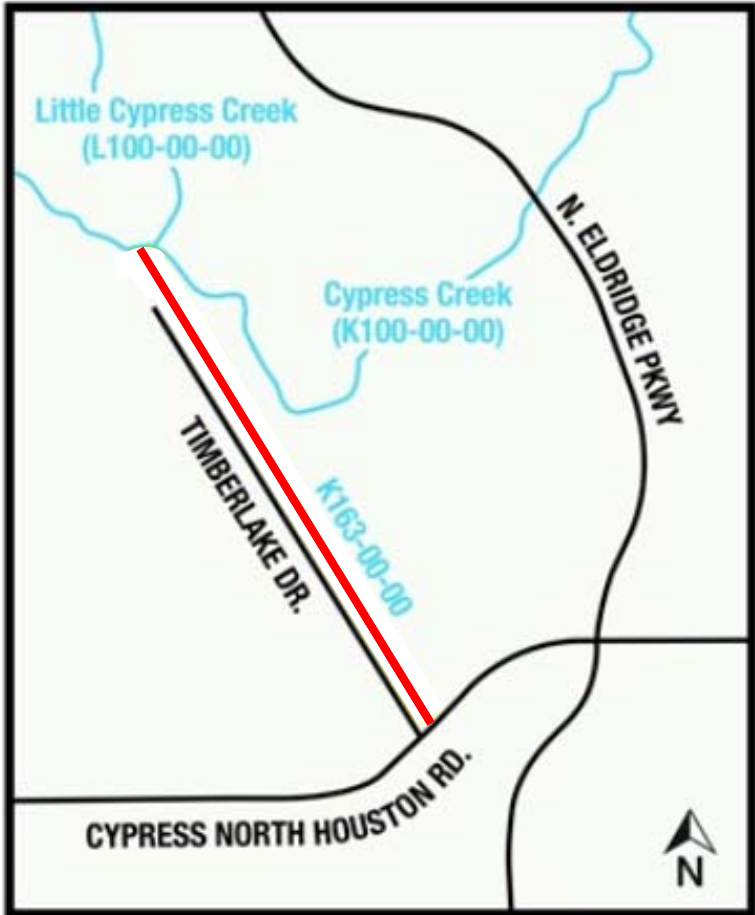
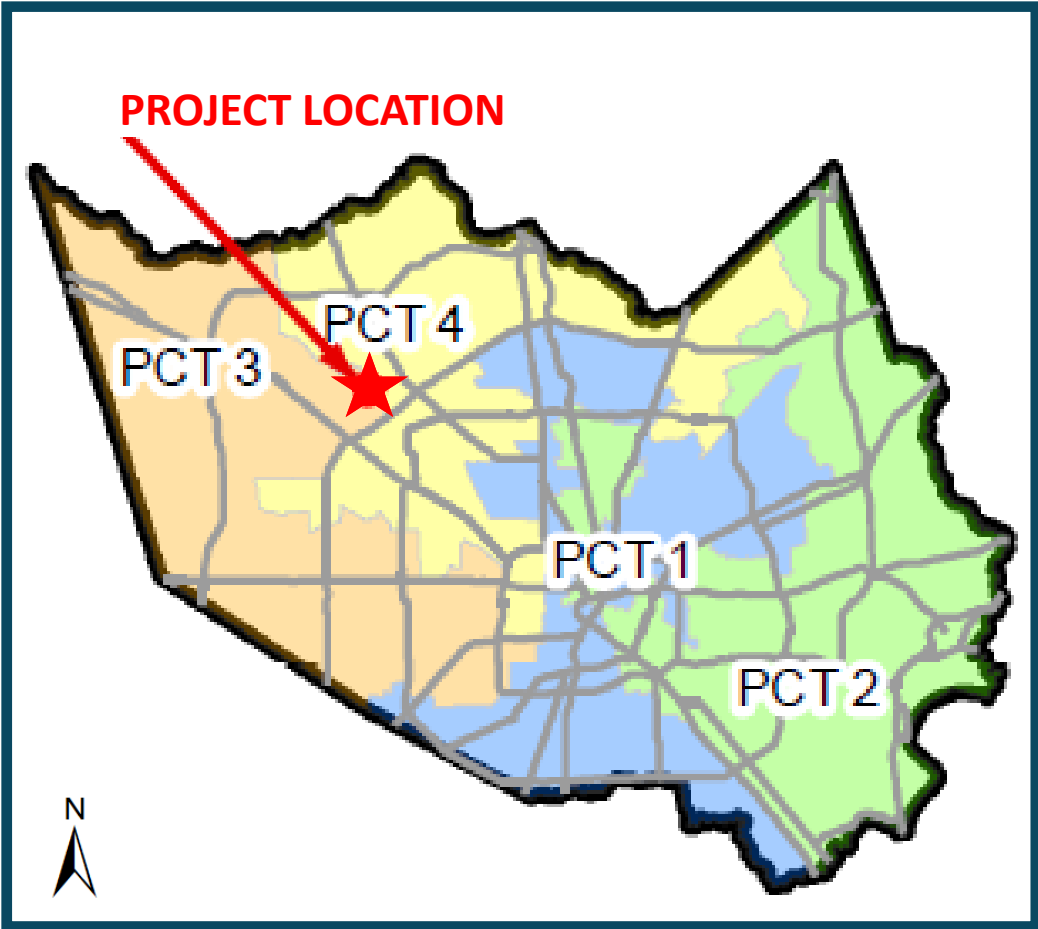


# **Cypress Creek Tributary K163-00-00-E001 Channel Improvements**

**Jessica Koutny, P.E., CFM, CPESC**  
Senior Project Manager  
LJA Engineering, Inc.



# PROJECT LOCATION



— Project Area

# K163-00-00 Channel Improvements

## PURPOSE:

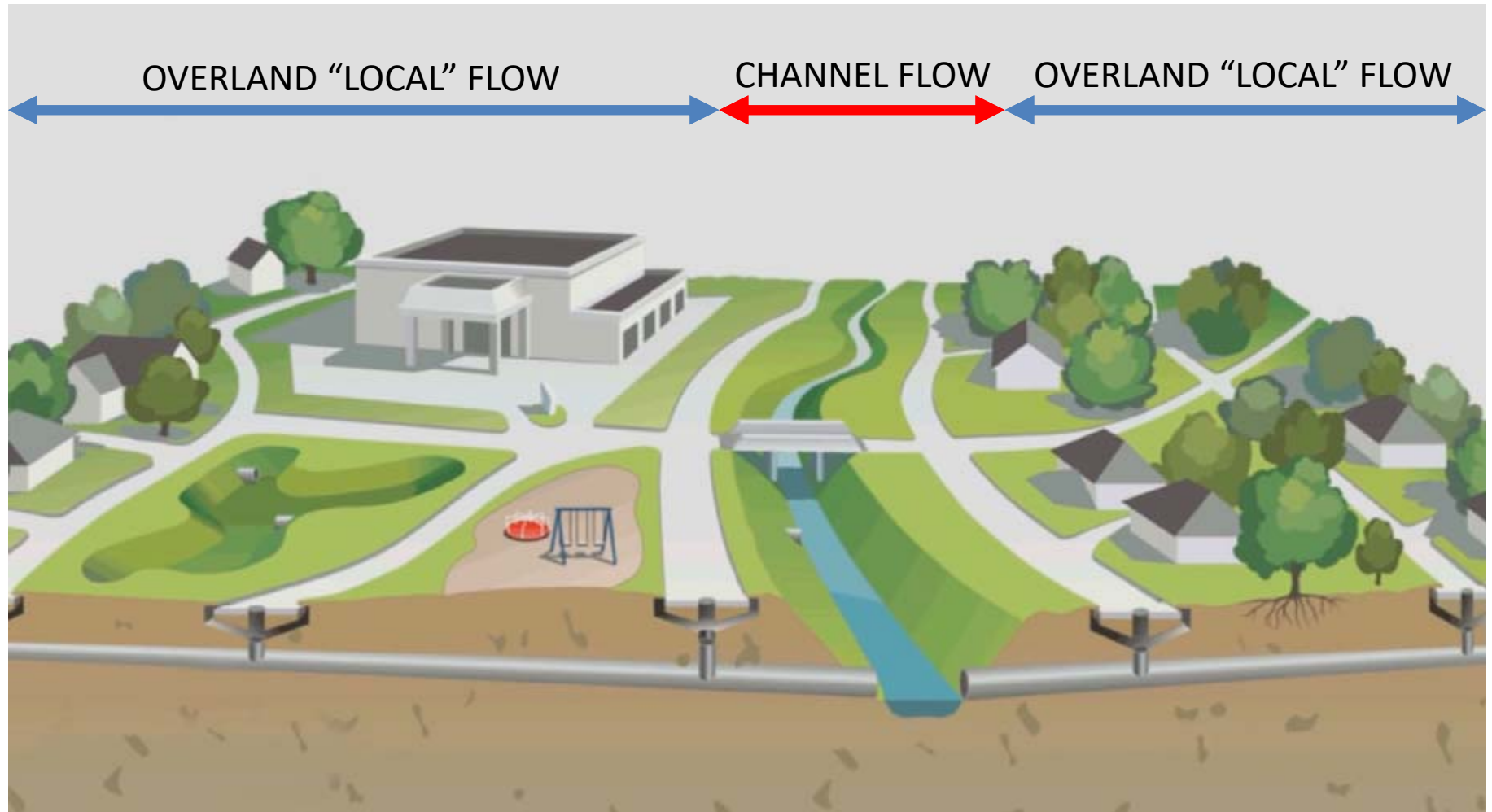
Improve stormwater conveyance and repair streambank erosion in the K163-00-00 channel, a tributary of Cypress Creek

**THIS PROJECT FOCUS IS THE K163-00-00 CHANNEL.**

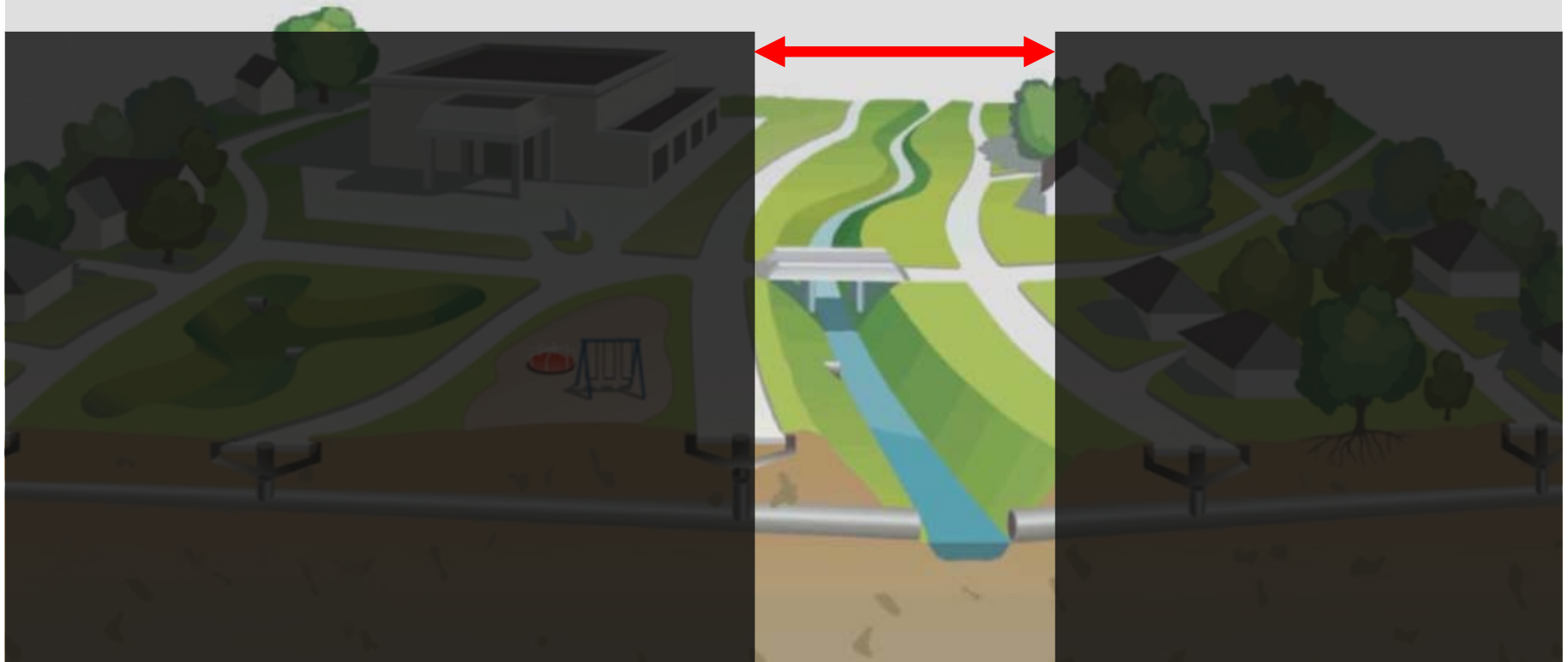
Other projects will focus on:

- Cypress Creek
- Improving the neighborhood drainage systems

# Project Work Zone



# Project Work Zone





# Project Work Zone



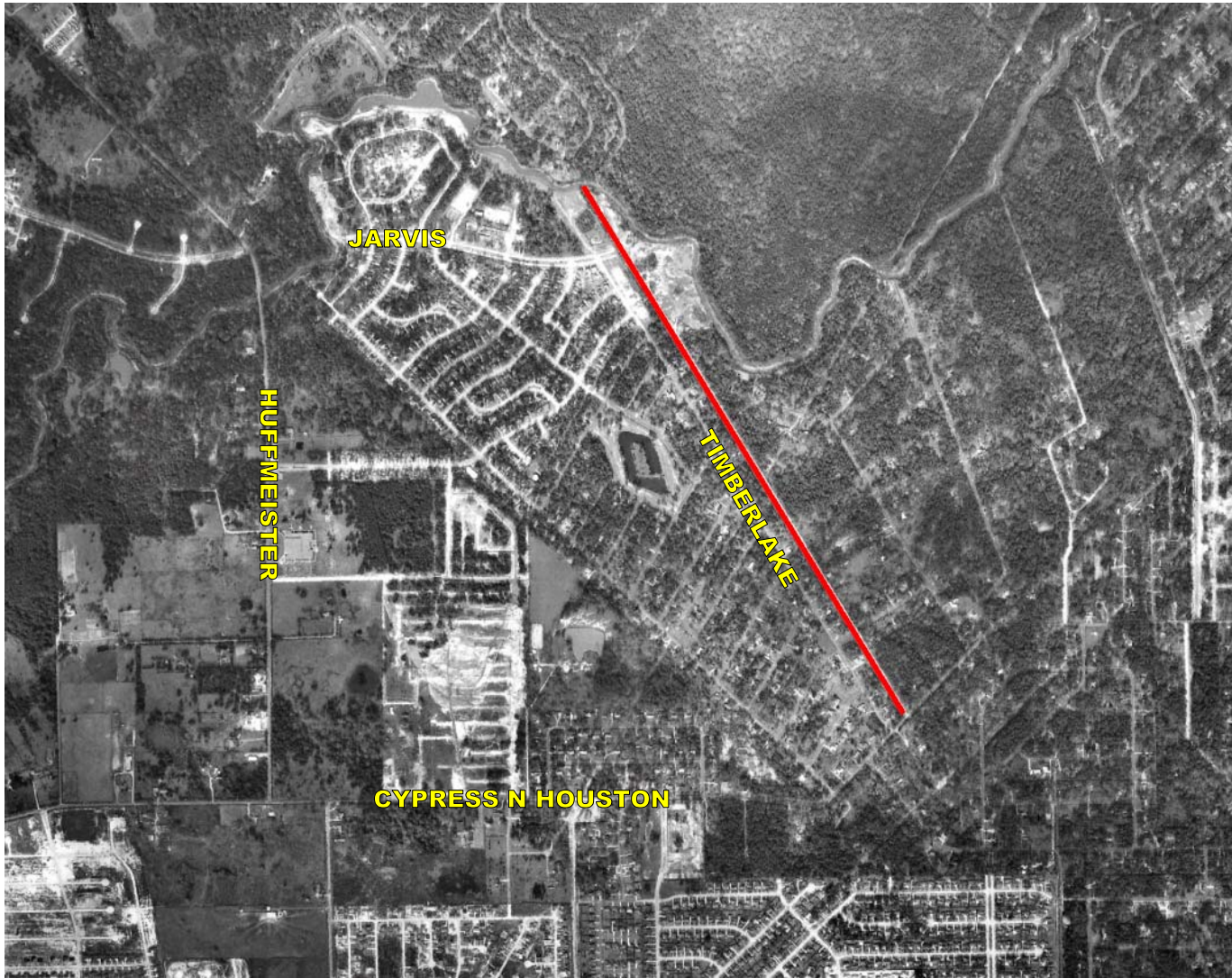


# Pre-Development (1953)





# Neighborhood Established (1978)





# Pre-Project (No Development Change, 2019)



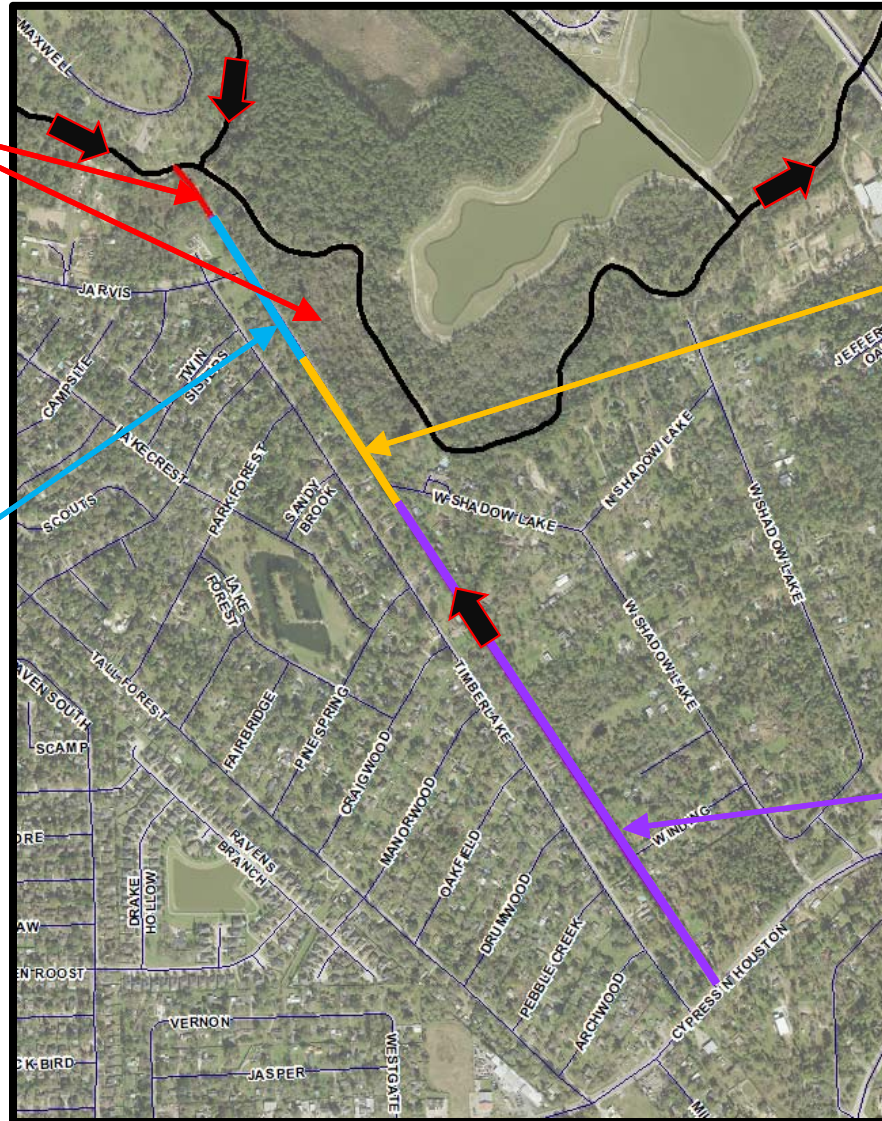


# Existing Conditions

**Wetland Areas**



**CHANNEL  
EROSION**



**2-YR Level of Service (LOS)**  
Rainfall event the stream is capable of containing within HCFCD right-of-way.

**COLLAPSED  
DROP STRUCTURE**



**SMALL CHANNEL**



# Existing Site Constraints

## Project Targets

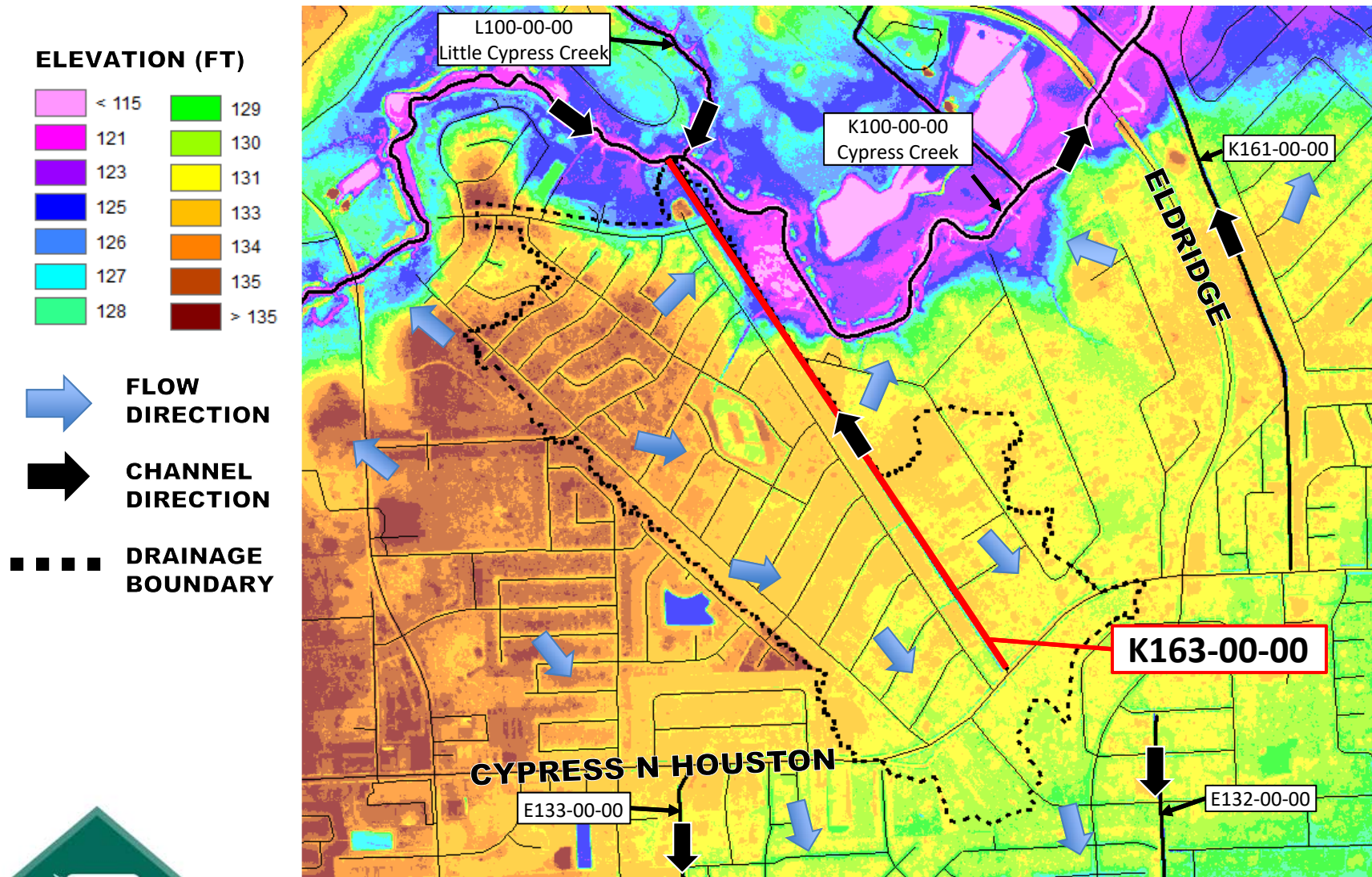
- Expand capacity
- Lower Flowline
- Stabilize Side Slope | Erosion Control
- No adverse impact

## Design Limitations

- Limited ROW
- Existing ROW Encroachment
- Utility Conflicts: Gas / Power / Cable
- Dispersive (Erosive) Soils Locations
- Reverse Topography



# Overland Topography



# Statistical Rainfall & Runoff Depths

## Rainfall Events (HCFCD 2009)

- 0.2% (500-year): 17.7 inches in 24-hours
- 1% (100-year): 12.4 inches in 24-hours
- 10% (10-year): 7.1 inches in 24-hours
- 50% (2-year): 4.1 inches in 24-hours

## Cypress Creek Flood Stage Levels (FEMA 2013)

- 0.2% (500-year): 132.30 feet
- 1% (100-year): 129.90 feet
- 2% (50-year): 129.00 feet
- 10% (10-year): 126.90 feet

# Reported Flooding Events

10% (10 YR)	2% (50-YR)	1% (100-YR)	0.2% (500-YR)
October 1949	October 1998	April 2016 (Tax Day)	August 2017 Harvey
January 1979	November 1998	-	-
October 1994	July 2012	-	-
June 2001 (Allison)	-	-	-
April 2009	-	-	-
May 2016	-	-	-

[www.HarrisCountyFWS.org](http://www.HarrisCountyFWS.org): Stream Gage 1159 (1983) 1170 (1988), 1165 (2014)



# Proposed Layout

## NO WORK

- USACE JURISDICTIONAL WETLAND

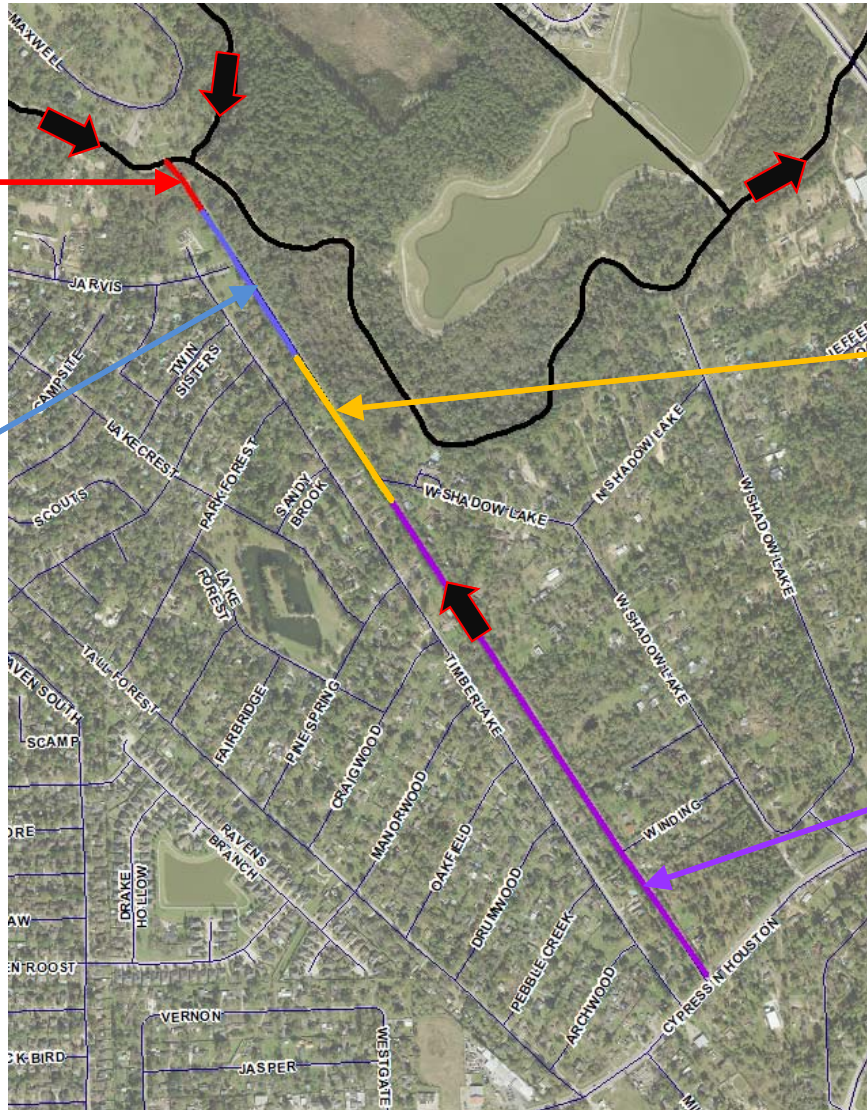


## EROSION CONTROL

- CHANNEL REGRADING
- SLOPE PROTECTION
- REALIGN STORM SEWER OUTFALLS

## SWALE

Small grass lined channel. Similar to a roadside ditch but not next to a road.



**100-YR Level of Service (LOS)**  
Rainfall event the stream is capable of containing within HCFCDD right-of-way.

## CHANNEL MODIFICATION



- BURIED 3 – 8' X 6' RCB
- SWALE OVER BOXES

## CHANNEL MODIFICATION



- BURIED 2 – 8' X 6' RCB
- SWALE OVER BOXES



# Examples of Slope Protection





# Proposed Layout

**NO WORK**

- USACE JURISDICTIONAL WETLAND

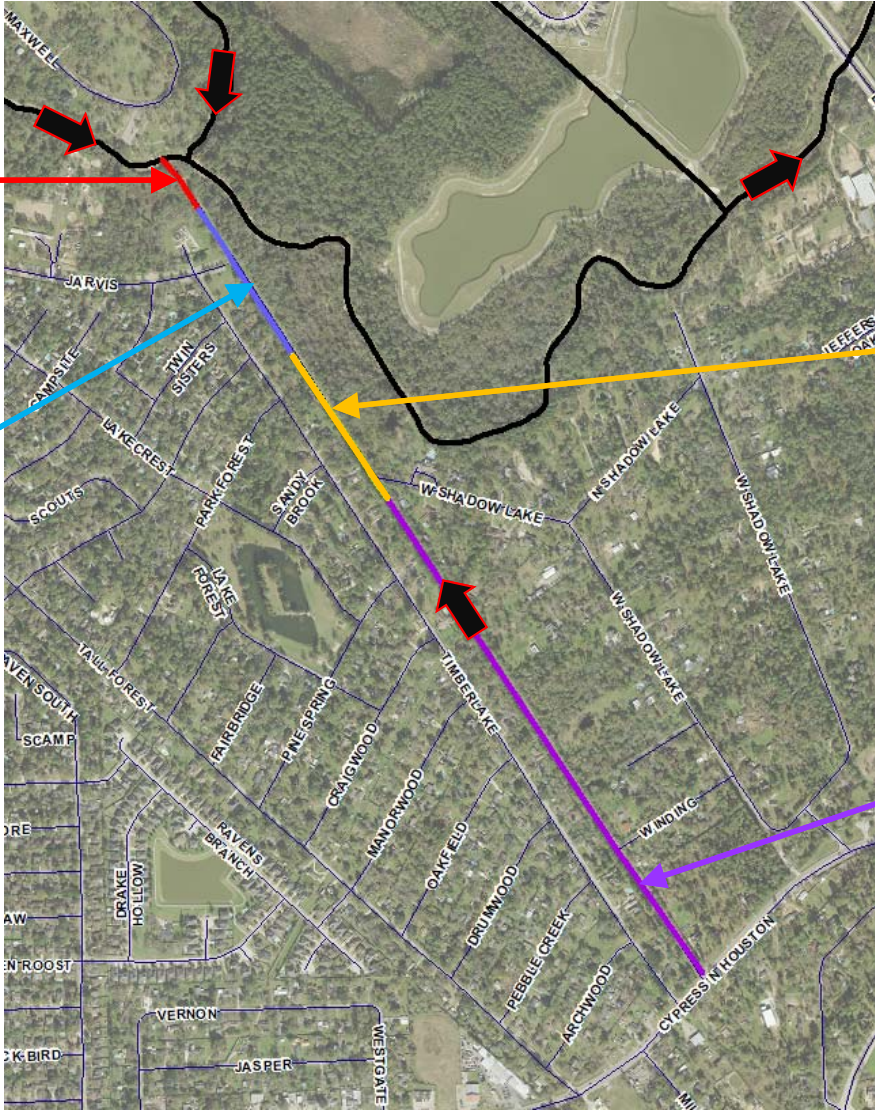


**EROSION CONTROL**

- CHANNEL REGRADING
- SLOPE PROTECTION
- REALIGN STORM SEWER OUTFALLS

**SWALE**

Small grass lined channel. Similar to a roadside ditch but not next to a road.



**100-YR Level of Service (LOS)**  
Rainfall event the stream is capable of containing within HCFCD right-of-way.

**CHANNEL MODIFICATION**



- BURIED 3 – 8' X 6' RCB
- SWALE OVER BOXES

**CHANNEL MODIFICATION**

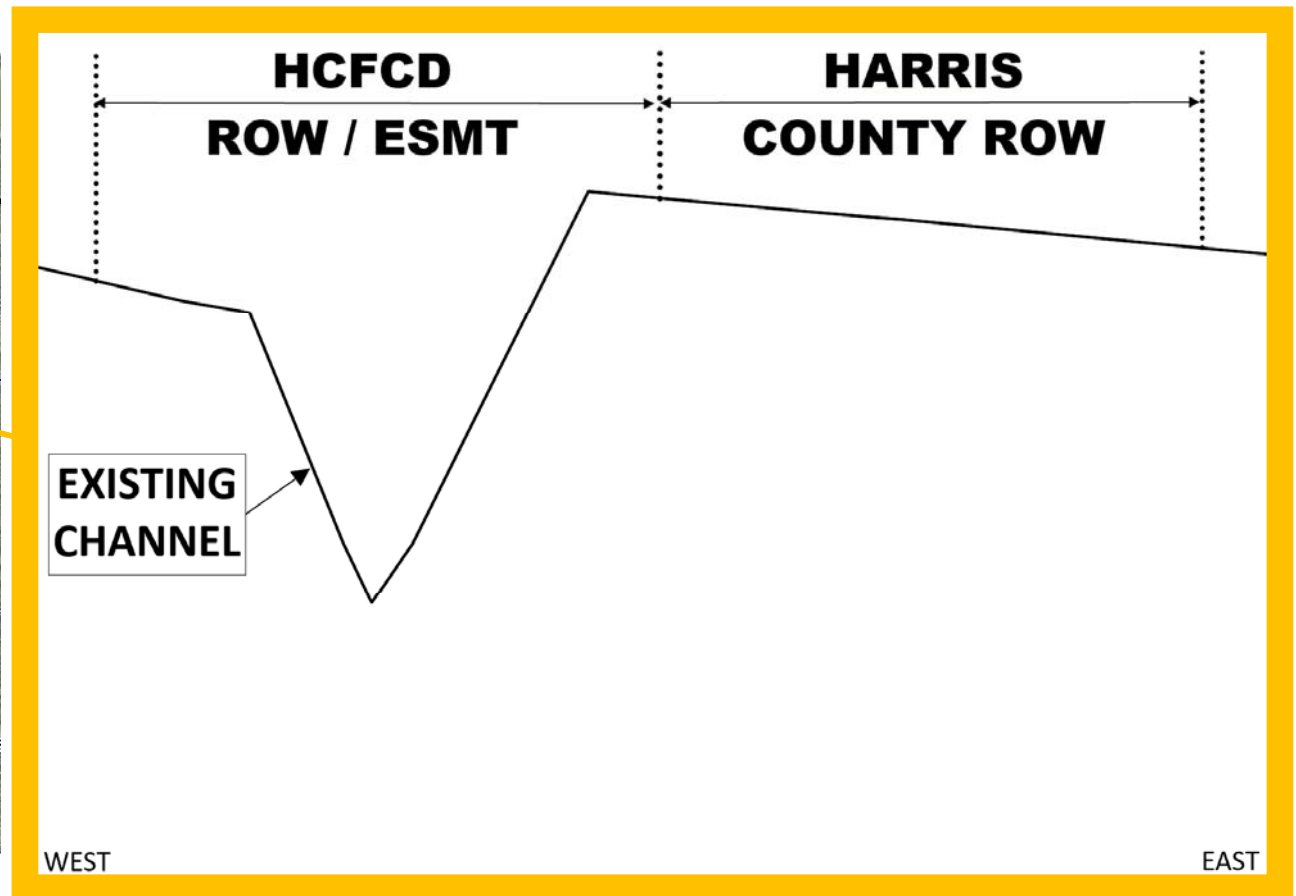


- BURIED 2 – 8' X 6' RCB
- SWALE OVER BOXES

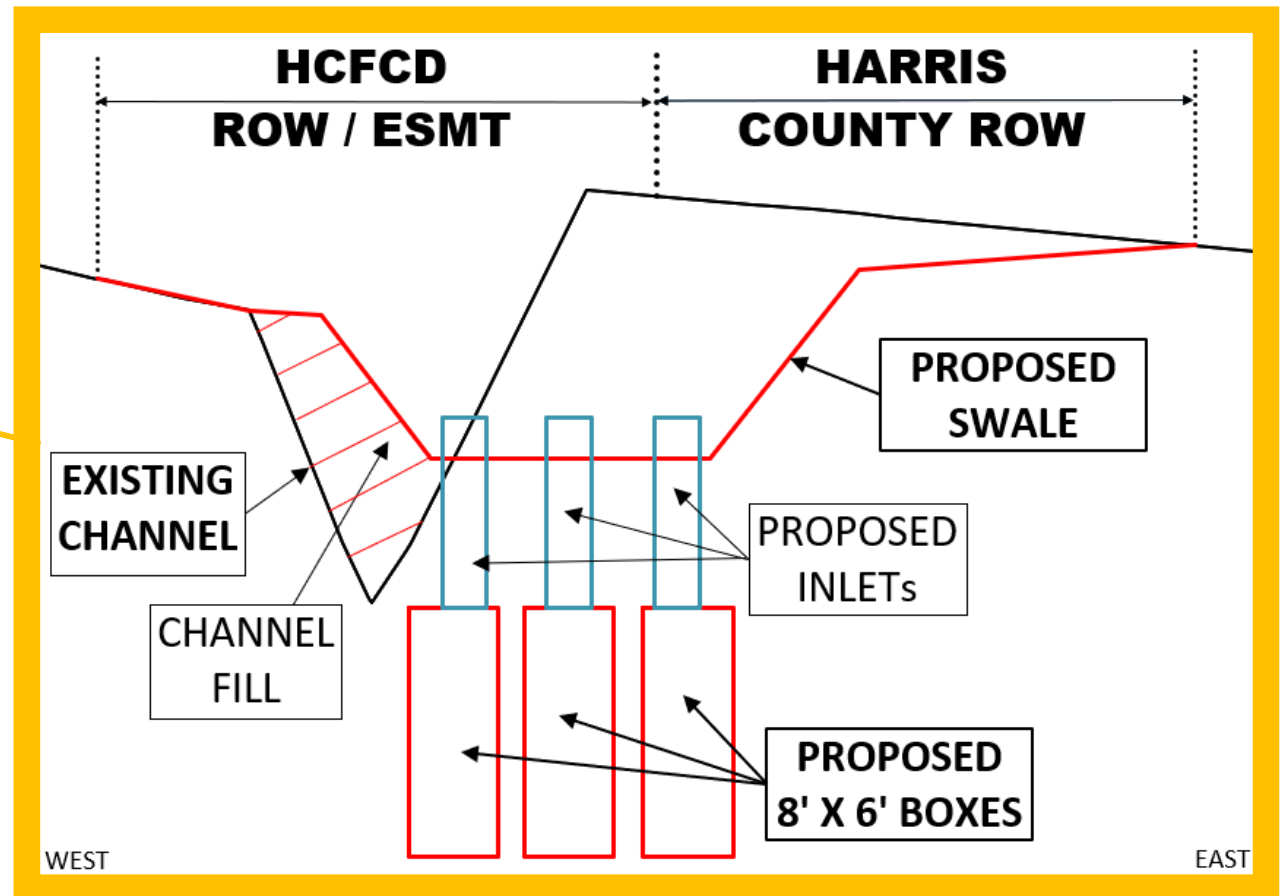




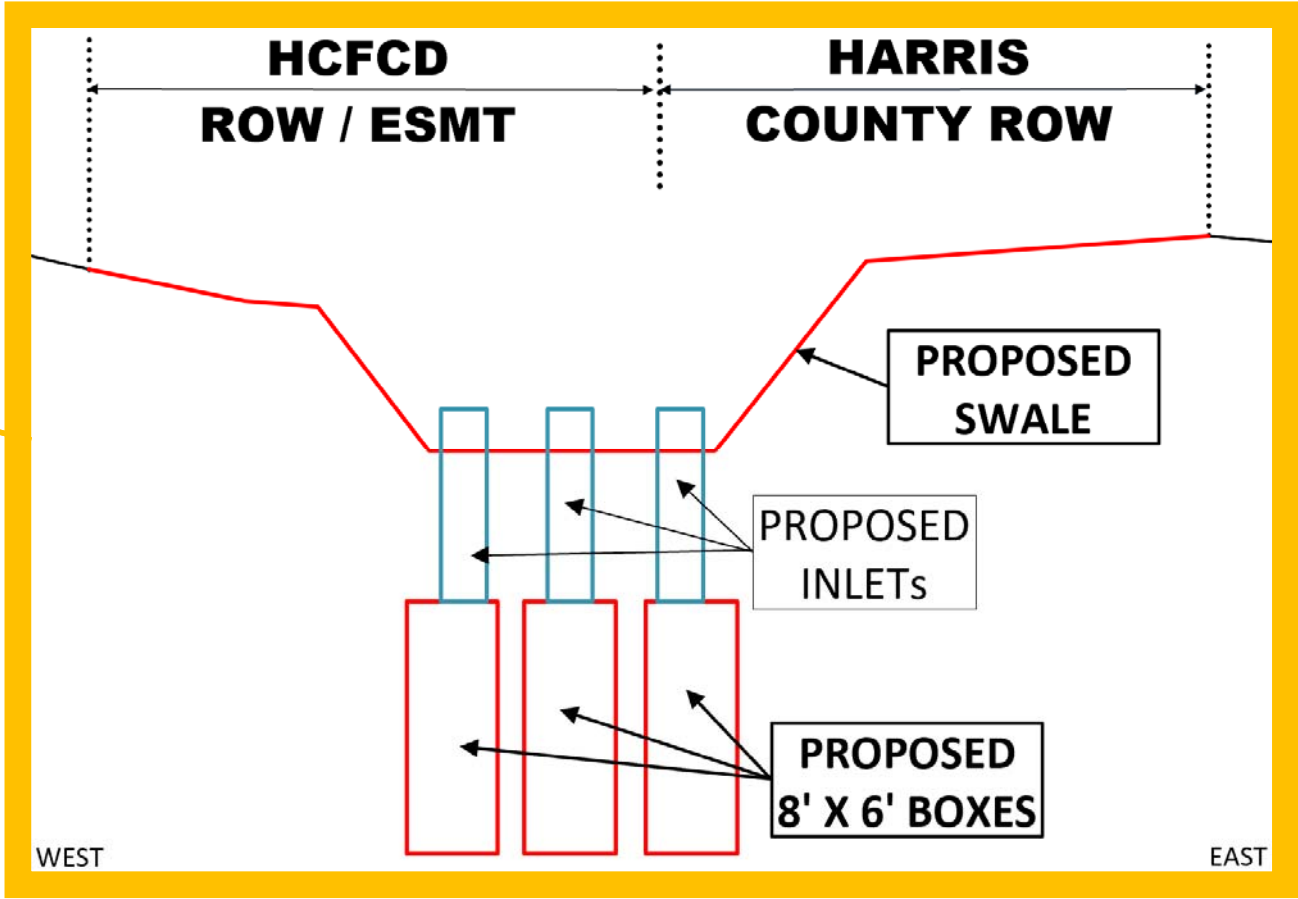
# Channel Modification



# Channel Modification



# Channel Modification





# Proposed Layout

**NO WORK**

- USACE JURISDICTIONAL WETLAND

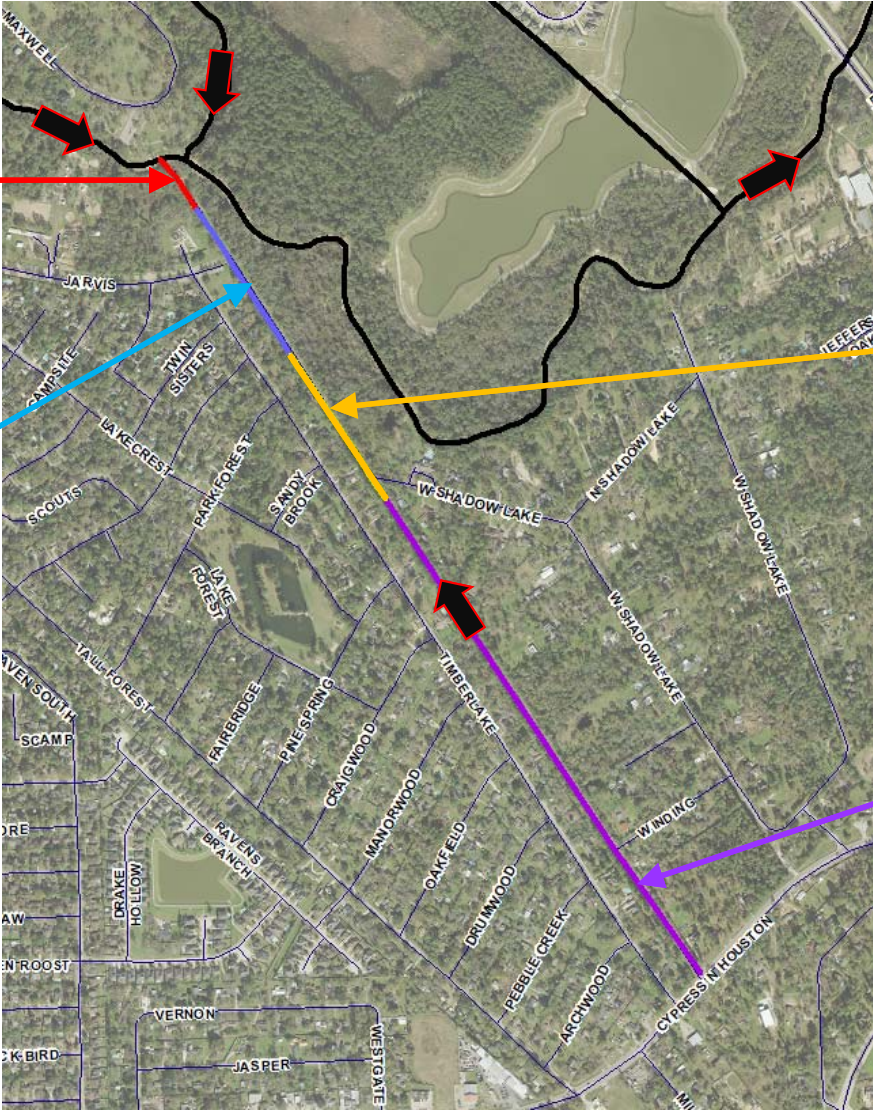


**EROSION CONTROL**

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- SLOPE PROTECTION
- REALIGN STORM SEWER OUTFALLS

**SWALE**

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**100-YR Level of Service (LOS)**  
Rainfall event the stream is capable of containing within HCFCD right-of-way.

**CHANNEL MODIFICATION**



- BURIED 3 – 8' X 6' RCB
- SWALE OVER BOXES

**CHANNEL MODIFICATION**



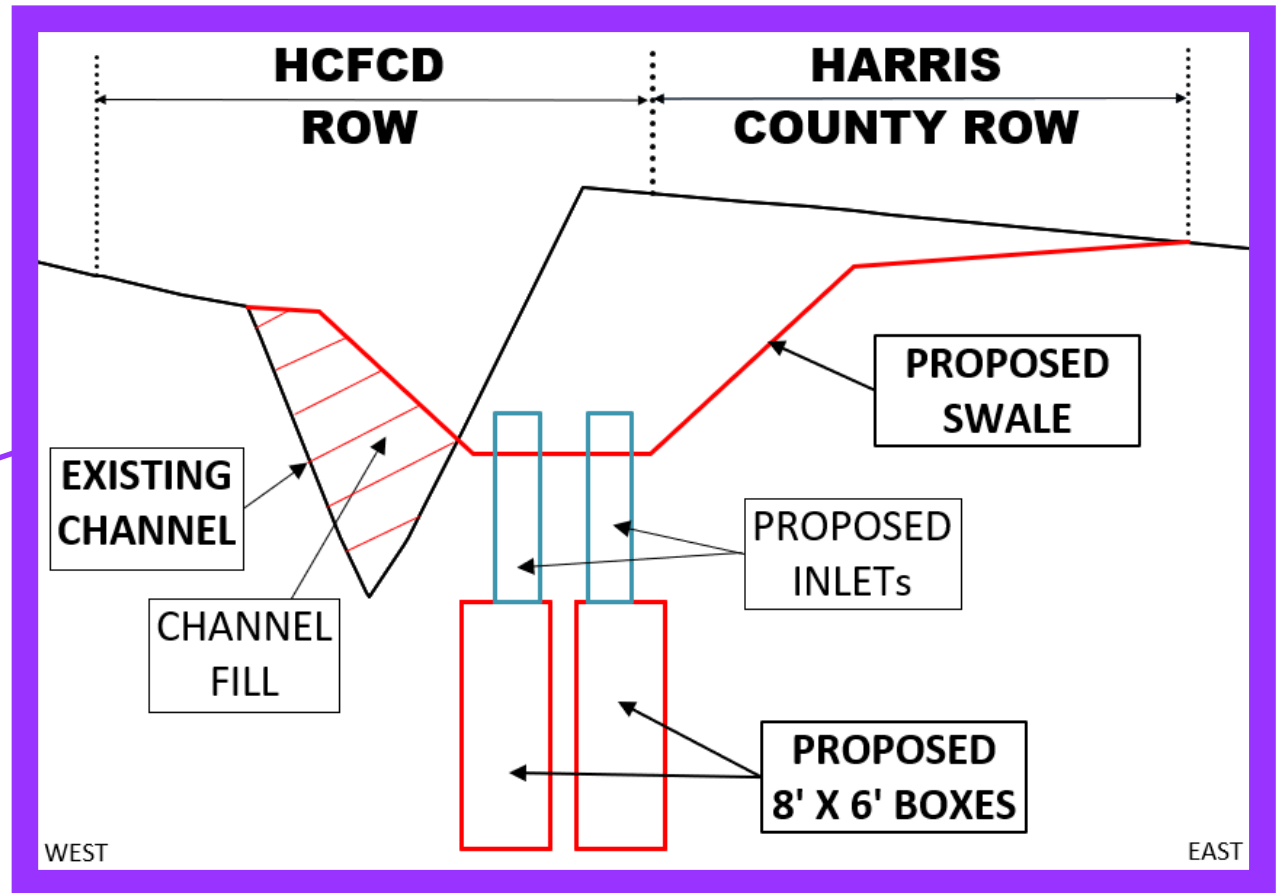
- BURIED 2 – 8' X 6' RCB
- SWALE OVER BOXES





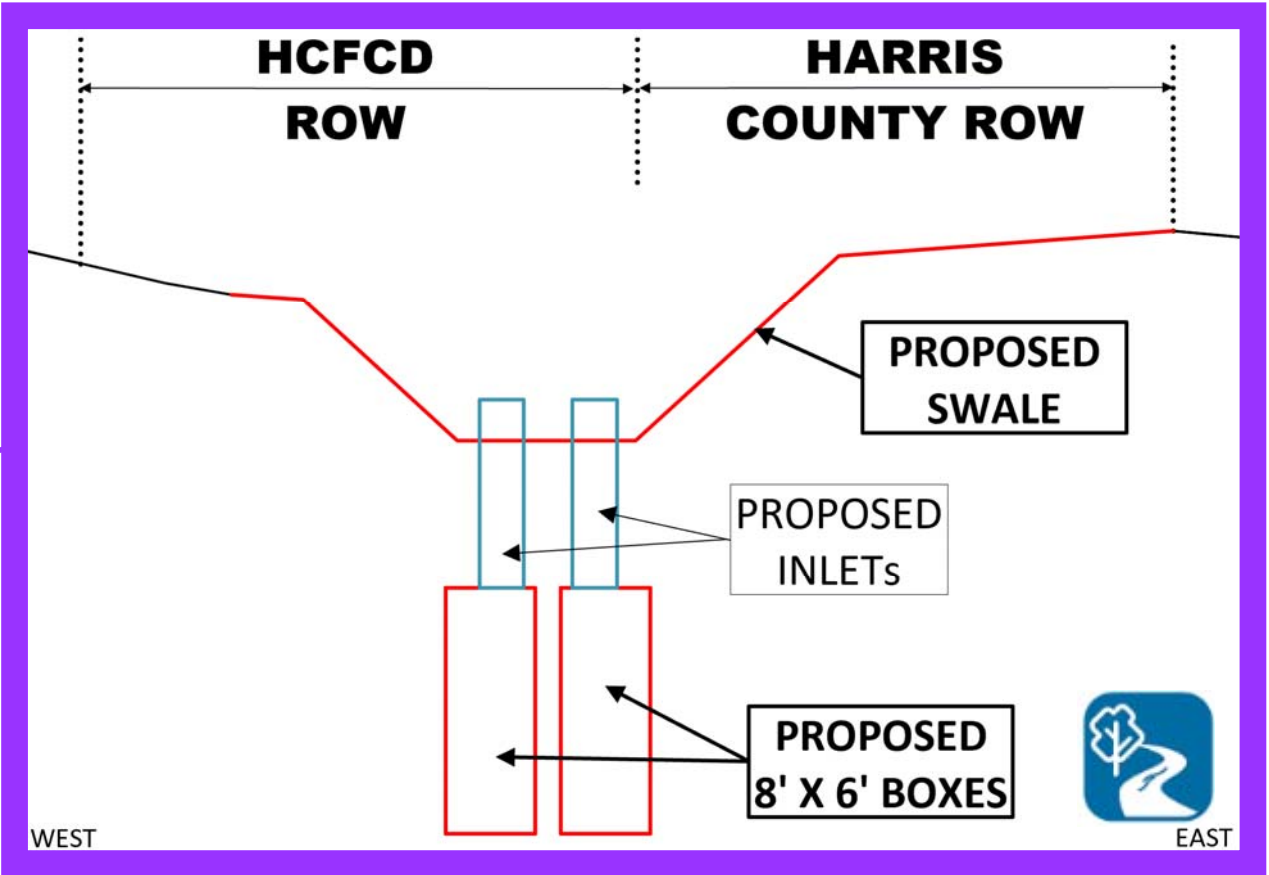


# Channel Modification





# Channel Modification



# Proposed Layout

**NO WORK**

- USACE JURISDICTIONAL WETLAND

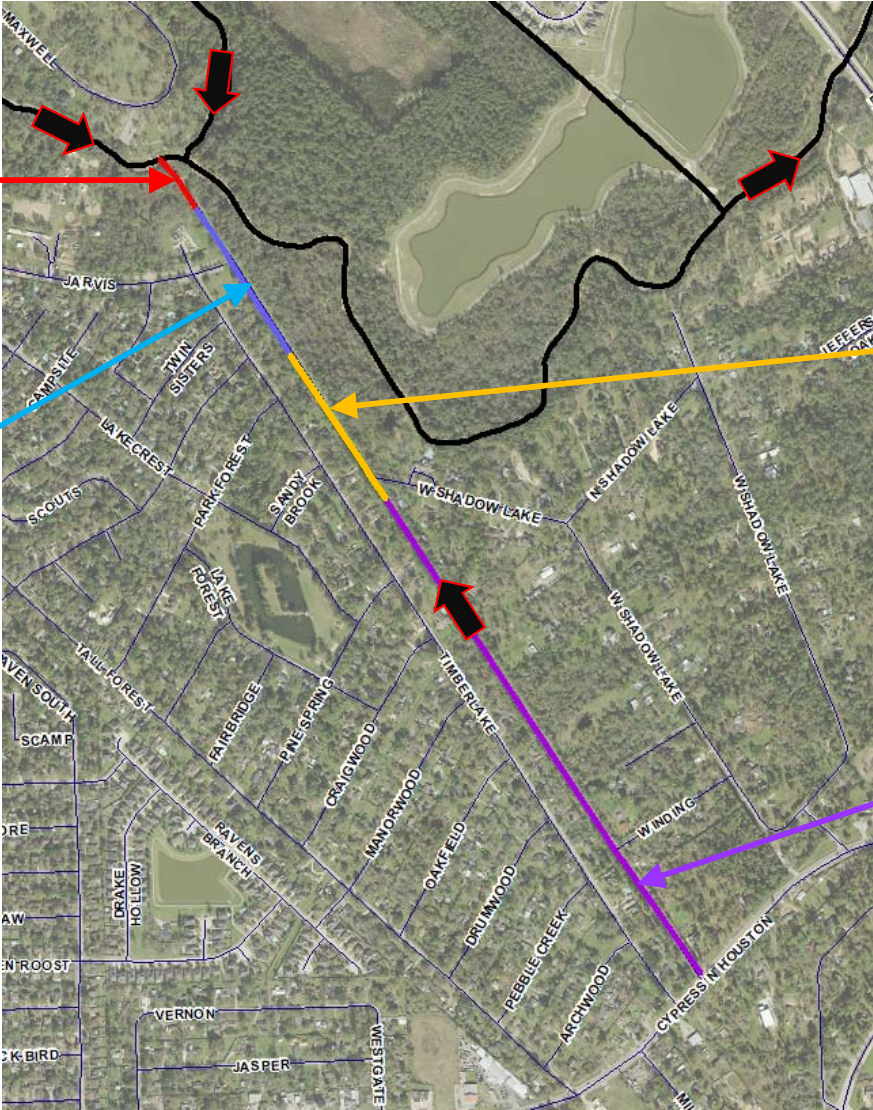


**EROSION CONTROL**

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Rainfall event the stream is capable of containing within HCFCD right-of-way.

**CHANNEL MODIFICATION**



- BURIED 3 – 8' X 6' RCB
- SWALE OVER BOXES

**CHANNEL MODIFICATION**



- BURIED 2 – 8' X 6' RCB
- SWALE OVER BOXES





# How does this benefit your community?

- Provides more widespread flood risk reduction
- Avoids environmentally sensitive areas
- Avoids costly utility relocation
- Avoids ROW acquisition
- Avoids major schedule delays



# Project Outlook

- Public Briefing: Today
- Design Phase: Winter 2019
- Construction Bidding: Winter 2019
  - Estimated Construction Cost - \$10M
  - Funded through 2018 Bond Program
- Construction Completion: Spring 2021

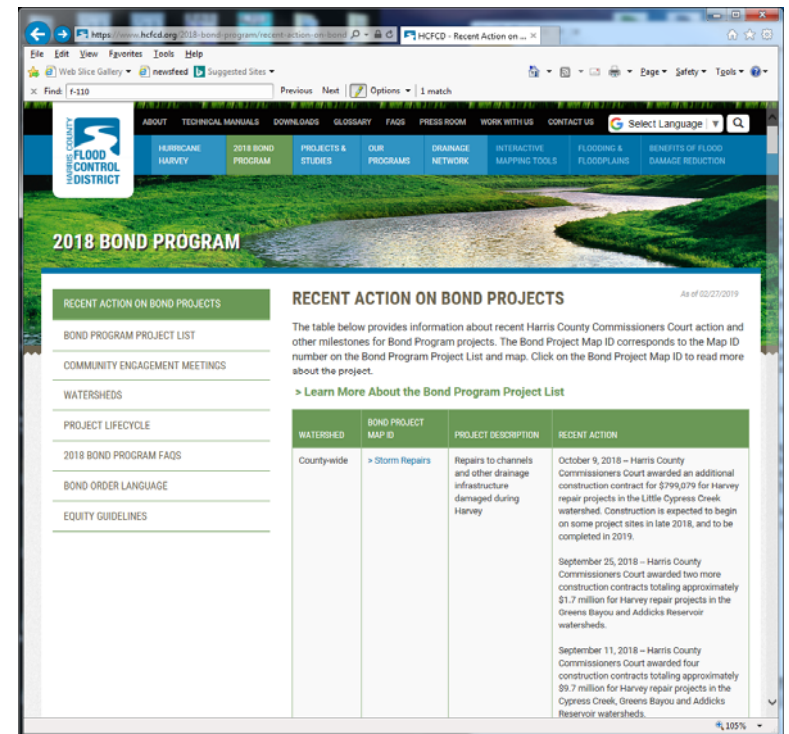


# We want to hear from you.

- See the tables & guides in back for more info
- Please visit us at:

[www.HCFCD.org/F23](http://www.HCFCD.org/F23)

- Learn more about the K163-00-00 Channel Improvements project.
- Submit questions and sign up for our mailing list.



The screenshot shows the Harris County Flood Control District website. The main content area is titled '2018 BOND PROGRAM'. Below this, there is a section for 'RECENT ACTION ON BOND PROJECTS' as of 02/27/2019. This section includes a table with the following data:

WATERSHED	BOND PROJECT MAP ID	PROJECT DESCRIPTION	RECENT ACTION
County-wide	> Storm Repairs	Repairs to channels and other drainage infrastructure damaged during Harvey	<p>October 9, 2018 – Harris County Commissioners Court awarded an additional construction contract for \$799,079 for Harvey repair projects in the Little Cypress Creek watershed. Construction is expected to begin on some project sites in late 2018, and to be completed in 2019.</p> <p>September 25, 2018 – Harris County Commissioners Court awarded two more construction contracts totaling approximately \$1.7 million for Harvey repair projects in the Greens Bayou and Addicks Reservoir watersheds.</p> <p>September 11, 2018 – Harris County Commissioners Court awarded four construction contracts totaling approximately \$9.7 million for Harvey repair projects in the Cypress Creek, Greens Bayou and Addicks Reservoir watersheds.</p>