CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Director

Mayor Timothy M. Keller

September 6, 2023

J. Graeme Means, P.E.
High Mesa Consulting Group
6010 B Midway Park Blvd NE
Albuquerque, NM 87109

RE: International Library Pond – Phase 1 & 2
Drainage Report
Engineer's Stamp Date: 08/04/23
Hydrology File: K19D005A
CPN: 722596

Dear Mr. Means:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based upon the information provided in your submittal received 08/04/2023, the Drainage Report **is not** approved for Work Order. The following comments need to be addressed for approval of the above referenced project:

1. AMAFCA has reviewed the Drainage Report and discussed this project's Phase 2 (CPN 722597) and its coordination with the Zuni-Penn Pond Project and determined that the analysis shown for Phase 2 is not appropriate for the proposed drainage infrastructure. The hydraulic analysis provided does not adequately demonstrate anticipated facility performance of IDL as a surge pond for the Dallas Storm Drain. As such, AMAFCA will not approve or concur with any drainage report that does not analyze the storm drain system using EPA SWMM (or equivalent hydraulic modeling). AMAFCA is currently working with its engineering consultant for the design of the Zuni-Penn Pond to perform such analysis that includes the proposed Phase 1 and Phase 2 plans for the IDL pond.

2. Hydrology has discussed what needs to be included in Phase 1 with Jim Roeder (DRC) and Jared Romero (AMAFCA) and the Drainage Report and Phase 1 Work Order (CPN 722596) will need to be revised to include installing the cattleguard inlet and connecting to the pond. With this in mind, the report needs to address the following items:

    a. Calculate the Q_{100} that is coming down Chico (Q_1). This can be from a previous Master Drainage Plan.
    b. Calculate the Q that will be collected by the new cattleguard inlet. (Q_2)
    c. Calculate the Q that bypasses the cattleguard inlet. (Q_3)
    d. Calculate the volume that the pond will hold and use this to build an emergency spillway. This should be at the low spot along Chico.
    e. Calculate the Q that will then use the emergency spillway and enter Chico. (Q_4)

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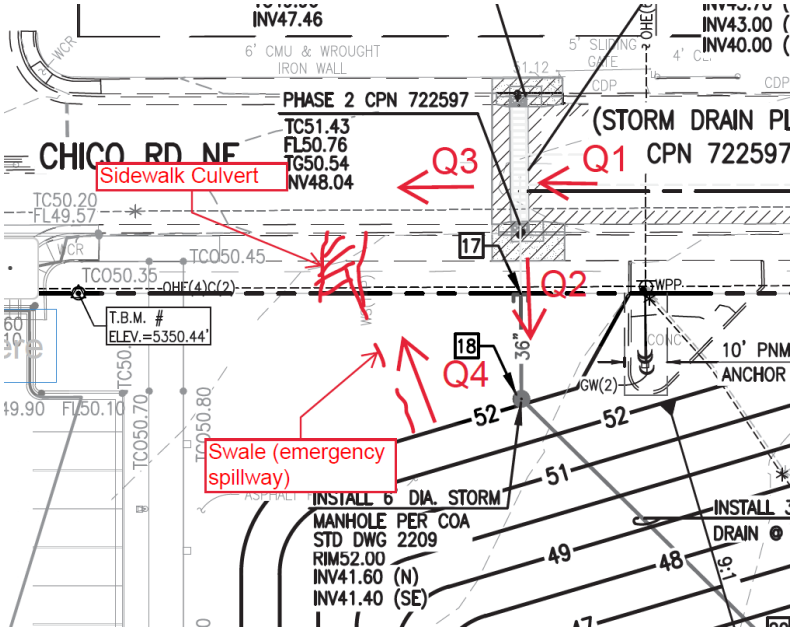


As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer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

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

Sincerely,

Renée C. Brissette

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

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

Project Title: International District Library Surge Pond **Building Permit #**_____ **Hydrology File #** K19/D005A
DRB#_____ **EPC#**_____
Legal Description: Tract A, International District Library City Address OR Parcel 7667 Central Ave NE

Applicant/Agent: High Mesa Consulting Group **Contact:** J. Graeme Means, PE
Address: 6010-B Midway Park Blvd NE, ABQ, NM 87109 **Phone:** 505-328-9064
Email: gmeans@highmesacg.com

Applicant/Owner: COA DMD Storm Drainage Section **Contact:** Shellie Eaton
Address: _____ **Phone:** 505-768-2774
Email: kverhage@cabq.gov

TYPE OF DEVELOPMENT: ___PLAT (#of lots) __RESIDENCE __DRB SITE ___ ADMIN SITE: X
RE-SUBMITTAL: X __YES _____ NO

DEPARTMENT: _____TRANSPORTATION X HYDROLOGY/DRAINAGE
Check all that apply:

TYPE OF SUBMITTAL:

___ENGINEER/ARCHITECT CERTIFICATION
___PAD CERTIFICATION
___CONCEPTUAL G&D PLAN
___GRADING PLAN
X DRAINAGE REPORT
___DRAINAGE MASTER PLAN
___FLOOD PLAN DEVELOPMENT PERMIT APP.
___ELEVATION CERTIFICATE
___CLOMR/LOMR
___TRAFFIC CIRCULATION LAYOUT (TCL) ADMINISTRATIVE
___TRAFFIC CIRCULATION LAYOUT FOR DRB APPROVAL
___TRAFFIC IMPACT STUDY (TIS)
___STREET LIGHT LAYOUT
___OTHER (SPECIFY)
___PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___BUILDING PERMIT APPROVAL
___CERTIFICATE OF OCCUPANCY
___CONCEPTUAL TCL DRB APPROVAL
___PRELIMINARY PLAT APPROVAL
___SITE PLAN FOR SUB'D APPROVAL
___SITE PLAN FOR BLDG PERMIT APPROVAL
___FINAL PLAT APPROVAL
___SIA/RELEASE OF FINANCIAL GUARANTEE
___FOUNDATION PERMIT APPROVAL
___GRADING PERMIT APPROVAL
___SO-19 APPROVAL
___PAVING PERMIT APPROVAL
___GRADING PAD CERTIFICATION
X WORK ORDER APPROVAL
___CLOMR/LOMR
___FLOOD PLAN DEVELOPMENT PERMIT
___OTHER (SPECIFY)_____

DATE SUBMITTED: 08/04/2023

HIGH MESA Consulting Group
Engineers, Surveyors & Subsurface Utility Consultants

International District Library Surge Pond Drainage Report
City Project #s 722596 & 7722597
Hydrology File K19/D005A
08/04/2023

EXECUTIVE SUMMARY: This project is located in the City of Albuquerque's International District, northwest of the intersection of Central Avenue NE and Pennsylvania Road NW. The City of Albuquerque project with partial AMAFCA funding will construct a surge / detention pond (Phase 1) with a related public storm drain system (Phase 2) intended to partially mitigate historic area flooding problems due to undersized or non-existent existing public drainage infrastructure, including the Dallas Street NW storm drain. Upon completion of Phase 1, the ponding area will be developed as a public City park by a separate project.

In current conditions there is flooding in Chico Road NE as evidenced by a mapped flood hazard zone (A). This is attributable to a large upstream basin with no storm drains or inlets to intercept or accept surface runoff. During larger rainfall events the Dallas storm drain reaches full capacity and can't intercept additional runoff from the east, resulting in surface flow bypass to the west down Central Avenue and Chico Road NE with associated downstream flooding. Phase 2 construction will have the ability to act as detention and surge pond for the Chico runoff, and also has the potential to work in tandem with the proposed Zuni-Pennsylvania Detention Pond project to significantly reduce the peak flow rate and volume of stormwater flowing north in the Dallas Street NE storm drain. If implemented, this would free up capacity to allow the Dallas system to more effectively intercept runoff from the east and convey it to the north, with an eventual outfall at the I-40 channel.

This report is submitted for City Work Order approval.

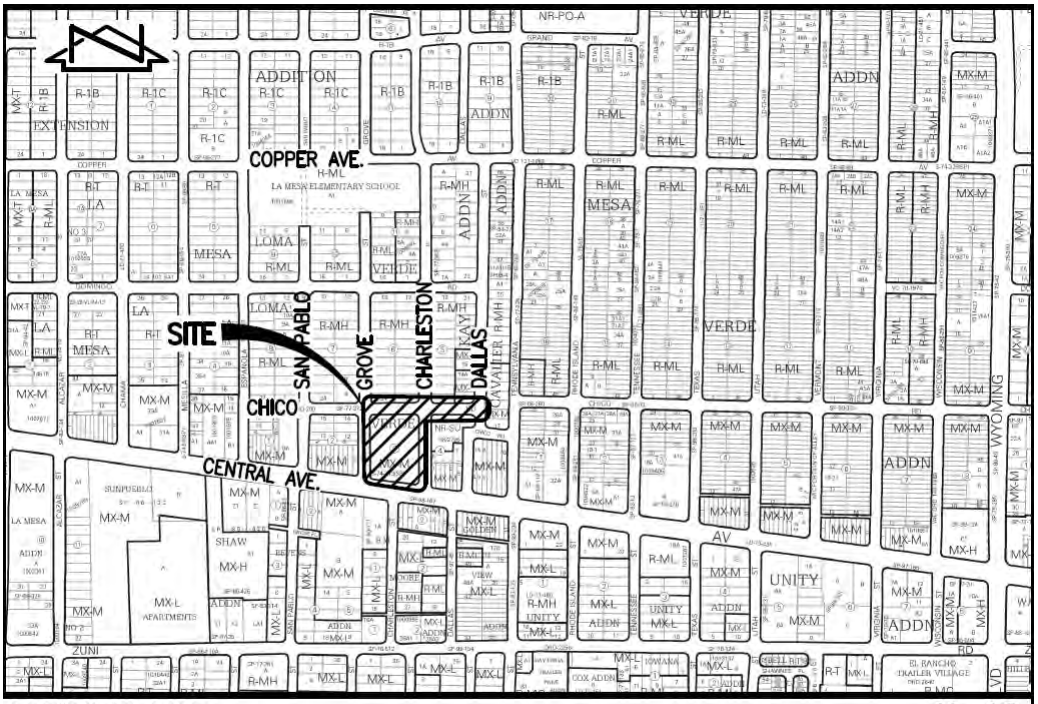
J. Graeme Means 08/04/2023

J. Graeme means, PE Date
New Mexico License # 13676

INTRODUCTION: Phase 1 of the project will construct an interim retention pond on City-owned property immediately east of the recently construction International District Library (IDL). This pond will include a storm drain pipe stubbed out to the north to the Chico right-of-way for future connection in Phase 2. Upon completion of Phase 1, the City will develop the pond as a park with a turf field.

Phase 2 will construct a new storm drain system with inlets in Chico Rd. NE that will intercept Chico Road surface flows, and will also operate relieve the burden on the overtaxed Dallas Street Storm drain by providing an outlet for stormwater to surge back to the proposed IDL pond under conditions where the flow depth in the 66" Dallas storm drain exceed 1.2 ft. The Dallas storm drain currently receives runoff from the Campus Wash Basin to the south of Central, and from the Central Avenue upstream contributing area. Providing a surge outlet for the Dallas system at Chico would reduce the peak flow rate and volume that continues north in Dallas from Chico, thereby allowing the Dallas storm drain to more effectively intercept runoff from the east-west streets north of Chico and reduce downstream flooding west of Dallas in those streets. The Chico storm drain connection to Dallas will also serve as the outfall for the pond after the peak storm conditions pass and the Dallas system can subsequently receive the discharge. At this point the surge pond will become a detention pond.

Phase 2 of the project will also include two new Type "A" inlets and a cattle guard inlet in Chico. Chico Road NE is currently encumbered by mapped floodplain and the contributing drainage basin does not have any inlets to intercept street flow and introduce the stormwater into the Dallas Storm drain at Chico. Downstream flooding in Chico is problematic. In addition to receiving potential surge flow from the Central Avenue Basin that contributes to the Dallas storm drain, the new IDL pond will also accept street flow intercepted in Chico Road NE by the new inlets, thereby reducing downstream flooding in Chico.



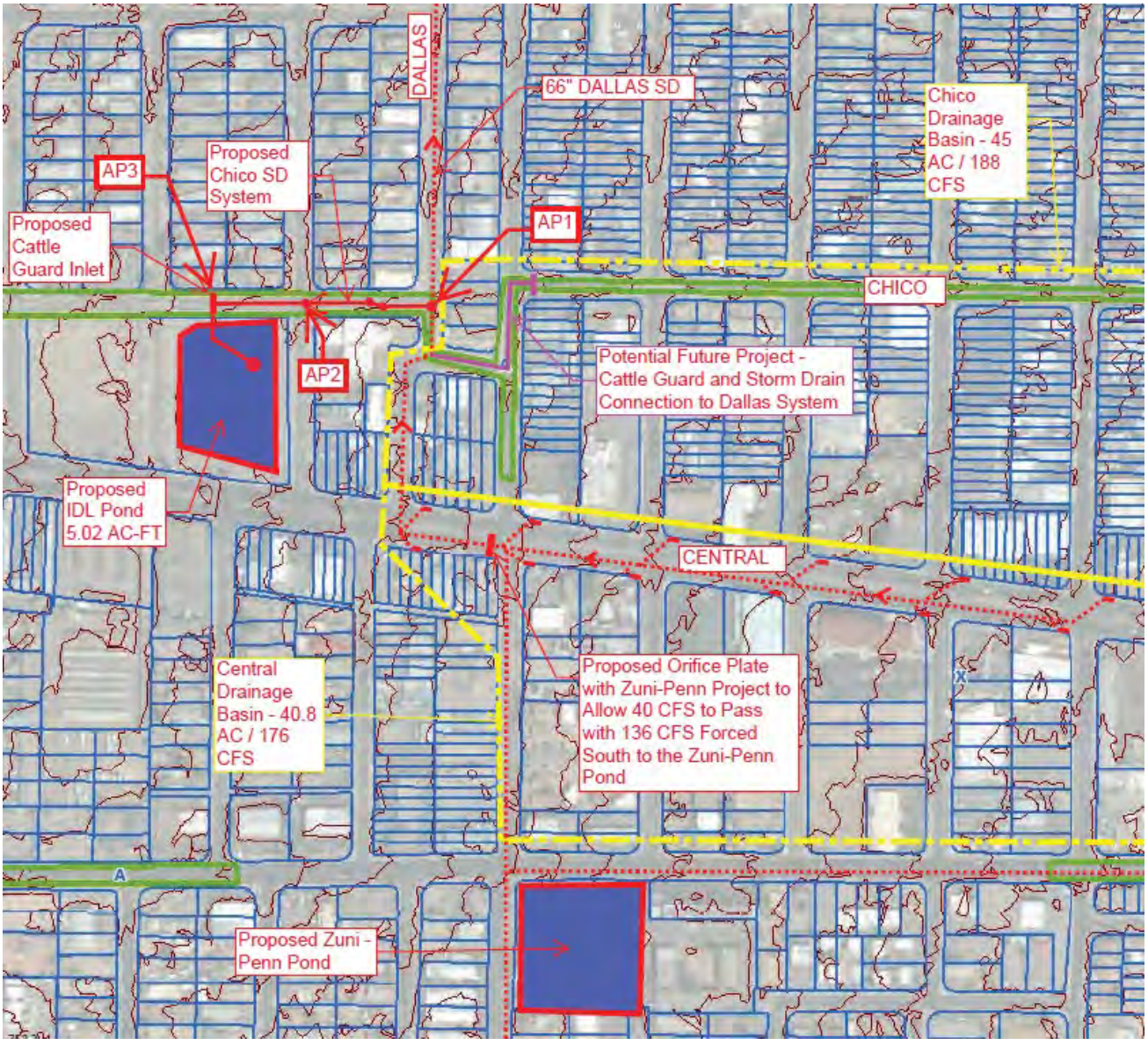
VICINITY MAP
SCALE: 1" = 750'

K-19

For most storm events, the Chico / IDL system will function as a detention pond for Chico runoff. It also will have the ability to work in tandem with the proposed Zuni-Pennsylvania Detention Pond project that proposes to construct an orifice plate in the Central Avenue storm drain that will limit the peak rate of stormwater flow in the reach of the Dallas Street Storm drain between Central and Chico, with the majority of the Central Avenue Basin runoff being forced up to the Zuni-Penn pond by the orifice plate.

The historic flooding issues and larger scale area drainage conditions are more fully described by the Final San Mateo to Moon Mini Drainage Management Plan prepared for AMAFCA by Smith Engineering Company dated November 2017 and by the Draft Zuni Pennsylvania Detention Pond Report prepared for AMAFCA by Parametrix dated October, 2022. The IDL Pond and Zuni-Penn ponds are also described and summarized in the AMAFCA Board Meeting Memo and Technical Memo dated 07/07/2022 (Exhibit B).

The aforementioned IDL Pond and Zuni-Penn projects with contributing drainage basins are shown by Exhibit A attached to this report with an excerpt below to show the two projects in context. The information and flow rates for the Zuni-Penn system are preliminary, and subject to the final design and analysis.



The Phase 1 IDL pond will be constructed on City-owned property – The eastern half of Tract A, International District Library (2020C-0057) located at the southwest corner of Charleston Street NE and Chico Road NE. The related storm drain improvements will be constructed in City rights-of-way for Dallas Street NE and Chico Road NE. Chico Road NE is encumbered by a Flood Hazard Zone (A).

EXISTING CONDITIONS (SITE): The proposed pond site is currently undeveloped and is mostly bare soil as a result of site demolition projects by the City in advance of and as part of the International District Library (IDL) project. The previous use was a paved parking lot and a small commercial building. The pond site generally slopes from east to west at approximately 1.5% where site runoff is intercepted by a temporary shallow retention / sediment pond. No runoff leaves the site from the proposed ponding area. Chico Road NE is a fully improved public street with curb and gutter and sidewalks that slopes from east to west at approximately 1.3%. Chico is encumbered by a Type A Flood Hazard Zone. There are currently no storm drains or drainage facilities serving Tract A or Chico Road NW, and street runoff and runoff from contributing areas flows downhill to the west of the site. As described by the aforementioned Mini Moon DMP, there is significant flooding in the downstream areas.

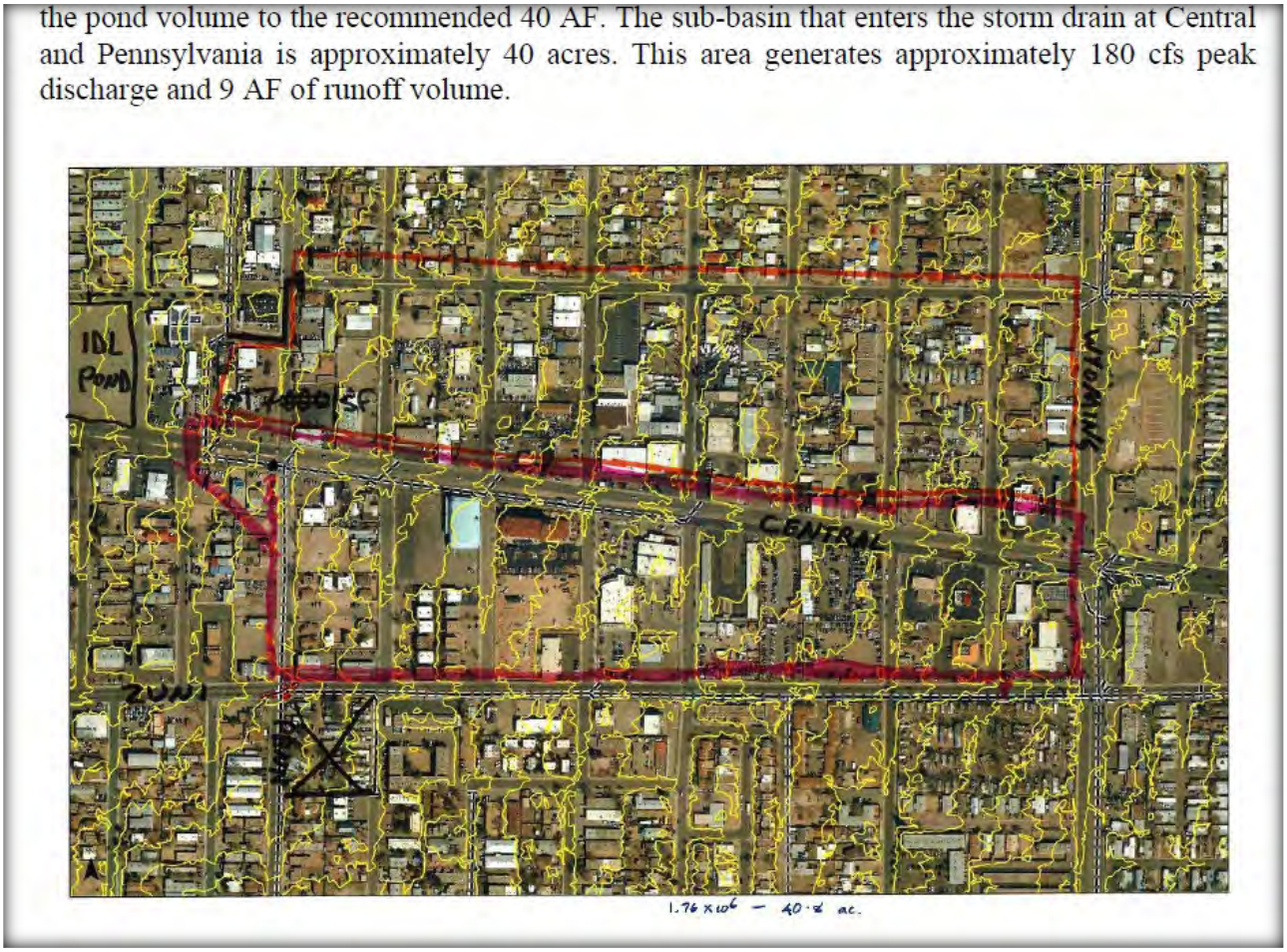
EXISTING CONDITIONS (UPSTREAM / OFF-SITE): There are three upstream drainage basins that impact this project. As described by the AMAFCA Memo (Exhibit B) and also by the Parametrix Zuni-Penn report, the **Central / Pennsylvania Basin** is roughly bordered by Central on the north, Zuni on the south, Wyoming on the east, and Pennsylvania on the West. This basin currently drains to the Dallas storm drain that is overtaxed. These basins from those reports are as shown by the following:

2.4 Central Pennsylvania Drainage Basin

The drainage basin that enters the storm drain at Pennsylvania and Central is approximately 39.64 acres (See Figure 4 below). Assuming a conservative estimate that this basin consists of 100% impervious area (D land treatment), the basin generates approximately 172 cfs during a 100-year storm and 7.70 acre-feet of runoff volume. The new detention pond will be designed to handle the volume from this basin in addition to the runoff in the Pennsylvania and Zuni storm drains adjacent to the pond site.

Figure 4. Central Pennsylvania Basin

the pond volume to the recommended 40 AF. The sub-basin that enters the storm drain at Central and Pennsylvania is approximately 40 acres. This area generates approximately 180 cfs peak discharge and 9 AF of runoff volume.



The AMAFCA Memo roughly calculated the area to be 40.8 acres with a 100-year peak discharge of 180 cfs and the Parametrix Report calculated the area to be 39.6 acres with a 100-year peak flow rate of 172 cfs.

The Chico Basin drains to the Dallas/Chico intersection (AP-1 on Exhibit A and for the purposes of this report). This basin is also roughly outlined on the AMAFCA image above and also shown on the exhibit below. Neither this office nor AMAFCA have been able to find record drainage reports for this basin.

As described in with Mini Moon DMP, the **Campus Wash Basin** serves a large area bounded by Central, Gibson, San Mateo, and Wyoming that generates a peak 100-year discharge 274 cfs to the Dallas storm drain. Previous studies have determined that the capacity of the Dallas storm drain at this point is also 274 cfs meaning that there is no capacity in the Dallas storm drain for additional runoff north of Central to enter the system under certain circumstances such as a storm that moves from south to north.

DEVELOPED CONDITIONS (Phase 1): Phase 1 will construct a temporary retention pond that will only accept the runoff that falls on it. No adjacent or offsite runoff will enter the pond until Phase 2 is constructed. The proposed Phase 1 grading plan is included as Exhibit C. As shown by the following, the 100 year, 10-day volume to be retained will be 0.2044 ac-ft / 8,900 cf. Ignoring infiltration, this will result in a 10-day water surface level of 5344.9 with a maximum depth of 1.2 ft at the outer edge of the apron of the proposed beehive inlet.

CALCULATIONS

I. SITE CHARACTERISTICS

A. PRECIPITATION ZONE = 3

B. $P_{100,6\,HR} = P_{360}$ = 2.43 IN

C.

TOTAL PROJECT AREA (A_T) =	98,000	SF
	2.25	AC

D. LAND TREATMENTS

1.

EXISTING LAND TREATMENT				DEVELOPED LAND TREATMENT			
SURGE POND BASIN	98,000	SF		SURGE POND BASIN	98,000	SF	
	2.25	AC			2.25	AC	
LAND TREATMENT	AREA (SF/AC)		%	LAND TREATMENT	AREA (SF/AC)		%
A				A			
B				B			
C	98,000	SF	100%	C	98,000	SF	100%
	2.25	AC			2.25	AC	
D				D			

II. HYDROLOGY

A. EXISTING CONDITION 100 YEAR STORM

1. SURGE POND BASIN

a. VOLUME 100-YR, 6-HR

$WT_E = (E_A \cdot A_A + E_B \cdot A_B + E_C \cdot A_C + E_D \cdot A_D)/A_T$

$(0.67 \cdot 0.00) + (0.86 \cdot 0.00) + (1.09 \cdot 2.25) + (2.58 \cdot 0.00)/2.25 =$ **1.09 IN**

$V_{100,6\,HR} = (E_W/12) \cdot A_T$ $(1.09/12) \cdot 2.25 =$ **0.2044 AC-FT =** **8,900 CF**

b. VOLUME 100-YR, 10-DAY

$V_{10Days} = V_{360} + A_D * (P_{10DAYS} - P_{360}) / 12$ in/ft =

$V_{10Days} = 0.2044 + 0$ AC * (3.90 - 2.17) / 12 in/ft = **0.2044 AC-FT =** **8,900 CF**

c. PEAK DISCHARGE 100-YR

$Q_{100} = Q_A \cdot A_A + Q_B \cdot A_B + Q_C \cdot A_C + Q_D \cdot A_D$

$(1.84 \cdot 0.00) + (2.49 \cdot 0.00) + (3.17 \cdot 2.25) + (4.49 \cdot 0.00) =$ **7.1 CFS**

DEVELOPED CONDITIONS (Phase 2):

As shown by the plan and profile (Exhibit D) and Exhibit A, Phase 2 of the project will convert the Phase 1 retention pond to a detention pond by installing a storm drain system in Chico with a cattle guard inlet and two Type "A" inlets. This system will drain via gravity to the Dallas Street storm drain at a new manhole at AP-1 unless the Dallas SD is surcharged in which case the pond storage will be temporarily held until the HGL in Dallas recedes to a level below the water surface level, allowing flow to the east. For events that result in a flow depth exceeding 1.2 ft in the Dallas storm drain or pressure/surcharged conditions, flow in Dallas will surge back up through the new Chico storm drain into the pond.

Intercepting Chico runoff and diverting it into the detention pond will significantly reduce the rate and volume of stormwater runoff observed downstream in Chico. For more frequent events, this intercepted runoff will initially drain into the pond until it reaches an elevation of 5343.7 at which point it will begin to flow down the Chico storm drain back to Dallas by gravity. For larger events that result in backup or capacity limitations in the Dallas storm drain, the pond will temporarily hold the stormwater up to the full 5.02 acre-ft capacity and water surface level of 5350.2 until the downstream surge condition recedes and will then drain under gravity flow at a maximum rate of 21.8 cfs (limited by the two 24" parallel pipes - see Exhibit E for calculations) and take approximately 2.8 hours to empty (219,593 CF / 21.8 CFS = 2.8 hrs).

The 45-acre Chico Basin is capable of generating approximately 7.2 acre-feet of runoff for the 100-year storm. The proposed pond will have a maximum storage volume of 5.02 acre-feet at the maximum W.S.L 5350.2 which is elevation of the proposed the cattle guard grate. At this elevation the pond will no longer accept surface runoff and any bypass flow will continue to the west in Chico. The cattle guard will therefore serve as the emergency overflow for this pond.

FUTURE CONDITIONS: As mentioned earlier in this report, the proposed Zuni-Penn project, once constructed, will detain runoff from the Campus Wash basin and a portion of the Central Basin will also be diverted into it by orifice plate, thereby significantly reducing the flow rate in the Dallas storm drain to a level much less than its capacity. This will either eliminate or significantly reduce the frequency of a surge condition as the maximum HGL in Dallas will be significantly lowered to an elevation corresponding to the flow depth resulting from the new reduced flow rate in the pipe downstream of Zuni-Penn. In conjunction with that project, and to provide future benefits to the watershed, an orifice plate could be added to the manhole at AP-1 to restrict the outflow to the north and increase the HGL in the manhole to 5354.95, thereby creating a controlled surge condition for storm water to back up in the Chico storm drain into the IDL pond for more frequent events. This HGL elevation of 5354.95 was selected based upon the most limiting reach with the two 24-inch parallel pipes keeping the HGL at the cattle guard rim and SDMH #1 rim with a potential surge flow of 46.9 cfs under pressure conditions (see Exhibit E for calculations). Although one could force the HGL at SDMH to the rim with an orifice plate, the resulting flow rate of 72.8 cfs in the 36-inch pipe reaches to the west would result in an HGL that exceeds the rim at SDMH #1 resulting in additional street flow.

Additionally, there have been discussions about a potential future project to introduce Chico runoff into the Dallas SD at Charleston, upstream of AP-1. The Chico basin currently has no infrastructure to introduce runoff into Dallas SD and runoff eventually continues to the west down Chico. This potential future project would increase flow in the Dallas storm drain upstream of AP-1, and therefore increase the HGL at the new AP-1 manhole and promote a surge condition back to the IDL pond.

The proposed Phase 2 Chico SD could therefore function as a surge outlet to the Phase 1 pond for the Zuni-Penn project and/or for a Charleston Diversion project. In the absence of either project, it will still serve as a detention pond to mitigate downstream flooding in Chico.

The size and installation timing of a potential future orifice plate at AP-1 should be determined by the future projects based upon their resultant flow rates and volumes in the Dallas storm drain. Until either is constructed, an orifice plate should not be installed as the Dallas system is already overtaxed and an orifice plate would be problematic as it would further restrict the capacity and result in additional bypass, backup, and flooding upstream of AP-1.

SUMMARY AND CONCLUSION

This project will construct a pond and storm drain system that will:

1) Be a temporary retention pond holding the runoff that falls on it (Phase 1).
2) Be further improved as a public park.
3) Intercept and detain Chico Road runoff (Phase 2), significantly reducing the peak rate and volume in the downstream street.
4) Significantly improve the current condition whereby there is no storm drain system or flow interception for a public street that is a mapped floodplain with downstream flooding issues.
5) Potentially work in tandem with the proposed Zuni-Penn project to relieve pressure on the existing overtaxed Dallas storm drain system.
6) Provide options for possible future flow interception at Chico and Pennsylvania.
7) Be constructed and maintained by the City of Albuquerque.
8) Provide water quality benefits.

A more complex analysis of the overall watershed with all systems in place is beyond the scope of study and report for this project. The limited hydraulic and hydrologic calculations contained herein are intended to support the functionality of the IDL pond and the Chico storm drain maximum surge capacity and capacity to drain out by gravity under non-pressure or surge conditions. to and not to represent a comprehensive analysis. The intent of this project is to provide a qualitative improvement to the overall area drainage conditions. All proposed manhole lids on this project will be vented to allow relief as surface flow to the streets if HGL's greater than rim height occur. In all cases the runoff will then either flow down to the next interception opportunity, or if the pond is full, will continue down the street to the west in Chico consistent with historic patterns, but with reduced rates and volumes, thereby representing a qualitative improvement for all rainfall events.

INTERNATIONAL DISTRICT LIBRARY SURGE POND - EXHIBIT A

HIGH MESA Consulting Group

DALLAS

66" DALLAS SD

Chico Drainage Basin - 45 AC / 188 CFS

AP3

Proposed Chico SD System

Proposed Cattle Guard Inlet

AP1

CHICO

AP2

Potential Future Project - Cattle Guard and Storm Drain Connection to Dallas System

Proposed IDL Pond 5.02 AC-FT

CENTRAL

WYOMING

Central Drainage Basin - 40.8 AC / 176 CFS

Proposed Orifice Plate with Zuni-Penn Project to Allow 40 CFS to Pass with 136 CFS Forced South to the Zuni-Penn Pond

Proposed Zuni - Penn Pond

752 3

616 0 308 616 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

1/5/2023

1: 3,693

Legend

Flood Zones 2012

- 0.2 PCT ANNUAL CHANCE FLOOD HA
- 1 PCT ANNUAL CHANCE FLOOD HAZ/ CHANNEL
- A
- AE
- AH
- AO
- D
- X
- X PROTECTED BY LEVEE

City Parcels

Contour 2ft - 2010

Municipal Limits

- Corrales
- Edgewood
- Los Ranchos
- Rio Rancho
- Tijeras
- UNINCORPORATED

Notes

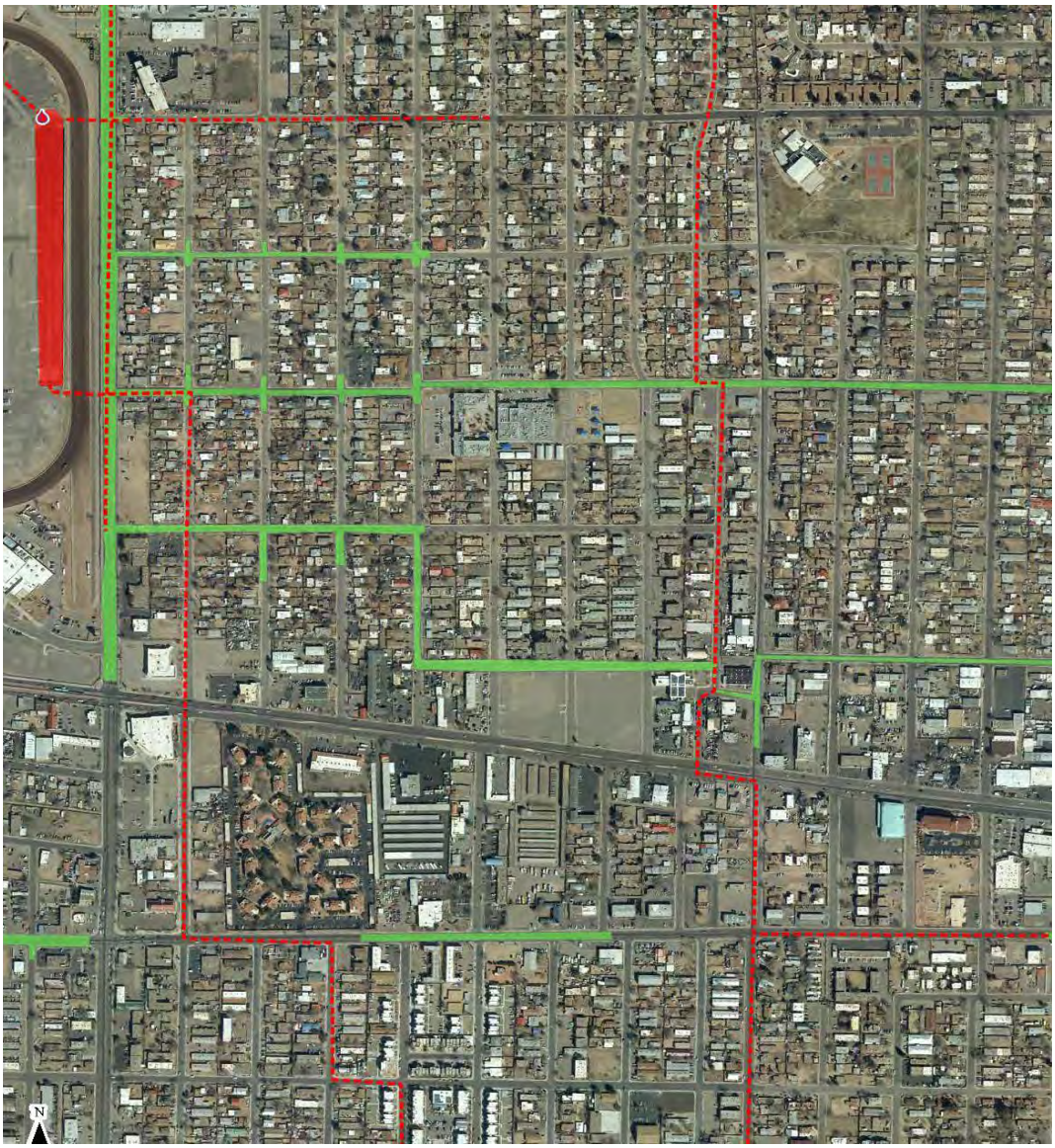
Exhibit B

AMAFCA Board Meeting Memorandum Agenda Item 13f(ii)
Information Item

To: AMAFCA Board of Directors
From: Bradley L Bingham, P.E., Drainage Engineer BLB
Date: July 22, 2022

Subject: Dallas Storm Drain Regional Flood Control Facilities - International District Library Pond – Project Update

Action Requested: None



The picture above depicts floodplain (in green) in the area downstream of the Dallas Storm Drain

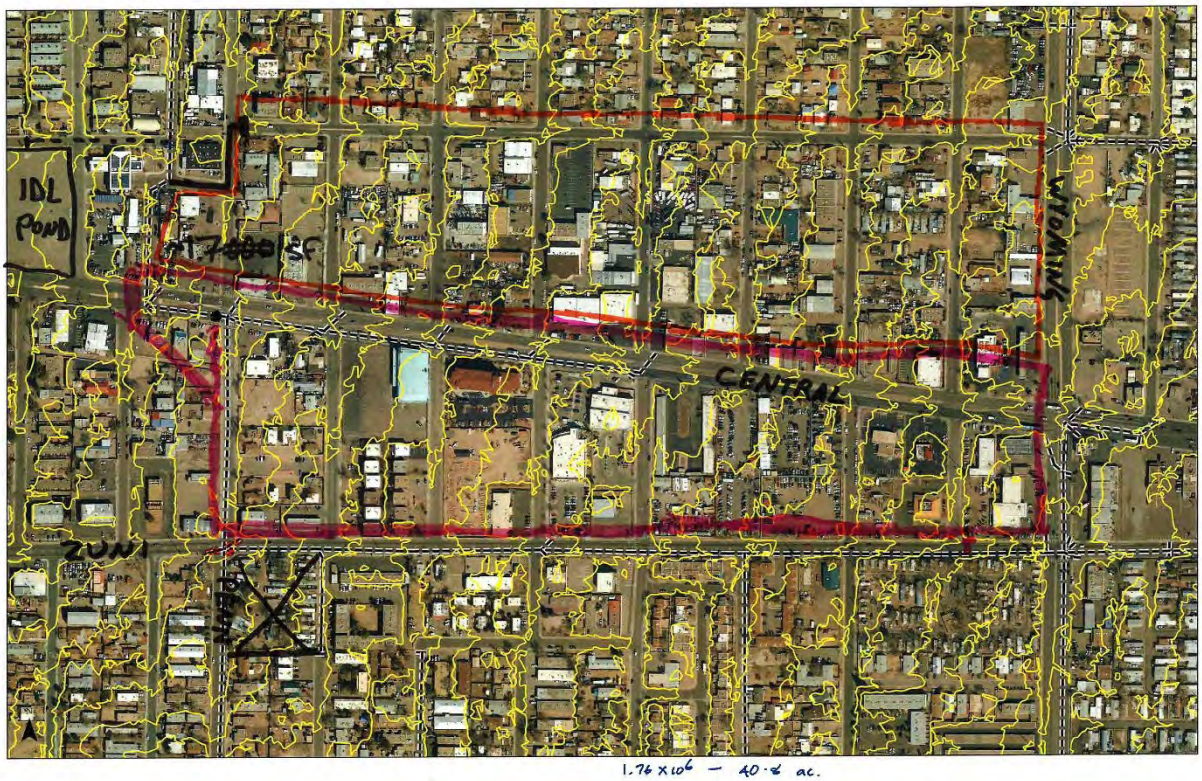
Past Hydrology Studies:

Campus Wash Floodplain Removal Project (Smith) - Identified that runoff from the study area (Central to Gibson, Wyoming to San Mateo) overwhelmed all storm drains serving the area. Specifically, the Dallas Storm Drain receives 274 cfs from south of Central. This is the maximum capacity of the 66" RCP SD and any runoff generated north of Central cannot enter the system.

San Mateo to Moon Mini DMP (Smith) - The study area encompassed Central to I-40, Moon to Washington. Study corroborated that storm drains (which generally run south to north) are full once they cross Central. It also determined that approximately 40 AF of detention storage is needed to mitigate the lack of capacity in the sub-basin that feeds the Dallas Storm Drain.

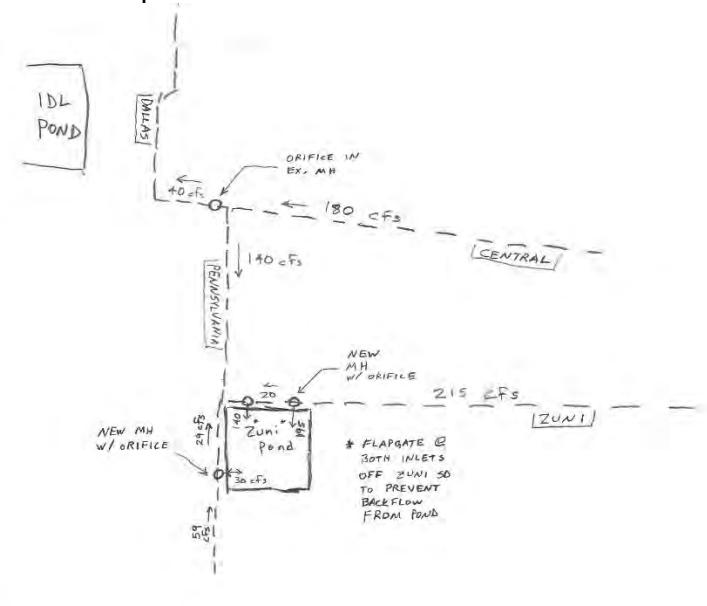
Zuni Penn Pond

Zuni Penn Pond Feasibility Study (Smith) - The study stated that the sub-basin upstream of the intersection of Zuni and Pennsylvania generates 38 AF total, and that a 22 AF detention pond releasing 48 cfs could be situated on the 2.2-acre site. To achieve 22 AF of storage, the bottom of the pond would have to be below the invert of the storm drain feeding it; therefore, pumping would be necessary. To maximize the benefit of the pond system, staff assessed the option of increasing the pond volume to the recommended 40 AF. The sub-basin that enters the storm drain at Central and Pennsylvania is approximately 40 acres. This area generates approximately 180 cfs peak discharge and 9 AF of runoff volume.



Assessing the system downstream of the proposed Zuni-Penn pond, it was determined that the storm drain would immediately be full again once runoff from Central entered it. Installing an

orifice (sized to allow 40 cfs to pass) at this location would essentially divert 140 cfs back to the Zuni Penn pond.



International District Library (IDL) Pond

In October 2019, AMAFCA and the City of Albuquerque entered into an agreement to participate in property acquisition, design, and construction of the International District Library Pond (at the site of the old Caravan Night Club). This property was identified, due to its proximity to the Dallas Storm Drain, as a location for a surge pond to "park" water out of the system until peak flows could pass. Preliminary design estimates identified 4-5 AF of storage volume could be available. Once the Zuni Penn pond is operational, there only be 60 cfs in the Dallas Storm Drain at the location of the IDL surge pond. Staff is recommending routing the sub-basin north of Central to the Dallas Storm Drain (at Chico) to fully maximize the benefit of the surge pond on the system. This will allow surface runoff on the streets north of Chico to enter the storm drain instead of bypassing the system.

Neither the Zuni Penn pond nor the IDL pond by themselves provide the fully-needed benefit to the system because immediately downstream from either of these facilities, the system becomes full again. .AMAFCA has committed $1.25 million (IDL) and $1.4 million (Zuni Penn) to date to help remove floodplain, and mitigate flooding problems in a blighted neighborhood near Louisiana Blvd and Central Ave..

Possible Budget Impact

Zuni Penn Regional Drainage Facility is a Tier 1 project. AMAFCA has paid $850,000 toward the property acquisition and design of the IDL pond. $400,000 will be provided once the construction contract is awarded

Possible Staff Impact

Project Management of the Zuni Penn Regional Drainage Facility design is part of staff normal work load.

Zuni-Penn Pond Project Technical Memorandum

To: AMAFCA Projects File # 2001ZuniPennPond
From: Bradley L. Bingham, P.E. AMAFCA Drainage Engineer
Date: July 7, 2022

Subject: Zuni Penn Pond Design

Summary:

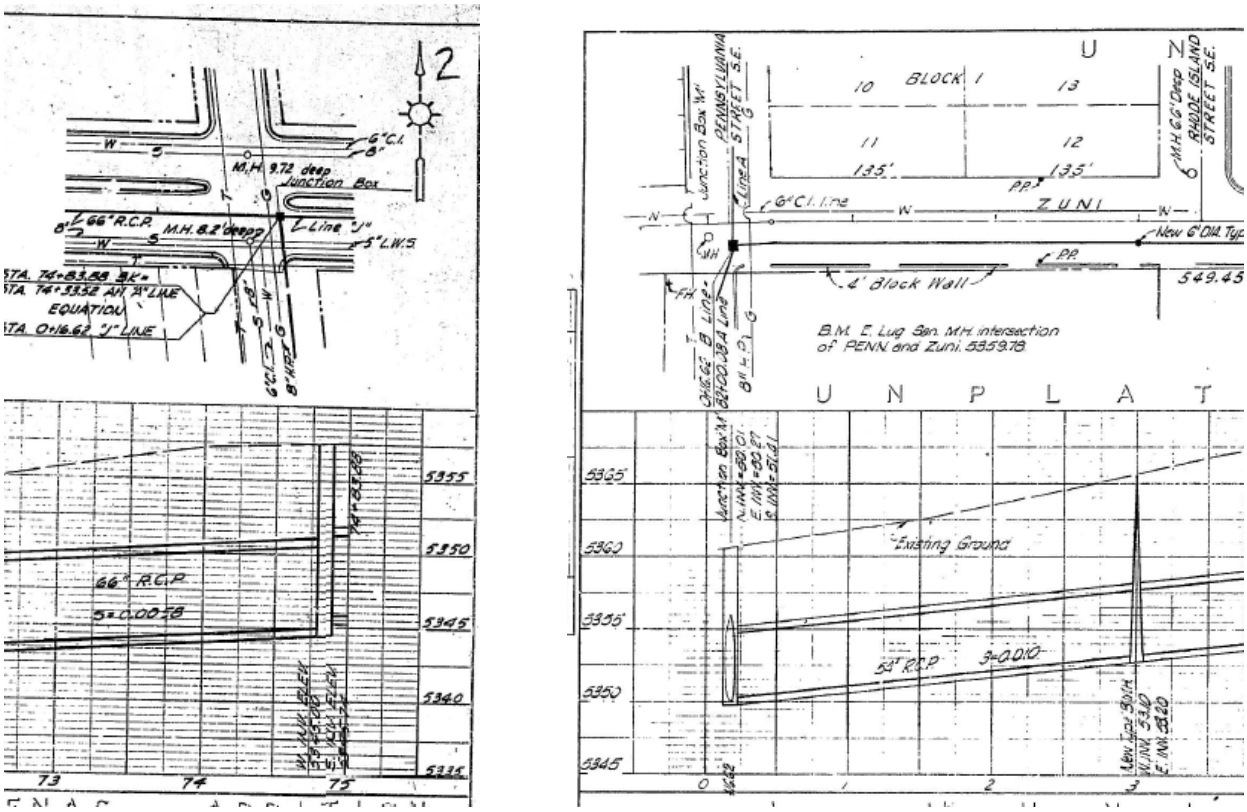
Past Hydrology Studies:
Campus Wash Floodplain Removal Project (Smith) - Identified that runoff from the study area (Central to Gibson, Wyoming to San Mateo) overwhelmed all storm drains serving the area. Specifically, the Dallas Storm Drain receives 274 cfs from south of Central. This is the maximum capacity of the 66" RCP SD and runoff generated north of Central cannot enter the system.

San Mateo to Moon Mini DMP (Smith) - The study area encompassed Central to I-40, Moon to Washington. Study corroborated that storm drains (which generally run south to north) are full once they cross Central. It determined that approximately 40 AF of detention storage is needed to mitigate the lack of capacity in the sub-basin that feeds the Dallas Storm Drain.

Hydrology
Zuni Penn Pond Feasibility Study (Smith) - The study stated that the sub-basin upstream of the intersection of Zuni and Pennsylvania generates 38 AF total, and that a 22 AF detention pond releasing 48 cfs could be situated on the 2.2 acre site. The sub-basin that enters the storm drain at Central and Pennsylvania is approximately 40 acres. The site is located in Zone 3 (Figure 6.2.3, DPM). Using DPM tables 6.2.13 and 6.2.14, this area generates approximately 180 cfs peak discharge and 9 AF of runoff volume. Assessing the system downstream of the proposed Zuni-Penn pond, it became obvious that the storm drain would be "full" again once runoff from Central entered it.

Hydraulics
The Zuni Penn Pond and Pumpstation is at the corner of Zuni and Pennsylvania. A 36" RCP SD (s = 0.65%, Qmax=59cfs) in Pennsylvania and a 54" RCP SD (s = 1.00%, Qmax=215 cfs) in Zuni combine at the intersection and heads north in a 66" RCP SD (s = 0.56%) in Pennsylvania to Central. The system continues west to Dallas, then north in Dallas to the Embudo Arroyo. A 66" RCP at 0.56% has a maximum capacity of 274 cfs.

Per Work Order plans for the Dallas St, Interceptor Storm Sewer (CPN 860460, 1929 datum), the invert of the 66" storm drain at Pennsylvania and Central is noted as 5345.74 and the rim is approximately 5357.5. Adjusting these elevations to 1988 datum (approximately 2.7 feet) yields an invert at 5348.4 and rim at 5360.2.



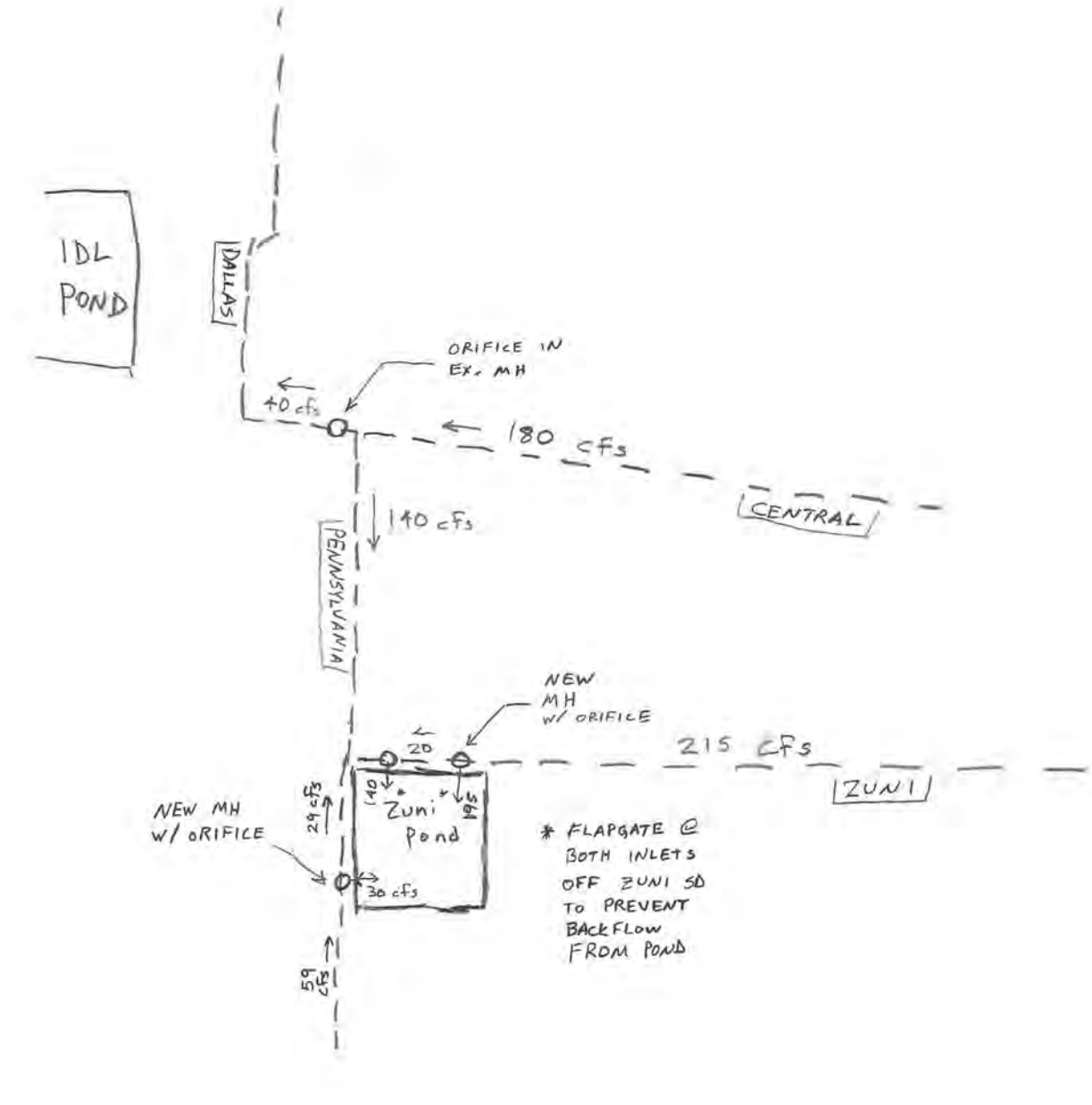
The work order plans show a manhole at Zuni and Pennsylvania with an invert at 5350.7 and rim at approximately 5360 +/-. Adjusted (1988 datum) invert is 5353.4 and 5362.7. Survey recently obtained verifies these adjustments.

Proposed Hydraulics

In order to maximize the benefit of the Zuni-Penn pond (and keep stormwater in the pond from "leaking" out at Central and Pennsylvania), the maximum water surface in the pond must be at or below 5360.2 and provide approximately 30 AF of storage at that elevation.

An orifice placed in the manhole at Central and Pennsylvania, sized to allow a maximum of 40 cfs to pass, will essentially divert the remaining 140 cfs to the Zuni Penn pond. A new 54" inlet into the pond from the Zuni storm drain will allow for this 140 cfs to enter the pond and a flapgate will prevent this 140 cfs flowrate from flowing back into the stormdrain.

A new manhole constructed at the northeast corner of the Zuni Penn pond (with an orifice sized for 20 cfs) will divert 195 cfs into the pond. Another orifice (sized for 40 cfs) placed at an existing manhole at Central and Pennsylvania will divert 140 cfs into the Zuni Penn pond. The outlet from the pond will entail the construction of a new manhole in the Pennsylvania storm drain (with and orifice sized for 30 cfs). See sketch below.



Surface water from the east, which currently bypasses the system, creates floodplain and flooding risk to numerous properties downstream. This proposed modification to the system will provide badly-needed capacity in the Dallas SD system and allow for the removal of many residential properties to be removed from the FEMA floodplain.

FIGURE 6.2.3 **Precipitation Zones**

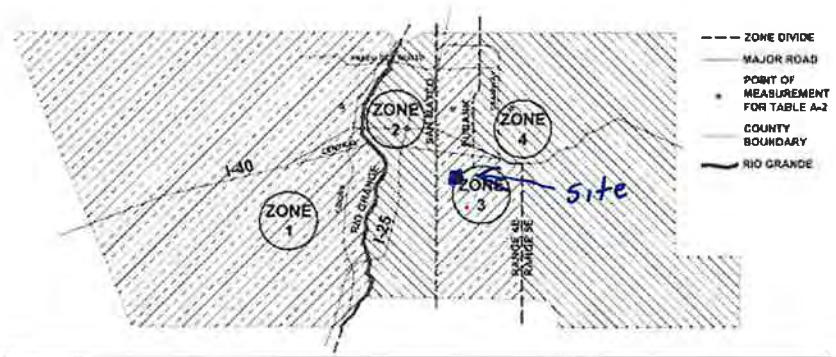
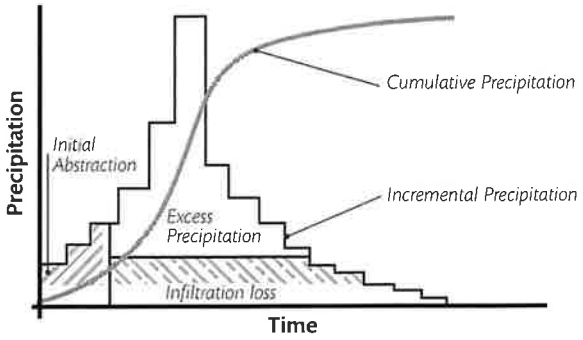


TABLE 6.2.8 **Precipitation for Zones 1-4**

Partial Duration		500 year		100 year		10 year		2 year	
		Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr	Depth (in)	Intensity in/hr
ZONE 1									
5	min.	0.701	8.41	0.538	6.46	0.335	4.02	0.207	2.48
10	min.	1.070	6.42	0.819	4.91	0.511	3.07	0.315	1.89
12	min.	-	5.96	-	4.58	-	2.85	-	1.76
15	min.	1.320	5.28	1.020	4.08	0.633	2.53	0.390	1.56
30	min.	1.780	3.56	1.370	2.74	0.852	1.70	0.525	1.05
60	min.	2.200	2.20	1.690	1.69	1.060	1.06	0.650	0.65
2	hr.	2.530	1.27	1.920	0.96	1.190	0.60	0.746	0.37
3	hr.	2.760	0.92	2.000	0.67	1.250	0.42	0.800	0.27
6	hr.	2.780	0.46	2.170	0.36	1.400	0.23	0.920	0.15
24	hr.	3.090	0.13	2.490	0.10	1.680	0.07	1.160	0.05
4	day	3.780	0.04	3.120	0.03	2.190	0.02	1.560	0.02
10	day	4.680	0.02	3.900	0.02	2.760	0.01	1.970	0.01
Zone 2									
5	min.	0.731	8.77	0.565	6.78	0.355	4.26	0.220	2.64
10	min.	1.110	6.66	0.860	5.16	0.540	3.24	0.335	2.01
12	min.	-	6.20	-	4.81	-	3.01	-	1.87
15	min.	1.380	5.52	1.070	4.28	0.669	2.68	0.415	1.66
30	min.	1.860	3.72	1.440	2.88	0.901	1.80	0.559	1.12
60	min.	2.300	2.30	1.780	1.78	1.120	1.12	0.692	0.69
2	hr.	2.660	1.33	2.030	1.02	1.260	0.63	0.797	0.40
3	hr.	2.730	0.91	2.100	0.70	1.320	0.44	0.844	0.28
6	hr.	2.980	0.50	2.290	0.38	1.480	0.25	0.977	0.16

FIGURE 6.2.4 **Precipitation and Time**



The 6-hour excess precipitation, E, by zone and treatment is summarized in *TABLE 6.2.13*.

TABLE 6.2.13 **6-hour Excess Precipitation, 'E'**

Zone	Land Treatment			
	A	B	C	D
100-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.55	0.73	0.95	2.24
2	0.62	0.80	1.03	2.33
3	0.67	0.86	1.09	2.58
4	0.76	0.95	1.20	3.34
2-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.00	0.01	0.13	0.92
2	0.00	0.02	0.16	0.98
3	0.00	0.05	0.19	1.05
4	0.00	0.28	0.87	1.39
10-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.11	0.26	0.43	1.43
2	0.15	0.30	0.48	1.51
3	0.18	0.34	0.52	1.64
4	0.25	0.41	0.59	2.15

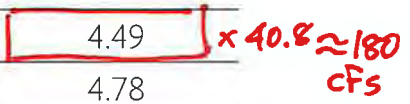
To determine the volume of runoff:

1. Determine the area in each treatment, A_A, A_B, A_C, A_D
2. Compute the weighted excess precipitation, E

$$V = \frac{2.58}{12} \times 40.8 \text{ ac} = 8.8 \text{ ac. ft}$$

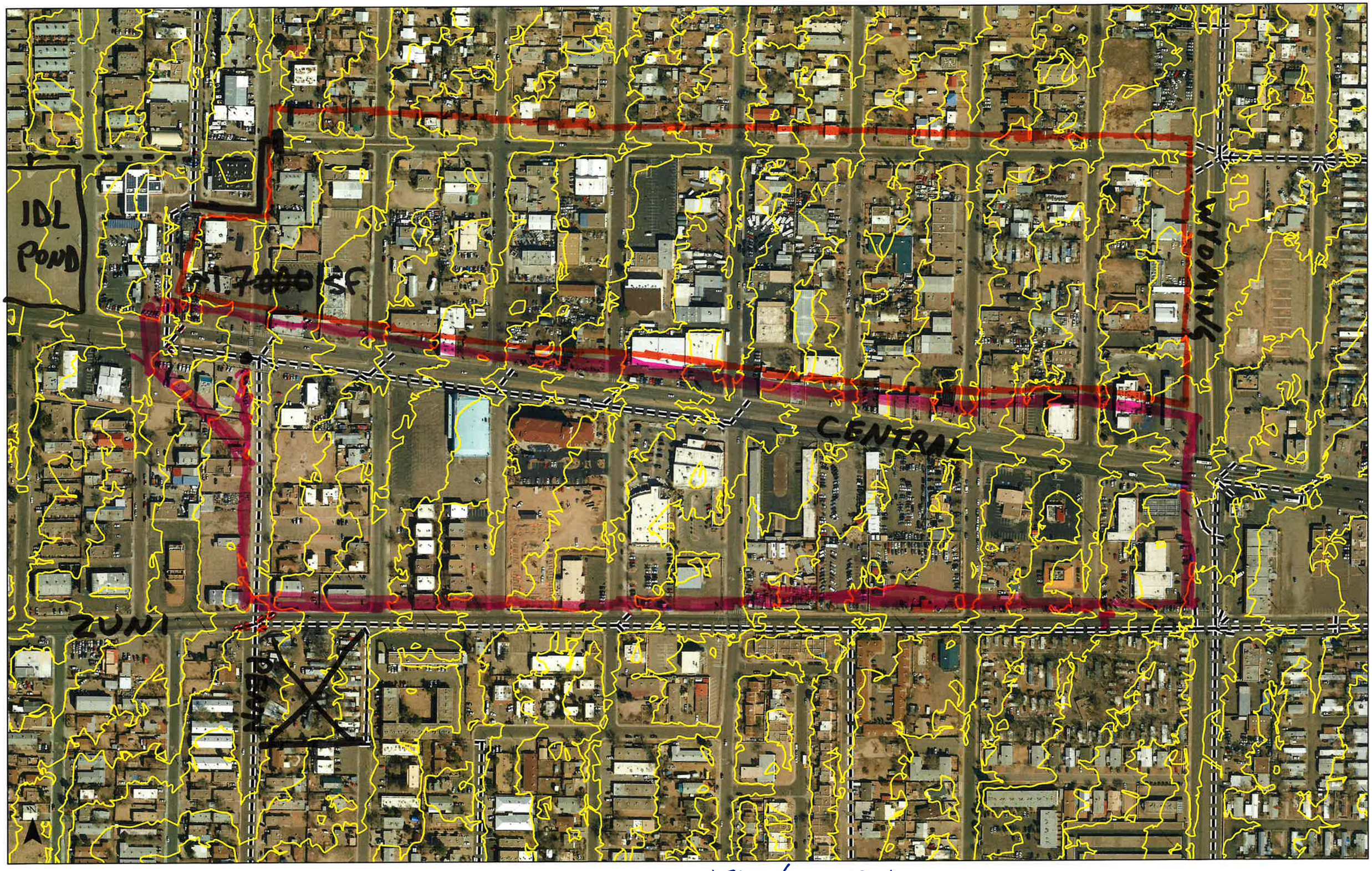
TABLE 6.2.14 **Peak Discharge**

Zone	Land Treatment			
	A	B	C	D
100-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	1.54	2.16	2.87	4.12
2	1.71	2.36	3.05	4.34
3	1.84	2.49	3.17	4.49
4	2.09	2.73	3.41	4.78
2-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.00	0.02	0.50	1.56
2	0.00	0.08	0.61	1.66
3	0.00	0.15	0.71	1.73
4	0.00	0.28	0.87	1.88
10-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.30	0.81	1.46	2.57
2	0.41	0.95	1.59	2.71
3	0.51	1.07	1.69	2.81
4	0.70	1.28	1.89	3.04

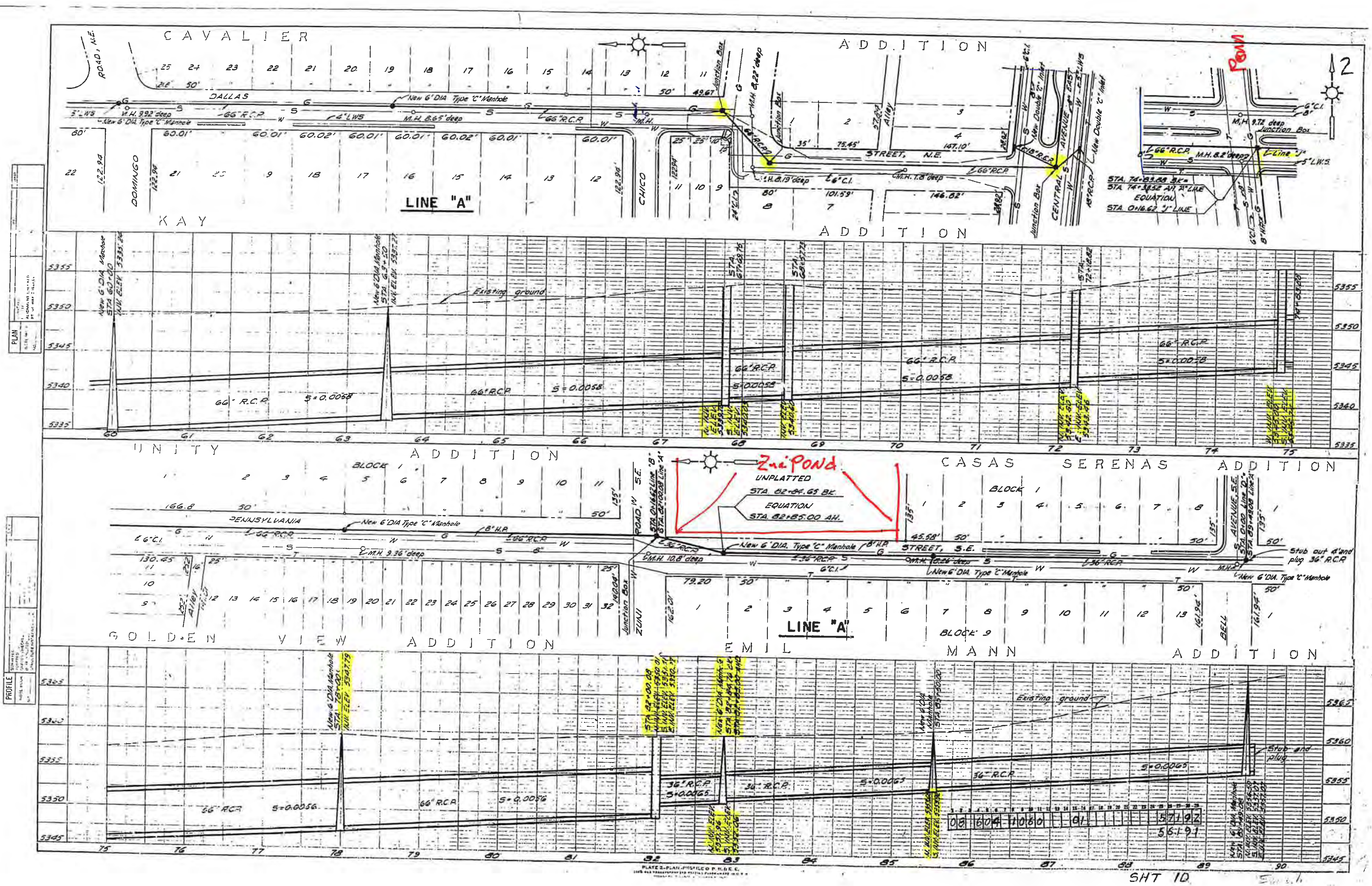


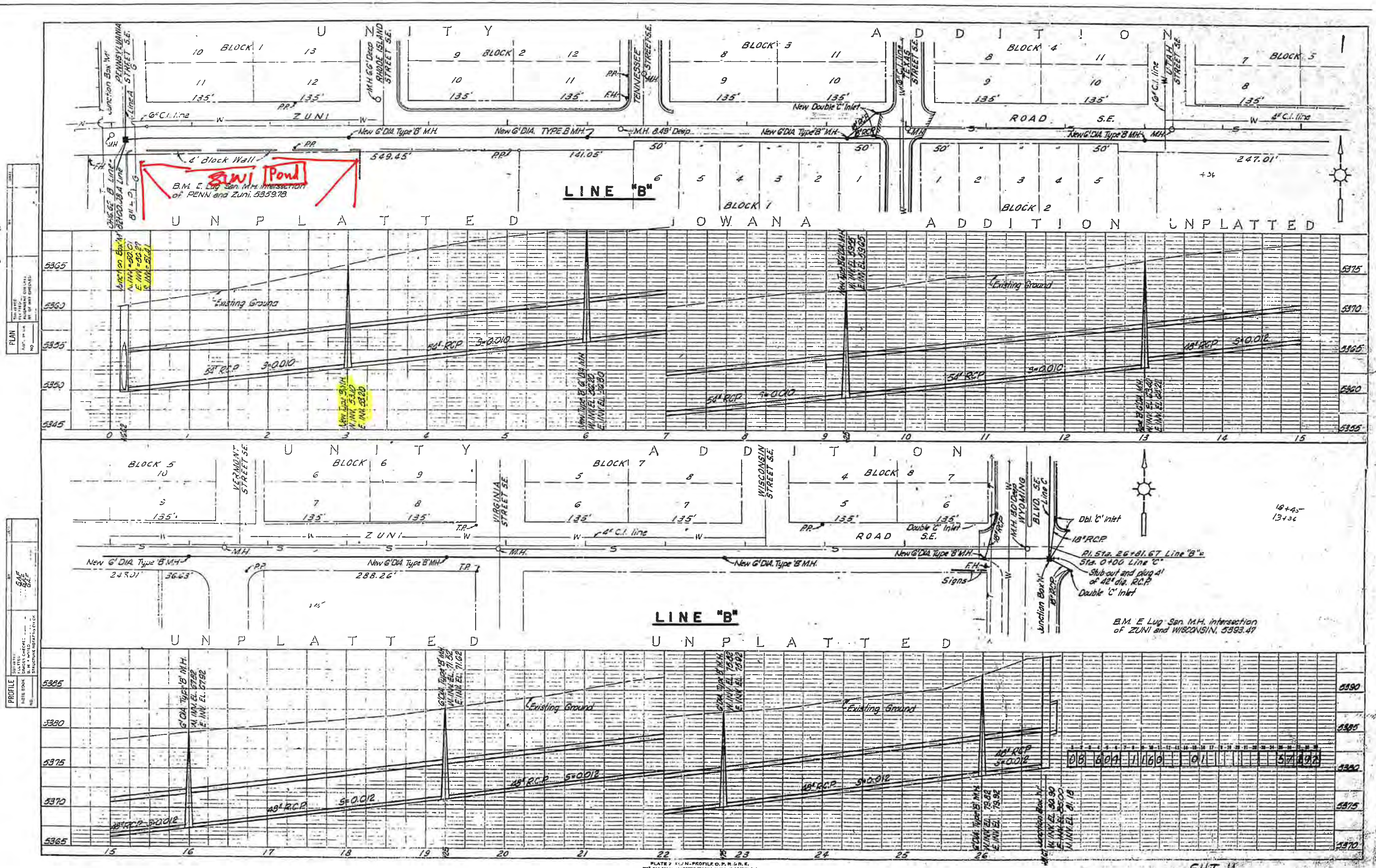
To determine the peak rate of discharge,

1. Determine the area in each treatment, A_A, A_B, A_C, A_D
2. Multiply the peak rate for each treatment by the respective areas and sum to compute the total Q_P.

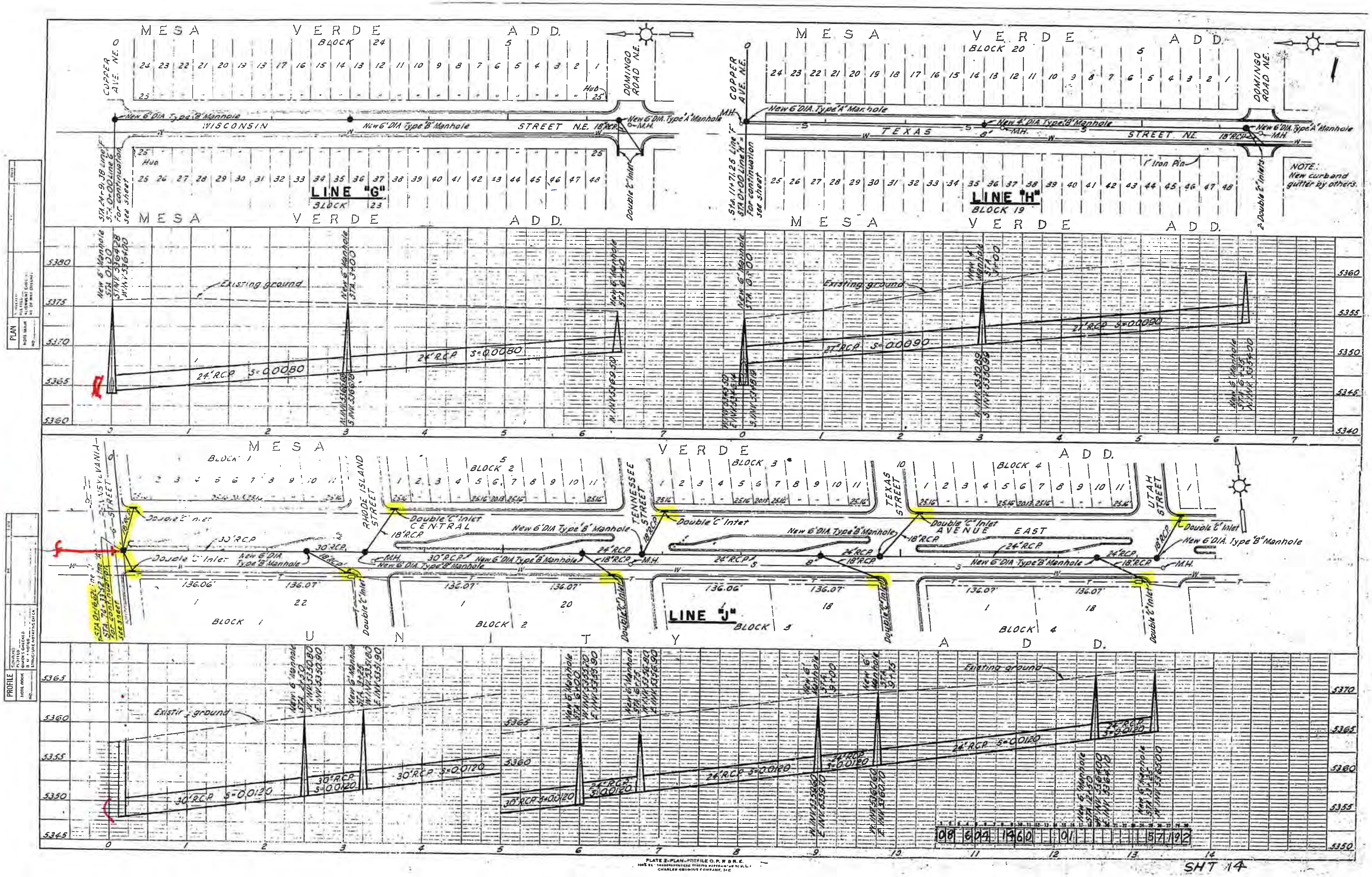


1.76×10^6 — 40.8 ac.


CAVALIER
ADDITION
KAY
ADDITION
LINE "A"
DALLAS
STREET, N.E.
DOMINGO
CHICO
CENTRAL AVENUE
Existing ground
66" R.C.P.
S=0.0058
UNITY ADDITION
CASAS SERENAS ADDITION
Zuni Pond
UNPLATTED
STA. 82+64.65 BK.
EQUATION
STA. 82+85.00 AH.
PENNSYLVANIA
ZUNI ROAD, S.E.
GOLDEN VIEW ADDITION
EMIL MANN ADDITION
BLOCK 9
BELL
36" R.C.P.
S=0.0065
Stub and plug
SHT 10



UNITY ADDITION
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
BLOCK 5
PENNSYLVANIA STREET S.E.
RHODE ISLAND STREET S.E.
TENNESSEE STREET S.E.
TEXAS STREET S.E.
UTAH STREET S.E.
ZUNI ROAD S.E.
New 6' DIA. Type 'B' M.H.
New Double 'C' Inlet
4' Block Wall
549.45'
141.05'
247.01'
Zuni Pond
B.M. E. Lug San. M.H. intersection of PENN. and Zuni. 5359.78
LINE "B"
UNPLATTED
IOWANA ADDITION
Existing Ground
54" RCP S=0.010
48" RCP S=0.012
PLAN
PROFILE
BLOCK 6
BLOCK 7
BLOCK 8
VERMONT STREET S.E.
VIRGINIA STREET S.E.
WISCONSIN STREET S.E.
WYOMING BLVD. S.E.
288.26'
Dbl. 'C' Inlet
18" RCP
Pl. Sta. 26+81.67 Line "B" = Sta. 0+00 Line "C"
Stub out and plug 4' of 42" dia. R.C.P.
Double 'C' Inlet
Junction Box 'N'
B.M. E. Lug San. M.H. intersection of ZUNI and WISCONSIN. 5393.47
SHT 11


MESA VERDE ADD.
BLOCK 24
COPPER AVE. NE.
DOMINGO ROAD NE.
WISCONSIN STREET N.E.
New 6' DIA. Type 'B' Manhole
New 6' DIA. Type 'A' Manhole
Double 'C' Inlet
LINE "G"
BLOCK 23
BLOCK 20
TEXAS STREET NE.
New 4' DIA. Type 'B' Manhole
1" Iron Pin
NOTE: New curb and gutter by others.
LINE "H"
BLOCK 19
2 Double 'C' Inlets
Existing ground
24" RCP S=0.0080
27" RCP S=0.0090
PENNSYLVANIA STREET
RHODE ISLAND STREET
TENNESSEE STREET
TEXAS STREET
UTAH STREET
CENTRAL AVENUE EAST
30" RCP
24" RCP
18" RCP
LINE "J"
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
UNITY ADD.
30" RCP S=0.0120
24" RCP S=0.0120
PLAN
PROFILE
PLATE 2-PLAN-PROFILE
SHT 14

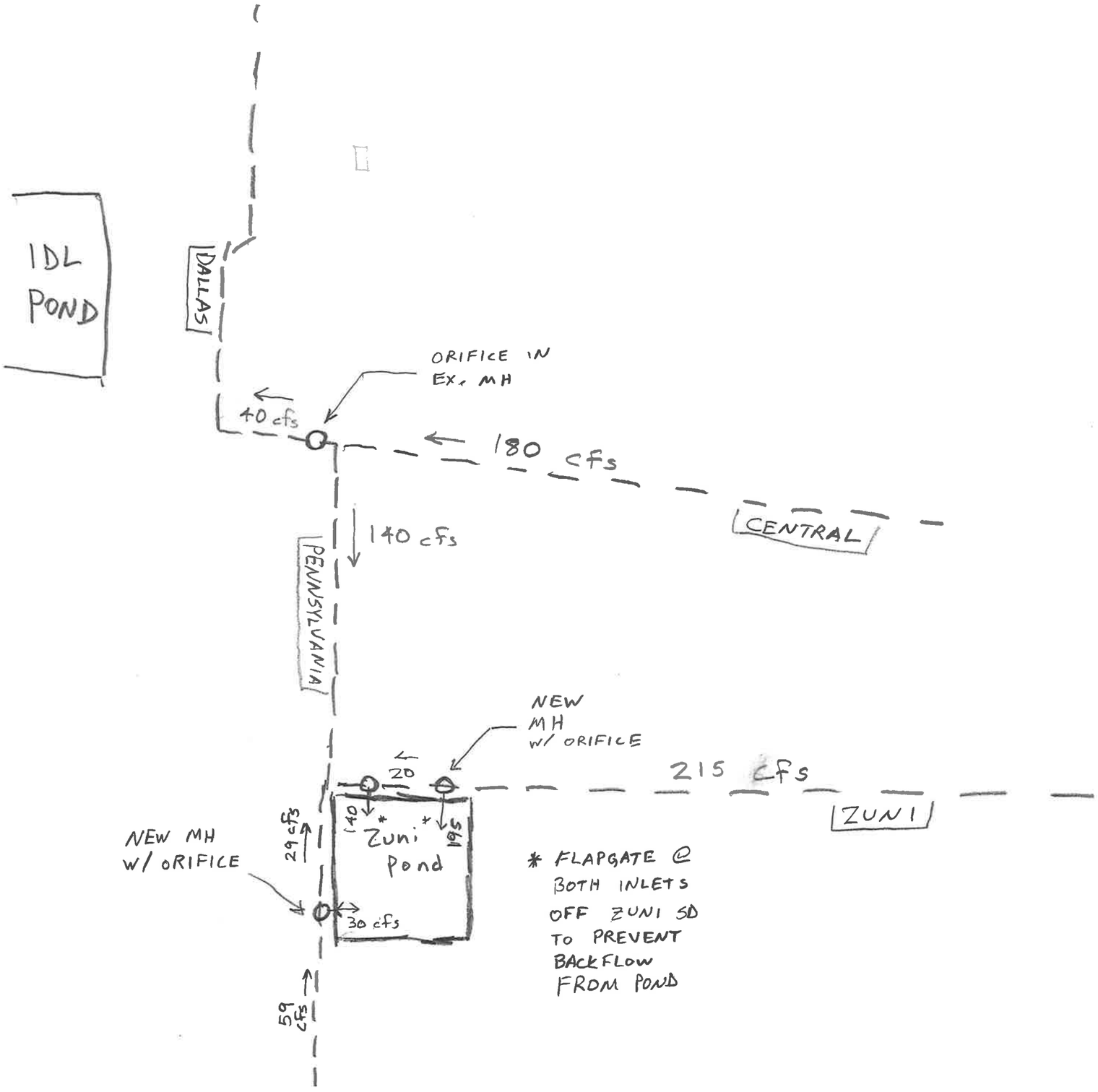

IDL POND
DALLAS
ORIFICE IN Ex. MH
40 cfs
180 cfs
CENTRAL
140 cfs
PENNSYLVANIA
NEW MH w/ ORIFICE
20
215 cfs
ZUNI
140
195
Zuni Pond
29 cfs
NEW MH w/ ORIFICE
30 cfs
59 cfs
* FLAPGATE @ BOTH INLETS OFF ZUNI SD TO PREVENT BACKFLOW FROM POND

EXHIBIT C

DRIVEPAD / SIDEWALK / CURB COORDINATE TABLE

NUMBER	NORTHING	EASTING
1	1483203.94	1547352.39
2	1483197.34	1547355.53
3	1483204.20	1547358.42
4	1483197.45	1547375.53
5	1483008.38	1547396.73
6	1483008.38	1547400.85
7	1482972.68	1547396.65
8	1482972.76	1547400.96
9	1482914.35	1547396.68
10	1482914.36	1547400.87
11	1482880.44	1547396.67
12	1482880.44	1547400.87

NUMBER	NORTHING	EASTING
13	1482859.97	1547396.66
14	1482859.99	1547400.79
15	1482826.44	1547396.73
16	1482826.45	1547400.93
17	1483189.21	1547224.35
18	1483164.82	1547224.52
19	1483089.77	1547300.76
20	1483097.71	1547292.71
21	1483081.76	1547292.71
22	1483063.40	1547326.31
23	1483063.40	1547338.31

TEMPORARY BENCHMARK #1 (T.B.M.)

A MAG NAIL IN ASPHALT PAVEMENT, AS SHOWN ON THIS SHEET.
ELEVATION = 5350.56 FEET (NAVD 1988)

TEMPORARY BENCHMARK #2 (T.B.M.)

A MAG NAIL W/WASHER STAMPED "CARTESIAN SURVEYS PLS 14271" ALSO BEING THE NORTHWEST PROPERTY CORNER OF BLOCK 2, AS SHOWN ON THIS SHEET.
ELEVATION = 5346.72 FEET (NAVD 1988)

TEMPORARY BENCHMARK #3 (T.B.M.)

A MAG NAIL W/WASHER STAMPED "CARTESIAN SURVEYS PLS 14271" ALSO BEING THE NORTHWEST PROPERTY CORNER OF BLOCK 3, AS SHOWN ON THIS SHEET.
ELEVATION = 5350.44 FEET (NAVD 1988)

TEMPORARY BENCHMARK #4 (T.B.M.)

A MAG NAIL W/WASHER STAMPED "CARTESIAN SURVEYS PLS 14271" ALSO BEING THE NORTHEAST PROPERTY CORNER OF BLOCK 3, AS SHOWN ON THIS SHEET.
ELEVATION = 5353.79 FEET (NAVD 1988)

TEMPORARY BENCHMARK #5 (T.B.M.)

A MAG NAIL W/WASHER STAMPED "CARTESIAN SURVEYS PLS 14271" ALSO BEING THE SOUTHEAST PROPERTY CORNER OF BLOCK 3, AS SHOWN ON THIS SHEET.
ELEVATION = 5354.48 FEET (NAVD 1988)

TEMPORARY BENCHMARK #204 (T.B.M.)

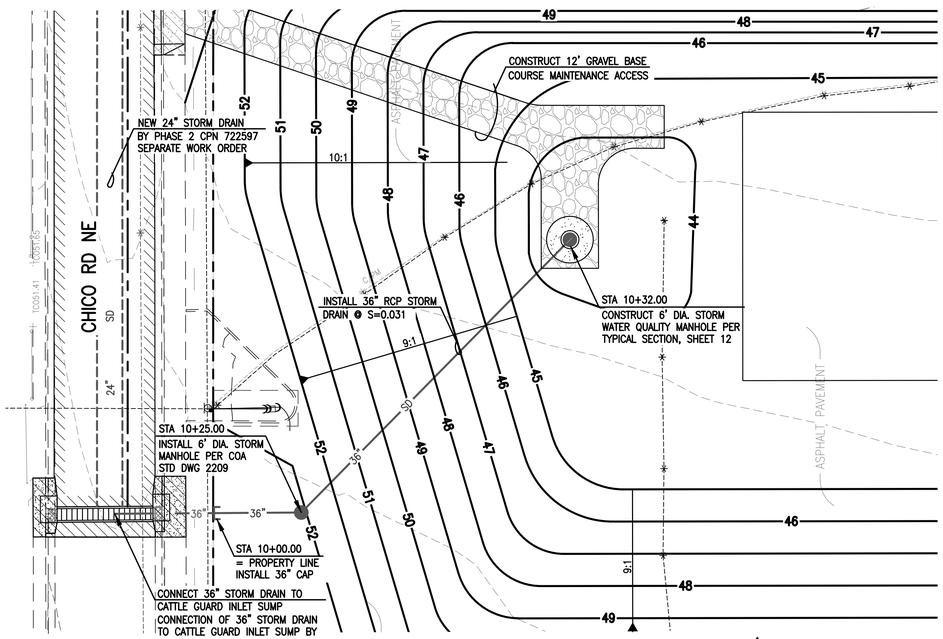
A MAG NAIL W/WASHER IN CONCRETE JOINT, AT THE NORTHEAST QUADRANT OF THE INTERSECTION OF CHICO ROAD AND DALLAS STREET, AS SHOWN ON THIS SHEET.
ELEVATION = 5357.32 FEET (NAVD 1988)

CONSTRUCTION NOTES:

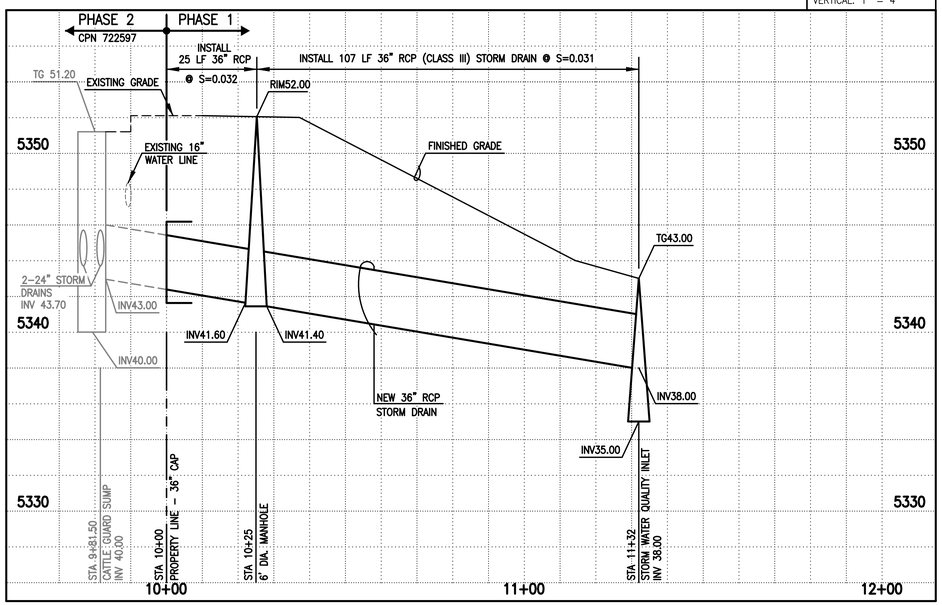
1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 811, FOR DESIGNATION (LINE-SPOTTING) OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INTERPRETATIONS IT MAKES WITHOUT FIRST CONTACTING THE ENGINEER AS REQUIRED ABOVE.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.
5. UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE TOPOGRAPHIC AND UTILITY SURVEY CONDUCTED BY THIS FIRM DATED 04/30/2018 AND INCLUDED AS SHEETS 3-6 OF THIS PLAN SET. THAT UTILITY SURVEY AND SUBSURFACE UTILITY ENGINEERING EFFORT IS NOT ALL-INCLUSIVE AND MAY NOT REPRESENT UTILITIES/INFRASTRUCTURE THAT HAVE BEEN ABANDONED-IN-PLACE, WERE INACCESSIBLE, OR OTHERWISE UNDETECTABLE DUE TO UNFORESEEN AND UNCONTROLLABLE SITE AND/OR UTILITY CONDITIONS. FURTHER, THAT UTILITY INVESTIGATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES, THEREFORE, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFORE. THE PROPERTY OWNER, DEVELOPER, OR CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UNDERGROUND UTILITY LINES. IN PLANNING AND CONDUCTING EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH STATE STATUES, NEW MEXICO EXCAVATION LAWS (NMB11), MUNICIPAL AND LOCAL ORDINANCES, SITE SPECIFIC RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE UTILITY LINES AND FACILITIES.
7. ALL UTILITIES WITHIN THE PROJECT LIMITS THAT ARE RENDERED OBSOLETE AND / OR UNUSED AS A RESULT OF THIS PROJECT SHALL NOT BE ABANDONED IN PLACE, BUT SHALL INSTEAD BE COMPLETELY REMOVED WITHIN THE PROJECT AREA AND CAPPED AT THE PROJECT LIMITS, UNLESS OTHERWISE NOTED.
8. THE GRADES INDICATED ON THIS PLAN ARE FINISHED GRADES UNLESS OTHERWISE INDICATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LEAVING SUBGRADE AT ELEVATIONS THAT SHALL ACCOMMODATE PROPOSED IMPROVEMENTS AS INDICATED ON THE PLANS INCLUDING, BUT NOT LIMITED TO, SURFACE DRAINAGE STRUCTURES, PAVING AND LANDSCAPING SURFACING.

***NOTE:**
CALCULATION FOR V100, 10-DAY VOLUME GENERATED BY SITE UTILIZES COA DPM METHODOLGY AND IS BASED UPON 2.25 AC POND SITE AND ASSUMES TYPE 'C' LAND TREATMENT

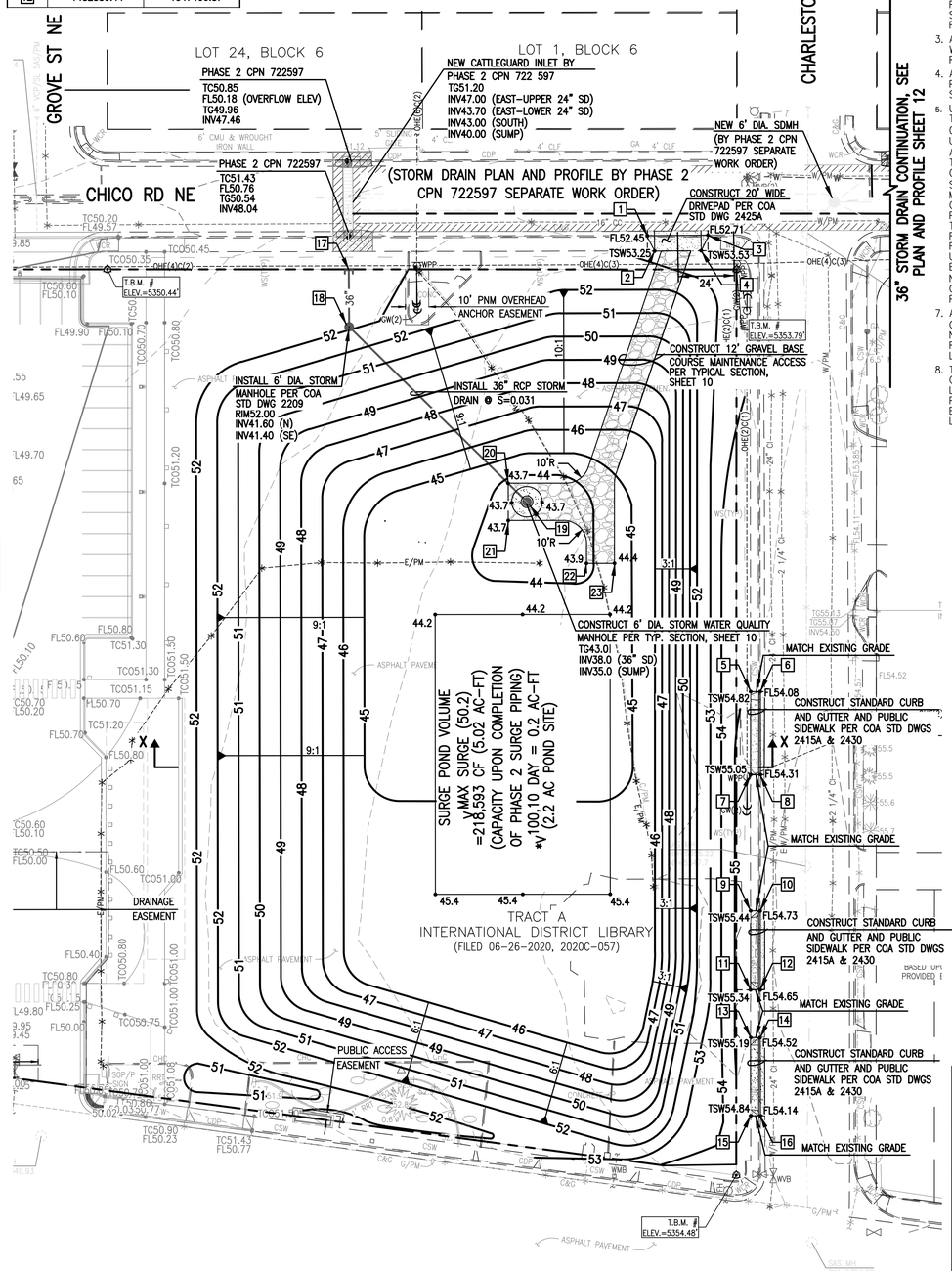
SURGE POND CAPACITY (6:1 MAX SLOPES)				
ELEV FT	AREA SF	VOL CF	∑ VOL CF	∑ VOL AC-FT
5343.0	1250	0	0	0.00
5344.0	3120	2185	2,185	0.05
5345.0	22950	13035	15,220	0.35
5346.0	31180	27065	42,285	0.97
5347.0	36020	33600	75,885	1.74
5348.0	41170	38595	114,480	2.63
5349.0	46660	43915	158,395	3.64
5350.0	52470	49565	207,960	4.77
5350.2	53860	10633	218,593	5.02



36" STORM DRAIN – PHASE 1



SCALE:
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 4'



SCALE: 1" = 30'

30 0 60
15 30

NOTE:
THIS IS NOT A BOUNDARY SURVEY OR A RIGHT OF WAY SURVEY. APPARENT PROPERTY CORNERS, RIGHT OF WAY LINES, PROPERTY LINES AND EASEMENT LINES AS SHOWN ARE DERIVED FROM A RECORDED PLAT DATED 06/26/2020 (DOC#2020057642) PREPARED BY HIGH MESA CONSULTING GROUP, NMPS 11184, DATED 06/2019 (2018.017.2). THE TOPOGRAPHIC INFORMATION DEPICTED HEREON IS BASED UPON THE "TOPOGRAPHIC AND UTILITY SURVEY" PREPARED BY HIGH MESA CONSULTING GROUP, NMPS NO. 11184, DATED 04/30/2018 (2018.017.1). SUPPLEMENTAL SURVEY DATED 06/07/2021 (2021.026.1).

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE
2017.017.1	HMCG	4/30/18

AS BUILT INFORMATION
CONTRACTOR — DATE
WORK STAKED BY — DATE
SURVEYED FOR ACCEPTANCE BY — DATE
FIELD LOCATION BY — DATE
DRAWINGS CORRECTED BY — DATE

BENCH MARKS
AN ACRS BRASS DISK STAMPED "7-K19" SET IN A CONCRETE CYLINDER, ON THE NOSE OF THE ISLAND EAST OF THE INTERSECTION OF CENTRAL AVENUE AND LOUISIANA BOULEVARD.
ELEVATION = 5325.99 FEET (NAVD 1988)

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

ENGINEER'S SEAL
I. GRAEME MEANS
NEW MEXICO
13676
REGISTERED PROFESSIONAL ENGINEER
08-02-2023

REMARKS	BY	DATE
Revisions		
DESIGN	J.D.S.	07-2023
Designed By	J.Y.R.	07-2023
Drawn By	G.M.	07-2023
Checked By		

HIGH MESA Consulting Group
Engineers, Surveyors & Subsurface Utility Consultants
6010-B Midway Park Blvd. NE • Albuquerque, New Mexico 87109
Phone: 505.345.4250 • Fax: 505.345.4254 • www.highmesacg.com

2021.026.2

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

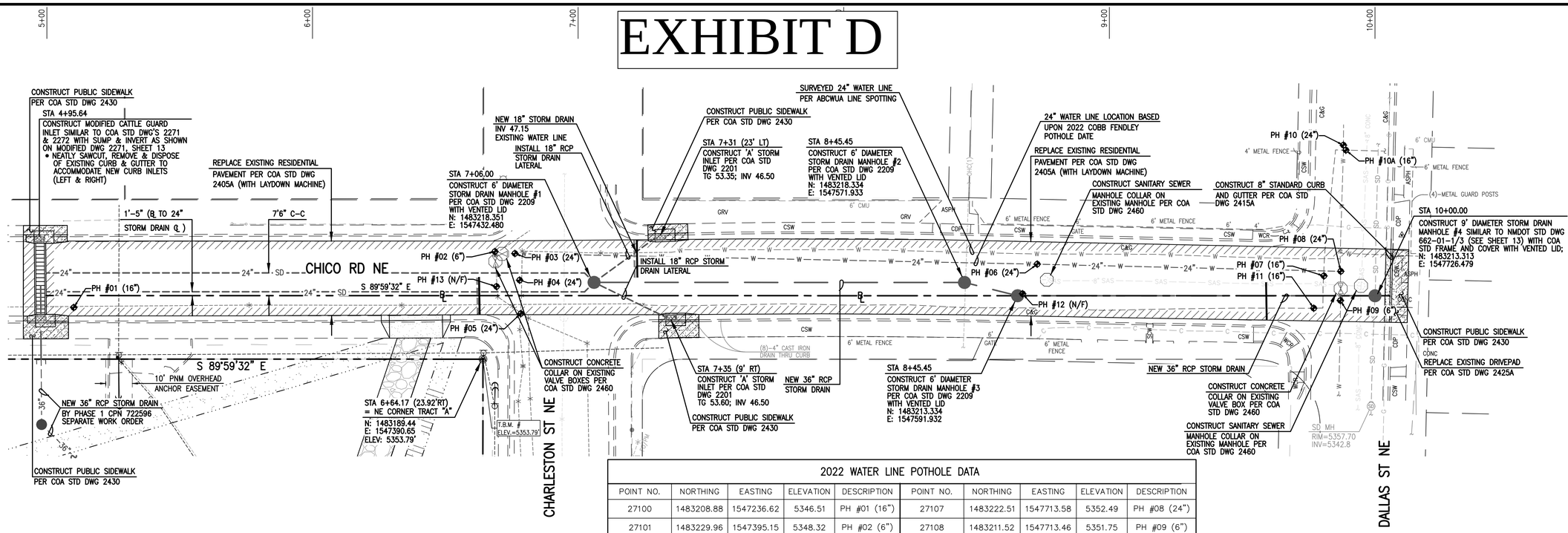
TITLE: INTERNATIONAL DISTRICT LIBRARY
SURGE POND – PHASE 1
GRADING PLAN

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

City Project No. 722596 | Zone Map No. K-19 | Sheet 9 Of 10

File Name: P:\data\2021\2021.026.2\ENG\210262_DesignBase_1.dwg - SH 9 - PH1 Plot Date: 8/2/23 Plot Time: 11:36

EXHIBIT D



NOTE:
THIS IS NOT A BOUNDARY SURVEY OR A RIGHT OF WAY SURVEY. APPARENT PROPERTY CORNERS, RIGHT OF WAY LINES, PROPERTY LINES AND EASEMENT LINES AS SHOWN ARE DERIVED FROM A RECORDED PLAT DATED 06/26/2020 (DOC#2020057642) PREPARED BY HIGH MESA CONSULTING GROUP, NMPS 11184, DATED 06/2019 (2018.017.2). THE TOPOGRAPHIC INFORMATION DEPICTED HEREON IS BASED UPON THE "TOPOGRAPHIC AND UTILITY SURVEY" PREPARED BY HIGH MESA CONSULTING GROUP, NMPS NO. 11184, DATED 04/30/2018 (2018.017.1). SUPPLEMENTAL SURVEY DATED 06/07/2021 (2021.026.1).

2022 WATER LINE POTHOLE DATA

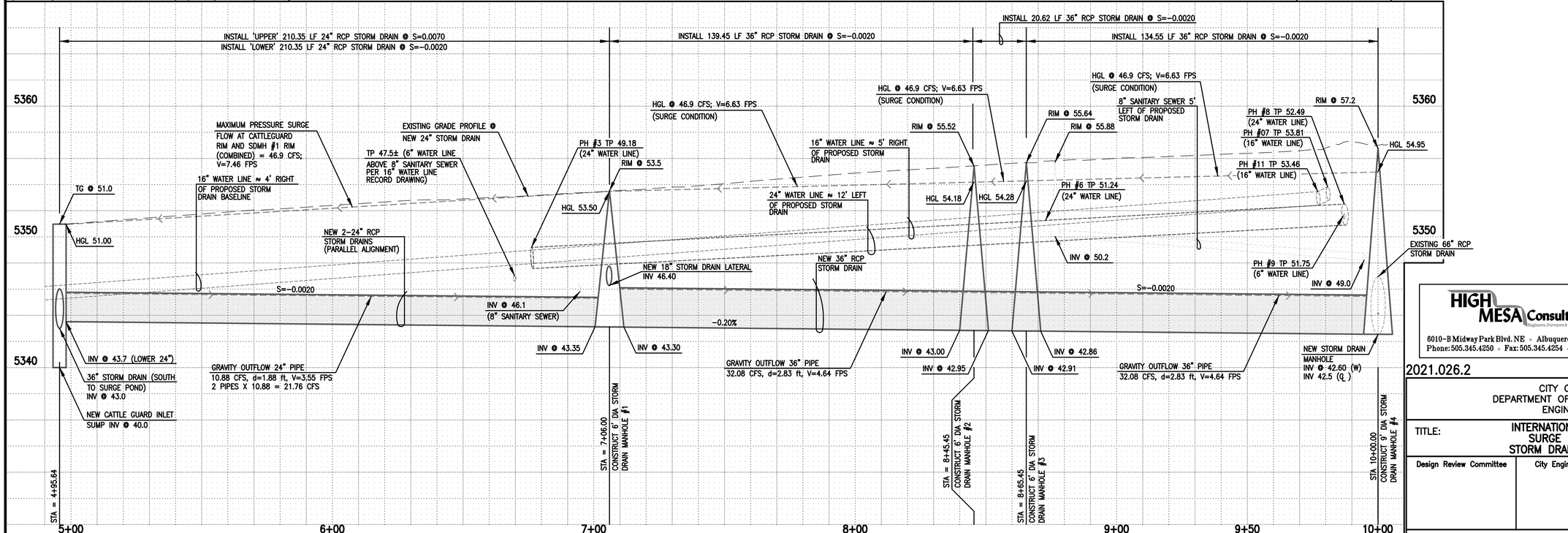
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
27100	1483208.88	1547236.62	5346.51	PH #01 (16")	27107	1483222.51	1547713.58	5352.49	PH #08 (24")
27101	1483229.96	1547395.15	5348.32	PH #02 (6")	27108	1483211.52	1547713.46	5351.75	PH #09 (6")
27102	1483229.21	1547402.69	5349.18	PH #03 (24")	27109	1483270.04	1547714.56	5352.57	PH #10 (24")
27103	1483219.20	1547404.47	5348.69	PH #04 (24")	27110	1483268.16	1547715.49	5354.45	PH #10A (16")
27104	1483206.59	1547404.88	5348.76	PH #05 (24")	27111	1483208.64	1547703.42	5353.46	PH #11 (16")
27105	1483225.21	1547599.30	5351.24	PH #06 (24")	27112	1483214.07	1547593.80	0.00	PH #12 (N/F)
27106	1483220.78	1547707.23	5353.81	PH #07 (16")	27113	1483216.79	1547395.76	0.00	PH #13 (N/F)

CHICO RD N.E.

* N/F = WATER LINE NOT FOUND

SCALE:
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 4'

FOR HYDROLOGY REVIEW - NOT FOR CONSTRUCTION



AS BUILT INFORMATION
CONTRACTOR
WORK STARTED BY: DATE
STREET WORK ACCEPTANCE BY: DATE
FIELD VERIFICATION BY: DATE
DRAWINGS CORRECTED BY: DATE

BENCH MARKS
AN AGRS BRASS DISK STAMPED "7-K19", SET IN A CONCRETE CYLINDER, ON THE NOSE OF THE ISLAND EAST OF THE INTERSECTION OF CENTRAL AVENUE AND LOUISIANA BOULEVARD.
ELEVATION = 5325.99 FEET (NAVD 1988)

MICRO-FILM INFORMATION
RECORDED BY: DATE
NO.

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE
2017.017.1	HMCG	4/30/18

ENGINEER'S SEAL
GRAEME MEANS NEW MEXICO 13676 REGISTERED PROFESSIONAL ENGINEER
08-04-2023

NO.	DATE	REMARKS	BY	Date
		Revisions	J.D.S.	07-2023
		DESIGN	J.Y.R.	07-2023
			G.M.	07-2023

Designed By
Drawn By
Checked By

HIGH MESA Consulting Group
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2021.026.2

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: INTERNATIONAL DISTRICT LIBRARY
SURGE POND – PHASE 2
STORM DRAIN PLAN AND PROFILE

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

City Project No. 722597 | Zone Map No. K-19 | Sheet 12 Of 13

File Name: P:\data\2021\2021.026.2\ENG\210262_DesignBase_1.dwg - SH 12 - PH2 Plot Date: 8/4/23 Plot Time: 11:15

EXHIBIT E

Project Summary Report

Project Description	
Worksheet	Circular Channel -
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coeffic	0.013	
Slope	002000	ft/ft
Diameter	24	in

Results		
Depth	2.00	ft
Discharge	10.12	cfs
Flow Area	3.1	ft²
Wetted Perime	6.28	ft
Top Width	0.00	ft
Critical Depth	1.14	ft
Percent Full	100.0	%
Critical Slope	005222	ft/ft
Velocity	3.22	ft/s
Velocity Head	0.16	ft
Specific Energy	2.16	ft
Froude Numbe	0.00	
Maximum Disc	10.88	cfs
Discharge Full	10.12	cfs
Slope Full	002000	ft/ft
Flow Type	N/A	

Two Parallel Pipes at 10.88 cfs each = 21.8 cfs. Gravity Flow Pond Draining After Storm Event

Project Summary Report

Project Description	
Worksheet	Circular Channel -
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coeffic	0.013	
Slope	002000	ft/ft
Diameter	36	in

Results		
Depth	3.00	ft
Discharge	29.83	cfs
Flow Area	7.1	ft²
Wetted Perime	9.42	ft
Top Width	0.00	ft
Critical Depth	1.77	ft
Percent Full	100.0	%
Critical Slope	004673	ft/ft
Velocity	4.22	ft/s
Velocity Head	0.28	ft
Specific Energy	3.28	ft
Froude Numbe	0.00	
Maximum Disc	32.08	cfs
Discharge Full	29.83	cfs
Slope Full	002000	ft/ft
Flow Type	N/A	

Gravity Flow in 36" Pipe - Pond Draining After Storm Event.

Surge Condition SDMH 4 to SDMH 3

Project Summary Report

Project Description	
Worksheet	Pressure Pipe
Flow Element	Pressure Pipe
Method	Manning's Forr
Solve For	Pressure at 1

Input Data		
Pressure at 2	4.30	psi
Elevation at 1	42.60	ft
Elevation at 2	42.86	ft
Length	35.00	ft
Mannings Coeffic	0.013	
Diameter	36	in
Discharge	46.90	cfs

Results		
Pressure at 1	4.70	psi
Headloss	0.67	ft
Energy Grade at	54.13	ft
Energy Grade at	53.46	ft
Hydraulic Grade	53.45	ft
Hydraulic Grade	52.78	ft
Flow Area	7.1	ft²
Wetted Perimeter	9.42	ft
Velocity	6.63	ft/s
Velocity Head	0.68	ft
Friction Slope	004945	ft/ft

Surge Condition SDMH 3 to SDMH 2

Project Summary Report

Project Description	
Worksheet	Pressure Pipe
Flow Element	Pressure Pipe
Method	Manning's For
Solve For	Pressure at 1

Input Data		
Pressure at 2	4.22	psi
Elevation at 1	42.91	ft
Elevation at 2	42.95	ft
Length	20.00	ft
Mannings Coeffic	0.013	
Diameter	36	in
Discharge	46.90	cfs

Results		
Pressure at 1	4.28	psi
Headloss	0.10	ft
Energy Grade at	53.47	ft
Energy Grade at	53.37	ft
Hydraulic Grade	52.78	ft
Hydraulic Grade	52.68	ft
Flow Area	7.1	ft²
Wetted Perimeter	9.42	ft
Velocity	6.63	ft/s
Velocity Head	0.68	ft
Friction Slope	004945	ft/ft

Surge Condition SDMH 2 to SDMH 1

Project Summary Report

Project Description	
Worksheet	Pressure Pipe
Flow Element	Pressure Pipe
Method	Manning's Forr
Solve For	Pressure at 1

Input Data		
Pressure at 2	3.77	psi
Elevation at 1	43.00	ft
Elevation at 2	43.30	ft
Length	39.00	ft
Mannings Coeffic	0.013	
Diameter	36	in
Discharge	46.90	cfs

Results		
Pressure at 1	4.20	psi
Headloss	0.69	ft
Energy Grade at	53.37	ft
Energy Grade at	52.68	ft
Hydraulic Grade	52.68	ft
Hydraulic Grade	52.00	ft
Flow Area	7.1	ft²
Wetted Perimeter	9.42	ft
Velocity	6.63	ft/s
Velocity Head	0.68	ft
Friction Slope	004945	ft/ft

Surge Condition SDMH 1 to Cattle Guard

Project Summary Report

Project Description	
Worksheet	Pressure Pipe
Flow Element	Pressure Pipe
Method	Manning's Forr
Solve For	Discharge

Input Data		
Pressure at 1	3.88	psi
Pressure at 2	2.73	psi
Elevation at 1	43.30	ft
Elevation at 2	43.70	ft
Length	110.00	ft
Mannings Coeffic	0.013	
Diameter	24	in

Results		
Discharge	23.43	cfs
Headloss	2.25	ft
Energy Grade at	53.11	ft
Energy Grade at	50.86	ft
Hydraulic Grade	52.25	ft
Hydraulic Grade	50.00	ft
Flow Area	3.1	ft²
Wetted Perimeter	6.28	ft
Velocity	7.46	ft/s
Velocity Head	0.86	ft
Friction Slope	010726	ft/ft

24" Pipe Max Pressure Capacity at Cattle Guard Grate and Rim at SDMH #1.
2 pipes x 23.43 cfs = 46.9 cfs