

CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Director



Mayor Timothy M. Keller

January 20, 2026

Noah Pierce, P.E.
Bohannon Huston, Inc.
7500 Jefferson St NE
Albuquerque, NM 87109

**RE: Geneivas Arroyo
CLOMR Request
Engineer's Stamp Date: 1-9-2026
Hydrology File: L15D006
Case # HYDR-2026-00007**

Dear Mr. Pierce:

PO Box 1293

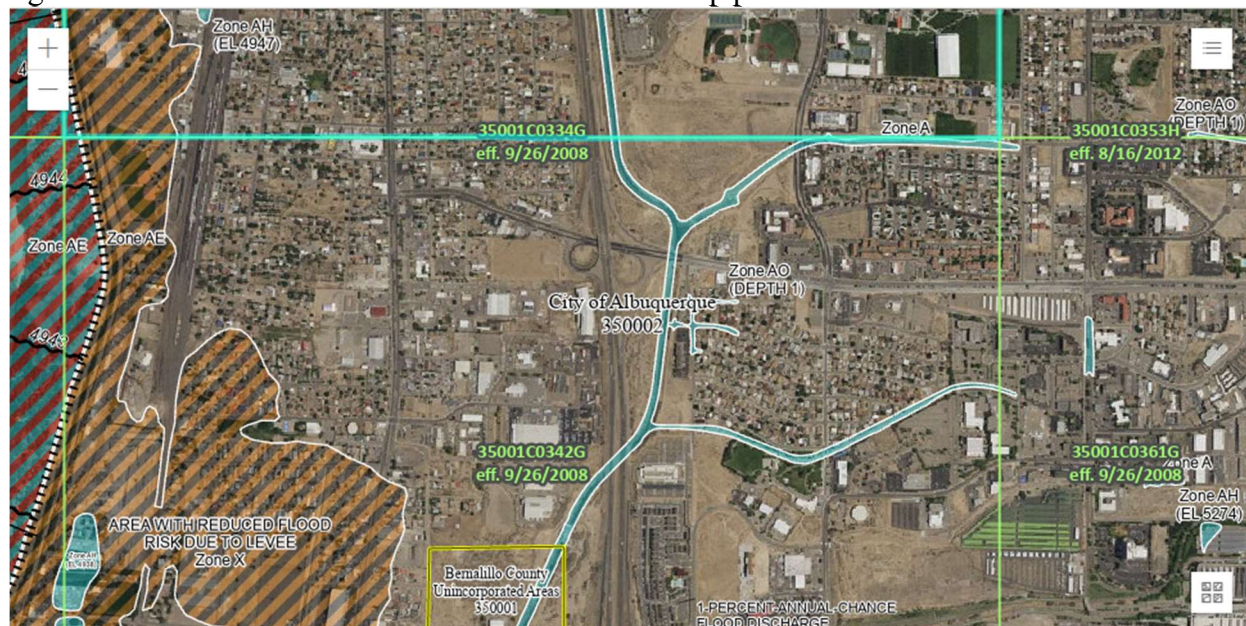
Based upon the information provided in your submittal received 1/9/2026, the CLOMR Request needs modifications before it can be submitted to FEMA with the City's concurrence. The following comments need to be addressed for the above referenced project:

Albuquerque

1. Please provide the engineer's signature and seal on the cover letter and FEMA MT-2 Forms.
2. Pg 5 of 65 Introduction and 12 of 65 VIII — check map panel numbers.

NM 87103

www.cabq.gov



CITY OF ALBUQUERQUE


Planning Department
Alan Varela, Director



Mayor Timothy M. Keller

NATIONAL FLOOD INSURANCE PROGRAM	PANEL 0342G		
	FIRM		
	FLOOD INSURANCE RATE MAP		
	BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS		
	PANEL 342 OF 825		
	(SEE MAP INDEX FOR FIRM PANEL LAYOUT)		
	CONTAINS:		
	COMMUNITY	NUMBER	PANEL SUFFIX
	ALBUQUERQUE, CITY OF	350002	0342 G
	BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0342 G

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

 **MAP NUMBER**
35001C0342G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

- Pg 14 of 65 - #1 – Split City and County on two lines. Make sure that the Panel numbers are all clearly shown.

<u>COMMUNITY</u>	<u>NUMBER</u>
ALBUQUERQUE, CITY OF	350002
BERNALILLO COUNTY	
UNINCORPORATED AREAS	350001

If you have any questions, please contact me at 505-924-3314 or amontoya@cabq.gov.

Sincerely,

Anthony Montoya, Jr., P.E., CFM
Senior Engineer, Hydrology
Planning Department, Development Review Services

CLOMR REQUEST REPORT FOR GENEIVAS ARROYO

DRAFT

Case No.: TBD

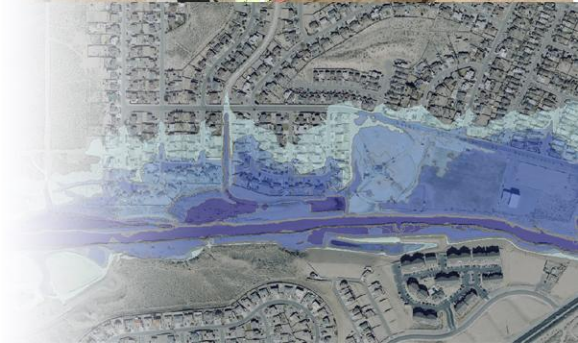
Community: City of Albuquerque,
Bernalillo County, NM

Community No.: 350001; 350002

JANUARY 9, 2026

Prepared by:

Bohannon  **Huston**



CONDITIONAL LETTER OF MAP REVISION (CLOMR)

REQUEST REPORT

FOR

GENEIVAS ARROYO

JANUARY 9, 2026

PREPARED FOR:

TBD

Prepared by:

BOHANNAN HUSTON, INC.

7500 JEFFERSON STREET NE

ALBUQUERQUE, NM 87109

Prepared by:

Reviewed by:

Grady Koenig, E.I.

Date

Vincent Steiner, P.E., CFM

Date

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EXHIBIT 1 – EFFECTIVE FIRM PANELS

EXHIBIT 2 – ANNOTATED FIRM PANELS

EXHIBIT 3 – CERTIFIED TOPOGRAPHIC WORK MAPS

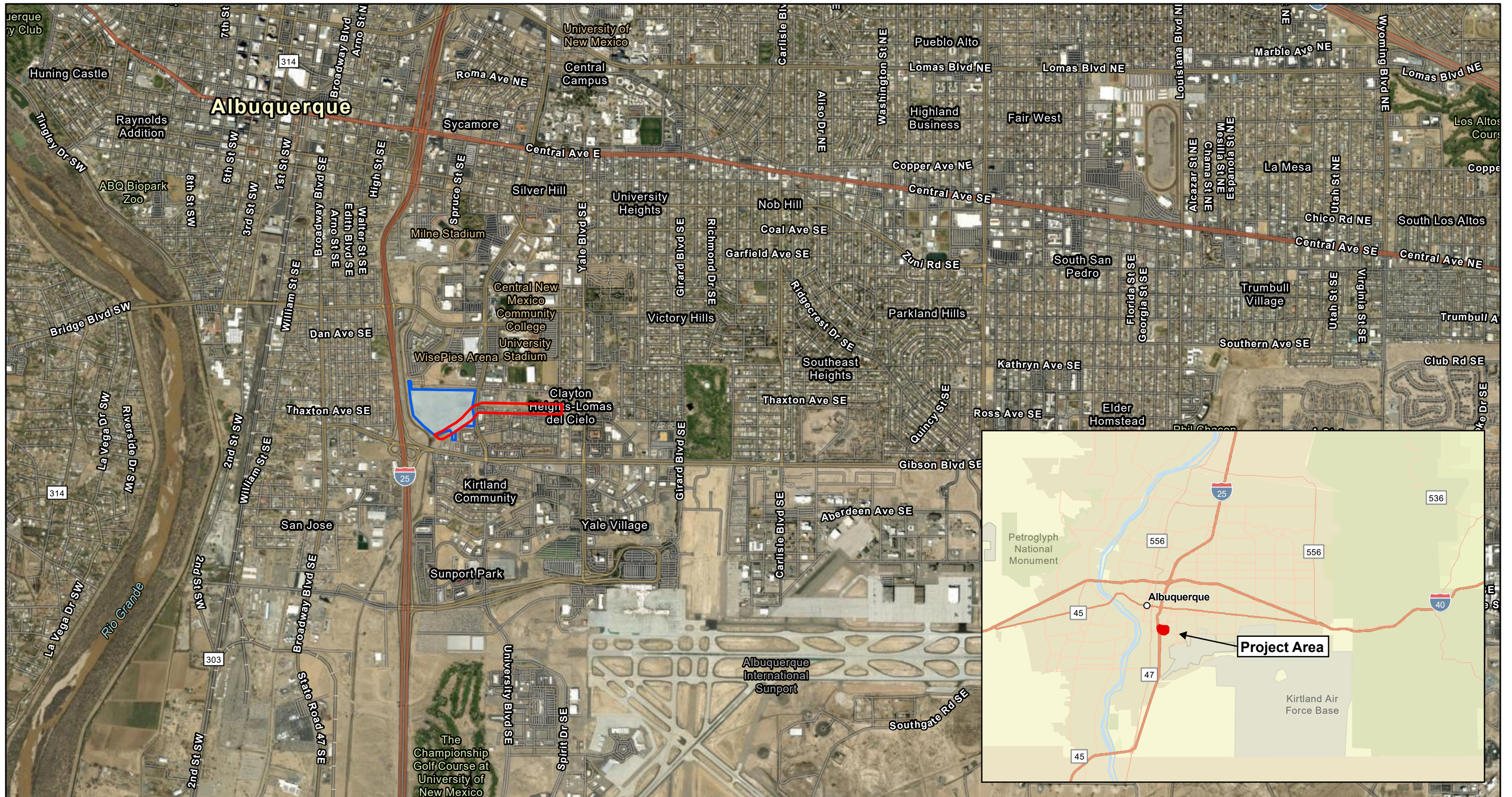
I. INTRODUCTION

This Conditional Letter of Map Revision (CLOMR) request is associated with the existing Special Flood Hazard Area (SFHA) for the Geneivas Arroyo to reflect proposed drainage improvements associated with the University of New Mexico (UNM) South Campus Commercial proposed development and to reflect existing upstream drainage improvements. The site is located in Albuquerque, New Mexico, east of I-25 and north of Gibson Boulevard SE. Figure 1 is a location map showing the proposed development. The UNM South Campus Commercial project proposes storm drain improvements to extend existing storm drains that outlet to the existing Geneivas Arroyo concrete channel (maintained by the City of Albuquerque [COA]) immediately downstream of University Boulevard, with the new storm drain outfall proposed downstream of an extension to Alumni Drive. The proposed storm drain outfall will discharge to a riprap lined reach of Geneivas Arroyo maintained by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA).

The project site is impacted by an effective Zone A SFHA associated with Geneivas Arroyo. The FEMA Flood Insurance Rate Map (FIRM) panels affected by this CLOMR request are provided as Exhibit 1 and include 3500010334G, 3500010342G, and 3500010361G, effective September 26, 2008. All revisions are within the COA.

II. FEMA FORMS

The FEMA MT-2 Forms relevant for this CLOMR request are included as Appendix A.



III. SURVEYING AND MAPPING INFORMATION

A topographic field survey was performed by Bohannon Huston, Inc. (BHI) in August 2025 for the UNM South Commercial project site, including the subject reach of Geneivas Arroyo through the site. Topographic survey data prepared by BHI is at the North American Datum 1983 (NAD1983) horizontal datum, New Mexico Central Zone (3002) and the North American Vertical Datum of 1988 (NAVD88) vertical datum (GEOID18). CAD files are in AutoCAD Civil 3D DWG format and use a Modified State Plane (Ground) coordinate system, scaled about the origin (Northing=0, Easting=0) using a combined factor (ground to grid) of 0.99967505000. The projection used for the Hydrologic Engineering Center-River Analysis System (HEC-RAS) model is New Mexico State Plane Central – US Survey Foot.

The *Construction Plans for Geneva’s Arroyo, Buena Vista Drive S.E. to South Diversion Channel*, prepared by Boyle Engineering Corporation in 1991 (herein referred as 1991 as-builts), represent the current Geneivas Arroyo improvements along the subject reach and were used to determine existing storm drain infrastructure (pipe size, length, slope and elevations) between University Boulevard and Buena Vista Drive. The 1991 as-builts use the North American Datum of 1929 (NAVD29) and as-built elevations were converted to NAVD88 elevations for this analysis. The elevation conversion was based on the National Geodetic Survey (NGS) Coordinate Conversion and Transformation Tool (NCAT) and was verified by field survey of storm drain manhole rim elevations. The 1991 as-builts are included as Appendix B.

IV. ESA COMPLIANCE

As required for a CLOMR request, an investigation was conducted to ensure compliance with Sections 9 and 10 of the Endangered Species Act (ESA). The investigation was performed by Barr Engineering and a report documenting their findings is included as Appendix C.

V. HYDROLOGY

A. METHOD DESCRIPTION

The 100-year design discharges for Geneivas Arroyo provided on the *Construction Plans for Geneva’s Arroyo, Buena Vista Drive S.E. to South Diversion Channel* (1991 as-builts) were adopted for design of Geneivas Arroyo improvements and for this CLOMR request, through coordination with COA and AMAFCA. No discharges for Geneivas Arroyo are provided in the Flood Insurance Study (FIS) and no hydrologic analysis of Geneivas Arroyo was performed for this project. See Appendix B for the 1991 as-builts.

VI. HYDRAULICS

A. STORM DRAIN HYDRAULICS

1. ANALYSIS METHOD

To analyze the hydraulics of the existing storm drain, the Stormwater Studio (SWS) program (version 3.0.0.40) was used. The existing storm drain captures runoff from the residential area to the east of Buena Vista Drive. The existing storm drain extends far to the east of Buena Vista Drive but for the purposes of this CLOMR request, the upstream limits of the storm drain analysis is Buena Vista Drive, corresponding to the upstream end of the effective Zone A SFHA.

SWS was used to prepare two models: one for the existing storm drain between Buena Vista Drive and University Boulevard and another for the proposed condition with the storm drain extension from University Boulevard to the outfall downstream of Alumni Drive.

2. STORM DRAIN PROFILE

The existing storm drain sizes, inverts, and slopes were taken from the 1991 as-builts after the vertical adjustment to NAVD88. Adjusted manhole rim elevations were compared to field survey rim elevations to verify the vertical adjustment.

The proposed storm drain extension size and profile was designed to convey the 100-year discharge per the 1991 as-builts.

3. ROUGHNESS COEFFICIENT

The *COA Development Process Manual* [COA DPM] (2020) was referenced for Manning’s n roughness coefficients. Table 6.16.26, “Values in Manning’s ‘n’”, in Article 6-16 of the *COA DMP* (2020) includes recommended values for various material types. Table 1 summarizes the manning’s n value associated with each material analyzed in the SWS models.

Table 1: Manning’s n Roughness Coefficients for Storm Drain Hydraulic Analysis

Element	Manning's n
Concrete	0.013
Corrugated Metal Pipe	0.024

4. TAILWATER ELEVATION

The tailwater elevation for the existing and proposed storm drain outfalls was determined using the water surface elevation (WSE) at the upstream cross-section of the existing and proposed HEC-RAS models, respectively. This is discussed further in Section B. 4. Boundary Conditions.

5. STRUCTURE LOSSES

Manholes were assumed to be half benched with HEC-22 equations used to calculate losses at structures. The junction box at the upstream end of the proposed storm drain was modeled as flat for the benching input and calculating the structure losses.

B. OPEN CHANNEL HYDRAULICS

1. METHOD DESCRIPTION

The United States Army Corps of Engineers (USACE) HEC-RAS version 6.6 was used to model the open channel reach of Geneivas Arroyo for existing and proposed conditions. From the outfall at University Boulevard, a concrete lined channel extends southwest to an additional outfall where the channel turns to riprap and eventually drains to a baffle chute at the downstream end of Geneivas Arroyo where it enters the South Diversion Channel. HEC-RAS model information (cross-sections, limits of study, etc.) is provided on the Topographic Work Map (Exhibit 2) and is further described below.

2. PARAMETERS ESTIMATION

a) *Roughness Coefficient*

The *COA DPM (2020)* was utilized in developing Manning's n roughness coefficients for input to HEC-RAS. Table 6.16.26, "Values in Manning's 'n'", in Article 6-16 of the *COA DMP (2020)* includes recommended values for various material types. Manning's n values are based on investigation of the site and engineering judgment. The existing channel reach directly downstream of the concrete lined reach has experienced sedimentation and is represented as a grass lined channel with a lower Manning's n value. The remainder of the downstream reach is riprap lined, with less sedimentation. Table 2 summarizes the Manning's n value associated with each material analyzed in the HEC-RAS models.

Table 2: Manning’s n Roughness Coefficients for Open Channel Hydraulic Analysis

Element	Manning's n
Concrete	0.013
Grass Lined Channels	0.025
Arroyo Overbanks	0.045
Medium Weight Dumped Ripap	0.045

b) *Expansion and Contraction Coefficients*

Coefficients that pertain to the hydraulics of expansion and contraction were applied to cross sections in HEC-RAS. Using Table 3-3 “Subcritical Flow Contraction and Expansion Coefficients” from the HEC-RAS guidance documents, the typical values of 0.3 and 0.1 for gradual transitions were used at all cross sections for the expansion and contraction coefficients respectively. An abrupt change occurs at the baffle chute at the downstream cross section, and the coefficients were increased to 0.5 for expansion and 0.3 for contraction.

3. CROSS SECTION DESCRIPTION

HEC-RAS cross sections were cut approximately every 50 feet using the survey terrain from the storm drain pipe outfall just west of University Boulevard, to the top of the baffle chute just upstream of the confluence with the South Diversion Channel. The channel geometry consists of two sections: one being a concrete lined trapezoidal channel having 2 feet horizontal to 1-foot vertical (2H:1V) side slopes and a bottom width of 11 feet; the other being a riprap lined trapezoidal channel with 2 feet horizontal to 1-foot vertical (2H:1V) side slopes and a bottom that varies from approximately 61 feet to 13 feet. Cross sections were oriented perpendicular to the direction of flow.

The proposed conditions model does not include a concrete lined channel and only analyzed the riprap channel because of the location of the proposed outfall. The proposed stilling basin immediately downstream of the new storm drain outfall was incorporated into the model using key cross sections.

4. BOUNDARY CONDITIONS

The downstream boundary condition for the HEC-RAS model is a known WSE determined using a weir calculation to model flow spilling over the top of the baffle chute. The known WSE is 5,042.32 feet at a depth of 3.32 feet at the baffle chute for the 100-year storm event. The weir

calculation has been included in Appendix D for reference.

The upstream boundary condition was defined as normal depth. The existing channel slope, provided by the 1991 as-builts, was applied to the normal depth slope input for HEC-RAS. The resultant normal depth was applied to the tailwater elevation for the SWS model analyzing the storm drain hydraulics.

In the proposed conditions model the upstream boundary was adjusted to the storm drain outfall cross section. The normal depth calculated at this cross section was applied to the proposed SWS model to analyze the proposed conditions.

5. MODELING CONSIDERATIONS

a) *Hydraulic Jump and Drop Analysis*

A hydraulic jump may occur at the transition of concrete to riprap channel lining, where the channel slope decreases and the channel cross section expands. This jump would be contained in the downstream existing riprap lined channel. The proposed outfall includes a stilling basin designed to induce a hydraulic jump and utilizes HEC-14 calculations to ensure the basin length contains the hydraulic jump and protects the downstream channel. Wingwalls have been designed to contain the jump and protect the proposed grading at the outfall.

b) *Ineffective Flow Areas*

The proposed model includes ineffective flow areas behind the wingwalls where flow would not be able to pond due to the wingwall design and velocities at the outfall.

c) *Supercritical Flows*

The existing concrete lined channel, which will be removed as part of the proposed project, is designed to endure supercritical flows. The HEC-RAS analysis was performed assuming that the flows are subcritical to be conservative in determining WSEs and analyzing the upstream storm drain.

C. RESULTS

1. STORM DRAIN HYDRAULIC ANALYSIS RESULTS

SWS output data is provided as Appendix E. All effective SFHA upstream of the proposed storm drain outfall would be removed because the 100-year discharge is conveyed in the storm drain. The Topographic Work Map reflecting these results is provided as Exhibit 3.

2. HEC-RAS RESULTS

HEC-RAS output data is provided as Appendix D. A Topographic Work Map reflecting proposed condition inundation limits based on the HEC-RAS model is provided as Exhibit 3.

3. COMPARISON OF RESULTS

The proposed design conveys the runoff in a storm drain for an additional length reducing the open channel distance compared to the existing infrastructure. The proposed inundation limits are limited to a shorter compared to existing conditions and significantly shorter reach as compared to the FEMA SFHA.

VII. EROSION, SEDIMENT TRANSPORT, AND GEOMORPHIC ANALYSIS

Scour and erosion calculations were not required for design and analysis of the subject Geneivas Arroyo improvements. All proposed infrastructure is concrete lined to prevent erosion and scour potential. The existing Geneivas Arroyo channel that is to remain is riprap lined.

Sediment transport was not analyzed for this study. The drainage area is fully developed, and all stormwater infrastructure is concrete lined producing minimal sediment yield. No additional sediment transport is assumed to occur with the existing storm drains remaining as is.

VIII. DRAFT FIS DATA

1. ANNOTATED FLOOD INSURANCE RATE MAPS

This CLOMR would affect multiple panels: 3500010334G, 3500010342G, and 3500010361G. Annotated FIRMs are included as Exhibit 2.

IX. CONCLUSION

A CLOMR is sought based on the analysis of existing storm drain improvements and the proposed storm drain improvements described herein to reduce the Zone A SFHA footprint. The proposed storm drain has been designed in accordance with applicable AMAFCA and COA codes and standards. A LOMR will be requested from FEMA after construction is complete. Proposed UNM South Commercial site development would be outside the revised FEMA SFHA after the LOMR is effective.

APPENDIX A – MT-2 FORMS

1. MT-2 Form 1 – Overview & Concurrence Form
2. MT-2 Form 2 – Riverine Hydrology and Hydraulics Form
3. MT-2 Form 3 – Riverine Structures Form (with supplemental section A and B)

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
OVERVIEW & CONCURRENCE FORM

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472 , Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72). All CLOMRs require documentation of compliance with the Endangered Species Act. Refer to the Instructions for details.

LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72).

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
350001;350002	City of Albuquerque, Bernalillio County	NM	35001	C0334G, C0342G, C0316C	9/26/2008

2. a. Flooding Source:

b. Types of Flooding: Riverine Coastal Shallow Flooding (e.g., Zones AO and AH)
 Alluvial Fan Lakes Other (Attach Description)

3. Project Name/Identifier:

4. FEMA zone designations (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

a. Effective:

b. Revised:

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- | | | | |
|-----------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------|
| <input checked="" type="checkbox"/> Physical Change | <input type="checkbox"/> Improved Methodology/Data | <input type="checkbox"/> Regulatory Floodway Revision | <input type="checkbox"/> Base Map Changes |
| <input type="checkbox"/> Coastal Analysis | <input checked="" type="checkbox"/> Hydraulic Analysis | <input type="checkbox"/> Hydrologic Analysis | <input type="checkbox"/> Corrections |
| <input type="checkbox"/> Weir-Dam Changes | <input type="checkbox"/> Levee Certification | <input type="checkbox"/> Alluvial Fan Analysis | <input type="checkbox"/> Natural Changes |
| <input type="checkbox"/> New Topographic Data | <input type="checkbox"/> Other (Attach Description) | | |

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

- Structures: Channelization Levee/Floodwall Bridge/Culvert
 Dam Fill Other (Attach Description)

6. Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? Yes Fee amount: \$ _____
 No, Attach Explanation

- Please see the DHS-FEMA Web site at <http://www.fema.gov/forms-documents-and-software/flood-map-related-fees> for Fee Amounts and Exemptions.

D. SIGNATURES

1. REQUESTOR'S SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: TBD	Company:	
Mailing Address:	Daytime Telephone:	Fax No.:
	E-mail Address:	
	Date:	

Signature of Requestor (required):

2. COMMUNITY CONCURRENCE

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title:		
Mailing Address:	Community Name:	
	Daytime Telephone:	Fax No.:
	E-mail Address:	
Community Official's Signature (required):		Date:

3. CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Vincent Steiner	License No.: NM 24319	Expiration Date: 12/31/2027
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Company Name: Bohannan Huston	Mailing Address: 7500 Jefferson St. NE, Albuquerque, NM 87109
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Telephone No.: 505-798-7862	Fax No.:
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E-mail Address: vsteiner@bhinc.com	
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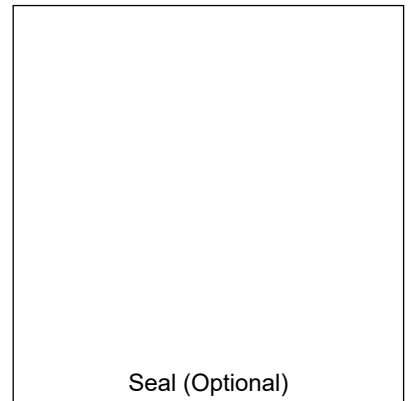
Signature:	Date:
------------	-------

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
RIVERINE HYDROLOGY & HYDRAULICS FORM (FORM 2)

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

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PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

Flooding Source: Geneivas Arroyo

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply):

- Not revised (skip to section B)
 No existing analysis
 Improved data
 Alternative methodology
 Proposed Conditions (CLOMR)
 Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- Precipitation/Runoff Model → Specify Model: _____ Duration: _____ Rainfall Amount: _____
 Statistical Analysis of Gage Records
 Regional Regression Equations
 Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review. 4. HEC-RAS File Description**:

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? Yes No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation.

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) or Special Flood Hazard Areas (SFHAs) increase compared to the effective BFEs? Yes No
If Yes, please attach **proof of property owner notification**. Examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
3. Does the request involve the placement or proposed placement of fill? Yes No
If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
4. Does the request involve the placement or proposed placement of fill? Yes No
If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.
5. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
RIVERINE STRUCTURES FORM (FORM 3)

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

Flooding Source: Geneivas Arroyo

Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

- | | |
|---------------------|----------------------------------|
| Channelization: | complete Section B |
| Bridge/Culvert: | complete Section C |
| Dam: | complete Section D |
| Levee/Floodwall: | complete Section E |
| Sediment Transport: | complete Section F (if required) |

Description Of Modeled Structure

1. Name of Structure: Existing Geneivas Arroyo Riprap Channel

Type (check one): Channelization Bridge/Culvert Levee/Floodwall Dam

Location of Structure: From Baffle Chute to Storm Drain Outfall

Downstream Limit/Cross Section: Baffle Chute/0

Upstream Limit/Cross Section: Storm Drain Outfall/378

2. Name of Structure: Storm Drain Extension from University Blvd.

Type (check one): Channelization Bridge/Culvert Levee/Floodwall Dam

Location of Structure: Storm Drain Extension from University Blvd.

Downstream Limit/Cross Section: Storm Drain Outfall/378

Upstream Limit/Cross Section: Existing Storm Drain Outfall/1226

3. Name of Structure: _____

Type (check one): Channelization Bridge/Culvert Levee/Floodwall Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Geneivas Arroyo

Name of Structure: Existing Geneivas Arroyo Riprap Channel

1. Hydraulic Considerations

The channel was designated to carry 605 (cfs) and/or the 100 - year flood

The design elevation in the channel is based on (check one):

- Subcritical flow
- Critical flow
- Supercritical flow
- Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- Inlet to channel
- Outlet to channel
- At Drop Structures
- At Transitions

Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

- Levees [Attach Section E (Levee/Floodwall)]
- Drop structures
- Superelevated sections
- Energy dissipater
- Transitions in cross sectional geometry
- Debris basin/detention basin [Attach Section D (Dam/Basin)]
- Weir
- Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? Yes No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Geneivas Arroyo

Name of Structure: Geneivas Arroyo Storm Drain

1. This revision reflects (check one):

- Bridge/Culvert not modeled in the FIS
- Modified Bridge/Culvert previously modeled in the FIS
- Revised analysis of Bridge/Culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): SWS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- Dimensions (height, width, span, radius, length)
- Shape (culverts only)
- Material
- Beveling and Rounding
- Wink Wall Angle
- Skew Angle
- Distance between Cross Sections
- Erosion Protection
- Low Chord Elevations - Upstream and Downstream
- Top of Road Elevations - Upstream and Downstream
- Structure Invert Elevations - Upstream and Downstream
- Stream Invert Elevations - Upstream and Downstream
- Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? Yes No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source: _____

Name of Structure: _____

1. This request is for (check one): Existing Dam/Basin New Dam/Basin Modification of existing Dam/Basin

2. The Dam/Basin was designed by (check one): Federal Agency State Agency Private Organization

Local Government Agency Name of the Agency or Organization: _____

3. The Dam was permitted as (check one): Federal Dam State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number _____ Permitting Agency or Organization _____

a. Local Government Dam Private Dam

Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? Yes No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

Yes, provide supporting documentation with your completed Form 2.

No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? Yes No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? Yes No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam/Basin

FREQUENCY (% annual chance)	FIS	REVISED
-----------------------------	-----	---------

10-year (10%)

50-year (2%)

100-year (1%)

500-year (0.2%)

Normal Pool Elevation

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

<input type="checkbox"/> Upgrading of an existing levee/floodwall system	<input type="checkbox"/> A newly constructed levee/floodwall system	<input type="checkbox"/> Reanalysis of an existing levee/floodwall system
--------------------------------------------------------------------------	---------------------------------------------------------------------	---------------------------------------------------------------------------

b. Levee elements and locations are (check one):

Earthen embankment, dike, berm, etc Stationed _____ to _____

Structured floodwall Stationed _____ to _____

Other (describe): _____ Stationed _____ to _____

E. LEVEE/FLOODWALL (CONTINUED)

c. Structural Type (check one): Monolithic cast-in place reinforced concrete Reinforced concrete masonry block
 Sheet piling Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?
 Yes No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1. Plan of the levee embankment and floodwall structures. | Sheet Numbers: _____ |
| 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: _____ |
| 3. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: _____ |
| 4. A layout detail for the embankment protection measures. | Sheet Numbers: _____ |
| 5. Location, layout, and size and shape of the levee embankment features, foundation treatment, Floodwall structure, closure structures, and pump stations. | Sheet Numbers: _____ |

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- | | | |
|--------------------------------------------------------------------------|------------------------------|-----------------------------|
| 3.0 feet or more at the downstream end and throughout | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3.5 feet or more at the upstream end | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4.0 feet within 100 feet upstream of all structures and/or constrictions | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Coastal

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------|
| 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater). | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.0 feet above the 1%-annual-chance stillwater surge elevation | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? Yes No

3. Closures

a. Openings through the levee system (check one): Exists Does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embarkment Protection

- a. The maximum levee slope land side is: _____
- b. The maximum levee slope flood side is: _____
- c. The range of velocities along the levee during the base flood is: _____ (min) to _____ (max)
- d. Embankment material is protected by (describe what kind): _____
- e. Riprap Design Parameters (check one): Velocity Tractive Stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D100	D50	Thickness	
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____
Sta _____ to _____	_____	_____	_____	_____	_____	_____	_____	_____

(Extend table on an added sheet as needed and reference each entry)

- f. Is a bedding/filter analysis and design attached? Yes No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embarkment and Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

Overall height: STA: _____, height _____ ft.

Limiting foundation soil strength:

Strength ϕ = _____ degrees, c = _____ psf

Slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results: _____

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment and Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? Yes No
 If Yes, describe methodology used:

e. Was a seepage analysis for the embankment performed? Yes No

f. Were uplift pressures at the embankment landside toe checked? Yes No

g. Were seepage exit gradients checked for piping potential? Yes No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall and Foundation Stability

a. Describe analysis submittal based on Code (check one): UBC (1988) Other (specify): _____

b. Stability analysis submitted provides for: Overturning Sliding If not, explain: _____

c. Loading included in the analyses were: Lateral earth @ $P_A =$ _____ psf; $P_p =$ _____ psf

Surcharge-Slope @ _____, surface _____ psf

Wind @ $P_w =$ _____ psf

Seepage (Uplift); _____ Earthquake @ $P_{eq} =$ _____ %g

1%-annual-chance significant wave height: _____ ft.

1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
 Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
 Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection is, is not provided. If provided, attach explanation and supporting documentation:
 Attach engineering analysis to support construction plans.

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin?
- b. The computed settlement range is _____ ft. to _____ ft.
- c. Settlement of the levee crest is determined to be primarily from : Foundation consolidation
 Embankment compression Other (Describe): _____
- d. Differential settlement of floodwalls has has not been accommodated in the structural design and construction
 Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:
 Drainage to pressure conduit: _____ acres
 Drainage to ponding area: _____ acres
- b. Relationship Established:
 Ponding elevation vs. storage Yes No
 Ponding elevation vs. gravity flow Yes No
 Differential head vs. gravity flow Yes No
- c. The river flow duration curve is enclosed: Yes No
- d. Specify the discharge capacity of the head pressure conduit: _____ cfs
- e. Which flooding conditions were analyzed?
 Gravity flow (Interior Watershed) Yes No
 Common storm (River Watershed) Yes No
 Historical ponding probability Yes No
 Coastal wave overtopping Yes No

 If No for any of the above, attach explanation.
- f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection.
 Yes No If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is : _____ cfs
- h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? Yes No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? Yes No

If the pumps are electric; are there backup power sources? Yes No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction is is not a problem

Hydrocompaction is is not a problem

Heave differential movement due to soils of high shrink/swell is is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure? Yes No

d. Sediment Transport Considerations:

Was sediment transport considered? Yes No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan and Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? Yes No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? Yes No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? Yes No

If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the formal maintenance plan for the levee/floodwall

12. Operational and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTATION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____

Company Name: _____ Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-mail Address: _____

CERTIFICATION OF THE LEVEE DOCUMENTATION

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acres-feet

Debris load associated with the base flood discharge: Volume _____ acres-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

APPENDIX B – HYDROLOGIC REFERENCES

1. Excerpts from Construction Plans for Geneiva's Arroyo Improvements
(Boyle Engineering, 1991)



CITY OF ALBUQUERQUE

CONSTRUCTION PLANS FOR

GENEIVA'S ARROYO IMPROVEMENTS

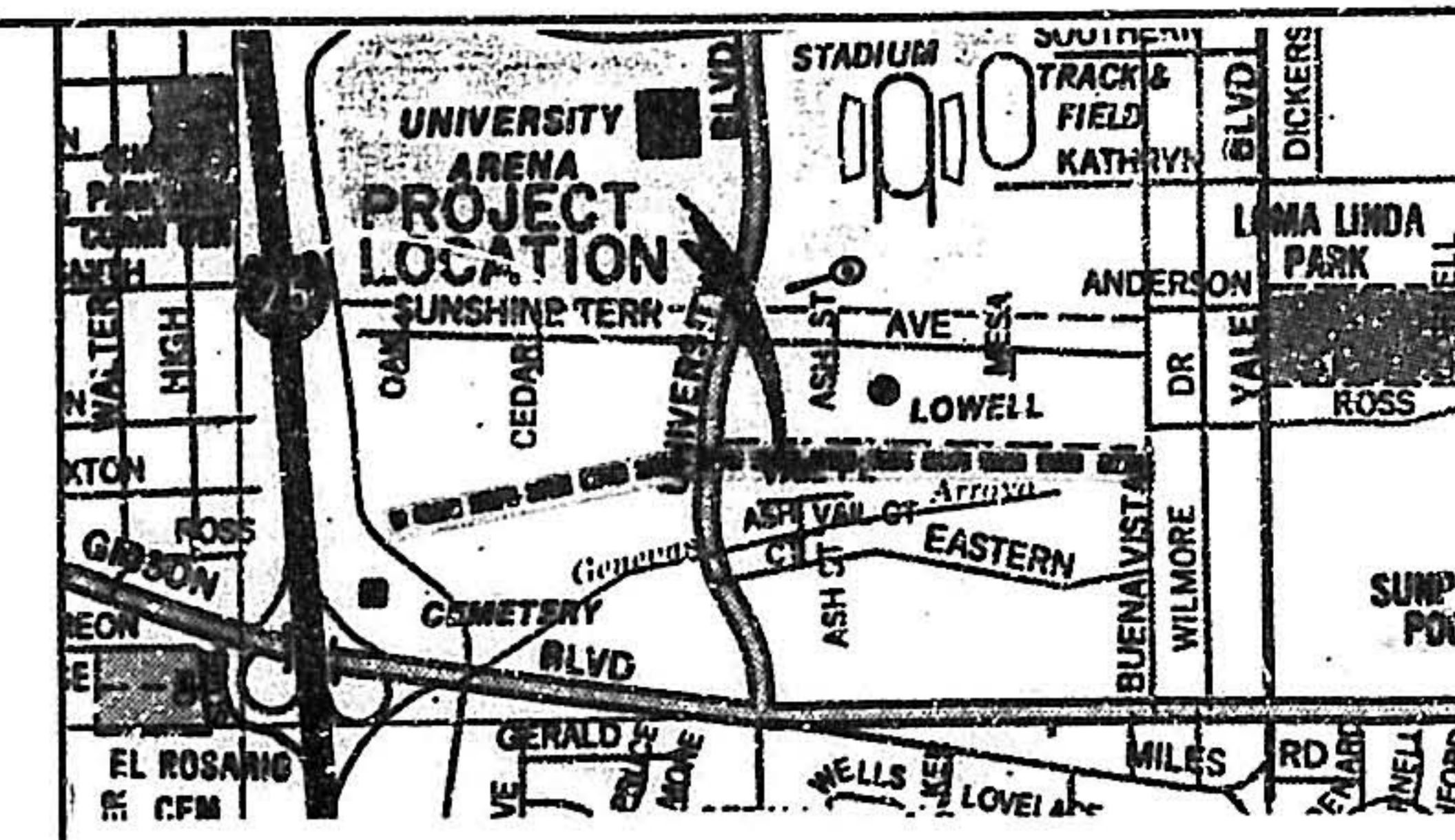
BUENA VISTA DRIVE S.E. TO SOUTH DIVERSION CHANNEL

INDEX

TITLE	SHEET NO.	TITLE	SHEET NO.
TITLE SHEET & GENERAL NOTES	1	PIPE COLLAR AND DETAILS	12
LOCATION MAP AND LEGEND	2	P&P - LINE 'A' & LINE 'B'	13-14
P&P - STA.10+35.00 to STA.19+75.00	3	TRAFFIC CONTROL PLANS -	
P&P - STA.19+75.00 to STA.34+00.00	4	BUENA VISTA DRIVE	15
P&P - STA.34+00.00 to STA.46+26.66	5	PHASE I, UNIVERSITY BLVD.	16
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GRADING PLAN	7-8	CHANNEL CROSS SECTIONS	18-20
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Excerpts From Construction Plans for Geneiva's Arroyo Improvements
Boyle Engineering
1991

ALBUQUERQUE, NEW MEXICO



VICINITY MAP
NOT TO SCALE

GENERAL NOTES:

1. TOPOGRAPHIC ORTHOPHOTO MAPS USED IN THE CONSTRUCTION PLANS WERE DEVELOPED FROM AERIAL PHOTOGRAPHS TAKEN ON MARCH 2, 1980.
2. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATION SERVICE, 280-1880, FOR LOCATION OF EXISTING UTILITIES.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
4. RIGHTS OF WAY ARE SHOWN IN THESE PLANS. CONTRACTOR SHALL NOT ENTER PRIVATE PROPERTY WITHOUT WRITTEN VERIFIABLE PERMISSION FROM EACH OWNER.
5. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREIN, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1988 (INCLUDING AMENDMENTS 1, 2 & 3) (REFERRED TO HEREIN AS THE "STANDARD SPECIFICATIONS").
6. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL OBTAIN A BARRICADEING PERMIT THROUGH CONSTRUCTION COORDINATION AT 788-2852. REFER TO SECTION 10, STANDARD SPECIFICATIONS.
7. RESEED ALL DISTURBED AREAS IN ACCORDANCE WITH SUPPLEMENTAL TECHNICAL SPECIFICATION SECTION 1011.

LEAN FILL CONSTRUCTION IS AT THE CONTRACTOR'S OPTION WITH AUTHORIZATION BY THE ENGINEER.

THE FOLLOWING NOTES APPLY WHEN CHECKED:

- ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
- BACKFILL COMPACTION SHALL BE ACCORDING TO SPECIFIED STREET USE.
- TACK COAT REQUIREMENTS SHALL BE DETERMINED BY THE CITY ENGINEER.
- SIDEWALKS AND WHEELCHAIR RAMPS WITHIN THE CURB RETURNS SHALL BE CONSTRUCTED WHEREVER A NEW CURB RETURN IS CONSTRUCTED.
- IF CURB IS DEEPENED FOR A DRIVEWAY, THE DRIVEWAY SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.
- ALL STORM DRAINAGE FACILITIES SHALL BE COMPLETED PRIOR TO FINAL ACCEPTANCE.
- THE REQUESTOR OR DEVELOPER SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ALL CURB AND GUTTER OR SIDEWALK DAMAGED AFTER APPROVAL BY THE CITY ENGINEER OF WORK COMPLETED BY THE CONTRACTOR.

RECORD DRAWING
THIS IS A RECORD DRAWING OF THE FACILITIES DESCRIBED IN THE TITLE BLOCK ONLY AND HAS BEEN PREPARED IN PART ON THE BASIS OF INFORMATION OBTAINED AND PROVIDED BY OTHERS. THE ENGINEER/ARCHITECT AND OTHER (S) WILL NOT BE RESPONSIBLE FOR ANY ERRORS (S) OR OMISSION (S) WHICH HAVE BEEN INCORPORATED INTO THIS DRAWING. ACTUAL CONDITIONS WILL VARY SOMEWHAT FROM THE CONDITIONS SHOWN HEREON AND AT SOME LOCATIONS THE VARIANCE MAY BE LARGE. IF THE PRECISE LOCATION OF ANY FACILITY IS REQUIRED, THE FACILITY SHOULD BE FIELD LOCATED BY THE SERVICE OF AN EMPLOYEE OF THE DISTRICT OR THE OWNER(S) OF THE UTILITIES INVOLVED.

APPROVAL OF AS BUILT DRAWINGS
CITY CONSTRUCTION ENGINEER
DATE 8/5/92

C of A PWD Maps & Records
1 2 3 4 5 6 7 8 9 10 11 12
26 39 41 90 01 92

2-22-91 ADDENDUM NO. 3 LWG

REV.	SHEETS	CITY ENGINEER	DATE	USER DEPT.	DATE	USER DEPT.	DATE



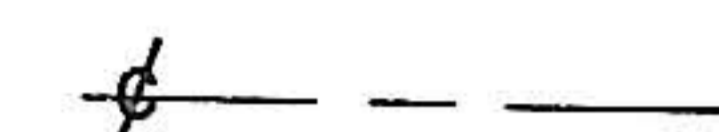
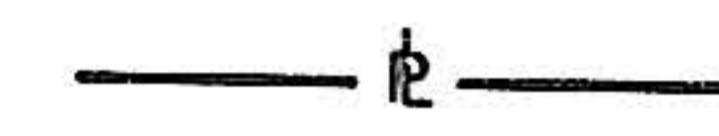
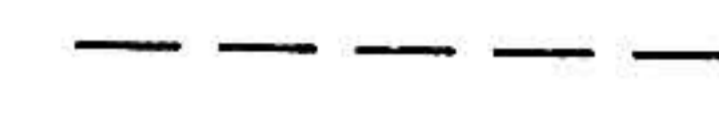


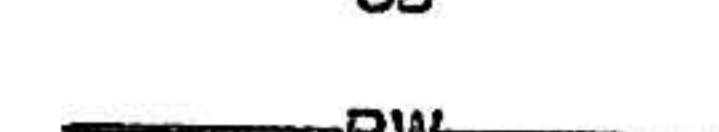
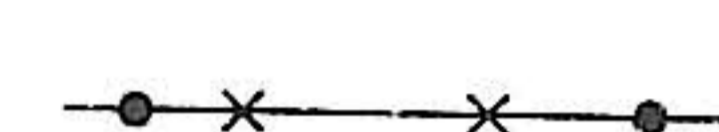

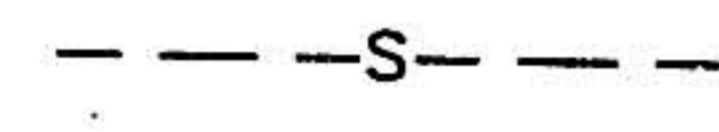
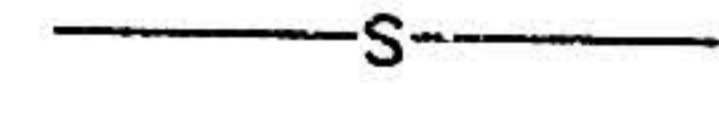
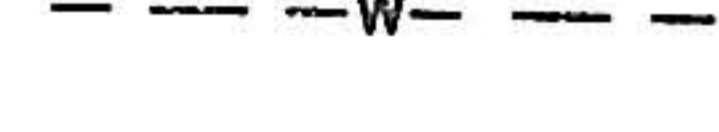
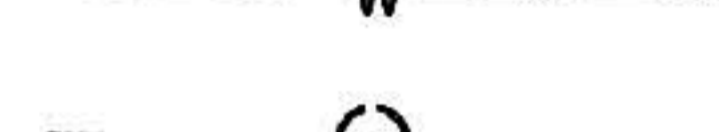

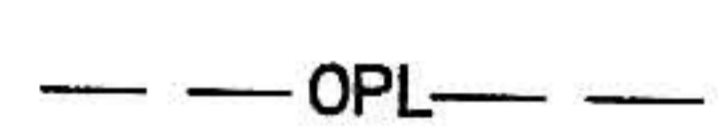
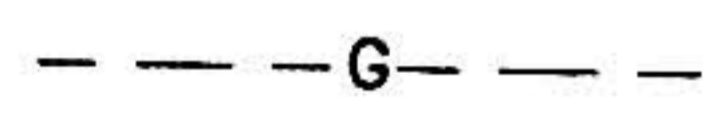



BOYLE
ENGINEERING CORPORATION

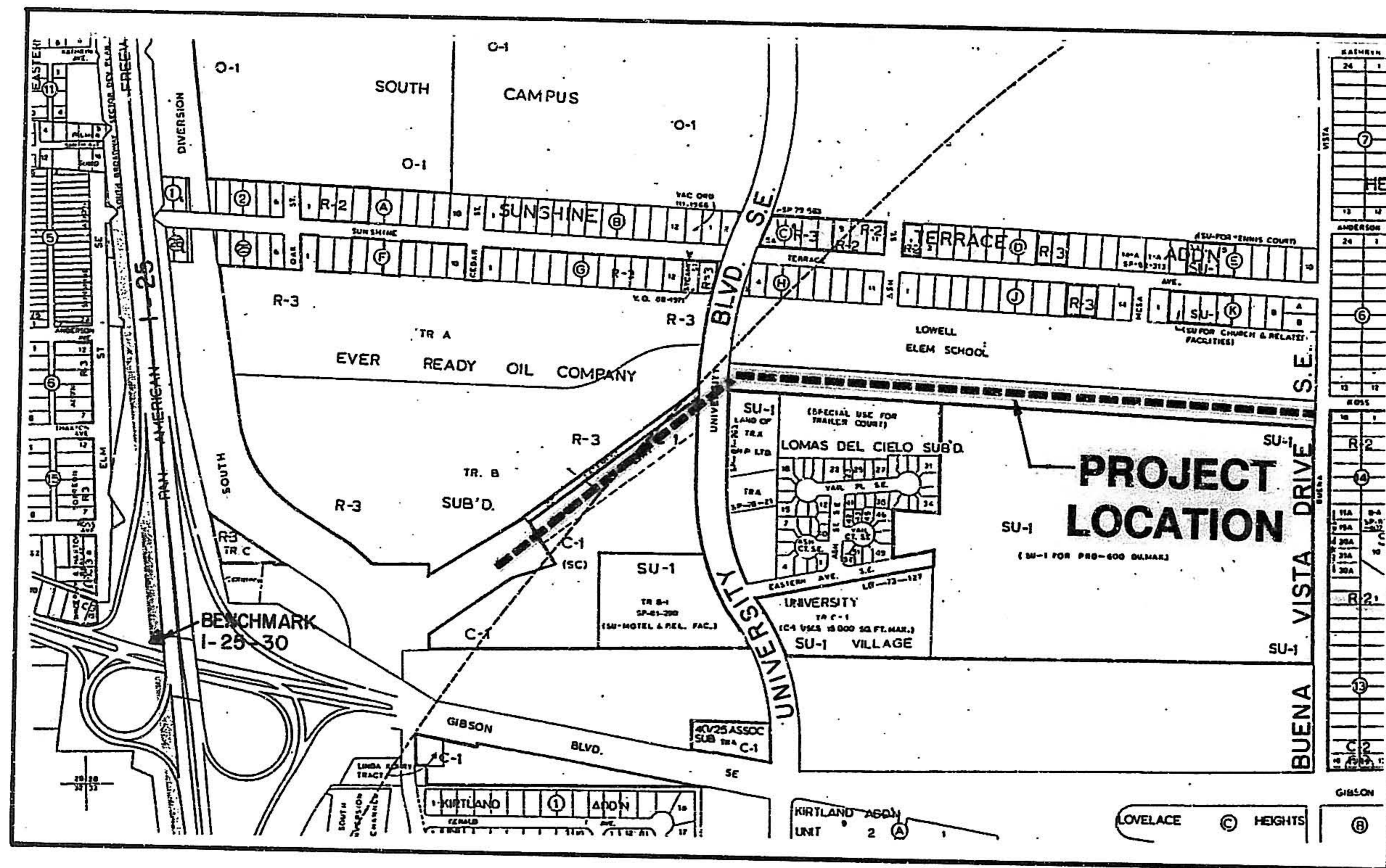
APPROVED FOR CONSTRUCTION
Russell B. Smith
CITY ENGINEER
DATE 1-11-91

PROJECT NUMBER: 3904

SHEET 1 OF 36

LEGEND

-  CENTERLINE
-  PROPERTY LINE
-  EXISTING GROUND CONTOUR
-  PROPOSED GROUND CONTOUR
-  EXISTING STORM DRAIN
-  PROPOSED STORM DRAIN
-  RIGHT OF WAY
-  CHAINLINK FENCE
-  SLOPE INDICATOR
-  EXISTING SEWER LINE
-  NEW SEWER LINE
-  EXISTING WATER LINE
-  NEW WATER LINE
-  EXISTING SEWER MANHOLE
-  NEW SEWER MANHOLE
-  EXISTING OVERHEAD POWER LINE
-  EXISTING GAS LINE
-  NEW STORM DRAIN INLET




LOCATION MAP L-15-Z

N.T.S.

City of A.P.W.D. Maps & Records
 261 3904 1902 92

RECORD DRAWING
 THIS IS A RECORD DRAWING OF THE FACILITIES IDENTIFIED IN THE TITLE BLOCK ONLY AND HAS BEEN PREPARED BY PART OF THE BOARD OF INSPECTION COMPLETED AND FORWARDED BY OTHERS. THE ENGINEER/ARCHITECT AND OTHER (S) WILL NOT BE RESPONSIBLE FOR ANY ERROR (S) OR OMISSION (S) WHICH MAY BE MADE IN THIS DRAWING. ACTION COMPLETED WILL BE REPORTED INTO THIS DRAWING. ACTION COMPLETED WILL BE REPORTED INTO THIS DRAWING. ACTION COMPLETED WILL BE REPORTED INTO THIS DRAWING. ACTION COMPLETED WILL BE REPORTED INTO THIS DRAWING.

ENGINEER'S SEAL		SURVEY INFORMATION		AS BUILT INFORMATION	
 WILLIAM M. JAMES REGISTERED PROFESSIONAL ENGINEER No. 11961		FIELD NOTES NO. _____ BY _____ DATE _____		BENCH MARKS NMSHC Brass Tablet, Stamped "Sta. 1-25-30", Set in top of a concrete post projecting 0.2 ft. above ground at the northwest corner of the overpass of Gibson Ave. S.E., of the southbound lane of I-25. Elevation = 5038.51.	
NO.	DATE	NO.	DATE	NO.	DATE
REMARKS	BY	REVISIONS	BY	DESIGNED BY	DATE
DESIGN				DRAWN BY	DATE
				CHECKED BY	DATE

CITY OF ALBUQUERQUE
 PUBLIC WORKS DEPARTMENT
 ENGINEERING GROUP

TITLE: LOCATION MAP & LEGEND
 GENEVA'S ARROYO IMPROVEMENTS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRG CHAIRMAN	<i>[Signature]</i>	1-11-91	WATER	<i>[Signature]</i>	1-11-91
TRANSPORTATION	<i>[Signature]</i>	1-12-91	WASTE WATER		
HYDROLOGY	<i>[Signature]</i>	1-10-91			

PROJECT NO. 3904 MAP NO. L-15-Z SHEET 2 OF 36

APPENDIX C – ENDANGERED SPECIES ACT REPORT

**In progress by environmental consultant; will be provided with
subsequent submittal.**

APPENDIX D – BAFFLE CHUTE WEIR ANALYSIS RESULTS

Weir Report

Top of Baffle Chute

Rectangular Weir

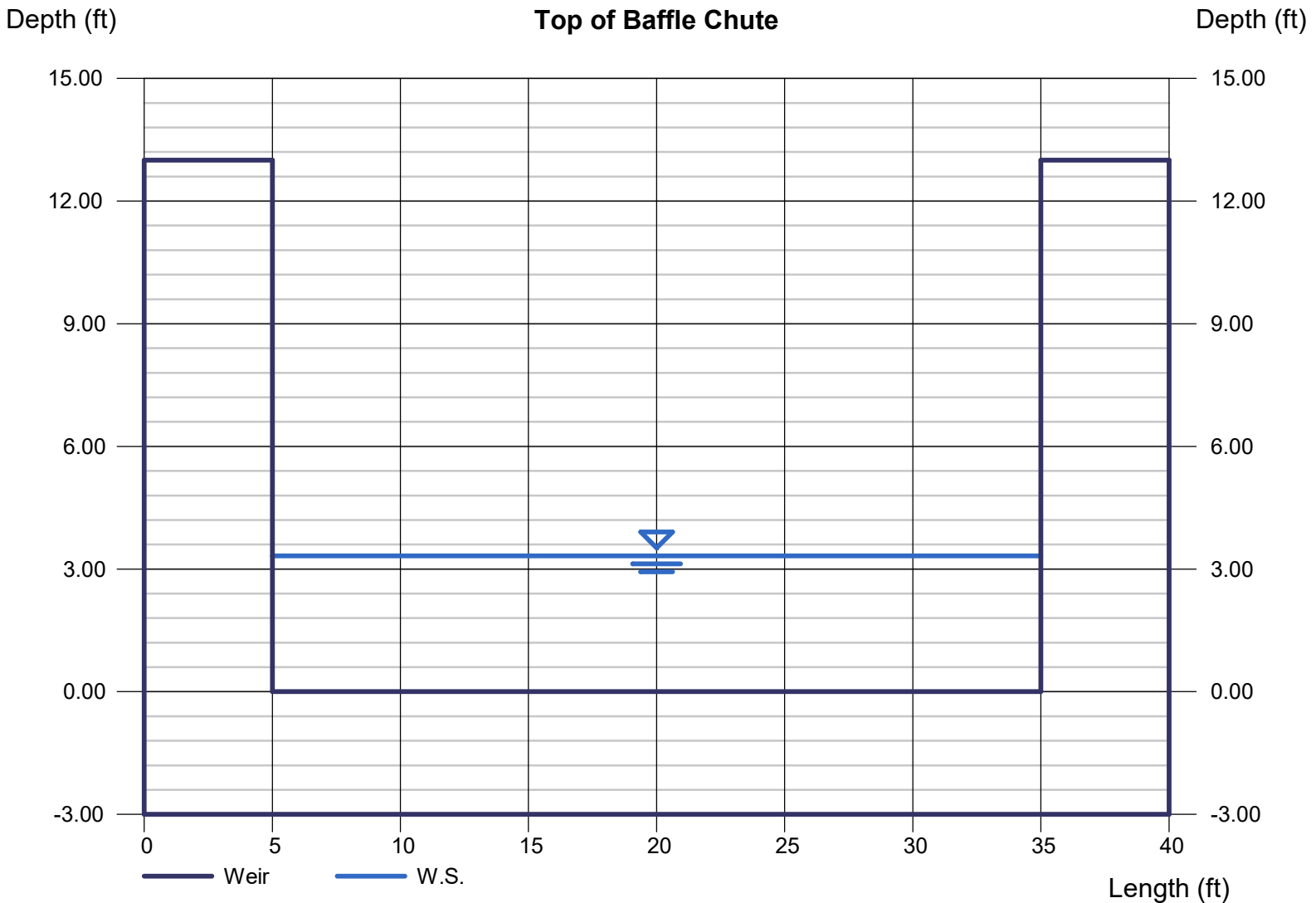
Crest = Sharp
Bottom Length (ft) = 30.00
Total Depth (ft) = 13.00

Highlighted

Depth (ft) = 3.32
Q (cfs) = 605.00
Area (sqft) = 99.73
Velocity (ft/s) = 6.07
Top Width (ft) = 30.00

Calculations

Weir Coeff. Cw = 3.33
Compute by: Known Q
Known Q (cfs) = 605.00



APPENDIX E – STORM DRAIN HYDRAULIC RESULTS

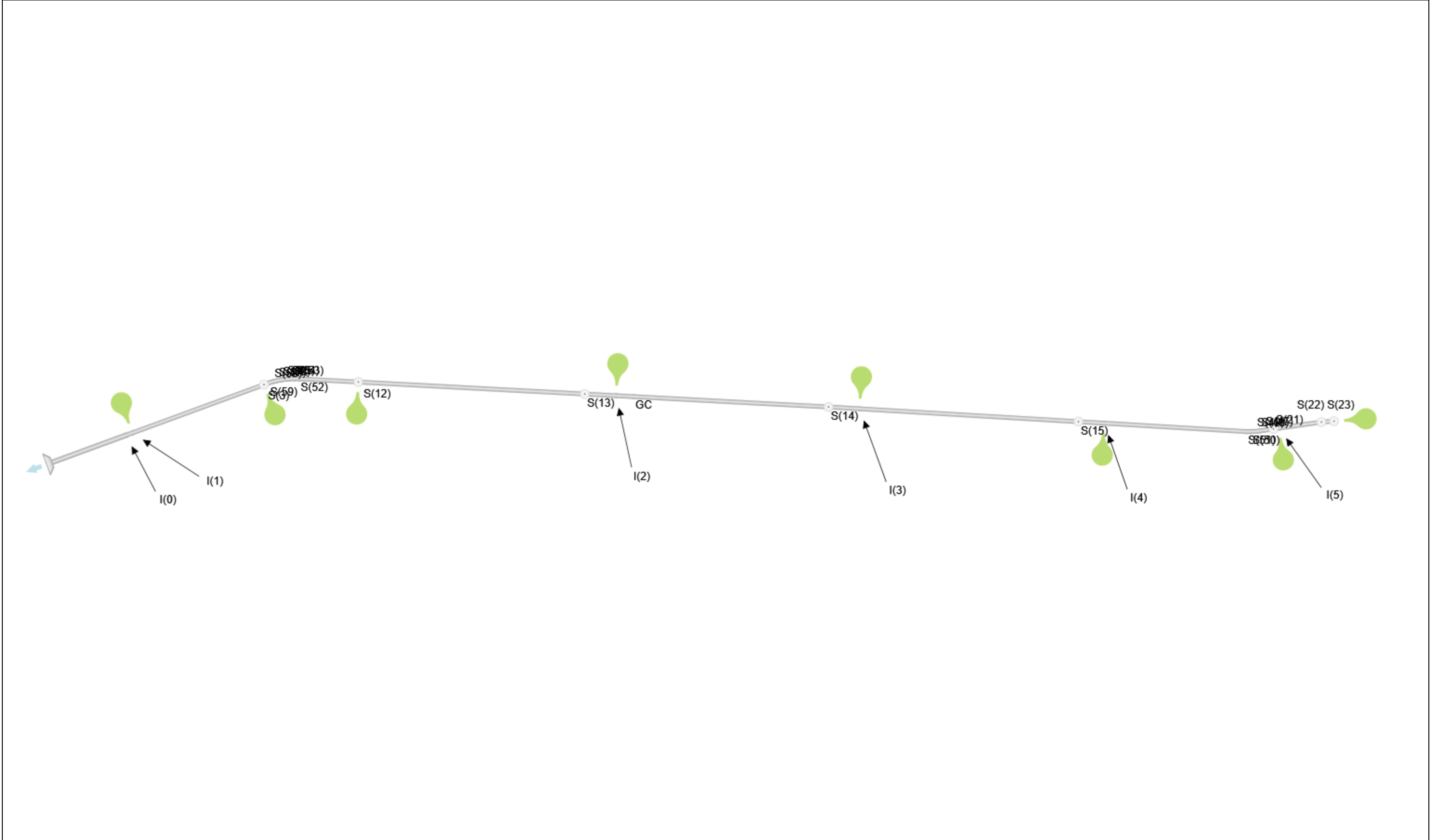
1. Existing Conditions Storm Drain Hydraulic Results
2. Proposed Conditions Storm Drain Hydraulic Results

Plan View

Stormwater Studio 2025 v 3.0.0.39

Project Name: EXISTING SD

09-11-2025

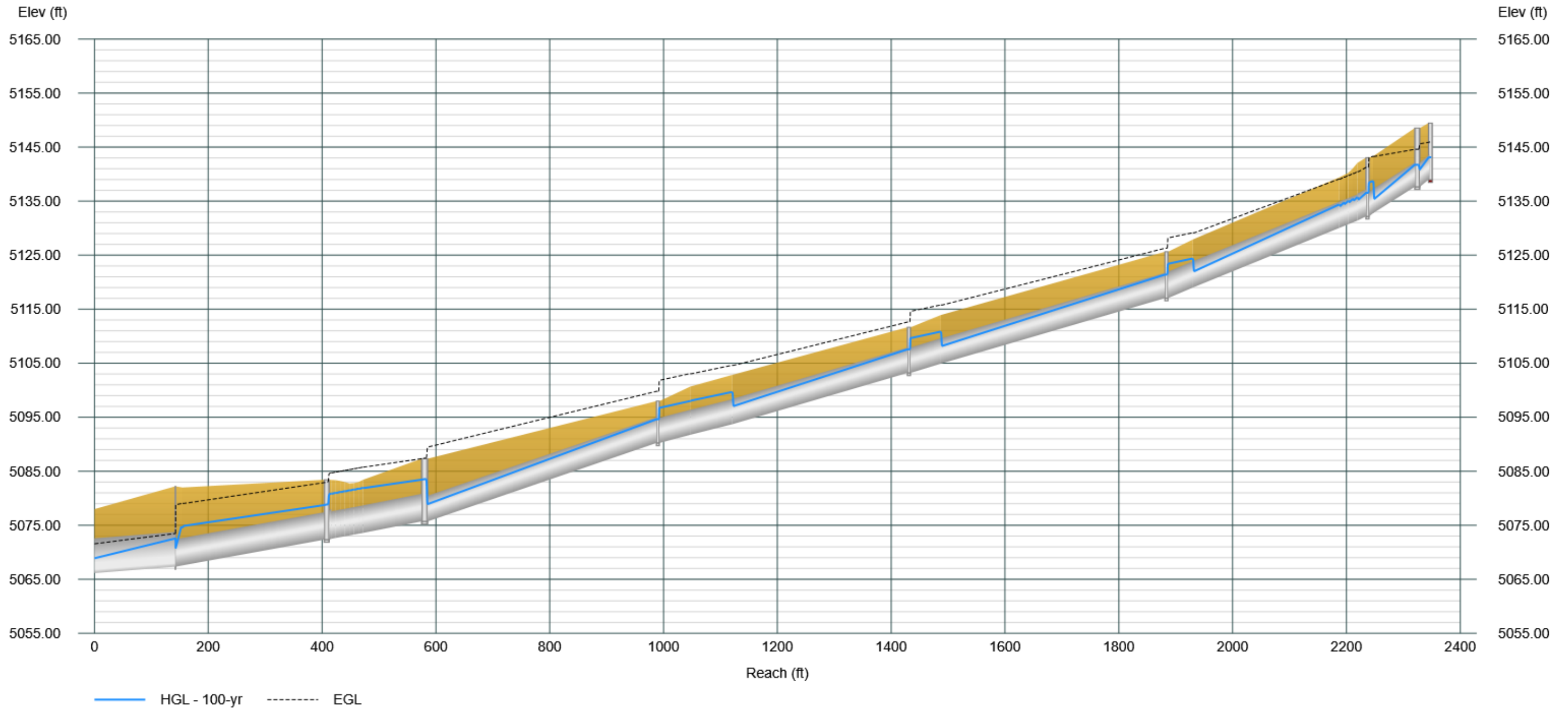


Profile View

Stormwater Studio 2026 v 3.0.0.40

Project Name: EXISTING SD

01-08-2026



Energy Grade Line Calculations

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
1	77x114a	331.00	5066.15	2.74'	25.22	5068.90	13.12	2.68	5071.57	142.25	5067.34	5.23	43.44	5072.57	7.62	0.90	5073.47	0.024	1.901	5072.58	5073.48	0.00
2	60	331.00	5067.34	3.49†	14.62	5070.83	22.65	7.97	5078.80	12.50	5067.58	5.00	19.63	5074.63	16.86	4.42	5079.05	0.013	0.247	5074.63	5079.05	0.00
3	60	321.00	5067.58	5.00	19.63	5074.89	16.35	4.16	5079.05	253.29	5072.34	5.00	19.63	5078.74	16.35	4.16	5082.90	0.013	3.848	5078.87	5083.02	0.12
4	60	310.00	5072.34	5.00	19.63	5080.70	15.79	3.88	5084.57	8.00	5072.50	5.00	19.63	5080.81	15.79	3.88	5084.69	0.013	0.113	5080.85	5084.73	0.04
5	60	310.00	5072.50	5.00	19.63	5080.85	15.79	3.88	5084.73	8.00	5072.66	5.00	19.63	5080.97	15.79	3.88	5084.84	0.013	0.113	5081.00	5084.88	0.04
6	60	310.00	5072.66	5.00	19.63	5081.00	15.79	3.88	5084.88	8.00	5072.82	5.00	19.63	5081.12	15.79	3.88	5084.99	0.013	0.113	5081.16	5085.03	0.04
7	60	310.00	5072.82	5.00	19.63	5081.16	15.79	3.88	5085.03	8.00	5072.97	5.00	19.63	5081.27	15.79	3.88	5085.15	0.013	0.113	5081.31	5085.19	0.04
8	60	310.00	5072.97	5.00	19.63	5081.31	15.79	3.88	5085.19	8.00	5073.13	5.00	19.63	5081.43	15.79	3.88	5085.30	0.013	0.113	5081.46	5085.34	0.04
9	60	310.00	5073.13	5.00	19.63	5081.46	15.79	3.88	5085.34	8.00	5073.29	5.00	19.63	5081.58	15.79	3.88	5085.45	0.013	0.113	5081.62	5085.49	0.04
10	60	310.00	5073.29	5.00	19.63	5081.62	15.79	3.88	5085.49	8.00	5073.44	5.00	19.63	5081.73	15.79	3.88	5085.61	0.013	0.113	5081.77	5085.65	0.04
11	60	310.00	5073.44	5.00	19.63	5081.77	15.79	3.88	5085.65	8.00	5073.60	5.00	19.63	5081.89	15.79	3.88	5085.76	0.013	0.113	5081.91	5085.79	0.03
12	60	310.00	5073.60	5.00	19.63	5081.91	15.79	3.88	5085.79	108.01	5075.72	5.00	19.63	5083.44	15.79	3.88	5087.32	0.013	1.530	5083.56	5087.44	0.12
13	54	288.00	5075.72	3.20†	12.08	5078.92	23.84	8.83	5089.48	409.93	5090.24	4.37 ²	15.77	5094.61	18.26	5.18	5099.79	0.013	10.317	5094.61	5099.79	0.00
14	54	288.00	5090.24	4.50	15.90	5096.73	18.11	5.10	5101.83	56.79	5091.74	4.50	15.90	5097.95	18.11	5.10	5103.05	0.013	1.218	5097.95	5103.05	0.00
15	54	284.00	5091.74	4.50	15.90	5098.10	17.86	4.96	5103.05	74.10	5093.71	4.50	15.90	5099.64	17.86	4.96	5104.60	0.013	1.545	5099.64	5104.60	0.00
16	54	284.00	5093.71	3.37†	12.76	5097.08	22.25	7.70	5104.60	310.37	5103.20	4.37 ²	15.77	5107.57	18.01	5.04	5112.61	0.013	8.013	5107.57	5112.61	0.00
17	54	284.00	5103.20	4.50	15.90	5109.64	17.86	4.96	5114.60	56.10	5104.92	4.50	15.90	5110.81	17.86	4.96	5115.77	0.013	1.170	5110.81	5115.77	0.00
18	54	279.00	5104.92	3.29†	12.45	5108.21	22.41	7.81	5115.77	396.31	5117.04	4.35 ²	15.75	5121.40	17.72	4.88	5126.28	0.013	10.508	5121.40	5126.28	0.00
19	54	279.00	5117.04	4.50	15.90	5123.41	17.55	4.79	5128.19	46.55	5119.01	4.50	15.90	5124.35	17.54	4.78	5129.13	0.013	0.938	5124.35	5129.13	0.00
20	54	274.00	5119.01	3.02†	11.35	5122.03	24.15	9.06	5129.13	256.94	5130.04	4.34 ²	15.73	5134.38	17.42	4.72	5139.10	0.013	9.964	5134.38	5139.10	0.00
21	54	274.00	5130.04	4.08†	15.15	5134.11	18.08	5.08	5139.10	8.00	5130.38	4.34 ²	15.73	5134.72	17.42	4.72	5139.44	0.013	0.344	5134.72	5139.44	0.00
22	54	274.00	5130.38	4.11†	15.24	5134.49	17.98	5.03	5139.44	8.00	5130.72	4.34 ²	15.73	5135.06	17.42	4.72	5139.78	0.013	0.340	5135.06	5139.78	0.00

Notes: Return Period = 100-yrs. ¹ Critical depth. ² Critical depth. † Supercritical. r = rectangular e = elliptical a = arch

Energy Grade Line Calculations

Project Name: EXISTING SD

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
23	54	274.00	5130.72	4.11‡	15.24	5134.83	17.98	5.03	5139.78	8.00	5131.06	4.34 ²	15.73	5135.40	17.42	4.72	5140.12	0.013	0.339	5135.40	5140.12	0.00
24	54	274.00	5131.06	4.11‡	15.24	5135.17	17.98	5.03	5140.12	8.00	5131.40	4.34 ²	15.73	5135.74	17.42	4.72	5140.46	0.013	0.340	5135.74	5140.46	0.00
25	54	274.00	5131.40	3.91‡	14.67	5135.31	18.68	5.42	5140.46	17.85	5132.17	4.34 ²	15.73	5136.51	17.42	4.72	5141.23	0.013	0.770	5136.51	5141.23	0.00
26	54	274.00	5132.17	4.50	15.90	5138.46	17.23	4.62	5143.08	10.00	5132.79	4.50	15.90	5138.66	17.23	4.61	5143.27	0.013	0.194	5138.66	5143.28	0.00
27	54	205.00	5132.79	2.64‡	9.70	5135.43	21.14	6.95	5143.28	77.53	5137.66	4.07 ²	15.14	5141.73	13.54	2.85	5144.58	0.013	1.308	5141.73	5144.58	0.00
28	54	205.00	5137.66	3.24‡	12.25	5140.90	16.74	4.36	5145.62	23.00	5138.96	4.08	15.15	5143.04	13.53	2.85	5145.88	0.013	0.266	5143.13	5145.98	0.09

Notes: Return Period = 100-yrs. ² Critical depth. ‡ Supercritical.

Project File: 20260033Existing SD with Adjustment.sws

Structure Report

Stormwater Studio 2026 v 3.0.0.40

Project Name: EXISTING SD

01-08-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Bench-ing	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)
1	I(0)	P(49)	MH	5082.20	5067.34	Impr	331.00	0.00	5072.75	0.00	5072.57	7.62
2	I(1)	P(50)	None	5082.00	5067.58	....	331.00	10.00	5074.63	....	5074.63	16.86
3	S(3)	P(2)	MH	5083.43	5072.34	Half	321.00	11.00	5079.57	0.12	5078.74	16.35
4	S(59)	P(3)	None	5083.40	5072.50	....	310.00	0.00	5080.85	....	5080.81	15.79
5	S(58)	P(4)	None	5083.35	5072.66	....	310.00	0.00	5081.00	....	5080.97	15.79
6	S(57)	P(5)	None	5083.20	5072.82	....	310.00	0.00	5081.16	....	5081.12	15.79
7	S(56)	P(6)	None	5083.00	5072.97	....	310.00	0.00	5081.31	....	5081.27	15.79
8	S(55)	P(7)	None	5082.75	5073.13	....	310.00	0.00	5081.46	....	5081.43	15.79
9	S(54)	P(8)	None	5082.82	5073.29	....	310.00	0.00	5081.62	....	5081.58	15.79
10	S(53)	P(9)	None	5083.00	5073.44	....	310.00	0.00	5081.77	....	5081.73	15.79
11	S(52)	P(10)	None	5083.43	5073.60	....	310.00	0.00	5081.91	....	5081.89	15.79
12	S(12)	P(11)	MH	5087.32	5075.72	Half	310.00	22.00	5084.22	0.12	5083.44	15.79
13	S(13)	P(12)	MH	5097.98	5090.24	Impr	288.00	0.00	5094.61	0.00	5094.61	18.26
14	I(2)	P(45)	None	5100.67	5091.74	....	288.00	4.00	5097.95	....	5097.95	18.11
15	GC	New	None	5102.84	5093.71	....	284.00	0.00	5099.64	....	5099.64	17.86
16	S(14)	P(13)	MH	5111.65	5103.20	Impr	284.00	0.00	5107.57	0.00	5107.57	18.01
17	I(3)	P(46)	None	5113.92	5104.92	....	284.00	5.00	5110.81	....	5110.81	17.86
18	S(15)	P(14)	MH	5125.62	5117.04	Impr	279.00	0.00	5121.40	0.00	5121.40	17.72
19	I(4)	P(47)	None	5127.91	5119.01	....	279.00	5.00	5124.35	....	5124.35	17.54
20	S(51)	P(15)	None	5139.39	5130.04	....	274.00	0.00	5134.38	....	5134.38	17.42
21	S(50)	P(16)	None	5139.80	5130.38	....	274.00	0.00	5134.72	....	5134.72	17.42
22	S(49)	P(17)	None	5140.23	5130.72	....	274.00	0.00	5135.06	....	5135.06	17.42
23	S(48)	P(18)	None	5141.06	5131.06	....	274.00	0.00	5135.40	....	5135.40	17.42
24	S(47)	P(19)	None	5142.07	5131.40	....	274.00	0.00	5135.74	....	5135.74	17.42
25	S(21)	P(20)	MH	5143.04	5132.17	Impr	274.00	0.00	5136.51	0.00	5136.51	17.42
26	I(5)	P(48)	None	5143.30	5132.79	....	274.00	69.00	5138.66	....	5138.66	17.23
27	S(22)	P(21)	MH	5148.53	5137.66	Half	205.00	0.00	5141.73	0.00	5141.73	13.54
28	S(23)	P(22)	MH	5149.44	5138.96	Half	205.00	205.00	5143.66	0.09	5143.04	13.53

Notes: IDF File = SampleIDF.idf, Return Period = 100-yrs. r = rectangular e = elliptical a = arch

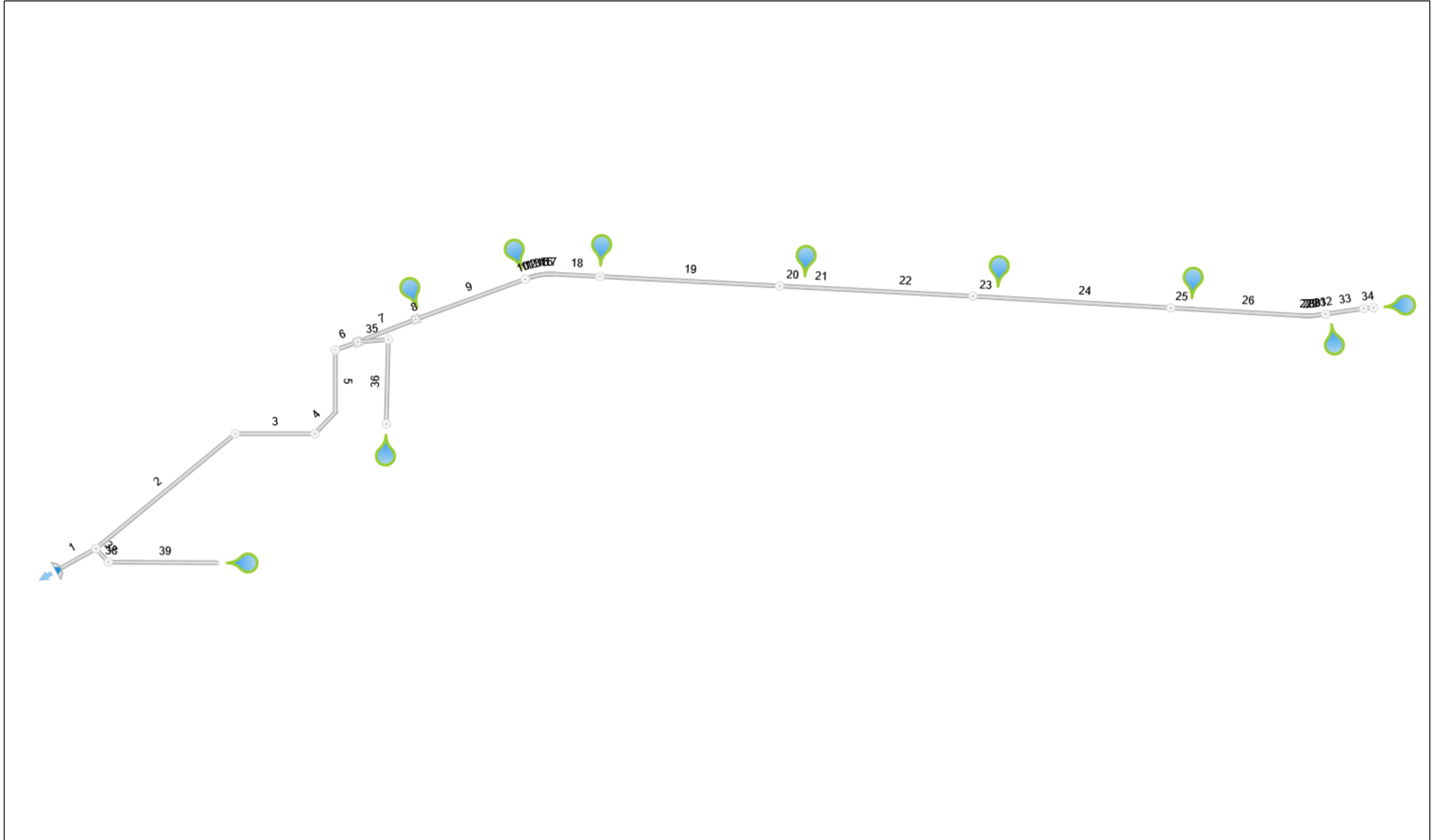
Project File: 2026003Existing SD with Adjustment.sws

Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-08-2026

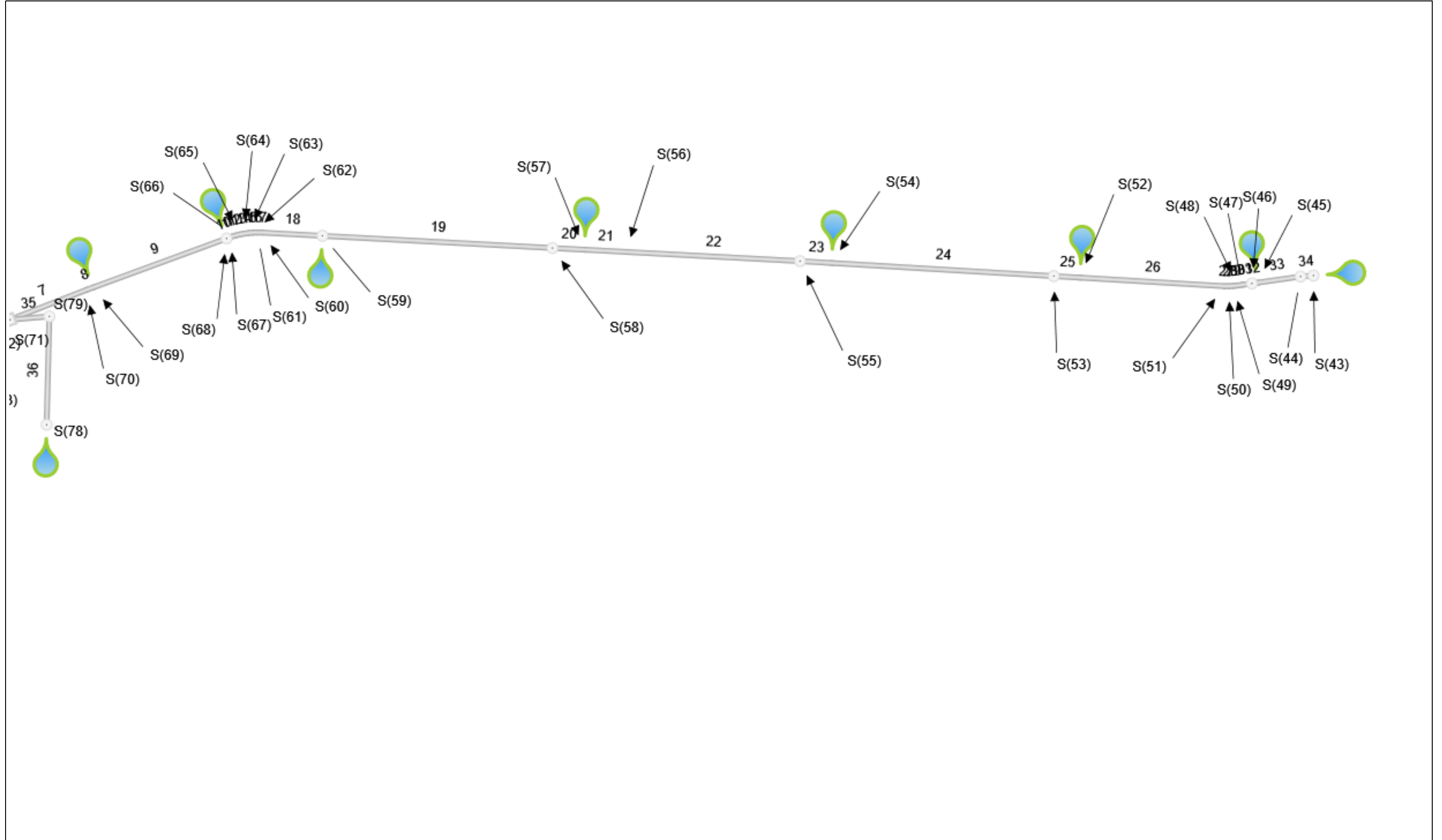


Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-06-2026

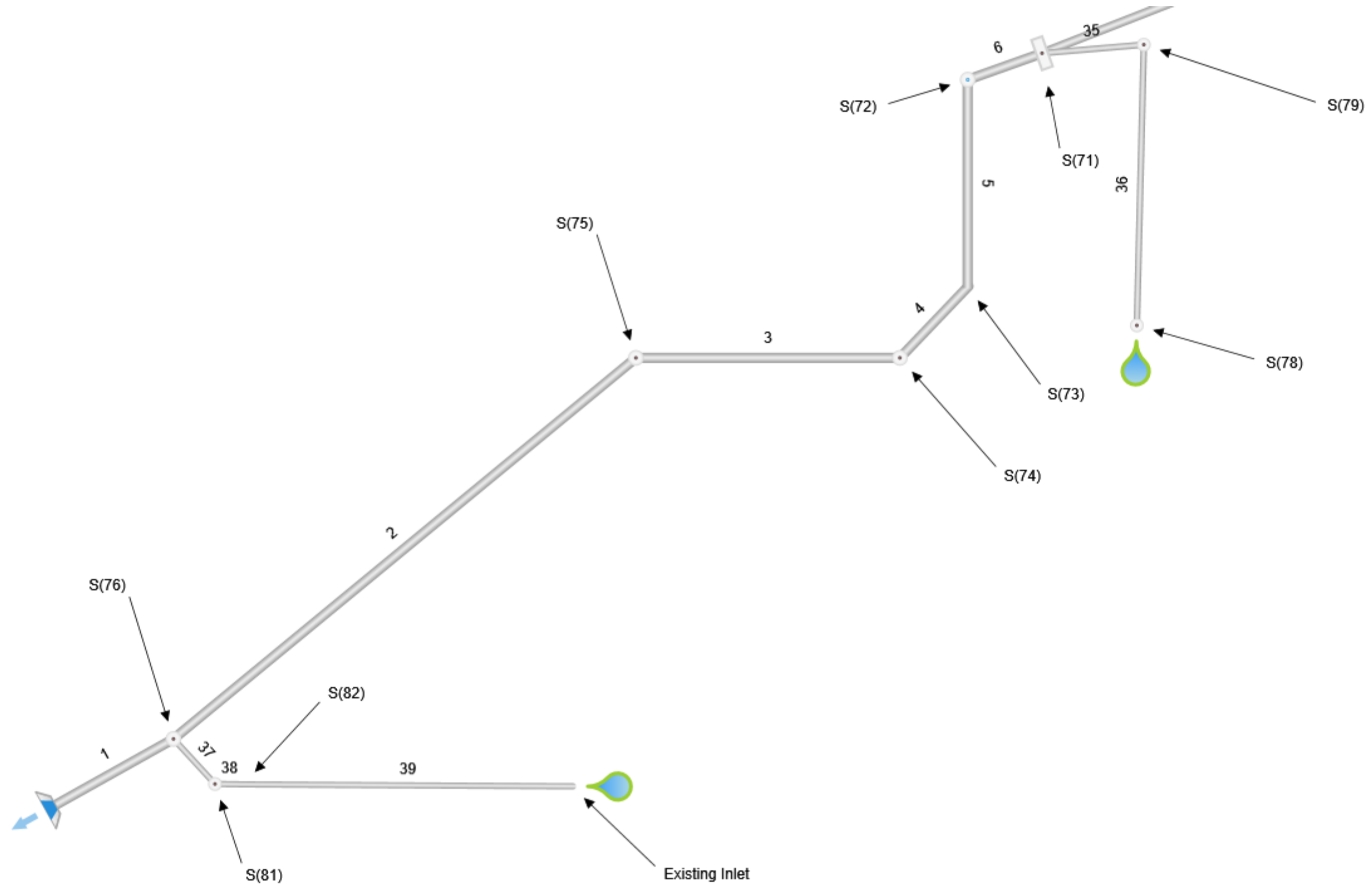


Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-06-2026

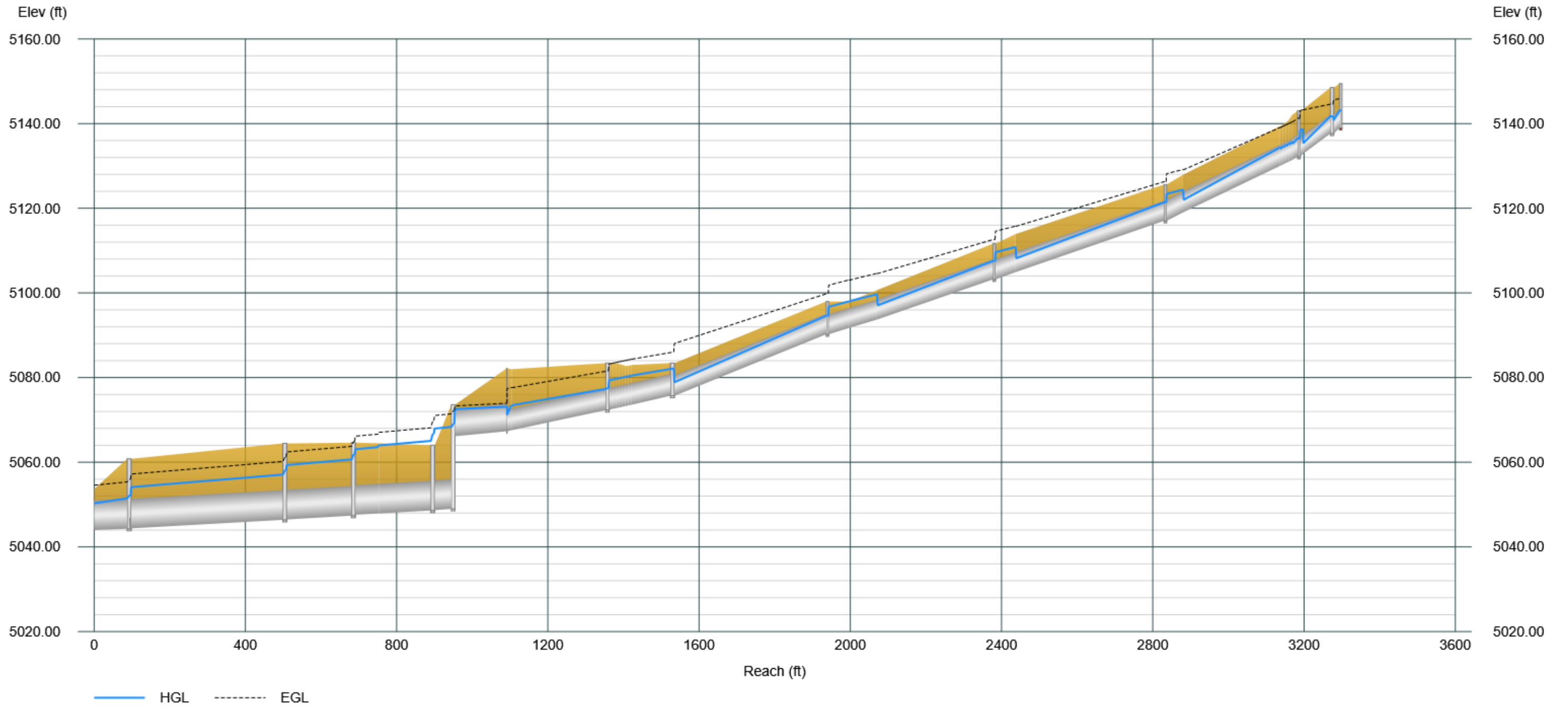


Profile View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-08-2026

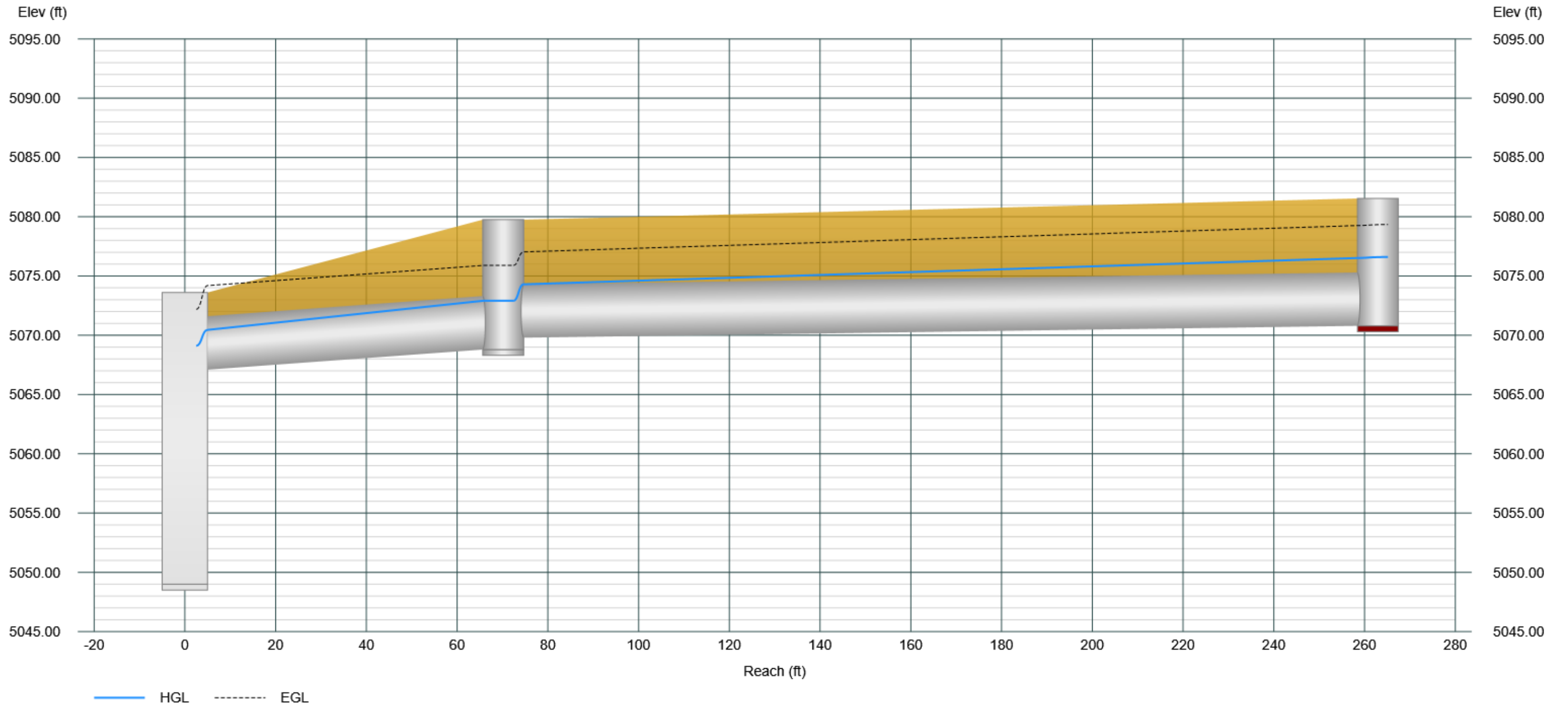


Profile View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-08-2026

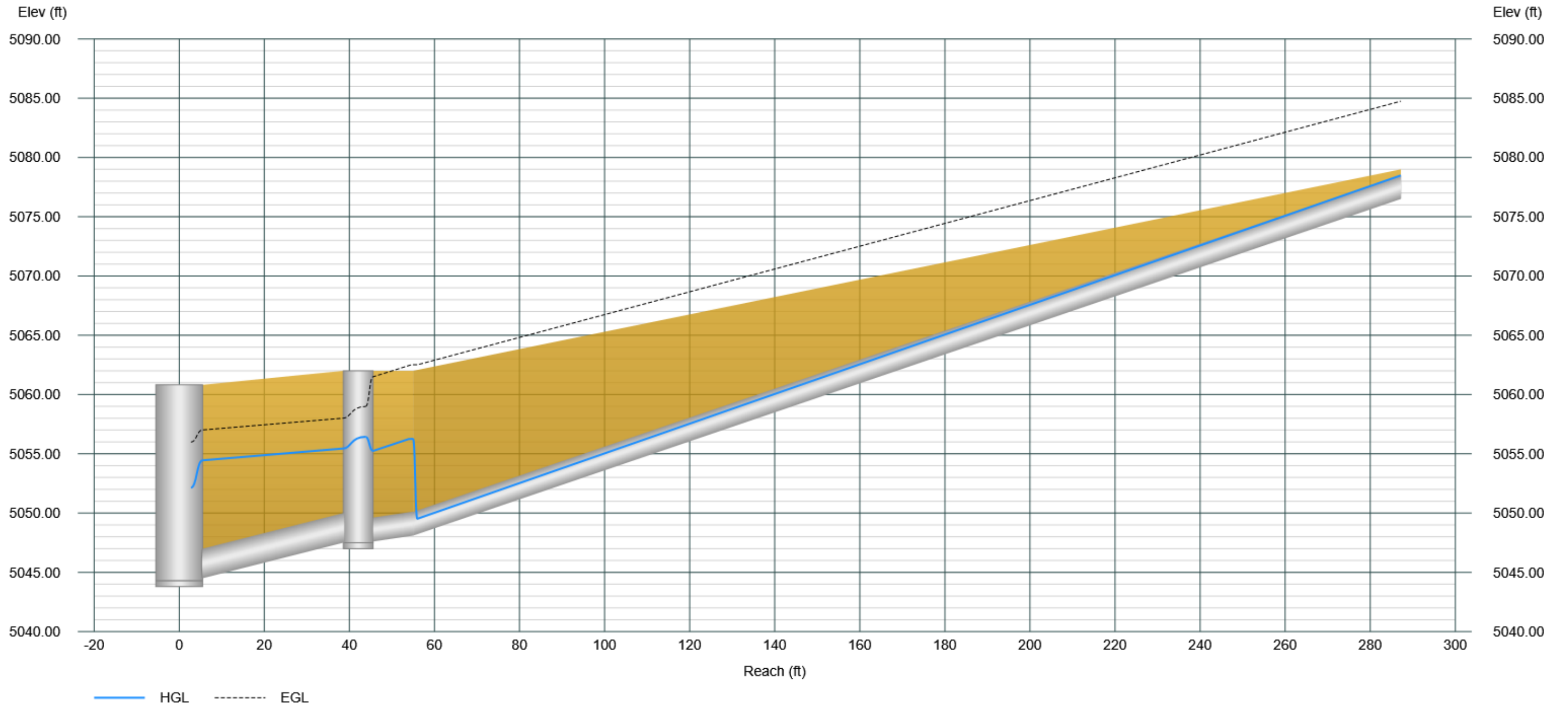


Profile View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-08-2026



Energy Grade Line Calculations

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
1	84	605.00	5044.00	6.29'	36.45	5050.29	16.60	4.28	5054.58	92.73	5044.30	7.00	38.48	5051.52	15.72	3.84	5055.36	0.013	0.782	5052.15	5055.99	0.63
2	84	542.00	5044.40	7.00 ³	38.48	5054.14	14.09	3.08	5057.22	411.48	5046.40	7.00	38.48	5057.10	14.08	3.08	5060.19	0.013	2.961	5058.13	5061.21	1.03
3	84	542.00	5046.50	7.00 ³	38.48	5059.36	14.09	3.08	5062.45	181.37	5047.40	7.00	38.48	5060.67	14.08	3.08	5063.75	0.013	1.306	5061.85	5064.94	1.18
4	84	542.00	5047.60	7.00 ³	38.48	5063.09	14.09	3.08	5066.17	67.41	5047.92	7.00	38.48	5063.57	14.08	3.08	5066.66	0.013	0.485	5064.02	5067.10	0.44
5	84	542.00	5047.92	7.00 ³	38.48	5064.02	14.09	3.08	5067.10	142.23	5048.60	7.00	38.48	5065.04	14.08	3.08	5068.13	0.013	1.024	5066.74	5069.82	1.69
6	84	542.00	5048.70	7.00 ³	38.48	5067.97	14.09	3.08	5071.05	54.18	5049.00	7.00	38.48	5068.36	14.08	3.08	5071.44	0.013	0.390	5069.11	5072.19	0.75
7	77x114e	331.00	5066.15	6.42 ³	47.88	5072.57	6.91	0.74	5073.31	142.25	5067.34	5.78	45.29	5073.12	7.31	0.83	5073.95	0.025	0.632	5073.12	5073.96	0.01
8	60	331.00	5067.34	3.96 [‡]	16.67	5071.30	19.85	6.13	5077.43	12.50	5067.58	5.00	19.63	5073.22	16.86	4.42	5077.64	0.013	0.208	5073.22	5077.64	0.00
9	60	321.00	5067.58	5.00	19.63	5073.49	16.35	4.16	5077.64	253.29	5072.34	5.00	19.63	5077.34	16.35	4.16	5081.50	0.013	3.851	5077.46	5081.62	0.12
10	60	310.00	5072.34	5.00	19.63	5079.29	15.79	3.88	5083.17	8.00	5072.50	5.00	19.63	5079.41	15.79	3.88	5083.29	0.013	0.113	5079.44	5083.31	0.03
11	60	310.00	5072.50	5.00	19.63	5079.44	15.79	3.88	5083.31	8.00	5072.66	5.00	19.63	5079.55	15.79	3.88	5083.43	0.013	0.113	5079.59	5083.46	0.04
12	60	310.00	5072.66	5.00	19.63	5079.59	15.79	3.88	5083.46	8.00	5072.82	5.00	19.63	5079.70	15.79	3.88	5083.58	0.013	0.113	5079.74	5083.62	0.04
13	60	310.00	5072.82	5.00	19.63	5079.74	15.79	3.88	5083.62	8.00	5072.97	5.00	19.63	5079.85	15.79	3.88	5083.73	0.013	0.113	5079.89	5083.77	0.04
14	60	310.00	5072.97	5.00	19.63	5079.89	15.79	3.88	5083.77	8.00	5073.13	5.00	19.63	5080.01	15.79	3.88	5083.88	0.013	0.113	5080.05	5083.92	0.04
15	60	310.00	5073.13	5.00	19.63	5080.05	15.79	3.88	5083.92	8.00	5073.29	5.00	19.63	5080.16	15.79	3.88	5084.04	0.013	0.113	5080.21	5084.08	0.05
16	60	310.00	5073.29	5.00	19.63	5080.21	15.79	3.88	5084.08	8.00	5073.44	5.00	19.63	5080.32	15.79	3.88	5084.20	0.013	0.113	5080.35	5084.22	0.02
17	60	310.00	5073.44	5.00	19.63	5080.35	15.79	3.88	5084.22	8.00	5073.60	5.00	19.63	5080.46	15.79	3.88	5084.34	0.013	0.113	5080.51	5084.38	0.05
18	60	310.00	5073.60	5.00	19.63	5080.51	15.79	3.88	5084.39	108.01	5075.72	5.00	19.63	5082.04	15.79	3.88	5085.92	0.013	1.530	5082.16	5086.03	0.12
19	54	288.00	5075.72	3.20 [‡]	12.08	5078.92	23.84	8.83	5088.08	409.93	5090.24	4.37 ²	15.77	5094.61	18.26	5.18	5099.79	0.013	11.719	5094.61	5099.79	0.00
20	54	288.00	5090.24	4.50	15.90	5096.73	18.11	5.10	5101.83	56.79	5091.74	4.50	15.90	5097.95	18.11	5.10	5103.05	0.013	1.218	5097.95	5103.05	0.00
21	54	284.00	5091.74	4.50	15.90	5098.10	17.86	4.96	5103.05	74.10	5093.71	4.50	15.90	5099.64	17.86	4.96	5104.60	0.013	1.545	5099.64	5104.60	0.00
22	54	284.00	5093.71	3.37 [‡]	12.76	5097.08	22.25	7.70	5104.60	310.37	5103.20	4.37 ²	15.77	5107.57	18.01	5.04	5112.61	0.013	8.009	5107.57	5112.61	0.00

Notes: ¹ Critical depth. ² Critical depth. ³ Normal depth. ‡ Supercritical. r = rectangular e = elliptical a = arch

Energy Grade Line Calculations

Project Name: 20260033Entire System

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
23	54	284.00	5103.20	4.50	15.90	5109.64	17.86	4.96	5114.59	56.10	5104.92	4.50	15.90	5110.81	17.86	4.96	5115.76	0.013	1.170	5110.81	5115.77	0.00
24	54	279.00	5104.92	3.29‡	12.45	5108.21	22.41	7.81	5115.77	396.31	5117.04	4.35 ²	15.75	5121.40	17.72	4.88	5126.27	0.013	10.508	5121.40	5126.27	0.00
25	54	279.00	5117.04	4.50	15.90	5123.40	17.55	4.79	5128.19	46.55	5119.01	4.50	15.90	5124.34	17.54	4.78	5129.13	0.013	0.938	5124.34	5129.13	0.00
26	54	274.00	5119.01	3.02‡	11.35	5122.03	24.15	9.06	5129.13	256.94	5130.04	4.34 ²	15.73	5134.38	17.42	4.72	5139.10	0.013	9.973	5134.38	5139.10	0.00
27	54	274.00	5130.04	4.08‡	15.15	5134.11	18.08	5.08	5139.10	8.00	5130.38	4.34 ²	15.73	5134.72	17.42	4.72	5139.44	0.013	0.344	5134.72	5139.44	0.00
28	54	274.00	5130.38	4.10‡	15.22	5134.48	18.00	5.04	5139.44	8.00	5130.72	4.34 ²	15.73	5135.06	17.42	4.72	5139.78	0.013	0.342	5135.06	5139.78	0.00
29	54	274.00	5130.72	4.07‡	15.14	5134.79	18.10	5.09	5139.78	8.00	5131.07	4.34 ²	15.73	5135.41	17.42	4.72	5140.13	0.013	0.348	5135.41	5140.13	0.00
30	54	274.00	5131.07	4.07‡	15.14	5135.14	18.10	5.09	5140.13	8.00	5131.41	4.34 ²	15.73	5135.75	17.42	4.72	5140.47	0.013	0.345	5135.75	5140.47	0.00
31	54	274.00	5131.41	3.91‡	14.67	5135.32	18.68	5.42	5140.47	17.85	5132.17	4.34 ²	15.73	5136.51	17.42	4.72	5141.23	0.013	0.761	5136.51	5141.23	0.00
32	54	274.00	5132.17	4.50	15.90	5138.46	17.23	4.62	5143.08	10.00	5132.79	4.50	15.90	5138.66	17.23	4.61	5143.27	0.013	0.194	5138.66	5143.27	0.00
33	54	205.00	5132.79	2.64‡	9.70	5135.43	21.14	6.95	5143.27	77.53	5137.66	4.07 ²	15.14	5141.73	13.54	2.85	5144.58	0.013	1.311	5141.73	5144.58	0.00
34	54	205.00	5137.66	3.24‡	12.25	5140.90	16.74	4.36	5145.62	23.00	5138.96	4.08	15.15	5143.04	13.53	2.85	5145.88	0.013	0.266	5143.13	5145.98	0.09
35	54	211.00	5067.10	3.36‡	12.72	5070.46	16.58	4.28	5074.19	70.16	5068.80	4.11 ²	15.24	5072.91	13.85	2.98	5075.89	0.013	1.700	5072.91	5075.89	0.00
36	54	211.00	5069.80	4.50 ³	15.90	5074.30	13.27	2.74	5077.04	192.76	5070.80	4.50	15.90	5076.52	13.27	2.74	5079.26	0.013	2.220	5076.60	5079.34	0.08
37	30	63.00	5044.50	2.50	4.91	5054.45	12.84	2.56	5057.01	42.07	5047.50	2.50	4.91	5055.45	12.83	2.56	5058.01	0.013	0.993	5056.44	5059.00	0.99
38	24	63.00	5047.60	2.00 ³	3.14	5055.24	20.06	6.25	5061.50	12.90	5048.10	2.00	3.14	5056.25	20.05	6.25	5062.50	0.013	1.001	5056.26	5062.51	0.01
39	24	63.00	5048.10	1.42‡	2.39	5049.52	26.40	10.83	5062.51	232.23	5076.50	1.99 ²	3.14	5078.49	20.06	6.26	5084.75	0.013	22.239	5078.49	5084.75	0.00

Notes: ² Critical depth. ³ Normal depth. ‡ Supercritical.

Project File: 20260033Proposed Entire SD Model.sws

Structure Report

Project Name: 20260033Entire System

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Benching	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)	Notes
1	S(76)	P(78)	MH	5060.82	5044.30	Half	605.00	0.00	5052.28	0.63	5051.52	15.72	
2	S(75)	P(77)	MH	5064.47	5046.40	Half	542.00	0.00	5057.72	1.03	5057.10	14.08	
3	S(74)	P(76)	MH	5064.64	5047.40	Half	542.00	0.00	5061.29	1.18	5060.67	14.08	
4	S(73)	P(75)	None	5064.50	5047.92	....	542.00	0.00	5064.02	....	5063.57	14.08	
5	S(72)	P(74)	MH	5064.02	5048.60	Half	542.00	0.00	5065.66	1.69	5065.04	14.08	MH to have bolted lid since HGL Exceeds ground elevation
6	S(71)	P(73)	MH	5073.61	5049.00	Flat	542.00	0.00	5068.98	0.75	5068.36	14.08	
7	S(70)	P(72)	MH	5082.20	5067.34	Impr	331.00	0.00	5073.28	0.01	5073.12	7.31	
8	S(69)	P(71)	None	5082.00	5067.58	....	331.00	10.00	5073.22	....	5073.22	16.86	
9	S(68)	P(70)	MH	5083.43	5072.34	Half	321.00	11.00	5078.17	0.12	5077.34	16.35	
10	S(67)	P(69)	None	5083.40	5072.50	....	310.00	0.00	5079.44	....	5079.41	15.79	
11	S(66)	P(68)	None	5083.40	5072.66	....	310.00	0.00	5079.59	....	5079.55	15.79	
12	S(65)	P(67)	None	5083.35	5072.82	....	310.00	0.00	5079.74	....	5079.70	15.79	
13	S(64)	P(66)	None	5083.20	5072.97	....	310.00	0.00	5079.89	....	5079.85	15.79	
14	S(63)	P(65)	None	5083.00	5073.13	....	310.00	0.00	5080.05	....	5080.01	15.79	
15	S(62)	P(64)	None	5082.75	5073.29	....	310.00	0.00	5080.21	....	5080.16	15.79	
16	S(61)	P(63)	None	5082.80	5073.44	....	310.00	0.00	5080.35	....	5080.32	15.79	
17	S(60)	P(62)	None	5083.00	5073.60	....	310.00	0.00	5080.51	....	5080.46	15.79	
18	S(59)	P(61)	MH	5083.43	5075.72	Half	310.00	22.00	5082.81	0.12	5082.04	15.79	
19	S(58)	P(60)	MH	5097.98	5090.24	Impr	288.00	0.00	5094.61	0.00	5094.61	18.26	
20	S(57)	P(59)	None	5097.98	5091.74	....	288.00	4.00	5097.95	....	5097.95	18.11	
21	S(56)	P(58)	None	5100.67	5093.71	....	284.00	0.00	5099.64	....	5099.64	17.86	
22	S(55)	P(57)	MH	5111.65	5103.20	Impr	284.00	0.00	5107.57	0.00	5107.57	18.01	
23	S(54)	P(56)	None	5113.92	5104.92	....	284.00	5.00	5110.81	....	5110.81	17.86	
24	S(53)	P(55)	MH	5125.62	5117.04	Impr	279.00	0.00	5121.40	0.00	5121.40	17.72	

Notes: r = rectangular e = elliptical a = arch

Project File: 20260033Proposed Entire SD Model.sws

Structure Report

Project Name: 20260033Entire System

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Benching	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)	
25	S(52)	P(54)	None	5127.91	5119.01	....	279.00	5.00	5124.34	....	5124.34	17.54	
26	S(51)	P(53)	None	5139.39	5130.04	....	274.00	0.00	5134.38	....	5134.38	17.42	
27	S(50)	P(52)	None	5139.80	5130.38	....	274.00	0.00	5134.72	....	5134.72	17.42	
28	S(49)	P(51)	None	5140.23	5130.72	....	274.00	0.00	5135.06	....	5135.06	17.42	
29	S(48)	P(50)	None	5141.06	5131.07	....	274.00	0.00	5135.41	....	5135.41	17.42	
30	S(47)	P(49)	None	5142.07	5131.41	....	274.00	0.00	5135.75	....	5135.75	17.42	
31	S(46)	P(48)	MH	5143.04	5132.17	Impr	274.00	0.00	5136.51	0.00	5136.51	17.42	
32	S(45)	P(47)	None	5143.30	5132.79	....	274.00	69.00	5138.66	....	5138.66	17.23	
33	S(44)	P(46)	MH	5148.53	5137.66	Half	205.00	0.00	5141.73	0.00	5141.73	13.54	
34	S(43)	P(45)	MH	5149.44	5138.96	Half	205.00	205.00	5143.66	0.09	5143.04	13.53	
35	S(79)	P(84)	MH	5079.75	5068.80	Half	211.00	0.00	5072.91	0.00	5072.91	13.85	
36	S(78)	P(82)	MH	5081.54	5070.80	Half	211.00	211.00	5077.07	0.08	5076.52	13.27	
37	S(81)	P(86)	MH	5062.00	5047.50	Half	63.00	0.00	5055.96	0.99	5055.45	12.83	
38	S(82)	P(85) (1)	None	5062.00	5048.10	....	63.00	0.00	5056.26	....	5056.25	20.05	
39	Existing Inlet	P(85)	None	5079.00	5076.50	....	63.00	63.00	5078.49	....	5078.49	20.06	

Notes:

Project File: 20260033Proposed Entire SD Model.sws

APPENDIX F – DIGITAL FILES (ATTACHED AS SEPARATE FILES)

1. HEC-RAS Model

- Existing Conditions Model (Plan: Existing_100-YR)
- Proposed Conditions Model (Plan: Proposed_100-YR)

2. Stormwater Studio Model

- Existing Conditions Model (20260033_Existing SD with Adjustments)
- Proposed Conditions Model (20260033_Proposed Entire SD Model)

EXHIBIT 1 – EFFECTIVE FIRM PANELS



FLOOD HAZARD INFORMATION

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
		Area with Flood Risk due to Levee Zone D
		Area of Minimal Flood Hazard Zone X
OTHER AREAS		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-636-6820.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAD, dated April 11, 2016.

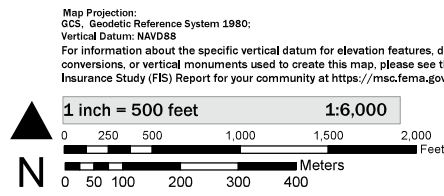
This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/22/2025 4:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure. The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area, after being converted from NGVD 29 to NAVD 88.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit <http://www.fema.gov/national-flood-insurance-program>.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM

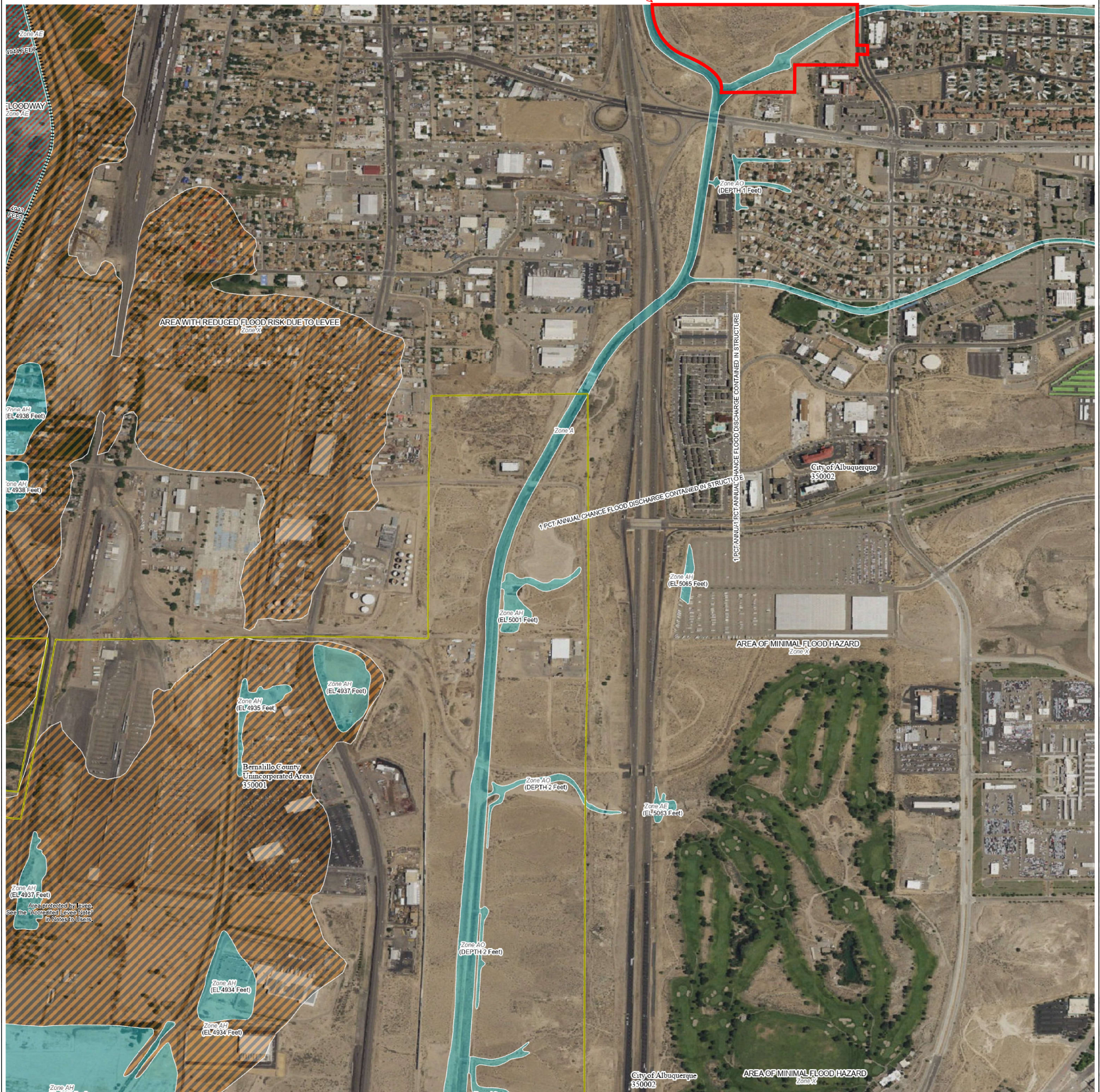
FLOOD INSURANCE RATE MAP
PANEL 334 OF 750



Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF ALBUQUERQUE	350002	0334

PROJECT AREA



FLOOD HAZARD INFORMATION

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
		Area with Flood Risk due to Levee Zone D
		Area of Minimal Flood Hazard Zone X
OTHER AREAS		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-636-6820.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAP, dated April 11, 2016.

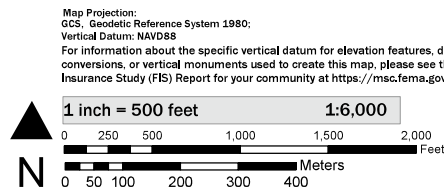
This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 02/22/2025 4:53 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure. The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area, after being converted from NGVD 29 to NAVD 88.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit <http://www.fema.gov/national-flood-insurance-program>.

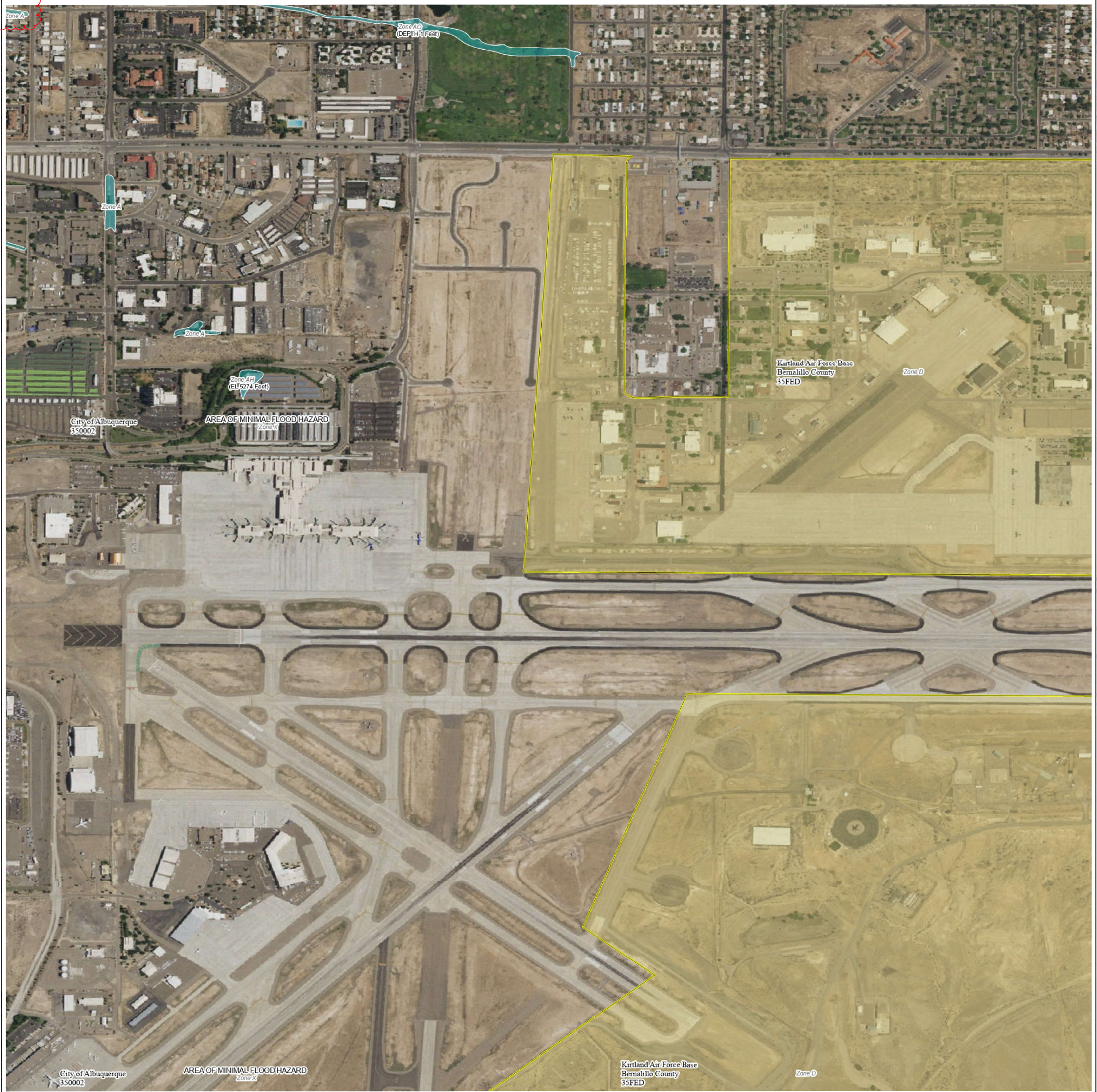
SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL 342 OF 750

Panel Contains:
COMMUNITY NUMBER PANEL
CITY OF ALBUQUERQUE 350001 0342
BERNALILLO COUNTY

Zone A to be removed to reflect previously constructed storm drain (outside current Project Area)



FLOOD HAZARD INFORMATION

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
		Area with Flood Risk due to Levee Zone D
		NO SCREEN Area of Minimal Flood Hazard Zone X
OTHER AREAS		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

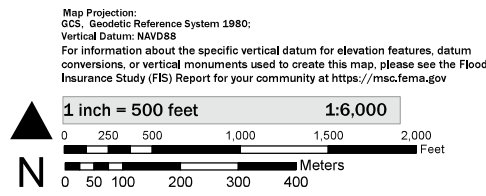
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-636-6820.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAD, dated April 11, 2015.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/22/2025 4:56 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP
PANEL 361 OF 750



Panel Contains:
COMMUNITY CITY OF ALBUQUERQUE KIRTLAND AIR FORCE BASE
NUMBER 35002 35FED
PANEL 0361

EXHIBIT 2 – ANNOTATED FIRM PANELS



106°37'29.61\"/>

FLOOD HAZARD INFORMATION
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, X, AH9 With EPE or Depth Zone AE, AO, AH, VE, AH Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot, or with drainage areas of less than one square mile Zone X Future Conditions 2% Annual Chance Flood Hazard Zone D Area with Reduced Flood Risk due to Levee See Notes Zone X Area with Flood Risk due to Levee Zone D
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone I Effective LOMR Area of Undetermined Flood Hazard Zone C
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall 20.2 Cross Sections with 1% Annual Chance

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-336-2427) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Communities assessing land on adjacent FIRM panels must obtain a current copy of the adjacent panel, as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-428-6332.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAD83, dated April 11, 2018.

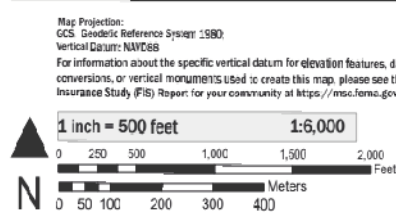
This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 9/22/2025 4:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview, Fact Sheet at <https://www.fema.gov/media-library/assets/documents/158418>.

This map complies with FEMA's standards for the use of digital flood maps. It is not valid as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map is not valid if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, north arrow, date, community identifiers, FIRM panel number, and FIRM effective date.

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure. The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area after being converted from NGVD 29 to NAVD 83.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plans on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in physical risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit <https://www.fema.gov/national-flood-insurance-program>.

SCALE



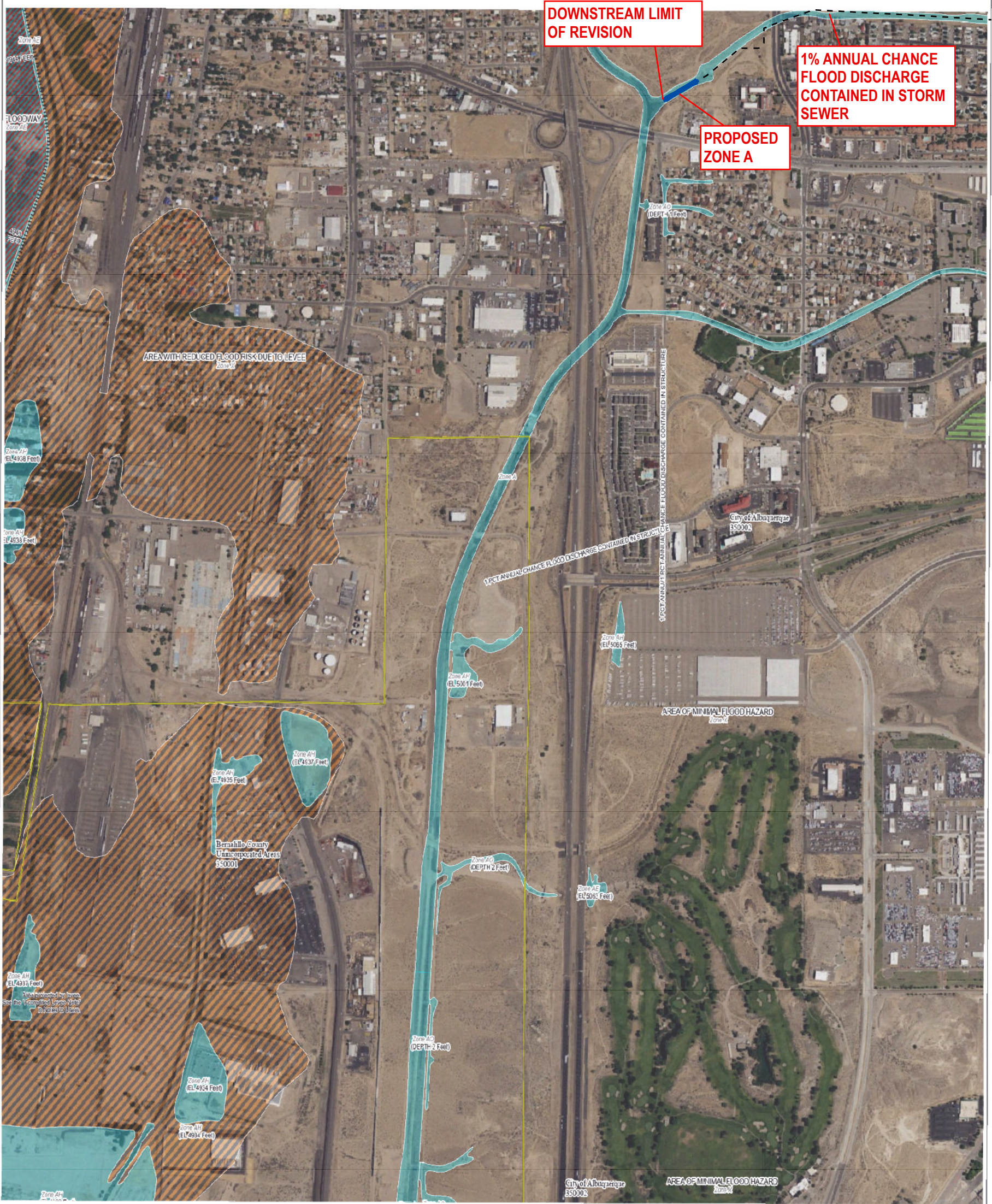
FEDERAL EMERGENCY MANAGEMENT AGENCY
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL 334 OF 750

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF ALBUQUERQUE	350002	0334

EXHIBIT 2
ANNOTATED FIRM
Panel 1 of 3



FLOOD HAZARD INFORMATION

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

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, X, A99
	With BFE or Depth Zone AE, AD, AH, VE, AP
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes Zone X
	Area with Flood Risk due to Levee Zone D
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOMRs
GENERAL STRUCTURES	Area of Undetermined Flood Hazard Zone D
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities owning land or adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-438-6629.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAD 83 dated April 11, 2018.

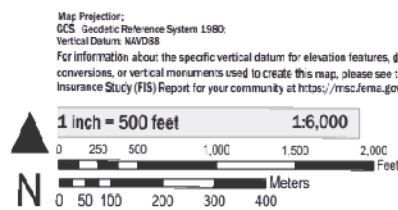
This map was digitized from FEMA's National Flood Hazard Layer (NFHL) on 02/22/2023 4:43 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118410>.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure. The flood hazard data inside this boundary on the FIRM panel has been republished from the previous effective (historic) FIRM for this area, after being converted from NAVD 29 to NAVD 83.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plans on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residential risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other structural measures. For more information on flood insurance, visit www.flood.gov.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
 FLOOD INSURANCE RATE MAP
 PANEL 342 of 750

Panel Contains:

COMMUNITY	35002	0342
CITY OF ALBUQUERQUE	350001	0342
BERNILLO COUNTY		

EXHIBIT 2
ANNOTATED FIRM
Panel 2 of 3

1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN STORM SEWER

UPSTREAM LIMIT OF REVISION



106°35'37.11"W 35°1'45.95"N

FLOOD HAZARD INFORMATION
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without: Base Flood Elevation (BFE) Zone A, X, AD9
	With BFE or Depth Zone AE, AD, AH, VE, AR
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes Zone X
	Area with Flood Risk due to Levee Zone C
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOMRs
OTHER AREAS	Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
	17.5 Coastal Transect
	Coastal Transect Base Line
	Profile Baseline
	Hydrographic Features
	Base Flood Elevation Line (BFE)

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report and/or digital versions of this map. Many of these products can be created or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

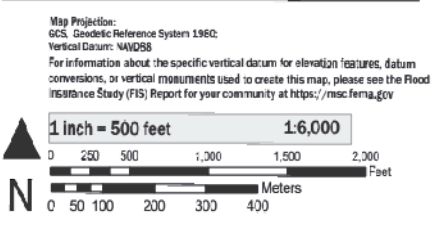
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-438-6620.

Basemap information shown on the FIRM was provided in digital format by USDA Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 8/22/2024 4:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/nfhl/assets/documents/118418>.

This map complies with FEMA's standards for the use of digital flood maps (FIRM). It is not to be used as described below. The basemap shown complies with FEMA's horizontal accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, trap creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL 361 of 750



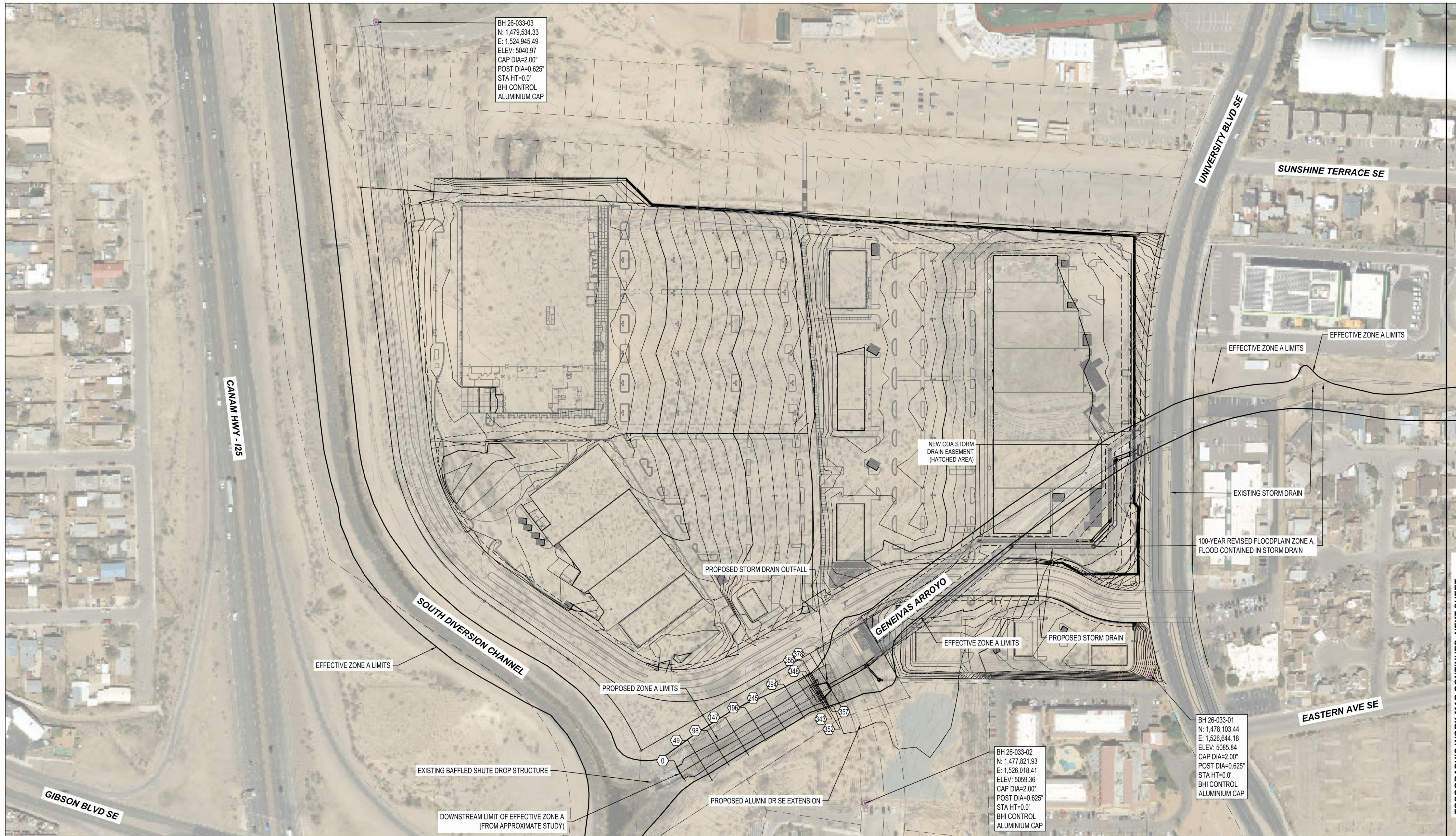
Panel Contains:
COMMUNITY
CITY OF ALBUQUERQUE
KIRTLAND AIR FORCE BASE

NUMBER
350002
35FED

PANEL
0361
0361

EXHIBIT 2
ANNOTATED FIRM
Panel 3 of 3

EXHIBIT 3 – CERTIFIED TOPOGRAPHIC WORK MAPS



BH 26-033-03
 N: 1,479,534.33
 E: 1,524,945.49
 ELEV: 5040.97
 CAP DIA=2.00"
 POST DIA=0.625"
 STA HT=0.0'
 BHI CONTROL
 ALUMINIUM CAP

NEW COA STORM
 DRAIN EASEMENT
 (HATCHED AREA)

PROPOSED STORM DRAIN OUTFALL

GENEIVAS ARROYO

EFFECTIVE ZONE A LIMITS

PROPOSED STORM DRAIN

EFFECTIVE ZONE A LIMITS

EFFECTIVE ZONE A LIMITS

EXISTING STORM DRAIN

100-YEAR REVISED FLOODPLAIN ZONE A,
 FLOOD CONTAINED IN STORM DRAIN

BH 26-033-01
 N: 1,478,103.44
 E: 1,526,644.18
 ELEV: 5085.84
 CAP DIA=2.00"
 POST DIA=0.625"
 STA HT=0.0'
 BHI CONTROL
 ALUMINIUM CAP

BH 26-033-02
 N: 1,477,821.93
 E: 1,526,018.41
 ELEV: 5059.36
 CAP DIA=2.00"
 POST DIA=0.625"
 STA HT=0.0'
 BHI CONTROL
 ALUMINIUM CAP

EXISTING BAFFLED SHUTE DROP STRUCTURE

PROPOSED ZONE A LIMITS

DOWNSTREAM LIMIT OF EFFECTIVE ZONE A
 (FROM APPROXIMATE STUDY)

PROPOSED ALUMNI DR SE EXTENSION

EASTERN AVE SE

CANAM HWY - 125

SOUTH DIVERSION CHANNEL

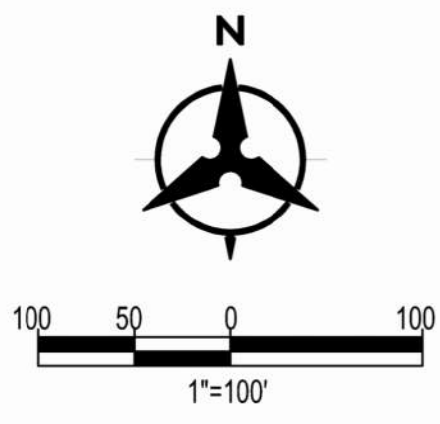
GIBSON BLVD SE

NOTES

1. VERTICAL DATUM: NAVD88
2. EFFECTIVE FLOODPLAIN LIMITS ARE SHOWN PER FIRM 35001C0342G, EFFECTIVE 9/26/2008, FIRM 35001C0334G, EFFECTIVE 9/26/2008, & FIRM 35001C0361G, EFFECTIVE 9/26/2008.
3. TOPOGRAPHY DATA ALONG THE GENEIVAS ARROYO IS FROM A FIELD SURVEY BY BOHANNAN HUSTON INC CONDUCTED IN SEPTEMBER 2025.
4. PARCEL AND EASEMENT INFORMATION IS PER SURVEY DATED 11/13/2025, PROVIDED BY BHI INC.
5. AERIAL IMAGERY IS FROM ESRI, DATED 12/30/2025.

LEGEND:

- HEC-RAS STREAMLINE / CENTERLINE
- HEC-RAS CROSS-SECTION
- EXISTING CONTOUR (1-FT) - INDEX
- EXISTING CONTOUR (1-FT) - INTERMEDIATE
- EFFECTIVE FEMA ZONE A SFHA
- PROPOSED FEMA ZONE A SFHA
- PARCEL LINES
- APPROXIMATE EASEMENT LINES
- SURVEY MONUMENT



**TOPOGRAPHIC WORK MAP
 CLOMR
 UNM SOUTH COMMERCIAL**

DRAWN BY:	HAJ	DATE:	1/9/26
CHECKED BY:	VCS	BHI PROJECT NO.	20260033
		SHEET NO.	1 OF 2



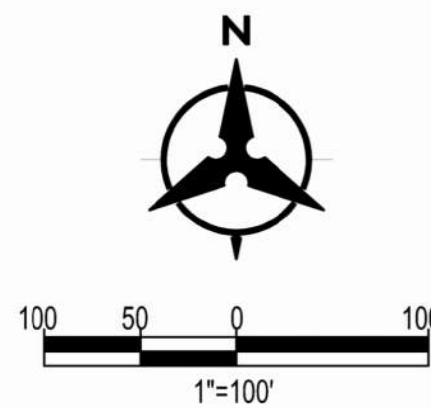
TOPOGRAPHIC WORK MAP CONTINUES, PREVIOUS SHEET

NOTES

1. VERTICAL DATUM: NAVD88
2. EFFECTIVE FLOODPLAIN LIMITS ARE SHOWN PER FIRM 35001C0342G, EFFECTIVE 9/26/2008, FIRM 35001C0334G, EFFECTIVE 9/26/2008, & FIRM 35001C0361G, EFFECTIVE 9/26/2008.
3. TOPOGRAPHY DATA ALONG THE GENEIVAS ARROYO IS FROM A FIELD SURVEY BY BOHANNAN HUSTON INC CONDUCTED IN SEPTEMBER 2025.
4. PARCEL AND EASEMENT INFORMATION IS PER SURVEY DATED 11/13/2025, PROVIDED BY BHI INC.
5. AERIAL IMAGERY IS FROM ESRI, DATED 12/30/2025.

LEGEND:

- HEC-RAS STREAMLINE / CENTERLINE
- HEC-RAS CROSS-SECTION
- EXISTING CONTOUR (1-FT) - INDEX
- EXISTING CONTOUR (1-FT) - INTERMEDIATE
- EFFECTIVE FEMA ZONE A SFHA
- PROPOSED FEMA ZONE A SFHA
- PARCEL LINES
- APPROXIMATE EASEMENT LINES
- SURVEY MONUMENT



**TOPOGRAPHIC WORK MAP
CLOMR
UNM SOUTH COMMERCIAL**

DRAWN BY:	HAJ	DATE:	1/9/26
CHECKED BY:	VCS	BHI PROJECT NO.:	20260033
		SHEET NO.:	2 OF 2

File: 9-Jan-2026 - 12:03pm Plotted by: HJOHNSON
P:\20260033\SW\Reports\Preliminary & Draft\Exhibits\Exhibit_3_22x34.dwg