CITY OF ALBUQUERQUE

Hydrology Section Planning Department
David S. Campbell, Director

Timothy M. Keller, Mayor

May 6, 2019

Rick Tietgens P.E.
AECOM
6501 Americas Parkway NE
Suite 900
Albuquerque, NM, 87110

RE: **ABCWUA Customer Service an Operations Facility - 6000 Alexander Blvd NE**
G&D Plan and Drainage Report Engineer's Stamp Date 4/15/2019
Hydrology File: F16D014C

Dear Mr. Tietgens:

The referenced submittal received on 4/22/2019 cannot be approved for Building Permit or Grading Permit. The following comments must be addressed prior to approvals.

Prior to approval for Building Permit

1) A copy of the site plan should be included with the G&D resubmittal to hydrology indicating a phasing plan showing the limits of the site improvements that must be completed prior to Certificate of Occupancy for each building, assuming that a separate permit will be obtained for each building or groups of buildings and occupancy requests will be made prior to the completion of all of the buildings. Each Phase must stand on its own and interim grading, if different than the final grading, may need to be shown with each phase, so the grading plans for each phase may need to be shown on separate sheets.
2) The Conceptual G&D Plan included in the EPC approved Site Plan must either have a bold label "NOT FOR CONSTRUCT" or it should be replaced by this Final G&D Plan in the Building permit plan sets.
3) The Vicinity map and Legal description should be included on the G&D Plan per DPM Chap 22.7 Grading and Drainage Plan Checklist. The legal description is "Tract A Plat of Tract A City of Albuquerque Water Treatment Facility containing 162.5256 acres".
4) The entire 163 acre site must be brought up to current standards. Please add an overall sheet showing all of the ponds on this site and grading details of all the ponds existing and proposed for approval prior to building permit. The focus of the report needs to be changed from "increased ponding for the increased impervious" to "limited discharge and or retention for the entire 163 acre site".
5) It does not appear that the ponds on this site have an outfall; so, they will function as temporary retention ponds instead of detention ponds. The original 1998 Calmat Industrial Park Grading and drainage plan showed this 163 acre site discharging 5 CFS west through a future storm drain in Vineyard Rd. which was apparently never constructed. The 2004 report for the City Treatment Plant says the West Pond will be equipped with a future pump station and force main that will discharge to the North Diversion Channel, also not constructed. This development may

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Albuquerque
NM 87103
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continue to provide temporary onsite retention provided that both the detention alternative and the retention alternative are designed now.

a) Permanent retention is not allowed by the state engineer, so please provide a conceptual future detention plan for the entire 163 acre site and discuss the future plan in the report. The future plan should identify the future allowable discharge rate from each pond. Cross connection of the ponds with future storm drains leading to one central future pump station and force main need to be conceptually shown on the overall plan.
b) Please provide a summary table of the temporary onsite retention of the 100 year 10 day volumes both required and provided. Identify the total volume draining to each pond as though they are not connected, then if any pond does not have capacity for the 100 year 10 day volume then consider distribution of the excess volume to adjacent ponds, which are all at about the same elevation.
c) The 25 acres portion of Renaissance Shopping Center south of mission and east of Culture Dr. discharges at a very slow rate, like this site was supposed to, but it does eventually discharge all of the 100 year volume which must be accounted for in the onsite retention design of this site.
d) An additional retention pond and drainage covenant is required for the portion of this site leased to Vulcan Materials.

6) Please add flow arrows and storm drains to the Basin Map. Show existing, proposed, and future storm drain pipes showing pipe sizes, flow rates, and velocities and inverts at each end.
7) Where does the solar array basin drain to? Add a detail of the new storm drain junction structure at the north east corner of the new north pond.
8) Provide 100 year hydraulic capacity calculations and details for each of the rundowns and curb openings. Identify the curb height in the parking lots.
9) Please include the pond volume calculations in the report including the areas of contours. Use the conic equation for the volume calculations.
10) The Storm Water Quality Volume (SWQV) must be permanently retained onsite for all new or redeveloped impervious surfaces. All of the new 11 acre development appears to be new impervious rather than redeveloped. The ponds are being represented as detention ponds which does not provide the onsite retention volume required to address Storm Water Quality requirements. Please clearly state how the SWQV is being provided and provide SWQV calculations for each pond, both the required and the provided volume.

Prior to Certificate of occupancy:

11) Public drainage easements are required for all ponds and drainage facilities receiving drainage from Mission Ave.
12) An Agreement and Covenant is required for all drainage facilities receiving public drainage.
13) Drainage covenants are required for all drainage facilities receiving only private drainage.

Sincerely,

James D. Hughes
Principal Engineer, Planning Dept.
Development Review Services

Albuquerque Bernalillo County Water Authority
Water Treatment Plant
Customer Service and Operations Facilities

GRADING AND DRAINAGE REPORT

April 15, 2019

AECOM

Contents

1.0 Background

The Site Development Plan for this project is a major amendment to a previously approved Site Development Plan for all or a portion of Tract A, plat of Tract A, COA Water Treatment Facility addressed at 6000 Alexander Blvd NE. The original site development plan was approved by EPC in February 2004 for a 162 acre site with construction of improvements completed in 2009 which utilized approximately 93 acres for use as a Water Treatment Plant.

In November, 2018, EPC approved the Site Development Plan covered by the proposed improvements covered in this report. The Notice of Decision is referenced as SI-2018-00123 – Major Amendment of Prior Approval, site Development Plan

2.0 Purpose

The purpose of this report is to analyze grading, drainage, and site improvements of the Albuquerque Bernalillo County Water Authority Customer Service and Operations Facilities project. The site of proposed improvements is the southeast corner of the existing 93 acre Water Treatment Plant west of the North Diversion Channel north of Mission Avenue. The proposed project will make improvements to approximately 11.55 acres of the existing 93 acre Water Treatment Plant (WTP) site. See Attachment A, Zone Atlas Page F-16-Z.

3.0 Existing Site Conditions

3.1 Overview

The existing property encompasses approximately 162 acres which is zoned NR-SU. Existing topography is relatively flat with elevations ranging from 5020 to 5045. A 5-15 foot high berm is located along the south and west property line. The eastern portion of the property (approximately 50 acres) is leased to Vulcan Materials, under their control for sand and gravel operations, and does not contribute flows to the remainder of the site due to a large depression in this location.

The Water Authority utilizes approximately 93 acres on the western portion of the property for use as a Water Treatment Plan (WTP). The facilities consist of 13 covered buildings and 5 open storage ponds. Two of these ponds are settled water storage basins, one is used as a drying bed, and two are storm water detention ponds. The site has an access road near the intersection of Mission Avenue and Alexander Blvd. A delivery entrance is also exists near the northeast edge of the operating WTP which connects to Chappell Road.

The site lies within a designated Zone X area which are areas determined to be outside the 500-year floodplain and protected by levee from the 100-year flood (FIRM No. 35001C0138 D, Panel 138 of 825). See Attachment B.

3.2 Site Basins (See Attachment C)

- WTP Basin

The main WTP basin is a 73 acre site which includes the existing WTP operational area. The basin includes three ponds which do not contribute to runoff. Two of the pond areas are settled water storage and the other is a solids drying bed. The total contributing area of the basin is 43.91 acres with approximately 13.8 acres of impervious land treatment. The WTP basin includes the existing West Detention Pond

- Solar Array Basin

An existing solar array is located east of the WTP basin. The solar array basin is 11.35 acres with 2.73 acres of impervious land treatment. The Solar Array Basin routes to the West detention Pond via connection to the WTP storm drain system.

- Employee Lot Basin

The employee lot basin currently contains no employee lot but is 4.37 acres of undeveloped land which includes the existing West Detention Pond.

- Visitor Lot Basin

The visitor lot basin currently contains no visitor lot but is 3.22 acres of undeveloped land. The Visitor Lot Basin routes runoff to the South Detention Pond

- Fleet Lot Basin

The fleet lot basin currently contains no fleet lot but is 11.55 acres of undeveloped land.

3.3 Offsite Generated Runoff

The site receives storm-water runoff from two separate offsite sources. The first offsite source is Mission Hills Elementary School which is an 8.93 acre site contributing a 100-year storm event volume of 1.75 acre feet which is conveyed to the West Detention pond via an existing 30-inch storm drain line.

The second source of offsite flow is The Mission Avenue Right of Way which has a contributing area of 14.52 acres. The Mission Avenue ROW produces a 100-year runoff of 2.86 acre-feet which is delivered to the south Detention Pond via an existing 48-inch culvert

3.4 Existing Site Detention Ponds

The site is served by two Detention Ponds which contain all of the runoff generated by the site plus two offsite sources. The first detention pond is the **West Detention** pond with 3:1 side slopes and a topographic measured volume of 10.5 acre-feet plus 2-feet of freeboard (See Attachment F for a volume analysis of the existing pond). This pond is sized to detain the 93-acre Water Treatment Plant runoff

(plus the runoff from Mission Hills Elementary School. Under existing conditions the 100-year volume of water routed to this pond is 10.11 acre-feet.

West Detention Pond	
Contributing Basin	100-year volume (Acre-Feet) -Existing
WTP Basin	6.79
Solar Array Basin	1.57
Mission Hills Elementary	1.75
Total	10.11

The second detention pond is the **South Detention Pond** with 3:1 side slopes and a measured volume of 5 acre-feet plus two feet of freeboard. This pond is sized to detain the runoff from the south central portion of the site plus the offsite runoff from Mission Avenue. An existing 48-inch culvert (in place for over 30-years) routes flow under the existing berm from the Mission Ave ROW to the South Detention pond. See Attachment G for an analysis of the existing 48-inch RCP. Under existing conditions the 100-year volume of water routed to the pond is 3.91 acre-feet

South Detention Pond	
Contributing Basin	100-year volume (Acre-Feet) -Existing
Employee Lot Basin	0.77
Visitor Lot Basin	0.28
Mission Avenue ROW Basin	2.86
Total	3.91

4.0 Proposed Improvements

The Albuquerque Bernalillo County Water Authority proposes to improve approximately 11.55 acres of its existing 93 acre WTP site. The proposed improvements will consolidate several operations currently conducted offsite and co-locate them within the WTP boundary (See Attachment D). The consolidated improvements will include a Customer Service and Operations building, Vehicle Maintenance, Warehouse and Mechanical Shops, and new Dewatering Building. Areas around the new buildings will be landscaped. The improvements will also include paved parking for visitors, employees and fleet vehicles. The majority of the paved parking will have overhead solar array canopy structures. A new access road will connect the fleet vehicle parking lot to the existing access road in the northeast portion of the WTP. The new employee parking will be connected to existing internal roadways which connect to the main WTP entrance on Alexander Blvd.

The grading of the improvements area, as shown in Attachment E, will lower a portion of the berm along Mission Avenue and slope the majority of the site north at 1% to 1.5% to a new East Detention Pond. A portion of the site will also continue to drain west to the existing South Detention Pond.

The existing South Detention Pond will be reduced in surface area to accommodate an employee parking area; the pond bottom will be lowered to develop required storage volume. The South Detention pond will have a bottom elevation of 5029.9, 100-year water surface of 5041.71, and a 6-foot chain link perimeter fence. The revised south Detention Pond will have 3:1 side slopes and a volume of 4.45 acre-feet plus 2-feet of freeboard. The new Visitor Lot will drain to the pond via surface flow and concrete/rip rap rundowns. The existing 48" inflow culvert from Mission Avenue ROW will remain unchanged; however, the additional pond depth will be protected with an extension of the rip rap rundown. The existing 48-inch overflow pipe which connects to the WTP storm drain system will remain unchanged. The total 100-year volume of runoff routed to the pond from the Mission Avenue ROW, Visitor Lot, and Employee Lot will be 4.35 acre-feet.

South Detention Pond	
Contributing Basin	100-year volume (Acre-Feet) -Proposed
Employee Lot Basin	1.02
Visitor Lot Basin	0.47
Mission Avenue ROW Basin	2.86
Total	4.35

The new East Detention Pond will have 3:1 side slopes and a volume of 4.1 acre-feet plus 2-feet of freeboard. The East Detention Pond will have a bottom elevation of 5030.0, a 100-year water surface of 5039.0, and a 6-foot perimeter fence. The Fleet Lot basin will drain to the new pond via surface flow and concrete/rip rap rundowns. A 48-inch overflow pipe will connect to the existing WTP storm drain system. The total 100-year volume of storm water runoff routed to the East pond is 2.99 acre-feet.

The new paved access road from the Fleet Lot to the existing delivery entrance to the northeast will cross the WTP basin adding approximately 0.4 acre feet of impervious area to the basin. The new paving will increase the 100-year runoff by 0.09 acre-feet. The new runoff will be routed the existing WTP storm drain system via a new curb inlet and 24-inch RCP. The internal WTP storm-drain system routes to the existing West Pond. The total 100-year volume of storm-water runoff to the West pond is 10.2 acre-feet

West Detention Pond	
Contributing Basin	100-year volume (Acre-Feet) -Proposed
WTP Basin	6.88
Solar Array Basin	1.57
Mission Hills Elementary	1.75
Total	10.2

5.0 Conclusions

Runoff volumes and flow rates are increased as a result of changes in land treatment for the project. Total 100-year runoff volumes will be increased by 2.53 acre feet distributed to three on-site detention ponds. The peak flow rate has increased by 14.90 cfs distributed to the three on-site detention ponds.

WUA - Customer Service and Operations Facilities												
Hydrology Calculations												
Precipitation Zone 2 - 100 year storm			P(360)=	2.29	in.	P(1440)=	2.59	in.	P(10 day) =	3.62	in.	
			Qdc=	3.05	cfs/acre	Qdd=	4.34	cfs/acre				
			Ec=	1.03		Ed=	2.33					
Basin	Basin Area (acre)	Land Treatment Factors										
		A	B	C	D	Ew (in.)	V(360)	V(1440)	V(100-10 day)		Q(100)	
		(Acres)				(in)	(af)	(af)	(af)		(cfs)	
Existing Conditions												
Mission Elementary	8.93	0	0	4.47	4.47	1.68	1.25	1.36	1.75		33.00	
WTP Site	43.91	0	0	30.11	13.8	1.44	5.26	5.61	6.79		151.73	
Solar Array	11.35	0	0	8.62	2.73	1.34	1.27	1.34	1.57		38.14	
Mission Ave	14.52	0	0	7.19	7.34	1.69	2.04	2.23	2.86		53.79	
Employee Lot	4.87	0	0	3.26	1.61	1.46	0.59	0.63	0.77		16.93	
Visitor Lot	3.22	0	0	3.22	0	1.03	0.28	0.28	0.28		9.82	
Fleet Lot	11.55	0	0	11.55	0	1.03	0.99	0.99	0.99		35.23	
Proposed Conditions										Change		Change
Mission Elementary	8.93	0	0	4.47	4.47	1.68	1.25	1.36	1.75	0.00	33.00	0.00
WTP Site	43.91	0	0	29.71	14.2	1.45	5.31	5.66	6.88	0.09	152.24	0.52
Solar Array	11.35	0	0	8.62	2.73	1.34	1.27	0.75	1.57	0.00	38.14	0.00
Mission Ave	14.52	0	0	7.19	7.34	1.69	2.04	2.23	2.86	0.00	53.79	0.00
Employee Lot	4.87	0	0	2.14	2.73	1.76	0.71	0.78	1.02	0.25	18.38	1.44
Visitor Lot	3.22	0	0	2.35	0.88	1.39	0.37	0.39	0.47	0.19	10.99	1.17
Fleet Lot	11.55	0	0	2.42	9.13	2.06	1.98	2.21	2.99	2.00	47.01	11.78
									Totals	**2.53**		**14.90**

Attachments

Albuquerque Bernalillo County Water Authority
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GRADING AND DRAINAGE REPORT

April 15, 2019

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1.0 Background

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2.0 Purpose

The purpose of this report is to analyze grading, drainage, and site improvements of the Albuquerque Bernalillo County Water Authority Customer Service and Operations Facilities project. The site of proposed improvements is the southeast corner of the existing 93 acre Water Treatment Plant west of the North Diversion Channel north of Mission Avenue. The proposed project will make improvements to approximately 11.55 acres of the existing 93 acre Water Treatment Plant (WTP) site. See Attachment A, Zone Atlas Page F-16-Z.

3.0 Existing Site Conditions

3.1 Overview

The existing property encompasses approximately 162 acres which is zoned NR-SU. Existing topography is relatively flat with elevations ranging from 5020 to 5045. A 5-15 foot high berm is located along the south and west property line. The eastern portion of the property (approximately 50 acres) is leased to Vulcan Materials, under their control for sand and gravel operations, and does not contribute flows to the remainder of the site due to a large depression in this location.

The Water Authority utilizes approximately 93 acres on the western portion of the property for use as a Water Treatment Plan (WTP). The facilities consist of 13 covered buildings and 5 open storage ponds. Two of these ponds are settled water storage basins, one is used as a drying bed, and two are storm water detention ponds. The site has an access road near the intersection of Mission Avenue and Alexander Blvd. A delivery entrance is also exists near the northeast edge of the operating WTP which connects to Chappell Road.

The site lies within a designated Zone X area which are areas determined to be outside the 500-year floodplain and protected by levee from the 100-year flood (FIRM No. 35001C0138 D, Panel 138 of 825). See Attachment B.

3.2 Site Basins (See Attachment C)

- WTP Basin

The main WTP basin is a 73 acre site which includes the existing WTP operational area. The basin includes three ponds which do not contribute to runoff. Two of the pond areas are settled water storage and the other is a solids drying bed. The total contributing area of the basin is 43.91 acres with approximately 13.8 acres of impervious land treatment. The WTP basin includes the existing West Detention Pond

- Solar Array Basin

An existing solar array is located east of the WTP basin. The solar array basin is 11.35 acres with 2.73 acres of impervious land treatment. The Solar Array Basin routes to the West detention Pond via connection to the WTP storm drain system.

- Employee Lot Basin

The employee lot basin currently contains no employee lot but is 4.37 acres of undeveloped land which includes the existing West Detention Pond.

- Visitor Lot Basin

The visitor lot basin currently contains no visitor lot but is 3.22 acres of undeveloped land. The Visitor Lot Basin routes runoff to the South Detention Pond

- Fleet Lot Basin

The fleet lot basin currently contains no fleet lot but is 11.55 acres of undeveloped land.

3.3 Offsite Generated Runoff

The site receives storm-water runoff from two separate offsite sources. The first offsite source is Mission Hills Elementary School which is an 8.93 acre site contributing a 100-year storm event volume of 1.75 acre feet which is conveyed to the West Detention pond via an existing 30-inch storm drain line.

The second source of offsite flow is The Mission Avenue Right of Way which has a contributing area of 14.52 acres. The Mission Avenue ROW produces a 100-year runoff of 2.86 acre-feet which is delivered to the south Detention Pond via an existing 48-inch culvert

3.4 Existing Site Detention Ponds

The site is served by two Detention Ponds which contain all of the runoff generated by the site plus two offsite sources. The first detention pond is the **West Detention** pond with 3:1 side slopes and a topographic measured volume of 10.5 acre-feet plus 2-feet of freeboard (See Attachment F for a volume analysis of the existing pond). This pond is sized to detain the 93-acre Water Treatment Plant runoff

(plus the runoff from Mission Hills Elementary School. Under existing conditions the 100-year volume of water routed to this pond is 10.11 acre-feet.

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4.0 Proposed Improvements

The Albuquerque Bernalillo County Water Authority proposes to improve approximately 11.55 acres of its existing 93 acre WTP site. The proposed improvements will consolidate several operations currently conducted offsite and co-locate them within the WTP boundary (See Attachment D). The consolidated improvements will include a Customer Service and Operations building, Vehicle Maintenance, Warehouse and Mechanical Shops, and new Dewatering Building. Areas around the new buildings will be landscaped. The improvements will also include paved parking for visitors, employees and fleet vehicles. The majority of the paved parking will have overhead solar array canopy structures. A new access road will connect the fleet vehicle parking lot to the existing access road in the northeast portion of the WTP. The new employee parking will be connected to existing internal roadways which connect to the main WTP entrance on Alexander Blvd.

The grading of the improvements area, as shown in Attachment E, will lower a portion of the berm along Mission Avenue and slope the majority of the site north at 1% to 1.5% to a new East Detention Pond. A portion of the site will also continue to drain west to the existing South Detention Pond.

The existing South Detention Pond will be reduced in surface area to accommodate an employee parking area; the pond bottom will be lowered to develop required storage volume. The South Detention pond will have a bottom elevation of 5029.9, 100-year water surface of 5041.71, and a 6-foot chain link perimeter fence. The revised south Detention Pond will have 3:1 side slopes and a volume of 4.45 acre-feet plus 2-feet of freeboard. The new Visitor Lot will drain to the pond via surface flow and concrete/rip rap rundowns. The existing 48" inflow culvert from Mission Avenue ROW will remain unchanged; however, the additional pond depth will be protected with an extension of the rip rap rundown. The existing 48-inch overflow pipe which connects to the WTP storm drain system will remain unchanged. The total 100-year volume of runoff routed to the pond from the Mission Avenue ROW, Visitor Lot, and Employee Lot will be 4.35 acre-feet.

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Runoff volumes and flow rates are increased as a result of changes in land treatment for the project. Total 100-year runoff volumes will be increased by 2.53 acre feet distributed to three on-site detention ponds. The peak flow rate has increased by 14.90 cfs distributed to the three on-site detention ponds.

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			Ec=	1.03		Ed=	2.33					
Basin	Basin Area (acre)	Land Treatment Factors										
		A	B	C	D	Ew (in.)	V(360)	V(1440)	V(100-10 day)		Q(100)	
		(Acres)				(in)	(af)	(af)	(af)		(cfs)	
Existing Conditions												
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Employee Lot	4.87	0	0	3.26	1.61	1.46	0.59	0.63	0.77		16.93	
Visitor Lot	3.22	0	0	3.22	0	1.03	0.28	0.28	0.28		9.82	
Fleet Lot	11.55	0	0	11.55	0	1.03	0.99	0.99	0.99		35.23	
Proposed Conditions										Change		Change
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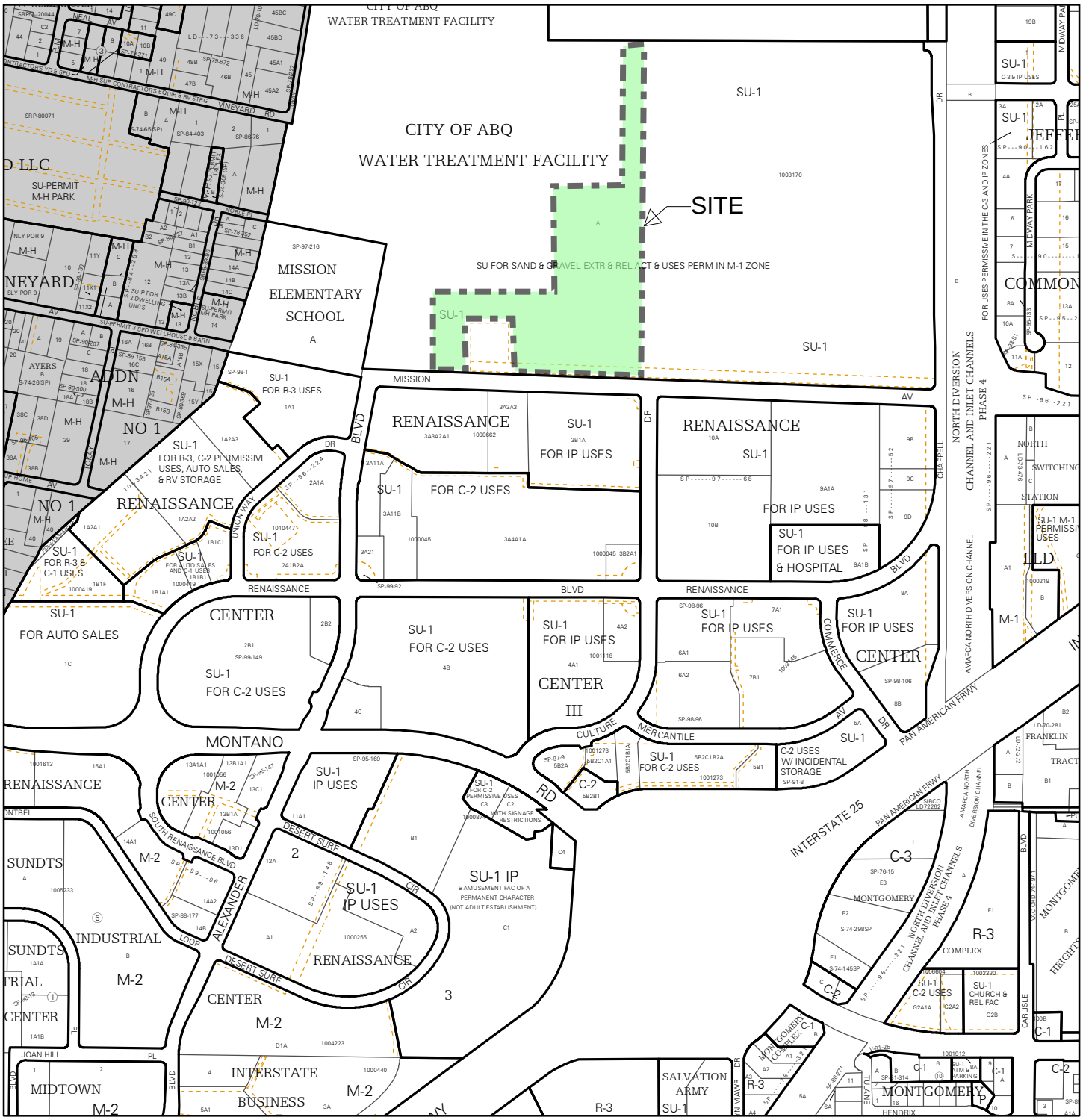
Employee Lot	4.87	0	0	2.14	2.73	1.76	0.71	0.78	1.02	0.25	18.38	1.44
Visitor Lot	3.22	0	0	2.35	0.88	1.39	0.37	0.39	0.47	0.19	10.99	1.17
Fleet Lot	11.55	0	0	2.42	9.13	2.06	1.98	2.21	2.99	2.00	47.01	11.78
									Totals	**2.53**		**14.90**

Attachments

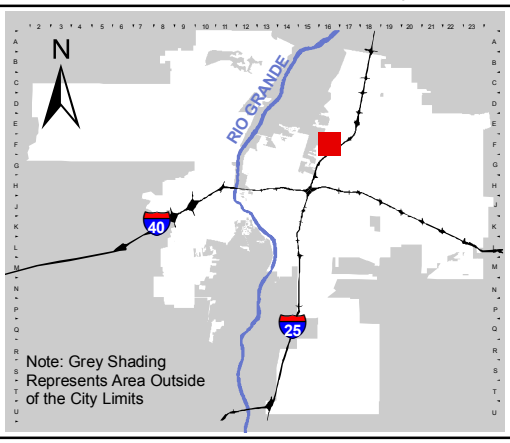


For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: May 16, 2018

The Zone Districts and various Overlays shown on these pages are no longer in effect as of May 17, 2018. Refer to the Integrated Development Ordinance (IDO) for current Zoning information.



Zone Atlas Page:

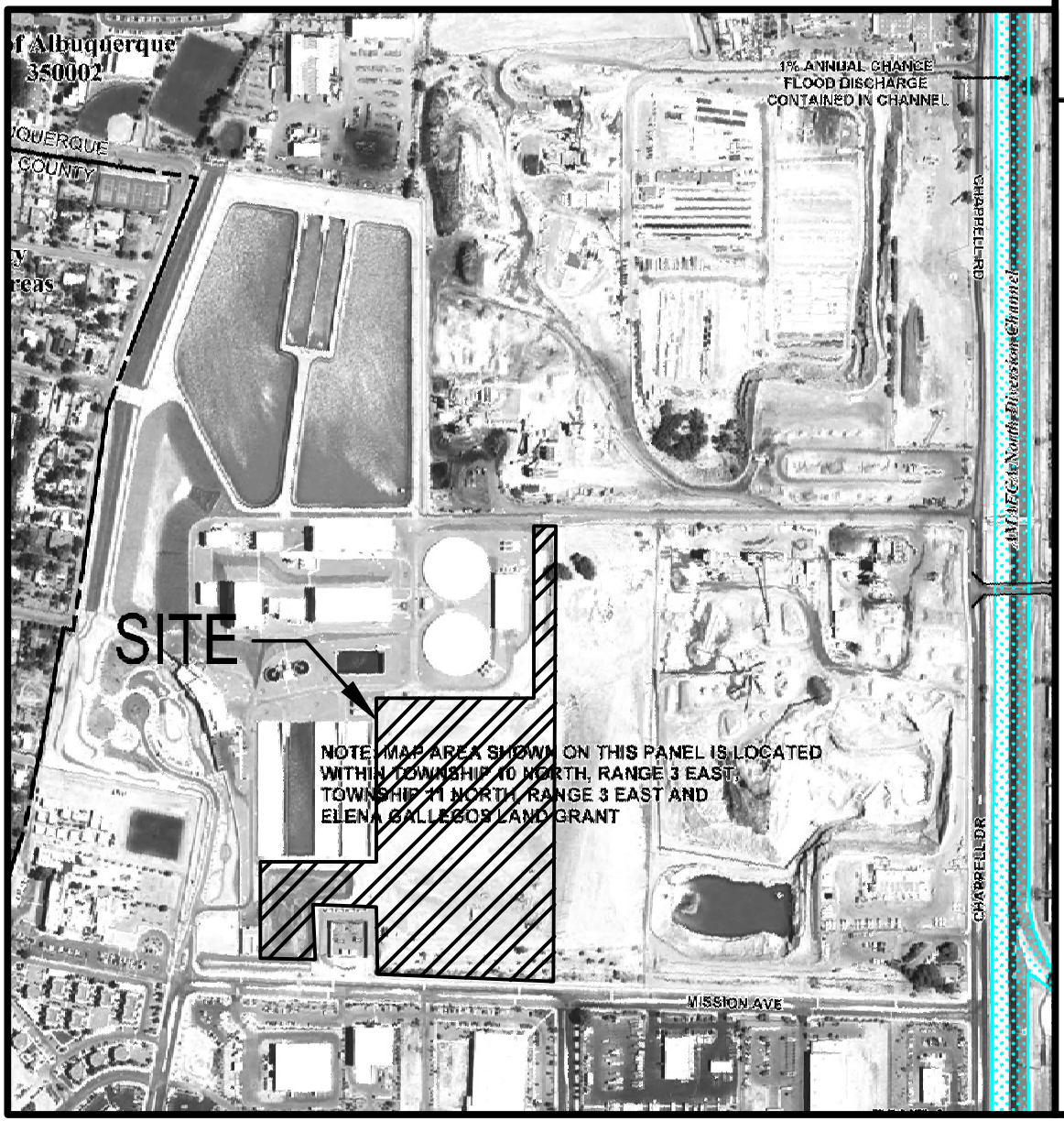
F-16-Z

Selected Symbols

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

0 750 1,500 Feet

Attachment A



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0138H

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 138 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0138	H
BERNALILLO COUNTY			
UNINCORPORATED AREAS	350001	0138	H

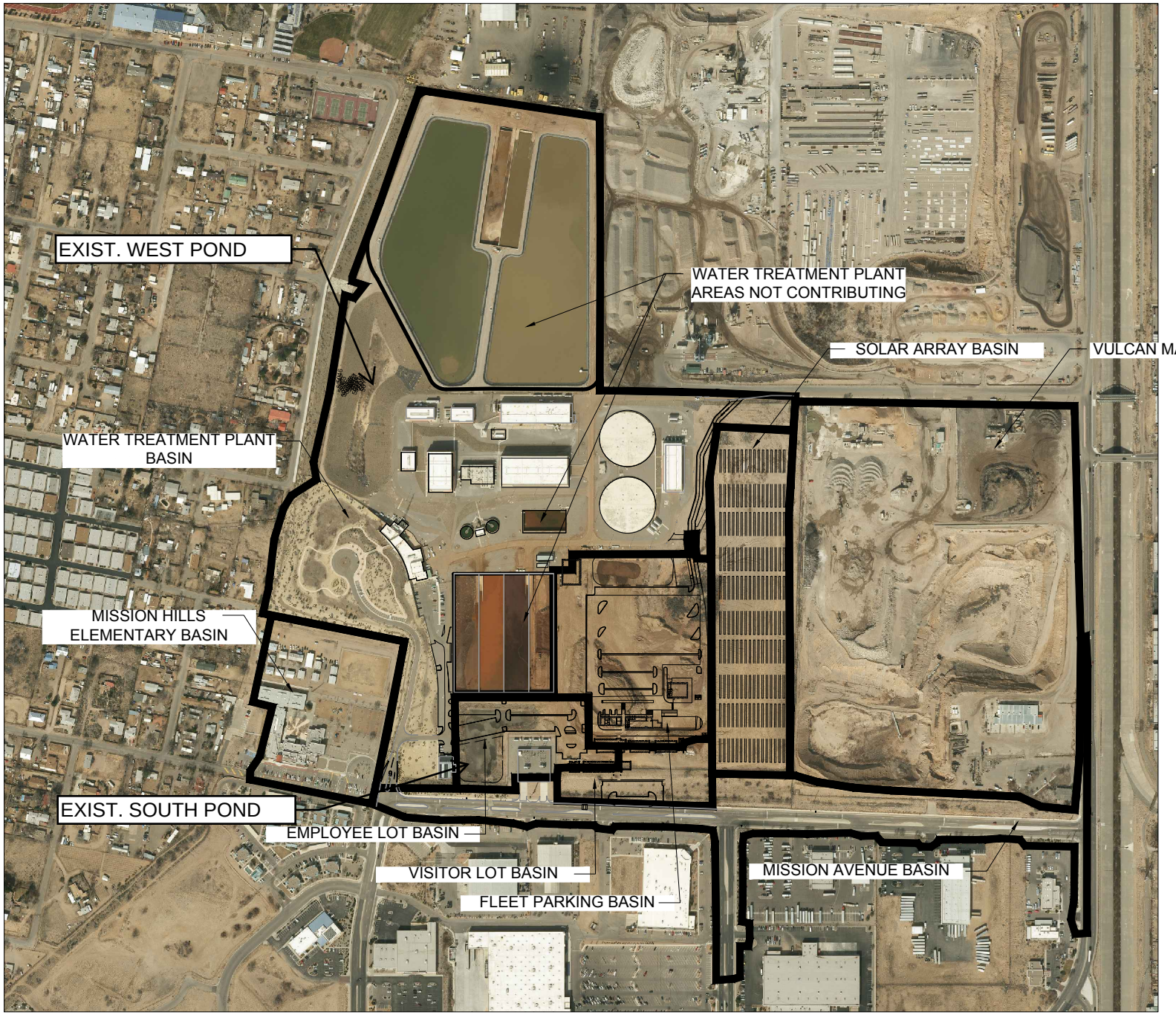
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0138H

MAP REVISED
AUGUST 16, 2012

FEMA MAP

Attachment B



PLAN NORTH

Scale 1"= 200'

0 200' 400'

ATTACHMENT C

SMPC Architects
PRINCIPLES OF DESIGN.
115 Amherst Drive SE.
Albuquerque, New Mexico
87106
T 505.255.8668
F 505.268.6665
www.smpcarchitects.com

AECOM Imagine it. Delivered.
One Park Square, 6501 Americas Pkwy NE,
Suite 900 Albuquerque, New Mexico 87110
(505)-855-7500

ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

CUSTOMER SERVICE AND OPERATIONS FACILITIES SITEWORK

6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION

DATE:

PROJECT #:

DRAWN BY:

CH'D BY:

SHEET TITLE

BASIN MAP

SHEET OF

PLAN NORTH

Scale 1"= 100'

0 100' 200'

ATTACHMENT D

SMPC Architects
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6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION

DATE:

PROJECT #:

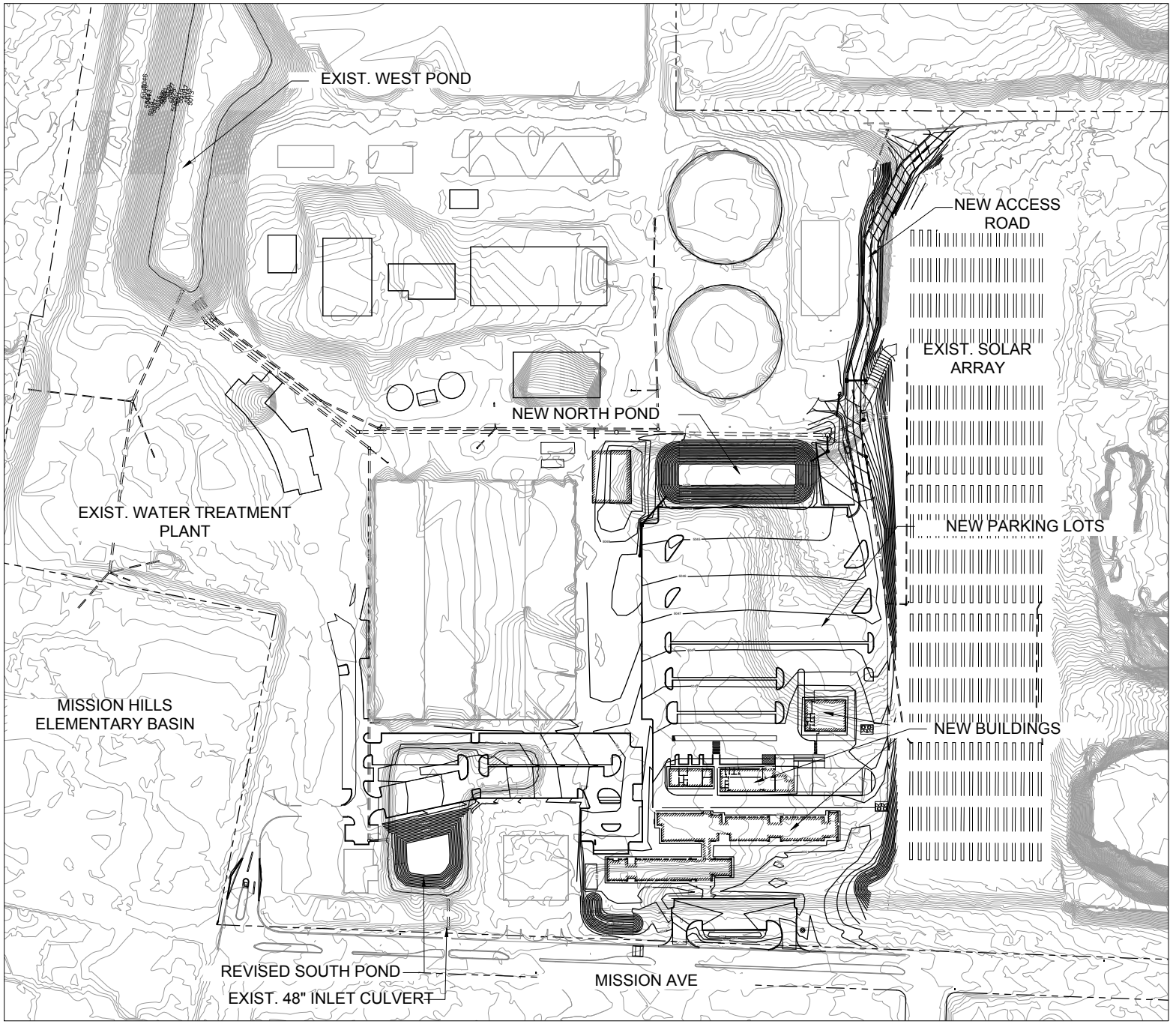
DRAWN BY:

CH'D BY:

SHEET TITLE

SITE IMPROVEMENTS

SHEET OF



PLAN NORTH

Scale 1"= 100'

0 100' 200'

ATTACHMENT E

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ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

CUSTOMER SERVICE AND OPERATIONS FACILITIES
SITEWORK

6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION

DATE:

PROJECT #:

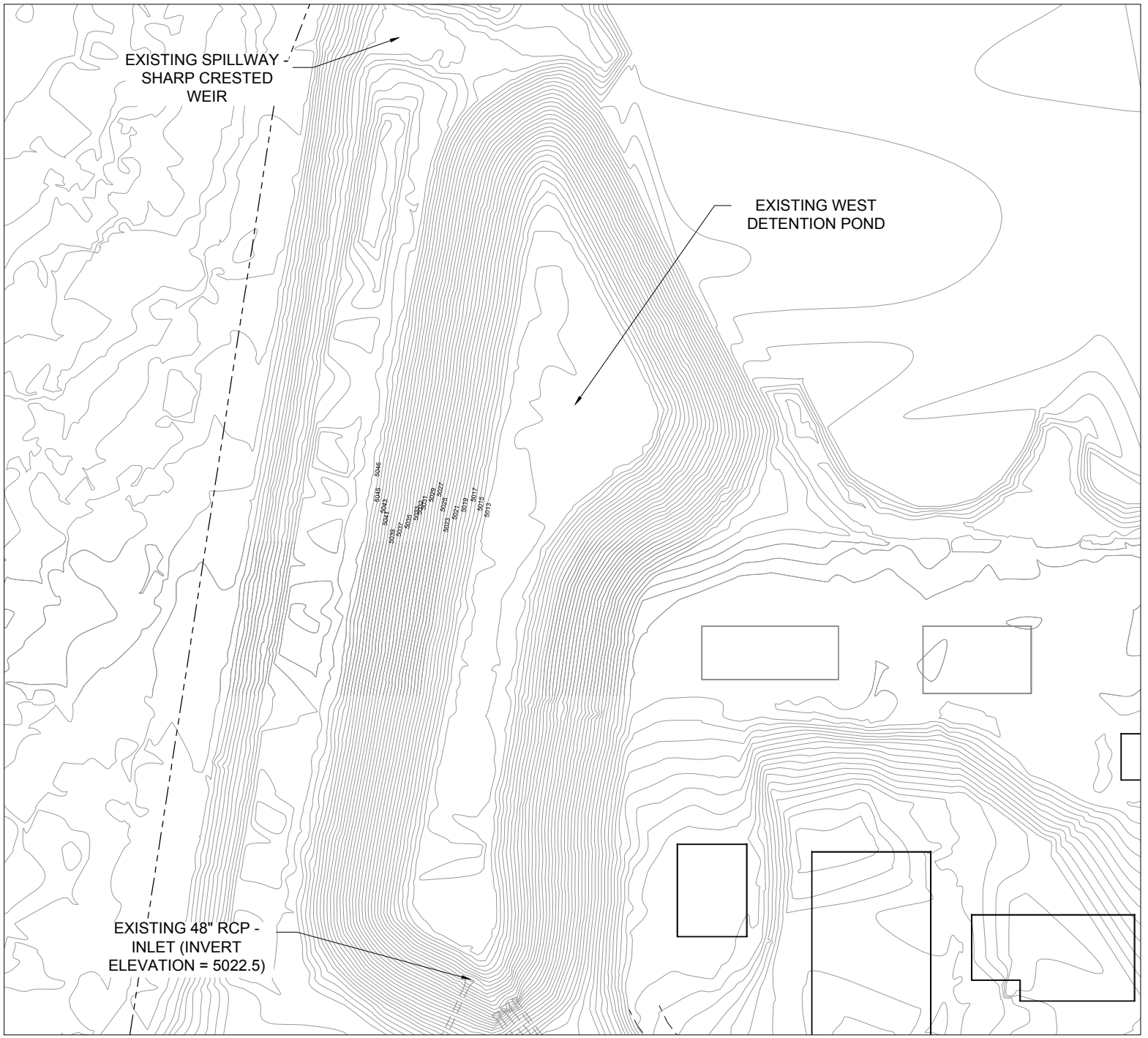
DRAWN BY:

CH'D BY:

SHEET TITLE

GRADING PLAN

SHEET OF



EXISTING WEST DETENTION POND
VOLUME ANALYSIS

BOTTOM ELEVATION	5013
LOWEST INLET PIPE INVERT ELEVATION	5022.5
FREEBOARD	2.0'
WATER SURFACE ELEVATION' (100 YEAR STORM)	5020.5

ELEVATIOI	VOLUME (CF)
5014	34,050
5015	51,317
5016	56,500
5017	61,602
5018	66,597
5019	71,509
5020	76,364
5020.5	40,589
	458,516 CF

10.53 ACRE FEET

PLAN NORTH

Scale 1"= 40'

0 40 80

ATTACHMENT F

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ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

CUSTOMER SERVICE AND OPERATIONS FACILITIES SITEWORK

6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION

DATE:
PROJECT #:
DRAWN BY:
CH'D BY:

SHEET TITLE

WEST DETENTION POND

SHEET OF

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Apr 9 2019

Circular Culvert

Invert Elev Dn (ft)	=	5043.71
Pipe Length (ft)	=	52.00
Slope (%)	=	0.56
Invert Elev Up (ft)	=	5044.00
Rise (in)	=	48.0
Shape	=	Circular
Span (in)	=	48.0
No. Barrels	=	1
n-Value	=	0.012
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

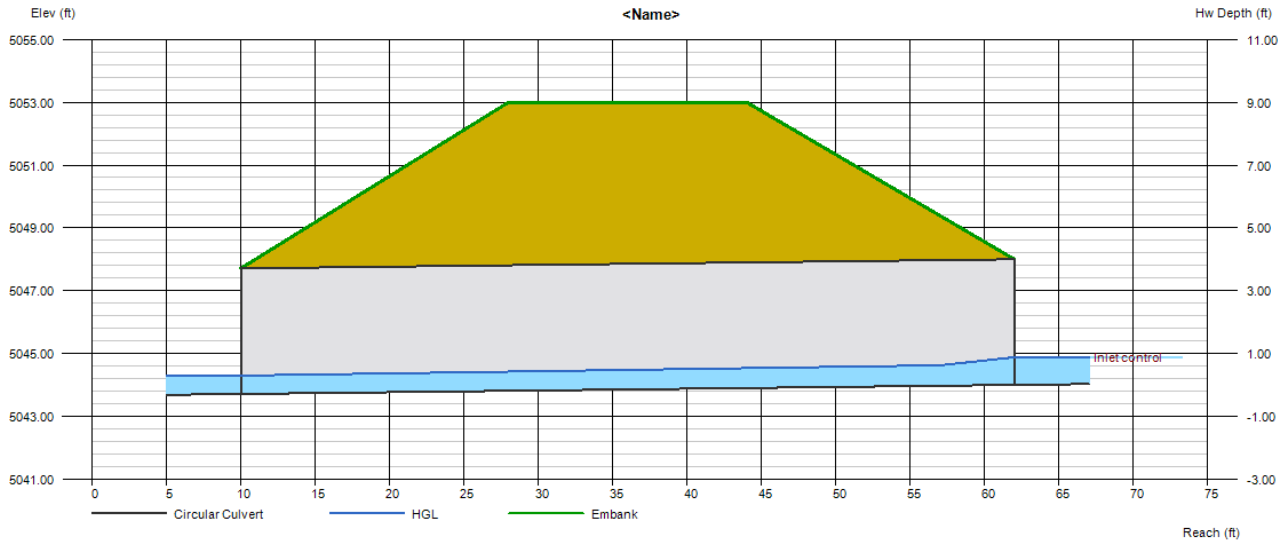
Top Elevation (ft)	=	5053.00
Top Width (ft)	=	16.00
Crest Width (ft)	=	0.00

Calculations

Qmin (cfs)	=	0.00
Qmax (cfs)	=	53.79
Tailwater Elev (ft)	=	0.00

Highlighted

Qtotal (cfs)	=	5.20
Qpipe (cfs)	=	5.20
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	4.56
Veloc Up (ft/s)	=	3.84
HGL Dn (ft)	=	5044.30
HGL Up (ft)	=	5044.66
Hw Elev (ft)	=	5044.88
Hw/D (ft)	=	0.22
Flow Regime	=	Inlet Control



Attachment G

Q			Veloc		Depth	
Total	Pipe	Over	Dn	Up	Dn	Up
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)
5.20	5.20	0.00	4.56	3.84	7.03	7.91
10.40	10.40	0.00	5.61	4.63	9.84	11.27
15.60	15.60	0.00	6.23	5.18	12.16	13.88
20.80	20.80	0.00	6.76	5.62	14.09	16.10
26.00	26.00	0.00	7.24	6.01	15.75	18.08
31.20	31.20	0.00	7.55	6.35	17.47	19.88
36.40	36.40	0.00	7.88	6.66	18.98	21.55
41.60	41.60	0.00	8.18	6.95	20.40	23.10
46.80	46.80	0.00	8.42	7.23	21.83	24.57
52.00	52.00	0.00	8.61	7.50	23.26	25.96

Attachment G

HGL			
Dn	Up	Hw	Hw/D
(ft)	(ft)	(ft)	
5044.30	5044.66	5044.88	0.22
5044.53	5044.94	5045.27	0.32
5044.72	5045.16	5045.58	0.39
5044.88	5045.34	5045.85	0.46
5045.02	5045.51	5046.10	0.52
5045.17	5045.66	5046.33	0.58
5045.29	5045.80	5046.56	0.64
5045.41	5045.93	5046.77	0.69
5045.53	5046.05	5046.99	0.75
5045.65	5046.16	5047.19	0.80

Attachment G

Attachment H

Runoff Volume calculations

Runoff Calculations

Mission Elementary

Total Land Area 389,119 sf 8.93 acres

From Table A-5 pg 9 Schools = 50% impervious

Land Treatment Type		Acres
Aa=	0%	0
Ab=	0%	0.00
Ac=	50%	4.47
Ad=	50%	4.47

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.68 inches

Volume (V360) = (Weighted E * Area)/12 = 1.25 ac-ft

From Table A-2 page 5 for Zone 2

P(6 hr)=	2.29
P (10 day)=	3.62

Volume (100yr-10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft	**1.75 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad	33.01 cfs

Runoff Calculations

Water Treatment Plant Site

Total Land Area	3,188,897	sf	73.21	acres
Area Not Contributing				
Drying beds	214,949	sf	4.93	acres
Raw Water Storage	1,061,195	sf	24.36	acres
Total Contributing Area			43.91	acres

Impervious Areas

Buildings	260,320	sf	5.98	acres
Pavements	296,212	sf	6.80	acres
Pond	44,752	sf	1.03	acres
New roads	17,250		0.40	acres
Total Impervious =			14.20	acres

Land Treatment Type		Acres
Aa=		0
Ab=		0.00
Ac=		29.71
Ad=		14.20

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.45 inches

Volume (V360) = (Weighted E * Area)/12 = 5.31 ac-ft

Rainfall depth — From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (100yr-10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft **6.88 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad **152.25** cfs

Runoff Calculations

Solar Array

Total Land Area	494,417	sf	11.35	acres

Impervious Areas

Foundations	119,040	sf	2.73	acres
Pavements	0	sf	0.00	acres
Total Impervious =			2.73	acres

Land Treatment Type		acres
Aa=		0
Ab=		0.00
Ac=		8.62
Ad=		2.73

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.34 inches

Volume (V360) = (Weighted E * Area)/12 = 1.27 ac-ft

Rainfall depth — From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft	**1.57 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad	**38.14** cfs

Runoff Calculations

Mission Ave

Total Land Area	632,635	sf	14.52	acres

Impervious Areas

Bldg	0	sf	0.00	acres
Pavements & Sidewalk	319,600	sf	7.34	acres
Total Impervious =			7.34	acres

Land Treatment Type		acres
Aa=		0
Ab=		0.00
Ac=		7.19
Ad=		7.34

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.69 inches

Volume (V360) = (Weighted E * Area)/12 = 2.04 ac-ft

Rainfall depth — From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft	**2.85 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad	**53.76** cfs

Runoff Calculations

Employee Parking

Total Land Area	212,352	sf	4.87	acres

Impervious Areas

Bldg	7,397	sf	0.17	acres
Pavements & Sidewalk	86,595	sf	1.99	acres
Pond	25,075	sf	0.58	acres
Total Impervious =			2.73	acres

Land Treatment Type		Acres
Aa=		0
Ab=		0.00
Ac=		2.14
Ad=		2.73

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.76 inches

Volume (V360) = (Weighted E * Area)/12 = 0.71 ac-ft

Rainfall depth From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft	**1.02 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad	18.39 cfs

Runoff Calculations

Visitor Lot

Total Land Area	140,391	sf	3.22	acres

Impervious Areas

Bldg	14,041	sf	0.32	acres
Pavements & Sidewalk	24,142	sf	0.55	acres
Total Impervious =			0.88	acres

Land Treatment Type		acres
Aa=		0
Ab=		0.00
Ac=		2.35
Ad=		0.88

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 1.38 inches

Volume (V360) = (Weighted E * Area)/12 = 0.37 ac-ft

Rainfall depth — From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft **0.47 ac-ft**

Peak Discharge (100 yr)

from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad 10.96 cfs

Runoff Calculations

Fleet Lot

Total Land Area	503,307	sf	11.55 acres

Impervious Areas

Bldg	53,300	sf	1.22 acres
Pavements & Sidewalk	306,001	sf	7.02 acres
Pond	38,588	sf	0.89 acres
Total Impervious =			9.13 acres

Land Treatment Type		acres
Aa=		0
Ab=		0.00
Ac=		2.42
Ad=		9.13

From Table A-8 for Zone 2, 100 yr, 6 hr Storm

	Inches
Ea=	0.62
Eb=	0.8
Ec=	1.03
Ed=	2.33

Weighted E = $\frac{EaAa + EbAb + EcAc + EdAd}{Aa+Ab+Ac+Ad}$ = 2.06 inches

Volume (V360) = (Weighted E * Area)/12 = 1.98 ac-ft

Rainfall depth — From Table A-2 page 5 for Zone 2

	inches
P(6 hr)=	2.29
P (10 day)=	3.62

Volume (100yr-10 day) = V360 + Ad * (P(10 day) - P (6 hr)) / 12 in/ft **2.99 ac-ft**

Peak Discharge (100 yr)

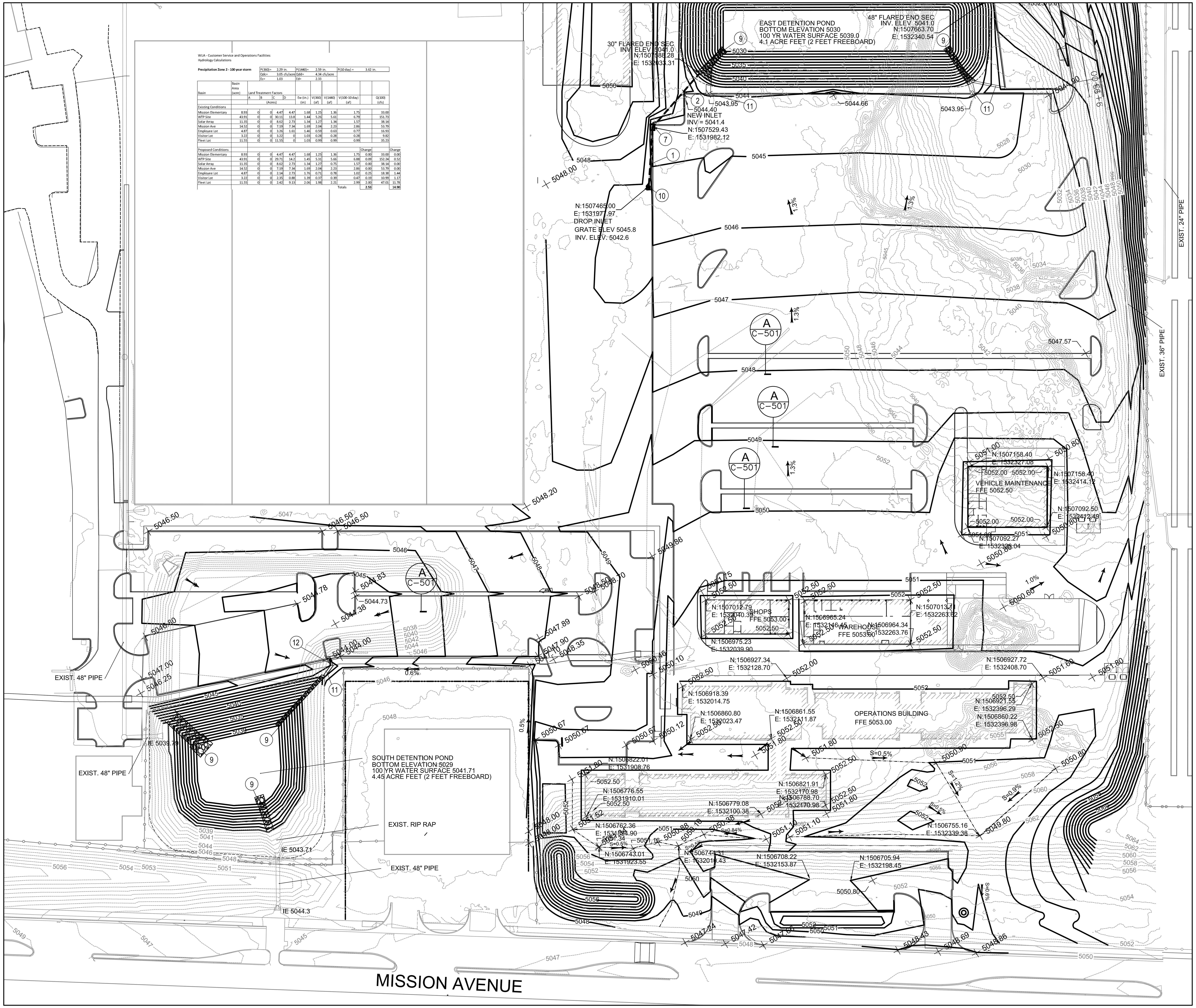
from Table A-9, pg 13, 100yr Peak Dischage

	cfs/acre
Qpc=	3.05
Qpd=	4.34

Total Qp= Qpc*Ac + Qpd*Ad 47.02 cfs

Ops Bldg	30,500
Veh Maint	4,140
Warehouse	6,160
Shops	3,500
Dewatering Bldg	9,000
Total Bldg	53,300
Fleet Parking	250,306
Sidewalk	6,642
Dewatering Pav.	16,150
Fire Lane	4,599
Road	6,643
Storage Lots	15,339
Cocnrete	6,322
Total Pavement	306,001

MATCH LINE - SEE DWG C-302



WUA - Customer Service and Operations Facilities
Hydrology Calculations

Precipitation Zone 2 - 100 year storm

P(360)= 2.29 in.	P(1440)= 2.59 in.	P(10 day) = 3.62 in.
Qdc= 3.05 cfs/acre	Qdd= 4.34 cfs/acre	
Ec= 1.03	Ed= 2.33	

Basin	Basin Area (acre)	Land Treatment Factors A	B	C	D	Ew (in.) (in)	V(360) (af)	V(1440) (af)	V(100-10 day) (af)	Change	Q(100) (cfs)	Change
		(Acres)										
Existing Conditions												
Mission Elementary	8.93	0	0	4.47	4.47	1.68	1.25	1.36	1.75		33.00	
WTP Site	43.91	0	0	30.11	13.8	1.44	5.26	5.61	6.79		151.73	
Solar Array	11.35	0	0	8.62	2.73	1.34	1.27	1.34	1.57		38.14	
Mission Ave	14.52	0	0	7.19	7.34	1.69	2.04	2.23	2.86		53.79	
Employee Lot	4.87	0	0	3.26	1.61	1.46	0.59	0.63	0.77		16.93	
Visitor Lot	3.22	0	0	3.22	0	1.03	0.28	0.28	0.28		9.82	
Fleet Lot	11.55	0	0	11.55	0	1.03	0.99	0.99	0.99		35.23	
Proposed Conditions										Change		Change
Mission Elementary	8.93	0	0	4.47	4.47	1.68	1.25	1.36	1.75	0.00	33.00	0.00
WTP Site	43.91	0	0	29.71	14.2	1.45	5.31	5.66	6.88	0.09	152.24	0.52
Solar Array	11.35	0	0	8.62	2.73	1.34	1.27	0.75	1.57	0.00	38.14	0.00
Mission Ave	14.52	0	0	7.19	7.34	1.69	2.04	2.23	2.86	0.00	53.79	0.00
Employee Lot	4.87	0	0	2.14	2.73	1.76	0.71	0.78	1.02	0.25	18.38	1.44
Visitor Lot	3.22	0	0	2.35	0.88	1.39	0.37	0.39	0.47	0.19	10.99	1.17
Fleet Lot	11.55	0	0	2.42	9.13	2.06	1.98	2.21	2.99	2.00	47.01	11.78
									Totals	**2.53**		**14.90**

PROJECT BENCHMARK

BLM SECTION CORNER BRASS CAP "SC 27-26-34-35", SET IN CONCRETE, 0.4' BELOW GROUND, APPROXIMATELY 14.6' NORTH OF THE NORTH SIDE OF 5741 MIDWAY PARK BLVD NE AND APPROXIMATELY 179' WEST OF THE CENTER LINE OF MIDWAY PARK BLVD NE. ELEVATION = 5113.12 FEET (NAVD 1988)

LEGEND

- 5050 — EXISTING GRADE CONTOUR
- EXISTING STORM DRAIN
- 5050 — NEW GRADE CONTOUR
- 5050 — NEW GRADE SPOT ELEVATION
- LIMITS OF GRADING
- SD — NEW STORM DRAIN PIPE
- NEW RIP RAP SLOPE PROTECTION

KEY NOTES

1. INSTALL 65 LF 24" RCP CLASS III
2. INSTALL 78' LF 24" RCP CLASS III
7. INSTALL NEW TYPE A STORM INLET PER COA STD DTL DWG 2201 (TYP. 2)
9. CONSTRUCT RIPRAP RUNDOWN PER 6/C-500
10. CONSTRUCT 3'x3' DROP INLET
11. CONSTRUCT CURB GAP W/CONCRETE CHUTE PER DTL 3/C-500
12. CONSTRUCT 18" SIDEWALK CULVERT PER COA STD DWG 2236

PLAN NORTH

Scale 1"= 50'
0 50 100

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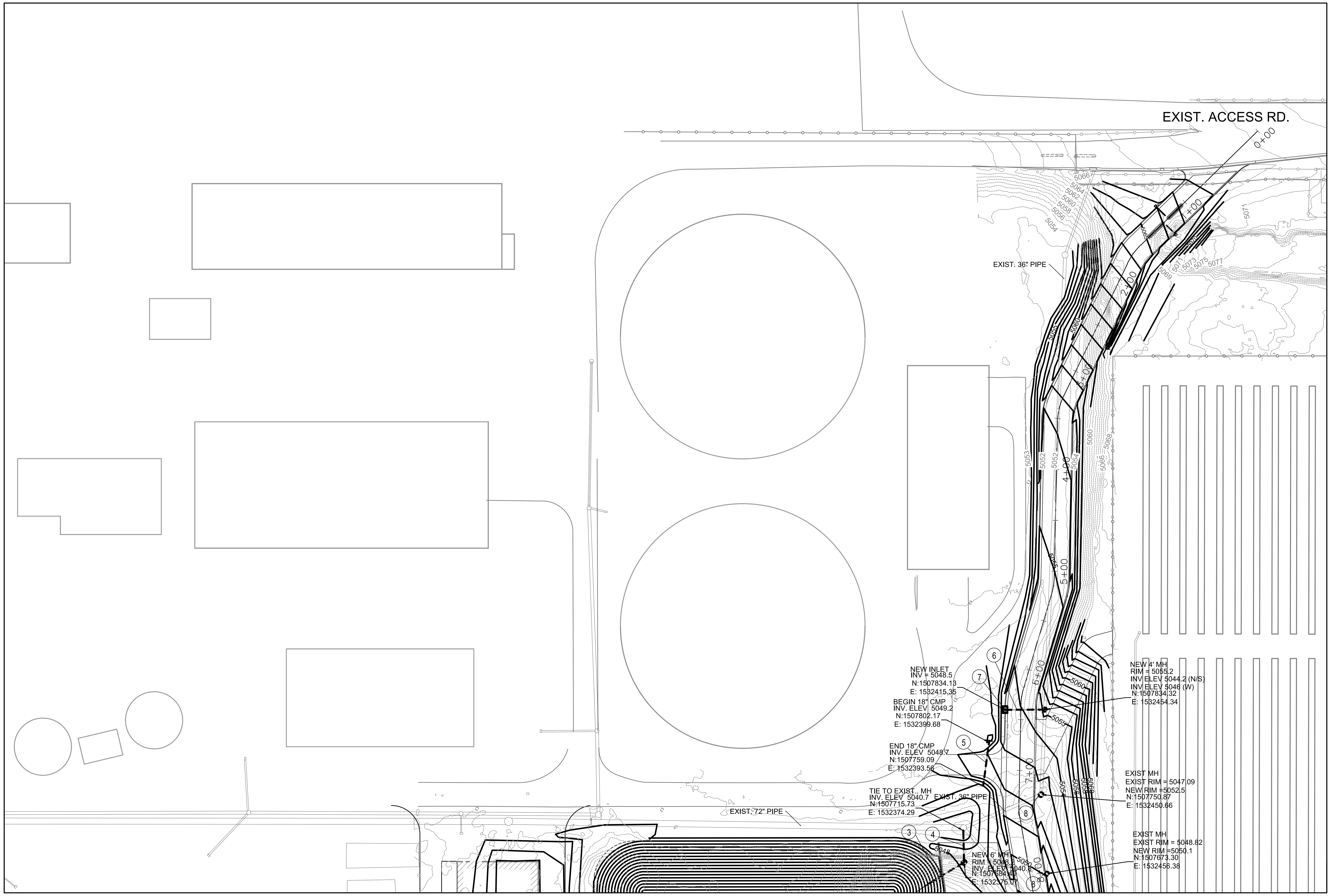
AECOM Imagine it. Delivered.
One Park Square, 6501 Americas Pkwy NE, Suite 900 Albuquerque, New Mexico 87110
(505)-855-7500

ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY
CUSTOMER SERVICE AND OPERATIONS FACILITIES
SITEWORK
6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION
DATE:		3/15/19
PROJECT #:		18018
DRAWN BY:		DRW
CH'D BY:		CR

SHEET TITLE
GRADING AND DRAINAGE PLAN

C-301
SHEET OF



MATCH LINE - SEE DWG C-301

LEGEND

- EXISTING GRADE CONTOUR
- EXISTING STORM DRAIN
- NEW GRADE CONTOUR
- NEW GRADE SPOT ELEVATION
- LIMITS OF GRADING
- NEW STORM DRAIN PIPE
- NEW RIP RAP SLOPE PROTECTION

KEY NOTES

3. INSTALL 40 LF 48" RCP CLASS III
4. INSTALL 31 LF 48" RCP CLASS III
5. INSTALL 45 LF RELOCATED 18" CMP CULVERT
6. INSTALL 39 LF 24" RCP CLASS III
7. INSTALL NEW TYPE A STORM INLET PER COA STD DTL DWG 2201 (TYP. 2)
8. RAISE EXIST MH LID

PLAN NORTH

Scale 1"= 50'

0 50 100

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CUSTOMER SERVICE AND OPERATIONS FACILITIES

SITEWORK

6000 Alexander Blvd NE, Albuquerque, NM 87107

NO	DATE	DESCRIPTION

DATE:	3/15/19
PROJECT #:	18018
DRAWN BY:	DRW
CH'D BY:	CR

SHEET TITLE

GRADING AND DRAINAGE PLAN

SHEET C-302 OF