

Prosperity Substation Drainage Report

Prepared for: PNM

AECOM Project Number: 60664881

March 2023



Imagine it.
Delivered.





This report, entitled Prosperity Substation Drainage Report, was prepared by me or directly under my supervision.



03/03/2023

Dana M Peterson, PE

New Mexico PE Number 23231



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Purpose

The purpose of this report is to determine pre- and post- runoff drainage characteristics and drainage design for the new PNM substation on Los Picaros Rd, between I-25 and University Blvd.

Introduction

Project Location

The project is located in Zone Atlas Grid Q15 on Tract A-1 and Tract B, Sunset Memorial Park, see below (Figure 1). PNM is also the owner of the lot to west (Tract A-2, Sunset Memorial Park); the existing plats are included as Attachment 1-1.

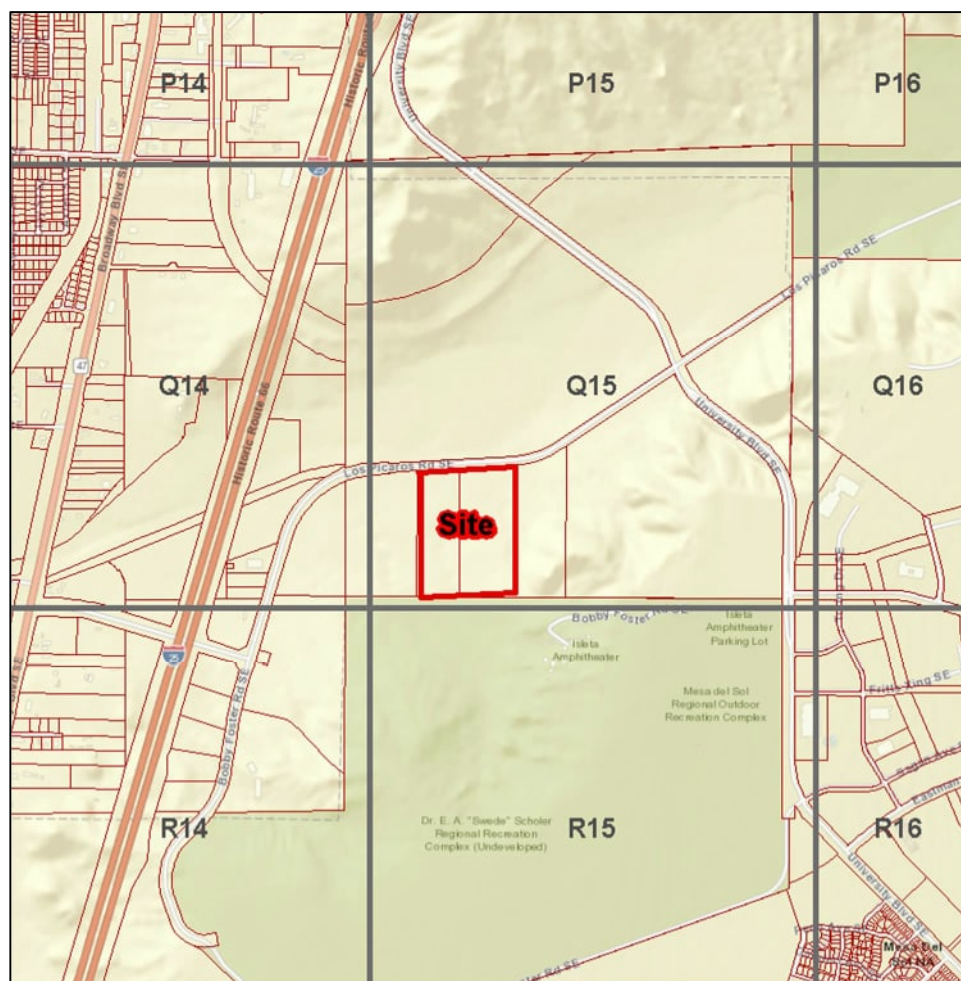


Figure 1: Project location

The Site is located in unincorporated Bernalillo County and takes access off Los Picaros Rd, a City of Albuquerque maintained road in unincorporated Bernalillo County. The adjacent properties to the south- Isleta Amphitheater, the Scholer Regional Recreational Complex, and the closed South Broadway Landfill are within the Albuquerque City limits; portions of these lands drain into the site.

Floodplain

This project is not located in a Special Flood Hazard Area per FEMA FIRM Panel: 35001C0344G effective: 9/26/2008 (Figure 2):

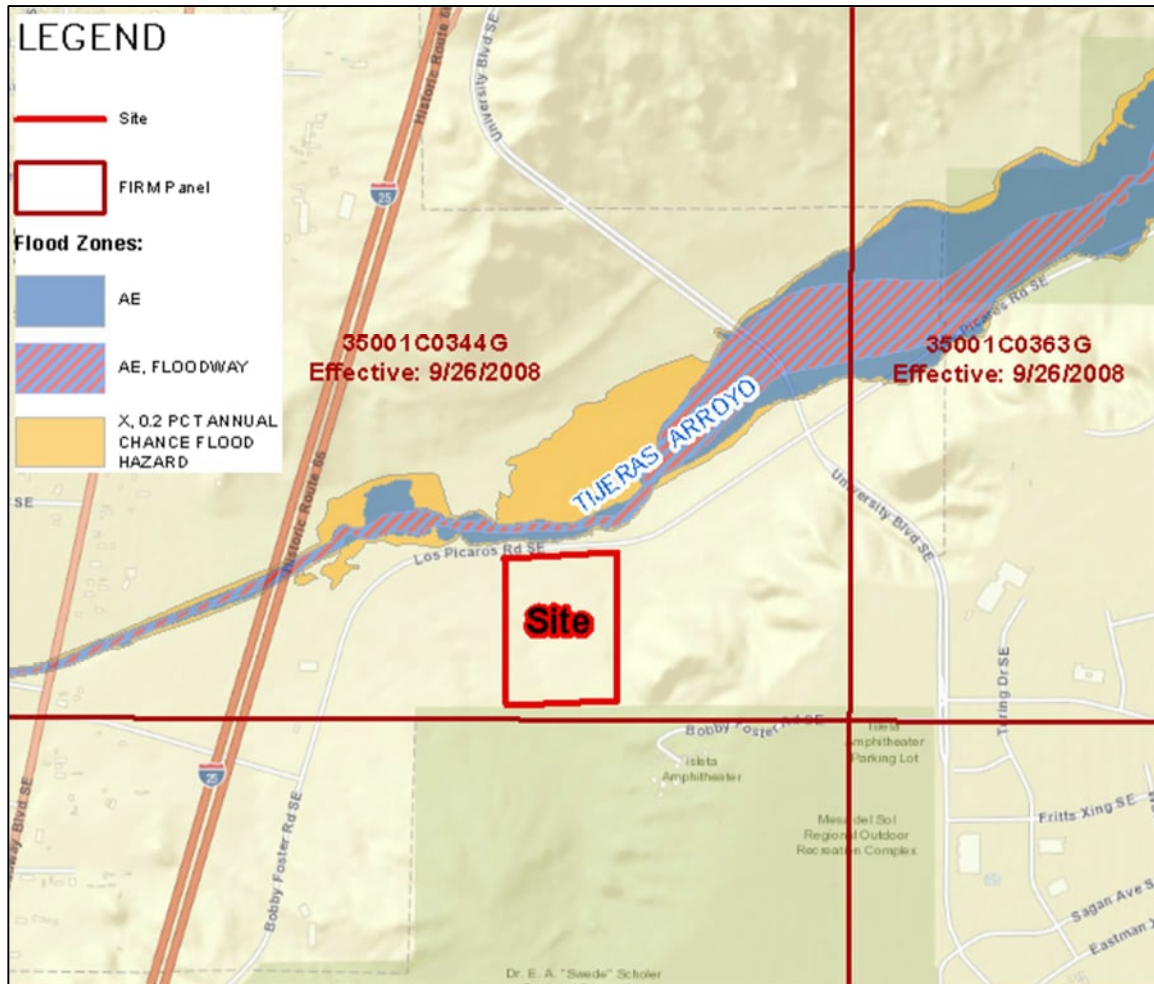


Figure 2: FEMA FIRM excerpt

This project is designed to result in no adverse impact to downstream floodplains, namely the Tijeras Arroyo Floodway and Floodplain.

Proposed Project

This project will consist of grading, wall construction, power substation improvements, access roads, ponding, and drainage improvements for a new PNM substation. Drainage patterns will be modified to discharge into ponds, swales and storm drain constructed with this project. The grading plan for this project is included as Attachment 1-2.

This project will be constructed in 2 phases. Phase 1 will construct the 145kw substation occupying the southern half of the site. Phase 2 will expand the substation into the north half of the site for the full 345kw substation.



Hydrology

The purpose of the existing and proposed Hydrology is to demonstrate that the proposed development will have no adverse impact on downstream capacity as it will not modify the discharge locations in a way that negatively impacts adjacent properties, including Los Picaros Road Right-of-Way (ROW).

Hydrology Design Data

Elevation data for the offsite contributing drainage areas was obtained from 2010 Bernalillo County LiDAR with 1-2ft vertical accuracy (BernCo, 2010). All elevation data herein is presented in NAVD 88; horizontal data is in NAD83/New Mexico State Plan Coordinate System -Central (US Foot). The following hydrologic inputs and assumptions were used:

- Software: HEC-HMS 4.10
- Runoff Method: SCS Curve Numbers w/ CABQ Land Treatments (A, B, C, & D)
- Storm: 100-year, 24-hour storm with peak at hour 12
- Precipitation Data: NOAA Atlas 14, at centroid of study area, see Attachment 1-3
- Time of Concentration: SCS Upland method, per DPM 6-2(B)(2)
- Lag time: SCS Curve Number method, per DPM 6-2(B)(3)

Existing Hydrology

The existing drainage is divided as shown in Figure 3 and in greater detail as Attachment 2-1. Hydrologic inputs are provided in Attachment 2-2; HEC-HMS model development and model results are provided in Attachment 2-3.

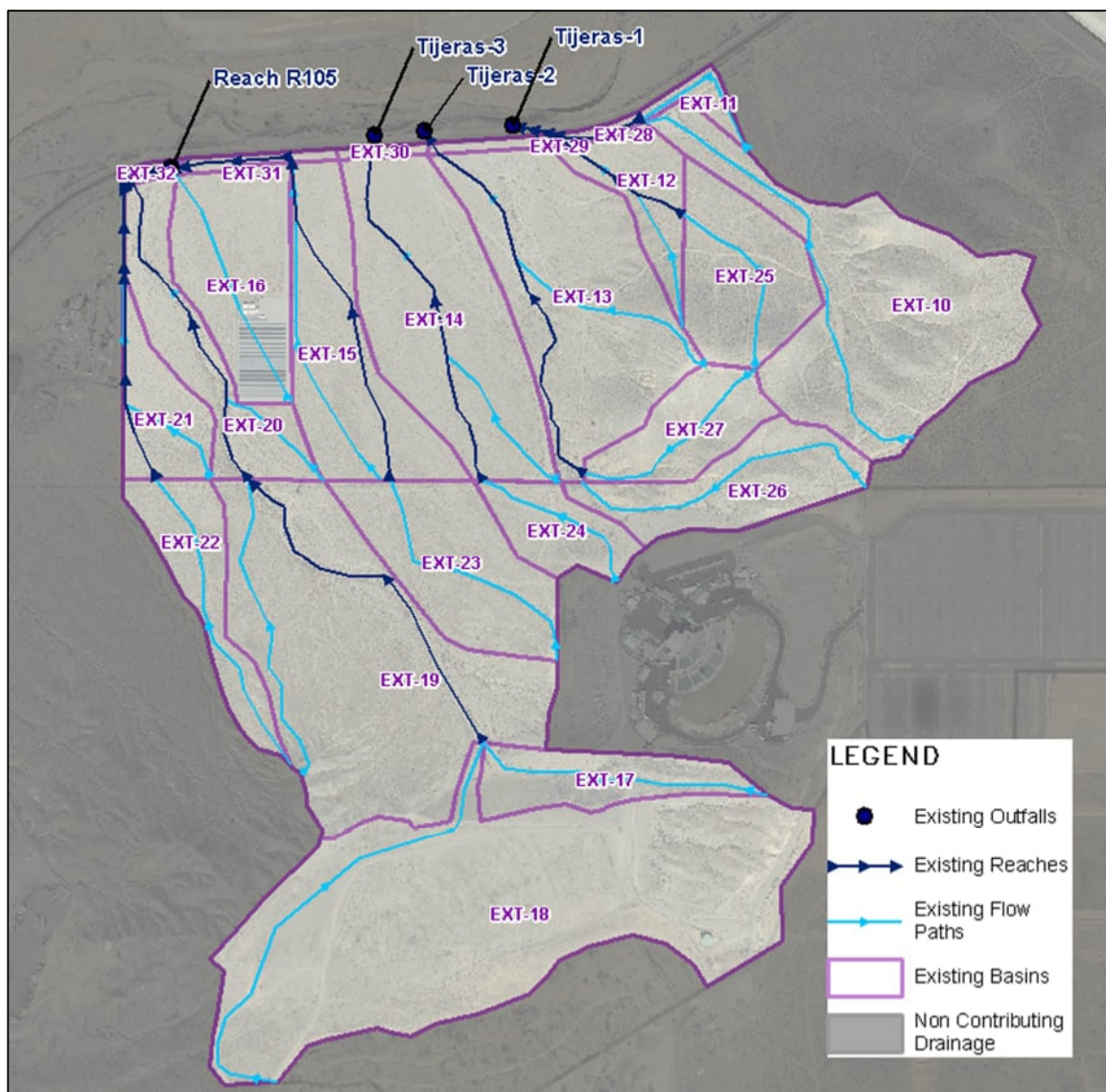


Figure 3: Existing drainage patterns

- Basins EXT-10, EXT-11, EXT-12, EXT-25, and EXT-28 discharge across Los Picaros Rd and into the Tijeras Arroyo at outfall "Tijeras-1". These flows are adjacent (east) to the project site and do not impact the project site but will be wholly or partially captured by the construction of a retention pond.
- Basins EXT-13, EXT-26, EXT-27, and EXT-29 discharge across Los Picaros Rd and into the Tijeras Arroyo at outfall "Tijeras-2". These flows impact the eastern side of the project site and will be impacted by the project.
- Basins EXT-14, EXT-24, and EXT-30 discharge into the Tijeras Arroyo at outfall "Tijeras-3". These flows impact the center of the project area and will be impacted by the project.
- Basins EXT-15, EXT-23, and EXT-31 discharge to a swale along the south side of Los Picaros Rd, then to outfall "LosPicaros-1". These flows impact the western side of the project area and will be impacted by the project.

- Basins EXT-16, EXT-19 and EXT-20 discharge to a swale along the south side of Los Picaros Rd then to outfall "LosPicaros-1". These flows are adjacent (west) to the project site and do not impact the project site, but a portion of these basins will be captured by the construction of a detention pond.
- Basins, EXT-17, EXT-18, EXT-21, EXT-22, and EXT-32 discharge to a swale along the south side of Los Picaros Rd then to outfall "LosPicaros-1". These flows are adjacent (west) to the project site and do not impact the project site nor will they be impacted by the project.

The existing site and surrounding drainage is moderately sloped desert scrub (Figure 4). Gradual slopes (0-10%) were assigned CABQ Land Treatment A, moderate slopes (11-20%) were assigned Treatment B, and steep slopes (21%+) were assigned Treatment C.

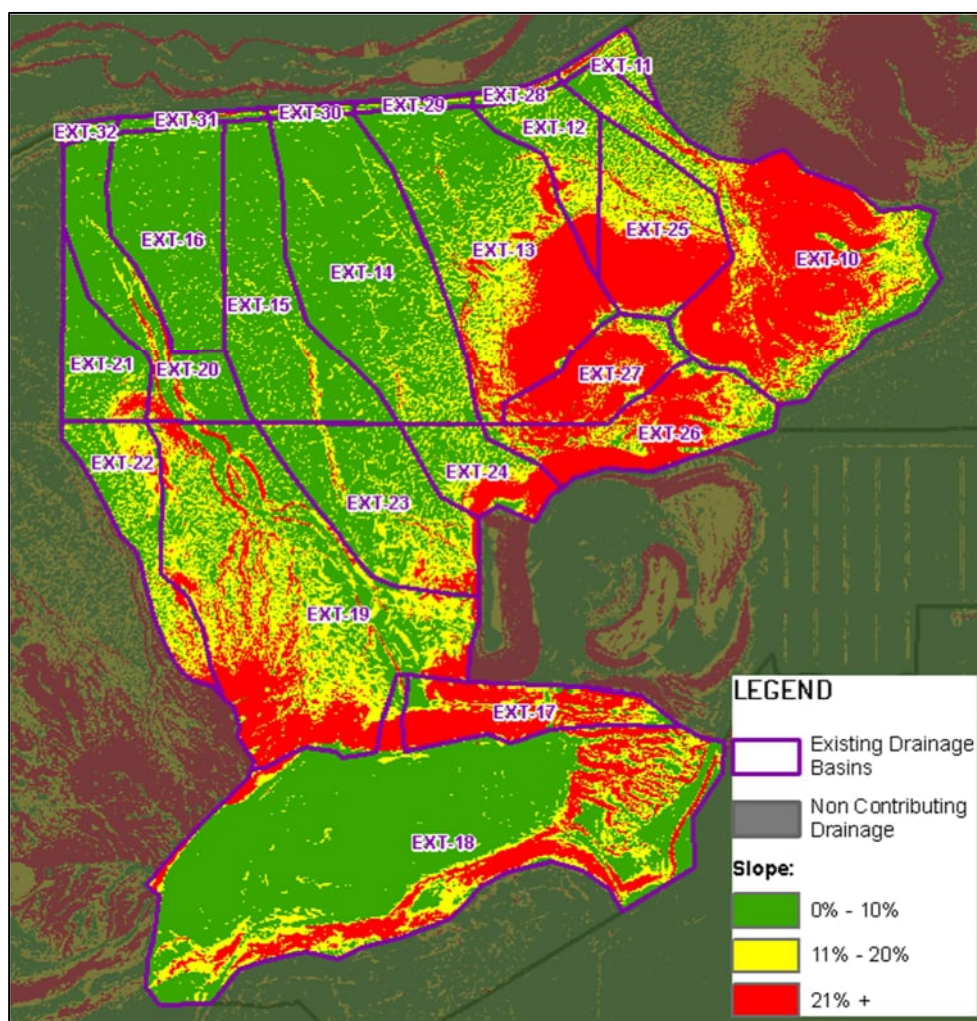


Figure 4: Contributing drainage area slopes

Slope was the primary driver for land treatment and curve number selection, with the following exceptions:

- Basin EXT-18. A substantial portion of this basin is the closed South Broadway Landfill; land treatments were adjusted to Treatment C, for landfill cap, over the landfill area.

- Basins- EXT-11, EXT-28, EXT29, EXT-30, EXT-31, and EXT-32. These basins are the Los Picaros Right-of-Way (ROW) (EXT-11 does contain a portion of private land) and were adjusted to include the paved road (Treatment D); remaining ROW was adjusted to Treatment C, for soils compacted by human activity.
- Basin EXT-16. This includes the existing PNM solar site. The solar site and gravel access road were adjusted to Treatment C, for soils compacted by human activity.

Proposed Hydrology

The proposed drainage area is divided as shown in Figure 5 and in greater detail as Attachment 3-1. Hydrologic inputs are provided in Attachment 3-2; HEC-HMS model development and model results are provided in Attachment 3-3.

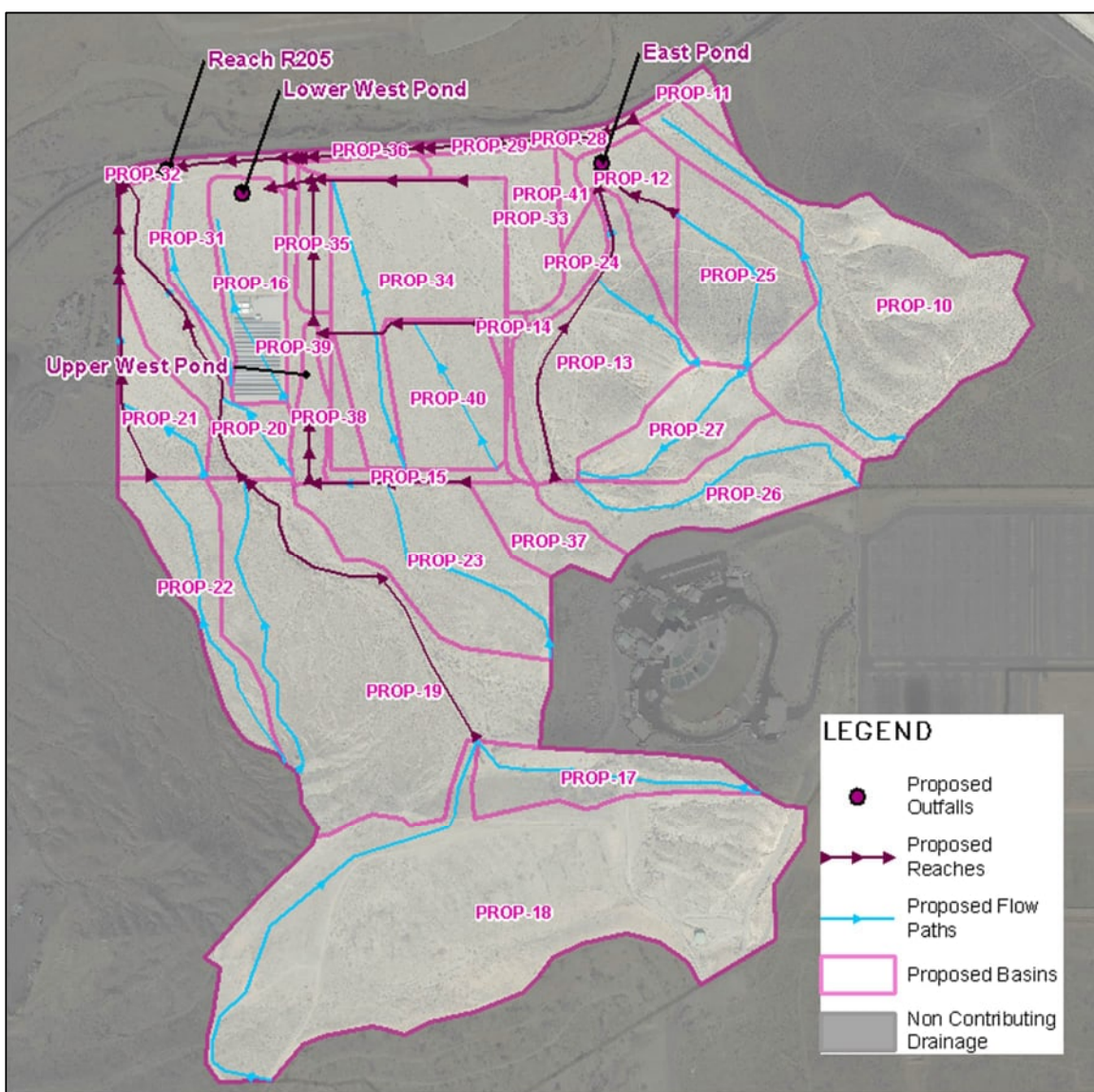


Figure 5: Proposed drainage patterns



The proposed grading will reroute drainage as follows:

- The delineations of basins EXT-12, EXT-13, EXT-14, EXT-15, EXT-16, EXT-19, EXT-20, EXT-23, EXT-24, EXT-26, EXT-28, EXT-29, EXT-30, and EXT-31 will be adjusted due to the proposed grading and relabeled using “PROP” instead of “EXT.”
- The delineations of basins EXT-10, EXT-11, EXT-17, EXT-18, EXT-21, EXT-22, EXT-25, EXT-27, and EXT-32 will not be adjusted by the proposed grading, but will also be relabeled using “PROP” instead of “EXT.”
- The discharges from PROP-26 and PROP-27 will combine and continue into basin PROP-13. The combined discharge from these basins empties into the East Pond (Retention).
- The discharge from PROP-14 and PROP-24 will be redirected around the proposed substation and will empty into East Pond.
- East Pond also receives the discharge from PROP-10, PROP-12, and PROP-25.
- The discharge from PROP-37 will join with the discharge from PROP-23, which will be extended to drain into Upper West Pond (Detention) at the north end of PROP-38.
- Upper West Pond will also receive the discharge from PROP-15 and PROP-38, and from PROP-40 in the proposed substation.
- Attenuated flow from Upper West Pond will be routed north and into Lower West Pond (Retention)
- Lower West Pond will also receive discharge from PROP-34 in the substation, and from Prop-16 and PROP-35.

Proposed Ponding

Three ponds are proposed with this project and were modeled within HEC-HMS as part of the proposed hydrology.

East Pond: This pond is sized to retain the runoff from the 100-yr, 10-day storm; cumulative inflow volume of 11.6 Ac-Ft. East Pond removes discharges previously flowing across Los Picaros and out to the Tijeras Arroyo at outfalls Tijeras-1 and Tijeras-2.

Lower West Pond: This pond is sized to retain the runoff from the 100-yr, 10-day storm; cumulative inflow volume of 8.5 Ac-Ft. Lower West Pond removes discharges previously flowing across Los Picaros and out to the Tijeras Arroyo at outfalls Tijeras-2 and Tijeras-3; some flows to the swale along Los Picaros Rd are also retained.

Upper West Pond: This pond is sized to detain runoff from the 100-yr, 24-hr storm; peak inflow of 65 cfs. Flows from Upper West Pond are attenuated to 34 cfs by a 30” outlet pipe. Due to the steep slope of the outlet pipe, the pipe will flow partially full and supercritical, meaning the pond outflow will be regulated by the headwater depth at the outfall, modeled as an orifice. Pond storage tables were developed from the proposed pond grading plans and orifice rating tables generated using a simple orifice equation as shown below in Table 1:



Table 1: Upper West Pond Storage and Orifice Information

West Pond Storage Table					
Description	Pond Depth	Elevation	Surface Area	Ave End Volume	Cumulative Volume
	Ft	Ft	Sq Ft	Ac-Ft	Ac-Ft
bottom of pond:	0	5077	157	0	0.000
	1	5078	9259	0.108	0.108
	2	5079	11809	0.242	0.350
	3	5080	14415	0.301	0.651
	4	5081	17079	0.362	1.012
top of pond:	5	5082	19798	0.423	1.436
West Pond - Simple Orifice ($Q=Ca(2gh)^{0.5}$), Circular orifice, sharp edge outlet pipe					
Orifice Dia	2.5	ft			
C coeffic.	0.6	unitless			
g	32.2	ft/s ²			
area	4.909	sf			
West Pond Outlet Rating Table					
depth from orifice invert	h	Q			
ft	ft	cfs			
0.00	-1.25	0			
0.25	-1.00				
0.50	-0.75				
0.75	-0.50				
1.00	-0.25				
1.25	0.00				
1.50	0.25	11.8			
1.75	0.50	16.7			
2.00	0.75	20.5			
2.25	1.00	23.6			
2.50	1.25	26.4			
2.75	1.50	28.9			
3.00	1.75	31.3			
3.25	2.00	33.4			
3.50	2.25	35.5			
3.75	2.50	37.4			
4.00	2.75	39.2			
4.25	3.00	40.9			
4.50	3.25	42.6			
4.75	3.50	44.2			
5.00	3.75	45.8			



Detailed results for the ponds are provided with the proposed hydrology, Attachment 3. Summary results are provided below (Table 2):

Table 2: Pond Summary Results

East Pond (Retention), 100-yr Storm			Lower West Pond (Retention), 100-yr Storm		
Peak Inflow, 24hr Storm:	161.9	cfs	Peak Inflow, 24hr Storm:	75.3	cfs
Volume, 24hr Storm:	6.7	Ac-Ft	Volume, 24hr Storm:	4.9	Ac-Ft
Volume, 10day Storm:	11.6	Ac-Ft	Volume, 10day Storm:	8.5	Ac-Ft
Upper West Pond (Detention)			100-yr, 10day Storm		
100-yr, 24hr Storm			Peak Inflow:	83.7	cfs
Peak Inflow:	64.8	cfs	Peak Outflow:	40.9	cfs
Peak Outflow:	34.0	cfs	Peak Storage:	1.09	Ac-Ft
Peak Storage:	0.75	Ac-Ft	Peak Elevation:	4.3	Ft
Peak Elevation:	3.3	Ft			

Downstream Capacity: Existing vs. Proposed

For the existing condition, the three Tijeras outfalls on the north side of Los Picaros Rd were selected based on imagery and low points in the terrain where storm water flows across Los Picaros Rd and into the arroyo. For the proposed condition, these flows across the road will be eliminated by the construction of East Pond and Lower West Pond; remnant flows along the frontage will be conveyed west in an improved swale along the south side of Los Picaros Rd. The overall change in flow and volume to Tijeras Arroyo is shown below in Table 3:

Table 3: Change in Tijeras Arroyo Flow and Volume: Existing vs. Proposed

EXISTING, 24-hr Storm			PROPOSED, 24-hr Storm				
Discharge Point	Q ₁₀₀ (cfs)	V ₁₀₀ (Ac-Ft)	Pond	Q ₁₀₀ (cfs)	V ₁₀₀ (Ac-Ft)		
Tijeras-1. Low point in road	96.1	4.0	East Pond (Retention)	161.9	6.7		
Tijeras-2. Low point in road	82.0	3.5	Lower West Pond (Retention)	75.3	4.9	Change in Flow (cfs)	Change in Volume (Ac-Ft)
Tijeras-3. Low point in road	43.5	1.9					
Total Discharge to Tijeras Arroyo:	221.6	9.3	Total Discharge to Tijeras Arroyo:	0	0	-221.6	-9.3

The proposed grading and ponding also slightly decreases the contributing flow along the south side of Los Picaros Road via its roadside swale. The values below are conservative because on multiple occasions, the existing roadside swale is silted in due to the sediment transport conveyed through the site, which can diminish the overall capacity. The change in offsite flow and volume at each outlet is shown below in Table 4:



Table 4: Change in Offsite Flow and Volume

Outlet ID	EXISTING, 24-hr Storm		PROPOSED, 24-hr Storm		Change in Flow (cfs)	Change in Volume (Ac-Ft)
	Q ₁₀₀ (cfs)	V ₁₀₀ (Ac-Ft)	Q ₁₀₀ (cfs)	V ₁₀₀ (Ac-Ft)		
R105/R205	63.9	2.9	41.6	1.9	-22.3	-1.0

Hydraulics

The proposed drainage improvements will include numerous swales, storm drain, culverts, and ponds. The ponds were modeled within the hydrologic analysis, the remaining drainage improvements were modeled using Bentley StormCAD CONNECT Edition 3. As there are no existing drainage improvements at this project site, no existing hydraulic analysis was performed. One box culvert is present at the adjacent solar array but will be removed and replaced with this project.

Hydraulic Design Criteria

The drainage improvements are sized to convey the 100-yr, 24-hr peak flows as determined in the hydrologic model. The hydraulic grade lines are determined from the energy grade lines using HEC-22, Third Edition calculated within StormCAD. The culverts are included within the channel profiles, with the headwater depth and inlet/outlet control analyzed using the Federal Highway Administration (FHWA) culvert equations within StormCAD. Geometric data for the improvements were obtained from the proposed grading plan, provided as Attachment 1-2.

Proposed Hydraulics

The calculated flows from the proposed hydrologic model were used in StormCAD to size the storm drain, culverts, and swales. Catch basins are included in substation that will capture some flow. However, the majority flows will be captured by perforated storm drain in gravel pack (French Drains), with the connecting catch basins serving primarily as access and maintenance points.

An over view of the StormCAD Layout, overlaid with the site grading is provided as Attachment 4-1. The following abbreviations are used in the StormCAD model and supporting attachments:

- BW- bottom width
- CB- catch basin
- EARD- East Access Road Ditch
- EDC- East Diversion Channel
- EODC- East Offsite Diversion Channel
- FD- flow depth
- HW- headwall
- LPD- Los Picaros Ditch
- LT SS / RT SS- left and right side slopes
- MH- manhole
- SPD- storm drain pipe
- WDC- West Diversion Channel
- XS- cross section

Cross sections called out as 'irregular channel' are V-ditches, remaining ditches are trapezoidal sections.

Input data used to develop the StormCAD model, is provided as Attachment 4-2. Pipe and channel profiles along with output tables are provided as Attachment 4-3. The StormCAD model is included in Attachment 5.

Project Phasing

This project will be constructed in 2 phases as shown in Figure 6: Phase 1 occupying the southern half of the site and Phase 2 expanding the substation into the north half of the site.

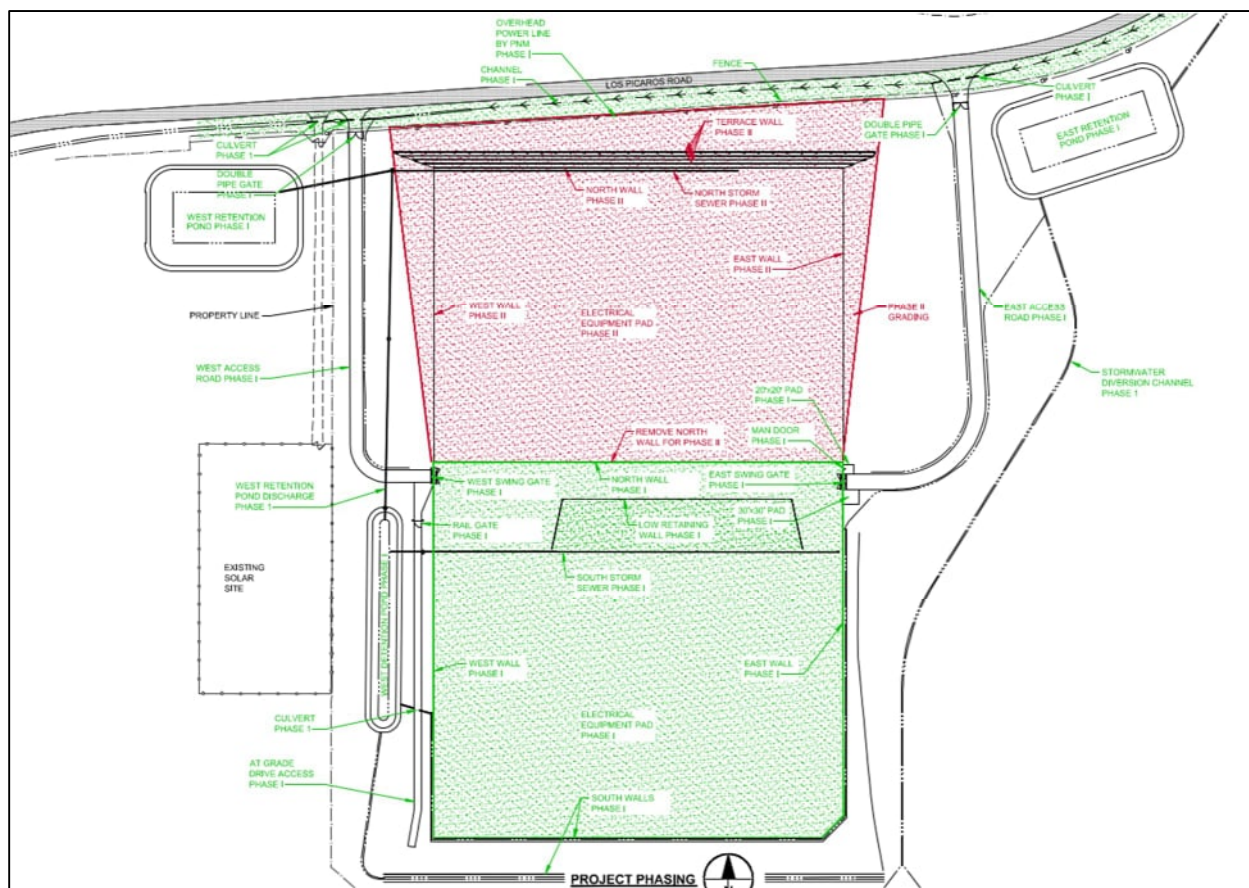


Figure 6: Project Phasing

Almost all permanent, or full build-out, drainage facilities will be constructed in Phase 1. The only substantial facility not constructed is the North Substation Lateral and its associated catch basins. Instead, an armored swale will be constructed in Phase 1 along this future storm drain alignment that will direct flows west and into a 5' x 5' drop inlet. This drop inlet will also serve as the junction box for the Phase 2 North Substation Lateral.

The intermediate swale was sized for the 100yr event using Bentley FlowMaster (CONNECT Edition). The flows will be directed to a 5' x 5' drop inlet; 100yr headwater depth was determined using FlowMaster assuming 50% clogging for inlets in sump. A berm will be constructed around the inlet to contain headwater plus freeboard. Input and output data are provided as Attachment 4-4 and the model is included in Attachment 5.

Storm Water Quality

No runoff from impervious surfaces is proposed with this development; therefore, no retention of storm water for storm water quality purposes is included with this project.



References and Data Sources

- Bentley Systems Inc. Haestad Methods Solution Center, 2021. "OpenFlows StormCAD CONNECT Edition Update 3" [software package]. Version 10.03.04.53. June 26, 2021.
- Bentley Systems Inc. Haestad Methods Solution Center, 2018. "FlowMaster CONNECT Edition" [software package]. Version 10.00.00.02. July 31, 2018.
- Bernalillo County, 2010. "LiDAR-derived, Topographic Contours – Bernalillo County." Bohannon-Huston, Inc.
- City of Albuquerque, 2020. "Albuquerque Development Process Manual: Chapter 6, Drainage, Flood Control, and Erosion Control". 2020.
- United State Army Corps of Engineers (USACE), 2022. "Hydraulic Engineering Center Hydrologic Modeling System (HEC-HMS)" [software package]. Version 4.10. July 28, 2022.
- United States Department of Commerce, National Oceanic and Atmospheric Administration, 2011. "NOAA Atlas 14, Volume 1, Version 5". Retrieved April 2021.



Attachment 1

Supporting Documents

- 1-1 Existing Plat
- 1-2 Drainage and Grading Plan
- 1-3 NOAA 14 Precipitation



1-1 Existing Plat

SP 10-19-0621

1/4 CORNER
(Brass Cap in place)

LAND DIVISION PLAT OF
SUNSET MEMORIAL PARK
 BERNALILLO COUNTY, NEW MEXICO
 (Within the S.W. 1/4 of Sec. 16, T.9N., R.3E., N.M.P.M.)
 OCTOBER, 1982

82 59934

State of New Mexico
 County of Bernalillo
 This instrument was filed for record
 on NOV 16 1982
 At 11:00 clock AM. Recorded in Vol. 87
 of records of said County Folio 57
 Clerk & Recorder
 Deputy Clerk

dy
 11/16/82

SCALE 1" = 200'

UNPLATTED LANDS

DESCRIPTION:

A Land Division Plat of a certain Tract of Land, lying and being situate in the Southwest Quarter (SW $\frac{1}{4}$) of Section 16, Township 9 North, Range 3 East, N.M.P.M., Bernalillo County, New Mexico, and being more particularly described as follows:
 BEGINNING at the Southwest corner of said Section 16, being an Iron Pipe in place, and running -
 THENCE, N. 00 deg. 04' 16" W., along the West line of said Section 16, a distance of 1571.64 feet to the North line of an existing road known as Los Picaros Road;
 THENCE, along the North line of said Los Picaros Road, N. 86 deg. 16' 43" E., a distance of 2030.94 feet to a point of curve to the left;
 THENCE, Northeasterly along the arc of said curve to the left with a Radius of 914.21 feet, a distance along arc of 481.56 feet to a point of tangent;
 THENCE, N. 56 deg. 05' 52" E., along the Northerly line of said Los Picaros Road, a distance of 185.53 feet to a point on the North-South 1/4 Section line of said Section 16;
 THENCE, S. 00 deg. 13' 13" W., along the North-South 1/4 Section line of said Section 16, a distance of 1929.90 feet to the South 1/4 corner of said Section 16, being a rebar in place;
 THENCE, S. 89 deg. 19' 57" W., along the South line of said Section 16, a distance of 2622.04 feet to the point of beginning and Containing 99.995 acres, more or less.

FREE CONSENT, DEDICATION

The undersigned owners and proprietors of the property described hereon, do hereby consent to the Platting of said property as shown hereon and the same is with free consent and in accordance with their desires.

THE BANK OF ALBUQUERQUE

SUNSET MEMORIAL PARK, INC.

BY: Ron Shettlesworth

BY: Chester F. Stewart

Ron Shettlesworth, Vice-President

Chester F. Stewart, President

ACKNOWLEDGEMENT

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) SSOn this 29th day of October, 1982, the foregoing instrument was acknowledged

before me by Ron Shettlesworth and Chester F. Stewart

My commission expires 11-9-85

Richard J. ...
 Notary Public

SURVEYOR'S CERTIFICATE

I, Verlon E. Hall, New Mexico Registered Land Surveyor No. 3241, do hereby certify that this Plat was prepared by me or under my supervision, meets the minimum requirements of the Bernalillo County Subdivision Ordinance and is true and correct to the best of my belief and knowledge.

Verlon E. Hall
 Verlon E. Hall, N.M.L.S. No. 3241

APPROVED AND ACCEPTED BY:

V. ...
 Planning Director 11/16/82
 Date

SP-85-285
 Number-County Zone Atlas Q-15-Z

Carl W. Entley
 City Engineer 11-16-82
 Date

Don ...
 A.M.A.F.C.A. 11/11/82
 Date

Robert A. ...
 Professional Engineer 11-16-82
 Date

Paul ...
 Water Resources 11-16-82
 Date

James ...
 Parks & Recreation 11-16-82
 Date

La Monte ...
 Chief City Surveyor 11/3/82
 Date



MICROFILM

FEB 22 1983

DISCLOSURE STATEMENT

The purpose of this Plat is to divide the Tract of Land described hereon into 2 Tracts as shown on this Plat, meeting the required zoning and set back requirements. Bearings are based on a Survey Plat of Section 16, T. 9 N., R. 3 E., N.M.P.M., Bernalillo County, New Mexico by D. T. Morrison, N.M.L.S. No. 1010, dated April 10, 1972. Property Corners were found and set as shown on this Plat.

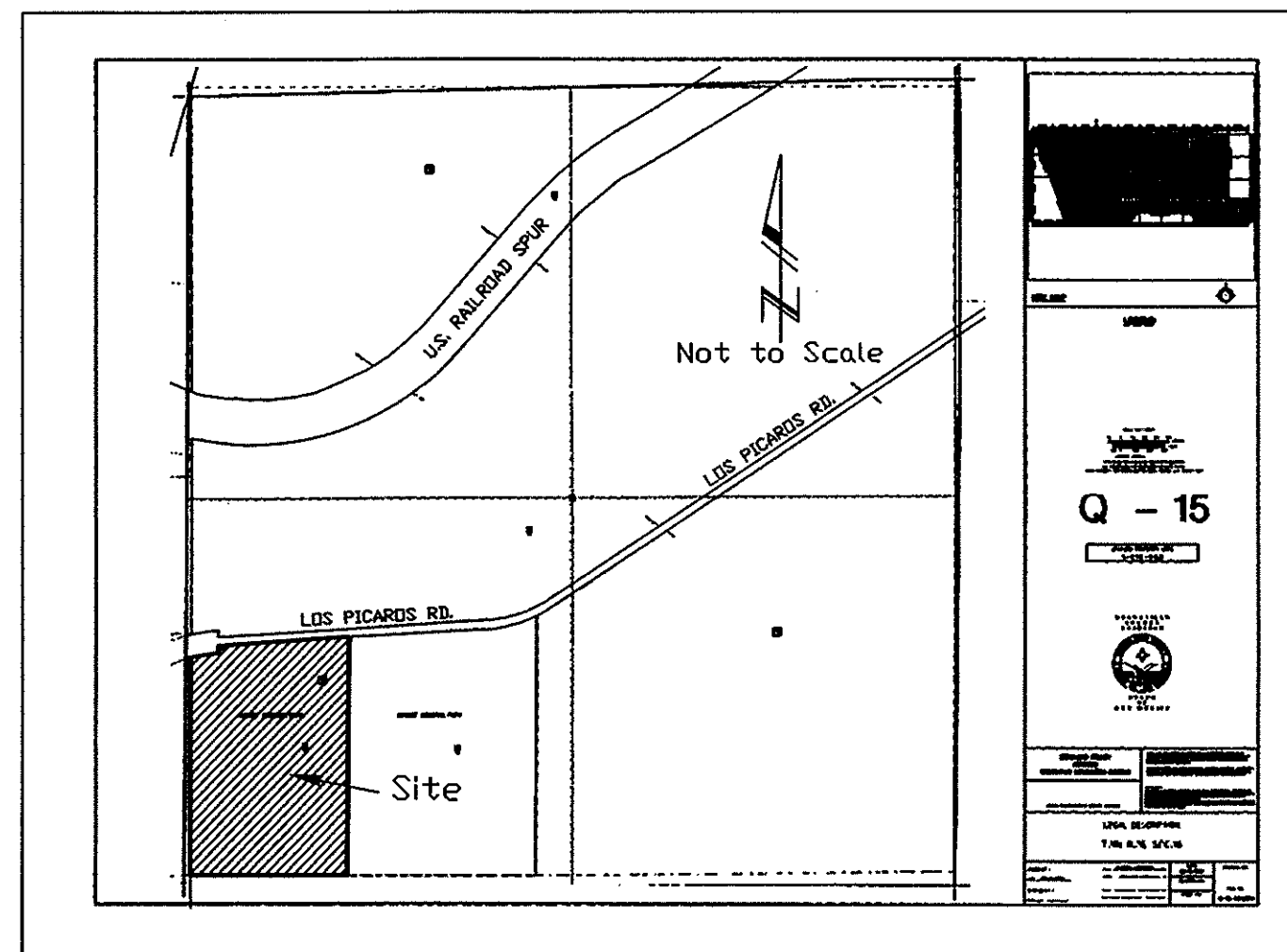
Approval of and filing with the Bernalillo County Clerk of this Plat does not vacate or in anyway affect public or private easements.

NOTE: The location of Los Picaros Rd. is from Survey Map made by D.T. Morrison & evidence found in the field.

HALL ENGINEERING & SURVEYING CO
 2625 Pennsylvania Ave N.E., Suite 350
 Albuquerque, New Mexico 87110
 Phones: (505) 884-6200 B 884-6444
 S-1880 10/19/81 FB 81-02

C20-87

C20-87



Vicinity Map (Not to scale)

DISCLOSURE STATEMENT

Replat of TRACT A Sunset Memorial Park

Los Picaros LLC
1111 University NE
Albuquerque, New Mexico 87102

There are no deed or plat restrictions of record, current zoning is A-1.

Upon development of any habitable building a drinking water system will be installed that meets the current Bernalillo County Drinking Water Well Ordinances and/or other Ordinance or municipal water by the ABCWUA.

Upon development a wastewater system will be installed that meets the current Bernalillo County Wastewater Ordinance and/or other Ordinance municipal sewer by the ABCWUA.

A list of suppliers for Solidwaste pick-up will be provided.

A slope analysis with 2' contours as relates to suitability for development, a terrain management plan as relates to soil erosion and the protection of ephemeral waterways and, CDA air quality permits will be obtained.

PNM, Comcast, and Qwest will be contacted for availability of service.

FREE CONSENT:

We, The Undersigned Owners, do hereby certify that we are the owners of the property described hereon and that we have caused the said property to be surveyed and replatted as shown hereon and that this plat is with our free consent. We do also grant any and all easements as may be created by this plat.

Christie F. Stewart
Owner

STATE OF NEW MEXICO
COUNTY OF BERNALILLO

The foregoing Instrument was acknowledged before me on this

18th day of September, 2008.

By: *Chester F. Stewart*

My Commission Expires May 14, 2009 *Carol Chavez*
Notary Public

UTILITY APPROVALS:

By: *Fernando Vigil* 9-18-08
PNM Electric Service Date

By: *Fernando Vigil* 9-18-08
PNM Gas Service Date

By: *Danilo Buhin* 9/23/08
Qwest Telecommunications Date

By: *Frank Bunka* 9.18.08
Comcast Date

Parcels A & B, Summary Plat of Valley View Industrial
Filed Bk. C16, Pg. 138
on 04-14-80

LEGAL DESCRIPTION:

Tract A Replat of SUNSET MEMORIAL PARK, situate in Section 16 T.9 N., R.3 E., N.M.P.M., Bernalillo County, New Mexico, being a replat of Tract A of Land Division Plat Sunset Memorial Park filed for record in the office of the County Clerk of Bernalillo County, New Mexico in Plat Book C20, Page 87 on November 5, 1982.

PURPOSE OF THE PLAT:

The purpose of this plat is to split one Tract into two tracts. Splitting Tract A into Tract A-1 and A-2.

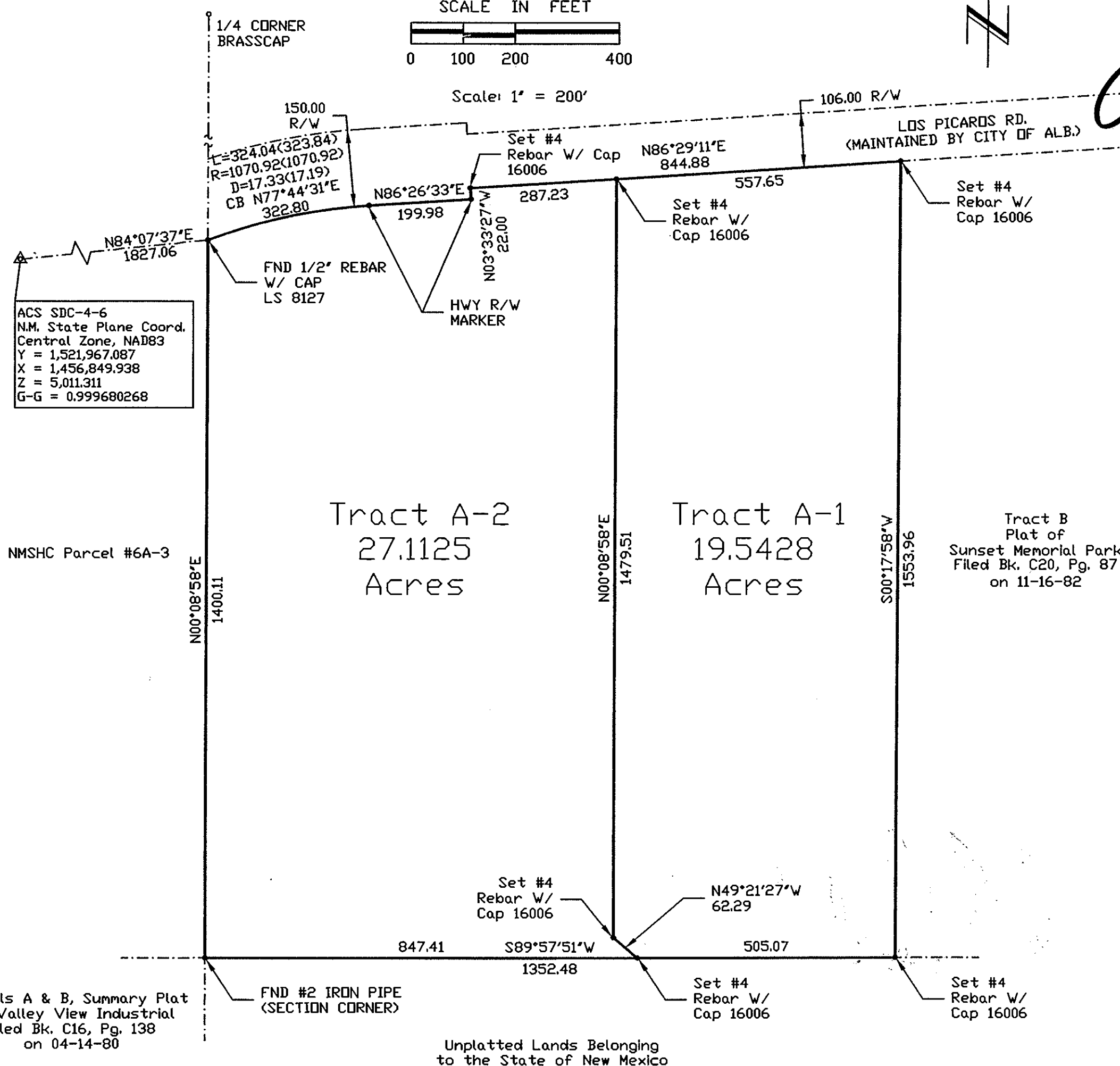
NOTES:

1. Zone Atlas Q-15-Z
2. Bearings are grid based on the New Mexico State Plane Coordinate System Central Zone (NAD83)
3. Distances are ground.
4. Unless otherwise shown, set a 1/2" rebar with plastic cap stamped LS 16006
5. Statement of Declaration: Tract A will be divided into two (2) Tracts.
6. A grading and drainage plan prepared by an engineer registered in the State of New Mexico may be required with future development of these lots.
7. Cross lot drainage must not be increased or impacted by development of these lots.
8. Lots must accept storm water runoff from adjacent roadways and properties as it currently exists.
9. No mass site grading, clearing, or grubbing is allowed without and approved grading and drainage plan.
10. Total gross acreage: 46.6553

SCALE IN FEET



Scale: 1" = 200'



Plat of Tract A-1 & A-2 of
SUNSET MEMORIAL PARK

Being a Replat of Tract A of
LAND DIVISION PLAT OF SUNSET MEMORIAL PARK
In Section 16, T.9 N., R.3 E., N.M.P.M.
Bernalillo County, New Mexico
September, 2008

COUNTY TREASURER CERTIFICATE:

This is to certify that taxes are current and paid on

2008-Codes U.P.C. 1015152010753105

Property Owner of Record:

LOS PICAROS

Bernalillo County Treasurer's office:

[Signature] 10.9.08

CITY/COUNTY APPROVALS

[Signature] 10/9/08
Bern. County Devel. Review Authority, Chair Date

[Signature] 9.25.08
Bernalillo County Zoning Date

[Signature] 9.26.2008
Bern. County Fire Marshal's Office Date

[Signature] 9/19/08
Bernalillo County Public Works Date

[Signature] 9/25/08
Bern. County Environmental Health Date

[Signature] 9-18-08
A.M.A.F.C.A. Date

[Signature] 9-19-08
City of Albuquerque Surveyor Date

[Signature] 9.25-08
A.B.C.W.U. Date

DOCH 2008111075

10/09/2008 11:58 AM Page: 1 of 1
PLAT R: 57.00 B: 2008C P: 0221 M. Toulous Olivera, Bernalillo County

SURVEYOR'S CERTIFICATION

I, William Goss, New Mexico Professional Land Surveyor No. 16006, hereby certify that this plat was prepared by me, that it meets the minimum requirements for monumentation and surveys of the Bernalillo County Subdivision Ordinance and standards for Surveying in the State of New Mexico as adopted by the New Mexico State Board of Registration for Professional Engineers and Land Surveyors; and that it is true and correct to the best of my knowledge and belief.

William Goss
William Goss N.M.L.S. No. 16006



Talos Log: 2008371432

Case number: SRP-80081

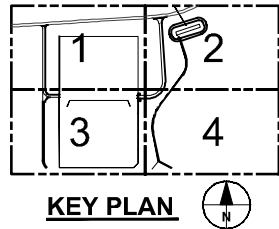
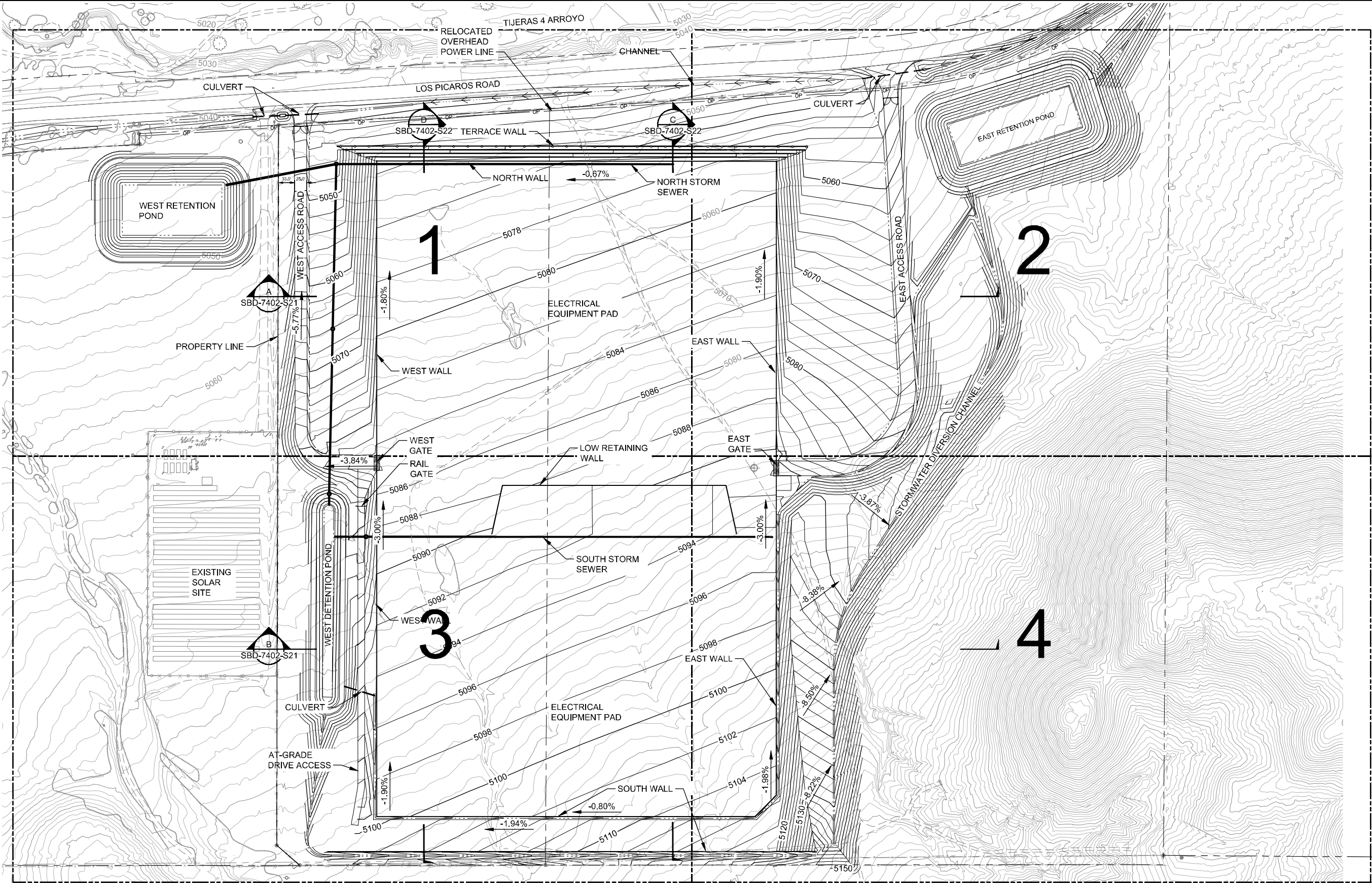
Unplatted Lands Belonging
to the State of New Mexico



1-2 Drainage and Grading Plan

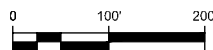
DWG: C:\Users\jessahiggins\OneDrive - AECOM\Documents\Projects\Prosperity\910_CAD\20-SHEETS\0-GRAVING OVERALL.dwg
DATE: Jan 24, 2023 12:14pm
USER: jessahiggins
PROJECT: PROSPERITY SUBSTATION
SHEET: 13 OF 60
SHEET TITLE: GRADING PLAN OVERALL
SHEET NUMBER: 13 OF 60

REVISION		
NO.	DATE	BY



GRADING PLAN OVERALL

Scale: 1"=100'



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(505)-855-7500

ENGINEER'S STAMP

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PROPRIETARY STATEMENT

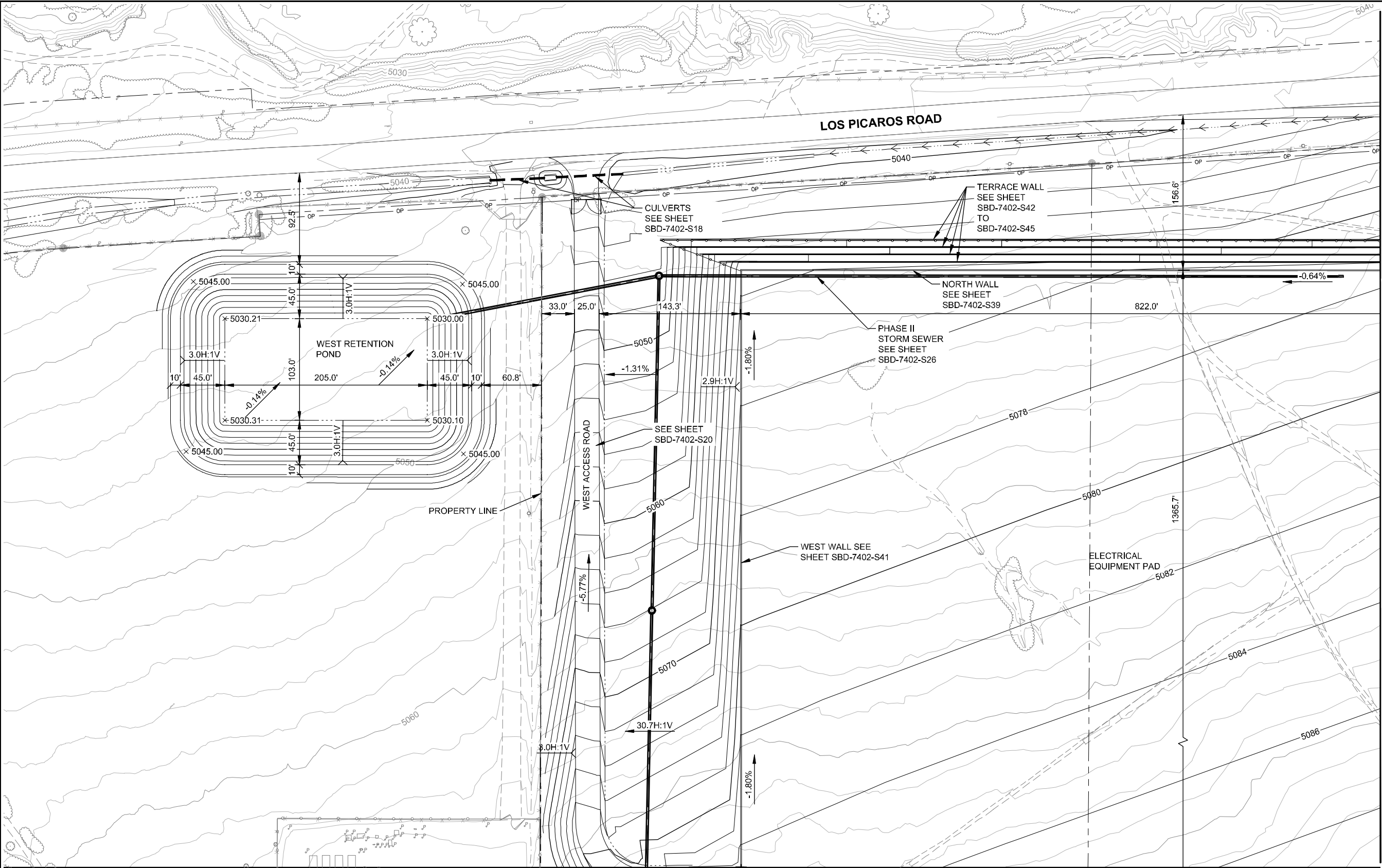
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PNM PUBLIC SERVICE COMPANY OF NEW MEXICO

DRAINAGE AND GRADING PLAN OVERALL

PROSPERITY SUBSTATION

DR: JSH	DATE: 1/9/23
CKD: RH	OK: SCALE: As Noted
APP:	
REV. NO.	SBD-7402-S13 13 OF 60



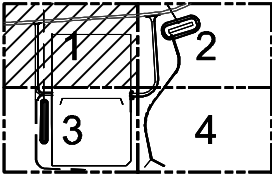
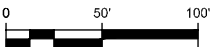
GENERAL NOTES

1.

MATCHLINE - SEE SHEET SBD-7402-S15

MATCHLINE - SEE SHEET SBD-7402-S16

GRADING PLAN
Scale: 1"=50'



KEY PLAN

REVISION	NO.	DATE	BY

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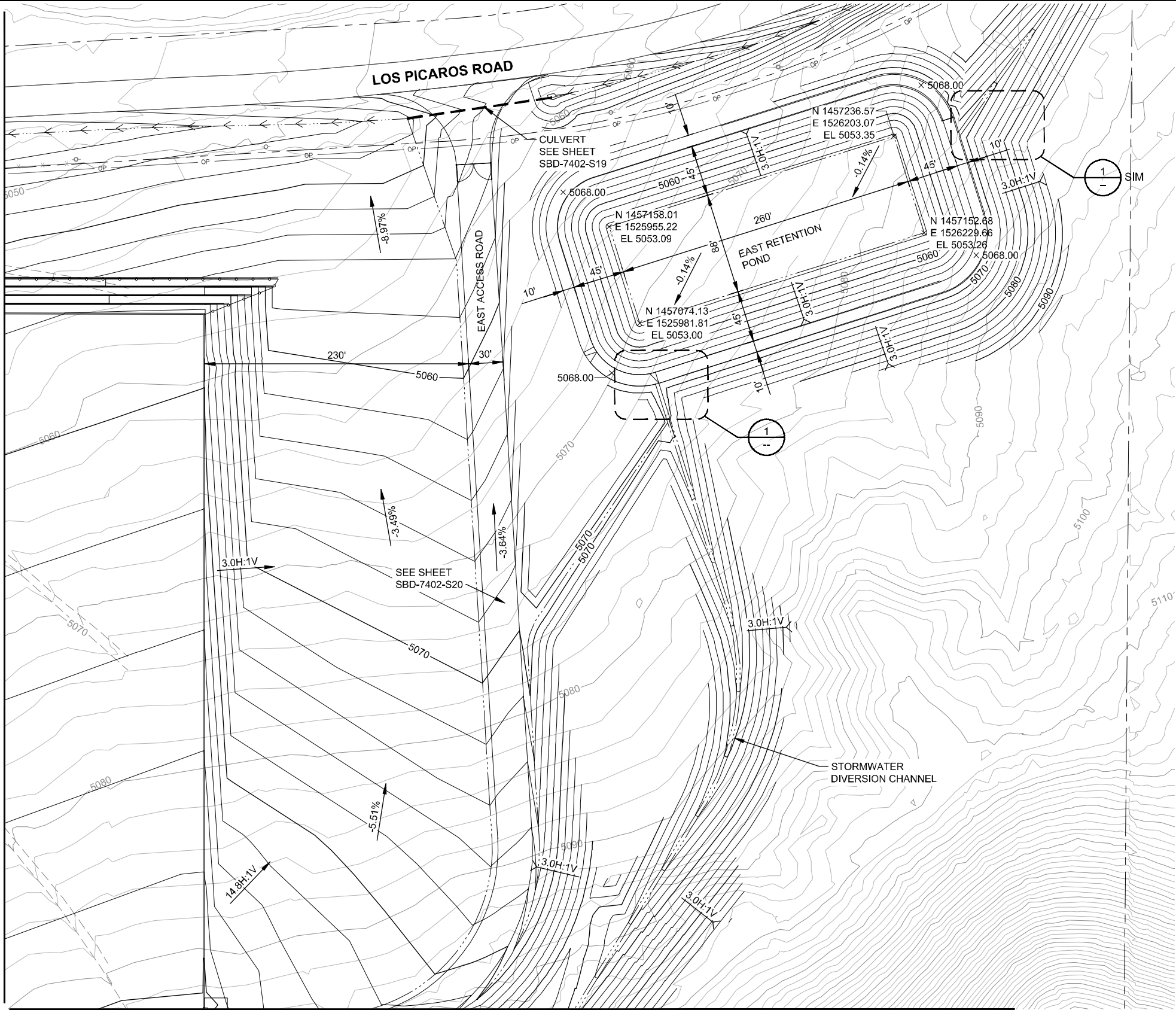
PNM PUBLIC SERVICE COMPANY OF NEW MEXICO

DRAINAGE AND GRADING PLAN 1

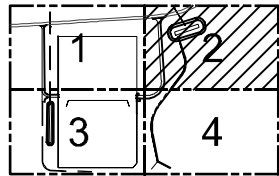
PROSPERITY SUBSTATION

DR: JSH	DATE: 1/9/23
CKD: RH	OK: SCALE: As Noted
APP:	
REV. NO.	SBD-7402-S14 14 OF 60

MATCHLINE - SEE SHEET SBD-7402-S14



MATCHLINE - SEE SHEET SBD-7402-S17
GRADING PLAN
Scale: 1"=50'

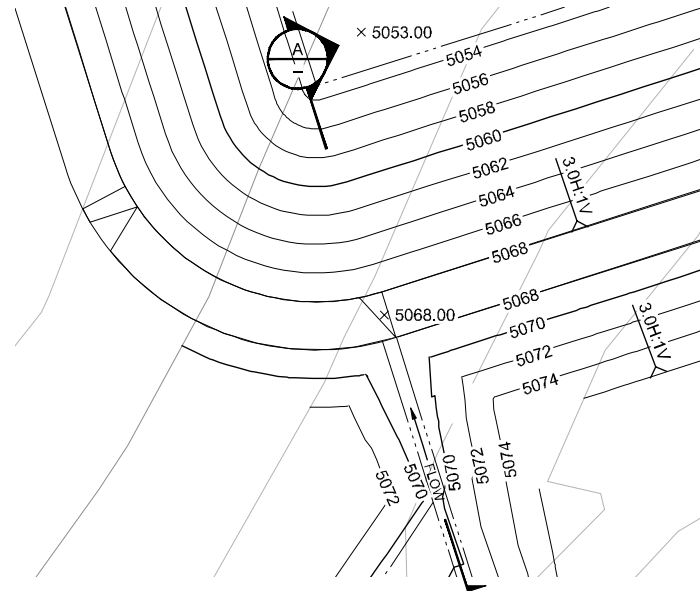


KEY PLAN

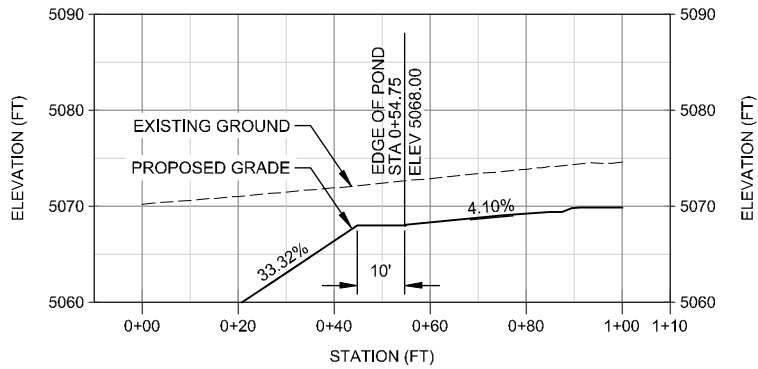


GENERAL NOTES

I.



1 | POND INLET DETAIL
Scale 1"=20'



A | POND INLET PROFILE
Scale 1"=20'

REVISION	NO.	DATE	BY

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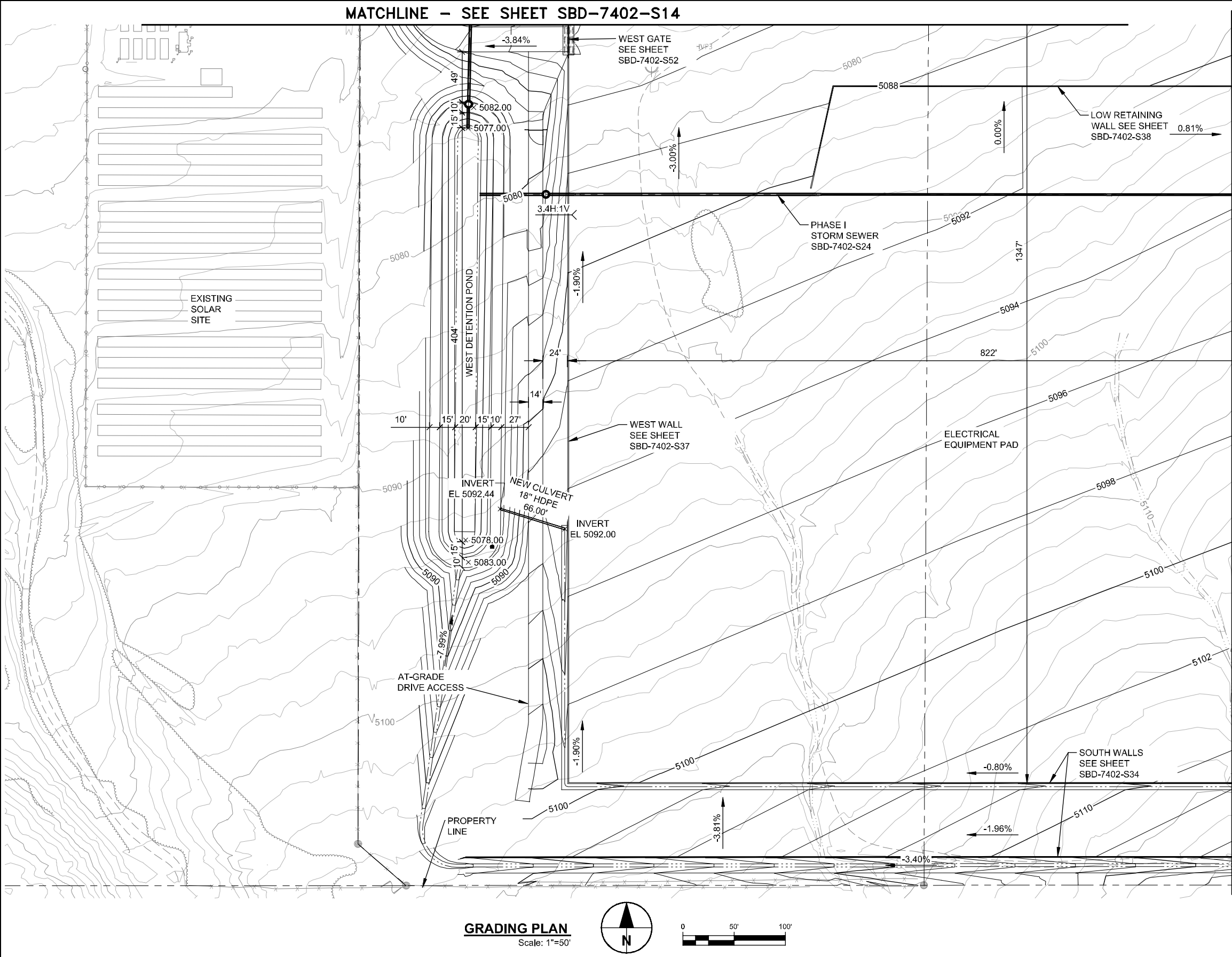
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DRAINAGE AND GRADING PLAN 2			
PROSPERITY SUBSTATION			
DR: JSH	DATE: 1/9/23		
CKD: RH	OK:	SCALE: As Noted	
APP:	SBD-7402-S15		15 OF 60
REV. NO.			

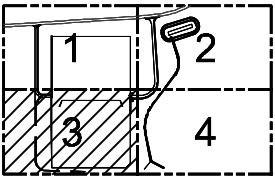
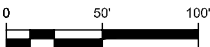


GENERAL NOTES

1.

MATCHLINE – SEE SHEET SBD-7402-S17

GRADING PLAN
Scale: 1"=50'



KEY PLAN

REVISION	NO.	DATE	BY

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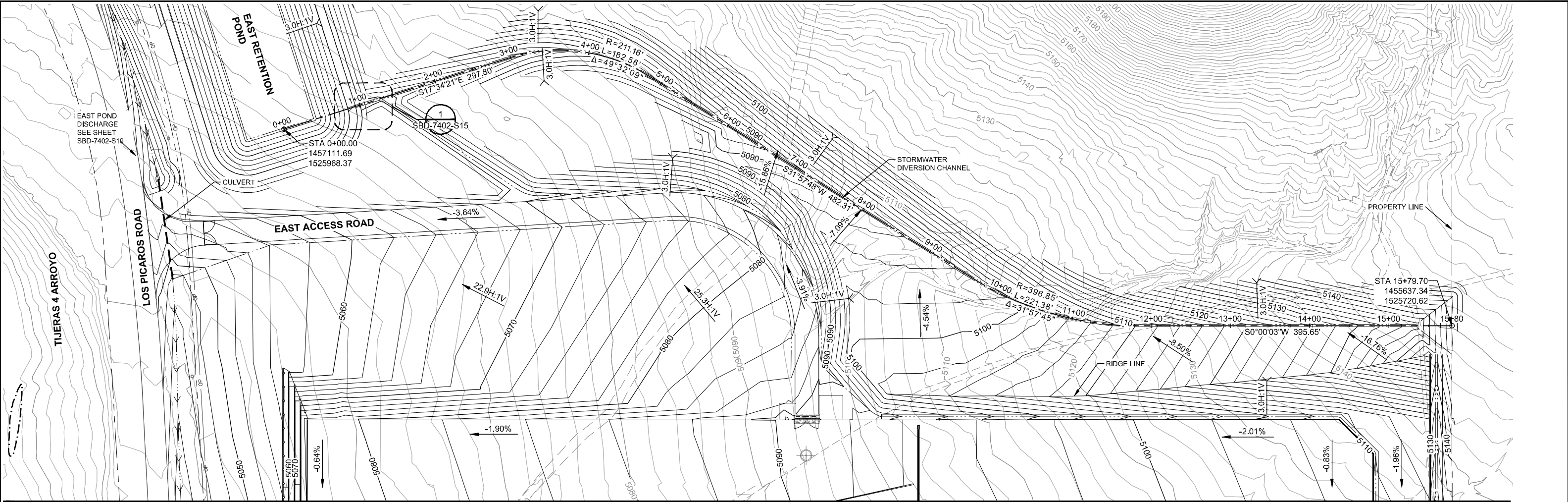
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PNM PUBLIC SERVICE COMPANY OF NEW MEXICO

DRAINAGE AND GRADING PLAN 3

PROSPERITY SUBSTATION

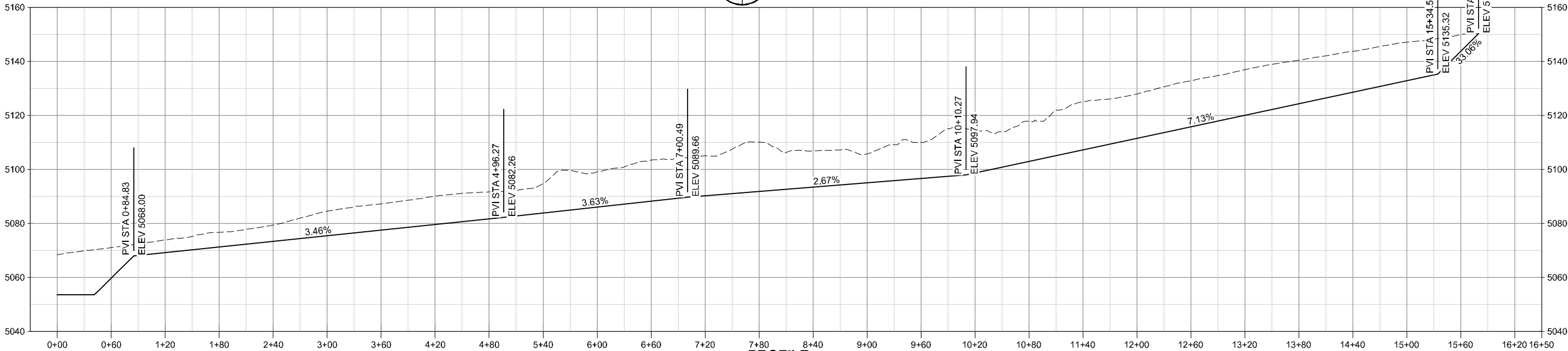
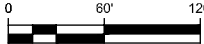
DR: JSH	DATE: 1/9/23
CKD: RH	OK: SCALE: As Noted
APP:	
REV. NO.	SBD-7402-S16 16 OF 60



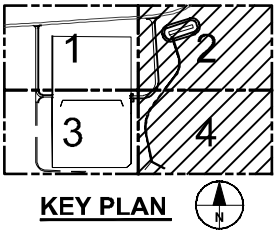
MATCHLINE – SEE SHEET SBD-7402-S14

MATCHLINE – SEE SHEET SBD-7402-S16

PLAN
Scale: 1"=60'



PROFILE
Scale: 1"=60' HORIZ.
1"=20' VERT.



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PNM PUBLIC SERVICE COMPANY OF NEW MEXICO			
DIVERSION CHANNEL PLAN & PROFILE PROSPERITY SUBSTATION			
DR: JSH	DATE: 1/9/23		
CKD: RH	OK:	SCALE: As Noted	
APP:	SBD-7402-S17		17 OF 60
REV. NO.			



1-3 NOAA 14 Precipitation



NOAA Atlas 14, Volume 1, Version 5
Location name: Albuquerque, New Mexico, USA*
Latitude: 34.9995°, Longitude: -106.6347°
Elevation: 5133.07 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	0.178 (0.155-0.206)	0.231 (0.200-0.267)	0.309 (0.266-0.357)	0.369 (0.318-0.424)	0.452 (0.387-0.518)	0.515 (0.439-0.591)	0.582 (0.492-0.667)	0.652 (0.547-0.747)	0.746 (0.620-0.856)	0.820 (0.678-0.942)
10-min	0.272 (0.236-0.314)	0.352 (0.304-0.407)	0.470 (0.406-0.543)	0.562 (0.484-0.646)	0.687 (0.589-0.789)	0.783 (0.667-0.899)	0.885 (0.749-1.01)	0.992 (0.833-1.14)	1.14 (0.944-1.30)	1.25 (1.03-1.43)
15-min	0.337 (0.293-0.389)	0.436 (0.377-0.504)	0.583 (0.503-0.673)	0.696 (0.599-0.801)	0.852 (0.730-0.977)	0.971 (0.827-1.12)	1.10 (0.928-1.26)	1.23 (1.03-1.41)	1.41 (1.17-1.62)	1.55 (1.28-1.78)
30-min	0.453 (0.394-0.523)	0.587 (0.508-0.679)	0.785 (0.677-0.906)	0.937 (0.807-1.08)	1.15 (0.983-1.32)	1.31 (1.11-1.50)	1.48 (1.25-1.70)	1.66 (1.39-1.90)	1.89 (1.58-2.18)	2.08 (1.72-2.39)
60-min	0.561 (0.488-0.648)	0.727 (0.629-0.840)	0.972 (0.838-1.12)	1.16 (0.998-1.33)	1.42 (1.22-1.63)	1.62 (1.38-1.86)	1.83 (1.55-2.10)	2.05 (1.72-2.35)	2.34 (1.95-2.69)	2.58 (2.13-2.96)
2-hr	0.638 (0.551-0.749)	0.816 (0.703-0.960)	1.08 (0.928-1.26)	1.29 (1.10-1.50)	1.58 (1.34-1.83)	1.81 (1.53-2.10)	2.05 (1.72-2.38)	2.31 (1.92-2.67)	2.67 (2.19-3.09)	2.96 (2.41-3.43)
3-hr	0.676 (0.590-0.790)	0.860 (0.746-1.00)	1.13 (0.977-1.31)	1.34 (1.15-1.55)	1.63 (1.39-1.89)	1.86 (1.59-2.15)	2.11 (1.79-2.44)	2.38 (1.99-2.74)	2.74 (2.27-3.16)	3.03 (2.49-3.51)
6-hr	0.785 (0.686-0.910)	0.988 (0.865-1.15)	1.27 (1.11-1.47)	1.49 (1.30-1.72)	1.80 (1.56-2.07)	2.03 (1.75-2.34)	2.28 (1.95-2.62)	2.54 (2.16-2.92)	2.90 (2.44-3.33)	3.18 (2.66-3.67)
12-hr	0.870 (0.768-0.988)	1.10 (0.971-1.25)	1.39 (1.22-1.57)	1.61 (1.42-1.83)	1.92 (1.68-2.17)	2.16 (1.88-2.44)	2.40 (2.08-2.72)	2.66 (2.28-3.00)	3.00 (2.55-3.40)	3.27 (2.76-3.72)
24-hr	0.978 (0.874-1.11)	1.23 (1.09-1.38)	1.53 (1.36-1.72)	1.77 (1.58-1.99)	2.10 (1.86-2.36)	2.35 (2.08-2.64)	2.61 (2.31-2.93)	2.87 (2.52-3.22)	3.23 (2.81-3.62)	3.50 (3.04-3.92)
2-day	1.04 (0.931-1.16)	1.30 (1.17-1.45)	1.62 (1.45-1.80)	1.86 (1.67-2.07)	2.20 (1.97-2.44)	2.46 (2.19-2.73)	2.72 (2.42-3.02)	2.99 (2.65-3.32)	3.34 (2.95-3.71)	3.61 (3.17-4.02)
3-day	1.12 (1.02-1.23)	1.40 (1.27-1.54)	1.72 (1.57-1.89)	1.98 (1.80-2.17)	2.32 (2.11-2.54)	2.58 (2.34-2.83)	2.85 (2.58-3.12)	3.11 (2.81-3.41)	3.47 (3.11-3.80)	3.73 (3.33-4.09)
4-day	1.20 (1.11-1.31)	1.50 (1.38-1.62)	1.83 (1.69-1.98)	2.09 (1.93-2.26)	2.44 (2.25-2.64)	2.71 (2.49-2.93)	2.98 (2.73-3.21)	3.24 (2.96-3.50)	3.59 (3.27-3.88)	3.85 (3.50-4.17)
7-day	1.39 (1.28-1.50)	1.72 (1.59-1.86)	2.09 (1.94-2.26)	2.38 (2.20-2.56)	2.75 (2.55-2.96)	3.03 (2.80-3.26)	3.31 (3.05-3.56)	3.57 (3.29-3.84)	3.91 (3.60-4.21)	4.16 (3.81-4.48)
10-day	1.53 (1.42-1.65)	1.90 (1.76-2.05)	2.31 (2.15-2.49)	2.64 (2.45-2.84)	3.07 (2.85-3.30)	3.40 (3.14-3.64)	3.72 (3.43-3.98)	4.04 (3.71-4.33)	4.44 (4.07-4.76)	4.74 (4.33-5.09)
20-day	1.94 (1.79-2.09)	2.40 (2.23-2.60)	2.92 (2.70-3.14)	3.30 (3.06-3.55)	3.79 (3.51-4.08)	4.15 (3.83-4.45)	4.49 (4.14-4.81)	4.81 (4.43-5.15)	5.20 (4.79-5.58)	5.48 (5.05-5.89)
30-day	2.32 (2.15-2.49)	2.87 (2.66-3.08)	3.45 (3.20-3.70)	3.88 (3.60-4.15)	4.41 (4.09-4.71)	4.79 (4.43-5.11)	5.14 (4.76-5.49)	5.48 (5.06-5.84)	5.87 (5.42-6.27)	6.15 (5.67-6.56)
45-day	2.81 (2.62-3.01)	3.47 (3.24-3.72)	4.13 (3.85-4.41)	4.60 (4.29-4.91)	5.16 (4.82-5.50)	5.54 (5.18-5.91)	5.88 (5.50-6.26)	6.18 (5.78-6.58)	6.51 (6.10-6.91)	6.69 (6.29-7.10)
60-day	3.25 (3.02-3.49)	4.01 (3.74-4.31)	4.78 (4.46-5.12)	5.32 (4.97-5.70)	5.98 (5.58-6.39)	6.42 (5.99-6.86)	6.83 (6.37-7.29)	7.18 (6.71-7.67)	7.58 (7.09-8.10)	7.83 (7.33-8.35)

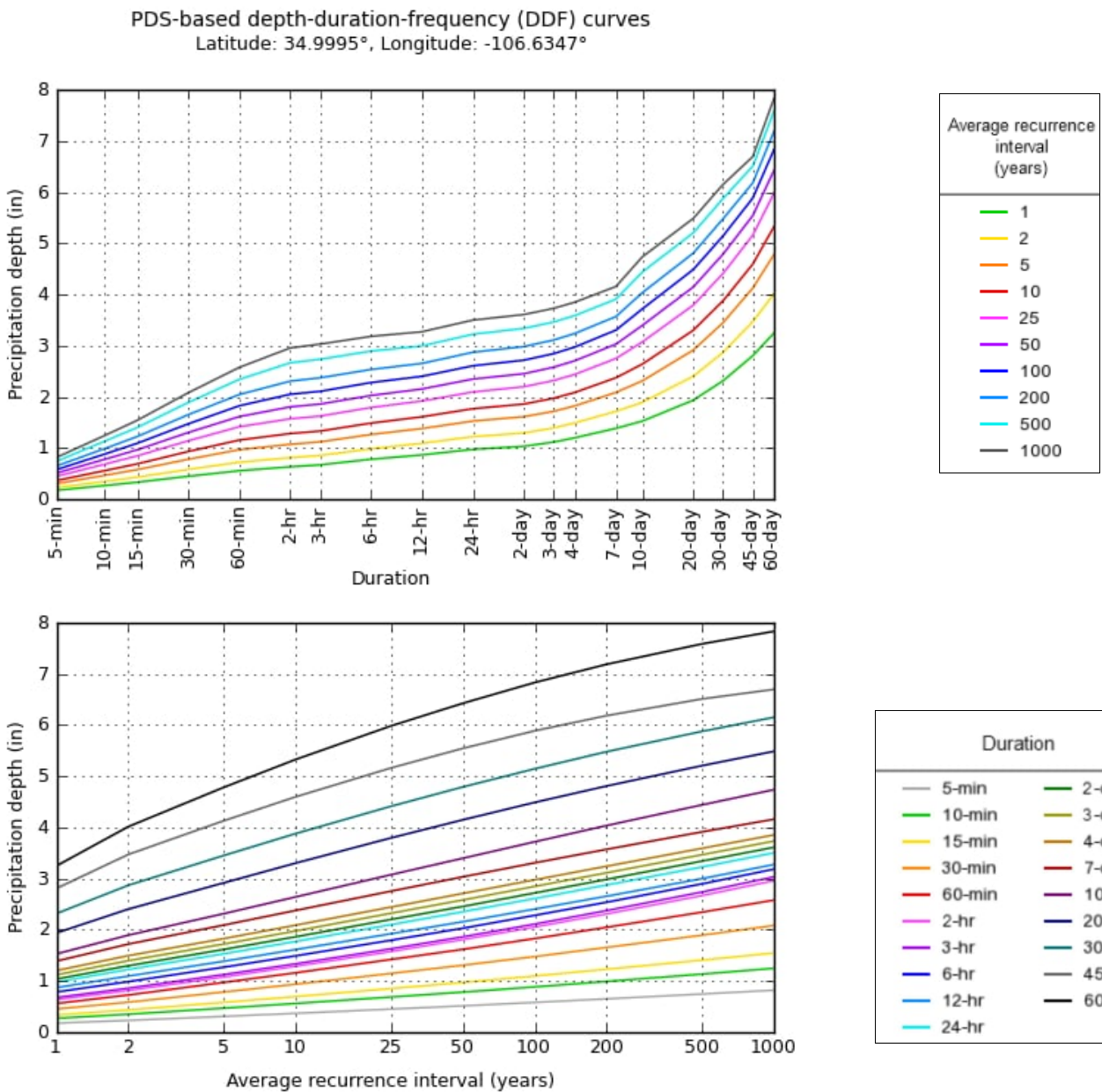
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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): Fri Apr 23 16:34:46 2021

[Back to Top](#)

Maps & aerials

Small scale terrain



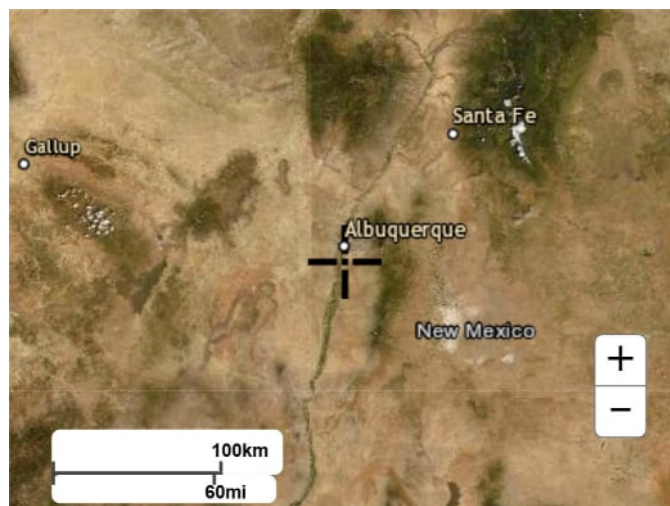
Large scale terrain



Large scale map



Large scale aerial



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[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](#)



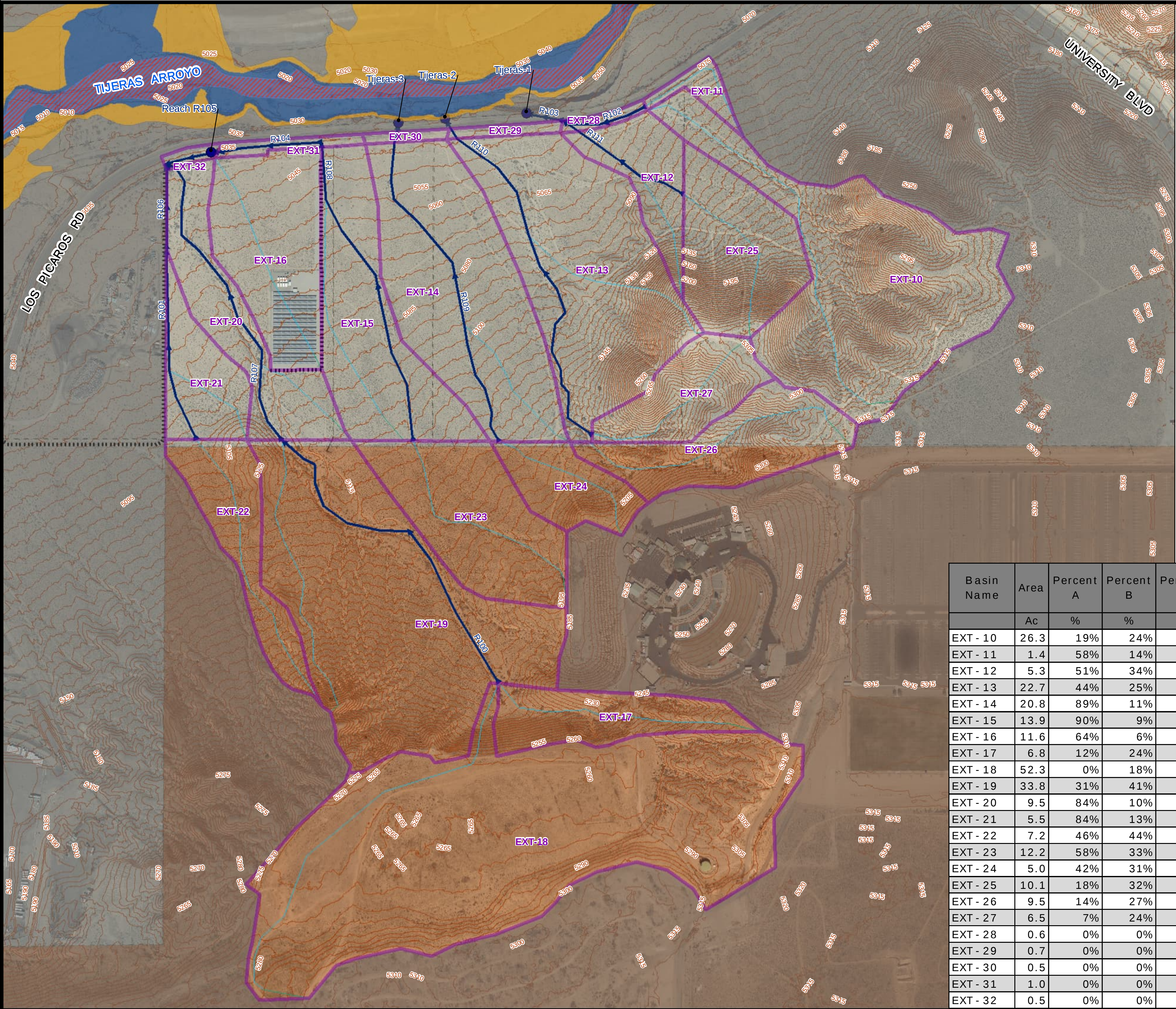
Attachment 2

Existing Hydrologic Calculations

- 2-1 Existing Drainage Patterns
- 2-2 Existing Drainage Tabulation
- 2-3 Existing HEC-HMS Inputs and Outputs



2-1 Existing Drainage Patterns



Name	Q100, 24hr Storm Volume cfs	24hr Storm Volume Ac - Ft	10day Storm Volume Ac - Ft
Reaches:			
R100	152.4	6.1	10.2
R101	13.0	0.5	1.0
R102	62.2	2.6	4.4
R103	96.1	4.0	6.8
R104	42.1	1.8	3.4
R105	63.9	2.9	5.2
R106	21.6	0.9	1.7
R107	212.8	8.9	15.0
R108	21.6	0.9	1.6
R109	9.9	0.4	0.7
R110	37.9	1.5	2.6
R111	22.1	0.9	1.6
Outfalls:			
R105	63.9	2.9	5.2
Tjeras - 1	96.1	4.0	6.8
Tjeras - 2	82.0	3.5	6.0
Tjeras - 3	43.5	1.9	3.4

LEGEND

EXISTING DRAINAGE BASINS

FLOOD ZONES:

AE

AE, FLOODWAY

X, 0.2 PCT ANNUAL CHANCE FLOOD HAZARD

NON - CONTRIBUTING DRAINAGE

BERM

OUTFALLS

CHANNEL REACHES

LONGEST FLOW PATHS:

SHEET

SHALLOW CONCENTRATED

CHANNEL

5FT CONTOURS

PROPERTY LINE

JURISDICTION:

ALBUQUERQUE

UNINCORPORATED



0 600 1,200 FEET

1 INCH = 300 FEET
WHEN PRINTED ON 22" X 34" PAPER



PROJECT: PROSPERITY SUBSTATION
LOCATION: BERNALILLO COUNTY, NM
PREPARED FOR: PNM
AECOM PROJECT NO.: 606XXXXX

Basin Name	Area	Percent A	Percent B	Percent C	Percent D	Weighted CN	Q100, 24hr Storm Volume cfs	24hr Storm Volume Ac - Ft	10day Storm Volume Ac - Ft	Runoff Rate cfs / Ac
EXT - 10	26.3	19%	24%	57%	0%	82.6	60.5	2.44	4.17	2.3
EXT - 11	1.4	58%	14%	19%	9%	80.8	2.9	0.12	0.21	2.1
EXT - 12	5.3	51%	34%	15%	0%	79.0	9.7	0.40	0.72	1.8
EXT - 13	22.7	44%	25%	31%	0%	80.3	45.3	1.85	3.27	2.0
EXT - 14	20.8	89%	11%	0%	0%	77.2	33.8	1.42	2.62	1.6
EXT - 15	13.9	90%	9%	0%	0%	77.2	22.6	0.95	1.75	1.6
EXT - 16	11.6	64%	6%	30%	0%	79.8	22.6	0.93	1.64	1.9
EXT - 17	6.8	12%	24%	64%	0%	83.3	16.3	0.65	1.11	2.4
EXT - 18	52.3	0%	18%	82%	0%	84.8	136.1	5.46	9.05	2.6
EXT - 19	33.8	31%	41%	28%	0%	80.4	68.0	2.78	4.89	2.0
EXT - 20	9.5	84%	10%	6%	0%	77.8	16.0	0.67	1.23	1.7
EXT - 21	5.5	84%	13%	3%	0%	77.5	9.1	0.38	0.70	1.7
EXT - 22	7.2	46%	44%	10%	0%	78.8	13.0	0.54	0.97	1.8
EXT - 23	12.2	58%	33%	9%	0%	78.5	21.6	0.90	1.62	1.8
EXT - 24	5.0	42%	31%	27%	0%	80.1	9.9	0.40	0.71	2.0
EXT - 25	10.1	18%	32%	50%	0%	82.1	22.6	0.91	1.57	2.2
EXT - 26	9.5	14%	27%	59%	0%	82.8	22.1	0.89	1.51	2.3
EXT - 27	6.5	7%	24%	69%	0%	83.7	15.8	0.64	1.07	2.5
EXT - 28	0.6	0%	0%	73%	27%	89.2	2.1	0.08	0.13	3.3
EXT - 29	0.7	0%	0%	73%	27%	89.2	2.5	0.10	0.16	3.4
EXT - 30	0.5	0%	0%	73%	27%	89.2	1.7	0.07	0.11	3.2
EXT - 31	1.0	0%	0%	73%	27%	89.2	3.3	0.13	0.21	3.3
EXT - 32	0.5	0%	0%	81%	19%	88.3	1.6	0.06	0.10	3.3

PNM REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D	OKD	APP'D
△						
△						
△						
△						

PNM

PUBLIC SERVICE COMPANY
OF NEW MEXICO

EXISTING CONDITIONS
DRAINAGE PATTERNS

DR:	DATE: 1 / 17 / 23	ATTACHMENT
ACAD-	APP:	2 - 1

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2-2 Existing Drainage Tabulation

Attachment 2-2: Existing Conditions Drainage Basins Input and Output Data

Input Data:

Basin Name	Area	Area	Area A	Area B	Area C	Area D	Percent A	Percent B	Percent C	Percent D	CN A	CN B	CN C	CN D	Weighted CN
	sf	Ac	Ac	Ac	Ac	Ac	%	%	%	%	unitless	unitless	unitless	unitless	unitless
EXT-10	1145724	26.3	5.02	6.22	15.06	0.00	19%	24%	57%	0%	77	79	86	98	82.6
EXT-11	60091	1.4	0.80	0.20	0.26	0.12	58%	14%	19%	9%	77	79	86	98	80.8
EXT-12	228840	5.3	2.68	1.80	0.77	0.00	51%	34%	15%	0%	77	79	86	98	79.0
EXT-13	986433	22.7	9.97	5.65	7.03	0.00	44%	25%	31%	0%	77	79	86	98	80.3
EXT-14	905213	20.8	18.50	2.28	0.00	0.00	89%	11%	0%	0%	77	79	86	98	77.2
EXT-15	606075	13.9	12.57	1.28	0.07	0.00	90%	9%	0%	0%	77	79	86	98	77.2
EXT-16	506693	11.6	7.45	0.69	3.49	0.00	64%	6%	30%	0%	77	79	86	98	79.8
EXT-17	296017	6.8	0.81	1.61	4.38	0.00	12%	24%	64%	0%	77	79	86	98	83.3
EXT-18	2277962	52.3	0.00	9.30	43.00	0.00	0%	18%	82%	0%	77	79	86	98	84.8
EXT-19	1472559	33.8	10.36	13.91	9.54	0.00	31%	41%	28%	0%	77	79	86	98	80.4
EXT-20	412283	9.5	7.92	0.94	0.61	0.00	84%	10%	6%	0%	77	79	86	98	77.8
EXT-21	240118	5.5	4.62	0.72	0.17	0.00	84%	13%	3%	0%	77	79	86	98	77.5
EXT-22	311854	7.2	3.30	3.13	0.73	0.00	46%	44%	10%	0%	77	79	86	98	78.8
EXT-23	530402	12.2	7.11	3.96	1.11	0.00	58%	33%	9%	0%	77	79	86	98	78.5
EXT-24	218161	5.0	2.09	1.55	1.37	0.00	42%	31%	27%	0%	77	79	86	98	80.1
EXT-25	441326	10.1	1.86	3.20	5.07	0.00	18%	32%	50%	0%	77	79	86	98	82.1
EXT-26	411818	9.5	1.35	2.52	5.58	0.00	14%	27%	59%	0%	77	79	86	98	82.8
EXT-27	280828	6.5	0.44	1.54	4.47	0.00	7%	24%	69%	0%	77	79	86	98	83.7
EXT-28	27334	0.6	0.00	0.00	0.46	0.17	0%	0%	73%	27%	77	79	86	98	89.2
EXT-29	32205	0.7	0.00	0.00	0.54	0.20	0%	0%	73%	27%	77	79	86	98	89.2
EXT-30	22779	0.5	0.00	0.00	0.38	0.14	0%	0%	73%	27%	77	79	86	98	89.2
EXT-31	43965	1.0	0.00	0.00	0.74	0.27	0%	0%	73%	27%	77	79	86	98	89.2
EXT-32	21467	0.5	0.00	0.00	0.40	0.09	0%	0%	81%	19%	77	79	86	98	88.3

Attachment 2-2: Existing Conditions Drainage Basins Input and Output Data

Output Data (From HEC-HMS):

Basin Name	Drainage Area	Q100, 24hr Storm	Time to Peak, 24hr Storm	24hr Storm Volume	10day Storm Volume	Runoff Rate
	Sq Mi.	cfs		Ac-Ft	Ac-Ft	cfs/Ac
EXT-10	0.0411	60.5	01Jan2023, 12:10	2.44	4.17	2.3
EXT-11	0.0022	2.9	01Jan2023, 12:10	0.12	0.21	2.1
EXT-12	0.0082	9.7	01Jan2023, 12:10	0.40	0.72	1.8
EXT-13	0.0354	45.3	01Jan2023, 12:10	1.85	3.27	2.0
EXT-14	0.0325	33.8	01Jan2023, 12:10	1.42	2.62	1.6
EXT-15	0.0217	22.6	01Jan2023, 12:10	0.95	1.75	1.6
EXT-16	0.0182	22.6	01Jan2023, 12:10	0.93	1.64	1.9
EXT-17	0.0106	16.3	01Jan2023, 12:10	0.65	1.11	2.4
EXT-18	0.0817	136.1	01Jan2023, 12:10	5.46	9.05	2.6
EXT-19	0.0528	68.0	01Jan2023, 12:10	2.78	4.89	2.0
EXT-20	0.0148	16.0	01Jan2023, 12:10	0.67	1.23	1.7
EXT-21	0.0086	9.1	01Jan2023, 12:10	0.38	0.70	1.7
EXT-22	0.0112	13.0	01Jan2023, 12:10	0.54	0.97	1.8
EXT-23	0.0190	21.6	01Jan2023, 12:10	0.90	1.62	1.8
EXT-24	0.0078	9.9	01Jan2023, 12:10	0.40	0.71	2.0
EXT-25	0.0158	22.6	01Jan2023, 12:10	0.91	1.57	2.2
EXT-26	0.0148	22.1	01Jan2023, 12:10	0.89	1.51	2.3
EXT-27	0.0101	15.8	01Jan2023, 12:10	0.64	1.07	2.5
EXT-28	0.0010	2.1	01Jan2023, 12:10	0.08	0.13	3.3
EXT-29	0.0012	2.5	01Jan2023, 12:10	0.10	0.16	3.4
EXT-30	0.0008	1.7	01Jan2023, 12:10	0.07	0.11	3.2
EXT-31	0.0016	3.3	01Jan2023, 12:10	0.13	0.21	3.3
EXT-32	0.0008	1.6	01Jan2023, 12:10	0.06	0.10	3.3

Attachment 2-2: Existing Conditions Time of Concentration and Lag Time

1st Flow Reach (Sheet Flow):

Basin Name	Flow Type	Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Velocity, Vn fps	nth Travel Time, Tn Hrs
EXT-10	SHEET	5315.2	5309.1	147	0.041	1	2.0	0.020
EXT-11	SHEET	5110.1	5105.0	60	0.084	1	2.9	0.006
EXT-12	SHEET	5250.0	5240.0	28	0.358	1	6.0	0.001
EXT-13	SHEET	5297.0	5295.0	40	0.049	1	2.2	0.005
EXT-14	SHEET	5155.9	5150.0	75	0.078	1	2.8	0.007
EXT-15	SHEET	5113.6	5105.0	164	0.053	1	2.3	0.020
EXT-16	SHEET	5089.1	5085.0	91	0.045	1	2.1	0.012
EXT-17	SHEET	5304.4	5295.0	195	0.048	1	2.2	0.025
EXT-18	SHEET	5300.9	5290.0	231	0.047	1	2.2	0.030
EXT-19	SHEET	5267.8	5260.0	52	0.149	1	3.9	0.004
EXT-20	SHEET	5107.7	5100.0	169	0.046	1	2.1	0.022
EXT-21	SHEET	5112.6	5105.0	69	0.110	1	3.3	0.006
EXT-22	SHEET	5260.0	5245.0	35	0.433	1	6.6	0.001
EXT-23	SHEET	5188.2	5185.0	149	0.021	1	1.5	0.028
EXT-24	SHEET	5231.4	5220.0	57	0.200	1	4.5	0.004
EXT-25	SHEET	5306.1	5300.0	73	0.083	1	2.9	0.007
EXT-26	SHEET	5314.6	5305.0	186	0.052	1	2.3	0.023
EXT-27	SHEET	5306.1	5300.0	115	0.053	1	2.3	0.014
EXT-28*								
EXT-29*								
EXT-30*								
EXT-31*								
EXT-32*								

*minimum Tc of 0.2 hrs used for small basins

Attachment 2-2: Existing Conditions Time of Concentration and Lag Time

2nd Flow Reach (Shallow Concentrated Flow):

Basin Name		Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Adjusted Slope, s' ** ft/ft	Velocity, Vn fps	nth Travel Time, Tn Hrs
EXT-10	SC	5309.1	5075.0	2076	0.113	2	0.059	4.9	0.118
EXT-11	SC	5105.0	5072.4	712	0.046	2	0.045	4.2	0.047
EXT-12	SC	5240.0	5082.2	653	0.242	2	0.068	5.2	0.035
EXT-13	SC	5295.0	5077.9	1026	0.212	2	0.066	5.1	0.056
EXT-14	SC	5150.0	5095.0	738	0.075	2	0.055	4.7	0.043
EXT-15	SC	5105.0	5053.4	1172	0.044	2	0.044	4.2	0.078
EXT-16	SC	5085.0	5035.6	1114	0.044	2	0.044	4.2	0.074
EXT-17	SC	5295.0	5178.8	1220	0.095	2	0.058	4.8	0.070
EXT-18	SC	5290.0	5178.8	2196	0.051	2	0.048	4.4	0.139
EXT-19	SC	5260.0	5091.2	1442	0.117	2	0.060	4.9	0.082
EXT-20	SC	5100.0	5075.0	438	0.057	2	0.051	4.5	0.027
EXT-21	SC	5105.0	5065.0	488	0.082	2	0.057	4.8	0.028
EXT-22	SC	5245.0	5088.2	1492	0.105	2	0.059	4.9	0.085
EXT-23	SC	5185.0	5112.3	1149	0.063	2	0.053	4.6	0.069
EXT-24	SC	5220.0	5134.1	798	0.108	2	0.059	4.9	0.046
EXT-25	SC	5300.0	5100.3	852	0.235	2	0.067	5.2	0.046
EXT-26	SC	5305.0	5155.0	1376	0.109	2	0.059	4.9	0.079
EXT-27	SC	5300.0	5154.9	895	0.162	2	0.063	5.0	0.050
EXT-28*									
EXT-29*									
EXT-30*									
EXT-31*									
EXT-32*									

*minimum Tc of 0.2 hrs used for small basins

**slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

Attachment 2-2: Existing Conditions Time of Concentration and Lag Time

3rd Flow Reach (Channel Flow):

Basin Name		Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Adjusted Slope, s' ** ft/ft	Velocity, Vn fps	nth Travel Time, Tn Hrs
EXT-10									
EXT-11									
EXT-12	CHANNEL	5082.2	5058.2	389	0.062	3	0.053	6.9	0.016
EXT-13	CHANNEL	5077.9	5045.1	648	0.051	3	0.048	6.6	0.027
EXT-14	CHANNEL	5095.0	5043.3	1054	0.049	3	0.047	6.5	0.045
EXT-15	CHANNEL	5053.4	5043.4	270	0.037	3		5.8	0.013
EXT-16									
EXT-17									
EXT-18									
EXT-19									
EXT-20	CHANNEL	5075.0	5037.4	1156	0.032	3		5.4	0.059
EXT-21	CHANNEL	5065.0	5047.1	621	0.029	3		5.1	0.034
EXT-22									
EXT-23									
EXT-24									
EXT-25									
EXT-26									
EXT-27									
EXT-28*									
EXT-29*									
EXT-30*									
EXT-31*									
EXT-32*									

*minimum Tc of 0.2 hrs used for small basins

**slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

Attachment 2-2: Existing Conditions Time of Concentration and Lag Time

Time of Concentration and Lag Time:

Basin Name	Calculated Time of Conc., Tc Hrs	Tc Used (0.2hrs Min.) Hrs	Lag Time Min	Recommended Max Time Step (0.29*Lag) Min
EXT-10	0.14	0.2	7.2	2.1
EXT-11	0.05	0.2	7.2	2.1
EXT-12	0.05	0.2	7.2	2.1
EXT-13	0.09	0.2	7.2	2.1
EXT-14	0.10	0.2	7.2	2.1
EXT-15	0.11	0.2	7.2	2.1
EXT-16	0.09	0.2	7.2	2.1
EXT-17	0.09	0.2	7.2	2.1
EXT-18	0.17	0.2	7.2	2.1
EXT-19	0.09	0.2	7.2	2.1
EXT-20	0.11	0.2	7.2	2.1
EXT-21	0.07	0.2	7.2	2.1
EXT-22	0.09	0.2	7.2	2.1
EXT-23	0.10	0.2	7.2	2.1
EXT-24	0.05	0.2	7.2	2.1
EXT-25	0.05	0.2	7.2	2.1
EXT-26	0.10	0.2	7.2	2.1
EXT-27	0.06	0.2	7.2	2.1
EXT-28*		0.2	7.2	2.1
EXT-29*		0.2	7.2	2.1
EXT-30*		0.2	7.2	2.1
EXT-31*		0.2	7.2	2.1
EXT-32*		0.2	7.2	2.1

*minimum Tc of 0.2 hrs used for small basins

Attachment 2-2: Existing Conditions Reach and Outfall Input and Output Data

Input Data:

Name	elev_hi	elev_low	length	Slope	s' **	K	Velocity	Travel Time
Reaches:	ft	ft	ft	ft/ft	ft/ft	unitless	fps	minutes
R100	5178.8	5091.1	1789	0.049	0.047	3	6.5	4.6
R101	5088.2	5047.1	997	0.041	0.041	3	6.1	2.7
R102	5072.4	5051.6	442	0.047	0.046	3	6.4	1.1
R103	5051.6	5045.0	185	0.036		3	5.7	0.5
R104	5041.5	5034.7	530	0.013		3	3.4	2.6
R105	5034.7	5033.9	279	0.003		3	1.5	3.0
R106	5047.1	5033.9	428	0.031		3	5.3	1.4
R107	5091.2	5033.9	1626	0.035		3	5.6	4.8
R108	5112.3	5041.5	1624	0.044	0.043	3	6.2	4.3
R109	5134.1	5041.5	1778	0.052	0.049	3	6.6	4.5
R110	5154.2	5041.3	1914	0.059	0.052	3	6.8	4.7
R111	5100.3	5051.6	725	0.067	0.054	3	7.0	1.7

**slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

Attachment 2-2: Existing Conditions Reach and Outfall Input and Output Data

Output Data (From HEC-HMS):

Name	drainage area	Q100, 24hr Storm	time of peak, 24hr Storm	24hr Storm Volume	10day Storm Volume
Reaches:	sq mi.	cfs		Ac-Ft	Ac-Ft
R100	0.092	152.4	01Jan2023, 12:14	6.11	10.16
R101	0.011	13.0	01Jan2023, 12:12	0.54	0.97
R102	0.043	62.2	01Jan2023, 12:10	2.56	4.38
R103	0.068	96.1	01Jan2023, 12:10	3.96	6.79
R104	0.041	42.1	01Jan2023, 12:14	1.85	3.37
R105	0.061	63.9	01Jan2023, 12:16	2.90	5.22
R106	0.020	21.6	01Jan2023, 12:12	0.92	1.67
R107	0.145	212.8	01Jan2023, 12:16	8.89	15.04
R108	0.019	21.6	01Jan2023, 12:14	0.90	1.62
R109	0.008	9.9	01Jan2023, 12:14	0.40	0.71
R110	0.025	37.9	01Jan2023, 12:14	1.53	2.59
R111	0.016	22.1	01Jan2023, 12:10	0.91	1.57
Outfalls:					
R105	0.061	63.9	01Jan2023, 12:16	2.90	5.22
Tijeras-1	0.068	96.1	01Jan2023, 12:10	3.96	6.79
Tijeras-2	0.062	82.0	01Jan2023, 12:12	3.48	6.01
Tijeras-3	0.041	43.5	01Jan2023, 12:12	1.89	3.44

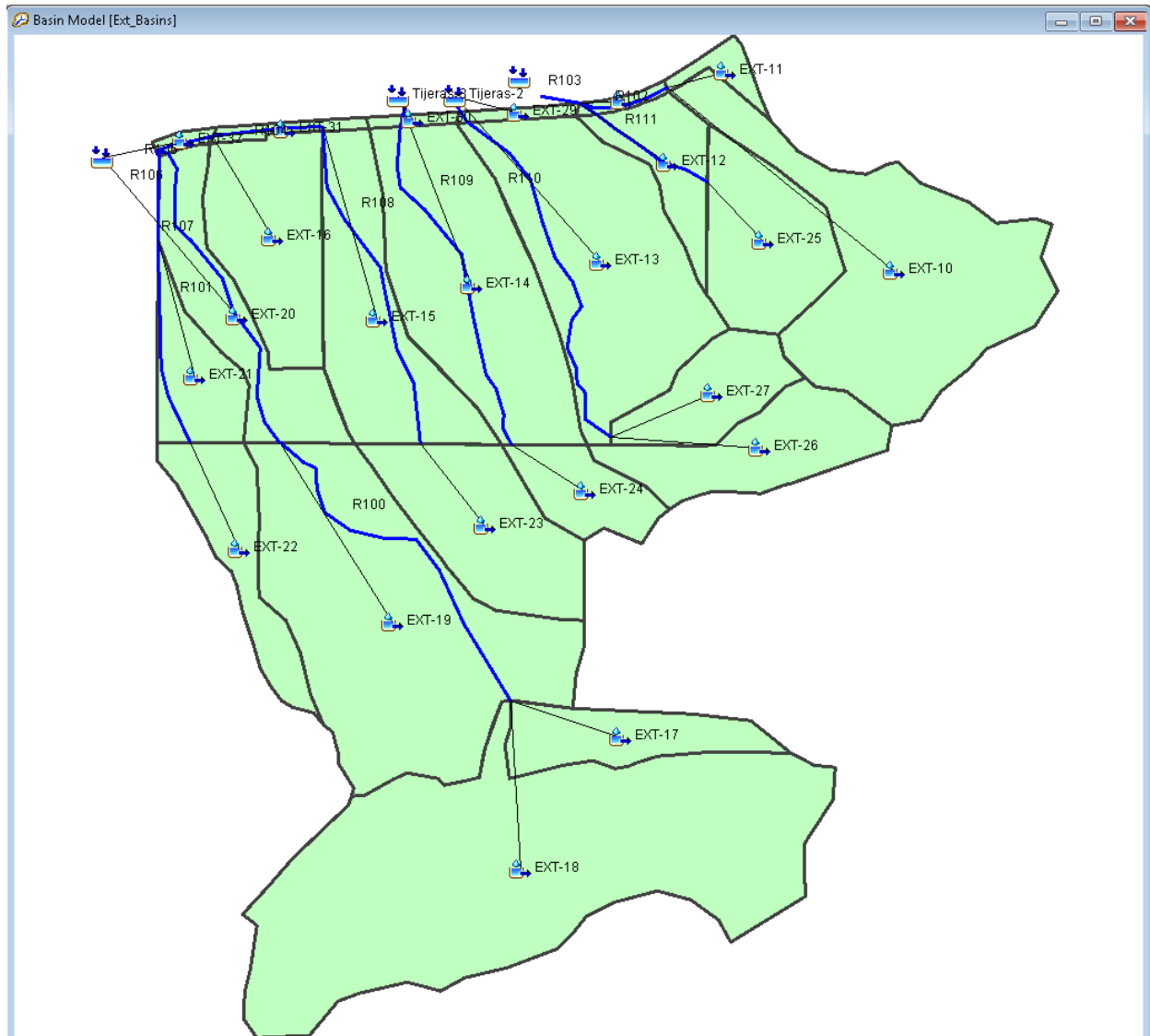


2-3 Existing HEC-HMS Inputs and Outputs

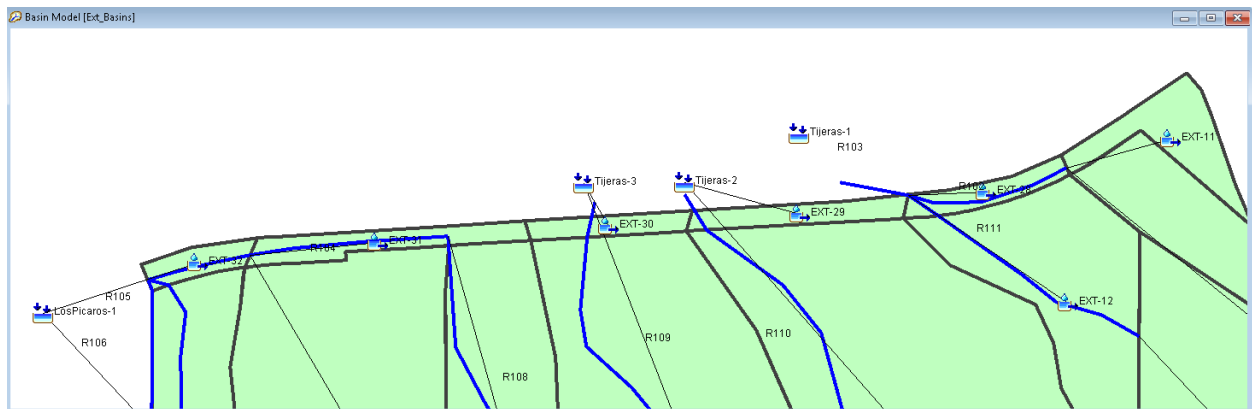
HEC-HMS Inputs and Outputs

Existing Conditions, 100yr, 24hr Storm & 100yr, 10day Storm

Basin Model



Basin Model – Street Detail



Precipitation

Frequency Storm			Frequency Storm		
Met Name: Met 24hr			Met Name: Met 24hr		
Annual-Partial Conversion: --None--			Annual-Partial Conversion: --None--		
Annual-Partial Ratio: 1.00			Annual-Partial Ratio: 1.00		
Storm Duration: 1 Day			Storm Duration: 1 Day		
Intensity Duration: 5 Minutes			Intensity Duration: 5 Minutes		
Intensity Position: 50 Percent			Intensity Position: 50 Percent		
Area Reduction: TP40 TP49			Area Reduction: TP40 TP49		
Storm Area: Subbasin Area(s)			Storm Area: Subbasin Area(s)		
Spatial Distribution: Uniform For All Subbasins			Spatial Distribution: Uniform For All Subbasins		
Duration	Depth (IN)	Area	Duration	Depth (IN)	Area
5 Minutes	0.582		5 Minutes	0.582	
15 Minutes	1.1		15 Minutes	1.1	
1 Hour	1.83		1 Hour	1.83	
2 Hours	2.05		2 Hours	2.05	
3 Hours	2.11		3 Hours	2.11	
6 Hours	2.28		6 Hours	2.28	
12 Hours	2.4		12 Hours	2.4	
1 Day	2.61		1 Day	2.61	
2 Days			2 Days		
4 Days			4 Days		
7 Days			7 Days		
10 Days			10 Days		

Control

Control Specifications

Name: Control 24hr

Description:

*Start Date (ddMMYYYY)

*Start Time (HH:mm)

*End Date (ddMMYYYY)

*End Time (HH:mm)

Time Interval:

Control Specifications

Name: Control 10day

Description:

*Start Date (ddMMYYYY)

*Start Time (HH:mm)

*End Date (ddMMYYYY)

*End Time (HH:mm)

Time Interval:

Summary Output Table

Existing Conditions, 100yr, 24hr Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EXT-10	0.0411	60.522	01Jan2023, 12:10	2.444
EXT-11	0.0022	2.908	01Jan2023, 12:10	0.118
EXT-12	0.0082	9.652	01Jan2023, 12:10	0.399
EXT-13	0.0354	45.329	01Jan2023, 12:10	1.854
EXT-14	0.0325	33.77	01Jan2023, 12:10	1.421
EXT-15	0.0217	22.55	01Jan2023, 12:10	0.949
EXT-16	0.0182	22.575	01Jan2023, 12:10	0.926
EXT-17	0.0106	16.256	01Jan2023, 12:10	0.654
EXT-18	0.0817	136.103	01Jan2023, 12:10	5.46
EXT-19	0.0528	68.029	01Jan2023, 12:10	2.781
EXT-20	0.0148	16.049	01Jan2023, 12:10	0.671
EXT-21	0.0086	9.131	01Jan2023, 12:10	0.383
EXT-22	0.0112	13.008	01Jan2023, 12:10	0.538
EXT-23	0.019	21.622	01Jan2023, 12:10	0.897
EXT-24	0.0078	9.864	01Jan2023, 12:10	0.404
EXT-25	0.0158	22.596	01Jan2023, 12:10	0.914
EXT-26	0.0148	22.053	01Jan2023, 12:10	0.89

Existing Conditions, 100yr, 24hr Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EXT-27	0.0101	15.844	01Jan2023, 12:10	0.637
EXT-28	0.001	2.081	01Jan2023, 12:10	0.084
EXT-29	0.0012	2.497	01Jan2023, 12:10	0.1
EXT-30	0.0008	1.664	01Jan2023, 12:10	0.067
EXT-31	0.0016	3.329	01Jan2023, 12:10	0.134
EXT-32	0.0008	1.595	01Jan2023, 12:10	0.064
LosPicaros-1	0.241	309.032	01Jan2023, 12:16	13.448
R100	0.0923	152.359	01Jan2023, 12:14	6.112
R101	0.0112	13.008	01Jan2023, 12:12	0.538
R102	0.0433	62.225	01Jan2023, 12:10	2.562
R103	0.0683	96.101	01Jan2023, 12:10	3.959
R104	0.0407	42.102	01Jan2023, 12:14	1.845
R105	0.0605	63.87	01Jan2023, 12:16	2.904
R106	0.0198	21.596	01Jan2023, 12:12	0.921
R107	0.1451	212.762	01Jan2023, 12:16	8.889
R108	0.019	21.622	01Jan2023, 12:14	0.897
R109	0.0078	9.864	01Jan2023, 12:14	0.404
R110	0.0249	37.897	01Jan2023, 12:14	1.526
R111	0.0158	22.144	01Jan2023, 12:10	0.914
Tijeras-1	0.0683	96.101	01Jan2023, 12:10	3.959
Tijeras-2	0.0615	81.977	01Jan2023, 12:12	3.48
Tijeras-3	0.0411	43.516	01Jan2023, 12:12	1.891

Existing Conditions, 100yr, 10day Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EXT-10	0.0411	77.806	06Jan2023, 00:10	4.17
EXT-11	0.0022	3.874	06Jan2023, 00:10	0.207
EXT-12	0.0082	13.368	06Jan2023, 00:10	0.715
EXT-13	0.0354	61.03	06Jan2023, 00:10	3.265
EXT-14	0.0325	48.807	06Jan2023, 00:10	2.618
EXT-15	0.0217	32.591	06Jan2023, 00:10	1.748
EXT-16	0.0182	30.72	06Jan2023, 00:10	1.643
EXT-17	0.0106	20.622	06Jan2023, 00:10	1.106
EXT-18	0.0817	168.242	06Jan2023, 00:08	9.052
EXT-19	0.0528	91.401	06Jan2023, 00:10	4.89

Existing Conditions, 100yr, 10day Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EXT-20	0.0148	22.857	06Jan2023, 00:10	1.225
EXT-21	0.0086	13.1	06Jan2023, 00:10	0.702
EXT-22	0.0112	18.097	06Jan2023, 00:10	0.968
EXT-23	0.019	30.29	06Jan2023, 00:10	1.621
EXT-24	0.0078	13.337	06Jan2023, 00:10	0.713
EXT-25	0.0158	29.332	06Jan2023, 00:10	1.571
EXT-26	0.0148	28.243	06Jan2023, 00:10	1.514
EXT-27	0.0101	19.95	06Jan2023, 00:10	1.071
EXT-28	0.001	2.408	06Jan2023, 00:08	0.131
EXT-29	0.0012	2.89	06Jan2023, 00:08	0.157
EXT-30	0.0008	1.926	06Jan2023, 00:08	0.105
EXT-31	0.0016	3.853	06Jan2023, 00:08	0.21
EXT-32	0.0008	1.87	06Jan2023, 00:08	0.101
LosPicaros-1	0.241	404.444	06Jan2023, 00:16	23.262
R100	0.0923	188.826	06Jan2023, 00:12	10.157
R101	0.0112	18.097	06Jan2023, 00:12	0.968
R102	0.0433	81.531	06Jan2023, 00:10	4.377
R103	0.0683	126.545	06Jan2023, 00:10	6.794
R104	0.0407	60.094	06Jan2023, 00:14	3.369
R105	0.0605	89.142	06Jan2023, 00:16	5.221
R106	0.0198	30.599	06Jan2023, 00:12	1.67
R107	0.1451	272.959	06Jan2023, 00:16	15.044
R108	0.019	30.29	06Jan2023, 00:14	1.621
R109	0.0078	13.337	06Jan2023, 00:14	0.713
R110	0.0249	48.193	06Jan2023, 00:14	2.585
R111	0.0158	29.264	06Jan2023, 00:10	1.571
Tijeras-1	0.0683	126.545	06Jan2023, 00:10	6.794
Tijeras-2	0.0615	106.867	06Jan2023, 00:12	6.007
Tijeras-3	0.0411	62.391	06Jan2023, 00:10	3.436



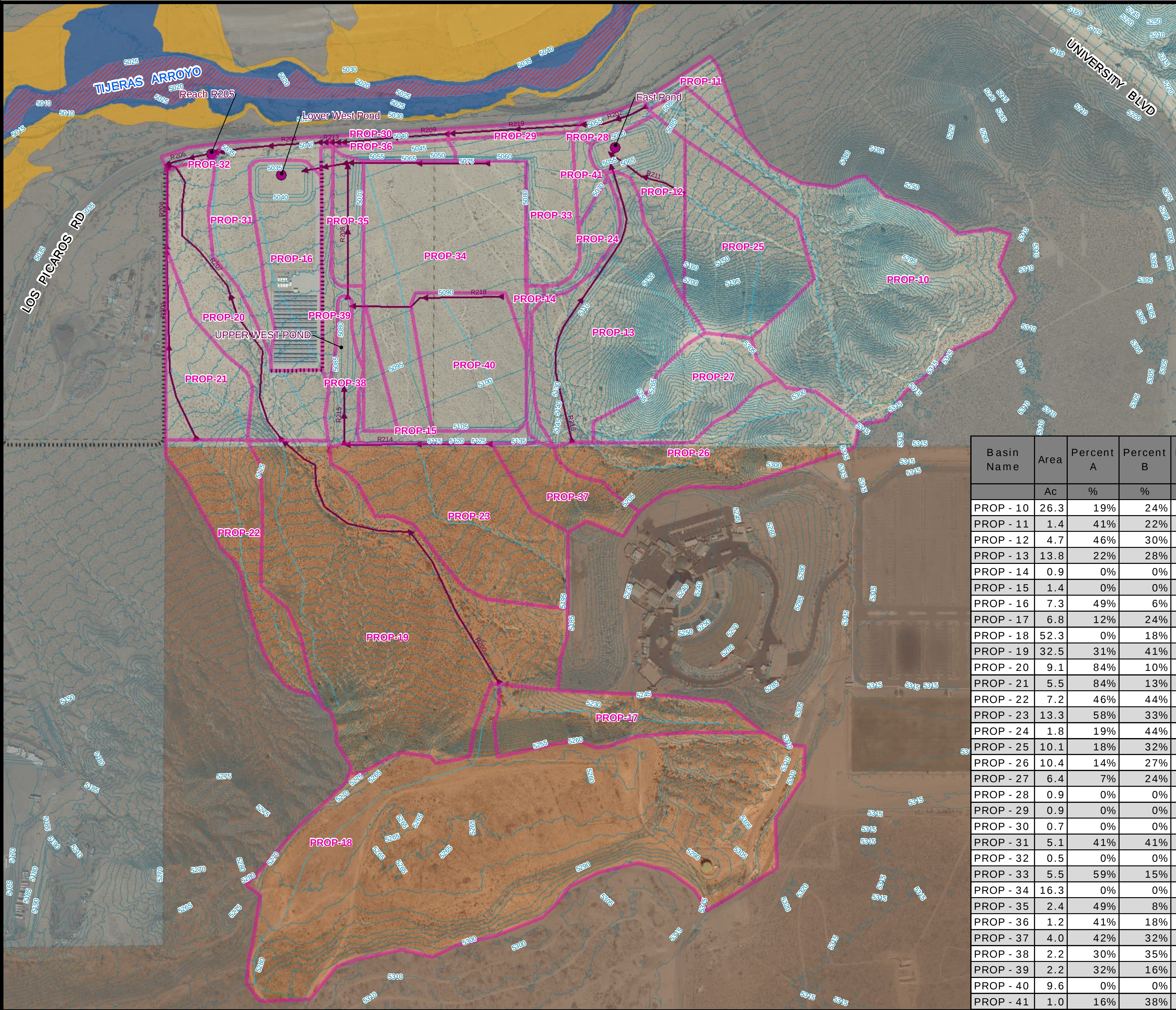
Attachment 3

Proposed Hydrologic Calculations

- 3-1 Proposed Drainage Patterns
- 3-2 Proposed Drainage Tabulation
- 3-3 Proposed HEC-HMS Inputs and Outputs



3-1 Proposed Drainage Patterns



Name	Q100, 24hr Storm cfs	24hr Storm Volume Ac - Ft	10day Storm Volume Ac - Ft
Reaches:			
R200	152.4	6.1	10.2
R201	13.0	0.5	1.0
R202	3.1	0.1	0.2
R204	34.3	1.5	2.4
R205	41.6	1.9	3.2
R206	21.6	0.9	1.7
R207	210.2	8.8	14.9
R208	34.0	2.7	4.7
R209	26.4	1.1	1.8
R211	21.1	0.9	1.5
R212	62.5	4.3	7.4
R213	30.4	1.3	2.1
R214	8.3	0.3	0.6
R215	31.6	1.3	2.4
R216	37.6	1.6	2.7
R217	31.1	1.3	2.3
R218	26.5	1.1	1.7
R219	7.6	0.3	0.5
Outfalls:			
R205	41.6	1.9	3.2
EastPond	161.9	6.7	11.6
WestPond - Lower	75.3	4.9	8.5

Basin Name	Area	Percent A	Percent B	Percent C	Percent D	Weighted CN	Q100, 24hr Storm	24hr Storm Volume	10day Storm Volume	Runoff Rate
	Ac	%	%	%	%	unitless	cfs	Ac - Ft	Ac - Ft	cfs/Ac
PROP - 10	26.3	19%	24%	57%	0%	82.6	60.5	2.44	4.17	2.3
PROP - 11	1.4	41%	22%	29%	9%	81.9	3.1	0.13	0.22	2.3
PROP - 12	4.7	46%	30%	24%	0%	79.8	9.1	0.37	0.66	1.9
PROP - 13	13.8	22%	28%	50%	0%	82.1	30.9	1.25	2.15	2.2
PROP - 14	0.9	0%	0%	100%	0%	86.0	2.5	0.10	0.16	2.8
PROP - 15	1.4	0%	0%	100%	0%	86.0	4.1	0.16	0.27	2.8
PROP - 16	7.3	49%	6%	45%	0%	81.2	15.4	0.63	1.09	2.1
PROP - 17	6.8	12%	24%	64%	0%	83.3	16.3	0.65	1.11	2.4
PROP - 18	52.3	0%	18%	82%	0%	84.8	136.1	5.46	9.05	2.6
PROP - 19	32.5	31%	41%	28%	0%	80.4	65.3	2.67	4.70	2.0
PROP - 20	9.1	84%	10%	6%	0%	77.8	15.4	0.64	1.18	1.7
PROP - 21	5.5	84%	13%	3%	0%	77.5	9.1	0.38	0.70	1.7
PROP - 22	7.2	46%	44%	10%	0%	78.8	13.0	0.54	0.97	1.8
PROP - 23	13.3	58%	33%	9%	0%	78.5	23.7	0.98	1.78	1.8
PROP - 24	1.8	19%	44%	37%	0%	81.2	3.8	0.15	0.27	2.2
PROP - 25	10.1	18%	32%	50%	0%	82.1	21.5	0.88	1.52	2.1
PROP - 26	10.4	14%	27%	59%	0%	82.8	23.3	0.94	1.62	2.2
PROP - 27	6.4	7%	24%	69%	0%	83.7	15.1	0.61	1.03	2.3
PROP - 28	0.9	0%	0%	83%	17%	88.0	2.4	0.10	0.16	2.5
PROP - 29	0.9	0%	0%	81%	19%	88.3	2.6	0.10	0.16	3.0
PROP - 30	0.7	0%	0%	81%	19%	88.3	2.4	0.10	0.15	3.2
PROP - 31	5.1	41%	41%	15%	3%	79.8	9.9	0.41	0.72	1.9
PROP - 32	0.5	0%	0%	81%	19%	88.3	1.6	0.06	0.10	3.2
PROP - 33	5.5	59%	15%	26%	0%	79.6	17.1	0.69	1.09	3.1
PROP - 34	16.3	0%	0%	100%	0%	86.0	31.1	1.28	2.27	1.9
PROP - 35	2.4	49%	8%	43%	0%	81.0	6.8	0.27	0.44	2.8
PROP - 36	1.2	41%	18%	41%	0%	81.1	2.5	0.10	0.18	2.1
PROP - 37	4.0	42%	32%	26%	0%	80.0	8.3	0.34	0.59	2.1
PROP - 38	2.2	30%	35%	35%	0%	80.8	4.3	0.18	0.31	2.0
PROP - 39	2.2	32%	16%	52%	0%	82.0	4.6	0.19	0.33	2.1
PROP - 40	9.6	0%	0%	100%	0%	86.0	26.5	1.06	1.73	2.8
PROP - 41	1.0	16%	38%	45%	0%	81.8	2.1	0.09	0.15	2.2

LEGEND

PROPOSED DRAINAGE BASINS

FLOOD ZONES:

- AE
- AE, FLOODWAY
- X, 0.2 PCT ANNUAL CHANCE FLOOD HAZARD

NON - CONTRIBUTING DRAINAGE

BERM

PROPOSED OUTFALLS

CHANNEL REACHES

LONGEST FLOW PATHS:

- SHEET
- SHALLOW CONCENTRATED
- CHANNEL
- 5 FT CONTOURS

PROPERTY LINE

JURISDICTION:

ALBUQUERQUE

UNINCORPORATED



0 600 1,200 FEET

1 INCH = 300 FEET
WHEN PRINTED ON 22" X 34" PAPER



PROJECT: PROSPERITY SUBSTATION
LOCATION: BERNALILLO COUNTY, NM
PREPARED FOR: PNM
AECOM PROJECT NO.: 606XXXXX

PNM REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D	OKD	APP'D
△						
△						
△						
△						

PNM

PUBLIC SERVICE COMPANY
OF NEW MEXICO

PROPOSED CONDITIONS
DRAINAGE PATTERNS

DR:	DATE: 2 / 28 / 23	ATTACHMENT
ACAD-	APP:	3 - 1

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3-2 Proposed Drainage Tabulation

Attachment 3-2:Proposed Conditions Drainage Basins Input and Output Data

Input Data:

Basin Name	Area sf	Area Ac	Area A Ac	Area B Ac	Area C Ac	Area D Ac	Percent A %	Percent B %	Percent C %	Percent D %	CN A unitless	CN B unitless	CN C unitless	CN D unitless	Weighted CN unitless
PROP-10	1145680	26.30	5.02	6.22	15.06	0.00	19%	24%	57%	0%	77	79	86	98	82.6
PROP-11	60043	1.38	0.56	0.30	0.40	0.12	41%	22%	29%	9%	77	79	86	98	81.9
PROP-12	204028	4.68	2.16	1.39	1.13	0.00	46%	30%	24%	0%	77	79	86	98	79.8
PROP-13	601084	13.80	3.03	3.87	6.89	0.00	22%	28%	50%	0%	77	79	86	98	82.1
PROP-14	38322	0.88	0.00	0.00	0.88	0.00	0%	0%	100%	0%	77	79	86	98	86.0
PROP-15	63043	1.45	0.00	0.00	1.45	0.00	0%	0%	100%	0%	77	79	86	98	86.0
PROP-16	318822	7.32	3.59	0.43	3.29	0.00	49%	6%	45%	0%	77	79	86	98	81.2
PROP-17	296017	6.80	0.81	1.61	4.38	0.00	12%	24%	64%	0%	77	79	86	98	83.3
PROP-18	2277962	52.30	0.00	9.30	43.00	0.00	0%	18%	82%	0%	77	79	86	98	84.8
PROP-19	1414049	32.46	9.95	13.35	9.16	0.00	31%	41%	28%	0%	77	79	86	98	80.4
PROP-20	395184	9.07	7.60	0.90	0.58	0.00	84%	10%	6%	0%	77	79	86	98	77.8
PROP-21	240118	5.51	4.62	0.72	0.17	0.00	84%	13%	3%	0%	77	79	86	98	77.5
PROP-22	311854	7.16	3.30	3.13	0.73	0.00	46%	44%	10%	0%	77	79	86	98	78.8
PROP-23	579154	13.30	7.76	4.33	1.21	0.00	58%	33%	9%	0%	77	79	86	98	78.5
PROP-24	76840	1.76	0.33	0.78	0.65	0.00	19%	44%	37%	0%	77	79	86	98	81.2
PROP-25	441326	10.13	1.86	3.20	5.07	0.00	18%	32%	50%	0%	77	79	86	98	82.1
PROP-26	453731	10.42	1.49	2.78	6.15	0.00	14%	27%	59%	0%	77	79	86	98	82.8
PROP-27	280828	6.45	0.44	1.54	4.46	0.00	7%	24%	69%	0%	77	79	86	98	83.7
PROP-28	40933	0.94	0.00	0.00	0.78	0.16	0%	0%	83%	17%	77	79	86	98	88.0
PROP-29	37229	0.85	0.00	0.00	0.69	0.16	0%	0%	81%	19%	77	79	86	98	88.3
PROP-30	32451	0.74	0.00	0.00	0.60	0.14	0%	0%	81%	19%	77	79	86	98	88.3
PROP-31	222210	5.10	2.09	2.09	0.74	0.17	41%	41%	15%	3%	77	79	86	98	79.8
PROP-32	21467	0.49	0.00	0.00	0.40	0.09	0%	0%	81%	19%	77	79	86	98	88.3
PROP-33	239757	5.50	3.25	0.83	1.43	0.00	59%	15%	26%	0%	77	79	86	98	79.6
PROP-34	709033	16.28	0.00	0.00	16.28	0.00	0%	0%	100%	0%	77	79	86	98	86.0
PROP-35	106189	2.44	1.19	0.20	1.04	0.00	49%	8%	43%	0%	77	79	86	98	81.0
PROP-36	53560	1.23	0.50	0.22	0.51	0.00	41%	18%	41%	0%	77	79	86	98	81.1
PROP-37	172807	3.97	1.67	1.25	1.05	0.00	42%	32%	26%	0%	77	79	86	98	80.0
PROP-38	94461	2.17	0.65	0.77	0.75	0.00	30%	35%	35%	0%	77	79	86	98	80.8
PROP-39	96909	2.22	0.71	0.36	1.16	0.00	32%	16%	52%	0%	77	79	86	98	82.0
PROP-40	416574	9.56	0.00	0.00	9.56	0.00	0%	0%	100%	0%	77	79	86	98	86.0
PROP-41	41536	0.95	0.16	0.37	0.43	0.00	16%	38%	45%	0%	77	79	86	98	81.8

Attachment 3-2:Proposed Conditions Drainage Basins Input and Output Data

Output Data (From HEC-HMS):

Basin Name	Drainage Area Sq Mi.	Q100, 24hr Storm cfs	Time to Peak, 24hr Storm	24hr Storm Volume Ac-Ft	10day Storm Volume Ac-Ft	Runoff Rate cfs/Ac
PROP-10	0.0411	60.5	01Jan2023, 12:10	2.44	4.17	2.3
PROP-11	0.0022	3.1	01Jan2023, 12:10	0.13	0.22	2.3
PROP-12	0.0073	9.1	01Jan2023, 12:10	0.37	0.66	1.9
PROP-13	0.0216	30.9	01Jan2023, 12:10	1.25	2.15	2.2
PROP-14	0.0014	2.5	01Jan2023, 12:10	0.10	0.16	2.8
PROP-15	0.0023	4.1	01Jan2023, 12:10	0.16	0.27	2.8
PROP-16	0.0114	15.4	01Jan2023, 12:10	0.63	1.09	2.1
PROP-17	0.0106	16.3	01Jan2023, 12:10	0.65	1.11	2.4
PROP-18	0.0817	136.1	01Jan2023, 12:10	5.46	9.05	2.6
PROP-19	0.0507	65.3	01Jan2023, 12:10	2.67	4.70	2.0
PROP-20	0.0142	15.4	01Jan2023, 12:10	0.64	1.18	1.7
PROP-21	0.0086	9.1	01Jan2023, 12:10	0.38	0.70	1.7
PROP-22	0.0112	13.0	01Jan2023, 12:10	0.54	0.97	1.8
PROP-23	0.0208	23.7	01Jan2023, 12:10	0.98	1.78	1.8
PROP-24	0.0028	3.8	01Jan2023, 12:10	0.15	0.27	2.2
PROP-25	0.0158	21.5	01Jan2023, 12:10	0.88	1.52	2.1
PROP-26	0.0163	23.3	01Jan2023, 12:10	0.94	1.62	2.2
PROP-27	0.0101	15.1	01Jan2023, 12:10	0.61	1.03	2.3
PROP-28	0.0015	2.4	01Jan2023, 12:10	0.10	0.16	2.5
PROP-29	0.0013	2.6	01Jan2023, 12:10	0.10	0.16	3.0
PROP-30	0.0012	2.4	01Jan2023, 12:10	0.10	0.15	3.2
PROP-31	0.0080	9.9	01Jan2023, 12:10	0.41	0.72	1.9
PROP-32	0.0008	1.6	01Jan2023, 12:10	0.06	0.10	3.2
PROP-33	0.0086	17.1	01Jan2023, 12:10	0.69	1.09	3.1
PROP-34	0.0254	31.1	01Jan2023, 12:10	1.28	2.27	1.9
PROP-35	0.0038	6.8	01Jan2023, 12:10	0.27	0.44	2.8
PROP-36	0.0019	2.5	01Jan2023, 12:10	0.10	0.18	2.1
PROP-37	0.0062	8.3	01Jan2023, 12:10	0.34	0.59	2.1
PROP-38	0.0034	4.3	01Jan2023, 12:10	0.18	0.31	2.0
PROP-39	0.0035	4.6	01Jan2023, 12:10	0.19	0.33	2.1
PROP-40	0.0149	26.5	01Jan2023, 12:10	1.06	1.73	2.8
PROP-41	0.0015	2.1	01Jan2023, 12:10	0.09	0.15	2.2

Attachment 3-2: Proposed Conditions Time of Concentration and Lag Time

1st Flow Reach (Sheet Flow):

Basin Name	Flow Type	Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Velocity, Vn fps	nth Travel Time, Tn Hrs
PROP-10	SHEET	5315.5	5308.3	147	0.049	1	2.2	0.018
PROP-11*								
PROP-12*								
PROP-13	SHEET	5296.9	5294.7	40	0.055	1	2.3	0.005
PROP-14*								
PROP-15*								
PROP-16	SHEET	5089.1	5084.9	91	0.046	1	2.1	0.012
PROP-17	SHEET	5304.4	5294.6	195	0.051	1	2.3	0.024
PROP-18	SHEET	5301.0	5289.8	231	0.048	1	2.2	0.029
PROP-19	SHEET	5268.0	5258.0	52	0.193	1	4.4	0.003
PROP-20	SHEET	5104.7	5095.2	198	0.048	1	2.2	0.025
PROP-21	SHEET	5111.7	5104.2	69	0.109	1	3.3	0.006
PROP-22	SHEET	5257.7	5242.6	35	0.437	1	6.6	0.001
PROP-23	SHEET	5188.6	5184.5	149	0.028	1	1.7	0.025
PROP-24*								
PROP-25	SHEET	5305.8	5299.2	73	0.090	1	3.0	0.007
PROP-26	SHEET	5314.8	5304.5	186	0.055	1	2.4	0.022
PROP-27	SHEET	5305.8	5300.3	115	0.048	1	2.2	0.015
PROP-28*								
PROP-29*								
PROP-30*								
PROP-31	SHEET	5079.6	5071.2	187	0.045	1	2.1	0.024
PROP-32*								
PROP-33*								
PROP-34	SHEET	5103.2	5095.0	323	0.025	1	1.6	0.056
PROP-35*								
PROP-36*								
PROP-37*								
PROP-38*								
PROP-39*								
PROP-40	SHEET	5113.5	5098.1	305	0.050	1	2.2	0.038
PROP-41*								

*minimum Tc of 0.2 hrs used for small basins

Attachment 3-2: Proposed Conditions Time of Concentration and Lag Time

2nd Flow Reach (Shallow Concentrated Flow):

Basin Name	Flow Type	Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Adjusted Slope, s' ** ft/ft	Velocity, Vn fps	nth Travel Time, Tn Hrs
PROP-10	SC	5308.3	5080.8	1960	0.116	2	0.060	4.9	0.111
PROP-11*									
PROP-12*									
PROP-13	SC	5294.7	5085.0	605	0.347	2	0.075	5.5	0.031
PROP-14*									
PROP-15*									
PROP-16	SC	5084.9	5045.0	842	0.047	2	0.046	4.3	0.054
PROP-17	SC	5294.5	5178.7	1220	0.095	2	0.058	4.8	0.070
PROP-18	SC	5289.8	5178.7	2196	0.051	2	0.048	4.4	0.139
PROP-19	SC	5258.1	5090.7	1442	0.116	2	0.060	4.9	0.082
PROP-20	SC	5095.2	5074.8	317	0.064	2	0.053	4.6	0.019
PROP-21	SC	5104.2	5064.8	488	0.081	2	0.056	4.8	0.029
PROP-22	SC	5242.6	5087.5	1492	0.104	2	0.059	4.8	0.085
PROP-23	SC	5184.5	5120.0	1129	0.057	2	0.051	4.5	0.069
PROP-24*									
PROP-25	SC	5299.2	5100.0	852	0.234	2	0.067	5.2	0.046
PROP-26	SC	5304.3	5154.7	1376	0.109	2	0.059	4.9	0.079
PROP-27	SC	5300.3	5154.8	895	0.163	2	0.063	5.0	0.050
PROP-28*									
PROP-29*									
PROP-30*									
PROP-31	SC	5071.2	5034.8	924	0.039	2		4.0	0.065
PROP-32*									
PROP-33*									
PROP-34	SC	5095.0	5076.9	1088	0.017	2		2.6	0.117
PROP-35*									
PROP-36*									
PROP-37*									
PROP-38*									
PROP-39*									
PROP-40	SC	5098.1	5090.0	479	0.017	2		2.6	0.051
PROP-41*									

*minimum Tc of 0.2 hrs used for small basins

**slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

Attachment 3-2: Proposed Conditions Time of Concentration and Lag Time

3rd Flow Reach (Channel Flow):

Basin Name	Flow Type	Elev_hi Ft	Elev_low Ft	Length Ft	Slope Ft/Ft	Conveyance Factor, K unitless	Adjusted Slope, s' ** ft/ft	Velocity, Vn fps	nth Travel Time, Tn Hrs
PROP-10									
PROP-11									
PROP-12									
PROP-13	CHANNEL	5085.0	5065.0	496	0.040	3		6.0	0.023
PROP-14									
PROP-15									
PROP-16									
PROP-17									
PROP-18									
PROP-19									
PROP-20	CHANNEL	5074.8	5036.8	1156	0.033	3		5.4	0.059
PROP-21	CHANNEL	5064.8	5046.5	621	0.029	3		5.2	0.033
PROP-22									
PROP-23	CHANNEL	5120.0	5107.5	361	0.035	3		5.6	0.018
PROP-24									
PROP-25									
PROP-26									
PROP-27									
PROP-28									
PROP-29									
PROP-30									
PROP-31									
PROP-32									
PROP-33									
PROP-34									
PROP-35									
PROP-36									
PROP-37									
PROP-38									
PROP-39									
PROP-40									
PROP-24									

*minimum Tc of 0.2 hrs used for small basins

**slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

Attachment 3-2: Proposed Conditions Time of Concentration and Lag Time

Time of Concentration and Lag Time:

Time of Concentration and Lag Time					
0	Basin Name	Calculated Time of Conc., Tc	Tc Used (0.2hrs Min.)	Lag Time	Recommended Max Time Step (0.29*Lag)
0		Hrs	Hrs	Min	Min
	PROP-10	0.13	0.2	7.2	2.1
	PROP-11*		0.2	7.2	2.1
	PROP-12*		0.2	7.2	2.1
	PROP-13	0.06	0.2	7.2	2.1
	PROP-14*		0.2	7.2	2.1
	PROP-15*		0.2	7.2	2.1
	PROP-16	0.07	0.2	7.2	2.1
	PROP-17	0.09	0.2	7.2	2.1
	PROP-18	0.17	0.2	7.2	2.1
	PROP-19	0.09	0.2	7.2	2.1
	PROP-20	0.10	0.2	7.2	2.1
	PROP-21	0.07	0.2	7.2	2.1
	PROP-22	0.09	0.2	7.2	2.1
	PROP-23	0.11	0.2	7.2	2.1
	PROP-24*		0.2	7.2	2.1
	PROP-25	0.05	0.2	7.2	2.1
	PROP-26	0.10	0.2	7.2	2.1
	PROP-27	0.06	0.2	7.2	2.1
	PROP-28*		0.2	7.2	2.1
	PROP-29*		0.2	7.2	2.1
	PROP-30*		0.2	7.2	2.1
	PROP-31	0.09	0.2	7.2	2.1
	PROP-32*		0.2	7.2	2.1
	PROP-33*		0.2	7.2	2.1
	PROP-34	0.17	0.2	7.2	2.1
	PROP-35*		0.2	7.2	2.1
	PROP-36*		0.2	7.2	2.1
	PROP-37*		0.2	7.2	2.1
	PROP-38*		0.2	7.2	2.1
	PROP-39*		0.2	7.2	2.1
	PROP-40	0.09	0.2	7.2	2.1
	PROP-41*		0.2	7.2	2.1

Attachment 3-2: Proposed Conditions Reach and Outfall Input and Output Data

Input Data:

Name	elev_hi	elev_low	length	Slope	s' **	K	Velocity	Travel Time
Reaches:	ft	ft	ft	ft/ft	ft/ft	unitless	fps	minutes
R200	5178.7	5090.6	1789	0.049	0.047	3	6.5	4.6
R201	5087.5	5046.5	997	0.041	0.041	3	6.1	2.7
R202	5071.9	5053.5	326	0.056	0.051	3	6.7	0.8
R204	5040.2	5034.8	530	0.010		3	3.0	2.9
R205	5034.8	5034.0	279	0.003		3	1.6	2.9
R206	5046.5	5034.0	428	0.029		3	5.1	1.4
R207	5090.7	5034.0	1626	0.035		3	5.6	4.8
R208**			689	0.048	0.046	3	6.5	1.8
R209	5040.1	5038.1	551	0.004		3	1.8	5.1
R211	5100.0	5055.1	451	0.100	0.058	3	7.3	1.0
R212**			211	0.011		3	3.1	1.1
R213**			92	0.010		3	3.0	0.5
R214	5132.4	5107.5	751	0.033		3	5.5	2.3
R215	5107.5	5083.0	300	0.082	0.057	3	7.1	0.7
R216	5144.2	5065.0	1534	0.052	0.048	3	6.6	3.9
R217**			720	0.040		3	6.0	2.0
R218**			800	0.010		3	3.0	4.4
R219	5053.5	5040.1	696	0.019		3	4.2	2.8

*slope adjustment per DPM section 6-2(B)(5) for slopes greater than 4%

**proposed storm drain slope used (from plan)

Attachment 3-2: Proposed Conditions Reach and Outfall Input and Output Data

Output Data (From HEC-HMS):

Name	drainage area	Q100, 24hr Storm	time of peak, 24hr Storm	24hr Storm Volume	10day Storm Volume
Reaches:	sq mi.	cfs		Ac-Ft	Ac-Ft
R200	0.092	152.4	01Jan2023, 12:14	6.11	10.16
R201	0.011	13.0	01Jan2023, 12:12	0.54	0.97
R202	0.002	3.1	01Jan2023, 12:10	0.13	0.22
R204	0.022	34.3	01Jan2023, 12:16	1.48	2.44
R205	0.030	41.6	01Jan2023, 12:18	1.89	3.16
R206	0.020	21.6	01Jan2023, 12:12	0.92	1.67
R207	0.143	210.2	01Jan2023, 12:16	8.78	14.85
R208	0.048	34.0	01Jan2023, 12:24	2.72	4.67
R209	0.015	26.4	01Jan2023, 12:16	1.10	1.78
R211	0.016	21.1	01Jan2023, 12:10	0.88	1.52
R212	0.077	62.5	01Jan2023, 12:16	4.27	7.39
R213	0.018	30.4	01Jan2023, 12:14	1.29	2.11
R214	0.006	8.3	01Jan2023, 12:12	0.34	0.59
R215	0.027	31.6	01Jan2023, 12:10	1.32	2.37
R216	0.026	37.6	01Jan2023, 12:12	1.55	2.65
R217	0.025	31.1	01Jan2023, 12:12	1.28	2.27
R218	0.0149	26.47	01Jan2023, 12:14	1.06	1.73
R219	0.0052	7.57	01Jan2023, 12:12	0.31	0.52
Outfalls:					
R205	0.0297	41.6	01Jan2023, 12:18	1.89	3.16
EastPond	0.1164	161.9	01Jan2023, 12:10	6.74	11.58
WestPond-Lower	0.0882	75.3	01Jan2023, 12:14	4.89	8.48

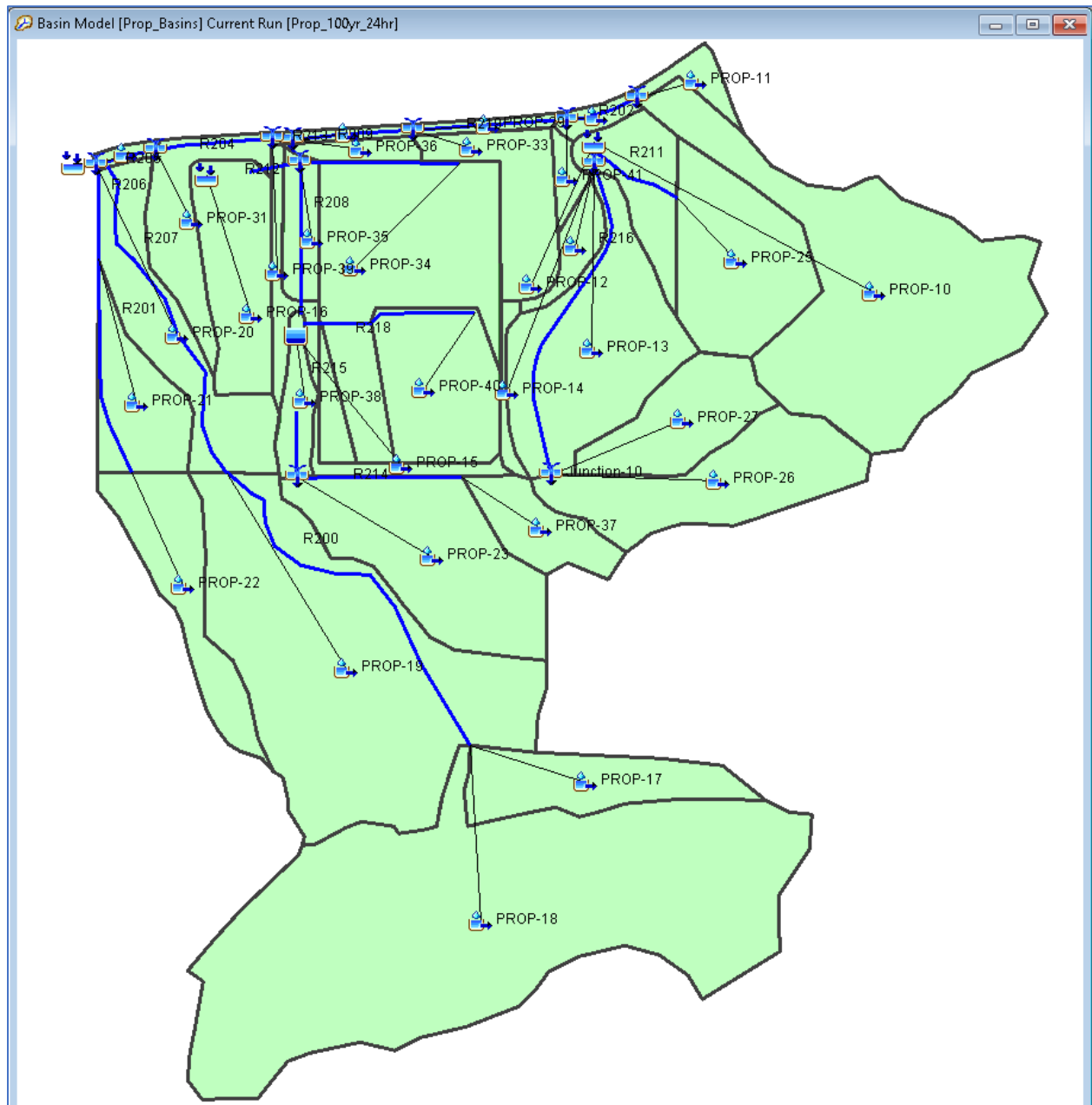


3-3 Proposed HEC-HMS Inputs and Outputs

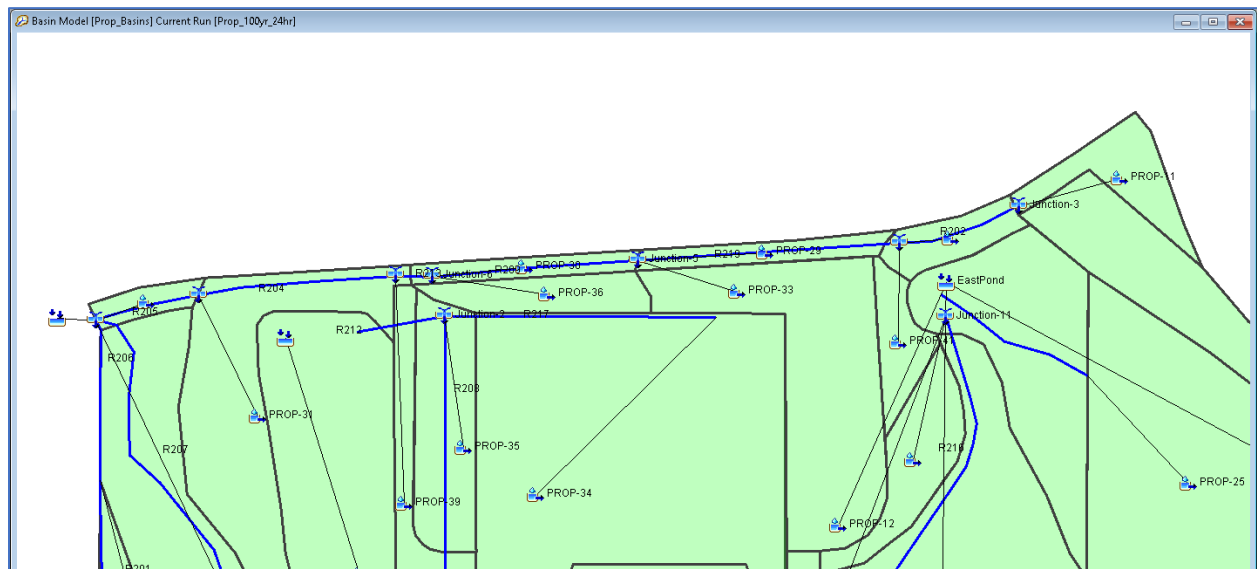
HEC-HMS Inputs and Outputs

Proposed Conditions, 100yr, 24hr Storm & 100yr, 10day Storm

Basin Model



Basin Model – Street Detail



Precipitation

Frequency Storm			Frequency Storm		
Met Name: Met 24hr			Met Name: Met 10day		
Annual-Partial Conversion: --None--			Annual-Partial Conversion: --None--		
Annual-Partial Ratio: 1.00			Annual-Partial Ratio: 1.00		
Storm Duration: 1 Day			Storm Duration: 10 Days		
Intensity Duration: 5 Minutes			Intensity Duration: 5 Minutes		
Intensity Position: 50 Percent			Intensity Position: 50 Percent		
Area Reduction: TP40 TP49			Area Reduction: TP40 TP49		
Storm Area: Subbasin Area(s)			Storm Area: Subbasin Area(s)		
Spatial Distribution: Uniform For All Subbasins			Spatial Distribution: Uniform For All Subbasins		
Duration	Depth (IN)	Area	Duration	Depth (IN)	Area
5 Minutes	0.582		5 Minutes	0.582	
15 Minutes	1.1		15 Minutes	1.1	
1 Hour	1.83		1 Hour	1.83	
2 Hours	2.05		2 Hours	2.05	
3 Hours	2.11		3 Hours	2.11	
6 Hours	2.28		6 Hours	2.28	
12 Hours	2.4		12 Hours	2.4	
1 Day	2.61		1 Day	2.61	
2 Days			2 Days	2.72	
4 Days			4 Days	2.98	
7 Days			7 Days	3.31	
10 Days			10 Days	3.72	

Control

 Control Specifications

Name: Control 24hr

Description:

*Start Date (ddMMYYYY)

*Start Time (HH:mm)

*End Date (ddMMYYYY)

*End Time (HH:mm)

Time Interval:

 Control Specifications

Name: Control 10day

Description:

*Start Date (ddMMYYYY)

*Start Time (HH:mm)

*End Date (ddMMYYYY)

*End Time (HH:mm)

Time Interval:

Pond Summary Tables

 Summary Results for Sink "EastPond"

Project: Project 2 Simulation Run: Prop_100yr_24hr
Sink: EastPond

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins
End of Run: 02Jan2023, 00:10 Meteorologic Model: Met 24hr
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 24hr

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Discharge: 161.869 (CFS)	Date/Time of Peak Discharge: 01Jan2023, 12:10
Volume: 6.744 (ACRE-FT)	

 Summary Results for Sink "EastPond"

Project: Project 2 Simulation Run: Prop_100yr_10day
Sink: EastPond

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins
End of Run: 10Jan2023, 00:10 Meteorologic Model: Met 10day
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 10day

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Discharge: 213.177 (CFS)	Date/Time of Peak Discharge: 06Jan2023, 00:10
Volume: 11.580 (ACRE-FT)	

Summary Results for Sink "WestPond-Lower"

Project: Project 2 Simulation Run: Prop_100yr_24hr

Sink: WestPond-Lower

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins

End of Run: 02Jan2023, 00:10 Meteorologic Model: Met 24hr

Compute Time:DATA CHANGED, RECOMPUTE Control Specifications:Control 24hr

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Discharge:75.258 (CFS) Date/Time of Peak Discharge01Jan2023, 12:14

Volume: 4.892 (ACRE-FT)

Summary Results for Sink "WestPond-Lower"

Project: Project 2 Simulation Run: Prop_100yr_10day

Sink: WestPond-Lower

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins

End of Run: 10Jan2023, 00:10 Meteorologic Model: Met 10day

Compute Time:DATA CHANGED, RECOMPUTE Control Specifications:Control 10day

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Discharge:99.590 (CFS) Date/Time of Peak Discharge06Jan2023, 00:12

Volume: 8.477 (ACRE-FT)

Summary Results for Reservoir "WestPond-Upper"

Project: Project 2 Simulation Run: Prop_100yr_24hr

Reservoir: WestPond-Upper

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins

End of Run: 02Jan2023, 00:10 Meteorologic Model: Met 24hr

Compute Time:DATA CHANGED, RECOMPUTE Control Specifications:Control 24hr

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Inflow: 64.809 (CFS) Date/Time of Peak Inflow: 01Jan2023, 12:12

Peak Discharge: 34.040 (CFS) Date/Time of Peak Discharge:01Jan2023, 12:22

Inflow Volume: 2.720 (ACRE-FT) Peak Storage: 0.748 (ACRE-FT)

Discharge Volume:2.717 (ACRE-FT) Peak Elevation: 3.3 (FT)

Summary Results for Reservoir "WestPond-Upper"

Project: Project 2 Simulation Run: Prop_100yr_10day

Reservoir: WestPond-Upper

Start of Run: 01Jan2023, 00:00 Basin Model: Prop_Basins

End of Run: 10Jan2023, 00:10 Meteorologic Model: Met 10day

Compute Time:DATA CHANGED, RECOMPUTE Control Specifications:Control 10day

Volume Units: ☐ IN ☒ ACRE-FT

Computed Results

Peak Inflow: 83.737 (CFS) Date/Time of Peak Inflow: 06Jan2023, 00:10

Peak Discharge: 40.895 (CFS) Date/Time of Peak Discharge:06Jan2023, 00:22

Inflow Volume: 4.673 (ACRE-FT) Peak Storage: 1.093 (ACRE-FT)

Discharge Volume:4.671 (ACRE-FT) Peak Elevation: 4.3 (FT)

Summary Output Tables

Proposed Conditions, 100yr, 24hr Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EastPond	0.1164	161.869	01Jan2023, 12:10	6.744
Junction-1	0.027	31.64	01Jan2023, 12:10	1.322
Junction-10	0.0264	38.362	01Jan2023, 12:10	1.55
Junction-11	0.0522	72.666	01Jan2023, 12:12	3.054
Junction-2	0.0768	63.026	01Jan2023, 12:14	4.265
Junction-3	0.0022	3.109	01Jan2023, 12:10	0.126
Junction-4	0.0052	7.57	01Jan2023, 12:10	0.306
Junction-5	0.0151	26.978	01Jan2023, 12:10	1.095
Junction-6	0.0182	30.356	01Jan2023, 12:14	1.294
Junction-7	0.0217	34.255	01Jan2023, 12:14	1.483
Junction-8	0.0297	41.557	01Jan2023, 12:16	1.89
Junction-9	0.2075	283.16	01Jan2023, 12:16	12.296
LosPicaros-1	0.2075	283.16	01Jan2023, 12:16	12.296
PROP-10	0.0411	60.522	01Jan2023, 12:10	2.444
PROP-11	0.0022	3.109	01Jan2023, 12:10	0.126
PROP-12	0.0073	9.056	01Jan2023, 12:10	0.372
PROP-13	0.0216	30.89	01Jan2023, 12:10	1.25
PROP-14	0.0014	2.487	01Jan2023, 12:10	0.1
PROP-15	0.0023	4.086	01Jan2023, 12:10	0.164
PROP-16	0.0114	15.443	01Jan2023, 12:10	0.628
PROP-17	0.0106	16.256	01Jan2023, 12:10	0.654
PROP-18	0.0817	136.103	01Jan2023, 12:10	5.46
PROP-19	0.0507	65.325	01Jan2023, 12:10	2.67
PROP-20	0.0142	15.399	01Jan2023, 12:10	0.643
PROP-21	0.0086	9.131	01Jan2023, 12:10	0.383
PROP-22	0.0112	13.008	01Jan2023, 12:10	0.538
PROP-23	0.0208	23.67	01Jan2023, 12:10	0.982
PROP-24	0.0028	3.793	01Jan2023, 12:10	0.154
PROP-25	0.0158	21.534	01Jan2023, 12:10	0.875
PROP-26	0.0163	23.311	01Jan2023, 12:10	0.943
PROP-27	0.0101	15.05	01Jan2023, 12:10	0.607
PROP-28	0.0015	2.353	01Jan2023, 12:10	0.095
PROP-29	0.0013	2.554	01Jan2023, 12:10	0.102

Proposed Conditions, 100yr, 24hr Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
PROP-30	0.0012	2.392	01Jan2023, 12:10	0.096
PROP-31	0.008	9.924	01Jan2023, 12:10	0.407
PROP-32	0.0008	1.595	01Jan2023, 12:10	0.064
PROP-33	0.0086	17.145	01Jan2023, 12:10	0.687
PROP-34	0.0254	31.098	01Jan2023, 12:10	1.278
PROP-35	0.0038	6.751	01Jan2023, 12:10	0.27
PROP-36	0.0019	2.543	01Jan2023, 12:10	0.103
PROP-37	0.0062	8.348	01Jan2023, 12:10	0.34
PROP-38	0.0034	4.272	01Jan2023, 12:10	0.175
PROP-39	0.0035	4.626	01Jan2023, 12:10	0.189
PROP-40	0.0149	26.47	01Jan2023, 12:10	1.06
PROP-41	0.0015	2.107	01Jan2023, 12:10	0.085
R200	0.0923	152.359	01Jan2023, 12:14	6.112
R201	0.0112	13.008	01Jan2023, 12:12	0.538
R202	0.0022	3.109	01Jan2023, 12:10	0.126
R204	0.0217	34.255	01Jan2023, 12:16	1.482
R205	0.0297	41.557	01Jan2023, 12:18	1.889
R206	0.0198	21.596	01Jan2023, 12:12	0.921
R207	0.143	210.191	01Jan2023, 12:16	8.778
R208	0.0476	34.01	01Jan2023, 12:24	2.717
R209	0.0151	26.357	01Jan2023, 12:16	1.095
R211	0.0158	21.058	01Jan2023, 12:10	0.875
R212	0.0768	62.475	01Jan2023, 12:16	4.265
R213	0.0182	30.356	01Jan2023, 12:14	1.294
R214	0.0062	8.348	01Jan2023, 12:12	0.34
R215	0.027	31.64	01Jan2023, 12:10	1.322
R216	0.0264	37.62	01Jan2023, 12:12	1.55
R217	0.0254	31.098	01Jan2023, 12:12	1.278
R218	0.0149	26.47	01Jan2023, 12:14	1.059
R219	0.0052	7.57	01Jan2023, 12:12	0.306
WestPond-Lower	0.0882	75.258	01Jan2023, 12:14	4.892
WestPond-Upper	0.0476	34.04	01Jan2023, 12:22	2.717

Proposed Conditions, 100yr, 10day Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
EastPond	0.1164	213.177	06Jan2023, 00:10	11.58
Junction-1	0.027	44.136	06Jan2023, 00:10	2.366
Junction-10	0.0264	49.534	06Jan2023, 00:10	2.654
Junction-11	0.0522	94.741	06Jan2023, 00:10	5.231
Junction-2	0.0768	82.736	06Jan2023, 00:12	7.386
Junction-3	0.0022	4.052	06Jan2023, 00:10	0.217
Junction-4	0.0052	9.767	06Jan2023, 00:10	0.523
Junction-5	0.0151	32.64	06Jan2023, 00:10	1.776
Junction-6	0.0182	37.057	06Jan2023, 00:14	2.108
Junction-7	0.0217	41.974	06Jan2023, 00:14	2.438
Junction-8	0.0297	51.852	06Jan2023, 00:14	3.16
Junction-9	0.2075	363.173	06Jan2023, 00:16	20.957
LosPicaros-1	0.2075	363.173	06Jan2023, 00:16	20.957
PROP-10	0.0411	77.806	06Jan2023, 00:10	4.17
PROP-11	0.0022	4.052	06Jan2023, 00:10	0.217
PROP-12	0.0073	12.323	06Jan2023, 00:10	0.659
PROP-13	0.0216	40.097	06Jan2023, 00:10	2.147
PROP-14	0.0014	3.018	06Jan2023, 00:08	0.163
PROP-15	0.0023	4.958	06Jan2023, 00:08	0.267
PROP-16	0.0114	20.408	06Jan2023, 00:10	1.092
PROP-17	0.0106	20.622	06Jan2023, 00:10	1.106
PROP-18	0.0817	168.242	06Jan2023, 00:08	9.052
PROP-19	0.0507	87.767	06Jan2023, 00:10	4.695
PROP-20	0.0142	21.93	06Jan2023, 00:10	1.175
PROP-21	0.0086	13.1	06Jan2023, 00:10	0.702
PROP-22	0.0112	18.097	06Jan2023, 00:10	0.968
PROP-23	0.0208	33.159	06Jan2023, 00:10	1.775
PROP-24	0.0028	5.013	06Jan2023, 00:10	0.268
PROP-25	0.0158	28.4	06Jan2023, 00:10	1.52
PROP-26	0.0163	30.26	06Jan2023, 00:10	1.62
PROP-27	0.0101	19.274	06Jan2023, 00:10	1.033
PROP-28	0.0015	2.963	06Jan2023, 00:10	0.159
PROP-29	0.0013	3.008	06Jan2023, 00:08	0.163
PROP-30	0.0012	2.805	06Jan2023, 00:08	0.152
PROP-31	0.008	13.504	06Jan2023, 00:10	0.722
PROP-32	0.0008	1.87	06Jan2023, 00:08	0.101
PROP-33	0.0086	20.103	06Jan2023, 00:08	1.09

Proposed Conditions, 100yr, 10day Storm				
Basin Name	Drainage Area	Q100	Time to Peak	Volume
	Sq Mi.	cfs		Ac-Ft
PROP-34	0.0254	42.502	06Jan2023, 00:10	2.273
PROP-35	0.0038	8.191	06Jan2023, 00:08	0.441
PROP-36	0.0019	3.374	06Jan2023, 00:10	0.18
PROP-37	0.0062	11.054	06Jan2023, 00:10	0.591
PROP-38	0.0034	5.789	06Jan2023, 00:10	0.31
PROP-39	0.0035	6.163	06Jan2023, 00:10	0.33
PROP-40	0.0149	32.116	06Jan2023, 00:08	1.73
PROP-41	0.0015	2.752	06Jan2023, 00:10	0.147
R200	0.0923	188.826	06Jan2023, 00:12	10.157
R201	0.0112	18.097	06Jan2023, 00:12	0.968
R202	0.0022	4.052	06Jan2023, 00:10	0.217
R204	0.0217	41.974	06Jan2023, 00:16	2.438
R205	0.0297	51.852	06Jan2023, 00:16	3.16
R206	0.0198	30.599	06Jan2023, 00:12	1.67
R207	0.143	269.614	06Jan2023, 00:16	14.85
R208	0.0476	40.845	06Jan2023, 00:24	4.671
R209	0.0151	32.206	06Jan2023, 00:14	1.776
R211	0.0158	28.308	06Jan2023, 00:10	1.52
R212	0.0768	82.005	06Jan2023, 00:14	7.385
R213	0.0182	37.057	06Jan2023, 00:14	2.108
R214	0.0062	11.054	06Jan2023, 00:12	0.591
R215	0.027	44.136	06Jan2023, 00:10	2.366
R216	0.0264	49.435	06Jan2023, 00:12	2.653
R217	0.0254	42.502	06Jan2023, 00:12	2.273
R218	0.0149	32.116	06Jan2023, 00:12	1.73
R219	0.0052	9.767	06Jan2023, 00:12	0.523
WestPond-Lower	0.0882	99.59	06Jan2023, 00:12	8.477
WestPond-Upper	0.0476	40.895	06Jan2023, 00:22	4.671



Attachment 4

Proposed Hydraulic Calculations

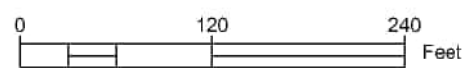
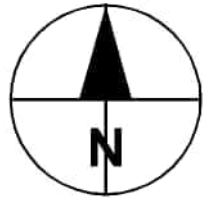
- 4-1 StormCAD Layout
- 4-2 Model Input Data
- 4-3 Profiles and Results Tables
- 4-4 FlowMaster Input and Output Data



4-1 StormCAD Layout



StormCAD LAYOUT, OVERVIEW
Scale: 1"=120'



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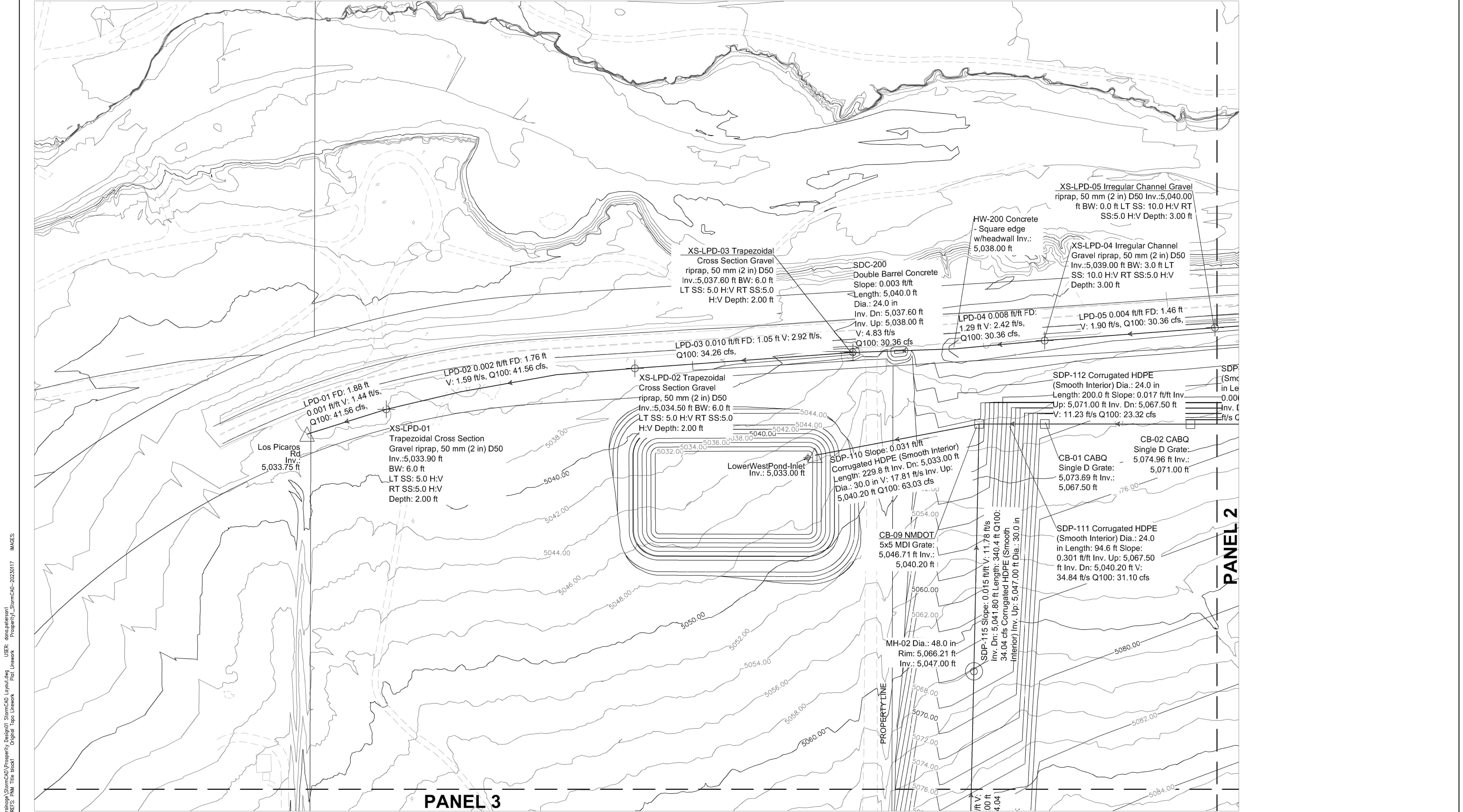
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PANEL 3

PANEL 2

REVISION

NO.	DATE	BY
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StormCAD LAYOUT, PANEL 1

Scale: 1"=60'

N

0

60

120

Feet

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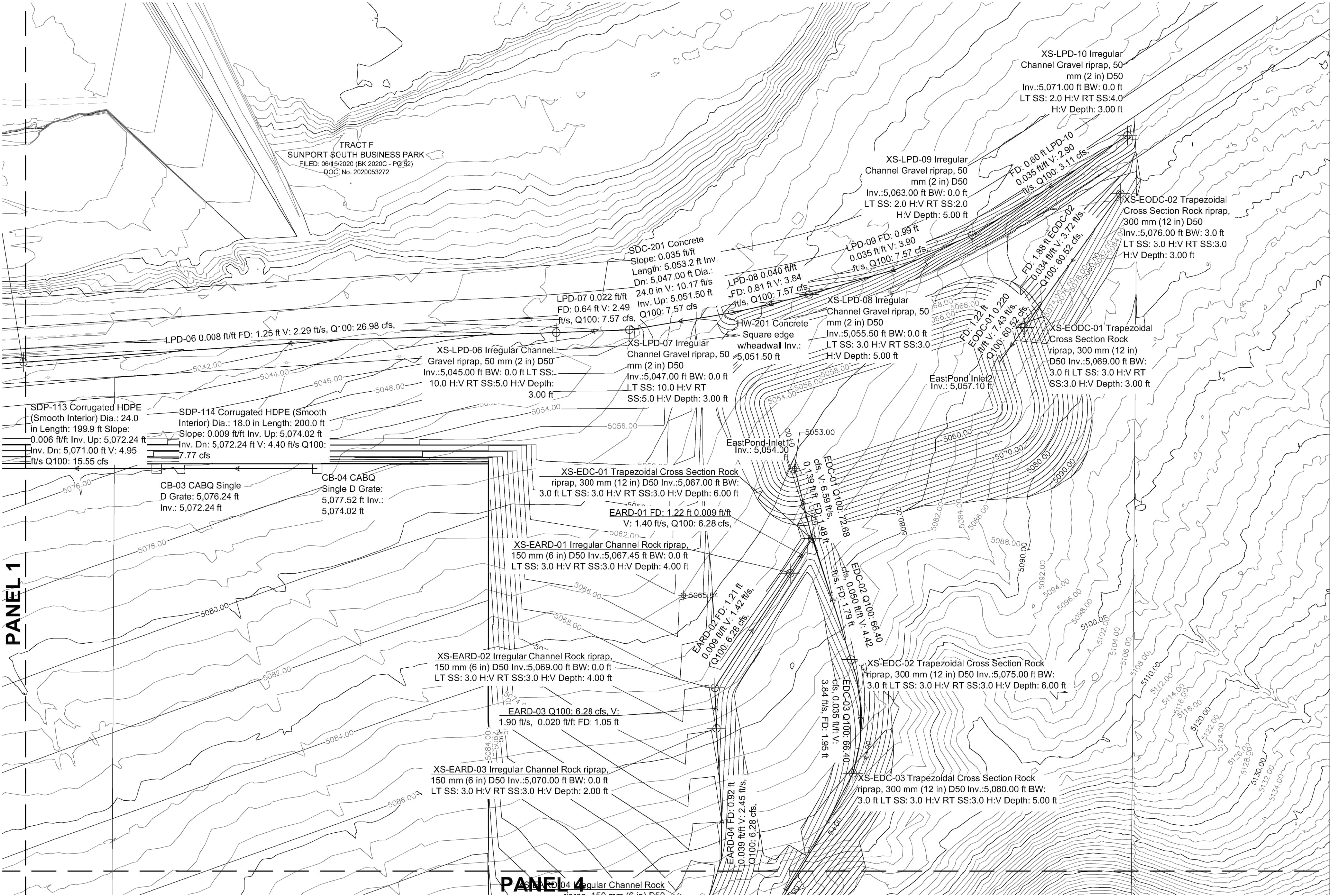
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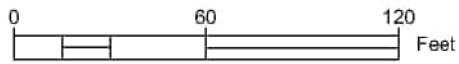
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DATE: Mar 01, 2023 10:25am PLOT: PNM Title sheet Original Logo Linework Plot Linework Prosperity_StormCAD-20230117 IMAGES:



PANEL 1

PANEL 4

StormCAD LAYOUT, PANEL 2
Scale: 1"=60'



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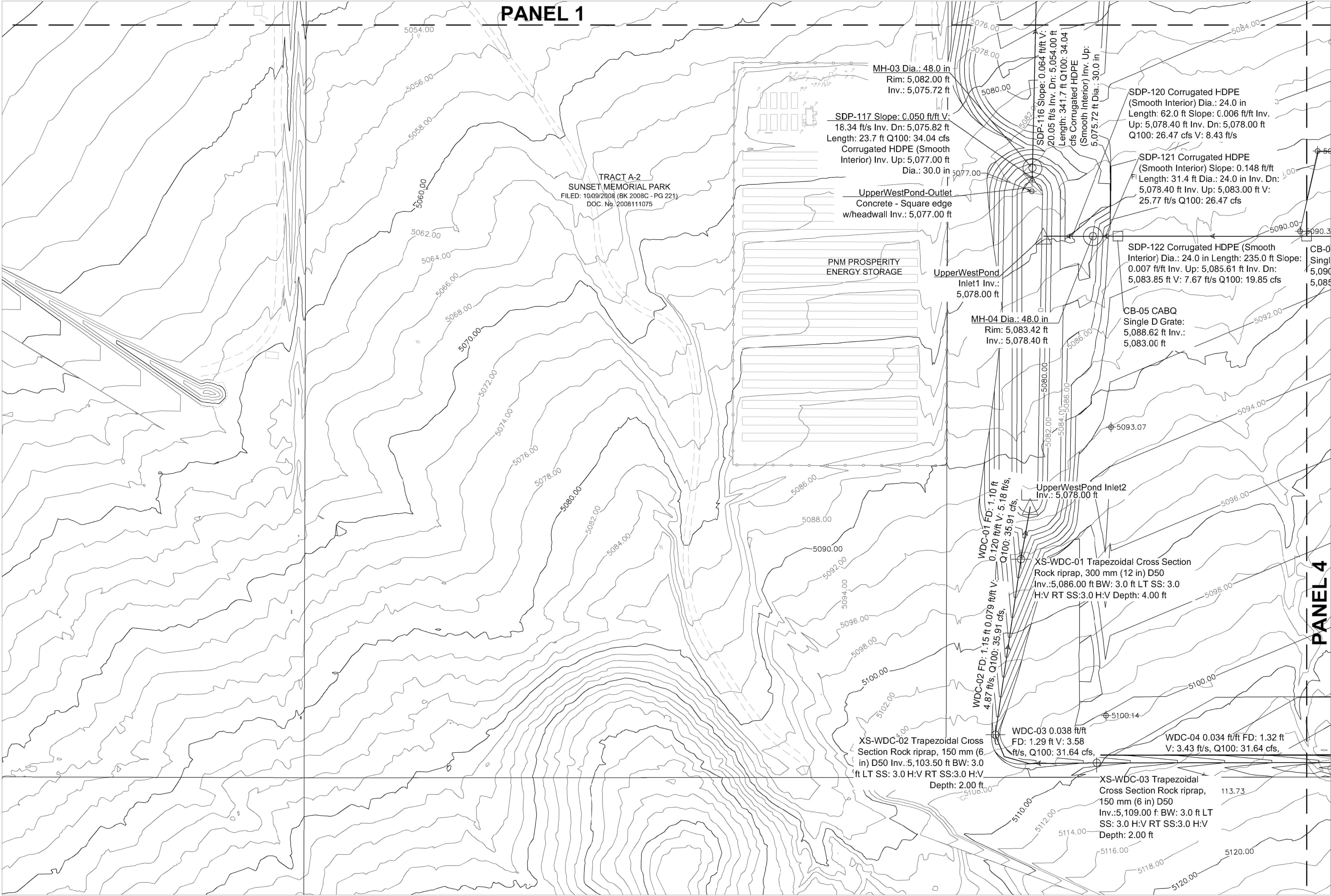
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StormCAD LAYOUT, PANEL 3

Scale: 1"=60'

N

0

60

120

Feet

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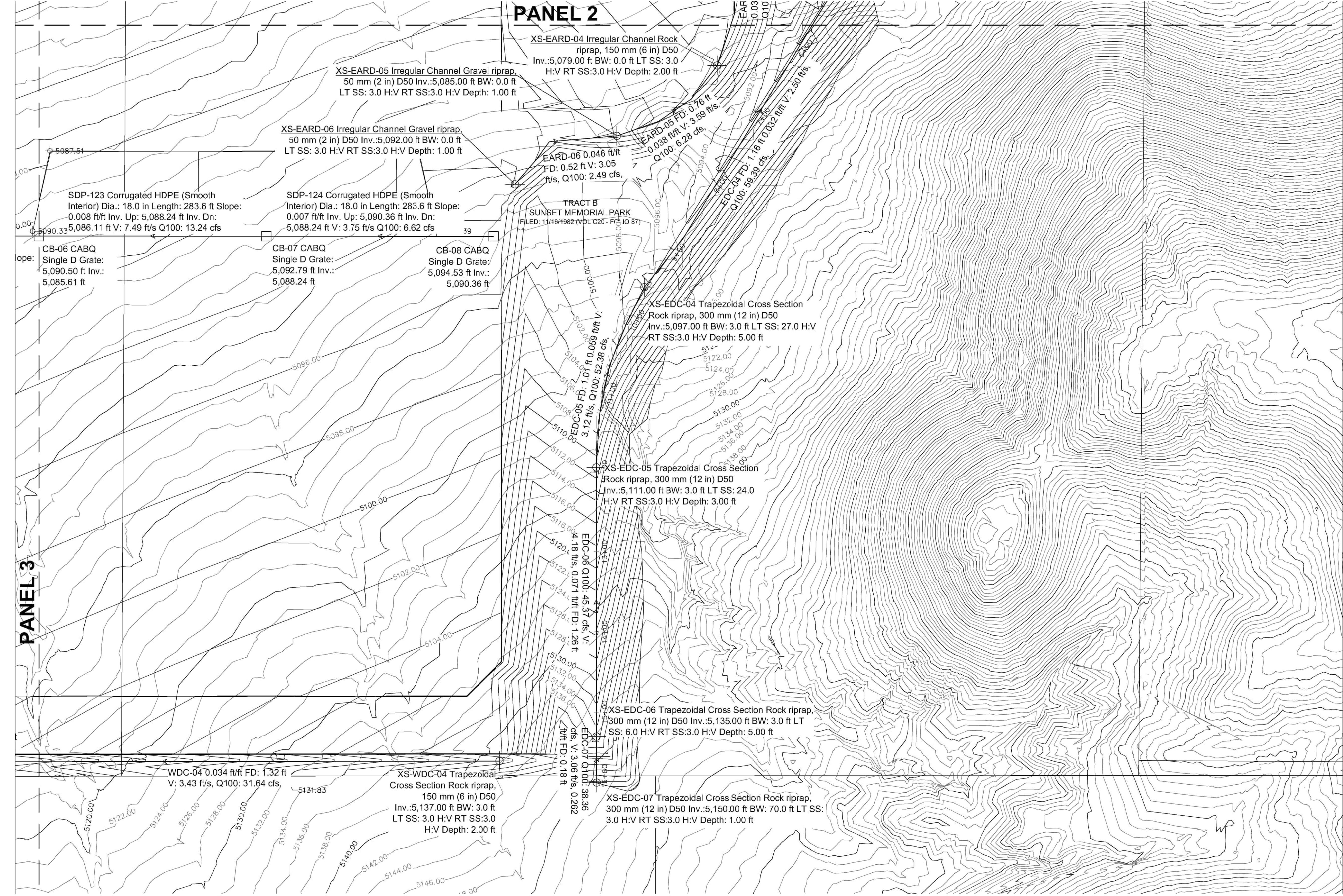
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DATE: Mar 01, 2023 10:21am REFS: PNM Title block Original Logo Linework Plot Linework Prosperity_StormCAD-20230117 IMAGES:

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DATE: Mar 01, 2023 10:25am REGS: PNM Title block Original Logo Linework Plot Linework Prosperity_StormCAD - 20230117 IMAGES:



REVISION	NO.	DATE	BY

StormCAD LAYOUT, PANEL 4

Scale: 1"=60'

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APP:		
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4-2 Model Input Data

Attachment 4-2: Proposed Conditions StormCAD Model Input Data

Catch Basin Table

StormCAD Note	StormCAD Element	HEC-HMS Flow Source Element	Flow (Known), cfs	Inlet	Elevation (Rim), ft	Elevation (Invert), ft
Apply 100% of R217 flows	CB-01	100% of R217	31.10	CABQ Single D	5,073.69	5,067.50
Apply 75% of R217 flows	CB-02	75% of R217	23.32	CABQ Single D	5,074.96	5,071.00
Apply 50% of R217 flows	CB-03	50% of R217	15.55	CABQ Single D	5,076.24	5,072.24
Apply 25% of R217 flows	CB-04	25% of R217	7.77	CABQ Single D	5,077.52	5,074.02
Apply 100% of R218 flows	CB-05	100% of R218	26.47	CABQ Single D	5,088.62	5,083.00
Apply 75% of R218 flows	CB-06	75% of R218	19.85	CABQ Single D	5,090.50	5,085.61
Apply 50% of R218 flows	CB-07	50% of R218	13.24	CABQ Single D	5,092.79	5,088.24
Apply 25% of R218 flows	CB-08	25% of R218	6.62	CABQ Single D	5,094.53	5,090.36
Apply Junction-2 flows	CB-09	Junction-2	63.03	NMDOT 5x5 MDI	5,046.71	5040.20

Manhole Table

StormCAD Note	StormCAD Element	HEC-HMS Flow Source Element	Flow (Known), cfs	Diameter (in)	Elevation (Rim), ft	Elevation (Invert), ft
	MH-02	N/A	N/A	48	5,066.21	5,047.00
	MH-03	N/A	N/A	48	5,082.00	5,075.72
	MH-04	N/A	N/A	48	5,083.42	5,078.40

Headwall Table

StormCAD Note	StormCAD Element	HEC-HMS Flow Source Element	Flow (Known), cfs	Inlet Description	Elevation (Invert), ft	Hydraulic Grade Line (In), ft
Apply WestPond-Upper flows	UpperWestPond-Outlet	WestPond-Upper	34.04	Concrete - Square edge w/headwall	5,077.00	5,077.52
No add'l flows	HW-200	N/A	N/A	Concrete - Square edge w/headwall	5,038.00	5,040.97
No add'l flows	HW-201	N/A	N/A	Concrete - Square edge w/headwall	5,051.50	5,053.02

Cross Section Table

StormCAD Note	StormCAD Element	HEC-HMS Flow Source Element	Inflow (Wet), Fixed Load, cfs
No add'l flows	XS-EARD-01	N/A	N/A
No add'l flows	XS-EARD-02	N/A	N/A
No add'l flows	XS-EARD-03	N/A	N/A
No add'l flows	XS-EARD-04	N/A	N/A
Apply Prop-24 flows	XS-EARD-05	Prop-24	3.79
Apply Prop-14 flows	XS-EARD-06	Prop-14	2.49
Junction inflow	XS-EDC-01	N/A	N/A
No add'l flows	XS-EDC-02	N/A	N/A
Apply 25% of Prop-13 routed flow	XS-EDC-03	25% of Prop-13 routed peak	7.01
Apply 25% of Prop-13 routed flow	XS-EDC-04	25% of Prop-13 routed peak	7.01
Apply 25% of Prop-13 routed flow	XS-EDC-05	25% of Prop-13 routed peak	7.01
Apply 25% of Prop-13 routed flow	XS-EDC-06	25% of Prop-13 routed peak	7.01
Apply Junction-10 flows	XS-EDC-07	Junction-10	38.36
No add'l flows	XS-EODC-01	N/A	N/A
Apply Prop-10 flows	XS-EODC-02	Prop-10	60.52
No add'l flows	XS-LPD-01	N/A	N/A
Apply Junction-8 flows	XS-LPD-02	Junction-8 (minus J-7)	7.30
Apply Junction-7 flows	XS-LPD-03	Junction-7 (minus J-6)	3.90
No add'l flows	XS-LPD-04	N/A	N/A
Apply Junction-6 flows	XS-LPD-05	Junction-6 (minus J-5)	3.38
Apply Junction-5 flows	XS-LPD-06	Junction-5 (minus J-4)	19.41
No add'l flows	XS-LPD-07	N/A	N/A
No add'l flows	XS-LPD-08	N/A	N/A
Apply Junction-4 flows	XS-LPD-09	Junction-4 (minus J-3)	4.46
Apply Junction-3 flows	XS-LPD-10	Junction-3	3.11
No add'l flows	XS-WDC-01	N/A	N/A
Apply Prop-38 flows	XS-WDC-02	Prop-38	4.27
No add'l flows	XS-WDC-03	N/A	N/A
Apply Junction-1 flows	XS-WDC-04	Junction-1	31.64

Attachment 4-2: Proposed Conditions StormCAD Model Input Data

Los Picaros Ditch: Cross Sections

XS-LPD-10

Vee, 2:1, 4:1, 3ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	3	left bank, 2:1
6	0	invert
18	3	right bank, 4:1

XS-LPD-09

Vee, 2:1, 2:1, 5ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	5	left bank, 2:1
10	0	invert
20	5	right bank, 2:1

XS-LPD-08

Vee, 3:1, 3:1, 5ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	5	left bank, 3:1
15	0	invert
30	5	right bank, 3:1

XS-LPD-07 XS-LPD-06

XS-LPD-05 XS-LPD-04

Vee, 10:1, 5:1, 3ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	3	left bank, 10:1
30	0	invert
45	3	right bank, 5:1

XS-LPD-03 XS-LPD-02

XS-LPD-01

Trap., 5:1, 5:1, 6ft BW, 2ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	2	left bank, 5:1
10	0	invert
16	0	invert
26	2	right bank, 5:1

East Diversion Channel: Cross Sections

XS-EDC-07

Trap. Funnel, 3:1, 3:1, 70ft BW, 1ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	1	left bank, 3:1
3	0	invert
73	0	invert
76	1	right bank, 3:1

XS-EDC-06

Trap., 6:1, 3:1, 3ft BW, 5ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	5	left bank, 6:1
30	0	invert
33	0	invert
48	5	right bank, 3:1

XS-EDC-05

Trap., 24:1, 3:1, 3ft BW, 3ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	3	left bank, 24:1
72	0	invert
75	0	invert
84	3	right bank, 3:1

XS-EDC-04

Trap., 27:1, 3:1, 3ft BW, 5ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	5	left bank, 27:1
135	0	invert
138	0	invert
153	5	right bank, 3:1

XS-EDC-03

Trap., 3:1, 3:1, 3ft BW, 5ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	5	left bank, 3:1
15	0	invert
18	0	invert
33	5	right bank, 3:1

XS-EDC-02 XS-EDC-01

Trap., 3:1, 3:1, 3ft BW, 6ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	6	left bank, 3:1
18	0	invert
21	0	invert
39	6	right bank, 3:1

Attachment 4-2: Proposed Conditions StormCAD Model Input Data

East Access Road Ditch: Cross Sections

XS-EARD-06 XS-EARD-05

Vee, 3:1, 3:1, 1ft deep

2-inch Gravel, n=0.041

Station, ft	Elevation, ft	discription
0	1	left bank, 3:1
3	0	invert
6	1	right bank, 3:1

XS-EARD-04 XS-EARD-03

Vee, 3:1, 3:1, 2ft deep

6-inch Rip-Rap, n=0.069

Station, ft	Elevation, ft	discription
0	2	left bank, 3:1
6	0	invert
12	2	right bank, 3:1

XS-EARD-02 XS-EARD-01

Vee, 3:1, 3:1, 4ft deep

6-inch Rip-Rap, n=0.069

Station, ft	Elevation, ft	discription
0	4	left bank, 3:1
12	0	invert
24	4	right bank, 3:1

West Diversion Channel: Cross Sections

XS-WDC-04 XS-WDC-03

XS-WDC-02

Trap., 3:1, 3:1, 3ft BW, 2ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	2	left bank, 3:1
6	0	invert
9	0	invert
15	2	right bank, 3:1

XS-WDC-01

Trap., 3:1, 3:1, 3ft BW, 4ft deep

12-inch Rip-Rap, n=0.078

Station, ft	Elevation, ft	discription
0	4	left bank, 3:1
12	0	invert
15	0	invert
27	4	right bank, 3:1

East Offsite Diversion Channel: Cross Sections

XS-EODC-02 XS-EODC-01

Trap., 3:1, 3:1, 3ft BW, 3ft deep

12-inch Rip-Rap, n=0.078

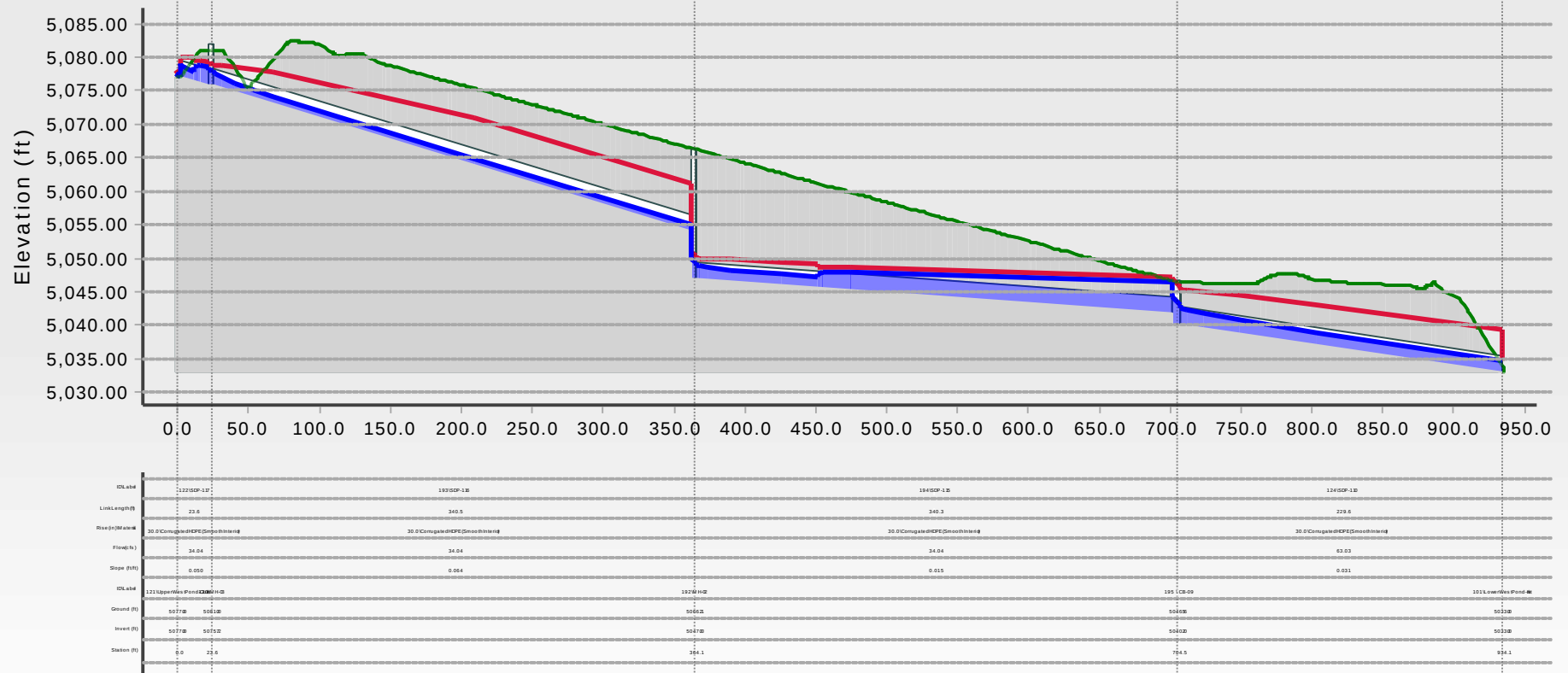
Station, ft	Elevation, ft	discription
0	3	left bank, 3:1
9	0	invert
12	0	invert
21	3	right bank, 3:1



4-3 Profiles and Results Tables

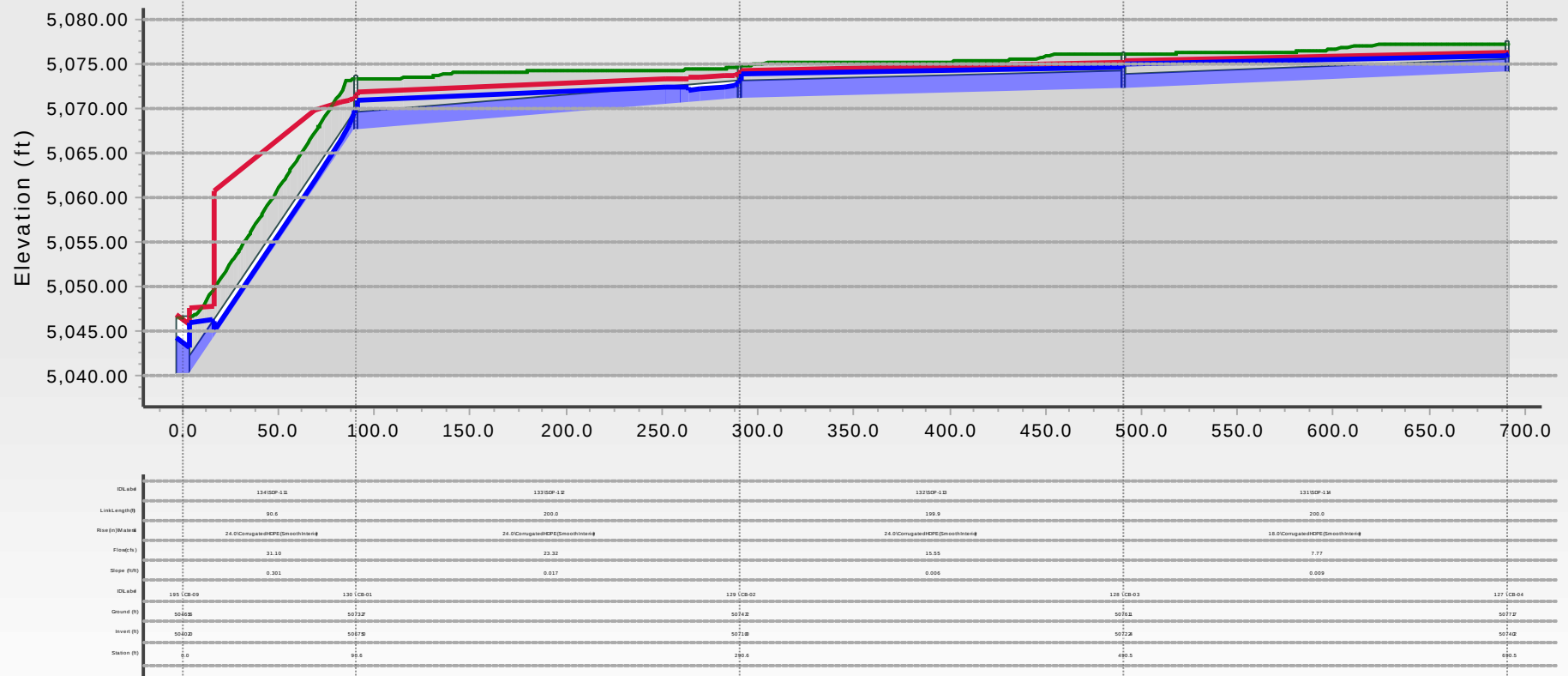
Prosperity Substation 100yr Proposed Conditions

UpperWestPond to LowerWestPond



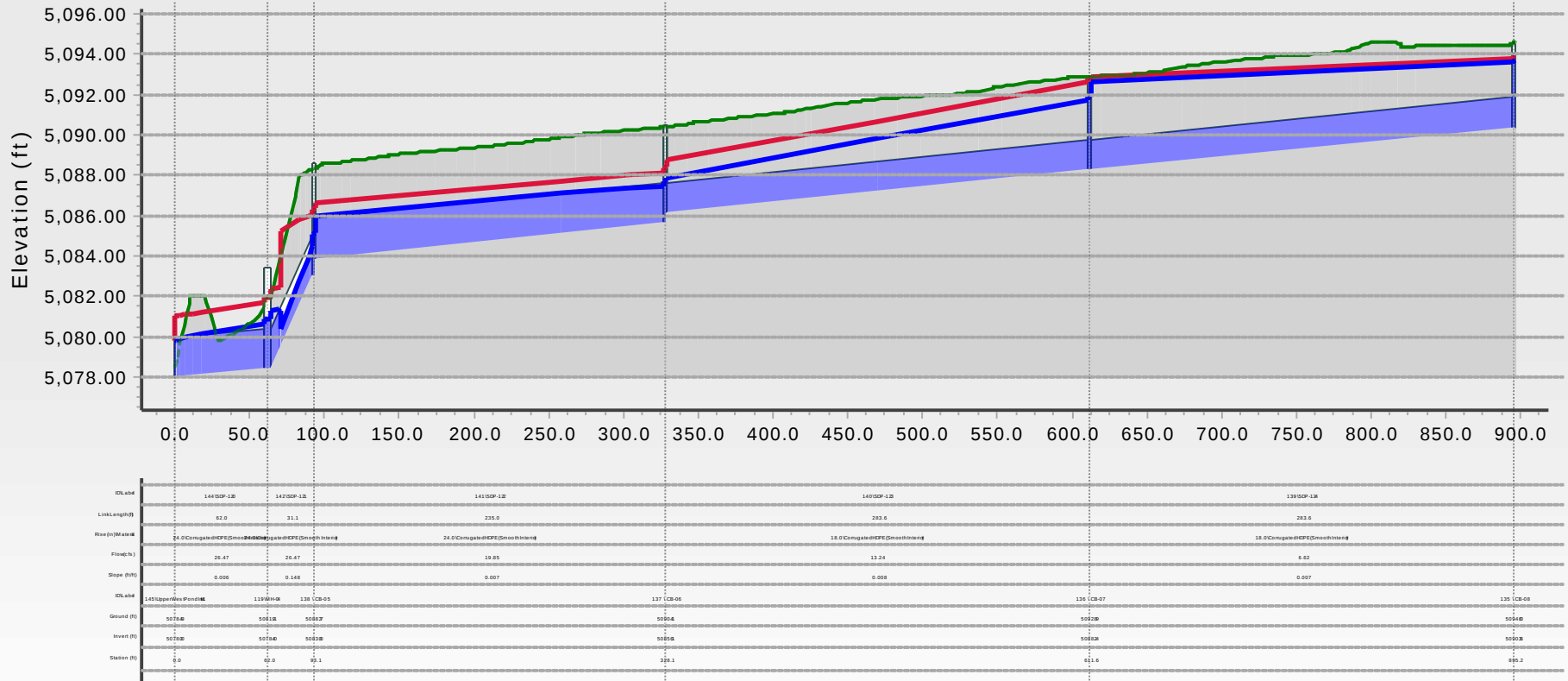
Prosperity Substation 100yr Proposed Conditions

North Substation Lateral



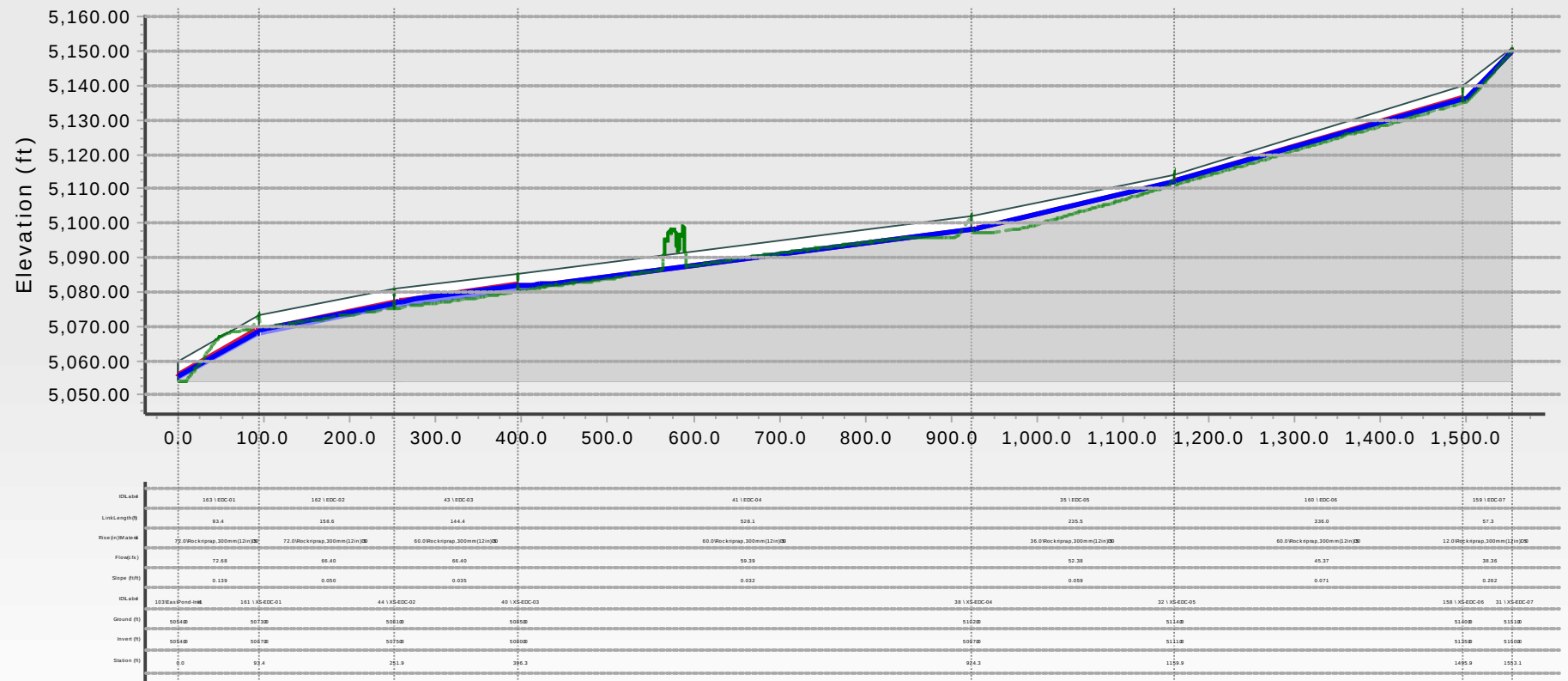
Prosperity Substation 100yr Proposed Conditions

South Substation Lateral



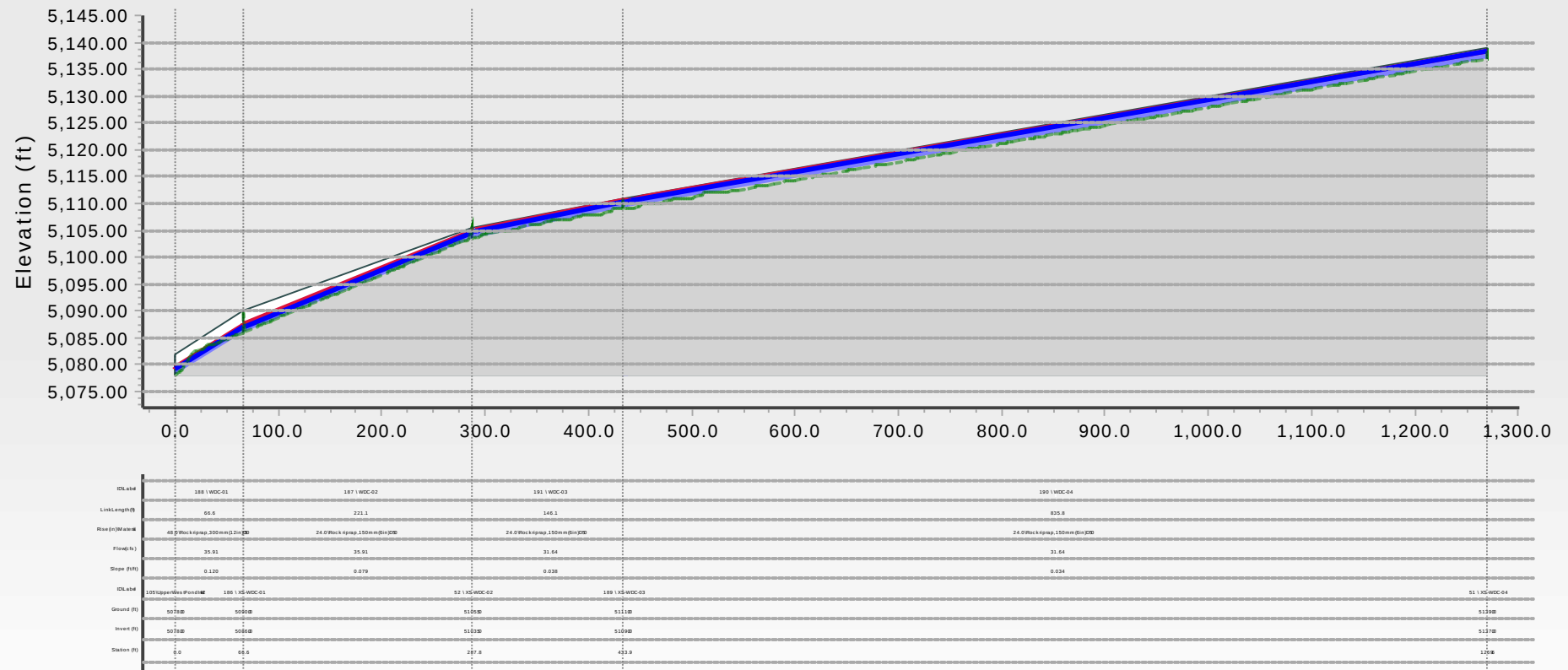
Prosperity Substation 100yr Proposed Conditions

East Diversion Channel



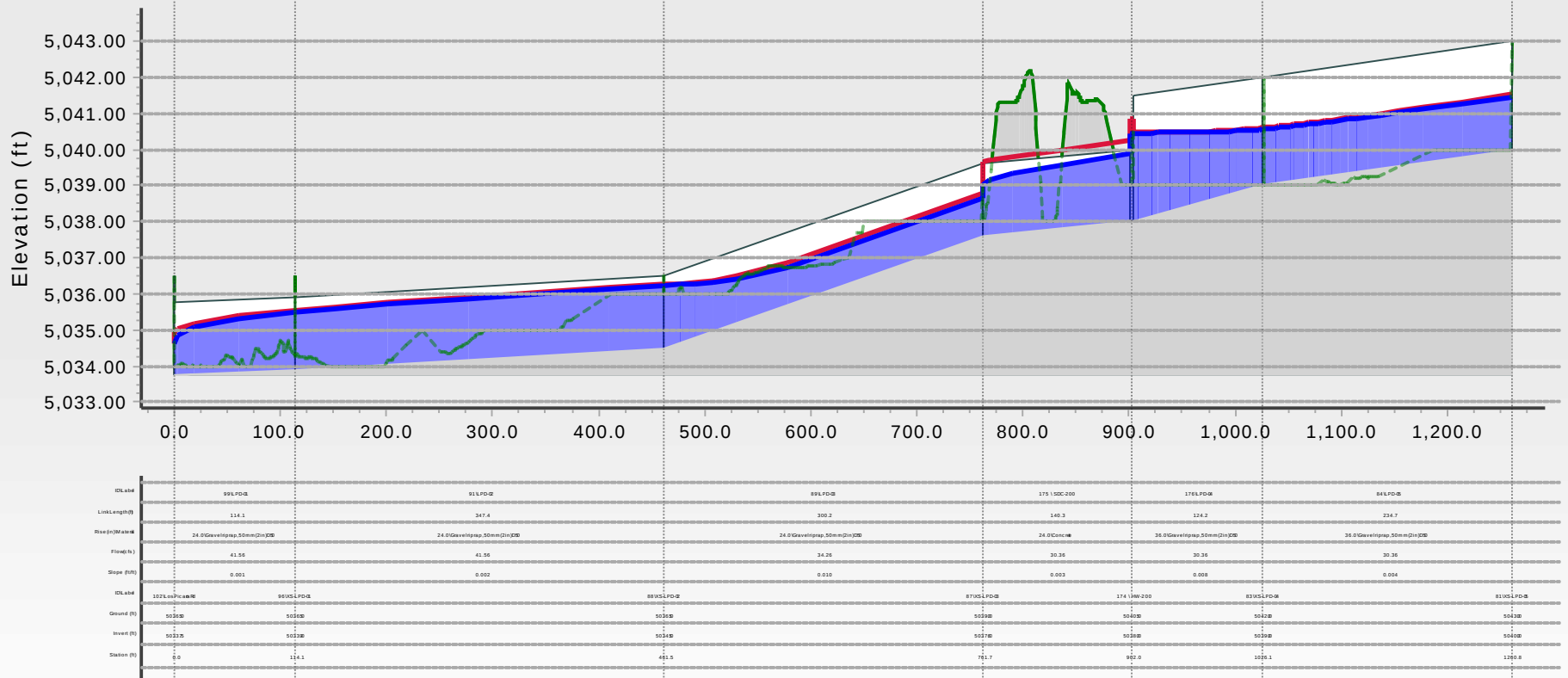
Prosperity Substation 100yr Proposed Conditions

West Diversion Channel



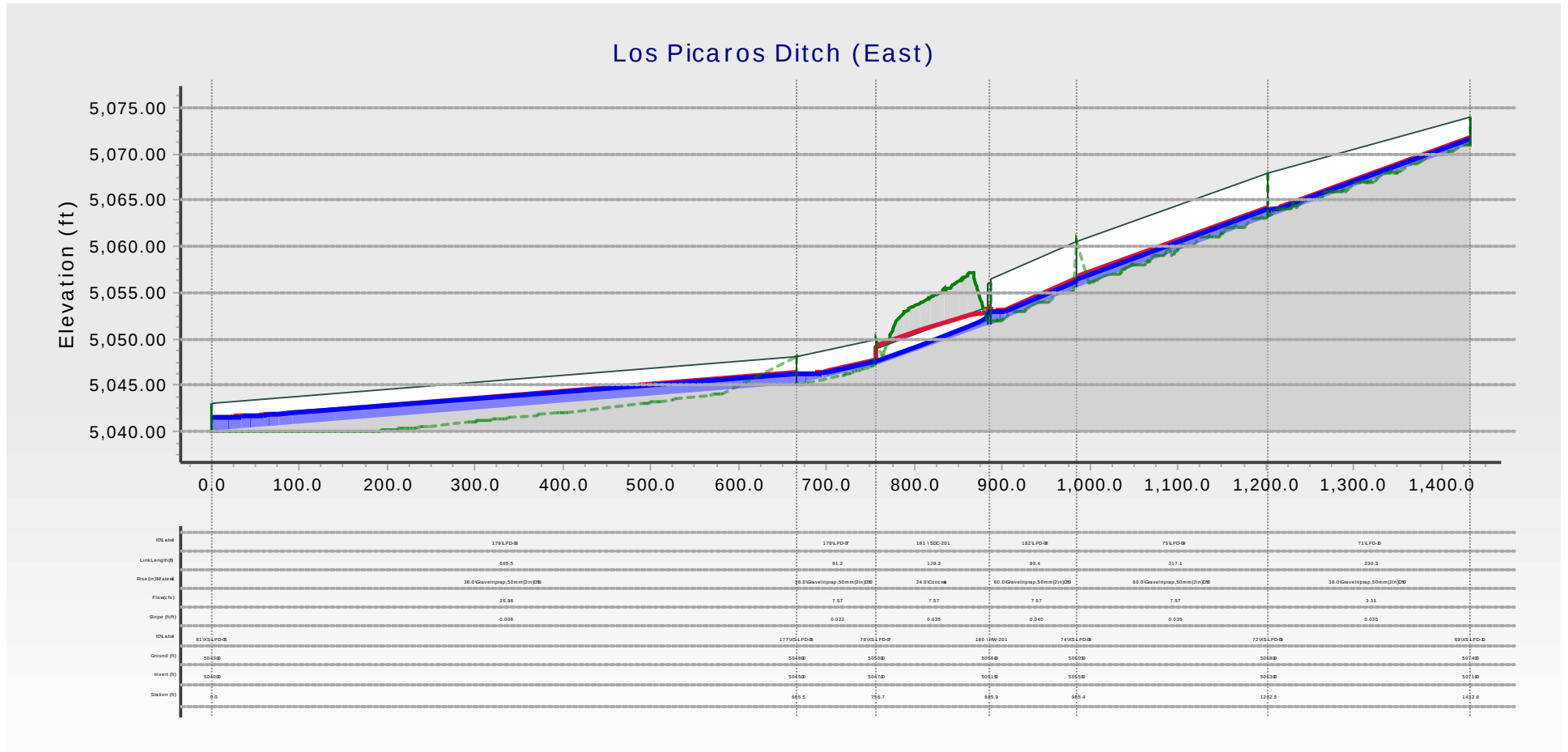
Prosperity Substation 100yr Proposed Conditions

Los Picaros Ditch (West)



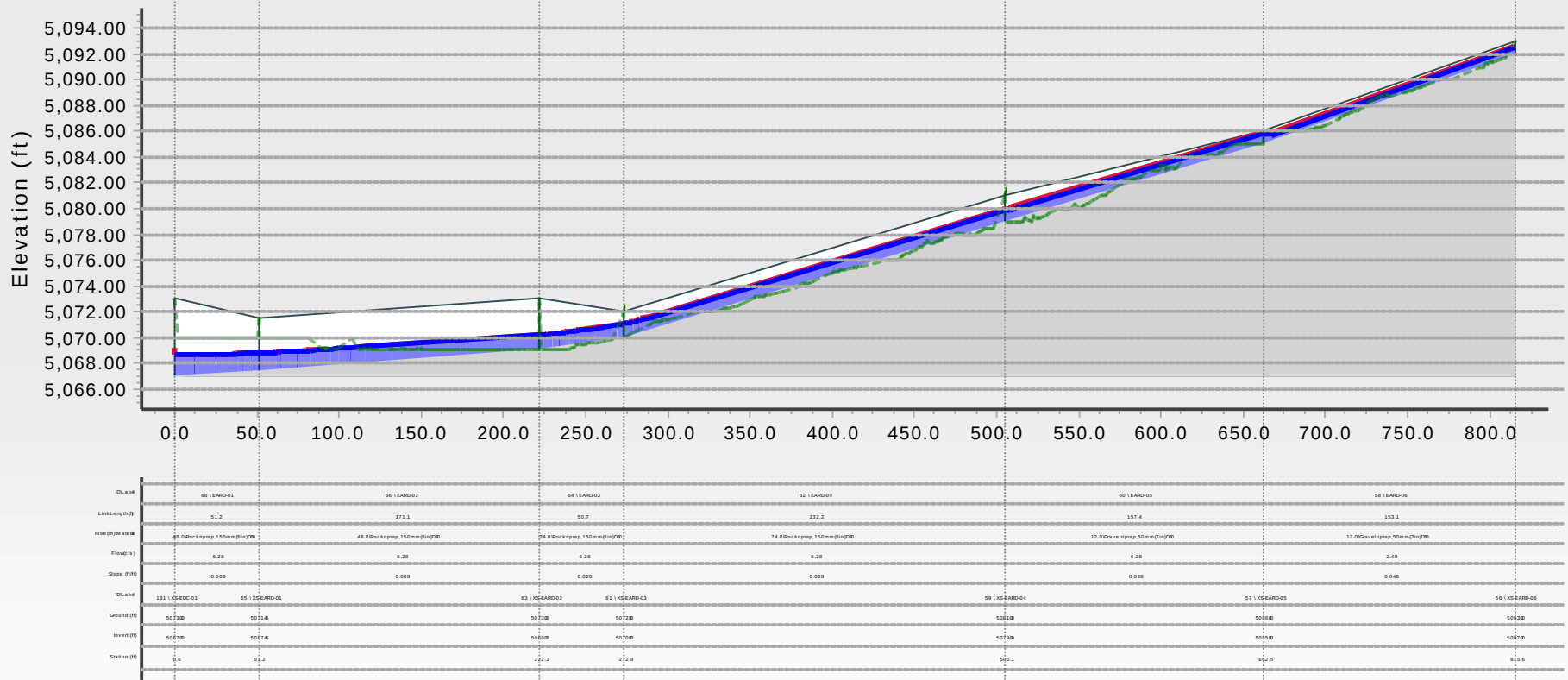
Prosperity Substation 100yr Proposed Conditions

Los Picaros Ditch (East)



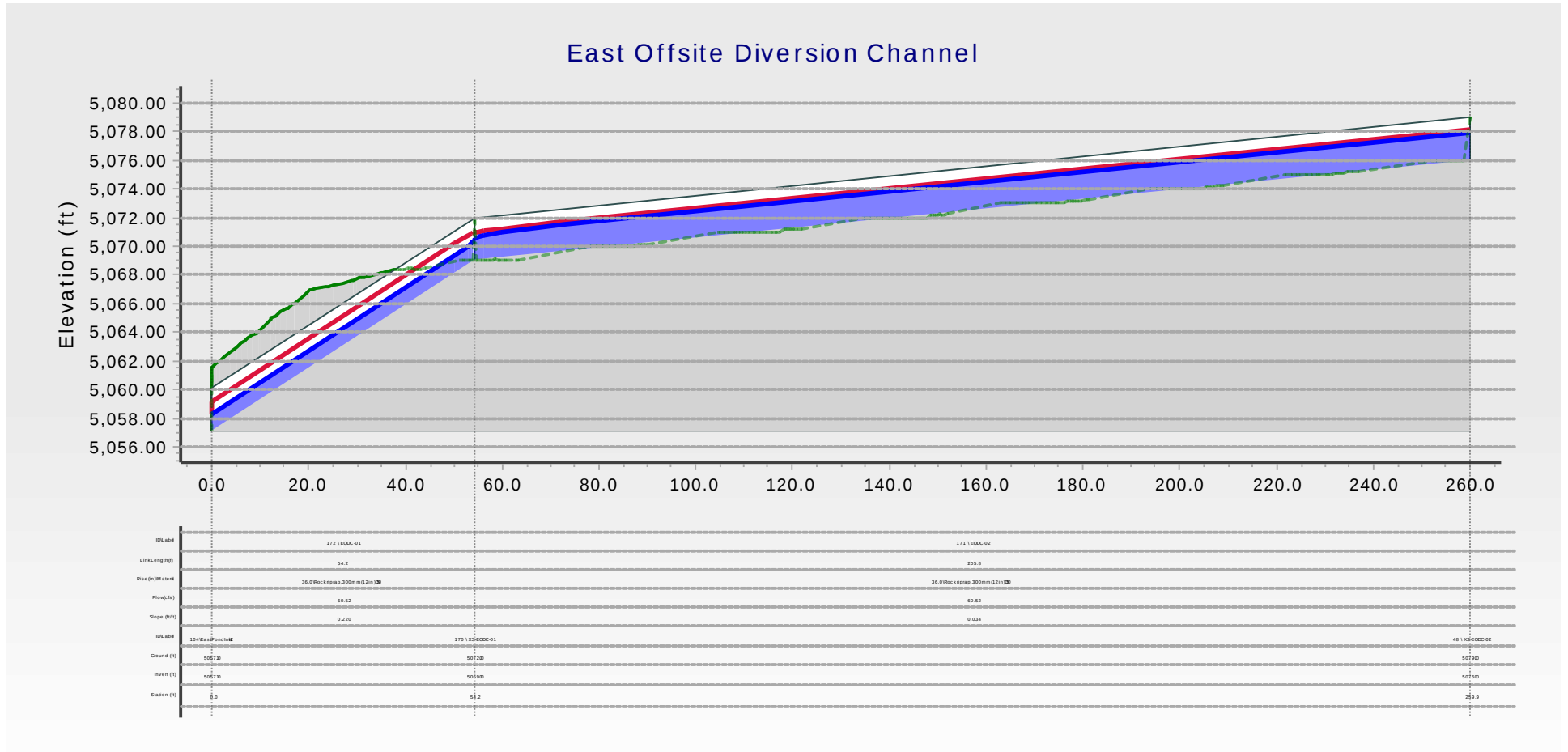
Prosperity Substation 100yr Proposed Conditions

East Access Rd Ditch



Prosperity Substation 100yr Proposed Conditions

East Offsite Diversion Channel



Conduit Table - Time: 0.00 hours

Prosperity Substation
100yr Proposed Conditions
Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Catalog Class	Flow (cfs)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)	Manning's n	Is Culvert?
SDC-200	HW-200	XS-LPD-03	5,038.00	5,037.60	140.3	0.003	24.0	Circle - Concrete	30.36	4.83	24.16	125.7	0.013	True
SDC-201	HW-201	XS-LPD-07	5,051.50	5,047.00	129.3	0.035	24.0	Circle - Concrete	7.57	10.17	42.21	17.9	0.013	True
SDP-110	CB-09	LowerWest Pond-Inlet	5,040.20	5,033.00	229.6	0.031	30.0	Circle - Corrugated HDPE (Smooth Interior)	63.03	17.81	78.68	80.1	0.012	False
SDP-111	CB-01	CB-09	5,067.50	5,040.20	90.6	0.301	24.0	Circle - Corrugated HDPE (Smooth Interior)	31.10	34.84	134.55	23.1	0.012	False
SDP-112	CB-02	CB-01	5,071.00	5,067.50	200.0	0.017	24.0	Circle - Corrugated HDPE (Smooth Interior)	23.32	11.23	32.42	71.9	0.012	False
SDP-113	CB-03	CB-02	5,072.24	5,071.00	199.9	0.006	24.0	Circle - Corrugated HDPE (Smooth Interior)	15.55	4.95	19.30	80.6	0.012	False
SDP-114	CB-04	CB-03	5,074.02	5,072.24	200.0	0.009	18.0	Circle - Corrugated HDPE (Smooth Interior)	7.77	4.40	10.73	72.4	0.012	False
SDP-115	MH-02	CB-09	5,047.00	5,041.80	340.3	0.015	30.0	Circle - Corrugated HDPE (Smooth Interior)	34.04	11.78	54.92	62.0	0.012	False
SDP-116	MH-03	MH-02	5,075.72	5,054.00	340.5	0.064	30.0	Circle - Corrugated HDPE (Smooth Interior)	34.04	20.05	112.22	30.3	0.012	False
SDP-117	UpperWest Pond-Outlet	MH-03	5,077.00	5,075.82	23.6	0.050	30.0	Circle - Corrugated HDPE (Smooth Interior)	34.04	18.34	99.31	34.3	0.012	False
SDP-120	MH-04	UpperWest Pond Inlet1	5,078.40	5,078.00	62.0	0.006	24.0	Circle - Corrugated HDPE (Smooth Interior)	26.47	8.43	19.68	134.5	0.012	False

Prosperity Substation
100yr Proposed Conditions
Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Catalog Class	Flow (cfs)	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)	Manning's n	Is Culvert?
SDP-121	CB-05	MH-04	5,083.00	5,078.40	31.1	0.148	24.0	Circle - Corrugated HDPE (Smooth Interior)	26.47	25.77	94.30	28.1	0.012	False
SDP-122	CB-06	CB-05	5,085.61	5,083.85	235.0	0.007	24.0	Circle - Corrugated HDPE (Smooth Interior)	19.85	7.67	21.21	93.6	0.012	False
SDP-123	CB-07	CB-06	5,088.24	5,086.11	283.6	0.008	18.0	Circle - Corrugated HDPE (Smooth Interior)	13.24	7.49	9.86	134.3	0.012	False
SDP-124	CB-08	CB-07	5,090.36	5,088.24	283.6	0.007	18.0	Circle - Corrugated HDPE (Smooth Interior)	6.62	3.75	9.84	67.3	0.012	False

Channel Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Rise (Unified) (ft)	Flow (cfs)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Normal) / Rise (%)
EARD-01	XS-EARD-01	XS-EDC-01	5,067.45	5,067.00	51.2	0.009	4.00	6.28	1.40	1.22	30.5
EARD-02	XS-EARD-02	XS-EARD-01	5,069.00	5,067.45	171.1	0.009	4.00	6.28	1.42	1.21	30.4
EARD-03	XS-EARD-03	XS-EARD-02	5,070.00	5,069.00	50.7	0.020	2.00	6.28	1.90	1.05	52.5
EARD-04	XS-EARD-04	XS-EARD-03	5,079.00	5,070.00	232.2	0.039	2.00	6.28	2.45	0.92	46.2
EARD-05	XS-EARD-05	XS-EARD-04	5,085.00	5,079.00	157.4	0.038	1.00	6.28	3.59	0.76	76.3
EARD-06	XS-EARD-06	XS-EARD-05	5,092.00	5,085.00	153.1	0.046	1.00	2.49	3.05	0.52	52.1
EDC-01	XS-EDC-01	EastPond-Inlet1	5,067.00	5,054.00	93.4	0.139	6.00	72.68	6.59	1.48	24.7
EDC-02	XS-EDC-02	XS-EDC-01	5,075.00	5,067.00	158.6	0.050	6.00	66.40	4.42	1.79	29.9
EDC-03	XS-EDC-03	XS-EDC-02	5,080.00	5,075.00	144.4	0.035	5.00	66.40	3.84	1.95	39.1
EDC-04	XS-EDC-04	XS-EDC-03	5,097.00	5,080.00	528.1	0.032	5.00	59.39	2.50	1.16	23.3

Prosperity Substation
100yr Proposed Conditions
Channel Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Rise (Unified) (ft)	Flow (cfs)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Normal) / Rise (%)
EDC-05	XS-EDC-05	XS-EDC-04	5,111.00	5,097.00	235.5	0.059	3.00	52.38	3.12	1.01	33.6
EDC-06	XS-EDC-06	XS-EDC-05	5,135.00	5,111.00	336.0	0.071	5.00	45.37	4.18	1.26	25.1
EDC-07	XS-EDC-07	XS-EDC-06	5,150.00	5,135.00	57.3	0.262	1.00	38.36	3.06	0.18	17.8
EODC-01	XS-EODC-01	EastPond Inlet2	5,069.00	5,057.10	54.2	0.220	3.00	60.52	7.43	1.22	40.7
EODC-02	XS-EODC-02	XS-EODC-01	5,076.00	5,069.00	205.8	0.034	3.00	60.52	3.72	1.88	62.7
LPD-01	XS-LPD-01	Los Picaros Rd	5,033.90	5,033.75	114.1	0.001	2.00	41.56	1.44	1.88	93.8
LPD-02	XS-LPD-02	XS-LPD-01	5,034.50	5,033.90	347.4	0.002	2.00	41.56	1.59	1.76	88.1
LPD-03	XS-LPD-03	XS-LPD-02	5,037.60	5,034.50	300.2	0.010	2.00	34.26	2.92	1.05	52.3
LPD-04	XS-LPD-04	HW-200	5,039.00	5,038.00	124.2	0.008	3.00	30.36	2.42	1.29	43.1
LPD-05	XS-LPD-05	XS-LPD-04	5,040.00	5,039.00	234.7	0.004	3.00	30.36	1.90	1.46	48.6
LPD-06	XS-LPD-06	XS-LPD-05	5,045.00	5,040.00	665.5	0.008	3.00	26.98	2.29	1.25	41.8
LPD-07	XS-LPD-07	XS-LPD-06	5,047.00	5,045.00	91.2	0.022	3.00	7.57	2.49	0.64	21.2
LPD-08	XS-LPD-08	HW-201	5,055.50	5,051.50	99.4	0.040	5.00	7.57	3.84	0.81	16.2
LPD-09	XS-LPD-09	XS-LPD-08	5,063.00	5,055.50	217.1	0.035	5.00	7.57	3.90	0.99	19.7
LPD-10	XS-LPD-10	XS-LPD-09	5,071.00	5,063.00	230.3	0.035	3.00	3.11	2.90	0.60	19.9
WDC-01	XS-WDC-01	UpperWestPond Inlet2	5,086.00	5,078.00	66.6	0.120	4.00	35.91	5.18	1.10	27.5
WDC-02	XS-WDC-02	XS-WDC-01	5,103.50	5,086.00	221.1	0.079	2.00	35.91	4.87	1.15	57.3
WDC-03	XS-WDC-03	XS-WDC-02	5,109.00	5,103.50	146.1	0.038	2.00	31.64	3.58	1.29	64.4
WDC-04	XS-WDC-04	XS-WDC-03	5,137.00	5,109.00	835.8	0.034	2.00	31.64	3.43	1.32	66.2

Catch Basin Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Inlet	Length (ft)	Width (ft)	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Headloss Method	HEC-22 Benching Method	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
CB-01	Apply 100% of R217 flows	31.10	CABQ Single D	2.10	2.90	5,073.27	5,073.69	5,067.50	HEC-22 Energy (Third Edition)	Flat	5,069.78	5,069.70	5,071.38	5,071.30

Prosperity Substation
100yr Proposed Conditions
Catch Basin Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Inlet	Length (ft)	Width (ft)	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Headloss Method	HEC-22 Benching Method	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
CB-02	Apply 75% of R217 flows	23.32	CABQ Single D	2.10	2.90	5,074.72	5,074.96	5,071.00	HEC-22 Energy (Third Edition)	Flat	5,073.04	5,073.01	5,074.07	5,074.04
CB-03	Apply 50% of R217 flows	15.55	CABQ Single D	2.10	2.90	5,076.11	5,076.24	5,072.24	HEC-22 Energy (Third Edition)	Flat	5,074.74	5,074.72	5,075.12	5,075.10
CB-04	Apply 25% of R217 flows	7.77	CABQ Single D	2.10	2.90	5,077.17	5,077.52	5,074.02	HEC-22 Energy (Third Edition)	Flat	5,075.98	5,075.93	5,076.28	5,076.23
CB-05	Apply 100% of R218 flows	26.47	CABQ Single D	2.10	2.90	5,088.37	5,088.62	5,083.00	HEC-22 Energy (Third Edition)	Flat	5,085.15	5,085.08	5,086.38	5,086.31
CB-06	Apply 75% of R218 flows	19.85	CABQ Single D	2.10	2.90	5,090.41	5,090.50	5,085.61	HEC-22 Energy (Third Edition)	Flat	5,087.74	5,087.67	5,088.40	5,088.34
CB-07	Apply 50% of R218 flows	13.24	CABQ Single D	2.10	2.90	5,092.89	5,092.79	5,088.24	HEC-22 Energy (Third Edition)	Flat	5,091.89	5,091.89	5,092.76	5,092.76
CB-08	Apply 25% of R218 flows	6.62	CABQ Single D	2.10	2.90	5,094.60	5,094.53	5,090.36	HEC-22 Energy (Third Edition)	Flat	5,093.66	5,093.64	5,093.87	5,093.86

Manhole Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Structure Type	Diameter (in)	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Headloss Method	HEC-22 Benching Method	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
MH-02		34.04	Circular Structure	48.0	5,066.21	5,066.21	5,047.00	HEC-22 Energy (Third Edition)	Flat	5,049.83	5,049.33	5,050.86	5,050.37
MH-03		34.04	Circular Structure	48.0	5,081.00	5,082.00	5,075.72	HEC-22 Energy (Third Edition)	Flat	5,078.05	5,078.05	5,079.09	5,079.09
MH-04		26.47	Circular Structure	48.0	5,081.91	5,083.42	5,078.40	HEC-22 Energy (Third Edition)	Flat	5,080.85	5,080.85	5,081.95	5,081.95

Cross Section Table - Time: 0.00 hours

Prosperity Substation
100yr Proposed Conditions
Cross Section Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Section Type	Bottom Width (ft)	Height (ft)	Slope (Left Side) (H:V)	Slope (Right Side) (H:V)	Material	Manning's n	Elevation (Invert) (ft)	Elevation (Ground) (ft)	Velocity (ft/s)	Depth (Node) (ft)	Hydraulic Grade (ft)
XS-EARD-01	No add'l flows	6.28	Irregular Channel	0.0	4.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,067.45	5,071.45	1.16	1.34	5,068.79
XS-EARD-02	No add'l flows	6.28	Irregular Channel	0.0	4.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,069.00	5,073.00	1.42	1.21	5,070.21
XS-EARD-03	No add'l flows	6.28	Irregular Channel	0.0	2.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,070.00	5,072.00	1.90	1.05	5,071.05
XS-EARD-04	No add'l flows	6.28	Irregular Channel	0.0	2.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,079.00	5,081.00	2.45	0.92	5,079.92
XS-EARD-05	Apply Prop-24 flows	6.28	Irregular Channel	0.0	1.00	3.0	3.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,085.00	5,086.00	1.40	0.77	5,085.77
XS-EARD-06	Apply Prop-14 flows	2.49	Irregular Channel	0.0	1.00	3.0	3.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,092.00	5,093.00	2.93	0.53	5,092.53
XS-EDC-01	Junction inflow	72.68	Trapezoidal Cross Section	3.0	6.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,067.00	5,073.00	0.79	1.62	5,068.62
XS-EDC-02	No add'l flows	66.40	Trapezoidal Cross Section	3.0	6.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,075.00	5,081.00	4.42	1.79	5,076.79
XS-EDC-03	Apply 25% of Prop- 13 routed flows	66.40	Trapezoidal Cross Section	3.0	5.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,080.00	5,085.00	0.94	1.95	5,081.95
XS-EDC-04	Apply 25% of Prop- 13 routed flows	59.39	Trapezoidal Cross Section	3.0	5.00	27.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,097.00	5,102.00	2.41	1.16	5,098.16
XS-EDC-05	Apply 25% of Prop- 13 routed flows	52.38	Trapezoidal Cross Section	3.0	3.00	24.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,111.00	5,114.00	4.77	1.01	5,112.01
XS-EDC-06	Apply 25% of Prop- 13 routed flows	45.37	Trapezoidal Cross Section	3.0	5.00	6.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,135.00	5,140.00	0.41	1.26	5,136.26
XS-EDC-07	Apply Junction-10 flows	38.36	Trapezoidal Cross Section	70.0	1.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,150.00	5,151.00	2.59	0.21	5,150.21
XS-EODC-01	No add'l flows	60.52	Trapezoidal Cross Section	3.0	3.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,069.00	5,072.00	5.47	1.48	5,070.48
XS-EODC-02	Apply Prop-10 flows	60.52	Trapezoidal Cross Section	3.0	3.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,076.00	5,079.00	3.72	1.88	5,077.88

Prosperity Substation
100yr Proposed Conditions
Cross Section Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Section Type	Bottom Width (ft)	Height (ft)	Slope (Left Side) (H:V)	Slope (Right Side) (H:V)	Material	Manning's n	Elevation (Invert) (ft)	Elevation (Ground) (ft)	Velocity (ft/s)	Depth (Node) (ft)	Hydraulic Grade (ft)
XS-LPD-01	No add'l flows	41.56	Trapezoidal Cross Section	6.0	2.00	5.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,033.90	5,036.50	1.87	1.59	5,035.49
XS-LPD-02	Apply Junction-8 flows	41.56	Trapezoidal Cross Section	6.0	2.00	5.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,034.50	5,036.50	1.35	1.73	5,036.23
XS-LPD-03	Apply Junction-7 flows	34.26	Trapezoidal Cross Section	6.0	2.00	5.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,037.60	5,039.00	6.44	1.05	5,038.65
XS-LPD-04	No add'l flows	30.36	Irregular Channel	3.0	3.00	10.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,039.00	5,042.00	1.67	1.56	5,040.56
XS-LPD-05	Apply Junction-6 flows	30.36	Irregular Channel	0.0	3.00	10.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,040.00	5,043.00	1.69	1.46	5,041.46
XS-LPD-06	Apply Junction-5 flows	26.98	Irregular Channel	0.0	3.00	10.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,045.00	5,048.00	0.64	1.25	5,046.25
XS-LPD-07	No add'l flows	7.57	Irregular Channel	0.0	3.00	10.0	5.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,047.00	5,050.00	10.17	0.64	5,047.64
XS-LPD-08	No add'l flows	7.57	Irregular Channel	0.0	5.00	3.0	3.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,055.50	5,060.50	3.97	0.83	5,056.33
XS-LPD-09	Apply Junction-4 flows	7.57	Irregular Channel	0.0	5.00	2.0	2.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,063.00	5,068.00	1.07	0.99	5,063.99
XS-LPD-10	Apply Junction-3 flows	3.11	Irregular Channel	0.0	3.00	2.0	4.0	Gravel riprap, 50 mm (2 in) D50	0.041	5,071.00	5,074.00	2.90	0.60	5,071.60
XS-WDC-01	No add'l flows	35.91	Trapezoidal Cross Section	3.0	4.00	3.0	3.0	Rock riprap, 300 mm (12 in) D50	0.078	5,086.00	5,090.00	4.89	1.14	5,087.14
XS-WDC-02	Apply Prop-38 flows	35.91	Trapezoidal Cross Section	3.0	2.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,103.50	5,105.50	4.29	1.15	5,104.65
XS-WDC-03	No add'l flows	31.64	Trapezoidal Cross Section	3.0	2.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,109.00	5,111.00	3.58	1.29	5,110.29
XS-WDC-04	Apply Junction-1 flows	31.64	Trapezoidal Cross Section	3.0	2.00	3.0	3.0	Rock riprap, 150 mm (6 in) D50	0.069	5,137.00	5,139.00	3.43	1.32	5,138.32

Prosperity Substation
100yr Proposed Conditions

Outfall Table - Time: 0.00 hours

Label	Boundary Condition Type	Flow (Total Out) (cfs)	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Depth (Node) (ft)	Hydraulic Grade (ft)	Energy Grade Line (ft)
EastPond Inlet2	Free Outfall	60.52	5,057.10	5,057.10	5,057.10	1.22	5,058.32	5,058.32
EastPond-Inlet1	Free Outfall	72.68	5,054.00	5,054.00	5,054.00	1.48	5,055.48	5,055.48
Los Picaros Rd	Free Outfall	41.56	5,036.50	5,036.50	5,033.75	0.89	5,034.64	5,034.64
LowerWestPond-Inlet	Free Outfall	63.03	5,033.00	5,041.00	5,033.00	1.72	5,034.72	5,034.72
UpperWestPond Inlet1	Free Outfall	26.47	5,078.49	5,080.00	5,078.00	1.80	5,079.80	5,079.80
UpperWestPond Inlet2	Free Outfall	35.91	5,078.00	5,078.00	5,078.00	1.10	5,079.10	5,079.10

Headwall Table - Time: 0.00 hours

Label	Notes	Flow (Total Out) (cfs)	Is Inlet?	Culvert Barrel Shape	Inlet Description	Downstream Conduit	Elevation (Invert) (ft)	Elevation (Ground) (ft)	Depth (In) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)
HW-200	No add'l flows	30.36	True	Circular	Concrete - Square edge w/headwall	SDC-200	5,038.00	5,040.50	2.45	5,040.45	5,040.45	5,040.84	5,040.84
HW-201	No add'l flows	7.57	True	Circular	Concrete - Square edge w/headwall	SDC-201	5,051.50	5,056.00	1.52	5,053.02	5,053.02	5,053.40	5,053.40
UpperWestPond-Outlet	Apply WestPond-Upper flows	34.04	False	<None>	Concrete - Square edge w/headwall	SDP-117	5,077.00	5,077.00	0.52	5,077.52	5,077.00	5,078.03	5,077.00



4-4 FlowMaster Input and Output Data

Worksheet for Phase 1- N Substation 2' Deep Trap. Swale

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.069
Channel Slope	0.020
Left Side Slope	3.000
Right Side Slope	3.000
Bottom Width	3.00
Discharge	31.10
Results	
Normal Depth	17.8
Flow Area	11.0
Wetted Perimeter	12.4
Hydraulic Radius	10.7
Top Width	11.89
Critical Depth	12.7
Critical Slope	0.082
Velocity	2.82
Velocity Head	0.12
Specific Energy	1.60
Froude Number	0.516
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0
Length	0.0
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	17.8
Critical Depth	12.7
Channel Slope	0.020
Critical Slope	0.082

Worksheet for Phase 1- 5x5 MDI in Sag

Project Description	
Solve For	Spread
Input Data	
Discharge	37.85
Left Side Slope	3.000
Right Side Slope	3.000
Bottom Width	6.50
Grate Width	5.00
Grate Length	5.0
Local Depression	0.0
Local Depression Width	0.0
Grate Type	P-50 mm x 100 mm (P-1-7/8"-4")
Clogging	50.0
Results	
Spread	11.8
Depth	10.7
Wetted Perimeter	12.1
Top Width	11.85
Open Grate Area	10.0
Active Grate Weir Length	15.0

Worksheet for Phase 2- 5x5 MDI in Sag

Project Description	
Solve For	Spread
Input Data	
Discharge	6.75
Left Side Slope	3.000
Right Side Slope	3.000
Bottom Width	6.50
Grate Width	5.00
Grate Length	5.0
Local Depression	0.0
Local Depression Width	0.0
Grate Type	P-50 mm x 100 mm (P-1-7/8"-4")
Clogging	50.0
Results	
Spread	8.2
Depth	3.4
Wetted Perimeter	8.3
Top Width	8.19
Open Grate Area	10.0
Active Grate Weir Length	15.0



Attachment 5

Models (Electronic)

- 5-1 HEC-HMS Model
- 5-2 Bentley StormCAD Model
- 5-3 Bentley FlowMaster Model