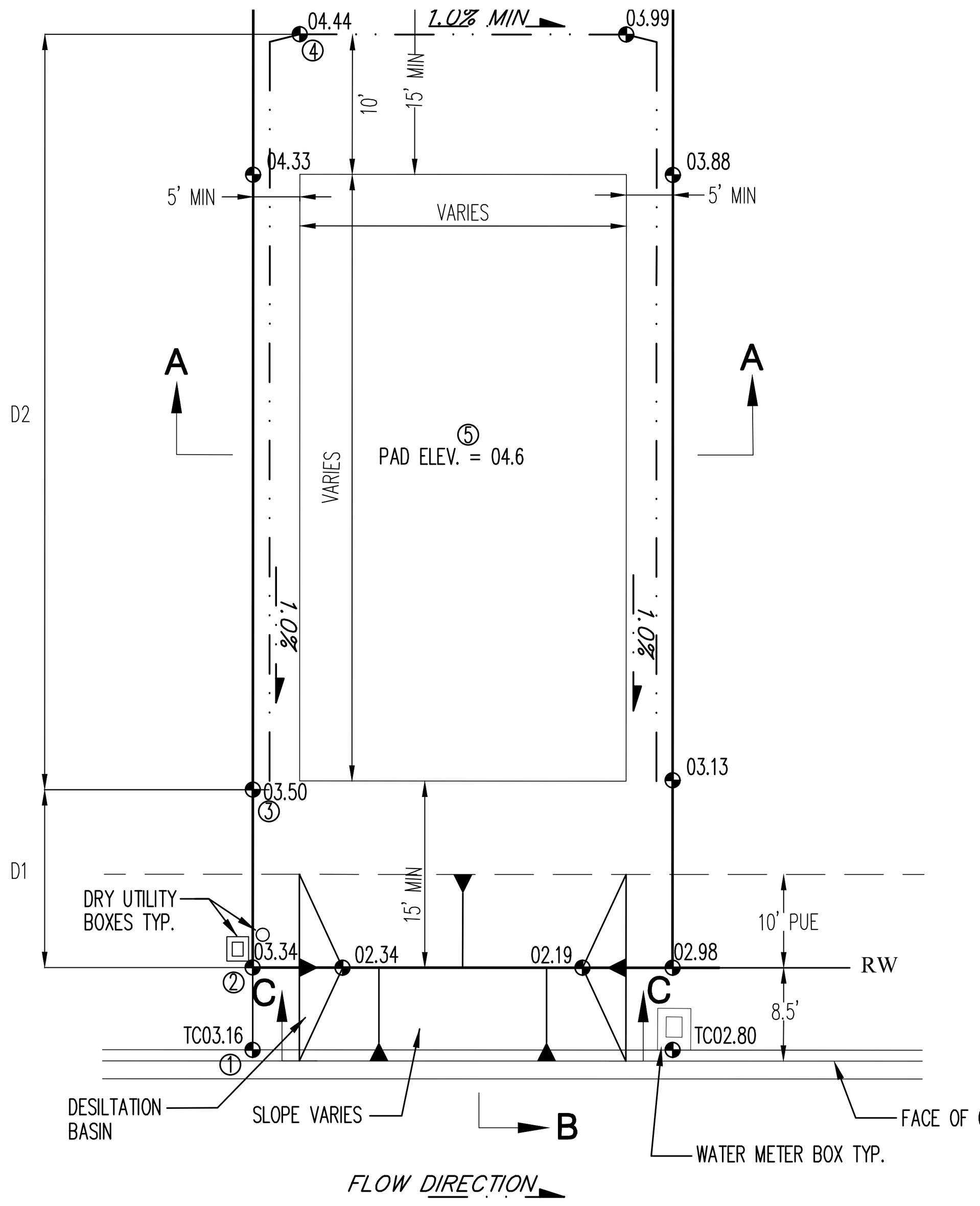
Bohannan Huston
www.bhinc.com 800.877.5332

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TAOS II AT THE TRAILS
GRADING PLAN

Design Review Committee	City Engineer Approval	Mo./Day/Yr.	Mo./Day/Yr.
		Last Design Update	

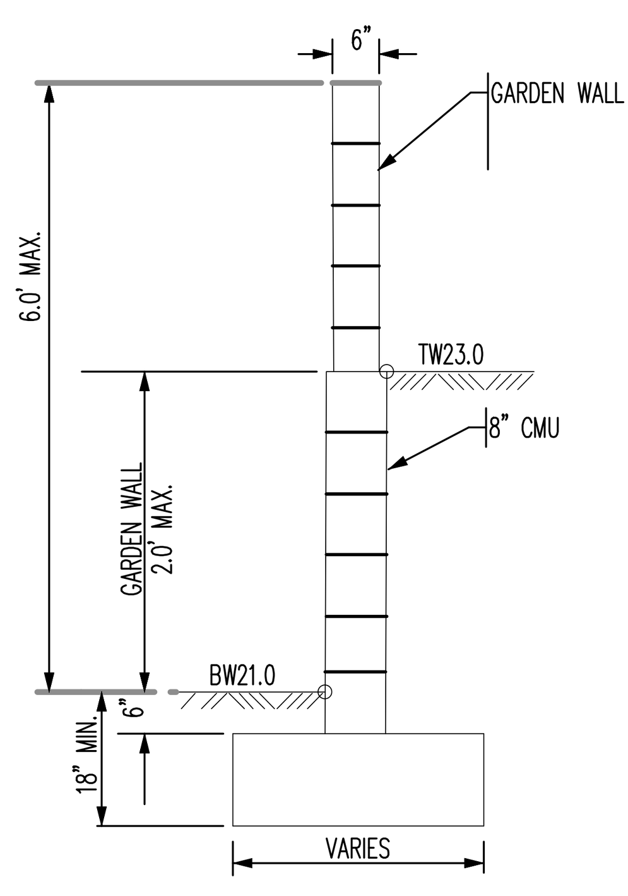
City Project No.	Zone Map No.	Sheet	Of
XXXXXX	C–09–Z	2	3



TYPICAL LOT GRADE DETAIL
WITH DESILTATION BASIN FOR SEDIMENTATION CONTROL
NOT TO SCALE

TO SET SPOT② – ADD 0.17' TO SPOT①
TO SET SPOT③ – MULTIPLY D1 BY 1.0% AND ADD TO SPOT②
TO SET SPOT④ – MULTIPLY D2 BY 1.0% AND ADD TO SPOT③
TO SET SPOT⑤ – ADD 0.2' TO SPOT④

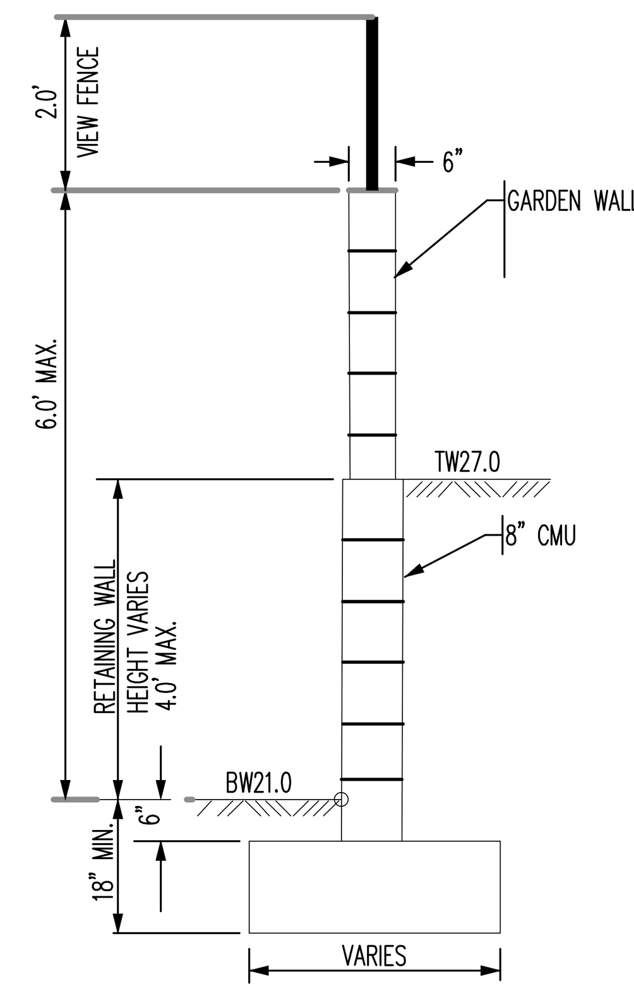
BOTTOM OF BASIN IS 1' BELOW PROPERTY LINE ELEVATION.
SEE GRADING PLANS FOR EXACT ELEVATIONS.
CONTRACTOR SHALL CONSTRUCT TEMPORARY DESILTATION BASIN AT EACH LOT.



TW=FINISHED GRADE ELEVATION AT TOP OF RETAINING WALL
BW=FINISHED GRADE ELEVATION AT BOTTOM OF RETAINING WALL

TYPICAL GARDEN WALL NOMENCLATURE
NOT TO SCALE

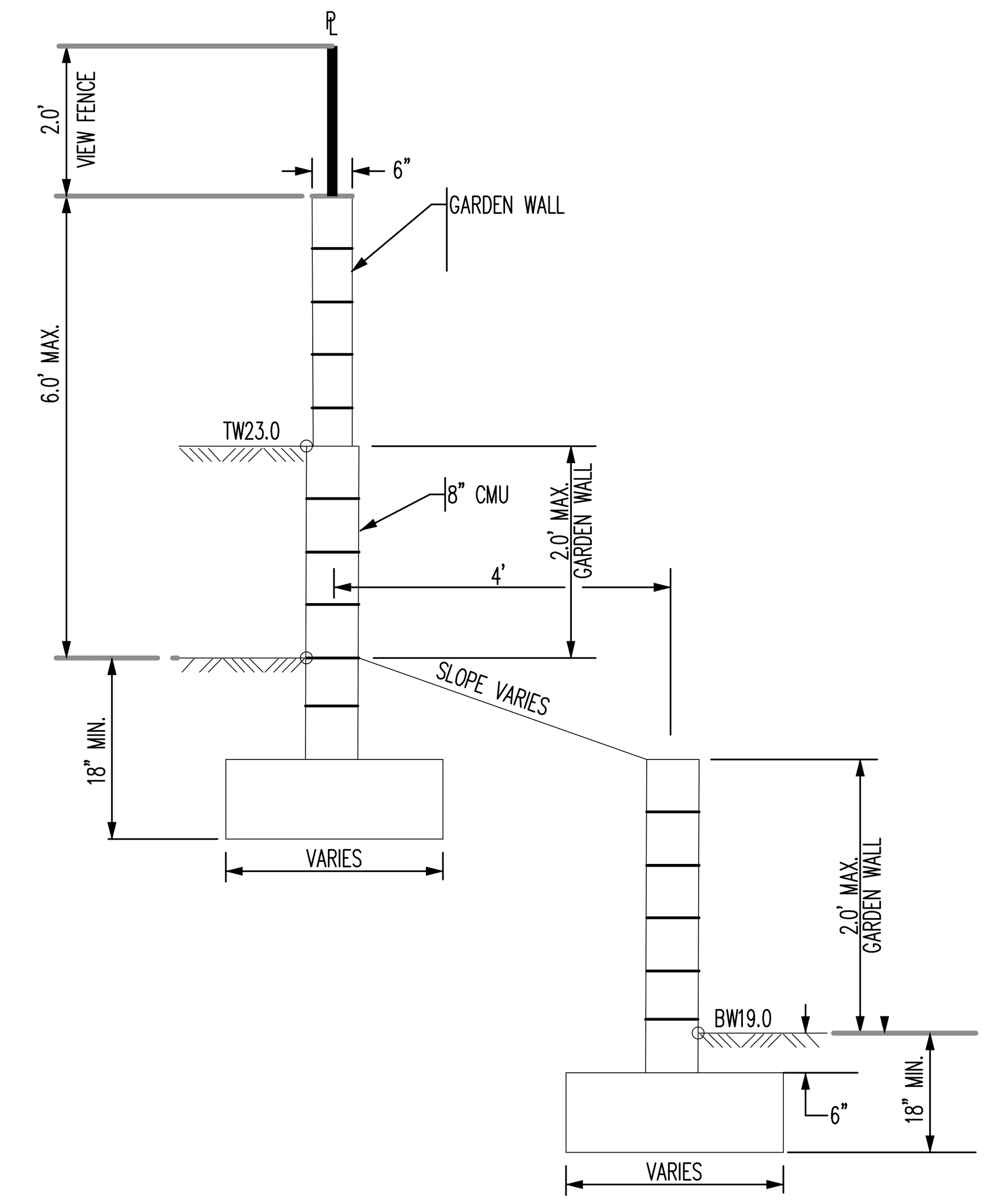
(RETAINING HEIGHT IS TAKEN TO BE DIFFERENCE IN FINISHED GRADES ON LEFT AND RIGHT SIDE OF WALL.)



TW=FINISHED GRADE ELEVATION AT TOP OF RETAINING WALL
BW=FINISHED GRADE ELEVATION AT BOTTOM OF RETAINING WALL

TYPICAL RETAINING WALL NOMENCLATURE
NOT TO SCALE

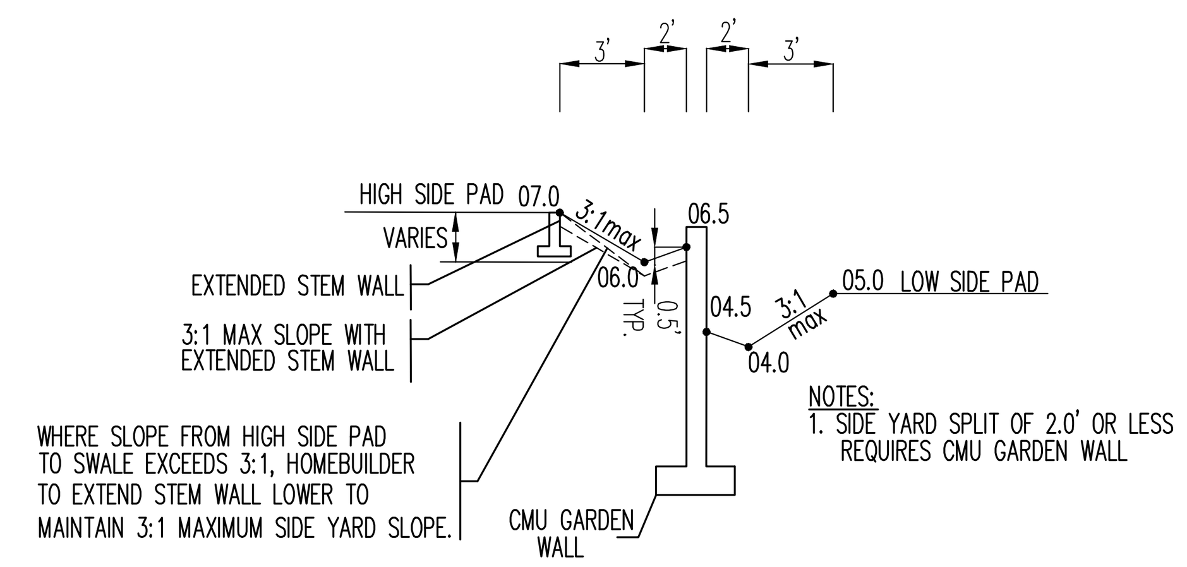
(RETAINING HEIGHT IS TAKEN TO BE DIFFERENCE IN FINISHED GRADES ON LEFT AND RIGHT SIDE OF WALL.)



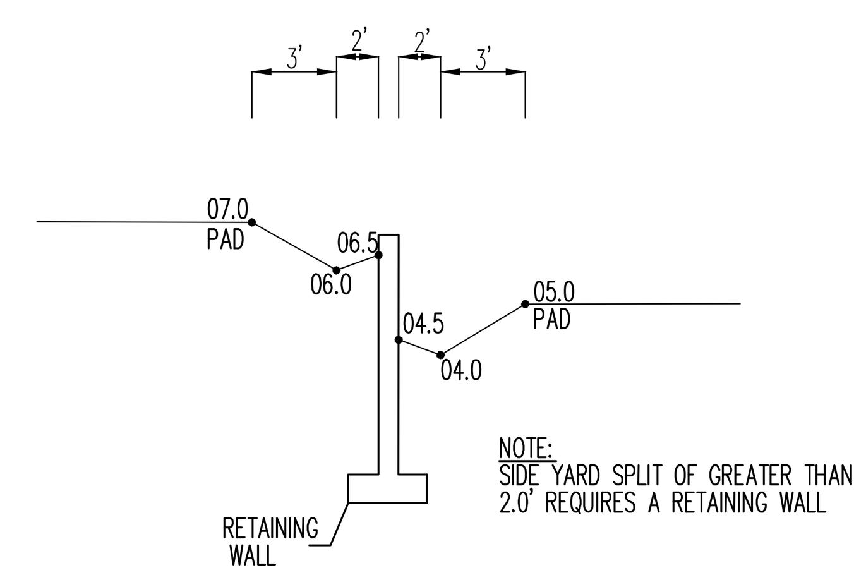
TW=FINISHED GRADE ELEVATION AT TOP OF RETAINING WALL
BW=FINISHED GRADE ELEVATION AT BOTTOM OF RETAINING WALL

TYPICAL TIERED WALL NOMENCLATURE
NOT TO SCALE

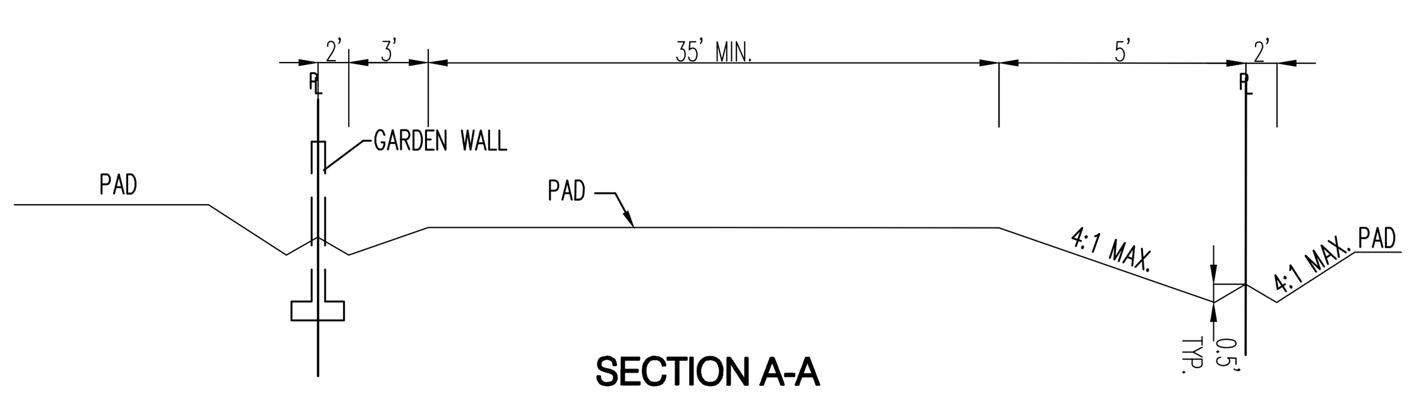
(RETAINING HEIGHT IS TAKEN TO BE DIFFERENCE IN FINISHED GRADES ON LEFT AND RIGHT SIDE OF WALL.)



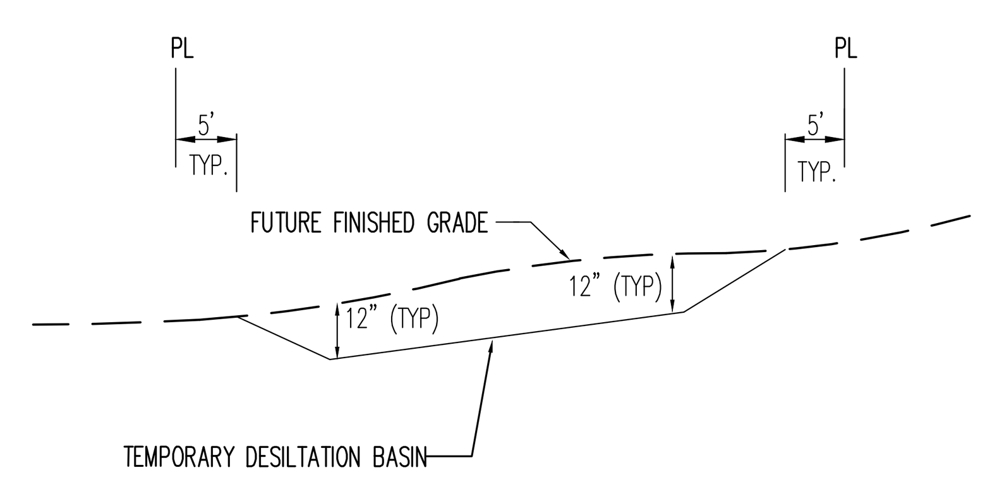
SIDE YARD GARDEN WALL DETAIL
NOT TO SCALE



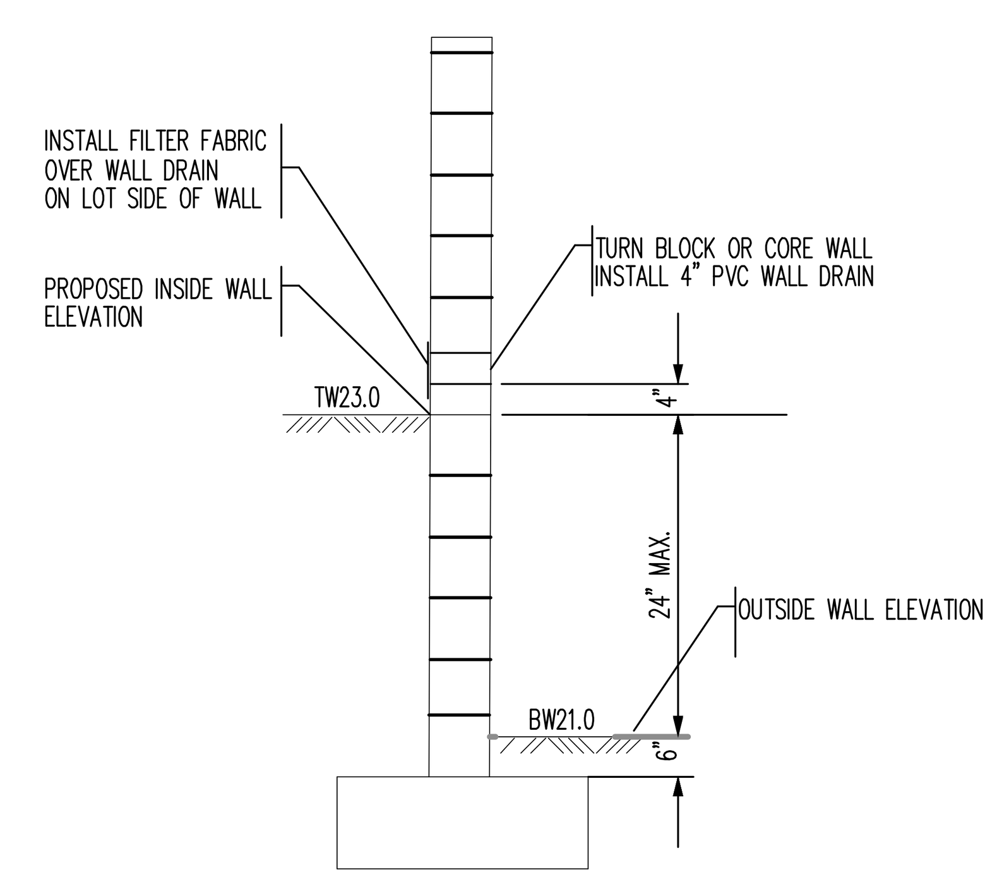
SIDE YARD RETAINING WALL DETAIL
NOT TO SCALE



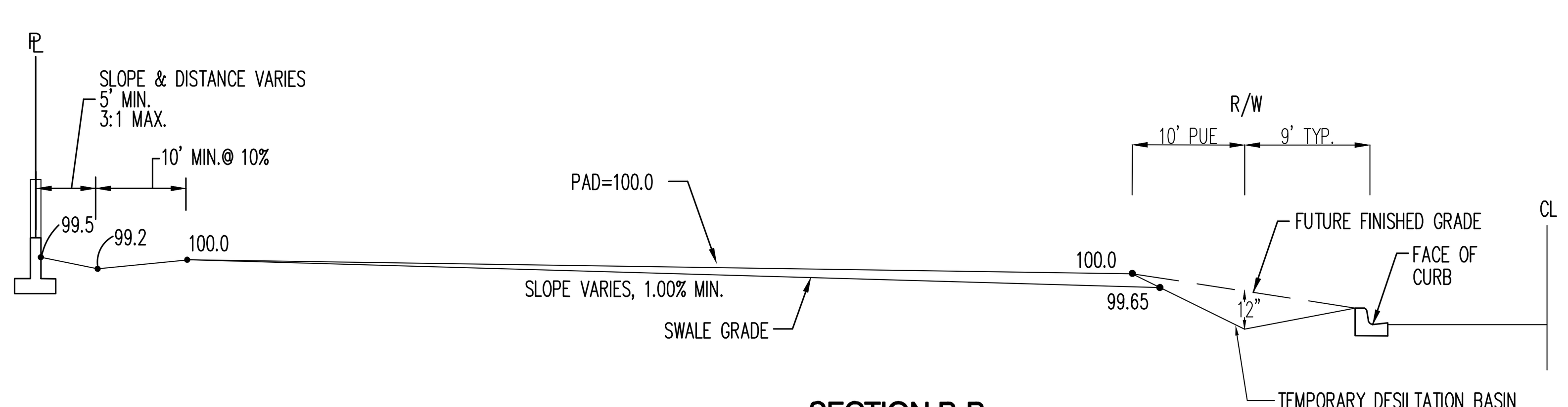
SECTION A-A
TYPICAL SIDE YARD SWALE
NOT TO SCALE



SECTION C-C
NOT TO SCALE



WALL DRAIN DETAIL
NOT TO SCALE



SECTION B-B
NOT TO SCALE

NOTE:

1. CONTRACTOR IS TO MASS GRADE ROADS TO 2' BEYOND FUTURE CURB. EXCESS FROM DRY UTILITY TRENCH IS TO BE USED TO BACK FILL BEHIND CURB.

2. FRONT YARDS ARE TO BE GRADED AS SHOWN ON THIS DETAIL FOR FINAL GRADING AND CERTIFICATION THIS DETAIL TO BE COORDINATED WITH.

3. HOME BUILDER TO BRING FRONT YARD TO ULTIMATE FRONT YARD GRADES AFTER HOME CONSTRUCTION IS COMPLETED. SEE ULTIMATE FRONT YARD GRADING DETAIL ON THIS SHEET.

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July 14, 2016 – 10:26am

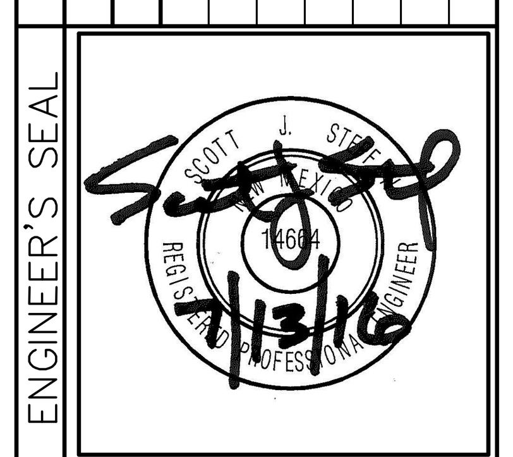
AS–BUILT INFORMATION
CONTRACTOR — DATE
WORK STAKED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICROFILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
ACS BRASS TABLET STAMPED "7–C10"
GEOGRAPHIC POSITION (NAD 83)
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
X = 1,499,200.29 Y = 1,521,838.43
GROUND–TO–GRID FACTOR = 0.999667290
Δα = –00°16'20"
NAVD 1988 ELEVATION = 5425.21

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL



No.	Date	REMARKS / REVISIONS / DESIGN	By

Designed By: SJS — DATE:07/2016
Drawn By: BJG — DATE:07/2016
Checked By: SJS — DATE:07/2016

Bohannan Huston
www.bhinc.com 800.877.5332

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TAOS II AT THE TRAILS
GRADING PLAN DETAILS

Design Review Committee	City Engineer Approval	Mo./Day/Yr.	Mo./Day/Yr.
		Last Design Update	

City Project No.	Zone Map No.	Sheet	Of
XXXXXX	C–09–Z	3	3

EXHIBIT 4

STORM DRAIN CAPACITY CALCULATIONS

Bohannan Huston

TAOS II AT THE TRAILS

PROPOSED STORM DRAIN NETWORK

JULY 2016

STORM INLET SUMMARY						
INLET	STREET GRADE (%)	UPSTREAM HALF ST FLOW (CFS)	UPSTREAM DEPTH (FT)	FLOW CAPTURED BY INLET (CFS)	BYPASS FLOW (CFS)	INLET TYPE
1	N/A SUMP	20.0	0.61	20.0	0.0	A
2	N/A SUMP	20.0	0.61	20.0	0.0	A
3	N/A SUMP	9.5	0.42	9.5	0.0	A
4	N/A SUMP	9.5	0.42	9.5	0.0	A

STORM DRAIN PIPE SUMMARY				
SDP	SIZE (IN)	SLOPE (%)	MAX CAPACITY OF FULL PIPE(CFS)	FLOW (CFS)
1	30	1.0%	41.02	40.0
2	24	1.0%	22.62	20.0
3	18	1.0%	10.50	9.5
4	24	1.0%	22.62	18.9

NOTES: 1. ALL INLETS ABOVE ARE SINGLE GRATE.

LEGEND

PROPOSED STORM DRAIN PIPE

PROPOSED STORM DRAIN MANHOLE

PROPOSED STORM DRAIN INLET

N

60 30 0 60

1" = 60'

PASEO DEL NORTE

EDISON ROAD N.W.

ALLEGIANCE STREET N.W.

HEARTHSTONE ROAD N.W.

DESERT SANDS ROAD N.W.

SANDIA SUNSET STREET N.W.

WARM STONE STREET N.W.

SILVER MESA STREET N.W.

RED STONE ROAD N.W.

TRACT A

TRACT B

TRACT C

RIO GALISTEO PLACE N.W.

OAKRIDGE STREET N.W.

TIJERAS CREEK ROAD N.W.

CT 05-2

ROAD N.W.

SDP1

SDP2

SDP3

SDP4

IN1

IN2

IN3

IN4

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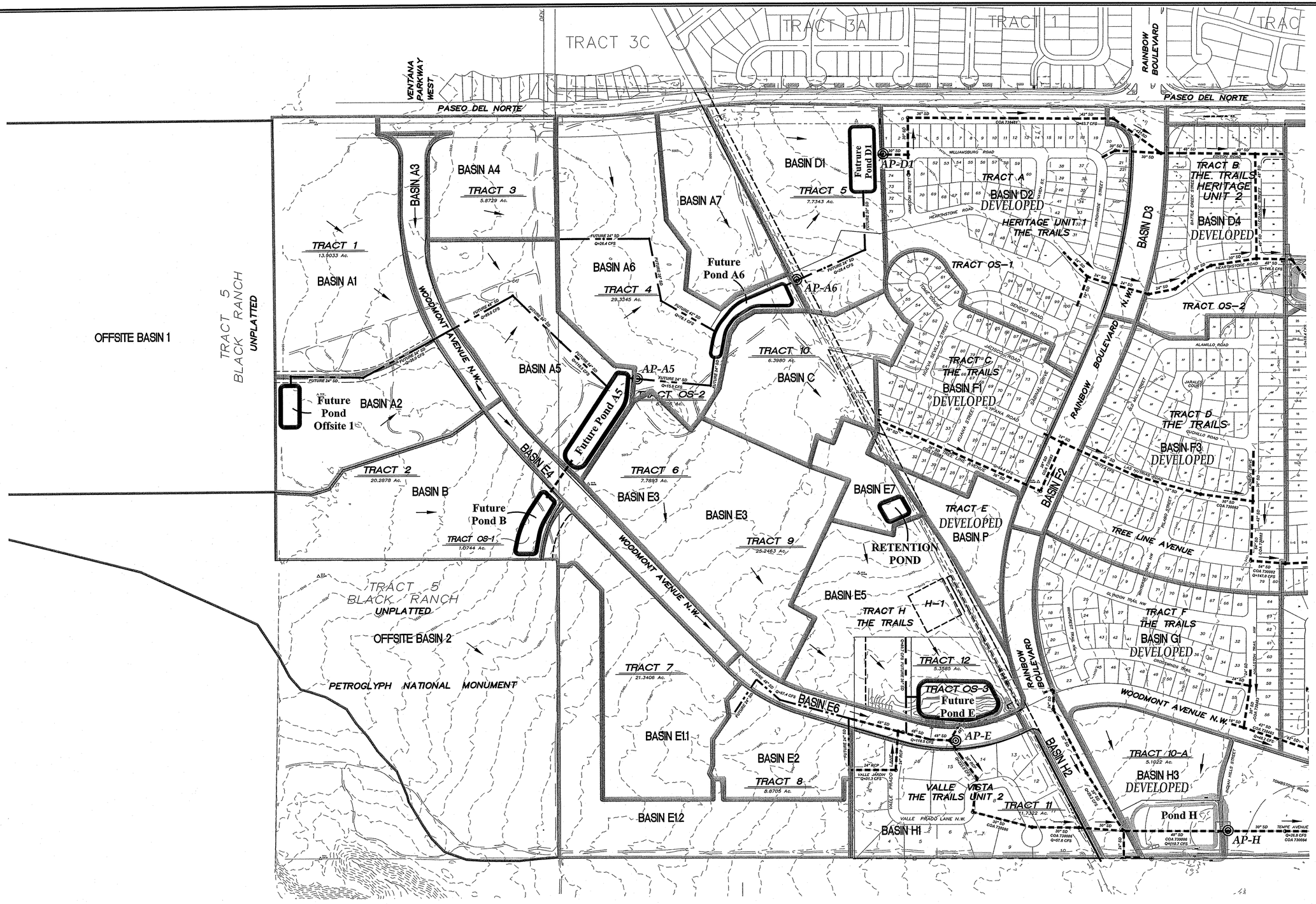
July 13, 2016 - 5:57pm

Bohannan Huston

EXHIBIT 5

SUPPLEMENTAL EXHIBITS FROM TRAILS UNITS 1-3 DMP

Bohannan Huston



NOTES:

1. STORM DRAIN SIZES BASED ON 100-YR, 24-HR STORM FLOWS. FUTURE PROJECTS MAY BE REQUIRED TO INCREASE STORM DRAIN SIZE BASED ON 100-YR, 6-HR STORM FLOWS.
2. THE INTENDED FUTURE CONTRIBUTION FROM THE TRAILS UNIT 4 IS 20 CFS TO THE MAXIMUM DOWNSTREAM DISCHARGE OF 62 CFS IN UNIVERSE BLVD.

LEGEND

- ANALYSIS POINT
- EXISTING STORM DRAIN
- FLOW DIRECTION
- FUTURE DEVELOPED STORM DRAIN

200' 100' 0 200' 400'

SCALE: 200'

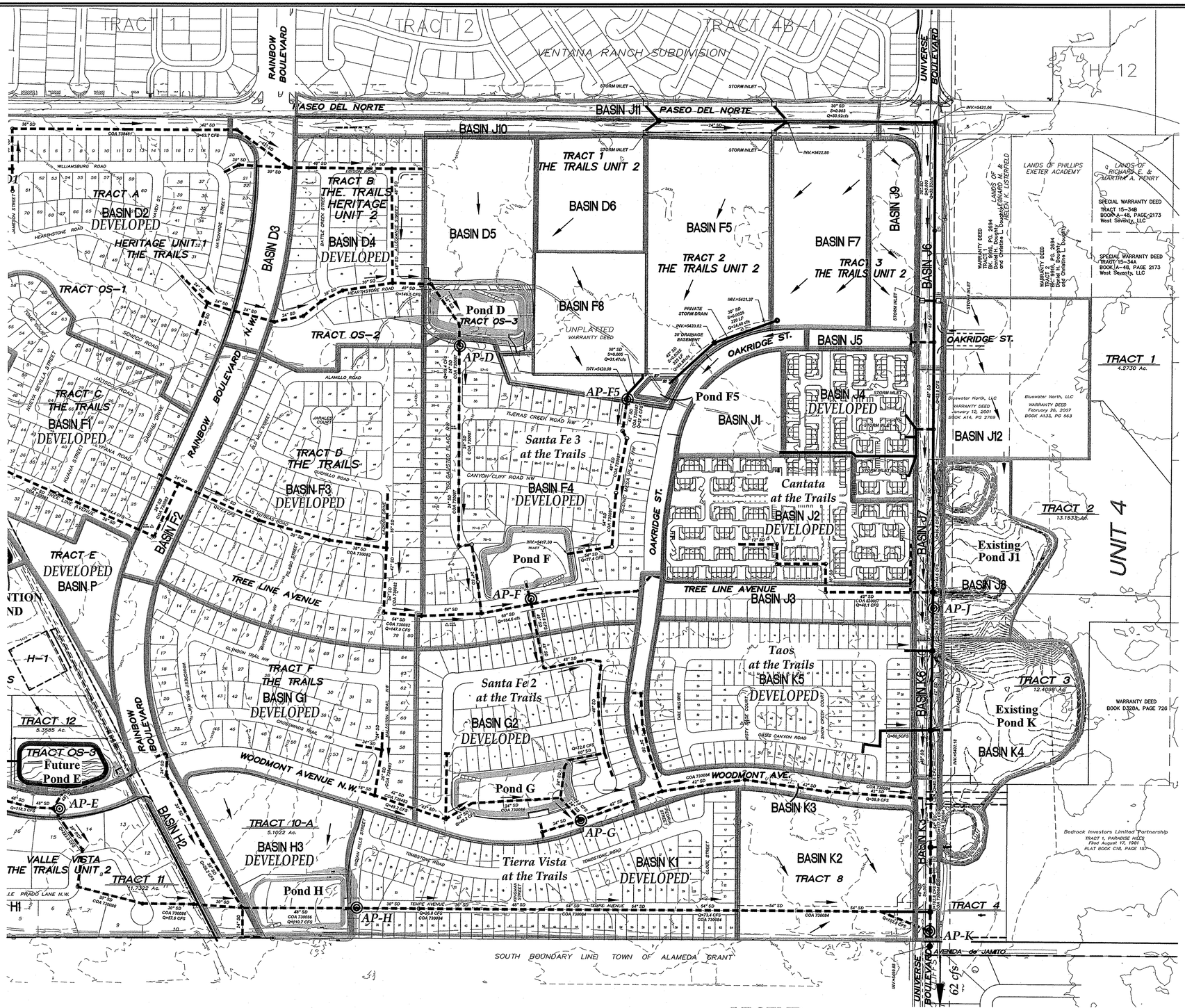
DATUM NAVD 1929

Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9248

UPDATE TO THE AMENDMENT TO DMP FOR THE TRAILS UNITS, 1, 2 AND 3

PLATE 1

NEW MEXICO 9677 REGISTERED PROFESSIONAL ENGINEER



DETENTION POND CHARACTERISTICS

POND	DRAIN AREA (AC)	Q100 IN (CFS)	Q100 OUT (CFS)	BYPASS Q (CFS)	MAX VOL (ac-ft)	V100 (ac-ft)	TOP ELEV	BOTTOM ELEV	WSEL
OFF 1	127.9	37.00	9.25		2.44	2.302	6	0	5.80
A5	179.6	121.19	16.29		4.61	4.256	5516	5511	5515.76
A6	204.2	84.21	16.19		4.72	3.241	5506	5500	5504.73
B	12.8	34.80	3.36		0.99	0.930	5519	5515	5518.86
D1	222.5	65.02	14.46		6.06	5.360	5475	5471	5474.48
D	274.7	146.48	5.93	13.77	6.24	4.035	5436.9	5429.5	5435.03
E	118.2	194.46	20.22		7.17	6.412	5452	5440	5451.44
F5	18.9	62.89	19.84		1.40	1.386	5426	5421	5425.97
F	373.1	259.49	17.58	6.20	11.76	10.293	5424.3	5415.08	5423.51
G	405.5	111.28	7.00	17.61	7.21	2.948	5422.5	5415.67	5419.83
H	149.8	97.80	4.50	21.60	3.02	2.205	5422	5418.65	5421.42
J	57.9	141.18	6.05	26.34	7.94	3.771	5417	5414	5415.66
K	670.8	239.15	15.75	44.91	14.84	8.346	5409	5404.85	5407.77

ANALYSIS POINT PEAK FLOWS

ANALYSIS POINT	PEAK FLOW
AP-A5	16.29 CFS
AP-A6	16.19 CFS
AP-D1	14.46 CFS
AP-D	19.42 CFS
AP-E	20.22 CFS
AP-F5	27.40 CFS
AP-F	23.78 CFS
AP-G	24.61 CFS
AP-H	26.10 CFS
AP-J	32.39 CFS
AP-K	60.66 CFS

DEVELOPED DRAINAGE BASIN CHARACTERISTICS

BASIN	AREA	LAND TREATMENT				Q	VOL
	ACRES	A	B	C	D	CFS	AC-FT
OFFSITE 1	127.87	100	0	0	0	37.00	4.426
A1	13.50	0	12.5	12.5	75	51.68	2.610
A2	8.52	0	33	33	34	23.43	0.960
A3	3.21	0	5	5	90	11.41	0.606
A4	7.59	0	7.5	7.5	85	26.39	1.381
A5	11.71	0	17	17	66	37.55	1.829
A6	16.97	0	19	19	62	53.44	2.558
A7	6.75	0	12.5	12.5	75	22.52	1.137
C	9.08	12.8	28.4	28.4	30.4	23.20	0.935
D1	11.62	0	19	19	62	36.60	1.752
D2	22.12	0	28.5	28.5	43	63.65	2.763
D3	3.71	0	5	5	90	13.18	0.701
D4	12.55	0	28.5	28.5	43	36.13	1.568
D5	8.75	0	23	23	54	26.55	1.224
D6	5.00	0	18	18	64	15.89	0.764
F1	14.13	0	21.7	21.8	56.5	43.39	2.025
F2	3.67	0	5	5	90	13.02	0.692
F3	22.80	0	21.7	21.8	56.5	70.02	3.267
F4	24.91	0	25	25	50	74.16	3.349
F5	11.85	0	12.5	12.5	75	39.52	1.996
F7	7.02	0	7.5	7.5	85	24.42	1.278
F8	5.00	0	18	18	64	15.89	0.764
G1	16.20	0	25	25	50	48.23	2.178
G2	16.19	0	25	25	50	48.22	2.177
OFFSITE 2	51.52	100	0	0	0	13.87	1.783
B	12.79	0	34	34	32	34.80	1.407
E1.1	11.91	0	28.1	28.1	43.8	34.41	1.501
E1.2	12.76	0	28.1	28.1	43.8	36.78	1.608
E2	5.55	0	30.7	30.7	38.6	15.63	0.660
E3	15.50	0	22	22	56	47.48	2.210
E4	3.69	0	5	5	90	13.11	0.697
E5	17.28	18.8	23.8	26.4	31	43.19	1.762
E6	3.12	0	5	5	90	11.09	0.590
E7	2.90	16.5	24.8	20.6	38.1	7.55	0.324
P	4.51	43	25	25	7	8.41	0.273
H1	11.00	0	26.6	26.6	46.8	32.26	1.431
H2	5.35	0	5	5	90	19.16	1.018
H3	7.62	0	20	20	60	23.79	1.128
J1	3.31	0	12.5	12.5	75	11.04	0.557
J2	10.92	0	12.5	12.5	75	36.40	1.839
J3	3.71	0	19	19	62	11.70	0.560
J4	6.44	0	12.5	12.5	75	21.47	1.084
J5	0.86	0	5	5	90	3.05	0.162
J6	2.70	0	5	5	90	9.59	0.510
J7	2.84	0	5	5	90	10.09	0.536
J8	5.78	0	70	30	0	12.31	0.355
J9	3.51	0	7.5	7.5	85	12.20	0.638
J10	4.02	0	5	5	90	14.27	0.759
J11	4.79	0	5	5	90	16.65	0.886
J12	9.08	100	0	0	0	10.65	0.314
K1	17.11	0	19	19	62	50.54	2.579
K2	9.51	0	15	15	70	29.39	1.537
K3	5.85	0	5	5	90	20.76	1.104
K4	8.58	0	70	30	0	18.28	0.527
K5	15.13	0	19	19	62	47.63	2.281
K6	1.41	0	5	5	90	5.01	0.266

LEGEND

- ANALYSIS POINT
- EXISTING STORM DRAIN
- FLOW DIRECTION
- FUTURE DEVELOPED STORM DRAIN

NOTES:

1. STORM DRAIN SIZES BASED ON 100-YR, 24-HR STORM FLOWS. FUTURE PROJECTS MAY BE REQUIRED TO INCREASE STORM DRAIN SIZE BASED ON 100-YR, 6-HR STORM FLOWS.
2. THE INTENDED FUTURE CONTRIBUTION FROM THE TRAILS UNIT 4 IS 20 CFS TO THE MAXIMUM DOWNSTREAM DISCHARGE OF 62 CFS IN UNIVERSE BLVD.

N

200' 100' 0 200' 400'

SCALE: 200'

DATUM NAVD 1929

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NEW MEXICO 9677 LICENSED PROFESSIONAL ENGINEER 2-26-15

UPDATE TO THE AMENDMENT TO DMP FOR THE TRAILS UNITS, 1, 2 AND 3

PLATE 2