CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

April 22, 2015

Scott Steffen, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson Street NE Courtyard I
Albuquerque, NM 87109

RE: **Valle Prado Unit 3**
Drainage Report and Grading and Drainage Plans
Engineer's Stamp Date 3-26-2015 (File: C09D011A)

Dear Mr. Steffen:

Based upon the information provided in your submittal received 3-30-2015, the above referenced submittals are approved for DRB action on the Preliminary Plat and Site Plan for Subdivision.

The Grading and Drainage Plans are approved for Grading Permit contingent upon DRB approval. Prior to Building Permit approval, Engineer Certification per the DPM checklist will be required.

Since the disturbed area on this site exceeds 1.0 acre, an Erosion and Sediment Control (ESC) Plan, prepared by a NM PE and approved by the City's Stormwater Engineer, will be required for this site

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf Addressee via Email

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

Bohannan Huston

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

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voice: 505.823.1000
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toll free: 800.877.5332

March 26, 2015

Rita Harmon, P. E.
Planning Department
Hydrology Review Section
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Valle Prado Unit 3, Grading and Drainage Plan (C09/D011A)

Dear Rita:

This letter provides a written response to your comments dated November 25, 2014:

Pertaining to the drainage concept presented in the Report and its congruency with the DMP:

1. *Approval from the Gas Company is required, as there is some grading and drainage into the easement. Gas Company approval to reference the Engineer's Stamp date. Indicate how far into gas easement, and how deep you will excavate in order to tie into the existing Storm Drain in Tree Line Avenue. The as-builts show that the last sticks of pipe would need to be removed.* **The requirement for Gas Company approval is noted. The existing 36" storm drain extends about 65' west of the 50' gas easement. Connection to the western terminus (per field design survey information) of the existing storm drain is at MH 20 per the Inlet and Storm Drain Network Map. Therefore, there will be no excavation required within the gas easement to tie to the existing storm drain.**

2. *Tract OS-2 seems to have historically drained thru Lot 24. Wall on North side of lot needs to allow historic flows to pass. The G&D Plan shows that runoff is directed towards the east side of the lot, which may impact adjacent Lots 39 and 47. What are the pad elevations of these lots? Show grades beyond property line. Is there a wall? It would be preferable for offsite flows to drain to gas easement side.* **A small retention pond has been added on Tract OS-2 to capture the historic flows that impact Lot 24. The grading plan matches the existing wall grades on the west side (Valle Prado side) of the wall along Santa Fe at the Trails Lots 39 and 47. As-built elevations from the grading and drainage certification for Lots 39 and 47 have been added to the grading plan.**

3. *Most of Lots 9, 10 and 11 drain to gas easement as opposed to Tract A or Tree Line Avenue.* **Most of Lots 10 and 11 drain to the gas easement. Lot 9 grading has been revised to drain to Tract A area outside the gas easement.**

4. *Parks and Rec. would like a trail alongside Pond A6. How does this impact the required pond volume, and subsequently this development?* **The Pond A6 grading per the approved Offsite Pond Grading Plan dated 9/16/14 is an interim grading plan. As previously discussed, the purpose of the 9/16/14 grading plan is to determine where the basalt surface lies within the pond area. This basalt surface data will be used to establish the permanent pond design such that Pond A6 will have the required volume per the Trails Drainage Master Plan. At this time it is premature to design a trail adjacent to Pond A6 as the pond design will change in the future. The permanent design of Pond A6 will occur with the development of upstream Basins that drain to Pond A6. A trail alongside Pond A6 will not impact the pond volume required by the Trails Drainage Master Plan. The future presence of a trail will not impact the Valle Prado Unit 3 subdivision. Pond A6 intercepts flows from Offsite Basin 1. Runoff volume from Offsite Basin 1 is 0.2 acre-feet. The interim storage volume of Pond A6 is 3.5 acre-feet.**

5. *Can a retaining wall be avoided on Lots 3 & 4?* **The rear yard retaining wall on Lots 3 & 4 is necessary due to the existing ground elevation differential between Two Rock Road and Tree Line Avenue and the location of basalt in Two Rock Road behind Lots 3 and 4. In addition, Tree Line Avenue needs to be lower than Two Rock Road at Longwalk Street to direct runoff to the sump in Tree Line Avenue. See additional grades provided on revised grading plan.**

6. *Why is the grade raised to 5510' South of Lots 19, 20 and 21? How does this fit in with the future plans for the extension of Two Rock Road to the future Sandmark Road and the Future Basin 3 (from Unit 1&2 Drainage Report)?* **The 5510' elevation is based on the conceptual grading plan for future lots that will back to Lots 19-21. The conceptual grading plan is based on depth to basalt for the future extension of Sandmark and Two Rock Roads and the lots that front Sandmark Road.**

7. *Drainage Report (IV) states Unit 3 is 14.5 acres, but Basin Map shows 9.1 acres.* **The 14.5 acres is based on the existing Tracts to be subdivided per the Preliminary Plat. Tract C, 7.7 acres, will be subdivided as part of future phases of the Valle Prado development. Basin 1 includes about 2 acres from Tract OS-2 that is not part of the 14.5 acres that is being subdivided to create Valle Prado Unit 3.**

8. *What is the datum difference in order to compare earlier and adjacent work orders?* **Approximately 2.7 feet.**

9. *Show existing flowline elevations and slopes where Tree Line ties into the existing at Santa Fe at the Trails.* **The existing information has been added.**

If you have any questions or require further information in order to approve the Grading and Drainage Plan, please feel free to contact me at 823-1000.

Sincerely,

Scott J. Steffen, P.E.
Vice President
Community Development and Planning Group

Enclosures

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: DMP FOR VALLE PRADO UNIT 3 Building Permit #: _____ City Drainage #: _____

DRB#: 1004404 EPC#: _____ Work Order#: _____

Legal Description: Tract F Valle Prado Unit 1 and Tract A Valle Prado Unit 2

City Address: _____

Engineering Firm: BOHANNAN HUSTON INC Contact: SCOTT STEFFEN

Address: 7500 JEFFERSON ST NE COURTYARD 1 ALBUQUERQUE NM 87109

Phone#: 823-1000 Fax#: _____ E-mail: SSTEFFEN@BHINC.COM

Owner: WOODMONT PASEO, LLC Contact: RICK BELTRAMO

Address: 6330 RIVERSIDE PLAZA LANE #160 ALBUQUERQUE NM 87120

Phone#: 505-761-9911 Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

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

Surveyor: _____ Contact: _____

Address: _____

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

Contractor: _____ Contact: _____

Address: _____

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

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL
- X DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL G & D PLAN
- X GRADING PLAN
- ___ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ___ ENGINEER'S CERT (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEER'S CERT (TCL)
- ___ ENGINEER'S CERT (DRB SITE PLAN)
- ___ ENGINEER'S CERT (ESC)
- ___ SO-19
- ___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ___ SIA/FINANCIAL GUARANTEE RELEASE
- X PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM)
- ___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- X GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ GRADING CERTIFICATION

- ___ SO-19 APPROVAL
- ___ ESC PERMIT APPROVAL
- ___ ESC CERT. ACCEPTANCE
- ___ OTHER (SPECIFY)

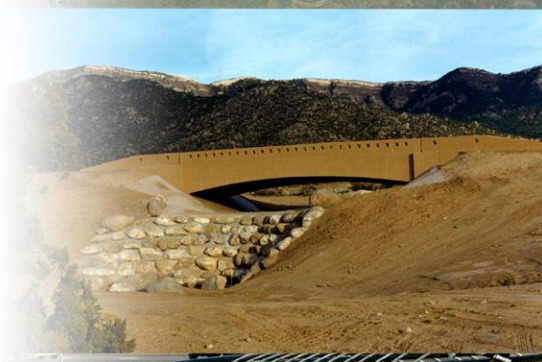
WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes ___ No ___ Copy Provided

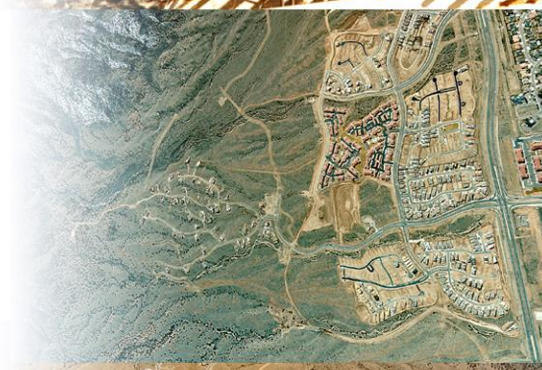
DATE SUBMITTED: 3/27/15 By: SCOTT STEFFEN

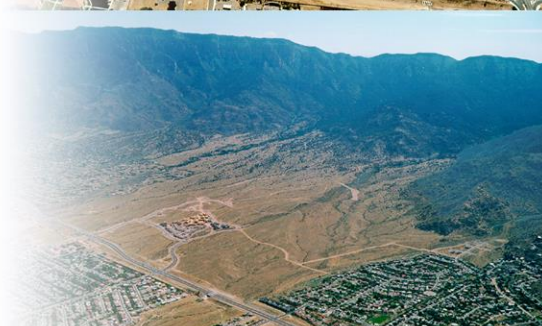
Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based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

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

DRAINAGE REPORT FOR VALLE PRADO UNIT 3 SUBDIVISION





MARCH 2015

Prepared for:

Woodmont Paseo, LLC

6300 Riverside Plaza Lane, Suite 160

Albuquerque, NM 87120

Bohannan Huston

Engineering

Spatial Data

Advanced Technologies

DRAINAGE REPORT
FOR
VALLE PRADO UNIT 3 AT THE TRAILS UNIT 3A
SUBDIVISION

MARCH 25, 2015

Prepared for:

WOODMONT PASEO, LLC
6300 RIVERSIDE PLAZA LANE, SUITE 160
ALBUQUERQUE, NM 87120

Prepared by:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109

Prepared By:

3/26/15

Scott J. Steffen, P.E. Date
Project Manager

SCOTT J. STEFFEN
NEW MEXICO
14664
REGISTERED PROFESSIONAL ENGINEER

TABLE OF CONTENTS

APPENDICES

EXHIBITS

I. PURPOSE

This report establishes a drainage management plan for Valle Prado Unit 3 at the Trails Unit 3A. The proposed development consists of 24 single family detached residential lots on approximately 14.5 acres. This project is located within the Volcano Trails Sector Plan area, in northwest Albuquerque, east of Rainbow Blvd and north of Woodmont Avenue. Valle Prado Unit 3 is in the Trails Units 1-3 Drainage Master Plan (DMP) area and has discharge of developed flows to an existing storm drain system in Tree Line Avenue in the Santa Fe at the Trails Subdivision, just east of this proposed subdivision. 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**. The storm drain inlets were sized using the 24-hour storm event (the 24-hour and 6-hour storm event produced the same Q). 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:

- *Amendment to the Drainage Master Plan for the Trails Units 1, 2, and 3*, prepared by Thompson Engineering Consultants, dated April 2014.

This amendment to the Drainage Management Plan (DMP) for the Trails "is to update the land use of the undeveloped parcels to match the density identified in the recently approved Volcano Trails Sector Development Plan (VTSDP) and to update the Developed Conditions Drainage Master Plan to adhere to the peak flow discharge from the previously approved Trails DMP". The DMP allows a discharge of 24.36 cfs from Valle Prado Unit 3.

III. SITE LOCATION AND CHARACTERISTICS

Valle Prado Unit 3 is currently undeveloped with grades ranging from one percent to three percent. The site generally slopes from west to east. It is bounded by Open Space Tract OS-2 to the north and west, Valle Prado Unit 2 to the south, and the Santa Fe at the Trails Subdivision to the east. Access to Valle Prado Unit 3 will be from Tree Line Avenue and Woodmont Avenue through Valle Prado Units 1 and 2.

IV. DEVELOPED HYDRAULIC AND HYDROLOGIC CONDITIONS

Valle Prado Unit 3 is a proposed single-family residential development with 24 lots on 14.5 acres. Proposed street and lot configurations are shown on the *Preliminary Plat*, **Exhibit 1.** Valle Prado Unit 3 is encompassed by Tract 10 at the Trails Unit 3A and labeled as Basin C with Q=24.36 cfs in the Trails Units 1-3 DMP. The DMP allows for full discharge of developed flows from Valle Prado Unit 3 to enter the existing storm drain in Tree Line Avenue.

The percent impervious land treatment for the proposed conditions is determined from Table A-5 of the DPM, Section 22.2. The Basin C percent impervious land treatment value used in the Trails DMP AHYMO analysis is 50 percent. The Valle Prado Unit 3 percent impervious land treatment calculated for this report has a cumulative impervious land treatment value of 28 percent.

A. OFFSITE FLOWS

Limited offsite flows from Tract OS-2 at the Trails Unit 3A reach Valle Prado Unit 3. Offsite flows from the west (Offsite Basin 1) are captured by Future Pond A6 as described in the DMP. Plates (exhibits) from the DMP have been included in this submittal as supplemental information, see **Exhibit 5**. For detailed analysis of the offsite flows and future ponds, please see the DMP. A portion of Tract OS-2 (Basin 1A) to the north of Valle Prado Unit 3 drains toward Lot 24. A retention pond, sized to capture two times the 100-year storm event (0.11 acre-feet), will intercept the runoff from Basin 1A north of Lot 24. The emergency spillway for the pond will be through an existing pedestrian access point at the west end of Teypana Road in the Santa Fe at the Trails Subdivision. Valle Prado Unit 3 is higher in elevation than the remaining undeveloped land to the north, and the Santa Fe at the Trails and Valle Prado Unit 2 Subdivisions to the east. Undeveloped land to the south (future phase of the Valle Prado development shown as Future Basin 3 in the Valle Prado

Unit 1 and 2 Drainage Report) drains toward South Sky Street in the Valle Prado Unit 2 Subdivision.

B. ONSITE FLOWS

Developed flows from Valle Prado Unit 3 will be directed to the existing 36 inch storm drain in Tree Line Avenue that was constructed with the Santa Fe at the Trails Subdivision. DMP Basin C is 8.18 acres and follows the Tract 10, Unit 3A boundary. The Unit 3 lot/street layout does not follow the Tract 10 boundary, which results in Basins 1-3 containing 9.1 acres. However, the lower percent impervious land in Unit 3 results in a total runoff that is less than the allowable runoff in the DMP. For reference, see **Exhibit 2** for Unit 3 basin locations and **Exhibits 3 and 4** for the storm drain and inlet locations.

Basins 1B (3.0 cfs) and 2 (11.6 cfs) drain to two Type A single grate inlets (Inlets #19 and 20) at a low point in Tree Line Avenue east of Longwalk Street. Inlets #19 and 20 are in a sump condition and there is no emergency spill way present, therefore the inlets have been sized to capture two times the 100-year storm event as shown in **Appendix B**. Runoff from Basin 3 (4.4 cfs) is intercepted by two Type A single grate inlets (Inlets #17 and 18) in Two Rock Road. Flow from these inlets is conveyed via storm drain to Tree Line Avenue where they combine with flows from Basins 1B and 2. The total runoff from Valle Prado Unit 3, 18.9 cfs, is less than the runoff, 24.36 cfs, allowed in the DMP.

C. FIRST FLUSH REQUIREMENTS

Valle Prado Unit 3 is required to meet the first flush requirements of the new City Drainage Ordinance. The Tree Line Avenue storm drain system passes through Ponds F and G. However, Ponds F and G are both surge ponds and have no storage capacity to hold the first flush from Valle Prado Unit 3. Therefore the first flush requirement for Valle Prado Unit 3 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, 45 ft. x75 ft. and 50 ft. x75 ft., in Valle Prado Unit 3, with a first flush requirement of 48 and 53 cubic feet, respectively. See the first flush pond detail for the typical lot location in the *Grading Plan Details*, **Exhibit 4**.

D. OFFSITE STORM DRAIN IMPROVEMENTS

The Amended Trails Units 1-3 DMP, April 2014, requires modifications to the Pond F and G inlet and outlet structures to meet the revised inflow and outflow flow rates. The

Pond F and G modifications will be constructed as part of the Valle Prado Unit 3 development to include the following:

- Provide outlet control (orifice) to limit the pond bypass flow plus routed discharge through the pond to a maximum of 23.9 and 24.6 cfs, for Ponds F and G, respectively, when the pond water surface is at the 100-year pond volume elevation.
- Provide pond inflow capacity to match the DMP inflow (bypass plus surge) of 261.9 and 111.3 cfs, for Ponds F and G, respectively.

V. CONCLUSION

This report provides a detailed study of the developed runoff and street capacities for the proposed Valle Prado Unit 3 at the Trails Unit 3A Subdivision. Included are the preliminary plat, basin map, grading plan, and all necessary hydrologic and hydraulic analyses. The proposed drainage plan for Valle Prado Unit 3 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 C: INROADS STORM DRAIN NETWORK FILE

APPENDIX A

DEVELOPED CONDITIONS AHYMO SUMMARY, OUTPUT, AND INPUT FILES

DEVELOPED CONDITIONS AHYMO SUMMARY FILE

Bohannan Huston

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COMMAND          IDENTIFICATION  NO.  NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)   ACRE     NOTATION

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*S
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LOCATION                        DEFAULT
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*s                    **********************
*S
*S
*S
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A-1

DEVELOPED CONDITIONS AHYMO OUTPUT FILE

Bohannan Huston

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*  CREATED OCTOBER 6, 2014
*  UPDATED MARCH 25, 2015
*
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          B             0.50                  1.25
          C             0.35                  0.83
          D             0.10                  0.04

*
*********************************************************
*
*********************************************************
*100 YEAR - 24 HOUR
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                          RAIN DAY=2.66 IN  DT=0.10 HRS


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*S
*S                    ************************
*S                    *COMPUTE ONSITE BASINS*
*s                    ************************
*S
*S
*S
*S COMPUTE BASIN 1A ****************************************************
*
COMPUTE NM HYD       ID=1 HYD=1A  AREA=0.001729 PER A=50 PER B=25
                          PER C=25 PER D=0  TP=-0.1715  RAINFALL=-1

     K =   .182027HR    TP =   .171500HR    K/TP RATIO =  1.061381     SHAPE CONSTANT, N =  3.327012
     UNIT PEAK =   3.0999    CFS   UNIT VOLUME =    .9940       B =   307.48      P60 = 1.8400
     AREA =      .001729 SQ MI    IA =    .53750 INCHES    INF =   1.35500 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD            ID=1   CODE=1

                                     HYDROGRAPH FROM AREA 1A


    RUNOFF VOLUME =      .58270 INCHES     =        .0537 ACRE-FEET
    PEAK DISCHARGE RATE =       1.51 CFS  AT   1.500 HOURS   BASIN AREA =   .0017 SQ. MI.



*
*S COMPUTE BASIN 1B ****************************************************
*
COMPUTE NM HYD       ID=2 HYD=1B  AREA=0.001921 PER A=0 PER B=35
                          PER C=35 PER D=30  TP=-0.1715  RAINFALL=-1

     K =   .093468HR    TP =   .171500HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   1.7685    CFS   UNIT VOLUME =    1.001       B =   526.28      P60 = 1.8400
     AREA =      .000576 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .152490HR    TP =   .171500HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989068
     UNIT PEAK =   2.7791    CFS   UNIT VOLUME =    .9998       B =   354.44      P60 = 1.8400
     AREA =      .001345 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD            ID=2   CODE=1

                                     HYDROGRAPH FROM AREA 1B


    RUNOFF VOLUME =     1.28741 INCHES     =        .1319 ACRE-FEET
    PEAK DISCHARGE RATE =       2.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0019 SQ. MI.



*
*S COMPUTE BASIN 2 ****************************************************
COMPUTE NM HYD       ID=3 HYD=2  AREA=0.007088  PER A=0 PER B=31
                          PER C=31 PER D=38  TP=-0.1715  RAINFALL=-1

     K =   .093468HR    TP =   .171500HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   8.2653    CFS   UNIT VOLUME =    1.005       B =   526.28      P60 = 1.8400
     AREA =      .002693 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .152490HR    TP =   .171500HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989068
     UNIT PEAK =   9.0823    CFS   UNIT VOLUME =    1.003       B =   354.44      P60 = 1.8400
     AREA =      .004395 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD            ID=3   CODE=1

                                   OUTFLOW HYDROGRAPH REACH     2.00


    RUNOFF VOLUME =     1.41777 INCHES     =        .5360 ACRE-FEET
    PEAK DISCHARGE RATE =      11.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0071 SQ. MI.
```

```
*
*S COMPUTE BASIN 3 ****************************************************
COMPUTE NM HYD       ID=4 HYD=3  AREA=0.002524  PER A=0 PER B=27
                          PER C=27 PER D=46  TP=-0.1715  RAINFALL=-1

     K =   .093468HR    TP =   .171500HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   3.5628    CFS   UNIT VOLUME =    1.004       B =   526.28      P60 = 1.8400
     AREA =      .001161 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000


     K =   .152490HR    TP =   .171500HR    K/TP RATIO =   .889153     SHAPE CONSTANT, N =  3.989068
     UNIT PEAK =   2.8168    CFS   UNIT VOLUME =    .9998       B =   354.44      P60 = 1.8400
     AREA =      .001363 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     3.00


    RUNOFF VOLUME =     1.54813 INCHES     =        .2084 ACRE-FEET
    PEAK DISCHARGE RATE =       4.35 CFS  AT   1.500 HOURS   BASIN AREA =   .0025 SQ. MI.


*
*S COMPUTE OFFSITE BASIN 1 ************************************************
COMPUTE NM HYD       ID=10 HYD=OFF.1  AREA=0.002282  PER A=70 PER B=15
                          PER C=15 PER D=0  TP=-0.1715  RAINFALL=-1

     K =   .193842HR    TP =   .171500HR    K/TP RATIO =  1.130272     SHAPE CONSTANT, N =  3.131237
     UNIT PEAK =   3.8901    CFS   UNIT VOLUME =    .9924       B =   292.35      P60 = 1.8400
     AREA =      .002282 SQ MI    IA =    .58250 INCHES    INF =   1.48100 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .100000

PRINT HYD            ID=10   CODE=1

                                    HYDROGRAPH FROM AREA OFF.1


    RUNOFF VOLUME =      .51355 INCHES     =        .0625 ACRE-FEET
    PEAK DISCHARGE RATE =       1.71 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.


*
```

```
*S ADD BASINS 1B AND 2 TO CREATE TEMP A ***********************************
 ADD HYD             ID=20 HYD=TEMP.A ID I=2 II=3
 PRINT HYD            ID=20 CODE=0
```

HYDROGRAPH FROM AREA TEMP.A

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.000	.1	10.000	.1	15.000	.1	20.000	.0
.100	.0	5.100	.1	10.100	.1	15.100	.1	20.100	.0
.200	.0	5.200	.1	10.200	.1	15.200	.1	20.200	.0
.300	.0	5.300	.1	10.300	.1	15.300	.1	20.300	.0
.400	.0	5.400	.1	10.400	.1	15.400	.1	20.400	.0
.500	.0	5.500	.1	10.500	.1	15.500	.1	20.500	.0
.600	.0	5.600	.1	10.600	.1	15.600	.0	20.600	.0
.700	.0	5.700	.1	10.700	.1	15.700	.1	20.700	.0
.800	.0	5.800	.1	10.800	.1	15.800	.1	20.800	.0
.900	.0	5.900	.1	10.900	.1	15.900	.0	20.900	.0
1.000	.0	6.000	.1	11.000	.1	16.000	.0	21.000	.0
1.100	.0	6.100	.1	11.100	.1	16.100	.0	21.100	.0
1.200	.4	6.200	.1	11.200	.1	16.200	.0	21.200	.0
1.300	2.1	6.300	.1	11.300	.1	16.300	.0	21.300	.0
1.400	8.8	6.400	.1	11.400	.1	16.400	.0	21.400	.0
1.500	14.5	6.500	.1	11.500	.1	16.500	.0	21.500	.0
1.600	12.6	6.600	.1	11.600	.1	16.600	.0	21.600	.0
1.700	8.5	6.700	.1	11.700	.1	16.700	.0	21.700	.0
1.800	5.9	6.800	.1	11.800	.1	16.800	.0	21.800	.0
1.900	4.2	6.900	.1	11.900	.1	16.900	.0	21.900	.0
2.000	3.3	7.000	.1	12.000	.1	17.000	.0	22.000	.0
2.100	2.4	7.100	.1	12.100	.1	17.100	.0	22.100	.0
2.200	1.5	7.200	.1	12.200	.1	17.200	.0	22.200	.0
2.300	1.1	7.300	.1	12.300	.1	17.300	.0	22.300	.0
2.400	.8	7.400	.1	12.400	.1	17.400	.0	22.400	.0
2.500	.6	7.500	.1	12.500	.1	17.500	.0	22.500	.0
2.600	.5	7.600	.1	12.600	.1	17.600	.0	22.600	.0
2.700	.4	7.700	.1	12.700	.1	17.700	.0	22.700	.0
2.800	.3	7.800	.1	12.800	.1	17.800	.0	22.800	.0
2.900	.3	7.900	.1	12.900	.1	17.900	.0	22.900	.0
3.000	.2	8.000	.1	13.000	.1	18.000	.0	23.000	.0
3.100	.2	8.100	.1	13.100	.1	18.100	.0	23.100	.0
3.200	.2	8.200	.1	13.200	.1	18.200	.0	23.200	.0
3.300	.1	8.300	.1	13.300	.1	18.300	.0	23.300	.0
3.400	.1	8.400	.1	13.400	.1	18.400	.0	23.400	.0
3.500	.1	8.500	.1	13.500	.1	18.500	.0	23.500	.0
3.600	.1	8.600	.1	13.600	.1	18.600	.0	23.600	.0
3.700	.1	8.700	.1	13.700	.1	18.700	.0	23.700	.0
3.800	.1	8.800	.1	13.800	.1	18.800	.0	23.800	.0
3.900	.1	8.900	.1	13.900	.1	18.900	.0	23.900	.0
4.000	.1	9.000	.1	14.000	.1	19.000	.0	24.000	.0
4.100	.1	9.100	.1	14.100	.1	19.100	.0	24.100	.0
4.200	.1	9.200	.1	14.200	.1	19.200	.0	24.200	.0
4.300	.1	9.300	.1	14.300	.1	19.300	.0	24.300	.0
4.400	.1	9.400	.1	14.400	.1	19.400	.0	24.400	.0
4.500	.1	9.500	.1	14.500	.1	19.500	.0	24.500	.0
4.600	.1	9.600	.1	14.600	.1	19.600	.0	24.600	.0
4.700	.1	9.700	.1	14.700	.1	19.700	.0	24.700	.0
4.800	.1	9.800	.1	14.800	.1	19.800	.0		
4.900	.1	9.900	.1	14.900	.1	19.900	.0		

RUNOFF VOLUME = 1.38990 INCHES = .6678 ACRE-FEET
PEAK DISCHARGE RATE = 14.55 CFS AT 1.500 HOURS BASIN AREA = .0090 SQ. MI.

```
*
   *S ADD BASINS TEMP A AND 3 TO CREATE AP 1**********************************
   ADD HYD             ID=21 HYD=AP1 ID I=4 II=20
   PRINT HYD            ID=21 CODE=0
```

HYDROGRAPH FROM AREA AP1

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.000	.1	10.000	.1	15.000	.1	20.000	.1
.100	.0	5.100	.1	10.100	.1	15.100	.1	20.100	.1
.200	.0	5.200	.1	10.200	.1	15.200	.1	20.200	.1
.300	.0	5.300	.1	10.300	.1	15.300	.1	20.300	.1
.400	.0	5.400	.1	10.400	.1	15.400	.1	20.400	.1
.500	.0	5.500	.1	10.500	.1	15.500	.1	20.500	.1
.600	.0	5.600	.1	10.600	.1	15.600	.1	20.600	.1
.700	.0	5.700	.1	10.700	.1	15.700	.1	20.700	.1
.800	.0	5.800	.1	10.800	.1	15.800	.1	20.800	.1
.900	.0	5.900	.1	10.900	.1	15.900	.1	20.900	.1
1.000	.0	6.000	.1	11.000	.1	16.000	.1	21.000	.1
1.100	.0	6.100	.1	11.100	.1	16.100	.1	21.100	.1
1.200	.6	6.200	.1	11.200	.1	16.200	.1	21.200	.1
1.300	2.8	6.300	.1	11.300	.1	16.300	.1	21.300	.1
1.400	11.5	6.400	.1	11.400	.1	16.400	.1	21.400	.1
1.500	18.9	6.500	.1	11.500	.1	16.500	.1	21.500	.1
1.600	16.3	6.600	.1	11.600	.1	16.600	.1	21.600	.1
1.700	11.1	6.700	.1	11.700	.1	16.700	.1	21.700	.1
1.800	7.7	6.800	.1	11.800	.1	16.800	.1	21.800	.1
1.900	5.5	6.900	.1	11.900	.1	16.900	.1	21.900	.1
2.000	4.3	7.000	.1	12.000	.1	17.000	.1	22.000	.1
2.100	3.2	7.100	.1	12.100	.1	17.100	.1	22.100	.1
2.200	2.0	7.200	.1	12.200	.1	17.200	.1	22.200	.1
2.300	1.4	7.300	.1	12.300	.1	17.300	.1	22.300	.1
2.400	1.1	7.400	.1	12.400	.1	17.400	.1	22.400	.1
2.500	.8	7.500	.1	12.500	.1	17.500	.1	22.500	.1
2.600	.7	7.600	.1	12.600	.1	17.600	.1	22.600	.1
2.700	.5	7.700	.1	12.700	.1	17.700	.1	22.700	.1
2.800	.4	7.800	.1	12.800	.1	17.800	.1	22.800	.1
2.900	.4	7.900	.1	12.900	.1	17.900	.1	22.900	.1
3.000	.3	8.000	.1	13.000	.1	18.000	.1	23.000	.1
3.100	.2	8.100	.1	13.100	.1	18.100	.1	23.100	.1
3.200	.2	8.200	.1	13.200	.1	18.200	.1	23.200	.1
3.300	.2	8.300	.1	13.300	.1	18.300	.1	23.300	.1
3.400	.2	8.400	.1	13.400	.1	18.400	.1	23.400	.1
3.500	.1	8.500	.1	13.500	.1	18.500	.1	23.500	.1
3.600	.1	8.600	.1	13.600	.1	18.600	.1	23.600	.1
3.700	.1	8.700	.1	13.700	.1	18.700	.1	23.700	.1
3.800	.1	8.800	.1	13.800	.1	18.800	.1	23.800	.1
3.900	.1	8.900	.1	13.900	.1	18.900	.1	23.900	.1
4.000	.1	9.000	.1	14.000	.1	19.000	.1	24.000	.1
4.100	.1	9.100	.1	14.100	.1	19.100	.1	24.100	.0
4.200	.1	9.200	.1	14.200	.1	19.200	.1	24.200	.0
4.300	.1	9.300	.1	14.300	.1	19.300	.1	24.300	.0
4.400	.1	9.400	.1	14.400	.1	19.400	.1	24.400	.0
4.500	.1	9.500	.1	14.500	.1	19.500	.1	24.500	.0
4.600	.1	9.600	.1	14.600	.1	19.600	.1	24.600	.0
4.700	.1	9.700	.1	14.700	.1	19.700	.1	24.700	.0
4.800	.1	9.800	.1	14.800	.1	19.800	.1		
4.900	.1	9.900	.1	14.900	.1	19.900	.1		

```
   RUNOFF VOLUME =     1.42450 INCHES     =        .8762 ACRE-FEET
   PEAK DISCHARGE RATE =      18.89 CFS  AT   1.500 HOURS   BASIN AREA =   .0115 SQ. MI.


*
*
*
FINISH

   NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:05:49
```

DEVELOPED CONDITIONS AHYMO INPUT FILE

Bohannan Huston

```
*S  VALLE PRADO UNIT 3 SUBDIVISION DRAINAGE BASIN (D) PROPOSED
*S  100 YEAR - 24 HOUR STORM
*S
*  CREATED OCTOBER 6, 2014
*  UPDATED MARCH 25, 2015
*
*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 1A ****************************************************
*
COMPUTE NM HYD        ID=1 HYD=1A  AREA=0.001729 PER A=50 PER B=25
                   PER C=25 PER D=0  TP=-0.1715  RAINFALL=-1
PRINT HYD             ID=1   CODE=1
*
*S COMPUTE BASIN 1B ****************************************************
*
COMPUTE NM HYD        ID=2 HYD=1B  AREA=0.001921 PER A=0 PER B=35
                   PER C=35 PER D=30  TP=-0.1715  RAINFALL=-1
PRINT HYD             ID=2   CODE=1

*
*S COMPUTE BASIN 2 *****************************************************
COMPUTE NM HYD        ID=3 HYD=2  AREA=0.007088  PER A=0 PER B=31
                   PER C=31 PER D=38  TP=-0.1715  RAINFALL=-1
PRINT HYD             ID=3   CODE=1
*
*S COMPUTE BASIN 3 *****************************************************
COMPUTE NM HYD        ID=4 HYD=3  AREA=0.002524  PER A=0 PER B=27
                   PER C=27 PER D=46  TP=-0.1715  RAINFALL=-1
PRINT HYD             ID=4   CODE=1
*
*S COMPUTE OFFSITE BASIN 1 *********************************************
COMPUTE NM HYD        ID=10 HYD=OFF.1  AREA=0.002282  PER A=70 PER B=15
                   PER C=15 PER D=0  TP=-0.1715  RAINFALL=-1
PRINT HYD             ID=10   CODE=1
*
*S ADD BASINS 1B AND 2 TO CREATE TEMP A ********************************
ADD HYD               ID=20 HYD=TEMP.A ID I=2 II=3
PRINT HYD             ID=20 CODE=0
*
*S ADD BASINS TEMP A AND 3 TO CREATE AP 1*******************************
ADD HYD               ID=21 HYD=AP1 ID I=4 II=20
PRINT HYD             ID=21 CODE=0
*
FINISH
```

APPENDIX B

STREET HYDRAULICS AND STORM DRAIN INLET ANALYSIS

Bohannan Huston

Two Rock_sta 19+00.txt

MANNING'S N = 0.017 SLOPE = 0.053

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	11.5	0.1	9.0	37.7	0.7
2.0	8.9	0.7	6.0	23.5	0.4	10.0	38.1	0.7
3.0	9.3	0.7	7.0	35.5	0.1	11.0	47.0	0.9
4.0	9.5	0.0	8.0	37.5	0.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.050	0.050	0.039	0.065	1.645	1.668	2.484	0.093
0.100	0.100	0.156	0.414	3.290	2.648	4.048	0.209
0.150	0.150	0.366	1.104	6.318	3.020	6.996	0.292
0.200	0.200	0.795	2.715	11.423	3.415	12.021	0.381
0.250	0.250	1.476	5.950	16.527	4.032	17.047	0.503
0.300	0.300	2.408	11.244	21.631	4.670	22.072	0.639
0.350	0.350	3.591	19.007	26.735	5.293	27.098	0.786
0.400	0.400	4.981	31.171	28.839	6.259	29.123	1.009
0.450	0.450	6.391	47.124	28.942	7.373	29.148	1.296
0.500	0.500	7.803	65.569	29.045	8.403	29.174	1.598
0.550	0.550	9.217	86.329	29.148	9.367	29.199	1.915
0.600	0.600	10.631	109.266	29.251	10.278	29.224	2.243
0.650	0.650	12.047	134.265	29.354	11.145	29.250	2.582
0.700	0.700	13.536	149.977	33.273	11.080	32.217	2.609
0.750	0.750	15.270	167.217	38.202	10.951	37.144	2.615
0.800	0.800	17.250	188.979	43.131	10.955	42.072	2.667

CAPACITY

BASIN 3 4.4 cfs < 31.2 cfs CAPACITY ∴ OK

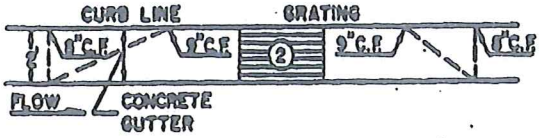
FLOW DEPTH @ 4.4 cfs ≈ 0.23'

INLET CAPACITY: SINGLE A INLET = 2.7 cfs
(SEE NOMOGRAPH)

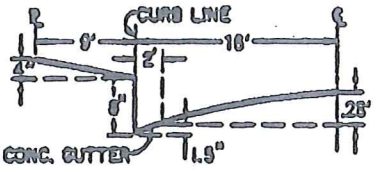
TWO A INLETS = 5.4 cfs > 4.4 cfs

NO BY PASS FLOW

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



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

D = 0.23'
S = 5.3%
Q = 2.7 cfs

PLATE 22.3 D-5

B-2

Tree Line Ave Sta 13+00.txt

MANNING'S N = 0.017 SLOPE = 0.013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.5	5.0	11.5	0.1	9.0	37.7	0.3
2.0	8.9	0.3	6.0	23.5	0.4	10.0	38.1	0.3
3.0	9.3	0.3	7.0	35.5	0.1	11.0	47.0	0.5
4.0	9.5	0.0	8.0	37.5	0.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.050	0.050	0.040	0.033	1.654	0.839	2.510	0.061
0.100	0.100	0.159	0.212	3.308	1.333	4.100	0.128
0.150	0.150	0.372	0.565	6.346	1.520	7.075	0.186
0.200	0.200	0.806	1.383	11.460	1.717	12.126	0.246
0.250	0.250	1.492	3.022	16.573	2.025	17.178	0.314
0.300	0.300	2.431	5.699	21.687	2.344	22.229	0.385
0.350	0.350	3.643	9.268	28.727	2.544	29.231	0.451
0.400	0.400	5.326	14.859	36.576	2.790	36.159	0.521
0.450	0.450	7.257	22.874	41.505	3.152	41.087	0.605
0.500	0.500	9.434	32.870	46.434	3.484	46.014	0.689

ROLL CURB CAPACITY ≈ 7.8 cfs

FLOW @ LOT 12/13 ≈ 5.0 cfs

∴ ROLL CURB OK

NO INLETS REQUIRED

MANNING'S N = 0.017 SLOPE = 0.016

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	11.5	0.1	9.0	37.7	0.7
2.0	8.9	0.7	6.0	23.5	0.4	10.0	38.1	0.7
3.0	9.3	0.7	7.0	35.5	0.1	11.0	47.0	0.9
4.0	9.5	0.0	8.0	37.5	0.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.050	0.050	0.039	0.035	1.645	0.905	2.484	0.063
0.100	0.100	0.156	0.225	3.290	1.437	4.048	0.132
0.150	0.150	0.366	0.599	6.318	1.639	6.996	0.192
0.200	0.200	0.795	1.474	11.423	1.853	12.021	0.253
0.250	0.250	1.476	3.230	16.527	2.188	17.047	0.324
0.300	0.300	2.408	6.103	21.631	2.534	22.072	0.400
0.350	0.350	3.591	10.316	26.735	2.873	27.098	0.478
0.400	0.400	4.981	16.918	28.839	3.397	29.123	0.579
0.450	0.450	6.391	25.576	28.942	4.002	29.148	0.699
0.500	0.500	7.803	35.586	29.045	4.560	29.174	0.823
0.550	0.550	9.217	46.854	29.148	5.084	29.199	0.952
0.600	0.600	10.631	59.302	29.251	5.578	29.224	1.084
0.650	0.650	12.047	72.870	29.354	6.049	29.250	1.219
0.700	0.700	13.536	81.398	33.273	6.013	32.217	1.262
0.750	0.750	15.270	90.754	38.202	5.943	37.144	1.299
0.800	0.800	17.250	102.565	43.131	5.946	42.072	1.350

CAPACITY

BASINS 1B & 2: 14.6 cfs < 46.8 cfs ∴ OK

INLET ANALYSIS:

FLOW DEPTH @ 14.6 cfs ≈ 0.39'

SINGLE A INLET IN SUMP @ d=0.39' ⇒ Q= 7.4 cfs

2 INLETS = 14.8 cfs > 14.6 cfs ∴ OK

USE 2 SINGLE A INLETS

INLET CAPACITY (2 x 100-YR)

@ TOP OF CURB (d=0.83') Q ≈ 17.2 cfs

2 INLETS = 34.4 cfs > 29.2 cfs (2 x 100 YR)

∴ USE 2 SINGLE A INLETS

LOW PT TREE LINE AVE

Single A inlet, in sump condition with curb openings on both sides:

Open Area (for orifice calc in sq. ft.): 3.93

Length of Weir (feet): 11.35

Head (ft)	Head (in)	Weir Q	Orifice Q	Control Q
0.05	0.6	0.34	4.23	0.34
0.1	1.2	0.96	5.99	0.96
0.15	1.8	1.77	7.33	1.77
0.2	2.4	2.72	8.47	2.72
0.25	3	3.80	9.46	3.80
0.3	3.6	5.00	10.37	5.00
0.35	4.2	6.30	11.20	6.30
0.4	4.8	7.70	11.97	7.70
0.45	5.4	9.19	12.70	9.19
0.5	6	10.76	13.39	10.76
0.55	6.6	12.41	14.04	12.41
0.6	7.2	14.14	14.66	14.14
0.65	7.8	15.95	15.26	15.26
0.7	8.4	17.82	15.84	15.84
0.75	9	19.76	16.39	16.39
0.8	9.6	21.77	16.93	16.93
0.85	10.2	23.85	17.45	17.45
0.9	10.8	25.98	17.96	17.96
0.95	11.4	28.18	18.45	18.45
1	12	30.43	18.93	18.93
1.05	12.6	32.74	19.40	19.40
1.1	13.2	35.11	19.85	19.85
1.15	13.8	37.53	20.30	20.30
1.2	14.4	40.00	20.74	20.74

Calculation of open area:

	(in^2)	(ft^2)
Total Grate Area	1000	6.9444444
Cross Bar Area	-366	-2.541667
Supports (ends)	-115.625	-0.802951
Areas Counted Twice	47.75	0.3315972
	566.125	3.9314236

Calculation of Length of Weir:

	(in)	(ft)
Total Perimeter of Grate	90	7.5
Short Cross Bars	-3.5	-0.291667
End Supports	-9.25	-0.770833
Bearing Bars	-13	-1.083333
Curb Openings	72	6
	136.25	11.354167

BASINS 1B & 2 = 14.6 cfs

B-5

APPENDIX C

INROADS STORM DRAIN NETWORK FILE

Bohannan Huston

Design Log

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InRoads Storm & Sanitary Design Log

Drainage File: P:\20150013\CDP\Control\Utility\20150013_SD.sdb

Design File: \\A-ABQ-NAS1\ABQ-USERS\SSTEFFEN\DOCUMENTS\DRAWING2.DWG

Display Log: \\A-ABQ-NAS1\ABQ-USERS\SSTEFFEN\DOCUMENTS\design.log

Date: Wednesday, March 25, 2015 8:39:33 AM

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HGL/EGL Computations:

Table A:

Struct_ID	D (in)	Q (cfs)	L (ft)	V (ft/s)	d (ft)	dc (ft)	V^2/2g (ft)	Sf (ft/ft)	Dn_Soffit (ft)	EGLdn (ft)	HGLdn (ft)	Tot_Loss (ft)	EGLup (ft)	HGLup (ft)	Rim_Elev. (ft)
Outfall	-	-	-	-	-	-	-	-	-	-	-	-	-	5482.15	-
SDP44	36	19.00	153.53	5.38	1.50	1.39	0.45	0.0529	5483.65	5482.60	5482.15	8.12	5490.72	5490.27	-
SDMH20	-	-	-	-	-	-	-	-	-	5490.72	5490.27	0.12	5490.84	5490.39	5494.77
(Alternate HGL and EGL Used)													5491.82	5491.37	
SDP43	18	7.30	14.81	10.87	0.61	1.04	1.83	-	5491.60	5493.20	5491.37	-	5493.68	5491.85	-
IN20	-	-	-	-	-	-	-	-	-	5493.68	5491.85	-	5493.68	5491.85	5494.41
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5490.72	5490.27	-
SDMH20	-	-	-	-	-	-	-	-	-	5490.72	5490.27	0.11	5490.83	5490.38	5494.77
(Alternate HGL and EGL Used)													5491.82	5491.37	
SDP42	18	7.30	16.19	10.43	0.63	1.04	1.69	-	5491.60	5493.06	5491.37	-	5493.54	5491.85	-
IN19	-	-	-	-	-	-	-	-	-	5493.54	5491.85	-	5493.54	5491.85	5494.41
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5490.72	5490.27	-
SDMH20	-	-	-	-	-	-	-	-	-	5490.72	5490.27	0.07	5490.78	5490.34	5494.77
SDP41	24	4.40	45.12	7.89	0.47	0.73	0.97	-	5490.70	5491.30	5490.34	-	5491.20	5490.23	-
SDMH19	-	-	-	-	-	-	-	-	-	5491.20	5490.23	-	5491.20	5490.23	5494.98
SDP15	24	4.40	66.88	5.36	0.61	0.73	0.45	-	5491.86	5490.93	5490.48	-	5491.51	5491.06	-
Junction	-	-	-	5.36	-	-	0.45	-	-	-	-	-	5491.51	5491.06	-
SDP19	24	4.40	63.33	5.36	0.61	0.73	0.45	-	5492.45	5491.51	5491.06	-	5492.06	5491.61	-
SDMH8	-	-	-	-	-	-	-	-	-	5492.06	5491.61	-	5492.06	5491.61	5495.76
SDP10	24	4.40	41.90	10.09	0.39	0.73	1.58	-	5493.10	5493.20	5491.61	-	5495.09	5493.50	-
SDMH1	-	-	-	-	-	-	-	-	-	5495.09	5493.50	-	5495.09	5493.50	5497.68
SDP9	18	2.20	17.98	10.92	0.26	0.56	1.85	-	5494.69	5495.36	5493.50	-	5497.02	5495.17	-
IN17	-	-	-	-	-	-	-	-	-	5497.02	5495.17	-	5497.02	5495.17	5498.74
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5495.09	5493.50	-
SDMH1	-	-	-	-	-	-	-	-	-	5495.09	5493.50	-	5495.73	5494.15	5497.68
(Alternate HGL and EGL Used)													5495.02	5494.81	
SDP13	18	2.20	21.99	3.64	0.56	0.56	0.21	0.0049	5495.28	5495.02	5494.81	0.11	5495.13	5494.92	-
IN18	-	-	-	-	-	-	-	-	-	5495.13	5494.92	-	5495.13	5494.92	5497.71

Table B:

LOSSES

Str_ID	Hf	Hb	Hstr	Hc	He	Hj	Total	LOSS_COEFFICENTS Dstr	Ko	CD	Cd	Cq	Cp	Cb	K
Outfall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDP44	8.12	-	-	-	-	-	8.12	-	-	-	-	-	-	-	-
SDMH20	-	-	0.12	-	-	-	0.12	1.67	1.234	1.000	0.352	0.633	1.000	1.000	0.275
SDP43	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
IN20	-	-	-	-	-	-	-	1.27	-	-	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDMH20	-	-	0.11	-	-	-	0.11	1.67	1.318	1.000	0.352	0.547	1.000	1.000	0.254
SDP42	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
IN19	-	-	-	-	-	-	-	1.27	-	-	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDMH20	-	-	0.07	-	-	-	0.07	1.67	0.234	1.000	0.352	1.779	1.000	1.000	0.147
SDP41	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
SDMH19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDP15	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
Junction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDP19	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
SDMH8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDP10	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
SDMH1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDP9	-	-	-	-	-	-	SuperCrt	-	-	-	-	-	-	-	-
IN17	-	-	-	-	-	-	-	0.26	-	-	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SDMH1	-	-	-	-	-	-	-	1.04	-	-	-	-	-	-	-
SDP13	0.11	-	-	-	-	-	0.11	-	-	-	-	-	-	-	-
IN18	-	-	-	-	-	-	-	1.04	-	-	-	-	-	-	-

C-2

EXHIBITS

EXHIBIT 1: PRELIMINARY PLAT

EXHIBIT 2: UNIT 3 BASIN MAP

EXHIBIT 3: INLET AND STORM DRAIN NETWORK MAP

EXHIBIT 4: GRADING PLAN

EXHIBIT 5: SUPPLEMENTAL EXHIBITS FROM DMP

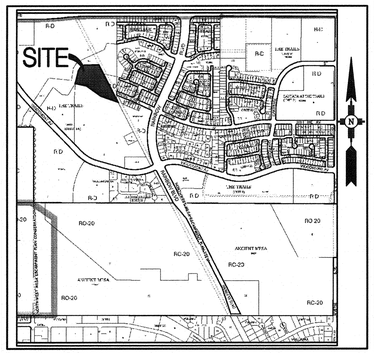
EXHIBIT 1

PRELIMINARY PLAT

Bohannan Huston

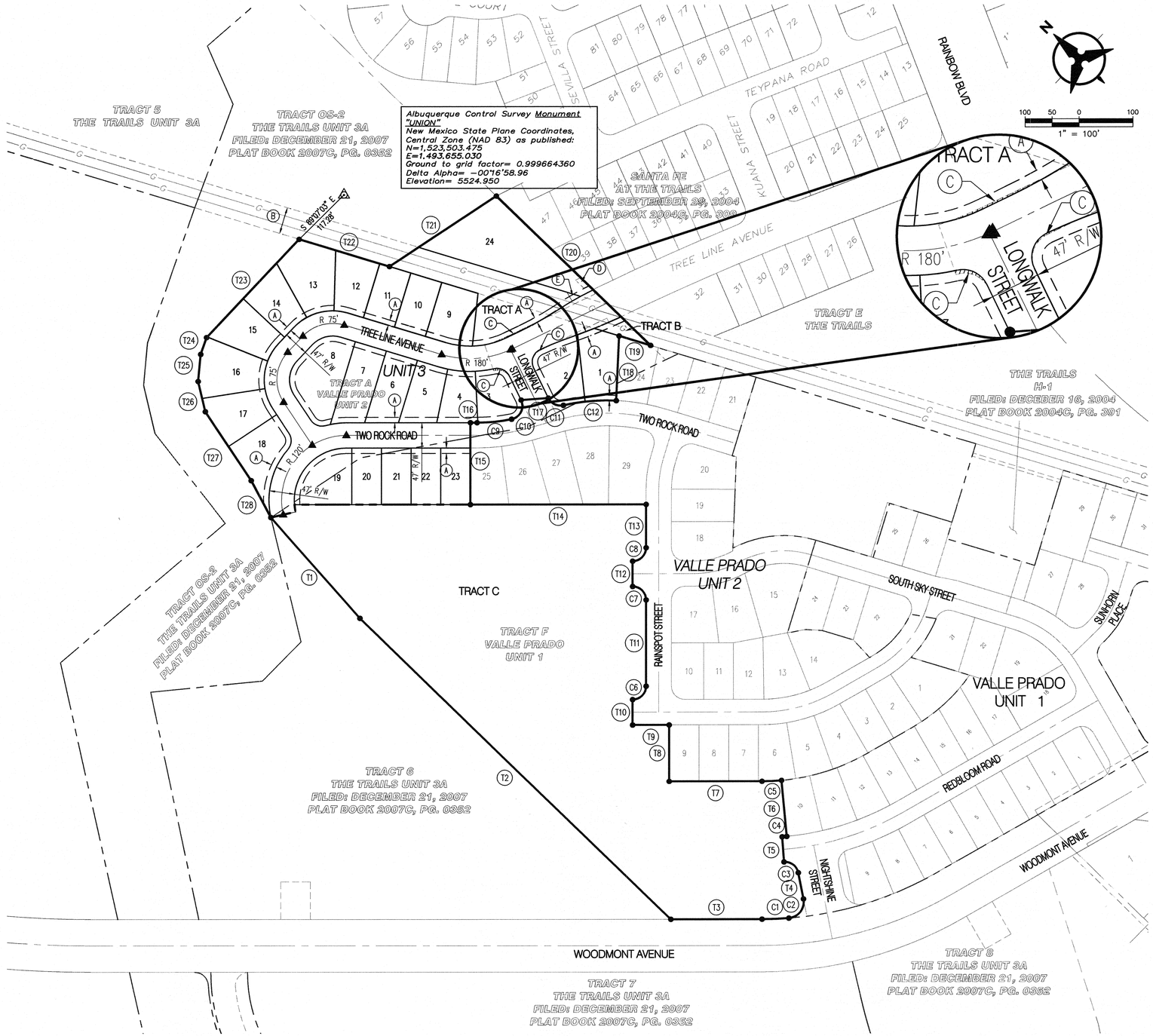
PRELIMINARY PLAT FOR
VALLE PRADO UNIT 3
at the TRAILS UNIT 3A
BEING A REPLAT OF TRACT F, VALLE PRADO UNIT 1 AND TRACT A, VALLE PRADO UNIT 2

NOVEMBER, 2014



VICINITY MAP

NOT TO SCALE ZONE ATLAS C-09-Z



KEYED NOTES

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

(B) EXISTING 50' SOUTHERN UNION GAS COMPANY RIGHT OF WAY EASEMENT FILED SEPTEMBER 16, 1930 IN BOOK 112, PAGE 515 AND FILED MARCH 29, 1956 IN BOOK D346, PAGE 356 AS DOCUMENT NO. 90568 AND N.M. STATE LAND OFFICE DEED OF RIGHT OF WAY AND EASEMENT NO. 646, DATED OCTOBER 3, 1930.

(C) EXISTING PUBLIC ROADWAY EASEMENT GRANTED TO THE CITY OF ALBUQUERQUE BY PLAT FILED DECEMBER 21, 2007 IN PLAT BOOK 2007C, PAGE 352. A PORTION TO BE VACATED WITH THIS PLAT

(D) EXISTING 10'X 20' QWEST UNDERGROUND UTILITY EASEMENT GRANTED BY PLAT FILED MARCH 16, 2006 IN BOOK 2006C, PAGE 85

(E) PRIVATE ACCESS EASEMENT FOR THE USE AND BENEFIT OF LOT 24 GRANTED WITH THIS PLAT.

Boundary Curve Table

ID	ARC	RADIUS	DELTA	TANGENT
C1	49.83'	651.00'	04°23'10"	24.93'
C2	50.66'	30.00'	96°45'03"	33.76'
C3	36.29'	25.00'	83°09'38"	22.18'
C4	8.58'	499.00'	00°59'06"	4.29'
C5	36.33'	394.00'	05°16'57"	18.18'
C6	39.27'	25.00'	90°00'00"	25.00'
C7	39.27'	25.00'	90°00'00"	25.00'
C8	39.27'	25.00'	90°00'00"	25.00'
C9	64.63'	326.50'	11°20'31"	32.42'
C10	45.61'	25.00'	104°31'52"	32.31'
C11	33.46'	25.00'	76°41'22"	19.78'
C12	98.55'	373.50'	15°07'05"	49.56'

Boundary Tangent Table

ID	BEARING	LENGTH
T1	S04°25'48"W	249.53'
T2	S00°00'00"E	803.67'
T3	S44°10'54"E	169.01'
T4	N34°40'53"E	49.76'
T5	N41°31'15"E	47.00'
T6	N40°32'09"E	105.00'
T7	N44°10'54"W	172.00'
T8	N45°49'06"E	105.00'
T9	N44°10'54"W	67.71'
T10	N45°49'06"E	47.00'
T11	N45°49'06"E	160.00'
T12	N45°49'06"E	47.00'
T13	N45°49'06"E	80.00'
T14	N44°10'54"W	325.79'

Boundary Tangent Table

ID	BEARING	LENGTH
T15	N45°49'06"E	152.00'
T16	S44°10'54"E	12.24'
T17	S48°19'15"E	50.60'
T18	N48°22'25"E	120.42'
T19	S27°16'28"E	60.99'
T20	N00°05'44"E	399.19'
T21	N77°45'21"W	237.91'
T22	N27°16'30"W	174.90'
T23	S89°01'47"W	250.90'
T24	S64°57'37"W	33.00'
T25	S51°14'55"W	50.59'
T26	S32°26'33"W	57.66'
T27	S12°11'46"W	153.58'
T28	S17°42'46"W	77.52'

LEGEND

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

LEGAL DESCRIPTION

Tract F, Valle Prado Unit 1 City of Albuquerque, Bernalillo County, New Mexico, as the same is shown and designated on the plat entitled "SUBDIVISION PLAT OF VALLE PRADO UNIT 1 (LOTS 1–32 & TRACTS A–F & OS–3A), CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO", filed in the office of the County Clerk of Bernalillo County, New Mexico, on _____, in Plat Book _____, Page _____, as Documnet No. _____, and Tract A, Valle Prado Unit 2 City of Albuquerque, Bernalillo County, New Mexico, as the same is shown and designated on the plat entitled "SUBDIVISION PLAT OF VALLE PRADO UNIT 2 (LOTS 1–29 & TRACT A), CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO", filed in the office of the County Clerk of Bernalillo County, New Mexico, on _____, in Plat Book _____, Page _____, as Documnet No. _____.

GENERAL NOTES

1. EXISTING ZONING: SU-2, VISL, VOLCANO TRAILS/SUBURBAN RESIDENTIAL SMALL LOT
   PROPOSED ZONING: SU-2, VISL, VOLCANO TRAILS/SUBURBAN RESIDENTIAL SMALL LOT
2. PROPOSED ACREAGE: 14.50 AC
   NUMBER OF LOTS: 24
   PROPOSED DENSITY: 1.66 DU/AC
3. MIN. LOT DIMENSIONS: 55' X 105'
   MINIMUM LOT AREA: 5,775 SQFT
4. SEWER AND WATER ARE PUBLIC TO BE OWNED AND MAINTAINED BY THE ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY. STREET AND STORM DRAIN IMPROVEMENTS ARE PUBLIC TO BE OWNED AND MAINTAINED BY THE CITY OF ALBUQUERQUE.
5. LOT SETBACKS SHALL CONFORM TO THE VOLCANO TRAILS SECTOR DEVELOPMENT PLAN.
6. WOODMONT AVENUE IMPROVEMENTS ACROSS TRACT C FRONTAGE FINANCIALLY GUARANTEED WITH VALLE PRADO UNIT 1.
7. ACCESS FOR LOTS 3 THROUGH 8 SHALL BE FROM TREE LINE AVENUE. NO ACCESS IS ALLOWED FROM TWO ROCK ROAD.

SITE DATA

ZONE ATLAS NO.	C-09-Z
ZONING	SU-2, VISL
MILES OF FULL WIDTH STREETS CREATED	0.26 MILES
NO. OF EXISTING TRACTS	2
NO. OF LOTS CREATED	24
NO. OF HOA TRACTS CREATED	2
NO. OF REMAINDER TRACTS CREATED	1

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, PTS, 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

(Acting) CITY SURVEYOR — DATE 10/23/14

KELLY CALHOUN
MANAGER, WOODMONT–PASEO, LLC — DATE 10-24-14

Bohannan Huston
www.bhinc.com 800.877.5332

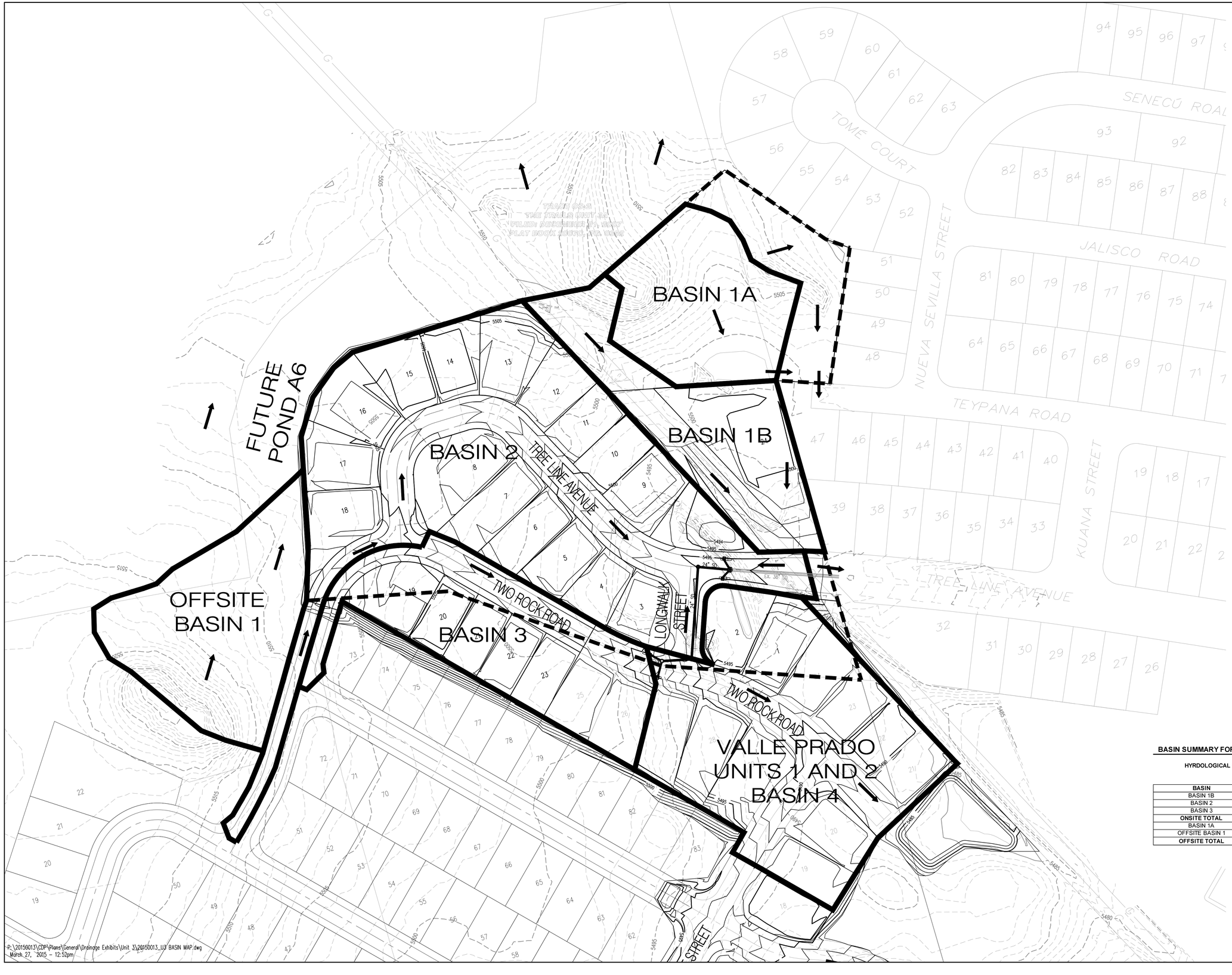
P:\20150013\CDP\Plans\General\Pre-Plat\Unit 3\20150013_U3_PRE-PLAT.dwg
October 21, 2014 – 1:36pm

EXHIBIT 2

UNIT 3 BASIN MAP

Bohannan Huston

VALLE PRADO
UNIT 3 BASIN MAP



LEGEND

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

BASIN SUMMARY FOR VALLE PRADO UNIT 3 (TRACT 10 @ THE TRAILS UNIT 3A)

HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED CALCULATED)

BASIN	AREA	% LAND TREATMENT				Q (100YR-24HR)
BASIN 1B	1.2	0.0%	35.0%	35.0%	30.0%	3.0
BASIN 2	4.5	0.0%	31.0%	31.0%	38.0%	11.6
BASIN 3	1.6	0.0%	27.0%	27.0%	46.0%	4.4
ONSITE TOTAL	**7.4**					**18.9**
BASIN 1A	1.1	50.0%	25.0%	25.0%	0.0%	1.5
OFFSITE BASIN 1	0.6	70.0%	15.0%	15.0%	0.0%	1.7
OFFSITE TOTAL	**1.7**					**3.2**

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EXHIBIT 3

INLET AND STORM DRAIN NETWORK MAP

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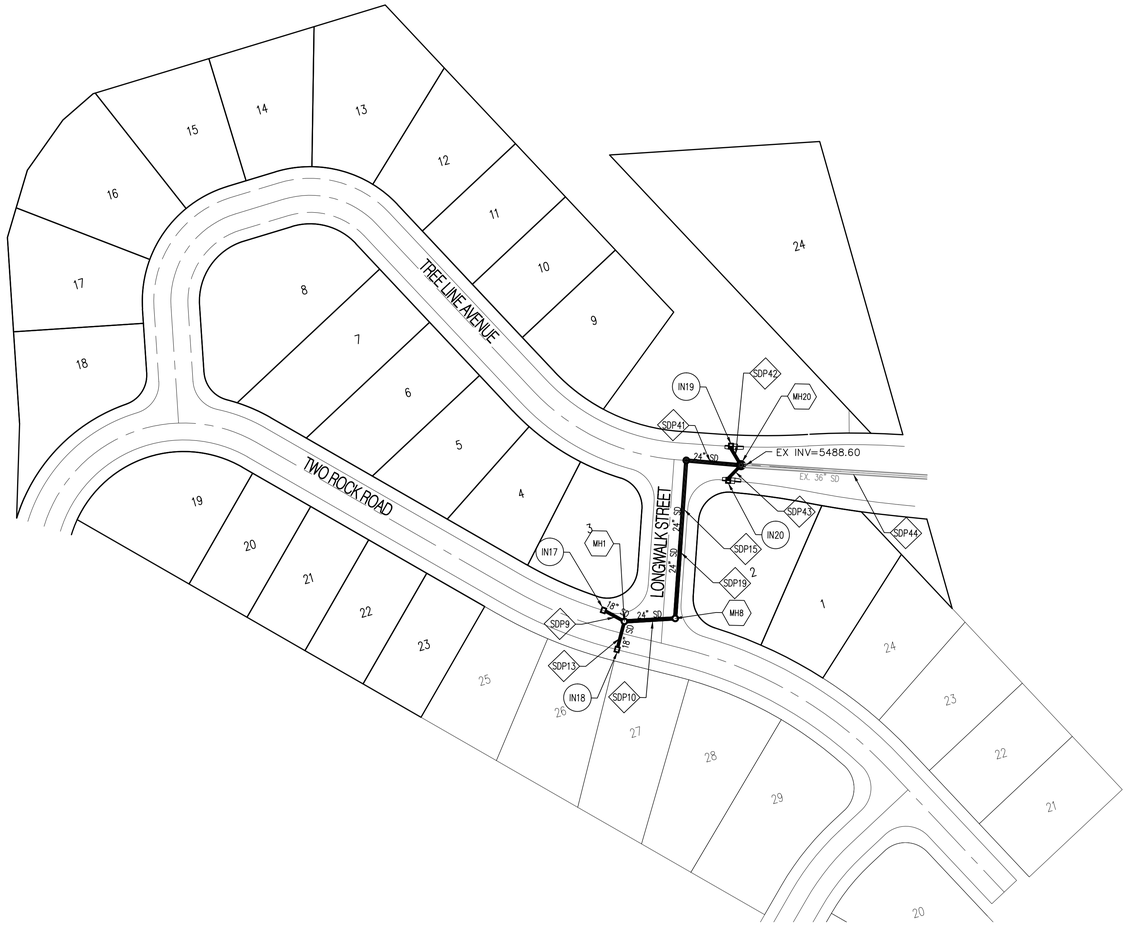
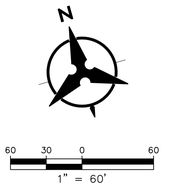
VALLE PRADO
UNIT 3
INLET AND STORM DRAIN NETWORK MAP

SUMMARY OF PIPE FLOWS				
ID	SIZE	SLOPE (%)	Q (cfs) ALLOWABLE	Q (cfs) ACTUAL
SDP9	18"	10.8%	34.5	2.2
SDP10	24"	5.3%	52.2	4.4
SDP13	18"	0.5%	7.4	2.2
SDP15	24"	0.9%	21.5	4.4
SDP19	24"	0.9%	21.5	4.4
SDP41	24"	2.7%	36.8	4.4
SDP42	18"	3.6%	20.1	7.3
SDP43	18"	4.1%	21.2	7.3
SDP44	36"	5.3%	153.4	18.9

SUMMARY OF INLET FLOWS					
ID	STREET SLOPE	WATER DEPTH (ft)	STREET FLOW UPSTREAM OF INLET (cfs)	FLOW CAPTURED BY INLET (cfs)	STREET FLOW BYPASSING INLET (cfs)
IN17	5.00%	0.23	2.2	2.2	0.0
IN18	5.00%	0.23	2.2	2.2	0.0
IN19	1.50%	0.43	7.3	7.3	0.0
IN20	1.50%	0.43	7.3	7.3	0.0

SUMMARY OF MANHOLES FLOWS	
ID	STORM DRAIN FLOWRATE (cfs)
MH1	4.4
MH8	4.4
MH19	4.4
MH20	18.9





LEGEND

- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET

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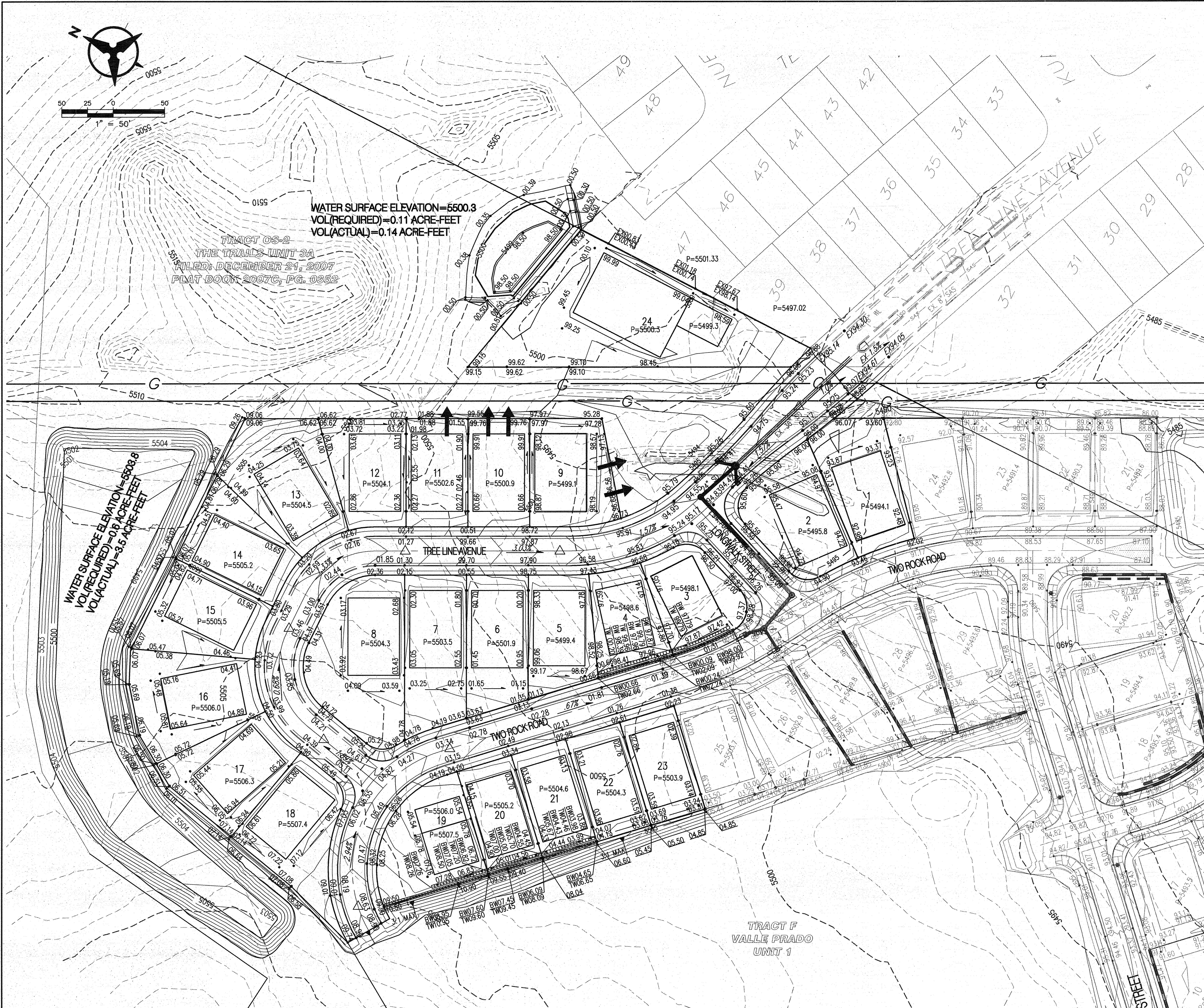
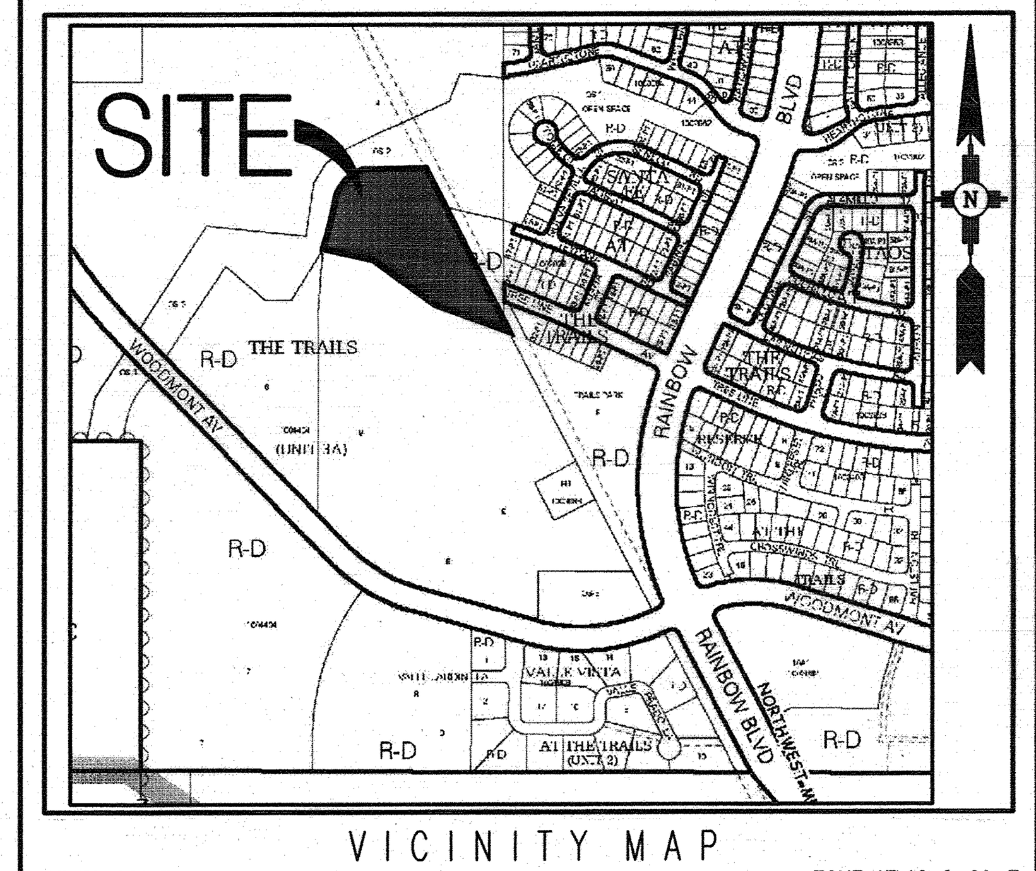
EXHIBIT 4

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 GARDEN WALL
- PROPOSED SLOPE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET
- WALL DRAIN

AS-BUILT INFORMATION	DATE
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 MONUMENT STAMPED "UNION"
GEOGRAPHIC POSITION (NAD 83)
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
N = 1,523,503.475 E = 1,493,655.030
GROUND-TO-GRID FACTOR = 0.999664360
Δα = -00°16'58.96"
NAVD 1988 ELEVATION = 5524.950

SURVEY INFORMATION		
FIELD NOTES	BY	DATE
NO.		

ENGINEER'S SEAL

No.	Date	By	REMARKS
			REVISIONS
			DESIGN

Designed By: SJS DATE: 10/14
Drawn By: DTH DATE: 10/14
Checked By: SJS DATE: 10/14

Bohannan ▲ Huston
www.bhinc.com 800.877.5332

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

VALLE PRADO
UNIT 3
GRADING AND DRAINAGE 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	2

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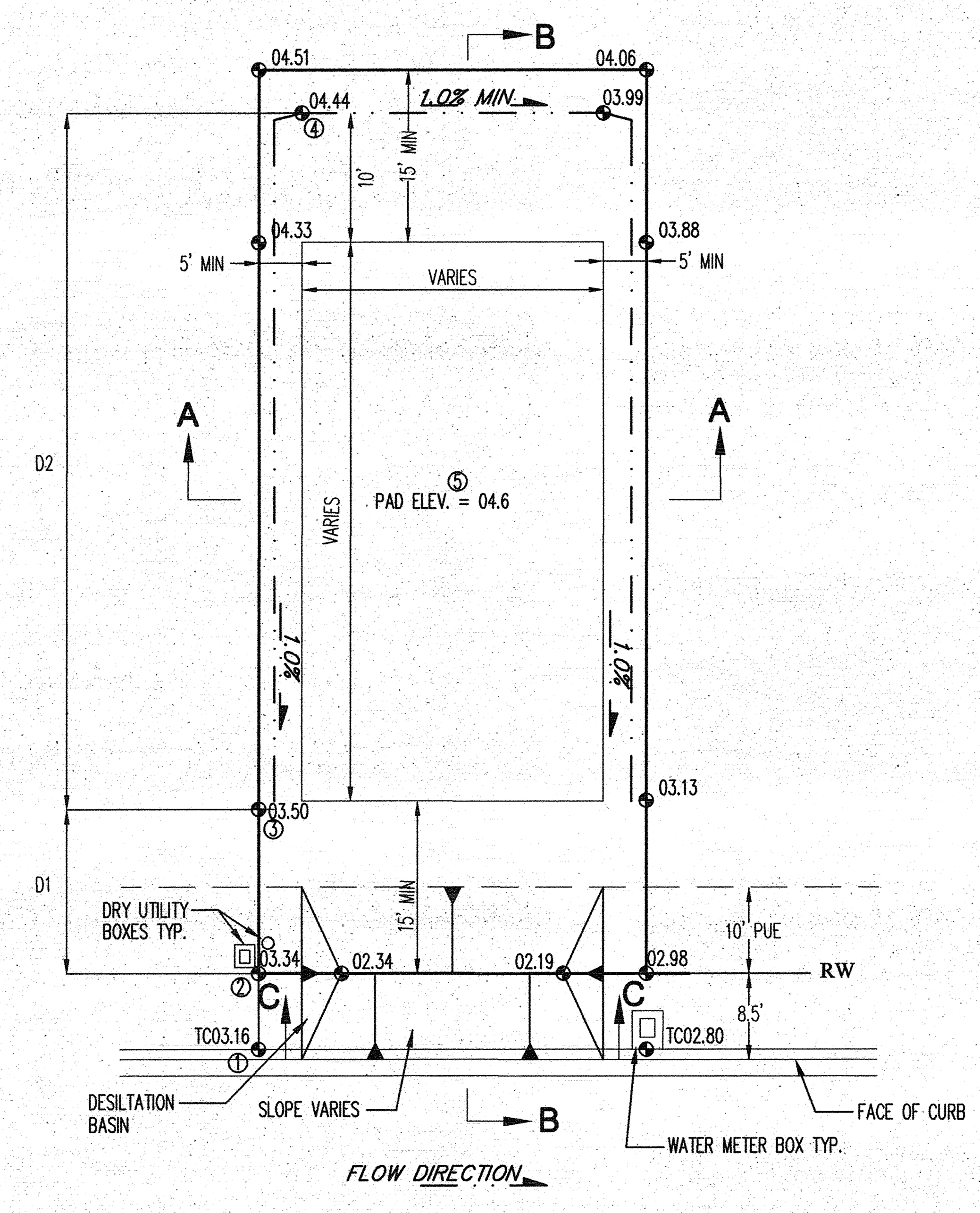
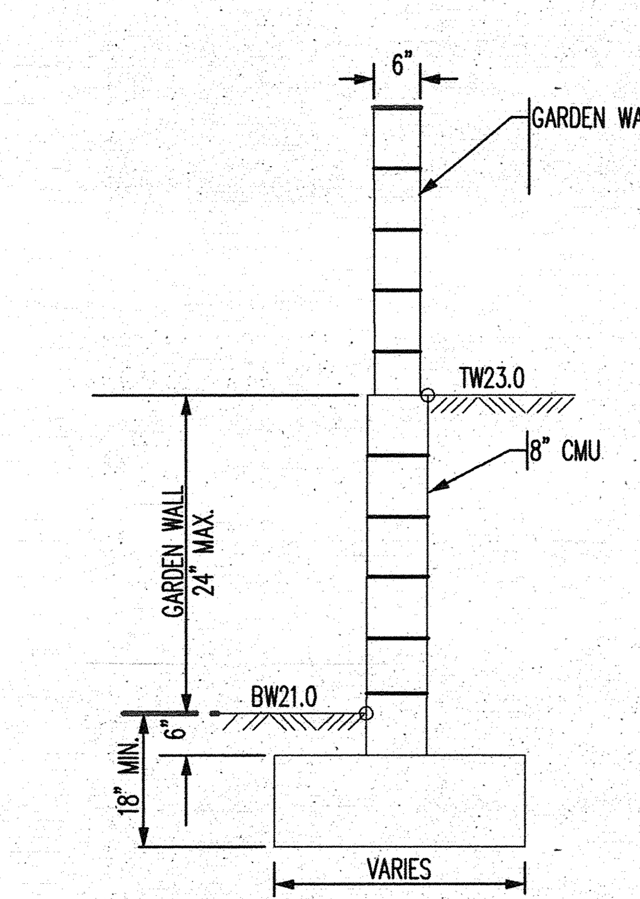


TYPICAL LOT GRADE DETAIL
WITH DESILTATION BASIN FOR SEDIMENTATION CONTROL

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.

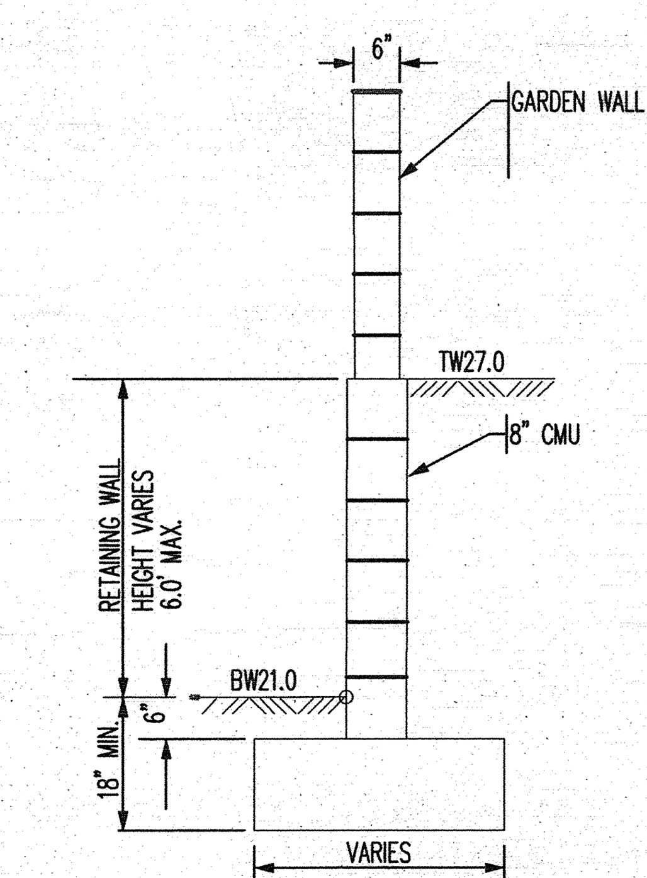


TW=FINISHED GRADE ELEVATION AT TOP OF RETAINING WALL
BW=FINISHED GRADE ELEVATION AT BOTTOM OF RETAINING WALL

TYPICAL GARDEN WALL NOMENCLATURE

NOT TO SCALE

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



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TYPICAL RETAINING WALL NOMENCLATURE

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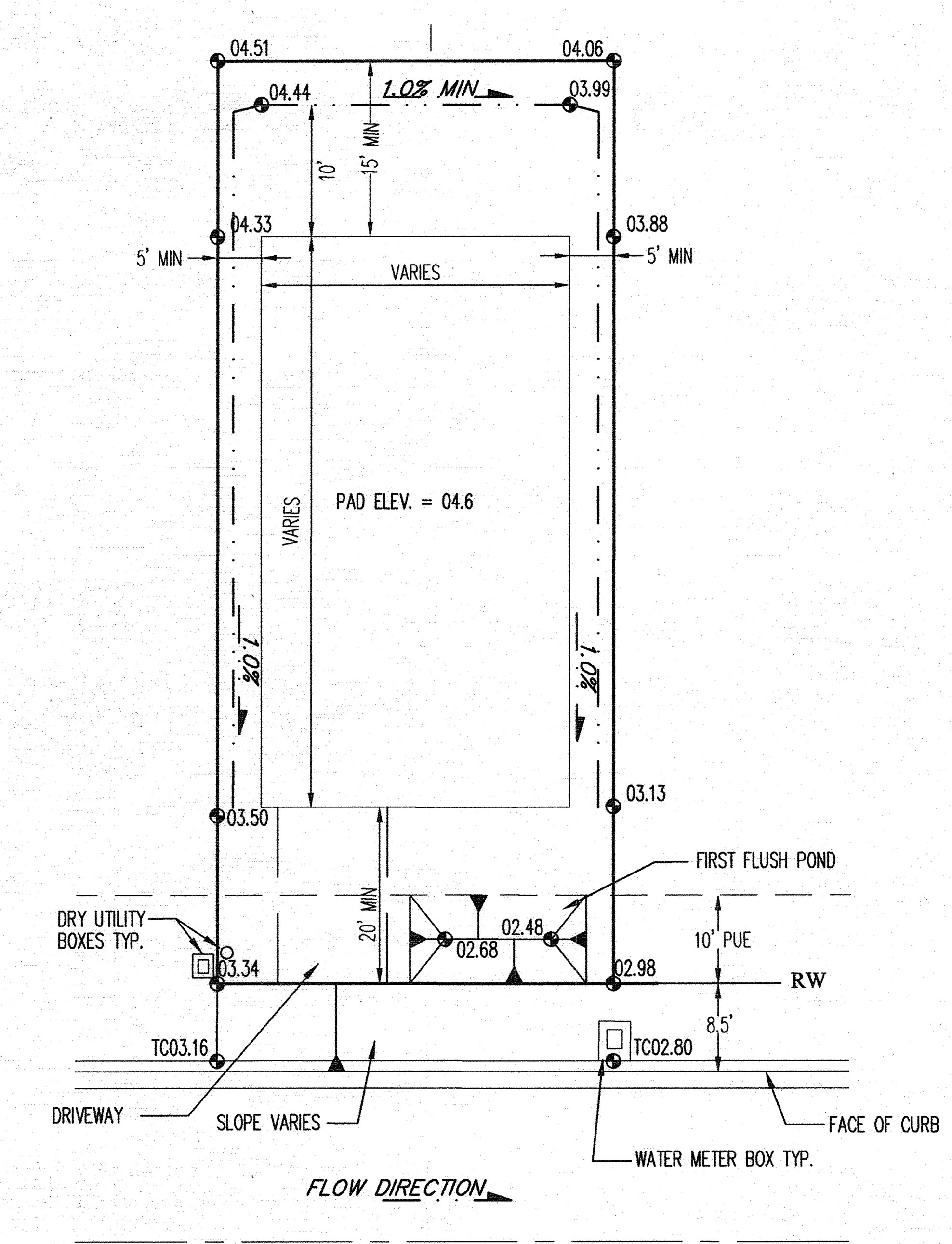
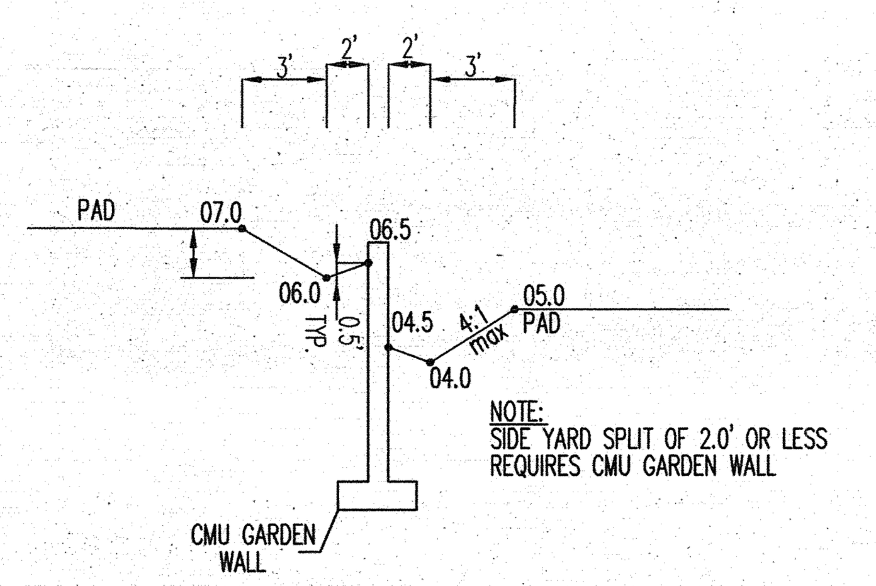


TYPICAL LOT GRADE DETAIL
WITH FIRST FLUSH POND

NOT TO SCALE

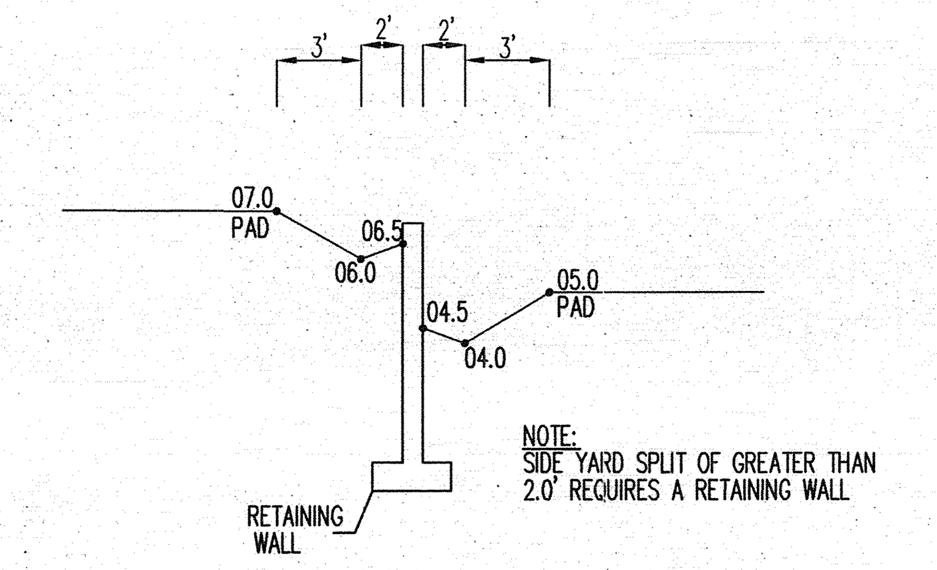
FIRST FLUSH VOLUME REQUIRED:
45'x75' PAD - 47 CUBIC FEET
50'x75' PAD - 53 CUBIC FEET

HOMEBUILDER SHALL CONSTRUCT FIRST FLUSH POND PRIOR TO LANDSCAPING FRONT YARD



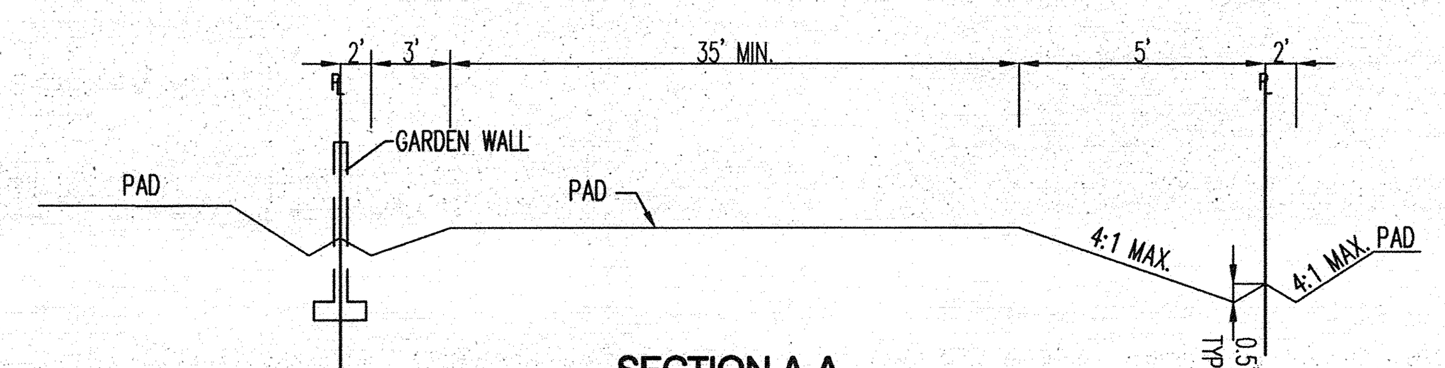
SIDE YARD GARDEN WALL DETAIL

NOT TO SCALE



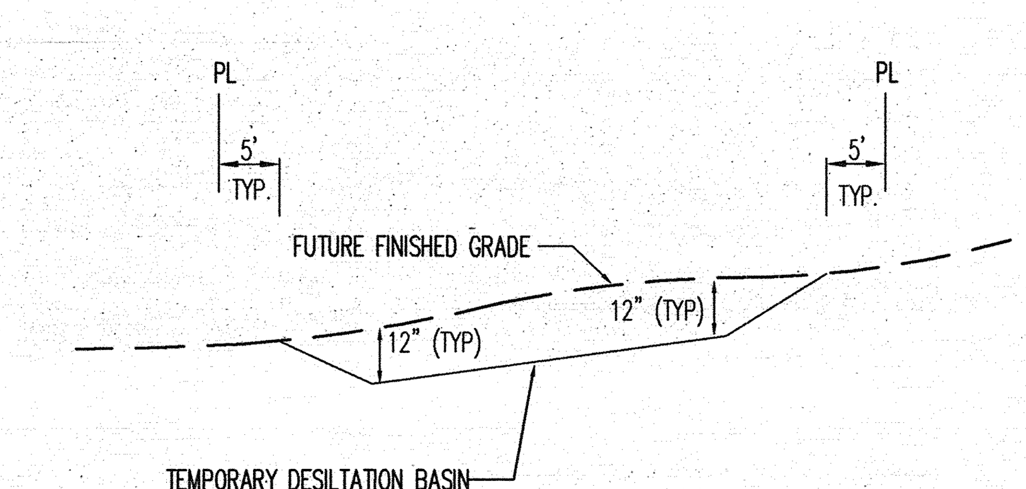
SIDE YARD RETAINING WALL DETAIL

NOT TO SCALE



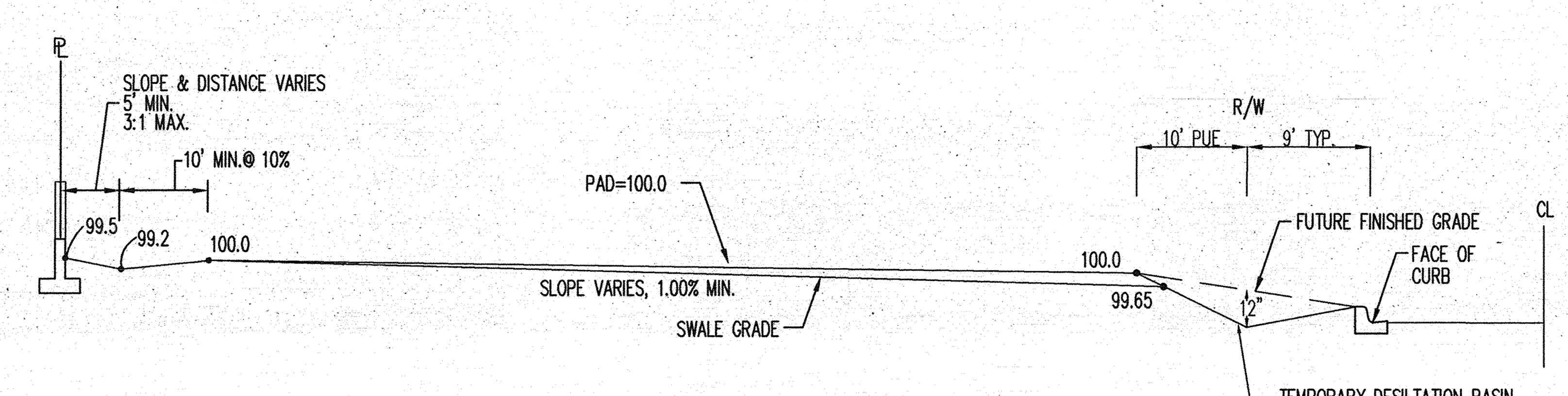
SECTION A-A
TYPICAL SIDE YARD SWALE

NOT TO SCALE



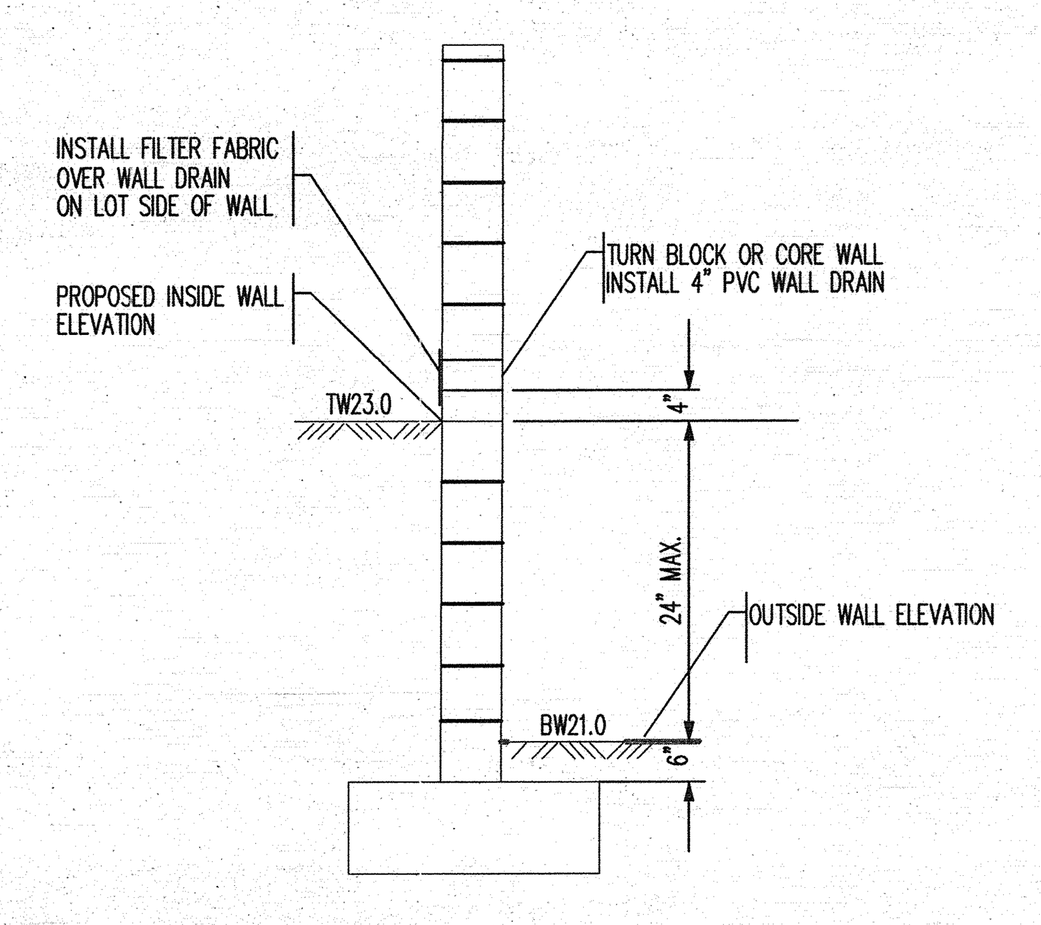
SECTION C-C

NOT TO SCALE



SECTION B-B

NOT TO SCALE



WALL DRAIN DETAIL

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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AS-BUILT INFORMATION

CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
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SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

No.	Date	By	REMARKS
			REVISIONS
			DESIGN

Designed By: SJS DATE: 05/2011
Drawn By: BJG DATE: 05/2011
Checked By: SJS DATE: 05/2011

Bohannan Huston
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

VALLE PRADO
UNIT 3
GRADING AND DRAINAGE DETAILS

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	2	2

EXHIBIT 5

SUPPLEMENTAL EXHIBITS FROM DMP

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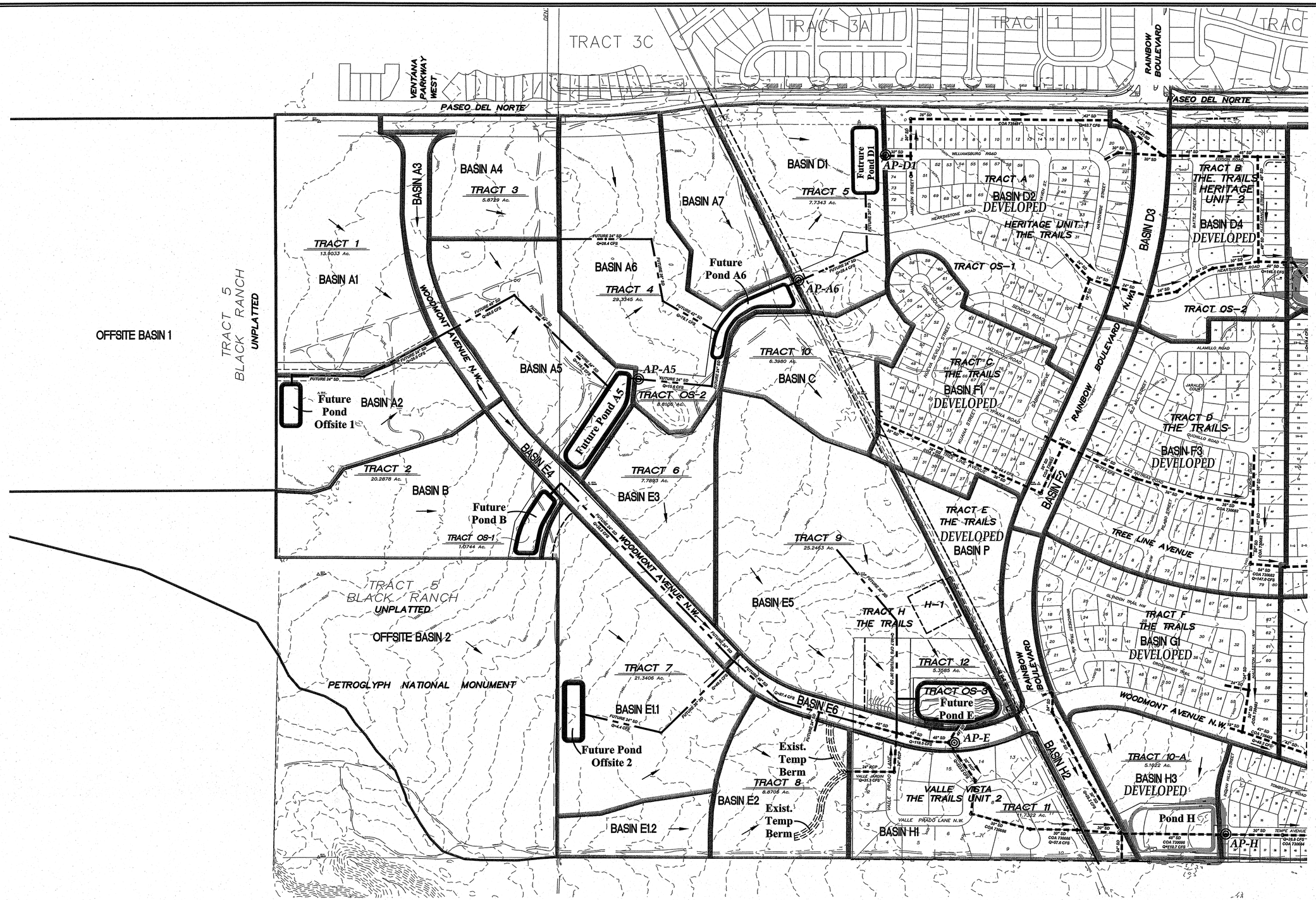


LEGEND

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

SCALE: 200' 100' 0 200' 400'

N

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.

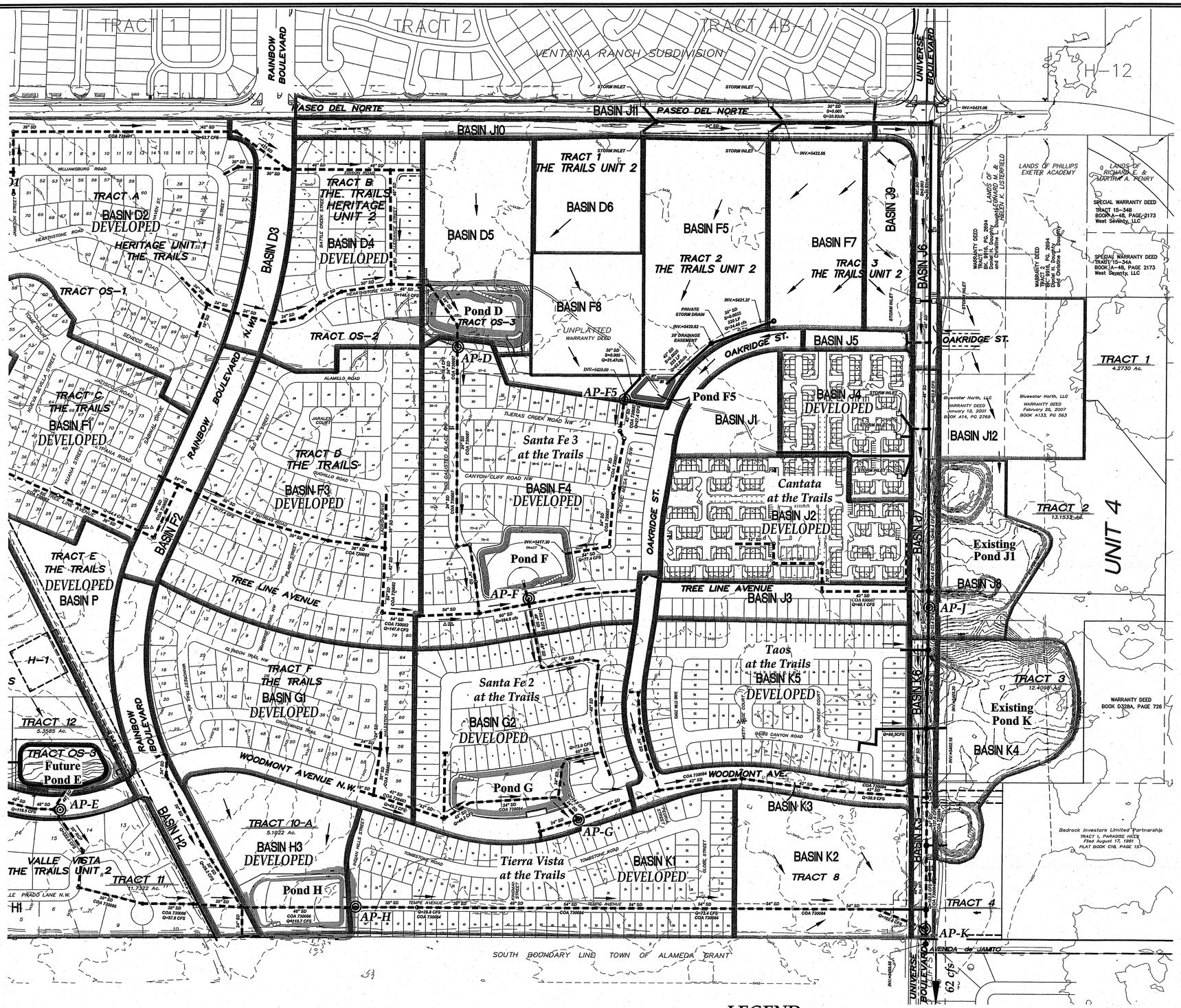
DAVID A. THOMPSON 9677 LICENSED PROFESSIONAL ENGINEER 4-14-14

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

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

PLATE 1



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	166.8	110.22	15.56		4.61	4.004	5516	5511	5515.59
A6	191.4	81.87	15.81		4.72	3.114	5506	5500	5504.64
D1	209.8	60.24	13.41		6.06	5.111	5475	5471	5474.29
D	261.9	154.87	5.93	13.77	6.24	4.035	5436.9	5429.5	5435.03
F5	18.9	62.89	19.84		1.40	1.386	5426	5421	5425.97
F	359.4	255.89	17.66	6.20	11.76	10.383	5424.3	5415.08	5423.56
G	391.8	93.49	7.00	17.61	7.21	2.955	5422.5	5415.67	5419.84
OFF 2	51.5	13.87	4.43		1.08	0.813	5	0	4.19
B	12.8	34.80	3.36		0.99	0.950	5519	5515	5518.86
E	137.0	198.83	6.80	15.30	7.52	6.008	5448	5441.6	5447.02
H	167.0	89.12	5.20	21.60	3.02	2.870	5422	5418.65	5421.89
J	57.9	141.18	6.05	26.34	7.94	3.771	5417	5414	5415.66
K	672.6	189.53	15.81	44.91	14.84	8.391	5409	5404.85	5407.79

ANALYSIS POINT PEAK FLOWS

ANALYSIS POINT	PEAK FLOW
AP-A5	15.56 CFS
AP-A6	15.81 CFS
AP-D1	13.41 CFS
AP-D	19.70 CFS
AP-F5	27.40 CFS
AP-F	23.86 CFS
AP-G	24.61 CFS
AP-E	22.30 CFS
AP-H	26.80 CFS
AP-J	32.39 CFS
AP-K	60.72 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	31.68	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	8.18	0	25	25	50	24.36	1.100
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	36.12	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	17.62	0	33	33	34	48.45	1.986
E1.2	3.76	0	33	33	34	10.36	0.424
E2	8.63	0	18	18	64	27.42	1.324
E3	7.66	0	25	25	50	22.82	1.030
E4	3.69	0	5	5	90	13.11	0.697
E5	28.17	0	29	29	42	80.67	3.482
E6	3.12	0	5	5	90	11.09	0.590
P	3.41	43	25	25	7	10.08	0.327
H1	11.68	0	16	16	68	37.78	1.856
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	5.83	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

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

N

200' 100' 0 200' 400'

SCALE: 200'

4-14-14

DATUM NAVD 1929

Thompson Engineering Consultants, Inc.
tecnm@yahoo.com
P.O. BOX 65760 ALBUQUERQUE, NM 87193
PHONE: (505) 271-2199
FAX: (505) 830-9246

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

PLATE 2