CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

May 21, 2021

Birk Ayer, P.E.
Ayer Design Group, LLC
215 Johnston Street
Rock Hill, SC 29730

RE: Sandia Collision Center
5900 Jefferson St. NE
Grading & Drainage Plans and Drainage Report
Engineer's Stamp Date: 04/02/21
Hydrology File: E17D011A

Dear Mr. Ayer:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based upon the information provided in your submittal received 05/05/2021, the Grading & Drainage Plans and Drainage Report are approved for Building Permit and action by the DRB on Site Plan for Building Permit.

Please attach a copy of this approved plan in the construction sets for Building Permit processing along with a copy of this letter. Prior to approval in support of Permanent Release of Occupancy by Hydrology, Engineer Certification per the DPM checklist will be required.

As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Doug Hughes, PE, jhughes@cabq.gov, 924-3420) 14 days prior to any earth disturbance.

Please provide Drainage Covenant for the detention pond per Article 6-15(C) of the DPM and a Drainage Covenant for the private drainage easement for the discharge pipe from the detention pond to the existing storm manhole prior to Permanent Release of Occupancy. There is a recording fee ($25, payable to Bernalillo County) for both. Please contact me if you have any question pertaining to the Drainage Covenant and email me the Covenant and Exhibit prior to executing it for completeness.

Please do one of the following:

- Drop off the original executed drainage covenant, the exhibit, and the $ 25.00 recording fee check made payable to Bernalillo County at the drop box outside the building and labeled the package using the address below.

- Mail the original executed drainage covenant, the exhibit, and the $ 25.00 recording fee check made payable to Bernalillo County to:

  Planning Dept./DRC
  Attn: Curtis Cherne
  600 2nd St. NW, Ste. 400
  Albuquerque, NM, 87102

Once approved and recorded, you will get a pdf copy of the recorded Drainage Covenant via email.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov .

Sincerely,

Renée C. Brissette

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: Sandia Collision Ctr Building Permit #: _____ Hydrology File #: _____

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

Legal Description: Lots 2-A and 2-B Fraternal Order of Police

City Address: 5900 and 5810 Jefferson St. NE

Applicant: Group 1 Realty, Inc. Contact: Brad Johnson

Address: 800 Gessner, Suite 500, Houston, TX 77024 bjohnson@group1auto.com

Phone#: 713-647-5700 Fax#: n/a E-mail: _____

Other Contact: Ayer Design Group, LLC Contact: Birk Ayer

Address: 215 Johnston Street, Rock Hill, SC 29730 birk@ayerdesigngroup.com

Phone#: 803-328-5858 office
803-517-7710 cell Fax#: _____ E-mail: _____

TYPE OF DEVELOPMENT: ____ PLAT (# of lots) ____ RESIDENCE X DRB SITE ___ ADMIN SITE

IS THIS A RESUBMITTAL? ____ Yes X No

DEPARTMENT ____ TRANSPORTATION X HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- ____ ENGINEER/ARCHITECT CERTIFICATION
- ____ PAD CERTIFICATION
- X CONCEPTUAL G & D PLAN
- X GRADING PLAN
- X DRAINAGE REPORT
- ____ 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
- ____ PRELIMINARY PLAT APPROVAL
- ____ SITE PLAN FOR SUB'D APPROVAL
- X SITE PLAN FOR BLDG. PERMIT APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ SIA/ RELEASE OF FINANCIAL GUARANTEE
- ____ FOUNDATION PERMIT APPROVAL
- ____ GRADING PERMIT APPROVAL
- ____ SO-19 APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ GRADING/ PAD CERTIFICATION
- ____ WORK ORDER APPROVAL
- ____ CLOMR/LOMR
- ____ FLOODPLAIN DEVELOPMENT PERMIT
- ____ OTHER (SPECIFY) _____

DATE SUBMITTED: 4-30-2021 By: Birkie Ayer,Jr. P.E.

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

DRAINAGE REPORT

For

SANDIA Collision Center

5900 Jefferson St. NE
Albuquerque, New Mexico

April 29, 2021

Prepared For:

GROUP 1 AUTOMOTIVE®

Group 1 Automotive, Inc.
800 Gessner, Suite 500
Houston, Texas 77024

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 05/21/21
BY: Renée C. Brissette
HydroTrans # E17D011A

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE CONSTRUED TO PERMIT VIOLATIONS OF ANY CITY ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT THE CITY OF ALBUQUERQUE FROM REQUIRING CORRECTION, OR ERROR OR DIMENSIONS IN PLANS, SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT AUTHORIZATION.

Prepared by:

AYER DESIGN GROUP
PROFESSIONAL ENGINEERING SERVICES
215 Johnston Street
Rock Hill, SC 29730
Phone: 803-328-5858

BIRKIE AYER JR
NEW MEXICO
25848
4/29/21
PROFESSIONAL ENGINEER

TABLE OF CONTENTS & ATTACHMENTS

I. EXECUTIVE SUMMARY

Group 1 Automotive, Inc. plans to construct a new collision center on property it owns adjacent to Sandia BMW in Albuquerque, New Mexico. The project will be known as Sandia Collision Center and will be located at 5900 Jefferson Street, NE. The project consists of a 22,733 sf building with a service drive canopy and associated infrastructure including a paved parking lot. The parking lot will serve the collision center employees and customers as well as providing inventory storage for the Sandia BMW campus which includes Sandia BMW and Sandia Mini. The site has been granted storm water access to Bear Arroyo without a detention requirement. However, water quality measures are required for automotive uses that include vehicle repair. A surface detention Best Management Practice (BMP) has been designed to capture the first flush water quality volume (0.42 inch depth) and released it over 48 to 96 hours and safely pass the 100-year runoff volume within 24 hours.

II. INTRODUCTION & PROJECT DATA

A.	Project location:	5900 Jefferson Street NE & 5810 Jefferson Street NE
B.	Legal Description:	Lots 2-A and 2-B Fraternal Order of Police Subdivision
C.	FEMA FIRM Panel:	35001C0139G, effective 9/26/2008
D.	Special Flood Hazard Area:	No
E.	Site Area:	5.005 Acres
F.	UPC#:	101706235713540112 and 101706235110240106
G.	Precipitation Zone:	Zone 2, Between Rio Grande and San Mateo

III. Site Topography

The site is located on two parcels (Fraternal Order of Police Lots 2-A and 2-B). The site has an access easement from Jefferson St. NE and proposed driveway connections to the existing Sandia BMW to the east, which is also owned by Group 1 Automotive. The site slopes generally from east to west and to northwest towards Jefferson St. NE with existing slope ranges of 2%-15%. Proposed finish grades range from 1 to 10% with the exception of cut and fill slopes of 3:1.

IV. Sediment & Erosion Control

Erosion control measures consisting of sediment pond, silt fence, construction entrance, and inlet protection. Final stabilization will be accomplished by paving and with a vegetative cover established by landscaping and stone mulch cover.

V. Storm Drainage & Detention

The proposed site will have concrete curb & gutter, catch basins, storm drain piping, utilities and landscaping. A proposed stormwater management basin (dry pond) will serve the overall site, with an outfall pipe connection to an existing drop inlet that outfalls into Bear Arroyo, located near the intersection of Bear Arroyo and Jefferson St. NE.

VI. BACKGROUND DOCUMENTS

A. Site Location Map	Figure A
B. IDO Zone Atlas	Figure B
C. USGS Topo	Figure C
D. FEMA Firm Map	Figure D
E. SOIL Map	Figure E
F. Geotechnical Investigation Report	Appendix 4

VII. EXISTING CONDITIONS

The site was previously developed with a building, parking and swimming pool. These improvements were removed from the site prior to Group 1 purchasing the property for development. Some gravel parking is present on the site today. It is used for inventory and overflow parking for Sandia BMW and Sandia Mini. A Conditional Use Permit (CUP) was obtained from the City of Albuquerque ZHE to allow outdoor vehicle storage following the property purchase by Group 1.

VIII. DEVELOPED CONDITIONS

The site will be graded to provide positive drainage away from the new building. The site will be paved with asphalt with concrete curb and gutter borders and landscaped islands. The new building finished floor elevation is proposed to be 5168.0. Drop inlets in the parking lot will collect stormwater runoff and convey it via underground rcp pipe to the surface detention basin located in the southwest corner of lot 2B. An outlet control structure will detain the WQV for 48-96 hours while releasing the 100-year runoff volume in 24 hours. A low flow outlet has been sized to drain the WQV over 2 days. A larger outlet has been set just above the water surface elevation of the WQV to release the larger storm events safely through the control structure and ultimately to an existing outfall to Bear Arroyo, which is managed by Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA). AMAFCA directed us to connect to the existing outfall as previously approved by them.

IX. CALCULATIONS

A. DESIGN CRITERIA
   1. WQV = Impervious Area x 0.42 Inches
   2. Retain WQV in surface basin for 48 hours but not more than 96 hours
   3. Pass 100-year runoff volume safely
   4. Provide bypass spillway sized to convey 100 year flow and indicate flow direction

5. Size onsite storm conduits for 100-year flows
6. Utilize site specific rainfall model for hydrology

B. METHODOLOGY

Rainfall PDF data was taken from NOAA Atlas 14 Mapping by using the address 5900 Jefferson NE on the NOAA website. This data was imported into the computer program Hydrocad. Hydrocad uses the SCS method. The peak intensity is set at 12 hours and the data was imported with no smoothing. A calculation increment of 0.01 hours was utilized. Time of concentration was set to 12 minutes. Minimum time of concentration in Hydrocad is 5 minutes.

Curve numbers were utilized to model ground cover conditions based on table 6.2.9 of the DPM as follows:

Treatment A: CN 77
Treatment B: CN 79
Treatment C: CN 86
Treatment D: CN 98

The resulting composite CN_C = 95 was calculated by Hydrocad.

The site consists of 2 drainage basins. Basin A sheet flows down the access driveway and out to Jefferson Street. Basin B is the bulk of the site including the building and parking areas and is collected in the storm drain piping system and directed to the surface detention basin. The water quality volume was conservatively calculated for the full site area to account for the small amount of area (Basin A) that cannot be directed into the BMP.

BMP volumes were input into Hydrocad using the following table by measuring the surface area of the pond contours in autocad.

Contour Elev.	Area (SF)	Comment
160.25	0	Low flow invert=bottom of pond
161	1351	
162	1839	
163	2399	
164	3031	
165	3736	
166	4511	
167	5464	Spillway Elevation
168	6241	Top of Berm

An outlet structure has been designed consisting of a precast concrete riser with rectangular outlet control orifices 36”x6” at elevation 5164.25, which is the WSE of the WQV. A 1.5” diameter low flow orifice at the bottom of the pond elevation will drain the WQV in about 50 hours.

The basin hydrograph was routed through the detention pond and control structure for 2-year and 100-year, 24 hour storm events.

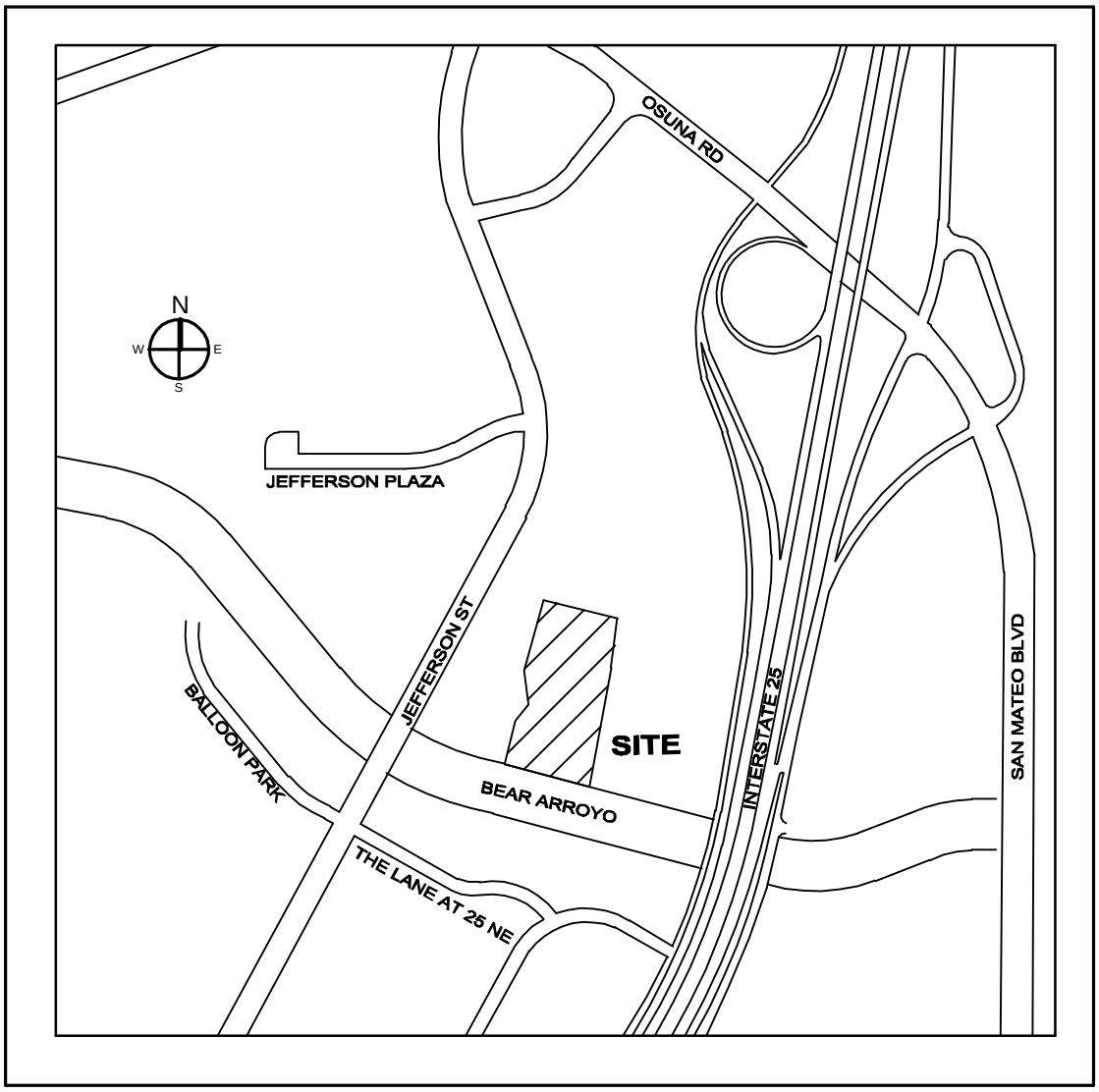
C. RESULTS SUMMARY

REQUIRED WQV: (includes basin A and basin B)	220,384 SF * 0.42 In/12 IN/FT	= 7713 CF
PROVIDED WQV:	@ WSE 5164.25	=7782 CF
100-YR WSE:	5165.39	
100-YEAR VOLUME STORED:	11,924 CF	
Freeboard at 100 to spillway	5167-5165.39	1.61 feet
Freeboard at 100 to top of berm	5168-5165.39	2.61 feet

Full Hydrocad Report is included in Appendix 1
Rainfall data from NOAA Atlas 14 is included as Appendix 2
Storm Drain Calculation Spreadsheet is included as Appendix 3

X. CONCLUSION

The proposed dry detention BMP meets the requirements of storing the water quality volume for the entire site and holding it for at least 48 hours but not more than 96 hours. It also safely contains the volume of the 100-year event runoff and releases it over 24 hours while maintaining sufficient freeboard. Onsite storm drain piping has been designed for 100 year peak flows.

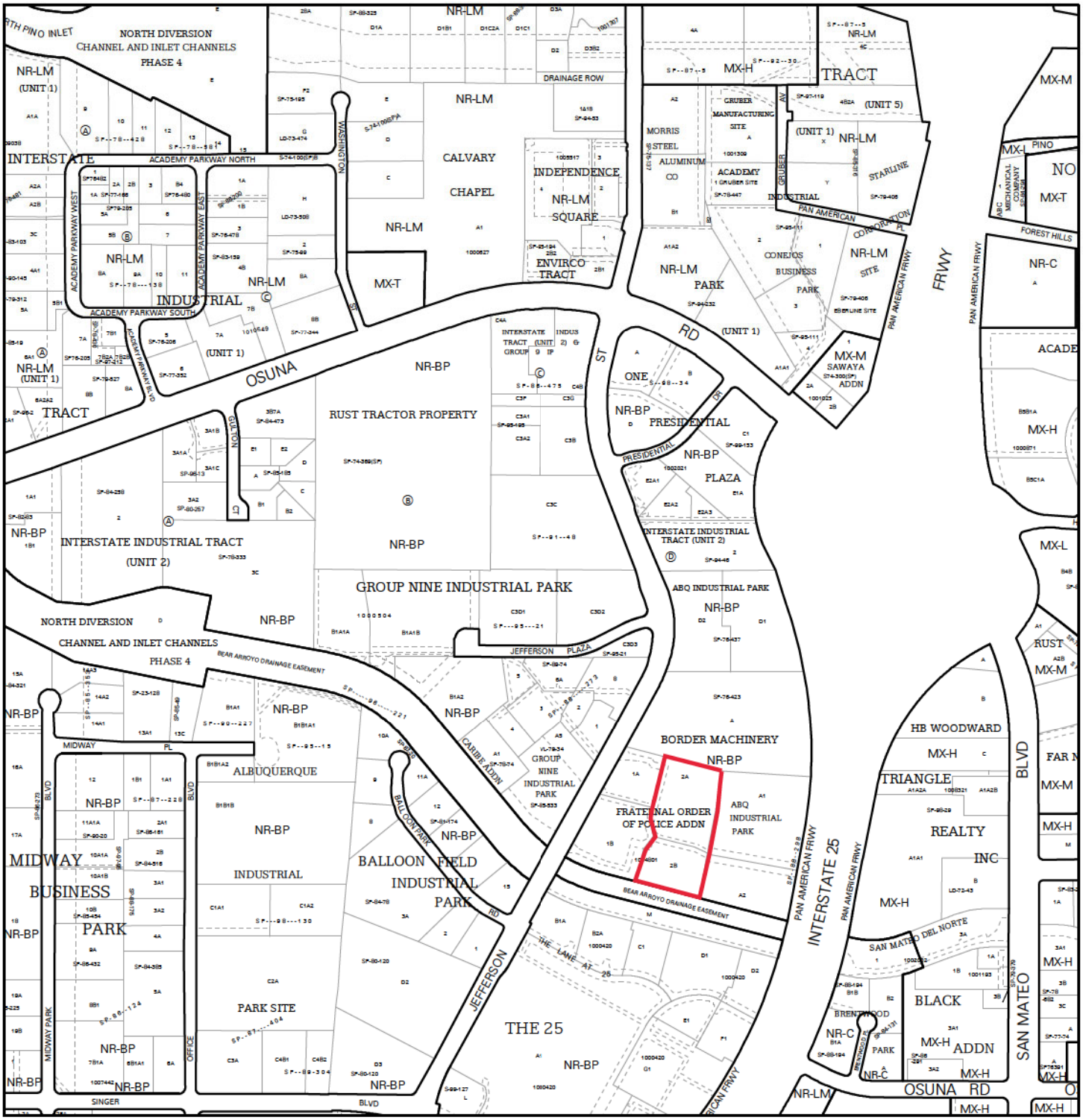


VICINITY MAP

N.T.S.

FIGURE A

FIGURE B



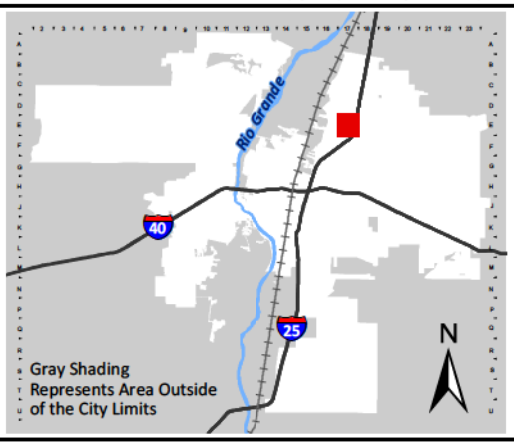
For more details about the Integrated Development Ordinance visit: http://www.cabq.gov/planning/codes-policies-regulations/integrated-development-ordinance

IDO Zone Atlas May 2018

Albuquerque Geographic Information System

IDO Zoning information as of May 17, 2018

The Zone Districts and Overlay Zones are established by the Integrated Development Ordinance (IDO).



Zone Atlas Page:

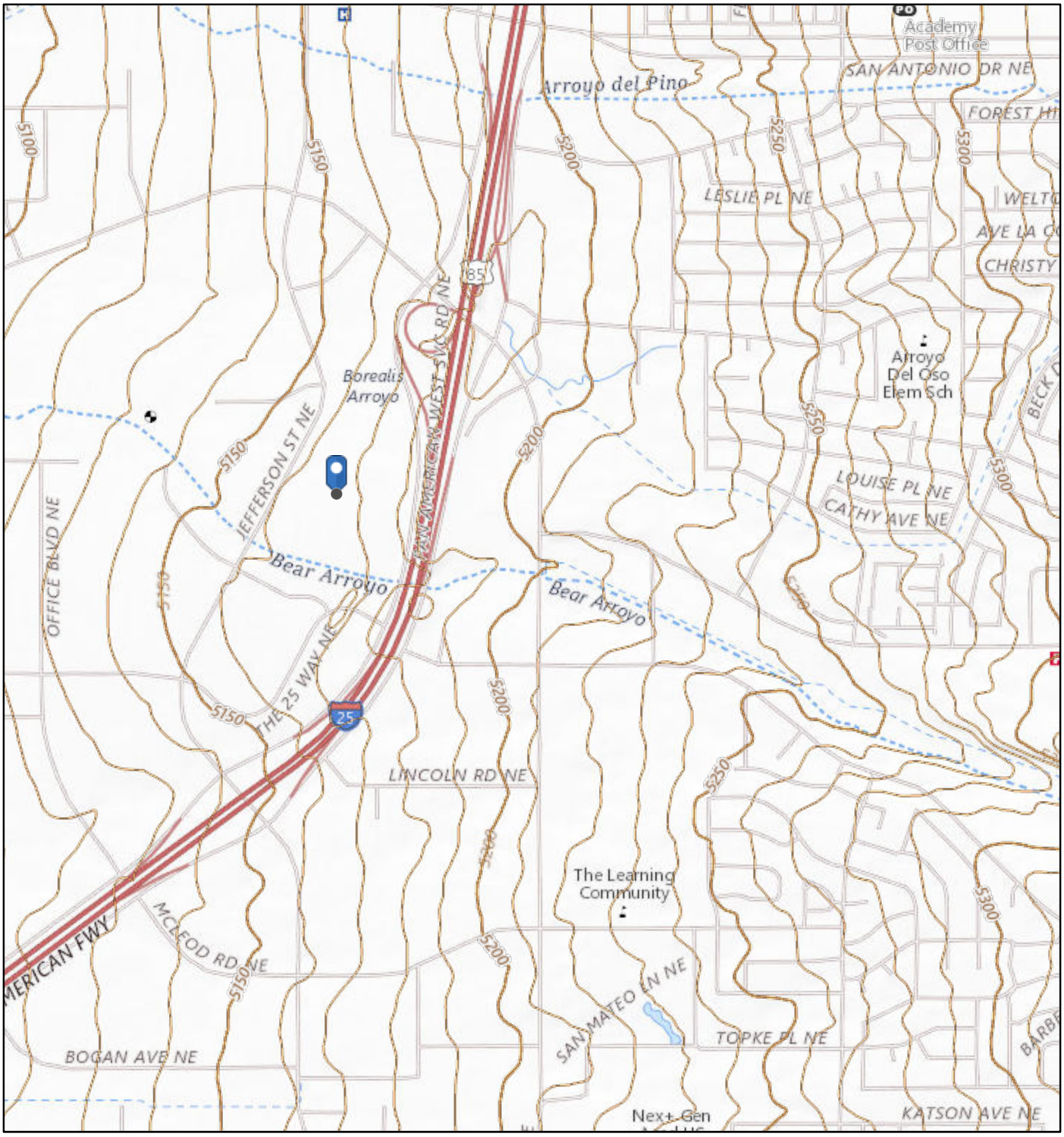
E-17-Z

- Easement
- Escarpment
- Petroglyph National Monument
- Areas Outside of City Limits
- Airport Protection Overlay (APO) Zone
- Character Protection Overlay (CPO) Zone
- Historic Protection Overlay (HPO) Zone
- View Protection Overlay (VPO) Zone

Feet: 0 250 500 1,000

5900 Jefferson St. NE

FIGURE C



4/29/2021, 3:25:10 PM

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

- State Capitol Buildings
- Post Offices
- Normal Intermediate Contours
- Normal Index Contours

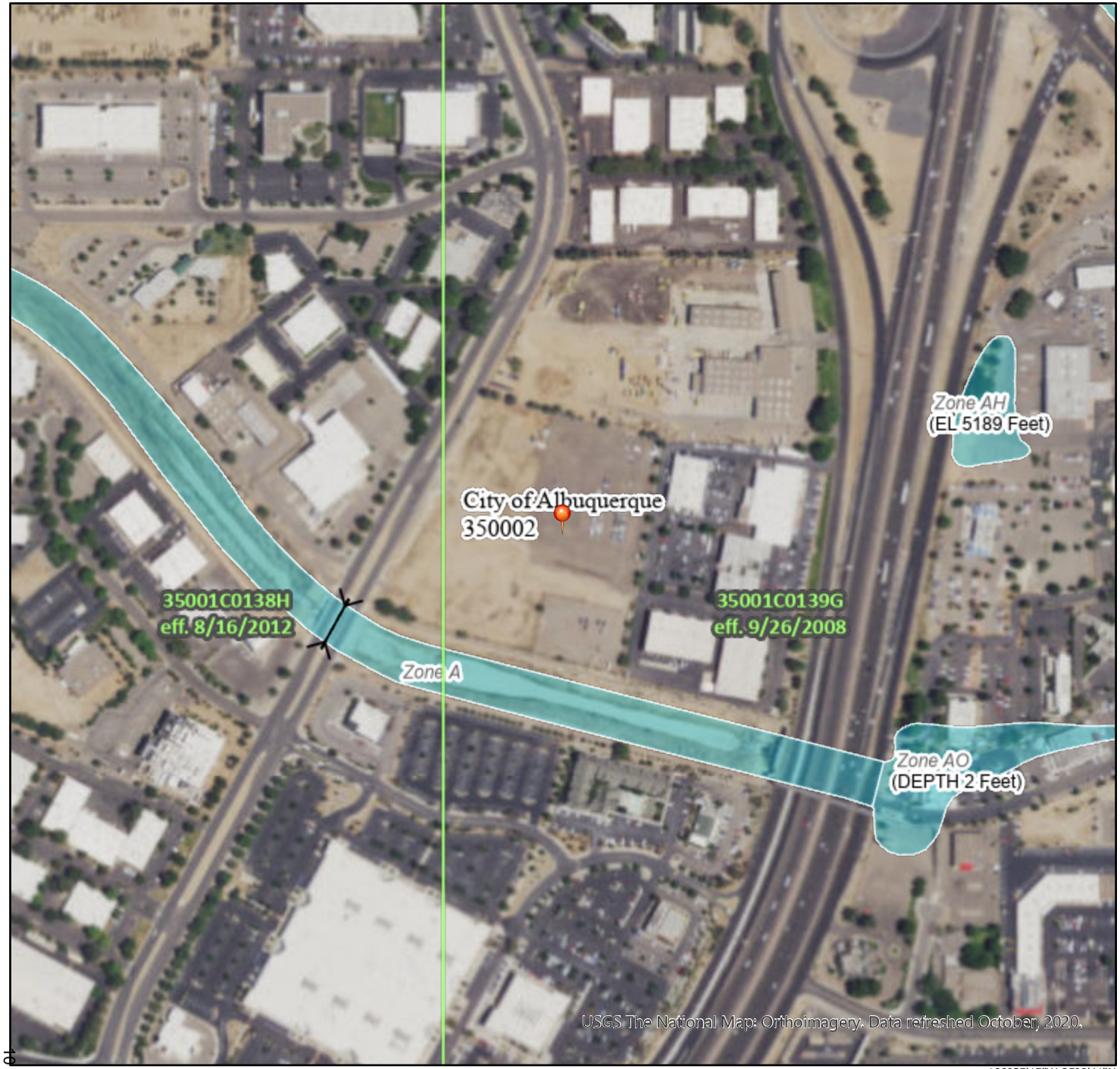
USGS TNM – National Structures Dataset. Data Refreshed April, 2021., USGS The National Map: 3D Elevation Program. Data Refreshed April, 2021., USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National

USGS
2021 USGS

National Flood Hazard Layer FIRMette

FEMA

106°35'52"W 35°9'10"N



106°35'15"W 35°8'41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

FIGURE D

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/5/2020 at 8:05 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FIGURE E

Soil Map—Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

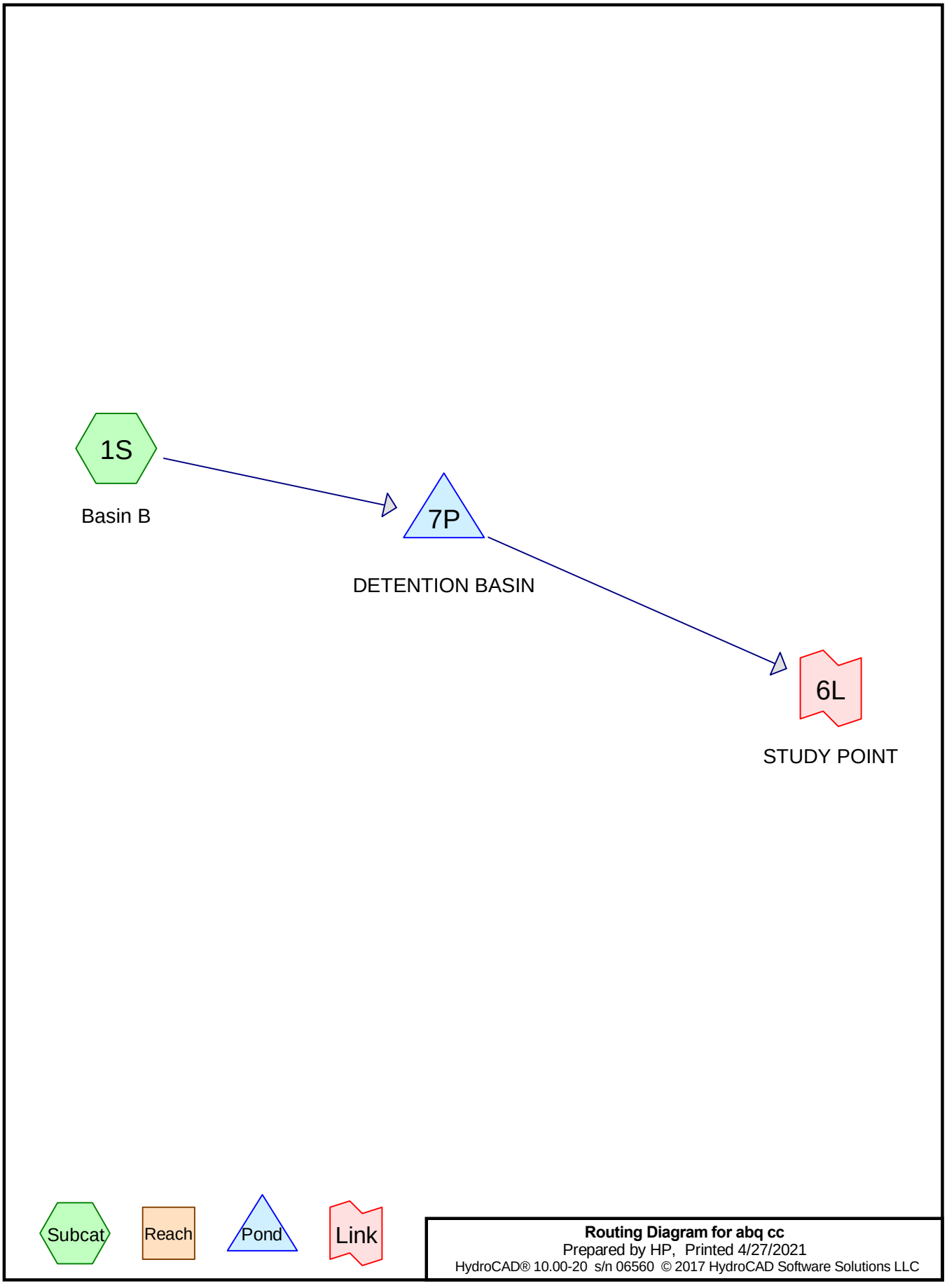
Map Scale: 1:1,380 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84


1S
Basin B
7P
DETENTION BASIN
6L
STUDY POINT
Subcat
Reach
Pond
Link
Routing Diagram for abq cc
Prepared by HP, Printed 4/27/2021
HydroCAD® 10.00-20 s/n 06560 © 2017 HydroCAD Software Solutions LLC

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Basin B Runoff Area=4.407 ac 77.83% Impervious Runoff Depth=0.78"
Tc=12.0 min CN=95 Runoff=5.80 cfs 0.288 af

Pond 7P: DETENTION BASIN Peak Elev=164.33' Storage=8,056 cf Inflow=5.80 cfs 0.288 af
Outflow=0.60 cfs 0.288 af

Link 6L: STUDY POINT Inflow=0.60 cfs 0.288 af
Primary=0.60 cfs 0.288 af

Total Runoff Area = 4.407 ac Runoff Volume = 0.288 af Average Runoff Depth = 0.78"
22.17% Pervious = 0.977 ac 77.83% Impervious = 3.430 ac

Summary for Subcatchment 1S: Basin B

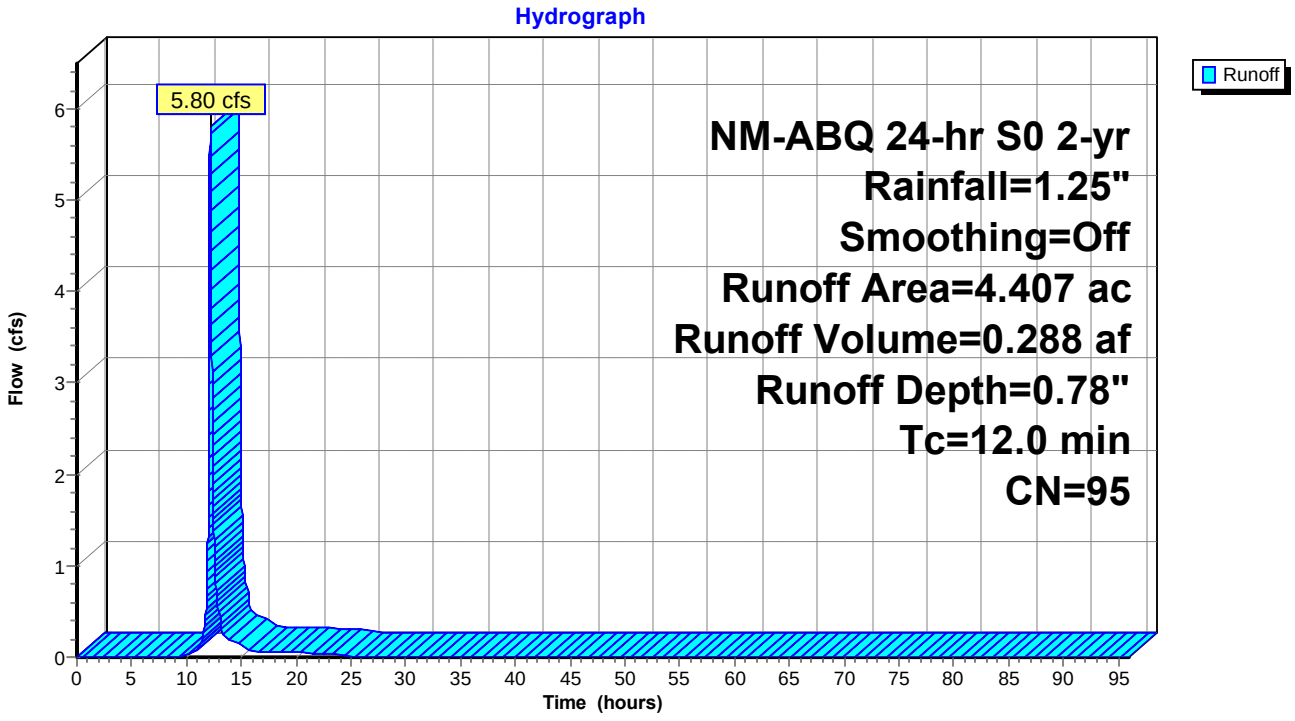
Runoff = 5.80 cfs @ 12.16 hrs, Volume= 0.288 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NM-ABQ 24-hr S0 2-yr Rainfall=1.25", Smoothing=Off

	Area (ac)	CN	Description
*	0.977	86	Treatment C
*	3.430	98	Treatment D
	4.407	95	Weighted Average
	0.977		22.17% Pervious Area
	3.430		77.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Basin B



Hydrograph for Subcatchment 1S: Basin B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	54.00	1.25	0.78	0.00
1.00	0.01	0.00	0.00	55.00	1.25	0.78	0.00
2.00	0.02	0.00	0.00	56.00	1.25	0.78	0.00
3.00	0.03	0.00	0.00	57.00	1.25	0.78	0.00
4.00	0.04	0.00	0.00	58.00	1.25	0.78	0.00
5.00	0.06	0.00	0.00	59.00	1.25	0.78	0.00
6.00	0.07	0.00	0.00	60.00	1.25	0.78	0.00
7.00	0.08	0.00	0.00	61.00	1.25	0.78	0.00
8.00	0.10	0.00	0.00	62.00	1.25	0.78	0.00
9.00	0.12	0.00	0.00	63.00	1.25	0.78	0.00
10.00	0.16	0.01	0.03	64.00	1.25	0.78	0.00
11.00	0.21	0.02	0.07	65.00	1.25	0.78	0.00
12.00	0.63	0.26	**1.81**	66.00	1.25	0.78	0.00
13.00	1.04	0.60	**0.47**	67.00	1.25	0.78	0.00
14.00	1.09	0.64	0.20	68.00	1.25	0.78	0.00
15.00	1.13	0.68	0.14	69.00	1.25	0.78	0.00
16.00	1.15	0.69	0.07	70.00	1.25	0.78	0.00
17.00	1.17	0.71	0.06	71.00	1.25	0.78	0.00
18.00	1.18	0.72	0.05	72.00	1.25	0.78	0.00
19.00	1.19	0.73	0.06	73.00	1.25	0.78	0.00
20.00	1.21	0.75	0.05	74.00	1.25	0.78	0.00
21.00	1.22	0.76	0.05	75.00	1.25	0.78	0.00
22.00	1.23	0.77	0.04	76.00	1.25	0.78	0.00
23.00	1.24	0.78	0.04	77.00	1.25	0.78	0.00
24.00	**1.25**	**0.78**	0.04	78.00	1.25	0.78	0.00
25.00	1.25	0.78	0.00	79.00	1.25	0.78	0.00
26.00	1.25	0.78	0.00	80.00	1.25	0.78	0.00
27.00	1.25	0.78	0.00	81.00	1.25	0.78	0.00
28.00	1.25	0.78	0.00	82.00	1.25	0.78	0.00
29.00	1.25	0.78	0.00	83.00	1.25	0.78	0.00
30.00	1.25	0.78	0.00	84.00	1.25	0.78	0.00
31.00	1.25	0.78	0.00	85.00	1.25	0.78	0.00
32.00	1.25	0.78	0.00	86.00	1.25	0.78	0.00
33.00	1.25	0.78	0.00	87.00	1.25	0.78	0.00
34.00	1.25	0.78	0.00	88.00	1.25	0.78	0.00
35.00	1.25	0.78	0.00	89.00	1.25	0.78	0.00
36.00	1.25	0.78	0.00	90.00	1.25	0.78	0.00
37.00	1.25	0.78	0.00	91.00	1.25	0.78	0.00
38.00	1.25	0.78	0.00	92.00	1.25	0.78	0.00
39.00	1.25	0.78	0.00	93.00	1.25	0.78	0.00
40.00	1.25	0.78	0.00	94.00	1.25	0.78	0.00
41.00	1.25	0.78	0.00	95.00	1.25	0.78	0.00
42.00	1.25	0.78	0.00	96.00	1.25	0.78	0.00
43.00	1.25	0.78	0.00				
44.00	1.25	0.78	0.00				
45.00	1.25	0.78	0.00				
46.00	1.25	0.78	0.00				
47.00	1.25	0.78	0.00				
48.00	1.25	0.78	0.00				
49.00	1.25	0.78	0.00				
50.00	1.25	0.78	0.00				
51.00	1.25	0.78	0.00				
52.00	1.25	0.78	0.00				
53.00	1.25	0.78	0.00				

Summary for Pond 7P: DETENTION BASIN

Inflow Area = 4.407 ac, 77.83% Impervious, Inflow Depth = 0.78" for 2-yr event
Inflow = 5.80 cfs @ 12.16 hrs, Volume= 0.288 af
Outflow = 0.60 cfs @ 12.80 hrs, Volume= 0.288 af, Atten= 90%, Lag= 38.0 min
Primary = 0.60 cfs @ 12.80 hrs, Volume= 0.288 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 164.33' @ 12.80 hrs Surf.Area= 3,265 sf Storage= 8,056 cf

Plug-Flow detention time= 668.9 min calculated for 0.288 af (100% of inflow)
Center-of-Mass det. time= 669.0 min (1,469.2 - 800.1)

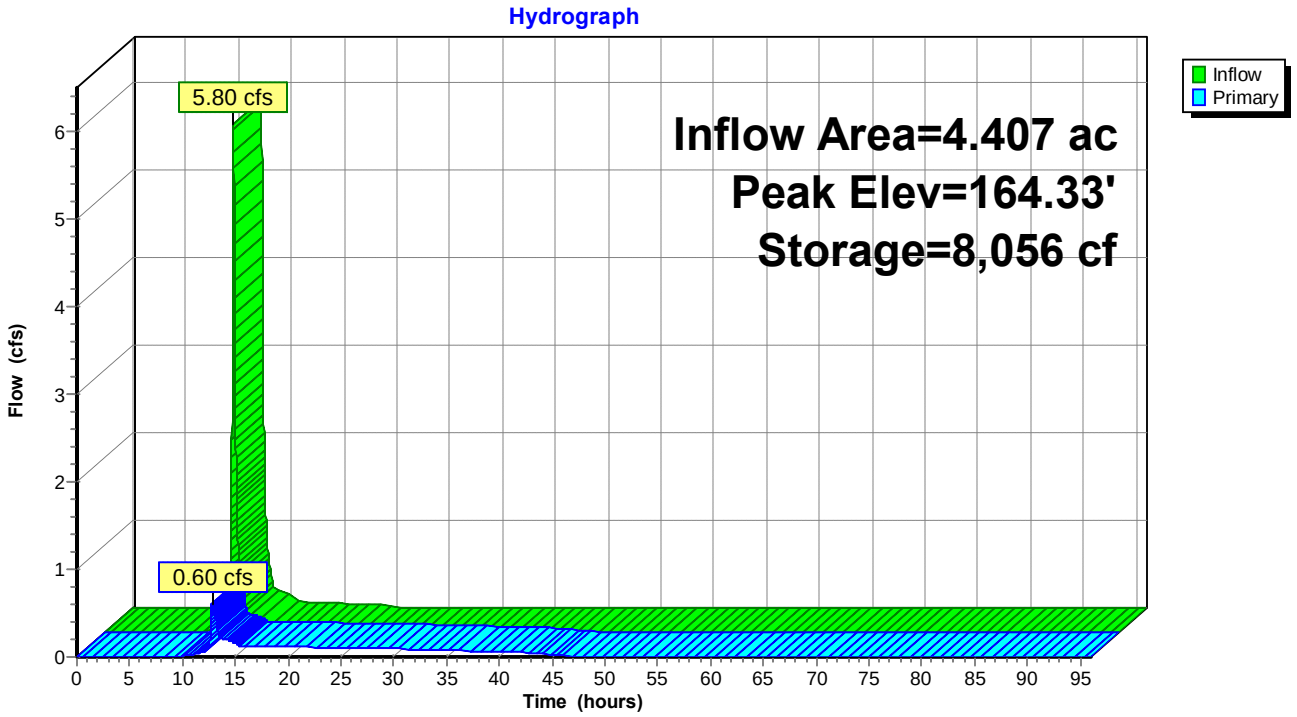
Volume	Invert	Avail.Storage	Storage Description
#1	160.25'	25,283 cf	**Cultec Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.25	0	0	0
161.00	1,351	507	507
162.00	1,839	1,595	2,102
163.00	2,399	2,119	4,221
164.00	3,031	2,715	6,936
165.00	3,736	3,384	10,319
166.00	4,511	4,124	14,443
167.00	5,464	4,988	19,430
168.00	6,241	5,853	25,283

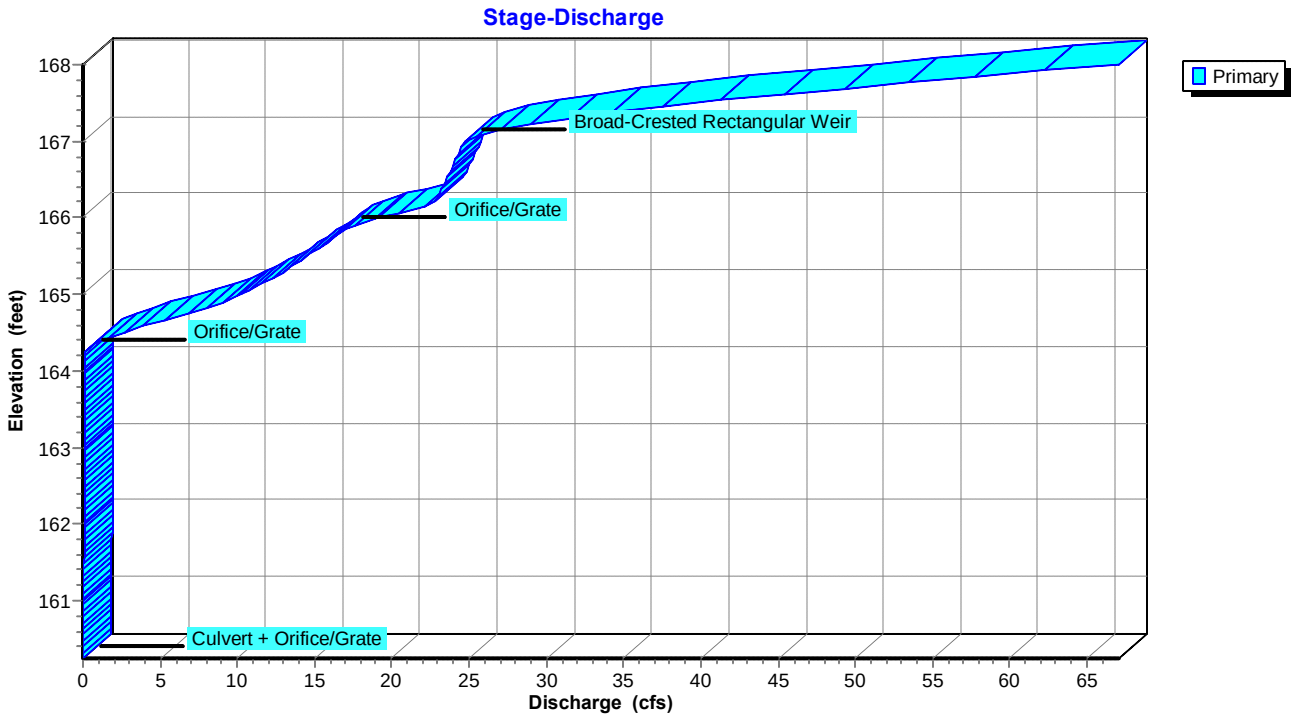
Device	Routing	Invert	Outlet Devices
#1	Primary	160.25'	**18.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 160.25' / 160.09' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	160.25'	**1.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	164.25'	**36.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	165.85'	**18.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	167.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.56 cfs @ 12.80 hrs HW=164.33' TW=159.00' (Fixed TW Elev= 159.00')
- **1=Culvert** (Passes 0.56 cfs of 17.57 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 9.65 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.45 cfs @ 0.91 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

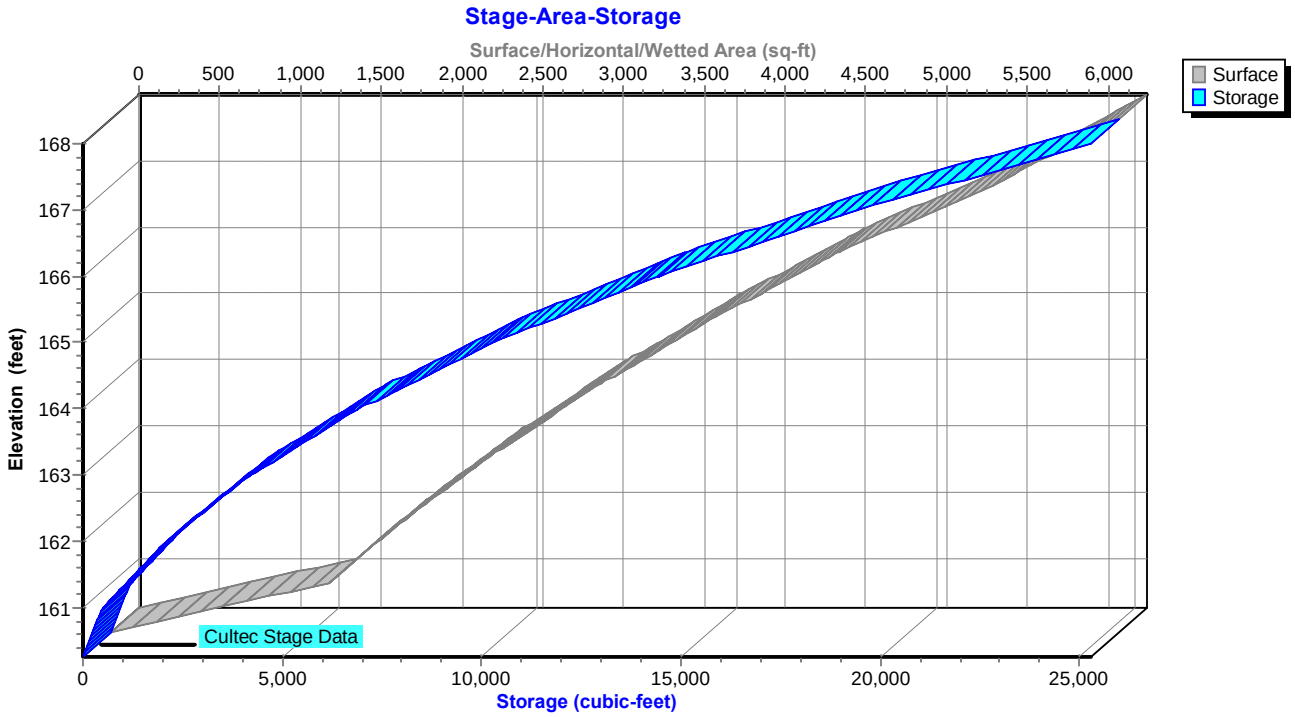
Pond 7P: DETENTION BASIN



Pond 7P: DETENTION BASIN



Pond 7P: DETENTION BASIN



Hydrograph for Pond 7P: DETENTION BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	160.25	0.00
2.00	0.00	0	160.25	0.00
4.00	0.00	0	160.25	0.00
6.00	0.00	0	160.25	0.00
8.00	0.00	0	160.25	0.00
10.00	0.03	51	160.33	0.01
12.00	**1.81**	**1,395**	**161.56**	**0.07**
14.00	**0.20**	**7,873**	**164.28**	**0.21**
16.00	0.07	7,699	164.23	0.12
18.00	0.05	7,302	164.11	0.12
20.00	0.05	6,881	163.98	0.11
22.00	0.04	6,408	163.81	0.11
24.00	0.04	5,904	163.62	0.11
26.00	0.00	5,170	163.35	0.10
28.00	0.00	4,445	163.08	0.10
30.00	0.00	3,756	162.78	0.09
32.00	0.00	3,109	162.48	0.09
34.00	0.00	2,505	162.19	0.08
36.00	0.00	1,944	161.90	0.07
38.00	0.00	1,436	161.58	0.07
40.00	0.00	985	161.30	0.06
42.00	0.00	590	161.05	0.05
44.00	0.00	276	160.66	0.03
46.00	0.00	93	160.39	0.02
48.00	0.00	31	160.30	0.00
50.00	0.00	11	160.27	0.00
52.00	0.00	4	160.26	0.00
54.00	0.00	1	160.25	0.00
56.00	0.00	0	160.25	0.00
58.00	0.00	0	160.25	0.00
60.00	0.00	0	160.25	0.00
62.00	0.00	0	160.25	0.00
64.00	0.00	0	160.25	0.00
66.00	0.00	0	160.25	0.00
68.00	0.00	0	160.25	0.00
70.00	0.00	0	160.25	0.00
72.00	0.00	0	160.25	0.00
74.00	0.00	0	160.25	0.00
76.00	0.00	0	160.25	0.00
78.00	0.00	0	160.25	0.00
80.00	0.00	0	160.25	0.00
82.00	0.00	0	160.25	0.00
84.00	0.00	0	160.25	0.00
86.00	0.00	0	160.25	0.00
88.00	0.00	0	160.25	0.00
90.00	0.00	0	160.25	0.00
92.00	0.00	0	160.25	0.00
94.00	0.00	0	160.25	0.00
96.00	0.00	0	160.25	0.00

Stage-Discharge for Pond 7P: DETENTION BASIN

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
160.25	0.00	162.41	0.09	164.57	3.61	166.73	24.06
160.29	0.00	162.45	0.09	164.61	4.28	166.77	24.16
160.33	0.01	162.49	0.09	164.65	5.00	166.81	24.25
160.37	0.01	162.53	0.09	164.69	5.74	166.85	24.34
160.41	0.02	162.57	0.09	164.73	6.53	166.89	24.43
160.45	0.02	162.61	0.09	164.77	7.29	166.93	24.53
160.49	0.02	162.65	0.09	164.81	7.91	166.97	24.62
160.53	0.03	162.69	0.09	164.85	8.47	167.01	24.74
160.57	0.03	162.73	0.09	164.89	8.98	167.05	25.19
160.61	0.03	162.77	0.09	164.93	9.46	167.09	25.84
160.65	0.03	162.81	0.09	164.97	9.91	167.13	26.63
160.69	0.04	162.85	0.09	165.01	10.34	167.17	27.53
160.73	0.04	162.89	0.09	165.05	10.75	167.21	28.55
160.77	0.04	162.93	0.10	165.09	11.14	167.25	29.71
160.81	0.04	162.97	0.10	165.13	11.52	167.29	30.99
160.85	0.04	163.01	0.10	165.17	11.88	167.33	32.38
160.89	0.04	163.05	0.10	165.21	12.24	167.37	33.88
160.93	0.05	163.09	0.10	165.25	12.58	167.41	35.49
160.97	0.05	163.13	0.10	165.29	12.92	167.45	37.24
161.01	0.05	163.17	0.10	165.33	13.24	167.49	39.11
161.05	0.05	163.21	0.10	165.37	13.56	167.53	41.09
161.09	0.05	163.25	0.10	165.41	13.87	167.57	43.19
161.13	0.05	163.29	0.10	165.45	14.17	167.61	45.33
161.17	0.05	163.33	0.10	165.49	14.47	167.65	47.31
161.21	0.06	163.37	0.10	165.53	14.76	167.69	49.35
161.25	0.06	163.41	0.10	165.57	15.04	167.73	51.44
161.29	0.06	163.45	0.10	165.61	15.32	167.77	53.58
161.33	0.06	163.49	0.11	165.65	15.60	167.81	55.78
161.37	0.06	163.53	0.11	165.69	15.87	167.85	58.06
161.41	0.06	163.57	0.11	165.73	16.13	167.89	60.39
161.45	0.06	163.61	0.11	165.77	16.39	167.93	62.78
161.49	0.06	163.65	0.11	165.81	16.65	167.97	**65.21**
161.53	0.07	163.69	0.11	165.85	16.90		
161.57	0.07	163.73	0.11	165.89	17.33		
161.61	0.07	163.77	0.11	165.93	17.91		
161.65	0.07	163.81	0.11	165.97	18.58		
161.69	0.07	163.85	0.11	166.01	19.34		
161.73	0.07	163.89	0.11	166.05	20.15		
161.77	0.07	163.93	0.11	166.09	21.03		
161.81	0.07	163.97	0.11	166.13	21.96		
161.85	0.07	164.01	0.11	166.17	22.71		
161.89	0.07	164.05	0.11	166.21	22.81		
161.93	0.08	164.09	0.11	166.25	22.91		
161.97	0.08	164.13	0.12	166.29	23.01		
162.01	0.08	164.17	0.12	166.33	23.11		
162.05	0.08	164.21	0.12	166.37	23.21		
162.09	0.08	164.25	0.12	166.41	23.30		
162.13	0.08	164.29	0.27	166.45	23.40		
162.17	0.08	164.33	0.55	166.49	23.49		
162.21	0.08	164.37	0.92	166.53	23.59		
162.25	0.08	164.41	1.35	166.57	23.69		
162.29	0.08	164.45	1.84	166.61	23.78		
162.33	0.08	164.49	2.39	166.65	23.88		
162.37	0.08	164.53	2.97	166.69	23.97		

Stage-Area-Storage for Pond 7P: DETENTION BASIN

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.25	0	0
160.35	180	68
160.45	360	135
160.55	540	203
160.65	721	270
160.75	901	338
160.85	1,081	405
160.95	1,261	473
161.05	1,375	586
161.15	1,424	746
161.25	1,473	905
161.35	1,522	1,065
161.45	1,571	1,224
161.55	1,619	1,384
161.65	1,668	1,543
161.75	1,717	1,703
161.85	1,766	1,862
161.95	1,815	2,022
162.05	1,867	2,208
162.15	1,923	2,419
162.25	1,979	2,631
162.35	2,035	2,843
162.45	2,091	3,055
162.55	2,147	3,267
162.65	2,203	3,479
162.75	2,259	3,691
162.85	2,315	3,903
162.95	2,371	4,115
163.05	2,431	4,356
163.15	2,494	4,628
163.25	2,557	4,899
163.35	2,620	5,171
163.45	2,683	5,442
163.55	2,747	5,714
163.65	2,810	5,985
163.75	2,873	6,257
163.85	2,936	6,528
163.95	2,999	6,800
164.05	3,066	7,105
164.15	3,137	7,443
164.25	3,207	7,782
164.35	3,278	8,120
164.45	3,348	8,458
164.55	3,419	8,797
164.65	3,489	9,135
164.75	3,560	9,473
164.85	3,630	9,812
164.95	3,701	10,150
165.05	3,775	10,525
165.15	3,852	10,938
165.25	3,930	11,350
165.35	4,007	11,762
165.45	4,085	12,175
165.55	4,162	12,587
165.65	4,240	12,999
165.75	4,317	13,412
165.85	4,395	13,824
165.95	4,472	14,236
166.05	4,559	14,692
166.15	4,654	15,191
166.25	4,749	15,690
166.35	4,845	16,188
166.45	4,940	16,687
166.55	5,035	17,186
166.65	5,130	17,685
166.75	5,226	18,183
166.85	5,321	18,682
166.95	5,416	19,181
167.05	5,503	19,723
167.15	5,581	20,308
167.25	5,658	20,893
167.35	5,736	21,478
167.45	5,814	22,064
167.55	5,891	22,649
167.65	5,969	23,234
167.75	6,047	23,820
167.85	6,124	24,405
167.95	**6,202**	**24,990**

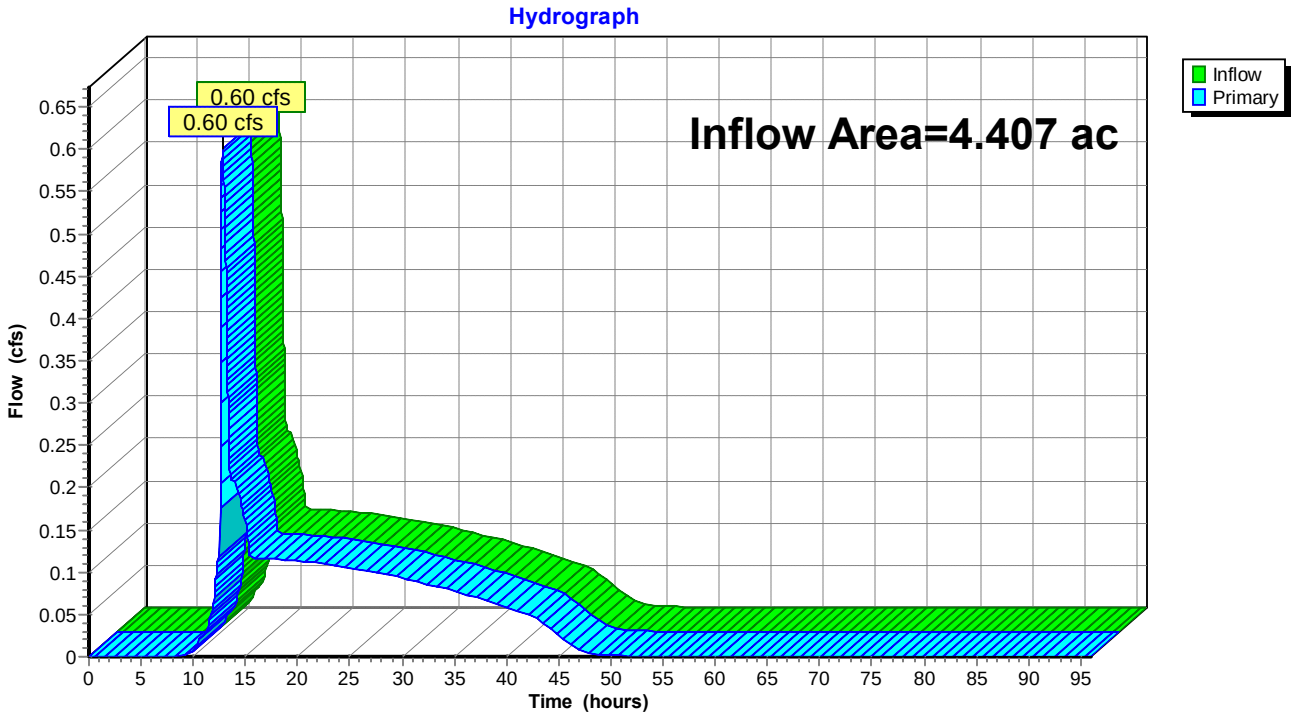
WQV REQ'D= 7713
WQV PROVIDED=7782 AT WSE 5164.25

Summary for Link 6L: STUDY POINT

Inflow Area = 4.407 ac, 77.83% Impervious, Inflow Depth = 0.78" for 2-yr event
Inflow = 0.60 cfs @ 12.80 hrs, Volume= 0.288 af
Primary = 0.60 cfs @ 12.80 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 6L: STUDY POINT



Hydrograph for Link 6L: STUDY POINT

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	54.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	64.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	65.00	0.00	0.00	0.00
12.00	**0.07**	0.00	**0.07**	66.00	0.00	0.00	0.00
13.00	**0.53**	0.00	**0.53**	67.00	0.00	0.00	0.00
14.00	0.21	0.00	0.21	68.00	0.00	0.00	0.00
15.00	0.16	0.00	0.16	69.00	0.00	0.00	0.00
16.00	0.12	0.00	0.12	70.00	0.00	0.00	0.00
17.00	0.12	0.00	0.12	71.00	0.00	0.00	0.00
18.00	0.12	0.00	0.12	72.00	0.00	0.00	0.00
19.00	0.11	0.00	0.11	73.00	0.00	0.00	0.00
20.00	0.11	0.00	0.11	74.00	0.00	0.00	0.00
21.00	0.11	0.00	0.11	75.00	0.00	0.00	0.00
22.00	0.11	0.00	0.11	76.00	0.00	0.00	0.00
23.00	0.11	0.00	0.11	77.00	0.00	0.00	0.00
24.00	0.11	0.00	0.11	78.00	0.00	0.00	0.00
25.00	0.11	0.00	0.11	79.00	0.00	0.00	0.00
26.00	0.10	0.00	0.10	80.00	0.00	0.00	0.00
27.00	0.10	0.00	0.10	81.00	0.00	0.00	0.00
28.00	0.10	0.00	0.10	82.00	0.00	0.00	0.00
29.00	0.10	0.00	0.10	83.00	0.00	0.00	0.00
30.00	0.09	0.00	0.09	84.00	0.00	0.00	0.00
31.00	0.09	0.00	0.09	85.00	0.00	0.00	0.00
32.00	0.09	0.00	0.09	86.00	0.00	0.00	0.00
33.00	0.08	0.00	0.08	87.00	0.00	0.00	0.00
34.00	0.08	0.00	0.08	88.00	0.00	0.00	0.00
35.00	0.08	0.00	0.08	89.00	0.00	0.00	0.00
36.00	0.07	0.00	0.07	90.00	0.00	0.00	0.00
37.00	0.07	0.00	0.07	91.00	0.00	0.00	0.00
38.00	0.07	0.00	0.07	92.00	0.00	0.00	0.00
39.00	0.06	0.00	0.06	93.00	0.00	0.00	0.00
40.00	0.06	0.00	0.06	94.00	0.00	0.00	0.00
41.00	0.05	0.00	0.05	95.00	0.00	0.00	0.00
42.00	0.05	0.00	0.05	96.00	0.00	0.00	0.00
43.00	0.04	0.00	0.04				
44.00	0.03	0.00	0.03				
45.00	0.03	0.00	0.03				
46.00	0.02	0.00	0.02				
47.00	0.01	0.00	0.01				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				
53.00	0.00	0.00	0.00				

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Basin B Runoff Area=4.407 ac 77.83% Impervious Runoff Depth=2.18"
Tc=12.0 min CN=95 Runoff=18.32 cfs 0.799 af

Pond 7P: DETENTION BASIN Peak Elev=165.39' Storage=11,924 cf Inflow=18.32 cfs 0.799 af
Outflow=13.71 cfs 0.799 af

Link 6L: STUDY POINT Inflow=13.71 cfs 0.799 af
Primary=13.71 cfs 0.799 af

Total Runoff Area = 4.407 ac Runoff Volume = 0.799 af Average Runoff Depth = 2.18"
22.17% Pervious = 0.977 ac 77.83% Impervious = 3.430 ac

Summary for Subcatchment 1S: Basin B

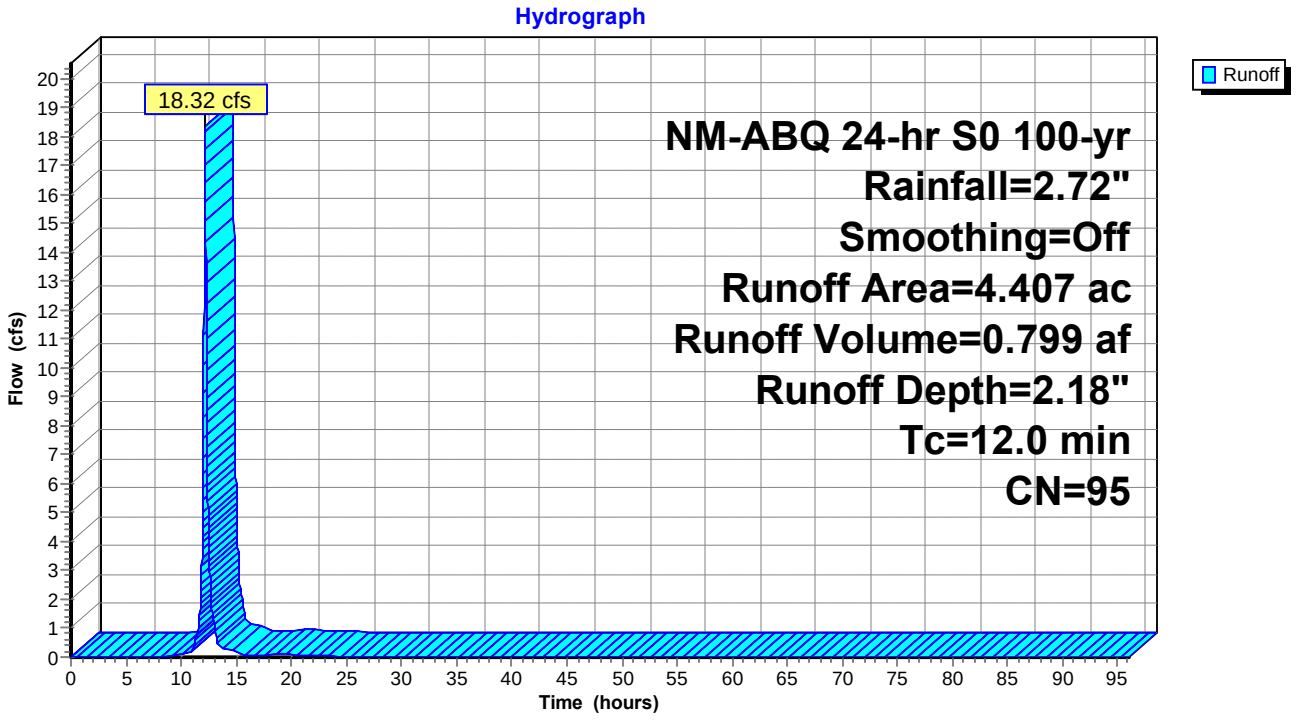
Runoff = 18.32 cfs @ 12.16 hrs, Volume= 0.799 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NM-ABQ 24-hr S0 100-yr Rainfall=2.72", Smoothing=Off

	Area (ac)	CN	Description
*	0.977	86	Treatment C
*	3.430	98	Treatment D
	4.407	95	Weighted Average
	0.977		22.17% Pervious Area
	3.430		77.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Basin B



Hydrograph for Subcatchment 1S: Basin B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.12	0.00	0.00
7.00	0.13	0.00	0.01
8.00	0.15	0.00	0.01
9.00	0.17	0.01	0.02
10.00	0.23	0.02	0.09
11.00	0.31	0.06	0.15
12.00	1.37	0.90	**6.33**
13.00	2.42	1.88	**1.27**
14.00	2.49	1.95	0.33
15.00	2.55	2.01	0.23
16.00	2.57	2.03	0.08
17.00	2.59	2.05	0.07
18.00	2.60	2.06	0.05
19.00	2.63	2.09	0.11
20.00	2.65	2.11	0.09
21.00	2.67	2.13	0.09
22.00	2.69	2.14	0.08
23.00	2.70	2.16	0.07
24.00	**2.72**	**2.18**	0.07
25.00	2.72	2.18	0.00
26.00	2.72	2.18	0.00
27.00	2.72	2.18	0.00
28.00	2.72	2.18	0.00
29.00	2.72	2.18	0.00
30.00	2.72	2.18	0.00
31.00	2.72	2.18	0.00
32.00	2.72	2.18	0.00
33.00	2.72	2.18	0.00
34.00	2.72	2.18	0.00
35.00	2.72	2.18	0.00
36.00	2.72	2.18	0.00
37.00	2.72	2.18	0.00
38.00	2.72	2.18	0.00
39.00	2.72	2.18	0.00
40.00	2.72	2.18	0.00
41.00	2.72	2.18	0.00
42.00	2.72	2.18	0.00
43.00	2.72	2.18	0.00
44.00	2.72	2.18	0.00
45.00	2.72	2.18	0.00
46.00	2.72	2.18	0.00
47.00	2.72	2.18	0.00
48.00	2.72	2.18	0.00
49.00	2.72	2.18	0.00
50.00	2.72	2.18	0.00
51.00	2.72	2.18	0.00
52.00	2.72	2.18	0.00
53.00	2.72	2.18	0.00
54.00	2.72	2.18	0.00
55.00	2.72	2.18	0.00
56.00	2.72	2.18	0.00
57.00	2.72	2.18	0.00
58.00	2.72	2.18	0.00
59.00	2.72	2.18	0.00
60.00	2.72	2.18	0.00
61.00	2.72	2.18	0.00
62.00	2.72	2.18	0.00
63.00	2.72	2.18	0.00
64.00	2.72	2.18	0.00
65.00	2.72	2.18	0.00
66.00	2.72	2.18	0.00
67.00	2.72	2.18	0.00
68.00	2.72	2.18	0.00
69.00	2.72	2.18	0.00
70.00	2.72	2.18	0.00
71.00	2.72	2.18	0.00
72.00	2.72	2.18	0.00
73.00	2.72	2.18	0.00
74.00	2.72	2.18	0.00
75.00	2.72	2.18	0.00
76.00	2.72	2.18	0.00
77.00	2.72	2.18	0.00
78.00	2.72	2.18	0.00
79.00	2.72	2.18	0.00
80.00	2.72	2.18	0.00
81.00	2.72	2.18	0.00
82.00	2.72	2.18	0.00
83.00	2.72	2.18	0.00
84.00	2.72	2.18	0.00
85.00	2.72	2.18	0.00
86.00	2.72	2.18	0.00
87.00	2.72	2.18	0.00
88.00	2.72	2.18	0.00
89.00	2.72	2.18	0.00
90.00	2.72	2.18	0.00
91.00	2.72	2.18	0.00
92.00	2.72	2.18	0.00
93.00	2.72	2.18	0.00
94.00	2.72	2.18	0.00
95.00	2.72	2.18	0.00
96.00	2.72	2.18	0.00

Summary for Pond 7P: DETENTION BASIN

Inflow Area = 4.407 ac, 77.83% Impervious, Inflow Depth = 2.18" for 100-yr event
Inflow = 18.32 cfs @ 12.16 hrs, Volume= 0.799 af
Outflow = 13.71 cfs @ 12.25 hrs, Volume= 0.799 af, Atten= 25%, Lag= 5.4 min
Primary = 13.71 cfs @ 12.25 hrs, Volume= 0.799 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 165.39' @ 12.25 hrs Surf.Area= 4,038 sf Storage= 11,924 cf

Plug-Flow detention time= 279.2 min calculated for 0.799 af (100% of inflow)
Center-of-Mass det. time= 279.1 min (1,049.6 - 770.5)

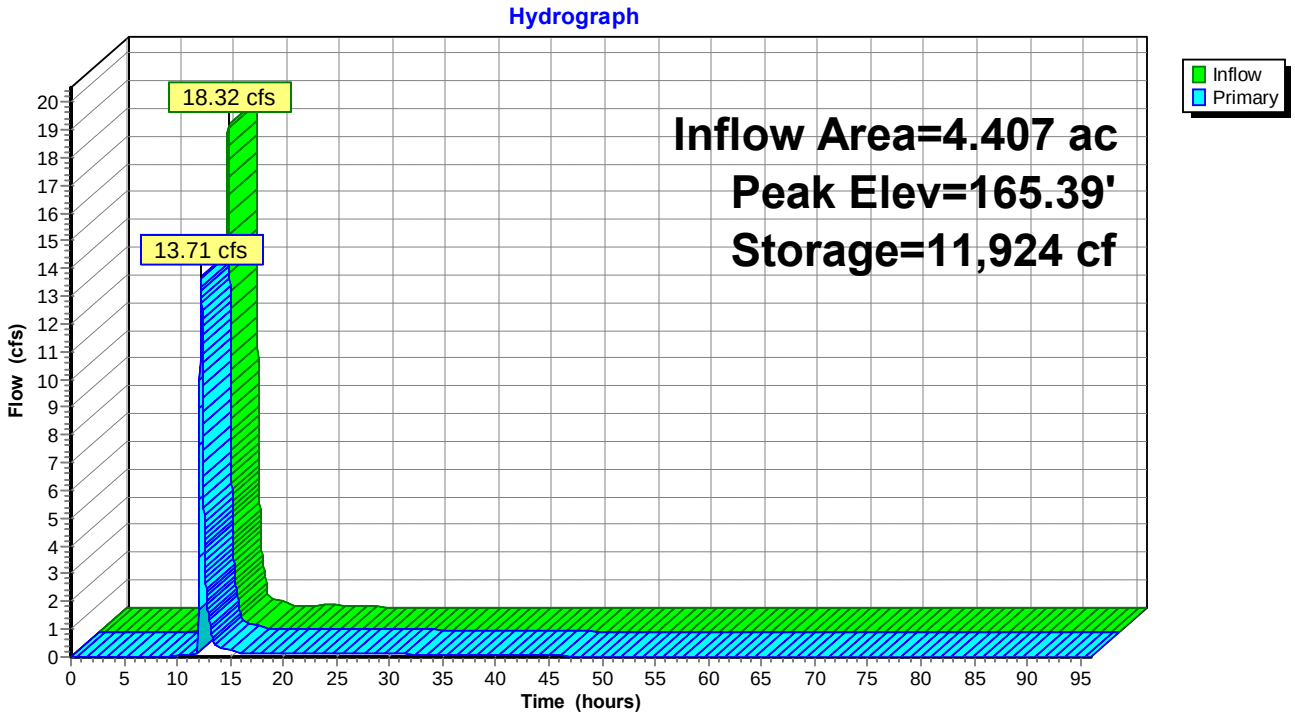
Volume	Invert	Avail.Storage	Storage Description
#1	160.25'	25,283 cf	**Cultec Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.25	0	0	0
161.00	1,351	507	507
162.00	1,839	1,595	2,102
163.00	2,399	2,119	4,221
164.00	3,031	2,715	6,936
165.00	3,736	3,384	10,319
166.00	4,511	4,124	14,443
167.00	5,464	4,988	19,430
168.00	6,241	5,853	25,283

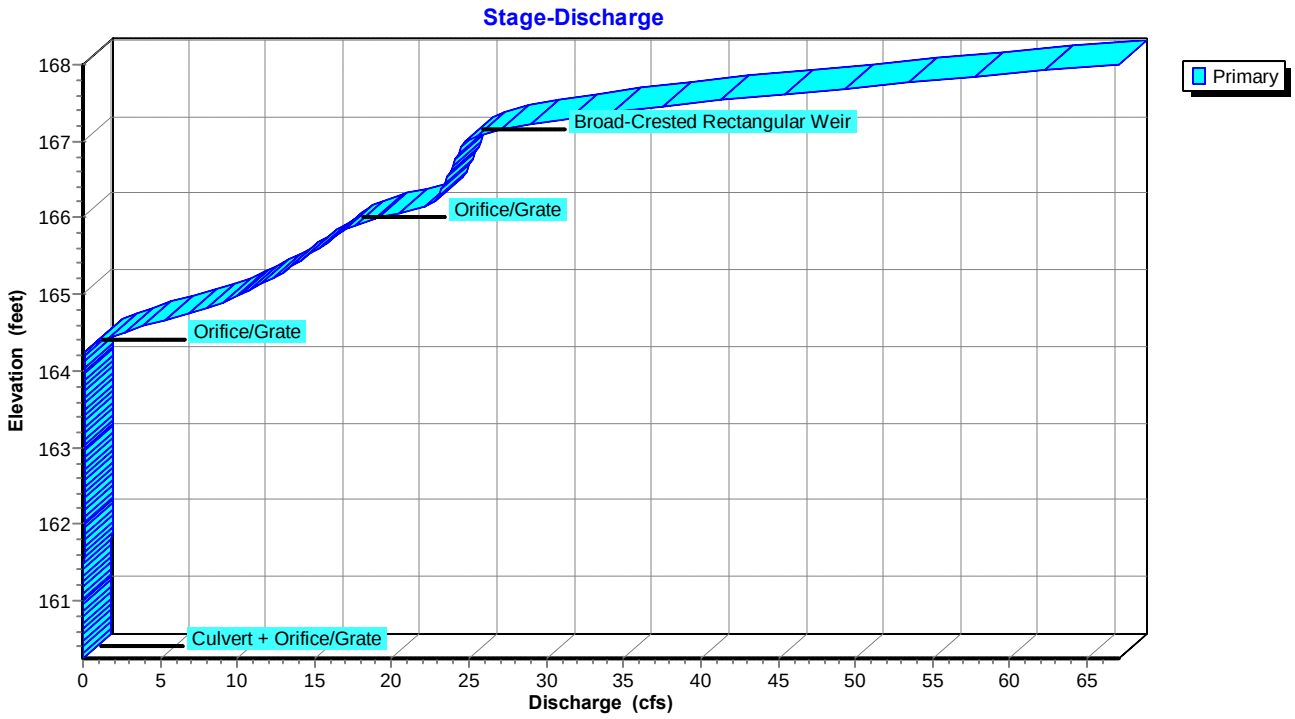
Device	Routing	Invert	Outlet Devices
#1	Primary	160.25'	**18.0" Round Culvert** L= 32.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 160.25' / 160.09' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	160.25'	**1.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	164.25'	**36.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	165.85'	**18.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	167.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=13.71 cfs @ 12.25 hrs HW=165.39' TW=159.00' (Fixed TW Elev= 159.00')
- **1=Culvert** (Passes 13.71 cfs of 20.69 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 10.85 fps)
  - **3=Orifice/Grate** (Orifice Controls 13.57 cfs @ 4.52 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

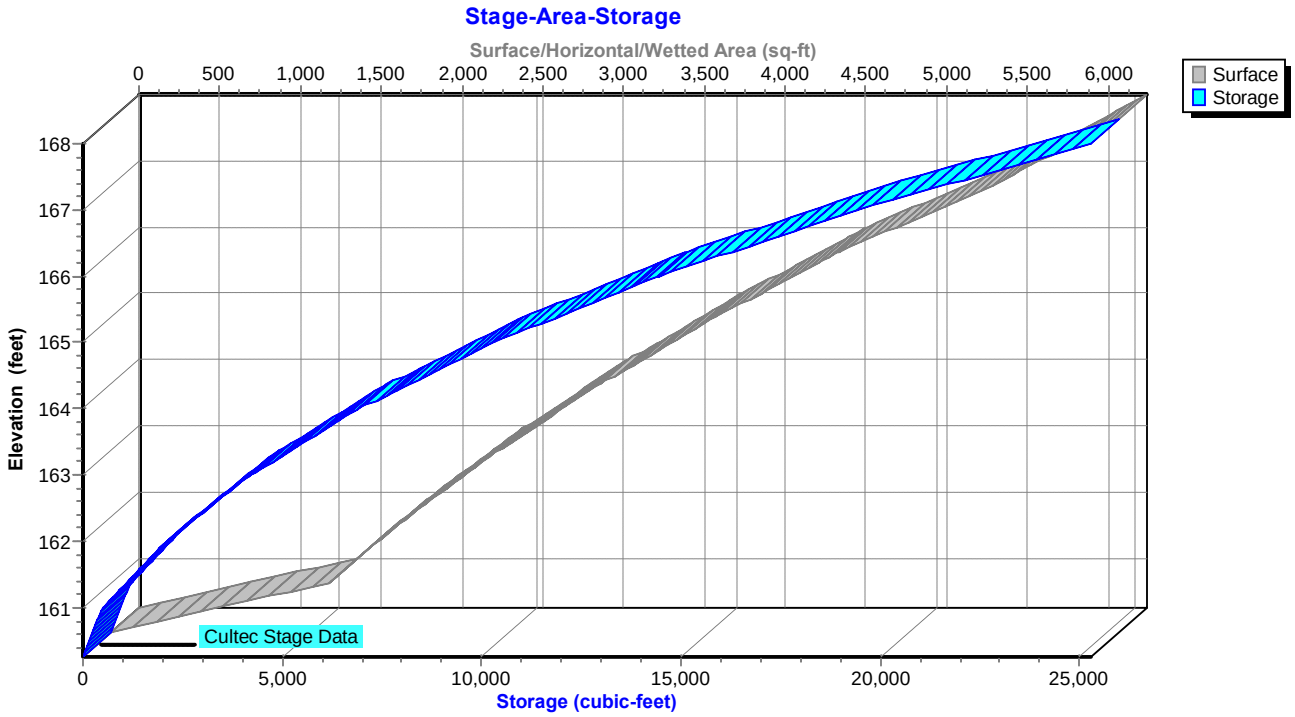
Pond 7P: DETENTION BASIN



Pond 7P: DETENTION BASIN



Pond 7P: DETENTION BASIN



Hydrograph for Pond 7P: DETENTION BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	160.25	0.00
2.00	0.00	0	160.25	0.00
4.00	0.00	0	160.25	0.00
6.00	0.00	3	160.25	0.00
8.00	0.01	31	160.30	0.00
10.00	0.09	207	160.56	0.03
12.00	**6.33**	**5,295**	**163.40**	**0.10**
14.00	**0.33**	**7,940**	**164.30**	**0.34**
16.00	0.08	7,742	164.24	0.12
18.00	0.05	7,379	164.13	0.12
20.00	0.09	7,275	164.10	0.11
22.00	0.08	7,065	164.04	0.11
24.00	0.07	6,764	163.94	0.11
26.00	0.00	6,013	163.66	0.11
28.00	0.00	5,251	163.38	0.10
30.00	0.00	4,522	163.11	0.10
32.00	0.00	3,829	162.82	0.09
34.00	0.00	3,177	162.51	0.09
36.00	0.00	2,568	162.22	0.08
38.00	0.00	2,002	161.94	0.08
40.00	0.00	1,488	161.62	0.07
42.00	0.00	1,031	161.33	0.06
44.00	0.00	631	161.08	0.05
46.00	0.00	304	160.70	0.04
48.00	0.00	106	160.41	0.02
50.00	0.00	35	160.30	0.01
52.00	0.00	12	160.27	0.00
54.00	0.00	4	160.26	0.00
56.00	0.00	2	160.25	0.00
58.00	0.00	1	160.25	0.00
60.00	0.00	0	160.25	0.00
62.00	0.00	0	160.25	0.00
64.00	0.00	0	160.25	0.00
66.00	0.00	0	160.25	0.00
68.00	0.00	0	160.25	0.00
70.00	0.00	0	160.25	0.00
72.00	0.00	0	160.25	0.00
74.00	0.00	0	160.25	0.00
76.00	0.00	0	160.25	0.00
78.00	0.00	0	160.25	0.00
80.00	0.00	0	160.25	0.00
82.00	0.00	0	160.25	0.00
84.00	0.00	0	160.25	0.00
86.00	0.00	0	160.25	0.00
88.00	0.00	0	160.25	0.00
90.00	0.00	0	160.25	0.00
92.00	0.00	0	160.25	0.00
94.00	0.00	0	160.25	0.00
96.00	0.00	0	160.25	0.00

AT 24 HRS, WSE FALL BELOW 164.25 WHICH IS WQV. THUS LARGER STORM HAS DRAINED OUT OF POND.

AT 48 HOURS THE POND STILL HAS A DISCHARGE. WQV STILL BEING DRAINED. BY 50 HOURS THE POND HAS NO DISCHARGE.

Stage-Discharge for Pond 7P: DETENTION BASIN

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
160.25	0.00	162.41	0.09	164.57	3.61	166.73	24.06
160.29	0.00	162.45	0.09	164.61	4.28	166.77	24.16
160.33	0.01	162.49	0.09	164.65	5.00	166.81	24.25
160.37	0.01	162.53	0.09	164.69	5.74	166.85	24.34
160.41	0.02	162.57	0.09	164.73	6.53	166.89	24.43
160.45	0.02	162.61	0.09	164.77	7.29	166.93	24.53
160.49	0.02	162.65	0.09	164.81	7.91	166.97	24.62
160.53	0.03	162.69	0.09	164.85	8.47	167.01	24.74
160.57	0.03	162.73	0.09	164.89	8.98	167.05	25.19
160.61	0.03	162.77	0.09	164.93	9.46	167.09	25.84
160.65	0.03	162.81	0.09	164.97	9.91	167.13	26.63
160.69	0.04	162.85	0.09	165.01	10.34	167.17	27.53
160.73	0.04	162.89	0.09	165.05	10.75	167.21	28.55
160.77	0.04	162.93	0.10	165.09	11.14	167.25	29.71
160.81	0.04	162.97	0.10	165.13	11.52	167.29	30.99
160.85	0.04	163.01	0.10	165.17	11.88	167.33	32.38
160.89	0.04	163.05	0.10	165.21	12.24	167.37	33.88
160.93	0.05	163.09	0.10	165.25	12.58	167.41	35.49
160.97	0.05	163.13	0.10	165.29	12.92	167.45	37.24
161.01	0.05	163.17	0.10	165.33	13.24	167.49	39.11
161.05	0.05	163.21	0.10	165.37	13.56	167.53	41.09
161.09	0.05	163.25	0.10	165.41	13.87	167.57	43.19
161.13	0.05	163.29	0.10	165.45	14.17	167.61	45.33
161.17	0.05	163.33	0.10	165.49	14.47	167.65	47.31
161.21	0.06	163.37	0.10	165.53	14.76	167.69	49.35
161.25	0.06	163.41	0.10	165.57	15.04	167.73	51.44
161.29	0.06	163.45	0.10	165.61	15.32	167.77	53.58
161.33	0.06	163.49	0.11	165.65	15.60	167.81	55.78
161.37	0.06	163.53	0.11	165.69	15.87	167.85	58.06
161.41	0.06	163.57	0.11	165.73	16.13	167.89	60.39
161.45	0.06	163.61	0.11	165.77	16.39	167.93	62.78
161.49	0.06	163.65	0.11	165.81	16.65	167.97	**65.21**
161.53	0.07	163.69	0.11	165.85	16.90		
161.57	0.07	163.73	0.11	165.89	17.33		
161.61	0.07	163.77	0.11	165.93	17.91		
161.65	0.07	163.81	0.11	165.97	18.58		
161.69	0.07	163.85	0.11	166.01	19.34		
161.73	0.07	163.89	0.11	166.05	20.15		
161.77	0.07	163.93	0.11	166.09	21.03		
161.81	0.07	163.97	0.11	166.13	21.96		
161.85	0.07	164.01	0.11	166.17	22.71		
161.89	0.07	164.05	0.11	166.21	22.81		
161.93	0.08	164.09	0.11	166.25	22.91		
161.97	0.08	164.13	0.12	166.29	23.01		
162.01	0.08	164.17	0.12	166.33	23.11		
162.05	0.08	164.21	0.12	166.37	23.21		
162.09	0.08	164.25	0.12	166.41	23.30		
162.13	0.08	164.29	0.27	166.45	23.40		
162.17	0.08	164.33	0.55	166.49	23.49		
162.21	0.08	164.37	0.92	166.53	23.59		
162.25	0.08	164.41	1.35	166.57	23.69		
162.29	0.08	164.45	1.84	166.61	23.78		
162.33	0.08	164.49	2.39	166.65	23.88		
162.37	0.08	164.53	2.97	166.69	23.97		

Stage-Area-Storage for Pond 7P: DETENTION BASIN

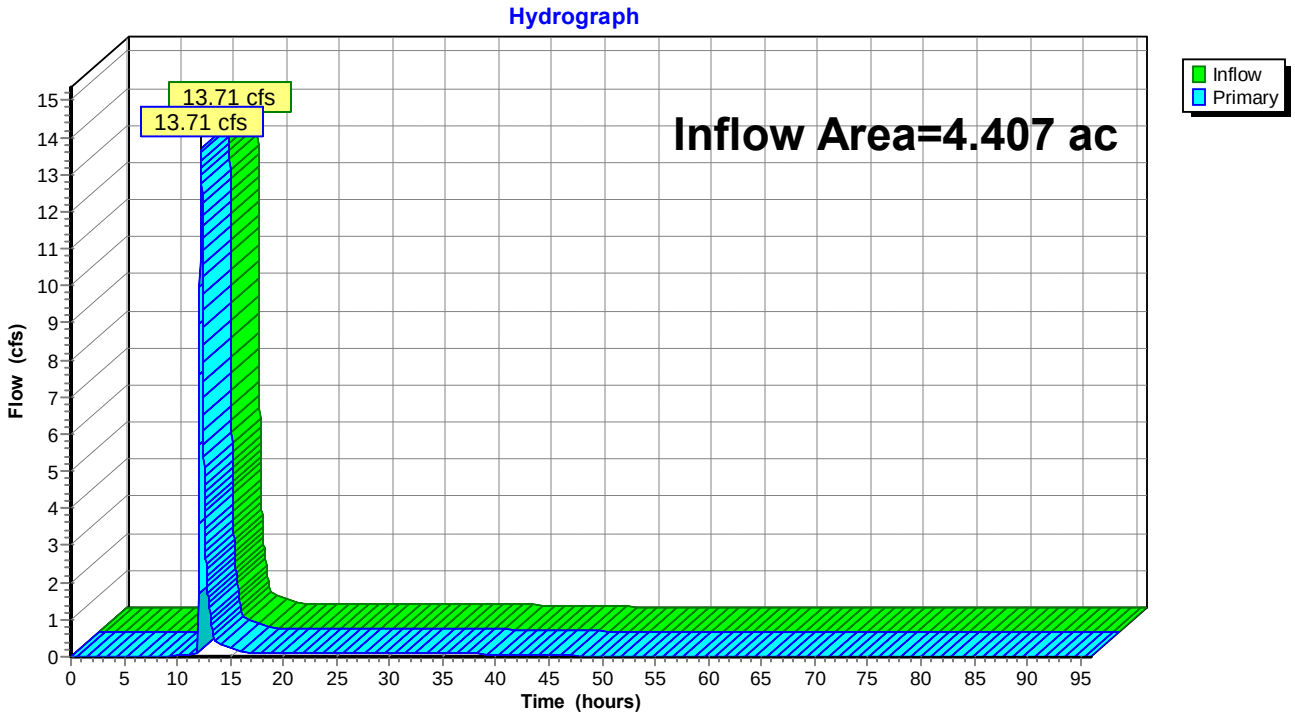
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.25	0	0
160.35	180	68
160.45	360	135
160.55	540	203
160.65	721	270
160.75	901	338
160.85	1,081	405
160.95	1,261	473
161.05	1,375	586
161.15	1,424	746
161.25	1,473	905
161.35	1,522	1,065
161.45	1,571	1,224
161.55	1,619	1,384
161.65	1,668	1,543
161.75	1,717	1,703
161.85	1,766	1,862
161.95	1,815	2,022
162.05	1,867	2,208
162.15	1,923	2,419
162.25	1,979	2,631
162.35	2,035	2,843
162.45	2,091	3,055
162.55	2,147	3,267
162.65	2,203	3,479
162.75	2,259	3,691
162.85	2,315	3,903
162.95	2,371	4,115
163.05	2,431	4,356
163.15	2,494	4,628
163.25	2,557	4,899
163.35	2,620	5,171
163.45	2,683	5,442
163.55	2,747	5,714
163.65	2,810	5,985
163.75	2,873	6,257
163.85	2,936	6,528
163.95	2,999	6,800
164.05	3,066	7,105
164.15	3,137	7,443
164.25	3,207	7,782
164.35	3,278	8,120
164.45	3,348	8,458
164.55	3,419	8,797
164.65	3,489	9,135
164.75	3,560	9,473
164.85	3,630	9,812
164.95	3,701	10,150
165.05	3,775	10,525
165.15	3,852	10,938
165.25	3,930	11,350
165.35	4,007	11,762
165.45	4,085	12,175
165.55	4,162	12,587
165.65	4,240	12,999
165.75	4,317	13,412
165.85	4,395	13,824
165.95	4,472	14,236
166.05	4,559	14,692
166.15	4,654	15,191
166.25	4,749	15,690
166.35	4,845	16,188
166.45	4,940	16,687
166.55	5,035	17,186
166.65	5,130	17,685
166.75	5,226	18,183
166.85	5,321	18,682
166.95	5,416	19,181
167.05	5,503	19,723
167.15	5,581	20,308
167.25	5,658	20,893
167.35	5,736	21,478
167.45	5,814	22,064
167.55	5,891	22,649
167.65	5,969	23,234
167.75	6,047	23,820
167.85	6,124	24,405
167.95	**6,202**	**24,990**

Summary for Link 6L: STUDY POINT

Inflow Area = 4.407 ac, 77.83% Impervious, Inflow Depth = 2.18" for 100-yr event
Inflow = 13.71 cfs @ 12.25 hrs, Volume= 0.799 af
Primary = 13.71 cfs @ 12.25 hrs, Volume= 0.799 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 6L: STUDY POINT



Hydrograph for Link 6L: STUDY POINT

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	54.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01	63.00	0.00	0.00	0.00
10.00	0.03	0.00	0.03	64.00	0.00	0.00	0.00
11.00	0.05	0.00	0.05	65.00	0.00	0.00	0.00
12.00	**0.10**	0.00	**0.10**	66.00	0.00	0.00	0.00
13.00	**1.41**	0.00	**1.41**	67.00	0.00	0.00	0.00
14.00	0.34	0.00	0.34	68.00	0.00	0.00	0.00
15.00	0.24	0.00	0.24	69.00	0.00	0.00	0.00
16.00	0.12	0.00	0.12	70.00	0.00	0.00	0.00
17.00	0.12	0.00	0.12	71.00	0.00	0.00	0.00
18.00	0.12	0.00	0.12	72.00	0.00	0.00	0.00
19.00	0.12	0.00	0.12	73.00	0.00	0.00	0.00
20.00	0.11	0.00	0.11	74.00	0.00	0.00	0.00
21.00	0.11	0.00	0.11	75.00	0.00	0.00	0.00
22.00	0.11	0.00	0.11	76.00	0.00	0.00	0.00
23.00	0.11	0.00	0.11	77.00	0.00	0.00	0.00
24.00	0.11	0.00	0.11	78.00	0.00	0.00	0.00
25.00	0.11	0.00	0.11	79.00	0.00	0.00	0.00
26.00	0.11	0.00	0.11	80.00	0.00	0.00	0.00
27.00	0.11	0.00	0.11	81.00	0.00	0.00	0.00
28.00	0.10	0.00	0.10	82.00	0.00	0.00	0.00
29.00	0.10	0.00	0.10	83.00	0.00	0.00	0.00
30.00	0.10	0.00	0.10	84.00	0.00	0.00	0.00
31.00	0.10	0.00	0.10	85.00	0.00	0.00	0.00
32.00	0.09	0.00	0.09	86.00	0.00	0.00	0.00
33.00	0.09	0.00	0.09	87.00	0.00	0.00	0.00
34.00	0.09	0.00	0.09	88.00	0.00	0.00	0.00
35.00	0.08	0.00	0.08	89.00	0.00	0.00	0.00
36.00	0.08	0.00	0.08	90.00	0.00	0.00	0.00
37.00	0.08	0.00	0.08	91.00	0.00	0.00	0.00
38.00	0.08	0.00	0.08	92.00	0.00	0.00	0.00
39.00	0.07	0.00	0.07	93.00	0.00	0.00	0.00
40.00	0.07	0.00	0.07	94.00	0.00	0.00	0.00
41.00	0.06	0.00	0.06	95.00	0.00	0.00	0.00
42.00	0.06	0.00	0.06	96.00	0.00	0.00	0.00
43.00	0.06	0.00	0.06				
44.00	0.05	0.00	0.05				
45.00	0.05	0.00	0.05				
46.00	0.04	0.00	0.04				
47.00	0.03	0.00	0.03				
48.00	0.02	0.00	0.02				
49.00	0.01	0.00	0.01				
50.00	0.01	0.00	0.01				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				
53.00	0.00	0.00	0.00				

NOAA Atlas 14, Volume 1, Version 5
Location name: Albuquerque, New Mexico, USA*
Latitude: 35.149°, Longitude: -106.5923°
Elevation: 5166.82 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.170 (0.144-0.203)	0.221 (0.185-0.262)	0.296 (0.250-0.352)	0.356 (0.298-0.421)	0.436 (0.364-0.517)	0.501 (0.415-0.593)	0.568 (0.467-0.672)	0.639 (0.523-0.756)	0.736 (0.597-0.871)	0.813 (0.656-0.962)
10-min	0.259 (0.220-0.308)	0.335 (0.282-0.398)	0.451 (0.380-0.536)	0.541 (0.453-0.641)	0.664 (0.554-0.787)	0.761 (0.632-0.903)	0.864 (0.711-1.02)	0.972 (0.796-1.15)	1.12 (0.909-1.33)	1.24 (0.999-1.46)
15-min	0.321 (0.272-0.382)	0.416 (0.349-0.494)	0.560 (0.471-0.665)	0.671 (0.561-0.795)	0.823 (0.686-0.975)	0.944 (0.784-1.12)	1.07 (0.882-1.27)	1.21 (0.987-1.43)	1.39 (1.13-1.64)	1.53 (1.24-1.81)
30-min	0.432 (0.366-0.515)	0.560 (0.470-0.665)	0.753 (0.634-0.896)	0.903 (0.756-1.07)	1.11 (0.924-1.31)	1.27 (1.06-1.51)	1.44 (1.19-1.71)	1.62 (1.33-1.92)	1.87 (1.52-2.21)	2.07 (1.67-2.44)
60-min	0.535 (0.453-0.637)	0.693 (0.582-0.823)	0.932 (0.785-1.11)	1.12 (0.935-1.33)	1.37 (1.14-1.63)	1.57 (1.31-1.87)	1.79 (1.47-2.11)	2.01 (1.65-2.38)	2.31 (1.88-2.74)	2.56 (2.06-3.02)
2-hr	0.643 (0.531-0.795)	0.825 (0.683-1.02)	1.09 (0.902-1.35)	1.31 (1.08-1.60)	1.61 (1.31-1.97)	1.85 (1.50-2.27)	2.11 (1.70-2.58)	2.38 (1.91-2.89)	2.76 (2.19-3.36)	3.06 (2.41-3.74)
3-hr	0.687 (0.572-0.841)	0.875 (0.726-1.07)	1.15 (0.954-1.41)	1.37 (1.13-1.67)	1.67 (1.37-2.04)	1.92 (1.57-2.33)	2.18 (1.77-2.64)	2.46 (1.98-2.98)	2.84 (2.27-3.44)	3.16 (2.50-3.84)
6-hr	0.803 (0.673-0.976)	1.01 (0.851-1.23)	1.31 (1.10-1.59)	1.54 (1.29-1.87)	1.87 (1.55-2.25)	2.11 (1.75-2.55)	2.38 (1.96-2.87)	2.66 (2.17-3.20)	3.04 (2.47-3.65)	3.35 (2.70-4.03)
12-hr	0.883 (0.749-1.04)	1.11 (0.942-1.32)	1.42 (1.20-1.67)	1.65 (1.40-1.95)	1.97 (1.66-2.32)	2.22 (1.86-2.61)	2.48 (2.07-2.91)	2.75 (2.28-3.23)	3.12 (2.56-3.66)	3.42 (2.78-4.07)
24-hr	0.996 (0.856-1.16)	1.25 (1.07-1.46)	1.57 (1.35-1.83)	1.83 (1.57-2.13)	2.17 (1.85-2.53)	2.44 (2.07-2.83)	2.72 (2.30-3.16)	3.00 (2.53-3.48)	3.39 (2.83-3.93)	3.69 (3.07-4.29)
2-day	1.04 (0.894-1.20)	1.30 (1.13-1.51)	1.64 (1.41-1.90)	1.90 (1.64-2.20)	2.26 (1.93-2.62)	2.54 (2.16-2.93)	2.83 (2.39-3.27)	3.12 (2.63-3.61)	3.51 (2.94-4.08)	3.82 (3.19-4.45)
3-day	1.14 (1.01-1.28)	1.42 (1.27-1.60)	1.77 (1.57-1.98)	2.04 (1.81-2.28)	2.40 (2.12-2.69)	2.68 (2.36-3.00)	2.96 (2.60-3.32)	3.24 (2.83-3.64)	3.62 (3.15-4.09)	3.92 (3.39-4.47)
4-day	1.25 (1.14-1.36)	1.55 (1.41-1.69)	1.89 (1.73-2.07)	2.17 (1.98-2.36)	2.53 (2.30-2.77)	2.81 (2.55-3.07)	3.09 (2.80-3.37)	3.37 (3.04-3.68)	3.74 (3.36-4.11)	4.01 (3.60-4.49)
7-day	1.42 (1.30-1.54)	1.76 (1.61-1.91)	2.14 (1.96-2.32)	2.43 (2.23-2.64)	2.81 (2.57-3.05)	3.10 (2.83-3.35)	3.38 (3.09-3.66)	3.65 (3.33-3.96)	3.99 (3.64-4.34)	4.25 (3.86-4.62)
10-day	1.57 (1.44-1.70)	1.94 (1.78-2.11)	2.37 (2.18-2.57)	2.71 (2.49-2.93)	3.15 (2.90-3.40)	3.48 (3.19-3.76)	3.81 (3.49-4.12)	4.14 (3.78-4.47)	4.56 (4.14-4.92)	4.86 (4.41-5.26)
20-day	1.95 (1.79-2.13)	2.42 (2.22-2.64)	2.93 (2.69-3.19)	3.32 (3.04-3.61)	3.81 (3.49-4.14)	4.16 (3.81-4.51)	4.50 (4.11-4.88)	4.82 (4.39-5.22)	5.21 (4.75-5.65)	5.49 (4.99-5.95)
30-day	2.34 (2.14-2.53)	2.89 (2.65-3.13)	3.47 (3.19-3.75)	3.90 (3.58-4.21)	4.43 (4.06-4.77)	4.81 (4.40-5.17)	5.16 (4.72-5.55)	5.49 (5.01-5.91)	5.87 (5.36-6.32)	6.14 (5.60-6.61)
45-day	2.86 (2.63-3.09)	3.53 (3.26-3.83)	4.20 (3.87-4.54)	4.68 (4.31-5.05)	5.25 (4.84-5.66)	5.63 (5.19-6.07)	5.98 (5.51-6.43)	6.27 (5.79-6.74)	6.59 (6.10-7.09)	6.78 (6.29-7.28)
60-day	3.29 (3.03-3.56)	4.06 (3.75-4.40)	4.83 (4.47-5.23)	5.38 (4.97-5.81)	6.04 (5.58-6.52)	6.48 (5.99-6.99)	6.88 (6.37-7.43)	7.23 (6.70-7.81)	7.62 (7.07-8.24)	7.85 (7.31-8.48)

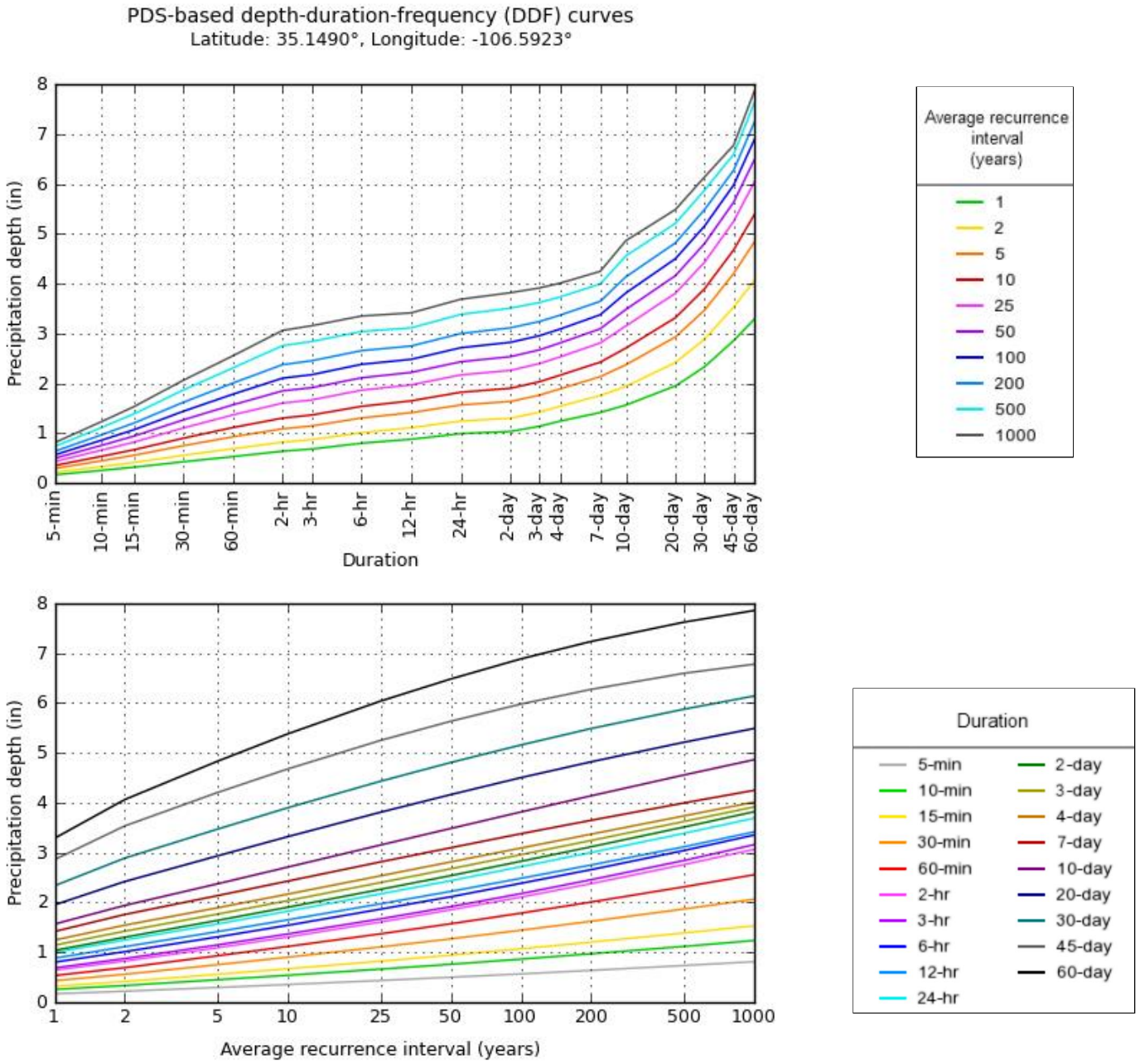
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



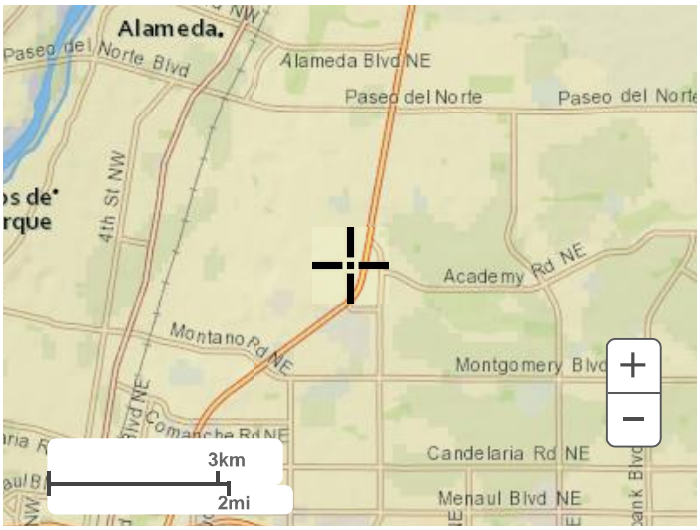
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Tue Apr 27 21:09:50 2021

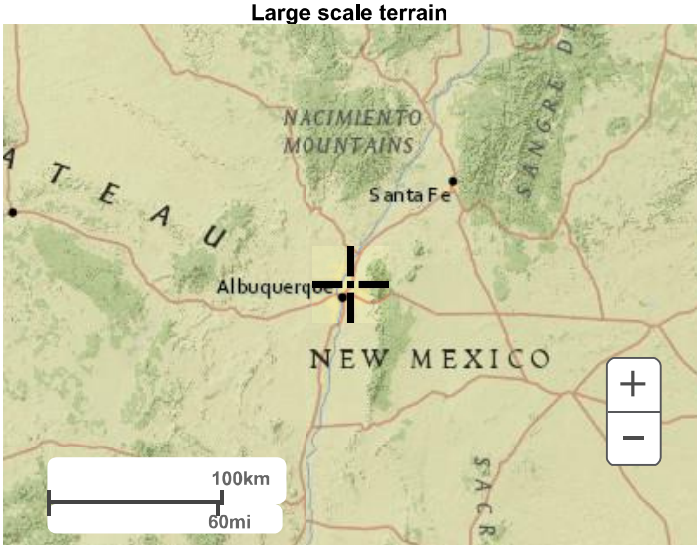
Back to Top

Maps & aerials

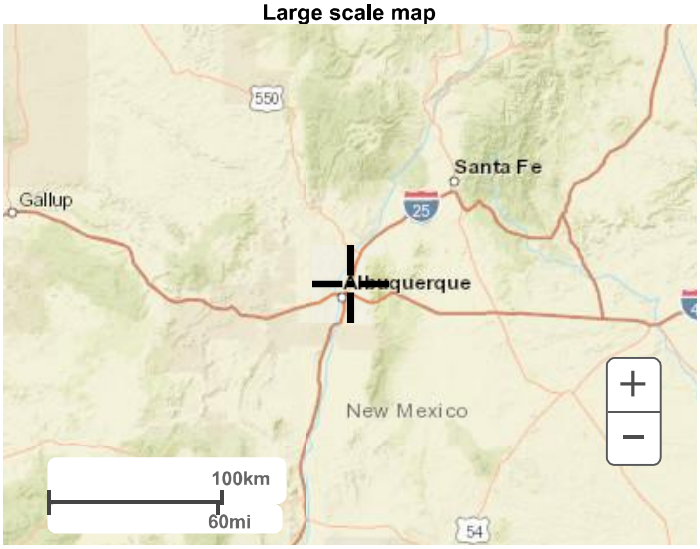
Small scale terrain



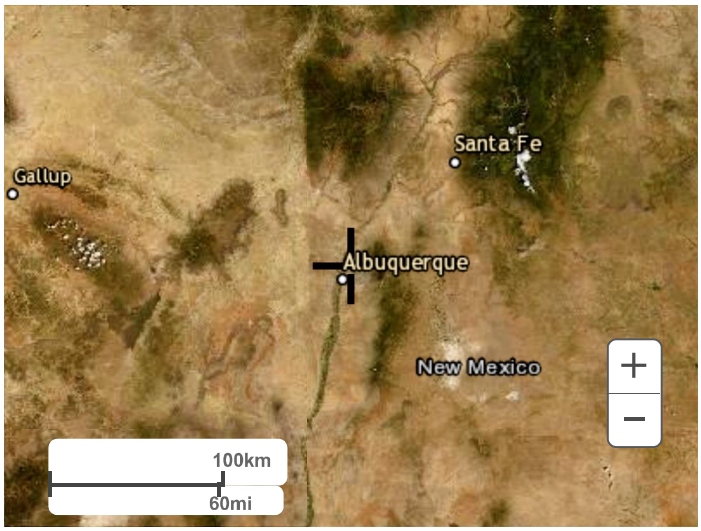
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

LOCATION		DRAINAGE AREA	RUNOFF				PIPE						TRAVEL TIME			INVERT ELEV.		PIPE DEPTH	
FROM	TO	(acre)	C	I	Q inlet (cfs)	Q pipe (cfs)	n	SLOPE (ft/ft)	LENGTH (ft)	SIZE (inches)	ROUNDED SIZE (inches)	TYPE	FULL VEL. (fps)	DELTA "T" (min)	TOTAL "T" (min)	UP-STREAM INV.	DOWN-STREAM INV.	UPSTREAM RIM ELEVATION	UPSTREAM COVER DEPTH
DI 12	DI 11	0.670	0.90	6.78	4.1	4.1	0.012	0.005	68	13.9	**15**	**RCP**	4.0	0.28	0.28	164.15	163.81	166.85	1.14
DI 11	DI 10	0.494	0.90	6.78	3.0	7.1	0.012	0.005	122	17.2	**18**	**RCP**	4.6	0.45	0.45	163.56	162.95	166.50	1.13
DI 10	DI 9	0.736	0.90	6.78	4.5	11.6	0.012	0.005	86	20.6	**24**	**RCP**	5.5	0.26	0.26	162.75	162.32	166.50	1.50
DI 9	DI 6	0.298	0.90	6.78	1.8	13.4	0.012	0.005	150	21.8	**24**	**RCP**	5.5	0.45	0.45	162.22	161.47	168.00	3.53
DI 8	DI 7	0.319	0.90	6.78	1.9	1.9	0.012	0.005	116	10.6	**15**	**RCP**	4.0	0.48	0.48	163.00	162.42	166.00	1.40
DI 7	DI 6	0.170	0.90	6.78	1.0	3.0	0.012	0.005	86	12.4	**15**	**RCP**	4.0	0.36	0.36	162.32	161.89	166.00	2.18
DI 6	JB 5	0.556	0.90	6.78	3.4	19.8	0.012	0.005	116	25.2	**30**	**RCP**	6.4	0.30	0.30	161.37	160.79	166.25	2.03
DI 4	JB 5	0.860	0.90	6.78	5.2	5.2	0.012	0.010	58	13.5	**15**	**RCP**	5.7	0.17	0.17	163.00	162.42	168.00	3.75

EARTHWORKS ENGINEERING GROUP, L.L.C.
7901 LORRAINE CT NE• ALBUQUERQUE, NM 87113
505-899-4886

GEOTECHNICAL INVESTIGATION

5900 JEFFERSON STREET NE
ALBUQUERQUE, NEW MEXICO

EEG Project No.: A20-843

Prepared for:

AYER DESIGN GROUP, LLC

Prepared by:

Patrick Gallegos, EIT

Reviewed By:

Dave Liebelt, P.E.

February 15, 2021

SUMMARY

The information presented in this section is a partial summary intended for reference use only. This information is intended for use only in conjunction with the complete geotechnical investigation report. Significant information contained in the complete geotechnical report may not be present here.

ON-SITE SOILS

To explore the site subsurface conditions, six test holes were excavated to a depth of approximately twenty feet within the proposed building area, an additional test hole was excavated to approximately thirty feet. One test hole was excavated in the building area to a depth of approximately eight-eight feet to determine the IBC seismic site classification of the site soils. Five additional test holes were excavated to a depth of ten feet in proposed parking lot and drive lane areas. The test holes in the building area were excavated with a truck mounted CME 75 drill rig using 3.25-inch hollow stem auger drilling techniques. N-Values were collected with a 140-pound hydraulic powered automatic hammer. The test holes in the parking lot and drive lane areas were excavated with a truck mounted CME 55 drill rig using 3.25-inch ID Hollow Stem Auger. N-Values were collected with a 140-pound cathead assisted safety hammer. The test hole locations are shown on the attached Site Plan, Figure 3. Detailed logs of the test holes are displayed on the attached Logs of Test Holes, Figures 5 through 15. In general, the test holes encountered fine to coarse grained, medium moist to moist, silty sand (SM) and slightly silty sand (SP-SM) in the upper fifteen feet. These soils were very loose to medium dense as measured by SPT. Approximately eight feet of uncontrolled fill soils were encountered in test holes 1 and 8. Beneath a depth of fifteen feet, the test holes generally encountered fine to medium grained, slightly moist to moist, silt (ML) and very silty sand (SM). The silts (ML) were soft to medium stiff as measured by SPT. The very silty sands (SM) were very loose to medium dense as measured by SPT. Groundwater was not encountered in the test holes to the maximum depth of exploration, approximately eighty-eight feet. On-site soils appear suitable for reuse as engineered fill provided, they are blended to a homogeneous mixture prior to use. Specifications for engineered fill are presented in the Earthwork section of this report.

REMEDIAL EARTHWORK

To provide uniform bearing conditions and limit the potential for post-construction movement, we recommend remedial earthwork in the form of over-excavation of the site soils and replacement with properly compacted engineered fill soil.

The site soils should be excavated to allow for the placement of a minimum of five feet of engineered fill beneath all foundations and concrete floors slabs. The upper eight feet of existing uncontrolled fill soil in the vicinity of test holes 1 and 8 should be excavated to a depth of eight feet below existing grade, see attached Remedial Earthwork, Figure 4. This area may then be brought to designed finished pad grade with properly compacted engineered fill soil. In each of the above cases soil removal should extend a minimum of five feet beyond the feet beyond the outside edges of foundations or greater to incorporate concrete flatwork.

FOUNDATIONS

The structure may be founded on either conventional isolated spread footings with a concrete slab-on-grade or on a monolithic slab with turned down edges and integral column footings. Foundations for the structure, bearing on properly compacted engineered fill, may be designed for an allowable bearing capacity of 2500 psf. Light pole foundations may be embedded into native soil and be designed for an allowable bearing capacity of 1500 psf. The base of exterior foundations should be embedded a minimum of eighteen inches below lowest adjacent grade. The base of interior footings may be embedded a minimum of twelve inches below finished pad grade. Isolated and continuous spread footings should be a minimum of twenty-four and eighteen inches wide, respectively. Turned down edges may be a minimum of sixteen inches wide. However, footing widths may need to be larger based on actual structure design loads. Bearing capacity values may be increased by one-third for short term loading from wind and seismic sources. Structures may be designed for a seismic site classification of **D**.

EARTHWORK

Following all cut earthwork, the soils at the base of excavations should be scarified to a depth of eight inches and moisture conditioned to optimum moisture content (+/- 3%). The surface of the natural soils at the base of excavations should be compacted to 95% maximum dry density as determined by ASTM Standard D1557. All engineered fill placed below the structure should be compacted to 95% maximum dry density at optimum moisture content (+/- 3%) as determined by ASTM Standard D1557.

EARTHWORK COMPACTION TESTING

Compaction testing must be performed by this office during earthwork construction to verify the compaction requirements outlined in this report have been met. Modified Proctor testing (ASTM D-1557) will be necessary to determine the maximum dry density and optimum moisture content of the natural soils at the base of excavations as well as on all engineered fill used below the structure. The surface of natural soils should be tested for compaction prior to placing

engineered fill. Engineered fill should be placed in loose lifts a maximum of eight-inches thick. Each lift of fill should be compacted prior to placing additional lifts. Compaction testing should be performed on fill at a minimum of every other lift until finished grade is reached. Utility trench backfill should be treated as engineered fill. The base of footing excavations and finished pad grade should be tested prior to placing reinforcement and pouring concrete.

EARTHWORK CERTIFICATION

Earthwork certification will only be provided if all recommendations presented herein are followed. It is up to the client to read and understand the recommendations prior to starting construction. Earthworks Engineering Group will answer all questions the client may have concerning these recommendations. Earthwork certification will be valid for five days following the last inspection by this office. Foundations should be poured during this time-period. The site must be re-inspected if foundations are not poured during this time-period or if site conditions change for any reason following the previous inspection.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

This report presents the results of our geotechnical investigation for a proposed commercial structure to be located at 5900 Jefferson Street NE in Albuquerque, New Mexico.

The investigation was performed to determine the site subsurface conditions, and based on the conditions encountered, develop geotechnical recommendations for:

- Remedial Earthwork
- Foundation Design
- Slabs-on-Grade
- Pavements
- Site Grading
- Earthwork Construction

The conclusions and recommendations presented are based on information provided by the client regarding the proposed construction, subsurface conditions disclosed by the test holes, laboratory testing, and the local standards of our profession at the time this report was prepared.

PROJECT DESCRIPTION

An aerial image from Google Earth as recent as July of 2007 indicates that the building site had been previously developed with multiple structures and a pool. An image from February of 2009 indicates that by that date, the structures and pool had been demolished, and backfilling of the pool had begun. By October of 2015 site had had been developed into is current configuration. Images from the above-mentioned dates are displayed on the attached Site Development History, Figures 1A through 1C.

To determine the new site layout relative to the previously existing structures, the new site layout was overlayed onto the July 2007 Google Earth image. This overlay indicated that the new site structure will be located where portions of the previous structure and pool were located. This image is displayed on the attached Site Overlay, Figure 2.

The new project will consist of construction of a new pre-engineered metal structure and adjacent parking lots and drive lanes. The structure will be a maximum of two stories in height. The drive lanes and parking lot with be constructed with either asphaltic pavement sections or PCC (Portland Cement Concrete). No below grade structures are anticipated.

For the purposes of this report, column and strip loads (dead + live) are anticipated to not exceed 65 kips and 2 kips per linear foot. This office must be contacted following final design to verify the recommendations presented herein remain applicable.

If structure loads or configuration differ from those indicated in this report, this office should be notified.

SOIL CONDITIONS

To explore the site subsurface conditions, six test holes were excavated to a depth of approximately twenty feet within the proposed building area, an additional test hole was excavated to approximately thirty feet. One test hole was excavated in the building area to a depth of approximately eight-eight feet to determine the IBC seismic site classification of the site soils. Five additional test holes were excavated to a depth of ten feet in proposed parking lot and drive lane areas. The test holes in the building area were excavated with a truck mounted CME 75 drill rig using 3.25-inch hollow stem auger drilling techniques. N-Values were collected with a 140-pound hydraulic powered automatic hammer. The test holes in the parking lot and drive lane areas were excavated with a truck mounted CME 55 drill rig using 3.25-inch ID Hollow Stem Auger. N-Values were collected with a 140-pound cathead assisted safety hammer. The test hole locations are shown on the attached Site Plan, Figure 3.

Detailed logs of the test holes are displayed on the attached Logs of Test Holes, Figures 5 through 15. In general, the test holes encountered fine to coarse grained, medium moist to moist, silty sand (SM) and slightly silty sand (SP-SM) in the upper fifteen feet. These soils were very loose to medium dense as measured by SPT. Approximately eight feet of uncontrolled fill soils were encountered in test holes 1 and 8. Beneath a depth of fifteen feet, the test holes generally encountered fine to medium grained, slightly moist to moist, silt (ML) and very silty sand (SM). The silts (ML) were soft to medium stiff as measured by SPT. The very silty sands (SM) were very loose to medium dense as measured by SPT.

Groundwater was not encountered in the test holes to the maximum depth of exploration, approximately eighty-eight feet.

On-site soils appear suitable for reuse as engineered fill provided, they are blended to a homogeneous mixture prior to use. Specifications for engineered fill are presented in the Earthwork section of this report.

The subsurface conditions presented above allow observation of a very small portion of the soils below the site. Significant variation in subsurface conditions may occur across the site that was not disclosed by the test holes.

REMEDIAL EARTHWORK

To provide uniform bearing conditions and limit the potential for post-construction movement, we recommend remedial earthwork in the form of over-excavation of the site soils and replacement with properly compacted engineered fill soil.

The site soils should be excavated to allow for the placement of a minimum of five feet of engineered fill beneath all foundations and concrete floors slabs. The upper eight feet of existing uncontrolled fill soil in the vicinity of test holes 1 and 8 should be excavated to a depth of eight feet below existing grade, see attached Remedial Earthwork, Figure 4. This area may then be brought to designed finished pad grade with properly compacted engineered fill soil. In each of the above cases soil removal should extend a minimum of five feet beyond the feet beyond the outside edges of foundations or greater to incorporate concrete flatwork.

FOUNDATION RECOMMENDATIONS

The structure may be founded on either conventional isolated spread footings with a concrete slab-on-grade or on a monolithic slab with turned down edges and integral column footings.

Foundations for the structure, bearing on properly compacted engineered fill, may be designed for an allowable bearing capacity of 2500 psf. Light pole foundations may be embedded into native soil and be designed for an allowable bearing capacity of 1500 psf.

The base of exterior foundations should be embedded a minimum of eighteen inches below lowest adjacent grade. The base of interior footings may be embedded a minimum of twelve inches below finished pad grade. Isolated and continuous spread footings should be a minimum of twenty-four and eighteen inches wide, respectively. Turned down edges may be a minimum of sixteen inches wide. However, footing widths may need to be larger based on actual structure design loads.

Bearing capacity values may be increased by one-third for short term loading from wind and seismic sources. Structures may be designed for a seismic site classification of **D**.

Lateral foundation loads will be resisted by a combination of passive soil pressure against the sides of foundations and friction along the base. A passive soil resistance of 300 pounds per cubic foot may be utilized for design for the structure foundations. A passive soil resistance of 250 pounds per cubic foot may be utilized for design of light pole foundations. Frictional resistance may be determined by multiplying foundation dead load by a coefficient of friction of 0.40.

Concrete slabs should be isolated from all utility lines. Frequent control joints should be cut to control random shrinkage cracking. If moisture sensitive flooring will be utilized the slab should be underlain by an impermeable moisture vapor barrier. If a moisture barrier is utilized, the slab reinforcement should be designed to resist shrinkage and curling. Exterior concrete must be air entrained to help prevent freeze/thaw damage.

Conventional foundations and slabs designed and constructed as described herein are not anticipated to experience movement of more than one inch. This estimate assumes the site soils will not be allowed to increase in moisture content and that all recommendations presented in this report will be fully implemented. Additional movement and distress may occur if the soils increase in moisture content or if the recommendations presented herein are not followed.

PAVEMENTS

The asphaltic pavement sections presented below are based on NMSHD pavement design procedures. Design of Portland Cement Concrete (PCC) pavements is based on upon The American Concrete Institute (ACI) 330R-01; Guide for Design and Construction of Concrete Parking Lots.

Based on the conditions encountered in the test holes, on-site surface soils are classified as AASHTO A-2-4 soils. An R-value of 40 was utilized for design of asphaltic pavement sections.

The following other design values were utilized:

Design Life	20-Years
Serviceability Index	1.5
Regional Factor	1.5
Asphalt Structural Coefficient	0.4
Aggregate Base Course Structural Coefficient	0.1

Table 1: Asphalt Pavement Design Coefficients

Based on the above criteria, the asphaltic pavement sections listed below would be expected to accommodate for the following traffic loads:

Section	18-Kip Daily ESAL	Asphaltic Concrete	Aggregate Base Course
Automobile Parking	1	3-inches	0-inches
Driveways	10	3-inches	4-inches

Table 2: Recommended Asphalt Pavement Sections

A modulus of subgrade reaction of 200 was used for PCC pavement design. A modulus of rupture of 500 psi correlating to a concrete strength of 3500 psi was used for PCC pavement design. Based on the above criteria the PCC pavement sections would be expected to accommodate for the following ADTT:

ADTT	PCC Thickness
1	4.5-inches
10	5.5-inches

Table 3: PCC Pavement Sections

Areas in front of dumpsters and truck docks should be paved with Portland Cement Concrete. A six-inch section of 3500 psi concrete with #4 steel reinforcing at 12-inches on center is adequate for this purpose.

The site should be graded to prevent saturation of pavement subgrade soils. The soils ability to support pavement is significantly reduced when the soils increase in moisture content.

The ground surface below pavement sections should be compacted to a minimum of 95% Maximum Dry Density at Optimum Moisture Content (+/-3%) as determined by ASTM D1557.

All imported fill below pavements should meet specification for engineered fill and exhibit a minimum R-value of 40. All imported fill should be prepared and compacted as outlined in the Earthworks Section of this report.

Prior to placing Aggregate Base Course, Asphaltic Concrete, or PCC a soil sterilant may be applied. The sterilant should be applied as per the manufacturer's recommendations

Aggregate Base course should be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

Asphaltic Concrete should exhibit a minimum Marshall stability of 1800 pounds and should be compacted to between 93% and 97% of maximum theoretical density.

Periodic pavement maintenance will be required over the design life. Required maintenance for pavements constructed on the uncontrolled fill may be above that required for normal pavements. Crack cleaning and sealing should be performed to extend pavement life. Seal coating may also be desired after the pavement has been in service for several years to improve appearances and increase pavement life.

EARTHWORK

STRIPPING AND GRUBBING

Prior to performing earthwork, all borrow and fill areas should be stripped of vegetation and deleterious materials. All strippings should be hauled offsite or utilized in landscaped areas. All existing fill, utilities, debris, septic systems, and disturbed soil should be removed from below the proposed structures.

NATURAL GROUND PREP

We anticipate the site soils may be excavated with conventional earthwork equipment.

Following all cut earthwork, the natural soils should be scarified to a depth of eight inches and moisture conditioned to optimum moisture content (+/- 3%). The surface of the natural soils should then be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557.

FILL PLACEMENT AND COMPACTION

Engineered fill should be stockpiled on site, moisture conditioned, and blended to a homogeneous mixture prior to use. Sieve analysis and Atterberg Limits tests will be required prior to acceptance of blended material. Structural fill should be placed in horizontal lifts a maximum of eight-inches in loose thickness, moisture conditioned to optimum moisture content (+/- 3%), and mechanically compacted. Lift thickness may need to be reduced based on the size of the compaction equipment utilized. Fill below footings and slabs should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557. Engineered fill should meet the specifications listed in Table 1:

U.S. SIEVE SIZE	%-PASSING
1 ½ -INCH	100
NO. 4	70-100
NO. 200	10-40

Table 4: Engineered Fill Specifications

Engineered fill soils should have a Plasticity Index of ten or less.

No organic, frozen, or decomposable material should be placed in the fill.

Cobbles and boulders should not be placed within structural fills.

In addition the engineered fill must exhibit less than 1% swell when remolded to 95% of the maximum dry density and 3% below the optimum moisture as determined by ASTM D1557, loaded to 100 psf, and inundated.

UTILITIES

Care should be taken when installing utilities that the prepared building pad is not overly disturbed. Trenches should be no wider than is necessary for proper installation of utilities. Utility line trenches should not be located immediately adjacent to or below foundations.

If water or sewer line leaks occur, differential movement of the structure may result. Prior to backfilling utility line trenches, all water and sewer lines should be pressure checked for leaks. Any leaks found should be repaired.

To reduce the possibility of breaking utility lines, compaction should be performed with light, hand-operated equipment. In order to achieve compaction, it will be necessary to place backfill in thinner lifts than would normally be necessary. The fill soils in trenches should be compacted to a minimum of 90% of maximum dry density as determined by ASTM D-1557. Fill soils in the upper six inches of trenches should be compacted to 95% of maximum dry density as determined by ASTM D-1557.

FOUNDATION EXCAVATIONS

Caving of sands in excavations should be expected. Prior to pouring concrete, foundation excavations should be cleaned of any slough, loose soil, or debris. Footing excavations should be scarified and moisture conditioned to optimum moisture content (+/- 3%). Foundation excavations should be compacted to a minimum of 95% of maximum dry density as determined by ASTM D-1557.

OBSERVATION AND TESTING

Compaction testing must be performed by this office during earthwork construction to verify the compaction requirements outlined in this report have been met.

Modified Proctor testing (ASTM D-1557) will be necessary to determine the maximum dry density and optimum moisture content of the natural soils at the base of excavations. The surface of natural soils should be tested for compaction prior to placing engineered fill.

Engineered fill material should be approved by this office prior to use. Following acceptance of the fill material, Modified Proctor testing (ASTM D-1557) will be necessary to determine the maximum dry density and optimum moisture content. Compaction testing should be performed on engineered fill at a minimum of every other lift until finished grade is reached.

Testing of utility line trenches for compaction should be performed at a minimum of every foot of compacted backfill thickness.

The base of footing excavations and finished pad grade should be tested prior to placing reinforcement and pouring concrete. Compaction testing cannot be performed if reinforcement has been installed and will need to be removed to perform testing.

EARTHWORK CERTIFICATION

Earthwork certification will only be provided if all recommendations presented herein are followed. It is up to the client to read and understand the recommendations prior to starting construction. Earthworks Engineering Group will answer all questions the client may have concerning these recommendations.

Earthwork certification will be valid for five days following the last inspection by this office. Foundations should be poured during this time-period. The site must be re-inspected if foundations are not poured during this time-period or if site conditions change for any reason following the previous inspection.

DRAINAGE, GRADING, AND LANDSCAPING

To reduce the risk of moisture induced movement the site should be graded to rapidly drain away from structures. We suggest a minimum five percent gradient within at least the first ten feet away from structures in areas not protected by sidewalks and pavement.

A perimeter barrier may be installed at the ground surface around the residence to prevent surface moisture infiltration adjacent to foundations. The barrier can be any durable, impermeable material such as liner under gravel or concrete paving.

Roof gutters and downspouts should be installed on the residence. Down spouts should discharge down slope and well away from the residence, a minimum of ten feet. Surface water should run off rapidly.

Ponding areas or onsite leach fields/infiltration areas should be located downhill from, and as far away from structures as possible, a minimum of twenty feet.

Any landscaping plants requiring irrigation more than occasional hand watering should not be planted adjacent to foundations.

Permanent slopes should be no steeper than 3:1 (horizontal to vertical) for gross slope stability. Steeper slopes will require retaining structures. The surface of slopes will need to be protected against erosion.

This office should review site grading and drainage plans to evaluate conformance with the recommendations presented herein.

SHORING

All trenches greater than four feet in depth must be sloped, shored or braced, or otherwise supported according to OSHA Construction and Safety Standards. Material excavated from the trench or spoil must be placed away from the edge of the excavation. The spoil should be retained in an effective manner such that no loose material can fall into the excavation.

Temporary construction excavations less than eight feet deep should be sloped no steeper than 1½:1 (horizontal: vertical). If deeper excavations are required, this office should be contacted for supplemental recommendations. Limited raveling of slopes will occur particularly as the exposed soils dry out. Heavy equipment and material stockpiles should be located a minimum of five feet from the top of slope.

MAINTENANCE

Performance of structures depends not only on proper design and construction, but also on an ongoing foundation maintenance program. A properly designed foundation may still experience distress from incorrectly controlled water sources, improper drainage, and landscaping. The owner should perform a yearly inspection to observe for necessary maintenance and repair.

Positive drainage should be provided away from the structure over the life of the building. A minimum slope of five percent within the ten feet of the structure should be maintained. Flowerbeds and landscaping that requires irrigation should not be installed adjacent to structures. Walkways and borders that dam water adjacent to foundations should be eliminated.

Depressions and excavations should be backfilled with compacted, non-swelling, relatively-impervious soils such as clayey sands.

Gutters and downspouts should be installed to control roof drainage. Downspouts should discharge a minimum of ten feet away from structures. Area drains may be installed around structures to improve drainage. Discharge pipes should slope a minimum of 1/8th inch vertical per foot of horizontal pipe. Drainage sewers and discharge channels should be kept free of debris.

Water bills should be monitored for unexplained increases in usage. Higher than normal water usage may indicate a leaking utility line. If a leaking line is suspected, utility lines should be pressure checked for leaks.

Expansion joints within exterior concrete flatwork should be filled with a flexible joint sealer to minimize water infiltration.

Some minor cracking of new concrete foundations, concrete flatwork, and interior dry wall is normal. This is a result of concrete shrinkage as it cures, "settling in" of the new structure, drying of timbers used in construction, etc. Normally most of this movement should cease within the first year following construction. However, depending on the structure and site conditions, movement may continue at a slow rate for several years. If cracks tend to open and close, increase significantly within a short period of time, or resume after a period of relative inactivity, it is recommended that this office be contacted to review the situation.

CLOSURE

The recommendations presented in this report are based upon the subsurface conditions disclosed by the test holes. Soil and groundwater conditions may vary between test holes and with time. This office may change the recommendations presented herein based on the conditions encountered during construction.

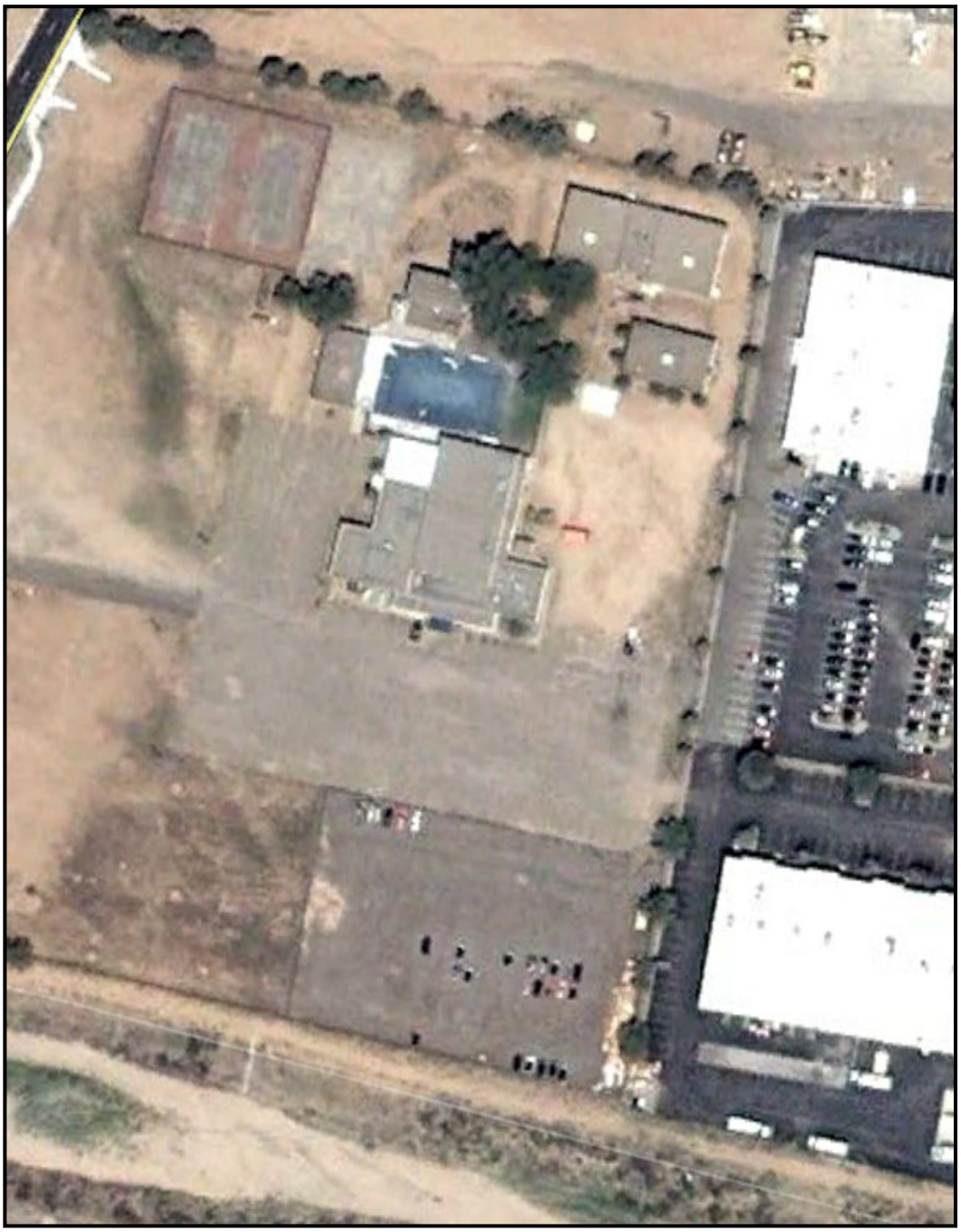
Prior to performing earthwork, a meeting between the client, this office, and the earthwork contractor should be arranged to discuss the earthwork and foundation recommendations and testing requirements of this project. The purpose of this meeting is to assure that recommendations and requirements are implemented and to minimize delays and expenses during construction.

In order to verify the recommendations presented herein are followed this office must perform field inspections and earthwork Proctor and compaction testing. If this office is not utilized to perform these services, the client agrees to assume all risk for post-construction movement and distress.

This report reflects our interpretation of the site subsurface conditions. We strongly recommend that prior to bidding all contractors perform their own subsurface investigation to form their own opinion of the site soil, rock and groundwater conditions. Should contractors elect to use this report for construction, bidding or estimating purposes, they do so at their own risk.

The staff of Earthworks Engineering Group, LLC is available for supplemental consultation as necessary at (505) 899-4886.

5900 Jefferson Street NE, Albuquerque, NM **Site Development History 2007**

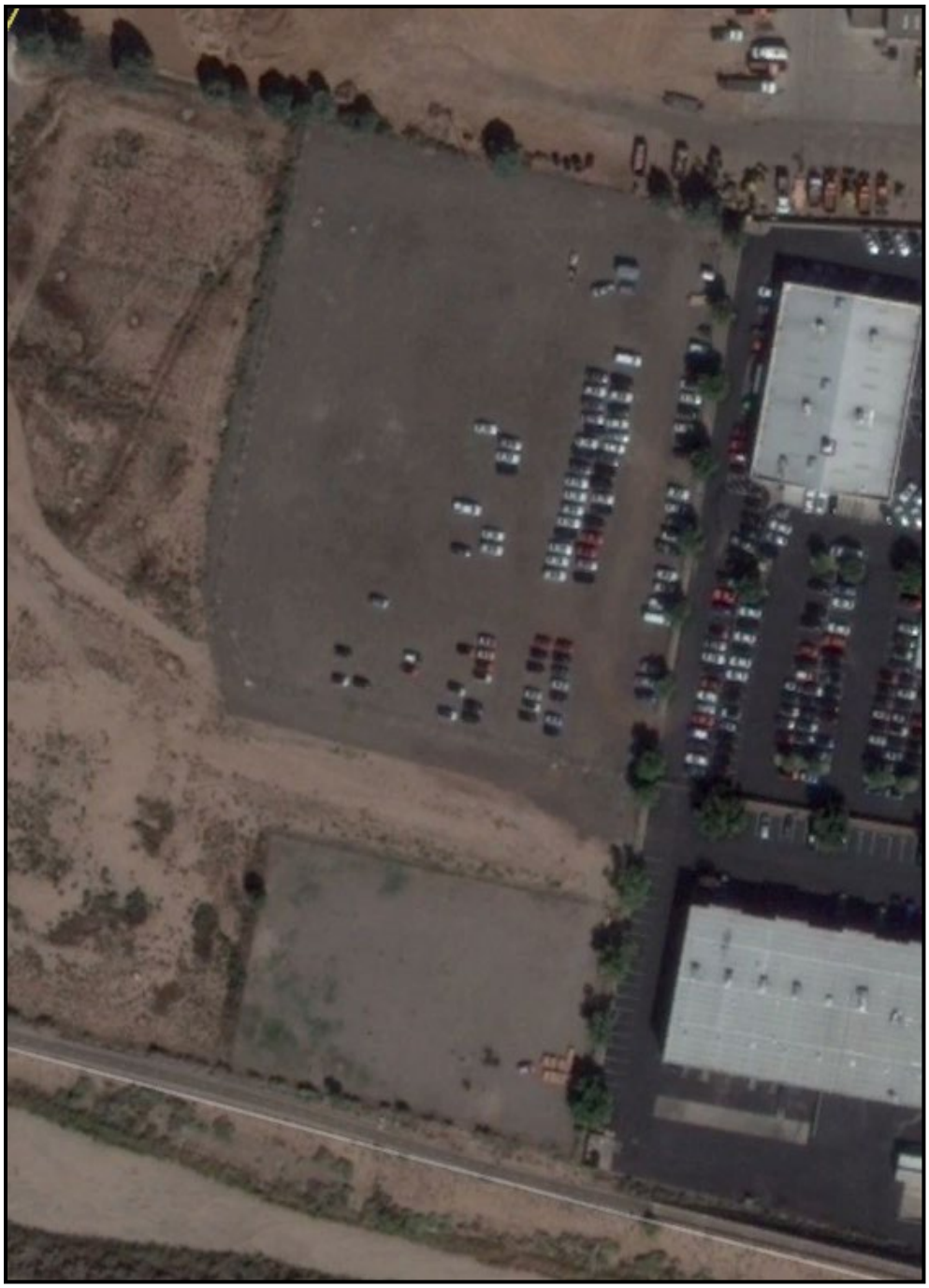


Project No.: A20-843 **Earthworks Engineering Group, LLC** **Figure 1A**

5900 Jefferson Street NE, Albuquerque, NM

Site Development History 2009

5900 Jefferson Street NE, Albuquerque, NM **Site Development History 2015**



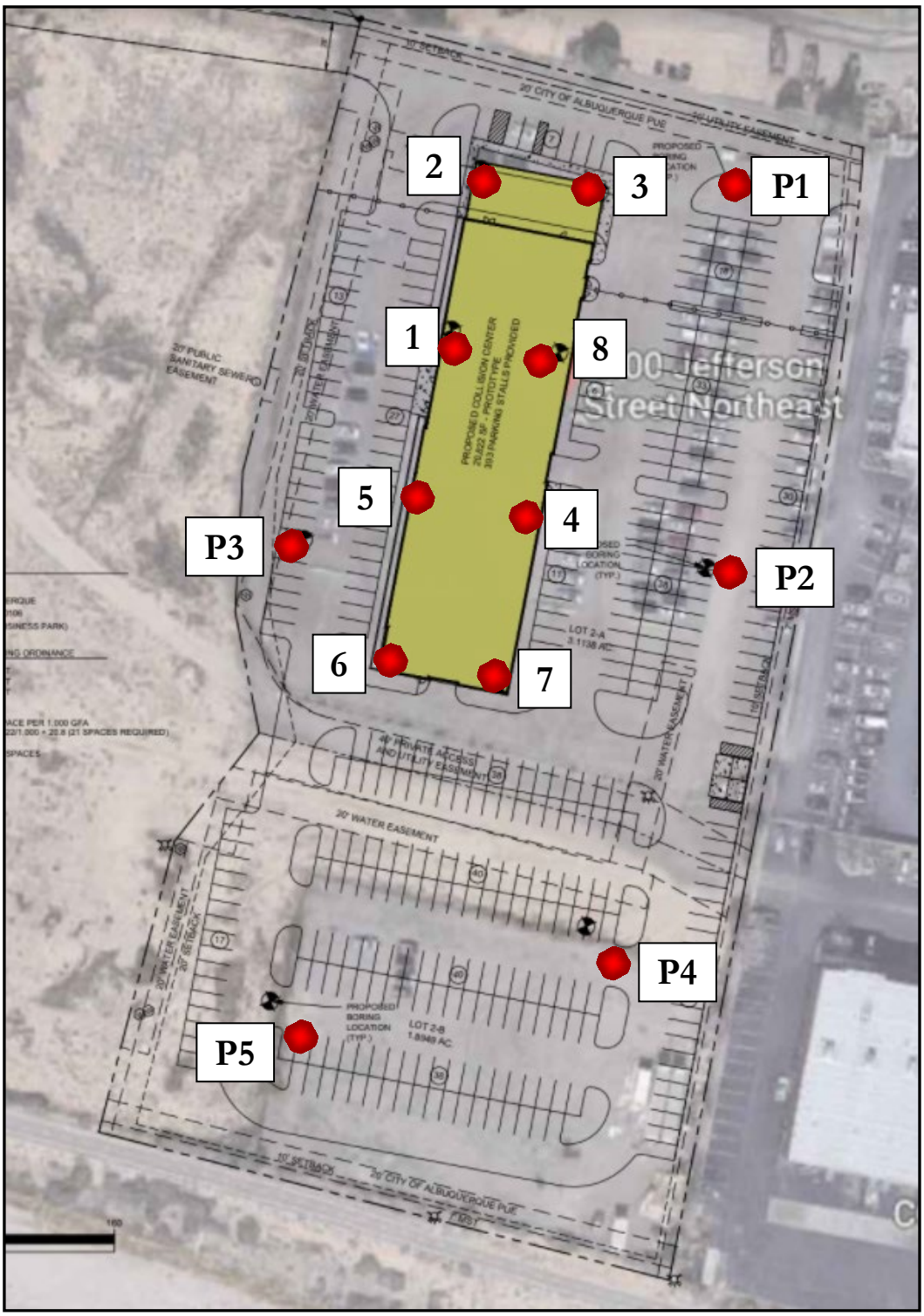
Project No.: A20-843 **Earthworks Engineering Group, LLC** **Figure 1C**

5900 Jefferson Street NE, Albuquerque, NM

Site Overlay (Approximate)

5900 Jefferson Street NE, Albuquerque, New Mexico

Site Plan



● TEST HOLE LOCATIONS

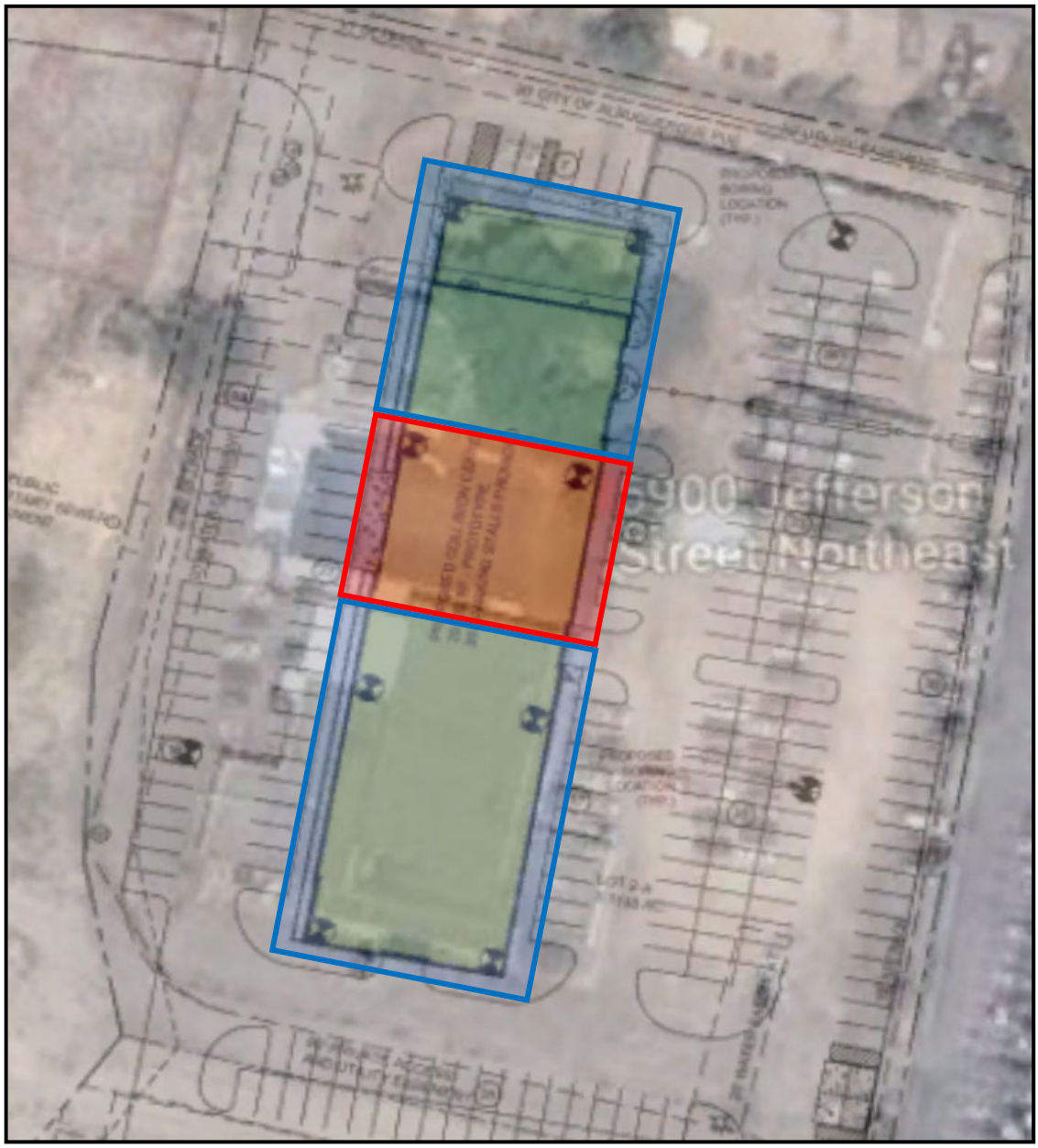
Project No.: A20-843

Earthworks Engineering Group, LLC

Figure 3

5900 Jefferson Street NE, Albuquerque, NM

Remedial Earthwork



5 ft. Engineered Fill Under Footings and Slabs

Excavate Upper 8 Ft. Bring to Finished Pad Grade

Project No.: A20-843

Earthworks Engineering Group, LLC

Figure 4

LOG OF TEST HOLE NO.: 1

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/18/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	11	S	SM	SAND, silty, fine to coarse grained, medium dense, medium moist, brown		3.9
5	13	S				5.2
10	9	S	SP-SM	SAND, slgihtly silty, fine to coarse grained, loose, slightly moist, brown		2.0
15	3	S	SM	SAND, very silty, fine to coarse grained, very loose, very moist, dark brown		10.1
20	5	S	ML	SILT, sandy, fine to medium grained, medium stiff, medium moist, dark brown		14.1
25				**Bottom of Test Hole at 21.5 Feet**		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 5.**

LOG OF TEST HOLE NO.: 2

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/18/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	4	S	SM	SAND, silty, fine to coarse grained, loose, medium moist, brown		5.4
5	2	S	SC	SAND, clayey, fine to medium grained, very loose, very moist, dark brown		10.9
		B	SM	SAND, silty, fine to coarse grained, medium moist, brown		3.1
10	6	S	SP-SM	SAND, slightly silty, fine to coarse grained, loose, medium moist, brown		3.1
15	26	S		- medium dense, slightly moist		2.4
20	18	S	SM	SAND, very silty, fne to medium grained, medium dense, moist, dark brown		7.8
25				**Bottom of Test Hole at 21.5 Feet**		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 6.**

LOG OF TEST HOLE NO.: 3

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/20/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	8	S	ML	SILT, sandy, fine to medium grained, stiff, slightly moist, dark brown		10.7
5	3	S	SP-SM	SAND, slightly silty, fine to medium grained, very loose, medium moist, brown		3.3
10	10	S	SM	SAND, silty, fine to medium grained, medium dense, medium moist, brown		4.2
15	3	S	ML	SILT, sandy, fine to medium grained, soft, medium moist, dark brown		12.6
20	20	S	SM	SAND, very silty, fine to medium grained, medium dense, medium moist, brown		5.9
25				**Bottom of Test Hole at 21.5 Feet**		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 7.**

LOG OF TEST HOLE NO.: 4

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/20/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	3	S	SM	SAND, silty, fine to medium grained, very loose, moist, brown		7.1
5	6	S		- loose		7.8
10	12	S	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, medium moist, brown		3.1
15	6	S	ML	SILT, sandy, fine to medium grained, medium stiff, medium moist, dark brown		13.8
20	7	S				15.6
25				**Bottom of Test Hole at 21.5 Feet**		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 8.**

LOG OF TEST HOLE NO.: 5

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/20/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	31.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	2	S	SM	SAND, silty, fine to medium grained, very loose, moist, brown		6.6
5	2	S				9.7
10	20	S	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, slightly moist, brown		2.6
15	7	S	ML	SILT, very sandy, fine to medium grained, medium stiff, slightly moist, dark brown		10.6
20	5	S		- slightly sandy		10.6
25	35	S	SM	SAND, silty, fine to medium grained, dense, moist, brown		8.7
30	14	S		- medium dense, medium moist		5.9
				Bottom of Test Hole at 31.5 Feet		

Project No.: A20-843 **Earthworks Engineering Group, LLC** **Figure 9.**

LOG OF TEST HOLE NO.: 6

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/20/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	4	S	SM	SAND, silty, fine to coarses grained, loose, moist, brown		6.6
			SP-SM	SAND, slgihtly silty, fine to coarse grained, loose, moist, brown		
5	16	S		- medium dense, slightly moist		2.9
10	10	S		- medium moist		3.1
15	5	S	ML	SILT, sandy, fine grained, medium stiff, slightly moist, dark brown		10.8
20	9	S	SM	SAND, very silty, fine to medium grained, loose, moist, brown		7.0
				Bottom of Test Hole at 21.5 Feet		
25						

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 10.**

LOG OF TEST HOLE NO.: 7

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1/20/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	21.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
			SM	SAND, silty, fine to medium grained, loose, moist, brown		
2	4	S	SP-SM	SAND, slightly silty, fine to coarse grained, loose, moist, brown		8.1
5	10	S		- medium dense, slightly moist		2.1
10	10	S				3.3
			ML	SILT, sandy, fine to medium grained, stiff, medium moist, brown		20.5
15	4	S		- soft, moist		16.6
20	13	S		- stiff		23.7
			SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, slightly moist, brown		2.9
25				**Bottom of Test Hole at 21.5 Feet**		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 11.**

LOG OF TEST HOLE NO.: 8

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	2/4/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	88 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	9	S	SM	FILL SAND, silty, fine to medium grained, loose, medium moist, brown		
5	11	S		- medium dense, moist		
				- Native Soil 8 feet		
10	21	S	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, medium moist, brown		
15	6	S	ML	SILT, sandy, fine to medium grained, medium stiff medium moist, dark brown		
20	6	S				
25	12		SM	SAND, silty, fine to coarse grained, medium dense, medium moist, brown		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 12.**

LOG OF TEST HOLE NO.: 8 Continued

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	2/4/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	88 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
30	25	S	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, medium moist, brown		
35	10	S	SM	SAND, silty, fine to medium grained, medium dense, moist, brwon		
40	16	S	ML	SILT, sandy, fine to medium grained, very stiff, slightly moist, dark brown		
45	27	S	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, medium moist, light brown		
50	38	S	SP	SAND, trace silt, fine to coarse grained, dense medium moist, pale brown/grey		
55	43	S				

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 12cont.**

LOG OF TEST HOLE NO.: 8 Continued

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	2/4/2021
Drilling Method:	CME 75, 3.25" ID Hollow Stem Auger, 140-lb. Auto Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	88 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
60	26	S				
65	22	S	SM	SAND, silty, fine to medium grained, medium dense, moist, brown		
70	15	S				
75	20	S				
80	21	S		- interbedded gravel and cobble layers		
85	22	S				
				Bottom of Test Holes 88 feet, Refusal on Gravel and Cobbles		

Project No.:A20-843 **Earthworks Engineering Group, LLC** **FIGURE 12cont.**

LOG OF TEST HOLE NO.: P1

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1.26.21
Drilling Method:	CME 55, 3.25" ID Hollow Stem Auger, 140-lb. Safety Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	11.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	5	S	ML	SILT, very sandy, fine to medium grained, medium stiff, slightly moist, brown		10.1
5	3	S		- slightly sandy, sift, medium moist		14.9
10	5	S		- medium stiff, slightly moist		9.9
				Bottom of Test Hole at 11.5 Feet		

LOG OF TEST HOLE NO.: P2

2	5	S	SM	SAND, silty, fine to medium grained, loose, medium moist, brown		3.1
5	5	S				3.1
10	15	S		- medium dense, slightly moist		2.9
				Bottom of Test Hole at 10 Feet		

Project No.: A20-843 **Earthworks Engineering Group, LLC** **FIGURE 13.**

LOG OF TEST HOLE NO.: P3

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1.26.21
Drilling Method:	CME 55, 3.25" ID Hollow Stem Auger, 140-lb. Safety Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	11.5 ft

Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
2	6	S	SM	SAND, silty, fine to medium grained, loose, medium moist, brown		3.4
5	9	S		- medium dense, slightly moist		2.9
10	12	S	SP-SM	SAND, slightly silty, fine to medium grained, medium dense, slightly moist, brown		2.8
				Bottom of Test Hole at 11.5 Feet		

LOG OF TEST HOLE NO.: P4

2	10	S	SM	SAND, silty, fine to coarse grained, medium dense, medium moist, brown		3.5
5	9	S		- loose		3.0
10	31	S	SP-SM	SAND, slightly silty, f. to c. gr., dense, sl. Moist, brown		1.9
				Bottom of Test Hole at 11.5 Feet		

LOG OF TEST HOLE NO.: P5

Project:	5900 Jefferson St NE, Albuquerque NM
Date Drilled:	1.26.21
Drilling Method:	CME 55, 3.25" ID Hollow Stem Auger, 140-lb. Safety Hammer
Surface Elevation:	Not Available
Depth to Groundwater:	Not Encountered
Bottom of Hole:	11.5 ft

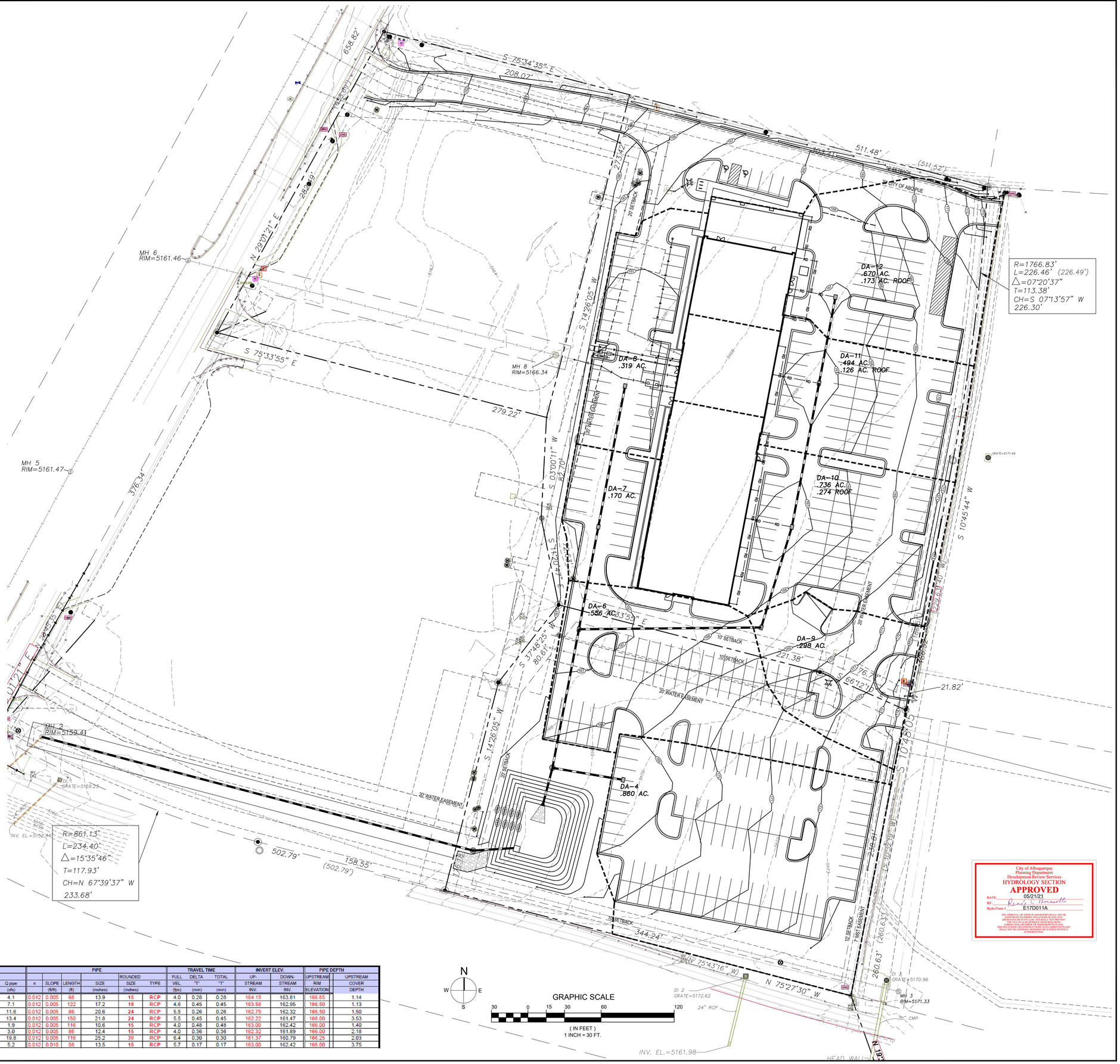
Depth (feet)	N-Value (blows/ft)	Sample Type	Unified Class.	Description	Dry Density (pcf)	Moisture Content (%)
		B	SP-SM	SAND, slightly silty, fine to coarse grained, medium dense, slightly moist		2.7
2	21	S				1.1
5	36	S		- dense, dry		0.9
10	32	S	SM	SAND, silty, f. to m. grained, dense, sl. moist, brown		2.3
				Bottom of Test Hole at 11.5 Feet		

Test Hole	Depth (feet)	Density, Dry (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Percent Passing - U.S. Sieve Numbers										
						1-1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	N0. 100	No. 200	2 µm
6	2		6.6					100	94	87	79	71	60	49	28.0	
	5		2.9					100	93	73	50	32	20	14	8.5	
	10		3.1				100	97	88	61	37	26	20	15	7.8	
	15		10.8						100	98	96	93	86	77	53.8	
	20		7.0				100	99	95	83	69	60	53	46	30.3	
7	2		8.1				100	99	95	87	76	68	61	55	34.5	
	5		2.1				100	99	95	72	46	27	15	10	5.6	
	10		3.3				100	95	77	51	32	21	15	12	8.4	
	11		20.5					100	97	90	85	82	80	77	69.1	
	15		16.6						100	99	98	97	96	94	79.7	
	20		23.7					100	99	95	88	83	79	75	64.4	
	21		2.9				100	97	88	66	40	25	18	14	7.3	
P1	2		10.1					100	99	95	89	83	78	70	50.1	
	5		14.9						100	99	97	95	94	90	75.1	
	10		9.9					100	97	90	81	75	70	66	52.1	
P2	2		3.1				100	96	87	73	64	58	50	41	23.7	
	5		3.1				100	99	94	87	80	75	67	56	33.2	
	10		2.9					100	95	82	67	58	52	44	24.2	
P3	2		3.4				100	99	98	94	81	71	62	48	31.5	
	5		2.9					100	97	81	69	62	49	46	28.5	
	10		2.8				100	93	84	52	34	27	22	16	7.5	
P4	2		3.5				100	99	95	88	80	73	64	54	33.3	
	5		3.0					100	94	83	71	63	56	48	30.0	
	10		1.9				100	95	83	57	36	25	18	13	8.3	
P5	1		2.7				100	95	86	65	45	35	28	21	11.7	
	2		1.1				100	99	94	63	31	18	12	9	5.2	
	5		0.9					100	92	62	32	18	11	8	4.8	
	10		2.3				100	98	90	75	61	49	39	30	19.9	

5900 Jefferson St NE, Albuquerque NM

Summary of Laboratory Test Results

Test Hole	Depth (feet)	Density, Dry (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Percent Passing - U.S. Sieve Numbers										
						1-1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	N0. 100	No. 200	2 µm
1	2		3.9				100	94	85	71	54	40	31	24	14.9	
	5		5.2				100	94	91	76	58	44	34	27	17.0	
	10		2.0				100	98	76	45	26	15	10	8	5.2	
	15		10.1				100	99	94	83	72	64	59	54	43.0	
	20		14.1					100	98	95	91	88	86	82	63.2	
2	2		5.4				100	91	82	75	67	60	52	42	25.3	
	5		10.9				100	98	96	93	90	86	79	68	43.3	
	9		3.1					100	97	79	53	36	26	21	18.6	
	10		3.1				100	98	86	65	46	31	21	15	9.8	
	15		2.4				100	99	90	65	46	34	25	18	10.2	
	20		7.8					100	98	89	69	69	63	57	43.0	
3	2		10.7				100	97	95	88	81	75	70	64	53.9	
	5		3.3					100	93	64	30	30	21	17	10.8	
	10		4.2					100	96	85	70	55	37	27	15.3	
	15		12.6					100	98	93	84	83	79	74	58.9	
	20		5.9					100	99	95	90	87	83	76	42.1	
4	2		7.1				100	98	92	83	76	70	63	53	31.5	
	5		7.8				100	99	92	81	70	61	52	44	26.0	
	10		3.1				100	96	79	55	35	25	17	13	8.3	
	15		13.8						100	98	94	90	86	81	61.2	
	20		15.6					100	98	95	90	86	83	79	68.5	
5	2		6.6				100	99	94	85	77	70	55	50	28.6	
	5		9.7					100	96	90	83	74	63	53	33.9	
	10		2.6				100	98	89	63	39	23	15	10	6.1	
	15		10.6					100	95	83	75	70	67	63	51.8	
	20		10.6					100	98	91	86	83	80	75	76.8	
	25		8.7				100	99	97	92	86	80	75	82	26.8	
	30		5.9				100	99	95	84	71	62	53	46	22.6	



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 INCH = 30 FT.

LOCATION		DRAINAGE AREA	RUNOFF				PIPE					TRAVEL TIME			INVERT ELEV.		PIPE DEPTH	
FROM	TO		C	I	Q inlet	Q pipe	n	SLOPE (ft/ft)	LENGTH (ft)	SIZE (inches)	ROUNDED SIZE (inches)	TYPE	FULL VEL. (fps)	DELTA "T" (min)	TOTAL "T" (min)	UP-STREAM INV.	DOWN-STREAM INV.	UPSTREAM RIM ELEVATION	UPSTREAM COVER DEPTH
		(acre)			(cfs)	(cfs)													
DI 12	DI 11	0.670	0.90	6.78	4.1	4.1	0.012	0.005	68	13.9	15	RCP	4.0	0.28	0.28	164.15	163.81	166.85	1.14
DI 11	DI 10	0.494	0.90	6.78	3.0	7.1	0.012	0.005	122	17.2	18	RCP	4.6	0.45	0.45	163.56	162.95	166.50	1.13
DI 10	DI 9	0.736	0.90	6.78	4.5	11.6	0.012	0.005	86	20.6	24	RCP	5.5	0.26	0.26	162.75	162.32	166.50	1.50
DI 9	DI 6	0.298	0.90	6.78	1.8	13.4	0.012	0.005	150	21.8	24	RCP	5.5	0.45	0.45	162.22	161.47	168.00	3.53
DI 8	DI 7	0.319	0.90	6.78	1.9	1.9	0.012	0.005	116	10.6	15	RCP	4.0	0.48	0.48	163.00	162.42	166.00	1.40
DI 7	DI 6	0.170	0.90	6.78	1.0	3.0	0.012	0.005	86	12.4	15	RCP	4.0	0.36	0.36	162.32	161.89	166.00	2.18
DI 6	JB 5	0.556	0.90	6.78	3.4	19.8	0.012	0.005	116	25.2	30	RCP	6.4	0.30	0.30	161.37	160.79	166.25	2.03
DI 4	JB 5	0.860	0.90	6.78	5.2	5.2	0.012	0.010	58	13.5	15	RCP	5.7	0.17	0.17	163.00	162.42	168.00	3.75

CALL NM ONE-CALL
SYSTEM SEVEN (7) DAYS
PRIOR TO ANY EXCAVATION

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 05/21/21
BY: Renee Brissette
HydroTrans #: E17D011A

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE CONSTRUED TO PERMIT VIOLATIONS OF ANY CITY ORDINANCE OR THE LAWS OF THE STATE OF NEW MEXICO. THE CITY OF ALBUQUERQUE IS FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS CONTAINED IN THESE SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT AUTHORIZATION.

AYER DESIGN GROUP
PROFESSIONAL ENGINEERING SERVICES
215 Johnston Street
Rock Hill, SC 29730
Phone: 803-328-5858

BURKLE AYER JR
NEW MEXICO
25848
PROFESSIONAL ENGINEER
4-2-21

PROJECT NAME:
SANDIA
COLLISION CENTER

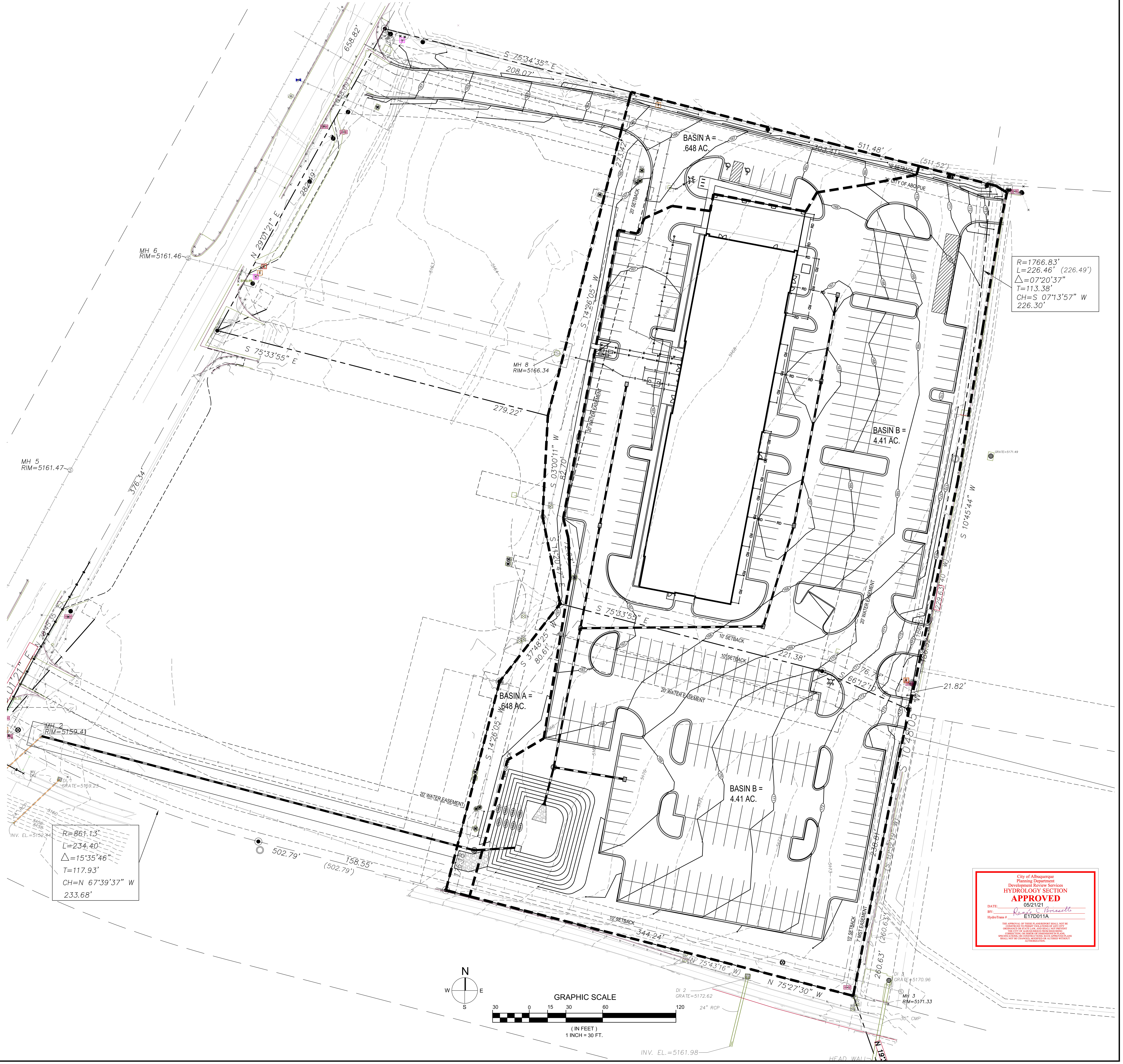
5900 JEFFERSON STREET NE
ALBUQUERQUE, NM

SHEET DESCRIPTION:
STORM AREA
PLAN

PROJECT #	2020-1
DRAWN BY	CC
CHECKED BY	BA

NO	ISSUE/REVISION	DATE
	FOR PERMIT	4/2/21

B1.0



S 75°34'35" E
208.07'
BASIN A =
.648 AC.
511.48'
(511.52')
10' SETBACK
CITY OF ABQ PUE
R=1766.83'
L=226.46' (226.49')
△=07°20'37"
T=113.38'
CH=S 07°13'57" W
226.30'
MH 6
RIM=5161.46
N 29°01'21" E
282.9'
658.82'
S 75°33'55" E
MH 8
RIM=5166.34
279.22'
S 14°26'05" W
273.42'
20' SETBACK
20' WATER EASEMENT
S 03°00'11" W
82.70'
BASIN B =
4.41 AC.
S 10°45'44" W
MH 5
RIM=5161.47
376.34'
S 75°33'55" E
10' SETBACK
221.38'
S 37°48'25" W
80.61'
S 66°12' W
21.82'
BASIN A =
.648 AC.
MH 2
RIM=5159.41
20' WATER EASEMENT
BASIN B =
4.41 AC.
S 10°48'05" W
R=861.13'
L=234.40'
△=15°35'46"
T=117.93'
CH=N 67°39'37" W
233.68'
502.79'
158.55'
(502.79')
10' SETBACK
344.24'
N 75°43'16" W
N 75°27'30" W
260.63'
(260.63')
DI 2
GRATE=5172.62
24" RCP
DI 3
GRATE=5170.96
MH 3
RIM=5171.33
INV. EL.=5161.98
HEAD WALL
GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 INCH = 30 FT.
City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 05/21/21
HydroTrans #: E17D011A

CALL NM ONE-CALL
SYSTEM SEVEN (7) DAYS
PRIOR TO ANY EXCAVATION

AYER DESIGN GROUP
PROFESSIONAL ENGINEERING SERVICES
215 Johnston Street
Rock Hill, SC 29730
Phone: 803-328-5858

BIRKIE AYER JR
NEW MEXICO
25848
PROFESSIONAL ENGINEER
4-2-21

PROJECT NAME:

SANDIA COLLISION CENTER

5900 JEFFERSON STREET NE
ALBUQUERQUE, NM

SHEET DESCRIPTION:

BASIN AREA PLAN

PROJECT #	2020-1
DRAWN BY	CC
CHECKED BY	BA

NO	ISSUE/REVISION	DATE
	FOR PERMIT	4/2/21

B1.1

GRADING NOTES

CONTRACTOR TO PROVIDE AS-BUILTS FOR ALL PRIVATE DETENTION, WATER QUALITY FACILITIES AND STORM DRAIN SYSTEMS. AS-BUILTS TO BE FIELD SURVEYED AND SEALED BY LICENSED SURVEYOR.

CONCRETE TRUCKS SHALL NOT TYPICALLY BE WASHED OUT ON SITE. SHOULD CONCRETE TRUCK WASHOUT BE PERMITTED ON SITE, COORDINATE LOCATION AND BMP'S WTH SITE INSPECTOR:

A. DO NOT DISPOSE OF CONCRETE TRUCK WASHOUT WASTE BY DUMPING INTO A SANITARY SEWER, STORM DRAIN OR ONTO SOIL OR PAVEMENT THAT CARRIES STORM WATER RUNOFF.

B. THE WASHOUT FROM CONCRETE TRUCKS SHOULD BE DISPOSED OF INTO:
- A DESIGNATED AREA THAT WILL LATER BE BACKFILLED (SLURRY PIT)
- AN AREA WHERE THE CONCRETE WASH CAN HARDEN AND THEN BE DISPOSED OF AS SOLID WASTE
- A LOCATION WHICH IS NOT SUBJECT TO WATER RUNOFF, AND MORE THAN 50 FEET AWAY FROM
- A STORM DRAIN, OPEN DITCH OR RECEIVING WATER WAY.

C. PUMP EXCESS CONCRETE IN CONCRETE PUMP BACK INTO CONCRETE MIXER TRUCK.

D. CONCRETE WASHOUT FROM CONCRETE PUMPER BINS CAN BE WASHED INTO CONCRETE PUMPER TRUCKS AND DISCHARGED INTO DESIGNATED WASHOUT AREA OR PROPERLY DISPOSED OF OFFSITE.

TEMPORARY TOILET FACILITIES SHALL BE PROVIDED FOR ALL CONSTRUCTION WORKERS AND SITE VISITORS IN ACCORDANCE WITH 2006 INTERNATIONAL PLUMBING CODE GENERAL REGULATIONS, SECTION 311. PORTABLE FACILITIES SHALL BE PLACED ON LEVEL GROUND AND AWAY FROM STORM DRAINAGE SYSTEMS (DITCHES, CATCH BASINS, ETC.) DISPOSAL AND HANDLING OF SANITARY WASTE MUST COMPLY WITH TCEQ REQUIREMENTS.

FINAL GRADES FOR GRASSED AND LANDSCAPED AREAS SHALL REQUIRE A MINIMUM OF 4"-6" OF CLEAN TOP SOIL, FREE OF DEBRIS AND CONTAMINANTS, AND PREFERABLY OF NATIVE ORIGIN.

SPOT GRADES SHOWN ARE FINISHED SURFACE ELEVATIONS, CONTRACTOR MUST MAKE ALLOWANCE FOR PAVEMENT THICKNESS.

WHEN PRECAST CONCRETE BOXES ARE USED FOR STORM STRUCTURES, THE TOP 12" SHALL BE CONSTRUCTED FROM BRICK OR BLOCK TO ALOW ADJUSTMENTS TO FINAL GRADE.

WHEN PRECAST CONCRETE BOXES ARE USED FOR STORM STRUCTURES, NO WAFFLE WALL BOXES OR KNOCK OUT PANELS WILL BE ALLOWED.

M.E.G. = MATCH EXISTING GRADE

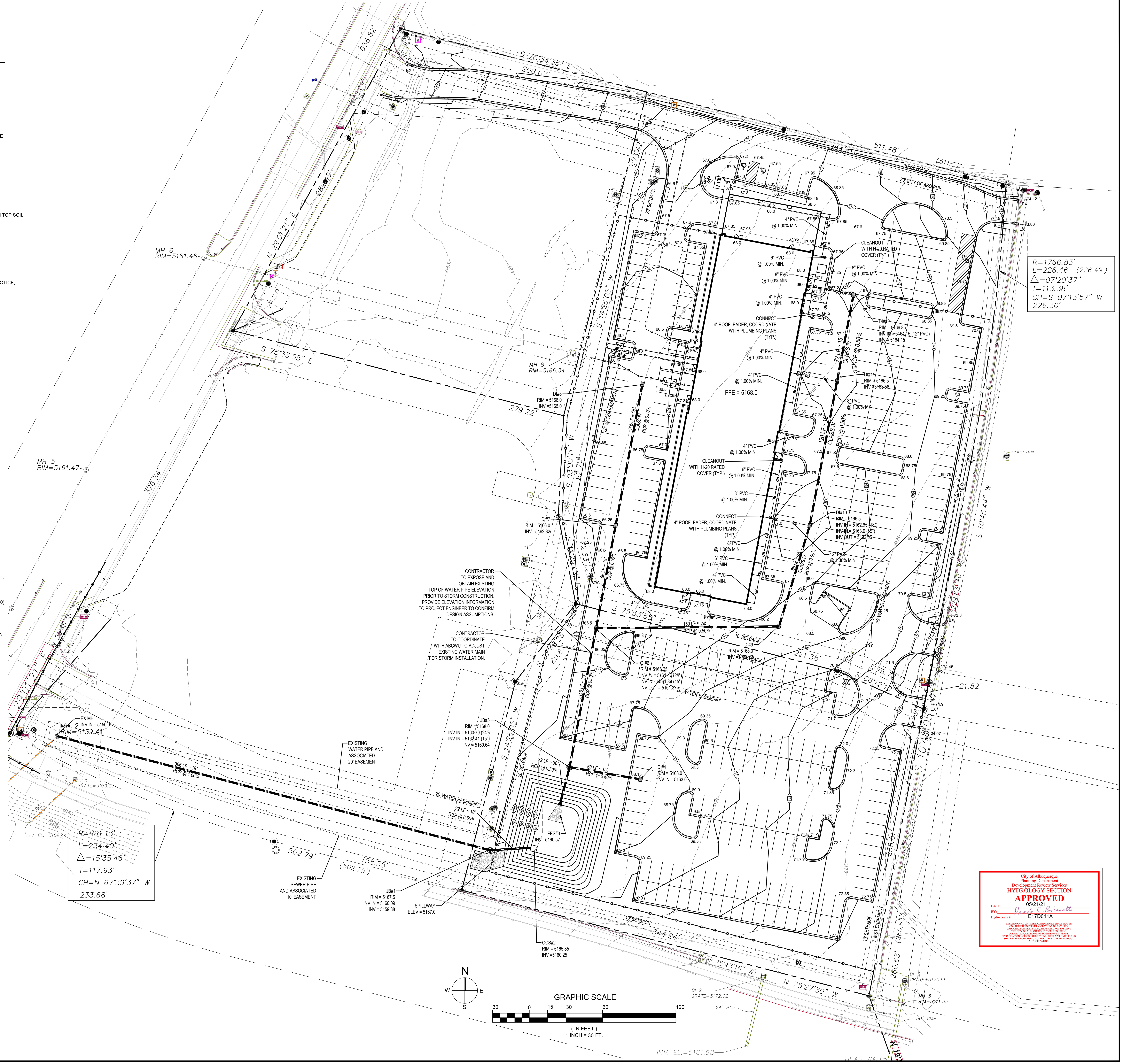
CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION STORM WATER GENERAL PERMIT, INCLUDING PREPARATION OF A SWPPP AND FILING NOI. CONTRACTOR TO PROVIDE A COPY OF SWPPP, THE SITE NOTICE, AND NOI TO CITY OF ALBUQUERQUE AND KEEP ON SITE UNTIL CONSTRUCTION COMPLETION.

EROSION & SEDIMENT CONTROL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A GRADING PERMIT PRIOR TO BEGINNING WORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR FILING FOR A NOTICE OF INTENT (N.O.I.) WITH EPA PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR TO PREPARE AND PROVIDE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) THAT IDENTIFIES ALL CONTROL MEASURES ON THE PROJECT.
3. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES INTO PUBLIC RIGHT-OF-WAY OR ONTO
4. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED. DOWN THE STREET.
5. SPOILS FROM THE PROJECT SHALL NOT BE DEPOSITED OR STORED IN THE STREET OR ROADWAY.
6. SPOILS SHALL BE STAGED ON THE UPSTREAM SIDE OF TRENCHES WHEN TRENCHING IS REQUIRED.
7. THE CONTRACTOR SHALL CLEAN AND REMOVE ALL FUGITIVE DUST, SOIL AND DEBRIS RESULTING FROM THIS PROJECT FROM THE STREET AT THE END OF EACH DAY.
8. CONTRACTOR SHALL LEAVE THE AREA IMMEDIATELY BEHIND THE CURB DEPRESSED TO CONTAIN NUISANCE FLOWS AND SEDIMENT.
9. CONCRETE TRUCKS SHALL BE SENT BACK TO THE PLANT FOR WASHING; THE WASHING OF CONCRETE TRUCKS SHALL NOT BE PERMITTED WITHIN THE PUBLIC RIGHT-OF-WAY.
10. WHEN APPLICABLE, CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" FROM THE CITY AND/OR FILE A NOTICE OF INTENT (N.O.I.) WITH THE EPA PRIOR TO BEGINNING CONSTRUCTION. ALL EPA REGULATIONS WILL BE REQUIRED ON THE PROJECT.
11. UNLESS FINAL STABILIZATION IS OTHERWISE PROVIDED FOR, ANY AREAS OF EXCESS DISTURBANCE (TRAFFIC ACCESS, STORAGE YARD, EXCAVATED MATERIAL, ETC.) SHALL BE RE-SEEDED ACCORDING TO CITY OF ALBUQUERQUE SPECIFICATION 1012 "MISCELLANEOUS SEEDING". THIS WILL BE CONSIDERED INCIDENTAL TO CONSTRUCTION, THEREFORE, NO SEPARATE PERMIT WILL BE MADE.
12. PROTECT EXISTING STORM DRAIN FACILITIES FROM SEDIMENT AS REQUIRED.
12. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL (CITY) ACCEPTANCE OF ANY PROJECT.

CONSTRUCTION NOTES

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 811, FOR DESIGNATION (LINE-SPOTTING) OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INTERPRETATIONS IT MAKES WITHOUT FIRST CONTACTING THE ENGINEER AS REQUIRED ABOVE.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.
5. UTILITY INFORMATION SHOWN HEREON IS BASED UPON ONSITE SURFACE EVIDENCE. IN ADDITION, UTILITY LINE-SPOTS WERE REQUESTED VIA THE NEW MEXICO ON CALL SERVICE (TICKET NO. 20DE020450). UTILITY LINES THAT APPEAR ON THESE DRAWINGS ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. IF ANY SUCH EXISTING LINES ARE SHOWN, THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE OWNER OF SAID UTILITY, AND THE INFORMATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE ENGINEER HAS CONDUCTED ONLY PRELIMINARY INVESTIGATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES. THIS INVESTIGATION IS NOT CONCLUSIVE, AND MAY NOT BE COMPLETE, THEREFORE, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE, PIPELINE, OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES, AND UNDERGROUND UTILITY LINES. IN PLANNING AND CONDUCTING EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.
6. ALL LANDSCAPE AND PAVED AREAS ADJACENT TO THE BUILDING SHALL BE PROVIDED WITH POSITIVE DRAINAGE TO AVOID ANY PONDING ADJACENT TO THE STRUCTURE.



City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 05/21/21
BY: [signature]
HydroTrans # E17D011A

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE CONSTRUED TO PERMIT VIOLATIONS OF ANY CITY ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT THE CITY OF ALBUQUERQUE FROM REQUIRING CORRECTION, OR ERROR OR DIMENSIONS IN PLANS, SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT AUTHORIZATION.

811
CALL NM ONE-CALL SYSTEM SEVEN (7) DAYS PRIOR TO ANY EXCAVATION

AYER DESIGN GROUP
PROFESSIONAL ENGINEERING SERVICES
215 Johnston Street
Rock Hill, SC 29730
Phone: 803-328-5858

BIRKIE AYER JR
NEW MEXICO
25848
PROFESSIONAL ENGINEER
4-2-21

PROJECT NAME:
SANDIA COLLISION CENTER

5900 JEFFERSON STREET NE
ALBUQUERQUE, NM

SHEET DESCRIPTION:
GRADING PLAN

PROJECT #	2020-1
DRAWN BY	CC
CHECKED BY	BA

NO	ISSUE/REVISION	DATE
	FOR PERMIT	4/2/21

C4.0

GENERAL MAINTENANCE PROCEDURES:

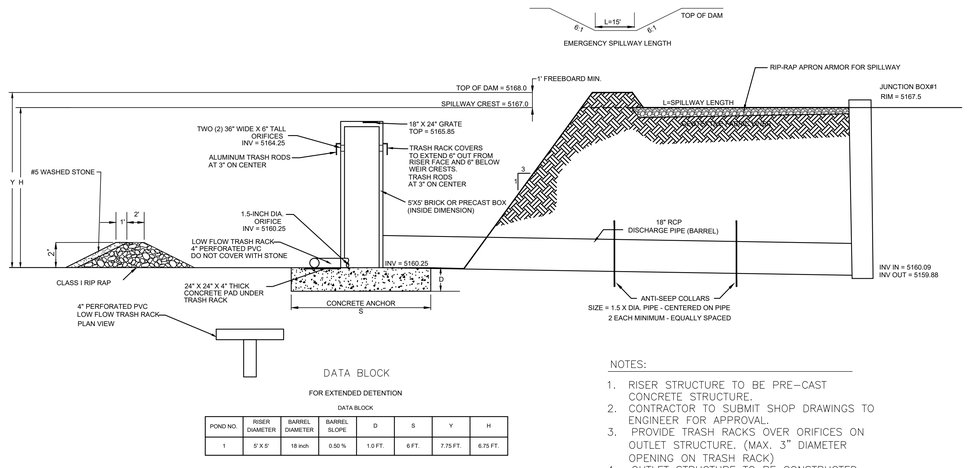
1. NEVER WASH OFF PAVED SURFACES WITH WATER, AS POLLUTANTS SUCH AS TRASH, GREASE, GASOLINE, DETERGENTS, AND METALS CAN COME IN CONTACT WITH THE WATER AND CREATE POLLUTED RUNOFF.
2. MAINTAIN A DEBRIS–FREE PARKING AREA BY DAILY COLLECTION AND SWEEPING. NEVER DISPOSE OF DEBRIS INTO THE GUTTER/STORM WATER SYSTEM.
3. USE RAGS OR ABSORBENTS TO CLEAN UP LEAKS OR SPILLS IMMEDIATELY.
4. MATERIALS USED FOR SPILL CLEAN UP SHOULD BE STORED IN CLOSED, LABELED CONTAINERS AND DISPOSED OF ACCORDING TO APPLICABLE REGULATIONS.
5. READ AND FOLLOW LABEL DIRECTIONS ON ALL PESTICIDES AND HERBICIDES. AVOID USING ON CLOUDY OR WINDY DAYS.
DO NOT USE AROUND ANY WATER WAYS, DITCHES, STORM SYSTEMS, OR ANY WATER CONVEYANCE SYSTEMS. USE NON TOXIC ALTERNATIVES WHEN POSSIBLE.

DAILY INSPECTIONS:

1. COLLECT AND SWEEP UP LITTER AND DEBRIS IN BOTH PAVED AND GRASSED AREAS. SPECIAL CARE SHOULD BE TAKEN AROUND OUTDOOR TRASH BINS, DUMPSTERS, CURB GUTTERS, AIR/WATER SUPPLY UNITS AND VACUUM AREAS AS THEY ARE AREAS PRONE TO DEBRIS AND LITTER.
2. INSPECT ALL VEHICLES IN LOT TO DETERMINE IF ANY SPILLS OR LEAKS HAVE OCCURED, AND CLEAN UP ANY LEAKS OR SPILLS IMMEDIATELY.
3. COLLECT AND DISPOSE OF ALL PET REFUSE AND DEBRIS IN PAVED, LANDSCAPED AND GRASSED AREAS. DISPOSE OF DEBRIS INTO CONTAINER OR TRASH RECEPTACLE, DO NOT WASH DEBRIS INTO STORM SYSTEM.

GENERAL POND MAINTENANCE PROCEDURES:

1. INSPECT MONTHLY OR AFTER EVERY RAINFALL EVENT OF 1" OR GREATER, WHICHEVER COMES FIRST.
   - A. REMOVE DEBRIS FROM OUTLET STRUCTURE AND POND.
   - B. CHECK AND CLEAR THE LOW FLOW ORIFICE OF ANY OBSTRUCTIONS.
   - C. CHECK THE POND SIDE SLOPES, REMOVE TRASH & REPAIR ERODED AREAS BEFORE THE NEXT RAIN.
   - D. IF THE POND IS OPERATED WITH A VEGETATIVE FILTER, CHECK FOR SEDIMENT ACCUMULATION, EROSION AND PROPER OPERATION OF FLOW SPREADER MECHANISM. REPAIR AS NECESSARY.
   - E. KEEP GRASS MOWED, REMOVE ANY TREES OR WOODY VEGETATION ON EMBANKMENT
2. QUARTERLY
   - A. INSPECT THE COLLECTION SYSTEM (IE: CATCH BASINS, PIPING, SWALES) FOR PROPER FUNCTIONING. CLEAR ACCUMULATED TRASH FROM BASIN BOTTOMS, AND CHECK PIPING FOR OBSTRUCTIONS.
   - B. CHECK POND INLET FOR UNDERCUTTING, REPLACE AND REPAIR BROKEN PIPES.
   - C. RESEED GRASSED SWALES, INCLUDING THE VEGETATED FILTER, IF APPLICABLE, TWICE A YEAR AS NECESSARY. REP[AIR ERODED AREAS IMMEDIATELY.
3. EVERY SIX MONTHS
   - A. REMOVE ACCUMULATED SEDIMENT FROM THE BOTTOM OF THE OUTLET STRUCTURE.
   - B. CHECK THE POND DEPTH AT VARIOUS POINTS IN THE POND. IF DEPTH IS REDUCED TO 75% OF ORIGINAL DEPTH, SEDIMENT SHALL BE REMOVED TO AT LEAST THE ORIGINAL DESIGN DEPTH.



DATA BLOCK

FOR EXTENDED DETENTION

DATA BLOCK

POND NO.	RISER DIAMETER	BARREL DIAMETER	BARREL SLOPE	D	S	Y	H
1	5' X 5'	18 inch	0.50 %	1.0 FT.	6 FT.	7.75 FT.	6.75 FT.

NOTES:

1. RISER STRUCTURE TO BE PRE–CAST CONCRETE STRUCTURE.
2. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
3. PROVIDE TRASH RACKS OVER ORIFICES ON OUTLET STRUCTURE. (MAX. 3" DIAMETER OPENING ON TRASH RACK)
4. OUTLET STRUCTURE TO BE CONSTRUCTED WITH STEPS.

GENERAL NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE BASIN AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE BEING CONSTRUCTED. SPILLWAYS SHOULD NOT BE CONSTRUCTED THROUGH FILL SECTIONS. ALL SPILLWAYS SHOULD BE LINED AND/OR RIPRAPPED.
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO DEPTH SHOWN ON STANDARD. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE TRAP SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
5. CONSTRUCTION OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
6. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER, UNLESS CERTIFIED BY REGISTERED GEOTECHICAL ENGINEER.
7. SEDIMENT BASIN EMBANKMENTS SHOULD BE PROVIDED WITH EROSION CONTROL AND STABILIZATION.
8. CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL, CLEANOUT POINT, OF THE BASIN.
9. SAFETY FENCING 3' HIGH SHOULD BE PLACED AROUND ALL SEDIMENT BASINS.
10. THE BERM ON SEDIMENT BASINS SHALL BE SEEDED ONCE FINAL GRADE HAS BEEN REACHED.
11. WASHED STONE AND WIRE BACKING SHALL BE USED WITH SILT FENCE WHENEVER SILT FENCE IS PLACE AT THE TOE OF A SLOPE 10' VERTICAL OR ALONG ANY CHANNEL OR WATER COURSE WHERE 50' OF BUFFER IS NOT PROVIDED.

A. RESULTS SUMMARY

REQUIRED WQV: (includes basin A and basin B)	220,384 SF * 0.42 In/12 IN/FT	= 7713 CF
PROVIDED WQV:	@ WSE 5164.25	=7782 CF
100-YR WSE:		5165.39
100-YEAR VOLUME STORED:		11,924 CF
Freeboard at 100 to spillway	5167-5165.39	1.61 feet
Freeboard at 100 to top of berm	5168-5165.39	2.61 feet

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 05/21/21
BY: Renée C. Brissette
Hydro/Trans # E17D011A

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE CONSTRUED TO PERMIT ANY VIOLATION OF ANY CITY ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT THE CITY FROM REQUIRING CORRECTION OF ERRORS, CORRECTION, OR ERRORS OR OMISSIONS IN PLANS, SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS SHALL NOT BE ENLARGED, ALTERED OR ALTERED WITHOUT AUTHORIZATION.

AYER DESIGN GROUP
PROFESSIONAL ENGINEERING SERVICES
215 Johnston Street
Rock Hill, SC 29730
Phone: 803-328-5858

BIRKLE AYER JR
NEW MEXICO
25848
PROFESSIONAL ENGINEER
4-2-21

PROJECT NAME:

SANDIA
COLLISION CENTER

5900 JEFFERSON STREET NE
ALBUQUERQUE, NM

SHEET DESCRIPTION:
STORM
DETAILS

PROJECT #	2020-1
DRAWN BY	CC
CHECKED BY	BA

NO	ISSUE/REVISION	DATE
	FOR PERMIT	4/2/21

C9.1