

NOTICE OF OPEN MEETING OF THE SAN ANTONIO REGIONAL FLOOD PLANNING GROUP
TECHNICAL SUBCOMMITTEE

Region 12

04/11/2023

1:30 PM

TAKE NOTICE that a meeting of the Technical Subcommittee of the San Antonio Regional Flood Planning Group as established by the Texas Water Development Board will be held on Tuesday, April 11, 2023, at 1:30 PM, in-person at the San Antonio River Authority, located at 100 E. Guenther St and virtually at <https://meet.goto.com/350390309>.

Agenda:

1. (1:30 PM) Roll-Call
2. Public Comments – limit 3 minutes per person
3. Review Progress on Task 12
4. Public Comments – limit 3 minutes per person
5. Date and Potential Agenda Items for Next Meeting
6. Adjourn

If you wish to provide written comments prior to or after the meeting, please email your comments to khayes@sariverauthority.org or physically mail them to the attention of Kendall Hayes at San Antonio River Authority, 100 E. Guenther, San Antonio, TX, 78204 and include “Region 12 San Antonio Flood Planning Group Meeting” in the subject line of the email.

Additional information may be obtained from: Kendall Hayes, (210) 302-3641, khayes@sariverauthority.org, San Antonio River Authority, 100 E. Guenther, San Antonio, TX 78204.

PROPOSED FMPs



2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Wilson 10 - Acquisitions of Flooded Structures
FMP ID: 12XXXXXX
Project Sponsor: Wilson County
Project Source: 2012 Karnes and Wilson County Hazard Mitigation Action Plan

Cost Information

Category	Cost*
Coordination/Documents	\$112,000
Real Estate	\$560,000
Environmental	-
Construction	-
Total Cost**	\$672,000

*Costs are using 2020 prices

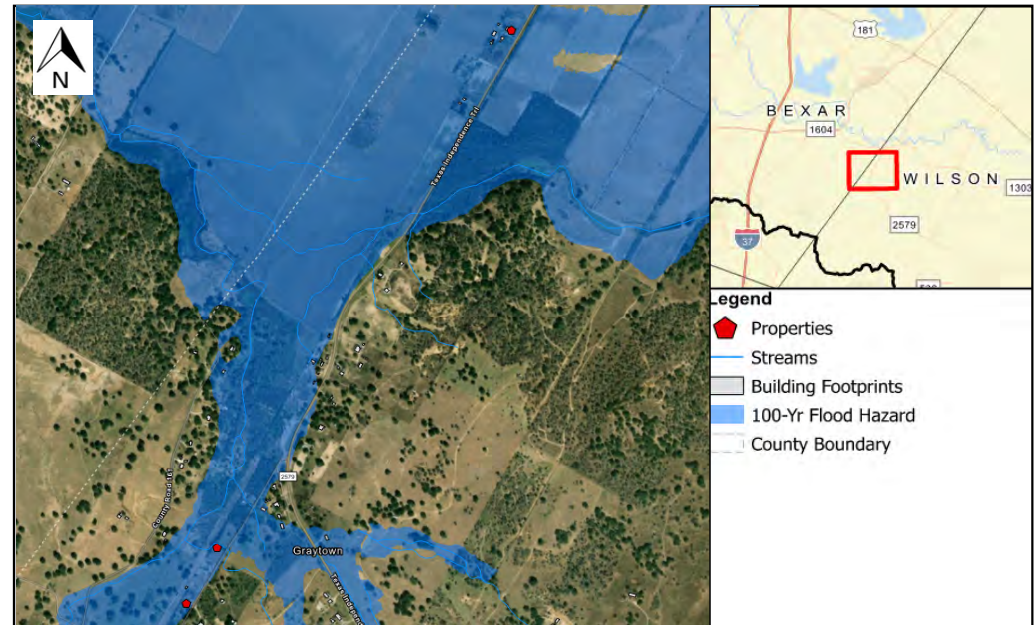
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	\$ 969,900	-
Total Benefits	\$ 969,900	
BCA	1.4	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	3
Commercial	-	-	-
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-	-	-



Project Description:

This project proposes to acquire the properties that are repeatedly flooded and remove the structures from the existing conditions floodplain extents through demolition or relocation. Properties that will be purchased are the following:

- Mobile Home - 246 CR 126, Floresville, TX 78114; PID#13127
- Single Family Home - 8185 FM 2579, Floresville, TX 78114; PID#13165
- Mobile Home - 366 CR 126, Floresville, TX 78114; PID#13119

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Wilson 10 - Acquisitions of Flooded Structures
FMP ID: 12XXXXXX
Project Sponsor: Wilson County
Date: 4/7/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Wilson 10 - Acquisitions of Flooded Structures, FME ID 121000126, from the 2012 Karnes and Wilson County Hazard Mitigation Action Plan was further developed during Task 12. This project is sponsored by Wilson County.

The problem area is located in Wilson County, near the Trib 348 to Lower San Antonio River. There are three structures that are repeatedly flooded in the 100-year flood event.

The Task 12 work that was completed for the Wilson 10 - Acquisitions of Flooded Structures project was a cost estimate and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

This project proposes to acquire the properties that are repeatedly flooded and remove the structures from the existing conditions floodplain extents through demolition or relocation. Properties that will be purchased are the following:

- Mobile Home - 246 CR 126, Floresville, TX 78114; PID#13127
- Single Family Home - 8185 FM 2579, Floresville, TX 78114; PID#13165
- Mobile Home - 366 CR 126, Floresville, TX 78114; PID#13119

The County records show that there are repeated impacts to each structure. PID#13127 is a mobile home that was washed off the cinder blocks in the June of 2010 flood and is vacant. PID#13165 is a single family home that has flooded repeatedly, the family has moved into a mobile home on the same property. PID#13119 is a mobile home that was significantly damaged in the June of 2010 flood and is vacant.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated project cost for the Wilson 10 - Acquisitions of Flooded Structures project is \$672,000, as calculated using 2020 market value prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project includes property acquisition for three structures within the existing conditions floodplain and will remove structures from the floodplain through demolition or relocation. Based on the FEMA memorandum with subject titled "Update to 'Cost-Effectiveness Determinations for Acquisitions and Elevations in Special Flood Hazard Areas Using Pre-Calculated Benefits'", HDR used the pre-calculated benefits listed in the memorandum to calculate the BCA. For an acquisition, the pre-calculated benefit value is \$323,000 per structure. The total benefits from the Wilson 10 - Acquisitions of Flooded Structures project is \$969,900 resulting in a BCA of 1.4.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Wilson 10 - Acquisitions of Flooded Structures
FMP ID: 12XXXXXX
Project Sponsor: Wilson County
Date: 4/7/2023

IMPACT ANALYSIS

There are no impacts from the acquisition of these three structures.

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No, there are no utility conflicts.

Permitting/Environmental:

Yes, there could be environmental conflicts that arise once the property is further evaluated.

Stakeholder coordination:

Due to the land acquisition and possible resident relocation, there will be various stakeholders involved in the process.

MITIGATION OF RISKS

Permitting/Environmental:

If environmental conflicts do arise, coordination with the correct agency should be started early on to avoid schedule delays. The cost of these potential environmental mitigation conflicts is included in the contingency cost.

Stakeholder Coordination:

The homeowners/businesses on and around the affected properties should be notified several weeks before the demolition start date. Public meetings and flyers will help communicate the impacts to affected businesses of any service interruption or inconvenience. To ensure timely completion of the proposed demolition, there will need to be coordination with utility companies to disconnect utility connections.

NATURE BASED SOLUTION (NBS) CONSIDERATION

The proposed project would remove the homes on each property which will reduce impervious cover and improve the infiltration on the properties.

INTERRELATED PROJECTS

There are no interrelated projects associated with the Wilson 10 - Acquisitions of Flooded Structures project.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

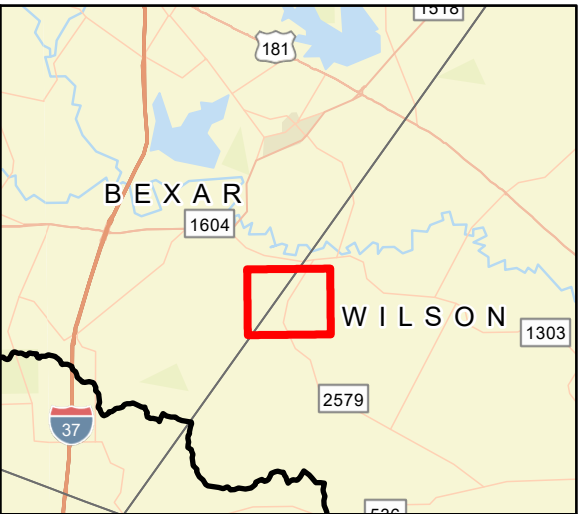
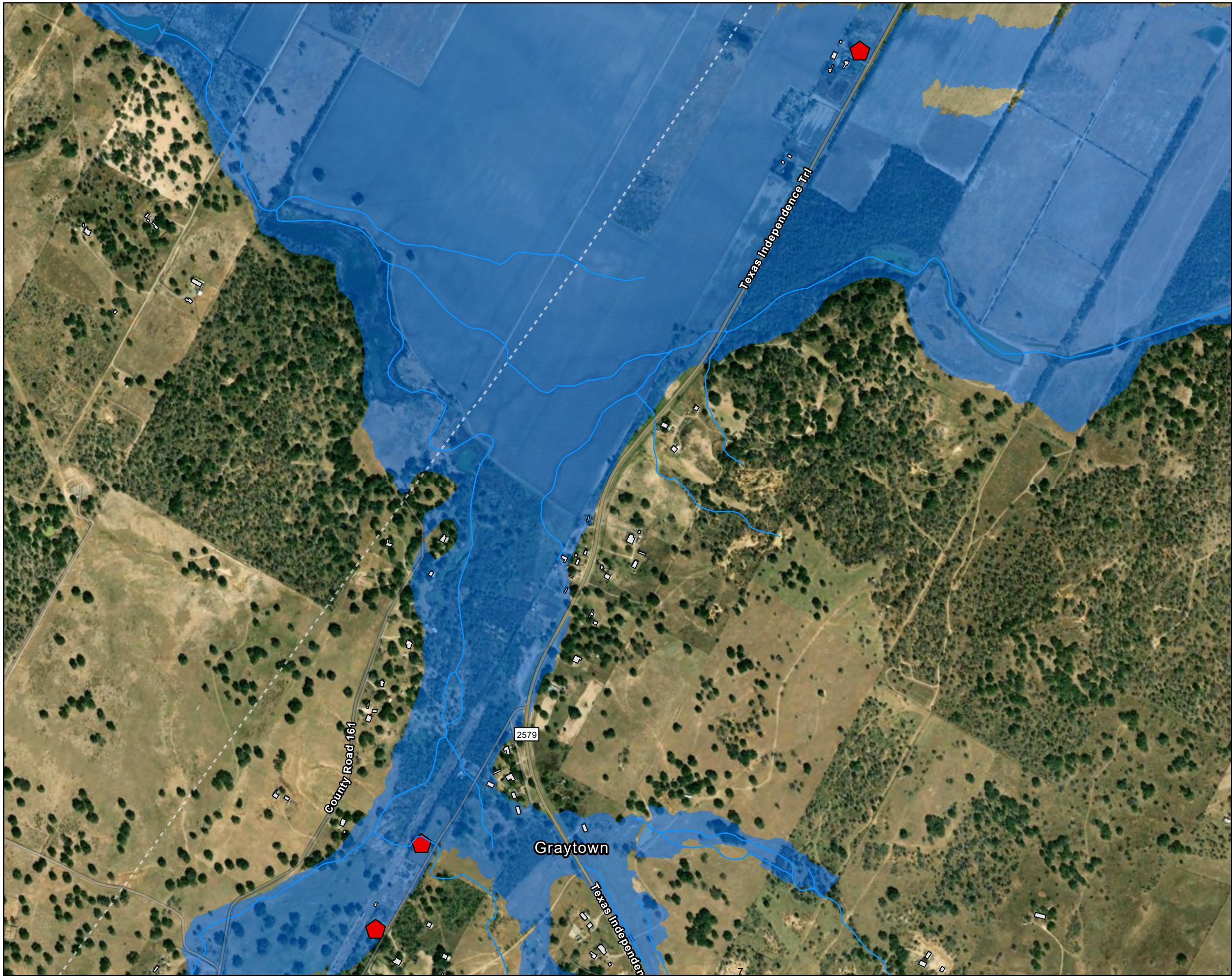
Project Name:	Wilson 10 - Acquisitions of Flooded Structures
Project Sponsor:	Wilson County
Firm Developing:	HDR
Date Developed:	4/7/2023
Unit Prices Used:	11/1/2020

ACQUISITION COSTS

- PID#13127 (Property + Demolition)	\$56,000.00
- PID#13165 (Property)	\$318,000.00
- PID#13165 (Relocation)	\$100,000.00
- PID#13119 (Property + Demolition)	\$86,000.00

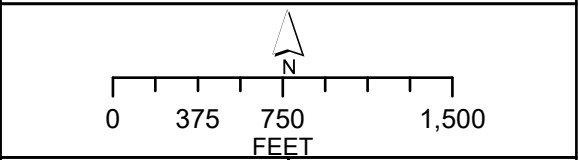
REAL ESTATE COORDINATION AND DOCUMENT DEVELOPMENT (20%)	\$112,000.00
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TOTAL COST ESTIMATE	\$672,000.00
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- Legend**
- Properties
 - Streams
 - Building Footprints
 - 100-Yr Flood Hazard
 - County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN
WILSON 10 -
ACQUISITIONS OF FLOODED STRUCTURES
EXISTING CONDITIONS



APRIL 2023



2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Bexar Bowling Way at Cibolo Creek Bridge

FMP ID: 12XXXXXX

Project Sponsor: Bexar County (near Guadalupe County line)

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	\$1,711,296
Real Estate	\$0
Environmental	\$30,000
Construction	\$11,510,150
Total Cost**	\$13,252,000

*Costs are using 2020 prices

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

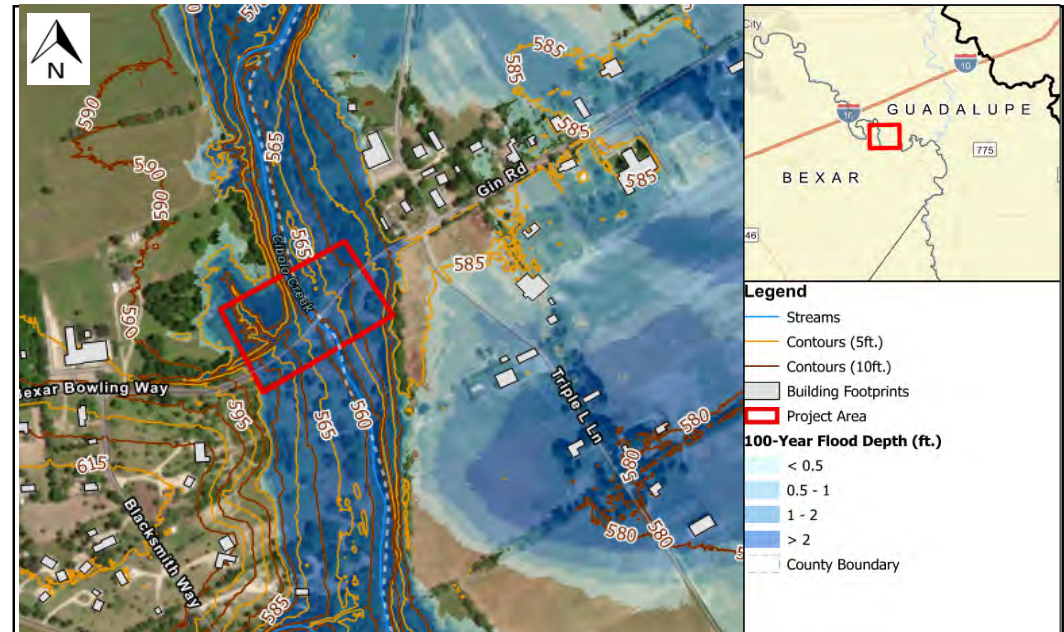
Event Damages	Baseline	Project
10-year storm	\$ 34,370	\$ -
25-year storm	\$ 51,554	\$ -
100-year storm	\$ 68,739	\$ -
Total Benefits	\$ 64,266	
BCA	\$ 0.01	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Critical	-	-	-
Flooded Road(miles)	0.25	0.25	0.25
Others Note	N/A	N/A	N/A
SVI Score	-		

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	22ft
Proposed	100-Yr	0



Project Description:

This project will eliminate overtopping of Bexar Bowling Way and provide conveyance for the 100-year storm event, removing the crossing from the existing conditions 100-year floodplain. Proposed improvements consist of removing the existing culvert and adding a bridge. The existing eight 27" corrugated metal pipes will be replaced with an 800ft bridge with a 25ft high opening. Cibolo Creek is a stream on an inventory that will require a mussel survey based on requirements by TPWD, an additional cost was added to account for this.

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Bexar Bowling Way at Cibolo Creek Bridge
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Bexar Bowling Way at Cibolo Creek Bridge, FME ID 121000163, from the 2022 Bexar County Line LWC Engineering Study was further developed during Task 12. This project is sponsored by Bexar County.

The problem area is located in Bexar County, close to the border with Guadalupe County. Bexar Bowling Way becomes Gin Road north of the Cibolo Creek crossing. Currently there is a low water crossing (LWC) at Bexar Bowling Way composed of eight 27” corrugated metal pipes. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. Floodwater overtopping the structure endanger residents attempting to cross and cuts off a main connection route for several businesses, a church, and residential homes.

The Task 12 work that was completed for the Bexar Bowling Way at Cibolo Creek Bridge project was a drainage analysis, cost estimate, impact analysis and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on the drainage analysis and conceptual design.

This project will eliminate overtopping of Bexar Bowling Way and provide conveyance for the 100-year storm event, removing the crossing from the existing conditions 100-year floodplain. Proposed improvements consist of removing the existing culvert and adding a bridge. The existing eight 27” corrugated metal pipes will be replaced with an 800ft bridge with a 25ft high opening. Note that further north of the crossing, Gin Road is still overtopping due to a spill coming from Cibolo Creek 2,250ft upstream of the crossing. It is recommended to have a study further evaluate this spill.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated the project cost for the Bexar Bowling Way at Cibolo Creek Bridge is \$13,252,000, as calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Bexar Bowling Way at Cibolo Creek Bridge
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Bexar Bowling Way and improve the level of service by providing a 100-year conveyance design.

Refer to the Amended Flood Plan Technical Memo for documented BCA assumptions and methodologies.

The 10-, 25-, 100-year benefits that were evaluated for this project include LWC improvements. The resulting benefit cost analysis was 0.01. The Table 1 below summarizes the components calculated in the TWDB BCA Tool. Costs may differ from previously reported cost because they are adjusted to the year of construction, assumed 2025-2026.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life		30
Event Damages	Baseline	Project
10 - year storm	\$34,370	\$0
25 - year storm	\$51,554	\$0
100 - year storm	\$68,739	\$0
Total Benefits from BCA Toolkit	\$64,266	
Other Benefits (Not Recreation)	\$0	
Recreation Benefits	-	
Total Costs	\$11,196,195	
	-	
Net Benefits	\$11,131,929	
	-	
Net Benefits with Recreation	\$11,131,929	
Final BCR	0.01	
Final BCR with Recreation	0.01	

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Bexar Bowling Way at Cibolo Creek Bridge
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies the impact analysis.

Existing and proposed conditions were analyzed for impact. The impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSE and velocities were compared in the HEC-RAS v5.0.5 model, see attached digital submittal for HEC-RAS Existing vs Proposed Results Comparison Summary. The proposed conditions showed reduced levels with both components. From the RAS results, the total inundated boundary was reduced in proposed conditions. See Exhibits 1-3 for existing, proposed, and a comparison of both boundaries. Flooded depths over the road were evaluated in the BCA. Reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	22 ft
Proposed	100-Yr	0 ft

(See full list of LWC impacts in the attached BCA results)

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required for this project.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

Yes, Cibolo Creek is a stream that will require a mussel survey based on requirements by TPWD. An additional cost of \$20,000 was added to the preliminary environmental assessment to account for the mussel survey.

Stakeholder Coordination:

Due to the road improvements, surrounding community, and adjoining counties there will be various stakeholders involved in the process.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Bexar Bowling Way at Cibolo Creek Bridge
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Permitting/Environmental:

If permits do arise during the design, coordination and permitting process should be started early on to avoid schedule delays.

Stakeholder Coordination:

Bexar Bowling Way is the main connection route for several businesses, a church, and residential homes. Road reconstruction will cause traffic disruptions and inconveniences for local residents due to limited alternative access points. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION (NBS) CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the culvert bottom to allow for aquatic organism passage.

Landscaping cost (3% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

INTERRELATED PROJECTS

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek. The spill starts 2,500ft upstream of the Bexar Bowling Way Crossing to 2,000ft north of Ullrich Road Crossing.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY	
Project Name:	Bexar Bowling Way at Cibolo Creek Bridge
Project Sponsor:	Bexar County (near Guadalupe County line)
Firm Developing:	HDR
Date Developed:	4/4/2023
Unit Prices Used:	11/1/2020

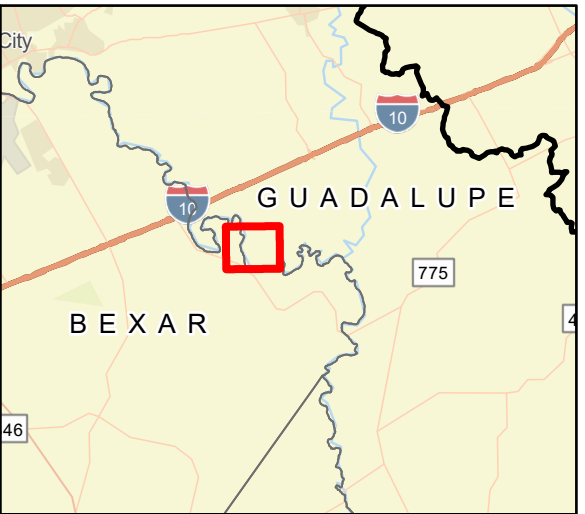
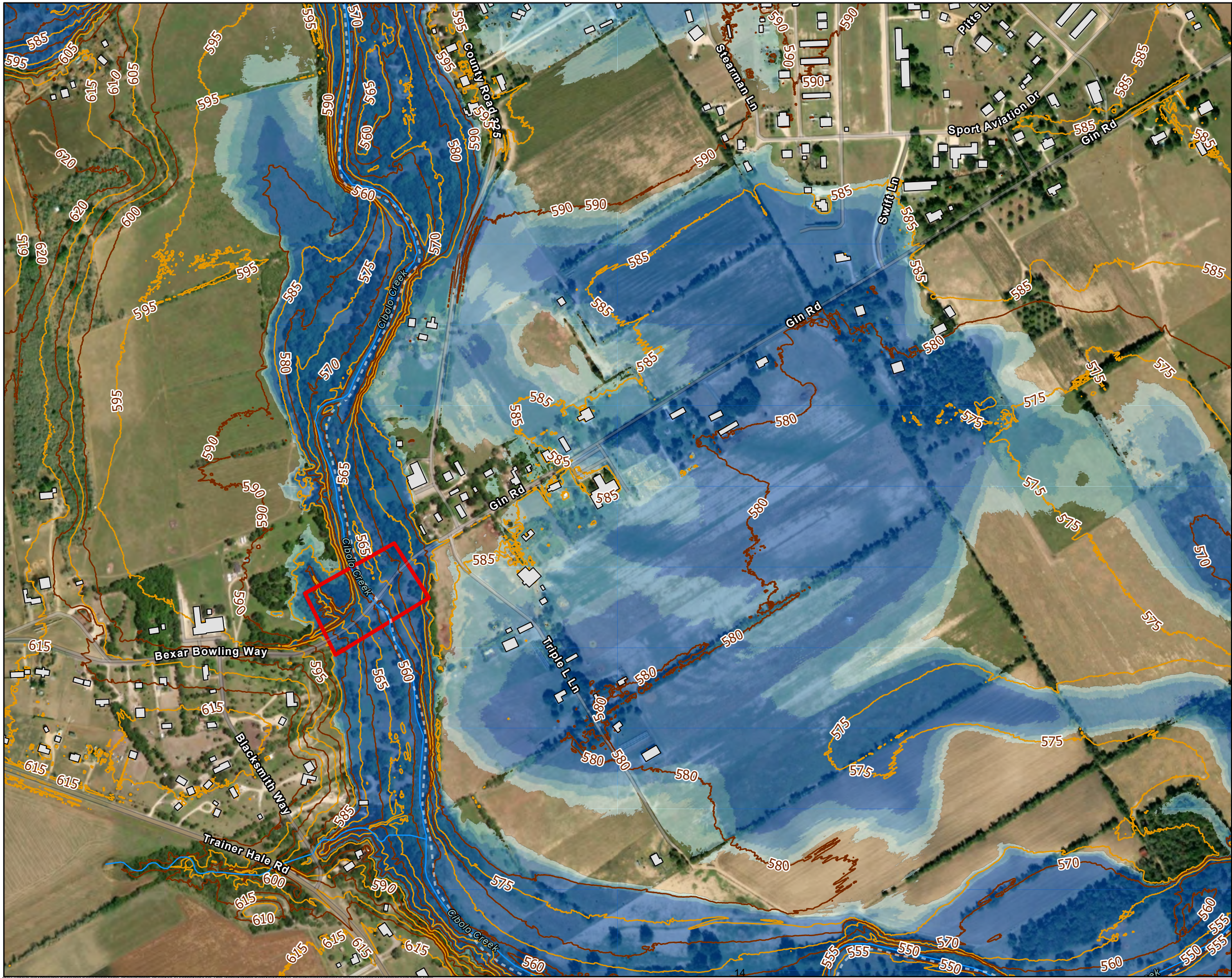
CONSTRUCTION COSTS

- STREET COST	\$8,119,112.15
- TREE PRESERVATION (2%)	\$162,382.24
- LANDSCAPING (3%)	\$243,573.36
- BOND AND INSURANCE (3%)	\$255,752.03
- BARICADES (3%)	\$263,424.59
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$1,278,760.16

TOTAL CONSTRUCTION COST ESTIMATE	\$10,323,004.54
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ENGINEER FEE (Fee Table plus 5%)	\$1,548,450.68
ENGINEER CONTINGENCY (10%)	\$154,845.07
CONSTRUCTION CONTINGENCY (10%)	\$1,032,300.45
PERMIT REQUIREMENT COSTS	\$8,000.00
ENVIRONMENTAL	\$30,000.00
MATERIAL TESTING (2% Construction Cost - <\$3M, 1.5% - >\$3M)	\$154,845.07

TOTAL PROJECT COST ESTIMATE	\$13,251,445.82
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Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Building Footprints
- Project Area

100-Year Flood Depth (ft.)

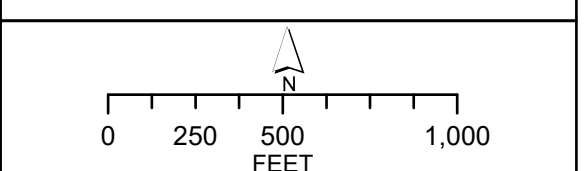
- < 0.5
- 0.5 - 1
- 1 - 2
- > 2

County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

BEXAR BOWLING WAY AT CIBOLO CREEK BRIDGE

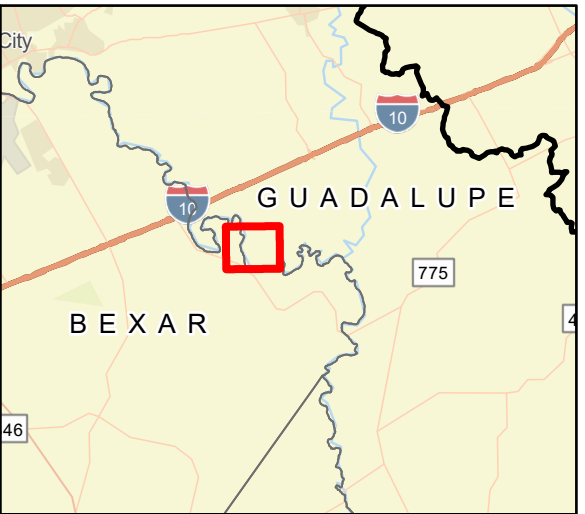
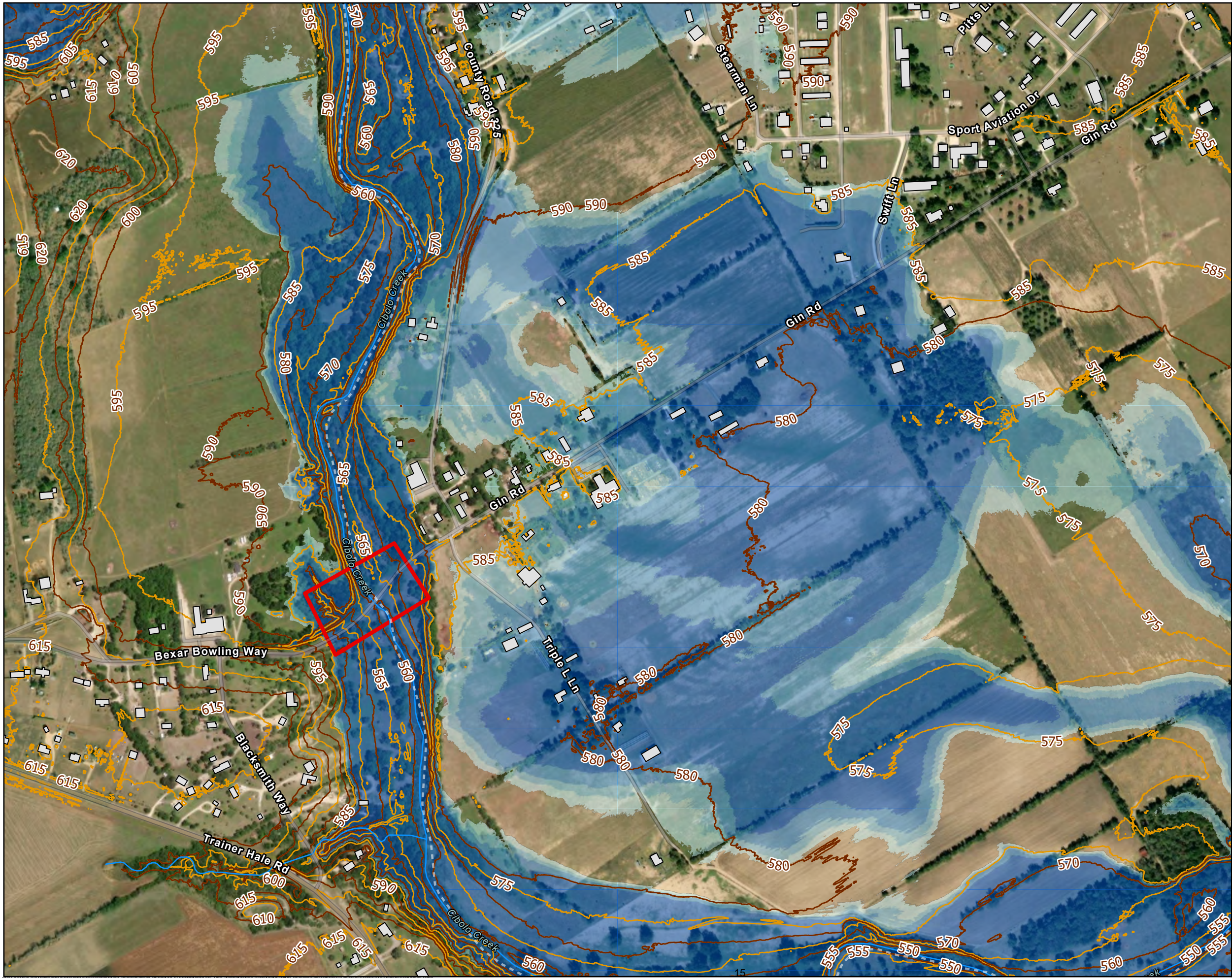
EXISTING CONDITIONS



REGION 12

SDR

APRIL 2023



Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Building Footprints
- Project Area

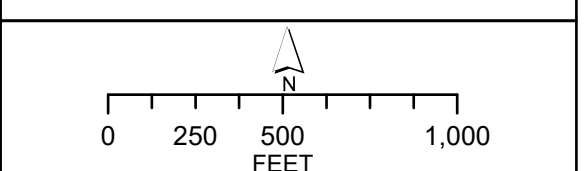
100-Year Flood Depth (ft.)


- < 0.5
- 0.5 - 1
- 1 - 2
- > 2

County Boundary


2023 SAN ANTONIO REGIONAL FLOOD PLAN

BEXAR BOWLING WAY AT
CIBOLO CREEK BRIDGE
PROPOSED CONDITIONS

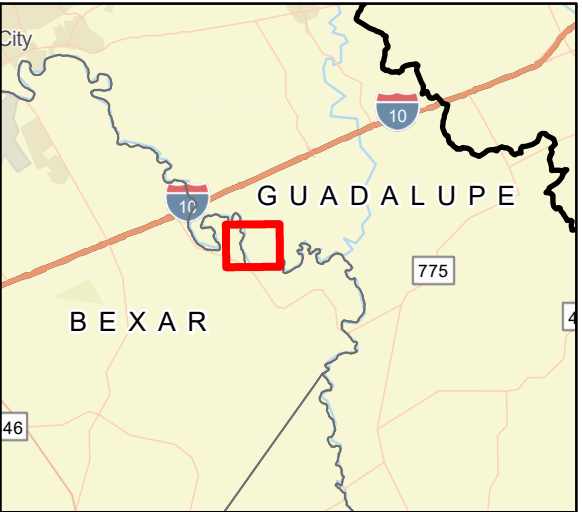
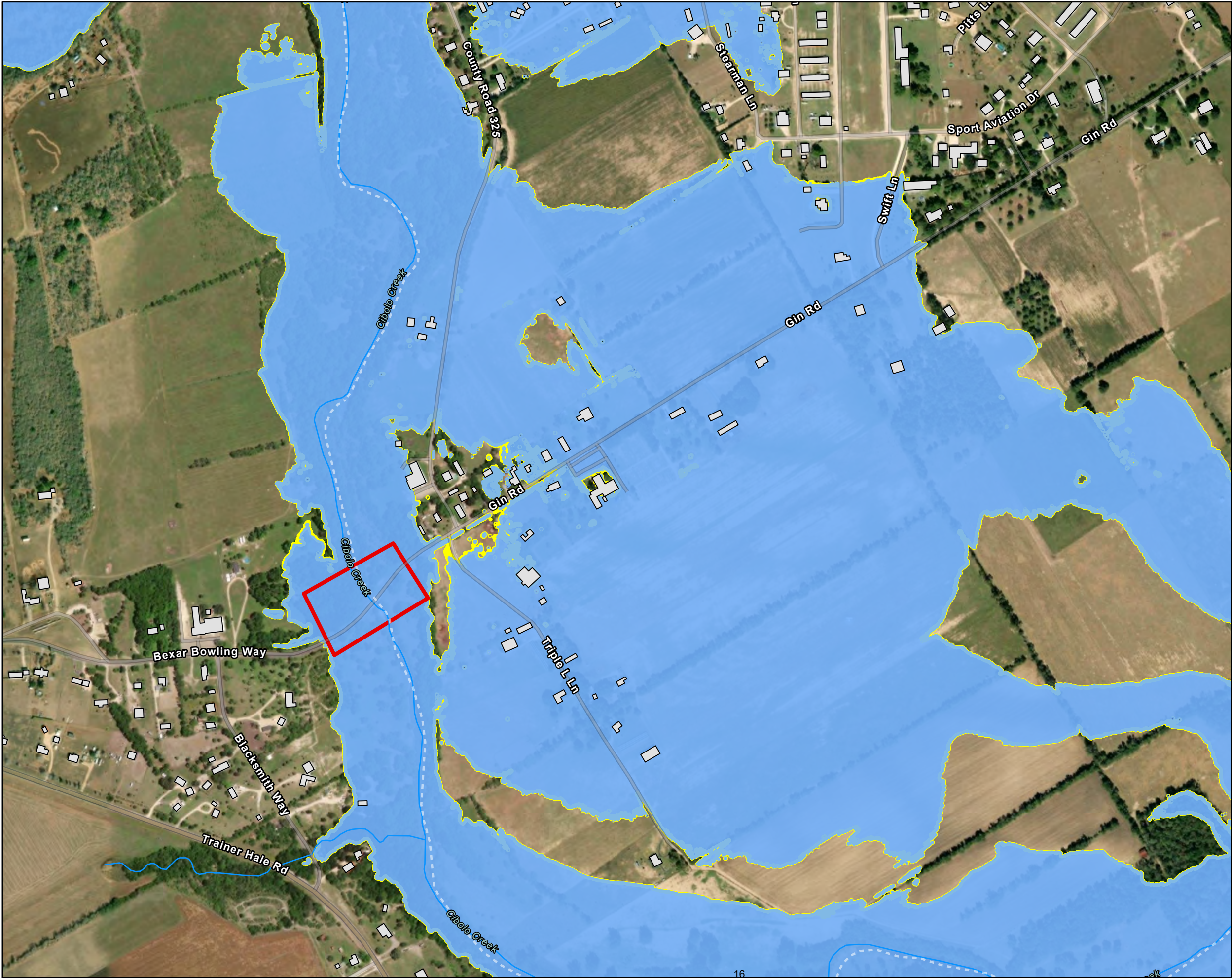




REGION 12



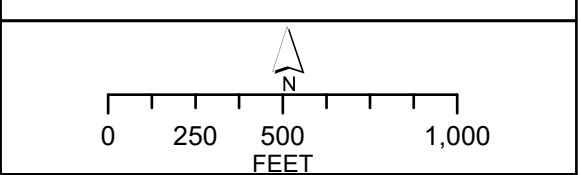
APRIL 2023



Legend

- Streams
- Building Footprints
- Project Area
- 1% Proposed Floodplain
- 1% Existing Floodplain
- County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN
BEXAR BOWLING WAY AT
CIBOLA CREEK BRIDGE
EXISTING AND PROPOSED CONDITIONS





REGION
12



APRIL 2023



2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Ullrich Road at Cibolo Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County (Border of Guadalupe County)

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	\$30,636
Real Estate	\$0
Environmental	\$0
Construction	\$133,199
Total Cost**	\$164,000

*Costs are using 2020 prices

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

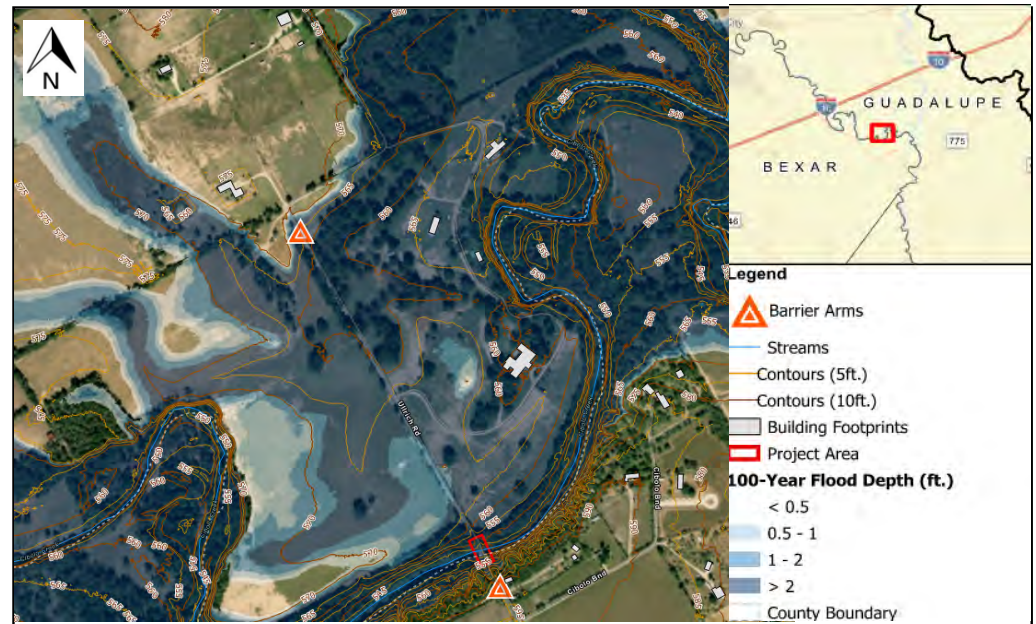
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	-
BCA	-	-

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.4	0.4	0.4
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-		

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	27 ft



Project Description:

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Ullrich Road at Cibolo Creek LWC Improvements, FME ID 121000163, from the 2022 Bexar County Line LWC Engineering Study was further developed during Task 12. The sponsor for this project is Bexar County.

The problem area is located at the intersection of Ullrich Road at Cibolo Creek. Currently there is a low water crossing (LWC) at Ullrich Road, composed of three 30" diameter reinforced concrete pipes. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. Floodwater overtopping the structure endanger residents attempting to cross.

The Task 12 work that was completed for the Ullrich Road at Cibolo Creek LWC Improvements project was a drainage analysis, cost estimate and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on drainage analysis to determine a feasible solution.

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such as upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated project cost for the Ullrich Road at Cibolo Creek LWC Improvements is \$164,000, as calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase the cost depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will reduce the danger incurred from Ullrich Road overtopping by discouraging vehicles from crossing the road during a flood event. HDR is working with the TWDB on accounting for benefits in the BCA.

Refer to the Amended Flood Plan Technical Memo for documented BCA assumptions and methodologies.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 2:

Table 2: Level of Service Existing Conditions

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	27 ft

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required for this project.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

No, permits will not be required because the proposed project is outside of the channel and does not impact the floodplain.

Stakeholder Coordination:

Stakeholder coordination will be required between the adjoining counties.

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Stakeholder Coordination:

It is recommended that coordination between the adjoining counties begins early so it does not cause any delays.

NATURE BASED SOLUTION CONSIDERATION

The proposed project does not include nature-based solutions.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

INTERRELATED PROJECTS

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek. The spill starts 2,500ft upstream of the Bexar Bowling Way Crossing to 2,000ft north of Ullrich Road Crossing.

Ullrich Road is overtopping at a second location and could be a danger to residents trying to access the camping park from the north. This additional risk is present during the 100-year flood event and is likely unflooded during the lower storms. It is recommended to place a partial third barrier arm on Ullrich Road Crossing north of the intersection of Rio Cibolo Way. The proposed interrelated study may alter the floodplain so this should be discussed when this third partial barrier is considered.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Ullrich Road at Cibolo Creek LWC Improvements
Project Sponsor:	Bexar County (Border of Guadalupe County)
Firm Developing:	HDR
Date Developed:	4/7/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

- BARRIER ARM GATE (\$50,000) X 2	\$100,000.00
- BOND AND INSURANCE (3%)	\$3,000.00
- BARICADES (3%)	\$3,090.00
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$15,000.00

TOTAL CONSTRUCTION COST ESTIMATE	\$121,090.00
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ENGINEER FEE (Fee Table plus 5%)	\$27,850.70
ENGINEER CONTINGENCY (10%)	\$2,785.07
CONSTRUCTION CONTINGENCY (10%)	\$12,109.00

TOTAL PROJECT COST ESTIMATE	\$163,834.77
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2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Ullrich Road at Cibolo Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County (Border of Guadalupe County)

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	\$30,636
Real Estate	\$0
Environmental	\$0
Construction	\$133,199
Total Cost**	\$164,000

*Costs are using 2020 prices

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

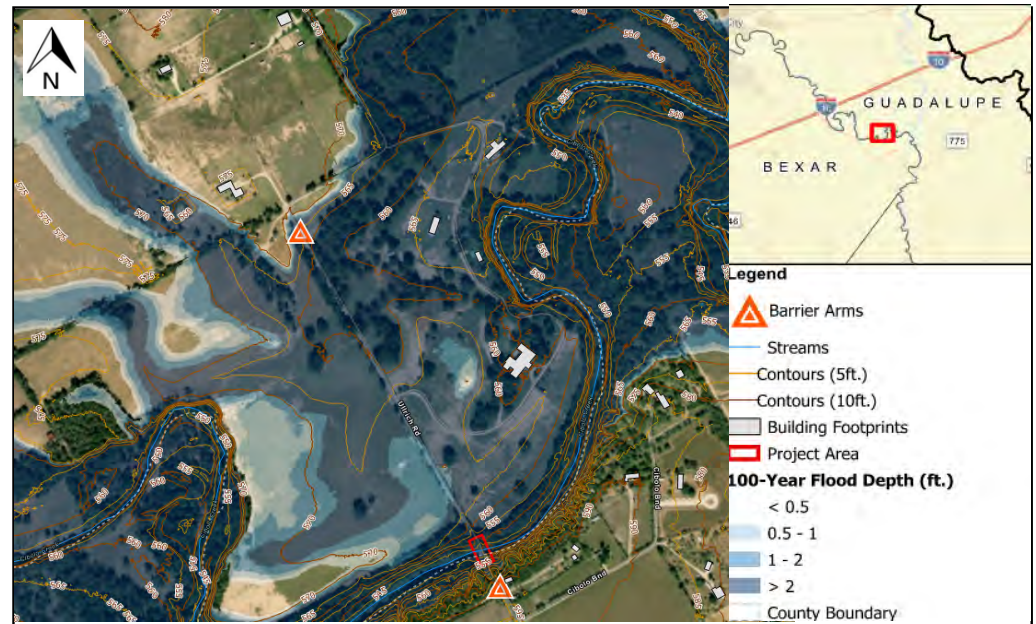
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	-
BCA	-	-

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.4	0.4	0.4
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-		

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	27 ft



Project Description:

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Ullrich Road at Cibolo Creek LWC Improvements, FME ID 121000163, from the 2022 Bexar County Line LWC Engineering Study was further developed during Task 12. The sponsor for this project is Bexar County.

The problem area is located at the intersection of Ullrich Road at Cibolo Creek. Currently there is a low water crossing (LWC) at Ullrich Road, composed of three 30" diameter reinforced concrete pipes. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. Floodwater overtopping the structure endanger residents attempting to cross.

The Task 12 work that was completed for the Ullrich Road at Cibolo Creek LWC Improvements project was a drainage analysis, cost estimate and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on drainage analysis to determine a feasible solution.

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such as upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated project cost for the Ullrich Road at Cibolo Creek LWC Improvements is \$164,000, as calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase the cost depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will reduce the danger incurred from Ullrich Road overtopping by discouraging vehicles from crossing the road during a flood event. HDR is working with the TWDB on accounting for benefits in the BCA.

Refer to the Amended Flood Plan Technical Memo for documented BCA assumptions and methodologies.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 2:

Table 2: Level of Service Existing Conditions

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	27 ft

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required for this project.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

No, permits will not be required because the proposed project is outside of the channel and does not impact the floodplain.

Stakeholder Coordination:

Stakeholder coordination will be required between the adjoining counties.

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Stakeholder Coordination:

It is recommended that coordination between the adjoining counties begins early so it does not cause any delays.

NATURE BASED SOLUTION CONSIDERATION

The proposed project does not include nature-based solutions.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Ullrich Road at Cibolo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County (Border of Guadalupe County)
Date: 4/7/2023

INTERRELATED PROJECTS

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek. The spill starts 2,500ft upstream of the Bexar Bowling Way Crossing to 2,000ft north of Ullrich Road Crossing.

Ullrich Road is overtopping at a second location and could be a danger to residents trying to access the camping park from the north. This additional risk is present during the 100-year flood event and is likely unflooded during the lower storms. It is recommended to place a partial third barrier arm on Ullrich Road Crossing north of the intersection of Rio Cibolo Way. The proposed interrelated study may alter the floodplain so this should be discussed when this third partial barrier is considered.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Ullrich Road at Cibolo Creek LWC Improvements
Project Sponsor:	Bexar County (Border of Guadalupe County)
Firm Developing:	HDR
Date Developed:	4/7/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

- BARRIER ARM GATE (\$50,000) X 2	\$100,000.00
- BOND AND INSURANCE (3%)	\$3,000.00
- BARICADES (3%)	\$3,090.00
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$15,000.00

TOTAL CONSTRUCTION COST ESTIMATE	\$121,090.00
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ENGINEER FEE (Fee Table plus 5%)	\$27,850.70
ENGINEER CONTINGENCY (10%)	\$2,785.07
CONSTRUCTION CONTINGENCY (10%)	\$12,109.00

TOTAL PROJECT COST ESTIMATE	\$163,834.77
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2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Freudenburg Road at Salitrillo Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	\$30,636
Real Estate	\$0
Environmental	\$0
Construction	\$133,199
Total Cost**	\$164,000

*Costs are using 2020 prices

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

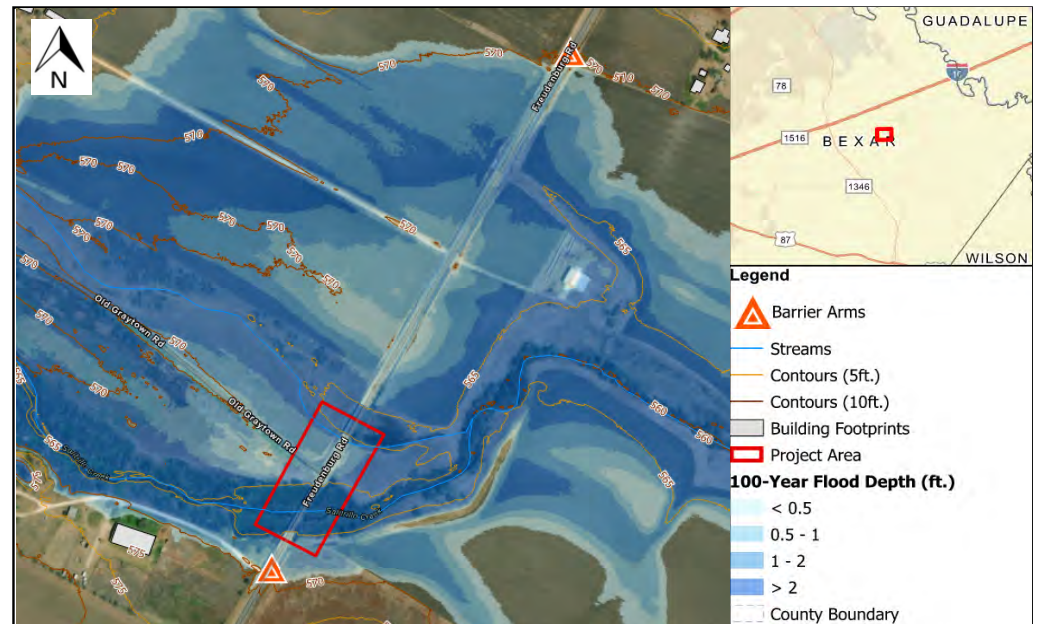
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	-
BCA	-	-

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.4	0.4	0.4
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-		

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 25-Yr	1 ft



Project Description:

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Freudenburg Road at Salitrillo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Freudenburg Road at Salitrillo Creek LWC Improvements, FME ID 121000159, from the 2022 Bexar County LWC Engineering Study was further developed during Task 12. The sponsor for this project is Bexar County.

The problem area is located at the intersection of Freudenburg Road at Salitrillo Creek and Tributary B to Salitrillo Creek. Currently there is a low water crossing (LWC) at Freudenburg Road, composed of three culvert groups, six 36" concrete pipes, eleven 11X5 concrete boxes, and fifteen 11X7 concrete boxes. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. Floodwater overtopping the structure endanger residents attempting to cross.

The Task 12 work that was completed for the Freudenburg Road at Salitrillo Creek LWC Improvements project was a drainage analysis, cost estimate and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on drainage analysis to determine a feasible solution.

This project will reduce potential danger at the LWC by discouraging vehicles from crossing the road during a flood event. The proposed improvements consist of adding flashing lights and an automatic barrier arm on each side of the LWC that will be lowered when the road is overtopped. Other alternatives were considered, such as upgrading the LWC to a bridge, but were deemed infeasible due to a low benefit-cost ratio.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated project cost for the Freudenburg Road at Cibolo Creek LWC Improvements is \$164,000, as calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase the cost depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will reduce the danger incurred from Freudenburg Road overtopping by discouraging vehicles from crossing the road during a flood event. HDR is working with the TWDB on accounting for benefits in the BCA.

Refer to the Amended Flood Plan Technical Memo for documented BCA assumptions and methodologies

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Freudentburg Road at Salitrillo Creek LWC Improvements
FMP ID: 12XXXXXX
Project Sponsor: Bexar County
Date: 4/7/2023

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 2:

Table 2: Level of Service Existing Conditions

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 25-Yr	1 ft

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required for this project.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

No, permits will not be required because the proposed project is outside of the channel and does not impact the floodplain.

Stakeholder Coordination:

No, stakeholder coordination will be required.

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

NATURE BASED SOLUTION CONSIDERATION

The proposed project does not include nature-based solutions.

INTERRELATED PROJECTS

There are no interrelated projects associated with this project.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Freudenburg Road at Salitrillo Creek LWC Improvements
Project Sponsor:	Bexar County
Firm Developing:	HDR
Date Developed:	4/4/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

- BARRIER ARM GATE (\$50,000) X 2	\$100,000.00
- BOND AND INSURANCE (3%)	\$3,000.00
- BARICADES (3%)	\$3,090.00
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$15,000.00

TOTAL CONSTRUCTION COST ESTIMATE	\$121,090.00
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ENGINEER FEE (Fee Table plus 5%)	\$27,850.70
ENGINEER CONTINGENCY (10%)	\$2,785.07
CONSTRUCTION CONTINGENCY (10%)	\$12,109.00

TOTAL PROJECT COST ESTIMATE	\$163,834.77
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2023 San Antonio Regional Flood Plan

Project Summary Sheet

Updated: 4/5/2023

Page 1 of 1

Project Name: Boerne Stage Road at Balcones Creek

FMP ID:

Project Sponsor: Kendall County (borders with Bexar County)

Project Source: Kendall County (borders with Bexar County)

Cost Information

Category	Cost*
Design	\$833,545
Real Estate	\$493,470
Environmental	\$10,000
Construction	\$4,517,301
Total Cost**	\$5,855,000

* Costs use September 2020 pricing

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

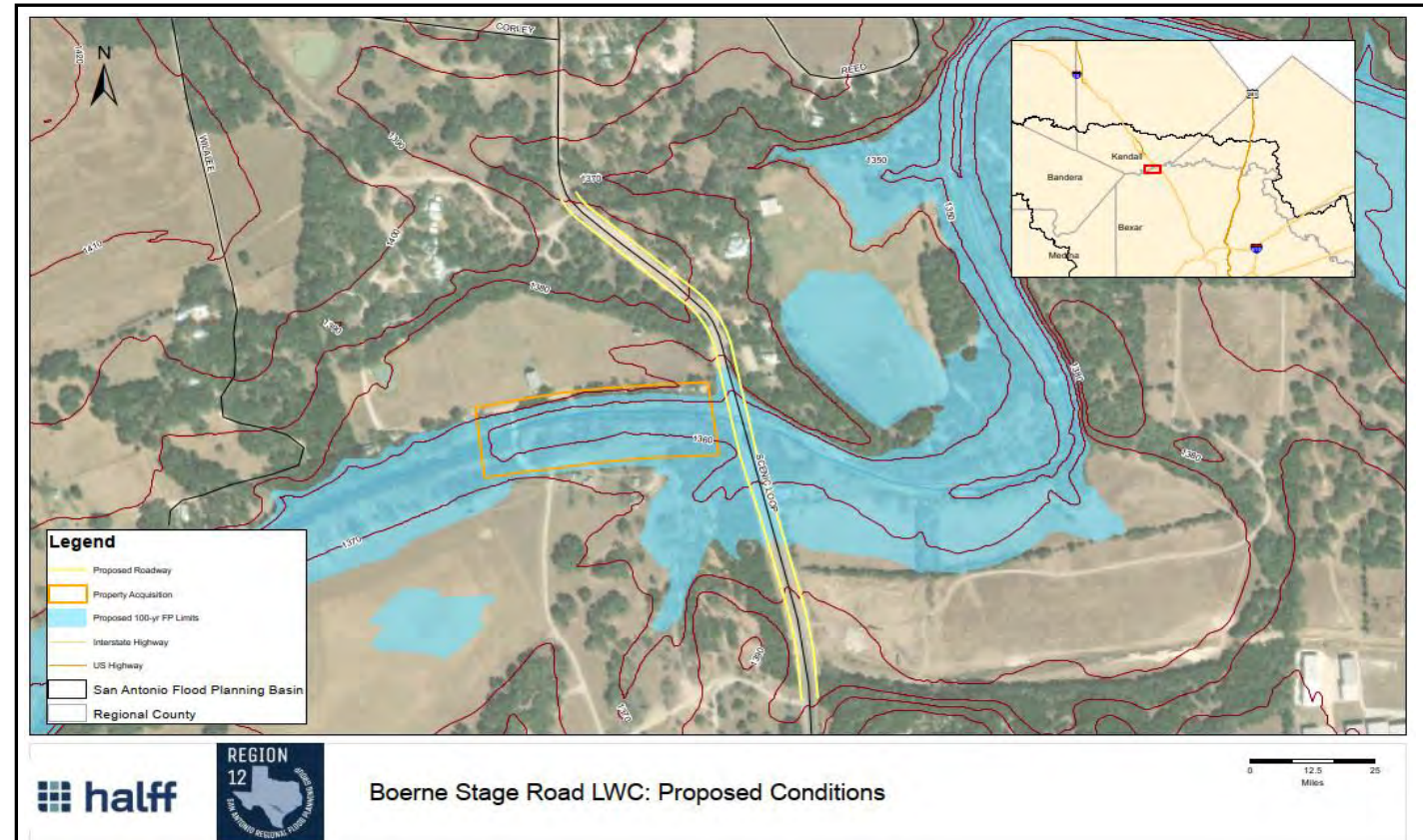
Event Damages	Baseline	Project
10-year storm	\$ 376,840	\$ -
50-year storm	\$ 376,840	\$ 587,635
100-year storm	\$ 376,840	\$ 423,254
Total Benefits	\$ 353,211	
BCA	0.1	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.083	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-	-	-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	6.7
Proposed	10-Yr	0



Project Description:

At the Boerne Stage Road crossing with Balcones Creek, the road is overtopped by the 10-year flood event at a maximum depth of 6.5 ft. The length of roadway flooded is approximately 0.13 miles. The proposed project is a bridge that will raise the roadway over the low water crossing at the intersection of Balcones Creek and Boerne Stage Road. The proposed bridge will convey the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed improvement. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Boerne Stage Road within the proximity of the Balcones Creek crossing. The proposed bridge will be approximately 280' in length with an elevated roadway approach of 250' that ties into the existing road. In addition, the project will remove 2 inline structures directly upstream of the proposed structure, which will require property access or acquisition. A flood beacon will be installed for safety at higher flood events. For this study, the most conservative estimate assumes acquisition for a public right of way easement. This project is located at the Kendall County/Bexar County line.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Boerne Stage Road at Balcones Creek - Low Water Crossing
FMP ID: -----
Project Sponsor: Kendall County (borders with Bexar County)
Date: 3/3/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Boerne Stage Road at Balcones Creek, FMP ID not yet created, from Kendall County was expanded on during Task 12. The sponsor for this project is Kendall County, however the project is located at the county line with Bexar County.

The problem area is located along Boerne Stage Road at a low water crossing with Balcones Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway.

The work completed for the Boerne Stage Road at Balcones Creek project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Boerne Stage Road crossing with Balcones Creek, the road is overtopped by the 10-year flood event at a maximum depth of 6.5 ft. The length of roadway flooded is approximately 0.13 miles. The proposed project is a bridge that will raise the roadway over the low water crossing at the intersection of Balcones Creek and Boerne Stage Road. The proposed bridge will convey the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed improvement. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Boerne Stage Road within the proximity of the Balcones Creek crossing. The proposed bridge will be approximately 280' in length with an elevated roadway approach of 250' that ties into the existing road. In addition, the project will remove 2 inline structures directly upstream of the proposed structure, which will require property access or acquisition. A flood beacon will be installed for safety at higher flood events. For this study, the most conservative estimate assumes acquisition for a public right of way easement. This project is located at the Kendall County/Bexar County line.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for the Boerne Stage Road at Balcones Creek LWC improvements are \$5,855,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Boerne Stage Road for the 10-year storm event by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water flow and remove the roadway out of the floodplain. The bridge₃₅ is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Boerne Stage Road at Balcones Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Kendall County
Date: 3/3/2023

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost ratio was 0.1. Table 1 below summarizes the components calculated in the TWDB BCA Toolkit.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life 30		
Event Damages	Baseline	Project
10 – year storm	\$376,840	\$-
50 – year storm	\$376,840	\$587,635
100 - year storm	\$376,840	\$423,254
Total Benefits from BCA Toolkit	\$353,211	
Other Benefits (Not Recreation)	\$46,220	
Recreation Benefits	-	
Total Costs	\$4,976,361	
Net Benefits	-\$4,576,930	
Net Benefits with Recreation	-\$4,576,930	
Final BCR	0.1	
Final BCR with Recreation	0.1	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on the impact analysis.

Existing and proposed conditions were analyzed for impact, the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSE and velocities were compared in the HEC-RAS v6.2.0 model. The proposed conditions showed reduced levels with both components. From

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Boerne Stage Road at Balcones Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Kendall County
Date: 3/3/2023

the RAS results, the total inundated boundary was reduced in proposed conditions, see Exhibits 1- 4 for existing and proposed conditions, WSEL comparison, and a proposed alignment. Flooded depths over the road were evaluated in the BCA and the reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	6.7
Proposed	10-Yr	0

(See full list of roadway crossing impacts in the attached BCA results as well as Table 2: Level of Service: Existing vs. Proposed)

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required. In addition, this area is part of the Glen Rose Limestone Formation, more specifically the Middle Trinity Aquifer. This aquifer is highly cavernous and includes many sink holes, and other karst features. According to the Texas Water Development Board, the Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its water is primarily used by municipalities, it also is used for irrigation, livestock, and other domestic purposes. Any proposed project in this area should note that groundwater and surface water supplies cannot be threatened by any proposed County mobility enhancements and must be protected.

Stakeholder coordination:

Due to the land acquisition, road improvement, and drainage considerations, there will be one stakeholder involved that owns the area where all of the construction will tentatively occur.

MITIGATION OF RISKS

Utility Coordination:

n/a

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Boerne Stage Road at Balcones Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Kendall County
Date: 3/3/2023

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays.

Boerne Stage Road is a low-traffic area. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the stream bottom to allow for aquatic organism passage.

Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Boerne Stage Road at Balcones Creek
Project Sponsor:	Kendall County
Firm Developing:	HALFF
Date Developed:	2/10/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

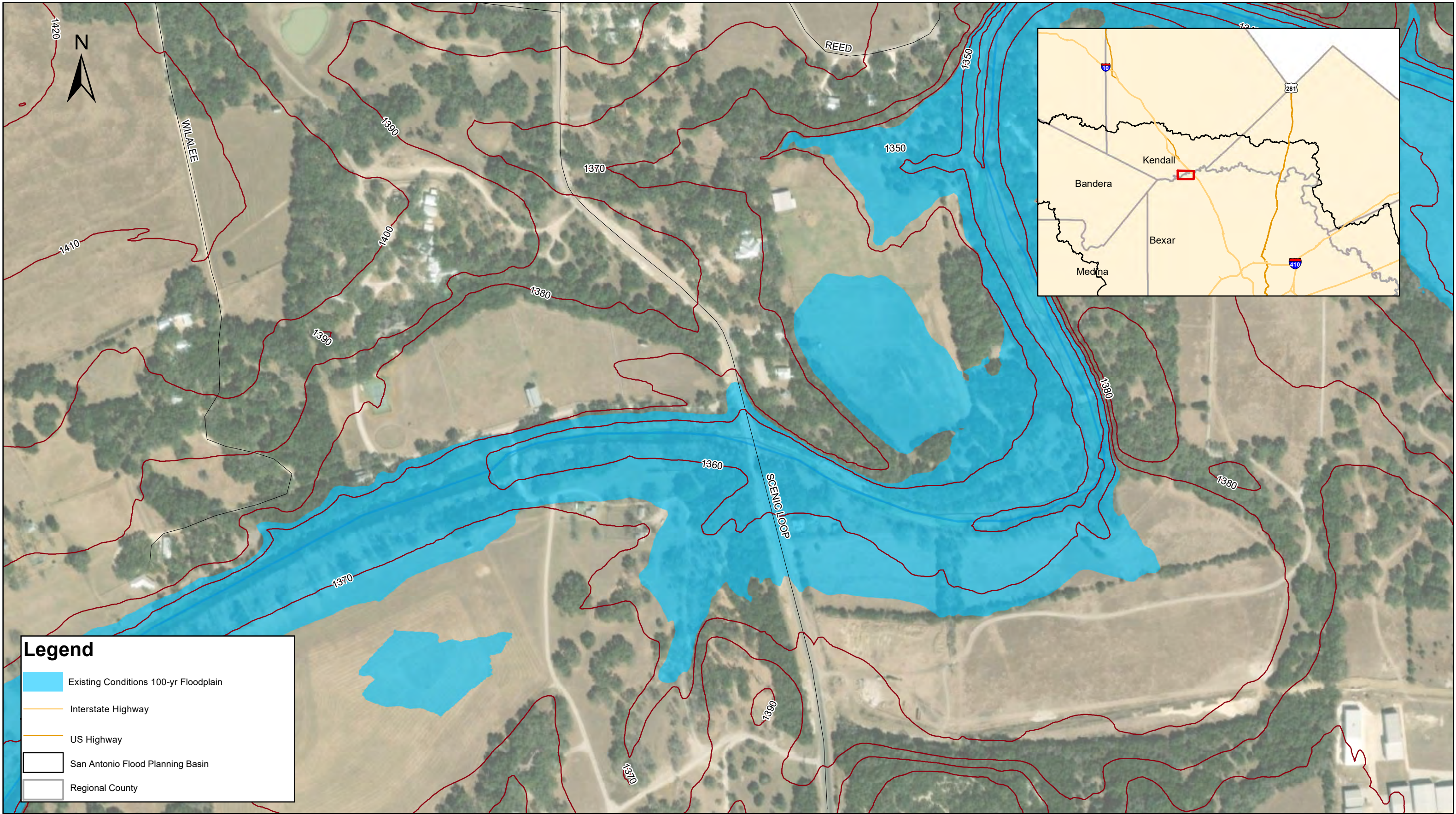
- DRAINAGE COST	\$2,623,129.14
- TREE PRESERVATION (2%)	\$59,745.87
- LANDSCAPING (10%)	\$298,729.34
- BOND AND INSURANCE (3%)	\$100,373.06
- BARICADES (3%)	\$103,384.25
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$501,865.28

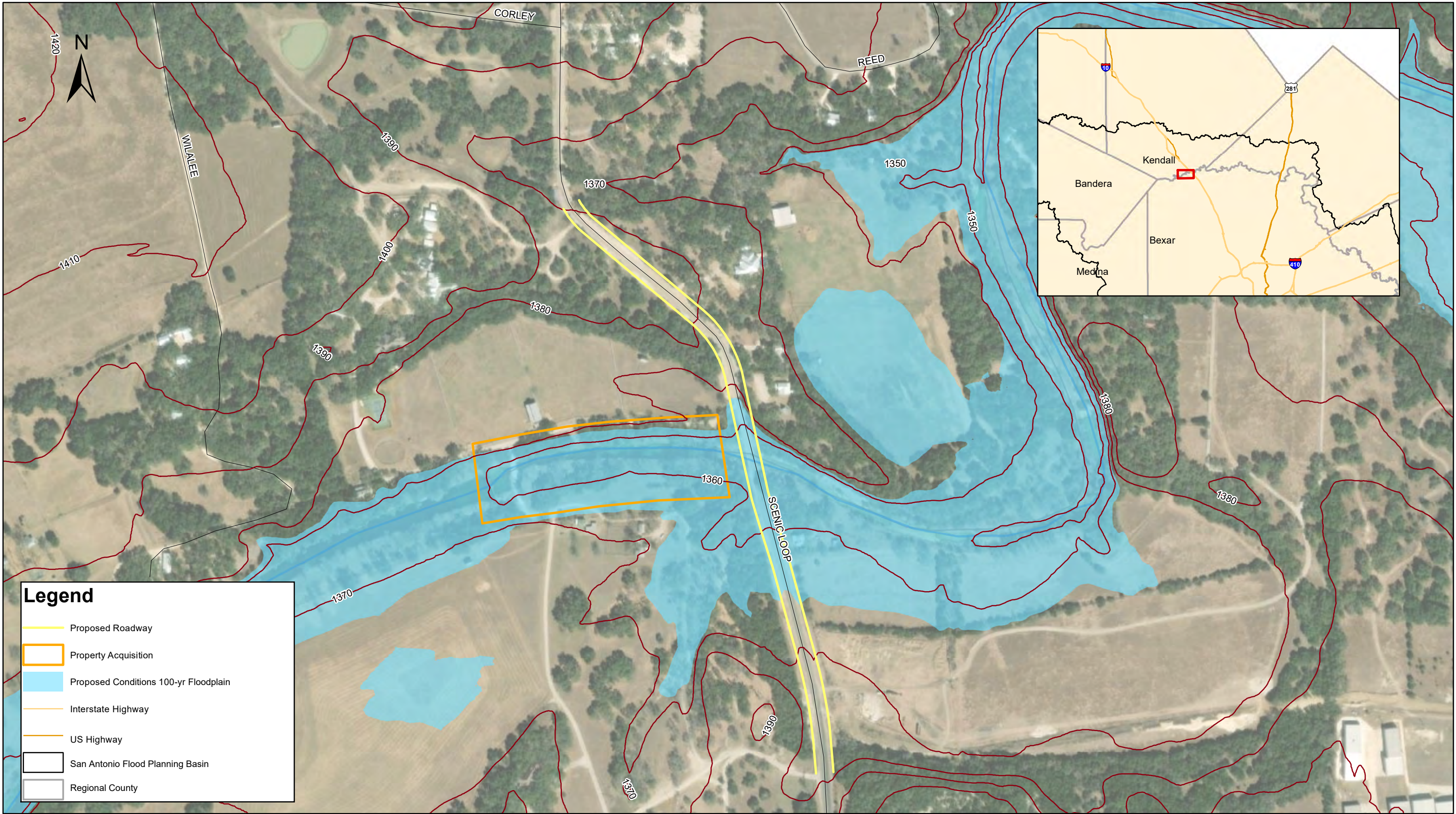
TOTAL CONSTRUCTION COST ESTIMATE	\$4,051,391.15
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ENGINEER FEE (Fee Table plus 5%)	\$648,222.58
ENGINEER CONTINGENCY (10%)	\$64,822.26
CONSTRUCTION CONTINGENCY (10%)	\$405,139.12
PERMIT REQUIREMENT COSTS	\$70,500.00
RIGHT-OF-WAY (LAND ACQUISITION)	\$490,970.00
RIGHT-OF-WAY SURVEY	\$2,500.00
ENVIRONMENTAL	\$10,000.00
MATERIAL TESTING (2% Construction Cost - <\$3M, 1.5% - >\$3M)	\$60,770.87

TOTAL PROJECT COST ESTIMATE	\$5,854,315.98
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DESIGN PHASE	\$1,337,014.84
CONSTRUCTION PHASE	\$4,517,301.14









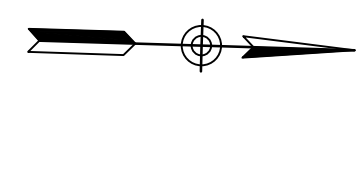


Legend

- Proposed Roadway
- Property Acquisition
- Proposed Conditions 100-yr Floodplain
- Interstate Highway
- US Highway
- San Antonio Flood Planning Basin
- Regional County

LEGEND:

E.O.P.	=	EDGE OF PAVEMENT
R.O.W.	=	RIGHT-OF-WAY
	=	PROPOSED RIGHT-OF-WAY
	=	PROPOSED EDGE OF PAVEMENT
	=	STREET CENTERLINE
	=	BALCONES CREEK CENTERLINE
	=	LIMITS OF BRIDGE
	=	LIMITS OF 100-YEAR FLOODPLAIN



SCALE: 1" = 100'

0 100 200

SCALE IN FEET

EXHIBIT 4 - BOERNE STAGE RD PROPOSED ALIGNMENT

[illegible]

PRELIMINARY

FOR INTERIM REVIEW ONLY

THESE DOCUMENTS ARE FOR INTERIM
REVIEW AND NOT INTENDED FOR
REGULATORY APPROVAL, PERMIT, BIDDING
OR CONSTRUCTION PURPOSES.

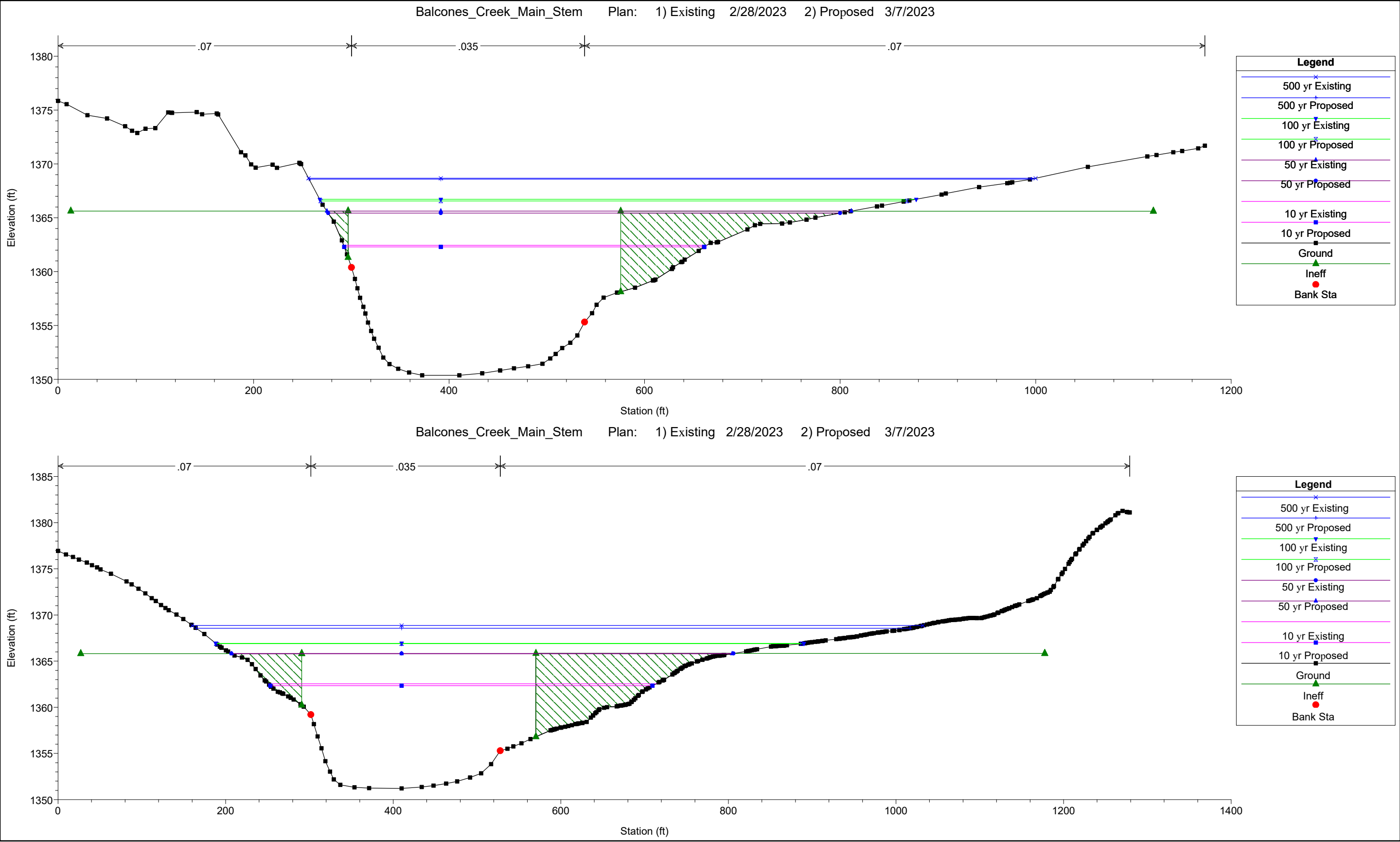
TBP/ELS ENGINEERING FIRM #F-312

HALFF ASSOCIATES, INC.
1201 NORTH BOWSER ROAD
RICHARDSON, TEXAS 75081
TBPOLS ENGINEERING FIRM #F-312

SHEET TITLE:

BOERNE STAGE RD

EXHIBIT 3 - WATER SURFACE ELEVATION COMPARISON





2023 San Antonio Regional Flood Plan

Project Summary Sheet

Updated: 4/6/2023

Page 1 of 1

Project Name: Specht & Obst Road at Cibolo Creek

FMP ID:

Project Sponsor: Bexar County

Project Source: Bexar County

Cost Information

Category	Cost*
Design	\$695,091
Real Estate	\$21,182
Environmental	\$10,000
Construction	\$3,766,868
Total Cost**	\$4,494,000

*Costs from 2020 prices

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

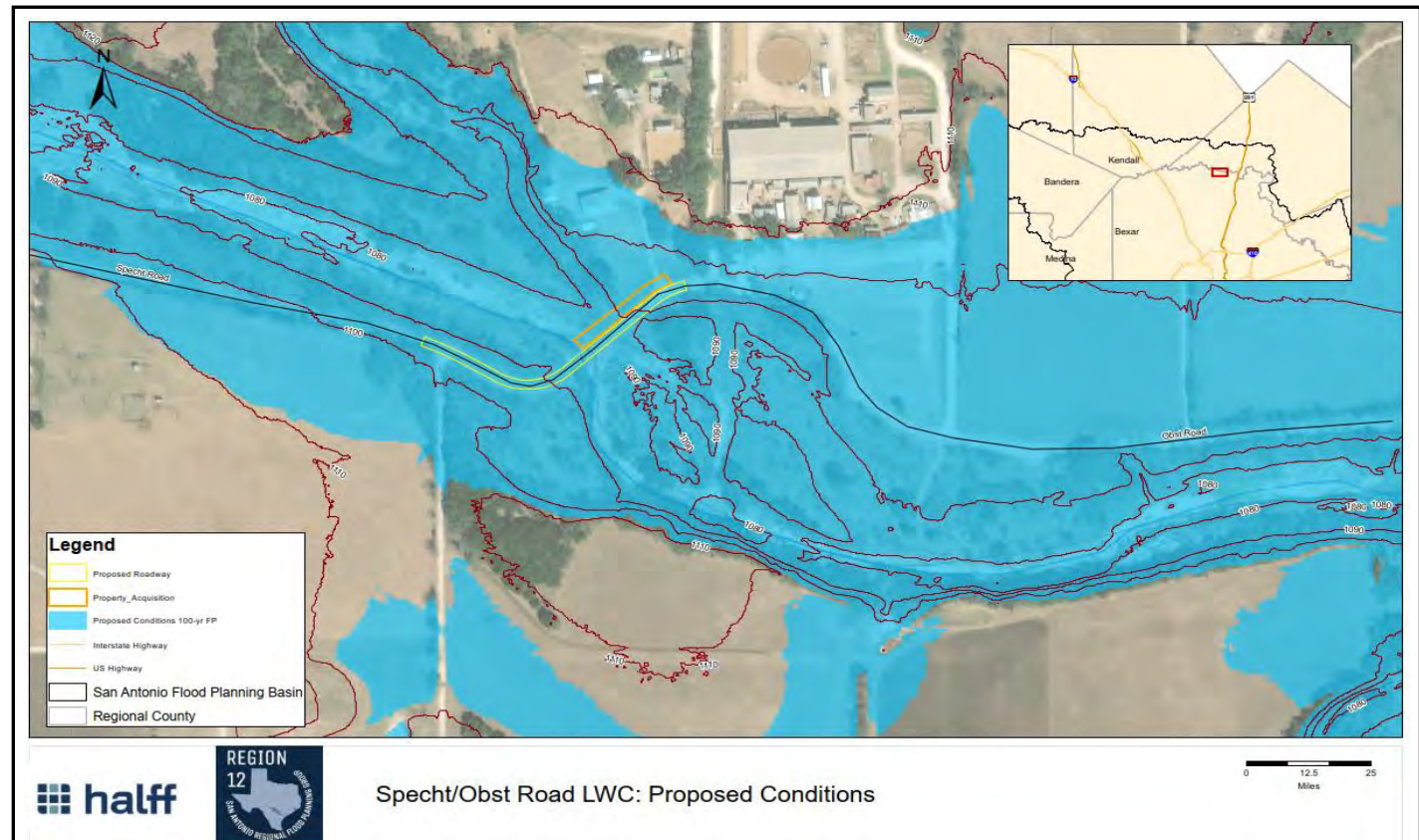
Event Damages	Baseline	Project
2-year storm	\$ 378,726	\$ 1,494
10-year storm	\$ 378,726	\$ 189,363
100-year storm	\$ 378,726	\$ 189,363
Total Benefits	\$ 2,031,323	
BCA	0.5	

Impact Analysis

Post-Project Total Removed	Storm Event		
	2-year	10-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.08	1.7	2.2
Critical	-	-	-
Others Note	1 Death		
SVI Score	-		

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	2-Yr Depth Over Road (ft)
Existing	< 2-Yr	8
Proposed	2-Yr	0



Project Description:

At the Specht and Obst Road crossing with Cibolo Creek, the road is currently being overtopped by the 2-year flood event at a maximum depth of 7.8 ft. In 2010, there was a fatality at this crossing during a flash flood event. The length of roadway being flooded is approximately 2.2 miles. This project proposed construction of a bridge to raise the roadway over the low water crossing at the intersection of Cibolo Creek and Specht and Obst Road. The proposed bridge will safely pass the 2-year flood event and lower the depth of water overtopping the roadway for larger flood events. The proposed roadway and bridge alignment will raise the road for residents in the proximity of Cibolo Creek crossing and access will be required to properly tie in adjoining driveways to the proposed raised roadway. In addition, a flood beacon will be added for safety at higher flood events. The proposed bridge will be approximately 270' in length with a connecting roadway realignment of 470' that ties into the existing road. This project is located at the Bexar County/Comal County line.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Specht & Obst Road at Cibolo Creek - Low Water Crossing
FMP ID: -----
Project Sponsor: Bexar/Comal County
Date: 3/3/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Specht & Obst Road at Cibolo Creek, FMP ID not yet created, from Bexar/Comal County was expanded on during Task 12. The sponsor for this project is Bexar County.

The problem area is located along Specht & Obst Road at a low water crossing with Cibolo Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway crossing due to a lower grade in the terrain.

The work completed for the Specht & Obst Road at Cibolo Creek project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Specht and Obst Road crossing with Cibolo Creek, the road is overtopped by the 2-year flood event at a maximum depth of 7.8 ft. In 2010, there was a fatality at this crossing during a flash flood event. The length of roadway flooded is approximately 2.2 miles. This project proposed includes construction of a bridge to raise the roadway over the low water crossing at the intersection of Cibolo Creek and Specht and Obst Road. The proposed bridge will safely pass the 2-year flood event and lower the depth of water overtopping the roadway for larger flood events. The proposed roadway and bridge alignment will raise the road for residents in the proximity of Cibolo Creek crossing and access will be required to properly tie in adjoining driveways to the proposed raised roadway. Due to right of way and topography constraints, the 100-year design was not considered for this proposed project. Instead, a flood beacon will be installed for added safety during higher flood events. The proposed bridge will be approximately 270' in length with a connecting roadway realignment of 470' that ties into the existing road. This project is located at the Bexar County/Comal County line.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for the Specht & Obst Road at Cibolo Creek LWC improvements are \$4,494,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Specht & Obst Road for the 2-year storm event by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water floodway and remove the roadway out of the floodplain. The bridge is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Specht & Obst Road at Cibolo Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Bexar/Comal County
Date: 3/3/2023

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. The benefits that were evaluated for this project are residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.5. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
2 – year storm	\$378,726	\$1,494
10 – year storm	\$378,726	\$189,363
100 - year storm	\$378,726	\$189,363
Total Benefits from BCA Toolkit	\$2,031,323	
Other Benefits (Not Recreation)	\$1,984	
Recreation Benefits	-	
Total Costs	\$3,820,203	
Net Benefits	-\$1,786,896	
Net Benefits with Recreation	-\$1,786,896	
Final BCR	0.5	
Final BCR with Recreation	0.5	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Existing and proposed conditions were analyzed for impact and the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSEL and velocities were compared in the HEC-RAS v6.2.0 model. The proposed conditions showed reduced levels with both components. From the RAS results, the total inundated boundary was reduced in proposed conditions. See Exhibits 1-4 for existing,

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Specht & Obst Road at Cibolo Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Bexar/Comal County
Date: 3/3/2023

proposed, comparison of WSEL, and proposed alignment. Flooded depths over the road were evaluated in the BCA with reduced impacts of lower flood depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing vs. Proposed

Condition	Level of Service	2-Yr Depth Over Road (ft)
Existing	< 2-Yr	8
Proposed	2-Yr	0

(See full list of impacts in the attached BCA results as well as Table 2: Level of Service Existing vs. Proposed)

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required.

Stakeholder coordination:

Due to the land acquisition, road improvement, and drainage considerations, there will be one stakeholder involved that owns the area where all of the construction will tentatively occur.

MITIGATION OF RISKS

Utility Coordination:

n/a

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays.

Specht & Obst Road is a low-traffic area. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Specht & Obst Road at Cibolo Creek - Low Water Crossing
FME ID: -----
Project Sponsor: Bexar/Comal County
Date: 3/3/2023

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the culvert bottom to allow for aquatic organism passage.

Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Specht & Obst Road at Cibolo Creek
Project Sponsor:	Bexar/Comal County
Firm Developing:	HALFF
Date Developed:	2/10/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

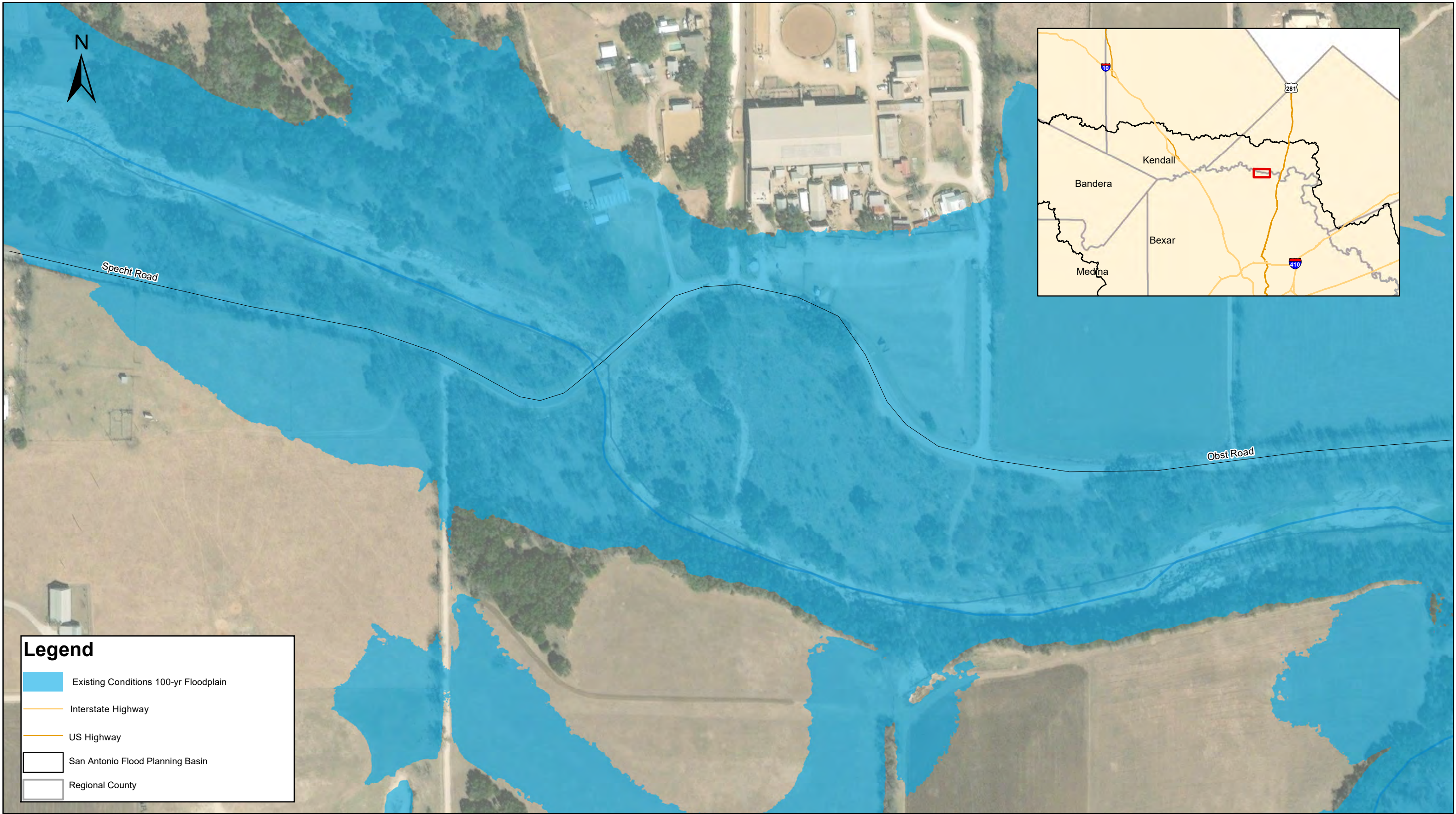
- DRAINAGE COST	\$2,028,242.35
- TREE PRESERVATION (2%)	\$49,820.63
- LANDSCAPING (10%)	\$249,103.13
- BOND AND INSURANCE (3%)	\$83,698.65
- BARICADES (3%)	\$86,209.61
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$418,493.26

TOTAL CONSTRUCTION COST ESTIMATE	\$3,378,356.56
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ENGINEER FEE (Fee Table plus 5%)	\$540,537.05
ENGINEER CONTINGENCY (10%)	\$54,053.70
CONSTRUCTION CONTINGENCY (10%)	\$337,835.66
PERMIT REQUIREMENT COSTS	\$50,500.00
RIGHT-OF-WAY (LAND ACQUISITION)	\$18,682.00
RIGHT-OF-WAY SURVEY	\$2,500.00
ENVIRONMENTAL	\$10,000.00
MATERIAL TESTING (2% Construction Cost - <\$3M, 1.5% - >\$3M)	\$50,675.35

TOTAL PROJECT COST ESTIMATE	\$4,493,140.32
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DESIGN PHASE	\$726,272.75
CONSTRUCTION PHASE	\$3,766,867.56



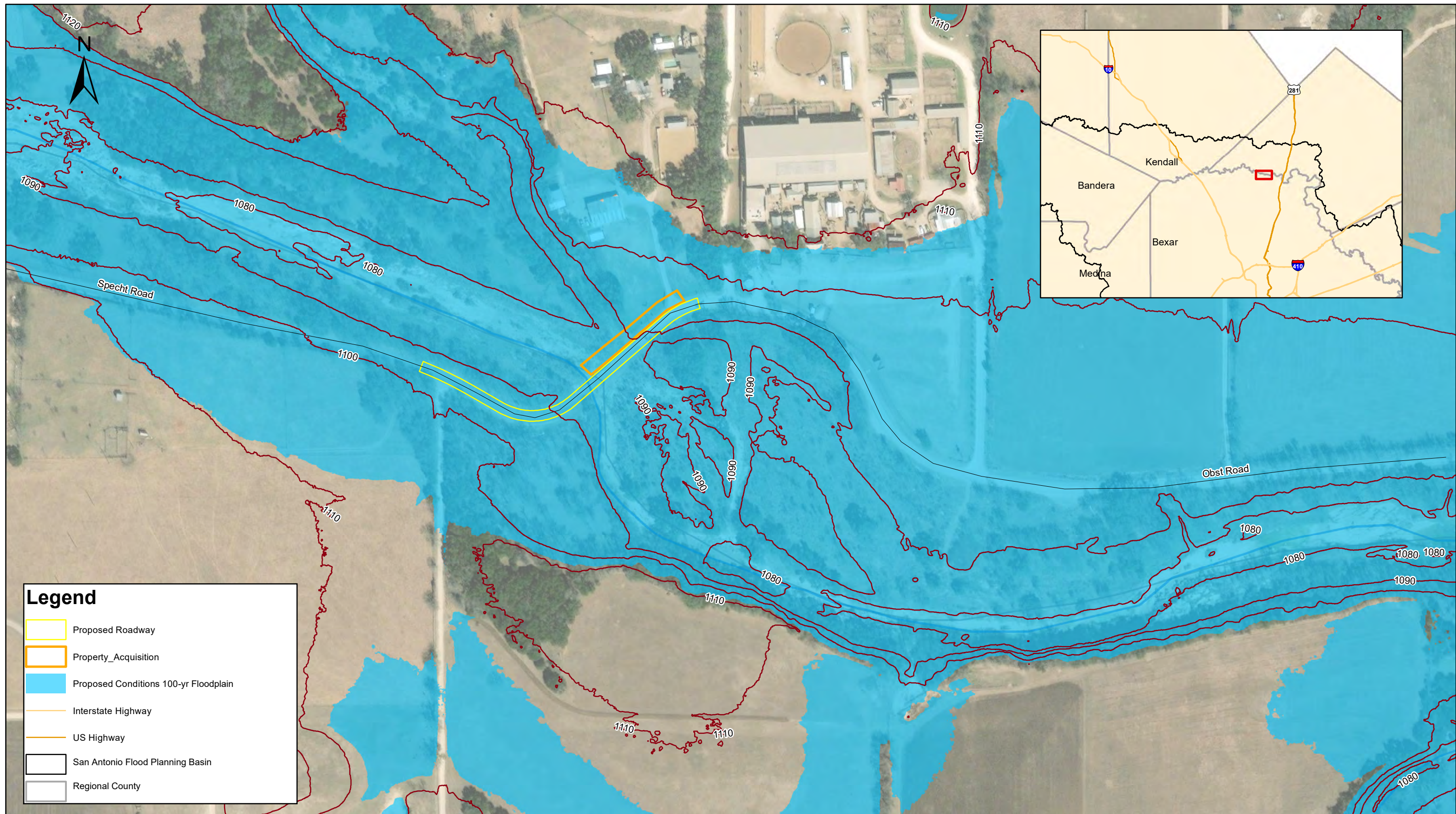




EXHIBIT 4 - SPECHT & OBST LWC
PROPOSED ALIGNMENT



REVISION		DESCRIPTION	
NO.	DATE		

PRELIMINARY
FOR INTERIM REVIEW ONLY

THESE DOCUMENTS ARE FOR INTERIM REVIEW AND NOT INTENDED FOR REGULATORY APPROVAL, PERMIT BIDDING OR CONSTRUCTION PURPOSES.

TBPELS ENGINEERING FIRM #F-312

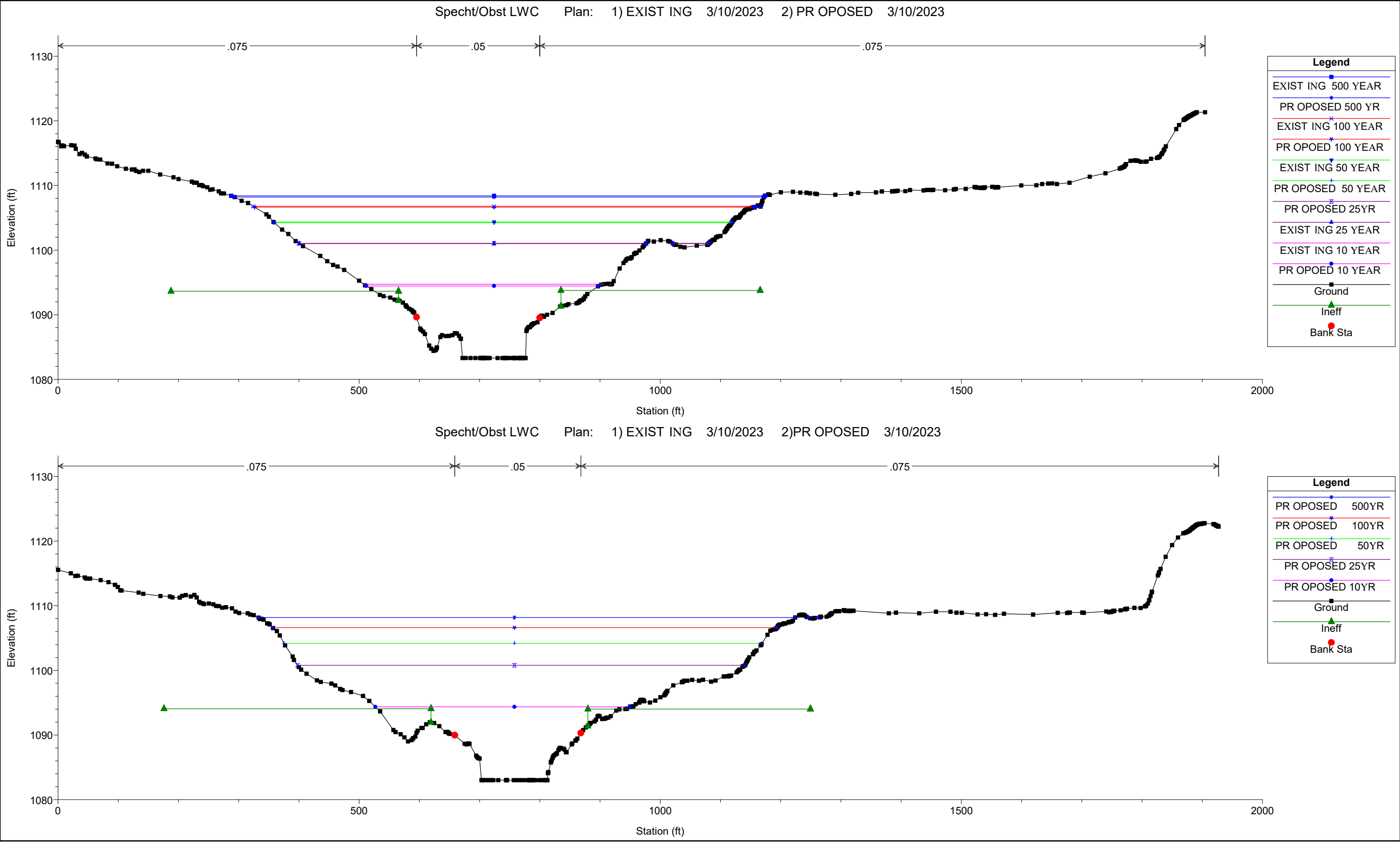
HALFF ASSOCIATES, INC.
1001 NORTH BOWSER ROAD
RICHARDSON, TEXAS 75081
TBPELS ENGINEERING FIRM #F-312

SHEET TITLE:

SPECHT & OBST

C806

EXHIBIT 3 - SPECHT OBST LWC CROSS SECTION COMPARISON





2023 San Antonio Regional Flood Plan

Project Summary Sheet

Updated: 4/6/2023

Page 1 of 1

Project Name: Damage Center 14 - Airport Tributary

FMP ID: -----

Project Sponsor: City of San Antonio

Project Source: Upper San Antonio River Master Plan (San Antonio River Authority)

Cost Information

Category	Cost*
Design	\$232,159
Real Estate	\$19,975,075
Environmental	\$0
Construction	\$0
Total Cost**	\$20,208,000

*Costs are using 2020 prices

**Rounded up to the nearest thousand

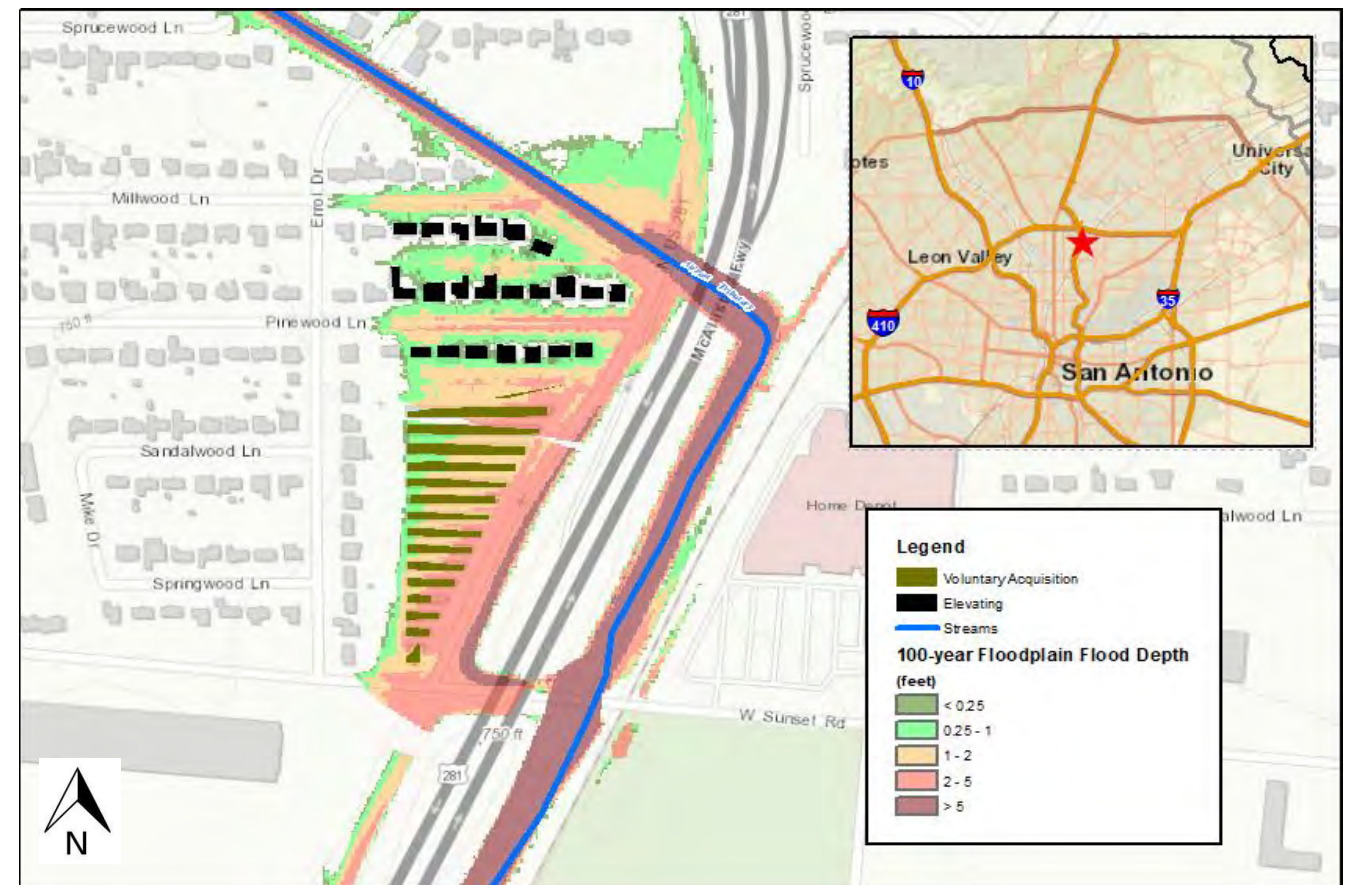
Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	\$ 1,885,677	-
100-year storm	\$ 5,429,195	-
Total Benefits	\$ 4,833,000	-
BCA	0.3	

Impact Analysis

Post-Project Total Removed	Storm Event		
	25-year	50-year	100-year
Residential	-	-	22
Commercial	-	15*	15*
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-	-	-

* All 15 structures are on one property



Project Description:

Damage Center 14 – Airport Tributary is bound by Loop 410 on the north side and by US 281 on the east and south side. Originally identified in the Upper San Antonio River Master plan, the Damage Center was inundated between Loop 410 and Chulie Road, which is solely of commercial properties, and downstream of Chulie Road, which is primarily residential areas. This damage center was re-evaluated based on changes to the floodplain mapping throughout Bexar County. Original analysis for this damage center included lateral detention versus voluntary acquisition. Channelization and culvert upgrades were deemed impractical due to space constraints. Given the decrease of the floodplain size and the previous studies conclusion that detention was not the most cost-effective alternative, voluntary acquisition was reviewed. The reduction of floodplain size and depth in the new hydrologic and hydraulic modeling offers an opportunity for elevating the residential structures, a more cost-effective alternative to voluntary acquisitions. The commercial property is still recommended for voluntary property acquisitions and would provide the opportunity to convert the parcel into an amenity for the entire community.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 14 – Airport Tributary

FMP ID: -----

Project Sponsor: City of San Antonio

Date: 3/21/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Damage Center 40-San Antonio River DS Reach near Roosevelt, FME ID 121000086, from the City of San Antonio was expanded on during Task 12. The sponsor for this project is City of San Antonio.

Damage Center 14 – Airport Tributary is bound by Loop 410 on the north side and by US 281 on the east and south side. Originally identified in the Upper San Antonio River Master Plan, the Damage Center was inundated by the 100-year event between Loop 410 and Chulie Road, which is solely commercial properties, and downstream of Chulie Road, which is primarily residential areas. Updated mapping has decreased the number of flooded properties, but acquisition and elevating opportunity still exist downstream of Millwood Lane.

The work completed for the Damage Center 14-Airport Tributary project was updates to the flood impacts, cost estimate, and Benefit Cost Analysis (BCA) to the previously completed study by San Antonio River Authority.

PROPOSED PROJECT SCOPE

This damage center was re-evaluated based on changes to the floodplain mapping throughout Bexar County. Original analysis for this damage center included lateral detention versus voluntary acquisition. Channelization and culvert upgrades were deemed impractical due to space constraints. Given the decrease of the floodplain size and the previous study's conclusion that detention was not the most cost-effective alternative, voluntary acquisition was reviewed. The reduction of floodplain size and depth in the new hydrologic and hydraulic modeling offers an opportunity for elevating the residential structures, a more cost-effective alternative to voluntary acquisitions. The commercial property is still recommended for voluntary property acquisitions and would provide the opportunity to convert the parcel into an amenity for the entire community.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs. Floodproofing and elevating costs were based off information from the U.S. Army Corp of Engineers publication *Raising and Moving Slab-on-Grade House with Slab Attached*.

The estimated project costs for Damage Center 14 – Airport Tributary for voluntary acquisition and elevating is \$20,208,000, was calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase costs depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 14 – Airport Tributary
FME ID: 121000086
Project Sponsor: City of San Antonio
Date: 3/21/2023

PROPOSED PROJECT BENEFITS

This project will remove residential structures from the floodplain through elevation. The commercial property recommended for voluntary property acquisition would provide the opportunity to convert the parcel into an amenity for the entire community.

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.3. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
10 - year storm	\$0	\$0
50 - year storm	\$1,885,677	\$0
100 - year storm	\$5,429,195	\$0
Total Benefits from BCA Toolkit	\$4,833,000	
Other Benefits (Not Recreation)	\$0	
Recreation Benefits	\$39,531	
Total Costs	\$18,340,206	
Net Benefits	-\$13,507,206	
Net Benefits with Recreation	-\$13,467,675	
Final BCR	0.3	
Final BCR with Recreation	0.3	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis. See Exhibit 1 for recommended acquisitions and elevated structures.

There are no impacts to the floodplain as this project does not alter the existing conditions in the floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 14 – Airport Tributary
FME ID: 121000086
Project Sponsor: City of San Antonio
Date: 3/21/2023

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
100	37	0	-37

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is suggested for the commercial Storage facility. In addition, property owner coordination will be required, as this project involves elevating residential structures.

Utilities Coordination:

Utility coordination could be required for homes to be elevated.

Permitting/Environmental:

Only local permitting will be required for elevating structures.

Stakeholder coordination:

Property owners are the only stakeholders for this project. Elevating or floodproofing would require permission from the property owners.

MITIGATION OF RISKS

Utility Coordination:

Coordination should occur early with utilities to determine level of effort to accommodate elevating structures.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with property owners to avoid schedule delays. Accommodations will have to be considered for property owners when the buildings might be inaccessible.

NATURE BASED SOLUTION CONSIDERATION

Acquisition of the commercial storage facility would provide 4 acres of open space that could be utilized as a community gathering space and offers potential for low impact development and green infrastructure, such as bioswales, extended detention, or vegetated swales.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Old Frio City Road at North Prong Creek LWC Improvements
Project Sponsor:	Bexar County
Firm Developing:	HDR
Date Developed:	3/3/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

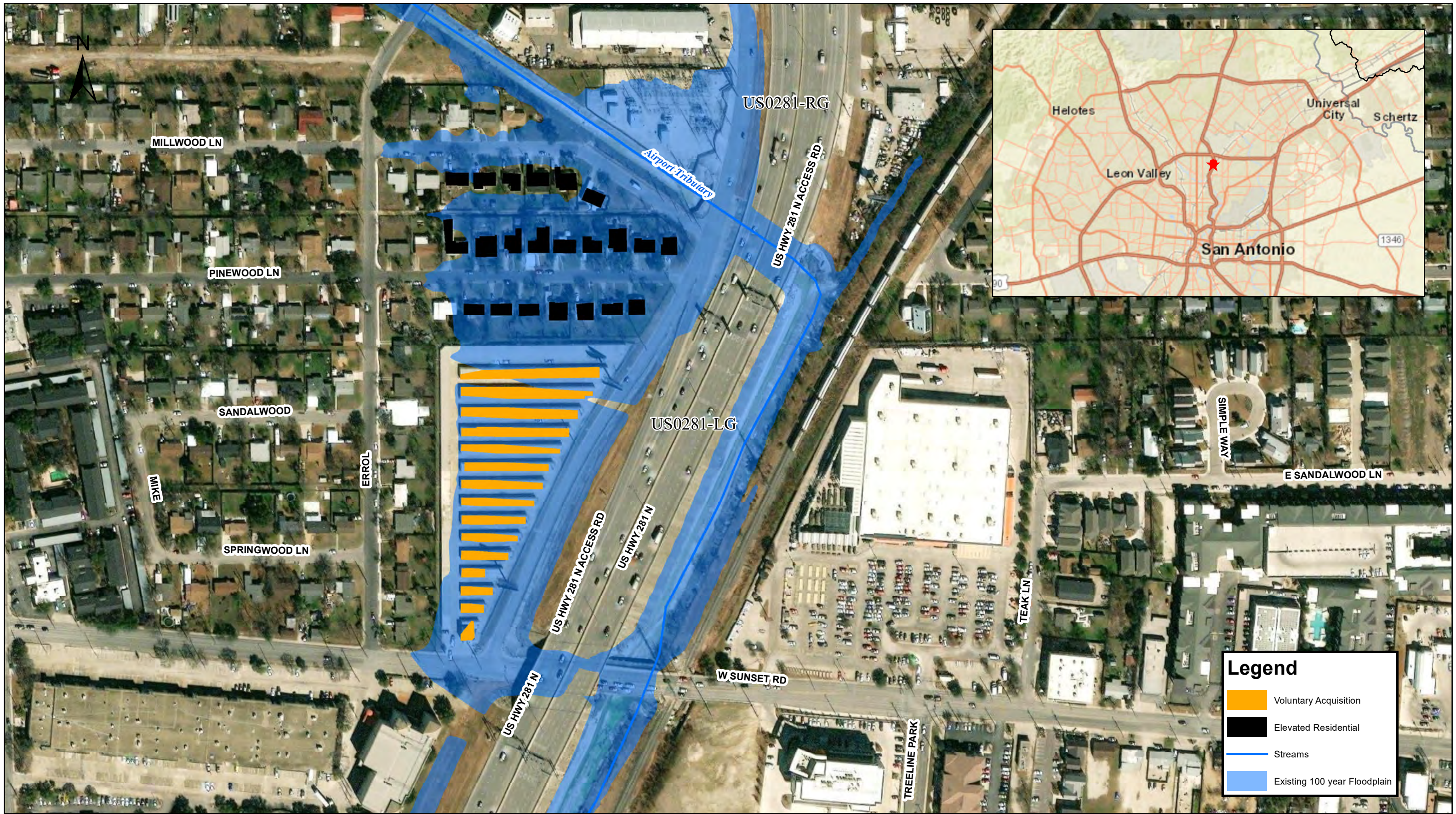
- DRAINAGE COST	\$1,079,560.00
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$161,934.00

TOTAL CONSTRUCTION COST ESTIMATE	\$1,241,494.00
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CONSULTANT FEE (Fee Table plus 5%)	\$211,053.98
CONTINGENCY (10%)	\$21,105.40
CONSTRUCTION CONTINGENCY (10%)	\$124,149.40
RIGHT-OF-WAY (LAND ACQUISITION)	\$19,972,575.00
RIGHT-OF-WAY SURVEY	\$2,500.00
ENVIRONMENTAL	\$0.00

TOTAL PROJECT COST ESTIMATE	\$21,572,877.78
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DESIGN PHASE	\$20,207,234.38
CONSTRUCTION PHASE	\$1,437,963.12





2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/6/2023
Page 1 of 1

Project Name: Damage Center 38 - Olmos Creek Near Montview

FMP ID: 121xxxxxx

Project Sponsor: City of San Antonio

Project Source: Upper San Antonio River Master Plan

Cost Information

Category	Cost
Design	\$260,011
Real Estate	\$0
Environmental	\$0
Construction	\$1,977,911
Total Cost**	\$2,238,000

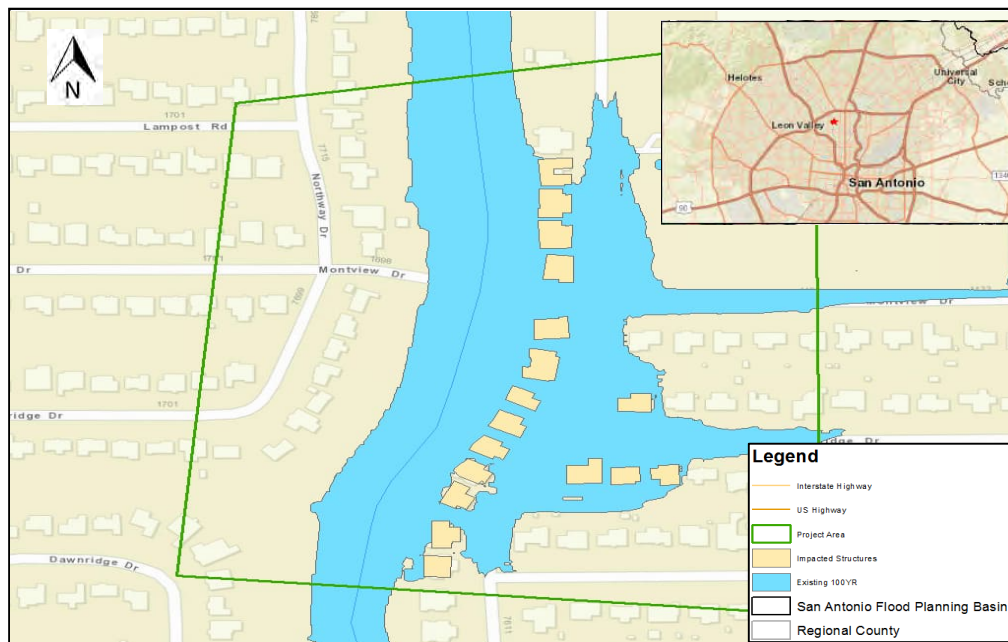
Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
100-year storm	\$ 1,825,823	\$ -
Total Benefits	\$ 3,485,000	
BCA	1.6	

**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	17
Commercial	-	-	-
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	-	-	-
SVI Score	-	-	-



Project Description:

A total of 17 lots are impacted by the 100-year flood. 10 of the 17 lots have a flood depth less than one foot, four lots have a flood depth less than two feet, two lots have a flood depth of less than three feet, and the remaining lot has a flood depth less than four feet. The original scope of the project included 10 affected lots with flooding depths ranging from 0.1 – 0.15 feet. The existing conditions modeled has since been updated since the Upper San Antonio River Master Plan, resulting in a rise in water surface elevations and affecting more structures. The recommended improvement in the Upper San Antonio River Master Plan for Damage Center 38 included flood proofing and elevating the affected structures. This proposed project evaluated elevating the inundated structures.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 38 - Olmos Creek Near Montview
FMP ID: -----
Project Sponsor: City of San Antonio
Date: 2/9/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan, Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. The Damage Center 38: Olmos Creek Near Montview, FME ID 121000081, from the Upper San Antonio River Master Plan (USRMP) was further developed during Task 12. The sponsor for this project is the City of San Antonio.

This damage center is between Jackson Keller Road and West Avenue just downstream of the confluence of Rock Creek and Olmos Creek. The area consists of primarily single-family residential properties. Robert E. Lee High School is just north of Loop 410 in the Castle Hills area. The flooding source for this damage center is Olmos Creek. Flooding occurs on the left overbank and begins just upstream of Montview. The Task 12 work that was completed for the Damage Center 38 project was an update to the cost estimate, impact analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

A total of 17 lots are impacted by the 100-year flood. 10 of the 17 lots have a flood depth less than one foot, four lots have a flood depth less than two feet, two lots have a flood depth of less than three feet, and the remaining lot has a flood depth less than four feet. The original scope of the project included 10 affected lots with flooding depths ranging from 0.10 – 0.15 feet. The existing conditions model has been updated since the USRMP, resulting in a rise in water surface elevations and affecting more structures. The recommended improvement in the USRMP for Damage Center 38 included flood proofing and elevating the affected structures. Elevating the inundated structures was the chosen improvement, as it provides a greater benefit by raising the structure above the base flood elevation.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated the project construction cost was \$407,554 in the USRMP. A new cost estimate was performed to account for the additional flood depth and homes in the floodplain. The costs for elevating structures ranged from \$43-\$45 per square foot depending on the height the structures were elevated. The costs for elevating were taken from Appendix E of the USACE Analysis of Nonstructural Committee Assessment. These costs were combined with additional project costs (Design, Permitting, Project Management, etc.) resulting in a project cost of \$2,238,000. At this time, funding for the project has not been identified or approved. The cost could be reduced if all 17 structures are not elevated. Structures that have a flood depth of less than three feet could be floodproofed which would significantly reduce the overall construction cost; however, floodproofing may be less effective at mitigating flood insurance requirements compared to elevating.

PROPOSED PROJECT BENEFITS

Elevating the structures would eliminate them from the effective FEMA floodplain for the 100-year storm. If structures are to be floodproofed instead of elevated, they will not be removed from the floodplain and flood insurance would still be required per the NFIP regulations.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 38: Olmos Creek Near Montview
FMP ID: 121xxxxxx
Project Sponsor: City of San Antonio
Date: 2/9/2023

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. In addition, assumptions were used from FEMA's *Update to "Cost-Effectiveness Determinations for Acquisitions and Elevations in Special Flood Hazard Areas Using Pre-Calculated Benefits" Memorandum*

The 100-year benefits that were evaluated for this project include residential buildings. The resulting benefit cost analysis was 1.6. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB CA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
100 - year storm	\$1,825,823	\$0
Total Benefits from BCA Toolkit	\$3,485,000	
Other Benefits (Not Recreation)	\$0	
Recreation Benefits	-	
Total Costs	\$2,164,794	
Net Benefits	\$1,320,206	
Net Benefits with Recreation	\$1,320,206	
Final BCR	1.6	
Final BCR with Recreation	1.6	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

A total of 17 structures were found to be impacted in this project area. The proposed improvements, while providing benefit to the structures, do not have an impact on the floodplain. See Exhibit 1 for elevated structures.

The following table summarizes the total amount of impacted structures in each storm (proposed count is assuming all structures are elevated).

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 38: Olmos Creek Near Montview
FMP ID: 121xxxxxx
Project Sponsor: City of San Antonio
Date: 2/9/2023

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
100	17	0	-17

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required.

Utilities Coordination:

Utility coordination could be required for homes to be elevated.

Permitting/Environmental:

No

Stakeholder coordination:

Property owners are the only stakeholders for this project. Elevating or floodproofing would require permission from the property owners.

MITIGATION OF RISKS

Utility Coordination:

Coordination should occur early with utilities to determine level of effort to accommodate elevating structures.

Stakeholder Coordination:

Coordination and permitting process should be started early on with property owners to avoid schedule delays. Accommodations will have to be considered for property owners when the buildings might be inaccessible.

NATURE BASED SOLUTION CONSIDERATION

Nature based solutions were not considered for this project.

INTERRELATED PROJECTS

There are no interrelated projects with this project.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Damage Center 1: Project 1A, B, C
Project Sponsor:	City of San Antonio
Firm Developing:	Halff
Date Developed:	2/10/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

- DRAINAGE COST	\$1,484,929.00
- TREE PRESERVATION (2%)	\$0.00
- LANDSCAPING (10%)	\$0.00
- BOND AND INSURANCE (3%)	\$44,547.87
- BARICADES (3%)	\$0.00
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	\$0.00

TOTAL CONSTRUCTION COST ESTIMATE	\$1,529,476.87
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ENGINEER FEE (Fee Table plus 5%)	\$260,011.07
ENGINEER CONTINGENCY (10%)	\$0.00
CONSTRUCTION CONTINGENCY (10%)	\$0.00
PERMIT REQUIREMENT COSTS	\$0.00
RIGHT-OF-WAY (LAND ACQUISITION)	\$0.00
RIGHT-OF-WAY SURVEY	\$0.00
ENVIRONMENTAL	\$0.00
MATERIAL TESTING (2% Construction Cost - <\$3M, 1.5% - >\$3M)	\$0.00

TOTAL PROJECT COST ESTIMATE	\$1,789,487.94
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DESIGN PHASE	\$260,011.07
CONSTRUCTION PHASE	\$1,977,910.58





2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/6/2023

Page 1 of 1

Project Name: Damage Center 40-San Antonio River DS Reach near Roosevelt

FMP ID:

Project Sponsor: City of San Antonio

Project Source: Upper San Antonio River Master Plan

Cost Information

Category	Cost*
Design	\$308,000
Real Estate	\$3,213,930
Environmental	\$0
Construction	\$3,225,658
Total Cost**	\$6,748,000

*Costs are using 2020 prices

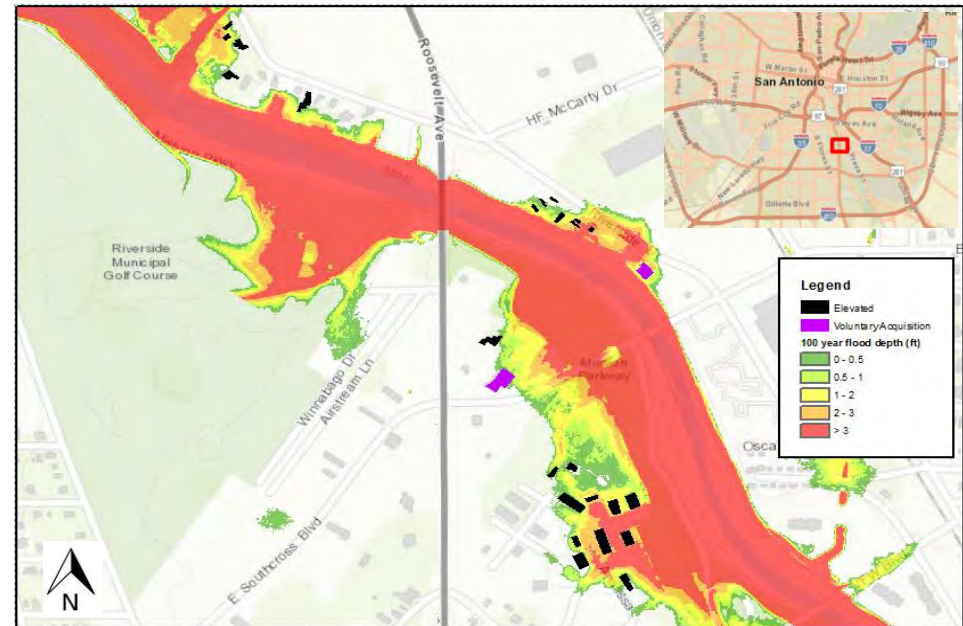
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
25-year storm	\$ 137,627	-
50-year storm	\$ 1,454,059	-
100-year storm	\$ 3,483,857	-
Total Benefits	\$ 3,926,000	
BCA	0.7	

Impact Analysis

Post-Project Total Removed	Storm Event		
	25-year	50-year	100-year
Residential	3	5	5
Commercial	1	6	21
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score	-	-	-



Project Description:

Business and residents along the San Antonio River downstream of Mission Road. While some properties were removed from the floodplain after the Mission Reach Ecosystem Restoration project on the river, there are several homes and properties that remain inundated. The original investigation for this project came from the Upper San Antonio River Master Plan. Flooding depths range from 0.05 to 3.41 feet. Damage Center Number 40 considered floodproofing, elevating, and voluntary acquisition. Many assumptions were carried over from the original study. A significant number of the structures within this damage center are multi-family housing and there are two lots owned by the San Antonio Housing Authority. It may not be feasible to elevate these structures; however, there may be the potential to abandon the first floor of the apartment buildings. All residential structures were assumed to be elevated. Commercial businesses were assumed as wet-floodproofed.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 40-San Antonio River DS Reach near Roosevelt
FMP ID: -----
Project Sponsor: City of San Antonio
Date: 3/21/2023

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Damage Center 40-San Antonio River DS Reach near Roosevelt, FME ID 121000079, from the City of San Antonio was expanded on during Task 12. The sponsor for this project is City of San Antonio.

Businesses and residents along the San Antonio River downstream of Mission Road become inundated during the 100-year flood event. While the Mission Reach Ecosystem Restoration project has mitigated flooding in this area, several homes and properties remain inundated. The original investigation for this project came from the Upper San Antonio River Master Plan.

The work completed for the Damage Center 40-San Antonio River DS Reach project was updates to the flood impacts, cost estimate, and Benefit Cost Analysis (BCA), previously studied by San Antonio River Authority (SARA).

PROPOSED PROJECT SCOPE

Flooding depths for structures in the floodplain range from 0.05 to 3.41 feet. The proposed project considered floodproofing, elevating, and voluntary acquisition. Many assumptions were carried over from the original study. A significant number of the structures within this damage center are multi-family housing, of which two lots are owned by the San Antonio Housing Authority. It may not be feasible to elevate these structures; however, there may be the potential to abandon the first floor of the apartment buildings. All residential structures were assumed to be elevated. The smaller commercial businesses were evaluated as wet-floodproofed. The 2 larger commercial businesses were evaluated as voluntary acquisition.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs. Floodproofing and elevating costs were based off information from the U.S. Army Corp of Engineers publication *Raising and Moving Slab-on-Grade House with Slab Attached*.

The estimated project cost for the proposed project is \$6,748,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will remove residential structures from the floodplain through elevation, as well as protect multi-family and commercial properties through wet floodproofing for the 100-year flood event.

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. In addition, benefit were determined from FEMA's *Update to "Cost-Effectiveness*

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 40-San Antonio River DS Reach near Roosevelt
FMP ID: 121xxxxxx
Project Sponsor: City of San Antonio
Date: 3/21/2023

Determinations for Acquisitions and Elevations in Special Flood Hazard Areas Using Pre-Calculated Benefits” Memorandum.

The benefits that were evaluated for this project are, residential buildings and commercial buildings. The resulting benefit cost analysis was 0.7. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
10 - year storm	\$137,627	\$0
50 - year storm	\$1,454,059	\$0
100 - year storm	\$4,090,345	\$0
Total Benefits from BCA Toolkit	\$3,926,000	
Other Benefits (Not Recreation)	\$0	
Recreation Benefits	-	
Total Costs	\$5,744,522	
Net Benefits	-\$1,818,522	
Net Benefits with Recreation	-\$1,818,522	
Final BCR	0.7	
Final BCR with Recreation	0.7	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

There are no impacts to the floodplain as this project does not alter the existing conditions in the floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: Damage Center 40-San Antonio River DS Reach near Roosevelt
FMP ID: 121xxxxxx
Project Sponsor: City of San Antonio
Date: 3/21/2023

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
100	26	0	-26

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required, however, property owner coordination will be required as this project involves elevating or flood proofing buildings.

Utilities Coordination:

Utility coordination could be required for homes to be elevated.

Permitting/Environmental:

Only local permitting will be required for elevating structures.

Stakeholder coordination:

Property owners are the only stakeholders for this project. Elevating or floodproofing would require permission from the property owners.

MITIGATION OF RISKS

Utility Coordination:

Coordination should occur early with utilities to determine level of effort to accommodate elevating structures.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with property owners to avoid schedule delays. Accommodations will have to be considered for property owners when the buildings might be inaccessible.

NATURE BASED SOLUTION CONSIDERATION

Acquisition of the commercial facilities would provide 2.56 acres of open space that could be utilized as a community gathering space and offers potential for low impact development and green infrastructure, such as bioswales, extended detention, or vegetated swales.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN PROJECT COST SUMMARY

Project Name:	Old Frio City Road at North Prong Creek LWC Improvements
Project Sponsor:	Bexar County
Firm Developing:	Halff
Date Developed:	3/3/2023
Unit Prices Used:	11/1/2020

CONSTRUCTION COSTS

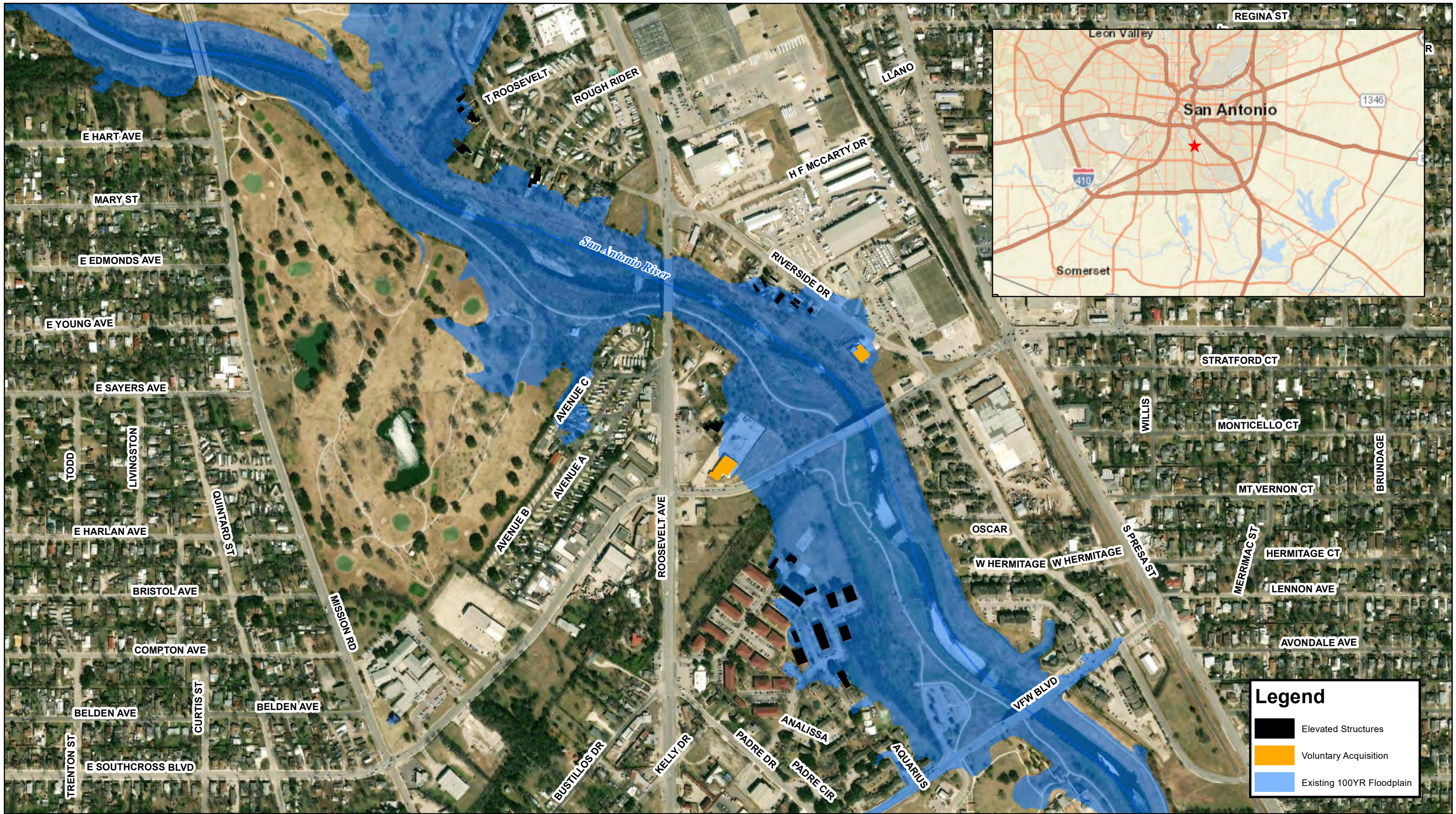
- DRAINAGE COST	\$2,986,720.00
- BOND AND INSURANCE (3%)	\$89,601.60
- MOBILIZATION & PREPARATION OF R.O.W. (5% + 0%)	\$200,000.00

TOTAL CONSTRUCTION COST ESTIMATE	\$3,276,321.60
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ENGINEER FEE (Fee Table plus 5%)	\$300,000.00
PERMIT REQUIREMENT COSTS	\$8,000.00
RIGHT-OF-WAY (LAND ACQUISITION)	\$3,208,930.00
RIGHT-OF-WAY SURVEY	\$5,000.00

TOTAL PROJECT COST ESTIMATE	\$6,798,251.60
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DESIGN PHASE	\$3,521,930.00
CONSTRUCTION PHASE	\$3,225,657.60



PROPOSED FMEs



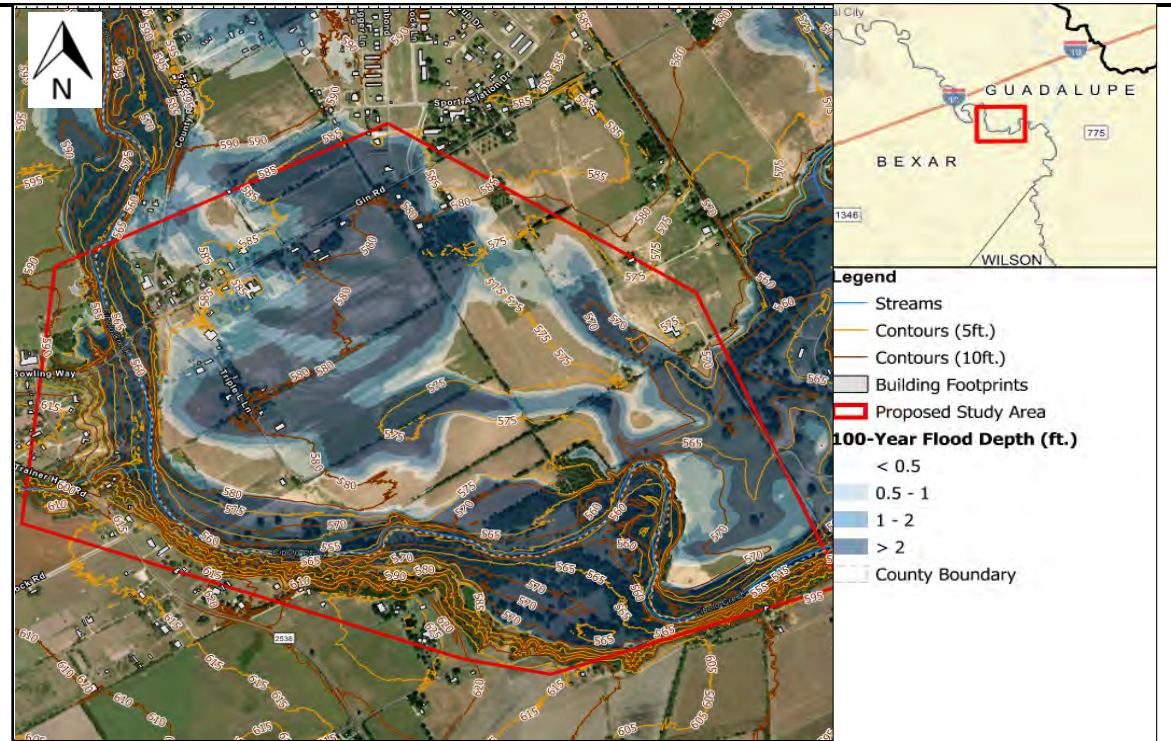
2023 San Antonio Regional Flood Plan Project Summary Sheet

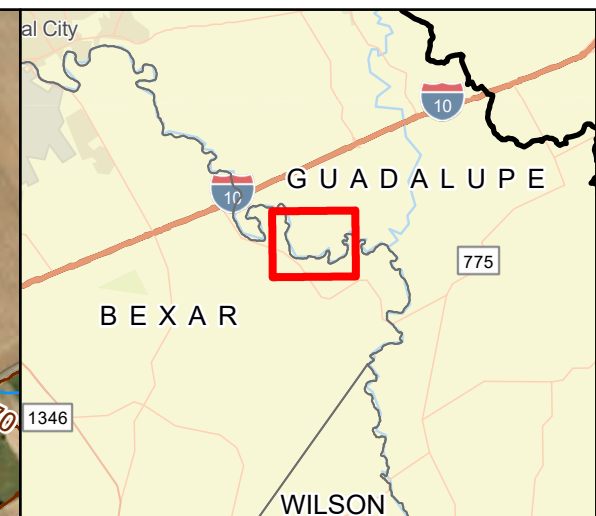
Updated: 4/7/2023
Page 1 of 1

Project Name: Cibolo Creek Spill Study
FME ID: 12XXXXXX
Project Sponsor: Bexar County (Borders Guadalupe County)
Project Source: 2022 Bexar County Drainage Needs
Study Type: Watershed Planning
Project Cost: \$ 48,800
(2020 Prices)

Project Description:

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek. The spill starts 2,500ft upstream of the Bexar Bowling Way Crossing to 2,000ft north of Ullrich Road Crossing. The project cost was developed using FME Planning Cost Estimates found in section 5.2.1.1 of the San Antonio Regional Flood Plan for Watershed Planning - \$40,000/square mile. The study areas covers 1.2 square miles.





Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Building Footprints
- Proposed Study Area

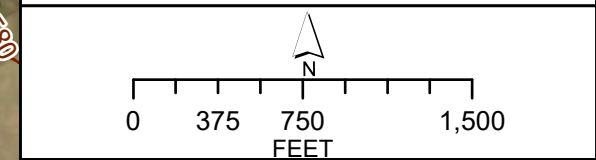
100-Year Flood Depth (ft.)

- < 0.5
- 0.5 - 1
- 1 - 2
- > 2

County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

CIBOLO CREEK
SPILL STUDY
PROPOSED STUDY





REGION
12
SAN ANTONIO REGIONAL FLOOD PLANNING



APRIL 2023



2023 San Antonio Regional Flood Plan Project Summary Sheet

Updated: 4/7/2023

Page 1 of 1

Project Name: Abbott Road and Graytown Road at Martinez Creek Study

FME ID: 12XXXXXX

Project Sponsor: Bexar County

Project Source: 2022 Bexar County Drainage Needs

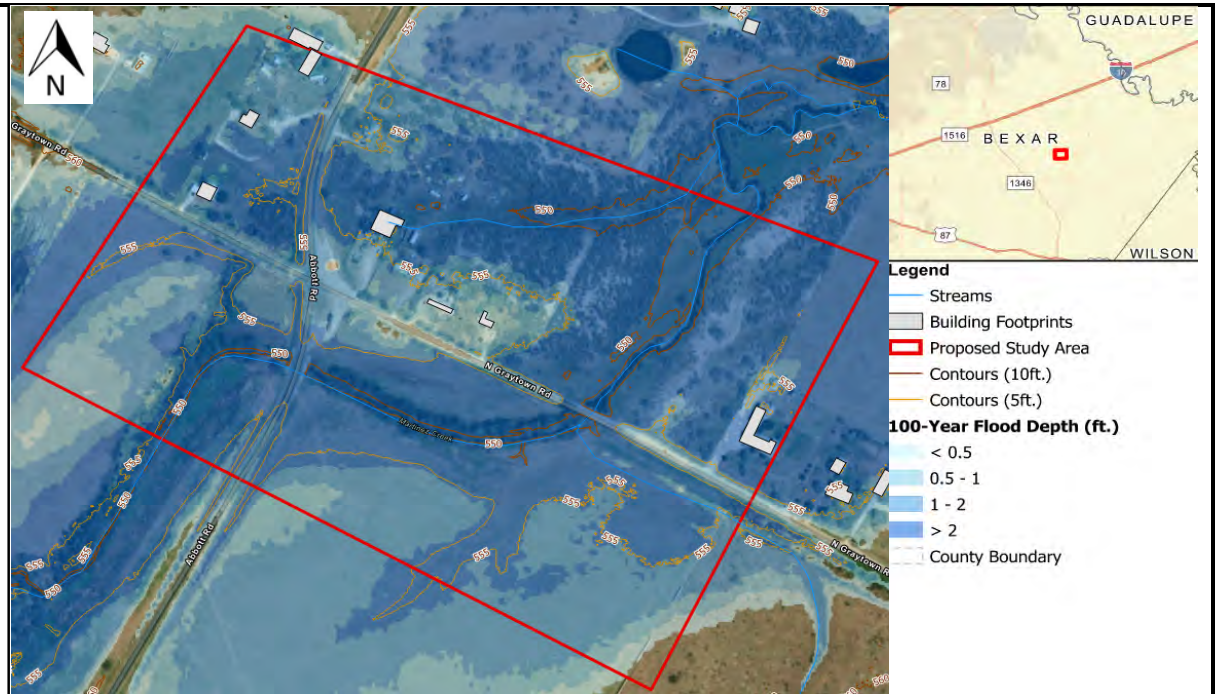
Study Type: Watershed Planning

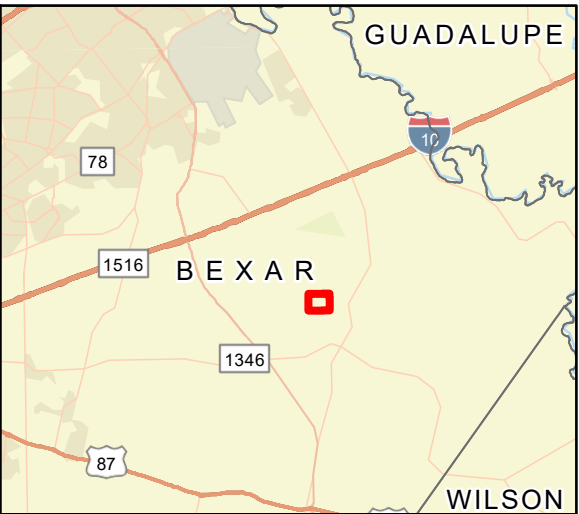
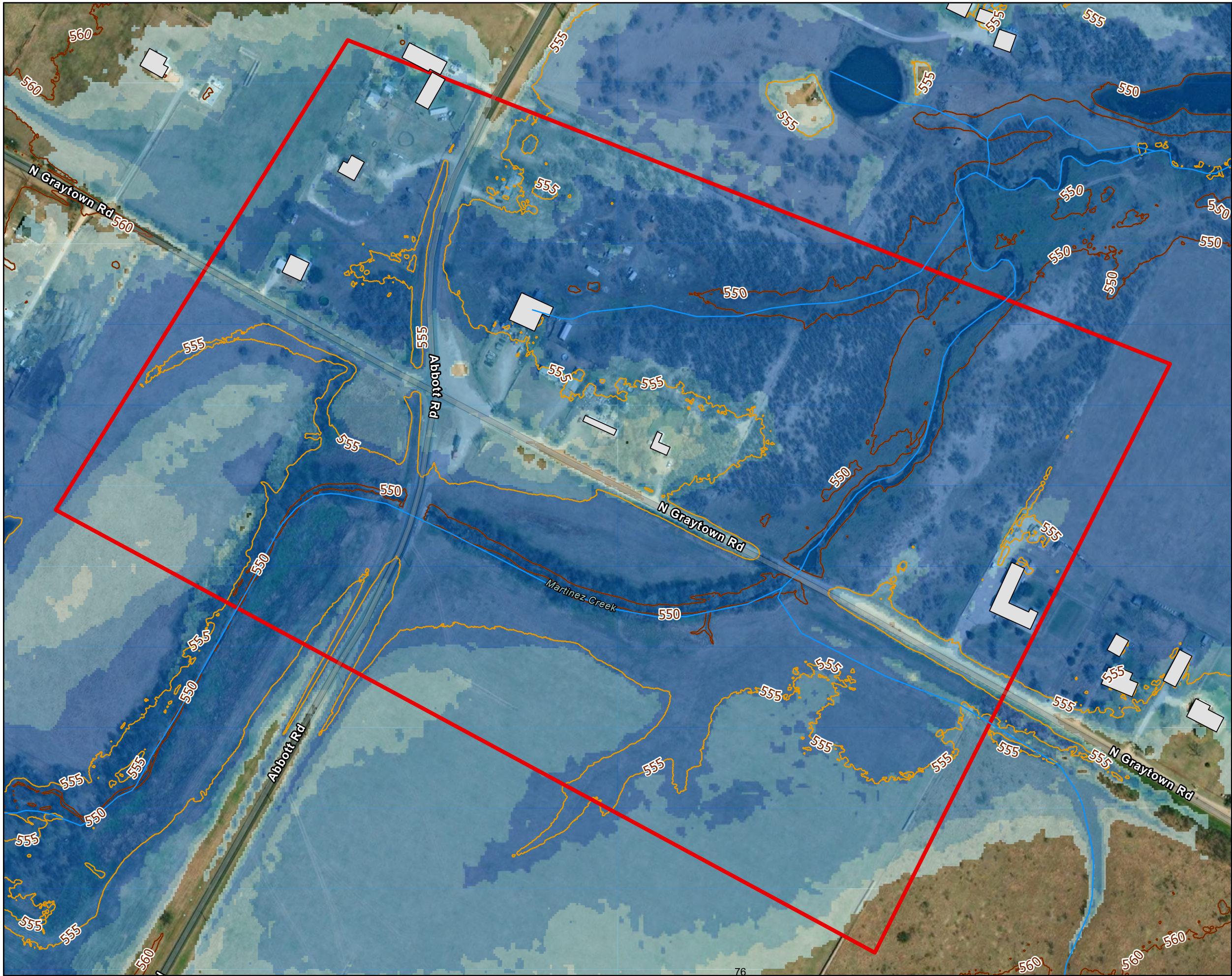
Project Cost: \$ 40,000
(2020 Prices)

Project Description:

During the analysis of crossings Abbott Road and Graytown Road at Martinez Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate alternatives to remove these roads from overtopping. Priority should be placed on this study due to the recent flood-related death that occurred on Graytown Road in 2021.

The project cost was developed using FME Planning Cost Estimates found in section 5.2.1.1 of the San Antonio Regional Flood Plan for Watershed Planning \$40,000/square mile. The study area is assumed to be 1 square mile.





Legend

- Streams
- Building Footprints
- Proposed Study Area
- Contours (10ft.)
- Contours (5ft.)

100-Year Flood Depth (ft.)

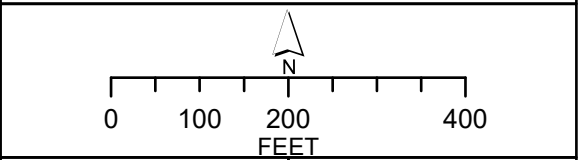
- < 0.5
- 0.5 - 1
- 1 - 2
- > 2

County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AND GRAYTOWN
AT MARTINEZ CREEK B

PROPOSED STUDY





REGION
12
SAN ANTONIO REGIONAL FLOOD PLANNING



APRIL 2023