

CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director



Mayor Timothy M. Keller

June 20, 2019

Mike Balaskovits, PE
Bohannon Huston, Inc.
7500 Jefferson St NE
Albuquerque, NM 87109

RE: Mesa Del Sol Montage Unit 3B
Revised Grading Plan Stamp Date: 6/6/19 (Sheets 1 & 5)
Grading Plan Stamp Date: 2/15/19
Drainage Report Stamp Date: 1/18/19
Hydrology File: R16D006

Dear Mr. Balaskovits:

PO Box 1293

Based on the submittal received on 6/7/19 the above-referenced Grading Plan and Drainage Report are re-approved for Preliminary Plat, Grading Permit & Work Order.

Albuquerque

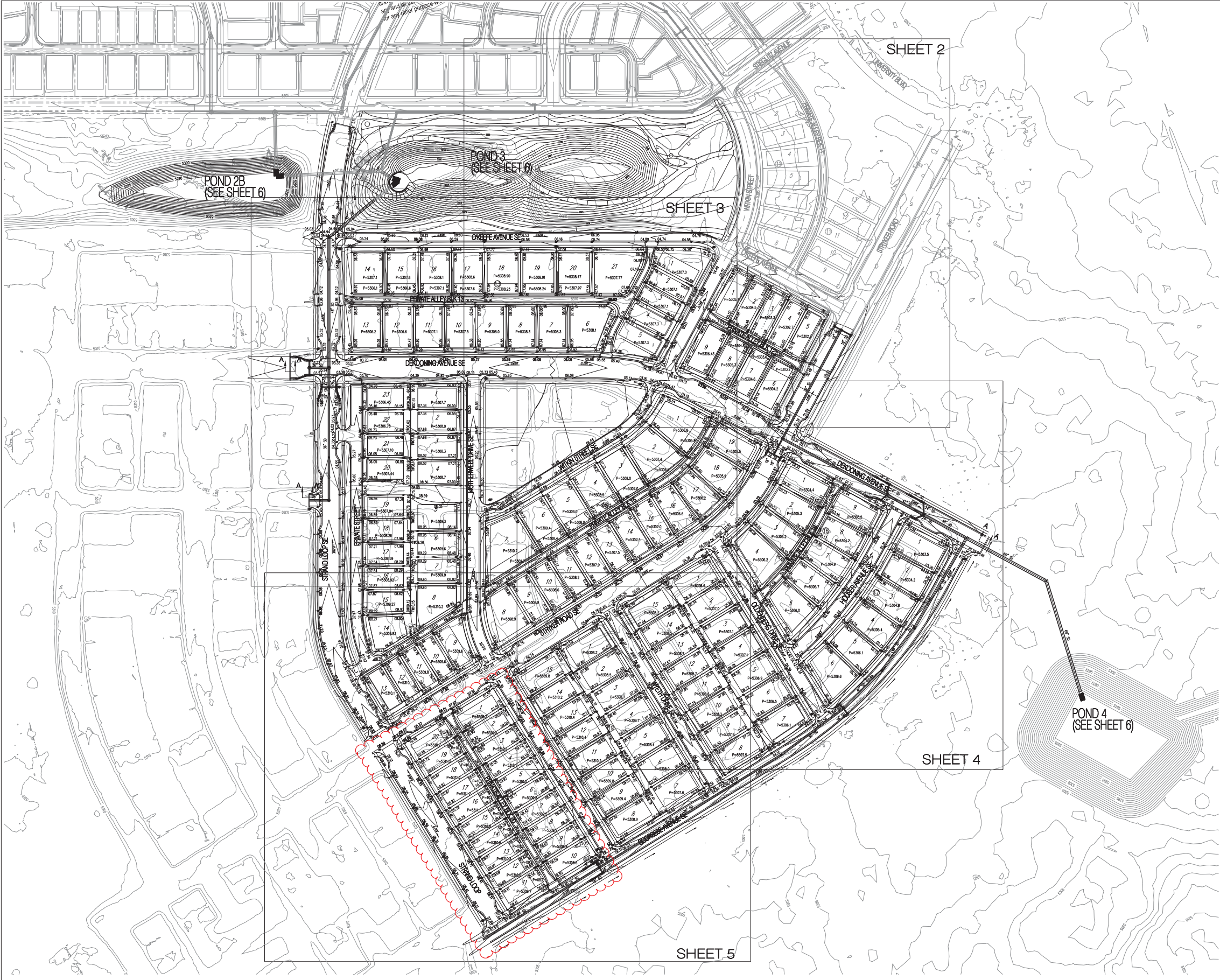
If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

NM 87103

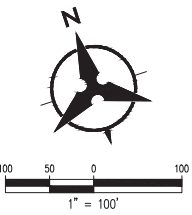
Sincerely,

www.cabq.gov

Dana M. Peterson
Senior Engineer, Planning Dept.
Development Review Services



- 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 BY GEO-TEST, INC. DATED 9-29-10
 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.
 8. ALL LOTS ADJACENT TO UNIVERSITY SHALL DRAIN TO THE ALLEY AS PER GRADES SHOWN ON GRADING PLAN. ROOF DRAINAGE SHALL BE GUTTERED TO PREVENT THESE FLOWS FROM ENTERING UNIVERSITY BLVD.



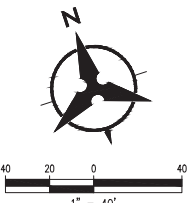
- LEGEND**
- (91.62) FUTURE SPOT ELEVATION
 - 91.62 PROPOSED SPOT ELEVATION
 - × 92.46 EXISTING SPOT ELEVATION (GRND & TC)
 - ===== EXISTING CURB & GUTTER
 - ===== PROPOSED MOUNTABLE CURB & GUTTER
 - ===== PROPOSED STANDARD CURB & GUTTER
 - 5470 — EXISTING CONTOUR W/ INDEX ELEVATION
 - FLOW ARROW
 - ===== PROPOSED RETAINING WALL (TO BE BUILT BY HOME BUILDER)
 - ===== PROPOSED GARDEN WALL, CONCRETE FILLED TO 1-FOOT DEPTH
 - ===== PROPOSED SLOPE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN MANHOLE
 - PROPOSED STORM DRAIN INLET
 - PROPOSED CATTLE GUARD INLET
 - WALL DRAIN
 - GRADING PHASE BOUNDARY

Bohannan & Huston
www.bhinc.com 800.877.5332

		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 3B GRADING AND DRAINAGE PLAN OVERALL			
Design Review Committee	City Engineer Approval	Mo./Day/Yr. Mo./Day/Yr.	
Last Design Update			
City Project No.	Zone Map No.	Sheet	Of
775782	R-15,16 S-15,16	1	7



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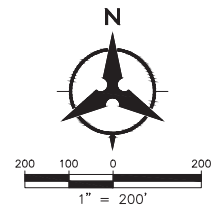
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MESA DEL SOL MONTAGE UNIT 3B GRADING AND DRAINAGE PLAN			
Design Review Committee	City Engineer Approval	Mo./Day/Yr.	
Last Design Update		Mo./Day/Yr.	
City Project No. 775782		Zone Map No. R-15,16 S-15,16	Sheet 5 Of 7

UPDATED BASIN SUMMARY TABLE TO ACCOUNT FOR THE ADDITION OF 5 LOTS TO MONTAGE UNIT 3B

BASIN I.D.	AREA (AC)	REV UNITS	ORIGINAL UNITS	% LAND TREATMENT					10 YR	DISCHARGE (CFS)	STORMWATER VOLUME		
				A	B	C	REV-D	ORIG-D			100YR	100 YR 6HR	100 YR 10-DAY
Basin A-1	5.8	32	32	0.0%	23.0%	24.0%	53.0%	53.0%	13.29	21.83	21.83	0.76	1.17
Basin A-2	4.7	21	21	0.0%	27.0%	27.0%	46.0%	46.0%	10.16	17.01	17.01	0.58	0.87
Basin A-3	4.4	17	17	0.0%	29.5%	29.5%	41.0%	41.0%	9.11	15.49	15.49	0.53	0.77
Basin A-4	5.2	24	24	0.0%	26.5%	26.5%	47.0%	47.0%	11.36	19.92	19.92	0.65	0.98
Basin A-5	4.4	15	15	0.0%	30.4%	30.4%	39.2%	38.0%	8.97	15.33	15.22	0.52	0.75
Basin B-1	9.3	32	47	0.0%	23.1%	23.1%	53.0%	47.0%	21.43	35.13	33.35	1.23	1.90
Basin B-2	2.2	4	4	0.0%	35.0%	40.0%	25.0%	25.0%	3.96	7.09	7.09	0.23	0.30
Basin B-3	4.5	26	27	0.0%	22.4%	22.4%	55.2%	57.0%	10.47	17.27	17.27	0.60	0.93
Basin B-4	4.6	23	24	0.0%	25.3%	25.3%	49.5%	51.0%	10.23	16.97	17.11	0.59	0.89
Basin B-5	6.6	28	29	0.0%	28.1%	28.1%	43.8%	45.0%	14.00	23.60	23.76	0.81	1.19
Basin B-6	3.7	10	9	0.0%	34.1%	34.1%	31.9%	30.0%	7.05	12.35	12.21	0.41	0.57
Basin B-7	2.9	11	10	0.0%	29.8%	29.8%	40.4%	38.0%	5.97	10.17	10.03	0.34	0.50
Basin C	0.8	3	3	0.0%	35.0%	40.0%	25.0%	25.0%	1.64	3.06	3.06	0.09	0.14
Basin M	2.2	4	4	0.0%	35.0%	40.0%	25.0%	25.0%	3.96	7.09	7.09	0.23	0.30
Future Basin 1	8.8	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	19.81	32.73	32.73	1.14	1.73
Future Basin 2	7.7	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	17.34	28.64	28.64	0.99	1.52
Future Basin 3	10.3	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	23.19	38.31	38.31	1.33	2.03
Future Basin 4	13.1	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	29.50	48.72	48.72	1.69	2.58
Future Basin 5	61.1	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	137.57	227.24	227.24	7.89	12.04
Future Basin 6	36.6	n/a	n/a	0.0%	12.4%	12.5%	75.0%	75.0%	98.28	153.64	153.64	5.58	9.24
TOTAL	282.1	286	281	5 < Lot difference					464.25	784.72	769.52	26.68	41.00
Montage 3B Difference										130.7	131.0	129.5	0.72
Percentage Difference										1.2	0.93%	0.14	2.12%

MESA DEL SOL NEIGHBORHOOD MONTAGE UNITS 3 & 4 DEVELOPED CONDITIONS UPDATED BASIN MAP 10/2018



LEGEND	
	PROPOSED BASIN BOUNDARY
	EXISTING BASIN BOUNDARY
	BASIN FLOW DIRECTION

PREVIOUS BASIN SUMMARY TABLE FROM 2014

BASIN I.D.	AREA (AC)	DISCHARGE (CFS)	STORMWATER VOLUME	
			100 YR 6HR	100 YR 10-DAY
Basin A-1	5.8	21.83	0.76	1.17
Basin A-2	4.7	17.01	0.58	0.87
Basin A-3	4.4	15.49	0.53	0.77
Basin A-4	5.2	19.92	0.65	0.98
Basin A-5	4.4	15.22	0.51	0.74
Basin A-6	3.2	10.75	0.36	0.50
Basin B-1	9.3	33.85	1.16	1.75
Basin B-2	2.2	7.96	0.27	0.41
Basin B-3	4.5	17.27	0.61	0.95
Basin B-4	4.6	17.11	0.59	0.91
Basin B-5	6.6	23.76	0.81	1.21
Basin B-6	3.7	12.21	0.40	0.55
Basin B-7	2.9	10.03	0.34	0.48
Basin C	0.8	2.80	0.09	0.14
Basin M	2.2	7.09	0.23	0.30
Future Basin 1	8.8	32.73	1.14	1.73
Future Basin 2	7.7	28.64	0.99	1.52
Future Basin 3	10.3	38.31	1.33	2.03
Future Basin 4	13.1	48.72	1.69	2.58
Future Basin 5	61.1	227.24	7.89	12.04
Future Basin 6	36.6	153.64	5.58	9.24

POND SUMMARY - FULLY DEVELOPED CONDITIONS			
POND	MAX WSE	REQ'D STORAGE VOLUME (AC-FT)	MAX DEPTH (FT)
1 (Future)	*	12.04	11.0
2A	5300.0	3.98	5.5
2B	5300.0	7.82	11.0
3	5300.0	8.54	11.0
4	5297.0*	19.04	14'

* Denotes pond to be designed in future

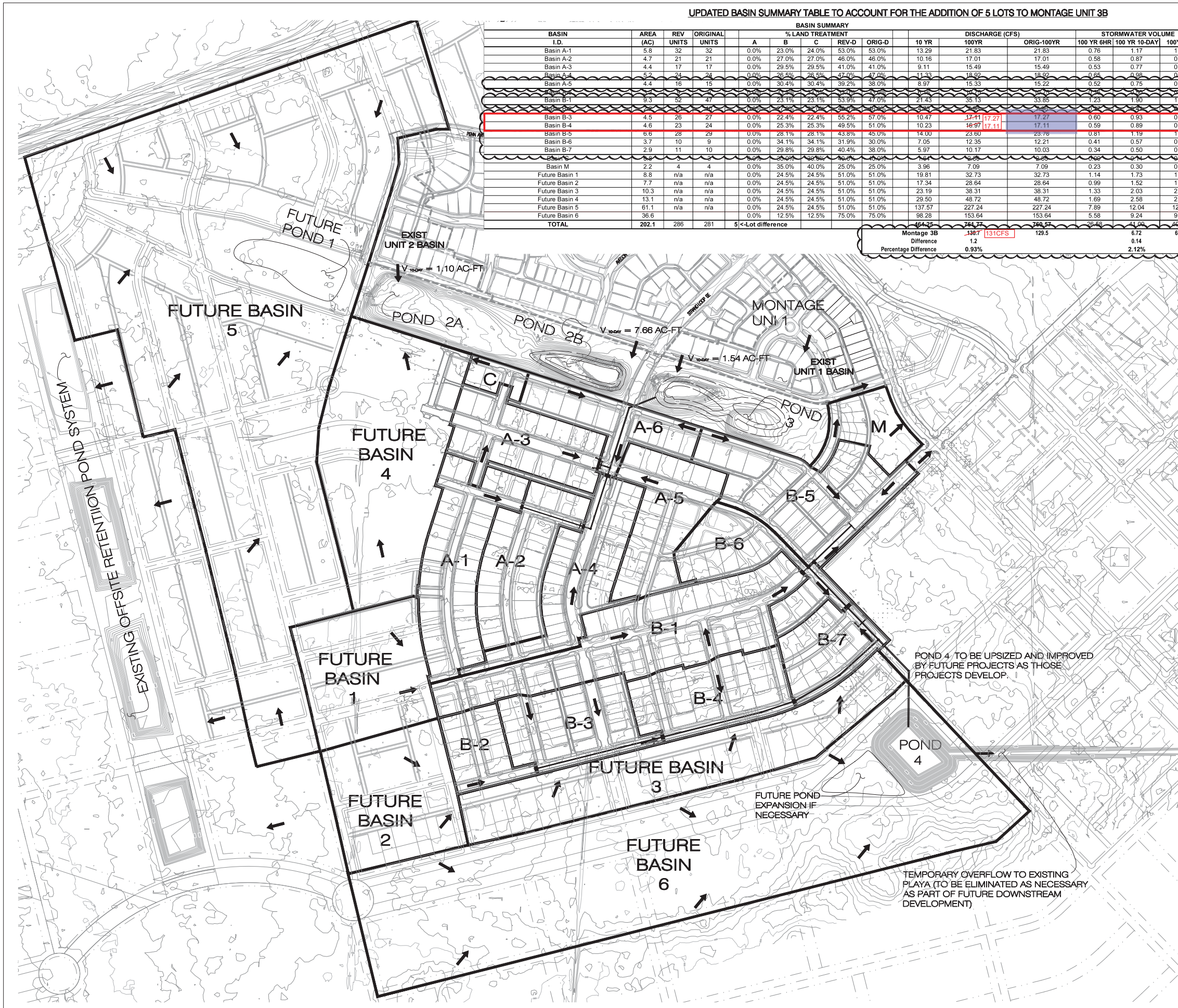
POND SUMMARY - REQUIRED VOLUMES FOR UNITS 3 AND 4				
POND	MAX WSE	REQ'D STORAGE VOLUME (AC-FT)	MAX DEPTH (FT)	MAX AVAILABLE VOLUME (AC-FT)
1 (Future)	NOT NEEDED	0.00	N/A	N/A
2A	5300.0	3.98	N/A	4.1
2B	5300.0	7.82	11.0	10.1
3	5300.0	8.54	11.0	10.1
4	5297.0	6.26	8.0	10.2

- NOTES:
- EXISTING POND 2A HAS ALREADY BEEN CONSTRUCTED AND CERTIFIED TO THE ABOVE VOLUME.
 - EXISTING POND 4 HAS BEEN CONSTRUCTED, AND CERTIFIED TO THE ABOVE VOLUME.
 - PONDS 2B AND 3 WILL BE UPSIZED BY THIS PROJECT TO ACCOMMODATE FLOWS FROM UNITS 3 AND 4 AS WELL AS EXISTING UNITS 1 AND 2.

TEMPORARY OVERFLOW TO EXISTING PLAYA (TO BE ELIMINATED AS NECESSARY AS PART OF FUTURE DOWNSTREAM DEVELOPMENT)

FUTURE POND EXPANSION IF NECESSARY

POND 4 TO BE UPSIZED AND IMPROVED BY FUTURE PROJECTS AS THOSE PROJECTS DEVELOP.



CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director



Mayor Timothy M. Keller

February 15, 2019

Mike Balaskovits, PE
Bohannon Huston, Inc.
7500 Jefferson St NE
Albuquerque, NM 87109

RE: Mesa Del Sol Montage Unit 3B
Grading Plan Stamp Date: 2/15/19
Drainage Report Stamp Date: 1/18/19
Hydrology File: R16D006

Dear Mr. Balaskovits:

Based on the submittal received on 1/23/19 the above-referenced Grading Plan and Drainage Report are approved for Grading Permit & Work Order.

PO Box 1293

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

Albuquerque

Sincerely,

NM 87103

Dana M. Peterson
Senior Engineer, Planning Dept.
Development Review Services

www.cabq.gov



City of Albuquerque

Planning Department
Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: MDS Montage Unit 3B **Building Permit #:** _____ **Hydrology File #:** R16/D006
DRB#: 2018-0013331 (1006008) **EPC#:** _____ **Work Order#:** _____
Legal Description: _____
City Address: _____

Applicant: BHI **Contact:** Mike Balaskovits
Address: 7500 Jefferson St. NE
Phone#: 505-798-7891 **Fax#:** _____ **E-mail:** mbalaskovits@bhinc.com

Other Contact: _____ **Contact:** _____
Address: _____
Phone#: _____ **Fax#:** _____ **E-mail:** _____

TYPE OF DEVELOPMENT: X (135) PLAT (# of lots) _____ RESIDENCE _____ DRB SITE _____ ADMIN SITE _____

IS THIS A RESUBMITTAL? X Yes _____ No _____

DEPARTMENT _____ TRANSPORTATION _____ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- _____ ENGINEER/ARCHITECT CERTIFICATION
- _____ PAD CERTIFICATION
- _____ CONCEPTUAL G & D PLAN
- X GRADING PLAN (Resubmittal)
- X DRAINAGE REPORT (Resubmittal)
- _____ DRAINAGE MASTER PLAN
- _____ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- _____ ELEVATION CERTIFICATE
- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT (TCL)
- _____ TRAFFIC IMPACT STUDY (TIS)
- _____ STREET LIGHT LAYOUT
- _____ OTHER (SPECIFY) _____
- _____ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- _____ BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY
- X PRELIMINARY PLAT APPROVAL
- _____ SITE PLAN FOR SUB'D APPROVAL
- _____ SITE PLAN FOR BLDG. PERMIT APPROVAL
- _____ FINAL PLAT APPROVAL
- _____ SIA/ RELEASE OF FINANCIAL GUARANTEE
- _____ FOUNDATION PERMIT APPROVAL
- X GRADING PERMIT APPROVAL
- _____ SO-19 APPROVAL
- _____ PAVING PERMIT APPROVAL
- _____ GRADING/ PAD CERTIFICATION
- _____ WORK ORDER APPROVAL
- _____ CLOMR/LOMR
- _____ FLOODPLAIN DEVELOPMENT PERMIT
- _____ OTHER (SPECIFY) _____

DATE SUBMITTED: 01/23/2019 **By:** Mike Balaskovits, PE (Kelly Klein, PE)

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

January 23, 2017

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

Mr. Shahab Biazar, P.E.
Principal Engineer, Planning Department
Development and Review Services
600 2nd St. NW
Albuquerque, NM 87103

Re: Project No 775782: Mesa Del Sol, Montage Unit 3B - Re-Submittal
-Drainage Report for Mesa del Sol Residential Montage Unit 3 and 4 (Prior Stamp Date:
4/25/2014) New Stamp Date 01/18/2019
-Grading & Drainage Plan (Prior Stamp Date 8/29/2018) New Stamp Date 01/18/2019

Dear Mr. Biazar:

Enclosed for your review is a copy of the revised Mesa de Sol, Montage Unit 3B Drainage Report and Grading and Drainage Plan. The revisions are based on comments that you provided in your letter dated October 24, 2018. Below is our response to each of your comments (your original comments in underlined italics below):

1. An Erosion and Sediment Control Plan must be submitted to Storm Water Quality prior to approval for Grading Permit. An ESC Plan has been submitted and approved. Reference: Mesa de Sol Unit 3B Erosion Sediment Control Plan Engineer's stamp date 12-19-18 (RE16E006).
2. The revised hydrology calculations shown on the updated Basin Map must be stamped and signed by a professional engineer licensed in the state of New Mexico. A revised Drainage Report is submitted with this letter in support of our responses to hydrology comments and contains the revised Basin Maps. The revised stamped and signed Drainage Report satisfies this comment.
3. The pond volume summary on the revised Basin Map is not adequate for review. Since this plan is revising the previous design of the ponds, a complete presentation of all related calculations is required. Detailed pond volume calculations are required including hydrology calculations and basin maps of all areas that drain to the ponds and volume calculations that show the area of each contour and the associated volume calculated using the conic equation. The Drainage Report for Mesa del Sol Residential Montage Unit 3 and 4 has been revised to address these comments. The existing volumes from Montage Units 1 and 2 entering the Ponds 2B and 3 is 7.75 ac-ft and was taken from the Approved Drainage Report Mesa del Sol Residential Montage Unit 1 and 2, revised 01/14/2011, COA Record Number R16D003A. The proposed development for Units 3 and 4 increases the pond volume requirements by 8.61 ac-ft. The total required pond volume is 16.36 ac-ft. The design capacity of the ponds is 19.71 ac ft. The ponds therefore have adequate capacity for existing and proposed conditions in their current design. Details of these calculations are discussed in Section V, Exhibits 5 and 6, and

Engineering ▲

Spatial Data ▲

Advanced Technologies ▲

Appendix E of the drainage report. The volume of the ponds was determined with the grading design software.

Show all pipes connecting to the ponds and provide HGL calculations for the pipes. Label 1 00-year water surface elevations and associated volumes of the ponds. Additional pond comments may be forthcoming after the design calculations are provided. The pipes are shown on the attached grading and drainage plan and updated on the Basin Maps within the drainage report. Per conversations with City Hydrology, HGL calculations have been checked in areas that have been considered critical and adjusted as necessary. In addition, the 100 year water surface elevations are also noted on the Developed Basin Maps within the Drainage Report.

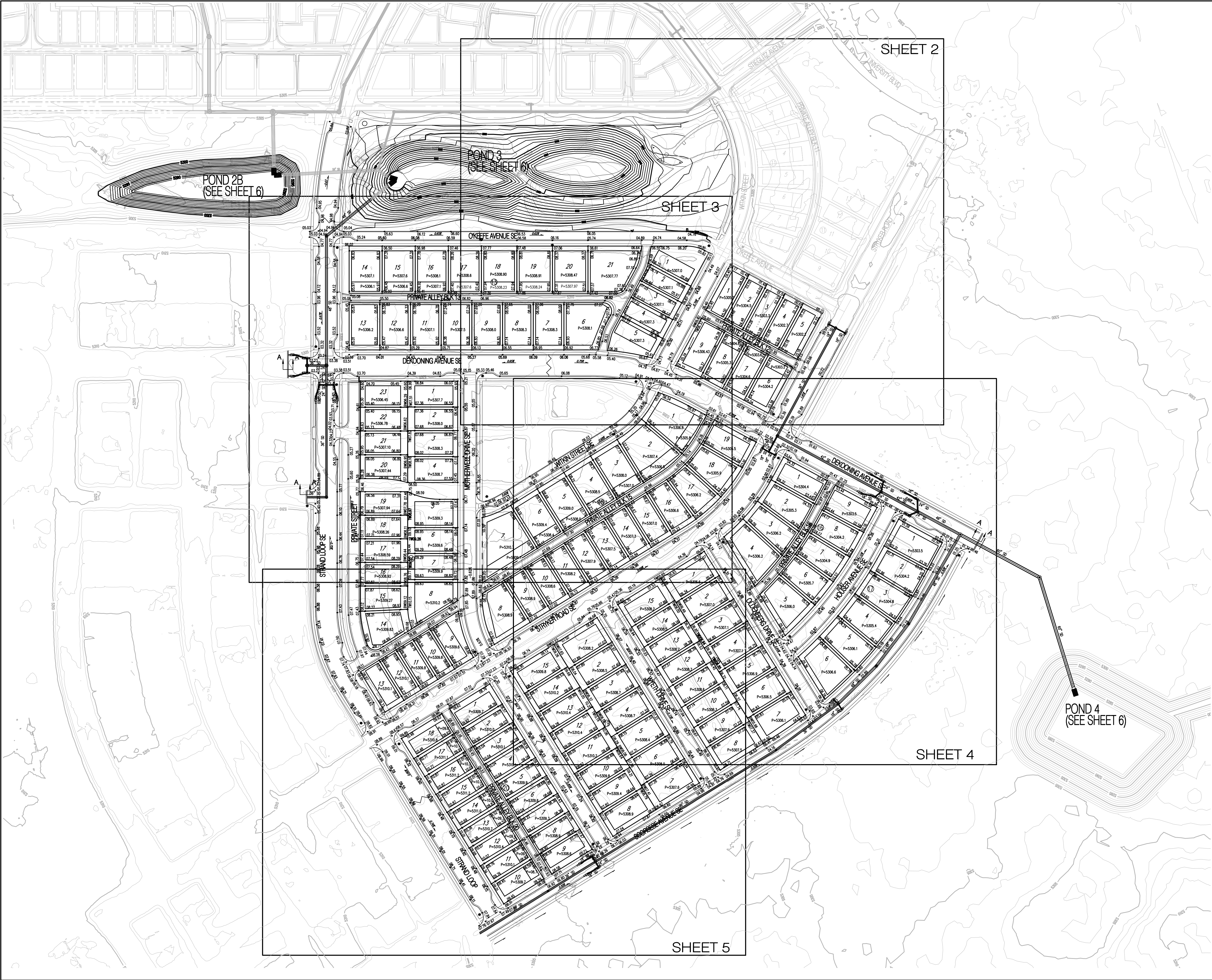
4. Provide HGL calculations per DPM and profiles showing HGL. The In Roads calculations in the report do not account for the minor losses using the DPM equations. An overall plan view and profiles should be included with the hydrology submittal and must agree with the G&D Plan. Profiles of all pipes, including the laterals, are required both in the Hydrology submittal and on the DRC plans... Per conversations with City Hydrology, HGL calculations are not required to be shown on the re-submitted Grading and Drainage plan set. However, BHI reviewed the HGL calculations and have shown the pipe design to be within acceptable standards and adjusted on the plans as necessary. See Attached "Hydraulic Analysis for Storm Drain using StormCAD for HGL Calculations" for the critical storm drain system out falling into Pond 3.
5. Show all retaining walls including those less than 2' and differentiate walls to be constructed by developer from walls to be deferred to builders. See Revised Grading Plan. All walls within the proposed design are 2' tall or under. Where walls near the 2' height, additional spot elevations TW (top of wall) and BW (bottom of wall) were added. Wall sections are detailed on Sheet 7 of 7 in the revised Grading and Drainage Plan.
6. Show typical sections at the walls showing both the interim grading that will be certified on the Engineer's Certification after the developer's work is complete and the future grading that will occur after the walls are built by the home builder. The typical sections should show the property lines and horizontal and vertical dimensions (maximum and minimum). See Revised Grading Plan – Sheet 7 of 7.
7. Show how the side yard walls will terminate, detailing the transition from 1.9' height to 0.0' height of retaining. Show that the grade is the same on both sides of the wall at the termination point. For example, there is a 1.9' grade difference between lots 8 and 9 in block 12 and lot 9 is 2' higher than the alley to the north. Show how the grade of lot 8 ties into the grade of the alley. Added to the Revised Grading Plan.
8. Add typical sections at walls, both retaining and garden walls, where they are next to right of ways showing that the footer does not encroach into the right of way. Added to the Revised Grading Plan on Sheet 7 of 7
9. Add the standard private maintenance note to the preliminary plat note regarding the drainage easement on the alleys. The attached Preliminary Plat includes this note.

10. More grading detail is needed on the interface between the alleys, the streets, and the lots. For example, the side yard swale elevations at the rear of lot 9 block 12 and the right of way elevation of Witkin Street next to lot 9 is about 0.5' higher than the pad, and the pad is about 1.3' higher than the adjacent grade in the alley which seems to indicate that some drainage is going to the alley. Grading Plan revised and spot elevation corrected on the attached Revised Grading Plan.
Show the sidewalks on sheet 3. Added to the Grading Plan.
11. Several spot elevations on sheet 2 appear to be incongruous with the surrounding elevations. The sub comments a-e under item 11 have been addressed and revised on the attached Grading Plan. All of the remaining grading sheets were reviewed and the spot elevations were also revised as necessary.

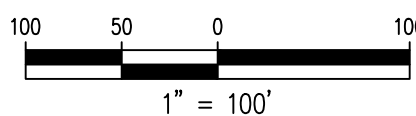
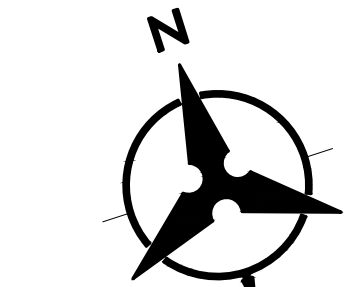
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Mike Balaskovits, PE
Vice President
Community Development and Planning




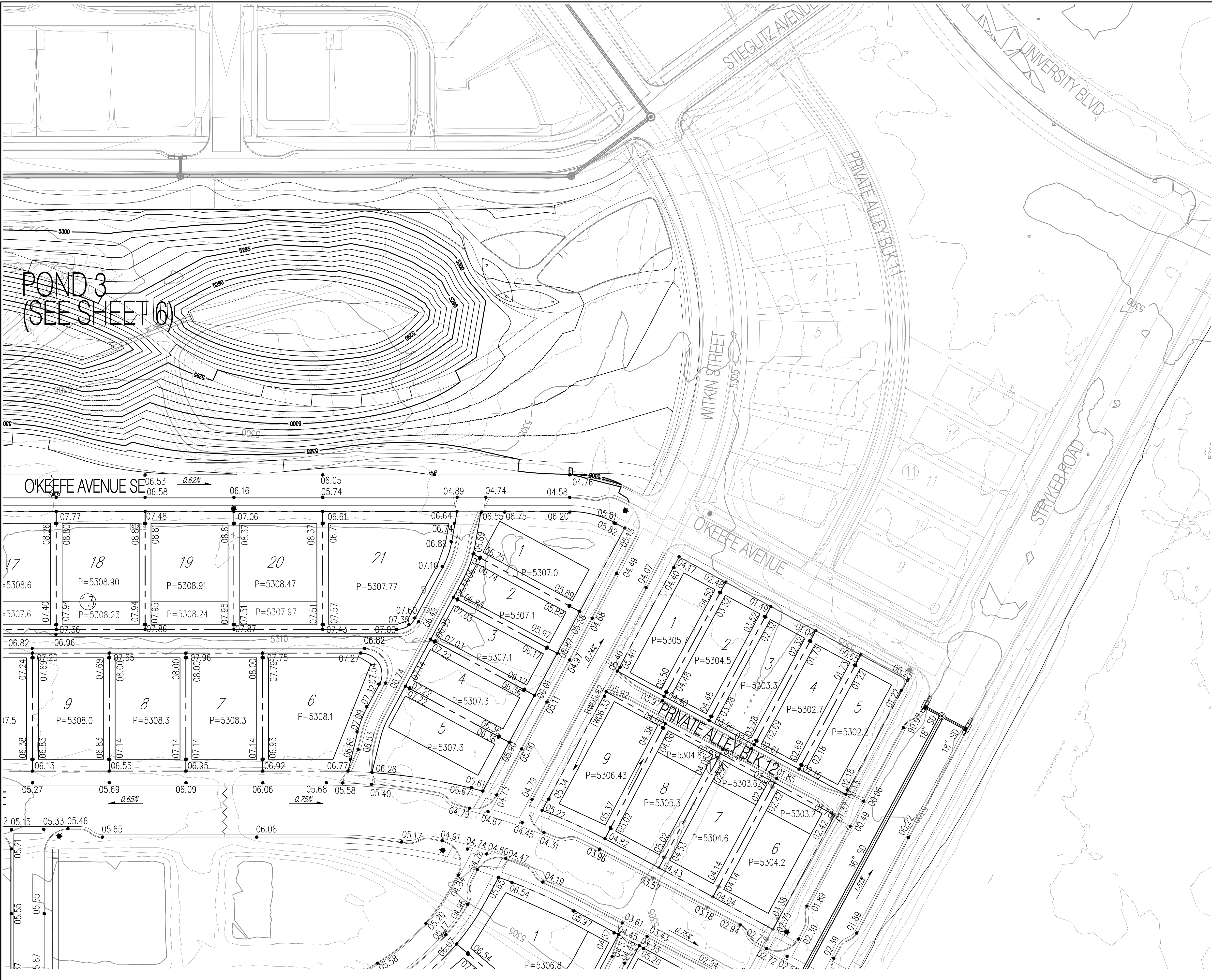
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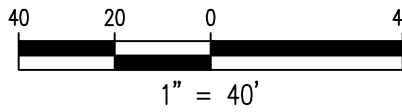
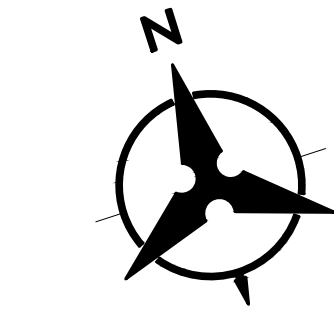
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		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 3B GRADING AND DRAINAGE PLAN OVERALL			
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
775782	R-15,16 S-15,16	1	7



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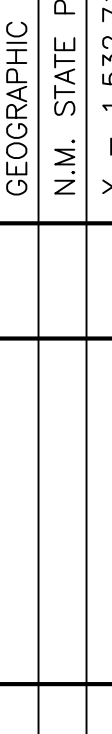


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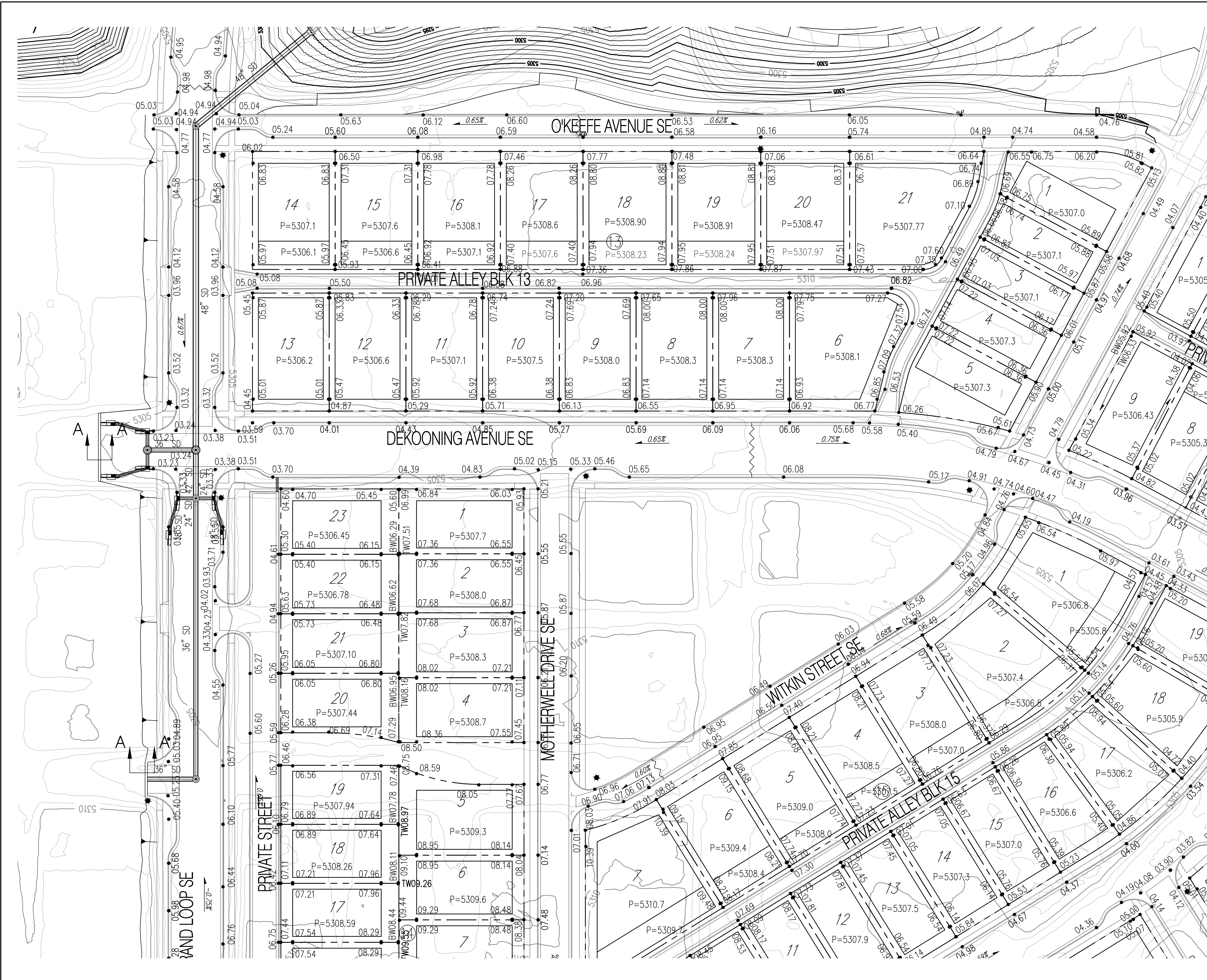
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
MESA DEL SOL MONTAGE UNIT 3B
GRADING AND DRAINAGE PLAN

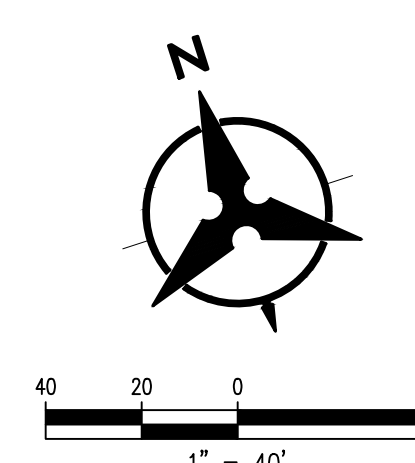
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	
City Project No. 775782		Zone Map No. R-15,16 S-15,16	Sheet 2	Of 7

ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS-BUILT INFORMATION	
<div><p>18187 2-15-19 MICHAEL B. REYNOLDS PROFESSIONAL ENGINEER MICHIGAN LICENSED</p></div>		FIELD NOTES		CONTRACTOR		DATE	
		NO.	BY	DATE	NO.	DATE	
REVISIONS		By					
DESIGN							
Designed By: CS		DATE: 12/19/2018					
Drawn By: BJC		DATE: 12/19/2018					
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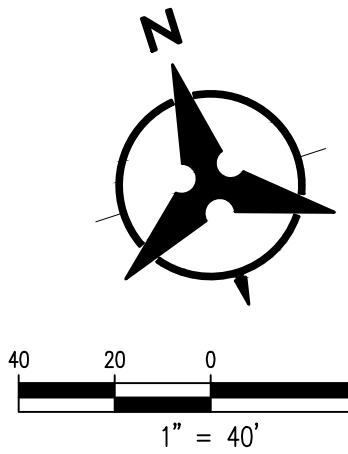
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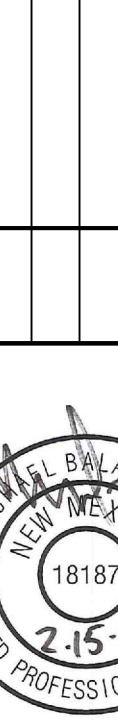
		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 3B GRADING AND DRAINAGE PLAN			
Design Review Committee	City Engineer Approval	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
775782	R-15,16 S-15,16	3	7



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ENGINEER'S SEAL										SURVEY INFORMATION				BENCH MARKS		AS-BUILT INFORMATION					
										NO.		BY		DATE		ACS TABLET STAMPED "1, R16, 1984"		CONTRACTOR		DATE	
																GEOGRAPHIC POSITION (NAD 83)		WORK BY		DATE	
																		INSPECTOR'S		DATE	
																		ACCEPTANCE BY		DATE	
																		VERIFICATION BY		DATE	
										No.		Date		N.M. STATE PLANE COORDINATES (CENTRAL ZONE)		DATE					
														X = 1,532,715.669 Y = 1,453,438.899		DATE					
														GROUND-TO-GRID FACTOR = 0.999664099		MICROFILM INFORMATION					
														Δα = -00'12'22.46"		RECORDED BY		DATE			
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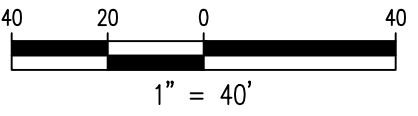
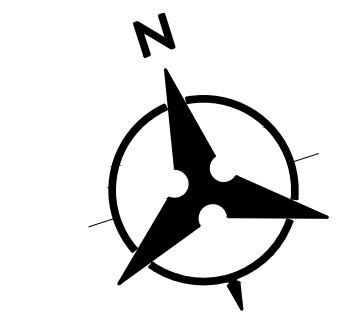
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GRADING AND DRAINAGE PLAN

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City Project No.	Zone Map No.	Sheet	Of
775782	R-15,16 S-15,16	4	7

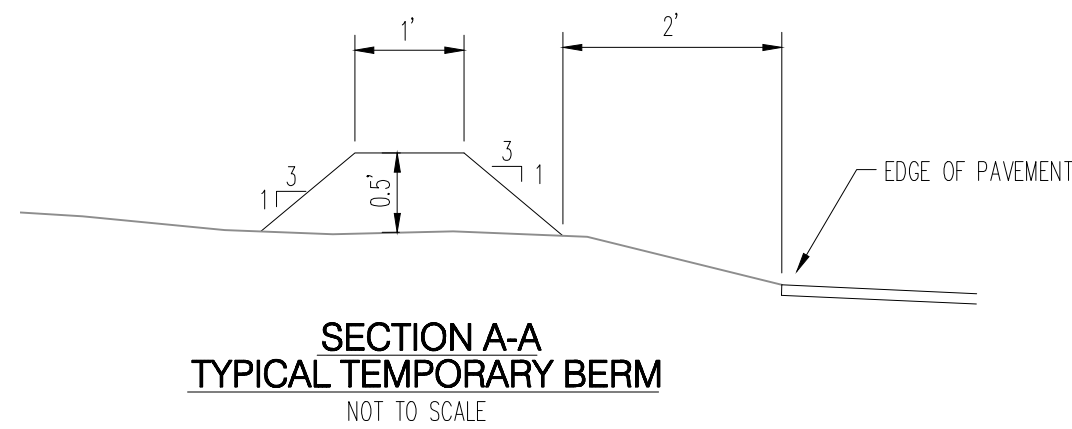
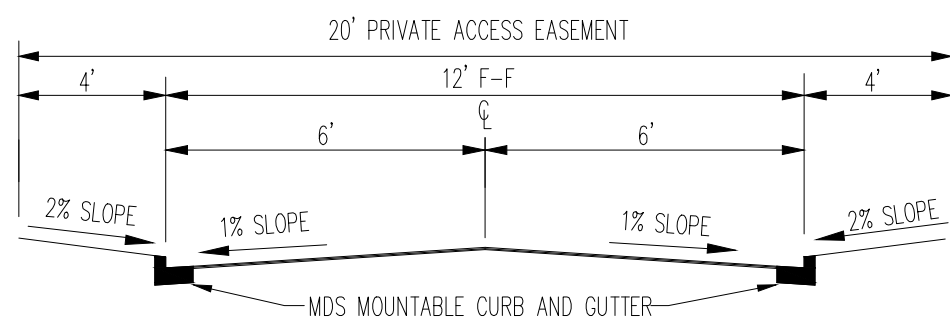
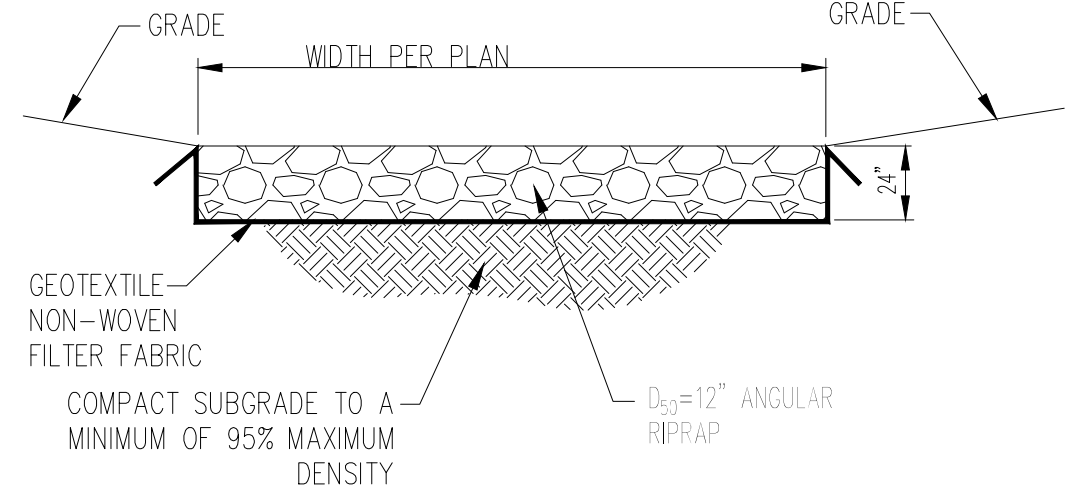
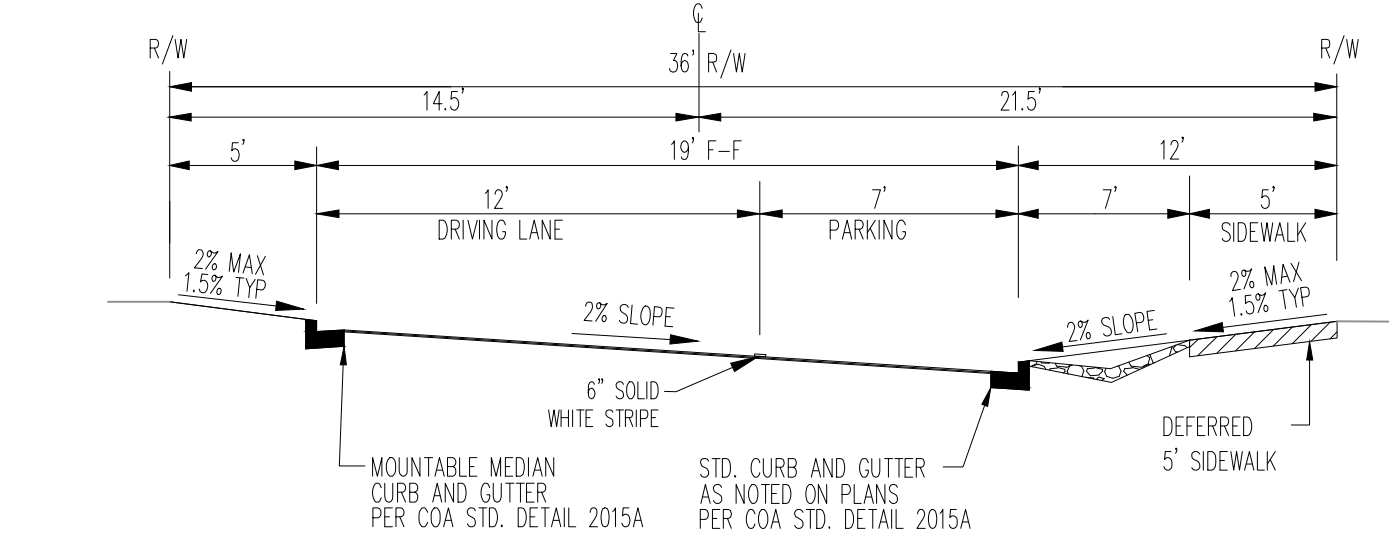
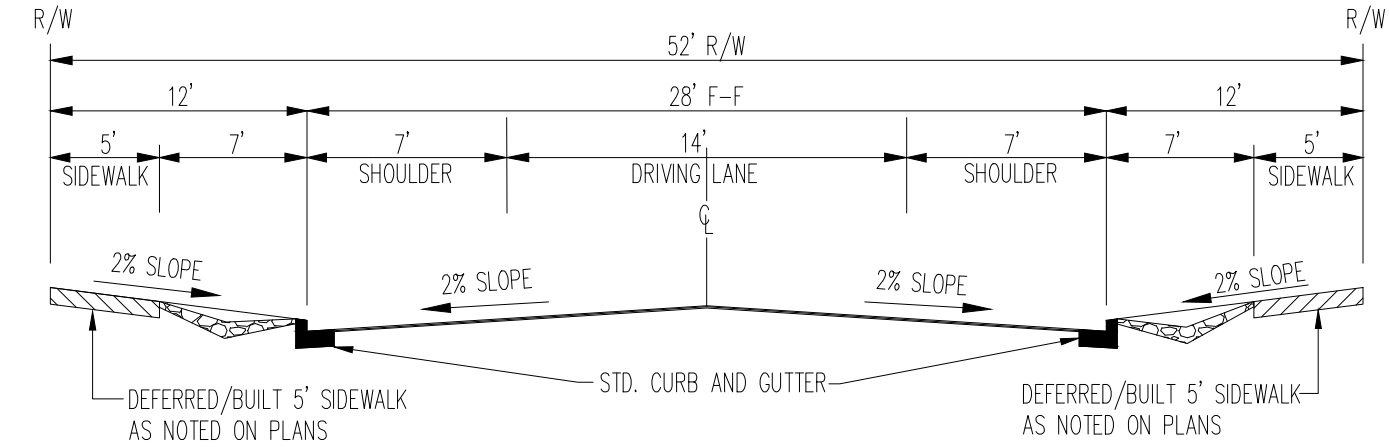
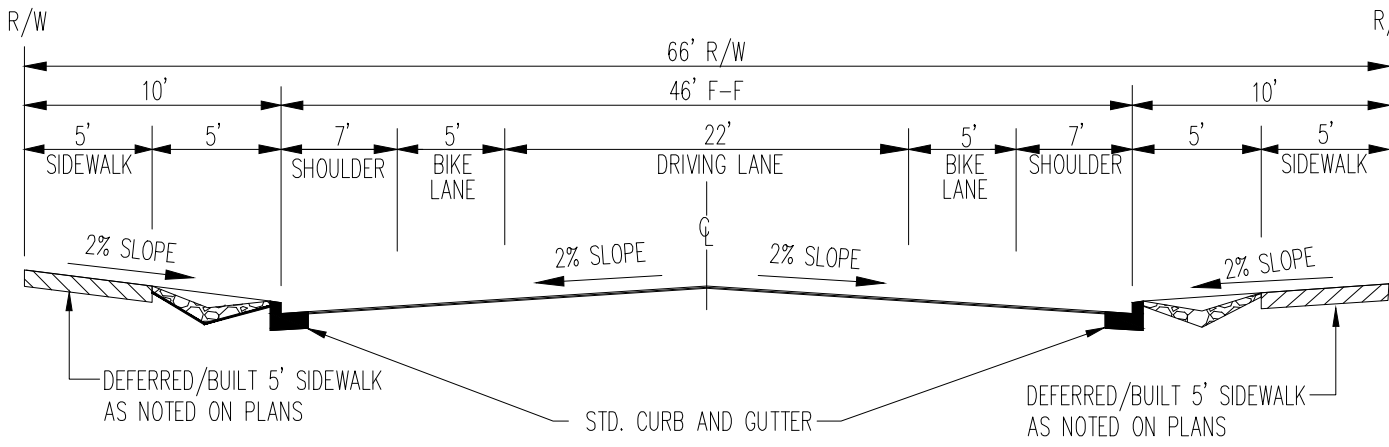
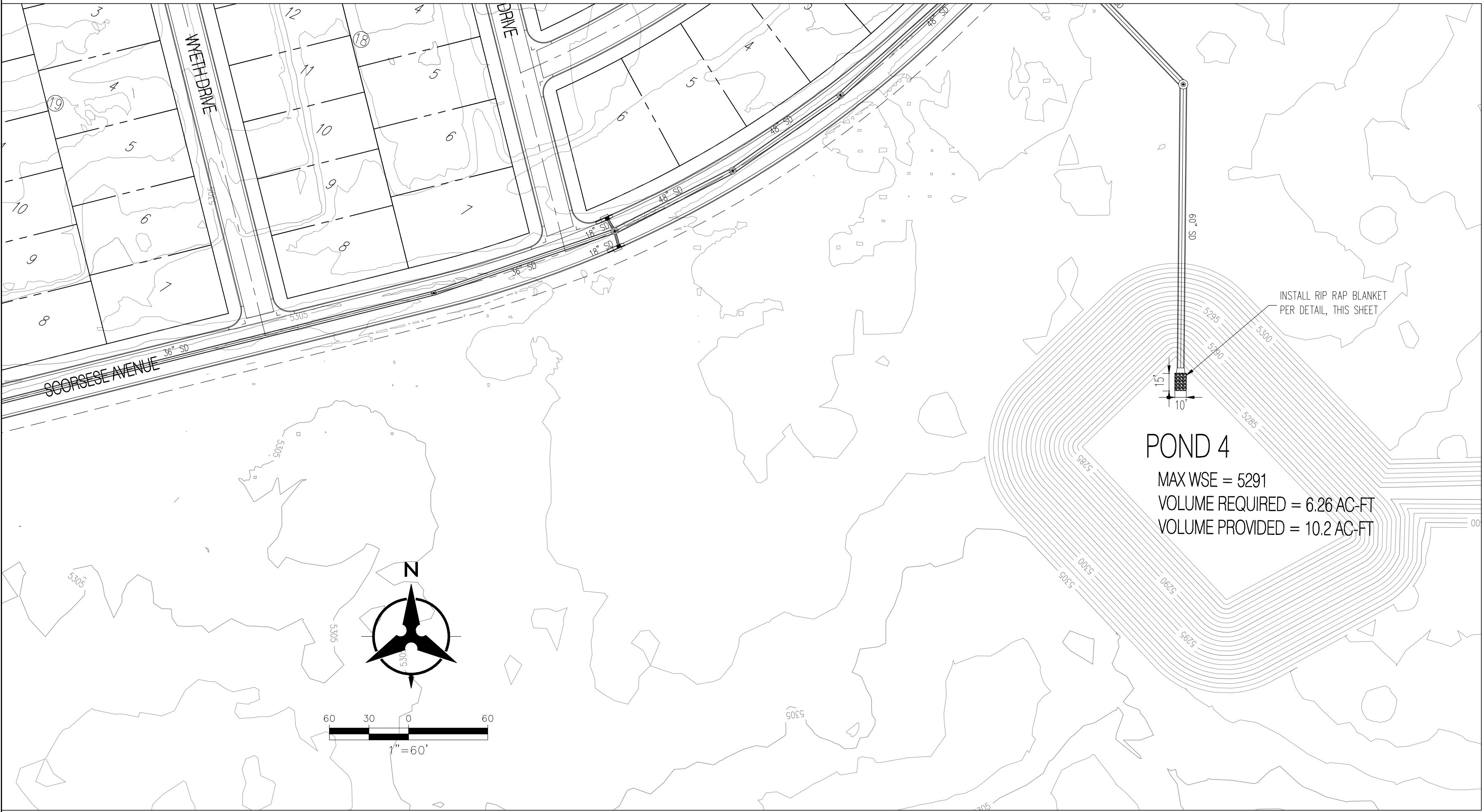
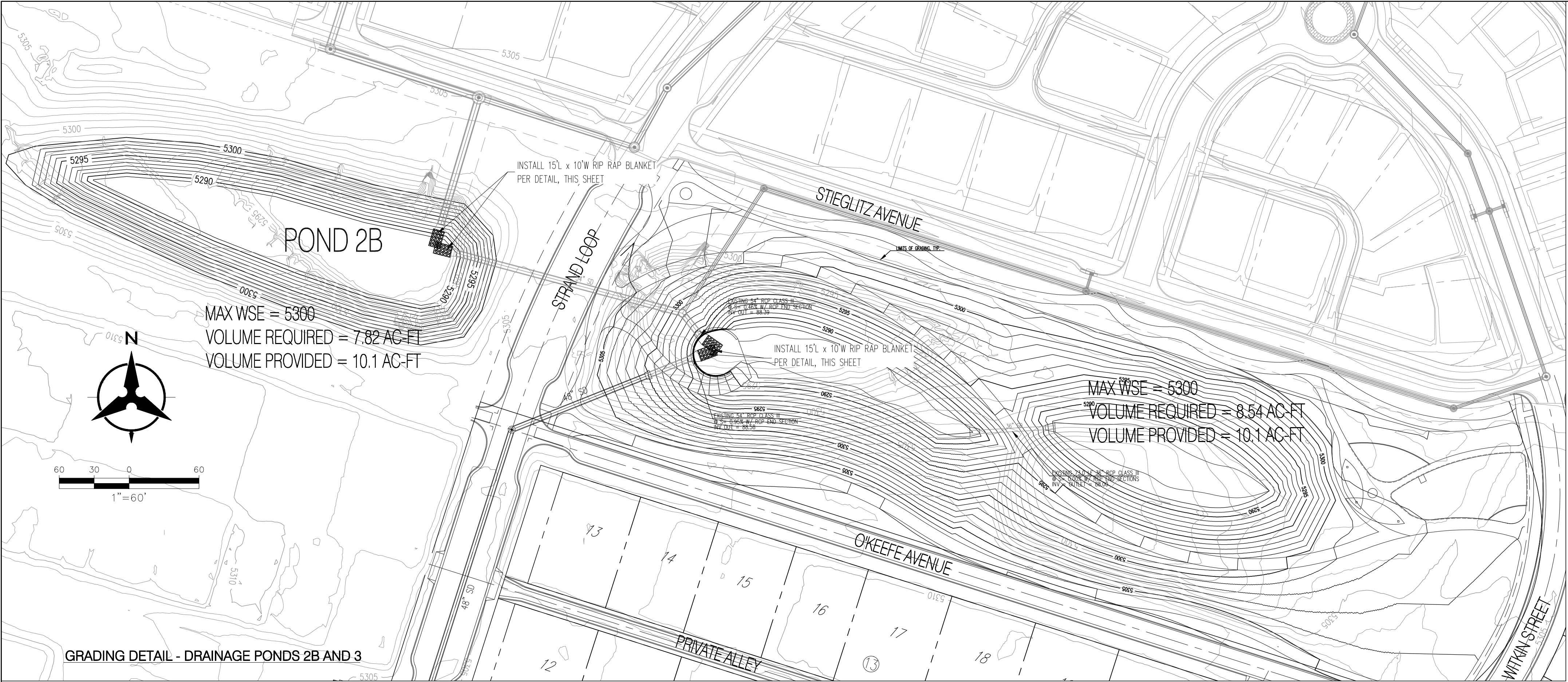


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AS-BUILT INFORMATION		BENCH MARKS		SURVEY INFORMATION		ENGINEER'S SEAL		REVISIONS		DESIGN	
CONTRACTOR	DATE	ACCS	TABLET	STAMPED	"1, R16, 1984"	DATE	BY	No.	Date	Remarks	By
WORKS BY	DATE	INSPECTOR'S	ACCEPTANCE	DATE	GEOGRAPHIC POSITION (NAD 83)	DATE					
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REVISIONS	DATE	VERIFICATION BY	DATE	GROUND-TO-GRID FACTOR = 0.999664099							
MICROFILM INFORMATION		REVISIONS		DESIGN		DATE:12/19/2018		DATE:12/19/2018		DATE:12/19/2018	
REVISIONS		DESIGN		DATE:12/19/2018		DATE:12/19/2018		DATE:12/19/2018		DATE:12/19/2018	
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Bohannon & Huston
www.bhinc.com 800.877.5332

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
MESA DEL SOL MONTAGE UNIT 3B

GRADING AND EROSION CONTROL PLAN DETAILS		Mo./Day/Yr.	
Design Review Committee	City Engineer Approval		
Last Design Update			
City Project No.	Zone Map No.	Sheet	Of
775782	R-15,16 S-15,16	6	7

CITY OF ALBUQUERQUE



December 24, 2018

Mike Balaskovits, P.E.
Bohannon Huston, Inc.
7500 Jefferson St NE Courtyard 1
Albuquerque, NM 87114

**Re: Mesa Del Sol Unit 3B
Erosion Sediment Control Plan
Engineer's Stamp Date 12-19-18 (R16E006)**

Dear Mr. Balaskovits,

Based upon the information provided in your submittal received 12-21-18, the above referenced plan is approved to be included in the SWPPP and to apply for an ESC Permit for grading and Building Permit and Work Order.

In the future:

1. Provide existing and proposed grades. The best way to accomplish this may be to superimpose the BMPs on the grading plan.
2. Show all areas of disturbance.

PO Box 1293

Happy Holidays!

Albuquerque

If you have any questions, you can contact me at 924-3420.

New Mexico 87103

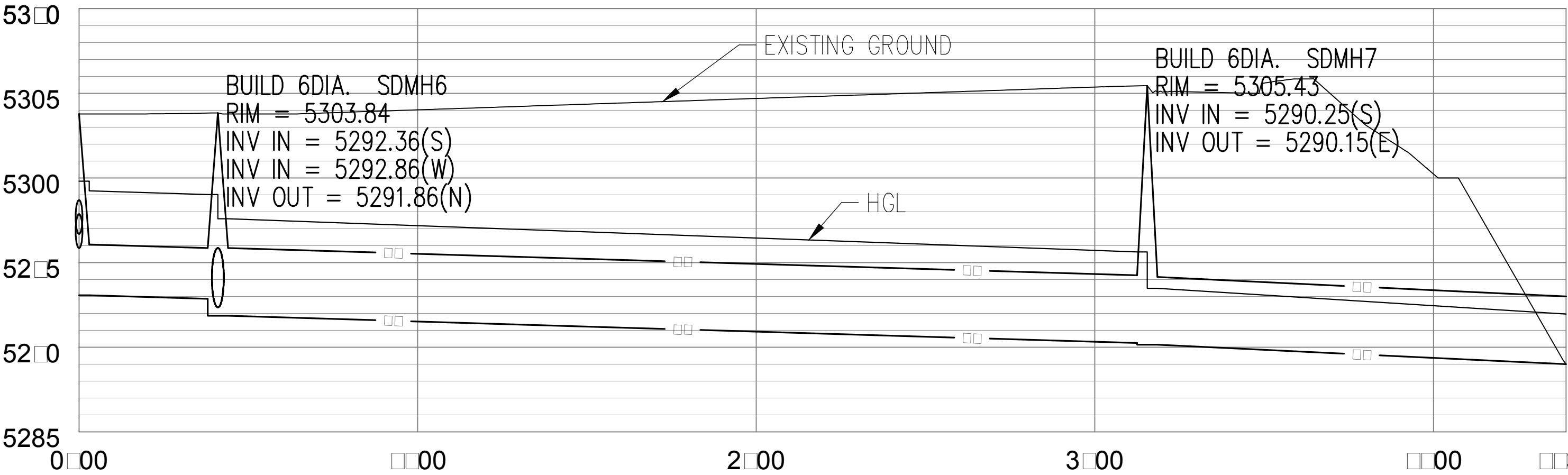
Sincerely,

Curtis Cherne, P.E.
Principal Engineer, Stormwater Quality
Planning Dept.

www.cabq.gov

C: email

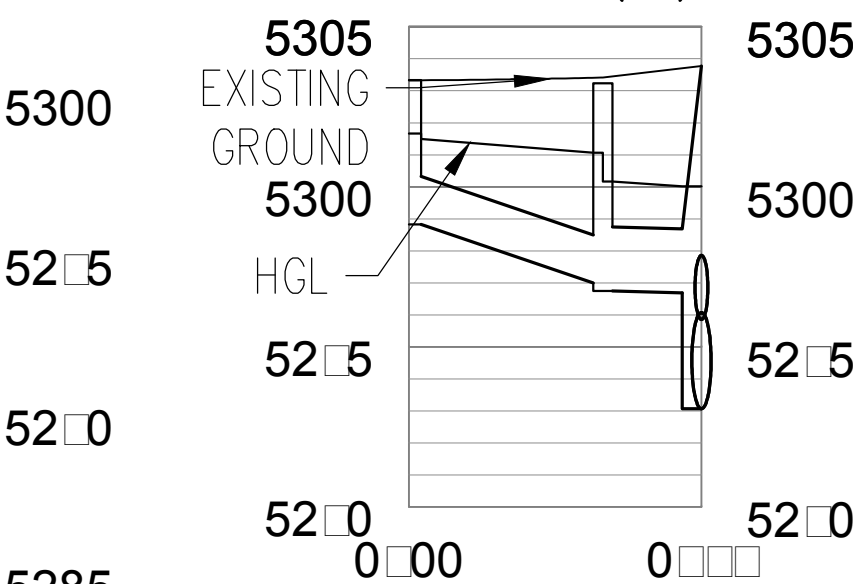
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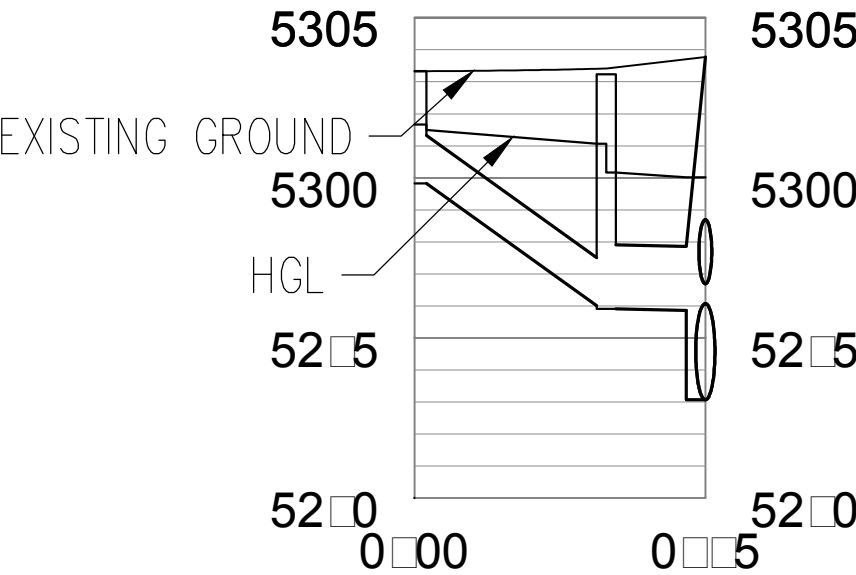
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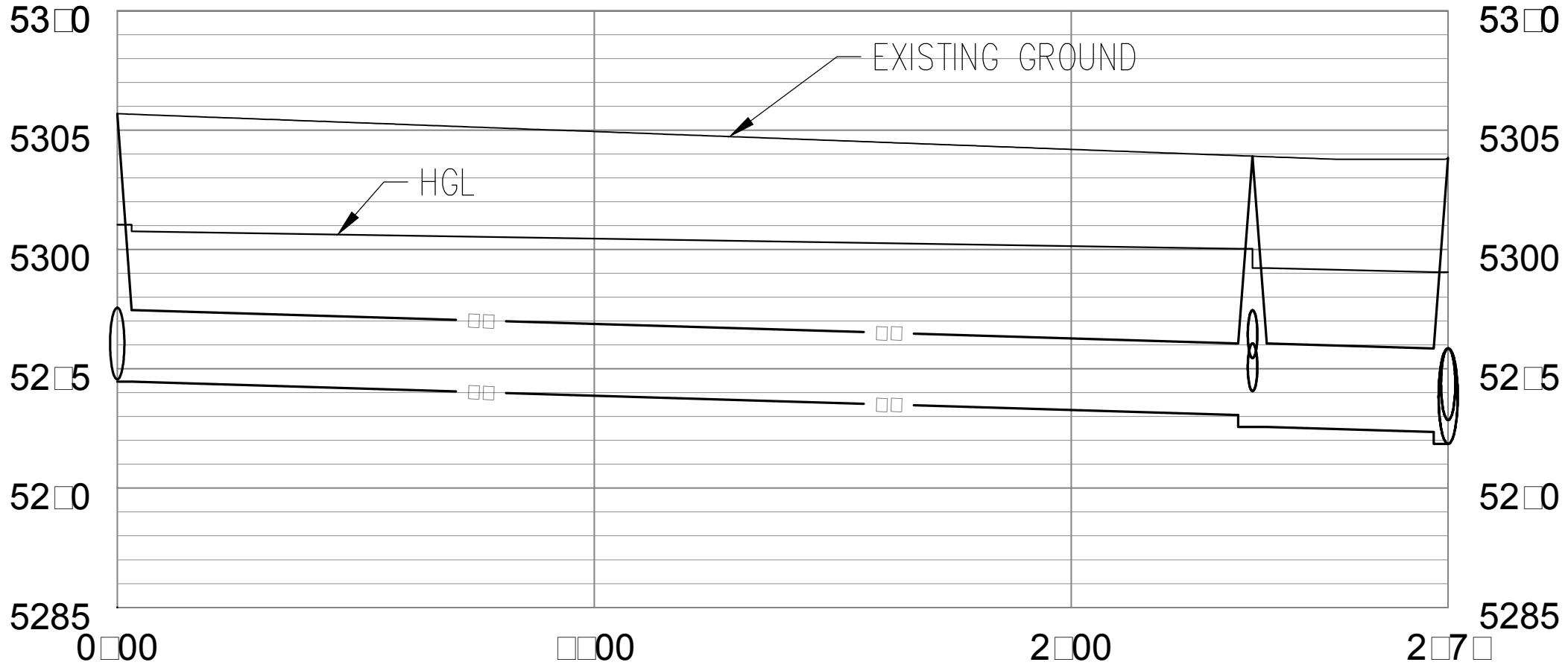
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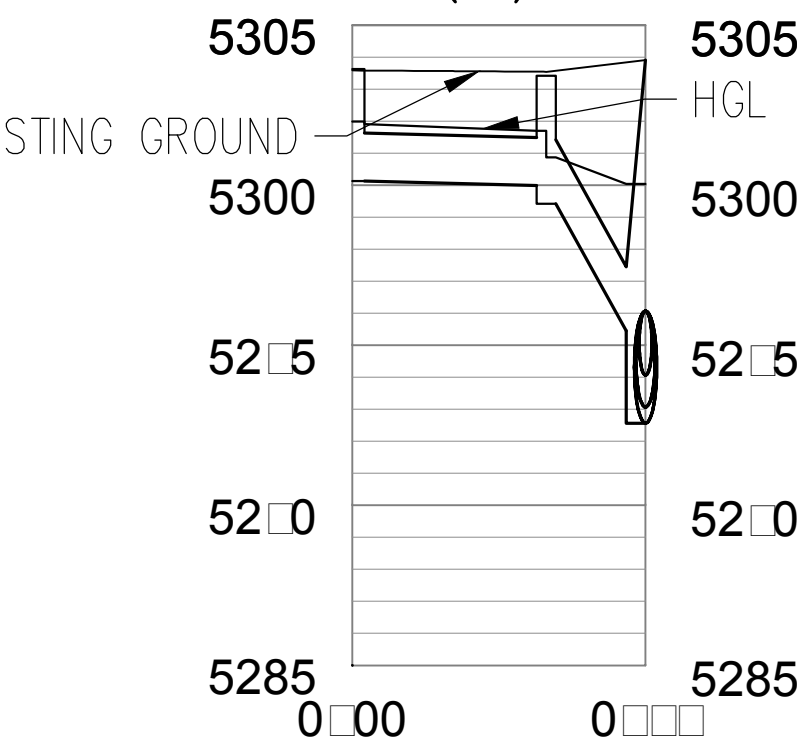
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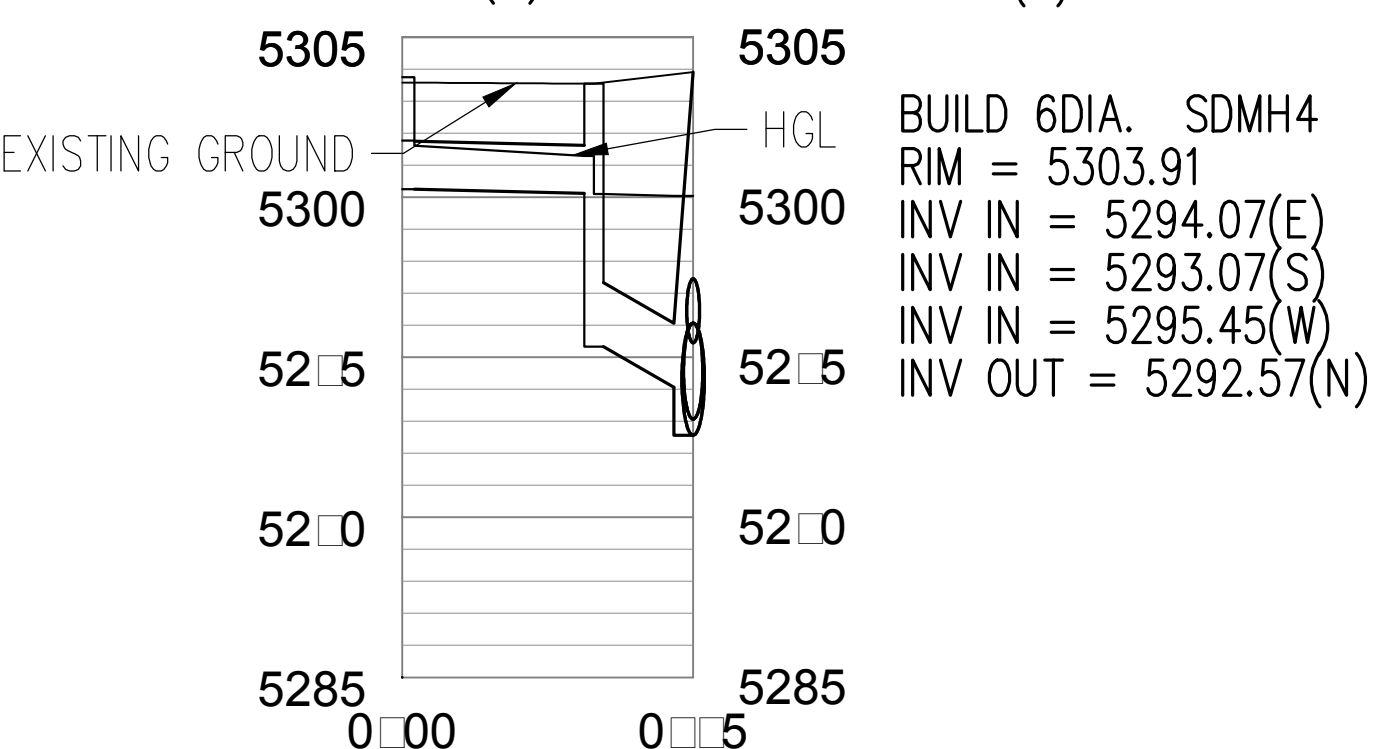
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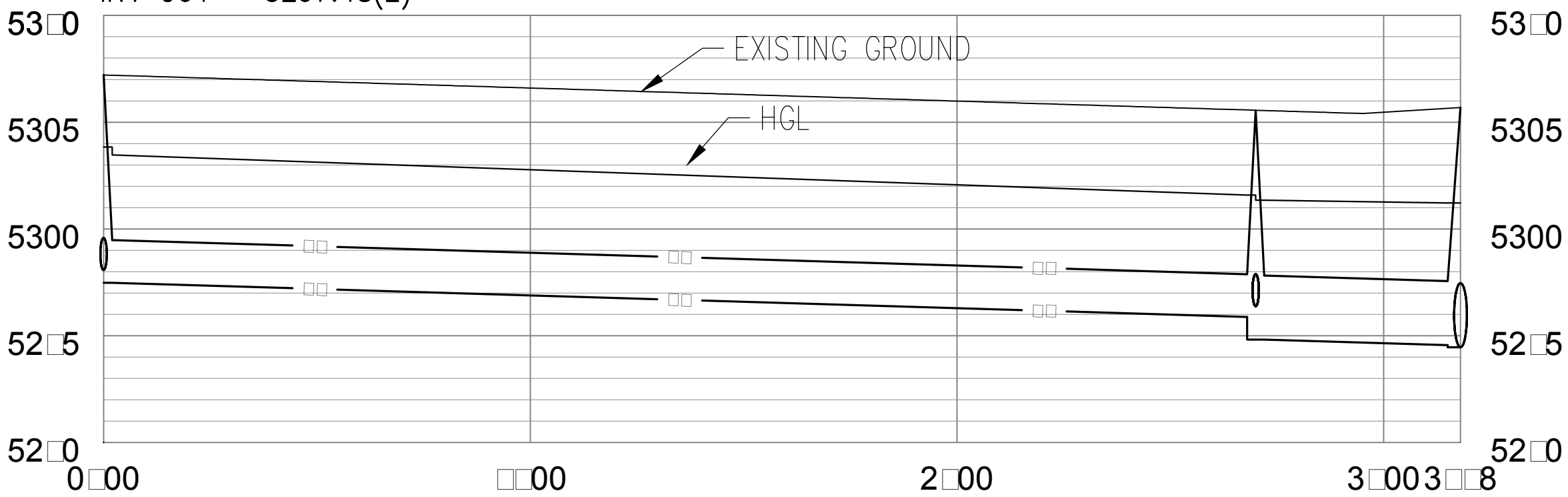
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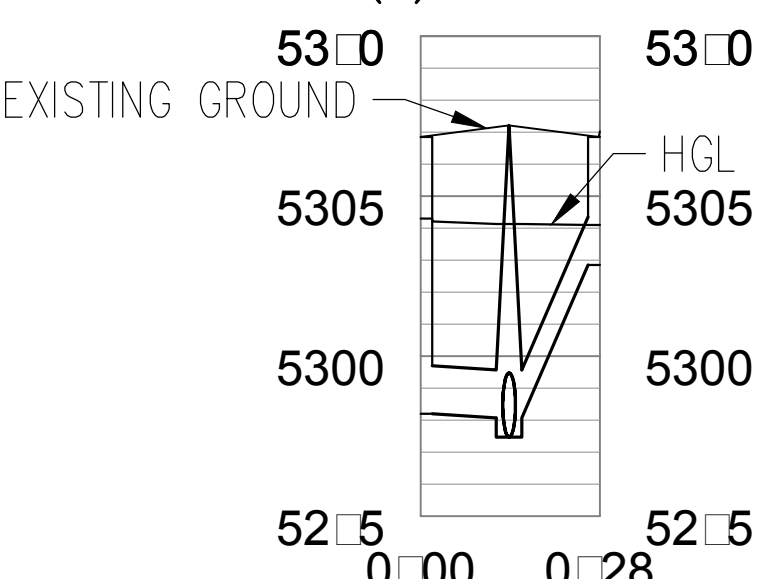
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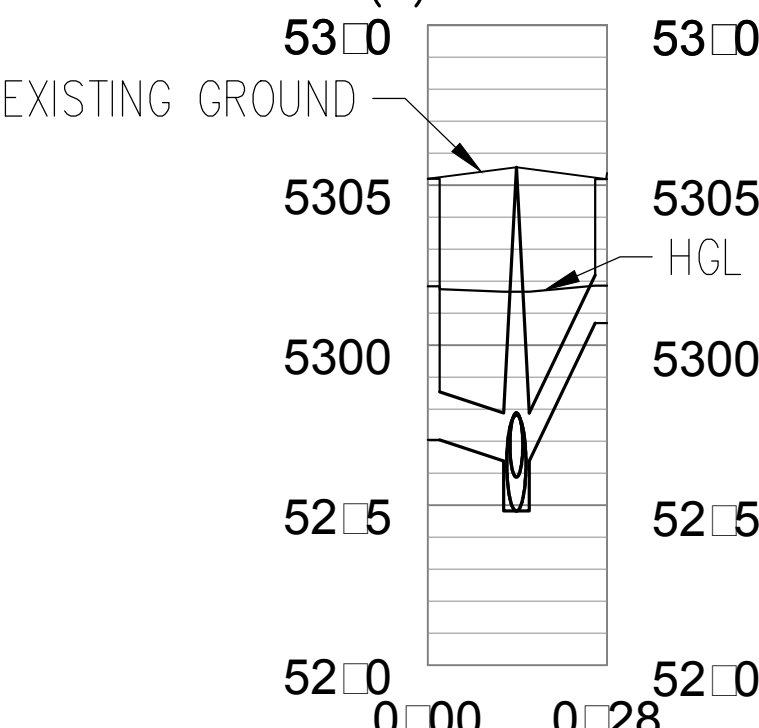
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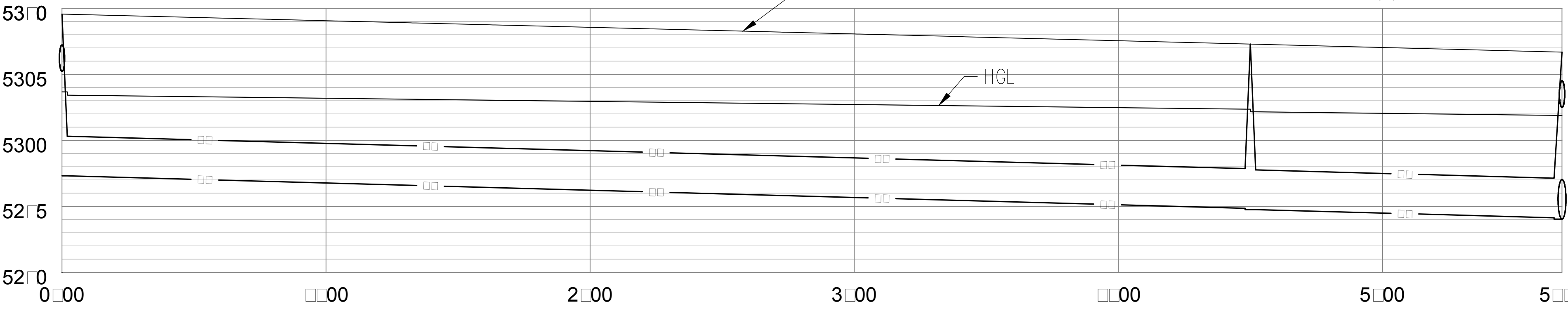


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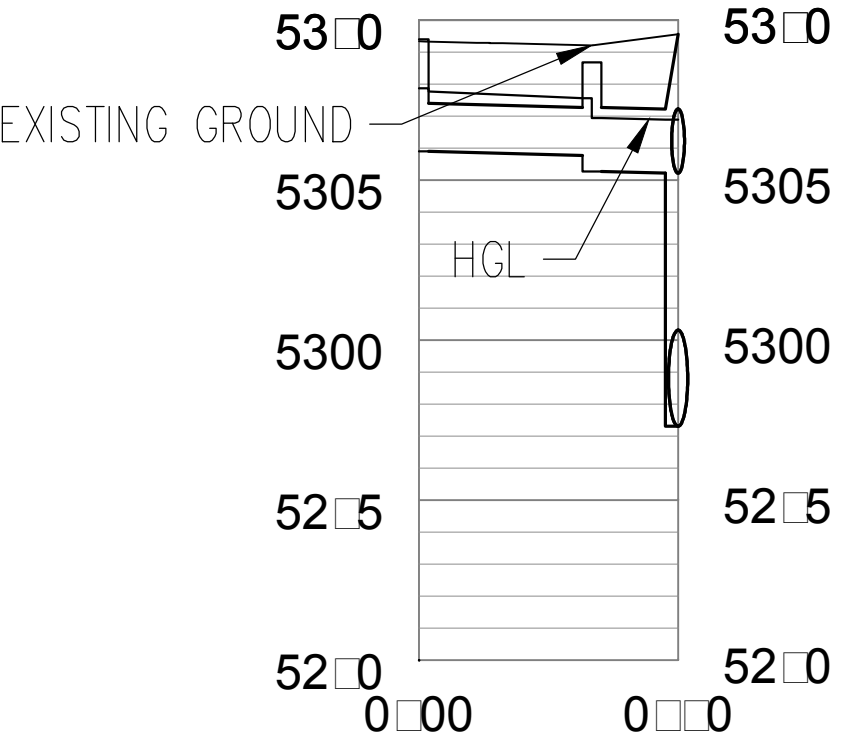


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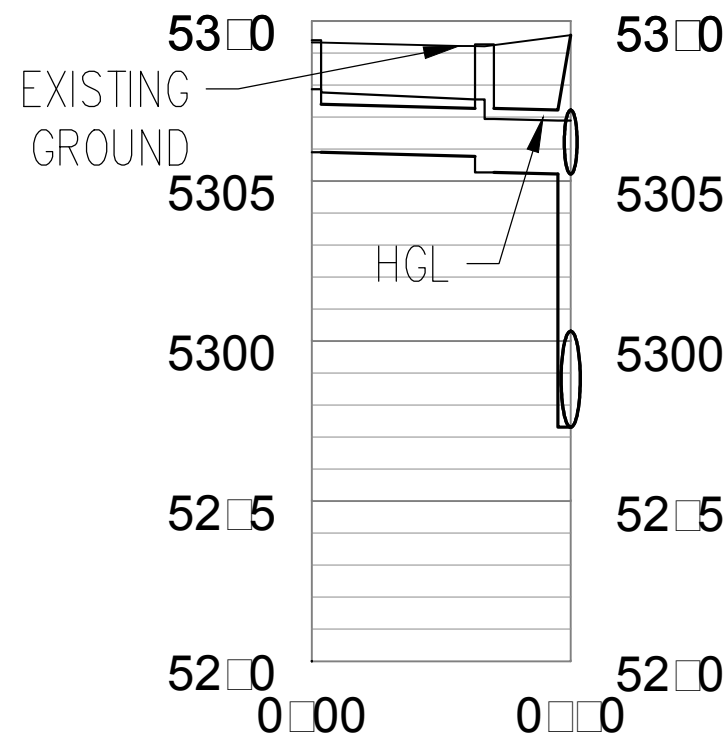
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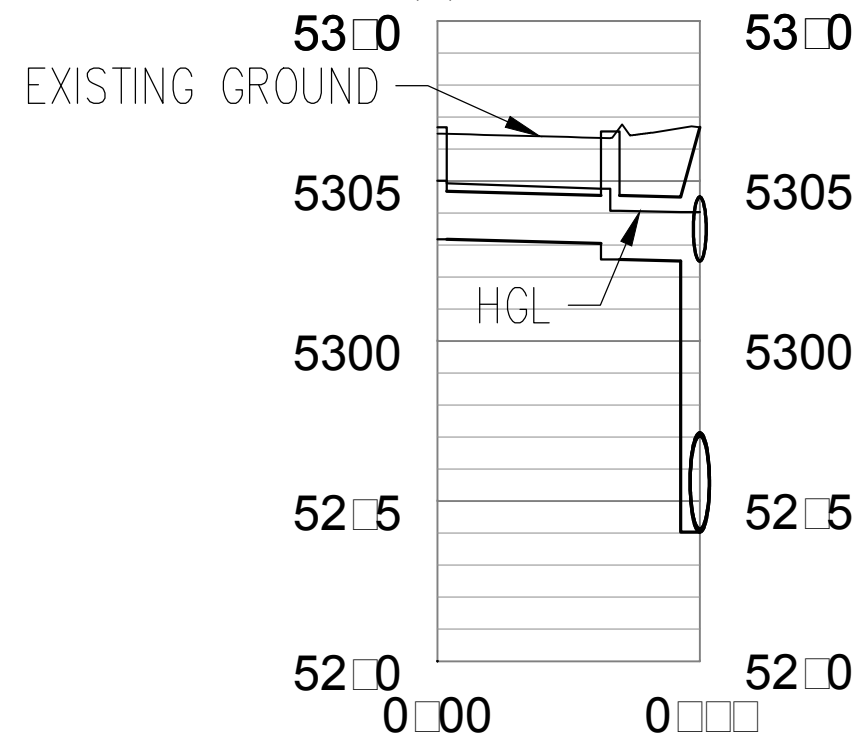
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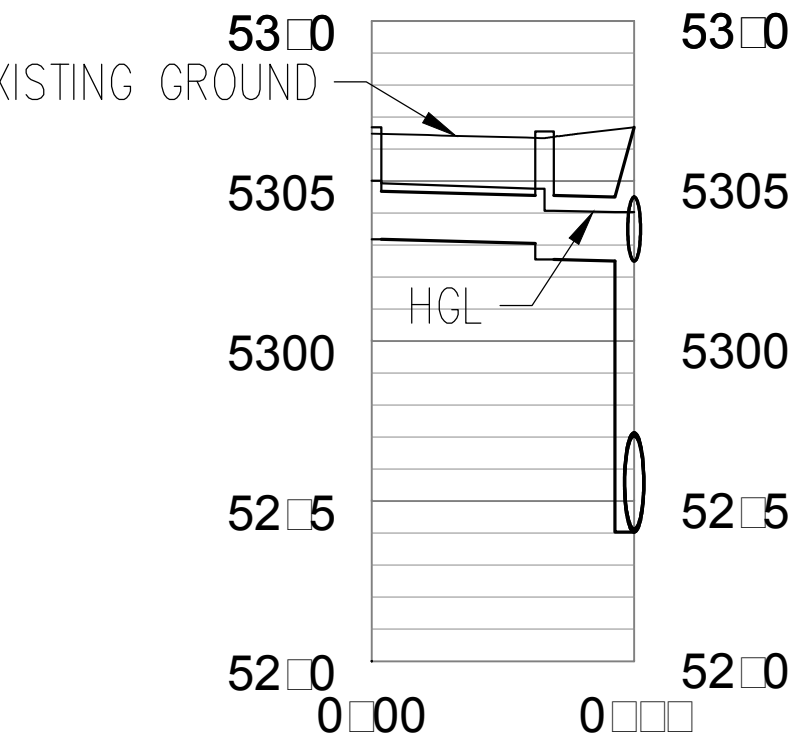
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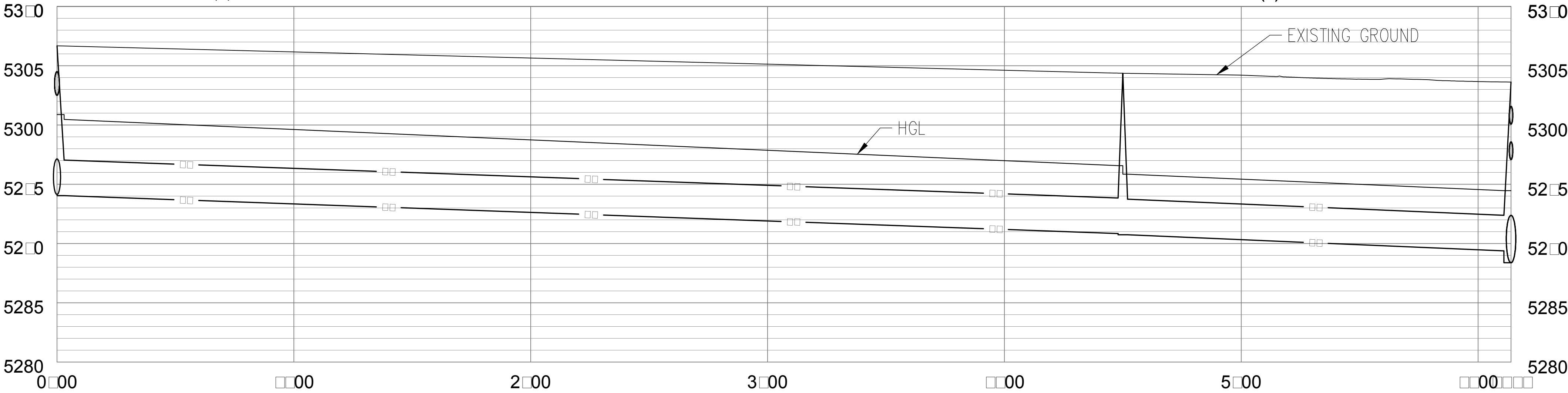
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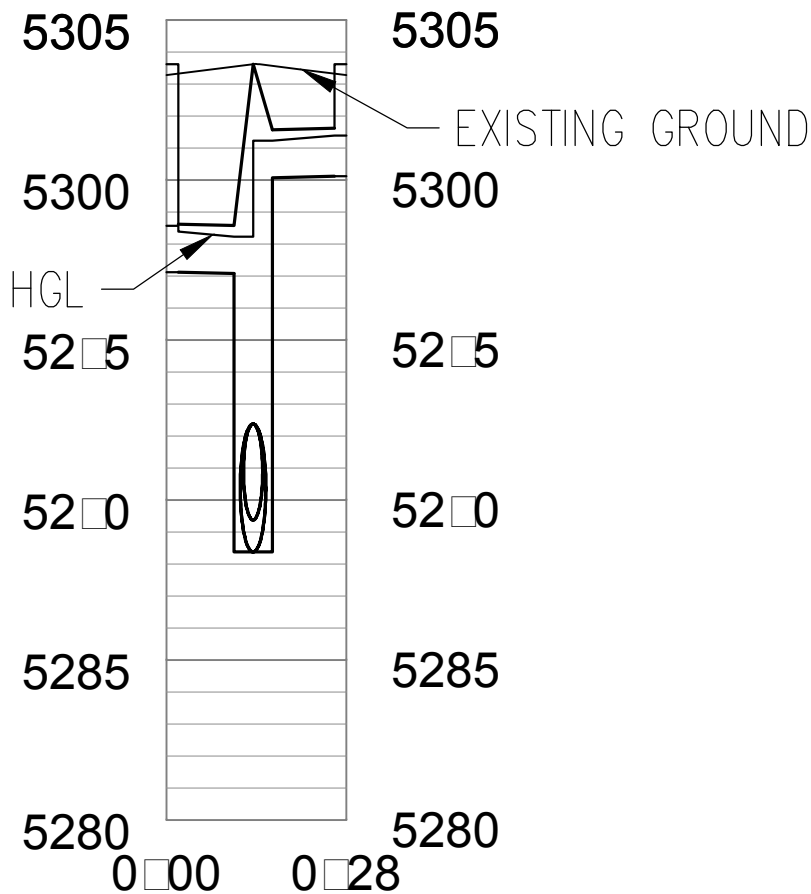
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INV OUT = 5288.38(NE)

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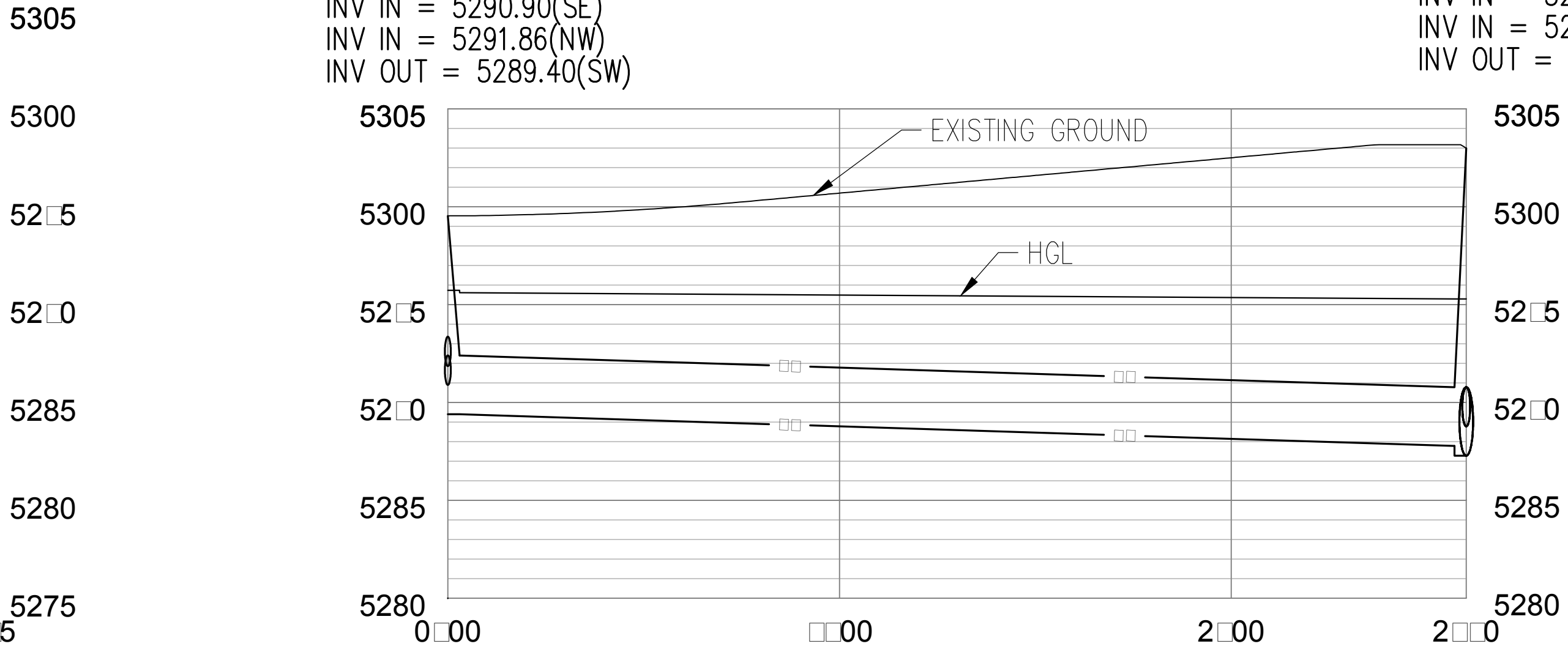
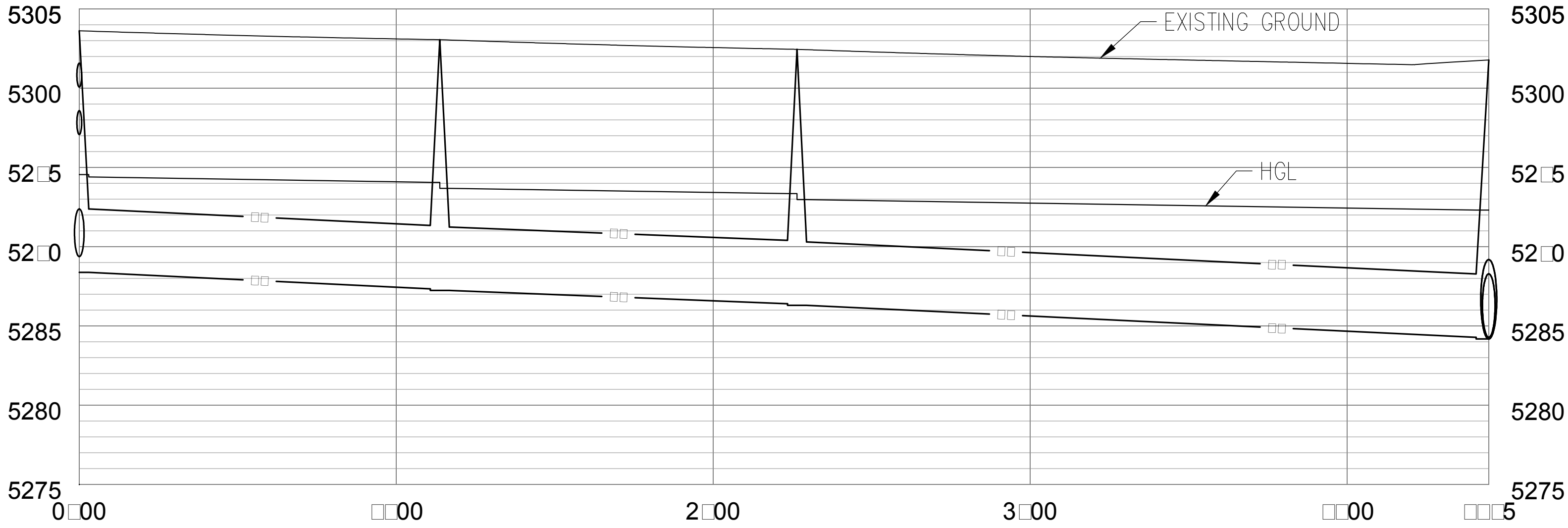
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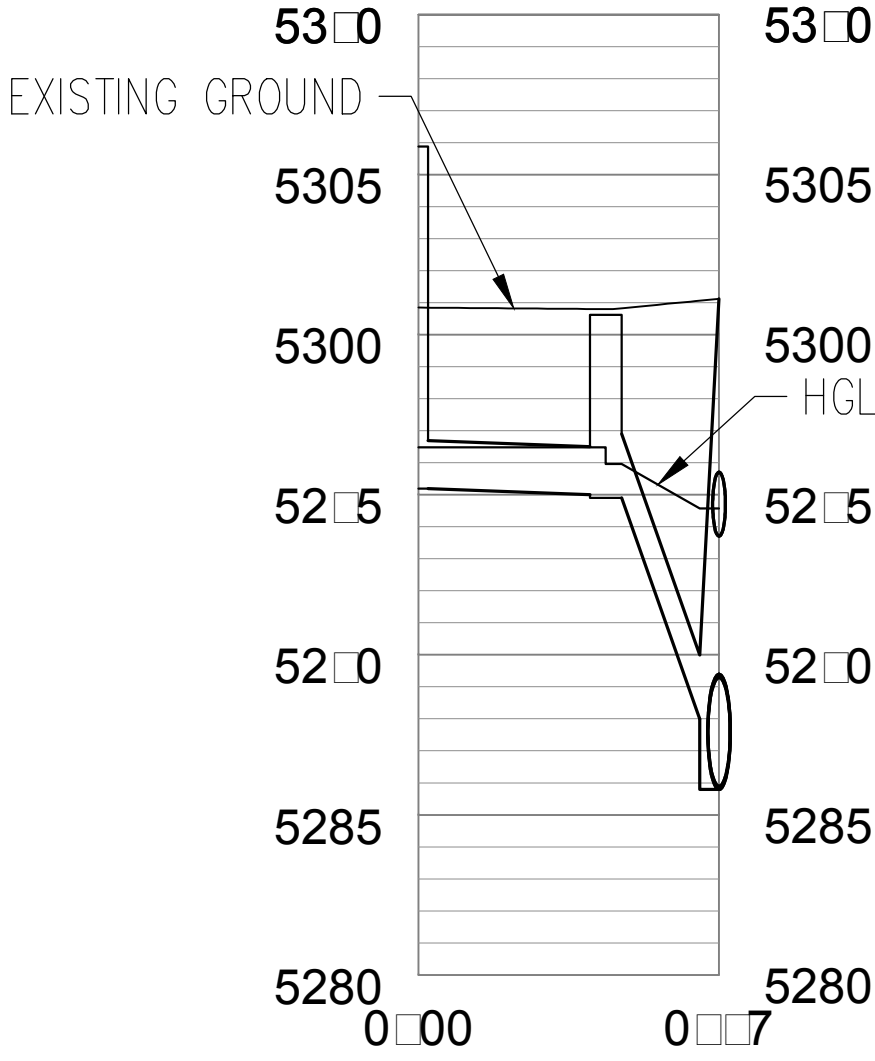
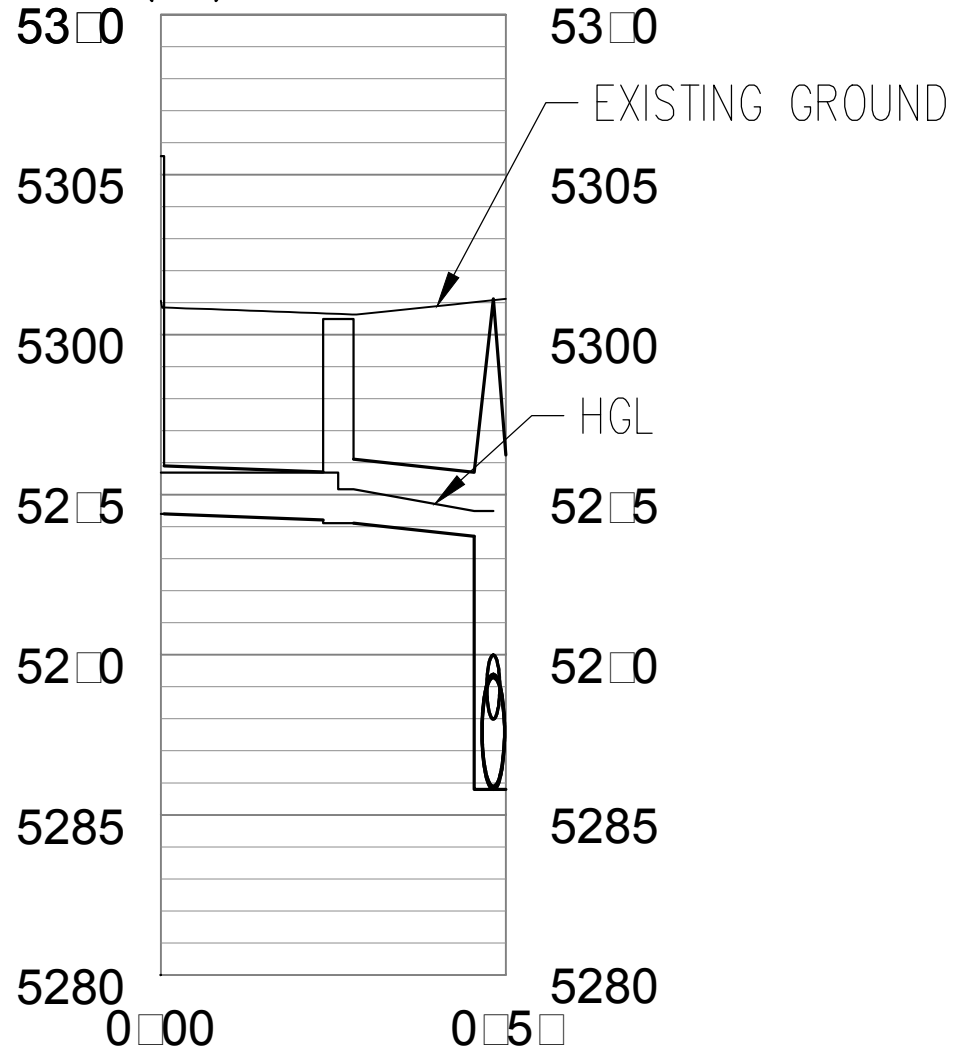
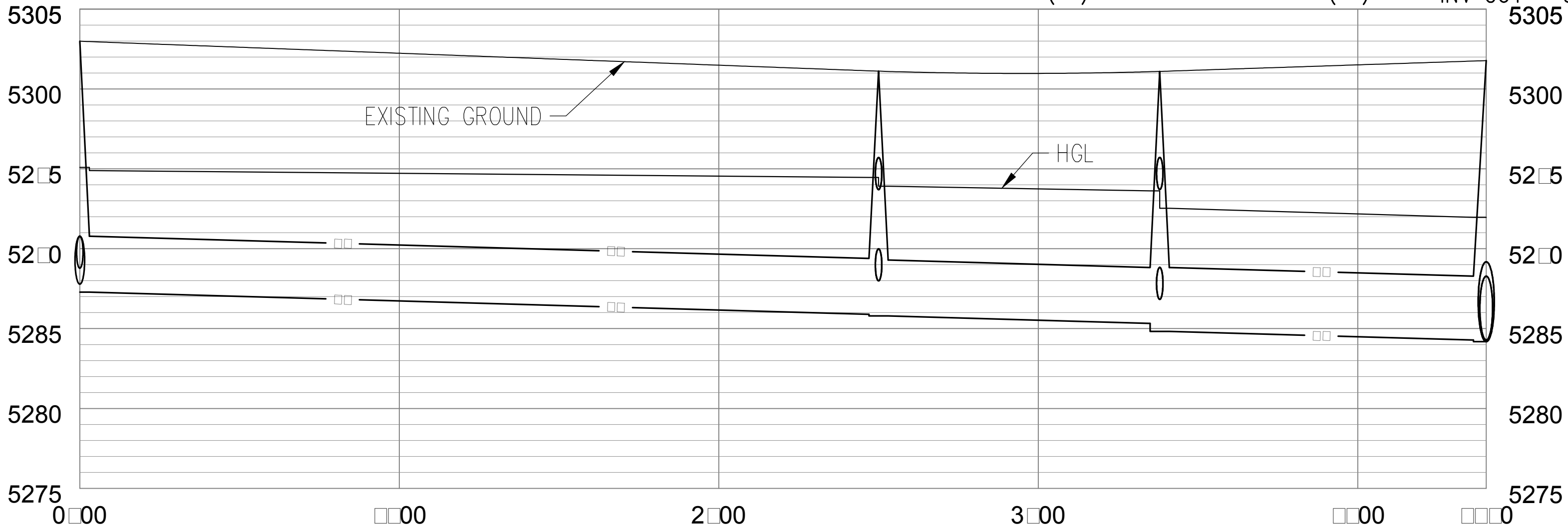
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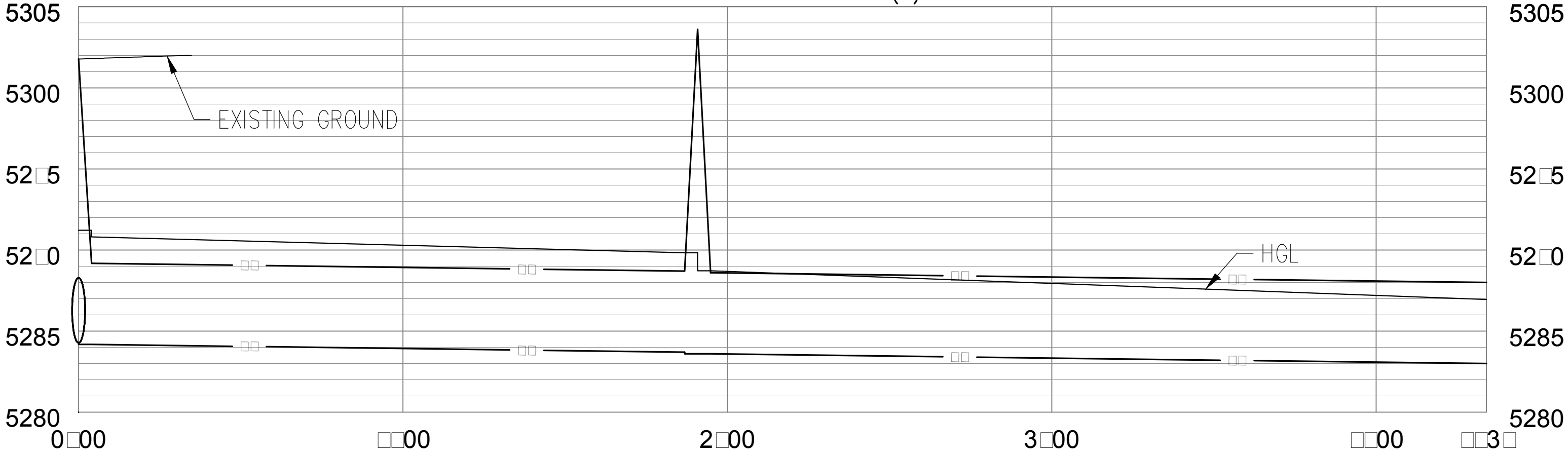
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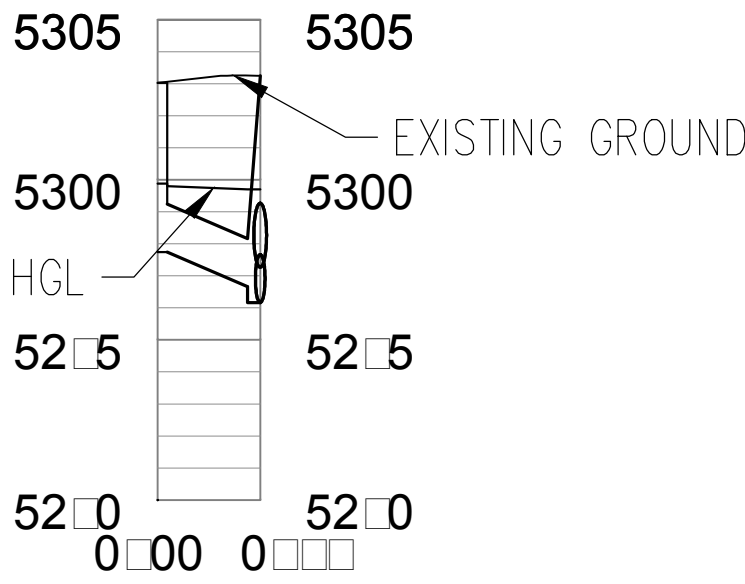
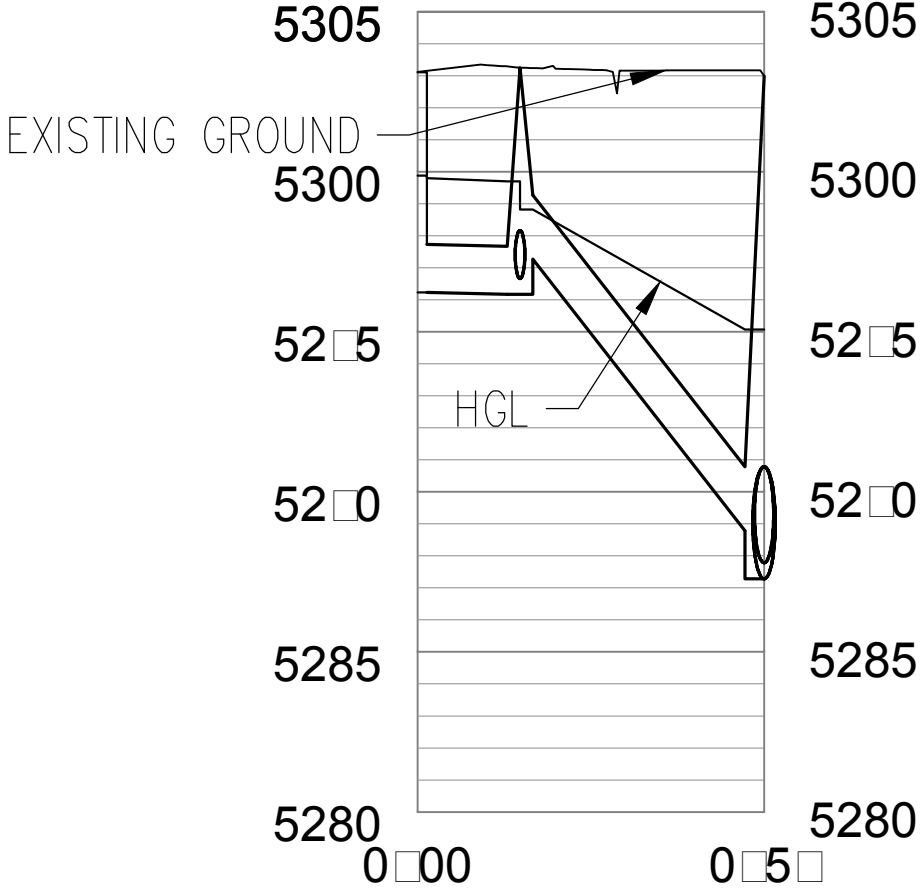
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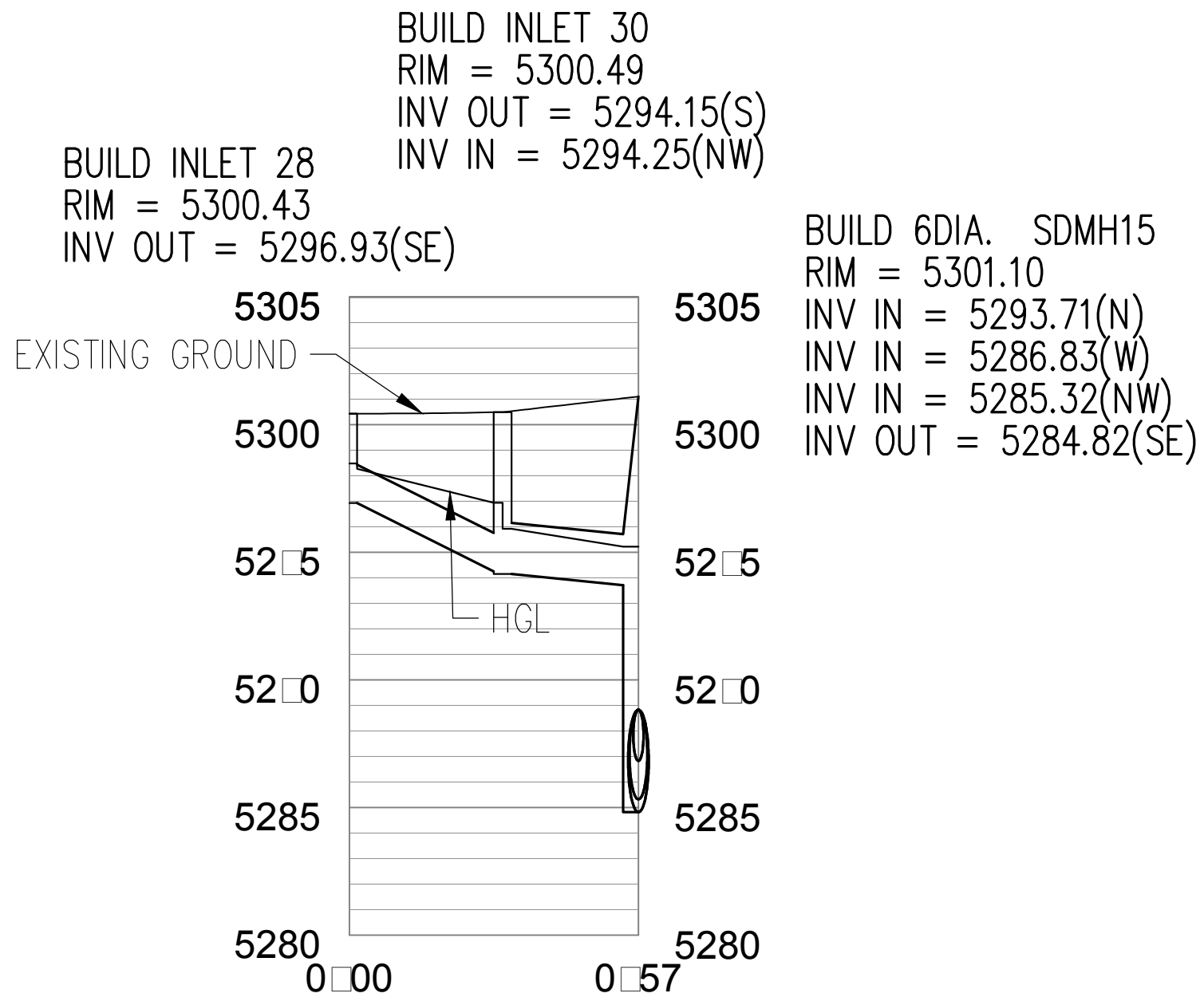
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INV IN = 5296.17(NW)
INV OUT = 5297.27(NE)





DRAINAGE REPORT FOR MESA DEL SOL RESIDENTIAL MONTAGE UNIT 3 AND 4

JANUARY 2019

Prepared for:

Corazon del Mesa 3B, LLC

**9600 Tennyson St. NE
Albuquerque, NM 87122**

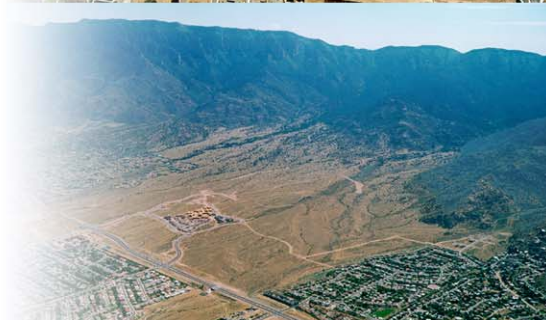
Prepared by:

Bohannon  Huston

Engineering

Spatial Data

Advanced Technologies



**DRAINAGE REPORT
FOR
MESA DEL SOL
RESIDENTIAL
MONTAGE UNIT 3 AND 4**

JANUARY 2019



Prepared for:
**MESA DEL SOL, LLC
5700 UNIVERSITY BLVD WEST SE - SUITE 310
ALBUQUERQUE, NM 87106**

Prepared by:
**BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109**

Prepared By:

Brian C. Patterson, P.E.
Design Engineer

Date

Mike Balaskovits, P.E.
Project Manager

Date

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I. PURPOSE

This drainage report is for Mesa del Sol Residential Montage Unit 3 and 4. The proposed development consists of approximately 277 single family detached and attached residential lots on approximately 67 acres which will be developed in two units (Unit 3 and 4). This project is located within Mesa del Sol, in southeast Albuquerque south of the intersection of Bobby Foster Road and University Blvd. The Mesa del Sol Residential Montage Unit 3 and 4 is part of a larger phase of residential development which will occur in the future; however, the fully developed drainage for the ultimate future condition as well as the interim developed conditions are addressed by this report. 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, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the *Development Process Manual (DPM), Volume 2 Design Criteria, Section 22.2, Hydrology, The City of Albuquerque*, January 2002. Basins, as referenced later in this report are less than 40 acres, therefore Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres, was used. The results are included in Appendices A through C. Street capacity and storm drain inlet calculations supporting this study are located in Appendix B.

The overall drainage concept for this project will be onsite and offsite ponding of storm water in the developed conditions. Onsite runoff will be captured by retention ponds, which are designed to retain and infiltrate approximately the 2-year storm volume, as well as the 100-year 10-day storm volume. These ponds will be owned and maintained by Mesa del Sol with agreement and covenants with the City of Albuquerque.

In Albuquerque, approximately 90% of the annual runoff is generated by rainfall events that are 1 inch or less, which equates to approximately the 2-year storm; therefore, this was the basis for sizing the infiltration basins within the retention ponds. The infiltration time utilizing the infiltration basins as well as the surrounding ponding area, will be 96 hours or less. Offsite flows affecting this project from the west will be captured by temporary retention ponds until development to the west occurs.

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

- *Technical Appendices for the Level B Plan for Mesa del Sol*, prepared by Calthorpe Associates, dated October 2006.

The Level B Plan contains a conceptual Drainage Management Plan (DMP), which outlines both existing and developed drainage conditions. Retention ponding of the 10-day developed storm volume is proposed by this report both by proposed ponding areas as well as the existing playa area located to the south within Zone 'A' as designated by FEMA, which has historically captured and retained storm water from the Mesa del Sol area. In addition, the Level B DMP states a volume capacity of the existing playa of 2,300 ac-ft., which is far in excess of the developed runoff volume of 480 ac-ft. for the entire Mesa del Sol development; therefore, the DMP demonstrates adequate downstream capacity. The Level B DMP also allows for a modified approach for regional ponding area, which consists of infiltrating the volumes smaller than the 10-day storm volume and bleeding off the remaining volume through a storm drain pipe, which will ultimately discharge into the existing playa. Therefore, the proposed concept for this report is in conformance with the Level B DMP.

- *Drainage Report for Mesa del Sol Residential Montage Unit 1 and 2*, prepared by Bohannon Huston, Inc., dated January 2011. COA Record # R16D0034

This drainage report provides drainage analysis for Units 1 and 2, which is located just north of Units 3 and 4. This report provides detailed analysis for the retention ponds that will accept flows from this development.

III. SITE LOCATION AND CHARACTERISTICS

Mesa del Sol Residential Montage Unit 3 and 4 will be developed in two units, Unit 3 and 4. Unit 3 will consist of the eastern portion of the project and the Unit 4 will comprise the remaining western half. Access to both units will be from University Blvd. SE.

The site has been previously graded with relatively flat slopes and generally slopes from west to east at an average grade of about 0.5%.

IV. EXISTING HYDRAULIC AND HYDROLOGIC CONDITIONS

The land comprising Mesa del Sol Residential Montage Unit 3 and 4 is currently undeveloped, but was graded several years ago. Ponds 2A, 2B, 3 and 4 are currently graded and accept developed runoff from existing Units 1 and 2, as well as undeveloped runoff to the west of these ponds. Runoff generated by the project site in its present state

drains toward the existing ponding areas. The existing playa represents the historic runoff capture point for the project site as well as the surrounding areas, and again, this flow has been historically retained and infiltrated within the existing playa.

V. DEVELOPED HYDRAULIC AND HYDROLOGIC CONDITIONS

A. PERMANENT STORM WATER DETENTION PONDS

Originally, Ponds 1, 2A, 2B, and 3 were anticipated to be constructed as detention ponds in the future. However, it is now proposed that these ponds function as retention ponds for this project and in the future, which is consistent with the drainage concept throughout the Mesa del Sol area, both commercial and residential. Existing ponds 2B and 3 will be upsized to accept developed runoff from this project. Existing Pond 4 will remain in its current configuration, and certified as part of the Financial Guaranty Release for this project. However, it is likely that Pond 4 will be reconfigured at some time in the future to accommodate the future adjacent improvements and will need upsizing based upon future plans. Again, all permanent retention ponds (Ponds 2A, 2B, and 3) will be designed to evacuate storm water through infiltration within 96 hours, and the infiltration basins serve to infiltrate the more frequent 2-yr (90th percentile) storms.

Ponds 2B and 3 were originally designed to assist in accommodating flows from Montage Units 1 and 2 with the intent to upgrade and increase the capacity of the ponds, as needed, when further development of the Mesa Del Sol area is completed. The original pond size estimates for 2B and 3 were 3.45 ac-ft and 4.30 ac-ft, respectively (*Approved Drainage Report Mesa del Sol Residential Montage Unit 1 and 2, by Bohannon Huston Inc dated 01/14/2011, COA Record Number R16D003A*). The proposed drainage design for Montage Units 3 and 4 increases the required capacity of the ponds. The needed composite volume required for Ponds 2B and 3 is 16.36 ac-ft. The updated design of the ponds as part of this project is 19.71 ac-ft.

POND	REQUIRED POND VOLUME FOR EXISTING CONDITIONS (AC-FT)	REQUIRED POND VOLUME FOR PROPOSED CONDITIONS (AC-FT)**	CALCULATED DESIGN POND VOLUME (AC-FT)
2B*	3.45	7.82	6.84
3*	4.30	8.54	12.87

*Pond 2B and 3 operate as a single pond with a 54" pipe that connects the two beneath Strand Loop.

** Required Volume includes Units 1, 2, 3 and 4.

The permanent storm ponds (Ponds 1-4) will each consist of a forebay, primary storage zone, infiltration basin, and pond outlet (please see Exhibit 9). The forebay will be located at the pipe inlet into the pond and its purpose is to dissipate energy and deposit sediment from the storm water. The infiltration basin consisting of a bed of gravel and/or rip-rap will assist in infiltrating the 2-year storm volume, and in concert with infiltration occurring in the remaining earthen portions of the pond, has been designed to drain the 100-year, 10-day storm water volume in 96 hours or less. The infiltration basins will be located a sufficient distance from the forebays in order to minimize the amount of silt entering the infiltration basins. Only Ponds 2A, 2B, and 3 are proposed to be graded to their near final configuration which will exclude constructing infiltration basins and forebays. These improvements will be provided at a later date with a separate grading submittal.

Infiltration calculations were based on an average of percolation test results performed by Geo-Test, Inc. on a permanent pond immediately north of Albuquerque Studios Mesa del Sol, New Mexico dated May 17, 2007, File No. 1-61211 (see summary tables below). A percolation rate of 0.3 in/hr. was recorded for 24" above ground surface, which was neglected for our average in our infiltration calculations. This was based on the assumption that the ponds would be cleaned and maintained before the point of virtually no infiltration was reached. A factor of safety of 1.1 was then used for the infiltration basin and a factor of safety of 2.0 was used for the remaining area of the pond to determine the time to infiltrate the required storm water volume, which is approximately the 2-year storm water volume in **Equation 1**.

Equation 1. $T_{\text{Drain}} = \text{Vol}_{\text{req}} / ((i_{\text{pond}}(A_{\text{eff}})) + (i_{\text{infiltration basin}}(A_{\text{eff}})))$

Where: Vol_{req} = Storm Volume (cf)

i_{pond} = Pond Infiltration rate = $i/2.0$ (in/hr)

$i_{\text{infiltration basin}}$ = Infiltration basin rate = $i/1.1$ (in/hr)

Infiltration basin = Area Infiltration Basin (sf)

A_{eff} = Avg Pond Area Minus Infiltration basin (sf)

POND INFILTRATION SUMMARY

POND	100-YR 10-DAY RETENTION VOLUME (AC- FT)	2-YR RETENTION VOLUME (AC- FT)	AREA OF INFILTRATION BASIN (SF)	AVG AREA OF POND (SF)	TIME TO INFILTRATE 100-YR 10-DAY VOLUME (HR)	TIME TO INFILTRATE 2- YR VOLUME (HR)
1 (Future)	N/A	N/A	N/A	N/A	N/A	N/A
2A	5.50	2.39	1500	100000	33	14
2B	7.82	3.39	1500	50000	92	40
3	8.54	3.71	1500	70000	72	31
4*	19.04	8.26	5000	130000	85	37

*denotes possible future configuration

B. ONSITE DEVELOPED BASINS**1. OUTFALL 'A'**

Outfall 'A' consists of Basins A-1, A-2, A-3, A-4, A-5 and A-6, as well as a portion of Future Basin 1, as shown on the Developed Conditions Basin Map. These flows will enter proposed storm drain inlets within these basins and ultimately discharge into Pond 3. Ponds 2B and 3 are interconnected with a 54" pipe beneath Strand Loop. This pipe was constructed as part of the Unit 1 project to the north. Therefore, these ponds act as a single pond with the water surfaces equilibrating. See Appendix B for street hydraulics and storm drain inlet analysis.

2. OUTFALL 'B'

Outfall 'B' consists of Basins B-1, B-2, B-3, B4, B-5, B-6, B-7, Future Basin 2 and Future Basin 3, as well as a portion of Future Basin 1, as shown on the Developed Conditions Basin Map. These flows will enter proposed storm drain inlets within these basins and ultimately discharge into Pond 4. See Appendix B for street hydraulics and storm drain inlet analysis.

The proposed pond system as well as the storm drain system has been designed to accommodate the future developed condition of this project. The existing playa will accept runoff leaving the site under the future developed conditions scenario in conformance with the Level B Drainage Management Plan.

3. OUTFALL TO UNIVERSITY BLVD.

This outfall consists of Basin M. Previously approved drainage reports allowed all of Existing Basin M to drain into University Blvd. This plan cuts this basin approximately in

half; therefore, much less flow will be directed into University Blvd. from this basin than was previously permitted.

VI. CONCLUSION

Onsite developed runoff generated by the site will be conveyed to retention ponds utilizing surface street flows in conjunction with underground public storm drain pipe networks. The drainage concept outlined by this report consists of retention ponding of developed runoff consistent with existing development throughout Mesa del Sol, and in conformance with previously approved Level A and Level B Master Plan drainage concepts. These ponds will hold water for 96 hours or less utilizing infiltration, also consistent with existing development plans throughout Mesa del Sol.

APPENDICES

APPENDIX A: BASIN CALCULATIONS

**APPENDIX B: STREET HYDRAULICS, STORM
DRAIN INLET ANALYSIS AND
ALLEY HYDRAULICS**

**APPENDIX C: INROADS STORM DRAIN OUTPUT
FILES**

APPENDIX D: INFILTRATION CALCULATIONS

APPENDIX E: POND VOLUME CALCULATIONS

APPENDIX A

BASIN CALCULATIONS

BASIN SUMMARY FOR MDS UNITS 3 and 4

BASIN I.D.	AREA (AC)	UNITS #	BASIN SUMMARY					DISCHARGE (CFS)			STORMWATER VOLUME	
			% LAND TREATMENT					10 YR	100 YR		100 YR 6HR	100 YR 10-DAY
			A	B	C	D						

HYDROLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)

A	16.00										50.31	0.71
B	30.64										96.38	1.35
H	7.17										19.31	0.32
I	5.53										14.83	0.24
L	2.01										6.31	0.09
M	3.32										10.42	0.15
OFFSITE 1	95.65										155.97	4.22
OFFSITE 2	64.46										105.92	2.85
TOTAL	224.78							0.00	459.45		9.93	9.93

* EXISTING BASINS CALCULATIONS WERE CALCULATED IN THE DMP FOR MESA DEL SOL UNITS 1 AND 2

HYDROLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED CALCULATED)

Basin A-1	5.8	32		0.0%	23.0%	24.0%	53.0%		13.29		21.83	0.76	1.17
Basin A-2	4.7	21		0.0%	27.0%	27.0%	46.0%		10.16		17.01	0.58	0.87
Basin A-3	4.4	17		0.0%	29.5%	29.5%	41.0%		9.11		15.49	0.53	0.77
Basin A-4	5.2	24		0.0%	26.5%	26.5%	47.0%		11.33		18.92	0.65	0.98
Basin A-5	4.4	15		0.0%	31.0%	31.0%	38.0%		8.87		15.22	0.51	0.74
Basin A-6	3.2	9		0.0%	33.5%	33.5%	33.0%		6.16		10.75	0.36	0.50
Basin B-1	9.3	43		0.0%	26.5%	26.5%	47.0%		20.27		33.85	1.16	1.75
Basin B-2	2.2	10		0.0%	27.0%	27.0%	46.0%		4.75		7.96	0.27	0.41
Basin B-3	4.5	27		0.0%	21.5%	21.5%	57.0%		10.62		17.27	0.61	0.95
Basin B-4	4.6	24		0.0%	24.5%	24.5%	51.0%		10.36		17.11	0.59	0.91
Basin B-5	6.6	29		0.0%	27.5%	27.5%	45.0%		14.15		23.76	0.81	1.21
Basin B-6	3.7	9		0.0%	35.0%	35.0%	30.0%		6.93		12.21	0.40	0.55
Basin B-7	2.9	10		0.0%	31.0%	31.0%	38.0%		5.85		10.03	0.34	0.48
Basin C	0.8	3		0.0%	30.0%	30.0%	40.0%		1.64		2.80	0.09	0.14
Basin M	2.2	4		0.0%	35.0%	40.0%	25.0%		3.96		7.09	0.23	0.30
Future Basin 1	8.8	n/a		0.0%	24.5%	24.5%	51.0%		19.81		32.73	1.14	1.73
Future Basin 2	7.7	n/a		0.0%	24.5%	24.5%	51.0%		17.34		28.64	0.99	1.52
Future Basin 3	10.3	n/a		0.0%	24.5%	24.5%	51.0%		23.19		38.31	1.33	2.03
Future Basin 4	13.1	n/a		0.0%	24.5%	24.5%	51.0%		29.50		48.72	1.69	2.58
Future Basin 5	61.1	n/a		0.0%	24.5%	24.5%	51.0%		137.57		227.24	7.89	12.04
Future Basin 6	36.6			0.0%	12.5%	12.5%	75.0%		98.28		153.64	5.58	9.24
TOTAL	202.1	277						463.15			760.57	26.52	40.86

APPENDIX B

**STREET HYDRAULICS, STORM DRAIN INLET
ANALYSIS, AND ALLEY HYDRAULICS**

MANNING'S N = 0.017 SLOPE = 0.006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	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	0.022	1.645	0.560	2.484	0.055
0.100	0.100	0.156	0.139	3.290	0.889	4.048	0.112
0.150	0.150	0.366	0.371	6.318	1.013	6.996	0.166
0.200	0.200	0.795	0.911	11.423	1.146	12.021	0.220
0.250	0.250	1.476	1.996	16.527	1.353	17.047	0.278
0.300	0.300	2.408	3.773	21.631	1.567	22.072	0.338
0.350	0.350	3.591	6.377	26.735	1.776	27.098	0.399
0.400	0.400	4.981	10.458	28.839	2.100	29.123	0.469
0.450	0.450	6.351	15.811	28.942	2.474	29.148	0.545
0.500	0.500	7.803	21.999	29.045	2.819	29.174	0.624
0.550	0.550	9.217	28.965	29.148	3.143	29.199	0.704
0.600	0.600	10.631	36.660	29.251	3.448	29.224	0.785
0.650	0.650	12.047	45.048	29.354	3.739	29.250	0.867
0.700	0.700	13.536	50.311	33.282	3.717	32.226	0.915
0.750	0.750	15.271	56.085	38.227	3.673	37.170	0.960
0.800	0.800	17.253	63.381	43.171	3.674	42.113	1.010
0.850	0.850	19.482	72.198	48.116	3.706	47.057	1.064

INLETS #1 & #2LOCATED @ INTERSECTION
OF ROTHKO & NAUMAN

BASIN A-1 - 23.2 CFS

2/3 FUTURE BASIN 1 - 22.2 CFS

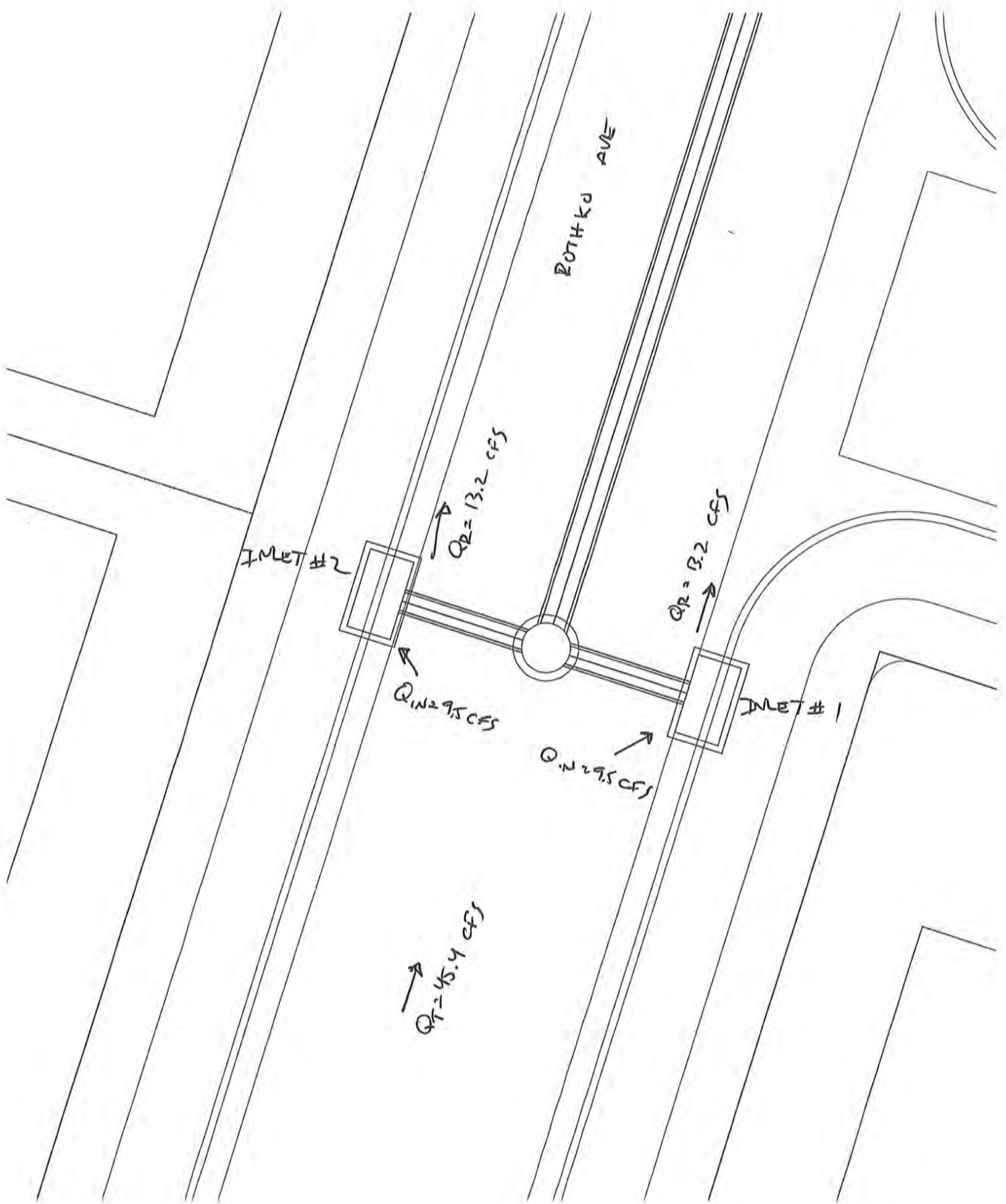
45.4 CFSSTREET CAPACITY $X = 0.87' < 0.90'$ ✓ OKINLET CAPACITY $d = 0.65'$ @ $S = 0.240$ - 8.2 CFS $S = 2\%$ - 14 CFS

$$\frac{2-0.2}{14-8.2} = \frac{2-0.6}{14-X} \Rightarrow \frac{1.8}{5.8} = \frac{1.4}{14-X} \Rightarrow 8.12 = 25.2 - 1.8X$$

$$\underline{X = 9.5 \text{ CFS (PER DOUBLE 'A')}}$$

RESIDUAL

$$45.4 \text{ CFS} - 2(9.5 \text{ CFS}) = \underline{26.4 \text{ CFS}}$$



MANNING'S N = 0.017 SLOPE = 0.006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	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	0.022	1.645	0.560	2.484	0.055
0.100	0.100	0.156	0.139	3.290	0.889	4.048	0.112
0.150	0.150	0.366	0.371	6.318	1.013	6.996	0.166
0.200	0.200	0.795	0.911	11.423	1.146	12.021	0.220
0.250	0.250	1.476	1.996	16.527	1.353	17.047	0.278
0.300	0.300	2.408	3.773	21.631	1.567	22.072	0.338
0.350	0.350	3.591	6.377	26.735	1.776	27.098	0.399
0.400	0.400	4.981	10.458	28.839	2.100	29.123	0.469
0.450	0.450	6.391	15.811	28.942	2.474	29.148	0.545
0.500	0.500	7.803	21.999	29.045	2.819	29.174	0.624
0.550	0.550	9.217	28.955	29.148	3.143	29.199	0.704
0.600	0.600	10.631	36.660	29.251	3.448	29.224	0.785
0.650	0.650	12.047	45.048	29.354	3.739	29.250	0.867
0.700	0.700	13.536	50.311	33.282	3.717	32.226	0.915
0.750	0.750	15.271	56.085	38.227	3.673	37.170	0.960
0.800	0.800	17.253	63.381	43.171	3.674	42.113	1.010
0.850	0.850	19.482	72.198	48.116	3.706	47.057	1.064

BASIN A-2 = 17.0 CFS
 RESIDUAL = 26.4 CFS
 INLETS #1 & #2 = 43.4 CFS

STREET CAPACITY

$$\frac{45.048 - 36.66}{0.867 - 0.785} = \frac{45.048 - 43.4}{0.867 - x} \Rightarrow \frac{8.388}{0.082} = \frac{2.348}{0.867 - x} \Rightarrow 0.192536 = 7.2724 - 8.388x$$

$$x = 0.94' < 0.90' \checkmark \text{ ok}$$

INLET CAPACITY

$$\frac{45.048 - 36.66}{0.65 - 0.60} = \frac{45.048 - 43.4}{0.65 - x} \Rightarrow \frac{8.388}{0.05} = \frac{2.348}{0.65 - x} \Rightarrow 0.1174 = 5.4522 - 8.388x$$

$$d = 0.64'$$

$$Q = 0.64, d = 0.64'$$

$$0.24 - 9 \text{ CFS}$$

$$2.4 - 13.5 \text{ CFS}$$

$$\frac{2 - 0.2}{13.5 - 9} = \frac{2 - 0.6}{13.5 - x} \Rightarrow \frac{1.8}{5.5} = \frac{1.4}{13.5 - x} \Rightarrow 7.7 = 24.3 - 1.8x$$

$$x = 9.2 \text{ CFS (PER DOUBLE A.)}$$

RESIDUAL

$$43.4 \text{ CFS} - 2(9.2 \text{ CFS}) = 25.0 \text{ CFS}$$



MANNING'S N = 0.017 SLOPE = 0.008

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	12.0	0.1	9.0	56.2	0.7
2.0	9.4	0.7	6.0	33.0	0.6	10.0	56.6	0.7
3.0	9.8	0.7	7.0	54.0	0.1	11.0	66.0	0.9
4.0	10.0	0.0	8.0	56.0	0.0			

INLETS #7 & #8LOCATED @ INTERSECTION
OF STRAND & DEKONING

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	0.024	1.645	0.626	2.484	0.056
0.100	0.100	0.156	0.155	3.290	0.993	4.048	0.115
0.150	0.150	0.366	0.414	6.318	1.133	6.996	0.170
0.200	0.200	0.795	1.019	11.423	1.281	12.021	0.226
0.250	0.250	1.476	2.232	16.527	1.512	17.047	0.286
0.300	0.300	2.408	4.218	21.631	1.752	22.072	0.348
0.350	0.350	3.591	7.130	26.735	1.985	27.098	0.411
0.400	0.400	5.026	11.111	31.839	2.211	32.123	0.476
0.450	0.450	6.711	16.297	36.943	2.428	37.148	0.542
0.500	0.500	8.648	22.812	42.048	2.638	42.174	0.608
0.550	0.550	10.837	30.780	47.152	2.840	47.199	0.675
0.600	0.600	13.151	42.438	47.255	3.227	47.224	0.762
0.650	0.650	15.467	55.530	47.358	3.590	47.250	0.850
0.700	0.700	17.856	66.904	51.279	3.747	50.219	0.918
0.750	0.750	20.490	79.153	56.211	3.863	55.151	0.982
0.800	0.800	23.371	93.182	61.144	3.987	60.082	1.047
0.850	0.850	26.499	109.087	66.077	4.117	65.014	1.114

BASIN A-4 = 18.9 CFS

RESIDUAL = 25.0 CFS

43.9 CFSSTREET CAPACITY

$$X = 0.76' < 0.90' \quad \checkmark \text{ok}$$

INLET CAPACITY

$$d = 0.6'$$

$$@ S = 0.75\%, d = 0.6'$$

$$0.2\% = 7.5 \text{ CFS}$$

$$2.0\% = 13 \text{ CFS}$$

$$\frac{13-7.5}{2-0.2} = \frac{13-X}{2-0.75} = \frac{5.5}{1.3} = \frac{17-X}{1.25} \Rightarrow 6.975 = 23.4 - 1.8X$$

$$\underline{\underline{d = 9.2 \text{ CFS}}} \quad (\text{PER DUBIE 'A'})$$

RESIDUAL

$$43.9 \text{ CFS} - 2(9.2 \text{ CFS}) = \underline{\underline{25.5 \text{ CFS}}}$$

MANNING'S N = 0.017 SLOPE = 0.008

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	12.0	0.1	9.0	56.2	0.7
2.0	9.4	0.7	6.0	33.0	0.6	10.0	56.6	0.7
3.0	9.8	0.7	7.0	54.0	0.1	11.0	66.0	0.9
4.0	10.0	0.0	8.0	56.0	0.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.050	0.050	0.039	0.024	1.645	0.626	2.484	0.056
0.100	0.100	0.156	0.155	3.290	0.993	4.048	0.115
0.150	0.150	0.366	0.414	6.318	1.133	6.996	0.170
0.200	0.200	0.795	1.019	11.423	1.281	12.021	0.226
0.250	0.250	1.476	2.232	16.527	1.512	17.047	0.286
0.300	0.300	2.408	4.218	21.631	1.752	22.072	0.348
0.350	0.350	3.591	7.130	26.735	1.985	27.098	0.411
0.400	0.400	5.026	11.111	31.839	2.211	32.123	0.476
0.450	0.450	6.711	16.297	36.943	2.428	37.148	0.542
0.500	0.500	8.648	22.812	42.048	2.638	42.174	0.608
0.550	0.550	10.837	30.780	47.152	2.840	47.199	0.675
0.600	0.600	13.151	42.438	47.255	3.227	47.224	0.762
0.650	0.650	15.467	55.530	47.358	3.590	47.250	0.850
0.700	0.700	17.856	66.904	51.279	3.747	50.219	0.918
0.750	0.750	20.490	79.153	56.211	3.863	55.151	0.982
0.800	0.800	23.371	93.182	61.144	3.987	60.082	1.047
0.850	0.850	26.499	109.087	66.077	4.117	65.014	1.114

INLETS #9 & #10LOCATED @ INTERSECTION
OF STRAND & DEKORINGRESIDUAL - 25.5 CFS
INLETS #7 & #8STREET CAPACITY

$$\frac{30.78 - 22.81}{0.675 - 0.608} = \frac{30.78 - 25.5}{0.675 - x} \Rightarrow \frac{7.97}{0.067} = \frac{5.28}{0.675 - x} \Rightarrow 0.44046 = 5.77975 - 7.97x$$

$$x = 0.62' < 0.90' \checkmark$$

INLET CAPACITY

$$\frac{30.78 - 22.81}{0.55 - 0.50} = \frac{30.78 - 25.5}{0.55 - x} \Rightarrow \frac{7.97}{0.05} = \frac{5.28}{0.55 - x} \Rightarrow 0.329 = 4.3835 - 7.97x$$

$$x = 0.51'$$

@ S = 0.75%, d = 0.51'

0.24% = 5.5 CFS

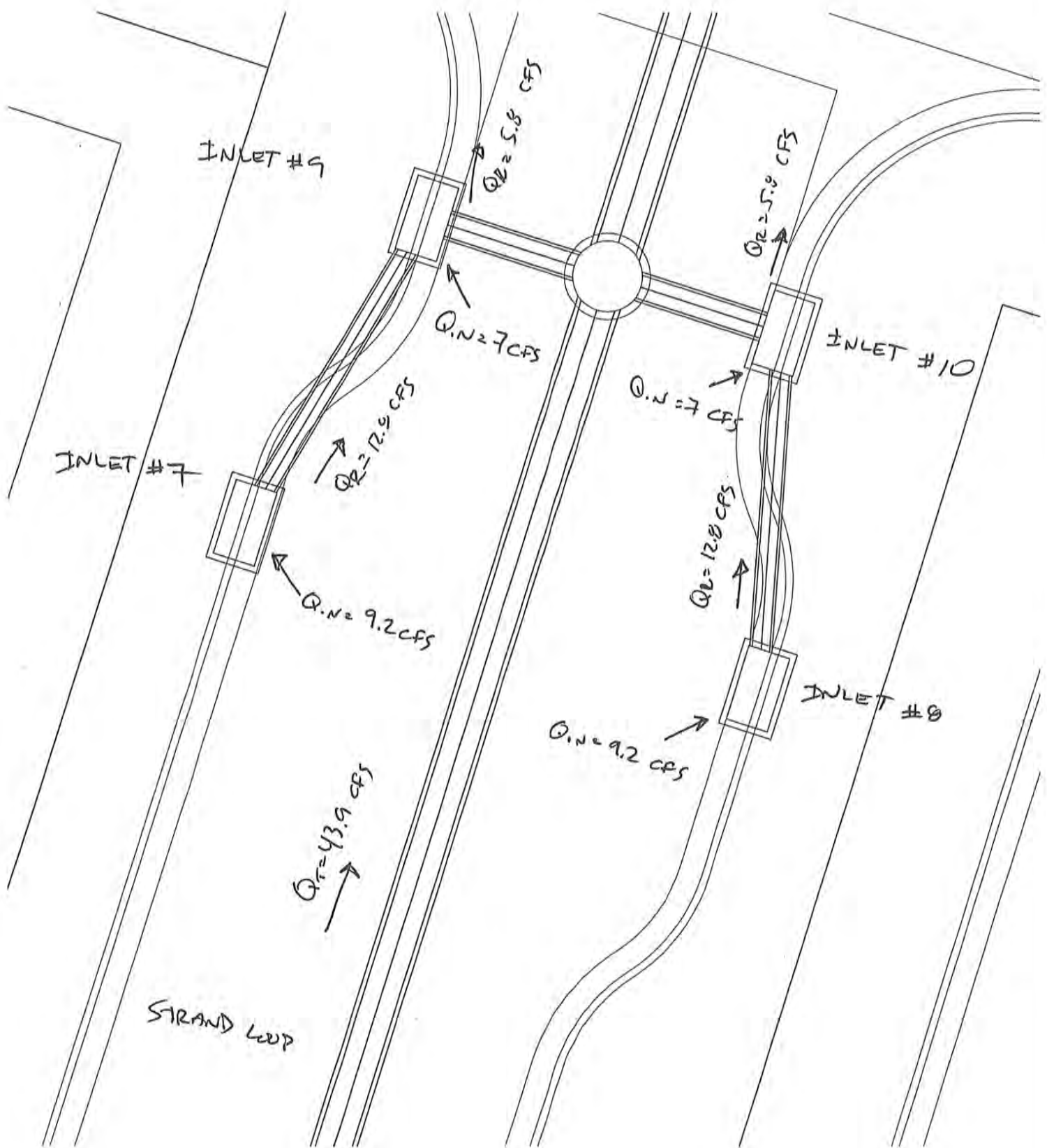
2% = 10.5 CFS

$$\frac{2 - 0.2}{10.5 - 5.5} = \frac{2 - 0.75}{10.5 - x} \Rightarrow \frac{1.8}{5} = \frac{1.25}{10.5 - x} \Rightarrow 6.25 = 13.9 - 1.9x$$

$$x = 7 \text{ CFS (PER DOUBLE 'A')}$$

RESIDUAL

$$25.5 \text{ CFS} - 2(7 \text{ CFS}) = \underline{\underline{11.5 \text{ CFS}}}$$



Inlets #5, #6, #11, #12 - Sump

LOCATED @ INTERSECTION OF
DEKALB & STANLEY

Double A inlet, in sump condition:

Open Area (for orifice calc in sq. ft.): 7.7977431
 Length of Weir (feet): 7.9791667
 Orifice Coefficient 0.6
 Weir Coefficient 3

Head (ft)	Head (in)	1 Wing		Grate		Control Q	
		Weir Q (cfs)	Weir Q (cfs)	Orifice Q (cfs)	Sgl Wing (cfs)	Dbl Wing (cfs)	
0.05	0.6	0.13	0.27	8.40	0.40	0.54	
0.1	1.2	0.38	0.76	11.87	1.14	1.52	
0.15	1.8	0.70	1.39	14.54	2.09	2.78	
0.2	2.4	1.07	2.14	16.79	3.21	4.29	
0.25	3	1.50	2.99	18.77	4.49	5.99	
0.3	3.6	1.97	3.93	20.56	5.91	7.88	
0.35	4.2	2.48	4.96	22.21	7.44	9.93	
0.4	4.8	3.04	6.06	23.75	9.09	12.13	
0.45	5.4	3.62	7.23	25.19	10.85	14.47	
0.5	6	4.24	8.46	26.55	12.71	16.95	
0.55	6.6	4.89	9.76	27.84	14.66	19.55	
0.6	7.2	5.58	11.13	29.08	16.70	22.28	
0.65	7.8	6.29	12.54	30.27	18.83	25.12	
0.667	8.0	6.54	13.04	30.66	19.58	26.11	
0.7	8.4	7.03	14.02	31.41	21.05	28.08	
0.75	9	7.79	15.55	32.52	23.34	31.14	
0.8	9.6	8.59	17.13	33.58	25.71	34.30	
0.85	10.2	9.40	18.76	34.62	28.16	37.57	
0.9	10.8	10.25	20.44	35.62	30.68	40.93	
0.95	11.4	11.11	22.16	36.60	33.28	44.39	
1	12	12.00	23.94	37.55	35.94	47.94	
1.05	12.6	12.91	25.76	38.47	38.67	51.58	
1.1	13.2	13.84	27.62	39.38	41.46	55.31	
1.15	13.8	14.80	29.52	40.26	44.32	59.12	
0.567	6.804	5.12	10.22	28.27	15.34	20.47	

Calculation of open area:

Total Grate Area	2000	13.888889
Cross Bar Area	-732	-5.083333
Supports (ends)	-115.625	-0.802951
(middle)	-100	-0.694444
Areas Counted Twice	70.5	0.4895833
	1122.875	7.7977431

Calculation of Length of Weir:

Total Perimeter of Grate	130	10.833333
Short Cross Bars	-7	-0.583333
Bearing Bars	-13	-1.083333
End Supports	-9.25	-0.770833
Middle Supports	-5	-0.416667
	110	7.9791667

BASED A-3 - 15.5 CFS

BASED A-5 - 15.2 CFS

BASED A-6 - 10.8 CFS

DESIGNAL INLETS $\pm 9 \pm 10 - 11.5$ CFS

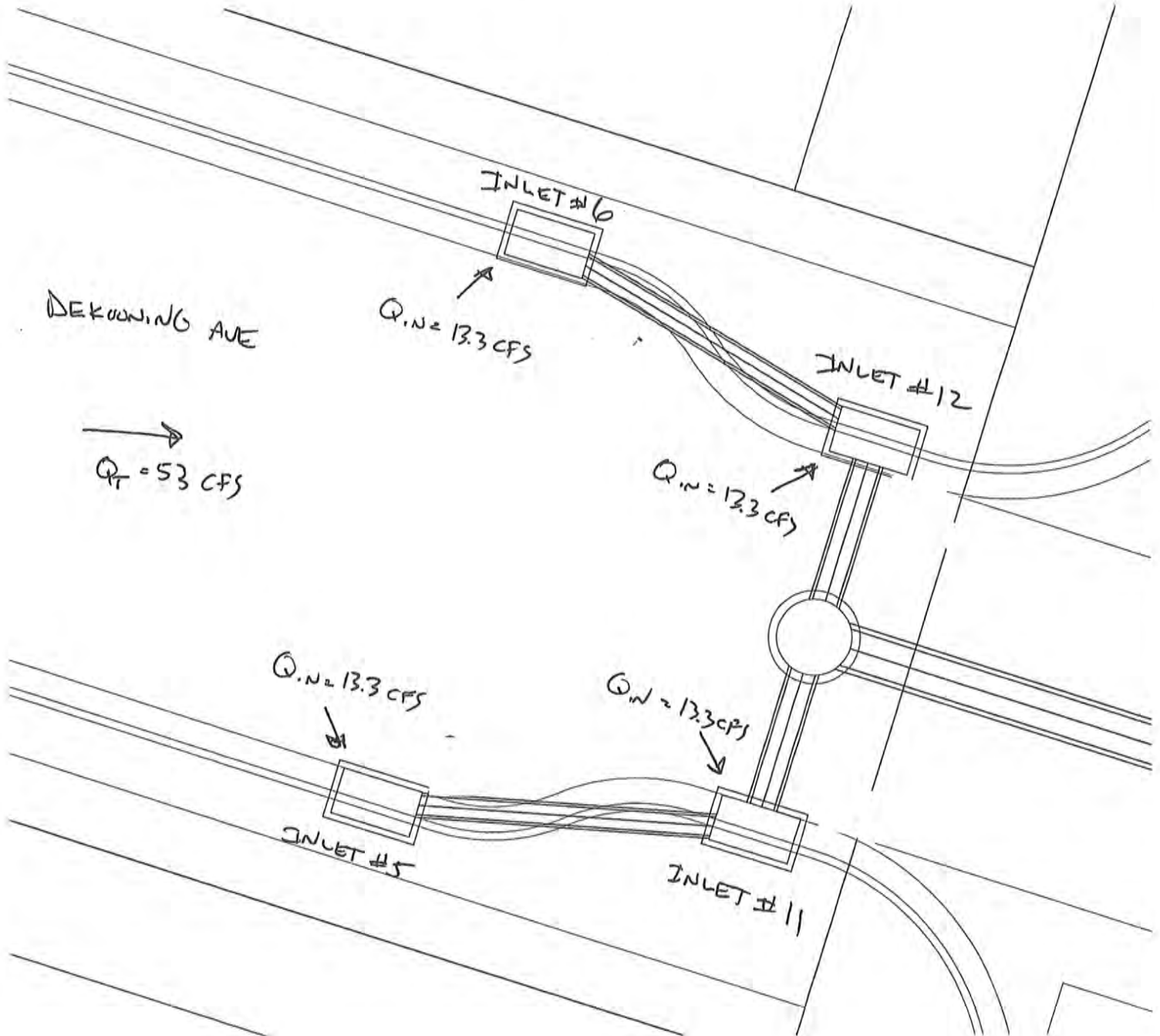
$$\frac{53 \text{ CFS}}{4} = 13.25 \text{ CFS / INLET}$$

$$\hookrightarrow h = 0.45'$$

$$2 \times 100 \times 12 = 26.5 \text{ CFS / INLET}$$

$$\hookrightarrow h = 0.67'$$

SUMP CONDITION



MANNING'S N = 0.017 SLOPE = 0.006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	12.0	0.1	9.0	56.2	0.7
2.0	9.4	0.7	6.0	33.0	0.6	10.0	56.6	0.7
3.0	9.8	0.7	7.0	54.0	0.1	11.0	66.0	0.9
4.0	10.0	0.0	8.0	56.0	0.0			

INLET #13 & #14LOCATED @ INTERSECTION OF
STRYKER & DEKUNING

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	0.022	1.645	0.560	2.484	0.055
0.100	0.100	0.156	0.139	3.290	0.889	4.048	0.112
0.150	0.150	0.366	0.371	6.318	1.013	6.996	0.166
0.200	0.200	0.795	0.911	11.423	1.146	12.021	0.220
0.250	0.250	1.476	1.996	16.527	1.353	17.047	0.278
0.300	0.300	2.408	3.773	21.631	1.567	22.072	0.338
0.350	0.350	3.591	6.377	26.735	1.776	27.098	0.399
0.400	0.400	5.026	9.938	31.839	1.978	32.123	0.461
0.450	0.450	6.711	14.576	36.943	2.172	37.148	0.523
0.500	0.500	8.648	20.404	42.048	2.359	42.174	0.587
0.550	0.550	10.837	27.530	47.152	2.540	47.199	0.650
0.600	0.600	13.151	37.958	47.255	2.886	47.224	0.730
0.650	0.650	15.467	49.667	47.358	3.211	47.250	0.810
0.700	0.700	17.856	59.841	51.279	3.351	50.219	0.875
0.750	0.750	20.490	70.796	56.211	3.455	55.151	0.936
0.800	0.800	23.371	83.344	61.144	3.566	60.082	0.998
0.850	0.850	26.499	97.570	66.077	3.682	65.014	1.061

BASIN B-1 - 37.9 CFS

1/3 FUTURE BASIN 1 - 10.3 CFS

44.2 CFSSTREET CAPACITY

$$\frac{49.67 - 37.96}{0.81 - 0.73} = \frac{49.67 - 44.2}{0.81 - x} \Rightarrow \frac{11.71}{0.08} = \frac{5.47}{0.81 - x} \Rightarrow 8.991 - 11.71x = 0.4376$$

$$x = 0.73' < 0.90' \text{ ok}$$

INLET CAPACITY

$$\frac{49.67 - 37.96}{0.65 - 0.60} = \frac{49.67 - 44.2}{0.65 - x} \Rightarrow \frac{11.71}{0.05} = \frac{5.47}{0.65 - x} \Rightarrow 7.6115 - 11.71x = 0.2735$$

$$d = 0.63'$$

@ S = 0.6%, d = 0.63'

0.2% = 8 CFS

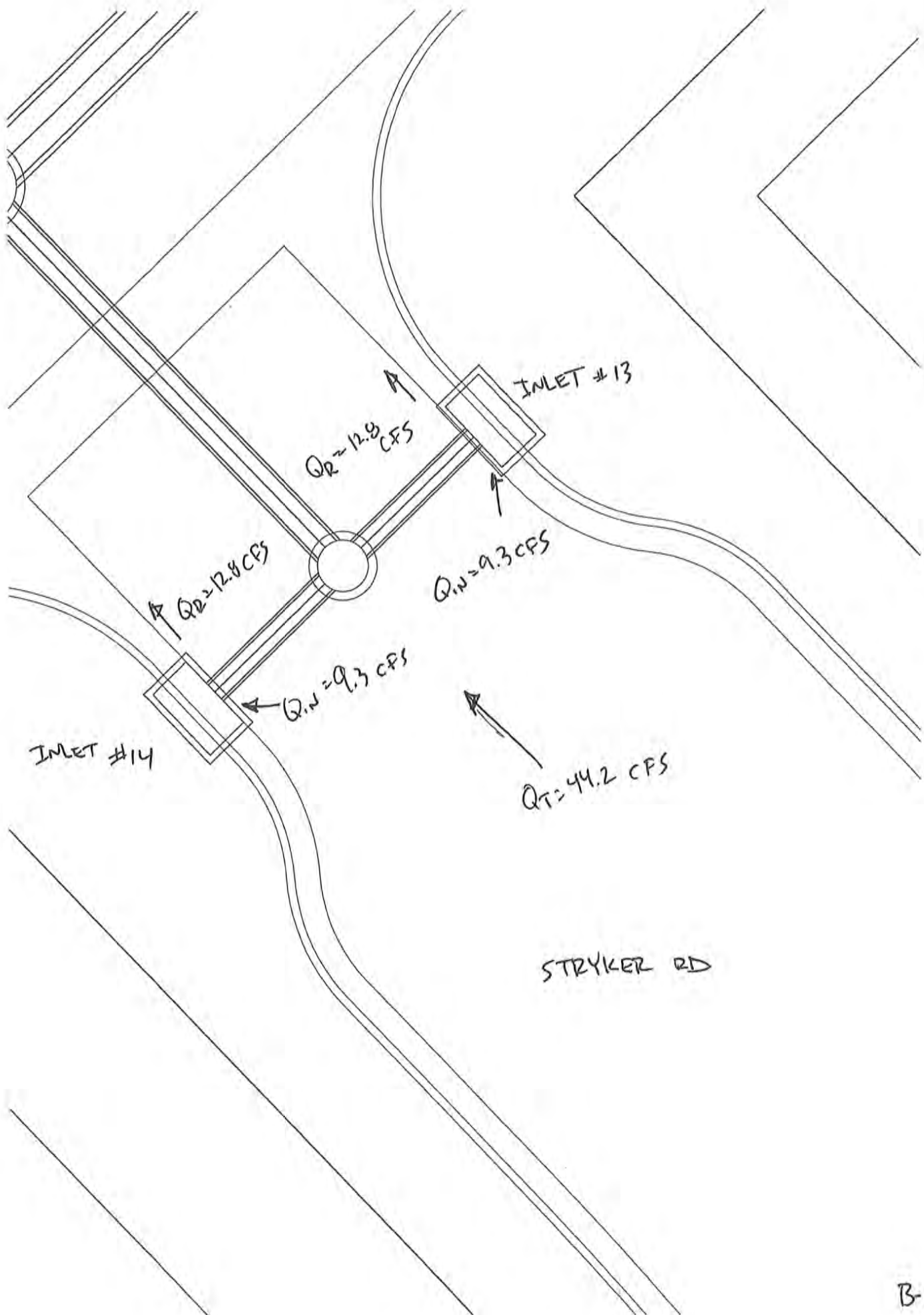
2% = 14 CFS

$$\frac{2 - 0.2}{14 - 8} = \frac{2 - 0.6}{14 - x} \Rightarrow \frac{1.8}{6} = \frac{1.4}{14 - x} \Rightarrow 9.4 = 25.2 - 1.8x \Rightarrow x = 9.3 \text{ CFS}$$

(PER DOUBLE A')

RESIDUAL

$$44.2 \text{ CFS} - 2(9.3 \text{ CFS}) = 25.6 \text{ CFS}$$



MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	0.0			

INLETS #15 & #16LOCATED @ INTERSECTION OF
SCORSESE & NAUMAN

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	0.020	1.645	0.511	2.484	0.054
0.100	0.100	0.156	0.127	3.290	0.811	4.048	0.110
0.150	0.150	0.366	0.338	6.318	0.925	6.996	0.163
0.200	0.200	0.795	0.832	11.423	1.046	12.021	0.217
0.250	0.250	1.476	1.823	16.527	1.235	17.047	0.274
0.300	0.300	2.408	3.444	21.631	1.430	22.072	0.332
0.350	0.350	3.591	5.822	26.735	1.621	27.098	0.391
0.400	0.400	4.981	9.547	28.839	1.917	29.123	0.457
0.450	0.450	6.391	14.433	28.942	2.258	29.148	0.529
0.500	0.500	7.803	20.082	29.045	2.574	29.174	0.603
0.550	0.550	9.217	26.441	29.148	2.869	29.199	0.678
0.600	0.600	10.631	33.466	29.251	3.148	29.224	0.754
0.650	0.650	12.047	41.123	29.354	3.413	29.250	0.831
0.700	0.700	13.536	45.927	33.282	3.393	32.226	0.879
0.750	0.750	15.271	51.199	38.227	3.353	37.170	0.925
0.800	0.800	17.253	57.859	43.171	3.354	42.113	0.975
0.850	0.850	19.482	65.907	48.116	3.383	47.057	1.028

FUTURE BASIN 2 - 28.6 CFS

BASIN B-2 - 8.0 CFS

19% FUTURE BASIN 3 - 7.6 CFS

44.2 CFSSTREET CAPACITY

$$\frac{45.93 - 41.12}{0.879 - 0.831} = \frac{45.93 - 44.2}{0.879 - x} \Rightarrow \frac{4.81}{0.048} = \frac{1.73}{0.879 - x} \Rightarrow 0.0834 = 4.22799 - 4.81x$$

$$x = 0.86' \checkmark \text{ ok}$$

INLET CAPACITY

$$\frac{45.93 - 41.12}{0.70 - 0.65} = \frac{45.93 - 44.2}{0.70 - x} \Rightarrow \frac{4.81}{0.05} = \frac{1.73}{0.7 - x} \Rightarrow 0.0965 = 3.367 - 4.81x$$

$$x = 0.67' \checkmark \text{ ok}$$

@ 5:05%, $\alpha = 0.67'$

0.2% - 9 CFS

2.0% - 15 CFS

$$\frac{15.9}{2 - 0.2} = \frac{15 - x}{2 - 0.5} \Rightarrow \frac{6}{1.5} = \frac{15 - x}{1.5} = 9 = 27 - x(1.0) \Rightarrow x = 10 \text{ CFS}$$

(PER DOUBLE A.)

RESIDUAL

$$44.2 \text{ CFS} - 2(10 \text{ CFS}) = \underline{\underline{24.2 \text{ CFS}}}$$

MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	0.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.050	0.050	0.039	0.020	1.645	0.511	2.484	0.054
0.100	0.100	0.156	0.127	3.290	0.811	4.048	0.110
0.150	0.150	0.366	0.338	6.318	0.925	6.996	0.163
0.200	0.200	0.795	0.832	11.423	1.046	12.021	0.217
0.250	0.250	1.476	1.823	16.527	1.235	17.047	0.274
0.300	0.300	2.408	3.444	21.631	1.430	22.072	0.332
0.350	0.350	3.591	5.822	26.735	1.621	27.098	0.391
0.400	0.400	4.981	9.547	28.839	1.917	29.123	0.457
0.450	0.450	6.391	14.433	28.942	2.258	29.148	0.529
0.500	0.500	7.803	20.082	29.045	2.574	29.174	0.603
0.550	0.550	9.217	26.441	29.148	2.869	29.199	0.678
0.600	0.600	10.631	33.486	29.251	3.148	29.224	0.754
0.650	0.650	12.047	41.123	29.354	3.413	29.250	0.831
0.700	0.700	13.536	49.927	33.282	3.393	32.226	0.879
0.750	0.750	15.271	51.199	38.227	3.353	37.170	0.925
0.800	0.800	17.253	57.859	43.171	3.354	42.113	0.975
0.850	0.850	19.482	65.907	48.116	3.383	47.057	1.028

INLETS #17 & #18LOCATED @ INTERSECTION OF
SCORSESE & NAUMAN

RESIDUAL - 24.2 CFS

INLETS #15 & #16

STREET CAPACITY

$$\frac{26.44 - 20.08}{0.63 - 0.60} = \frac{26.44 - 24.2}{0.60 - x} \Rightarrow \frac{6.36}{0.03} = \frac{2.24}{0.60 - x} \Rightarrow 4.3248 - 6.36x = 0.1792$$

$$x = 0.65' \quad \checkmark \quad \text{OK}$$

INLET CAPACITY

$$\frac{26.44 - 20.08}{0.55 - 0.50} = \frac{26.44 - 24.2}{0.55 - x} \Rightarrow \frac{6.36}{0.05} = \frac{2.24}{0.55 - x} \Rightarrow 0.112 = 3.498 - 6.36x$$

$$x = 0.53'$$

Q S: 0.5%, d = 0.53'

Q 2% - 10.5 CFS

Q 0.2% - 5.5 CFS

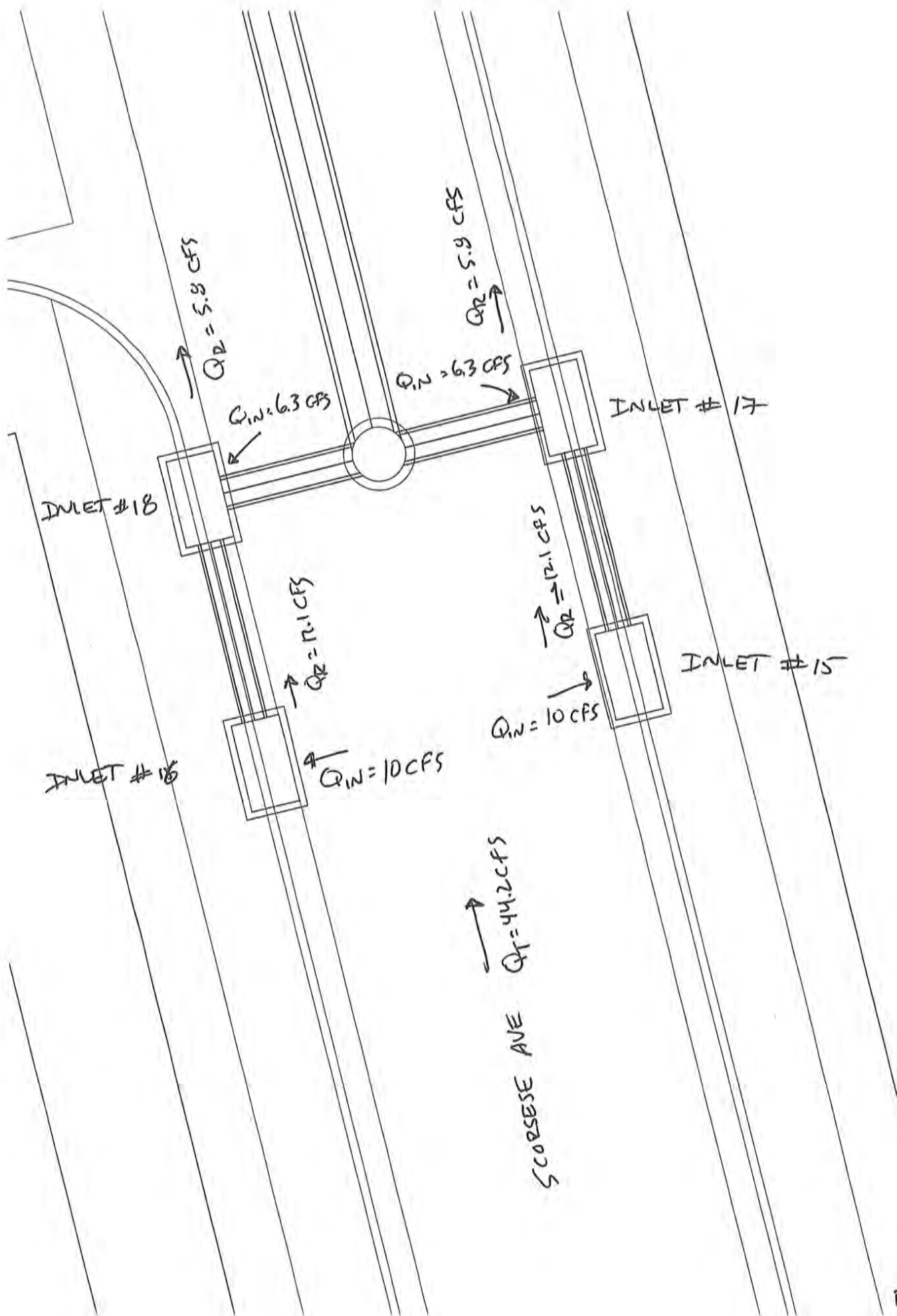
$$\frac{10.5 - 5.5}{2 - 0.2} = \frac{10.5 - x}{2 - 0.5} \Rightarrow \frac{5}{1.8} = \frac{10.5 - x}{1.5} \Rightarrow 7.5 = 18.9 - 1.8x$$

$$x = 6.3 \text{ CFS}$$

(PER DOUBLE 'A')

RESIDUAL

$$24.2 \text{ CFS} - 2(6.3 \text{ CFS}) = \underline{\underline{11.6 \text{ CFS}}}$$



MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	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	0.020	1.645	0.511	2.484	0.054
0.100	0.100	0.156	0.127	3.290	0.811	4.048	0.110
0.150	0.150	0.366	0.338	6.318	0.925	6.996	0.163
0.200	0.200	0.795	0.832	11.423	1.046	12.021	0.217
0.250	0.250	1.476	1.823	16.527	1.235	17.047	0.274
0.300	0.300	2.408	3.444	21.631	1.430	22.072	0.332
0.350	0.350	3.591	5.822	26.735	1.621	27.098	0.391
0.400	0.400	4.981	9.547	28.839	1.917	29.123	0.457
0.450	0.450	6.391	14.433	28.942	2.258	29.148	0.529
0.500	0.500	7.803	20.082	29.045	2.574	29.174	0.603
0.550	0.550	9.217	26.441	29.148	2.869	29.199	0.678
0.600	0.600	10.631	33.466	29.251	3.148	29.224	0.754
0.650	0.650	12.047	41.123	29.354	3.413	29.250	0.831
0.700	0.700	13.536	49.927	33.282	3.393	32.226	0.879
0.750	0.750	15.271	51.199	38.227	3.353	37.170	0.925
0.800	0.800	17.253	57.859	43.171	3.354	42.113	0.975
0.850	0.850	19.482	65.907	48.116	3.383	47.057	1.028

INLETS #19 & #20

LOCATED @ INTERSECTION OF
SCORSESE & MOTHERWELLRESIDUAL - 11.6 CFS
INLETS #17 & #18

BASIN B-3 - 17.3 CFS

30% FUTURE BASIN 3 - 10.9 CFS

39.8 CFS

STREET CAPACITY

$$\frac{41.12 - 33.47}{0.83 - 0.75} = \frac{41.12 - 39.8}{0.83 - x} \Rightarrow \frac{7.65}{0.08} = \frac{1.32}{0.83 - x} \Rightarrow 0.1056 = 6.3495 - 7.65x$$

$$x = 0.82' \checkmark \text{ ok}$$

INLET CAPACITY

$$\frac{41.12 - 33.47}{0.65 - 0.60} = \frac{41.12 - 39.8}{0.65 - x} \Rightarrow \frac{7.65}{0.05} = \frac{1.32}{0.65 - x} \Rightarrow 4.9725 - 7.65x = 0.066$$

$$d = 0.64'$$

@ S = 0.5%, d = 0.64'

0.2% - 8 CFS

2.0% - 13.5 CFS

$$\frac{2 - 0.2}{17.5 - 8} = \frac{2 - 0.5}{13.5 - x} \Rightarrow \frac{1.8}{5.5} = \frac{1.5}{13.5 - x} \Rightarrow 8.25 = 24.3 - 1.8x$$

$$x = 8.9 \text{ CFS (PER DOUBLE 'A')}$$

RESIDUAL

$$39.8 \text{ CFS} - 2(8.9 \text{ CFS}) = \underline{22 \text{ CFS}}$$

MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.0	8.0	40.0	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	0.020	1.645	0.511	2.484	0.054
0.100	0.100	0.156	0.127	3.290	0.811	4.048	0.110
0.150	0.150	0.366	0.338	6.318	0.925	6.996	0.163
0.200	0.200	0.795	0.832	11.423	1.046	12.021	0.217
0.250	0.250	1.476	1.823	16.527	1.235	17.047	0.274
0.300	0.300	2.408	3.444	21.631	1.430	22.072	0.332
0.350	0.350	3.591	5.822	26.735	1.621	27.098	0.391
0.400	0.400	4.981	9.547	28.839	1.917	29.123	0.457
0.450	0.450	6.391	14.433	28.942	2.258	29.148	0.529
0.500	0.500	7.803	20.082	29.045	2.574	29.174	0.603
0.550	0.550	9.217	26.441	29.148	2.869	29.199	0.678
0.600	0.600	10.631	33.466	29.251	3.148	29.224	0.754
0.650	0.650	12.047	41.123	29.354	3.413	29.250	0.831
0.700	0.700	13.536	49.927	33.282	3.393	32.226	0.879
0.750	0.750	15.271	51.199	38.227	3.353	37.170	0.925
0.800	0.800	17.253	57.859	43.171	3.354	42.113	0.975
0.850	0.850	19.482	65.907	48.116	3.383	47.057	1.028

INLETS #21 & #22

LOCATED @ INTERSECTION
OF SCORSESE & MITCHELLRESIDUAL - 22 CFS
INLETS #19 & #20

STREET CAPACITY

$$\frac{26.44 - 20.08}{0.68 - 0.60} = \frac{26.44 - 22}{0.68 - x} \Rightarrow \frac{6.36}{0.08} = \frac{4.44}{0.68 - x} \Rightarrow 0.3552 = 4.3248 - 6.36x$$

$$x = 0.62' \checkmark \text{ OK}$$

INLET CAPACITY

$$\frac{26.44 - 20.08}{0.55 - 0.50} = \frac{26.44 - 22}{0.55 - x} \Rightarrow \frac{6.36}{0.05} = \frac{4.44}{0.55 - x} \Rightarrow 0.222 = 3.498 - 6.36x$$

$$d = 0.52'$$

① S = 0.5%, d = 0.52'

0.2% - 5.2 CFS

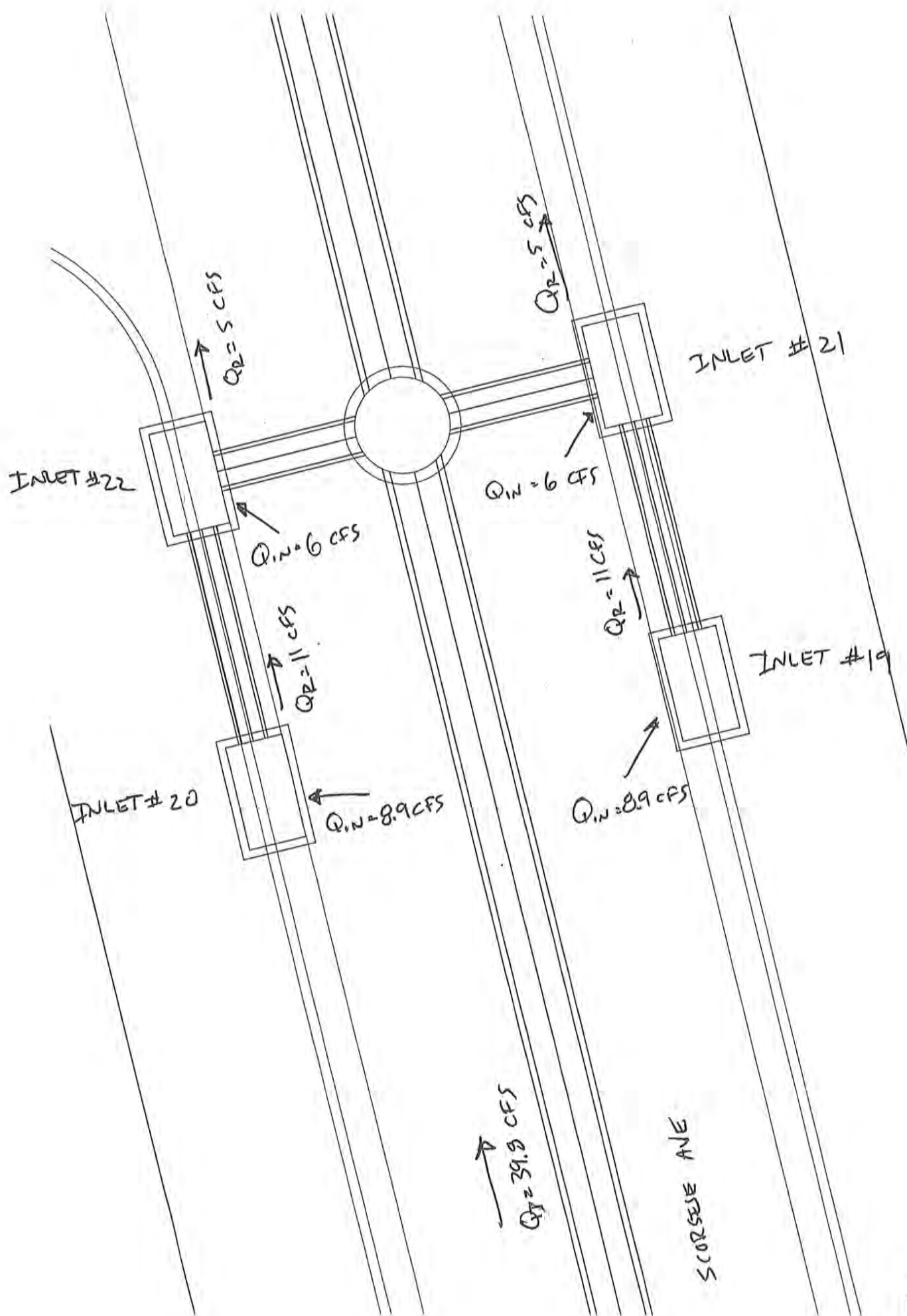
2.0% - 10.0 CFS

$$\frac{2 - 0.2}{10 - 5.2} = \frac{2 - 0.5}{10 - x} \Rightarrow \frac{1.8}{4.8} = \frac{1.5}{10 - x}$$

$$18 - 1.8x = 7.2$$

$$x = 6 \text{ CFS (PER DOUBLE 'A')}$$

$$\frac{\text{RESIDUAL}}{22 \text{ CFS} - 2(6 \text{ CFS})} = 10 \text{ CFS}$$



MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	5.0	14.0	0.1	9.0	40.2	0.7
2.0	11.4	0.7	6.0	26.0	0.4	10.0	40.6	0.7
3.0	11.8	0.7	7.0	38.0	0.1	11.0	52.0	0.9
4.0	12.0	0.7	8.0	40.0	0.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.050	0.050	0.039	0.020	1.645	0.511	2.484	0.054
0.100	0.100	0.156	0.127	3.290	0.811	4.048	0.110
0.150	0.150	0.366	0.338	6.318	0.925	6.996	0.163
0.200	0.200	0.795	0.832	11.423	1.046	12.021	0.217
0.250	0.250	1.476	1.823	16.527	1.235	17.047	0.274
0.300	0.300	2.408	3.444	21.631	1.430	22.072	0.332
0.350	0.350	3.591	5.822	26.735	1.621	27.098	0.391
0.400	0.400	4.981	9.547	28.839	1.917	29.123	0.457
0.450	0.450	6.391	14.433	28.942	2.258	29.148	0.529
0.500	0.500	7.803	20.082	29.045	2.574	29.174	0.603
0.550	0.550	9.217	26.441	29.148	2.869	29.199	0.678
0.600	0.600	10.631	33.466	29.251	3.148	29.224	0.754
0.650	0.650	12.047	41.123	29.354	3.413	29.250	0.831
0.700	0.700	13.536	49.927	33.282	3.393	32.226	0.879
0.750	0.750	15.271	51.199	38.227	3.353	37.170	0.925
0.800	0.800	17.253	57.859	43.171	3.354	42.113	0.975
0.850	0.850	19.482	65.907	48.116	3.383	47.057	1.028

INLETS #23 & 24

LOOKING @ INTERSECTION OF
SCORSESE & OLDENBERG

BASIN 3 - 17.1 CFS

RESIDUAL - 10 CFS

INLETS #21 & 22

29.6 FUTURE BASIN 3 - 11.1 CFS

38.2 CFS

STREET CAPACITY

$$\frac{41.12 - 33.47}{0.83 - 0.75} = \frac{41.12 - 38.2}{0.83 - x} \Rightarrow \frac{7.65}{0.08} = \frac{2.92}{0.83 - x} \Rightarrow 0.2336 = 6.3495 - 7.65x$$

$$x = 0.90' < 0.90' \checkmark \text{ ok}$$

INLET CAPACITY

$$\frac{41.12 - 33.47}{0.65 - 0.60} = \frac{41.12 - 38.2}{0.65 - x} \Rightarrow \frac{7.65}{0.05} = \frac{2.92}{0.65 - x} \Rightarrow 0.146 = 4.9725 - 7.65x$$

$$d = 0.63'$$

@ S = 0.5%, d = 0.63'

0.2% - 8 CFS

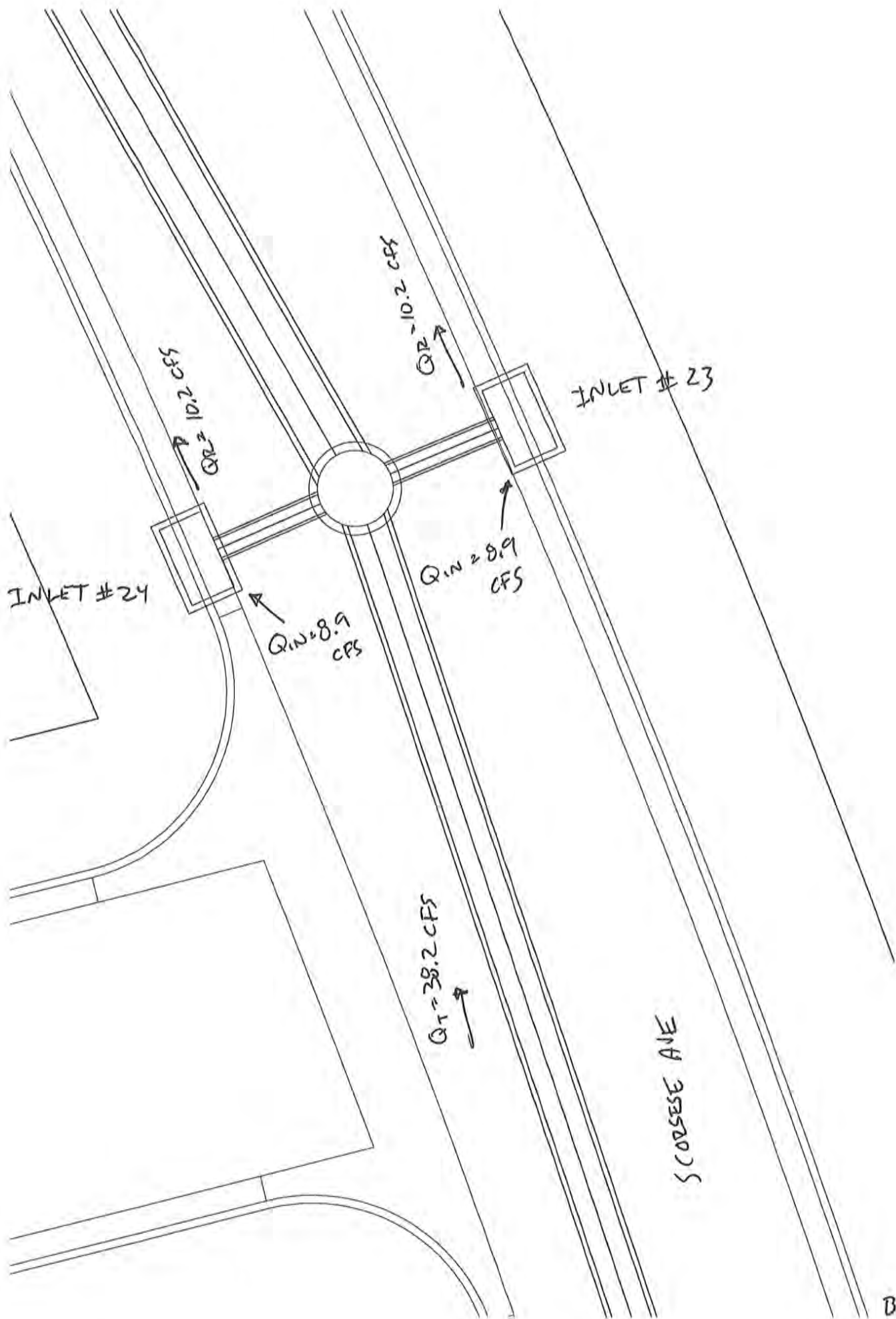
2.0% - 13.5 CFS

$$\frac{2 - 0.2}{13.5 - 8} = \frac{2 - 0.5}{13.5 - x} \Rightarrow \frac{1.8}{5.5} = \frac{1.5}{13.5 - x} \Rightarrow 9.25 = 24.3 - 1.8x$$

$$x = 8.9 \text{ CFS (PER DOUBLE 'A')}$$

RESIDUAL

$$39.2 \text{ CFS} - 2(8.9 \text{ CFS}) = \underline{\underline{20.4 \text{ CFS}}}$$



INLETS #25, 25A, 26, 26A

Located @ intersection
of DeKooning & Houser

MANNING'S N = 0.017 SLOPE = 0.008

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.9	4.0	12.0	0.2	7.0	56.0	0.0
2.0	9.4	0.7	5.0	33.0	0.5	8.0	56.6	0.7
3.0	10.0	0.0	6.0	54.0	0.2	9.0	66.0	0.9

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOPWID WATER	TOTAL ENERGY (FT)	FROUDE NO.
0.050	0.050	0.032	0.020	1.317	0.632	1.270	1.270	0.056	0.704
0.100	0.100	0.127	0.127	2.635	1.002	2.540	2.540	0.116	0.790
0.150	0.150	0.286	0.375	3.952	1.314	3.809	3.809	0.177	0.846
0.200	0.200	0.548	0.697	7.967	1.271	7.779	7.779	0.225	0.844
0.250	0.250	1.082	1.501	13.781	1.388	13.547	13.547	0.280	0.866
0.300	0.300	1.903	3.044	19.594	1.600	19.316	19.316	0.340	0.898
0.350	0.350	3.013	5.506	25.407	1.827	25.085	25.085	0.402	0.930
0.400	0.400	4.412	9.060	31.221	2.054	30.854	30.854	0.466	0.958
0.450	0.450	6.099	13.870	37.034	2.274	36.623	36.623	0.530	0.983
0.500	0.500	8.074	20.089	42.847	2.488	42.392	42.392	0.596	1.005
0.550	0.550	10.332	28.279	47.525	2.737	47.026	47.026	0.667	1.029
0.600	0.600	12.686	39.736	47.662	3.132	47.119	47.119	0.753	1.064
0.650	0.650	15.044	52.695	47.799	3.503	47.213	47.213	0.841	1.094
0.700	0.700	17.451	64.783	50.815	3.712	50.211	50.211	0.914	1.110
0.750	0.750	20.085	76.979	55.750	3.833	55.145	55.145	0.978	1.120
0.800	0.800	22.965	90.955	60.685	3.961	60.079	60.079	1.044	1.129
0.850	0.850	26.092	106.807	65.620	4.093	65.013	65.013	1.111	1.139

Residual Inlets 13 + 14 = 25.6 CFS
Basin B-6 12.2 CFS
37.8 CFS

STREET CAPACITY

28.279 0.667
37.80 X
39.736 0.753
 $X = 0.74 < 0.9 \checkmark$

INLET CAPACITY

0.550 28.279
X 37.80
0.600 39.736
depth = 0.59'

@ S=0.75% d=0.59

0.2% 7 CFS
0.75% X CFS
2% 13 CFS

↑
DOUBLE A

X = 8.8 CFS
(Per Double Grate)

6.2 CFS

X
10.1 CFS

↑
SINGLE A

X = 7.6 CFS
(PER SINGLE Grate)

RESIDUAL FLOW:

$Q = 37.8 \text{ CFS} - [2(7.6 \text{ CFS}) + 2(8.8 \text{ CFS})] = 5 \text{ CFS}$

B-20
(revised)

Single A

$$d = 0.59$$

$$S = 0.2$$

$$Q = 6.2 \text{ cfs}$$

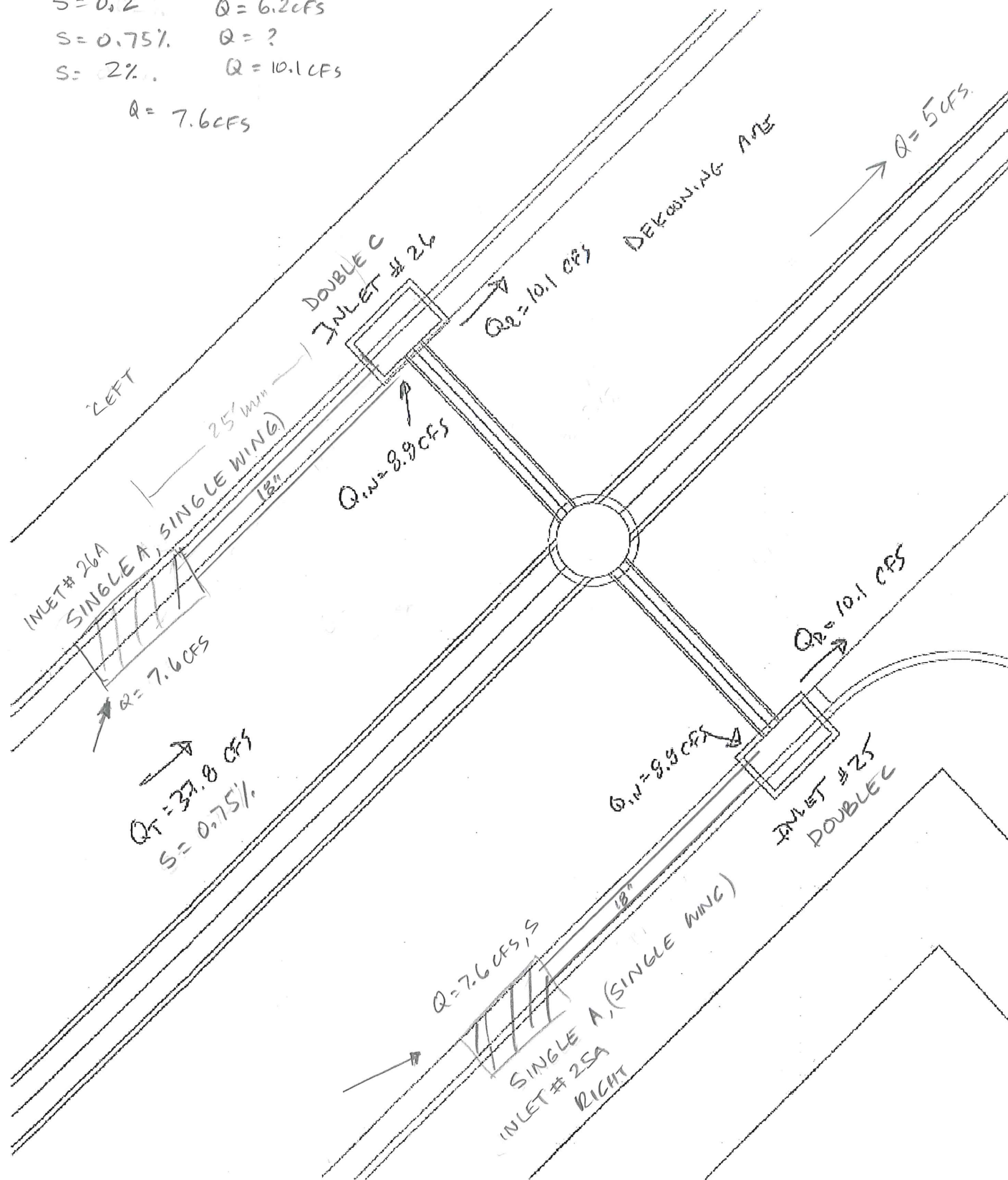
$$S = 0.75\%$$

$$Q = ?$$

$$S = 2\%$$

$$Q = 10.1 \text{ cfs}$$

$$Q = 7.6 \text{ cfs}$$



DISTANCE BETWEEN INLETS IN SERIES (Plate 22.3-D-12)

$$\text{Froude \#} = 1.064$$

$$d = 10.098(F_r) + 9.0309 \Rightarrow d = 19.76' \text{ USE } 25' \text{ MIN.}$$

B-21
(Revised)

INLETS # : 28, 29, 30 - SUMP

Located near the intersection
of Dekoning + Houser

Double A inlet, in sump condition:

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

Length of Weir (feet):

Orifice Coefficient

Weir Coefficient

7.7977431
7.9791667
0.6
3

Head (ft)	Head (in)	1 Wing		Grate		Control Q	
		Weir Q (cfs)	Weir Q (cfs)	Weir Q (cfs)	Orifice Q (cfs)	Sgl Wing (cfs)	Dbl Wing (cfs)
0.05	0.6	0.13	0.27	0.40	8.40	0.40	0.54
0.1	1.2	0.38	0.76	1.14	11.87	1.14	1.52
0.15	1.8	0.70	1.39	2.09	14.54	2.09	2.78
0.2	2.4	1.07	2.14	3.21	16.79	3.21	4.29
0.25	3	1.50	2.99	4.49	18.77	4.49	5.99
0.3	3.6	1.97	3.93	5.91	20.56	5.91	7.88
0.35	4.2	2.48	4.96	7.44	22.21	7.44	9.93
0.4	4.8	3.04	6.06	9.09	23.75	9.09	12.13
0.45	5.4	3.62	7.23	10.85	25.19	10.85	14.47
0.5	6	4.24	8.46	12.71	26.55	12.71	16.95
0.55	6.6	4.89	9.76	14.66	27.84	14.66	19.55
0.6	7.2	5.58	11.13	16.70	29.08	16.70	22.28
0.65	7.8	6.29	12.54	18.83	30.27	18.83	25.12
0.667	8.0	6.54	13.04	19.58	30.66	19.58	26.11
0.7	8.4	7.03	14.02	21.05	31.41	21.05	28.08
0.75	9	7.79	15.55	23.34	32.52	23.34	31.14
0.8	9.6	8.59	17.13	25.71	33.58	25.71	34.30
0.85	10.2	9.40	18.76	28.16	34.62	28.16	37.57
0.9	10.8	10.25	20.44	30.68	35.62	30.68	40.93
0.95	11.4	11.11	22.16	33.28	36.60	33.28	44.39
1	12	12.00	23.94	35.94	37.55	35.94	47.94
1.05	12.6	12.91	25.76	38.67	38.47	38.67	51.58
1.1	13.2	13.84	27.62	41.46	39.38	41.46	55.31
1.15	13.8	14.80	29.52	44.32	40.26	44.32	59.12
0.567	6.804	5.12	10.22	15.34	28.27	15.34	20.47

Calculation of open area:

Total Grate Area	2000	13.888889
Cross Bar Area	-732	-5.083333
Supports (ends)	-115.625	-0.802951
(middle)	-100	-0.694444
Areas Counted Twice	70.5	0.4895833
	1122.875	7.7977431

Calculation of Length of Weir:

Total Perimeter of Grate	130	10.833333
Short Cross Bars	-7	-0.583333
Bearing Bars	-13	-1.083333
End Supports	-9.25	-0.770833
Middle Supports	-5	-0.416667
	110	7.9791667

Residual inlet # 26A, 26 + 25A, 25 = 5.0 cfs
Residual inlet # 23 + 24 = 20.4 cfs
Basin B7 → = 10.2 cfs

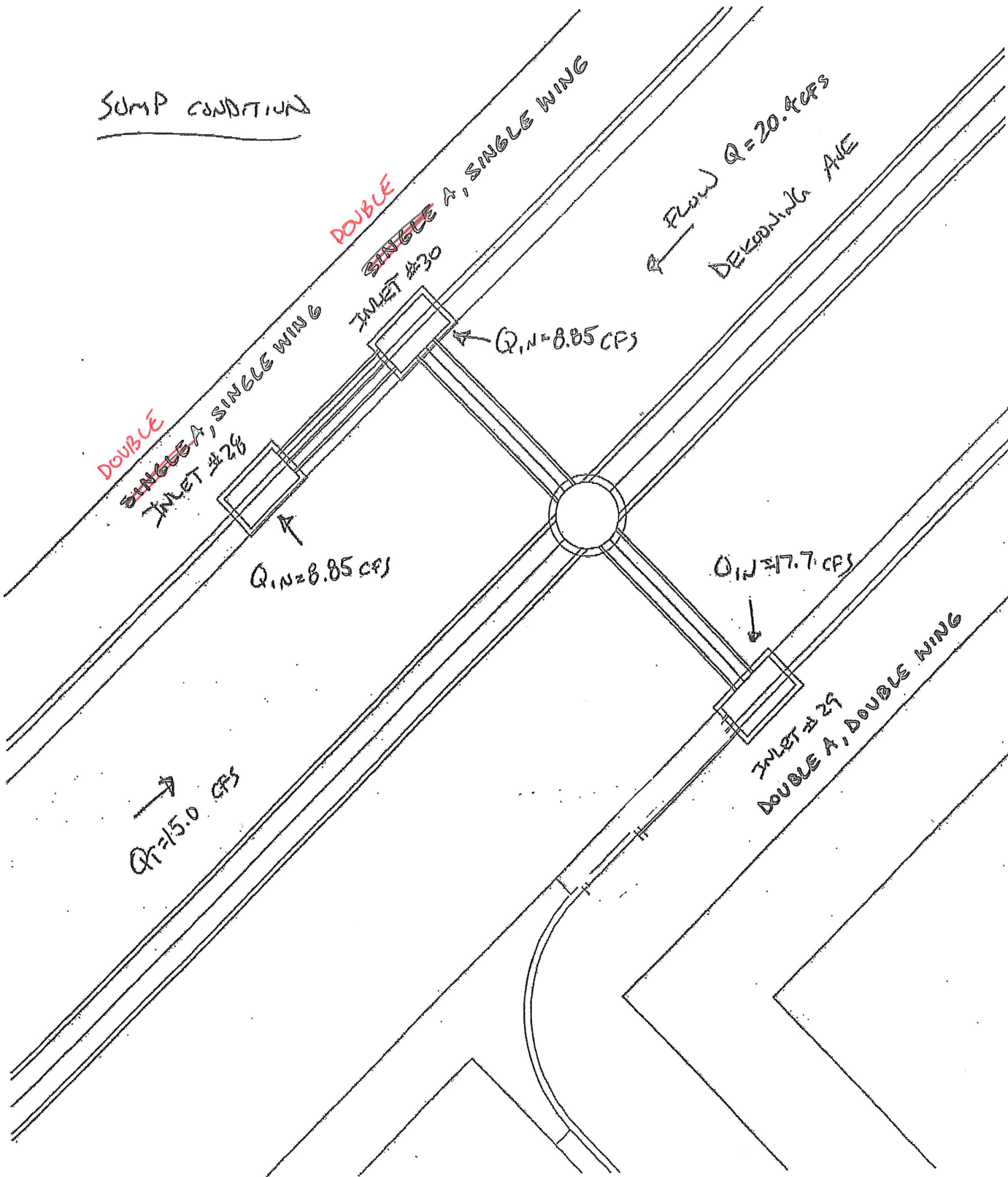
$$35.6 \text{ cfs} / 2 = 17.8 \text{ cfs}$$

2 INLETS ON LF SIDE OF DEKONING = $\frac{17.8}{2} = 8.9 \text{ cfs}$
SINGLE WING $h = 0.39'$

1 INLET ON RT SIDE OF DEKONING = 17.8 cfs
DOUBLE WING $h = 0.51'$

$$2 \times 100 \text{ yr} = 2(17.8 \text{ cfs}) = 35.6 \text{ cfs}; h = 0.82' < 0.9' \checkmark$$

SUMP CONDITION



B-23
(Revised)

INLETS # 31 & 32

LOCATED NEAR THE INTERSECTION
OF STRYKER & O'KEEFE

Double A inlet, in sump condition:

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

Length of Weir (feet):

Orifice Coefficient

Weir Coefficient

7.7977431

7.9791667

0.6

3

Head (ft)	Head (in)	1 Wing		Grate		Control Q	
		Weir Q (cfs)	Weir Q (cfs)	Weir Q (cfs)	Orifice Q (cfs)	Sgl Wing (cfs)	DbI Wing (cfs)
0.05	0.6	0.13	0.27	0.40	8.40	0.54	0.54
0.1	1.2	0.38	0.76	1.14	11.87	1.52	1.52
0.15	1.8	0.70	1.39	2.09	14.54	2.78	2.78
0.2	2.4	1.07	2.14	3.21	16.79	4.29	4.29
0.25	3	1.50	2.99	4.49	18.77	5.99	5.99
0.3	3.6	1.97	3.93	5.91	20.56	7.88	7.88
0.35	4.2	2.48	4.96	7.44	22.21	9.93	9.93
0.4	4.8	3.04	6.06	9.09	23.75	12.13	12.13
0.45	5.4	3.62	7.23	10.85	25.19	14.47	14.47
0.5	6	4.24	8.46	12.71	26.55	16.95	16.95
0.55	6.6	4.89	9.76	14.66	27.84	19.55	19.55
0.6	7.2	5.58	11.13	16.70	29.08	22.28	22.28
0.65	7.8	6.29	12.54	18.83	30.27	25.12	25.12
0.667	8.0	6.54	13.04	19.58	30.66	26.11	26.11
0.7	8.4	7.03	14.02	21.05	31.41	28.08	28.08
0.75	9	7.79	15.55	23.34	32.52	31.14	31.14
0.8	9.6	8.59	17.13	25.71	33.58	34.30	34.30
0.85	10.2	9.40	18.76	28.16	34.62	37.57	37.57
0.9	10.8	10.25	20.44	30.68	35.62	40.93	40.93
0.95	11.4	11.11	22.16	33.28	36.60	44.39	44.39
1	12	12.00	23.94	35.94	37.55	47.94	47.94
1.05	12.6	12.91	25.76	38.67	38.47	51.58	51.58
1.1	13.2	13.84	27.62	41.46	39.38	55.31	55.31
1.15	13.8	14.80	29.52	44.32	40.26	59.12	59.12
0.567	6.804	5.12	10.22	15.34	28.27	20.47	20.47

Calculation of open area:

Total Grate Area	2000	13.888889
Cross Bar Area	-732	-5.083333
Supports (ends)	-115.625	-0.802951
(middle)	-100	-0.694444
Areas Counted Twice	70.5	0.4895833
	1122.875	7.7977431

Calculation of Length of Weir:

Total Perimeter of Grate	130	10.833333
Short Cross Bars	-7	-0.583333
Bearing Bars	-13	-1.083333
End Supports	-9.25	-0.770833
Middle Supports	-5	-0.416667
	110	7.9791667

Basin B-5 - $23.9 \text{ cfs} / 2 = 11.9 \text{ cfs} / \text{INLET}$
 $\hookrightarrow h \approx 0.40'$

2 Times weir $= 23.9 \text{ cfs} / \text{INLET}$
 $\hookrightarrow h \approx 0.60'$

STRYKER RD

SUMP CONDITION

$Q_T = 23.9 \text{ CFS}$

INLET #31

$Q_{IN} = 11.9 \text{ CFS}$

INLET #32

$Q_{IN} = 11.9 \text{ CFS}$

Flow

Alley_0.50.txt

MANNING'S N = 0.017 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.4	4.0	5.0	0.1	7.0	16.0	0.0
2.0	2.4	0.3	5.0	10.0	0.2	8.0	17.6	0.3
3.0	4.0	0.0	6.0	15.0	0.1	9.0	20.0	0.4

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.050	0.050	0.033	0.017	1.325	0.524	1.309	0.054
0.100	0.100	0.131	0.109	2.650	0.832	2.618	0.111
0.150	0.150	0.320	0.279	6.046	0.872	6.000	0.162
0.200	0.200	0.757	0.762	11.512	1.007	11.454	0.216
0.250	0.250	1.435	1.898	14.492	1.323	14.424	0.277
0.300	0.300	2.168	3.693	14.987	1.703	14.909	0.345
0.350	0.350	2.943	5.605	17.205	1.905	17.120	0.406

TYPICAL ALLEY CAPACITY
 @ 0.540 \approx 6 CFS

APPENDIX C

INROADS STORM DRAIN OUTPUT FILES

Design Log

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InRoads Storm & Sanitary Design Log

Drainage File: P:\20140338\CDP\Control\Data\20140338_SB.sdb

Design File: P:\20140338\CDP\HYDRO\20140338BASINS_BCP.DWG

Display Log: P:\20140338\CDP\HYDRO\design.log

Date: Wednesday, April 23, 2014 2:07:47 PM

=====

Designing inlet IN1

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:

Gutter Flow:	9.5000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft
Flow downstream:	9.5000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
Spread:	12.5768 ft		
Depth in Gutter:	0.3353 ft	Assigned Bypass:	N/A

Designing pipe SDP18

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:

Total Flow:	9.5000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.1041 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
Depth of Flow:	0.5430 ft	Flow Status:	Partial
Critical Depth:	1.1900 ft	Capacity:	33.8840 cfs
Velocity:	16.4217 ft/s		
Froude Number:	4.5761	Flow Regime:	SuperCritical

Designing inlet IN2

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:

Gutter Flow:	9.5000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft
Flow downstream:	9.5000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
Spread:	2.5171 ft		
Depth in Gutter:	0.8804 ft	Assigned Bypass:	N/A

Designing pipe SDP19

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:

Total Flow:	9.5000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.1006 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
Depth of Flow:	0.5480 ft	Flow Status:	Partial
Critical Depth:	1.1900 ft	Capacity:	33.3220 cfs
Velocity:	16.2193 ft/s		
Froude Number:	4.4961	Flow Regime:	SuperCritical

Designing manhole SDMH1

Results:

Total Flow:	19.0000 cfs	Flow From:	Upstream
Status:	Fixed		
Chamber Width:	4.0000 ft	Chamber Length:	4.0000 ft

Designing pipe SDP6

Results:

Total Flow:	19.0000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.0184 ft/ft
Pipe Width:	24.0000 in	Pipe Height:	24.0000 in
Depth of Flow:	1.1390 ft	Flow Status:	Partial
Critical Depth:	1.5600 ft	Capacity:	30.6727 cfs
Velocity:	10.2709 ft/s		
Froude Number:	1.8746	Flow Regime:	SuperCritical

Designing inlet IN3

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:

Gutter Flow:	9.2000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft
Flow downstream:	9.2000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
Spread:	12.4778 ft		
Depth in Gutter:	0.3305 ft	Assigned Bypass:	N/A

Designing pipe SDP16

WARNING: Full flow velocity is greater than maximum (10.0000)

Outfall A.txt

Results:
 Total Flow: 9.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.4372 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 0.3680 ft Flow Status: Partial
 Critical Depth: 1.1700 ft Capacity: 69.4576 cfs
 Velocity: 27.2427 ft/s
 Froude Number: 9.4080 Flow Regime: SuperCritical

Designing inlet IN4
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 9.2000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 9.2000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 2.4865 ft
 Depth in Gutter: 0.8700 ft Assigned Bypass: N/A

Designing pipe SDP17
 WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 9.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.4228 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 0.3710 ft Flow Status: Partial
 Critical Depth: 1.1700 ft Capacity: 68.3053 cfs
 Velocity: 26.9331 ft/s
 Froude Number: 9.2606 Flow Regime: SuperCritical

Designing manhole SDMH2

Results:
 Total Flow: 37.4000 cfs Flow From: Upstream
 Status: Fixed
 Chamber Width: 4.0000 ft Chamber Length: 4.0000 ft

Designing pipe SDP5

Results:
 Total Flow: 37.4000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0100 ft/ft
 Pipe Width: 36.0000 in Pipe Height: 36.0000 in
 Depth of Flow: 1.6060 ft Flow Status: Partial
 Critical Depth: 1.9800 ft Capacity: 66.6984 cfs
 Velocity: 9.7016 ft/s
 Froude Number: 1.5075 Flow Regime: SuperCritical

Designing manhole SDMH3

Results:
 Total Flow: 37.4000 cfs Flow From: upstream
 Status: Fixed
 Chamber Width: 6.0000 ft Chamber Length: 6.0000 ft

Designing pipe SDP4

Results:
 Total Flow: 37.4000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0100 ft/ft
 Pipe Width: 36.0000 in Pipe Height: 36.0000 in
 Depth of Flow: 1.6060 ft Flow Status: Partial
 Critical Depth: 1.9800 ft Capacity: 66.6984 cfs
 Velocity: 9.7016 ft/s
 Froude Number: 1.5075 Flow Regime: SuperCritical

Designing inlet IN7
 WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 9.2000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 9.2000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 2.6384 ft
 Depth in Gutter: 0.8396 ft Assigned Bypass: N/A

Designing pipe SDP12

Results:
 Total Flow: 9.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0124 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 1.0020 ft Flow Status: Partial
 Critical Depth: 1.1700 ft Capacity: 11.6932 cfs
 Velocity: 7.3263 ft/s
 Froude Number: 1.3708 Flow Regime: SuperCritical

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outfall A.txt

Designing inlet IN9

WARNING: Spread is greater than maximum spread (2,5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:
 Gutter Flow: 7.0000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
 Flow Downstream: 16.2000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 16.4872 ft
 Depth in Gutter: 0.2373 ft Assigned Bypass: N/A

Designing pipe SDP13

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 16.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.4632 ft/ft
 Pipe Width: 24.0000 in Pipe Height: 24.0000 in
 Depth of Flow: 0.4380 ft Flow Status: Partial
 Critical Depth: 1.4500 ft Capacity: 153.9599 cfs
 Velocity: 31.7151 ft/s
 Froude Number: 10.0785 Flow Regime: Supercritical

WARNING: Pipe Too large for valid connection to inlet.

Designing inlet IN8

WARNING: Spread is greater than maximum spread (2,5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 9.2000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
 Flow Downstream: 9.2000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 668.6888 ft
 Depth in Gutter: 0.0303 ft Assigned Bypass: N/A

Designing pipe SDP14

Results:
 Total Flow: 9.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0124 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 1.0020 ft Flow Status: Partial
 Critical Depth: 1.1700 ft Capacity: 11.6928 cfs
 Velocity: 7.3263 ft/s
 Froude Number: 1.3708 Flow Regime: Supercritical

Designing inlet IN10

WARNING: Spread is greater than maximum spread (2,5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:
 Gutter Flow: 7.0000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
 Flow Downstream: 16.2000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 1921.2516 ft
 Depth in Gutter: 0.0137 ft Assigned Bypass: N/A

Designing pipe SDP15

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 16.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.4775 ft/ft
 Pipe Width: 24.0000 in Pipe Height: 24.0000 in
 Depth of Flow: 0.4340 ft Flow Status: Partial
 Critical Depth: 1.4500 ft Capacity: 156.3222 cfs
 Velocity: 32.1310 ft/s
 Froude Number: 10.2606 Flow Regime: Supercritical

WARNING: Pipe Too large for valid connection to inlet.

Designing manhole SDMH4

Results:
 Total Flow: 69.8000 cfs Flow From: Upstream
 Status: Fixed
 Chamber width: 6.0000 ft Chamber Length: 6.0000 ft

Designing pipe SDP3

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 69.8000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0300 ft/ft
 Pipe Width: 42.0000 in Pipe Height: 42.0000 in
 Depth of Flow: 2.1440 ft Flow Status: Partial
 Critical Depth: 2.6100 ft Capacity: 100.6098 cfs
 Velocity: 11.2922 ft/s
 Froude Number: 1.4791 Flow Regime: Supercritical

Outfall A.txt

Designing inlet IN6

WARNING: Spread is greater than maximum spread (2.5000 ft)
WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
Gutter Flow: 13.2500 cfs Flow From: Injected Storm
Status: Fixed
Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
Flow Downstream: 13.2500 cfs Bypass To: 0.0000 cfs
Percent Cap: 100.0000 % Capacity: 0.0000 cfs
Spread: 2.8531 ft
Depth in Gutter: 0.9971 ft Assigned Bypass: N/A

Designing pipe SDP8

Results:
Total Flow: 13.2500 cfs Flow From: Upstream
Status: Fixed Slope: 0.0141 ft/ft
Pipe Width: 18.0000 in Pipe Height: 18.0000 in
Depth of Flow: 1.3390 ft Flow Status: Partial
Critical Depth: 1.3500 ft Capacity: 12.4761 cfs
Velocity: 7.9530 ft/s
Froude Number: 1.0471 Flow Regime: Critical

Designing inlet IN12

WARNING: Spread is greater than maximum spread (2.5000 ft)
WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
WARNING: Pipe Too large for valid connection to inlet.

Results:
Gutter Flow: 13.2500 cfs Flow From: Injected Storm
Status: Fixed
Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
Flow Downstream: 26.5000 cfs Bypass To: 0.0000 cfs
Percent Cap: 100.0000 % Capacity: 0.0000 cfs
Spread: 16.0031 ft
Depth in Gutter: 0.3543 ft Assigned Bypass: N/A

Designing pipe SDP9

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
Total Flow: 26.5000 cfs Flow From: Upstream
Status: Fixed Slope: 0.3926 ft/ft
Pipe Width: 24.0000 in Pipe Height: 24.0000 in
Depth of Flow: 0.5850 ft Flow Status: Partial
Critical Depth: 1.7900 ft Capacity: 141.7453 cfs
Velocity: 34.5458 ft/s
Froude Number: 9.3913 Flow Regime: supercritical

WARNING: Pipe Too large for valid connection to inlet.

Designing inlet IN5

WARNING: Spread is greater than maximum spread (2.5000 ft)
WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
Gutter Flow: 13.2500 cfs Flow From: Injected Storm
Status: Fixed
Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
Flow Downstream: 13.2500 cfs Bypass To: 0.0000 cfs
Percent Cap: 100.0000 % Capacity: 0.0000 cfs
Spread: 15.1790 ft
Depth in Gutter: 0.3657 ft Assigned Bypass: N/A

Designing pipe SDP10

Results:
Total Flow: 13.2500 cfs Flow From: Upstream
Status: Fixed Slope: 0.0141 ft/ft
Pipe Width: 18.0000 in Pipe Height: 18.0000 in
Depth of Flow: 1.3400 ft Flow Status: Partial
Critical Depth: 1.3500 ft Capacity: 12.4707 cfs
Velocity: 7.9486 ft/s
Froude Number: 1.0448 Flow Regime: Critical

Designing inlet IN11

WARNING: Spread is greater than maximum spread (2.5000 ft)
WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
WARNING: Pipe Too large for valid connection to inlet.

Results:
Gutter Flow: 13.2500 cfs Flow From: Injected Storm
Status: Fixed
Inlet Length: 6.5000 ft Inlet width: 2.0000 ft
Flow Downstream: 26.5000 cfs Bypass To: 0.0000 cfs
Percent Cap: 100.0000 % Capacity: 0.0000 cfs
Spread: 15.6046 ft
Depth in Gutter: 0.3597 ft Assigned Bypass: N/A

Designing pipe SDP11

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
Total Flow: 26.5000 cfs Flow From: Upstream
Status: Fixed Slope: 0.4047 ft/ft
Pipe Width: 24.0000 in Pipe Height: 24.0000 in
Page 4

Depth of Flow: 0.5810 ft
 Critical Depth: 1.7900 ft
 Velocity: 34.8766 ft/s
 Froude Number: 9.5170

Outfall A.txt
 Flow Status: Partial
 Capacity: 143.9202 cfs
 Flow Regime: SuperCritical

WARNING: Pipe Too large for valid connection to inlet.
Designing manhole SDMH5

Results:
 Total Flow: 53.0000 cfs
 Status: Fixed
 Chamber Width: 6.0000 ft

Flow From: Upstream
 Chamber Length: 6.0000 ft

Designing pipe SDP7

Results:
 Total Flow: 53.0000 cfs
 Status: Fixed
 Pipe Width: 36.0000 in
 Depth of Flow: 2.0190 ft
 Critical Depth: 2.3600 ft
 Velocity: 10.4692 ft/s
 Froude Number: 1.3766

Flow From: Upstream
 Slope: 0.0100 ft/ft
 Pipe Height: 36.0000 in
 Flow Status: Partial
 Capacity: 66.6984 cfs
 Flow Regime: SuperCritical

Designing manhole SDMH6

Results:
 Total Flow: 122.8000 cfs
 Status: Fixed
 Chamber Width: 6.0000 ft

Flow From: Upstream
 Chamber Length: 6.0000 ft

Designing pipe SDP2

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 122.8000 cfs
 Status: Fixed
 Pipe Width: 48.0000 in
 Depth of Flow: 2.8450 ft
 Critical Depth: 3.3300 ft
 Velocity: 12.8407 ft/s
 Froude Number: 1.3941

Flow From: Upstream
 Slope: 0.0100 ft/ft
 Pipe Height: 48.0000 in
 Flow Status: Partial
 Capacity: 143.6433 cfs
 Flow Regime: SuperCritical

Designing manhole SDMH7

Results:
 Total Flow: 122.8000 cfs
 Status: Fixed
 Chamber Width: 6.0000 ft

Flow From: Upstream
 Chamber Length: 6.0000 ft

Designing pipe SDP1

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 122.8000 cfs
 Status: Fixed
 Pipe Width: 48.0000 in
 Depth of Flow: 2.8420 ft
 Critical Depth: 3.3300 ft
 Velocity: 12.8553 ft/s
 Froude Number: 1.3970

Flow From: Upstream
 Slope: 0.0100 ft/ft
 Pipe Height: 48.0000 in
 Flow Status: Partial
 Capacity: 143.8413 cfs
 Flow Regime: SuperCritical

HGL/EGL Computations:

Table A:

Struct ID Rim Elev. (ft)	D (in)	Q (cfs)	L (ft)	V (ft/s)	d (ft)	dc (ft)	VA2/2g (ft)	Sf (ft/ft)	Dn_Soffit (ft)	EGLdn (ft)	HGLdn (ft)	Tot_Loss (ft)	EGLup (ft)	HGLup (ft)
outfall	-	-	-	-	-	-	-	-	-	-	-	-	-	5295.50
SDP1	48	122.80	123.67	9.77	-	-	1.48	0.0073	5293.00	5296.98	5295.50	0.90	5297.89	5296.40
SDMH7	-	-	-	-	-	-	-	-	-	5297.89	5296.40	1.14	5299.03	5297.55
5305.43 SDP2	48	122.80	274.51	9.77	-	-	1.48	0.0073	5294.31	5299.03	5297.55	2.01	5301.04	5299.55
SDMH6	-	-	-	-	-	-	-	-	-	5301.04	5299.55	0.23	5301.27	5299.78
5303.84 SDP3	42	69.80	41.00	7.25	-	-	0.82	0.0048	5296.60	5301.27	5299.78	0.20	5301.46	5300.64
SDMH4	-	-	-	-	-	-	-	-	-	5301.46	5300.64	0.17	5301.63	5300.81
5303.91 SDP4	36	37.40	238.01	5.29	-	-	0.44	0.0031	5296.55	5301.63	5300.81	0.75	5302.38	5301.94
SDMH3	-	-	-	-	-	-	-	-	-	5302.38	5301.94	0.52	5302.90	5302.46
5305.69 SDP5	36	37.40	48.00	5.29	-	-	0.44	0.0031	5298.79	5302.90	5302.46	0.15	5303.05	5302.61
SDMH2	-	-	-	-	-	-	-	-	-	5303.05	5302.61	0.07	5303.12	5302.68
5305.56 SDP6	24	19.00	270.05	6.05	-	-	0.57	0.0071	5298.32	5303.12	5302.68	1.90	5305.02	5304.46
SDMH1	-	-	-	-	-	-	-	-	-	5305.02	5304.46	0.24	5305.26	5304.70

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Outfall A.txt													
5307.21 SDP18	18	9.50	13.90	5.38	-	-	0.45	0.0082	5302.81	5305.26	5304.70	0.11	5305.38 5304.93
- IN1	-	-	-	-	-	-	-	-	-	5305.38	5304.93	-	5305.38 5304.93
5306.85 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5301.04 5299.55
- SDMH6	-	-	-	-	-	-	-	-	-	5301.04	5299.55	0.51	5301.55 5300.06
5303.84 SDP7	36	53.00	41.00	7.50	-	-	0.87	0.0063	5296.10	5301.55	5300.06	0.26	5301.81 5300.93
- SDMH5	-	-	-	-	-	-	-	-	-	5301.81	5300.93	0.48	5302.28 5301.41
5303.78 SDP9	24	26.50	17.37	8.44	-	-	1.11	0.0137	5295.55	5302.28	5301.41	0.24	5302.52 5301.42
- IN12	-	-	-	-	-	-	-	-	-	5302.52	5301.42	1.25	5303.77 5302.66
5303.40 SDP8	18	13.25	30.09	7.50	-	-	0.87	0.0159	5299.50	5303.77	5302.66	0.48	5304.25 5303.37
- IN6	-	-	-	-	-	-	-	-	-	5304.25	5303.37	-	5304.25 5303.37
5303.33 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5301.46 5300.64
- SDMH4	-	-	-	-	-	-	-	-	-	5301.46	5300.64	0.17	5301.63 5300.82
5303.91 SDP13	24	16.20	17.82	5.16	-	-	0.41	0.0051	5295.55	5301.63	5300.82	0.09	5301.73 5301.31
- IN9	-	-	-	-	-	-	-	-	-	5301.73	5301.31	0.39	5302.11 5301.70
5303.53 SDP12	18	9.20	30.09	5.21	-	-	0.42	0.0077	5300.30	5302.11	5301.70	0.23	5302.34 5301.92
- IN7	-	-	-	-	-	-	-	-	-	5302.34	5301.92	-	5302.34 5301.92
5303.59 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5301.46 5300.64
- SDMH4	-	-	-	-	-	-	-	-	-	5301.46	5300.64	0.17	5301.63 5300.82
5303.91 SDP15	24	16.20	17.54	5.16	-	-	0.41	0.0051	5295.55	5301.63	5300.82	0.09	5301.72 5301.31
- IN10	-	-	-	-	-	-	-	-	-	5301.72	5301.31	0.39	5302.11 5301.70
5303.53 SDP14	18	9.20	30.09	5.21	-	-	0.42	0.0077	5300.30	5302.11	5301.70	0.23	5302.34 5301.92
- IN8	-	-	-	-	-	-	-	-	-	5302.34	5301.92	-	5302.34 5301.92
5303.59 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5303.05 5302.61
- SDMH2	-	-	-	-	-	-	-	-	-	5303.05	5302.61	0.10	5303.14 5302.71
5305.56 SDP16	18	9.20	15.09	5.21	-	-	0.42	0.0077	5297.82	5303.14	5302.71	0.12	5303.26 5302.84
- IN3	-	-	-	-	-	-	-	-	-	5303.26	5302.84	-	5303.26 5302.84
5305.19 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5303.05 5302.61
- SDMH2	-	-	-	-	-	-	-	-	-	5303.05	5302.61	0.10	5303.14 5302.71
5305.56 SDP17	18	9.20	15.38	5.21	-	-	0.42	0.0077	5297.82	5303.14	5302.71	0.12	5303.26 5302.84
- IN4	-	-	-	-	-	-	-	-	-	5303.26	5302.84	-	5303.26 5302.84
5305.19 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5305.02 5304.46
- SDMH1	-	-	-	-	-	-	-	-	-	5305.02	5304.46	0.24	5305.26 5304.70
5307.21 SDP19	18	9.50	14.24	5.38	-	-	0.45	0.0082	5302.81	5305.26	5304.70	0.12	5305.38 5304.93
- IN2	-	-	-	-	-	-	-	-	-	5305.38	5304.93	-	5305.38 5304.93
5306.85 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5301.81 5300.93
- SDMH5	-	-	-	-	-	-	-	-	-	5301.81	5300.93	0.48	5302.28 5301.41
5303.78 SDP11	24	26.50	17.08	8.44	-	-	1.11	0.0137	5295.55	5302.28	5301.41	0.23	5302.52 5301.41
- IN11	-	-	-	-	-	-	-	-	-	5302.52	5301.41	1.24	5303.76 5302.66
5303.40 SDP10	18	13.25	30.09	7.50	-	-	0.87	0.0159	5299.50	5303.76	5302.66	0.48	5304.24 5303.37
- IN5	-	-	-	-	-	-	-	-	-	5304.24	5303.37	-	5304.24 5303.37
5303.33	-	-	-	-	-	-	-	-	-	-	-	-	-

Table B:

LOSSES	Str_ID	Hf	Hb	Hstr	Hc	He	Hj	Total	LOSS_COEFFICIENTS	Ka	Cd	Cd	Cq	Cp
Cb	K								Dstr					
Outfall		-	-	-	-	-	-	-	-	-	-	-	-	-
SDP1		0.90	-	-	-	-	-	0.90	-	-	-	-	-	-
SDMH7		-	-	1.14	-	-	-	1.14	6.19	1.184	1.000	0.650	1.000	1.000
1.000 0.769		2.01	-	-	-	-	-	2.01	-	-	-	-	-	-
SDP2		-	-	-	-	-	-	-	-	-	-	-	-	-
SDMH6		-	-	0.23	-	-	-	0.23	6.56	0.150	1.000	0.673	1.532	1.000
1.000 0.155		0.20	-	-	-	-	-	0.20	-	-	-	-	-	-
SDP3		-	-	-	-	-	-	-	-	-	-	-	-	-
SDMH4		-	-	0.17	-	-	-	0.17	7.19	0.171	1.000	0.770	1.562	1.000
1.000 0.206		0.75	-	-	-	-	-	0.75	-	-	-	-	-	-
SDP4		-	-	-	-	-	-	-	-	-	-	-	-	-

outfall A.txt													
-	SDMH3	-	-	0.52	-	-	0.52	6.07	1.553	1.000	0.764	1.000	1.000
1.000	SDP5	0.15	-	-	-	-	0.15	-	-	-	-	-	-
-	SDMH2	-	-	0.07	-	-	0.07	6.39	0.133	1.000	0.787	1.587	1.000
1.000	SDP6	1.90	-	-	-	-	1.90	-	-	-	-	-	-
-	SDMH1	-	-	0.24	-	-	0.24	3.25	1.553	1.000	0.669	0.405	1.000
1.000	SDP18	0.11	-	-	-	-	0.11	-	-	-	-	-	-
-	IN1	-	-	-	-	-	-	2.58	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH6	-	-	0.51	-	-	0.51	6.56	1.488	1.000	0.673	0.345	1.000
1.000	SDP7	0.26	-	-	-	-	0.26	-	-	-	-	-	-
-	SDMH5	-	-	0.48	-	-	0.48	7.48	1.553	1.000	0.865	0.405	1.000
1.000	SDP9	0.24	-	-	-	-	0.24	-	-	-	-	-	-
-	IN12	-	-	1.25	-	-	1.25	3.42	1.634	1.000	0.689	1.000	1.000
1.000	SDP8	0.48	-	-	-	-	0.48	-	-	-	-	-	-
-	IN6	-	-	-	-	-	-	5.04	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH4	-	-	0.17	-	-	0.17	7.19	1.518	1.000	0.770	0.180	1.000
1.000	SDP13	0.09	-	-	-	-	0.09	-	-	-	-	-	-
-	IN9	-	-	0.39	-	-	0.39	2.51	1.634	1.000	0.573	1.000	1.000
1.000	SDP12	0.23	-	-	-	-	0.23	-	-	-	-	-	-
-	IN7	-	-	-	-	-	-	2.83	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH4	-	-	0.17	-	-	0.17	7.19	1.518	1.000	0.770	0.180	1.000
1.000	SDP15	0.09	-	-	-	-	0.09	-	-	-	-	-	-
-	IN10	-	-	0.39	-	-	0.39	2.51	1.634	1.000	0.573	1.000	1.000
1.000	SDP14	0.23	-	-	-	-	0.23	-	-	-	-	-	-
-	IN8	-	-	-	-	-	-	2.83	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH2	-	-	0.10	-	-	0.10	6.39	1.462	1.000	0.787	0.191	1.000
1.000	SDP16	0.12	-	-	-	-	0.12	-	-	-	-	-	-
-	IN3	-	-	-	-	-	-	2.15	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH2	-	-	0.10	-	-	0.10	6.39	1.462	1.000	0.787	0.191	1.000
1.000	SDP17	0.12	-	-	-	-	0.12	-	-	-	-	-	-
-	IN4	-	-	-	-	-	-	2.15	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH1	-	-	0.24	-	-	0.24	3.25	1.553	1.000	0.669	0.405	1.000
1.000	SDP19	0.12	-	-	-	-	0.12	-	-	-	-	-	-
-	IN2	-	-	-	-	-	-	2.58	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH5	-	-	0.48	-	-	0.48	7.48	1.553	1.000	0.865	0.405	1.000
1.000	SDP11	0.23	-	-	-	-	0.23	-	-	-	-	-	-
-	IN11	-	-	1.24	-	-	1.24	3.41	1.634	1.000	0.689	1.000	1.000
1.000	SDP10	0.48	-	-	-	-	0.48	-	-	-	-	-	-
-	IN5	-	-	-	-	-	-	5.04	-	-	-	-	-

Design Log

InRoads Storm & Sanitary Design Log

Drainage File: P:\20140338\CDP\Control\Data\20140338_SD.sdb

Design File: P:\20140338\CDP\HYDRO\20140338BASINS_BCP.DWG

Display Log: P:\20140338\CDP\HYDRO\design.log

Date: Wednesday, April 23, 2014 2:06:37 PM

Designing inlet IN16

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:	Gutter Flow:	10.0000 cfs	Flow From:	Injected Storm
	Status:	Fixed		
	Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
	Flow Downstream:	10.0000 cfs	Bypass To:	0.0000 cfs
	Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
	Spread:	2.5786 ft		
	Depth in Gutter:	0.8949 ft	Assigned Bypass:	N/A

Designing pipe SDP44

Results:	Total Flow:	10.0000 cfs	Flow From:	Upstream
	Status:	Fixed	Slope:	0.0148 ft/ft
	Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
	Depth of Flow:	0.9980 ft	Flow Status:	Partial
	Critical Depth:	1.2100 ft	Capacity:	12.7855 cfs
	Velocity:	7.9994 ft/s		
	Froude Number:	1.5016	Flow Regime:	SuperCritical

Designing inlet IN18

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:	Gutter Flow:	6.3000 cfs	Flow From:	Injected Storm
	Status:	Fixed		
	Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
	Flow Downstream:	16.3000 cfs	Bypass To:	0.0000 cfs
	Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
	Spread:	2.1689 ft		
	Depth in Gutter:	0.7524 ft	Assigned Bypass:	N/A

Designing pipe SDP43

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:	Total Flow:	16.3000 cfs	Flow From:	Upstream
	Status:	Fixed	Slope:	0.0940 ft/ft
	Pipe Width:	24.0000 in	Pipe Height:	24.0000 in
	Depth of Flow:	0.6590 ft	Flow Status:	Partial
	Critical Depth:	1.4500 ft	Capacity:	69.3764 cfs
	Velocity:	18.0283 ft/s		
	Froude Number:	4.5881	Flow Regime:	SuperCritical

WARNING: Pipe Too large for valid connection to inlet.

Designing inlet IN15

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:	Gutter Flow:	10.0000 cfs	Flow From:	Injected Storm
	Status:	Fixed		
	Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
	Flow Downstream:	10.0000 cfs	Bypass To:	0.0000 cfs
	Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
	Spread:	13.6665 ft		
	Depth in Gutter:	0.3290 ft	Assigned Bypass:	N/A

Designing pipe SDP45

Results:	Total Flow:	10.0000 cfs	Flow From:	Upstream
	Status:	Fixed	Slope:	0.0148 ft/ft
	Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
	Depth of Flow:	0.9980 ft	Flow Status:	Partial
	Critical Depth:	1.2100 ft	Capacity:	12.7856 cfs
	Velocity:	7.9994 ft/s		
	Froude Number:	1.5016	Flow Regime:	SuperCritical

Designing inlet IN17

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:	Gutter Flow:	6.3000 cfs	Flow From:	Injected Storm
	Status:	Fixed		
	Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
	Flow Downstream:	16.3000 cfs	Bypass To:	0.0000 cfs

outfall 8.txt
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 11.5188 ft
 Depth in Gutter: 0.2763 ft Assigned Bypass: N/A

Designing pipe SDP46

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 16.3000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0910 ft/ft
 Pipe Width: 24.0000 in Pipe Height: 24.0000 in
 Depth of Flow: 0.6650 ft Flow Status: Partial
 Critical Depth: 1.4500 ft Capacity: 68.2257 cfs
 Velocity: 17.8058 ft/s
 Froude Number: 4.5085 Flow Regime: SuperCritical

WARNING: Pipe Too large for valid connection to inlet.

Designing manhole SDMH8

Results:
 Total Flow: 32.6000 cfs Flow From: Upstream
 Status: Fixed
 Chamber Width: 4.0000 ft Chamber Length: 4.0000 ft

Designing pipe SDP42

Results:
 Total Flow: 32.6000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0108 ft/ft
 Pipe Width: 36.0000 in Pipe Height: 36.0000 in
 Depth of Flow: 1.4480 ft Flow Status: Partial
 Critical Depth: 1.8500 ft Capacity: 69.1940 cfs
 Velocity: 9.6412 ft/s
 Froude Number: 1.6012 Flow Regime: SuperCritical

Designing manhole SDMH9

Results:
 Total Flow: 32.6000 cfs Flow From: Upstream
 Status: Fixed
 Chamber Width: 4.0000 ft Chamber Length: 4.0000 ft

Designing pipe SDP41

Results:
 Total Flow: 32.6000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0100 ft/ft
 Pipe Width: 36.0000 in Pipe Height: 36.0000 in
 Depth of Flow: 1.4800 ft Flow Status: Partial
 Critical Depth: 1.8500 ft Capacity: 66.6984 cfs
 Velocity: 9.3751 ft/s
 Froude Number: 1.5358 Flow Regime: SuperCritical

Designing inlet IN20

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 8.9000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 8.9000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 2.4669 ft
 Depth in Gutter: 0.8569 ft Assigned Bypass: N/A

Designing pipe SDP47

Results:
 Total Flow: 8.9000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0111 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 1.0180 ft Flow Status: Partial
 Critical Depth: 1.1500 ft Capacity: 11.0726 cfs
 Velocity: 6.9627 ft/s
 Froude Number: 1.2858 Flow Regime: SuperCritical

Designing inlet IN22

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:
 Gutter Flow: 6.0000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 14.9000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 2.1278 ft
 Depth in Gutter: 0.7391 ft Assigned Bypass: N/A

Designing pipe SDP48

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 14.9000 cfs Flow From: Upstream

Status:	Fixed	outfall 8.txt
Pipe Width:	24.0000 in	Slope:
Depth of Flow:	0.4170 ft	Pipe Height:
Critical Depth:	1.3900 ft	Flow Status:
Velocity:	31.2805 ft/s	Capacity:
Froude Number:	10.2030	Flow Regime:

WARNING: Pipe Too large for valid connection to inlet.
 Designing inlet IN19
 WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:		
Gutter Flow:	8.9000 cfs	Flow From: Injected Storm
Status:	Fixed	
Inlet Length:	6.5000 ft	Inlet width:
Flow Downstream:	8.9000 cfs	Bypass To:
Percent Cap:	100.0000 %	Capacity:
Spread:	13.1294 ft	Assigned Bypass:
Depth in Gutter:	0.3143 ft	N/A

Designing pipe SDP49

Results:		
Total Flow:	8.9000 cfs	Flow From: Upstream
Status:	Fixed	
Pipe Width:	18.0000 in	Slope:
Depth of Flow:	1.0180 ft	Pipe Height:
Critical Depth:	1.1500 ft	Flow Status:
Velocity:	6.9627 ft/s	Capacity:
Froude Number:	1.2858	Flow Regime: SuperCritical

Designing inlet IN21

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:		
Gutter Flow:	6.0000 cfs	Flow From: Injected Storm
Status:	Fixed	
Inlet Length:	6.5000 ft	Inlet width:
Flow Downstream:	14.9000 cfs	Bypass To:
Percent Cap:	100.0000 %	Capacity:
Spread:	10.2712 ft	Assigned Bypass:
Depth in Gutter:	0.2874 ft	N/A

Designing pipe SDP50

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	14.9000 cfs	Flow From: Upstream
Status:	Fixed	
Pipe Width:	24.0000 in	Slope:
Depth of Flow:	0.4210 ft	Pipe Height:
Critical Depth:	1.3900 ft	Flow Status:
Velocity:	30.8584 ft/s	Capacity:
Froude Number:	10.0145	Flow Regime: SuperCritical

WARNING: Pipe Too large for valid connection to inlet.
 Designing manhole SDMH10

Results:		
Total Flow:	62.4000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	6.0000 ft	Chamber Length:
		6.0000 ft

Designing pipe SDP40

Results:		
Total Flow:	62.4000 cfs	Flow From: Upstream
Status:	Fixed	
Pipe Width:	36.0000 in	Slope:
Depth of Flow:	2.3010 ft	Pipe Height:
Critical Depth:	2.5400 ft	Flow Status:
Velocity:	10.7214 ft/s	Capacity:
Froude Number:	1.2481	Flow Regime: SuperCritical

Designing manhole SDMH11

Results:		
Total Flow:	62.4000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	4.0000 ft	Chamber Length:
		4.0000 ft

Designing pipe SDP39

Results:		
Total Flow:	62.4000 cfs	Flow From: Upstream
Status:	Fixed	
Pipe Width:	36.0000 in	Slope:
Depth of Flow:	2.3010 ft	Pipe Height:
Critical Depth:	2.5400 ft	Flow Status:
Velocity:	10.7214 ft/s	Capacity:
Froude Number:	1.2481	Flow Regime: SuperCritical

Outfall B.txt

Designing inlet IN24

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 8.9000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 8.9000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 2.4779 ft
 Depth in Gutter: 0.8546 ft Assigned Bypass: N/A

Designing pipe SDP51

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 8.9000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.8284 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 0.3090 ft Flow Status: Partial
 Critical Depth: 1.1500 ft Capacity: 95.6051 cfs
 Velocity: 33.7533 ft/s
 Froude Number: 12.7942 Flow Regime: Supercritical

Designing inlet IN23

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 8.9000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Flow Downstream: 8.9000 cfs Bypass To: 0.0000 cfs
 Percent Cap: 100.0000 % Capacity: 0.0000 cfs
 Spread: 17.9918 ft
 Depth in Gutter: 0.2601 ft Assigned Bypass: N/A

Designing pipe SDP52

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 8.9000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.7958 ft/ft
 Pipe Width: 18.0000 in Pipe Height: 18.0000 in
 Depth of Flow: 0.3120 ft Flow Status: Partial
 Critical Depth: 1.1500 ft Capacity: 93.7086 cfs
 Velocity: 33.2924 ft/s
 Froude Number: 12.5551 Flow Regime: Supercritical

Designing manhole SDMH12

Results:
 Total Flow: 80.2000 cfs Flow From: Upstream
 Status: Fixed
 Chamber width: 6.0000 ft Chamber Length: 6.0000 ft

Designing pipe SDP38

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 80.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0100 ft/ft
 Pipe Width: 48.0000 in Pipe Height: 48.0000 in
 Depth of Flow: 2.1360 ft Flow Status: Partial
 Critical Depth: 2.7100 ft Capacity: 143.6433 cfs
 Velocity: 11.7410 ft/s
 Froude Number: 1.5826 Flow Regime: Supercritical

Designing manhole SDMH13

Results:
 Total Flow: 80.2000 cfs Flow From: Upstream
 Status: Fixed
 Chamber width: 6.0000 ft Chamber Length: 6.0000 ft

Designing pipe SDP37

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:
 Total Flow: 80.2000 cfs Flow From: Upstream
 Status: Fixed Slope: 0.0100 ft/ft
 Pipe Width: 48.0000 in Pipe Height: 48.0000 in
 Depth of Flow: 2.1360 ft Flow Status: Partial
 Critical Depth: 2.7100 ft Capacity: 143.6433 cfs
 Velocity: 11.7410 ft/s
 Froude Number: 1.5826 Flow Regime: Supercritical

Designing inlet IN32

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:
 Gutter Flow: 11.9000 cfs Flow From: Injected Storm
 Status: Fixed
 Inlet Length: 6.5000 ft Inlet Width: 2.0000 ft
 Page 4

Flow Downstream:	11.9000 cfs	Outfall B.txt	
Percent Cap:	100.0000 %	Bypass To:	0.0000 cfs
Spread:	15.3239 ft	Capacity:	0.0000 cfs
Depth in Gutter:	0.3410 ft	Assigned Bypass:	N/A

Designing pipe SDP26

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:			
Total Flow:	11.9000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.0785 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
Depth of Flow:	0.6630 ft	Flow Status:	Partial
Critical Depth:	1.3100 ft	Capacity:	29.4294 cfs
Velocity:	15.7646 ft/s	Flow Regime:	SuperCritical
Froude Number:	3.9084		

Designing inlet IN31

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:			
Gutter Flow:	11.9000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
Flow Downstream:	11.9000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
Spread:	15.1951 ft	Assigned Bypass:	N/A
Depth in Gutter:	0.3427 ft		

Designing pipe SDP27

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:			
Total Flow:	11.9000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.0423 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
Depth of Flow:	0.7940 ft	Flow Status:	Partial
Critical Depth:	1.3100 ft	Capacity:	21.6021 cfs
Velocity:	12.5127 ft/s	Flow Regime:	SuperCritical
Froude Number:	2.7702		

Designing manhole SDMH19

Results:			
Total Flow:	23.8000 cfs	Flow From:	Upstream
Status:	Fixed		
Chamber Width:	4.0000 ft	Chamber Length:	4.0000 ft

Designing pipe SDP25

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:			
Total Flow:	23.8000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.0113 ft/ft
Pipe Width:	36.0000 in	Pipe Height:	36.0000 in
Depth of Flow:	1.1980 ft	Flow Status:	Partial
Critical Depth:	1.5700 ft	Capacity:	70.7597 cfs
Velocity:	9.0241 ft/s	Flow Regime:	SuperCritical
Froude Number:	1.6802		

Designing inlet IN14

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:			
Gutter Flow:	9.3000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
Flow Downstream:	9.3000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs
Spread:	37.8451 ft	Assigned Bypass:	N/A
Depth in Gutter:	0.1710 ft		

Designing pipe SDP29

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:			
Total Flow:	9.3000 cfs	Flow From:	Upstream
Status:	Fixed	Slope:	0.0925 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in
Depth of Flow:	0.5540 ft	Flow Status:	Partial
Critical Depth:	1.1700 ft	Capacity:	31.9544 cfs
Velocity:	15.6460 ft/s	Flow Regime:	SuperCritical
Froude Number:	4.3103		

Designing inlet IN13

WARNING: Spread is greater than maximum spread (2.5000 ft)

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:			
Gutter Flow:	9.3000 cfs	Flow From:	Injected Storm
Status:	Fixed		
Inlet Length:	6.5000 ft	Inlet Width:	2.0000 ft
Flow Downstream:	9.3000 cfs	Bypass To:	0.0000 cfs
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs

outfall 8.txt

Spread:	12.0874 ft	
Depth in Gutter:	0.3391 ft	Assigned Bypass: N/A

Designing pipe SDP30

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	9.3000 cfs	Flow From: Upstream
Status:	Fixed	Slope: 0.0876 ft/ft
Pipe Width:	18.0000 in	Pipe Height: 18.0000 in
Depth of Flow:	0.5620 ft	Flow Status: Partial
Critical Depth:	1.1700 ft	Capacity: 31.0822 cfs
Velocity:	15.3464 ft/s	Flow Regime: SuperCritical
Froude Number:	4.1931	

Designing manhole SDMH17

Results:		
Total Flow:	18.6000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	4.0000 ft	Chamber Length: 4.0000 ft

Designing pipe SDP28

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	18.6000 cfs	Flow From: Upstream
Status:	Fixed	Slope: 0.1836 ft/ft
Pipe Width:	24.0000 in	Pipe Height: 24.0000 in
Depth of Flow:	0.5930 ft	Flow Status: Partial
Critical Depth:	1.5500 ft	Capacity: 96.9367 cfs
Velocity:	23.7946 ft/s	Flow Regime: SuperCritical
Froude Number:	6.4205	

Designing manhole SDMH18

Results:		
Total Flow:	42.4000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	6.0000 ft	Chamber Length: 6.0000 ft

Designing pipe SDP24

Results:		
Total Flow:	42.4000 cfs	Flow From: Upstream
Status:	Fixed	Slope: 0.0085 ft/ft
Pipe Width:	42.0000 in	Pipe Height: 42.0000 in
Depth of Flow:	1.6600 ft	Flow Status: Partial
Critical Depth:	2.0200 ft	Capacity: 92.7576 cfs
Velocity:	9.4239 ft/s	Flow Regime: SuperCritical
Froude Number:	3.4650	

Designing inlet IN25

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:		
Gutter Flow:	8.8000 cfs	Flow From: Injected Storm
Status:	Fixed	
Inlet Length:	6.5000 ft	Inlet Width: 2.0000 ft
Flow Downstream:	8.8000 cfs	Bypass To: 0.0000 cfs
Percent Cap:	100.0000 %	Capacity: 0.0000 cfs
Spread:	14.1473 ft	
Depth in Gutter:	0.2985 ft	Assigned Bypass: N/A

Designing pipe SDP31

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	8.8000 cfs	Flow From: Upstream
Status:	Fixed	Slope: 0.4218 ft/ft
Pipe Width:	18.0000 in	Pipe Height: 18.0000 in
Depth of Flow:	0.3630 ft	Flow Status: Partial
Critical Depth:	1.1400 ft	Capacity: 68.2199 cfs
Velocity:	26.5652 ft/s	Flow Regime: SuperCritical
Froude Number:	9.2417	

Designing inlet IN26

WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:		
Gutter Flow:	8.8000 cfs	Flow From: Injected Storm
Status:	Fixed	
Inlet Length:	6.5000 ft	Inlet width: 2.0000 ft
Flow Downstream:	8.8000 cfs	Bypass To: 0.0000 cfs
Percent Cap:	100.0000 %	Capacity: 0.0000 cfs
Spread:	2.4569 ft	
Depth in Gutter:	0.8532 ft	Assigned Bypass: N/A

Designing pipe SDP32

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	8.8000 cfs	Flow From: Upstream

Status:	Fixed	outfall 8.txt	Slope:	0.4140 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in	
Depth of Flow:	0.3650 ft	Flow Status:	Partial	
Critical Depth:	1.1400 ft	Capacity:	67.5848 cfs	
Velocity:	26.3603 ft/s	Flow Regime:	SuperCritical	
Froude Number:	9.1434			

Designing manhole SDMH16

Results:	Total Flow:	60.0000 cfs	Flow From:	Upstream
Status:	Fixed			
Chamber Width:	6.0000 ft	Chamber Length:	6.0000 ft	

Designing pipe SDP23

Results:	Total Flow:	60.0000 cfs	Flow From:	Upstream
Status:	Fixed		Slope:	0.0085 ft/ft
Pipe Width:	42.0000 in	Pipe Height:	42.0000 in	
Depth of Flow:	2.0490 ft	Flow Status:	Partial	
Critical Depth:	2.4200 ft	Capacity:	92.7576 cfs	
Velocity:	10.2470 ft/s	Flow Regime:	SuperCritical	
Froude Number:	1.3868			

Designing inlet IN27

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:	Gutter Flow:	12.7000 cfs	Flow From:	Injected Storm
Status:	Fixed			
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft	
Flow Downstream:	12.7000 cfs	Bypass To:	0.0000 cfs	
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs	
Spread:	20.7401 ft	Assigned Bypass:	N/A	
Depth in Gutter:	0.2957 ft			

Designing pipe SDP33

Results:	Total Flow:	12.7000 cfs	Flow From:	Upstream
Status:	Fixed		Slope:	0.0126 ft/ft
Pipe Width:	18.0000 in	Pipe Height:	18.0000 in	
Depth of Flow:	1.5000 ft	Flow Status:	Full	
Critical Depth:	1.5000 ft	Capacity:	11.7876 cfs	
Velocity:	7.1867 ft/s	Flow Regime:	Subcritical	
Froude Number:	0.0000			

Designing inlet IN29

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:	Gutter Flow:	12.7000 cfs	Flow From:	Injected Storm
Status:	Fixed			
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft	
Flow Downstream:	25.4000 cfs	Bypass To:	0.0000 cfs	
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs	
Spread:	23.0019 ft	Assigned Bypass:	N/A	
Depth in Gutter:	0.2779 ft			

Designing pipe SDP34

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:	Total Flow:	25.4000 cfs	Flow From:	Upstream
Status:	Fixed		Slope:	0.4507 ft/ft
Pipe Width:	24.0000 in	Pipe Height:	24.0000 in	
Depth of Flow:	0.5530 ft	Flow Status:	Partial	
Critical Depth:	1.7700 ft	Capacity:	151.8705 cfs	
Velocity:	35.8089 ft/s	Flow Regime:	SuperCritical	
Froude Number:	10.0387			

WARNING: Pipe Too large for valid connection to inlet.

Designing inlet IN28

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.

Results:	Gutter Flow:	12.7000 cfs	Flow From:	Injected Storm
Status:	Fixed			
Inlet Length:	6.5000 ft	Inlet width:	2.0000 ft	
Flow Downstream:	12.7000 cfs	Bypass To:	0.0000 cfs	
Percent Cap:	100.0000 %	Capacity:	0.0000 cfs	
Spread:	2.8537 ft	Assigned Bypass:	N/A	
Depth in Gutter:	0.9719 ft			

Designing pipe SDP35

Results:	Total Flow:	12.7000 cfs	Flow From:	Upstream
Status:	Fixed		Slope:	0.0126 ft/ft
Pipe Width:	24.0000 in	Pipe Height:	24.0000 in	
Depth of Flow:	1.0000 ft	Flow Status:	Partial	

Critical Depth:	1.2800 ft	Outfall B.txt
Velocity:	8.0748 ft/s	Capacity: 25.3862 cfs
Froude Number:	1.6063	Flow Regime: SuperCritical

Designing inlet IN30

WARNING: Spread is greater than maximum spread (2.5000 ft)
 WARNING: Inlet forced to capture all flow, ignoring capacity calculations.
 WARNING: Pipe Too large for valid connection to inlet.

Results:		
Gutter Flow:	12.7000 cfs	Flow From: Injected Storm
Status:	Fixed	
Inlet Length:	6.5000 ft	Inlet width:
Flow Downstream:	25.4000 cfs	Bypass To:
Percent Cap:	100.0000 %	Capacity:
Spread:	2.8647 ft	Assigned Bypass:
Depth in Gutter:	0.9697 ft	N/A

Designing pipe SDP36

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	25.4000 cfs	Flow From: Upstream
Status:	Fixed	Slope:
Pipe Width:	24.0000 in	Pipe Height:
Depth of Flow:	0.5550 ft	Flow Status:
Critical Depth:	1.7700 ft	Capacity:
Velocity:	35.6290 ft/s	Flow Regime: SuperCritical
Froude Number:	9.9687	

WARNING: Pipe Too large for valid connection to inlet.

Designing manhole SDMH15

Results:		
Total Flow:	110.8000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	6.0000 ft	Chamber Length:
		6.0000 ft

Designing pipe SDP22

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	110.8000 cfs	Flow From: Upstream
Status:	Fixed	Slope:
Pipe Width:	48.0000 in	Pipe Height:
Depth of Flow:	2.7980 ft	Flow Status:
Critical Depth:	3.1800 ft	Capacity:
Velocity:	11.7973 ft/s	Flow Regime: SuperCritical
Froude Number:	1.3000	

Designing manhole SDMH14

Results:		
Total Flow:	191.0000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	8.0000 ft	Chamber Length:
		8.0000 ft

Designing pipe SDP21

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	191.0000 cfs	Flow From: Upstream
Status:	Fixed	Slope:
Pipe Width:	60.0000 in	Pipe Height:
Depth of Flow:	3.3680 ft	Flow Status:
Critical Depth:	3.9500 ft	Capacity:
Velocity:	13.5718 ft/s	Flow Regime: SuperCritical
Froude Number:	1.3813	

Designing manhole SDMH20

Results:		
Total Flow:	191.0000 cfs	Flow From: Upstream
Status:	Fixed	
Chamber Width:	8.0000 ft	Chamber Length:
		8.0000 ft

Designing pipe SDP20

WARNING: Full flow velocity is greater than maximum (10.0000)

Results:		
Total Flow:	191.0000 cfs	Flow From: Upstream
Status:	Fixed	Slope:
Pipe Width:	60.0000 in	Pipe Height:
Depth of Flow:	3.3700 ft	Flow Status:
Critical Depth:	3.9500 ft	Capacity:
Velocity:	13.5627 ft/s	Flow Regime: SuperCritical
Froude Number:	1.3797	

HGL/EGL Computations:

Table A:

outfall 8.txt														
Struct_ID Rim Elev. (ft)	D (in)	Q (cfs)	L (ft)	V (ft/s)	d (ft)	dc (ft)	VA2/2g (ft)	SF (ft/ft)	Dn_Soffit (ft)	EGLdn (ft)	HGLdn (ft)	Tot_Loss (ft)	EGLup (ft)	HGLup (ft)
outfall	-	-	-	-	-	-	-	-	-	-	-	-	-	5292.10
SDP20	60	191.00	243.20	9.73	-	-	1.47	0.0054	5288.00	5293.57	5292.10	1.31	5294.88	5293.41
SDMH20	-	-	-	-	-	-	-	-	-	5294.88	5293.41	1.10	5295.98	5294.51
5303.60 SDP21	60	191.00	190.81	9.73	-	-	1.47	0.0054	5290.13	5295.98	5294.51	1.03	5297.01	5295.54
SDMH14	-	-	-	-	-	-	-	-	-	5297.01	5295.54	0.25	5297.26	5295.79
5301.78 SDP22	48	110.80	102.19	8.82	-	-	1.21	0.0059	5290.78	5297.26	5295.79	0.61	5297.87	5296.66
SDMH15	-	-	-	-	-	-	-	-	-	5297.87	5296.66	0.23	5298.10	5296.89
5301.10 SDP23	42	60.00	88.00	6.24	-	-	0.60	0.0036	5291.19	5298.10	5296.89	0.31	5298.41	5297.81
SDMH16	-	-	-	-	-	-	-	-	-	5298.41	5297.81	0.13	5298.54	5297.94
5301.12 SDP24	42	42.40	250.01	4.41	-	-	0.30	0.0018	5291.99	5298.54	5297.94	0.44	5298.99	5298.69
SDMH18	-	-	-	-	-	-	-	-	-	5298.99	5298.69	0.17	5299.16	5298.86
5302.99 SDP25	36	23.80	260.02	3.37	-	-	0.18	0.0013	5293.66	5299.16	5298.86	0.33	5299.49	5299.32
SDMH19	-	-	-	-	-	-	-	-	-	5299.49	5299.32	0.08	5299.57	5299.39
5299.53 SDP26	18	11.90	16.88	6.73	-	-	0.70	0.0128	5295.13	5299.57	5299.39	0.22	5299.79	5299.08
IN32 5299.15	-	-	-	-	-	-	-	-	-	5299.79	5299.08	-	5299.79	5299.08
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5297.01	5295.54
SDMH14	-	-	-	-	-	-	-	-	-	5297.01	5295.54	0.52	5297.53	5296.06
5301.78 SDP37	48	80.20	231.16	6.38	-	-	0.63	0.0031	5290.78	5297.53	5296.06	0.72	5298.25	5297.62
SDMH13	-	-	-	-	-	-	-	-	-	5298.25	5297.62	0.22	5298.47	5297.84
5302.56 SDP38	48	80.20	220.23	6.38	-	-	0.63	0.0031	5293.12	5298.47	5297.84	0.69	5299.15	5298.52
SDMH12	-	-	-	-	-	-	-	-	-	5299.15	5298.52	0.23	5299.38	5298.75
5303.66 SDP39	36	62.40	157.10	8.83	-	-	1.21	0.0088	5294.36	5299.38	5298.75	1.38	5300.76	5299.54
SDMH11	-	-	-	-	-	-	-	-	-	5300.76	5299.54	0.23	5300.99	5299.78
5304.36 SDP40	36	62.40	450.02	8.83	-	-	1.21	0.0088	5295.98	5300.99	5299.78	3.94	5304.93	5303.72
SDMH10	-	-	-	-	-	-	-	-	-	5304.93	5303.72	0.30	5305.22	5304.01
5306.68 SDP41	36	32.60	118.01	4.61	-	-	0.33	0.0024	5300.53	5305.22	5304.01	0.28	5305.51	5305.18
SDMH9	-	-	-	-	-	-	-	-	-	5305.51	5305.18	0.04	5305.54	5305.21
5307.29 SDP42	36	32.60	450.03	4.61	-	-	0.33	0.0024	5301.76	5305.54	5305.21	1.08	5306.62	5306.29
SDMH8	-	-	-	-	-	-	-	-	-	5306.62	5306.29	0.09	5306.71	5306.38
5309.56 SDP43	24	16.30	13.89	5.19	-	-	0.42	0.0052	5305.66	5306.71	5306.38	0.07	5306.78	5306.36
IN18	-	-	-	-	-	-	-	-	-	5306.78	5306.36	0.32	5307.11	5306.69
5309.20 SDP44	18	10.00	20.00	5.66	-	-	0.50	0.0091	5306.10	5307.11	5306.69	0.18	5307.29	5306.79
IN16 5309.30	-	-	-	-	-	-	-	-	-	5307.29	5306.79	-	5307.29	5306.79
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5297.87	5296.66
SDMH15	-	-	-	-	-	-	-	-	-	5297.87	5296.66	0.26	5298.13	5296.92
5301.10 SDP34	24	25.40	25.04	8.09	-	-	1.02	0.0126	5289.69	5298.13	5296.92	0.32	5298.44	5297.43
IN29	-	-	-	-	-	-	-	-	-	5298.44	5297.43	0.75	5299.19	5298.18
5300.56 SDP33	18	12.70	20.00	7.19	-	-	0.80	0.0146	5297.30	5299.19	5298.18	0.29	5299.49	5298.68
IN27 5300.47	-	-	-	-	-	-	-	-	-	5299.49	5298.68	-	5299.49	5298.68
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5297.87	5296.66
SDMH15	-	-	-	-	-	-	-	-	-	5297.87	5296.66	0.26	5298.13	5296.92
5301.10 SDP36	24	25.40	25.34	8.09	-	-	1.02	0.0126	5289.69	5298.13	5296.92	0.32	5298.45	5297.43
IN30	-	-	-	-	-	-	-	-	-	5298.45	5297.43	0.75	5299.20	5298.18
5300.56 SDP35	24	12.70	20.00	4.04	-	-	0.25	0.0032	5297.80	5299.20	5298.18	0.06	5299.26	5299.01
IN28 5300.47	-	-	-	-	-	-	-	-	-	5299.26	5299.01	-	5299.26	5299.01
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5298.41	5297.81
SDMH16	-	-	-	-	-	-	-	-	-	5298.41	5297.81	0.09	5298.50	5297.90
5301.12 SDP31	18	8.80	24.78	4.98	-	-	0.39	0.0070	5289.99	5298.50	5297.90	0.17	5298.68	5298.29
IN25 5300.58	-	-	-	-	-	-	-	-	-	5298.68	5298.29	-	5298.68	5298.29
New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5298.41	5297.81
SDMH16	-	-	-	-	-	-	-	-	-	5298.41	5297.81	0.09	5298.50	5297.90

OutFall 8.txt													
5301.12 SDP32	18	8.80	25.08	4.98	-	-	0.39	0.0070	5289.99	5298.50	5297.90	0.18	5298.68 5298.30
- IN26	-	-	-	-	-	-	-	-	-	5298.68	5298.30	-	5298.68 5298.30
5300.58 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5298.99 5298.69
- SDMH18	-	-	-	-	-	-	-	-	-	5298.99	5298.69	0.13	5299.12 5298.82
5302.99 SDP28	24	18.60	41.69	5.92	-	-	0.54	0.0068	5292.66	5299.12	5298.82	0.28	5299.40 5298.86
- SDMH17	-	-	-	-	-	-	-	-	-	5299.40	5298.86	0.15	5299.55 5299.01
5303.27 SDP29	18	9.30	15.90	5.26	-	-	0.43	0.0078	5298.87	5299.55	5299.01	0.12	5299.68 5299.25
- IN14	-	-	-	-	-	-	-	-	-	5299.68	5299.25	-	5299.68 5299.25
5303.03 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5299.49 5299.32
- SDMH19	-	-	-	-	-	-	-	-	-	5299.49	5299.32	0.08	5299.57 5299.39
5299.53 SDP27	18	11.90	24.19	6.73	-	-	0.70	0.0128	5295.13	5299.57	5299.39	0.31	5299.88 5299.18
- IN31	-	-	-	-	-	-	-	-	-	5299.88	5299.18	-	5299.88 5299.18
5298.99 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5299.15 5298.52
- SDMH12	-	-	-	-	-	-	-	-	-	5299.15	5298.52	0.06	5299.22 5298.59
5303.66 SDP51	18	8.90	17.94	33.75	-	-	17.71	0.0072	5292.86	5299.22	5298.59	-	5316.81 5299.11
- IN24	-	-	-	-	-	-	-	-	-	5316.81	5299.11	-	5316.81 5299.11
5303.30 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5299.15 5298.52
- SDMH12	-	-	-	-	-	-	-	-	-	5299.15	5298.52	0.07	5299.22 5298.59
5303.66 SDP52	18	8.90	18.13	33.29	-	-	17.22	0.0072	5292.86	5299.22	5298.59	-	5316.34 5299.11
- IN23	-	-	-	-	-	-	-	-	-	5316.34	5299.11	-	5316.34 5299.11
5303.31 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5304.93 5303.72
- SDMH10	-	-	-	-	-	-	-	-	-	5304.93	5303.72	0.27	5305.20 5303.99
5306.68 SDP48	24	14.90	15.31	4.74	-	-	0.35	0.0043	5299.53	5305.20	5303.99	0.07	5305.26 5304.92
- IN22	-	-	-	-	-	-	-	-	-	5305.26	5304.92	0.38	5305.65 5305.30
5306.35 SDP47	18	8.90	20.00	5.04	-	-	0.39	0.0072	5303.30	5305.65	5305.30	0.14	5305.79 5305.40
- IN20	-	-	-	-	-	-	-	-	-	5305.79	5305.40	-	5305.79 5305.40
5306.45 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5304.93 5303.72
- SDMH10	-	-	-	-	-	-	-	-	-	5304.93	5303.72	0.27	5305.20 5303.99
5306.68 SDP50	24	14.90	15.58	4.74	-	-	0.35	0.0043	5299.53	5305.20	5303.99	0.07	5305.27 5304.92
- IN21	-	-	-	-	-	-	-	-	-	5305.27	5304.92	0.38	5305.65 5305.30
5306.35 SDP49	18	8.90	20.00	5.04	-	-	0.39	0.0072	5303.30	5305.65	5305.30	0.14	5305.79 5305.40
- IN19	-	-	-	-	-	-	-	-	-	5305.79	5305.40	-	5305.79 5305.40
5306.45 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5306.62 5306.29
- SDMH8	-	-	-	-	-	-	-	-	-	5306.62	5306.29	0.09	5306.71 5306.38
5309.56 SDP46	24	16.30	14.23	5.19	-	-	0.42	0.0052	5305.66	5306.71	5306.38	0.07	5306.78 5306.36
- IN17	-	-	-	-	-	-	-	-	-	5306.78	5306.36	0.32	5307.11 5306.69
5309.20 SDP45	18	10.00	20.00	5.66	-	-	0.50	0.0091	5306.10	5307.11	5306.69	0.18	5307.29 5306.79
- IN15	-	-	-	-	-	-	-	-	-	5307.29	5306.79	-	5307.29 5306.79
5309.30 New Branch	-	-	-	-	-	-	-	-	-	-	-	-	5299.40 5298.86
- SDMH17	-	-	-	-	-	-	-	-	-	5299.40	5298.86	0.15	5299.55 5299.01
5303.27 SDP30	18	9.30	16.23	5.26	-	-	0.43	0.0078	5298.87	5299.55	5299.01	0.13	5299.68 5299.25
- IN13	-	-	-	-	-	-	-	-	-	5299.68	5299.25	-	5299.68 5299.25
5302.98	-	-	-	-	-	-	-	-	-	-	-	-	-

Table B:

LOSSES	Str_ID	Hf	Hb	Hstr	Hc	He	Hj	Total	LOSS_COEFFICIENTS	Ko	Co	Cd	Cq	Cp
Ch	K								Dstr					
Outfall		-	-	-	-	-	-	-	-	-	-	-	-	-
SDP20		1.31	-	-	-	-	-	1.31	-	-	-	-	-	-
SDMH20		-	-	1.10	-	-	-	1.10	8.38	1.101	1.000	0.682	1.000	1.000
SDP21		1.03	-	-	-	-	-	1.03	-	-	-	-	-	-
SDMH14		-	-	0.25	-	-	-	0.25	8.85	0.160	1.000	0.704	1.522	1.000

						Outfall B.txt									
-	SDP22	0.61	-	-	-	0.61	-	-	-	-	-	-	-	-	-
-	SDMH15	-	-	0.23	-	0.23	9.07	0.150	1.000	0.817	1.557	1.000	-	-	-
1.000	0.191	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP23	0.31	-	-	-	0.31	-	-	-	-	-	-	-	-	-
-	SDMH16	-	-	0.13	-	0.13	9.42	0.171	1.000	0.906	1.399	1.000	-	-	-
1.000	0.217	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP24	0.44	-	-	-	0.44	-	-	-	-	-	-	-	-	-
-	SDMH18	-	-	0.17	-	0.17	8.12	1.518	1.000	0.829	0.461	1.000	-	-	-
1.000	0.580	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP25	0.33	-	-	-	0.33	-	-	-	-	-	-	-	-	-
-	SDMH19	-	-	0.08	-	0.08	5.79	1.462	1.000	0.742	0.405	1.000	-	-	-
1.000	0.439	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP26	0.22	-	-	-	0.22	-	-	-	-	-	-	-	-	-
-	IN32	-	-	-	-	-	4.43	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH14	-	-	0.52	-	0.52	8.85	1.502	1.000	0.704	0.336	1.000	-	-	-
1.000	0.355	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP37	0.72	-	-	-	0.72	-	-	-	-	-	-	-	-	-
-	SDMH13	-	-	0.22	-	0.22	8.60	0.434	1.000	0.791	1.000	1.000	-	-	-
1.000	0.343	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP38	0.69	-	-	-	0.69	-	-	-	-	-	-	-	-	-
-	SDMH12	-	-	0.23	-	0.23	7.26	0.417	1.000	0.715	1.194	1.000	-	-	-
1.000	0.356	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP39	1.38	-	-	-	1.38	-	-	-	-	-	-	-	-	-
-	SDMH11	-	-	0.23	-	0.23	6.66	0.239	1.000	0.807	1.000	1.000	-	-	-
1.000	0.193	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP40	3.94	-	-	-	3.94	-	-	-	-	-	-	-	-	-
-	SDMH10	-	-	0.30	-	0.30	6.29	0.200	1.000	0.779	1.574	1.000	-	-	-
1.000	0.245	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP41	0.28	-	-	-	0.28	-	-	-	-	-	-	-	-	-
-	SDMH9	-	-	0.04	-	0.04	6.52	0.133	1.000	0.796	1.000	1.000	-	-	-
1.000	0.106	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP42	1.08	-	-	-	1.08	-	-	-	-	-	-	-	-	-
-	SDMH8	-	-	0.09	-	0.09	2.73	1.462	1.000	0.472	0.405	1.000	-	-	-
1.000	0.280	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP43	0.07	-	-	-	0.07	-	-	-	-	-	-	-	-	-
-	IN18	-	-	0.32	-	0.32	1.76	1.671	1.000	0.464	1.000	1.000	-	-	-
1.000	0.774	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP44	0.18	-	-	-	0.18	-	-	-	-	-	-	-	-	-
-	IN16	-	-	-	-	-	1.99	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH15	-	-	0.26	-	0.26	9.07	1.488	1.000	0.817	0.177	1.000	-	-	-
1.000	0.216	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP34	0.32	-	-	-	0.32	-	-	-	-	-	-	-	-	-
-	IN29	-	-	0.75	-	0.75	1.63	1.671	1.000	0.442	1.000	1.000	-	-	-
1.000	0.739	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP33	0.29	-	-	-	0.29	-	-	-	-	-	-	-	-	-
-	IN27	-	-	-	-	-	2.71	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH15	-	-	0.26	-	0.26	9.07	1.488	1.000	0.817	0.177	1.000	-	-	-
1.000	0.216	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP36	0.32	-	-	-	0.32	-	-	-	-	-	-	-	-	-
-	IN30	-	-	0.75	-	0.75	1.63	1.671	1.000	0.443	1.000	1.000	-	-	-
1.000	0.740	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP35	0.06	-	-	-	0.06	-	-	-	-	-	-	-	-	-
-	IN28	-	-	-	-	-	3.04	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH16	-	-	0.09	-	0.09	9.42	1.518	1.000	0.906	0.112	1.000	-	-	-
1.000	0.154	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP31	0.17	-	-	-	0.17	-	-	-	-	-	-	-	-	-
-	IN25	-	-	-	-	-	2.21	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH16	-	-	0.09	-	0.09	9.42	1.518	1.000	0.906	0.112	1.000	-	-	-
1.000	0.154	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP32	0.18	-	-	-	0.18	-	-	-	-	-	-	-	-	-
-	IN26	-	-	-	-	-	2.22	-	-	-	-	-	-	-	-
-	New Branch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDMH18	-	-	0.13	-	0.13	8.12	1.518	1.000	0.829	0.352	1.000	-	-	-
1.000	0.442	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP28	0.28	-	-	-	0.28	-	-	-	-	-	-	-	-	-
-	SDMH17	-	-	0.15	-	0.15	1.59	1.553	1.000	0.435	0.405	1.000	-	-	-
1.000	0.274	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	SDP29	0.12	-	-	-	0.12	-	-	-	-	-	-	-	-	-

IN14	-	-	-	-	-	Outfall B.txt	0.77	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH19	-	-	0.08	-	-	0.08	5.79	1.462	1.000	0.742	0.405	1.000
1.000 0.439	-	-	-	-	-	-	-	-	-	-	-	-
SDP27	0.31	-	-	-	-	0.31	-	-	-	-	-	-
IN31	-	-	-	-	-	-	4.69	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH12	-	-	0.06	-	-	0.06	7.26	1.479	1.000	0.715	0.096	1.000
1.000 0.102	-	-	-	-	-	-	-	-	-	-	-	-
SDP51	0.13	-	-	-	-	0.13	-	-	-	-	-	-
IN24	-	-	-	-	-	-	0.31	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH12	-	-	0.07	-	-	0.07	7.26	1.476	1.000	0.715	0.100	1.000
1.000 0.106	-	-	-	-	-	-	-	-	-	-	-	-
SDP52	0.13	-	-	-	-	0.13	-	-	-	-	-	-
IN23	-	-	-	-	-	-	0.31	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH10	-	-	0.27	-	-	0.27	6.29	1.553	1.000	0.779	0.185	1.000
1.000 0.224	-	-	-	-	-	-	-	-	-	-	-	-
SDP48	0.07	-	-	-	-	0.07	-	-	-	-	-	-
IN22	-	-	0.38	-	-	0.38	3.12	1.671	1.000	0.652	1.000	1.000
1.000 1.090	-	-	-	-	-	-	-	-	-	-	-	-
SDP47	0.14	-	-	-	-	0.14	-	-	-	-	-	-
IN20	-	-	-	-	-	-	3.45	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH10	-	-	0.27	-	-	0.27	6.29	1.553	1.000	0.779	0.185	1.000
1.000 0.224	-	-	-	-	-	-	-	-	-	-	-	-
SDP50	0.07	-	-	-	-	0.07	-	-	-	-	-	-
IN21	-	-	0.38	-	-	0.38	3.12	1.671	1.000	0.652	1.000	1.000
1.000 1.090	-	-	-	-	-	-	-	-	-	-	-	-
SDP49	0.14	-	-	-	-	0.14	-	-	-	-	-	-
IN19	-	-	-	-	-	-	3.45	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH8	-	-	0.09	-	-	0.09	2.73	1.462	1.000	0.472	0.405	1.000
1.000 0.280	-	-	-	-	-	-	-	-	-	-	-	-
SDP46	0.07	-	-	-	-	0.07	-	-	-	-	-	-
IN17	-	-	0.32	-	-	0.32	1.76	1.671	1.000	0.464	1.000	1.000
1.000 0.775	-	-	-	-	-	-	-	-	-	-	-	-
SDP45	0.18	-	-	-	-	0.18	-	-	-	-	-	-
IN15	-	-	-	-	-	-	1.99	-	-	-	-	-
New Branch	-	-	-	-	-	-	-	-	-	-	-	-
SDMH17	-	-	0.15	-	-	0.15	1.59	1.553	1.000	0.435	0.405	1.000
1.000 0.274	-	-	-	-	-	-	-	-	-	-	-	-
SDP30	0.13	-	-	-	-	0.13	-	-	-	-	-	-
IN13	-	-	-	-	-	-	0.80	-	-	-	-	-

Hydraulic Analysis for Storm Drain Using StormCAD

Project Name: Mesa Del Sol Neighborhood Montage Units 3 & 4

Project No.: 20190195

Prepared By: P. Carrillo

Date: 1/23/2019

Label	-Node- (Upstream) (Downstream)	-Depth- (Upstream) (Downstream) (ft)	-EGL- (Upstream) (Downstream) (ft)	-Ground- (Upstream) (Downstream) (ft)	-HGL- (Upstream) (Downstream) (ft)	HGL Clearance (HGL depth below Ground) (ft)	-Invert- (Upstream) (Downstream) (ft)	Section Discharge Capacity (cfs)	-X- (Upstream) (Downstream) (ft)	-Y- (Upstream) (Downstream) (ft)
SDP40	SDMH10	6.84	5,301.92	5,306.68	5,300.47	6.21	5,294.04	62.40	1,530,894.26	1,449,579.15
	SDMH11	5.34	5,297.30	5,304.36	5,296.57	7.79	5,290.75	56.47	1,531,330.77	1,449,688.51
SDP43	INLET 18	2.06	5,307.66	5,308.68	5,306.94	1.74	5,305.27	16.30	1,530,340.02	1,449,454.18
	SDMH8	6.18	5,304.00	5,309.56	5,306.89	2.67	5,297.31	16.01	1,530,343.29	1,449,441.12
SDP42	SDMH9	6.36	5,303.82	5,309.56	5,303.42	6.14	5,297.31	32.60	1,530,343.29	1,449,441.12
	SDMH9	7.47	5,302.56	5,307.29	5,302.36	4.93	5,294.76	49.46	1,530,779.80	1,449,550.48
SDP45	INLET 15	1.97	5,308.37	5,309.40	5,307.77	1.63	5,305.90	10.00	1,530,320.46	1,449,421.14
	INLET 17	1.87	5,307.85	5,309.27	5,307.55	1.72	5,305.27	7.72	1,530,346.56	1,449,428.06
SDP44	INLET 16	1.97	5,308.37	5,309.40	5,307.77	1.63	5,305.90	10.00	1,530,313.74	1,449,447.97
	INLET 18	1.87	5,307.85	5,308.68	5,307.56	1.12	5,305.27	7.72	1,530,340.02	1,449,454.18
SDP47	INLET 20	1.83	5,305.41	5,306.68	5,304.93	1.75	5,303.18	8.90	1,530,864.75	1,449,586.02
	INLET 22	1.73	5,305.00	5,306.55	5,304.76	1.79	5,302.55	7.72	1,530,890.90	1,449,592.74
SDP46	INLET 17	2.06	5,307.66	5,309.27	5,306.95	2.32	5,305.27	16.30	1,530,346.56	1,449,428.06
	SDMH8	6.18	5,304.00	5,309.56	5,306.90	2.66	5,297.31	16.00	1,530,343.29	1,449,441.12
SDP38	SDMH12	6.17	5,295.16	5,303.62	5,294.40	9.22	5,288.38	80.20	1,531,485.78	1,449,741.79
	SDMH22	6.56	5,294.44	5,303.06	5,294.06	9.00	5,287.25	140.55	1,531,587.07	1,449,793.56
SDP39	SDMH11	5.34	5,297.30	5,304.36	5,295.85	8.51	5,290.75	62.40	1,531,330.77	1,449,688.51
	SDMH12	6.15	5,295.18	5,303.62	5,294.46	9.16	5,288.38	61.90	1,531,485.78	1,449,741.79
SDP36	INLET 30	2.12	5,297.37	5,300.49	5,295.92	4.57	5,294.15	25.40	1,531,777.37	1,450,103.94
	SDMH15	7.95	5,293.99	5,301.10	5,295.21	5.89	5,284.83	31.99	1,531,770.00	1,450,078.46
SDP37	SDMH13	6.80	5,293.73	5,302.45	5,292.97	9.48	5,286.30	80.20	1,531,679.37	1,449,858.23
	SDMH14	6.92	5,292.69	5,301.78	5,292.31	9.47	5,284.18	140.38	1,531,840.93	1,450,004.90
SDP34	INLET 29	2.07	5,297.87	5,300.49	5,296.43	4.06	5,294.66	25.40	1,531,749.53	1,450,076.63
	SDMH15	7.95	5,293.99	5,301.10	5,293.38	7.72	5,284.83	159.96	1,531,770.00	1,450,078.46
SDP35	INLET 28	1.55	5,299.39	5,300.43	5,298.27	2.16	5,296.93	12.70	1,531,756.52	1,450,125.57
	INLET 30	2.06	5,297.42	5,300.49	5,296.94	3.55	5,294.15	33.22	1,531,777.37	1,450,103.94
SDP32	INLET 26	1.16	5,295.69	5,300.49	5,295.17	5.32	5,294.11	8.80	1,531,720.69	1,450,161.98
	SDMH16	8.25	5,294.64	5,301.12	5,294.50	6.62	5,285.79	33.17	1,531,708.91	1,450,141.80
SDP33	INLET 27	1.85	5,299.58	5,300.43	5,298.61	1.82	5,296.93	12.70	1,531,728.80	1,450,098.07
	INLET 29	2.06	5,297.89	5,300.49	5,298.14	2.35	5,294.66	7.43	1,531,749.53	1,450,076.63
SDP30	INLET 13	2.14	5,300.31	5,303.03	5,299.80	3.23	5,297.74	9.30	1,531,519.18	1,450,283.91
	SDMH17	2.66	5,300.13	5,303.25	5,299.70	3.55	5,296.17	30.80	1,531,507.93	1,450,295.29
SDP31	INLET 25	1.16	5,296.48	5,300.62	5,295.96	4.66	5,294.90	8.80	1,531,693.20	1,450,135.82
	SDMH16	8.25	5,294.64	5,301.12	5,294.57	6.55	5,285.79	169.98	1,531,708.91	1,450,141.80

C-20
(revised)

Label	-Node- (Upstream) (Downstream)	-Depth- (Upstream) (Downstream) (ft)	-EGL- (Upstream) (Downstream) (ft)	-Ground- (Upstream) (Downstream) (ft)	-HGL- (Upstream) (Downstream) (ft)	HGL Clearance (HGL depth below Ground) (ft)	-Invert- (Upstream) (Downstream) (ft)	Section Discharge Capacity (cfs)	-X- (Upstream) (Downstream) (ft)	-Y- (Upstream) (Downstream) (ft)
SDP50	INLET 21 SDMH10	1.93 6.68	5,304.80 5,302.09	5,306.55 5,306.68	5,304.08 5,304.03	2.47 2.65	5,302.55 5,294.04	14.90 16.00	1,530,897.70 1,530,894.26	1,449,565.58 1,449,579.15
SDP51	INLET 24 SDMH12	1.45 6.15	5,299.05 5,295.18	5,303.62 5,303.62	5,298.39 5,298.23	5.23 5.39	5,297.12 5,288.38	8.90 7.43	1,531,478.96 1,531,485.78	1,449,753.47 1,449,741.79
SDP52	INLET 23 SDMH12	1.45 6.15	5,302.05 5,295.18	5,303.62 5,303.62	5,301.39 5,301.23	2.23 2.39	5,300.12 5,288.38	8.90 7.43	1,531,489.60 1,531,485.78	1,449,727.72 1,449,741.79
SDP53	IN1 INLET 26	1.29 1.16	5,295.69 5,295.69	5,305.58 5,300.49	5,295.69 5,295.69	9.89 4.80	5,294.40 5,294.11	0.00 10.75	1,531,699.97 1,531,720.69	1,450,183.72 1,450,161.98
SDP54	SDMH22 SDMH13	6.56 6.80	5,294.44 5,293.73	5,303.06 5,302.45	5,293.68 5,293.35	9.38 9.10	5,287.25 5,286.30	80.20 127.87	1,531,587.07 1,531,679.37	1,449,793.56 1,449,858.23
SDP55	IN2 INLET 25	1.29 1.16	5,296.48 5,296.48	5,305.88 5,300.62	5,296.48 5,296.48	9.40 4.14	5,295.19 5,294.90	0.00 10.75	1,531,667.72 1,531,693.20	1,450,151.94 1,450,135.82
SDP18	INLET 1 SDMH1	6.10 6.10	5,304.75 5,304.40	5,306.85 5,307.21	5,304.21 5,304.13	2.64 3.08	5,298.20 5,297.48	9.50 11.65	1,530,279.00 1,530,283.20	1,450,571.46 1,450,584.64
SDP19	INLET 2 SDMH1	1.46 6.10	5,304.87 5,304.40	5,306.85 5,307.21	5,304.10 5,304.13	2.75 3.08	5,302.85 5,297.48	9.50 71.36	1,530,287.50 1,530,283.20	1,450,598.14 1,450,584.64
SDP14	INLET 8 INLET 10	1.52 4.85	5,302.23 5,300.65	5,303.75 5,303.55	5,301.62 5,301.29	2.13 2.26	5,300.25 5,295.33	9.20 7.43	1,530,671.56 1,530,673.19	1,450,680.19 1,450,710.14
SDP15	INLET 10 SDMH4	4.90 6.81	5,300.59 5,300.29	5,303.55 5,303.91	5,300.10 5,300.04	3.45 3.87	5,295.33 5,292.57	16.20 76.66	1,530,673.19 1,530,658.46	1,450,710.14 1,450,714.83
SDP16	INLET 3 SDMH2	4.80 6.62	5,302.26 5,301.93	5,305.19 5,305.56	5,301.75 5,301.67	3.44 3.89	5,297.04 5,294.82	9.20 26.97	1,530,536.25 1,530,540.45	1,450,489.47 1,450,502.65
SDP17	INLET 4 SDMH2	1.38 6.62	5,302.67 5,301.93	5,305.19 5,305.56	5,301.86 5,301.67	3.33 3.89	5,300.69 5,294.82	9.20 67.82	1,530,544.75 1,530,540.45	1,450,516.15 1,450,502.65
SDP10	INLET 5 INLET 11	1.84 4.48	5,302.54 5,301.59	5,303.33 5,303.23	5,301.49 5,301.07	1.84 2.16	5,299.83 5,295.91	13.25 39.83	1,530,597.20 1,530,627.14	1,450,753.25 1,450,751.62
SDP11	INLET 11 SDMH5	4.58 6.34	5,301.49 5,300.68	5,303.23 5,303.78	5,300.17 5,300.02	3.06 3.76	5,295.91 5,293.07	26.50 16.00	1,530,627.14 1,530,631.84	1,450,751.62 1,450,766.35
SDP12	INLET 7 INLET 9	1.86 1.70	5,302.41 5,301.96	5,303.63 5,303.42	5,301.91 5,301.70	1.72 1.72	5,300.13 5,299.42	9.20 7.43	1,530,627.62 1,530,643.68	1,450,693.84 1,450,719.53
SDP13	INLET 9 SDMH4	1.85 6.81	5,301.80 5,300.29	5,303.42 5,303.91	5,300.87 5,300.04	2.55 3.87	5,299.42 5,292.57	16.20 135.73	1,530,643.68 1,530,658.46	1,450,719.53 1,450,714.83
SDP9	INLET 12 SDMH5	3.74 6.34	5,301.49 5,300.68	5,303.23 5,303.78	5,300.17 5,300.02	3.06 3.76	5,296.75 5,293.07	26.50 16.76	1,530,636.49 1,530,631.84	1,450,781.03 1,450,766.35
SDP8	INLET 6 INLET 12	2.84 3.64	5,302.54 5,301.59	5,303.33 5,303.23	5,301.49 5,301.07	1.84 2.16	5,298.83 5,296.75	13.25 27.39	1,530,610.85 1,530,636.49	1,450,797.18 1,450,781.03
SDP5	SDMH2 SDMH3	6.67 6.39	5,301.87 5,301.48	5,305.56 5,305.69	5,301.35 5,301.21	4.21 4.48	5,294.82 5,294.46	37.40 51.66	1,530,540.45 1,530,586.18	1,450,502.65 1,450,488.07
SDP4	SDMH3 SDMH4	6.58 6.81	5,301.28 5,300.29	5,305.69 5,303.91	5,300.76 5,300.03	4.93 3.88	5,294.46 5,292.57	37.40 51.66	1,530,586.18 1,530,658.46	1,450,488.07 1,450,714.83

C-21
(revised)

Label	-Node- (Upstream) (Downstream)	-Depth- (Upstream) (Downstream) (ft)	-EGL- (Upstream) (Downstream) (ft)	-Ground- (Upstream) (Downstream) (ft)	-HGL- (Upstream) (Downstream) (ft)	HGL Clearance (HGL depth below Ground) (ft)	-Invert- (Upstream) (Downstream) (ft)	Section Discharge Capacity (cfs)	-X- (Upstream) (Downstream) (ft)	-Y- (Upstream) (Downstream) (ft)
SDP7	SDMH5	6.74	5,300.29	5,303.78	5,299.24	4.54	5,293.07	53.00	1,530,631.84	1,450,766.35
	SDMH6	6.03	5,299.54	5,303.84	5,299.02	4.82	5,291.86	51.66	1,530,670.91	1,450,753.90
SDP6	SDMH1	6.36	5,304.15	5,307.21	5,303.46	3.75	5,297.48	19.00	1,530,283.20	1,450,584.64
	SDMH2	6.62	5,301.93	5,305.56	5,301.59	3.97	5,294.82	17.52	1,530,540.45	1,450,502.65
SDP1	SDMH7	4.50	5,295.94	5,305.43	5,293.48	11.95	5,290.15	122.80	1,530,754.27	1,451,015.43
	SDP1 FREE_EXT	(N/A)	(N/A)	5,293.00	5,291.96	1.04	5,289.00	140.00	1,530,869.15	1,451,061.22
SDP3	SDMH4	6.90	5,300.20	5,303.91	5,299.22	4.69	5,292.57	69.80	1,530,658.46	1,450,714.83
	SDMH6	6.03	5,299.54	5,303.84	5,299.05	4.79	5,291.86	77.93	1,530,670.91	1,450,753.90
SDP2	SDMH6	6.20	5,299.37	5,303.84	5,297.59	6.25	5,291.86	122.80	1,530,670.91	1,450,753.90
	SDMH7	3.92	5,296.52	5,305.43	5,295.63	9.80	5,290.15	111.26	1,530,754.27	1,451,015.43
SDP29	INLET 14	3.65	5,300.31	5,303.11	5,299.80	3.31	5,296.23	9.30	1,531,496.84	1,450,306.83
	SDMH17	2.66	5,300.13	5,303.25	5,299.70	3.55	5,296.17	7.43	1,531,507.93	1,450,295.29
SDP28	SDMH17	3.18	5,299.61	5,303.25	5,298.82	4.43	5,296.17	18.60	1,531,507.93	1,450,295.29
	SDMH18	7.67	5,295.39	5,302.99	5,295.07	7.92	5,287.28	114.49	1,531,535.38	1,450,321.76
SDP27	INLET 31	4.87	5,296.57	5,298.99	5,295.73	3.26	5,291.00	11.90	1,531,739.31	1,450,484.84
	SDMH19	6.25	5,295.90	5,299.53	5,295.48	4.05	5,289.40	7.43	1,531,722.53	1,450,502.24
SDP26	INLET 32	3.85	5,296.48	5,298.99	5,295.63	3.36	5,291.92	11.90	1,531,710.85	1,450,514.35
	SDMH19	6.25	5,295.90	5,299.53	5,295.48	4.05	5,289.40	7.43	1,531,722.53	1,450,502.24
SDP25	SDMH19	6.33	5,295.82	5,299.53	5,295.61	3.92	5,289.40	23.80	1,531,722.53	1,450,502.24
	SDMH18	7.67	5,295.39	5,302.99	5,295.29	7.70	5,287.28	53.21	1,531,535.38	1,450,321.76
SDP24	SDMH18	7.81	5,295.26	5,302.99	5,294.90	8.09	5,287.28	42.40	1,531,535.38	1,450,321.76
	SDMH16	8.25	5,294.64	5,301.12	5,294.46	6.66	5,285.79	75.95	1,531,708.91	1,450,141.80
SDP23	SDMH16	8.25	5,294.64	5,301.12	5,293.92	7.20	5,285.79	60.00	1,531,708.91	1,450,141.80
	SDMH15	7.95	5,293.99	5,301.10	5,293.63	7.47	5,284.83	75.95	1,531,770.00	1,450,078.46
SDP22	SDMH15	7.96	5,293.98	5,301.10	5,292.53	8.57	5,284.83	110.80	1,531,770.00	1,450,078.46
	SDMH14	6.92	5,292.69	5,301.78	5,291.96	9.82	5,284.18	108.44	1,531,840.93	1,450,004.90
SDP21	SDMH14	7.04	5,292.58	5,301.78	5,290.81	10.97	5,284.18	191.00	1,531,840.93	1,450,004.90
	SDMH20	5.41	5,290.71	5,303.60	5,289.83	13.77	5,283.60	134.06	1,531,973.38	1,449,867.56
SDP20	SDMH20	5.64	5,290.48	5,303.60	5,288.72	14.88	5,283.60	191.00	1,531,973.38	1,449,867.56
	SDP20 FREE_EXT	(N/A)	(N/A)	5,288.00	5,286.95	1.05	5,283.00	130.21	1,531,971.10	1,449,624.37
SDP49	INLET 19	1.83	5,305.41	5,306.68	5,304.93	1.75	5,303.18	8.90	1,530,871.47	1,449,559.19
	INLET 21	1.73	5,305.00	5,306.55	5,304.76	1.79	5,302.55	7.72	1,530,897.70	1,449,565.58
SDP48	INLET 22	1.93	5304.8	5306.55	5304.08	2.47	5302.55	14.9	1530890.9	1449592.74
	SDMH10	6.68	5302.09	5306.68	5304.03	2.65	5292.04	16.01	1530894.26	1449579.15
SDP41	SDMH9	7.47	5302.56	5307.29	5302.16	5.13	5294.76	32.6	1530779.8	1449550.48
	SDMH10	6.68	5302.09	5306.68	5301.89	4.79	5294.04	49.46	1530894.26	1449579.15

C-22
(revised)

APPENDIX D

INFILTRATION CALCULATIONS

POND INFILTRATION CALCULATIONS

FOR SAND: 10 min/in

(FROM ONSITE STORMWATER
DISPOSAL SYSTEM DESIGN AND
CONSTRUCTION, MINIMUM GUIDELINES
AND REQUIREMENTS - WASHINGTON
COUNTY, DATED JAN 25, 2005)

↓

$$120 \text{ min/FT} = 2 \text{ hr/FT} \Rightarrow 0.5 \text{ CF/HR/SF}$$

USE 0.5 CF/HR/SF FOR INFILTRATION BASIN

USE $\frac{1}{2}$ (0.5) CF/HR/SF FOR REMAINING POND AREA
↳ FACTOR OF SAFETY

TIME TO DRAIN POND

$$T_{\text{DRAIN}} = \frac{V_{2\text{-YR}}}{[0.5 A_{\text{INF}} + 0.25 A_{\text{POND INF}}]}$$

WHERE: $V_{2\text{-YR}}$ = 2-YR STORM VOLUME (CF)

A_{INF} = AREA INFILTRATION BASIN (SF)

$A_{\text{POND INF}}$ = Avg. POND AREA MINUS A_{INF} (SF)

Behannan & Huston

PROJECT NAME

SHEET

OF

ENGINEERING

PROJECT NO.

BY CSS

DATE

5-16-07

SPATIAL DATA

SUBJECT POND INFILTRATION CALCULATIONS CH'D

DATE

ADVANCED TECHNOLOGIES

D-1

POND INFILTRATION Calculations

FOR SAND: $1.74 \text{ in/hr} = 34.48 \text{ in/min}$

↓

$$413.76 \frac{\text{min}}{\text{ft}} = 6.896 \frac{\text{hr}}{\text{ft}} \Rightarrow 0.145 \frac{\text{CF}}{\text{hr} \cdot \text{SF}}$$

USE $0.145 \frac{\text{CF}}{\text{hr} \cdot \text{SF}}$ FOR INFILTRATION BASIN

Bohannon - Huston

PROJECT NAME

SHEET

OF

ENGINEERING

PROJECT NO

BY B.J.L

DATE

9-26-07

SPATIAL DATA

SUBJECT POND INFILTRATION Calculations

CH'D

DATE

ADVANCED TECHNOLOGIES

D-2

POND INFILTRATION CALCULATIONS

FOR SAND: 10 min/in

(FROM ONSITE STORMWATER

DISPOSAL SYSTEM DESIGN AND
CONSTRUCTION, MINIMUM GUIDELINES
AND REQUIREMENTS - WASHINGTON
COUNTY, DATED JAN 25, 2005)

↓

$$120 \text{ min/FT} = 2 \text{ hr/FT} \Rightarrow 0.5 \text{ CF/HR/SF}$$

USE 0.5 CF/HR·SF FOR INFILTRATION BASIN

USE $\frac{1}{2}$ (0.5) CF/HR·SF FOR REMAINING POND AREA
↳ FACTOR OF SAFETY

TIME TO DRAIN POND_g

$$T_{\text{DRAIN}} = V_{2\text{-YR}} / [0.5 A_{\text{INF}} + 0.25 A_{\text{POND INF}}]$$

WHERE: $V_{2\text{-YR}}$ = 2-YR STORM VOLUME (CF)

A_{INF} = AREA INFILTRATION BASIN (SF)

$A_{\text{POND INF}}$ = Avg POND AREA MINUS A_{INF} (SF)

Bohannon & Huston

PROJECT NAME

SHEET

OF

ENGINEERING

PROJECT NO.

BY CSS

DATE

5-16-07

SPATIAL DATA

SUBJECT POND INFILTRATION CALCULATIONS CHD

DATE

ADVANCED TECHNOLOGIES

D-3

POND INFILTRATION Calculations

FOR SAND: $1.74 \text{ in/hr} = 34.48 \text{ in/min}$

↓

$$413.76 \frac{\text{min}}{\text{ft}} = 6.896 \frac{\text{hr}}{\text{ft}} \Rightarrow 0.145 \frac{\text{CF}}{\text{hr} \cdot \text{SF}}$$

USE $0.145 \frac{\text{CF}}{\text{hr} \cdot \text{SF}}$ FOR INFILTRATION BASIN

Bohannon - Huston

PROJECT NAME

SHEET

OF

ENGINEERING

PROJECT NO

BY B.J.L.

DATE

9-26-07

SPATIAL DATA

SUBJECT POND INFILTRATION Calculations

CHD

DATE

ADVANCED TECHNOLOGIES

D-4

APPENDIX E

POND VOLUME CALCULATIONS

POND 2A	Pond 2A.txt			
	Elevation	Incremental Volume cu ft	Cumulative Volume cu ft	Acre-Feet Surface Area sq ft
	5294.5000	973.3054	973.3054	0.0223 4386.6135
	5295.0000	2650.5057	3623.8111	0.0832 6676.3677
	5295.5000	4251.2300	7875.0411	0.1808 10487.5991
	5296.0000	6264.7455	14139.7866	0.3246 14468.7852
	5296.5000	8153.2609	22293.0475	0.5118 18228.0361
	5297.0000	10278.3327	32571.3802	0.7477 23069.8801
	5297.5000	13033.2289	45604.6092	1.0469 29498.4812
	5298.0000	16873.2582	62477.8674	1.4343 38587.8213
	5298.5000	21443.9508	83921.8182	1.9266 47009.6335
	5299.0000	25860.2969	109782.1151	2.5203 56317.1985
	5299.5000	31251.7437	141033.8589	3.2377 68406.4902
	5300.0000	37877.7953	178911.6541	4.1072 82482.1196
	5300.5000	43900.3594	222812.0135	5.1151 92752.3987
	5301.0000	49037.9908	271850.0043	6.2408 104391.3594

Hydraulic Analysis for Ponds 2B & 3 Using AutoCAD Civil 3D

Project Name: Mesa Del Sol Neighborhood Montage Units 3 & 4

Project No.: 20190195

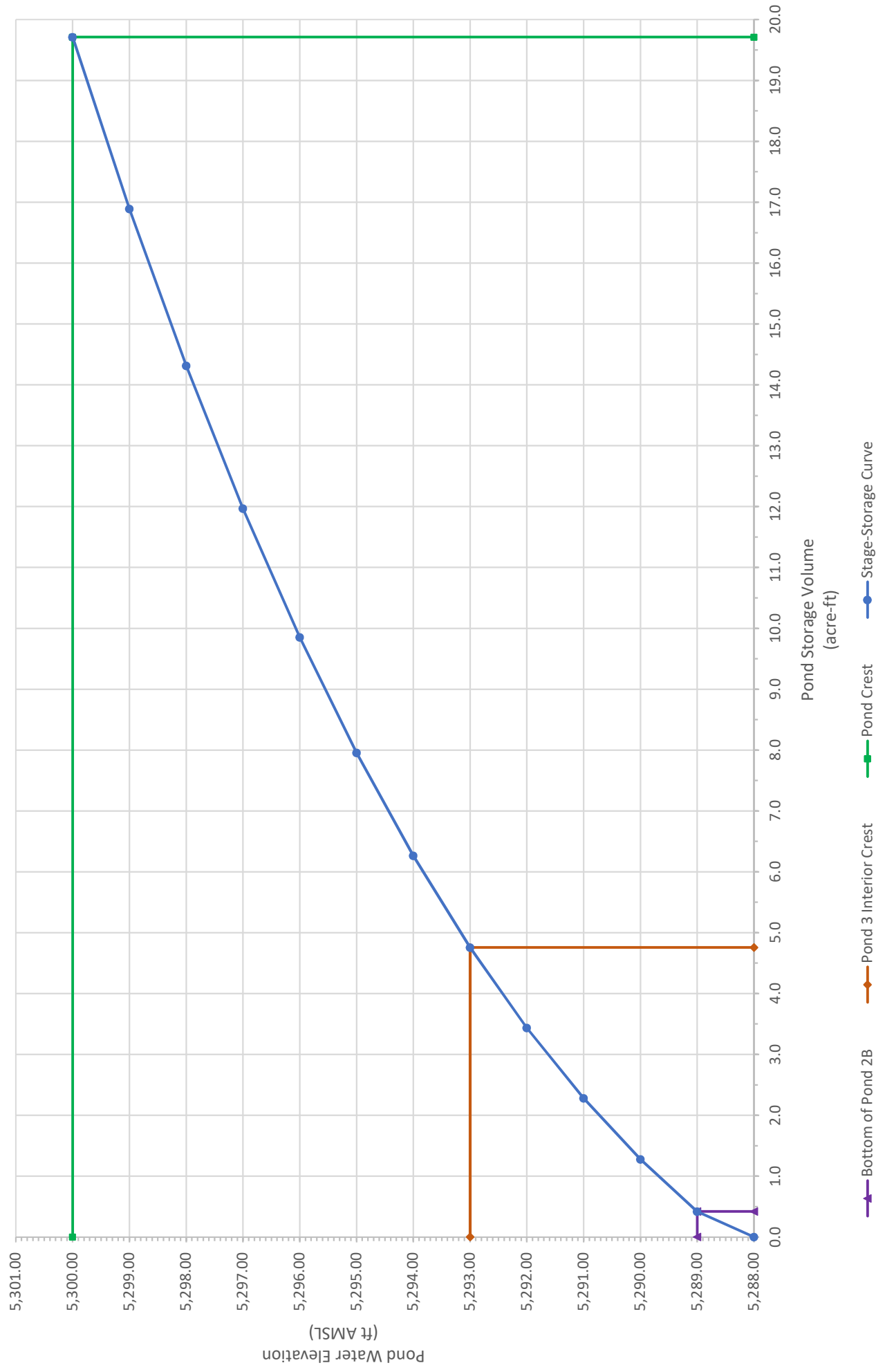
Prepared By: P. Carrillo

Date: 12/26/2018

Contour Elevation (ft AMSL)	Contour Area (sq. ft)	Contour Area (acres)	Depth (ft)	Incremental Volume (Conic) (cu. yds)	Incremental Volume (Conic) (ac-ft)	Cumulative Volume (Conic) (cu. yds)	Cumulative Volume (Conic) (ac-ft)
5,288.00	16,403.47	0.38	0.00	0.00	0.00	0.00	0.00
5,289.00	34,244.60	0.79	1.00	678.03	0.42	1,236.32	0.42
5,290.00	40,445.36	0.93	1.00	1,382.28	0.86	2,699.01	1.28
5,291.00	46,982.87	1.08	1.00	1,618.00	1.00	4,400.91	2.28
5,292.00	53,889.71	1.24	1.00	1,867.25	1.16	6,354.29	3.44
5,293.00	61,132.66	1.40	1.00	2,128.96	1.32	8,571.85	4.76
5,294.00	69,674.67	1.60	1.00	2,430.23	1.51	11,093.59	6.26
5,295.00	77,894.90	1.79	1.00	2,731.59	1.69	13,919.63	7.96
5,296.00	87,308.77	2.00	1.00	3,059.03	1.90	17,075.85	9.85
5,297.00	97,061.16	2.23	1.00	3,414.42	2.12	20,590.35	11.97
5,298.00	107,132.94	2.46	1.00	3,780.56	2.34	24,473.91	14.31
5,299.00	117,501.05	2.70	1.00	4,159.49	2.58	28,742.04	16.89
5,300.00	128,714.69	2.95	1.00	4,554.45	2.82	20,769.71	19.71

REVISED

Pond 2B and 3 Stage-Storage Curve



POND 4

Pond 4.txt

Elevation	Incremental Volume cu ft	Cumulative Volume cu ft	Acre-Feet	Surface Area sq ft
5283.5000	11351.7866	11351.7866	0.2606	23333.3008
5284.0000	11985.6638	23337.4504	0.5358	24613.5002
5284.5000	12631.9855	35969.4358	0.8257	25918.5918
5285.0000	13290.7516	49260.1874	1.1309	27248.5674
5285.5000	13961.9622	63222.1496	1.4514	28603.4265
5286.0000	14645.6172	77867.7668	1.7876	29983.1870
5286.5000	15341.7166	93209.4834	2.1398	31387.8311
5287.0000	16050.2605	109259.7439	2.5083	32817.3608
5287.5000	16771.2489	126030.9928	2.8933	34271.7832
5288.0000	17504.6816	143535.6744	3.2951	35751.0930
5288.5000	18250.5589	161786.2333	3.7141	37255.2876
5289.0000	19008.8806	180795.1138	4.1505	38784.3804
5289.5000	19779.6467	200574.7605	4.6046	40338.3560
5290.0000	20562.8572	221137.6178	5.0766	41917.2249
5290.5000	21358.5123	242496.1300	5.5669	43520.9766
5291.0000	22166.6117	264662.7417	6.0758	45149.6140
5291.5000	22987.1556	287649.8973	6.6035	46803.1526
5292.0000	23820.1439	311470.0413	7.1504	48481.5723
5292.5000	24665.5767	336135.6180	7.7166	50184.8809
5293.0000	25523.4540	361659.0720	8.3025	51913.0803
5293.5000	26393.7756	388052.8476	8.9085	53666.1692
5294.0000	27276.5418	415329.3894	9.5347	55444.1462
5294.5000	28171.7523	443501.1417	10.1814	57247.0088
5295.0000	0.0000	443501.1417	0.0000	0.0000

EXHIBITS

EXHIBIT 1: PRELIMINARY PLATS

EXHIBIT 2: LEVEL B PLANNING ZONES

**EXHIBIT 3: LEVEL B OVERALL STORMWATER
PLAN**

**EXHIBIT 4: LEVEL B RESIDENTIAL AREAS
DRAINAGE MANAGEMENT PLAN**

EXHIBIT 5: EXISTING CONDITIONS BASIN MAP

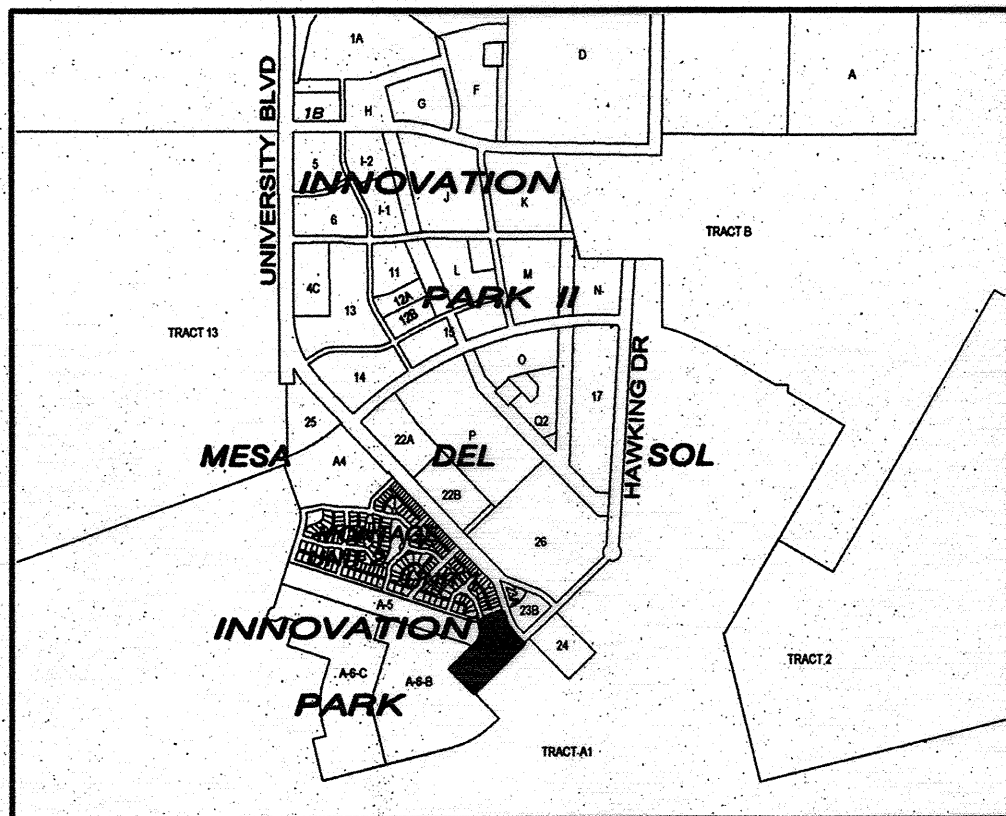
**EXHIBIT 6: DEVELOPED CONDITIONS BASIN
MAP**

EXHIBIT 7: INLET AND STORM DRAIN ANALYSIS

**EXHIBIT 8: TYPICAL PERMANENT STORM POND
DETAIL**

EXHIBIT 9: GRADING PLAN

EXHIBIT 1
PRELIMINARY PLATS



LOCATION MAP
ZONE ATLAS R-16 & S-16
NOT TO SCALE

SUBDIVISION DATA

1. DRB No.
2. Zone Atlas Index Number: R-16 & S-16.
3. Zoning: PC
4. Gross Subdivision Acreage: 6.7708 Acres.
5. Total number of Lots/Tracts Created: Thirteen (13) Lots and Four (4) Tracts.
6. 0.15 miles public street right-of-way created.
0.12 miles of half width streets created.
7. 0.10 miles private streets created.
Area of private streets created: 0.2152 Acres (Tract 1).
8. Date of Survey: April, 2011.
9. Plat is located within Sections 22 and 27, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico.

PURPOSE OF PLAT

The purpose of this Plat is to Subdivide all of Tract A-6-A of the Plat of Tracts A-6-A, A-6-B & A-6-C of the Mesa Del Sol Innovation Park, Albuquerque, New Mexico as the same is shown and designated on the Plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico on July 11, 2011 in Book 2011C, Page 0066 as Document No. 2011063035 into Thirteen (13) lots, Four (4) Tracts, to grant easements and to dedicate public street right of way to the City of Albuquerque.

PUBLIC UTILITY EASEMENTS

PUBLIC UTILITY EASEMENTS shown on this plat are granted for the common and joint use of:

- A. Public Service Company of New Mexico ("PNM"), a New Mexico corporation, (PNM Electric) for installation, maintenance, and service of overhead and underground electrical lines, transformers, and other equipment and related facilities reasonably necessary to provide electrical services.
- B. New Mexico Gas Company for installation, maintenance, and service of natural gas lines, valves and other equipment and facilities reasonably necessary to provide natural gas services.
- C. Qwest Corporation d/b/a CenturyLink QC for the installation, maintenance, and service of such lines, cable, and other related equipment and facilities reasonably necessary to provide communication services.
- D. Cable One for the installation, maintenance, and service of such lines, cable, and other related equipment and facilities reasonably necessary to provide Cable services.

Included, is the right to build, rebuild, construct, reconstruct, locate, relocate within the easement, change, remove, replace, modify, renew, operate and maintain facilities for purposes described above, together with free access to, from, and over said easements, with the right and privilege of going upon, over and across adjoining lands of Grantor for the purposes set forth herein and with the right to utilize the right of way and easement to extend services to customers of Grantee, including sufficient working area space for electric transformers, with the right and privilege to trim and remove trees, shrubs or bushes which interfere with the purposes set forth herein. No building, sign, pool (aboveground or subsurface), hot tub, concrete or wood pool decking, or other structure shall be erected or constructed on said easements, nor shall any well be drilled or operated thereon. Property owners shall be solely responsible for correcting any violations of National Electrical Safety Code by construction of pools, decking, or any structures adjacent to or near easements shown on this plat.

Easements for electric transformer/switchgears, as installed, shall extend ten (10) feet in front of transformer/switchgear doors and five (5) feet on each side.

Disclaimer

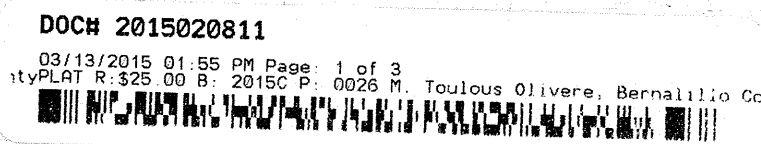
In approving this plat, Public Service Company of New Mexico (PNM), New Mexico Gas Company (NMGC) and Qwest Corporation D/B/A CenturyLink (QWEST) did not conduct a Title Search of the properties shown hereon. Consequently, PNM, NMGC and QWEST do not waive or release any easement or easement rights which may have been granted by prior plat, replat or other document and which are not specifically described and shown on this plat.

The City of Albuquerque and its designees and/or contractors may install, maintain and service water and wastewater lines within the 10' PUE.

DESCRIPTION

A certain tract of land located within Sections 22 and 27, Township 9 North, Range 3 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, being and comprising all of Tract "A-6-A" of the Plat of Tracts A-6-A, A-6-B & A-6-C of the Mesa Del Sol Innovation Park, Albuquerque, New Mexico as the same is shown and designated on the Plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico on July 11, 2011 in Book 2011C, Page 0066 as Document No. 2011063035.

Tract contains 6.7708 acres, more or less.



FREE CONSENT AND DEDICATION

The plat shown hereon is made with free consent and in accordance of the desires of the undersigned owner(s), the execution of this plat is their free act and deed. Those signing as owner(s) warrant that they hold among them, complete indefeasible title in fee simple to the land shown on this plat. Owner(s) hereby affirm that the described property shown on this plat lies within the platting and subdivision jurisdiction of Albuquerque, New Mexico. Said owner(s) hereby dedicate right of way to the City of Albuquerque in fee simple with warranty covenants and grant easements as may be shown on this plat. Permanent access easements are granted for private alleys and streets.

MESA DEL SOL, LLC,
a New Mexico limited liability company

By:

Name:

Title:

State of Colorado)
SS
County of Denver)

This instrument was acknowledged before me on 15 day of December, 2014 by

Brian Fennelly

My Commission Expires: 02/12/2015

Stacy Jager
Notary Public

NOTES

1. Bearings are New Mexico State Plane Grid Bearings (Central Zone) NAD 1983. Basis of Bearings is between City of Albuquerque Control Monuments "I-R16" and "3-Q16". Bearing = N12°15'06"E
2. Distances are ground distances.
3. Record Bearings and distances are the same as shown on this plat and the same as shown on the Plat of Tracts A-6-A, A-6-B & A-6-C of the Mesa Del Sol Innovation Park, Albuquerque, New Mexico as the same is shown and designated on the Plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico on July 11, 2011 in Book 2011C, Page 0066 as Document No. 2011063035.
4. Record easements taken from search and report File No. FT000058876 dated Monday, September 27, 2010 from Fidelity National Title.
5. All streets and drainage improvements are to be public, to be dedicated for maintenance to the City of Albuquerque.
6. Tract 1 (private alley) is subject to a blanket PUE, Private Access and Private Drainage Easements Granted with the filing of this plat and is private and should be maintained by the Homeowners Association. Covenants will Prohibit Parking in Alleys.
7. Tract 1 (Private Alley) contains 0.2152 acres of land.
8. Tract C will be owned and maintained by the Homeowners Association and is encumbered by a blanket PUE and Public Access Easement granted with the filing of this Plat.
9. Tracts A-1 thru A-6 of the Bulk Land Plat of Tracts A-1 thru A-6 Mesa Del Sol Innovation Park filed December 6, 2010 in Book 2010C, Page 131 as Document No. 2010123421 are subject to an Easement Agreement filed June 21, 2006 in Book A-119, Page 1052 as Document No. 2006-091310, records of Bernalillo County, New Mexico. Easement terminates upon Tract A-6-A with the filing of this Plat.
10. Tract A-5 is subject to an existing blanket Public Storm Drain Easement granted by the plat filed December 6, 2010 in Book 2010C, Page 131 as Document No. 2010123421. This easement to be confined and further defined by future platting action.
11. The property on this plat is subject to a Pre-Development Facilities Fee Agreement with the Albuquerque Public Schools, recorded at Dec. 16, 2014 Doc # 2014099631
12. SOLAR NOTE - Pursuant to Section 14-14-4-7 of the City of Albuquerque Code of Ordinances, "No property within the area of this Plat shall at any time be subject to a deed restriction, covenant, or binding agreement prohibiting solar collectors from being installed on buildings or erected on the lots or tracts within the area of proposed Plat. The foregoing requirement shall be a condition to approval of this plat."
13. The front (adjacent to street) lot corner will not be staked with the exception of intermediate "pc's and pt's". A witness corner projected along the property line being a chiseled "x" in the curb and gutter will be set upon completion of all street improvements. Offset distance will be adjusted by even foot increments to fall within the pan. Remaining lot corners will be marked with a 5/8" rebar and plastic cap stamped "Gromatzky PS 16469", a nail and washer stamped "Gromatzky PS 16469" or a nail and washer stamped "line only".
14. Centerline monuments to be installed at centerline PC's, PT's, angle points and street intersections prior to acceptance of subdivision street improvements and will consist of a standard 3-1/4" aluminum alloy cap stamped "CITY OF ALBUQUERQUE", CENTERLINE MONUMENTATION", "SURVEY MARKER", "DO NOT DISTURB", "PLS 16469".

PLAT OF MESA DEL SOL MONTAGE UNIT 3A (A REPLAT OF TRACT A-6-A MESA DEL SOL INNOVATION PARK) ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO DECEMBER, 2014

PROJECT NUMBER 1006008

APPLICATION NUMBER 15DRB-70056

UTILITY APPROVALS:

<u>QWEST CORPORATION d/b/a CENTURYLINK QC</u>	<u>1/22/15</u>
DATE	
<u>COMCAST CABLE</u>	<u>1/26/15</u>
DATE	
<u>PNM ELECTRIC SERVICES</u>	<u>1-26-15</u>
DATE	
<u>NEW MEXICO GAS COMPANY</u>	<u>1/22/15</u>
DATE	

CITY APPROVALS:

<u>Soren M. Reinhardt P.S.</u>	<u>1/14/15</u>
CITY SURVEYOR	DATE
<u>ALBUQUERQUE BERNALILLO COUNTY</u>	<u>02-18-15</u>
TRAFFIC ENGINEERING, TRANSPORTATION DIVISION	DATE
<u>ALBUQUERQUE BERNALILLO COUNTY</u>	<u>02/18/15</u>
WATER UTILITY AUTHORITY	DATE
<u>Carol S. Dumont</u>	<u>2-18-15</u>
PARKS & RECREATION DEPARTMENT	DATE
<u>Ante a Chua</u>	<u>2-18-15</u>
A.M.A.F.C.A.	DATE
<u>Ante a Chua</u>	<u>2-18-15</u>
CITY ENGINEER	DATE
<u>DRB CHAIRPERSON, PLANNING DEPARTMENT</u>	<u>3-17-15</u>
DATE	
<u>REAL PROPERTY DIVISION</u>	<u>3-17-15</u>
DATE	

TAX CERTIFICATION

THIS IS TO CERTIFY THAT TAXES ARE CURRENT AND PAID ON UPC #

1-016-050-2005282010

PROPERTY OWNER OF RECORD: Mesa Del Sol

George Stone 3-17-15
BERNALILLO COUNTY TREASURER'S OFFICE DATE

SURVEYOR'S CERTIFICATION

I, Robert Gromatzky, a registered Professional New Mexico Surveyor, certify that I am responsible for this survey and that this plat was prepared by me or under my supervision, shows all existing easements as shown on the plats of record, or made known to me by the owner, utility companies, or other interested parties and conforms to the Minimum Requirements of the Board of Registration for Professional Engineers and Professional Surveyors and meets the minimum requirements for monumentation and surveys contained in the Albuquerque Subdivision Ordinance, and is true and accurate to the best of my knowledge and belief.

Robert Gromatzky
Robert Gromatzky
New Mexico Professional Surveyor 16469

Date: December 11, 2014

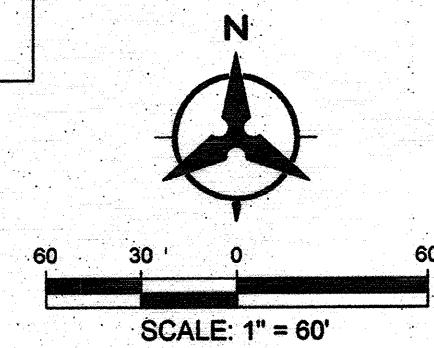


Bohannon & Huston
7500 JEFFERSON STREET NE ALBUQUERQUE, NEW MEXICO

PLAT OF
**MESA DEL SOL
MONTAGE UNIT 3A**
(A REPLAT OF TRACT A-6-A MESA DEL SOL INNOVATION PARK)
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
JANUARY, 2015

DOCH 2015020811
03/13/2015 01:55 PM Page 2 of 3
ty:PLAT R \$25 00 B 2015C P 0026 M Toulouse Olivere, Bernalillo Co

ACS BRASS TABLE STAMPED "1-R16"
GEOGRAPHIC POSITION (NAD 83)
NM STATE PLANE COORDINATES (CENTRAL ZONE)
N = 1,453,438.899 E = 1,532,715.669
GROUND TO GRID FACTOR = 0.999664099
DELTA ALPHA = -0012'22.46"
NAVD 1988 ELEVATION = 5291.451



CURVE DATA						
ID	DELTA	TANGENT	ARC	RADIUS	CHORD	CHORD BRG
C1	65°00'00"	110.85'	197.40'	174.00'	186.98'	N13°32'24"E
C2	25°00'00"	100.85'	198.09'	454.00'	196.53'	S31°27'36"E
C3	63°24'30"	185.31'	332.01'	300.00'	315.32'	N14°20'09"E
C4	68°35'12"	182.89'	333.34'	326.00'	319.01'	S14°36'50"W
C5	65°00'00"	191.12'	340.34'	300.00'	322.38'	N13°32'24"E
C6	65°00'00"	203.86'	363.03'	320.00'	343.87'	S13°32'24"W
C7	06°49'30"	19.44'	38.83'	326.00'	38.81'	N08°56'20"W
C8	02°36'29"	6.83'	13.66'	300.00'	13.65'	S17°39'22"E
C9	06°51'31"	19.54'	39.02'	326.00'	39.00'	N02°06'49"W
C10	09°58'49"	26.19'	52.26'	300.00'	52.19'	S11°21'43"E
C11	06°51'31"	19.54'	39.02'	326.00'	39.00'	N04°45'42"E
C12	10°04'04"	26.43'	52.71'	300.00'	52.65'	S01°20'16"E
C13	06°51'31"	19.54'	39.02'	326.00'	39.00'	N11°37'13"E
C14	10°07'04"	26.56'	52.98'	300.00'	52.91'	S08°45'18"W
C15	06°51'31"	19.54'	39.02'	326.00'	39.00'	N18°28'44"E
C16	10°07'54"	26.59'	53.05'	300.00'	52.98'	S18°52'47"W
C17	06°51'31"	19.54'	39.02'	326.00'	39.00'	N25°20'14"E
C18	10°08'32"	26.53'	52.93'	300.00'	52.86'	S29°00'00"W
C19	06°51'31"	19.54'	39.02'	326.00'	39.00'	N32°11'45"E
C20	10°02'59"	26.38'	52.62'	300.00'	52.55'	S39°04'46"W
C21	08°16'55"	23.60'	47.12'	326.00'	47.08'	N39°45'58"E
C22	01°56'09"	5.07'	10.14'	300.00'	10.13'	S45°04'19"W
C23	05°12'57"	14.58'	29.13'	320.00'	29.12'	N43°25'55"E
C24	07°15'41"	20.30'	40.56'	320.00'	40.53'	N37°11'36"E
C25	07°28'21"	20.90'	41.73'	320.00'	41.70'	N29°49'35"E
C26	07°50'50"	21.95'	43.83'	320.00'	43.79'	N22°09'58"E
C27	37°12'10"	107.70'	207.78'	320.00'	204.15'	N00°21'31"W
C28	02°19'42"	6.62'	13.25'	326.00'	13.25'	N13°30'55"W

TANGENT DATA		
ID	BEARING	DISTANCE
T1	N18°57'36"W	58.17'
T2	S18°57'36"E	64.40'
T3	N43°57'36"W	26.00'
T4	N46°02'24"E	39.87'
T5	N18°57'36"W	48.40'
T6	N43°57'36"W	60.00'
T7	S46°02'24"W	56.00'
T8	N43°57'36"W	20.00'
T9	N18°57'36"W	61.07'
T10	N71°02'24"E	20.00'
T11	S46°02'24"W	10.96'
T12	N18°57'36"W	23.75'

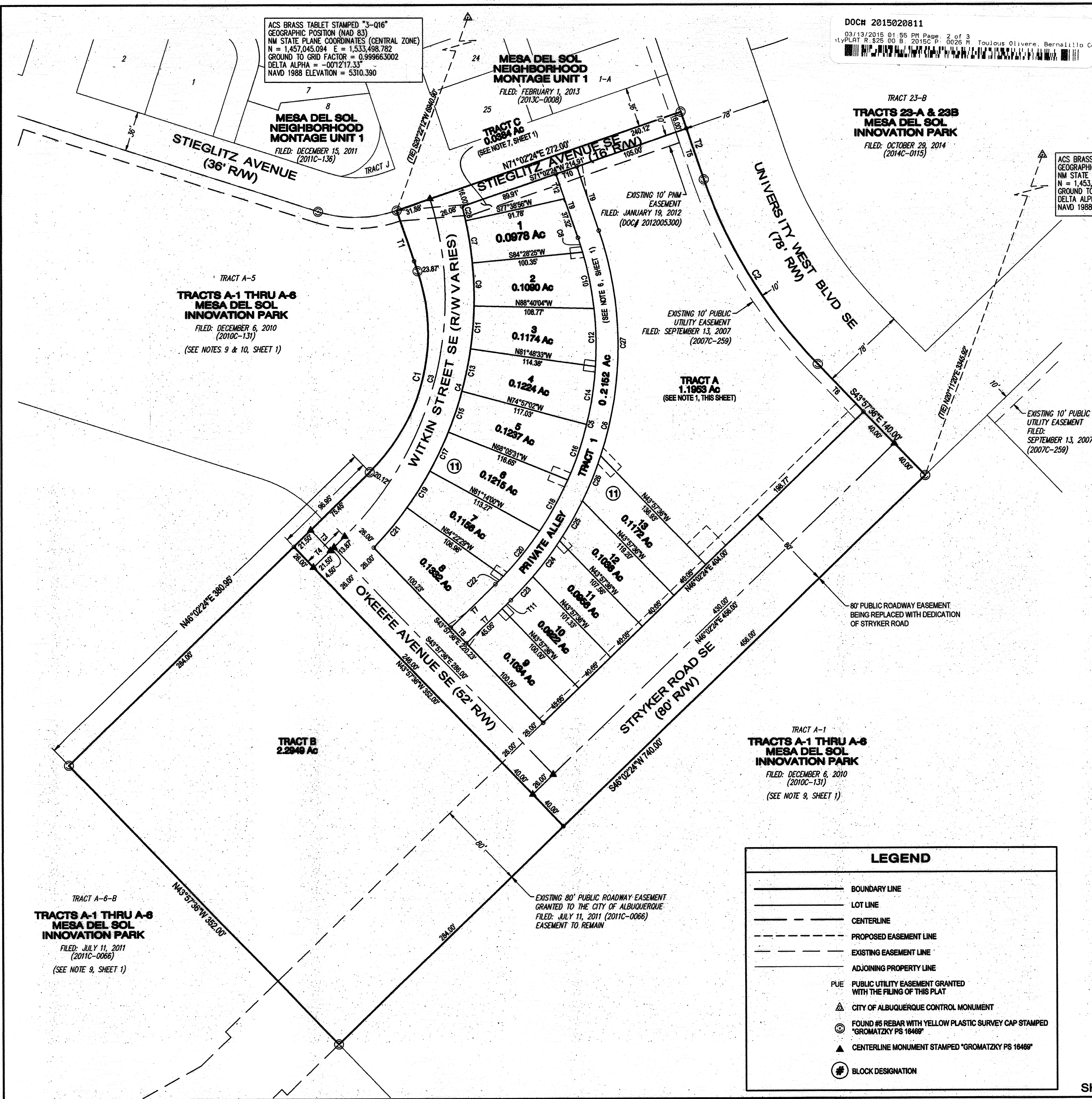
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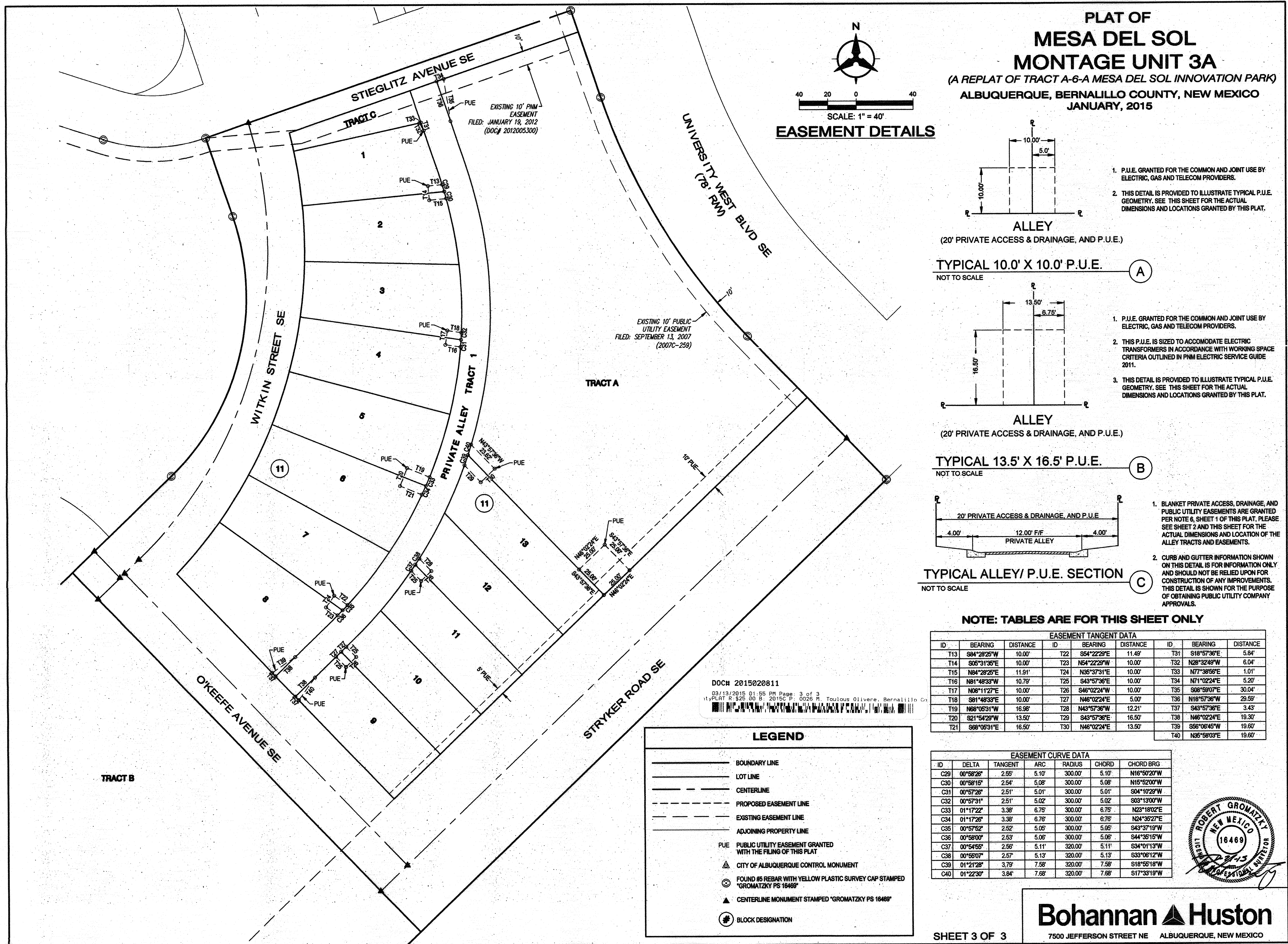
- Tract A to be a private community park to be owned and maintained by Mesa Del Sol.
- All lot sideyards shall have a 5' shared private drainage easement centered on the lot line (2.5' on each side) granted with the filing of this plat.



Bohannon & Huston
7500 JEFFERSON STREET NE ALBUQUERQUE, NEW MEXICO

LEGEND	
	BOUNDARY LINE
	LOT LINE
	CENTERLINE
	PROPOSED EASEMENT LINE
	EXISTING EASEMENT LINE
	ADJOINING PROPERTY LINE
	PUE PUBLIC UTILITY EASEMENT GRANTED WITH THE FILING OF THIS PLAT
	CITY OF ALBUQUERQUE CONTROL MONUMENT
	FOUND #5 REBAR WITH YELLOW PLASTIC SURVEY CAP STAMPED "GROMATZKY PS 16469"
	CENTERLINE MONUMENT STAMPED "GROMATZKY PS 16469"
	BLOCK DESIGNATION





- (A) LOT LINE TO BE ELIMINATED BY THIS PLAT
- (B) EXISTING 10' PNM EASEMENT (7/22/1954, BK D285, PG 517) TO BE VACATED BY PLAT.
- (C) PORTION OF EXISTING 66'-80' PUBLIC ROADWAY EASEMENT (7/11/2011, BK 2011C PG 0066, DOC#2011063035) TO BE VACATED BY PLAT.
- (D) DESIGN VARIANCE REQUEST – PROPOSED PRIVATE ACCESS STREET WILL BE UTILIZED TO CONFORM WITH THE LEVEL A/B REQUIREMENTS WHICH PROHIBIT SINGLE LOT DIRECT ACCESS TO CONNECTOR STREETS (STRAND LOOP).

Areas designated on the accompanying plan as "drainage easements," ["detention areas"] are hereby dedicated by the owner as a perpetual easement for the common use and benefit of the various lots within the subdivisions for the purpose of permitting the conveyance of storm water runoff and the constructing and maintaining of drainage facilities [storm water detention facilities] in accordance with standards prescribed by the City of Albuquerque. No fence, wall, planting, building or other obstruction may be placed or maintained in easement area without approval of the City Engineer of the City of Albuquerque. There also shall be no alteration of the grades or contours in said easement area without the approval of the City Engineer. It shall be the duty of the lot owners of this subdivision to maintain said drainage easement [detention area] and facilities at their cost in accordance with standards prescribed by the City of Albuquerque. The City shall have the right to enter periodically to inspect the facilities. In the event said lot owners fail to adequately and properly maintain drainage easement [detention area] and facilities, at any time following fifteen (15) days written notice to said lot owners, the City may enter upon said area, perform said maintenance, and the cost of performing said maintenance shall be paid by applicable lot owners proportionately on the basis of lot ownership. In the event lot owners fail to pay the cost of maintenance within thirty (30) days after demand for payment made by the City, the City may file a lien against all lots in the subdivision for which proportionate payment has not been made. The obligations imposed herein shall be binding upon the owner, his heirs, and assigns and shall run with all lots within this subdivision.

The Grantor agrees to defend, indemnify, and hold harmless, the City, its officials, agents and employees from and against any and all claims, actions, suits, or proceedings of any kind brought against said parties for or on account of any matter arising from the drainage facility provided for herein or the Grantor's failure to construct, maintain, or modify said drainage facility.

1. OFFSTREET: A MINIMUM OF TWO COVERED PARKING SPACES PER LOT SHALL BE PROVIDED PER THE LEVEL A AND B MASTER PLANS.

TOTAL MINIMUM NUMBER OF OFFSTREET PARKING SPACES TO BE PROVIDED: 270 SPACES

2. ONSTREET: GUEST PARKING WILL BE ACCOMODATED BY ONSTREET PARKING AS PER THE LEVEL A AND B MASTER PLANS:

TOTAL ONSTREET PARKING PROVIDED: 250 SPACES

BOUNDARY CURVE TABLE				
ID	ARC	RADIUS	DELTA	TANGENT
C1	57.67'	116.50'	28°21'44"	29.44'
C4	477.42'	915.00'	29°53'43"	244.28'
C5	184.49'	333.00'	31°44'33"	94.68'

BOUNDARY TANGENT TABLE		
ID	BEARING	LENGTH
T1	S72°19'20"E	959.14'
T2	S43°57'36"E	8.67'
T3	N46°02'24"E	36.27'
T4	S44°01'01"E	352.00'
T5	S46°02'24"W	284.08'
T8	S43°57'36"E	375.00'
T9	S46°02'24"W	103.38'
T10	S75°56'07"W	731.98'
T11	N14°03'53"W	575.23'
T12	N17°40'40"E	544.20'
T13	N72°19'20"W	162.00'
T14	N17°40'40"E	256.00'






TRACT A-6-C
MESA DEL SOL
INNOVATION PARK
RECORDED: 12-06-2010
BK: 2010C, P: 0131 M

MESA DEL SOL
NEIGHBORHOOD
MONTAGE UNIT 1
RECORDED: 12-15-2011
BK: 2011C, P: 0136 M

TRACTS 23-A & 23-B
MESA DEL SOL
INNOVATION PARK
RECORDED: 01-16-2009
(2009C-14)

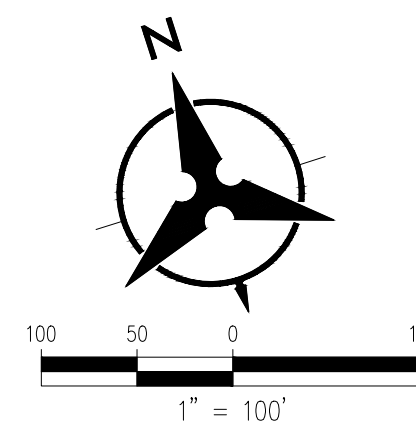
MESA DEL SOL
NEIGHBORHOOD
MONTAGE UNIT 3A
RECORDED: 3-13-2015
BK: 2015C, P: 0026 M

TRACT A-1
MESA DEL SOL
INNOVATION PARK
RECORDED: 12-06-2010
BK: 2010C, P: 0131 M

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

A REPLAT OF TRACT A-6-B MESA DEL SOL INNOVATION PARK
AND TRACT B MONTAGE UNIT 3A

ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
SEPTEMBER, 2018



CERTAIN TRACTS OF LAND LOCATED WITHIN SECTIONS 22 AND 27, TOWNSHIP 9 NORTH, RANGE 3 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, BEING AND COMPRISING ALL OF TRACT A-6-B MESA DEL SOL INNOVATION PARK FILED: JULY 11, 2011 IN BOOK 2011C, PAGE 0066 AS DOCUMENT #2011063035 AND TRACT B MESA DEL SOL MONTAGE UNIT 34 FILED: MARCH 13, 2015, IN BOOK 2015C, PAGE 0026, AS DOCUMENT #2015020811.

1. EXISTING ZONING: PC
PROPOSED DEVELOPMENT: RESIDENTIAL
2. GROSS ACREAGE: 32.30 Acres
TOTAL NUMBER OF LOTS/TRACTS: 135 LOTS; 1 INCLUDING 6 ALLEY TRACTS
PROPOSED GROSS DENSITY: 4.18 DU/Ac.
3. MINIMUM LOT DIMENSIONS: 40' X 100'
4. ALL STREETS AND DRAINAGE IMPROVEMENTS ARE TO BE PUBLIC. TO BE DEDICATED
FOR MAINTENANCE TO THE CITY OF ALBUQUERQUE, EXCEPT FOR THE PRIVATE ROADWAY
ADJACENT TO STANLEY COVE, WHICH WILL BE OWNED AND MAINTAINED BY THE
HOMEOWNERS ASSOCIATION.
5. ALLEYS ARE TO BE PRIVATE AND OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION
6. 2.03 MILES OF FULL WIDTH STREETS CREATED
7. LOT SETBACKS SHALL CONFORM TO LEVEL A AND LEVEL B MASTER PLANS.
8. ALL OF THE PROPERTY SHOWN ON THIS PLAT MAY BE SUBJECT TO A GRANT OF
TELECOMMUNICATIONS EASEMENT AND REAL COVENANT FILED IN THE BERNALILLO
COUNTY, NEW MEXICO REAL ESTATE RECORDS.
9. ZONE ATLAS NO. R-16 & S-16
10. TRACTS A, B, D AND E ARE PRIVATE COMMON AREA TRACTS TO BE OWNED AND MAINTAINED
BY THE HOMEOWNERS ASSOCIATION.

1. ALL ALLEYS ARE PRIVATE AND WILL HAVE A BLANKET PUE, PRIVATE ACCESS AND PRIVATE DRAINAGE EASEMENTS
2. COVENANTS WILL PROHIBIT PARKING IN ALL ALLEYS
3. ALL LOT SIDEYARDS SHALL HAVE A 5' SHARED PRIVATE DRAINAGE EASEMENT CENTERED ON THE LOT LINE (2.5' ON EACH SIDE).

1. UNLESS OTHERWISE NOTED, ALL BOUNDARY CORNERS SHOWN THUS (●) SHALL BE MARKED BY A #5 REBAR STAMPED "PHILLIPS PS 15517".
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT DESIGNATED CENTERLINE PCS, PTS., ANGLE POINTS AND STREET INTERSECTIONS AND SHOWN THUS (▲) WILL BE MARKED BY A FOUR (4") ALUMINUM CAP STAMPED "CITY OF ALBUQUERQUE, CENTERLINE MONUMENTATION, DO NOT DISTURB, P.L.S. 15517".
3. THE SUBDIVISION BOUNDARY WILL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN NAD83 CENTRAL ZONE.
4. BASIS OF BEARINGS WILL BE NEW MEXICO STATE PLANE GRID BEARINGS.
5. DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS AND ALL OTHER ANGLE POINTS TO ALLOW THE USE OF CENTERLINE MONUMENTATION.

APPROVED

Soray M. Panchheer P.S. 8/28/18
CITY SURVEYOR DATE

B Fennelly 8-29-18
 Brian Fennelly, Authorized Signatory, DATE
 HEKTAR, LLC
 A Limited Liability Company

A Limited Liability Company

Steve B. Chavez 8/29/18

Steve Chavez, Authorized Signatory, DATE

MDS Investments, LLC

A Limited Liability Company

Reborn

Bohannon **Huston**
www.bhinc.com 800.877.5332

EXHIBIT 2

LEVEL B PLANNING ZONES

LEVEL B PLANNING ZONES

Figure 4A-7

Legend

1. Employment Center
2. Residential Area
3. I-25/Broadway
4. County Rec.
5. La Semilla

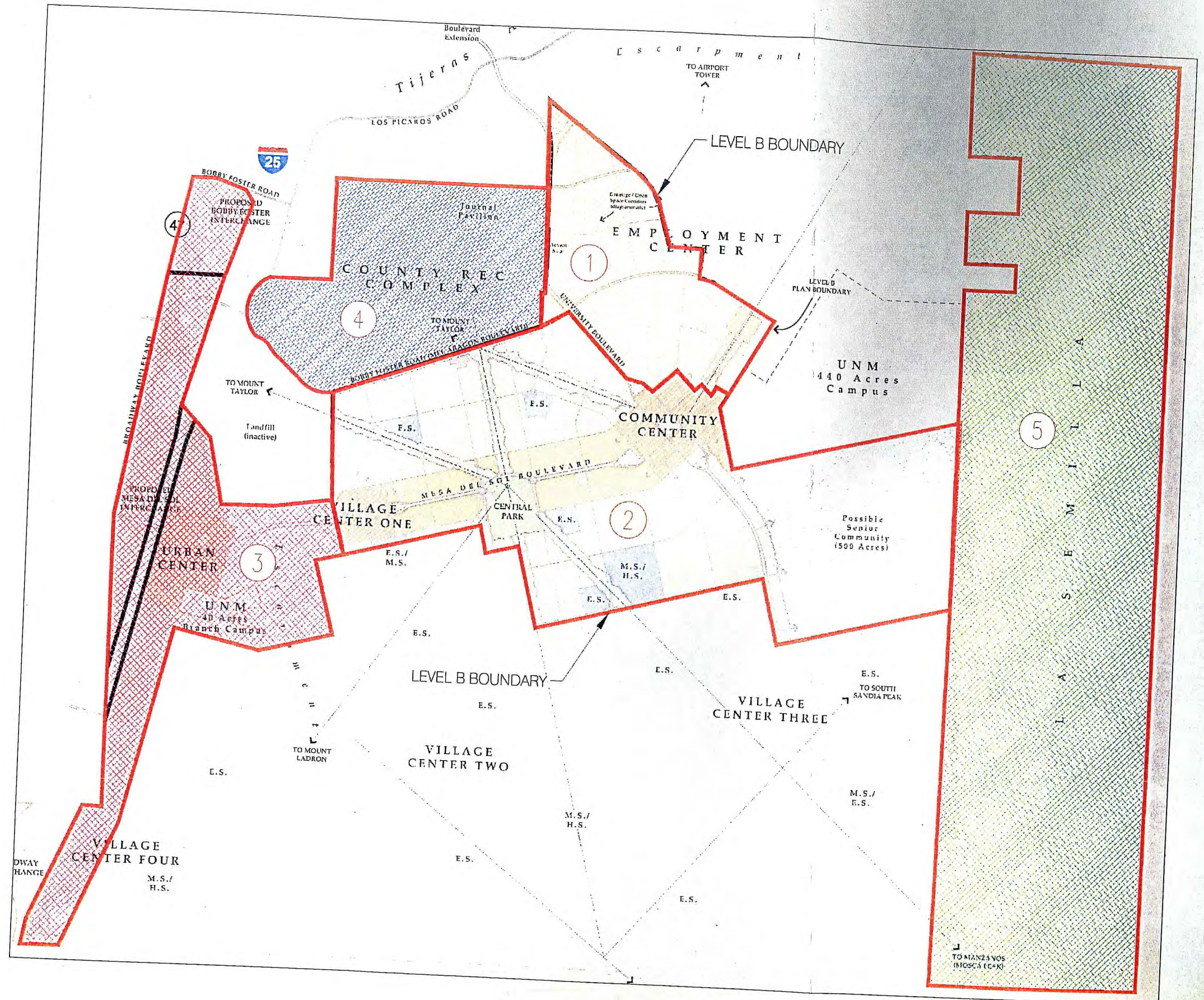
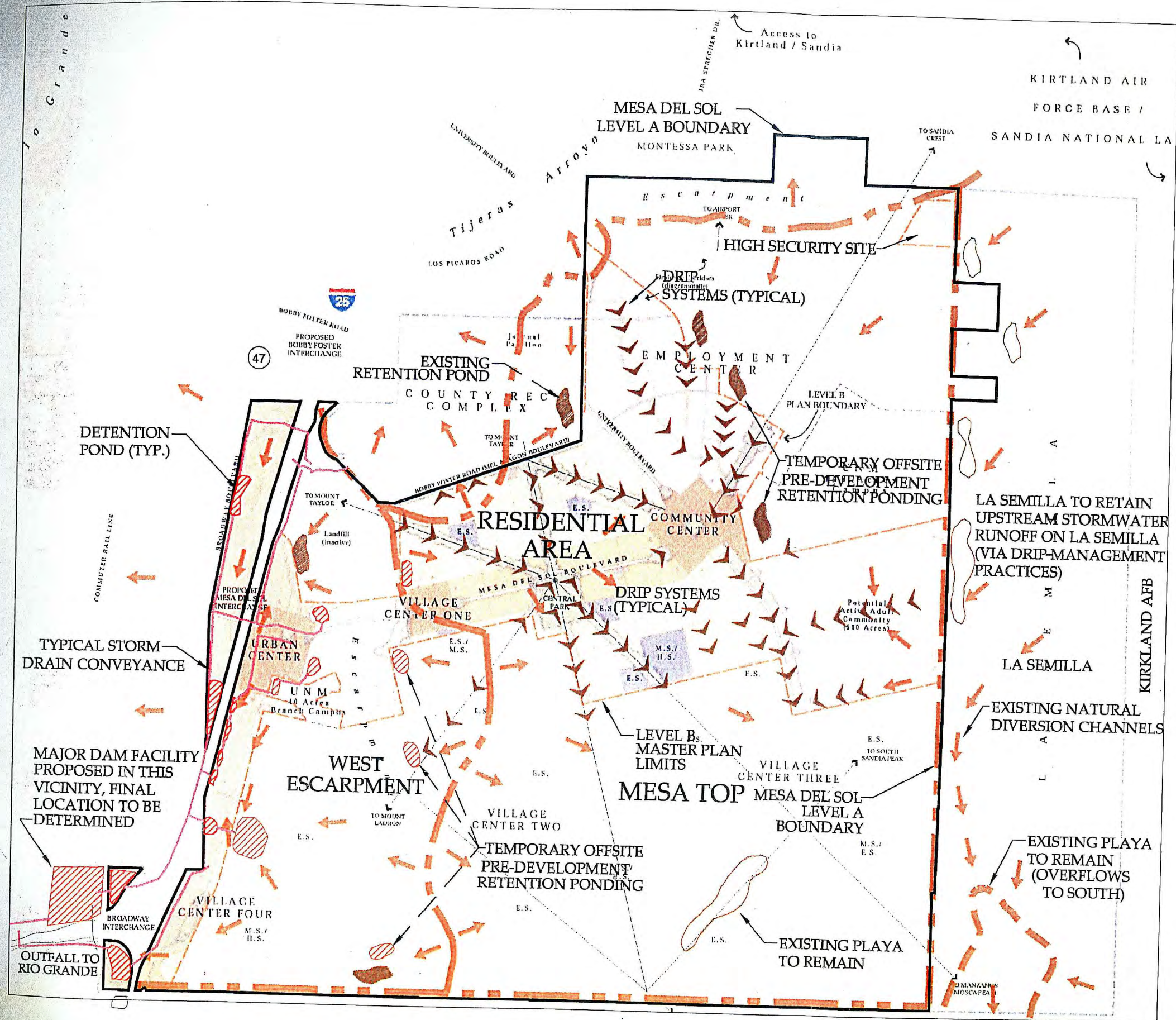


EXHIBIT 3

LEVEL B OVERALL STORMWATER PLAN



OVERALL
STORMWATER PLAN
Figure 4A-1

Legend

Notes:

Shown facilities are illustrative only.

Mesa Top Area

Drainage management concept plan uses distributed retention/infiltration ponds (DRIPs) to collect all flows generated on the mesa top in the residential lands.

Non-residential lands (i.e. employment center, UNM, public sites) may utilize shared onsite drip systems.

West Escarpment

The drainage management concepts of collecting runoff in detention ponds and discharging storm water to a large storm water detention basin as proposed by the AMAFCA study entitled "Southwest valley drainage management plan," dated Jan. 1988. The detention pond discharges to the Rio Grande.

-  DRIP (distributed retention and infiltration pond)
-  Temporary Retention Pond
-  Surface Flow Direction
-  Developed Basin Lines
-  Mesa del Sol Boundary

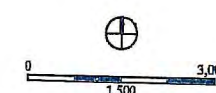


EXHIBIT 4

LEVEL B RESIDENTIAL AREAS
DRAINAGE MANAGEMENT PLAN

RESIDENTIAL AREAS DRAINAGE MANAGEMENT PLAN

Figure 4A-11

Legend

Notes:

- Illustrative Only
- Storm drain system shown is intended to illustrate typical storm drain collection system and drip pond. Does not necessarily apply to final future subdivision planning

- Total Drainage Basin
- - - Drainage Subbasin
- Storm Drain and Outfall
- Basin Flow Direction
- DRIP Pond (Retention Pond)

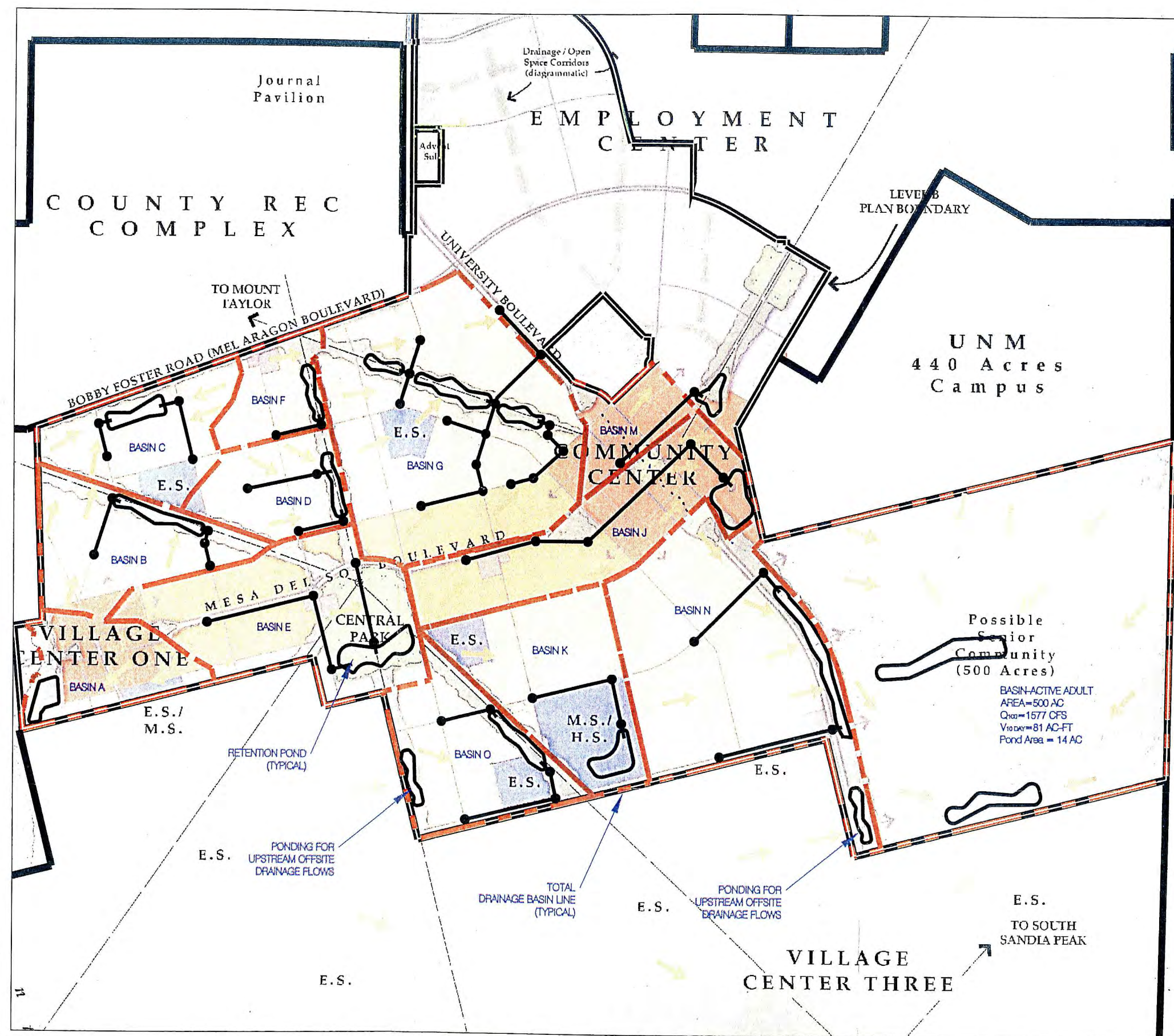
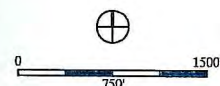


EXHIBIT 5

EXISTING CONDITIONS BASIN MAP

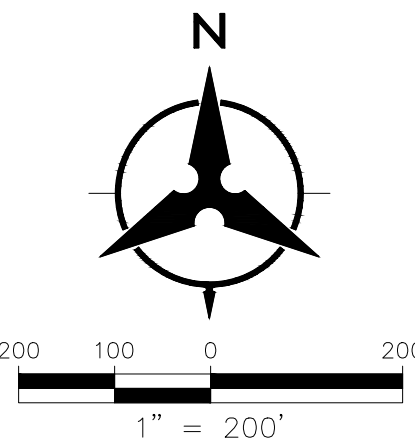
EXHIBIT 6

DEVELOPED CONDITIONS BASIN MAP

UPDATED BASIN SUMMARY TABLE TO ACCOUNT FOR THE ADDITION OF 5 LOTS TO MONTAGE UNIT 3B

BASIN SUMMARY														
BASIN I.D.	AREA (AC)	REV UNITS	ORIGINAL UNITS	% LAND TREATMENT				DISCHARGE (CFS)			STORMWATER VOLUME			
				A	B	C	REV-D	10 YR	100YR	ORIG-100YR	100 YR 6HR	100 YR 10-DAY	100Y-10D	
Basin A-1	5.8	32	32	0.0%	23.0%	24.0%	53.0%	53.0%	13.29	21.83	21.83	0.76	1.17	1.17
Basin A-2	4.7	21	21	0.0%	27.0%	27.0%	46.0%	46.0%	10.16	17.01	17.01	0.58	0.87	0.87
Basin A-3	4.4	17	17	0.0%	29.5%	29.5%	41.0%	41.0%	9.11	15.49	15.49	0.53	0.77	0.77
Basin A-4	5.2	24	24	0.0%	26.5%	26.5%	47.0%	47.0%	11.33	18.92	18.92	0.65	0.98	0.98
Basin A-5	4.4	16	15	0.0%	30.4%	30.4%	39.2%	38.0%	8.97	15.33	15.22	0.52	0.75	0.74
Basin A-6	3.2	10	9	0.0%	34.1%	34.1%	31.9%	31.9%	7.05	12.35	12.21	0.41	0.57	0.55
Basin B-1	9.3	52	47	0.0%	23.1%	23.1%	53.9%	47.0%	21.43	35.13	33.85	1.23	1.90	1.75
Basin B-2	2.2	4	4	0.0%	35.0%	40.0%	25.0%	25.0%	3.96	7.09	7.09	0.23	0.30	0.30
Basin B-3	4.5	26	27	0.0%	22.4%	22.4%	55.2%	57.0%	10.47	17.11	17.27	0.60	0.93	0.95
Basin B-4	4.6	23	24	0.0%	25.3%	25.3%	49.5%	51.0%	10.23	16.97	17.11	0.59	0.89	0.91
Basin B-5	6.6	28	29	0.0%	28.1%	28.1%	43.8%	45.0%	14.00	23.60	23.76	0.81	1.19	1.21
Basin B-6	3.7	10	9	0.0%	34.1%	34.1%	31.9%	30.0%	7.05	12.35	12.21	0.41	0.57	0.55
Basin B-7	2.9	11	10	0.0%	29.8%	29.8%	40.4%	38.0%	5.97	10.17	10.03	0.34	0.50	0.48
Basin C	0.8	0	0	0.0%	30.0%	30.0%	76.0%	75.0%	1.64	2.80	2.79	0.09	0.14	0.14
Basin M	2.2	4	4	0.0%	35.0%	40.0%	25.0%	25.0%	3.96	7.09	7.09	0.23	0.30	0.30
Future Basin 1	8.8	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	19.81	32.73	32.73	1.14	1.73	1.73
Future Basin 2	7.7	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	17.34	28.64	28.64	0.99	1.52	1.52
Future Basin 3	10.3	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	23.19	38.31	38.31	1.33	2.03	2.03
Future Basin 4	13.1	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	29.50	48.72	48.72	1.69	2.58	2.58
Future Basin 5	61.1	n/a	n/a	0.0%	24.5%	24.5%	51.0%	51.0%	137.57	227.24	227.24	7.89	12.04	12.04
Future Basin 6	36.6	n/a	n/a	0.0%	12.5%	12.5%	75.0%	75.0%	98.28	153.64	153.64	5.58	9.24	9.24
TOTAL	202.1	286	281	5	<Lot difference				464.25	764.77	764.57	26.50	41.00	40.85
Montage 3B Difference									130.7	129.5		6.72	6.58	
Percentage Difference									1.2			0.14		
									2.93%			2.12%		

MESA DEL SOL
NEIGHBORHOOD
MONTAGE UNITS 3 & 4
DEVELOPED CONDITIONS
UPDATED BASIN MAP
10/2018



LEGEND

— PROPOSED BASIN BOUNDARY
--- EXISTING BASIN BOUNDARY
→ BASIN FLOW DIRECTION

PREVIOUS BASIN SUMMARY TABLE FROM 2014

BASIN SUMMARY				
BASIN I.D.	AREA (AC)	DISCHARGE (CFS) 100YR	STORMWATER VOLUME 100 YR 6HR	STORMWATER VOLUME 100 YR 10-DAY
Basin A-1	5.8	21.83	0.76	1.17
Basin A-2	4.7	17.01	0.58	0.87
Basin A-3	4.4	15.49	0.53	0.77
Basin A-4	5.2	18.92	0.65	0.98
Basin A-5	4.4	15.22	0.51	0.74
Basin A-6	3.2	10.75	0.36	0.50
Basin B-1	9.3	33.85	1.16	1.75
Basin B-2	2.2	7.96	0.27	0.41
Basin B-3	4.5	17.27	0.61	0.95
Basin B-4	4.6	17.11	0.59	0.91
Basin B-5	6.6	23.76	0.81	1.21
Basin B-6	3.7	12.21	0.40	0.55
Basin B-7	2.9	10.03	0.34	0.48
Basin C	0.8	2.80	0.09	0.14
Basin M	2.2	7.09	0.23	0.30
Future Basin 1	8.8	32.73	1.14	1.73
Future Basin 2	7.7	28.64	0.99	1.52
Future Basin 3	10.3	38.31	1.33	2.03
Future Basin 4	13.1	48.72	1.69	2.58
Future Basin 5	61.1	227.24	7.89	12.04
Future Basin 6	36.6	153.64	5.58	9.24

POND SUMMARY - FULLY DEVELOPED CONDITIONS			
POND	MAX WSE	REQ'D STORAGE VOLUME (AC-FT)	MAX DEPTH (FT)
1 (Future)		12.04	
2A	5300.0	3.98	5.5
2B	5300.0	7.82	11.0
3	5300.0	8.54	11.0
4	5297.0*	19.04	14*

* Denotes pond to be designed in future

POND SUMMARY - REQUIRED VOLUMES FOR UNITS 3 AND 4				
POND	MAX WSE	REQ'D STORAGE VOLUME (AC-FT)	MAX DEPTH (FT)	MAX AVAILABLE VOLUME (AC-FT)
1 (Future)	NOT NEEDED	0.00	N/A	N/A
2A	5300.0	3.98	N/A	4.1
2B	5300.0	7.82	11.0	10.1
3	5300.0	8.54	11.0	10.1
4	5291.0	6.26	8.0	10.2

- NOTES:
- EXISTING POND 2A HAS ALREADY BEEN CONSTRUCTED AND CERTIFIED TO THE ABOVE VOLUME.
 - EXISTING POND 4 HAS BEEN CONSTRUCTED, AND CERTIFIED TO THE ABOVE VOLUME.
 - PONDS 2B AND 3 WILL BE UPSIZED BY THIS PROJECT TO ACCOMMODATE FLOWS FROM UNITS 3 AND 4 AS WELL AS EXISTING UNITS 1 AND 2.

POND 4: TO BE UPSIZED AND IMPROVED BY FUTURE PROJECTS AS THOSE PROJECTS DEVELOP.

FUTURE POND EXPANSION IF NECESSARY

TEMPORARY OVERFLOW TO EXISTING PLAYA (TO BE ELIMINATED AS NECESSARY AS PART OF FUTURE DOWNSTREAM DEVELOPMENT)



EXHIBIT 7

INLET AND STORM DRAIN ANALYSIS

MESA DEL SOL MONTAGE
UNITS 3 AND 4
INLET AND STORM DRAIN ANALYSIS
9/2014 - Revised 01/2019

SUMMARY OF PIPE FLOWS				
ID	SIZE	SLOPE (%)	Q (cfs) ALLOWABLE	Q (cfs) ACTUAL
SDP1	48"	1.00%	143.8	122.8
SDP2	48"	1.00%	143.8	122.8
SDP3	42"	1.00%	100.6	69.8
SDP4	36"	1.00%	66.7	37.4
SDP5	36"	1.00%	66.7	37.4
SDP6	24"	1.80%	30.7	19.0
SDP7	36"	1.00%	66.7	53.0
SDP8	18"	1.40%	12.5	13.3
SDP9	24"	39.30%	141.7	26.5
SDP10	18"	1.40%	12.5	13.3
SDP11	24"	40.50%	143.9	26.5
SDP12	18"	1.20%	11.7	9.2
SDP13	24"	46.30%	153.9	16.2
SDP14	18"	1.20%	11.7	9.2
SDP15	24"	47.70%	156.3	16.2
SDP16	18"	43.70%	69.5	9.2
SDP17	18"	42.30%	68.3	9.2
SDP18	18"	10.40%	33.9	9.5
SDP19	18"	10.40%	33.9	9.5
SDP20	60"	0.85%	239.9	191.0
SDP21	60"	0.85%	239.9	191.0
SDP22	48"	0.85%	132.4	110.8
SDP23	42"	0.85%	92.8	73.2
SDP24	42"	0.85%	92.8	42.4
SDP25	36"	1.10%	70.8	23.8
SDP26	18"	7.80%	29.4	11.9
SDP27	18"	4.20%	21.6	11.9
SDP28	24"	18.40%	96.9	18.6
SDP29	18"	9.30%	32.0	9.3
SDP30	18"	8.80%	31.1	9.3
SDP31A	18"	0.75%	9.1	7.6
SDP31	24	56.40%	170.0	16.4
SDP32A	18"	0.75%	9.1	7.6
SDP32	24	2.15%	33.2	16.4
SDP33	DELETED			
SDP34	24"	50.00%	159.9	25.4
SDP35	18"	10.00%	33.2	12.7
SDP36	24"	2.00%	32.0	17.7
SDP37	48"	1.00%	143.6	80.2
SDP38	48"	1.00%	143.6	80.2
SDP39	36"	1.00%	66.7	62.4
SDP40	36"	1.00%	66.7	62.4
SDP41	36"	1.00%	66.7	32.6
SDP42	36"	1.10%	69.2	32.6
SDP43	24"	9.40%	69.4	16.3
SDP44	18"	1.50%	12.8	10
SDP45	18"	1.50%	12.8	10
SDP46	24"	9.10%	68.2	16.3
SDP47	18"	1.10%	11	8.9
SDP48	24"	47.50%	155.9	14.9
SDP49	18"	1.10%	11	8.9
SDP50	24"	45.90%	153	14.9
SDP51	18"	82.80%	95.6	8.9
SDP52	18"	79.60%	93.7	8.9

SUMMARY OF INLET FLOWS					
ID	STREET SLOPE	STREET FLOW DEPTH (ft)	STREET FLOW UPSTREAM OF INLET (cfs)	FLOW CAPTURED BY INLET (cfs)	STREET FLOW BYPASSING INLET (cfs)
IN1	0.60%	0.65	22.7	9.5	13.2
IN2	0.60%	0.65	22.7	9.5	13.2
IN3	0.60%	0.64	21.7	9.2	12.50
IN4	0.60%	0.64	21.7	9.2	12.50
IN5	SUMP	0.60	13.3	13.3	N/A
IN6	SUMP	0.60	13.3	13.3	N/A
IN7	0.75%	0.60	22.0	9.2	12.8
IN8	0.75%	0.60	22.0	9.2	12.8
IN9	0.75%	0.51	12.8	7.0	5.8
IN10	0.75%	0.51	12.8	7.0	5.8
IN11	SUMP	0.60	13.3	13.3	N/A
IN12	SUMP	0.60	13.3	13.3	N/A
IN13	0.60%	0.63	22.1	9.3	12.80
IN14	0.60%	0.63	22.1	9.3	12.80
IN15	0.50%	0.67	22.1	10.0	12.1
IN16	0.50%	0.67	22.1	10.0	12.10
IN17	0.50%	0.53	12.1	6.3	5.8
IN18	0.50%	0.53	12.1	6.3	5.80
IN19	0.50%	0.64	19.9	8.9	11.0
IN20	0.50%	0.64	19.9	8.9	11.0
IN21	0.50%	0.52	11.0	6.0	5.00
IN22	0.50%	0.52	11.0	6.0	5.00
IN23	0.50%	0.63	19.1	8.9	10.20
IN24	0.50%	0.63	19.1	8.9	10.20
IN25A	0.75%	0.59	18.9	7.6	11.30
IN25	0.75%	0.59	11.3	8.8	2.50
IN26A	0.75%	0.59	18.9	7.6	11.30
IN26	0.75%	0.59	11.3	8.8	2.50
IN27	DELETED				
IN28	SUMP	0.40	8.9	8.9	N/A
IN29	SUMP	0.51	17.7	17.7	N/A
IN30	SUMP	0.40	8.9	8.9	N/A
IN31	SUMP	0.55	11.9	11.9	N/A
IN32	SUMP	0.55	11.9	11.9	N/A

SUMMARY OF MANHOLES FLOWS	
ID	STORM DRAIN FLOWRATE (cfs)
MH1	19.0
MH2	37.4
MH3	37.4
MH4	69.8
MH5	53.0
MH6	122.8
MH7	122.8
MH8	32.6
MH9	32.6
MH10	62.4
MH11	62.4
MH12	80.2
MH13	80.2
MH14	191.0
MH15	110.8
MH16	75.2
MH17	18.6
MH18	42.0
MH19	23.8
MH20	191.0

LEGEND

- PROPOSED STORM DRAIN PIPE ———
- PROPOSED STORM DRAIN MANHOLE ○
- PROPOSED STORM DRAIN INLET □

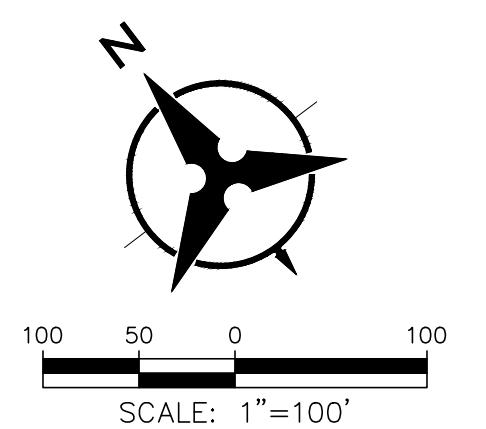
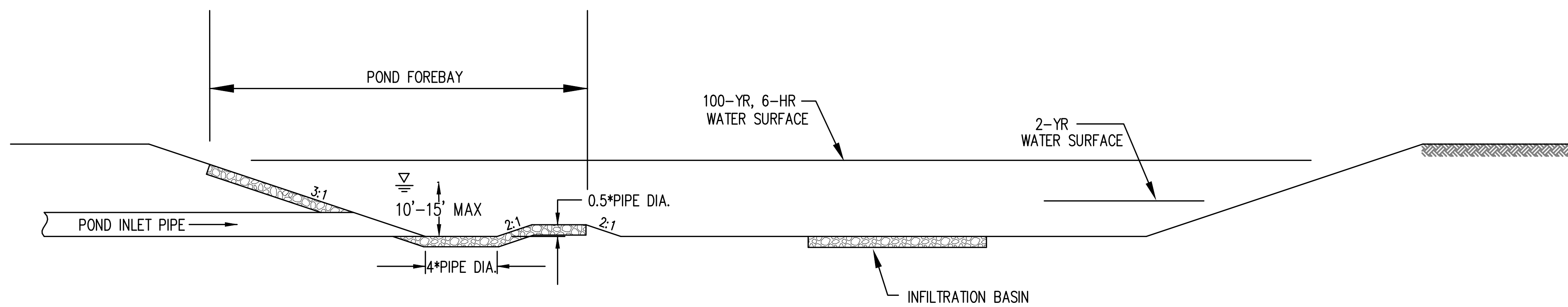
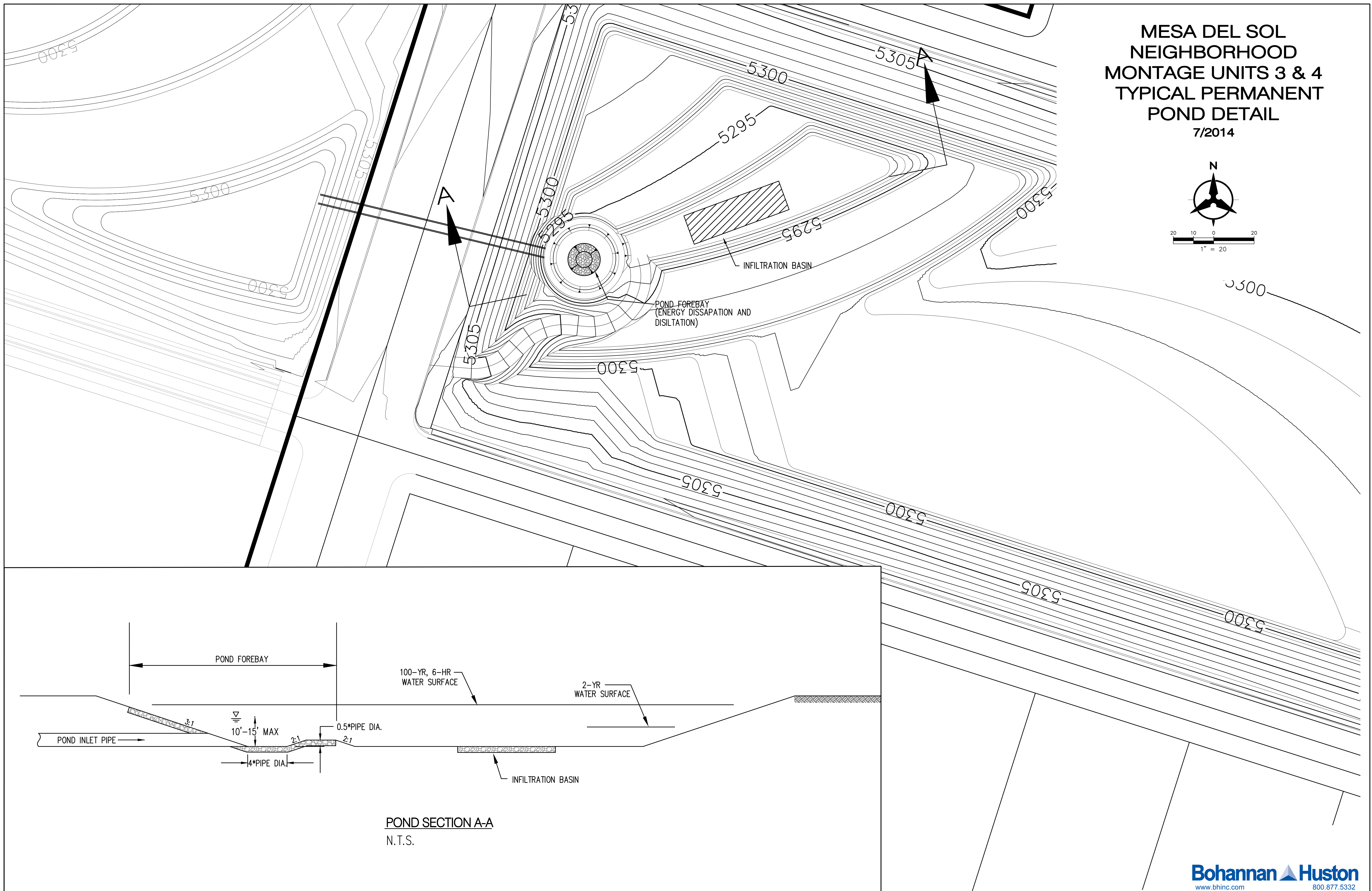
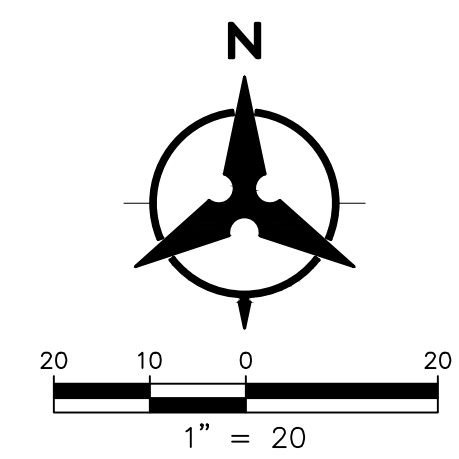


EXHIBIT 8

TYPICAL PERMANENT STORM POND DETAIL

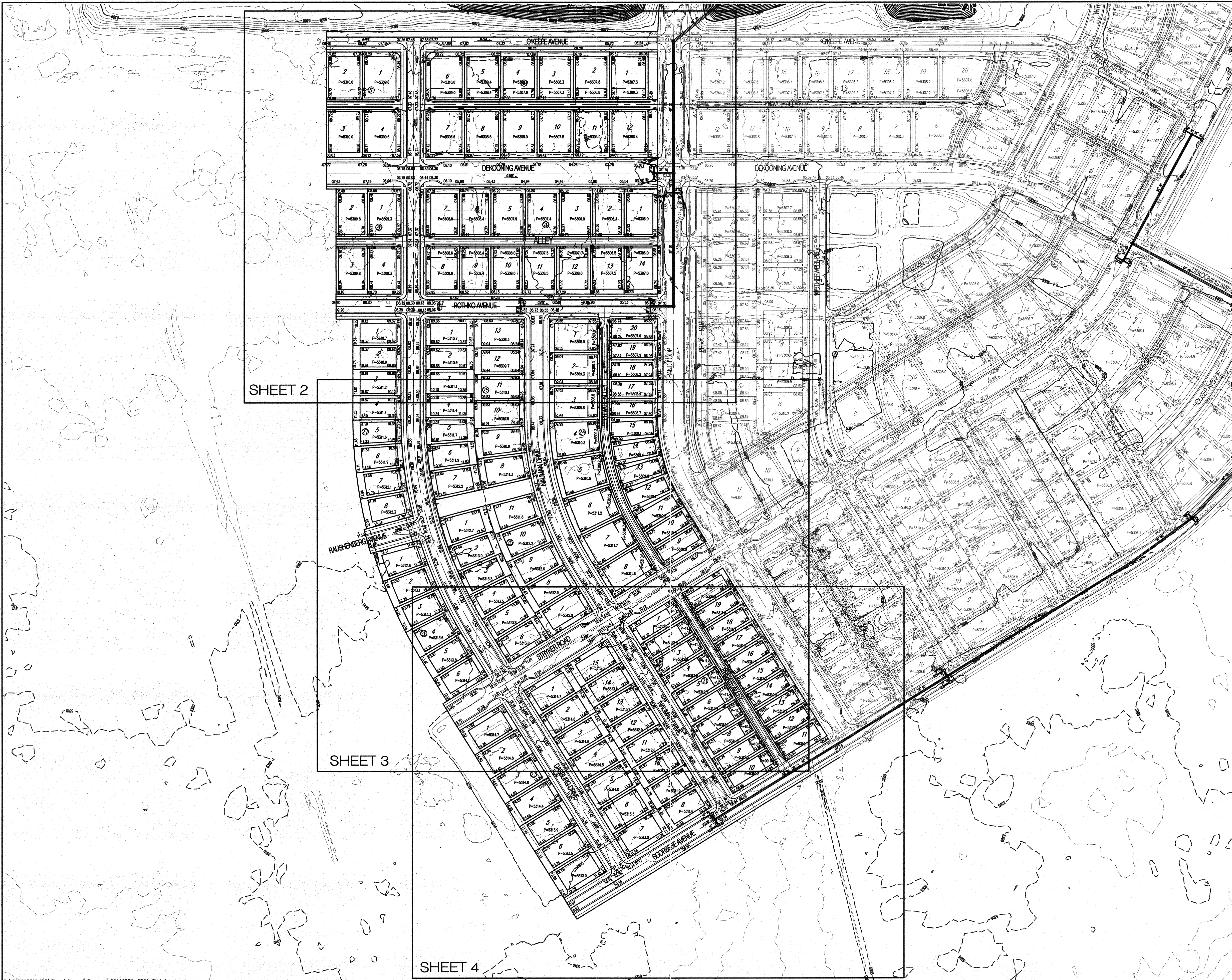
MESA DEL SOL NEIGHBORHOOD MONTAGE UNITS 3 & 4 TYPICAL PERMANENT POND DETAIL

7/2014

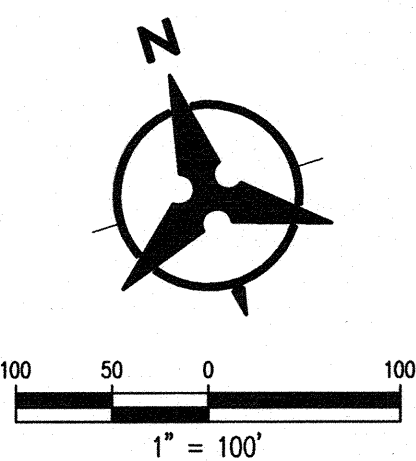


POND SECTION A-A
N.T.S.

EXHIBIT 9
GRADING PLAN




- 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 BY GEO-TEST, INC. DATED 9-29-10
 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.
 8. ALL LOTS ADJACENT TO UNIVERSITY SHALL DRAIN TO THE ALLEY AS PER GRADES SHOWN ON GRADING PLAN. ROOF DRAINAGE SHALL BE GUTTERED TO PREVENT THESE FLOWS FROM ENTERING UNIVERSITY BLVD.



- LEGEND**
- (91.62) FUTURE SPOT ELEVATION
 - 91.62 PROPOSED SPOT ELEVATION
 - × 92.46 EXISTING SPOT ELEVATION (GRID & TC)
 - EXISTING CURB & GUTTER
 - == PROPOSED MOUNTABLE CURB & GUTTER
 - == PROPOSED STANDARD CURB & GUTTER
 - 5470 EXISTING CONTOUR W/ INDEX ELEVATION
 - FLOW ARROW
 - PROPOSED RETAINING WALL (TO BE BUILT BY HOME BUILDER)
 - PROPOSED GARDEN WALL, CONCRETE FILLED TO 1-FOOT DEPTH
 - PROPOSED SLOPE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN MANHOLE
 - PROPOSED STORM DRAIN INLET
 - PROPOSED CATTLE GUARD INLET
 - WALL DRAIN
 - GRADING PHASE BOUNDARY

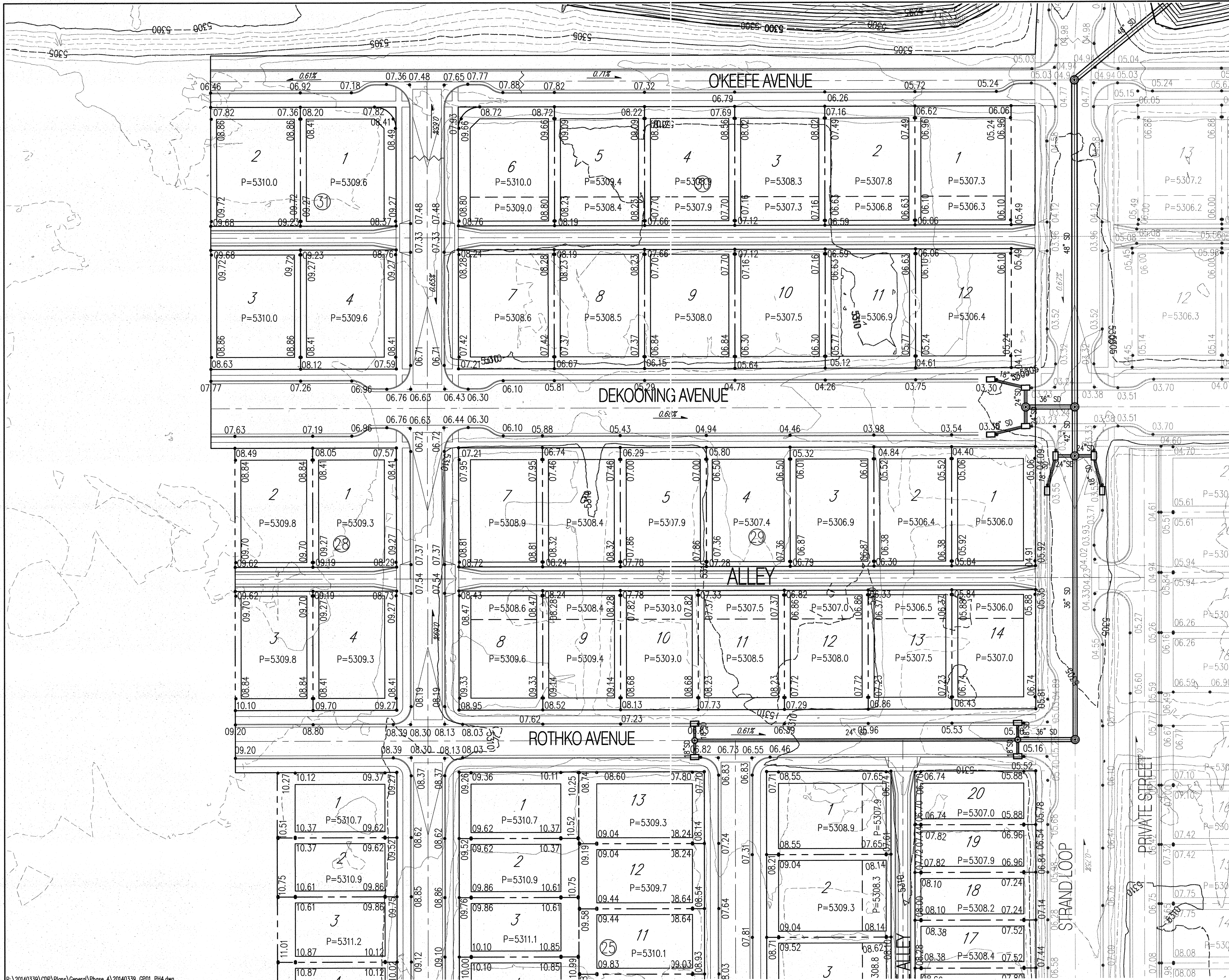
ROUGH GRADING (±0.5')
APPROVED FOR ROUGH GRADING DATE

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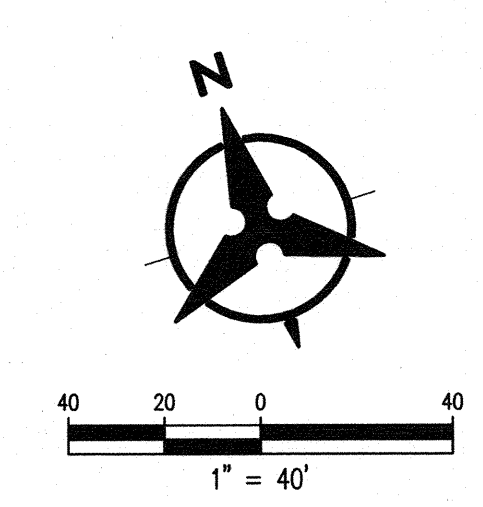
		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 4 GRADING AND DRAINAGE PLAN OVERALL			
Design Review Committee	City Engineer Approval	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
XXXXXX	R-15,16 S-15,16	1	5

AS-BUILT INFORMATION		BENCH MARKS		SURVEY INFORMATION		FIELD NOTES		ENGINEER'S SEAL		REMARKS	
CONTRACTOR	DATE	CONTRACTOR	DATE	NO.	BY	NO.	BY	NO.	BY	REVISIONS	DESIGN
INSPECTOR'S NAME	DATE	INSPECTOR'S NAME	DATE								
FIELD NAME BY	DATE	FIELD NAME BY	DATE								
VERIFICATION BY	DATE	VERIFICATION BY	DATE								
CONNECTED BY	DATE	CONNECTED BY	DATE								
MICROFILM INFORMATION		MICROFILM INFORMATION		MICROFILM INFORMATION		MICROFILM INFORMATION		MICROFILM INFORMATION		MICROFILM INFORMATION	
RECORDED BY	DATE	RECORDED BY	DATE	RECORDED BY	DATE	RECORDED BY	DATE	RECORDED BY	DATE	RECORDED BY	DATE
NO.		NO.		NO.		NO.		NO.		NO.	






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 - WALL DRAIN
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- ROUGH GRADING (±0.5')
- APPROVED FOR ROUGH GRADING DATE

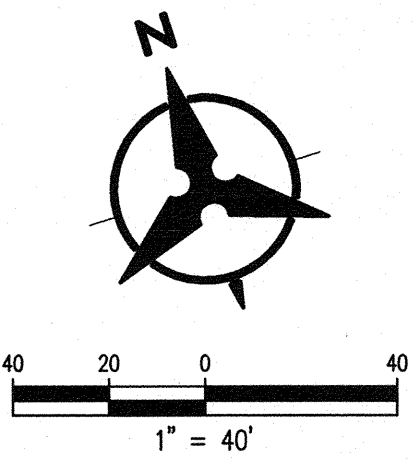
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CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 4 GRADING AND DRAINAGE PLAN	
Design Review Committee	City Engineer Approval
Mo./Day/Yr.	Mo./Day/Yr.
City Project No. XXXXXX	Zone Map No. R-15,16 S-15,16
Sheet 2	Of 5

		ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS-BUILT INFORMATION	
		 A-24-14		FIELD NOTES					
				NO.	BY	DATE			



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 - PROPOSED CATTLE GUARD INLET
 - WALL DRAIN
 - GRADING PHASE BOUNDARY

ROUGH GRADING (±0.5')
APPROVED FOR ROUGH GRADING DATE

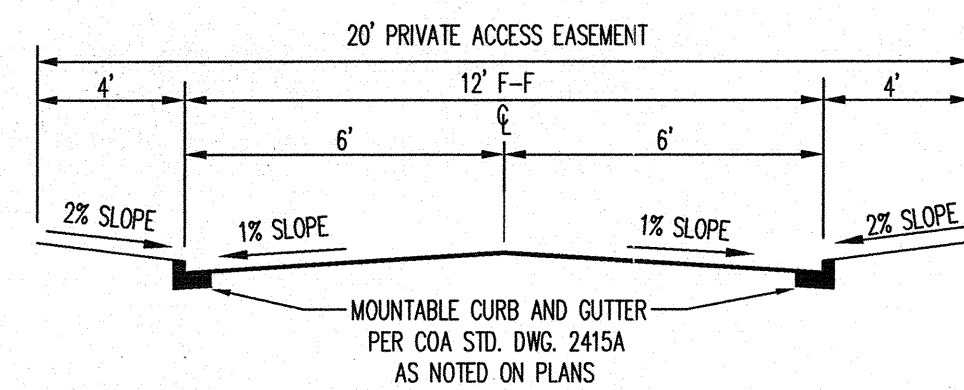
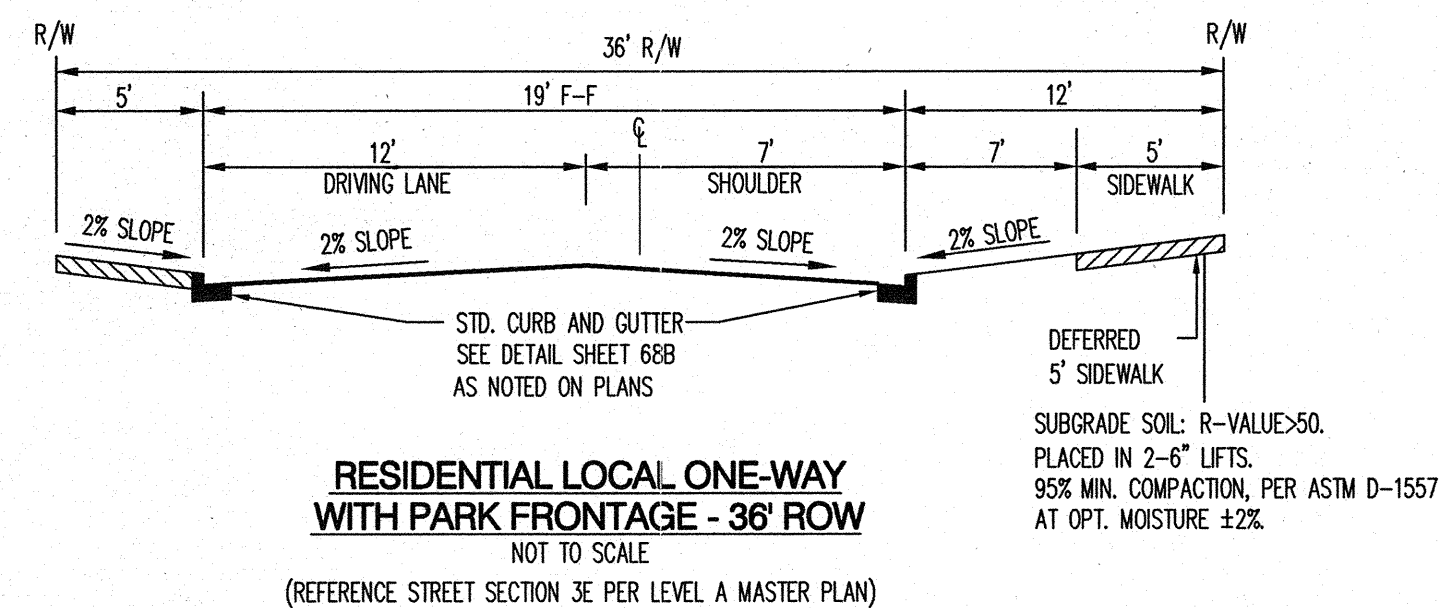
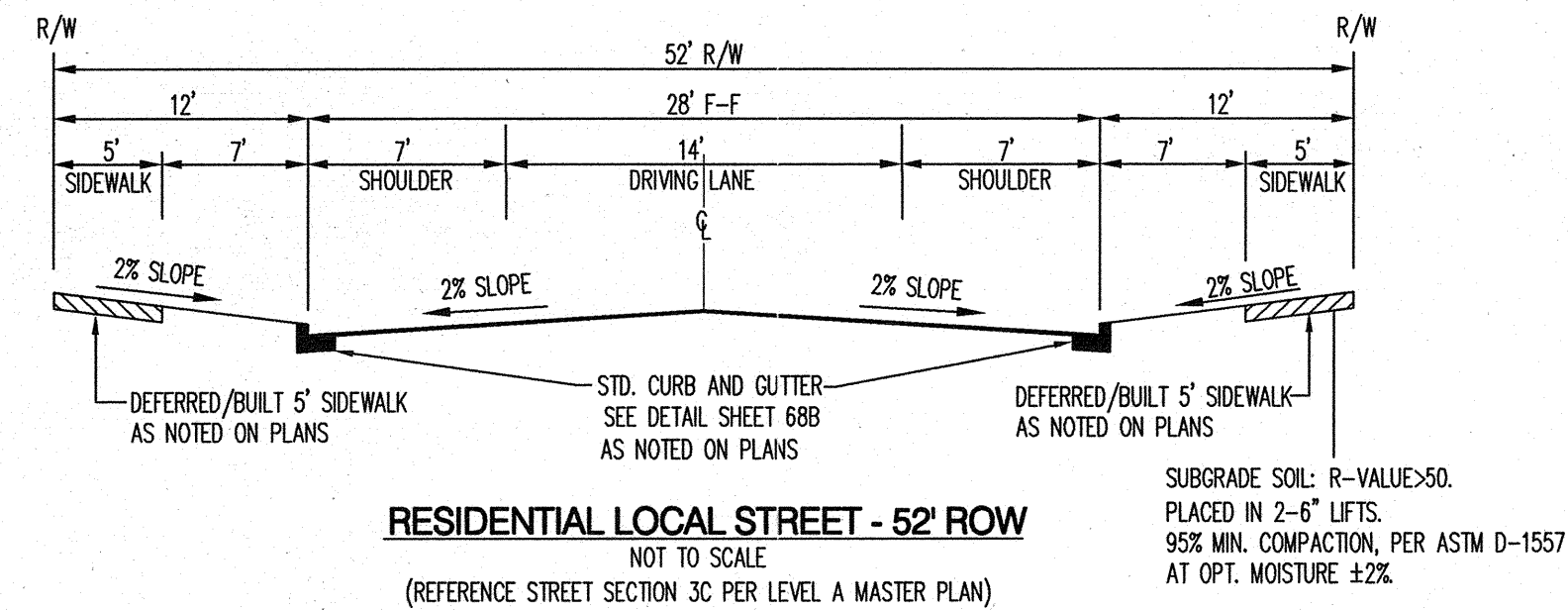
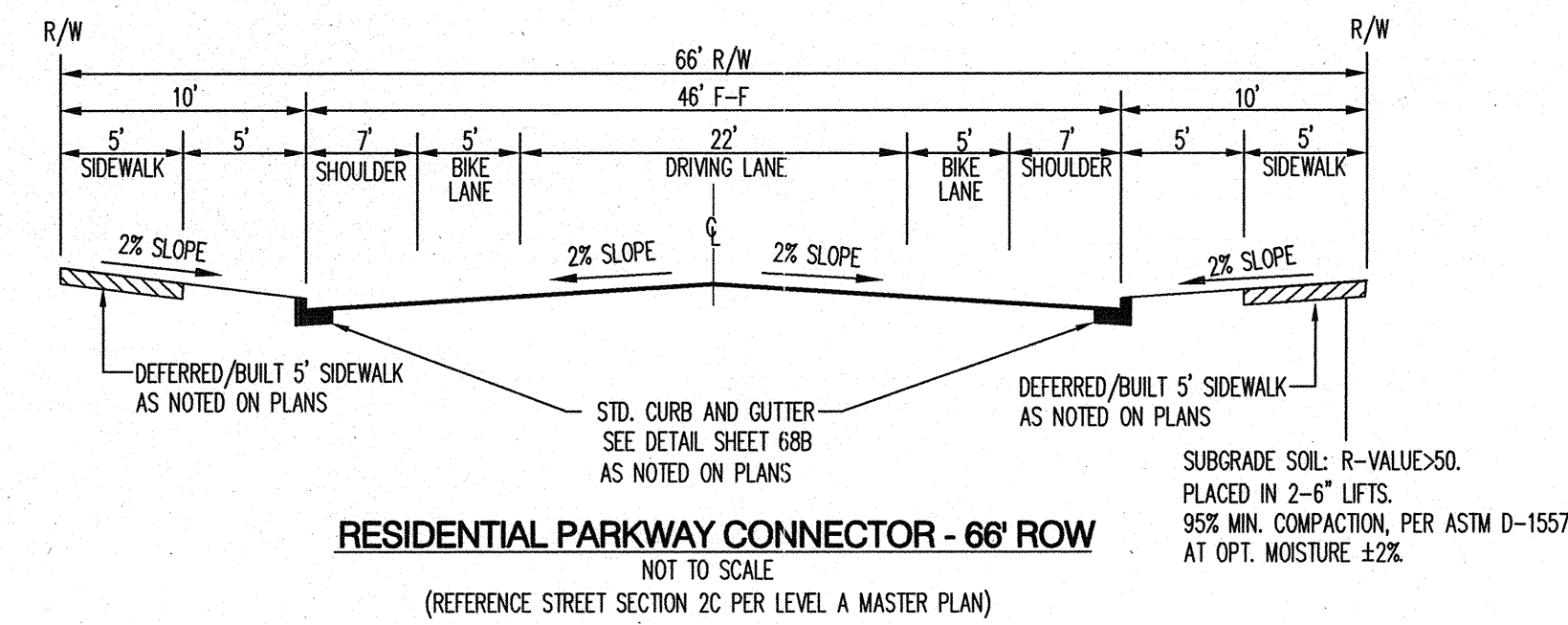
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

MESA DEL SOL MONTAGE UNIT 4
GRADING AND DRAINAGE PLAN

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

City Project No. XXXXXXX Zone Map No. R-15,16 S-15,16 Sheet 4 Of 5



ALLEY TRACT - 20' PRIVATE ACCESS EASEMENT
NOT TO SCALE
(REFERENCE STREET SECTION 4A PER LEVEL A MASTER PLAN)

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		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT	
MESA DEL SOL MONTAGE UNIT 4			
GRADING AND EROSION CONTROL PLAN DETAILS			
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.
City Project No.	Zone Map No.	Sheet	Of
XXXXXX	R-15,16 S-15,16	5	5

AS-BUILT INFORMATION		BENCH MARKS		SURVEY INFORMATION		ENGINEER'S SEAL		REVISIONS		DESIGN	
CONTRACTOR	DATE	ACS MONUMENT "2-D9"	DATE	NO.	BY	16244	By	No.	Date	DATE: 4/25/2014	By
INSPECTOR'S	DATE	GEOGRAPHIC POSITION (NAD 83)	DATE			16244				DATE: 4/25/2014	
ACCEPTANCE BY	DATE	N.M. STATE PLANE COORDINATES (CENTRAL ZONE)	DATE			16244				DATE: 4/25/2014	
PERMIT	DATE	X = 1,493,615.357 Y = 1,515,761.743	DATE			16244				DATE: 4/25/2014	
DRAWINGS BY	DATE	GROUND-TO-GRID FACTOR = 0.999667790	DATE			16244				DATE: 4/25/2014	
MICROFILM INFORMATION	DATE	Δα = -00°16'58.43"	DATE			16244				DATE: 4/25/2014	
		NO.				16244				DATE: 4/25/2014	
		NO.				16244				DATE: 4/25/2014	