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2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Bexar Bowling Way at Cibolo Creek Bridge

FMP ID: 12XXXXXX

Project Sponsor: Bexar County and Guadalupe County

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**

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**	

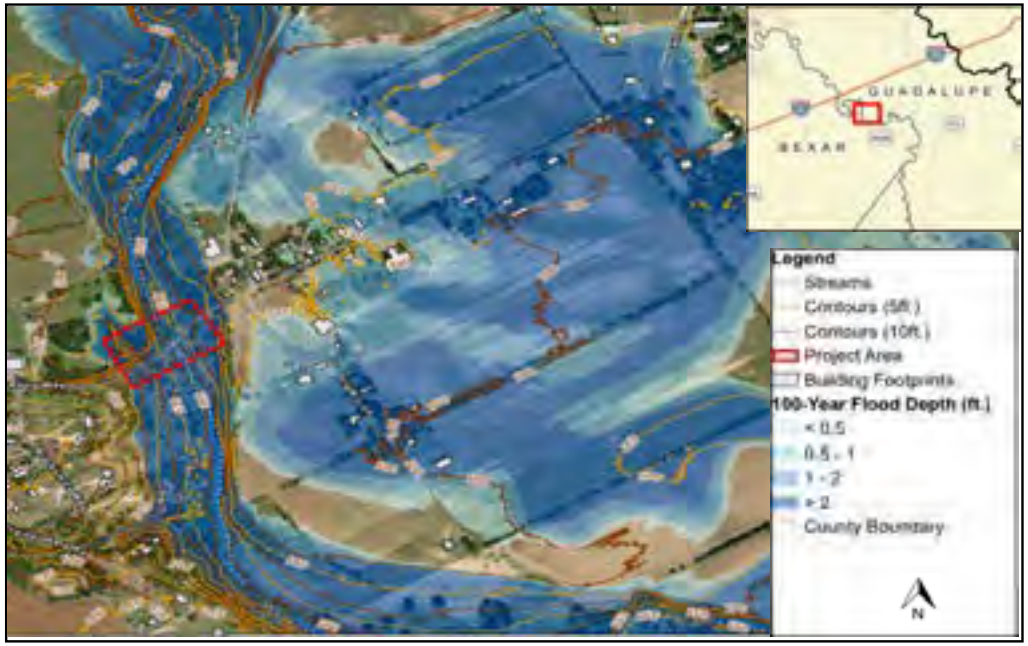
*Costs are using 2020 prices
**Rounded up to the nearest thousand

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 that will require a mussel survey based on requirements by TPWD, an additional $20K 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. The project is on the border of Bexar and Guadalupe County, these counties will need to coordinate on cost and construction phasing.

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 and 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 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 and Guadalupe County.

The problem area is located on the border of Bexar County and 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 school, 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, more discussion on this in the "Interrelated Projects" section. The project is on the border of Bexar and Guadalupe County, these counties will need to coordinate on cost and construction phasing.

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. Bexar and Guadalupe Counties will need to coordinate on cost.

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 and Guadalupe 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, road flooding reduction, and critical facility access. 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	$68,224
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$12,738,927
Net Benefits	-$12,670,703
Net Benefits with Recreation	-$12,670,703
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 and Guadalupe 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 attached exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA. Reduced impacts show lower flooded depths in proposed conditions. The following Table 2 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 and Guadalupe 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.

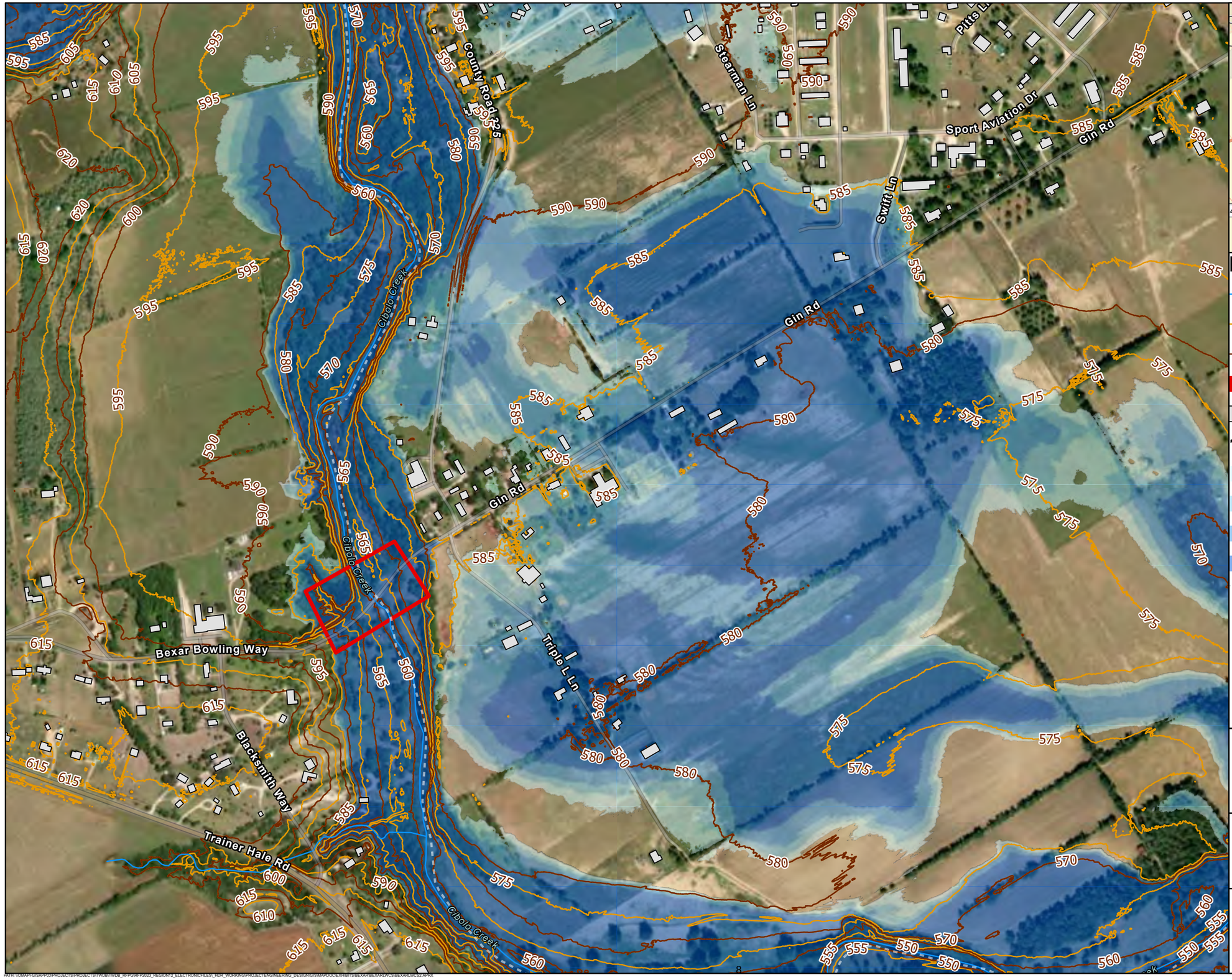
INTERRELATED PROJECTS

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**
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**
DESIGN PHASE	$1,741,295.75
CONSTRUCTION PHASE	$11,510,150.07



Legend

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

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

N

0 250 500 1,000

FEET

REGION 12

HDR

APRIL 2023

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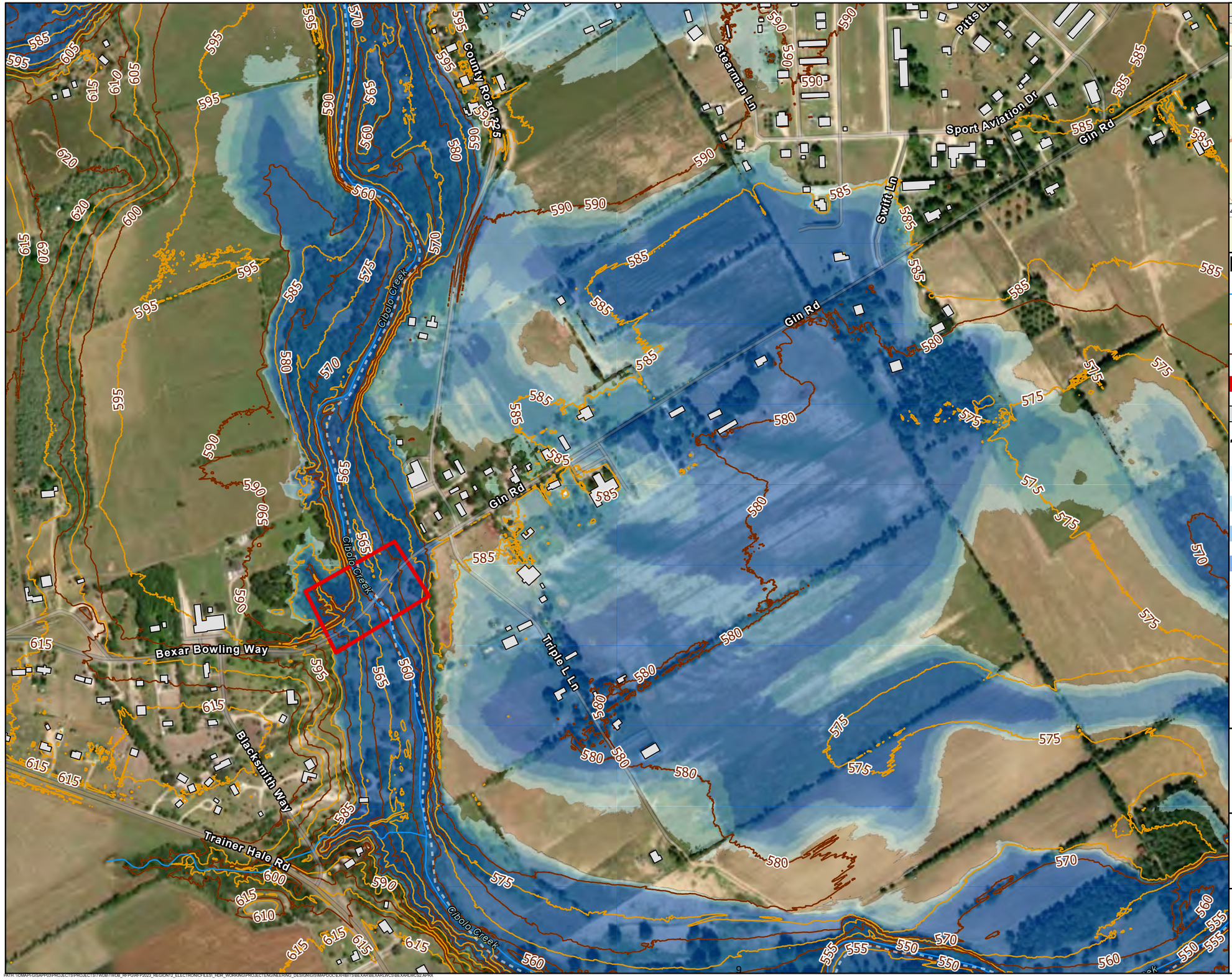

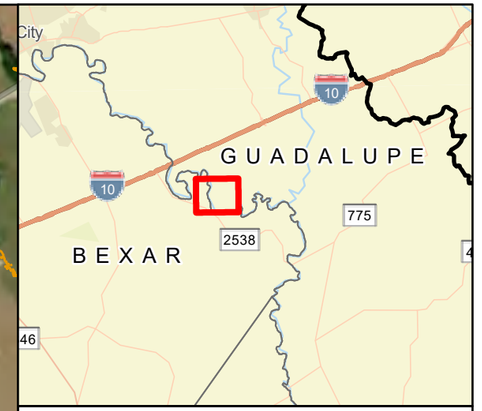

Legend

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

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

N

0 250 500 1,000
FEET

REGION 12

HDR

APRIL 2023

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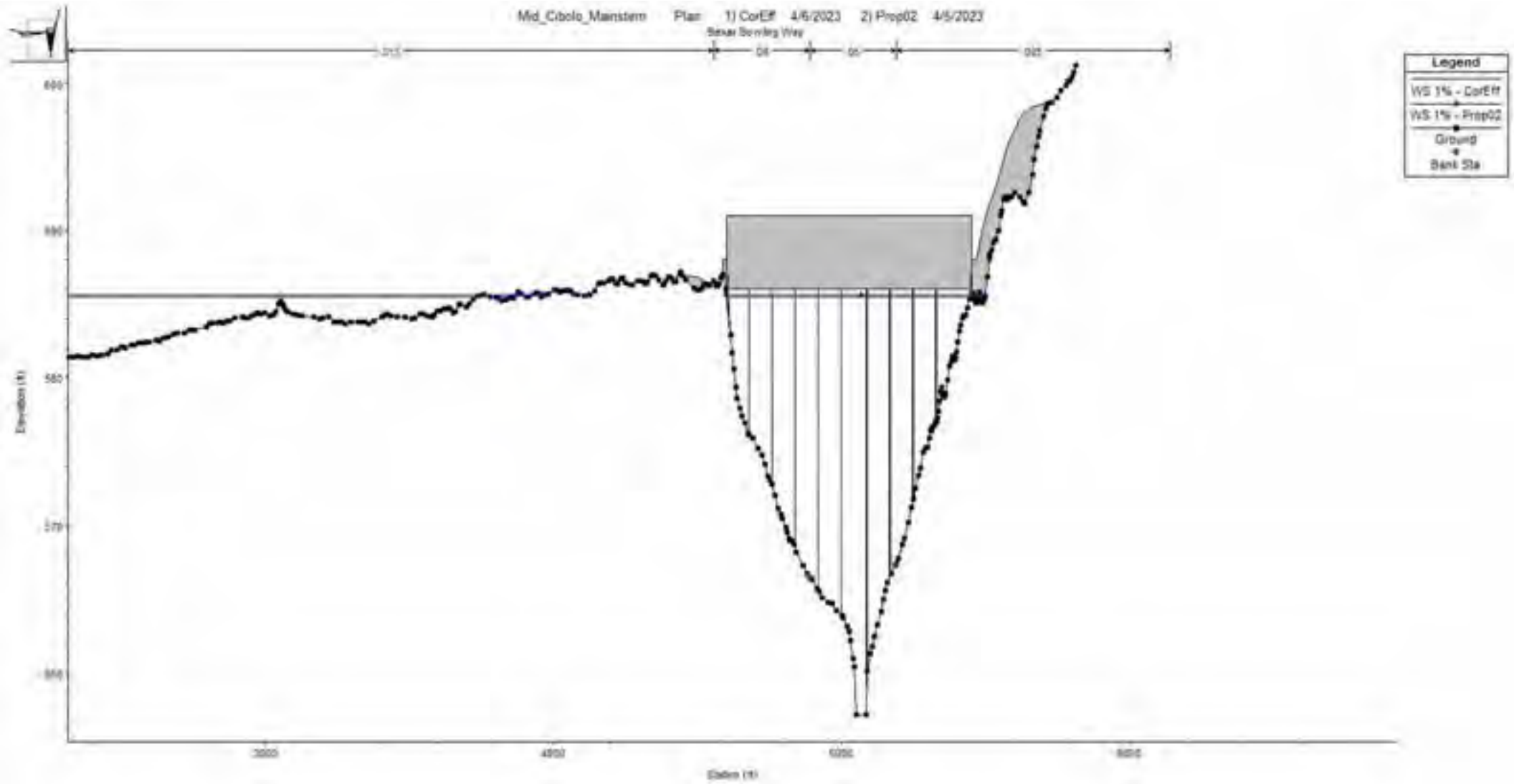

Mid_Cibolo_Mainstem Plan: 1) CorEff 4/6/2023 2) Prop02 4/5/2023
Legend
WS 1% - CorEff
WS 1% - Prop02
Ground
Bank Sta

2023 San Antonio Regional Flood Plan
Project Summary Sheet

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	Original Project	Nature Based Solution
Category	**Cost***	**Cost***
Design	$250,000	$550,000
Real Estate	$22,350,750	$22,350,750
Environmental	$0	$0
Construction	$3,207,831	$4,669,271
Total Cost**	**$25,809,000**	**$27,571,000**

*Costs using September 2020 prices
**Rounded up to the nearest thousand

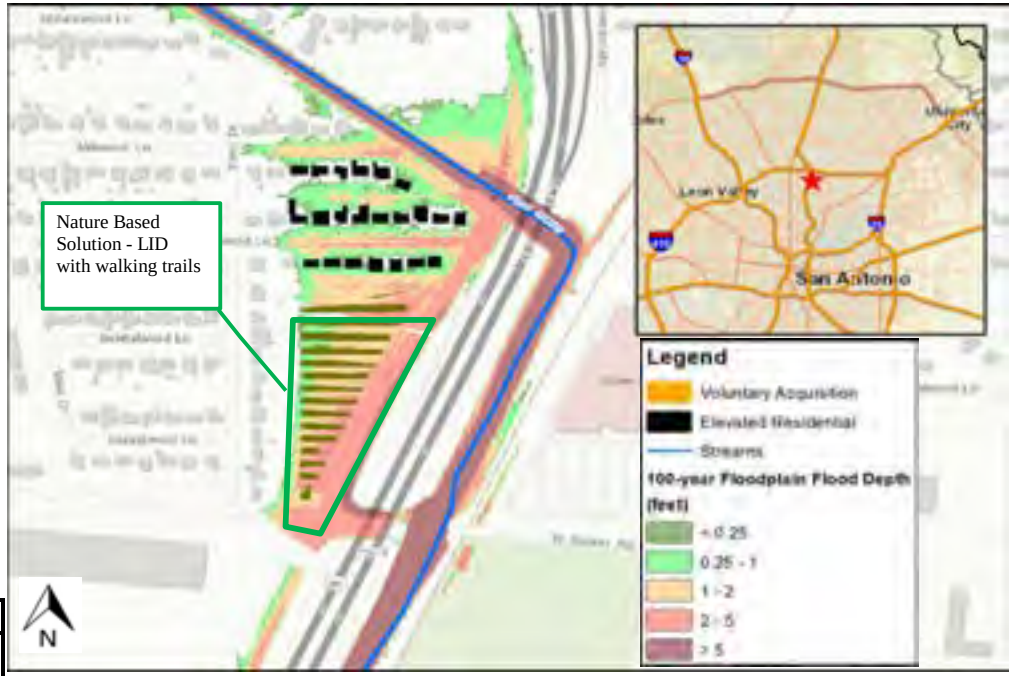
Benefit Cost Analysis (BCA)

	Original Project		Nature Based Solution	
Event Damages	**Baseline**	**Project**	**Baseline**	**Project**
100-year storm	$ 9,355,000	-	$ 9,335,000	-
Total Benefits	**$ 11,448,437**	-	**$ 12,366,592**	-
BCA	**0.5**		**0.5**	

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			-

* 15 buildings located 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.
This project includes the a cost estimate and BCA based on the original project and an additional nature based solution, which proposes turning the 4 acre commercial property into a community space with walking trails and low impact development.

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	**$223,739.50**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$33,560.93**
TOTAL CONSTRUCTION COST ESTIMATE	**$257,300.43**
CONSULTANT FEE (Fee Table plus 5%)	**$51,460.09**
CONTINGENCY (10%)	**$5,146.01**
CONSTRUCTION CONTINGENCY (10%)	**$25,730.04**
RIGHT-OF-WAY (LAND ACQUISITION)	**$22,348,250.00**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$0.00**
TOTAL PROJECT COST ESTIMATE	**$22,690,386.56**
DESIGN PHASE	$22,407,356.09
CONSTRUCTION PHASE	$298,018.78

halff

REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Damage Center 14: Airport Tributary
Existing 100 year Floodplain and Impacted Structures

2023 San Antonio Regional Flood Plan
Project Summary Sheet

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

FME ID: 12XXXXXX

Project Sponsor: Bexar County

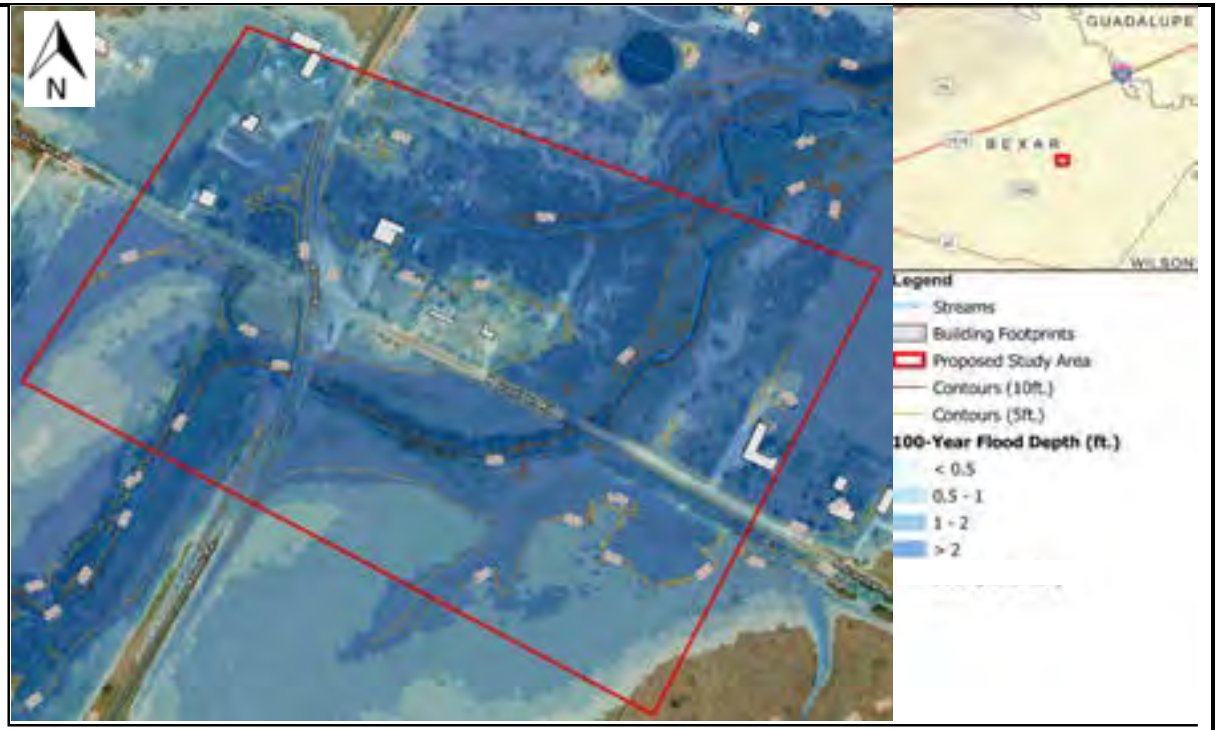
Project Source: 2022 Bexar County Drainage Needs

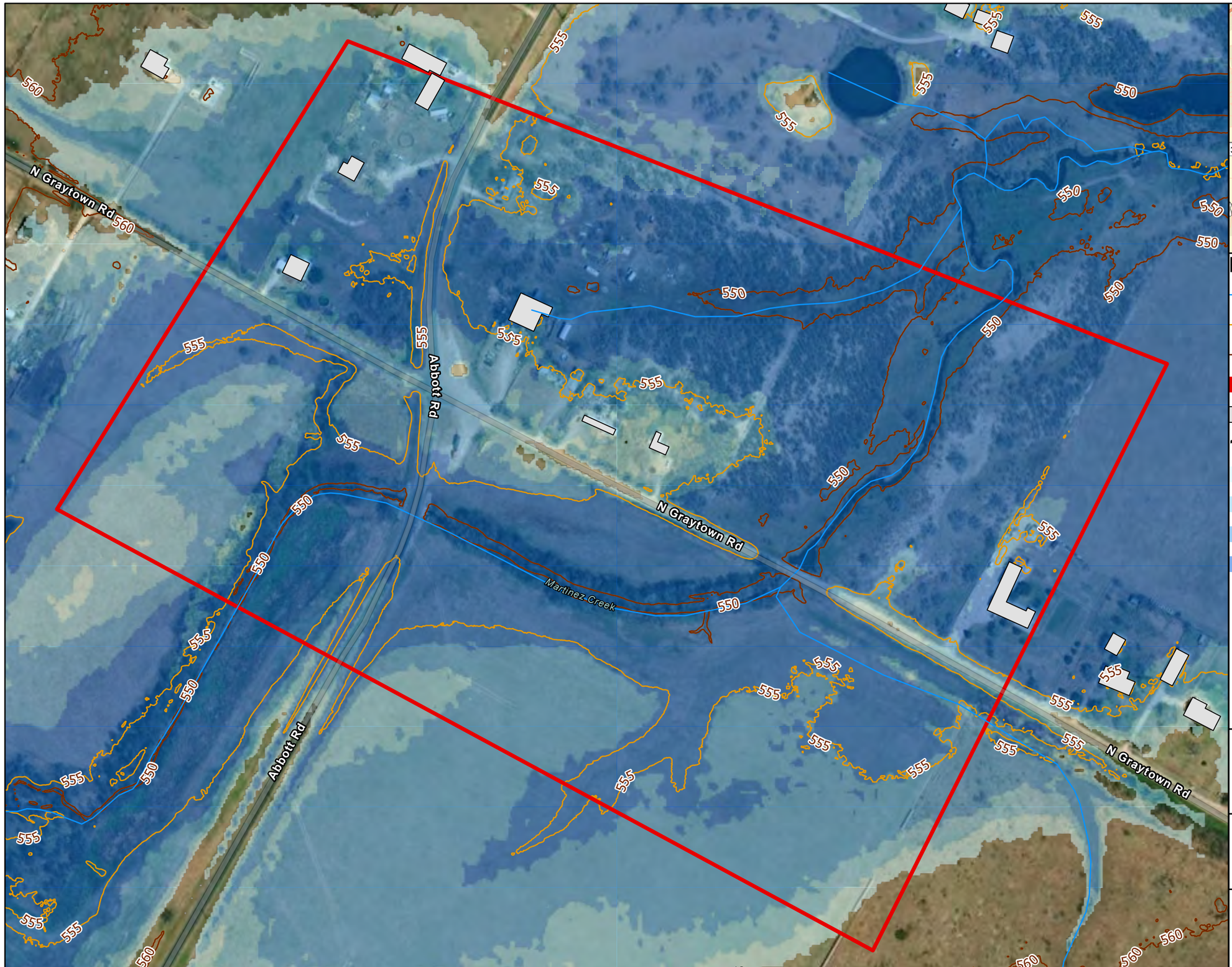
Study Type: Project Planning

Project Cost: (2020 Prices) $ 300,000

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 Project Planning.





Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AND GRAYTOWN AT MARTINEZ CREEK B

PROPOSED STUDY

N

0 100 200 400

FEET

REGION 12

APRIL 2023

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Ullrich Road at Cibolo Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County and Guadalupe County

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	$43,956
Real Estate	$0
Environmental	$0
Construction	$199,799
Total Cost**	**$244,000**

*Costs are using 2020 prices
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

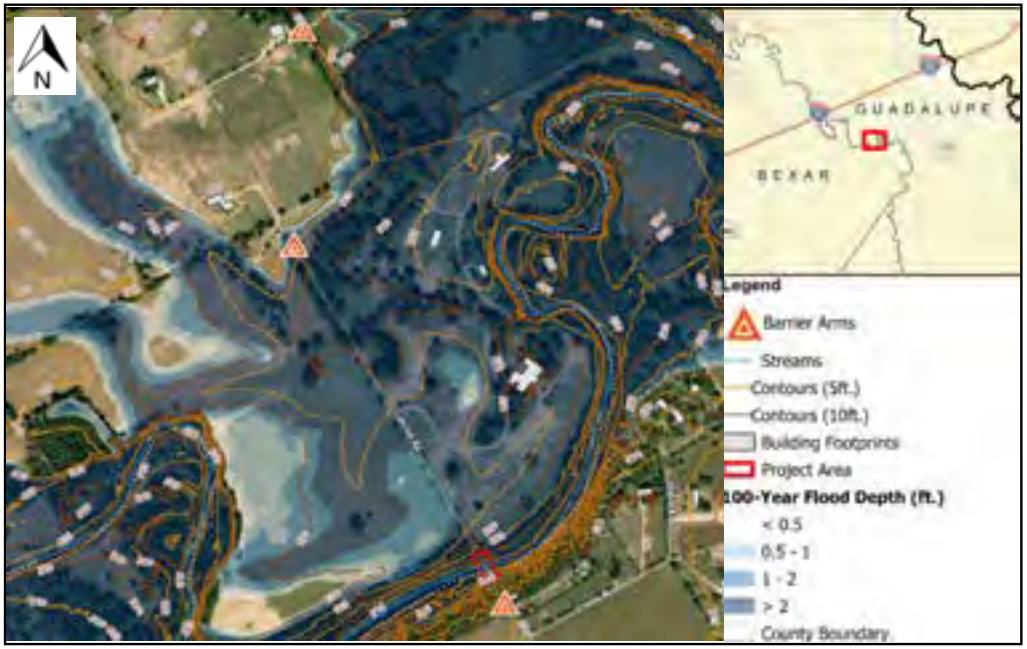
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	
BCA	-	

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. The LWC is on the border of Bexar and Guadalupe County, an automatic barrier arm is anticipated to be placed in each county. It is recommended that these counties coordinate on cost and construction.

Approximately 0.5 miles north of the LWC, Cibolo Creek overtops the roadway at an additional location near the intersection of Ullrich Road and Rio Cibolo Way. Based on best available hydraulic modeling, the floodplain is estimated to overtop this location during the 25-year storm event with a depth of nearly 4-ft. A third single-lane barrier arm is recommended at this location to discourage southbound traffic while still allowing northbound traffic (i.e., from Rio Cibolo Way) to exit.

Other alternatives were considered, such as upgrading the LWC to a bridge. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain.

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.

HDR is working with the TWDB on accounting for barrier arm benefits in the BCA.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Ullrich Road at Cibolo Creek LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County and 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 and Guadalupe 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. The LWC is on the border of Bexar and Guadalupe County, an automatic barrier arm is anticipated to be placed in each county. It is recommended that these counties coordinate on cost and construction.

Approximately 0.5 miles north of the LWC, Cibolo Creek overtops the roadway at an additional location near the intersection of Ullrich Road and Rio Cibolo Way. Based on best available hydraulic modeling, the floodplain is estimated to overtop this location during the 25-year storm event with a depth of nearly 4-ft. This additional flood risk poses a danger to residents near Rio Cibolo Way as well as to southbound vehicles attempting to cross the Ullrich Rd LWC. A third single-lane barrier arm is recommended at this location to discourage southbound traffic while still allowing northbound traffic (i.e., from Rio Cibolo Way) to exit. Potential benefits of this optional barrier arm may be further refined by a more detailed 2D hydraulic flood study upstream of the project area, as discussed below in the "Interrelated Projects" section of this project narrative.

Other alternatives were considered, such as upgrading the LWC to a bridge. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Ullrich Road at Cibolo Creek LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County and Guadalupe County**
Date: **4/7/2023**

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 $244,000, 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. With the project being across two counties, costs will need to be coordinated with the appropriate county.

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.

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 1:

Table 1: 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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Ullrich Road at Cibolo Creek LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County and Guadalupe County**
Date: **4/7/2023**

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.

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.

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 results of a more detailed flood study may influence the locations of the proposed barrier arms (i.e., to ensure they are located outside the floodplain) as well as the potential benefit of the third optional single-lane barrier arm (i.e., based on the degree of floodplain overtopping at Ullrich Road and Rio Cibolo Way).

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

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

CONSTRUCTION COSTS	
- BARRIER ARM GATE ($50,000) X 3	**$150,000.00**
- BOND AND INSURANCE (3%)	**$4,500.00**
- BARICADES (3%)	**$4,635.00**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$22,500.00**
TOTAL CONSTRUCTION COST ESTIMATE	**$181,635.00**
ENGINEER FEE (Fee Table plus 5%)	**$39,959.70**
ENGINEER CONTINGENCY (10%)	**$3,995.97**
CONSTRUCTION CONTINGENCY (10%)	**$18,163.50**
TOTAL PROJECT COST ESTIMATE	**$243,754.17**
DESIGN PHASE	$43,955.67
CONSTRUCTION PHASE	$199,798.50

Legend

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

100-Year Flood Depth (ft.)

- < 0.5
- 0.5 - 1
- 1 - 2
- > 2
- County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ULLRICH ROAD
CIBOLO CREEK
EXISTING CONDITIONS

N

0 187.5 375 750
FEET

REGION 12

HDR

APRIL 2023

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Felix Road at Dry Hollow Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County and Wilson 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)

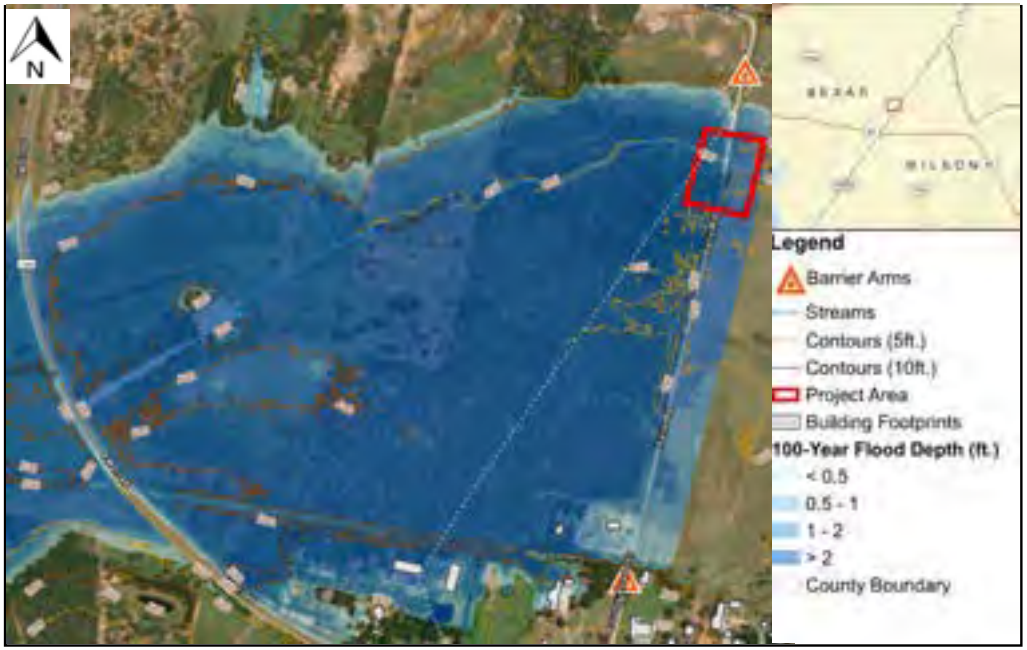
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	
BCA	-	

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	3 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. The LWC is on the border of Bexar and Wilson County, an automatic barrier arm is anticipated to be placed in each county. It is recommended that these counties coordinate on cost and construction.

Other alternatives were considered, such as upgrading the LWC to a bridge. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain.

A more crucial crossing to improve is FM 1346. This crossing is 3,000ft upstream of Felix Road and is overtopped during the 10% flood event. This is the main road for residents and the detour route would take 13mins.

HDR is working with the TWDB on accounting for barrier arm benefits in the BCA.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Felix Road at Dry Hollow Creek LWC Improvements**
FMP ID: **12XXXXXXX**
Project Sponsor: **Bexar County and Wilson County**
Date: **4/4/2023**

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 Felix Road at Dry Hollow 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 and Wilson County.

The problem area is located at the intersection of Felix Road at Dry Hollow Creek. Currently there is a low water crossing (LWC) at Felix Road, composed of one 24" pipe. 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 Felix Road at Dry Hollow 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. The LWC is on the border of Bexar and Wilson County, an automatic barrier arm is anticipated to be placed in each county. It is recommended that these counties coordinate on cost and construction.

Other alternatives were considered, such as upgrading the LWC to a bridge. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain.

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 Felix Road at Dry Hollow 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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Felix Road at Dry Hollow Creek LWC Improvements**
FMP ID: **12XXXXXXX**
Project Sponsor: **Bexar County and Wilson County**
Date: **4/4/2023**

PROPOSED PROJECT BENEFITS

This project will reduce the danger incurred from Felix 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.

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 1:

Table 1: Level of Service Existing Conditions

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	3 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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Felix Road at Dry Hollow Creek LWC Improvements**
FMP ID: **12XXXXXXX**
Project Sponsor: **Bexar County and Wilson County**
Date: **4/4/2023**

NATURE BASED SOLUTION CONSIDERATION

The proposed project does not include nature-based solutions.

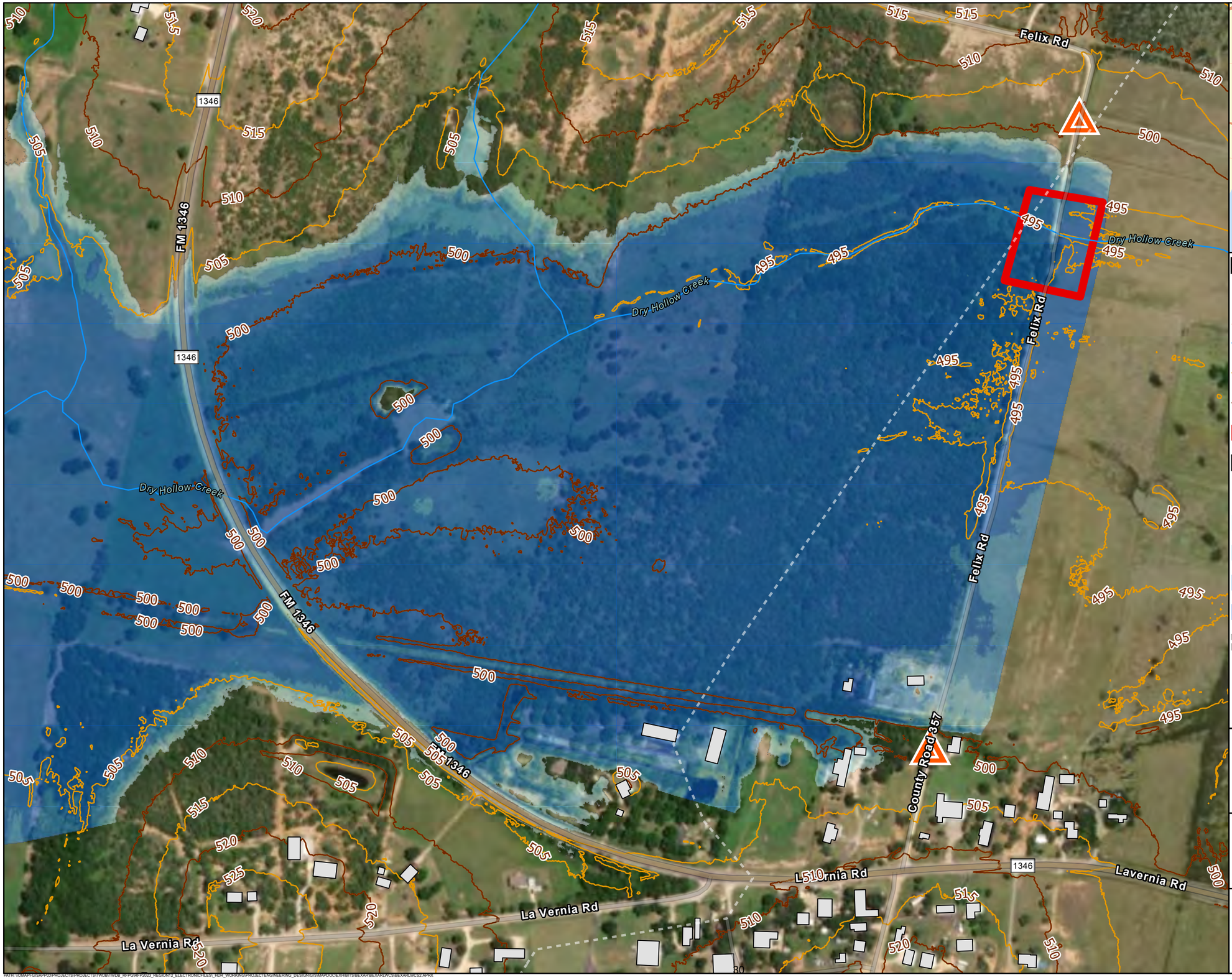
INTERRELATED PROJECTS

FM 1346 is 3,000ft upstream of Felix Road and is overtopped during the 10% flood event. This is the main road for residents and the detour route would take 13mins. Recommend considering a study to improve FM 1346.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Felix Road at Dry Hollow Creek LWC Improvements**
Project Sponsor:	**Bexar County and Wilson 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**
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**
DESIGN PHASE	$30,635.77
CONSTRUCTION PHASE	$133,199.00



Legend

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

100-Year Flood Depth (ft.)

- < 0.5
- 0.5 - 1
- 1 - 2
- > 2
- County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

FELIX ROAD
DRY HOLLOW CREEK
EXISTING CONDITIONS

N

0 150 300 600
FEET

REGION 12

APRIL 2023

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Old Frio Road at North Prong Creek LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County (Border of Medina and Atascosa County)

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	$426,353
Real Estate	$0
Environmental	$10,000
Construction	$2,581,573
Total Cost**	**$3,018,000**

*Costs are using 2020 prices
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 299,403	-
25-year storm	$ 191,618	-
100-year storm	$ 215,570	-
Total Benefits	**$ 280,742**	
BCA	**0.1**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.25	0.25	0.25
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	1.9 ft
Proposed	100-Yr	0

Project Description:

This project will eliminate overtopping of Old Frio City Road and provide 100-year conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation and adding a bridge. The proposed road profile will increase 4ft from existing. The existing five 24" RCP will be replaced with a 250ft wide bridge with a 4ft high opening. This LWC is located in Bexar County but borders both Medina and Atascosa Counties.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Old Frio City Road at North Prong Creek LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **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 FMXs from the Plan dated January 10th, 2023. The Old Frio City Road at North Prong Creek LWC Improvements, 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 Medina and Atascosa Counties. At the intersection of Old Frio City Road and North Prong Creek, just after Unnamed Trib to North Prong Atascosa River confluences with Unnamed Trib 5 in North Prong Creek. Currently there is a low water crossing (LWC) at Old Frio City Road is composed of five 24" RCP. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. When the structure overtops it cuts off a main connection route for the nearby neighborhood.

The Task 12 work that was completed for the Old Frio City Road at North Prong Creek LWC Improvements 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 drainage analysis to determine a feasible solution.

This project will eliminate overtopping of Old Frio City Road and provide 100-Yr conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation and adding a bridge. The proposed road profile will increase 4ft from existing. The existing five 24" RCP will be replaced with a 250ft wide bridge with a 4ft high opening.

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 Old Frio City Road at North Prong Creek LWC Improvements is $3,018,000, 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.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Old Frio City Road and improve the level of service by providing a 100-Yr conveyance design.

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: **Old Frio City Road at North Prong Creek LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

The 10-, 25-, 100-Yr benefits that were evaluated for this project include; LWC improvements. The resulting benefit cost analysis was 0.1. 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	**$299,403**	**$0**
25 - year storm	**$191,618**	**$0**
100 - year storm	**$215,570**	**$0**

Total Benefits from BCA Toolkit	$280,742
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$2,901,203
Net Benefits	-$2,620,461
Net Benefits with Recreation	-$2,620,461
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 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 the 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 attached Exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following Table 2 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	1.9 ft
Proposed	100-Yr	0 ft

(See full list of roadway crossing 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:

No permits will be required.

Stakeholder coordination:

Due to the road improvement and local surrounding community there will be various stakeholders involved in the process.

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:

Old Frio City Road is the main access for several residential properties. Road reconstruction will cause traffic disruptions and inconveniences for locals 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.

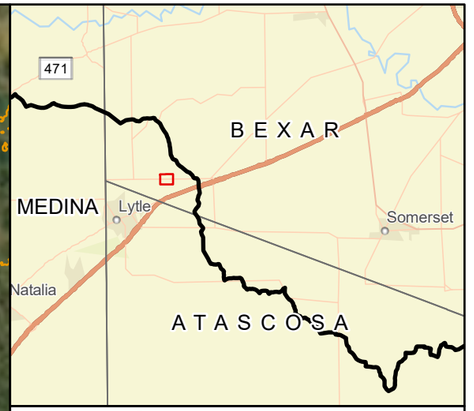
INTERRELATED PROJECTS

There are no interrelated projects.

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	
- STREET COST	**$1,848,080.51**
- LANDSCAPING (3%)	**$55,442.42**
- BOND AND INSURANCE (3%)	**$57,105.69**
- BARICADES (3%)	**$58,818.86**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$285,528.44**
TOTAL CONSTRUCTION COST ESTIMATE	**$2,304,975.91**
ENGINEER FEE (Fee Table plus 5%)	**$380,321.02**
ENGINEER CONTINGENCY (10%)	**$38,032.10**
CONSTRUCTION CONTINGENCY (10%)	**$230,497.59**
DESIGN ENHANCEMENT (0% Construction Costs)	**$0.00**
PERMIT REQUIREMENT COSTS	**$8,000.00**
UTILITY RELOCATION COSTS	**$0.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$0.00**
RIGHT-OF-WAY SURVEY	**$0.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$46,099.52**
TOTAL PROJECT COST ESTIMATE	**$3,017,926.14**
DESIGN PHASE	$436,353.13
CONSTRUCTION PHASE	$2,581,573.02



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

OLD FRIO CITY ROAD
NORTH PRONG CREEK
EXISTING CONDITIONS

N

0 75 150 300
FEET

REGION 12

HDR

MARCH 2023

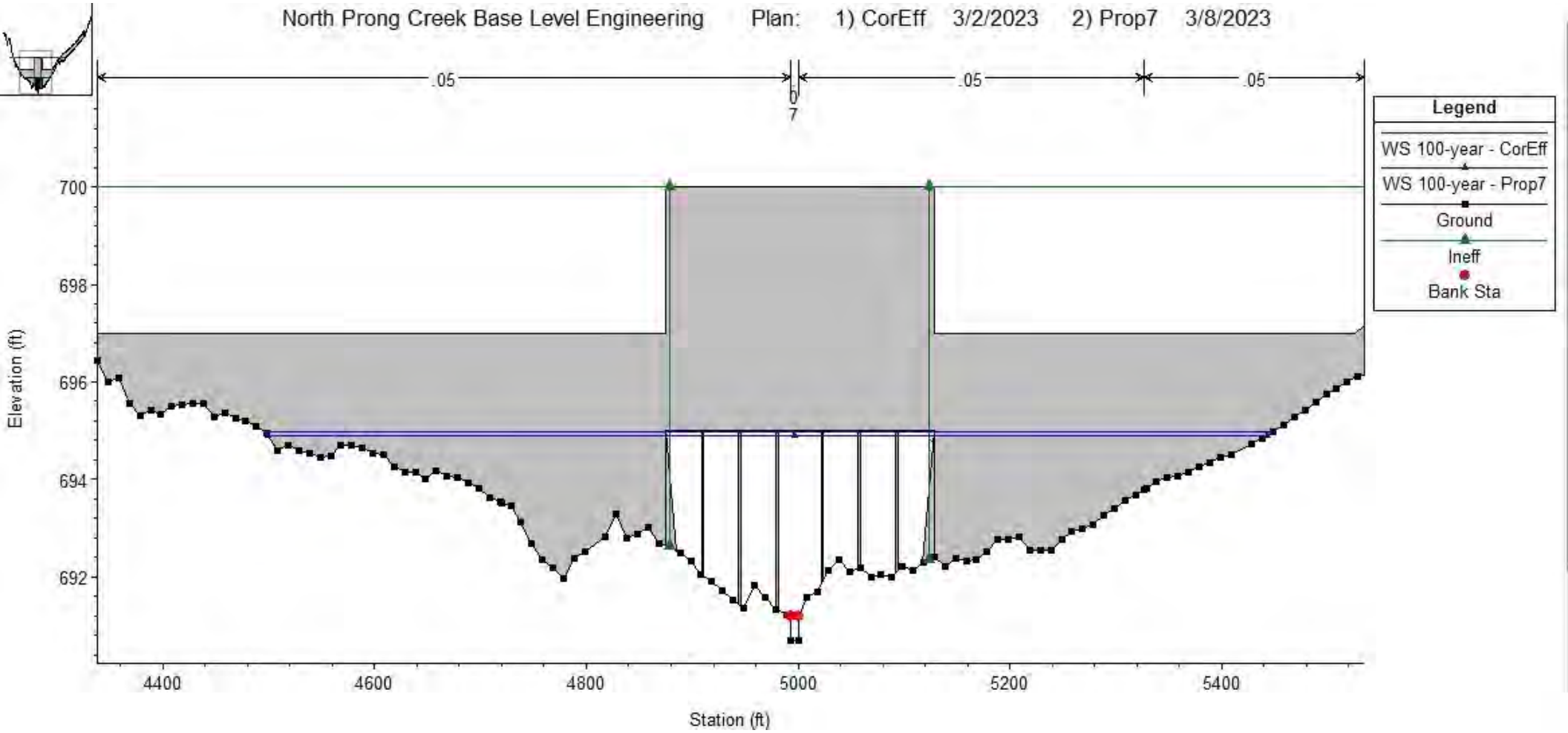
PATH: \\GMAP-GISAPP03\PROJECTS\PROJECTS1\WUBT\WUB_RFP\GRP\2023_REGION12_ELECTRONICFILES_HDR_WORKING\PROJECTENGINEERING_DESIGN\GIS\MAPDOC\EXHIBITS\BEXARBEXARLWC\BEXARLWC52.APRX

2023 SAN ANTONIO REGIONAL FLOOD PLAN

OLD FRIO CITY ROAD
NORTH PRONG CREEK

PROPOSED CONDITIONS

MARCH 2023


North Prong Creek Base Level Engineering
Plan: 1) CorEff 3/2/2023 2) Prop7 3/8/2023
.05
.05
.05
0
7
Legend
WS 100-year - CorEff
WS 100-year - Prop7
Ground
Ineff
Bank Sta
700
698
696
694
692
Elevation (ft)
4400
4600
4800
5000
5200
5400
Station (ft)

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	$748,247
Real Estate	$0
Environmental	$30,000
Construction	$4,689,635
Total Cost**	**$5,468,000**

*Costs are using 2020 prices
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$154,238	-
25-year storm	$231,357	-
100-year storm	$223,628	-
Total Benefits	**$ 253,070**	
BCA	**0.05**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Critical	-	-	-
Flooded Roads (miles)	0.3	0.3	0.3
Others Note	N/A	N/A	N/A
SVI Score			-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	50-Yr Depth Over Road (ft)	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	3.2 ft	3.4 ft
Proposed	50-Yr	0 ft	0.3 ft

Project Description:

This project will eliminate overtopping of Abbott Road and provide 50-year conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation, upgrading culverts, and adding a bridge. The proposed road profile will increase 3ft from existing. The existing six 24" RCP will be replaced with three 5ft x 2ft culverts and the four 48" RCP will be replaced with a 300ft wide bridge with a 5.5ft high opening. Salitrillo Creek is a stream on an inventory that will require a mussel survey based on requirements by TPWD, an additional cost of $20K was added to account for this.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **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 FMXs from the Plan dated January 10th, 2023. The Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) 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 Abbott Road and both creeks Trib A to Salitrillo Creek and Salitrillo Creek. Currently the two low water crossings (LWC) at Abbott Road are composed of six 24" RCP (over Trib A) and four 48" RCP. The LWC's are undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. When the structure overtops it cuts off a main connection route for the nearby neighborhood.

The Task 12 work that was completed for the Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements 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 drainage analysis to determine a feasible solution.

This project will eliminate overtopping of Abbott Road and provide 50-Yr conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation, upgrading culverts, and adding a bridge. The proposed road profile will increase 3ft from existing. The existing six 24" RCP will be replaced with three 5ft x 2ft culverts and the four 48" RCP will be replaced with a 300ft wide bridge with a 5.5ft high opening.

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 Abbot Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements is $5,473,000, 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. Salitrillo Creek is a stream on an inventory that will require a mussel survey based on requirements by TPWD, an additional cost of $20,000 was added to account for this. 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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Abbott Road and improve the level of service by providing a 50-Yr conveyance design.

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

The 10-, 25-, 100-Yr benefits that were evaluated for this project include; LWC improvements. The resulting benefit cost analysis was 0.05. 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	**$154,238**	**$0**
25 - year storm	**$231,357**	**$0**
100 - year storm	**$223,628**	**$0**

Total Benefits from BCA Toolkit	$253,070
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$5,256,404
Net Benefits	-$5,003,334
Net Benefits with Recreation	-$5,003,334
Final BCR	**0.05**
Final BCR with Recreation	**0.05**

IMPACT ANALYSIS

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

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

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 v6.3.1 model, see attached digital submittal for the 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 attached Exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following Table 2 summarizes the level of service pre- and post-project:

Table 2: Level of Service Existing Vs. Proposed

Condition	Level of Service	50-Yr Depth Over Road (ft)	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	3.2 ft	3.4 ft
Proposed	50-Yr	0 ft	0.3 ft

(See full list of roadway crossing 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, Salitrillo Creek is a stream that will require a mussel survey based on requirements by TPWD.

Stakeholder coordination:

Due to the road improvement and local surrounding community there will be various stakeholders involved in the process.

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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

Permitting/Environmental:

Coordination and surveying process should be started early on with TPWD to avoid schedule delays. An additional cost of $20,000 was added to the preliminary environmental assessment to account for the mussel survey.

Stakeholder Coordination:

Abbott Road is the main access for several residential properties. Road reconstruction will cause traffic disruptions and inconveniences for locals 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 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.

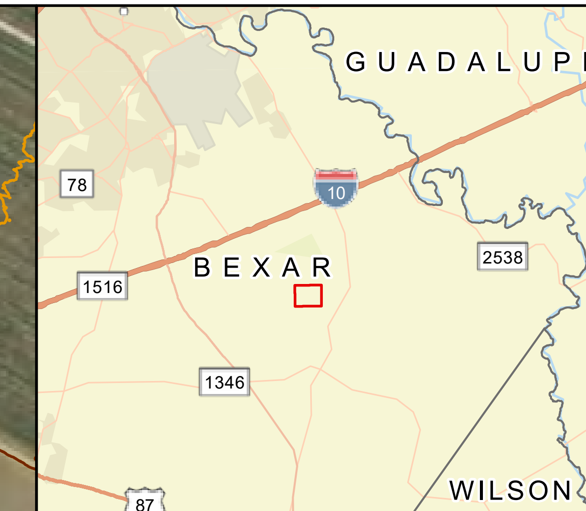
INTERRELATED PROJECTS

There are no interrelated projects.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Abbot Road at Trib A and Salitrillo Creek (CB-23) & (CB-24) LWC Improvements**
Project Sponsor:	**Bexar County**
Firm Developing:	**HDR**
Date Developed:	**3/3/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- STREET COST	**$3,194,125.14**
- DRAINAGE COST	**$178,116.35**
- LANDSCAPING (3%)	**$101,167.24**
- BOND AND INSURANCE (3%)	**$104,202.26**
- BARICADES (3%)	**$107,328.33**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$521,011.31**
TOTAL CONSTRUCTION COST ESTIMATE	**$4,205,950.64**
ENGINEER FEE (Fee Table plus 5%)	**$672,952.10**
ENGINEER CONTINGENCY (10%)	**$67,295.21**
CONSTRUCTION CONTINGENCY (10%)	**$420,595.06**
PERMIT REQUIREMENT COSTS	**$8,000.00**
UTILITY RELOCATION COSTS	**$0.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$0.00**
RIGHT-OF-WAY SURVEY	**$0.00**
ENVIRONMENTAL	**$30,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$63,089.26**
TOTAL PROJECT COST ESTIMATE	**$5,467,882.27**
DESIGN PHASE	$778,247.31
CONSTRUCTION PHASE	$4,689,634.96



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AT TRIB A AND SALITRILLO CREEK (CB-23) & (CB-24)

EXISTING CONDITIONS

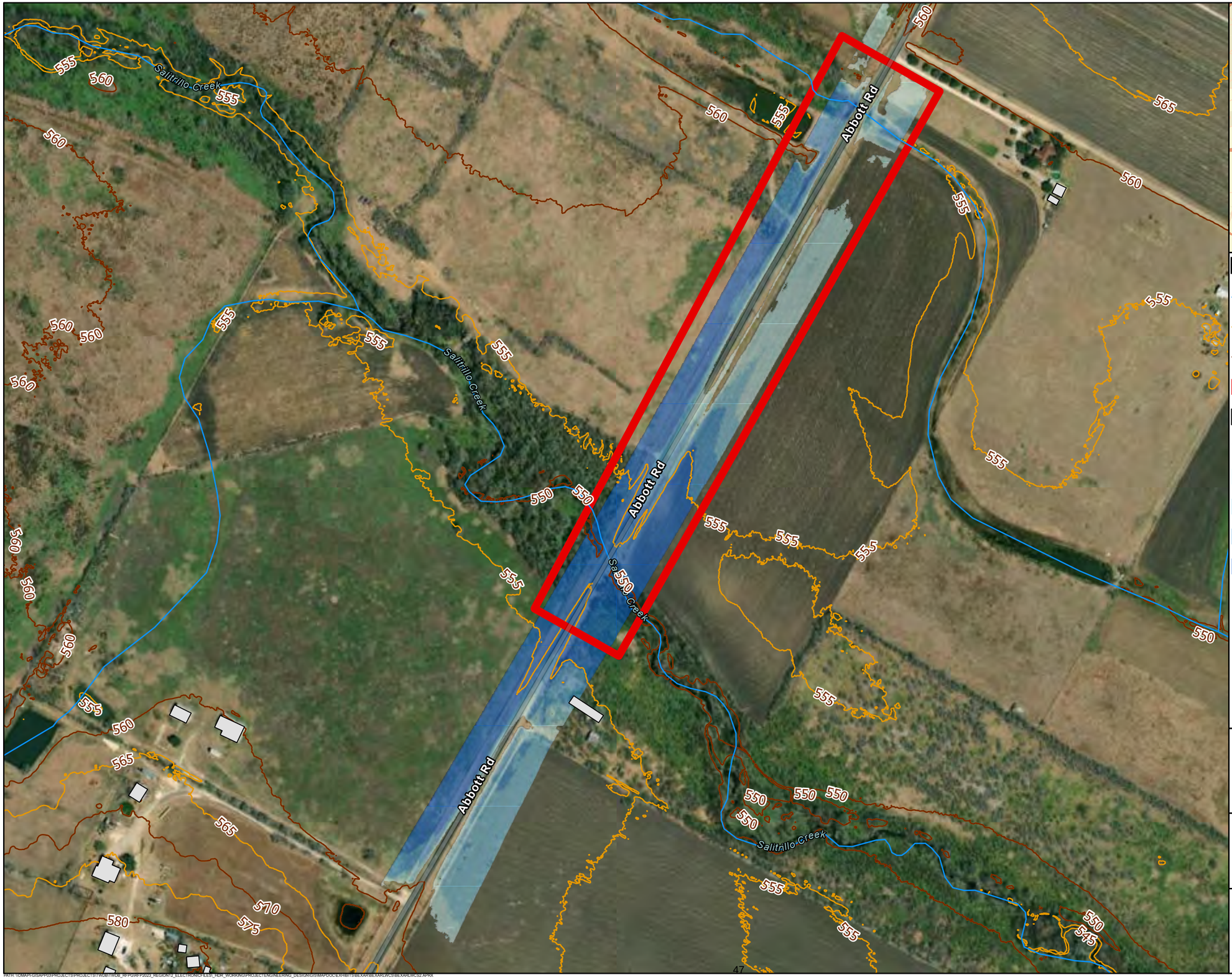
N

0 125 250 500
FEET

REGION 12

HDR

MARCH 2023



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AT TRIB A AND
SALITRILLO CREEK (CB-23) & (CB-24)

PROPOSED CONDITIONS

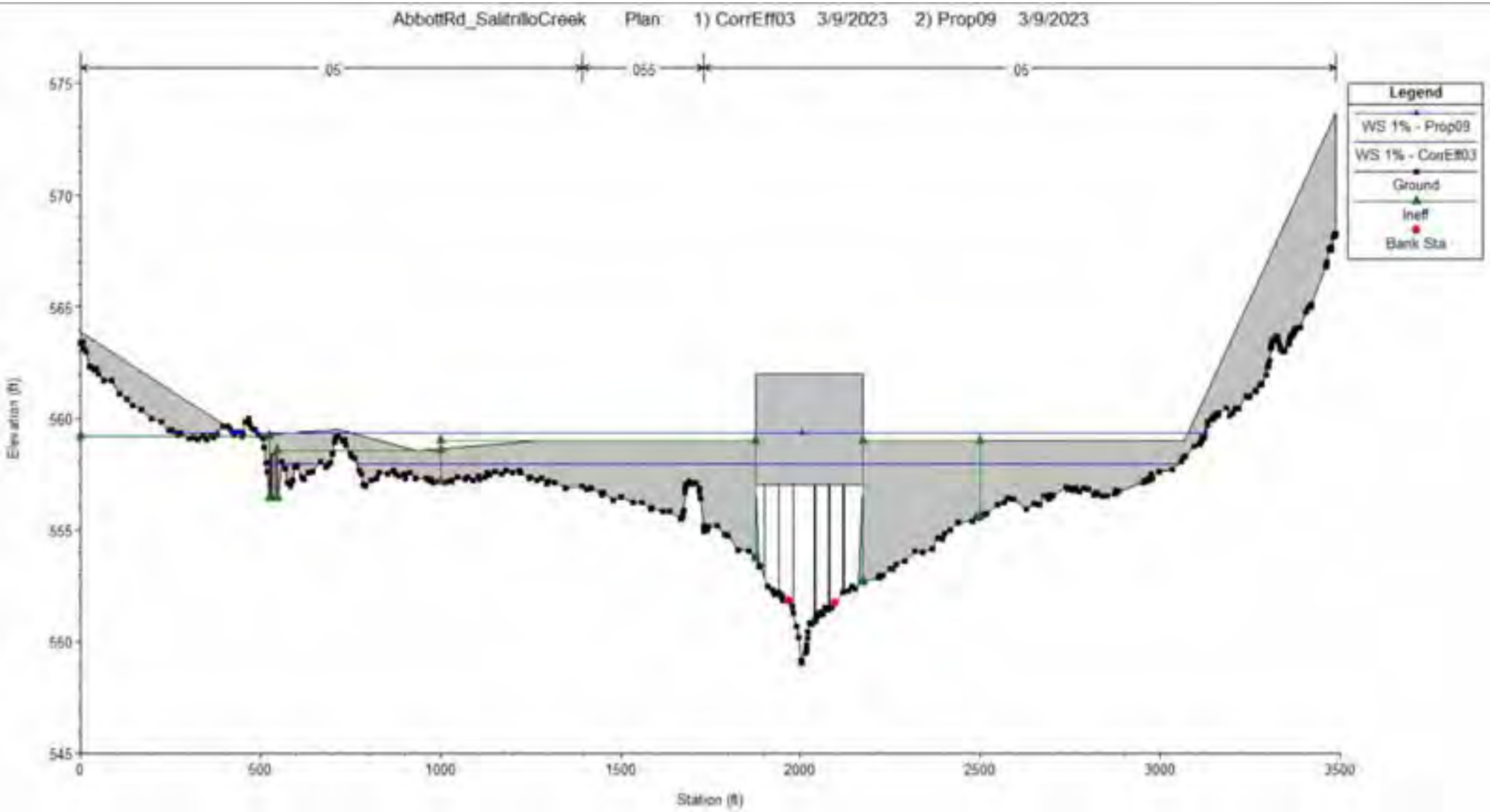
N

0 125 250 500
FEET

REGION 12

HDR

MARCH 2023


AbbottRd_SalitrilloCreek Plan: 1) CorrEff03 3/9/2023 2) Prop09 3/9/2023
05
055
05
Legend
WS 1% - Prop09
WS 1% - CorrEff03
Ground
Ineff
Bank Sta
Elevation (ft)
575
570
565
560
555
550
545
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) LWC Improvements

FMP ID: 12XXXXX

Project Sponsor: Bexar County

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	$121,440
Real Estate	$0
Environmental	$10,000
Construction	$607,908
Total Cost**	**$740,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 112,943	$ -
25-year storm	$ 169,415	$ -
100-year storm	$ 254,122	$ -
Total Benefits	**$ 211,773**	
BCA	**0.3**	

*Costs are using 2020 prices
**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Road (miles)	0.25	0.25	0.25
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	2.1 ft
Proposed	100-Yr	0 ft

Project Description:

This project will eliminate overtopping of Abbott Road and provide 100-year conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading and culvert upgrades. The existing two 36” RCP will be replaced by three 10ft x 3ft reinforced concrete boxes.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **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 FMXs from the Plan dated January 10th, 2023. The Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) 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 Abbott Road and Unnamed Trib 01 to Salitrillo Creek. Currently there is a low water crossing (LWC) at Abbott Road is composed of two 36" RCP. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. When the structure overtops it cuts off a main connection route for the nearby neighborhood.

The Task 12 work that was completed for the Abbott Road and Unnamed Trib 01 to Salitrillo Creek LWC Improvements 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 drainage analysis to determine a feasible solution.

This project will eliminate overtopping of Abbott Road and provide 100-Yr conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading and culvert upgrades. The existing two 36" RCP will be replaced by three 10x3 reinforced concrete boxes.

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 Abbott Road and Unnamed Trib 01 to Salitrillo Creek LWC Improvements is $745,000, 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 eliminate overtopping at Abbott Road 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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

The 10-, 25-, 100-Yr benefits that were evaluated for this project include; LWC improvements. The resulting benefit cost analysis was 0.3. 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	**$112,943**	**$0**
25 - year storm	**$169,415**	**$0**
100 - year storm	**$254,122**	**$0**

Total Benefits from BCA Toolkit	$211,773	
Other Benefits (Not Recreation)	$0	
Recreation Benefits	-	
Total Costs	$710,753	
Net Benefits	-$498,980	
Net Benefits with Recreation	-$498,980	
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.

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 v5.0.7 model, see attached digital submittal for the 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 attached Exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following Table 2 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	2.1 ft
Proposed	100-Yr	0 ft

(See full list of roadway crossing 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:

No permits will be required.

Stakeholder coordination:

Due to the road improvement and local surrounding community there will be various stakeholders involved in the process.

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.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

Stakeholder Coordination:

Abbott Road is the main access for several residential properties. Road reconstruction will cause traffic disruptions and inconveniences for locals 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 CONSIDERATION

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

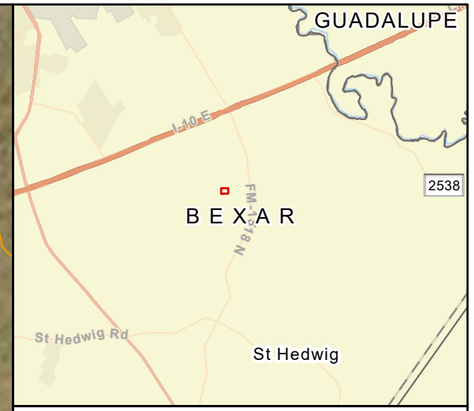
INTERRELATED PROJECTS

There are no interrelated projects.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Abbott Road at Unnamed Tributary 1 to Salitrillo Creek (CB-25) LWC Improvements**
Project Sponsor:	**Bexar County**
Firm Developing:	**HDR**
Date Developed:	**3/3/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- STREET COST	**$12,365.64**
- DRAINAGE COST	**$422,820.11**
- LANDSCAPING (3%)	**$13,055.57**
- BOND AND INSURANCE (3%)	**$13,447.24**
- BARICADES (3%)	**$13,850.66**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$67,236.20**
TOTAL CONSTRUCTION COST ESTIMATE	**$542,775.41**
ENGINEER FEE (Fee Table plus 5%)	**$103,127.33**
ENGINEER CONTINGENCY (10%)	**$10,312.73**
CONSTRUCTION CONTINGENCY (10%)	**$54,277.54**
PERMIT REQUIREMENT COSTS	**$8,000.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$10,855.51**
TOTAL PROJECT COST ESTIMATE	**$739,348.53**
DESIGN PHASE	$131,440.06
CONSTRUCTION PHASE	$607,908.46



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AT UNNAMED TRIBUTARY 1 TO SALITRILLO CREEK (CB-25)

EXISTING CONDITIONS

N

0 25 50 100

FEET

REGION 12

MARCH 2023

Legend

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

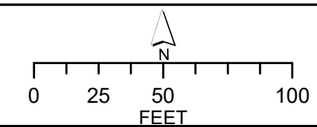
100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

ABBOTT ROAD AT UNNAMED TRIBUTARY 1 TO SALITRILLO CREEK (CB-25)

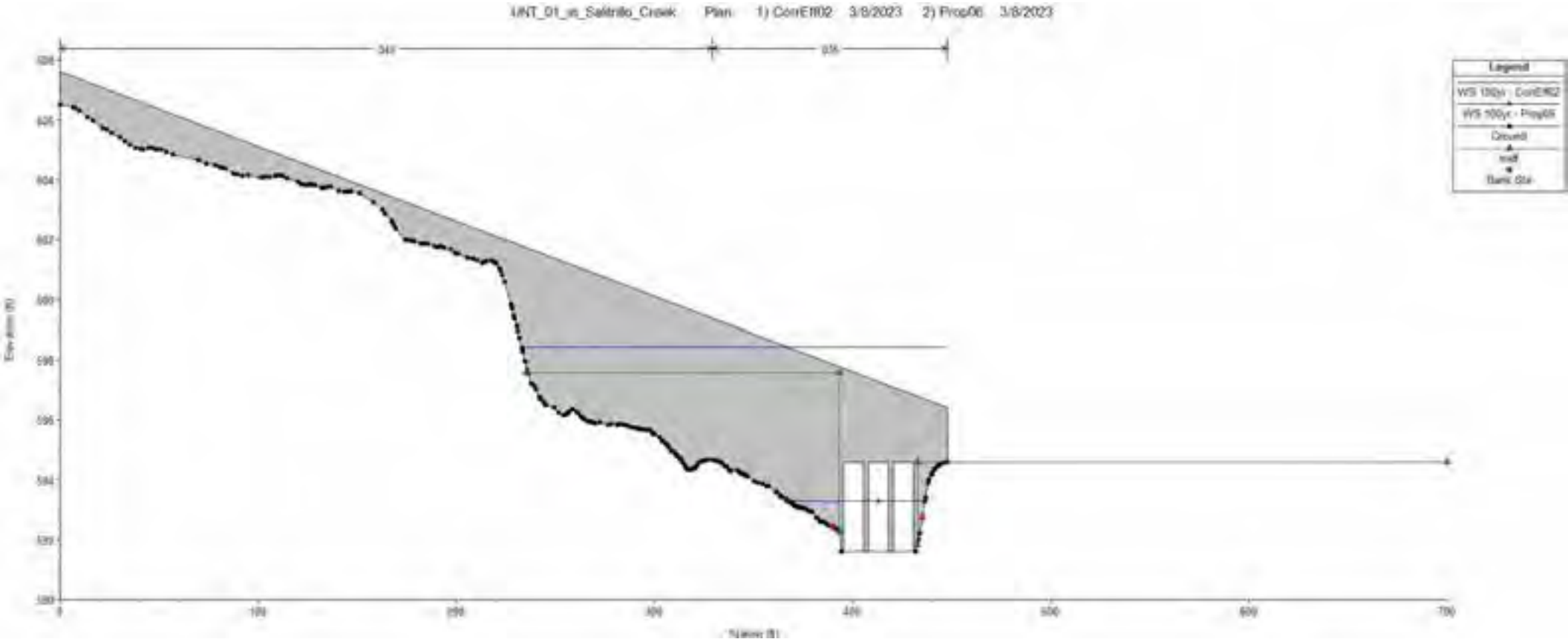
PROPOSED CONDITIONS



REGION 12

HDR

MARCH 2023


UNT_01_in_Saltrillo_Creek Plan: 1) ConrEff02 3/8/2023 2) Prop06 3/8/2023
340
65
Legend
WS 100yr : ConrEff02
WS 100yr : Prop06
Ground
Bank Sta
0
100
200
300
400
500
600
700

2023 San Antonio Regional Flood Plan
Project Summary Sheet

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)

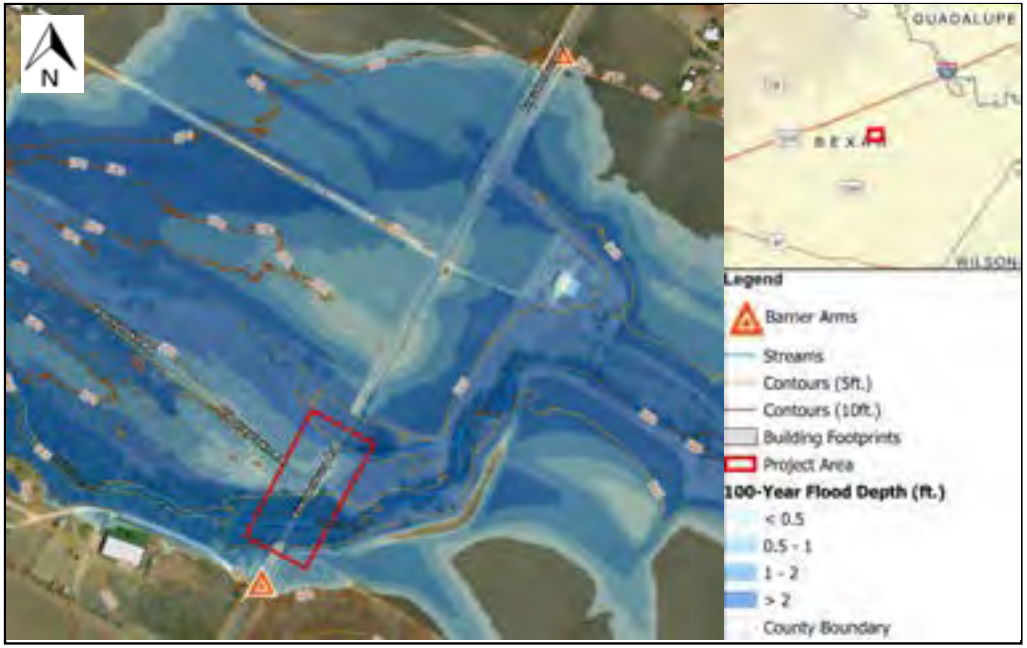
Event Damages	Baseline	Project
10-year storm	-	-
25-year storm	-	-
100-year storm	-	-
Total Benefits	-	
BCA	-	

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	1-3 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 as upgrading the LWC to two 250ft span bridges and six 6ft x 5ft concrete boxes. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain. HDR is working with the TWDB on accounting for barrier arm benefits in the BCA.

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 36in concrete pipes, eleven 11ft x 5ft concrete boxes, and fifteen 11ft x 7ft 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 two 250ft span bridges and six 6ft x 5ft concrete boxes. These alternatives were deemed infeasible due to high construction costs and few estimated benefits associated with raising this non-critical road out of the floodplain.

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 barrier arm benefits in the BCA.

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**

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

IMPACT ANALYSIS

The proposed infrastructure will not have a negative downstream impact. Current impacts to the LWC can be found in the following Table 1:

Table 1: 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.

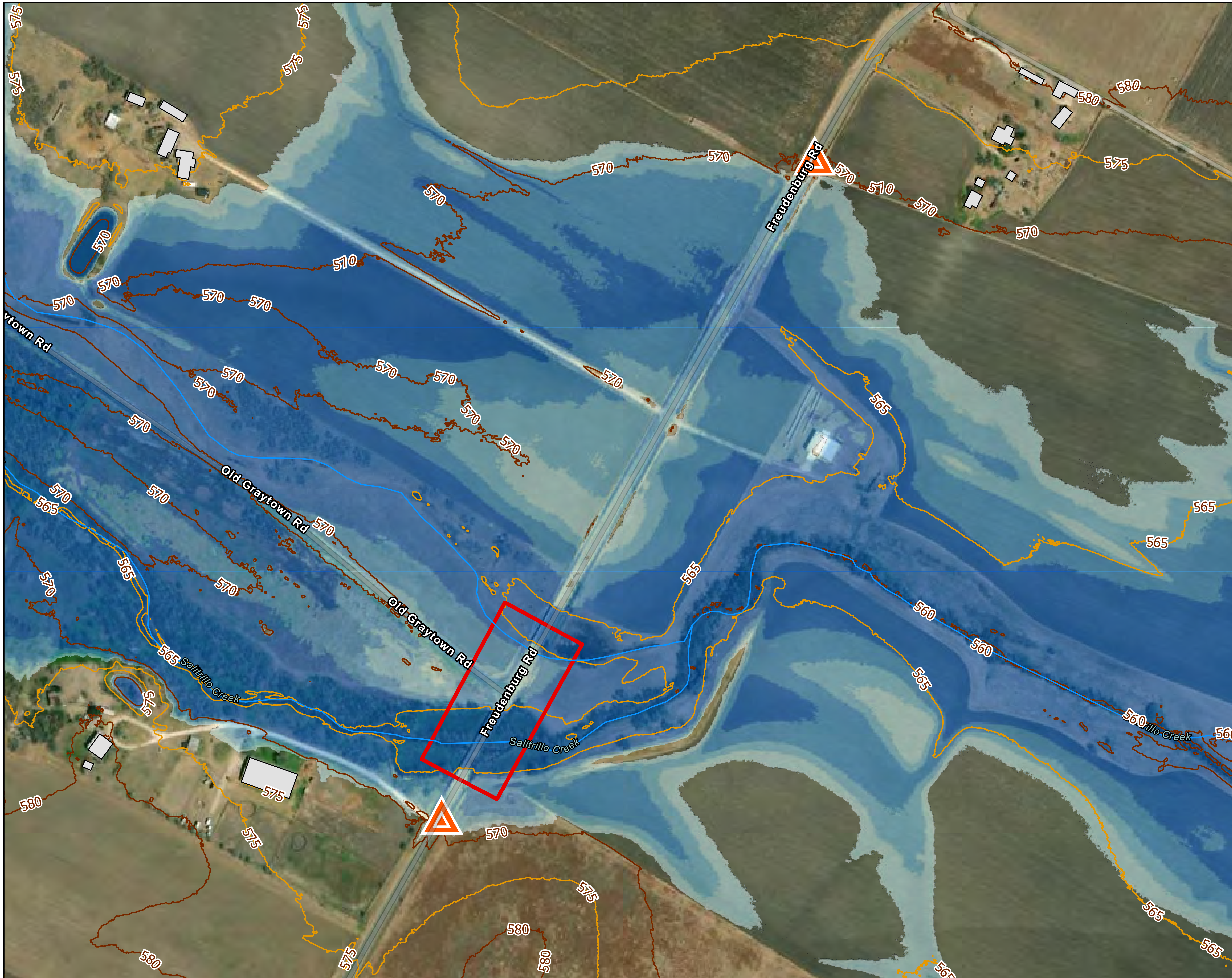
INTERRELATED PROJECTS

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**
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**
DESIGN PHASE	$30,635.77
CONSTRUCTION PHASE	$133,199.00



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

FREUDENBURG ROAD
SALITRILLO CREEK - TRIBUTARY B
EXISTING CONDITIONS

N

0 125 250 500
FEET

REGION 12

HDR

APRIL 2023

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Gass Road at Culebra Creek Tributary D LWC Improvements

FMP ID: 12XXXXXX

Project Sponsor: Bexar County

Project Source: 2022 Bexar County Drainage Needs

Cost Information

Category	Cost*
Design	$536,927
Real Estate	$0
Environmental	$10,000
Construction	$3,350,875
Total Cost**	**$3,898,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 4,655,612	$ -
25-year storm	$ 5,603,250	$ -
100-year storm	$ 5,761,320	$ -
Total Benefits	**$ 6,281,841**	
BCA	**1.7**	

*Costs are using 2020 prices
**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	25-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Road (miles)	0.25	0.25	0.25
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	3.3 ft
Proposed	100-Yr	0

Project Description:

This project will eliminate overtopping of Gass Road and provide 100-year conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation and adding a bridge. The proposed road profile will increase 8ft from existing. The existing one 2.25" arch pipe will be replaced with a 300ft wide bridge with a 6ft high opening.
Note that when this road floods, there is no detour route present.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Gass Road at Culebra Creek Tributary D LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **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 FMXs from the Plan dated January 10th, 2023. The Gass Road at Culebra Creek Tributary D 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 Gass Road and Culebra Creek Tributary D. Currently there is a low water crossing (LWC) at Gass Road, composed of one 2.25" arch pipe. The LWC is undersized which results in overtopping during the 10-, 25-, 50-, and 100-Yr storm events. When the structure overtops it cuts off a main connection route for the nearby neighborhood.

The Task 12 work that was completed for the Gass Road at Culebra Creek Tributary D LWC Improvements 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 drainage analysis to determine a feasible solution.

This project will eliminate overtopping of Gass Road and provide 100-Yr conveyance design, removing structures from the existing conditions floodplain extents. Proposed improvements consist of channel regrading, increasing the road elevation and adding a bridge. The proposed road profile will increase 8ft from existing. The existing one 2.25" arch pipe will be replaced with a 300ft span bridge with a 6ft high opening.

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 Gass Road at Culebra Creek Tributary D LWC Improvements is $3,989,000, 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. Note that this crossing falls within the ETJ of CoSA so a tree preservation permit might be required and it is factored into the total cost. 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 eliminate overtopping at Gass Road and improve the level of service by providing a 100-Yr conveyance design.

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: **Gass Road at Culebra Creek Tributary D LWC Improvements**
FMP ID: **12XXXXX**
Project Sponsor: **Bexar County**
Date: **3/3/2023**

The 10-, 25-, 100-Yr benefits that were evaluated for this project include; LWC improvements. The resulting benefit cost analysis was 1.7. 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	**$4,655,612**	**$0**
25 - year storm	**$5,603,250**	**$0**
100 - year storm	**$5,761,320**	**$0**

Total Benefits from BCA Toolkit	$6,281,841
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$3,747,049
Net Benefits	$2,534,792
Net Benefits with Recreation	$2,534,792
Final BCR	**1.7**
Final BCR with Recreation	**1.7**

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, 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 v6.0 model, see attached digital submittal for the 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 attached Exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA,

reduced impacts show lower flooded depths in proposed conditions. The following Table 2 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	3.3 ft
Proposed	100-Yr	0 ft

(See full list of roadway crossing 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, a FEMA permit and tree preservation will be required.

Stakeholder coordination:

Due to the road improvement and local surrounding community there will be various stakeholders involved in the process. Note that Gass Road is the only access route for business across the creek.

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:

Coordination and permitting process should be started early on with CoSA and FEMA to avoid schedule delays.

Stakeholder Coordination:

Abbott Road is the main access for several residential properties. Road reconstruction will cause traffic disruptions and inconveniences for locals 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 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.

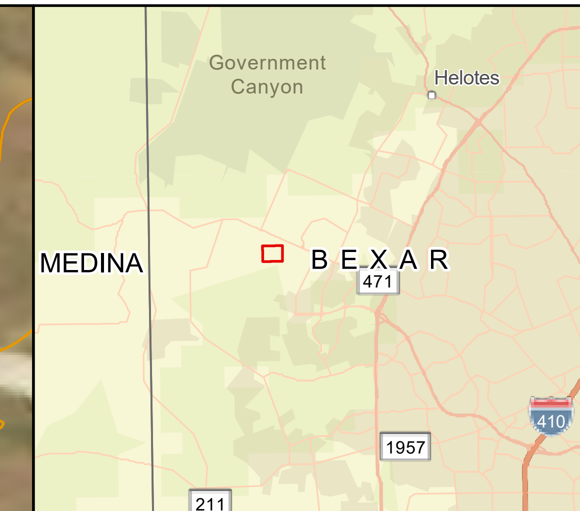
INTERRELATED PROJECTS

There are no interrelated projects.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Gass Road at Culebra Creek Tributary D LWC Improvements**
Project Sponsor:	**Bexar County**
Firm Developing:	**HDR**
Date Developed:	**3/3/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- STREET COST	**$2,363,664.17**
- TREE PRESERVATION (2%)	**$47,273.28**
- LANDSCAPING (3%)	**$70,909.93**
- BOND AND INSURANCE (3%)	**$74,455.42**
- BARICADES (3%)	**$76,689.08**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$372,277.11**
TOTAL CONSTRUCTION COST ESTIMATE	**$3,005,268.99**
PROGRAM MANAGEMENT FEE (0% of Costs)	**$0.00**
ENGINEER FEE (Fee Table plus 5%)	**$480,843.04**
ENGINEER CONTINGENCY (10%)	**$48,084.30**
CONSTRUCTION CONTINGENCY (10%)	**$300,526.90**
DESIGN ENHANCEMENT (0% Construction Costs)	**$0.00**
PERMIT REQUIREMENT COSTS	**$8,000.00**
UTILITY RELOCATION COSTS	**$0.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$0.00**
RIGHT-OF-WAY SURVEY	**$0.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$45,079.03**
FEMA FLOOD PLAIN STUDY	**$0.00**
PROJECT ADMIN. (0%)	**$0.00**
PRIMELink Costs (0%)	**$0.00**
INFLATION FACTOR (0% compounded for 5 years)	**$0.00**
TOTAL PROJECT COST ESTIMATE	**$3,897,802.26**
DESIGN PHASE	$546,927.34
CONSTRUCTION PHASE	$3,350,874.92



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

GASS ROAD LWC

EXISTING CONDITIONS

N

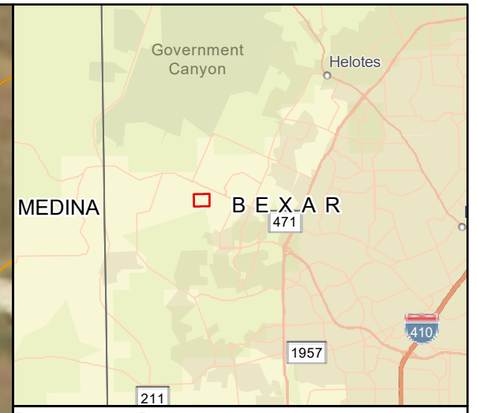
0 90 180 360

FEET

REGION 12

HDR

MARCH 2023



Legend

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

100-Year Flood Depth (ft.)

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

2023 SAN ANTONIO REGIONAL FLOOD PLAN

GASS ROAD LWC

PROPOSED CONDITIONS

N

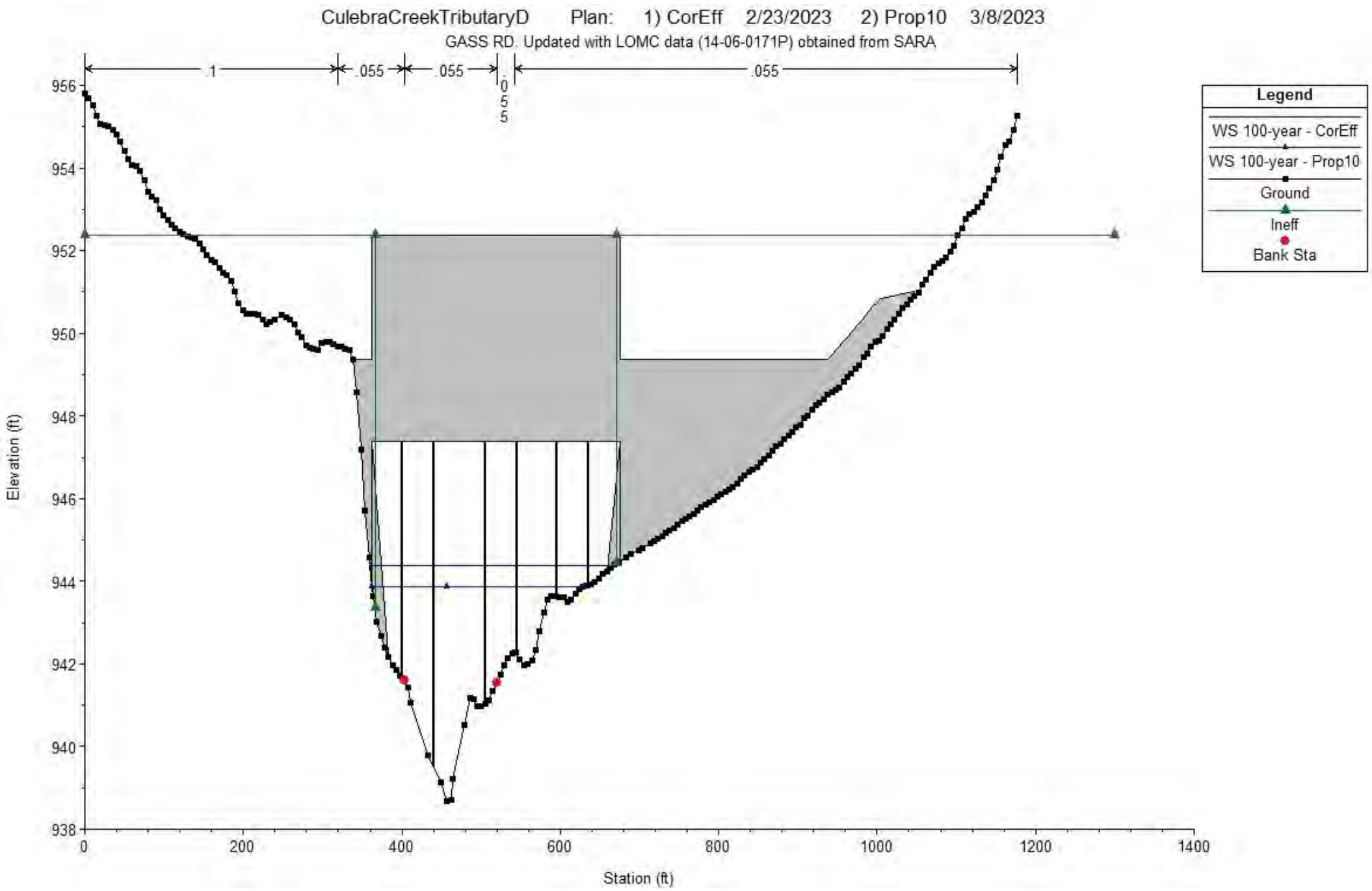
0 90 180 360

FEET

REGION 12

HDR

MARCH 2023


CulebraCreekTributaryD Plan: 1) CorEff 2/23/2023 2) Prop10 3/8/2023
GASS RD. Updated with LOMC data (14-06-0171P) obtained from SARA
.1
.055
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Legend
WS 100-year - CorEff
WS 100-year - Prop10
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
956
954
952
950
948
946
944
942
940
938
0
200
400
600
800
1000
1200
1400

2023 San Antonio Regional Flood Plan
Project Summary Sheet

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	$98,432
Real Estate	$492,161
Environmental	-
Construction	-
Total Cost**	**$591,000**

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**	

*Costs are using 2020 prices
**Rounded up to the nearest thousand

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 three frequently flooded properties 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
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.

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 three frequently flooded properties 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 damaged and washed off its cinder blocks in the June of 2010 flood and is now vacant. PID#13165 is a permanent single-family structure that has flooded repeatedly; the family has moved into a mobile home on the same property which will need to be relocated. PID#13119 is a mobile home that was significantly damaged in the June of 2010 flood and is now 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 2023 market value prices. To meet the TWDB the requirements that FMP costs should be reported in 2020 prices, the cost was adjusted to 2020 using a CCI factor of 0.87 and totaling $591,000. 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.

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.

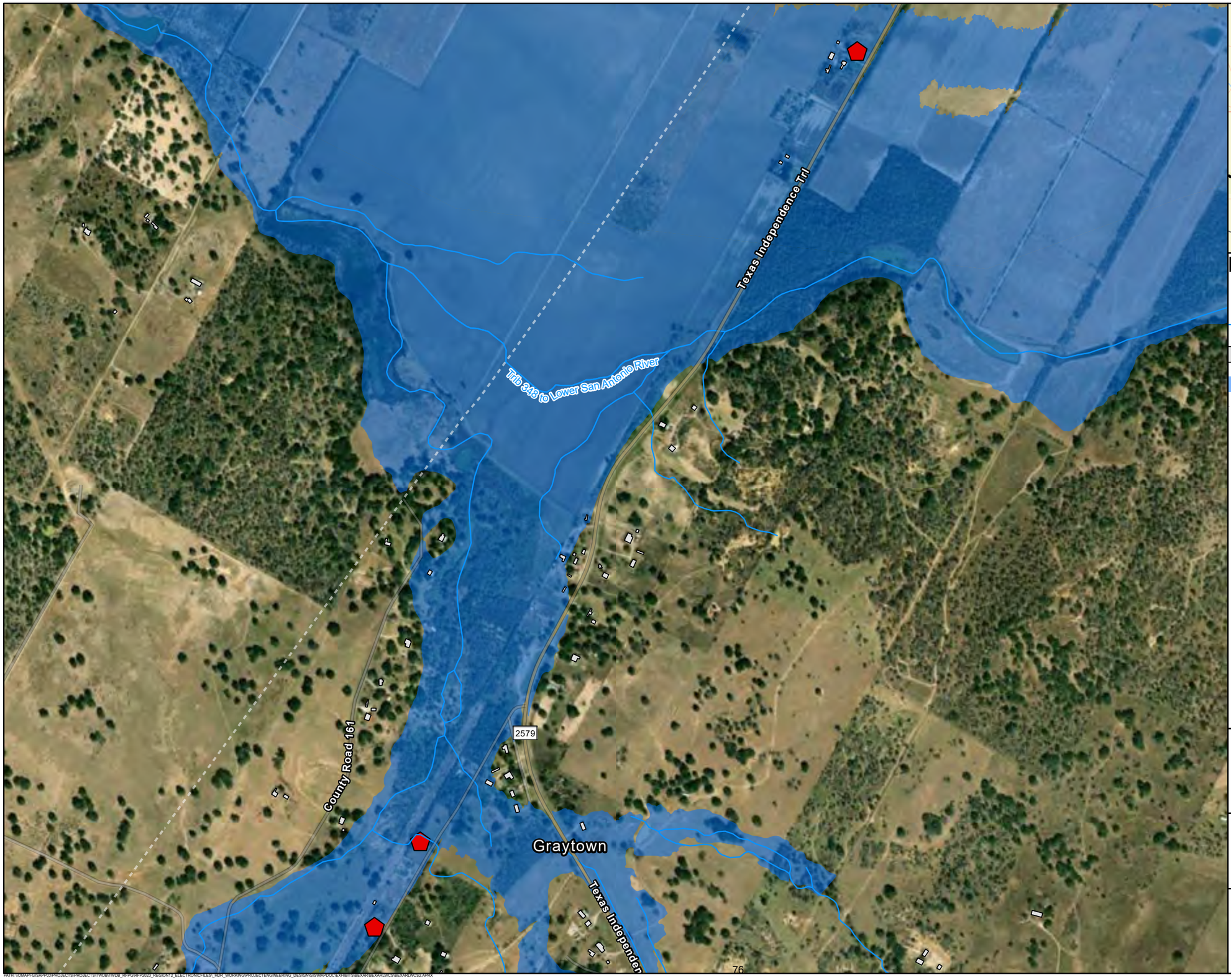
INTERRELATED PROJECTS

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**
TOTAL COST ESTIMATE	**$672,000.00**



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

N

0 375 750 1,500
FEET

REGION 12

HDR

APRIL 2023

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Damage Center 1: Project 1A, B, C

FMP ID: 12XXXXXX

Project Sponsor: Floresville

Project Source: 2012 Wilson County Watershed Master Plan

Cost Information

Category	Cost*
Design	$1,082,552
Real Estate	$287,334
Environmental	$10,000
Construction	$2,928,368
Total Cost**	**$4,309,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 1,374,634	$ 948,149
50-year storm	$ 2,360,181	$ 1,672,657
100-year storm	$ 4,466,168	$ 2,083,814
Total Benefits	**$ 1,050,065**	
BCA	**0.3**	

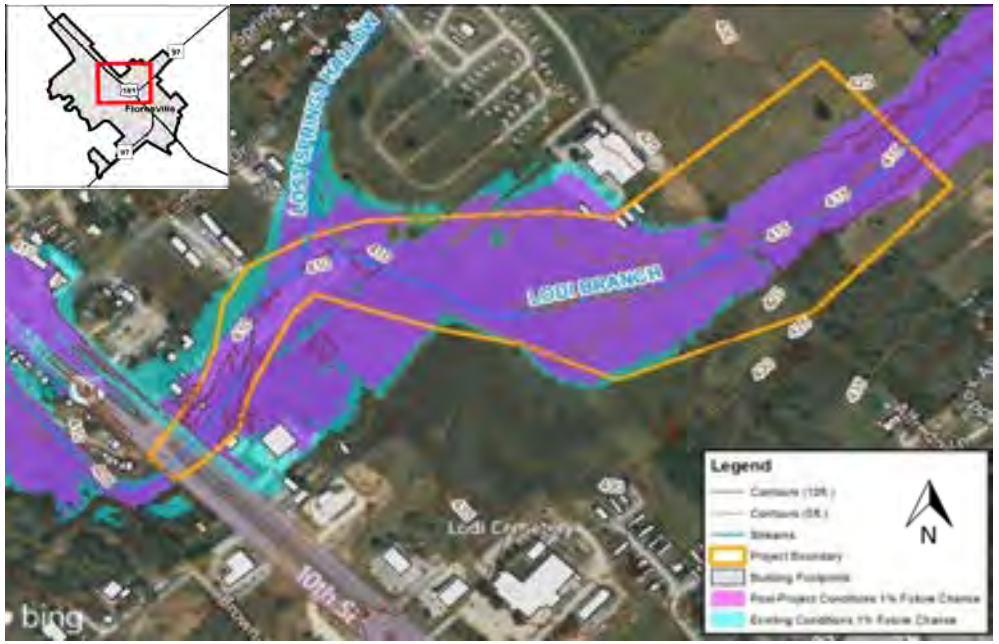
*Costs Adjusted from 2012 to 2020 using CCI
**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	4	6	6
Commercial	5	3	4
Critical	-	-	1
Road (miles)	-	1	1
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	< 100-Yr	0.4 ft
Proposed	100-Yr	0 ft



Project Description:

Detention pond, channel improvements, and additional culverts are required to reduce the downstream flooding, aid in removing the majority of the existing structures from the FEMA floodplain and convey the 100-year flow. The proposed detention pond will be located along Lodi Branch north of Haddox Alley and store approximately 60-acres-ft. The proposed channel improvements run along Lodi Branch, from the confluence with Lost Springs Hallow to US Highway 181. The proposed channel will be 1,200 feet long with a bottom width of 100 feet. Currently there are nine 4-foot by 7-foot culverts under Highway 181, this project proposes to add three additional 4-foot by 7-foot.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 1: Project 1A, B, C**
FMP ID: **12XXXXX**
Project Sponsor: **City of Floresville**
Date: **2/9/2023**

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 Damage Center 1: Project 1A, 1B, 1C, FME ID 121000150, from the 2012 Wilson County Watershed Master Plan was further developed during Task 12. The sponsor for this project is the City of Floresville.

The problem area is located along Lodi Branch, where it confluences with Lost Springs Hallow just upstream of US Highway 181. Currently there is a backwater effect on Lodi Branch from Lost Springs Hallow flooding the surrounding structures. The backwater effect is in part due to conveyance issues under US Highway 181 from the existing nine 4-ft by 7-ft culverts. The limited conveyance results in US Highway 181 overtopping during the 100-Yr storm.

The Task 12 work that was completed for the Damage Center 1 project was an update to the cost estimate, impact analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Detention pond, channel improvements, and additional culverts are required to reduce the downstream flooding, aid in removing the majority of the existing structures from the FEMA floodplain and convey the 100-Yr flow. The proposed detention pond will be located along Lodi Branch north of Haddox Alley and store approximately 60-acres-ft. The proposed channel improvements run along Lodi Branch, from the confluence with Lost Springs Hallow to US Highway 181. The proposed channel will be 1,200ft long with a bottom width of 100ft. Currently there are nine 4-ft by 7-ft culverts under Highway 181, this project proposes to add three additional 4-ft by 7-ft. The proposed improvements will reduce flooding issues and improve access to businesses and neighborhoods in the area.

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 $2,274,293 in the 2012 Wilson County Watershed Master Plan. A Construction Cost Index (CCI) factor of 1.25 was applied to convert the costs from 2012 to 2020 dollars. These costs were combined with additional project costs (Design, Permitting, Project Management, etc.) resulting in a project cost of $4,495,393. See attached Floresville Cost Summary for cost breakdown. 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 US Highway 181 and improve the level of service by providing a 100-Yr conveyance design. The detention and channelization will improve the flooding in the surrounding community and remove structures from the FEMA floodplain.

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: **Damage Center 1: Project 1A, B, C**
FMP ID: **12XXXXX**
Project Sponsor: **City of Floresville**
Date: **2/9/2023**

The 100-Yr benefits that were evaluated for this project include; residential buildings and commercial buildings. The resulting benefit cost analysis was 0.3. 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	**$1,374,634**	**$948,149**
50 - year storm	**$2,398,549**	**$1,672,657**
100 - year storm	**$2,829,526**	**$2,083,814**

Total Benefits from BCA Toolkit	$1,050,065
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$4,139,684
Net Benefits	-$3,089,619
Net Benefits with Recreation	-$3,089,619
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.

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 v4.1 model, see attached digital submittal for the 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 attached Exhibits for existing and proposed project layouts and WSE comparison. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following Table 2 summarizes the level of service pre- and post-project:

Table 2: Total Impacted Structures per Storm Frequency

Storm	Existing	Proposed	Difference
100-Yr	38	28	-10
50-Yr	33	24	-9
10-Yr	23	14	-9

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

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

Yes, there is possible utility conflict running underground along US Highway 181. The proposed culverts would cause them to relocate.

Permitting/Environmental:

Yes, a USACE 404 permit and a TxDOT ROW Permit will be required.

Stakeholder coordination:

Due to the land acquisition, road improvement, and utility relocation, there will be various stakeholders involved in the process.

MITIGATION OF RISKS

ROW/Real Estate Acquisition:

Land will need to be acquired to build the detention pond, potential increase in cost could acquire depending on the admin costs.

Utility Coordination:

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:

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

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 1: Project 1A, B, C**
FMP ID: **12XXXXX**
Project Sponsor: **City of Floresville**
Date: **2/9/2023**

Stakeholder Coordination:

US Highway 181 is the main access for several commercial properties. Road reconstruction will cause traffic disruptions and inconveniences for businesses 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 CONSIDERATION

During the design phase, nature-based solutions could be considered for this project. The cost estimate for landscaping was increased to 10% to allow for potential water quality components. This project could also incorporate natural channel components and possible floodplain buffers. Additionally, the space used for the proposed detention pond could include a park as a recreational benefit.

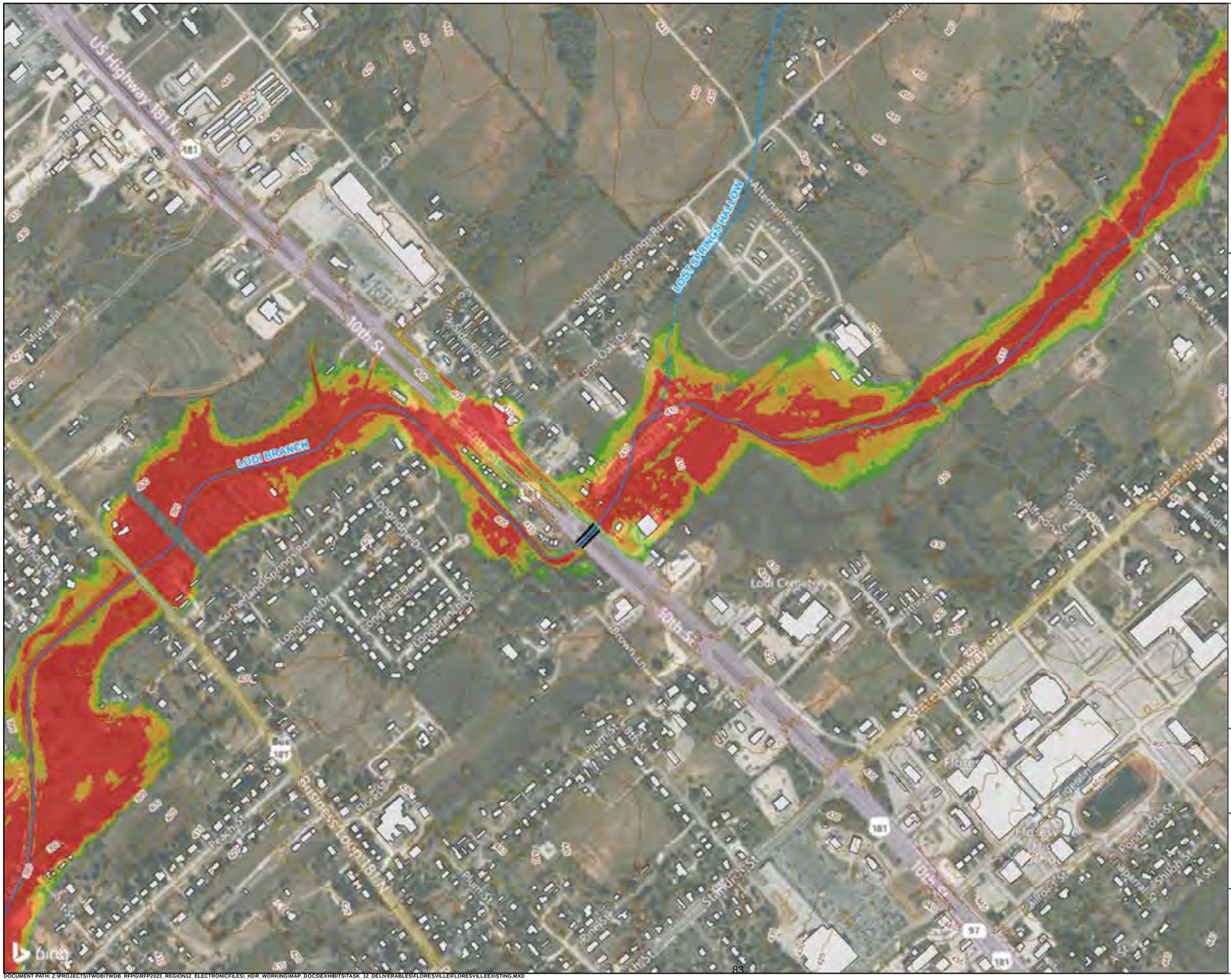
INTERRELATED PROJECTS

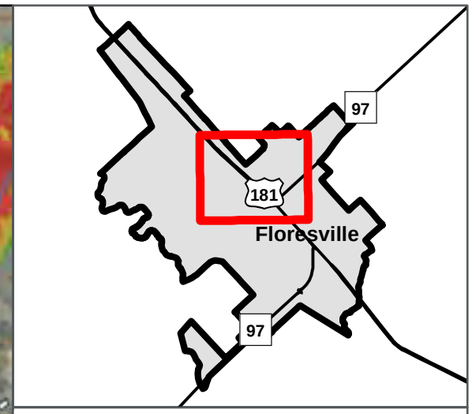
Originally in the 2012 Wilson County Watershed Master Plan the different components of this project were split (1A Detention, 1B Culvert Improvement, and 1C Channelization). However, in order to have the most benefit, it is recommended to construct these components together.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

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

CONSTRUCTION COSTS	
- DRAINAGE COST	**$1,927,885.72**
- TREE PRESERVATION (2%)	**$38,557.71**
- LANDSCAPING (10%)	**$192,788.57**
- BOND AND INSURANCE (3%)	**$64,776.96**
- BARICADES (3%)	**$66,720.27**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$323,884.80**
TOTAL CONSTRUCTION COST ESTIMATE	**$2,614,614.03**
ENGINEER FEE (Fee Table plus 5%)	**$431,411.31**
ENGINEER CONTINGENCY (10%)	**$43,141.13**
CONSTRUCTION CONTINGENCY (10%)	**$261,461.40**
PERMIT REQUIREMENT COSTS	**$608,000.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$284,834.00**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$52,292.28**
TOTAL PROJECT COST ESTIMATE	**$4,308,254.16**
DESIGN PHASE	$1,379,886.45
CONSTRUCTION PHASE	$2,928,367.71





Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Existing Culverts
- Building Footprints

100-Year Flood Depth (ft)

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

DATA SOURCES: SARA, Bing, FEMA, TWDB, TXDOT, TNRIS, ESRI

DISCLAIMER: Map building information was compiled from the best available sources. No warranty is made for the accuracy or completeness.

2023 SAN ANTONIO REGIONAL FLOOD PLAN

FLORESVILLE, TX
DAMAGE CENTER 1: PROJECT 1A, B, C
EXISTING CONDITIONS

N

0 750 1,500
FEET

REGION 12

HDR

FEBRUARY 2023 | **EX 1**

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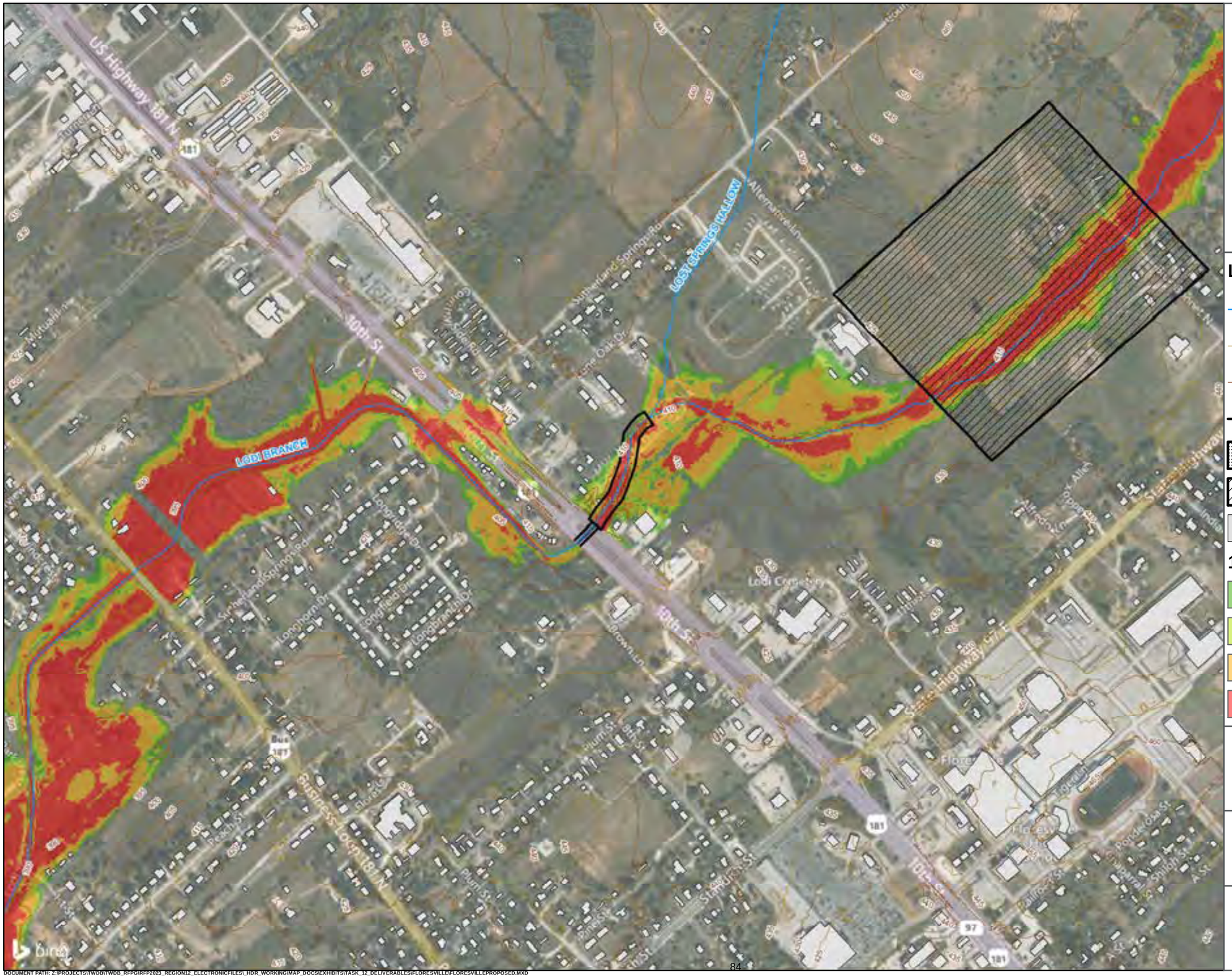

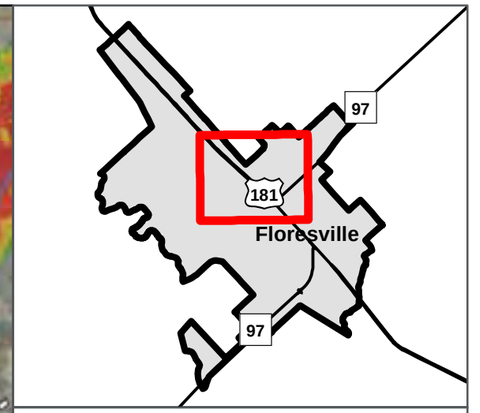

Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Proposed Culverts
- Channel
- Detention Pond
- Building Footprints

100-Year Flood Depth (ft)

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

DATA SOURCES: SARA, Bing, FEMA, TWDB, TXDOT, TNRIS, ESRI

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2023 SAN ANTONIO REGIONAL FLOOD PLAN

FLORESVILLE, TX
DAMAGE CENTER 1: PROJECT 1A, B, C
PROPOSED CONDITIONS

N

0 750 1,500
FEET

REGION 12

HDR

FEBRUARY 2023 | **EX 2**

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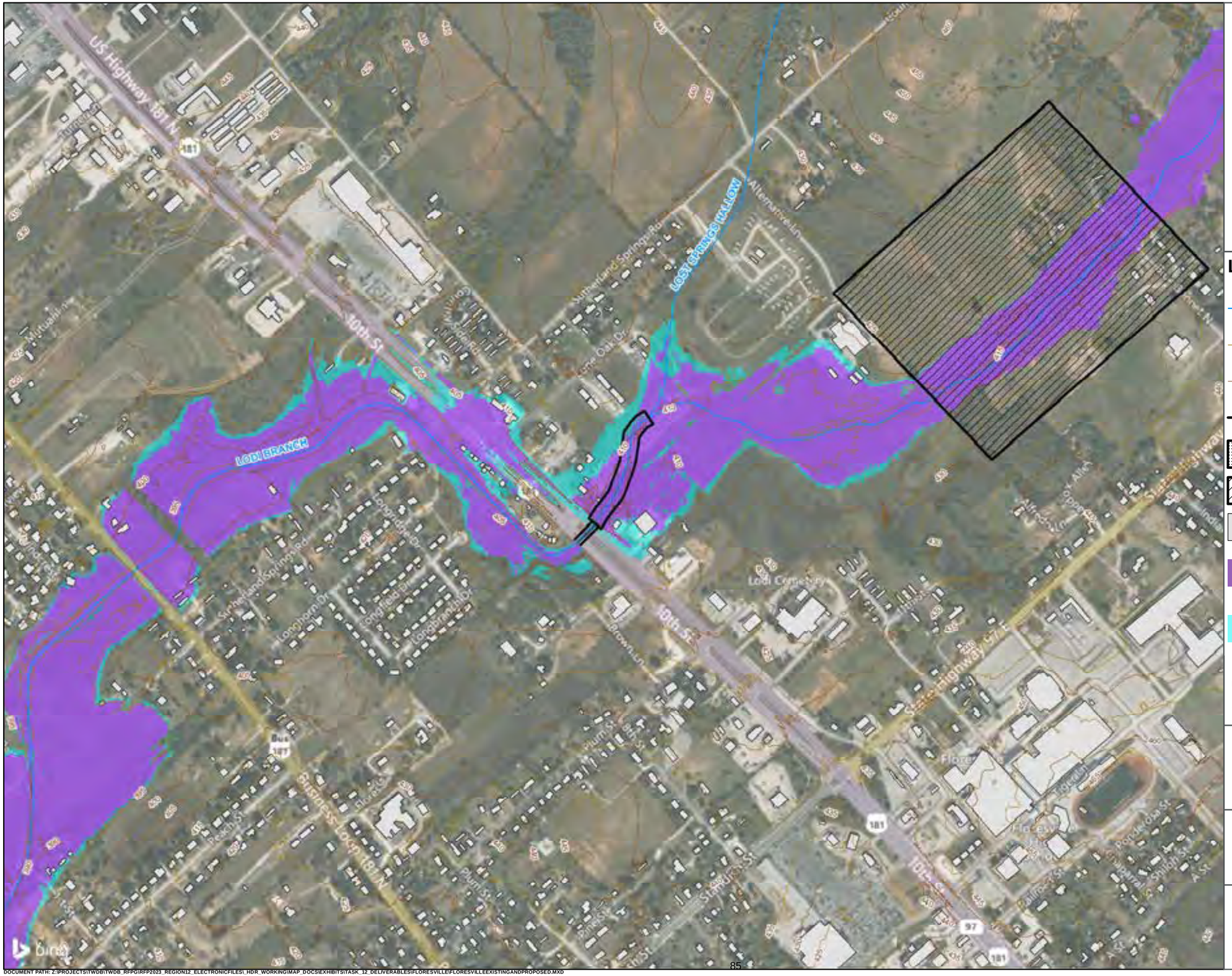

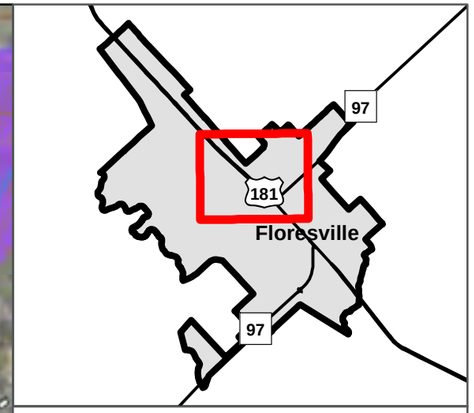

Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Proposed Culverts
- Channel
- Detention Pond
- Building Footprints
- Post-Project Conditions 100-Year Flooding
- Existing Conditions 100-Year Flooding

DATA SOURCES: SARA, Bing, FEMA, TWDB, TXDOT, TNRIS, ESRI

DISCLAIMER: Map building information was compiled from the best available sources. No warranty is made for the accuracy or completeness.

2023 SAN ANTONIO REGIONAL FLOOD PLAN

FLORESVILLE, TX
DAMAGE CENTER 1: PROJECT 1A, B, C
EXISTING AND PROPOSED CONDITIONS

N

0 750 1,500
FEET

REGION 12

HDR

FEBRUARY 2023 | **EX 3**

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