CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

March 20, 2015

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

RE: American Toyota (File: C18D012)
Drainage Report, Engineer's Stamp Date 3-16-15
Grading and Drainage Plan, Engineer's Stamp Date 3-17-15

Dear Mr. Soule:

Based upon the information provided in your submittal received 3-18-15, the above referenced submittal is approved for action by the DRB on the Site Plan for for Building Permit with the following condition(s):

1. The proposed runoff to the Alameda Storm Drain is limited to 25 cfs. This is based on trying to reconcile the difference between the existing runoff of 33 cfs and the allowed runoff of 16 cfs from SAD #201(though this site is not a part of the hydrology report).
2. The "first flush" needs to be captured at Outfalls 2,3, and 4.
3. Details showing how the "first flush" mechanism will work need to be shown prior to approval for Building Permit.

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

Sincerely,

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

Orig: Drainage file
c.pdf: via Email: Recipient, Monica Ortiz

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: American Toyota Building Permit #: _____ City Drainage #: C18d012

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

Legal Description: Tracts A1 and B-1, American Toyota and lots 15-18 tract a unit b NAA

City Address: 5995 Alameda NE

Engineering Firm: RIO GRANDE ENGINEERING Contact: DAVID SOULE

Address: PO BOX 93924, ALBUQUERQUE, NM 87199

Phone#: 505.321.9099 Fax#: 505.872.0999 E-mail: DAVID@RIOGRANDEENGINEERING.COM

Owner: miller family group Contact: _____

Address: _____

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

Architect: john mahony Contact: _____

Address: _____

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

Surveyor: CONSTRUCTION SURVEY INCORPORATED Contact: JOHN GALLEGOS

Address: _____

Phone#: 917.8921 Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

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

TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

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

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

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

DATE SUBMITTED: 3/17/15 By: _____

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

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

REVISED
DRAINAGE REPORT

For

AMERICAN TOYOTA EXPANSION

Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

MARCH 2015

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map

PURPOSE

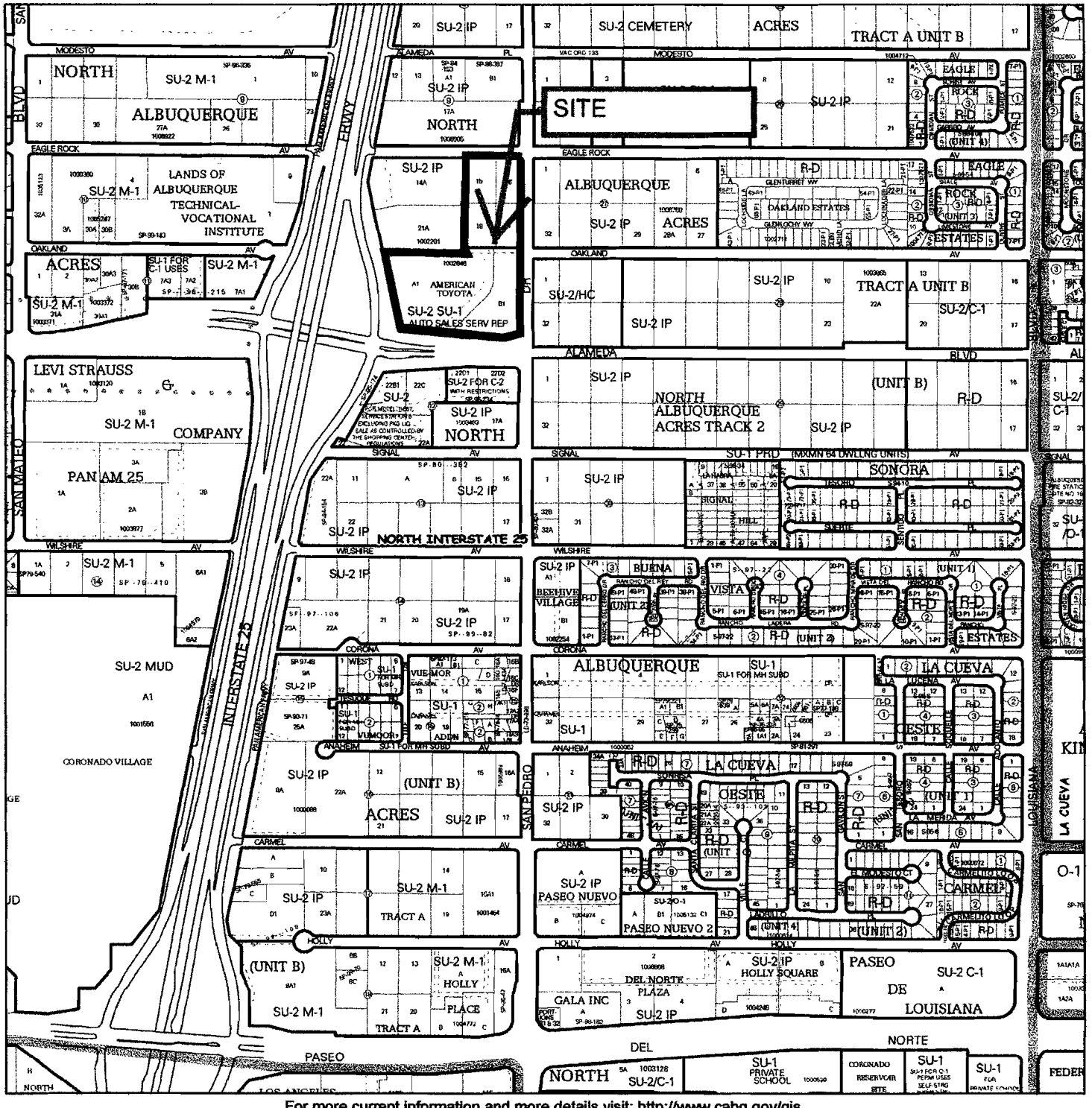
The purpose of this report is to provide the Drainage Management Plan for the development of a 10acre parcel located at 5995 alameda. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines. This report will demonstrate that the grading does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 10-acre parcel of land located on the west side of San Pedro between Alameda and Eagle rock. The legal description of this site is Lots A and B land of American Toyota and lots 15-18, tract A, unit B North Albuquerque Aces. As shown on FIRM map35013C0137H, the majority of the site is located within Flood Zone X; a portion of the site is impacted by flood zone AO-1 foot. The site has had significant grading activities upon it over the past 10 years. The site is not in native condition and is currently developed. Due to the upstream construction of san Pedro, the site is not affected by any upland flow. The site free discharges to the west. The development of the site will require the site to discharge at a rate equal to or less than the fully developed conditions assumed for this site in the governing North Albuquerque Acres Master Drainage Plan (NAAMDP), which relevant excerpts can be found in appendix B.

EXISTING CONDITIONS

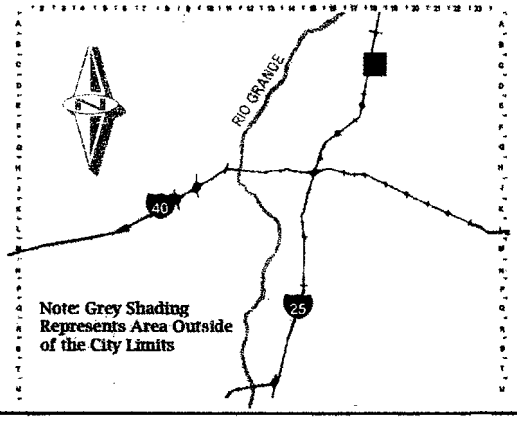
The site currently does have structures on it and has been impacted by human development over the years. The site is currently used as a car dealership and sales lot. The site was developed utilizing he approved drainage report in file C18d12, of which excerpts are found in appendix A. The file is old and significant portions were not found. The site is not impacted by any upland flows. As shown in appendix C, The site currently contains 4 basins. The three southern basins discharge to Alameda and existing storm drain in Alameda. The fourth basin discharges to the Eagle Rock Storm drain. As shown in appendix C, Basin Alameda B discharge 11.39 cfs to the Alameda roadway via surface flow thru the driveway. Basin Alameda A-1 discharges 7.78 cfs to the alameda storm drain via a 12" RCP conduit, and Alameda A-2 discharges 13.87 cfs to an 24" storm drain that runs within the frontage road connecting to the Alameda storm drain. Basins Eagle C, the north portion of the site currently drains 13.20 cfs to a series of inlets which are connected to the Eagle rock storm drain. The adjacent site grading plan showed the inlets are designed for free discharge of the entire basin, which is significantly reduced due to the completion of San Mateo.



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

AGIS
Albuquerque Geographic Information System

Map amended through: 2/4/2010



Note: Grey Shading Represents Area Outside of the City Limits

Zone Atlas Page:

C-18-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1,500 Feet

PROPOSED CONDITIONS

The proposed improvements consist of demolishing the existing building and constructing a new 75,000 building. The general drainage patterns will remain, and increases in flows will be captured and harvested in accordance with new city policy. The amount of storage required was calculated by determining the allowed discharge rates for each identified basin within the North Albuquerque Acres Master drainage plan. Appendix B includes the developed conditions map of the NAA Drainage master plan and a map of the site with the allowed peak discharge rates allowed with the proposed land treatment assumptions of the NAADMP. The site is allowed to discharge 36.93 cfs to Alameda and 6.69 cfs to Eagle Rock. Based upon comments by the city and NMDOT, the plan will maintain the existing discharge points, reduce the flows to less than existing and lest than allowed and capture the water generated from the activities associated with the use of the building as a vehicle service center. The proposed basin map shown in appendix D shows the basins captured by the underground catchment basins. Basin C2 Generates 6.03 cfs and 14,476 cubic feet of water during the 100-year, 10-day event. The entire basin is captured by infiltrator system 1. Basin B2 generates 3.26 and 9,154 cubic feet of water during the 100-year, 10-day event. Basin A2 generates 2.09 and 5,984 cubic feet of water during the 100-year, 10-day event. Each of these basins is retained onsite. The inlets act as emergency overflows. The remaining basins with the exception of C1 free discharge to the historical discharge points at rates less than existing and allowed. Basin C1 generates less than existing rates but 2.45 cfs greater than allowed, therefore the flow is throttled by the construction of a detention area located in the parking lot. The discharge rate is controlled by an 8" weir in the header curb. As shown in Appendix E, this pond was modeled using AYHMO and the resultant peak discharge is 6.5 cfs which is less than allowed. All proposed basins discharge water to existing discharge points at less than existing rates and less than the rates allowed in the NAADMP. A portion of the east driveway does enter the San Pedro right of way at a rate of .67 cfs. This is collected by the san

Pedro storm drain; near the bottom of the system therefore will not have an effect the drainage system.

The surrounding existing fully developed infrastructure was designed based upon the fully developed assumptions of the NAADMP. This site was designed to conform to the design assumptions within the plan. At all discharge points the discharge rates are less than allowed. Appendix F demonstrates all the inlets, pipes and rundowns have been sized to accommodate the 100-year design storms. In the event of clogging or rain events greater than the 100-year event the flows will overflow to the existing historical paths. The water retained onsite exceeds the volume required in a 100-year, 10-day storm. The retention basins were placed to capture the entire flow from the work areas of the buildings to eliminate nuisance flow that the NMDOT requested. No offsite improvements will be constructed.

SUMMARY AND RECOMMENDATIONS

This project is a redevelopment of an existing site. The development discharge will be consistent with and in all cases less than the land use assumptions of the North Albuquerque Acres Master drainage plan. The use of underground infiltration will be used to collect the excess discharge and the water quality volume required. The site has been designed in accordance with City of Albuquerque Drainage ordinance. This drainage plan and report conforms to the governing drainage regulations of the City. Since the effected area site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity. A letter of Map revision (LOMR) has been submitted to remove the floodplain. No insurable structures are located within the FEMA flood plain. Due to grading work in the area of the flood plain being removed a flood plain permit will be required.

APPENDIX A

Excerpts of Original drainage report

AMERICAN TOYOTA TRACT B

GRADING AND DRAINAGE PLAN

Prepared by:

Bohannan Huston, Inc.
4925 Juan Tabo N. E. Suite 202
Albuquerque, New Mexico 87112

September, 1994

AMERICAN TOYOTA TRACT B

GRADING AND DRAINAGE PLAN

PURPOSE AND SCOPE

The purpose of this Grading and Drainage Plan is to develop the hydrology for the subject property, and to [illegible] for use as a vehicle parking and storage facility.

The scope of this report is the analysis of drainage conditions for Tract B, originally analyzed in 1986, using current hydrologic criteria. This plan describes the existing conditions, offsite drainage [illegible] pertaining to the site, and the proposed method of managing stormwater runoff.

SITE LOCATION AND DESCRIPTION

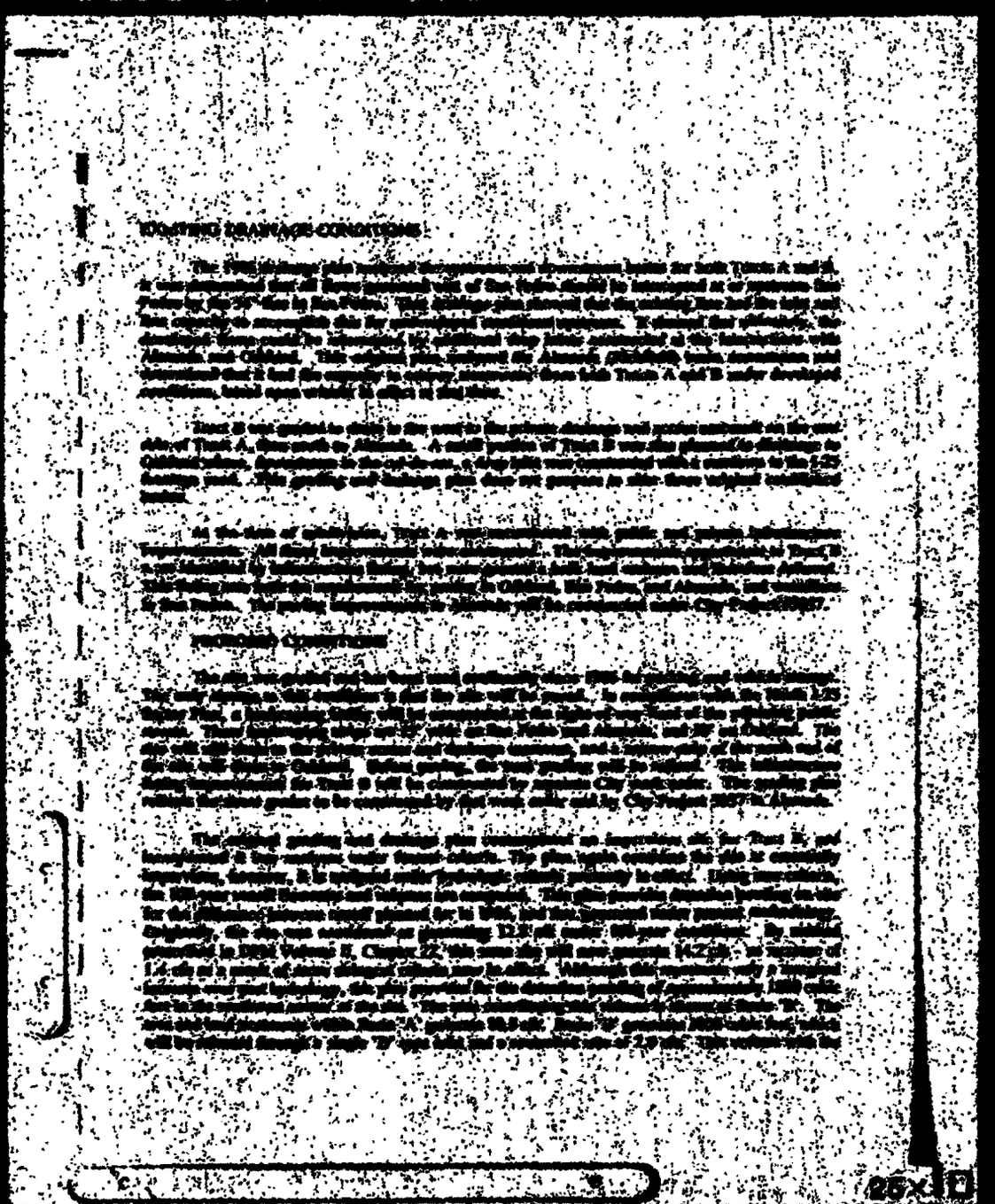
The project site is American Toyota Tract B. It consists of 2.[illegible] acres [illegible] [illegible]

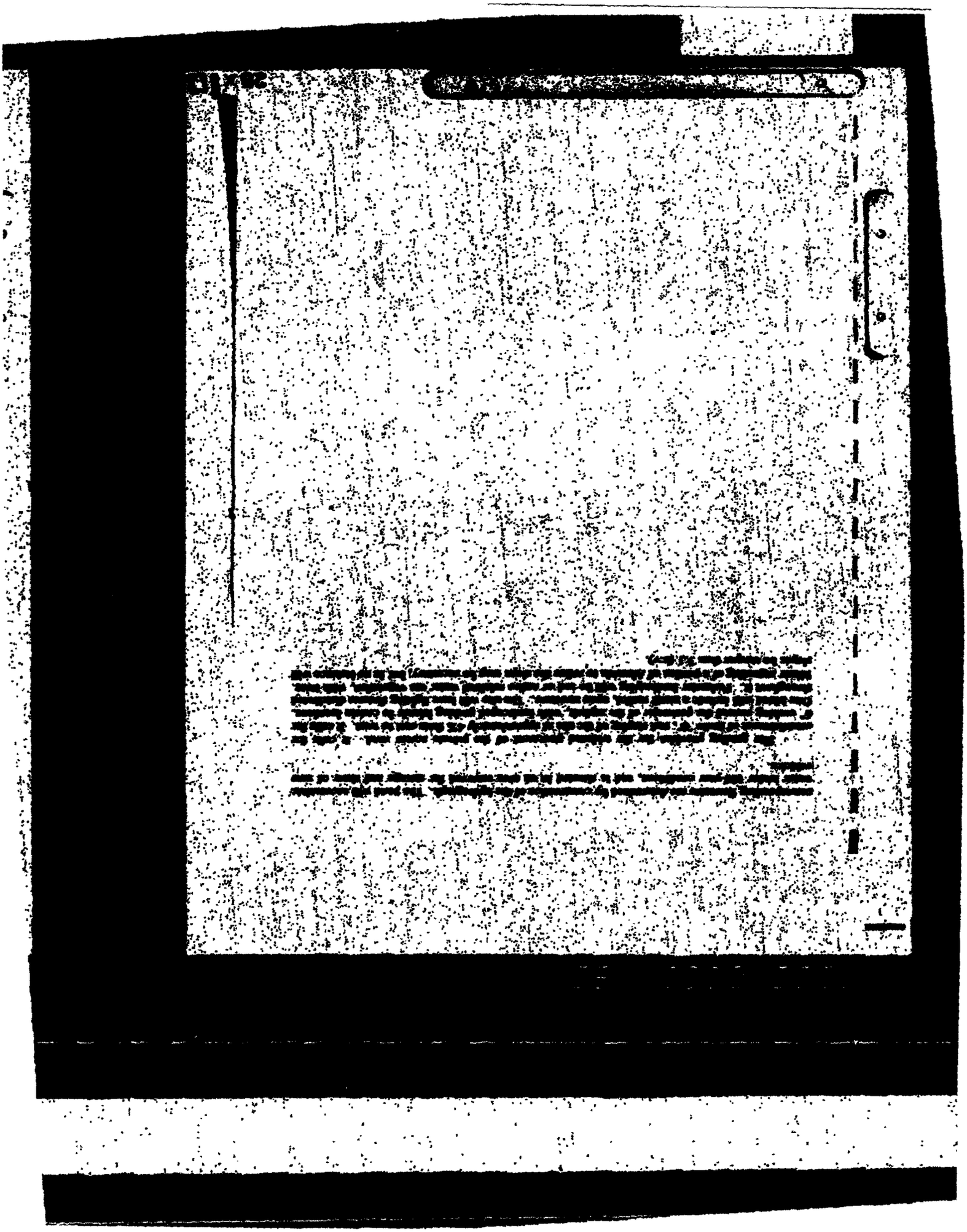
The site is [illegible] [illegible]

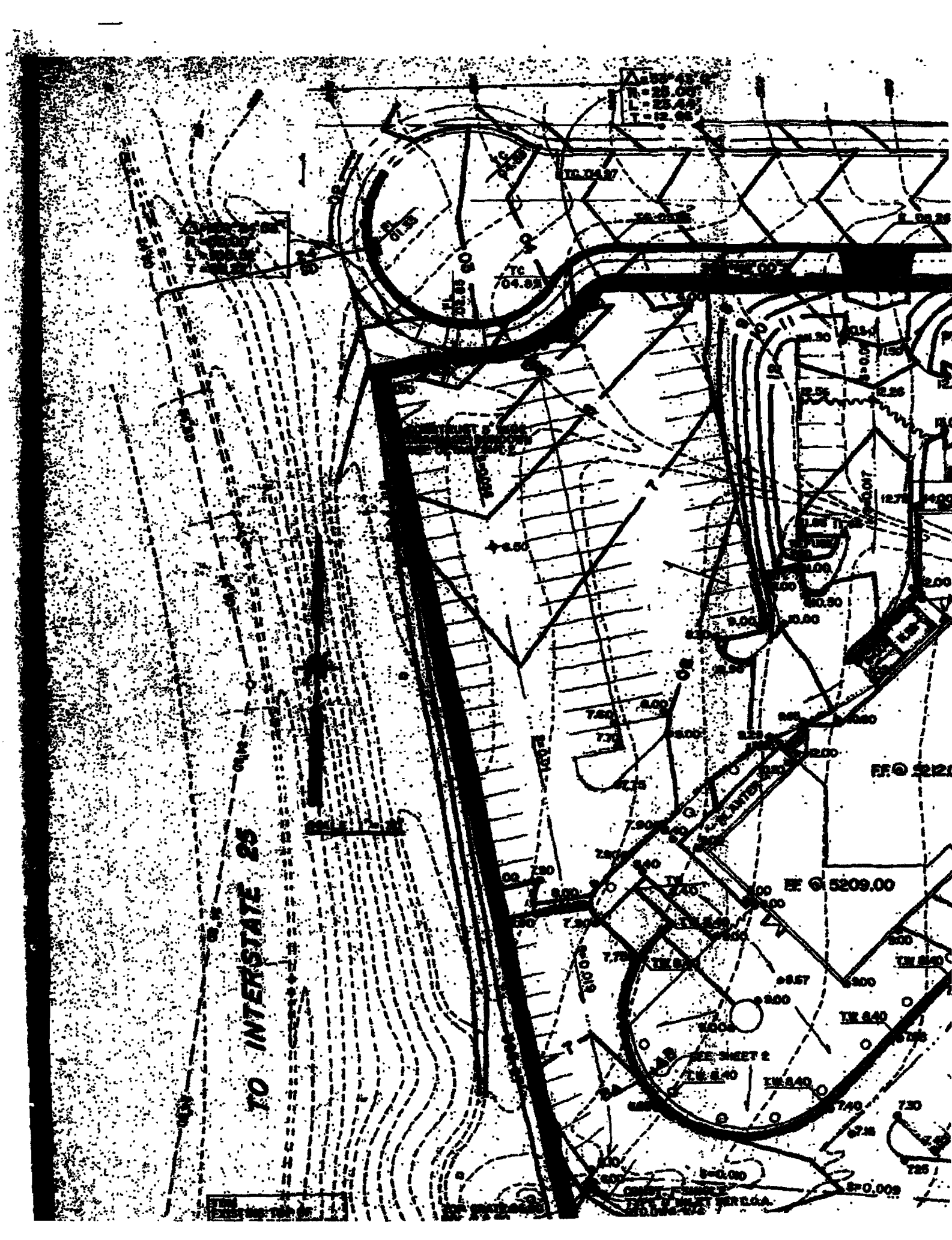
[illegible]

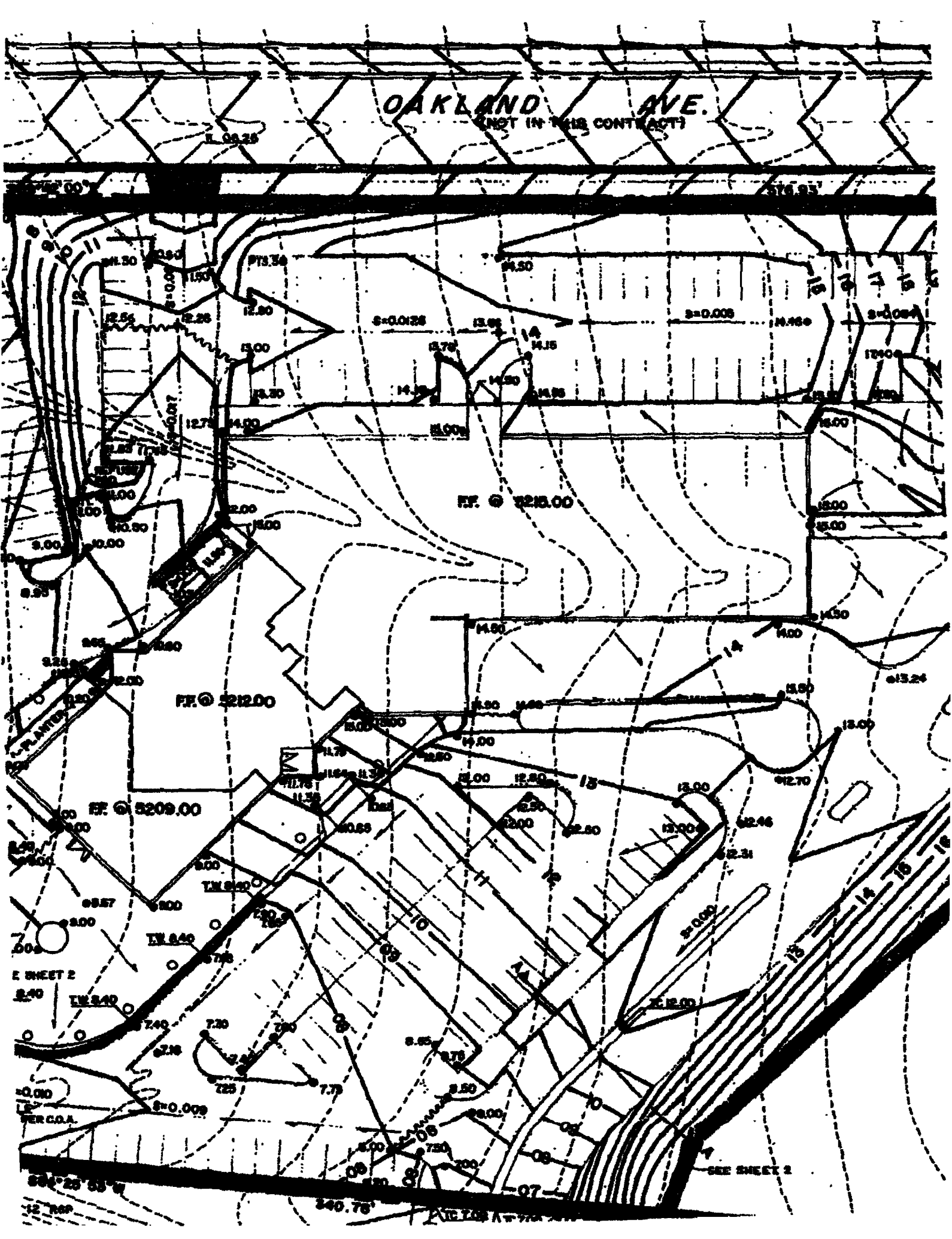
[illegible]

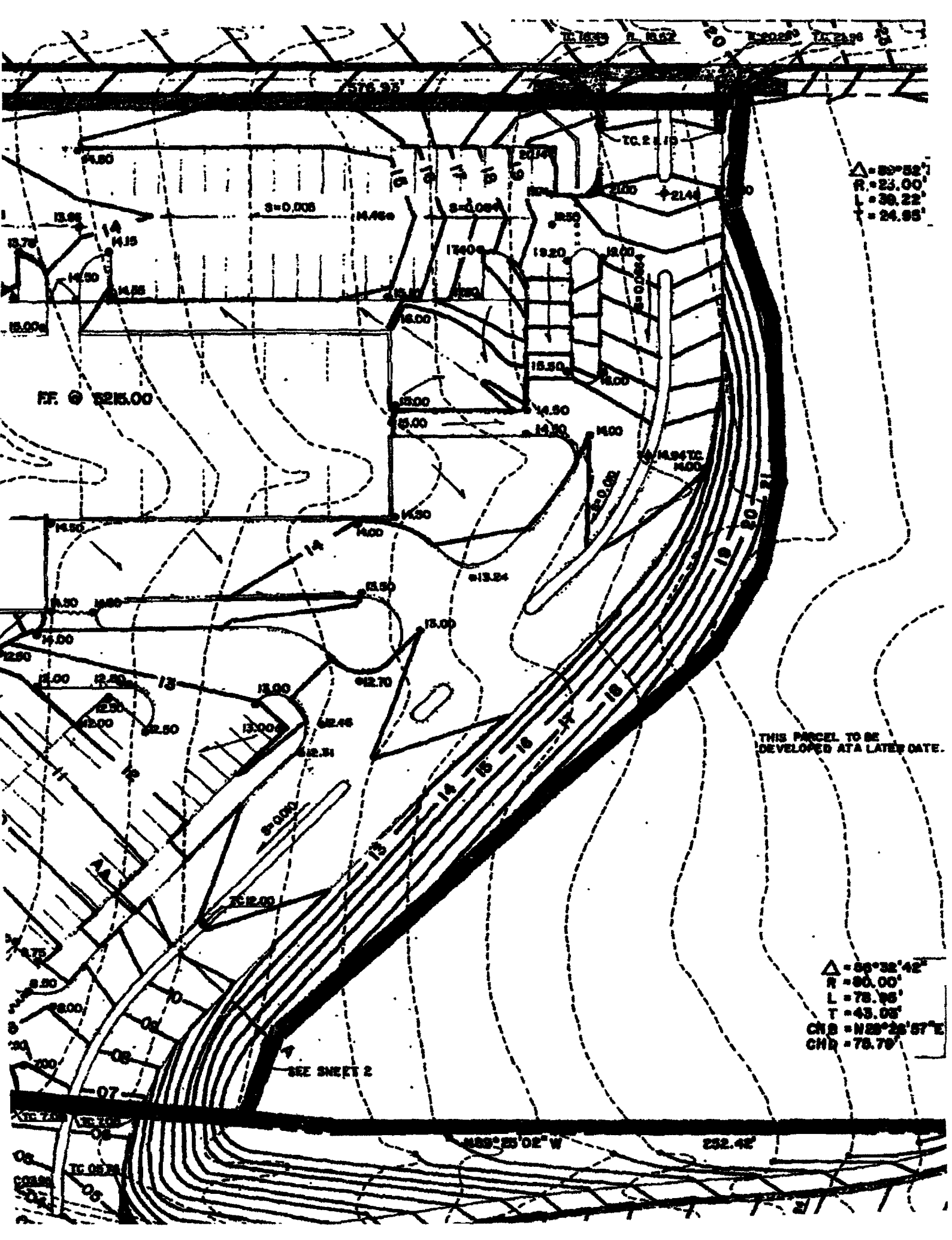
[illegible]






TO INTERSTATE 25
SEE SHEET 2
FF @ 5209.00


OAKLAND AVE.
(NOT IN THIS CONTRACT)
F.F. @ 5213.00
F.F.@ 5212.00
F.F. @ 5209.00
S=0.0126
S=0.008
S=0.009
SEE SHEET 2
SEE SHEET 2
240.75'


F.F. @ 1215.00
Δ = 89°52'
R = 23.00'
L = 36.22'
T = 24.95'
THIS PARCEL TO BE DEVELOPED AT A LATER DATE.
Δ = 89°32'42"
R = 90.00'
L = 78.38'
T = 43.08'
CHB = N29°28'57"E
CHD = 75.79'
SEE SHEET 2
S89°25'02"W
252.42'

NEW MEXICO
STATE HIGHWAY DEPARTMENT

DISTRICT NO. 3

[illegible]

November 10, [illegible]

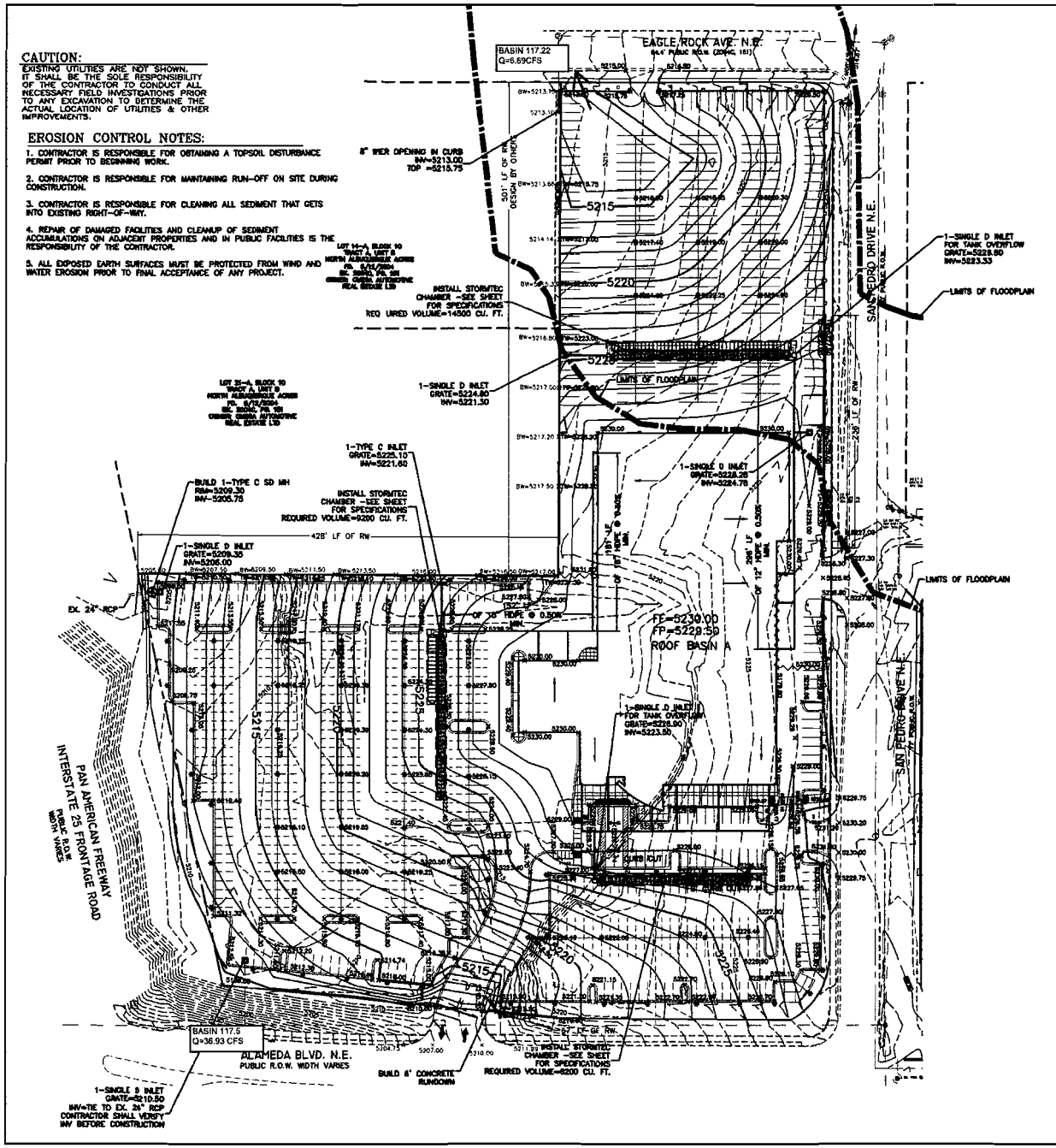
To Whom It May Concern:

The storm sewer system in existence on [illegible] Drive in the vicinity of Alameda Drive, as well as the storm sewer system constructed to pass storm water under I-25 at the Alameda Interchange are not the property of or maintained by the State Highway Department.

D. G. [illegible]
District Highway Engineer

APPENDIX B

NAADMP EXCERPTS

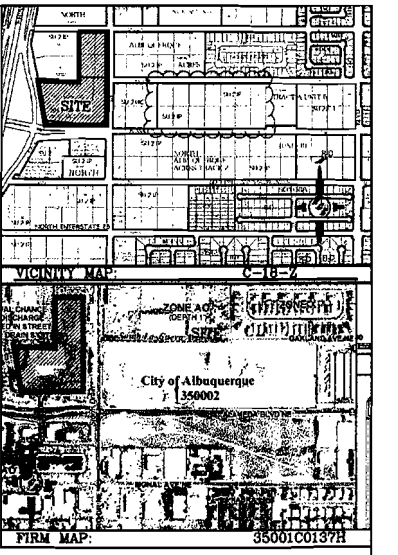


CAUTION:

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

EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.



LEGAL DESCRIPTION:

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
4. ALL LANDSCAPE MEDIANS WILL BE DEPRESSED 6" FROM FLOW LINE AND 1' CURB OPENING PROVIDED ON THE HIGH SIDE, FOR WATER QUALITY.

LEGEND

- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- PROPOSED CONTOUR
- PROPOSED INDEX CONTOUR
- SLOPE TIE
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY
- PROPOSED CURB AND GUTTER
- EXISTING CURB AND GUTTER
- PROPOSED SIDEWALK
- PROPOSED SETBACK
- PROPOSED LOT LINE
- PROPOSED SCREEN WALL
- PROPOSED RETAINING WALL
- LIMITS OF FLOODPLAIN

N

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

ROUGH GRADING APPROVAL DATE

ENGINEER'S SEAL	AMERICAN TOYOTA	DRAWN BY MCWJ
	GRADING AND DRAINAGE PLAN	DATE 3-17-15
	Rio Grande Engineering	SHEET #
DAVID SOULE P.E. #14322		JOB # 21403

FINAL
NORTH ALBUQUERQUE ACRES
MASTER DRAINAGE PLAN

Prepared For:

City of Albuquerque

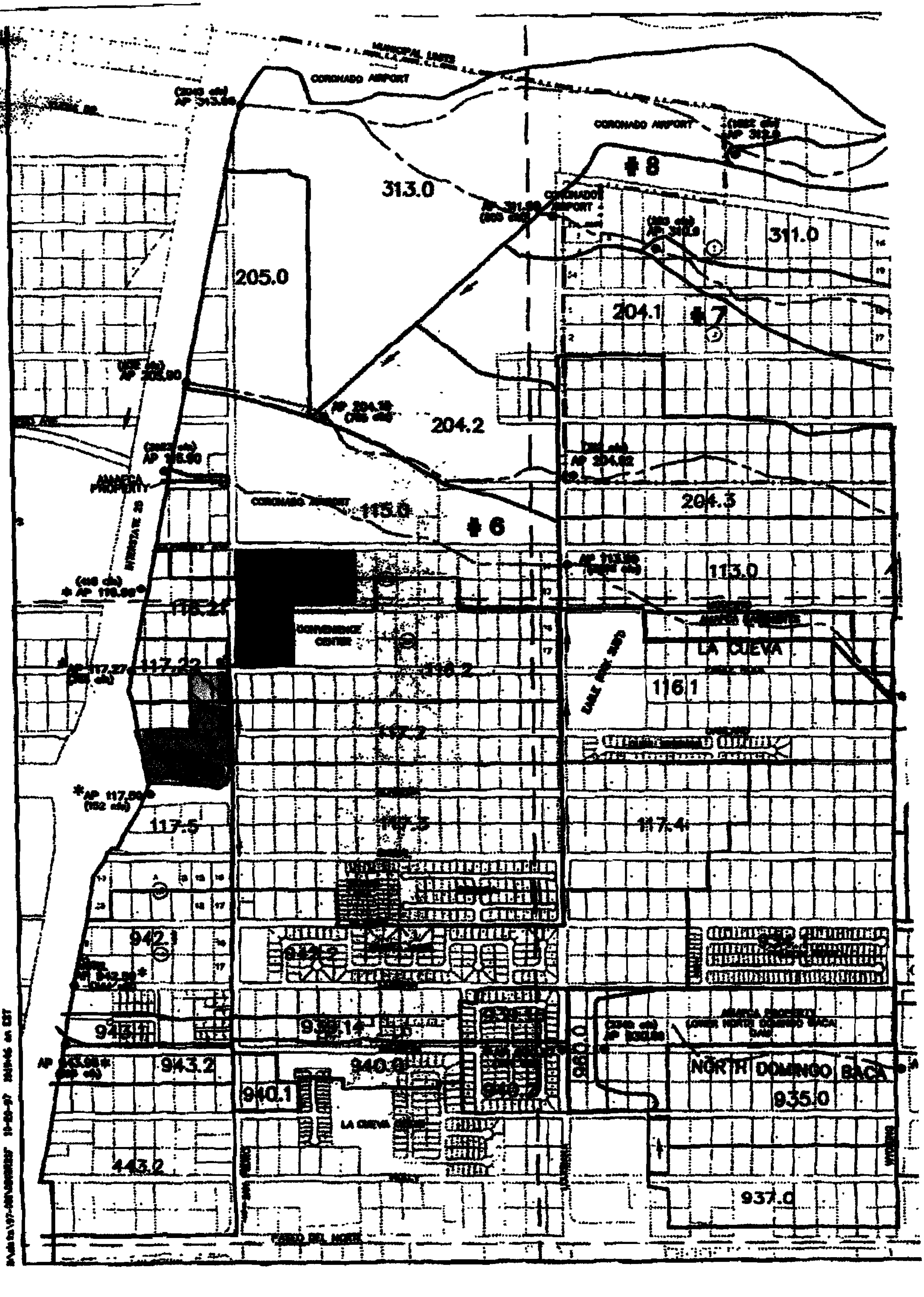
Prepared By:

ENGINEERS AND ENVIRONMENTAL SCIENTISTS
1720-B Randolph Road SE, Albuquerque, NM 87106
Telephone (505) 243-7300
Fax (505) 243-7400
rti@nmia.com

DONALD S. DIXON
NEW MEXICO
11043
REGISTERED PROFESSIONAL

10/28/98

October 1998



CORONADO AIRPORT
AP 313.86
313.0
#8
311.0
205.0
204.1
#7
AP 204.35
204.2
AP 204.82
204.3
INTERSTATE 25
115.0
#6
AP 113.50
113.0
CONVENIENCE CENTER
LA CUEVA
116.1
117.22
AP 117.27
116.2
117.2
AP 117.56
117.5
117.3
117.4
942.1
942.2
943.1
939.14
943.2
940.0
940.1
935.0
NORTH DOMINGO BACA
443.2
937.0
PASEO DEL NORTE

TABLE A-2 (cont.)

LA CUEVA ARROYO SUB-BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
113*	Existing	.1136	80	0	15	5	.133
	Future	.1000	0	25	15	60	.133
115*	Existing	.1337	80	0	15	5	.133
	Future	.1202	0	26	12	62	.133
116*	Existing	.1309	80	0	5	15	.133
116.1	Future	.1000	0	25	15	50	.133
116.2	Future	.0719	0	25	15	60 50	.133
116.21	Future	.0344	0	40	20	40	.133
117.2*	Existing	.1391	73	0	7	20	.22
	Future	.0500	0	34	16	50	.133
117.21*	Existing	.0234	0	34	16	50	.133
117.22*	Future	.0156	0	20	10	70	.133
117.3*	Existing	.0863	65	5	15	15	.133
	Future	.1172	0	34	16	50	.133
117.31*	Existing	.0250	0	34	16	50	.133
117.32*	Existing	.0090	0	34	16	50	.133
117.4*	Existing	.0750	85	0	5	10	.133
	Future	.0512	0	25	15	60	.133
[redacted]	Existing	.0550	0	10	20	70	.133
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
118	Existing	.0649	0	20	10	70	.133
	Future	.0649	0	20	10	70	.133
118.1	Existing	.0306	75	5	10	10	.133
	Future	.0306	0	20	30	50	.133
119	Existing	.0549	0	20	10	70	.133
	Future	.0549	0	20	10	70	.133
120	Existing	.0268	50	0	0	50	.133
	Future	.0268	0	20	10	70	.133
121	Existing	.0489	80	0	15	5	.133
	Future	.0489	0	20	10	70	.133

*Modified for COA NAA MDP 9/97

Weighted E Method

AMERICAN TOYOTA

NAAMDP Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
EAGLEROCK(117.22)	66508	1.527	0%	0	20.0%	0.305	10.0%	0.15268	70%	1.069	1.965	0.250	6.69	0.393
ALAMEDA (117.5)	367341	8.433	0%	0	20.0%	1.687	10.0%	0.8433	70%	5.903	1.965	1.381	36.93	2.168

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

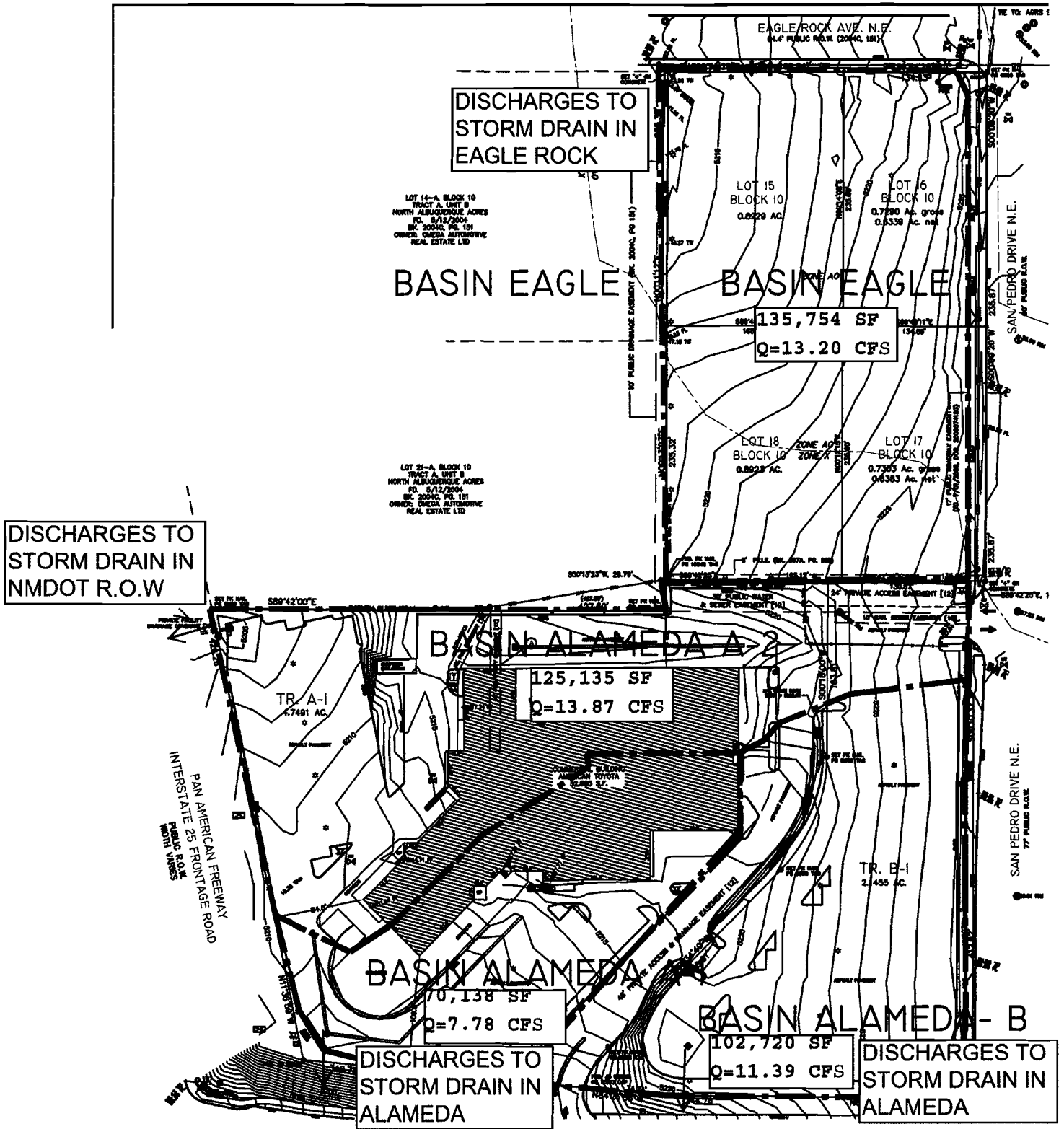
Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66	Qa= 1.87
Eb= 0.92	Qb= 2.6
Ec= 1.29	Qc= 3.45
Ed= 2.36	Qd= 5.02

APPENDIX C

EXISTING HYDROLOGY


EAGLE ROCK AVE. N.E.
DISCHARGES TO STORM DRAIN IN EAGLE ROCK
LOT 15 BLOCK 10
0.8529 AC.
LOT 16 BLOCK 10
0.7390 Ac. gross
0.6339 Ac. net
SAN PEDRO DRIVE N.E.
BASIN EAGLE
BASIN EAGLE
135,754 SF
Q=13.20 CFS
LOT 18 BLOCK 10
0.8923 AC.
LOT 17 BLOCK 10
0.7303 Ac. gross
0.6383 Ac. net
DISCHARGES TO STORM DRAIN IN NMDOT R.O.W
BASIN ALAMEDA A-2
125,135 SF
Q=13.87 CFS
TR. A-1
4.7491 AC.
PAN AMERICAN FREEWAY
INTERSTATE 25 FRONTAGE ROAD
TR. B-1
2.1455 AC.
SAN PEDRO DRIVE N.E.
BASIN ALAMEDA
70,138 SF
Q=7.78 CFS
BASIN ALAMEDA - B
102,720 SF
Q=11.39 CFS
DISCHARGES TO STORM DRAIN IN ALAMEDA
DISCHARGES TO STORM DRAIN IN ALAMEDA

Weighted E Method

AMERICAN TOYOTA

EXISTING Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
BASIN C- EAGLE	135754	3.116	0%	0	0.0%	0.000	50.0%	1.55824	50%	1.558	1.825	0.474	13.20	0.682
BASIN ALAMEDA B	102720	2.358	0%	0	4.0%	0.094	6.0%	0.14149	90%	2.122	2.238	0.440	11.39	0.723
BASIN ALAMEDA A1	70138	1.610	0%	0	4.0%	0.064	6.0%	0.09661	90%	1.449	2.238	0.300	7.78	0.494
BASIN ALAMEDA A2	125135	2.873	0%	0	4.0%	0.115	6.0%	0.17236	90%	2.585	2.238	0.536	13.87	0.881
WATER QUALITY	433747	9.957461												

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66 Qa= 1.87

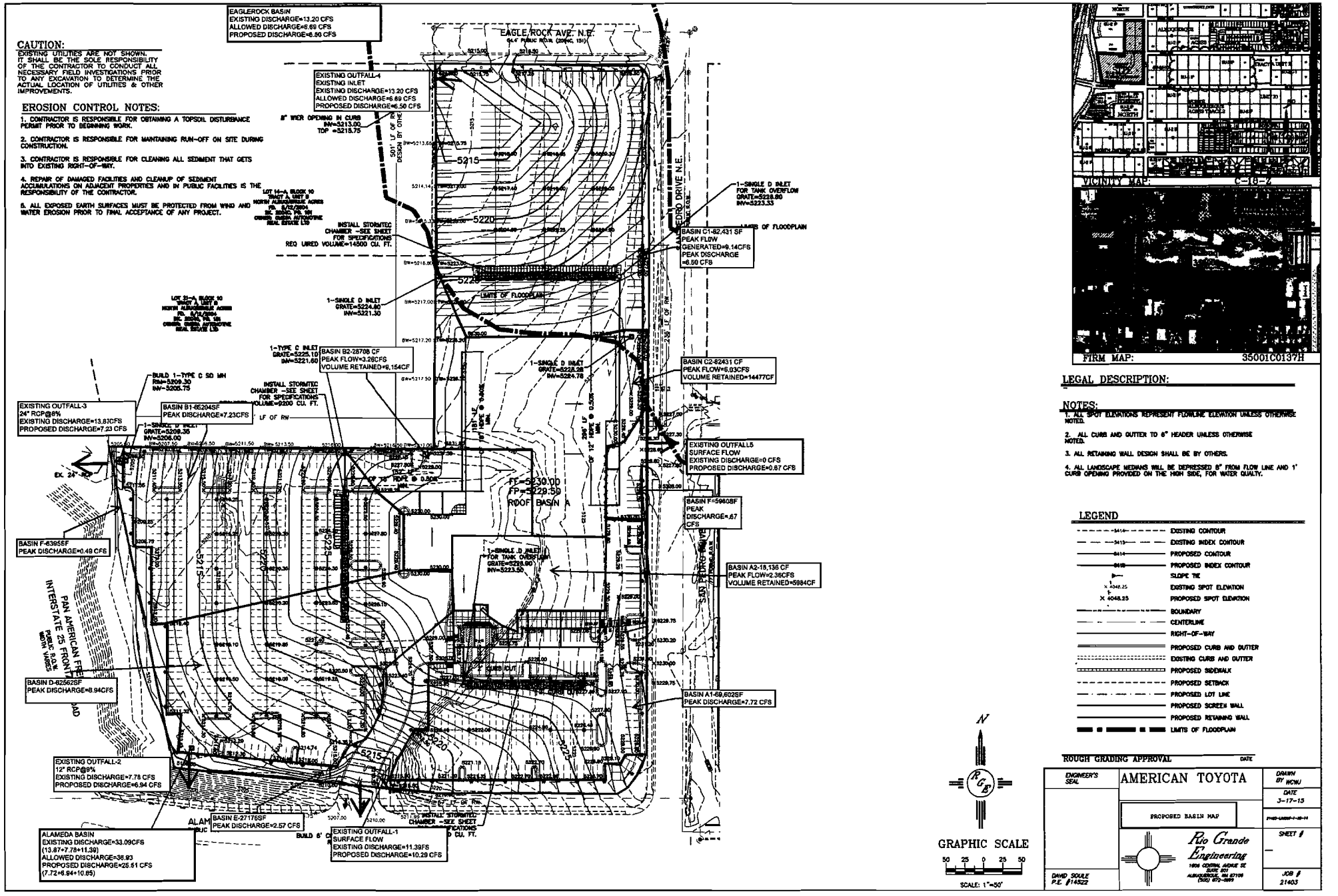
Eb= 0.92 Qb= 2.6

Ec= 1.29 Qc= 3.45

Ed= 2.36 Qd= 5.02

APPENDIX D

PROPOSED HYDROLOGY



CAUTION:

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

EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

LEGAL DESCRIPTION:

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
4. ALL LANDSCAPE MEDIANS WILL BE DEPRESSED 6" FROM FLOW LINE AND 1' CURB OPENING PROVIDED ON THE HIGH SIDE, FOR WATER QUALTY.

LEGEND

- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- PROPOSED CONTOUR
- PROPOSED INDEX CONTOUR
- SLOPE TIE
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY
- PROPOSED CURB AND GUTTER
- EXISTING CURB AND GUTTER
- PROPOSED SIDEWALK
- PROPOSED SETBACK
- PROPOSED LOT LINE
- PROPOSED SCREEN WALL
- PROPOSED RETAINING WALL
- LIMITS OF FLOODPLAIN

N

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

ROUGH GRADING APPROVAL DATE

ENGINEER'S SEAL

DAVID SOULE
P.E. #14322

AMERICAN TOYOTA

PROPOSED BASIN MAP

Rio Grande Engineering
1606 CENTRAL AVENUE SE
SUITE 101
ALBUQUERQUE, NM 87106
(505) 872-0999

DRAWN BY WCWJ

DATE 3-17-15

SHEET # —

JOB # 21403

Weighted E Method

AMERICAN TOYOTA

PROPOSED Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN A1	69602	1.598	0%	0	4.0%	0.064	6.0%	0.09587	90%	1.438	2.238	0.298	7.72	0.490
BASIN A2	18136	0.416	0%	0	0.0%	0.000	0.0%	0	100%	0.416	2.360	0.082	2.09	0.137
BASIN B1	65204	1.497	0%	0	4.0%	0.060	6.0%	0.08981	90%	1.347	2.238	0.279	7.23	0.459
BASIN B2	28708	0.659	0%	0	0.0%	0.000	5.0%	0.03295	95%	0.626	2.307	0.127	3.26	0.210
BASIN C1	82431	1.892	0%	0	4.0%	0.076	6.0%	0.11354	90%	1.703	2.238	0.353	9.14	0.580
BASIN C2	52325	1.201	0%	0	0.0%	0.000	0.0%	0	100%	1.201	2.360	0.236	6.03	0.396
BASIN D	62562	1.436	0%	0	4.0%	0.057	6.0%	0.08617	90%	1.293	2.238	0.268	6.94	0.440
BASIN E	27176	0.624	0%	0	10.0%	0.062	42.0%	0.26203	48%	0.299	1.767	0.092	2.57	0.132
BASIN F	6395	0.147	0%	0	0.0%	0.000	15.0%	0.02202	85%	0.125	1.235	0.015	0.49	0.032
BASIN G	5985	0.137	0%	0	0.0%	0.000	10.0%	0.01374	90%	0.124	2.253	0.026	0.67	0.042
WATER QUALITY	418524	9.608								10580 cf				

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66 Qa= 1.87

Eb= 0.92 Qb= 2.6

Ec= 1.29 Qc= 3.45

Ed= 2.36 Qd= 5.02

Weighted E Method

AMERICAN TOYOTA

OUTFALL #1

PROPOSED Developed Basins

											100-Year, 6-hr.			10-DAY
Basin	Area (sf)	Area (acres)	Treatment A %	(acres)	Treatment B %	(acres)	Treatment C %	(acres)	Treatment D %	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN A1	69602	1.598	0%	0	4.0%	0.064	6.0%	0.09587	90%	1.438	2.238	0.298	7.72	0.490
BASIN A2	18136	0.416	0%	0	0.0%	0.000	0.0%	0	100%	0.416	2.360	0.082	2.09	0.137
BASIN E	27176	0.624	0%	0	0.0%	0.000	0.0%	0	100%	0.624	2.360	0.123	3.13	0.206
WATER QUALITY	2288.704										RESULTANT DISCHARGE		10.85	CFS
											EXISTING		11.39	CFS

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66
Eb= 0.92
Ec= 1.29
Ed= 2.36

Qa= 1.87
Qb= 2.6
Qc= 3.45
Qd= 5.02

STORAGE PROVIDED 6000 CF 0.137741047
STORAGE REQUIRED 5984.88
FIRST FLUSH 2288.704

Weighted E Method

AMERICAN TOYOTA
OUTFALL#2

PROPOSED Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A %	(acres)	Treatment B %	(acres)	Treatment C %	(acres)	Treatment D %	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN D	62562	1.436	0%	0	4.0%	0.057	6.0%	0.08617	90%	1.293	2.238	0.268	6.94	0.440

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66 Qa= 1.87
Eb= 0.92 Qb= 2.6
Ec= 1.29 Qc= 3.45
Ed= 2.36 Qd= 5.02

RESULTANT DISCHARGE 6.94 CFS
EXISTING 7.78 CFS

FIRST FLUSH 1591.668624

STORAGE 1800 0.04132231

Weighted E Method

AMERICAN TOYOTA
OUTFALL 3

PROPOSED Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN B1	65204	1.497	0%	0	4.0%	0.060	6.0%	0.08981	90%	1.347	2.238	0.279	7.23	0.459
BASIN B2	28708	0.659	0%	0	0.0%	0.000	5.0%	0.03295	95%	0.626	2.307	0.127	3.26	0.210

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66
Eb= 0.92
Ec= 1.29
Ed= 2.36

Qa= 1.87
Qb= 2.6
Qc= 3.45
Qd= 5.02

RESULTANT DISCHARGE	7.23 CFS
EXISTING	13.87 CFS
STORAGE PROVIDED	9200 CF
STORAGE REQUIRED	9154.2635 CF
FIRST FLUSH	2435.42567 CF

Weighted E Method

AMERICAN TOYOTA
OUTFALL 4

PROPOSED Developed Basins

											100-Year, 6-hr.			24 hour
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
BASIN C1	82431	1.892	0%	0	4.0%	0.076	6.0%	0.11354	90%	1.703	2.238	0.353	9.14	0.489
BASIN C2	52325	1.201	0%	0	0.0%	0.000	0.0%	0	100%	1.201	2.360	0.236	6.03	0.332
WATER QUALITY	2101.9905	1.8923554												

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66
Eb= 0.92
Ec= 1.29
Ed= 2.36

Qa= 1.87
Qb= 2.6
Qc= 3.45
Qd= 5.02

DIRECT DIS' DISCHARGE	9.14 CFS
EXISTING	13.22 CFS
ALLOWED	6.69
ROUTED DISCHARGE	6.5

STORAGE PROVIDED	14583 cf
STORAGE REQUIRED	14476.5833 CF
FIRST FLUSH	3584.53217 CF

Weighted E Method

AMERICAN TOYOTA
OUTFALL 5

PROPOSED Developed Basins

											100-Year, 6-hr.			24 hour
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
BASIN G	5985	0.137	0%	0	0.0%	0.000	10.0%	0.01374	90%	0.124	2.253	0.026	0.67	0.036
WATER QUALITY	152.6175	0.1373967												

DIRECT DISCHARGE 0.67 CFS
EXISTING 0.00 CFS

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 3)

Ea= 0.66 Qa= 1.87
Eb= 0.92 Qb= 2.6
Ec= 1.29 Qc= 3.45
Ed= 2.36 Qd= 5.02

APPENDIX E

POND ROUTING AND AHYMO

VOLUME CALCULATIONS

PARKING LOT POND

	ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME (AC-FT)	Q (CFS)
POND BOTTOM	13	0	1		
	13.5	0.5	1277	0.00733471	0.69879828
	14.00	1.00	4995.00	0.0359965	1.9765
	14.50	1.50	7174.0000	0.06984128	3.63106236
	15.00	2.00	10384.0000	0.10077066	5.59038621
	15.50	2.50	12600.0000	0.13191232	7.81280224

Orifice Equation

Q=CLH^1.5

C =	2.95
L(F)	0.67
H (Ft) =	VARIES

```
*S      AHYMO - NORTH TRAMWAY ESTATES
*S              POND ROUTING

START                 TIME=0.0  PUNCH CODE=0


RAINFALL              TYPE=2
                      QUARTER=0.0     ONE= 2.14 IN
                      SIX= 2.60 IN    DAY= 3.10 IN    DT = 0.05 HR



COMPUTE NM HYD        ID=1  HYD NO=101  DA= .00296 SQ MI
                      PER A=00  PER B=4  PER C=6  PER D=90
                      TP=-.177  MASSRAIN=-1


PRINT HYD             ID=1  CODE=24


* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR       ID=2   HYD NO=102   INFLOW=1   CODE=24
                      OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
                         0.01             0.001          13.00
                         0.69             0.007          13.50
                         1.98             0.036          14.00
                         3.63             0.069          14.50
                         5.59             0.101          15.00
                         7.81             0.132          15.50



FINISH
```

```
       AHYMO PROGRAM (AHYMO-S4)                        - Version: S4.01a - Rel: 01a
            RUN DATE (MON/DAY/YR) = 03/06/2015
            START TIME (HR:MIN:SEC) = 13:27:25     USER NO.=
RioGrandeSingleA41963517
            INPUT FILE = ngs\Owner\Desktop\2013\13151-AMERICAN
TOYOTA\Drainage\SUBMITTAL 030615\AHYMO.OUT


          AHYMO PROGRAM (AHYMO-S4)                          - Version: S4.01a - Rel: 01a
               RUN DATE (MON/DAY/YR) = 03/06/2015
               START TIME (HR:MIN:SEC) = 13:02:52     USER NO.= RioGrandeSingleA41
               INPUT FILE = ents and Settings\Owner\Desktop\2013\13151-AMERICAN TO


       *S      AHYMO - NORTH TRAMWAY ESTATES
       *S              POND ROUTING

       START                TIME=0.0  PUNCH CODE=0


       RAINFALL             TYPE=2
                            QUARTER=0.0    ONE= 2.14 IN
                            SIX= 2.60 IN   DAY= 3.10 IN   DT = 0.05 HR



                       24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIV
                       DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                         0.0000  0.0031  0.0062  0.0096  0.0133  0.0171  0.0214
                         0.0274  0.0368  0.0470  0.0575  0.0690  0.0807  0.0927
                         0.1052  0.1178  0.1320  0.1467  0.1627  0.1887  0.2196
                         0.2611  0.3081  0.3661  0.4435  0.5307  0.6811  0.9149
                         1.3155  1.5971  1.8192  1.9308  2.0287  2.0989  2.1549
                         2.2036  2.2393  2.2720  2.2991  2.3181  2.3331  2.3464
                         2.3590  2.3700  2.3804  2.3905  2.4002  2.4083  2.4129
                         2.4175  2.4219  2.4261  2.4303  2.4343  2.4383  2.4422
                         2.4459  2.4495  2.4531  2.4566  2.4601  2.4634  2.4667
                         2.4699  2.4731  2.4762  2.4792  2.4822  2.4851  2.4880
                         2.4909  2.4937  2.4965  2.4992  2.5019  2.5046  2.5072
                         2.5098  2.5124  2.5149  2.5175  2.5200  2.5224  2.5249
                         2.5273  2.5296  2.5320  2.5343  2.5366  2.5389  2.5412
                         2.5434  2.5456  2.5478  2.5500  2.5521  2.5542  2.5564
                         2.5584  2.5605  2.5626  2.5646  2.5666  2.5686  2.5706
                         2.5725  2.5745  2.5764  2.5783  2.5802  2.5821  2.5839
                         2.5858  2.5876  2.5894  2.5912  2.5930  2.5948  2.5965
                         2.5983  2.6000  2.6017  2.6035  2.6052  2.6069  2.6086
                         2.6104  2.6121  2.6138  2.6155  2.6172  2.6190  2.6207
                         2.6224  2.6241  2.6258  2.6275  2.6292  2.6309  2.6326
                         2.6343  2.6360  2.6377  2.6394  2.6411  2.6428  2.6445
                         2.6461  2.6478  2.6495  2.6512  2.6529  2.6545  2.6562
                         2.6579  2.6595  2.6612  2.6629  2.6645  2.6662  2.6679
                         2.6695  2.6712  2.6728  2.6745  2.6761  2.6778  2.6794
                         2.6811  2.6827  2.6844  2.6860  2.6876  2.6893  2.6909
                         2.6925  2.6942  2.6958  2.6974  2.6990  2.7007  2.7023
                         2.7039  2.7055  2.7071  2.7087  2.7104  2.7120  2.7136
                         2.7152  2.7168  2.7184  2.7200  2.7216  2.7232  2.7248
                         2.7264  2.7279  2.7295  2.7311  2.7327  2.7343  2.7359
                         2.7374  2.7390  2.7406  2.7422  2.7437  2.7453  2.7469
                         2.7484  2.7500  2.7516  2.7531  2.7547  2.7562  2.7578
                         2.7593  2.7609  2.7624  2.7640  2.7655  2.7671  2.7686
```

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

```
COMPUTE NM HYD       ID=1  HYD NO=101  DA= .00296 SQ MI
                     PER A=00  PER B=4  PER C=6  PER D=90
                     TP=-.177  MASSRAIN=-1


     K =  0.096465HR    TP =  0.177000HR    K/TP RATIO =  0.545000     SHAPE
     UNIT PEAK =   7.9209    CFS   UNIT VOLUME =   0.9984       B =   526.28
     AREA =     0.002664 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 I
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT


     K =  0.157759HR    TP =  0.177000HR    K/TP RATIO =  0.891296     SHAPE
     UNIT PEAK =  0.59158    CFS   UNIT VOLUME =   0.9789       B =   353.75
     AREA =     0.000296 SQ MI    IA =   0.41000 INCHES    INF =   0.99800 I
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT

PRINT HYD            ID=1  CODE=24

                                   PARTIAL HYDROGRAPH   101.00

     TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS
     0.000      0.0          5.000      0.0         10.000      0.1
     1.000      0.4          6.000      0.1         11.000      0.1
```

2.000	1.7	7.000	0.1	12.000	0.1
3.000	0.1	8.000	0.1	13.000	0.1
4.000	0.0	9.000	0.1	14.000	0.0

RUNOFF VOLUME = 2.68726 INCHES = 0.4242 ACRE-FEET
PEAK DISCHARGE RATE = 8.46 CFS AT 1.550 HOURS BASIN AREA = 0

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR ID=2 HYD NO=102 INFLOW=1 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.01	0.001	13.00
0.69	0.007	13.50
1.98	0.036	14.00
3.63	0.069	14.50
5.59	0.101	15.00
7.81	0.132	15.50

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	12.99	0.001	0.00
1.20	1.13	13.51	0.007	0.71
2.40	0.54	13.76	0.022	1.37
3.60	0.05	13.03	0.001	0.05
4.80	0.05	13.03	0.001	0.04
6.00	0.06	13.03	0.001	0.06
7.20	0.06	13.04	0.001	0.06
8.40	0.06	13.03	0.001	0.06
9.60	0.06	13.03	0.001	0.06
10.80	0.05	13.03	0.001	0.05
12.00	0.05	13.03	0.001	0.05
13.20	0.05	13.03	0.001	0.05
14.40	0.05	13.03	0.001	0.05
15.60	0.05	13.03	0.001	0.05
16.80	0.05	13.03	0.001	0.05
18.00	0.04	13.03	0.001	0.04
19.20	0.04	13.02	0.001	0.04
20.40	0.04	13.02	0.001	0.04
21.60	0.04	13.02	0.001	0.04
22.80	0.04	13.02	0.001	0.04
24.00	0.04	13.02	0.001	0.04
25.20	0.00	13.00	0.001	0.01
26.40	0.00	13.00	0.001	0.01
27.60	0.00	13.00	0.001	0.01
28.80	0.00	13.00	0.001	0.01
30.00	0.00	13.00	0.001	0.01
31.20	0.00	13.00	0.001	0.01
32.40	0.00	13.00	0.001	0.01
33.60	0.00	13.00	0.001	0.01
34.80	0.00	13.00	0.001	0.01
36.00	0.00	13.00	0.001	0.01

37.20	0.00	13.00	0.001	0.01
38.40	0.00	13.00	0.001	0.01
39.60	0.00	13.00	0.001	0.01
40.80	0.00	13.00	0.001	0.01
42.00	0.00	13.00	0.001	0.01
43.20	0.00	13.00	0.001	0.01
44.40	0.00	13.00	0.001	0.01
45.60	0.00	13.00	0.001	0.01
46.80	0.00	13.00	0.001	0.01
48.00	0.00	13.00	0.001	0.01
49.20	0.00	13.00	0.001	0.01
50.40	0.00	13.00	0.001	0.01
51.60	0.00	13.00	0.001	0.01
52.80	0.00	13.00	0.001	0.01
54.00	0.00	13.00	0.001	0.01
55.20	0.00	13.00	0.001	0.01
56.40	0.00	13.00	0.001	0.01
57.60	0.00	13.00	0.001	0.01
58.80	0.00	13.00	0.001	0.01
60.00	0.00	13.00	0.001	0.01
61.20	0.00	13.00	0.001	0.01
62.40	0.00	13.00	0.001	0.01
63.60	0.00	13.00	0.001	0.01
64.80	0.00	13.00	0.001	0.01
66.00	0.00	13.00	0.001	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
67.20	0.00	13.00	0.001	0.01
68.40	0.00	13.00	0.001	0.01
69.60	0.00	13.00	0.001	0.01
70.80	0.00	13.00	0.001	0.01
72.00	0.00	13.00	0.001	0.01
73.20	0.00	13.00	0.001	0.01
74.40	0.00	13.00	0.001	0.01
75.60	0.00	13.00	0.001	0.01
76.80	0.00	13.00	0.001	0.01
78.00	0.00	13.00	0.001	0.01
79.20	0.00	13.00	0.001	0.01
80.40	0.00	13.00	0.001	0.01
81.60	0.00	13.00	0.001	0.01
82.80	0.00	13.00	0.001	0.01
84.00	0.00	13.00	0.001	0.01
85.20	0.00	13.00	0.001	0.01
86.40	0.00	13.00	0.001	0.01
87.60	0.00	13.00	0.001	0.01
88.80	0.00	13.00	0.001	0.01
90.00	0.00	13.00	0.001	0.01
91.20	0.00	13.00	0.001	0.01
92.40	0.00	13.00	0.001	0.01
93.60	0.00	13.00	0.001	0.01
94.80	0.00	13.00	0.001	0.01
96.00	0.00	13.00	0.001	0.01
97.20	0.00	13.00	0.001	0.01
98.40	0.00	13.00	0.001	0.01
99.60	0.00	13.00	0.001	0.01
100.80	0.00	13.00	0.001	0.01
102.00	0.00	13.00	0.001	0.01
103.20	0.00	13.00	0.001	0.01
104.40	0.00	13.00	0.001	0.01
105.60	0.00	13.00	0.001	0.01
106.80	0.00	13.00	0.001	0.01

108.00	0.00	13.00	0.001	0.01
109.20	0.00	13.00	0.001	0.01
110.40	0.00	13.00	0.001	0.01
111.60	0.00	13.00	0.001	0.01
112.80	0.00	13.00	0.001	0.01
114.00	0.00	13.00	0.001	0.01
115.20	0.00	13.00	0.001	0.01
116.40	0.00	13.00	0.001	0.01
117.60	0.00	13.00	0.001	0.01
118.80	0.00	13.00	0.001	0.01
120.00	0.00	13.00	0.001	0.01
121.20	0.00	13.00	0.001	0.01
122.40	0.00	13.00	0.001	0.01
123.60	0.00	13.00	0.001	0.01
124.80	0.00	13.00	0.001	0.01
126.00	0.00	13.00	0.001	0.01
127.20	0.00	13.00	0.001	0.01
128.40	0.00	13.00	0.001	0.01
129.60	0.00	13.00	0.001	0.01
130.80	0.00	13.00	0.001	0.01
132.00	0.00	13.00	0.001	0.01
133.20	0.00	13.00	0.001	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
134.40	0.00	13.00	0.001	0.01
135.60	0.00	13.00	0.001	0.01
136.80	0.00	13.00	0.001	0.01
138.00	0.00	13.00	0.001	0.01
139.20	0.00	13.00	0.001	0.01
140.40	0.00	13.00	0.001	0.01
141.60	0.00	13.00	0.001	0.01
142.80	0.00	13.00	0.001	0.01
144.00	0.00	13.00	0.001	0.01
145.20	0.00	13.00	0.001	0.01
146.40	0.00	13.00	0.001	0.01
147.60	0.00	13.00	0.001	0.01
148.80	0.00	13.00	0.001	0.01
150.00	0.00	13.00	0.001	0.01
151.20	0.00	13.00	0.001	0.01
152.40	0.00	13.00	0.001	0.01
153.60	0.00	13.00	0.001	0.01
154.80	0.00	13.00	0.001	0.01
156.00	0.00	13.00	0.001	0.01
157.20	0.00	13.00	0.001	0.01
158.40	0.00	13.00	0.001	0.01
159.60	0.00	13.00	0.001	0.01
160.80	0.00	13.00	0.001	0.01
162.00	0.00	13.00	0.001	0.01
163.20	0.00	13.00	0.001	0.01
164.40	0.00	13.00	0.001	0.01
165.60	0.00	13.00	0.001	0.01
166.80	0.00	13.00	0.001	0.01
168.00	0.00	13.00	0.001	0.01
169.20	0.00	13.00	0.001	0.01
170.40	0.00	13.00	0.001	0.01
171.60	0.00	13.00	0.001	0.01
172.80	0.00	13.00	0.001	0.01
174.00	0.00	13.00	0.001	0.01
175.20	0.00	13.00	0.001	0.01
176.40	0.00	13.00	0.001	0.01
177.60	0.00	13.00	0.001	0.01

178.80	0.00	13.00	0.001	0.01
180.00	0.00	13.00	0.001	0.01
181.20	0.00	13.00	0.001	0.01
182.40	0.00	13.00	0.001	0.01
183.60	0.00	13.00	0.001	0.01
184.80	0.00	13.00	0.001	0.01
186.00	0.00	13.00	0.001	0.01
187.20	0.00	13.00	0.001	0.01
188.40	0.00	13.00	0.001	0.01
189.60	0.00	13.00	0.001	0.01
190.80	0.00	13.00	0.001	0.01
192.00	0.00	13.00	0.001	0.01
193.20	0.00	13.00	0.001	0.01
194.40	0.00	13.00	0.001	0.01
195.60	0.00	13.00	0.001	0.01
196.80	0.00	13.00	0.001	0.01
198.00	0.00	13.00	0.001	0.01
199.20	0.00	13.00	0.001	0.01

PEAK DISCHARGE = 5.575 CFS - PEAK OCCURS AT HOUR 1.70
MAXIMUM WATER SURFACE ELEVATION = 14.996
MAXIMUM STORAGE = 0.1008 AC-FT INCREMENTAL TIME= 0.050000HRS

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 13:02:52

APPENDIX F

HYDRAULIC CALCULATIONS

Concrete Channel

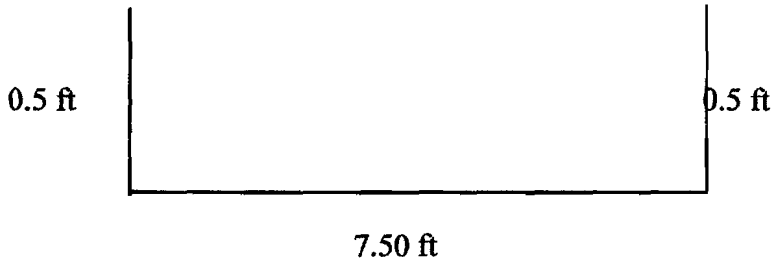
Weir Equation:

$$Q=CLH^{3/2}$$

Q= 7.75 cfs
C = 2.95
H = 0.5 ft
L = Length of weir

$$L = \frac{7.75}{2.95(0.5)^{3/2}}$$

L = 7.43 ft
Use 7.50 feet for length of weir



DROP INLET CALCULATIONS

POND	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
1A	SINGLE	4.43	7.78	0.1330	0.5

ORIFICE EQUATION

Q = CA sqrt(2gH) H=(Q/CA)^2)/2G

C = 0.6

g = 32.2

INLET GRATE=40"X25"

CALCULATE FOR BARS

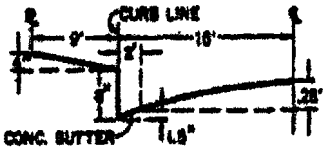
40-(11*.5) 34.5"

25-(13*.5) 18.5"

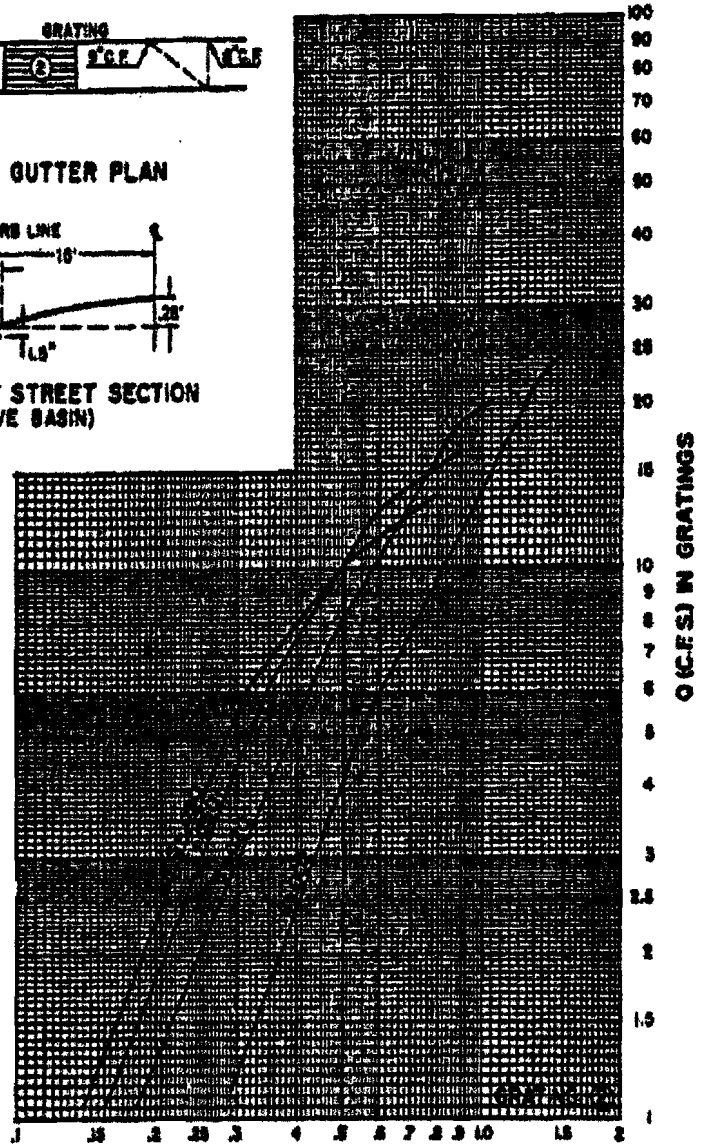
OPENING IS 4.43 SF PER GRATE

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

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



inlets on 5% slope
capacity 10cfs

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
18HDPE	18	1	1.77	0.375	9.13	6.03	3.41

Manning's Equation:

Q = 1.49/n * A * R^(2/3) * S^(1/2)

A = Area
R = D/4
S = Slope
n = 0.015

APPENDIX G

STORM TECH DETAILS

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	PEGGY GRAHAM 720-982-6303 PEGGY.GRAHAM@ADS-PIPE.COM
ADS SALES REP:	PETER NICHOLS 505-301-5604 PETER.NICHOLS@ADS-PIPE.COM
PROJECT NO:	82394 REV2

ADVANCED DRAINAGE SYSTEMS, INC.

AMERICAN TOYOTA

ALBUQUERQUE, NM

STORMWATER CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTITIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT (SYSTEM #1)

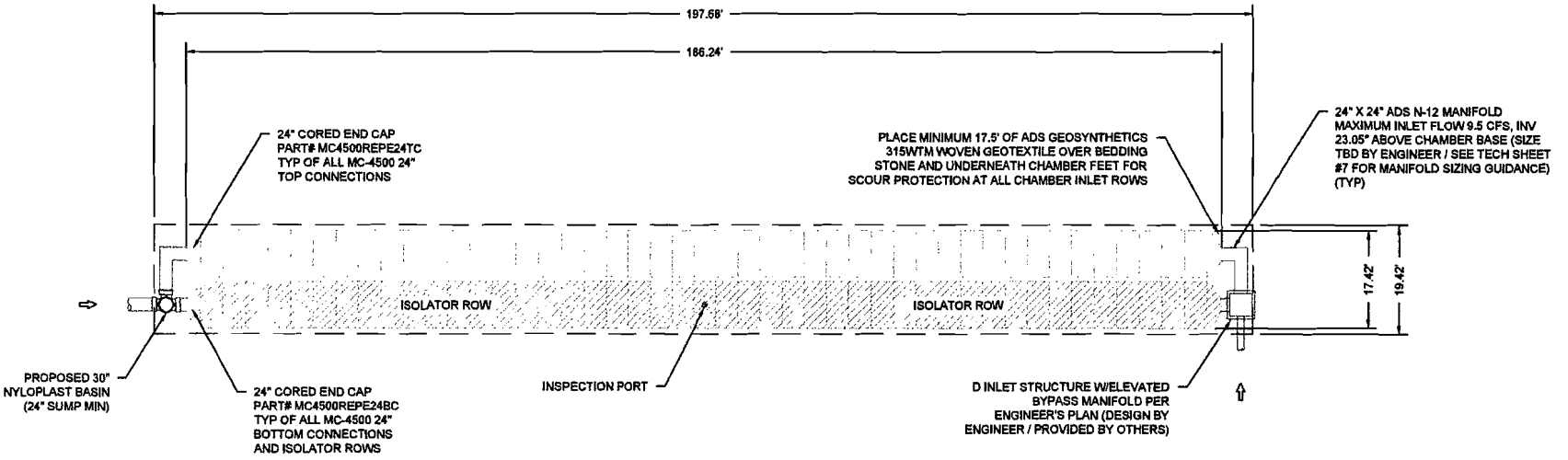
(90) STORMTECH MC-4500 CHAMBERS
(4) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12" COVER STONE, 9" BASE STONE, 30% STONE VOID
INSTALLED SYSTEM VOLUME (PERIMETER STONE INCLUDED): 14,583 CF
AREA OF SYSTEM: 3,839 FT²
PERIMETER OF SYSTEM: 434 FT

PROPOSED ELEVATIONS (SYSTEM #1)

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	5229.00
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	5224.50
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	5224.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	5224.00
TOP OF STONE:	5223.00
TOP OF CHAMBER:	5222.00
24" TOP MANIFOLD INVERT:	5218.92
24" ISOLATOR ROW INVERT:	5217.19
BOTTOM OF CHAMBER:	5217.00
BOTTOM OF STONE:	5216.25

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.



REV	DRW	CHK	DESCRIPTION
1/29/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/19/15	WCM	KMB	SYSTEM REMOVED

AMERICAN TOYOTA
ALBUQUERQUE, NM

DATE: 12/30/14 | DRAWN: WCM
PROJECT #: 82394 | CHECKED: GFI

StormTech
Detention Retention Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL, CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

0 20' 40'

PROPOSED LAYOUT (SYSTEM #2)

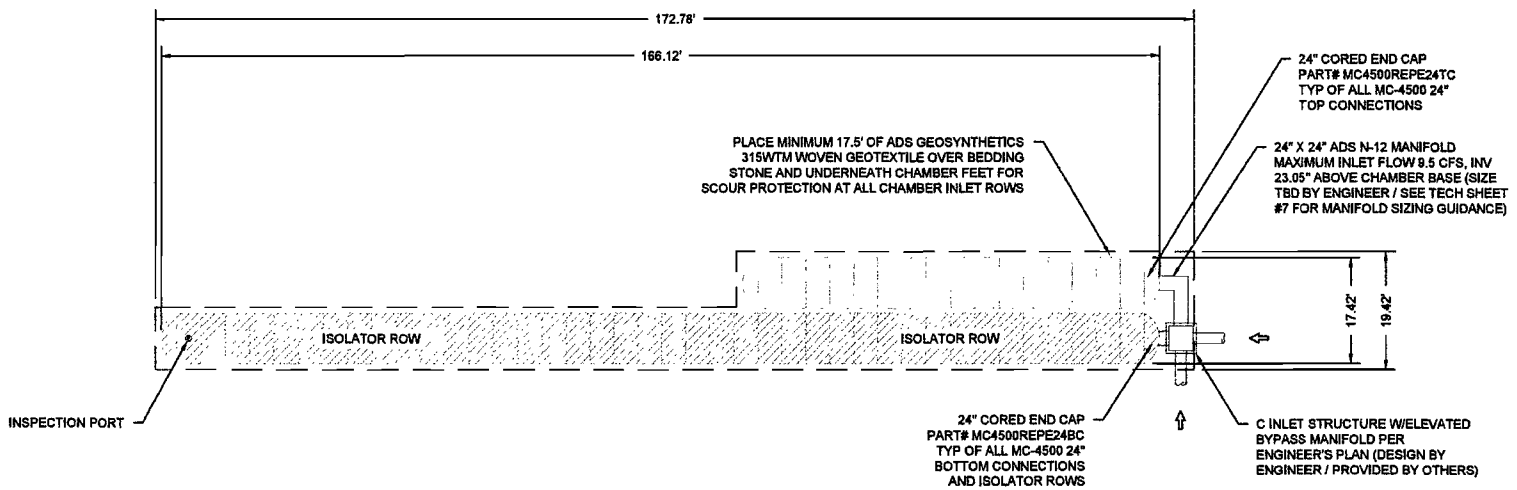
(56) STORMTECH MC-4500 CHAMBERS
(4) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12" COVER STONE, 9" BASE STONE, 30% STONE VOID
INSTALLED SYSTEM VOLUME (PERIMETER STONE INCLUDED): 9,290 CF
AREA OF SYSTEM: 2,477 FT²
PERIMETER OF SYSTEM: 384 FT

PROPOSED ELEVATIONS (SYSTEM #2)

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	5229.00
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	5224.50
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	5224.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	5224.00
TOP OF STONE:	5223.00
TOP OF CHAMBER:	5222.00
24" TOP MANIFOLD INVERT:	5218.92
24" ISOLATOR ROW INVERT:	5217.19
BOTTOM OF CHAMBER:	5217.00
BOTTOM OF STONE:	5216.25

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.



REV	DRW	CHK	DESCRIPTION
1/28/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/16/15	WCM	KMS	SYSTEM REMOVED

AMERICAN TOYOTA
ALBUQUERQUE, NM

DATE: 12/30/14 DRAWN: WCM
PROJECT #: 82394 CHECKED: GFI

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

0 20' 40'

StormTech
Detention Retention Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

PROPOSED LAYOUT (SYSTEM #3)

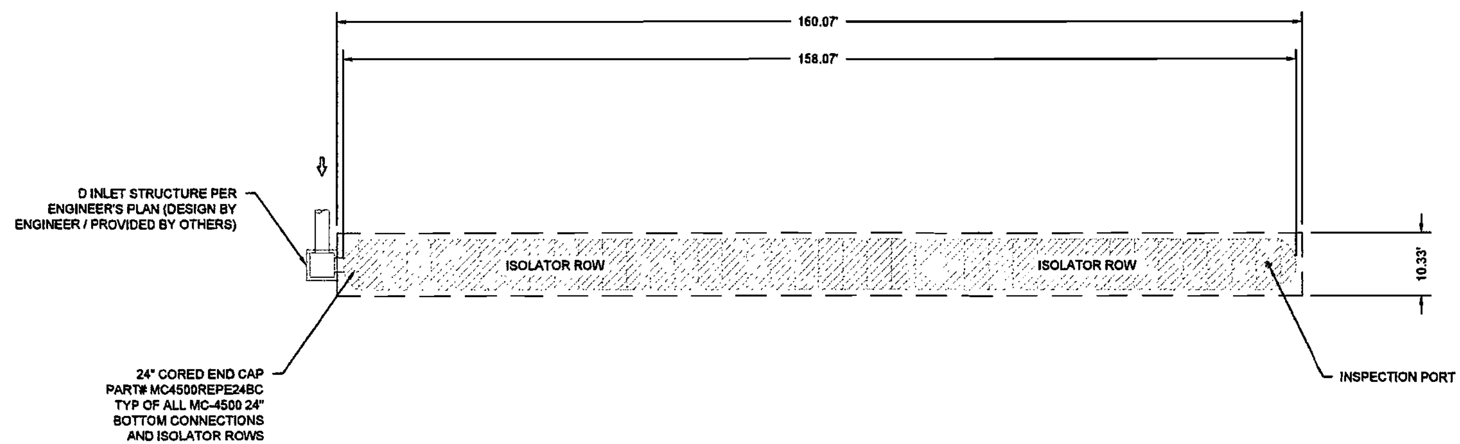
(38) STORMTECH MC-4500 CHAMBERS
(2) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12" COVER STONE, 9" BASE STONE, 30% STONE VOID
INSTALLED SYSTEM VOLUME (PERIMETER STONE INCLUDED): 6,232 CF
AREA OF SYSTEM: 1,654 FT²
PERIMETER OF SYSTEM: 341 FT

PROPOSED ELEVATIONS (SYSTEM #3)

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	5230.00
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	5225.50
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	5225.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	5225.00
TOP OF STONE:	5224.00
TOP OF CHAMBER:	5223.00
24" ISOLATOR ROW INVERT:	5218.19
BOTTOM OF CHAMBER:	5218.00
BOTTOM OF STONE:	5217.25

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.



AMERICAN TOYOTA
ALBUQUERQUE, NM

DATE: 12/30/14	DRAWN: WCM
PROJECT #: 82394	CHECKED: GFI

REV	DRW	CHK	DESCRIPTION
1/28/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/16/15	WCM	KMS	SYSTEM REMOVED

StormTech
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

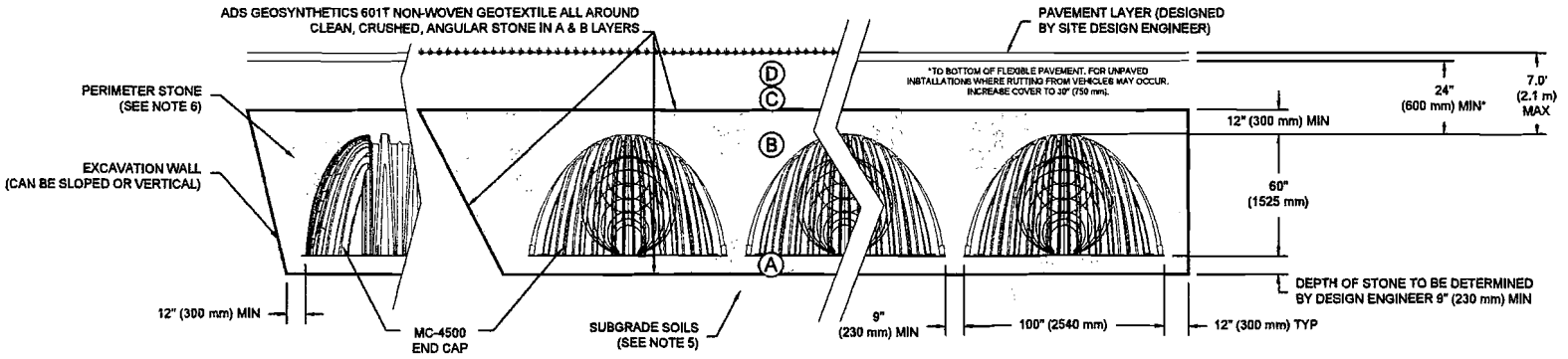
ADS ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

0 20' 40'

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

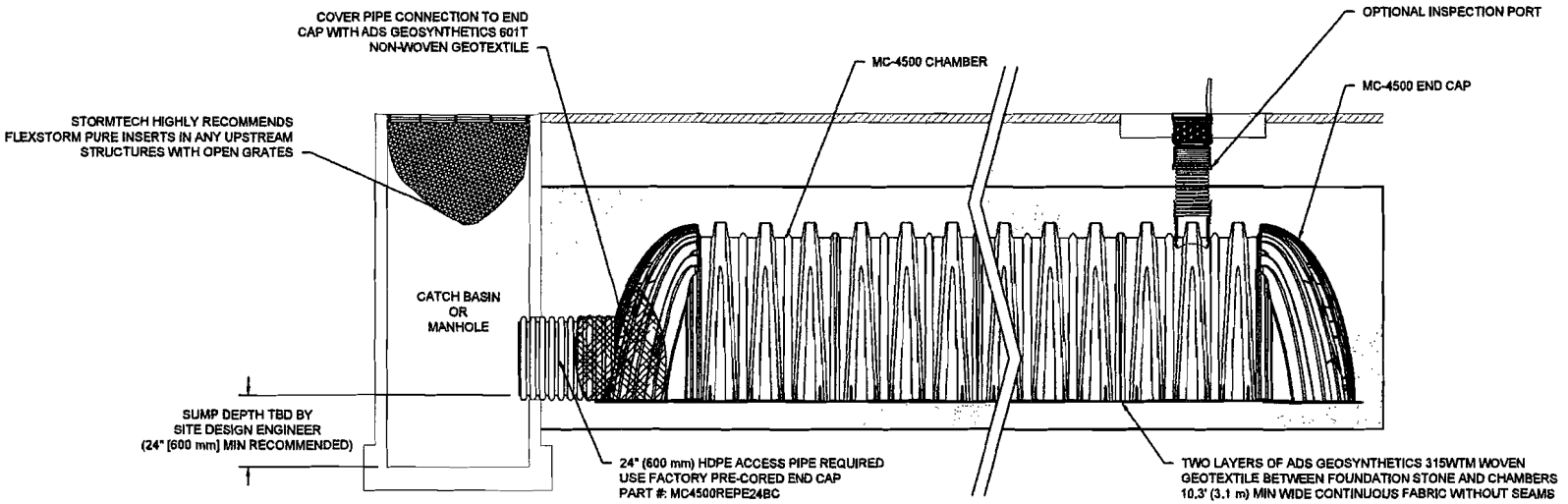
AMERICAN TOYOTA
ALBUQUERQUE, NM

DATE: 12/30/14 | DRAWN: WCM | CHECKED: GFI | PROJECT #: 82394

REV	DRW	CHK	DESCRIPTION
1/26/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/16/15	WCM	KMS	SYSTEM REMOVED

StormTech
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



MC-4500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

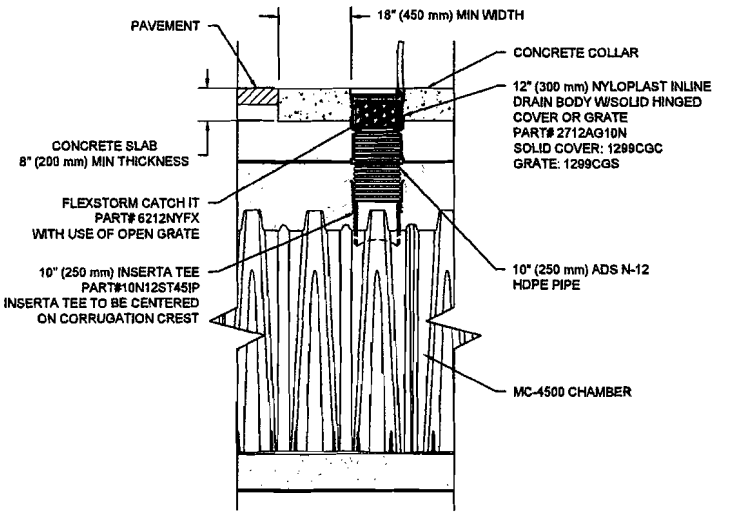
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



MC-4500 INSPECTION PORT DETAIL
NTS

REV	DRW	CHK	DESCRIPTION
1/26/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/19/15	WCM	KMS	SYSTEM REMOVED

AMERICAN TOYOTA
ALBUQUERQUE, NM

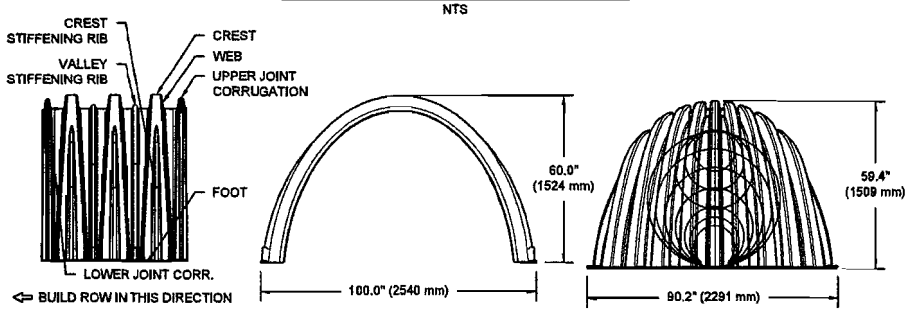
DATE: 12/30/14 DRAWN: WCM
PROJECT #: 82394 CHECKED: GFI

StormTech
Detention/Retention Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL, CT | 06067
(860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT	130.0 lbs.	(59.0 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	90.2" X 59.4" X 30.7"	(2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35.7 CUBIC FEET	(1.01 m³)
MINIMUM INSTALLED STORAGE*	108.7 CUBIC FEET	(3.08 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

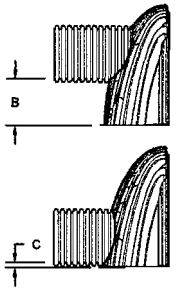
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	B	C
MC4500REPE06T	6" (150 mm)	42.54" (1.081 m)	—
MC4500REPE06B		—	0.86" (22 mm)
MC4500REPE08T	8" (200 mm)	40.50" (1.029 m)	—
MC4500REPE08B		—	1.01" (26 mm)
MC4500REPE10T	10" (250 mm)	38.37" (975 mm)	—
MC4500REPE10B		—	1.33" (34 mm)
MC4500REPE12T	12" (300 mm)	35.69" (907 mm)	—
MC4500REPE12B		—	1.55" (39 mm)
MC4500REPE15T	15" (375 mm)	32.72" (831 mm)	—
MC4500REPE15B		—	1.70" (43 mm)
MC4500REPE18TC	18" (450 mm)	29.36" (746 mm)	—
MC4500REPE18BC		—	1.97" (50 mm)
MC4500REPE24TC	24" (600 mm)	23.05" (585 mm)	—
MC4500REPE24BC		—	2.26" (57 mm)
MC4500REPE30BC	30" (750 mm)	—	2.95" (75 mm)
MC4500REPE36BC	36" (900 mm)	—	3.25" (83 mm)
MC4500REPE42BC	42" (1050 mm)	—	3.55" (90 mm)

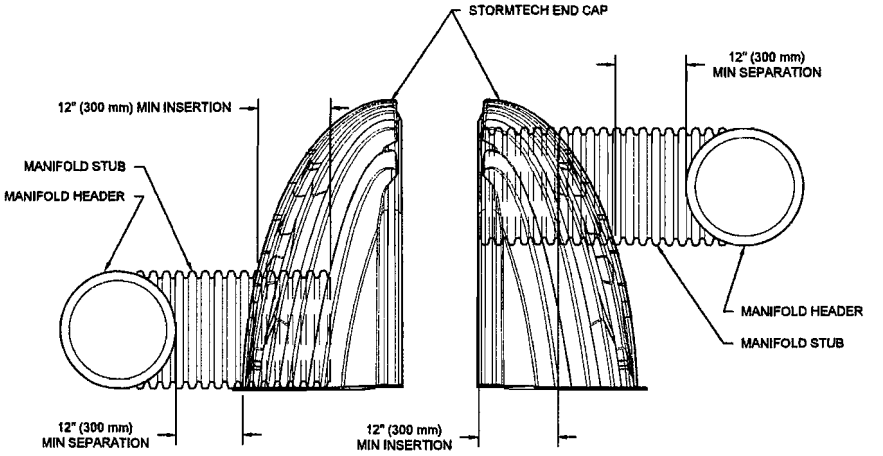
NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS.
CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm)
THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHTEST POSSIBLE FOR THE PIPE SIZE.



MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

REV	DRW	CHK	DESCRIPTION
1/28/15	HCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/18/15	WCM	KMS	SYSTEM REMOVED

AMERICAN TOYOTA
ALBUQUERQUE, NM

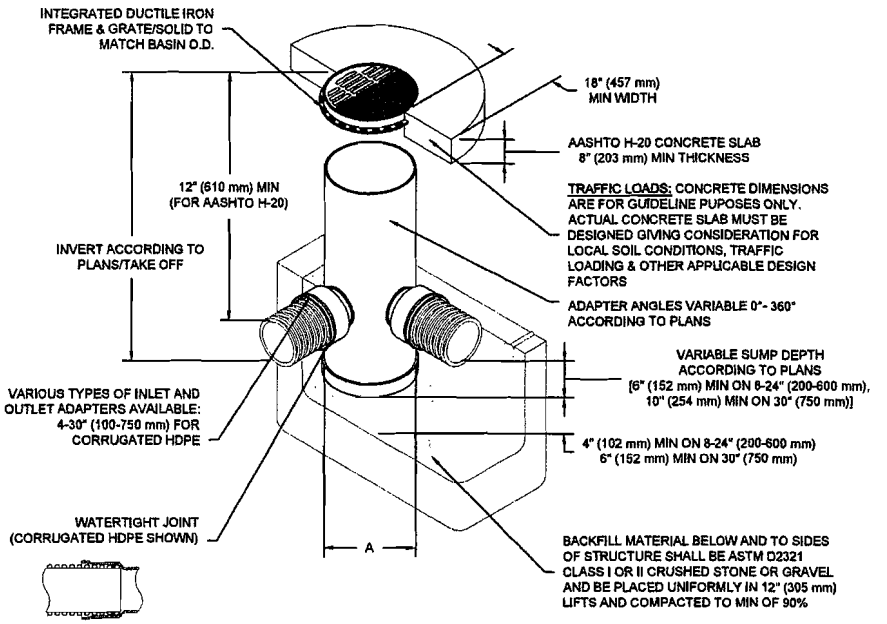
DATE: 12/30/14 | DRAWN: WCM | PROJECT #: 82394 | CHECKED: GFI

4DS. ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

StormTech
Detention | Retention | Water Quality
70 HAWKINS ROAD, SUITE 3 | ROCKY HILL, CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

REV	DRW	CHK	DESCRIPTION
1/28/15	WCM	KAP	NEW STORAGE VOLUMES AND STONE VOID
3/16/15	WCM	KMB	SYSTEM REMOVED

AMERICAN TOYOTA
ALBUQUERQUE, NM

DATE: 12/30/14 DRAWN: WCM

PROJECT #: 82394 CHECKED: GFI

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

3135 VERONA AVE
BUFORD, GA 30518
PH: (770) 932-2949
FAX: (770) 932-2490
www.nyloplast-us.com
Nyloplast

Project: **82394 - System #1 - REV2**

Chamber Model - [redacted]
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) - %
Base of Stone Elevation - ft
Amount of Stone Above Chambers - in
Amount of Stone Below Chambers - in
Area of system - sf Min. Area - 3420 sf min. area

[redacted]								
81	0.00	0.00	0.00	0.00	95.98	95.98	14583.88	5223.00
80	0.00	0.00	0.00	0.00	95.98	95.98	14487.90	5222.92
79	0.00	0.00	0.00	0.00	95.98	95.98	14391.93	5222.83
78	0.00	0.00	0.00	0.00	95.98	95.98	14295.95	5222.75
77	0.00	0.00	0.00	0.00	95.98	95.98	14199.98	5222.67
76	0.00	0.00	0.00	0.00	95.98	95.98	14104.00	5222.58
75	0.00	0.00	0.00	0.00	95.98	95.98	14008.03	5222.50
74	0.00	0.00	0.00	0.00	95.98	95.98	13912.05	5222.42
73	0.00	0.00	0.00	0.00	95.98	95.98	13816.08	5222.33
72	0.00	0.00	0.00	0.00	95.98	95.98	13720.10	5222.25
71	0.00	0.00	0.00	0.00	95.98	95.98	13624.13	5222.17
70	0.00	0.00	0.00	0.00	95.98	95.98	13528.15	5222.08
69	0.04	0.00	3.69	0.00	94.87	98.56	13432.18	5222.00
68	0.12	0.01	10.45	0.04	92.83	103.32	13333.62	5221.92
67	0.16	0.03	14.83	0.11	91.50	106.43	13230.30	5221.83
66	0.21	0.05	18.79	0.19	90.28	109.26	13123.88	5221.75
65	0.27	0.07	24.15	0.27	88.65	113.07	13014.62	5221.67
64	0.45	0.09	40.75	0.35	83.64	124.75	12901.55	5221.58
63	0.67	0.11	59.87	0.45	77.88	138.20	12776.80	5221.50
62	0.80	0.14	71.91	0.57	74.23	146.71	12638.60	5221.42
61	0.91	0.17	81.73	0.67	71.25	153.66	12491.89	5221.33
60	1.00	0.19	90.26	0.77	68.67	159.69	12338.23	5221.25
59	1.09	0.22	97.86	0.86	66.36	165.08	12178.54	5221.17
58	1.16	0.24	104.71	0.97	64.27	169.95	12013.46	5221.08
57	1.23	0.27	111.06	1.08	62.33	174.47	11843.51	5221.00
56	1.30	0.30	116.97	1.19	60.53	178.69	11669.03	5220.92
55	1.36	0.32	122.49	1.29	58.84	182.63	11490.35	5220.83
54	1.42	0.35	127.68	1.39	57.25	186.33	11307.72	5220.75
53	1.47	0.37	132.60	1.48	55.75	189.83	11121.39	5220.67
52	1.53	0.39	137.26	1.58	54.32	193.16	10931.56	5220.58
51	1.57	0.42	141.70	1.67	52.96	196.34	10738.40	5220.50
50	1.62	0.44	145.92	1.76	51.67	199.36	10542.06	5220.42
49	1.67	0.46	149.96	1.85	50.43	202.24	10342.70	5220.33
48	1.71	0.48	153.82	1.94	49.25	205.00	10140.46	5220.25
47	1.75	0.50	157.51	2.02	48.12	207.64	9935.46	5220.17
46	1.79	0.53	161.04	2.10	47.03	210.17	9727.81	5220.08
45	1.83	0.55	164.45	2.18	45.99	212.61	9517.64	5220.00
44	1.86	0.56	167.71	2.26	44.98	214.95	9305.03	5219.92
43	1.90	0.58	170.85	2.33	44.02	217.20	9090.08	5219.83
42	1.93	0.60	173.87	2.41	43.09	219.37	8872.87	5219.75
41	1.96	0.62	176.77	2.48	42.20	221.45	8653.51	5219.67
40	2.00	0.64	179.56	2.55	41.34	223.45	8432.06	5219.58
39	2.03	0.66	182.25	2.62	40.51	225.39	8208.61	5219.50
38	2.05	0.67	184.84	2.69	39.71	227.25	7983.22	5219.42
37	2.08	0.69	187.33	2.76	38.95	229.04	7755.97	5219.33
36	2.11	0.71	189.73	2.83	38.21	230.76	7526.93	5219.25
35	2.13	0.72	192.05	2.90	37.49	232.43	7296.16	5219.17
34	2.16	0.74	194.28	2.96	36.80	234.04	7063.73	5219.08
33	2.18	0.76	196.43	3.02	36.14	235.59	6829.69	5219.00
32	2.21	0.77	198.50	3.09	35.50	237.08	6594.09	5218.92
31	2.23	0.79	200.49	3.15	34.88	238.52	6357.01	5218.83
30	2.25	0.80	202.40	3.21	34.29	239.90	6118.49	5218.75
29	2.27	0.82	204.24	3.28	33.72	241.24	5878.59	5218.67
28	2.29	0.84	206.01	3.36	33.16	242.54	5637.35	5218.58
27	2.31	0.85	207.71	3.38	32.65	243.74	5394.81	5218.50
26	2.33	0.86	209.34	3.43	32.14	244.91	5151.08	5218.42
25	2.34	0.87	210.90	3.49	31.66	246.04	4906.16	5218.33
24	2.36	0.89	212.39	3.54	31.20	247.13	4660.12	5218.25
23	2.38	0.90	213.82	3.59	30.75	248.16	4412.99	5218.17
22	2.39	0.91	215.19	3.64	30.33	249.16	4164.83	5218.08
21	2.41	0.92	216.49	3.69	29.92	250.10	3915.67	5218.00
20	2.42	0.93	217.73	3.74	29.53	251.00	3665.57	5217.92
19	2.43	0.95	218.91	3.78	29.17	251.86	3414.56	5217.83
18	2.44	0.96	220.04	3.83	28.82	252.68	3162.70	5217.75
17	2.46	0.97	221.10	3.87	28.48	253.45	2910.02	5217.67
16	2.47	0.98	222.10	3.91	28.17	254.18	2656.57	5217.58

Project: **82394 - System #3 - REV2**

Chamber Model - [redacted]
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) - %
Base of Stone Elevation - ft
Amount of Stone Above Chambers - in
Amount of Stone Below Chambers - in
Area of system - sf Min. Area - 1454 sf min. area

[redacted]								
81	0.00	0.00	0.00	0.00	41.35	41.35	6232.42	5224.00
80	0.00	0.00	0.00	0.00	41.35	41.35	6191.07	5223.92
79	0.00	0.00	0.00	0.00	41.35	41.35	6149.72	5223.83
78	0.00	0.00	0.00	0.00	41.35	41.35	6108.37	5223.75
77	0.00	0.00	0.00	0.00	41.35	41.35	6067.02	5223.67
76	0.00	0.00	0.00	0.00	41.35	41.35	6025.67	5223.58
75	0.00	0.00	0.00	0.00	41.35	41.35	5984.32	5223.50
74	0.00	0.00	0.00	0.00	41.35	41.35	5942.97	5223.42
73	0.00	0.00	0.00	0.00	41.35	41.35	5901.62	5223.33
72	0.00	0.00	0.00	0.00	41.35	41.35	5860.27	5223.25
71	0.00	0.00	0.00	0.00	41.35	41.35	5818.92	5223.17
70	0.00	0.00	0.00	0.00	41.35	41.35	5777.57	5223.08
69	0.04	0.00	1.56	0.00	40.88	42.44	5736.22	5223.00
68	0.12	0.01	4.41	0.02	40.02	44.45	5693.78	5222.92
67	0.16	0.03	6.26	0.05	39.46	45.77	5649.33	5222.83
66	0.21	0.05	7.93	0.10	38.94	46.97	5603.56	5222.75
65	0.27	0.07	10.20	0.14	38.25	48.58	5556.59	5222.67
64	0.45	0.09	17.21	0.18	36.14	53.52	5508.01	5222.58
63	0.67	0.11	25.28	0.23	33.70	59.20	5454.49	5222.50
62	0.80	0.14	30.36	0.28	32.16	62.80	5395.28	5222.42
61	0.91	0.17	34.51	0.34	30.90	65.74	5332.48	5222.33
60	1.00	0.19	38.11	0.38	29.80	68.30	5266.74	5222.25
59	1.09	0.22	41.32	0.43	28.83	70.57	5198.45	5222.17
58	1.16	0.24	44.21	0.48	27.94	72.64	5127.87	5222.08
57	1.23	0.27	46.89	0.54	27.12	74.55	5055.24	5222.00
56	1.30	0.30	49.39	0.60	26.36	76.34	4980.68	5221.92
55	1.36	0.32	51.72	0.65	25.64	78.01	4904.34	5221.83
54	1.42	0.35	53.91	0.70	24.97	79.57	4826.34	5221.75
53	1.47	0.37	55.99	0.74	24.33	81.06	4746.76	5221.67
52	1.53	0.39	57.96	0.79	23.73	82.47	4665.70	5221.58
51	1.57	0.42	59.83	0.83	23.15	83.82	4583.23	5221.50
50	1.62	0.44	61.61	0.88	22.60	85.10	4499.42	5221.42
49	1.67	0.46	63.32	0.93	22.08	86.32	4414.32	5221.33
48	1.71	0.48	64.95	0.97	21.58	87.49	4328.00	5221.25
47	1.75	0.50	66.50	1.01	21.10	88.61	4240.51	5221.17
46	1.79	0.53	67.99	1.05	20.64	89.68	4151.90	5221.08
45	1.83	0.55	69.43	1.09	20.19	90.72	4062.22	5221.00
44	1.86	0.56	70.81	1.13	19.77	91.71	3971.51	5220.92
43	1.90	0.58	72.14	1.17	19.36	92.66	3879.80	5220.83
42	1.93	0.60	73.41	1.20	18.97	93.58	3787.14	5220.75
41	1.96	0.62	74.64	1.24	18.59	94.46	3693.56	5220.67
40	2.00	0.64	75.81	1.28	18.22	95.31	3599.09	5220.58
39	2.03	0.66	76.95	1.31	17.87	96.13	3503.78	5220.50
38	2.05	0.67	78.04	1.35	17.53	96.92	3407.65	5220.42
37	2.08	0.69	79.10	1.38	17.21	97.68	3310.72	5220.33
36	2.11	0.71	80.11	1.41	16.89	98.41	3213.04	5220.25
35	2.13	0.72	81.09	1.45	16.59	99.12	3114.63	5220.17
34	2.16	0.74	82.03	1.48	16.30	99.81	3015.50	5220.08
33	2.18	0.76	82.94	1.51	16.02	100.46	2915.70	5220.00
32	2.21	0.77	83.81	1.54	15.74	101.10	2815.23	5219.92
31	2.23	0.79	84.65	1.57	15.48	101.71	2714.13	5219.83
30	2.25	0.80	85.46	1.60	15.23	102.29	2612.43	5219.75
29	2.27	0.82	86.24	1.64	14.99	102.86	2510.13	5219.67
28	2.29	0.84	86.98	1.68	14.75	103.41	2407.27	5219.58
27	2.31	0.85	87.70	1.69	14.53	103.92	2303.86	5219.50
26	2.33	0.86	88.39	1.72	14.32	104.42	2199.93	5219.42
25	2.34	0.87	89.05	1.74	14.11	104.90	2095.51	5219.33
24	2.36	0.89	89.68	1.77	13.92	105.36	1990.61	5219.25
23	2.38	0.90	90.28	1.80	13.73	105.80	1885.25	5219.17
22	2.39	0.91	90.86	1.82	13.55	106.22	1779.44	5219.08
21	2.41	0.92	91.41	1.84	13.37	106.63	1673.22	5219.00
20	2.42	0.93	91.93	1.87	13.21	107.01	1566.59	5218.92
19	2.43	0.95	92.43	1.89	13.05	107.38	1459.58	5218.83
18	2.44	0.96	92.90	1.91	12.90	107.72	1352.21	5218.75
17	2.46	0.97	93.35	1.93	12.76	108.05	1244.48	5218.67
16	2.47	0.98	93.78	1.96	12.63	108.36	1136.43	5218.58

Project: **82394 - System #2 - REV2**

Chamber Model - [redacted]
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) - %
Base of Stone Elevation - ft
Amount of Stone Above Chambers - in
Amount of Stone Below Chambers - in
Area of system - sf Min. Area - 2177 sf min. area

[redacted]								
81	0.00	0.00	0.00	0.00	61.93	61.93	9290.97	5223.00
80	0.00	0.00	0.00	0.00	61.93	61.93	9229.04	5222.92
79	0.00	0.00	0.00	0.00	61.93	61.93	9167.12	5222.83
78	0.00	0.00	0.00	0.00	61.93	61.93	9105.19	5222.75
77	0.00	0.00	0.00	0.00	61.93	61.93	9043.27	5222.67
76	0.00	0.00	0.00	0.00	61.93	61.93	8981.34	5222.58
75	0.00	0.00	0.00	0.00	61.93	61.93	8919.42	5222.50
74	0.00	0.00	0.00	0.00	61.93	61.93	8857.49	5222.42
73	0.00	0.00	0.00	0.00	61.93	61.93	8795.57	5222.33
72	0.00	0.00	0.00	0.00	61.93	61.93	8733.64	5222.25
71	0.00	0.00	0.00	0.00	61.93	61.93	8671.72	5222.17
70	0.00	0.00	0.00	0.00	61.93	61.93	8609.79	5222.08
69	0.04	0.00	2.29	0.00	61.24	63.53	8547.87	5222.00
68	0.12	0.01	6.50	0.04	59.96	66.50	8484.34	5221.92
67	0.16	0.03	9.23	0.11	59.13	68.46	8417.83	5221.83
66	0.21	0.05	11.69	0.19	58.36	70.24	8349.38	5221.75
65	0.27	0.07	15.03	0.27	57.34	72.63	8279.14	5221.67
64	0.45	0.09	25.36	0.35	54.21	79.92	8206.50	5221.58
63	0.67	0.11	37.25	0.45	50.61	88.32	8126.58	5221.50
62	0.80	0.14	44.74	0.57	48.33	93.64	8038.26	5221.42
61	0.91	0.17	50.86	0.67	46.47	97.99	7944.62	5221.33
60	1.00	0.19	56.16	0.77	44.85	101.78	7846.63	5221.25
59	1.09	0.22	60.89	0.86	43.40	105.15	7744.85	5221.17
58	1.16	0.24	65.15	0.97	42.09	108.21	7639.70	5221.08
57	1.23	0.27	69.10	1.08	40.87	111.05	7531.49	5221.00
56	1.30	0.30	72.78	1.19	39.73	113.71	7420.44	5220.92
55	1.36	0.32	76.22	1.29	38.67	116.18	7306.73	5220.83
54	1.42	0.35	79.45	1.39	37.67	118.51	7190.55	5220.75
53	1.47	0.37	82.51	1.48	36.73	120.72	7072.04	5220.67
52	1.53	0.39	85.41	1.58	35.83	122.81	6951.32	5220.58
51	1.57	0.42	88.17	1.67	34.97	124.81	6828.50	5220.50
50	1.62	0.44	90.80	1.76	34.16	126.72	6703.69	5220.42
49	1.67	0.46	93.31	1.85	33.38	128.54	6576.97	5220.33
48	1.71	0.48	95.71	1.94	32.63	130.28	6448.44	5220.25
47	1.75	0.50	98.00	2.02	31.92	131.94	6318.16	5220.17
46	1.79	0.53	100.20	2.10	31.23	133.54	6186.22	5220.08
45	1.83	0.55	102.32	2.18	30.57	135.08	6052.68	5220.00
44	1.86	0.56	104.35	2.26	29.94	136.55	5917.60	5219.92
43	1.90	0.58	106.31	2.33	29.33	137.97	5781.05	5219.83
42	1.93	0.60	108.18	2.41	28.75	139.34	5643.08	5219.75
41	1.96	0.62	109.99	2.48	28.18	140.65	5503.74	5219.67
40	2.00	0.64	111.73	2.55	27.64	141.92	5363.09	5219.58
39	2.03	0.66	113.40	2.62	27.12	143.14	5221.17	5219.50
38	2.05	0.67	115.01	2.69	26.61	144.32	5078.03	5219.42
37	2.08	0.69	116.56	2.76	26.13	145.45	4933.71	5219.33
36	2.11	0.71	118.05	2.83	25.66	146.54	4788.26	5219.25
35	2.13	0.72	119.50	2.90	25.21	147.60	4641.71	5219.17
34	2.16	0.74	120.89	2.96	24.77	148.62	4494.12	5219.08
33	2.18	0.76	122.22	3.02	24.35	149.60	4345.50	5219.00
32	2.21	0.77	123.51	3.09	23.95	150.54	4195.90	5218.92
31	2.23	0.79	124.75	3.15	23.56	151.45	4045.36	5218.83
30	2.25	0.80	125.94	3.21	23.18	152.33	3893.91	5218.75
29	2.27	0.82	127.08	3.28	22.82	153.18	3741.58	5218.67
28	2.29	0.84	128.18	3.36	22.46	154.01	3588.40	5218.58
27	2.31	0.85	129.24	3.38	22.14	154.76	3434.39	5218.50
26	2.33	0.86	130.25	3.43	21.82	155.51	3279.63	5218.42
25	2.34	0.87	131.22	3.49	21.51	156.22	3124.12	5218.33
24	2.36	0.89	132.15	3.54	21.22	156.91	2967.90	5218.25
23	2.38	0.90	133.04	3.59	20.93	157.57	2810.99	5218.17
22	2.39	0.91	133.89	3.64	20.66	158.20	2653.42	5218.08
21	2.41	0.92	134.71	3.69	20.41	158.80	2495.22	5218.00
20	2.42	0.93	135.48	3.74	20.16	159.38	2336.42	5217.92
19	2.43	0.95	136.21	3.78	19.93	159.92	2177.04	5217.83
18	2.44	0.96	136.91	3.83	19.70	160.44	2017.12	5217.75
17	2.46	0.97	137.57	3.87	19.49	160.93	1856.68	5217.67
16	2.47	0.98	138.20	3.91	19.29	161.40	1695.74	5217.58

CAUTION:

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

EROSION CONTROL NOTES:

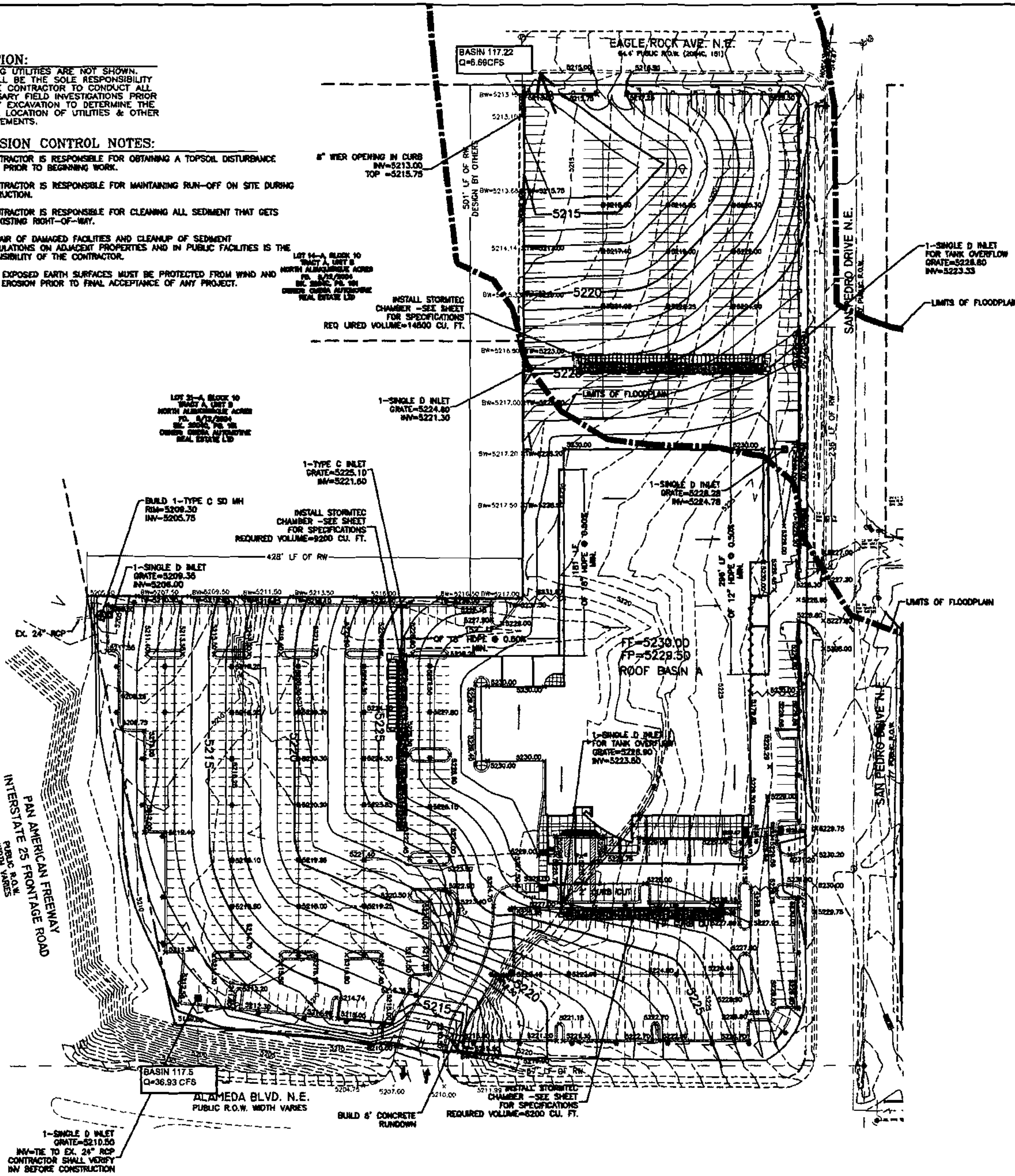
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

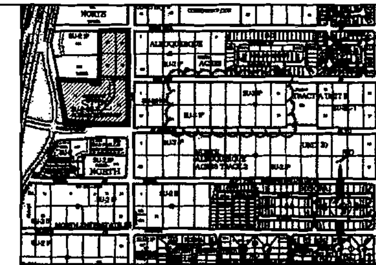
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.

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

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

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




VICINITY MAP: C-18-Z


FIRM MAP: 35001C0137H

LEGAL DESCRIPTION:

NOTES:

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

2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.

3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

4. ALL LANDSCAPE MEDIANS WILL BE DEPRESSED 6" FROM FLOW LINE AND 1' CURB OPENING PROVIDED ON THE HIGH SIDE, FOR WATER QUALITY.

LEGEND

5414	EXISTING CONTOUR
5415	EXISTING INDEX CONTOUR
5414	PROPOSED CONTOUR
5415	PROPOSED INDEX CONTOUR
	SLOPE TIE
× 4048.25	EXISTING SPOT ELEVATION
× 4048.25	PROPOSED SPOT ELEVATION
	BOUNDARY
	CENTERLINE
	RIGHT-OF-WAY
	PROPOSED CURB AND GUTTER
	EXISTING CURB AND GUTTER
	PROPOSED SIDEWALK
	PROPOSED SETBACK
	PROPOSED LOT LINE
	PROPOSED SCREEN WALL
	PROPOSED RETAINING WALL
	LIMITS OF FLOODPLAIN

N

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

ROUGH GRADING APPROVAL DATE

ENGINEER'S SEAL	AMERICAN TOYOTA	DRAWN BY WCWJ
	GRADING AND DRAINAGE PLAN	DATE 3-17-15
DAVID SOULE P.E. #14522	Rio Grande Engineering 1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 872-0999	SHEET #
		JOB # 21403