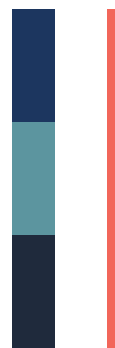




NCTCOG Public Works Roundup



# A Shockingly Fishy Story

Crossing Marine Creek Lake with an Inverted Siphon



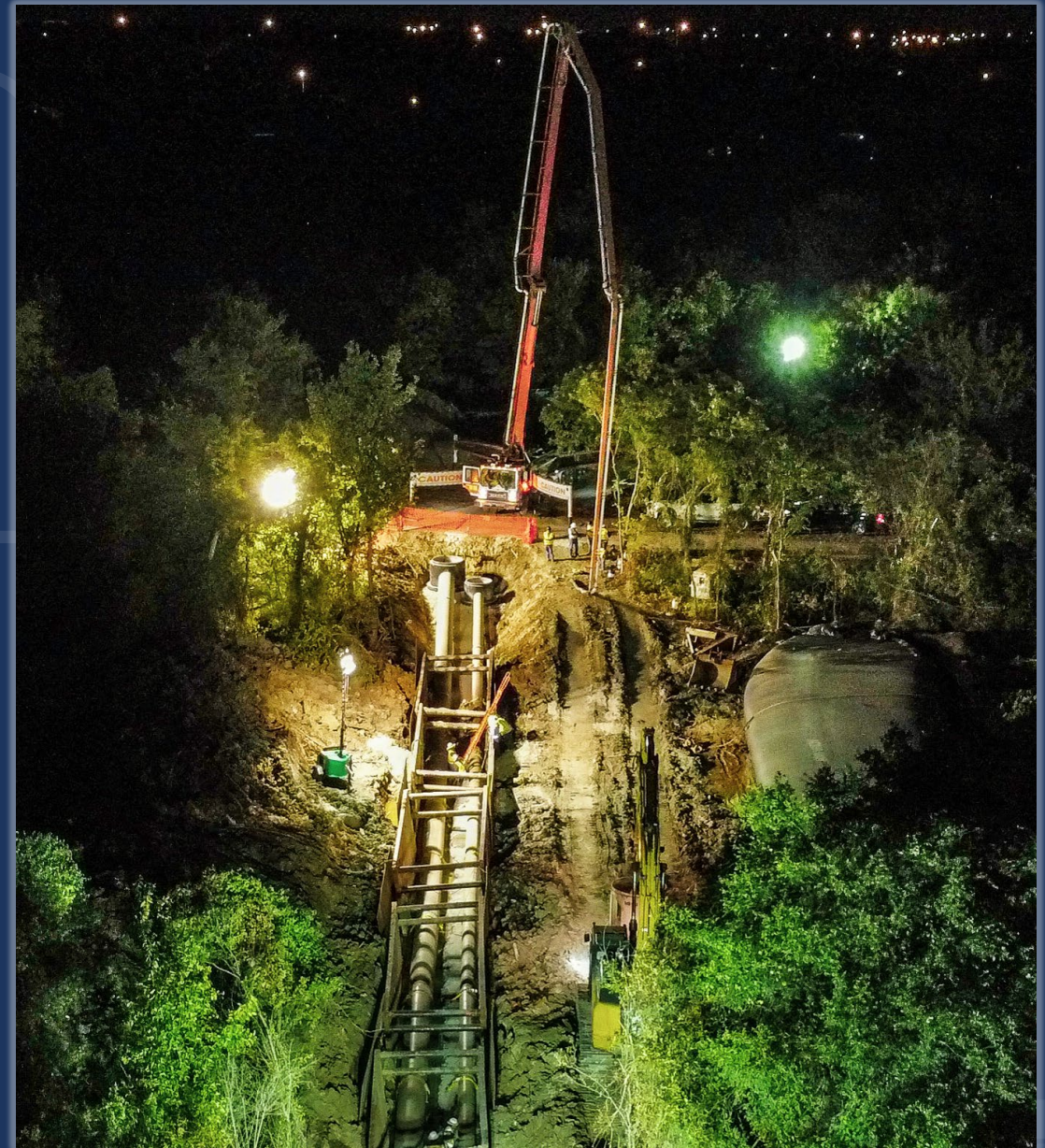
# INTRODUCTION

LEAH HODGE  
HALFF ASSOCIATES  
PROJECT MANAGER/ENGINEER

CARMEN DRAKE  
CITY OF FORT WORTH WATER DEPARTMENT  
CONSTRUCTION INSPECTOR

WALTER NORWOOD  
CITY OF FORT WORTH WATER DEPARTMENT  
PROJECT MANAGER/ENGINEER

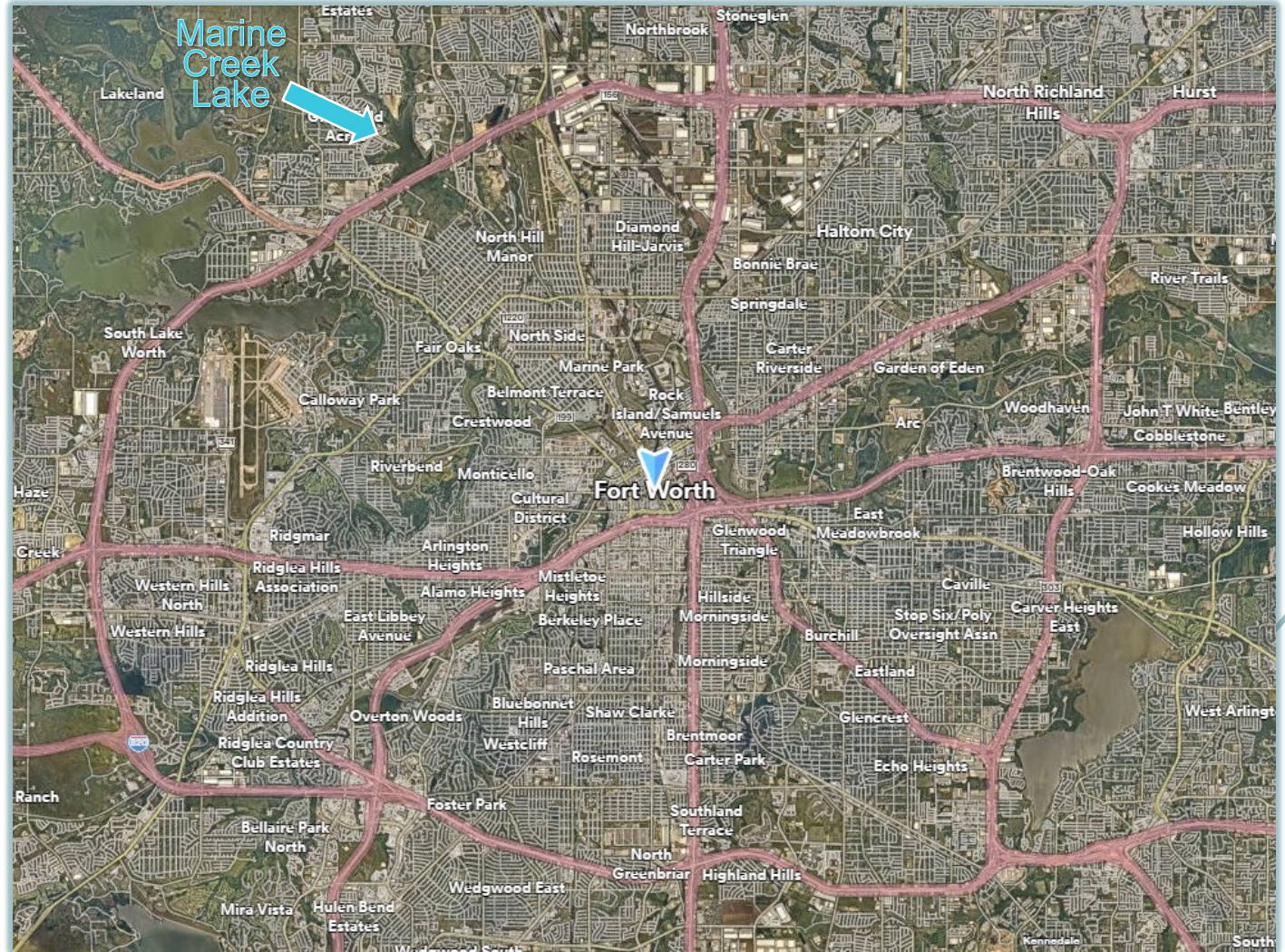
CONTRACTOR  
MCKEE UTILITY CONTRACTORS





# PROJECT LOCATION

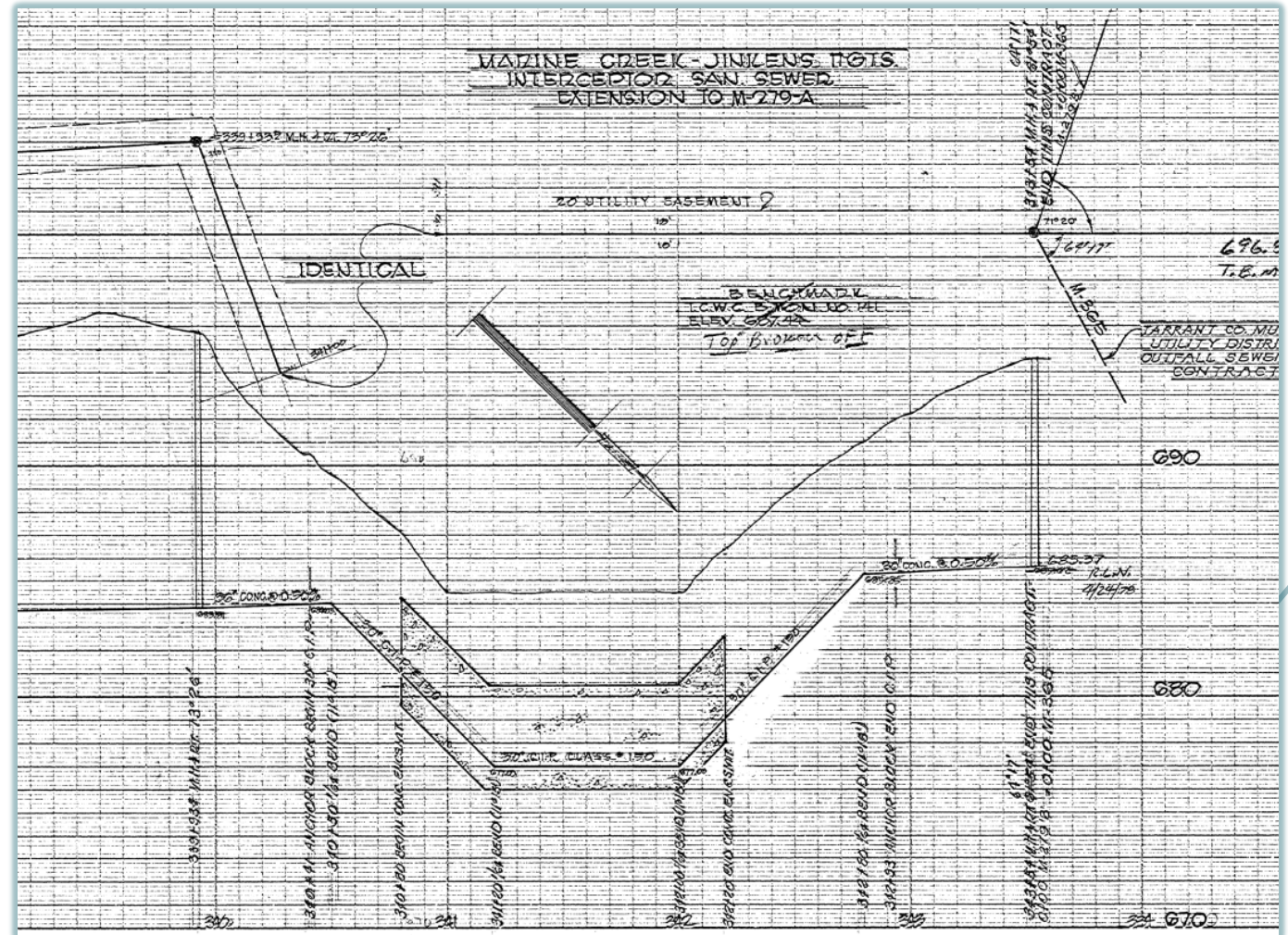
- City of Fort Worth Water Department
- Sewer interceptor replacement along the west side of Marine Creek Lake





## EXISTING INVERTED SIPHON

- Installed in 1970s
- Single barrel
- 30-inch cast iron pipe
- 20-foot utility easement
- Insufficient capacity
- Does not meet TCEQ



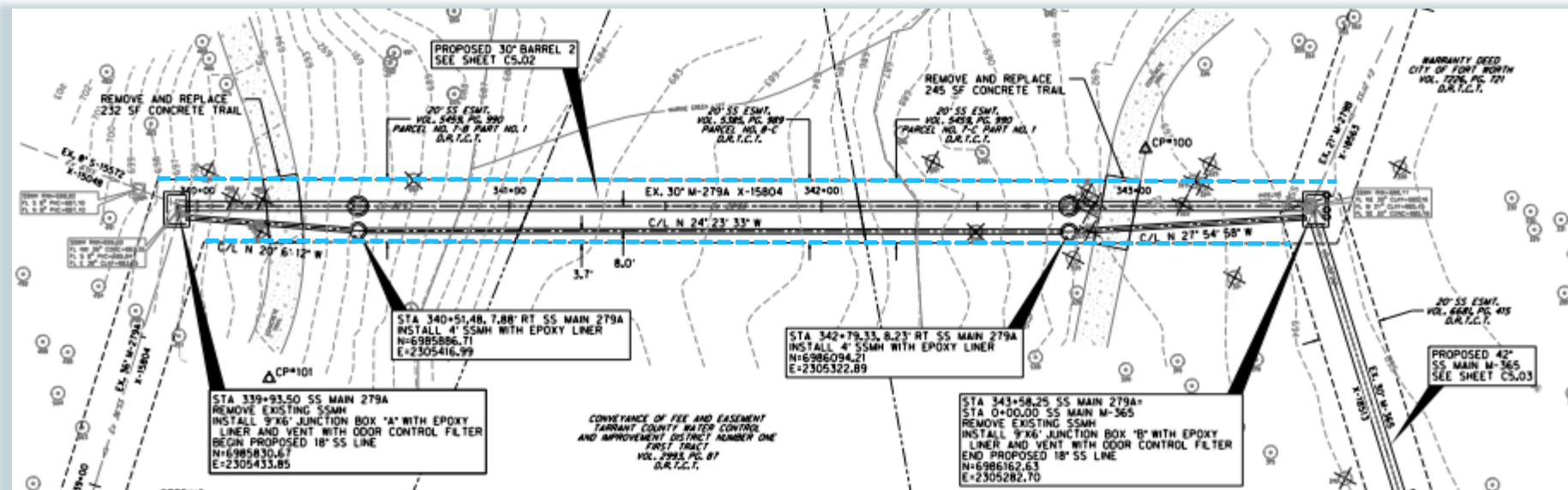


# INVERTED SIPHON REQUIREMENTS

## TCEQ CHAPTER 217 DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS RULE §217.53 PIPE DESIGN

### Section (n) Inverted Siphons and Sag Pipes

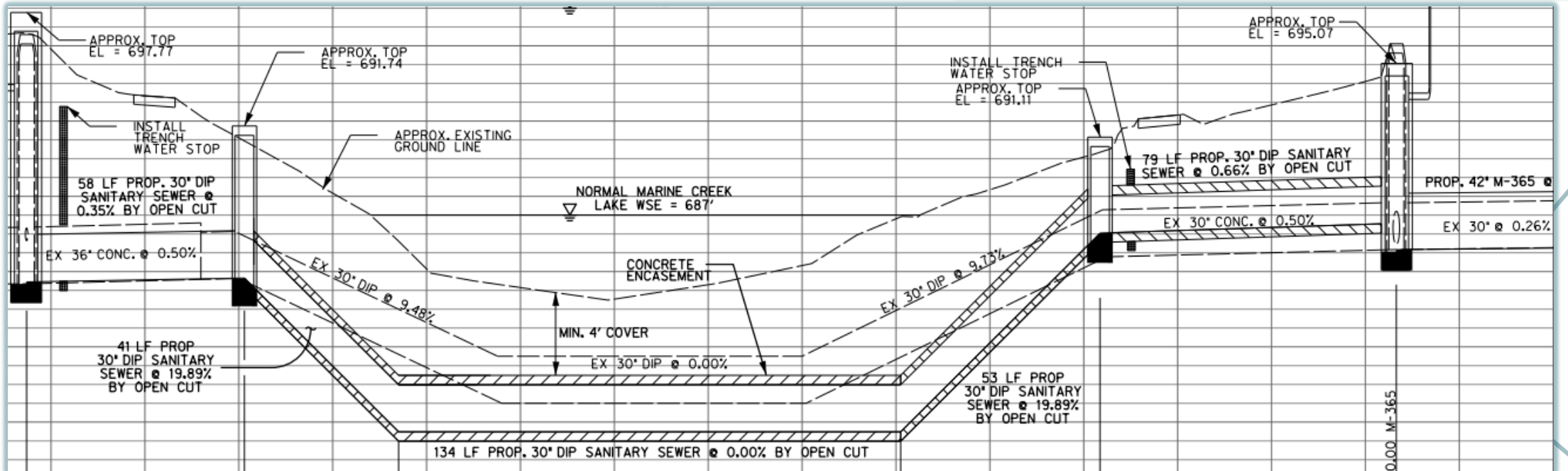
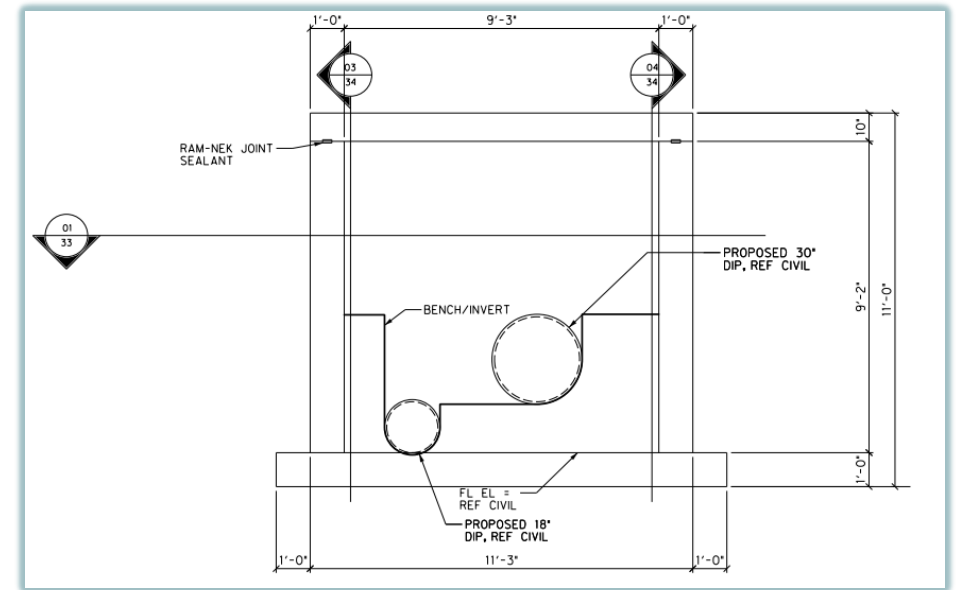
- Must include two or more barrels
- Must be sized to achieve a velocity of at least 3.0 feet per second
- Must be designed to divert the normal flow to one barrel





# DESIGN - SIZING

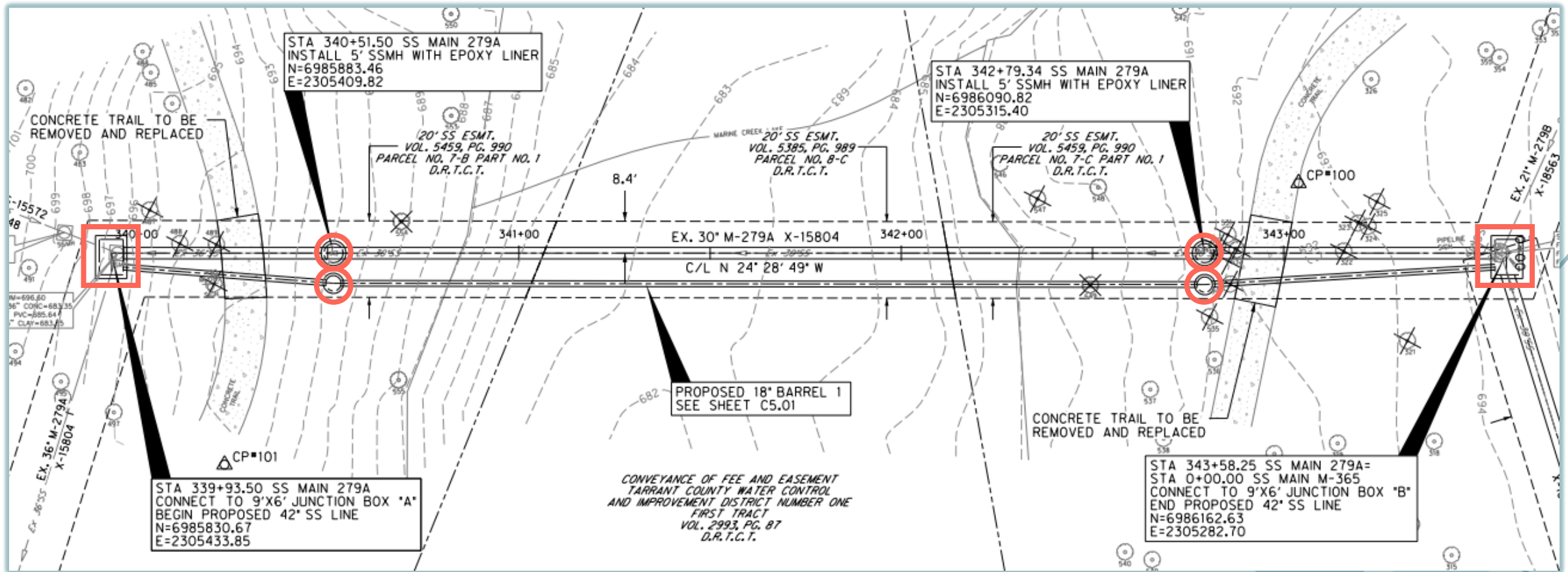
- First barrel designed to convey dry weather flow
- Second barrel designed to convey design flows
- Verify minimum velocity is met
- Verify there is sufficient head to overcome losses





# DESIGN - MAINTAINANCE

- Flow can be diverted to either barrel
- Two access points on each barrel for cleaning





# DESIGN - FLOATATION

- Confirm cover is sufficient to prevent floatation
- Address floatation during installation





# BYPASS PUMPING PLAN



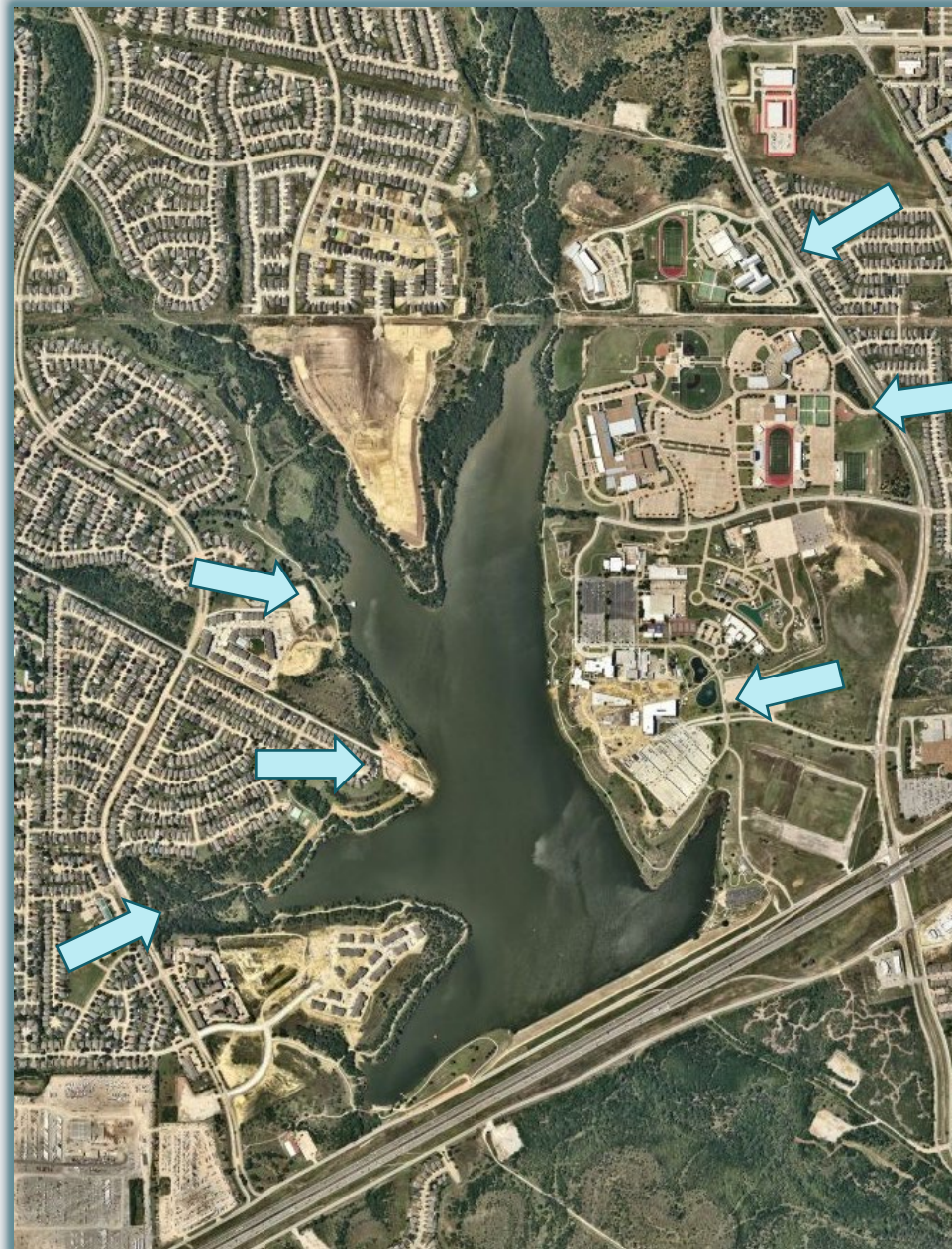


# COMMUNITY IMPACTS

Private HOA  
Park and Dock

TRWD  
Boat Ramp

CFW PARD  
Marine Creek Lake Park



EMS ISD  
Marine Creek MS

EMS ISD  
Chisholm Trail HS

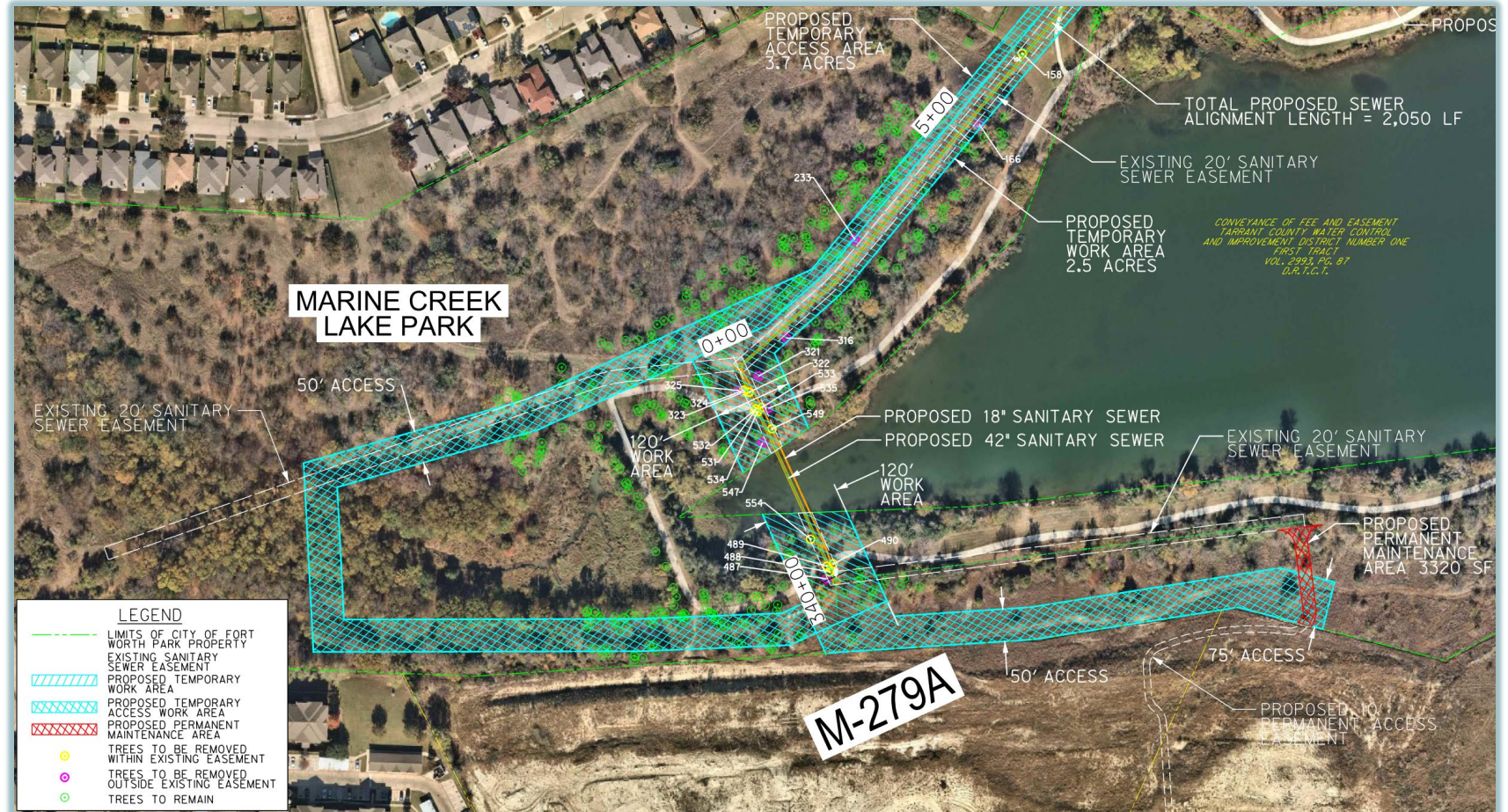
Tarrant County College  
Northwest Campus



# PERMITTING

## City of Fort Worth Park and Recreation Department

- Tree Survey and Removal Plan and Mitigation
- Site visits with the Urban Forestry Management Section
- Park Conversion





# PERMITTING

## Tarrant Regional Water District

- Required boat ramp and trails remain open throughout construction
- Required cofferdam be constructed of rubber bladder or sheet piles; No earthen dam
- Required turbidity curtain be installed and maintained
- Discharge monitoring plan and water quality testing



# PERMITTING

United States Army Corps of Engineers

- Construction authorized under Nationwide Permit 58
- Aquatic resource relocation plan approved by Texas Parks and Wildlife





# MARINE CREEK LAKE









# BYPASS PUMPING



















































# QUESTIONS

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