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Innovative approaches
Practical results
Outstanding service

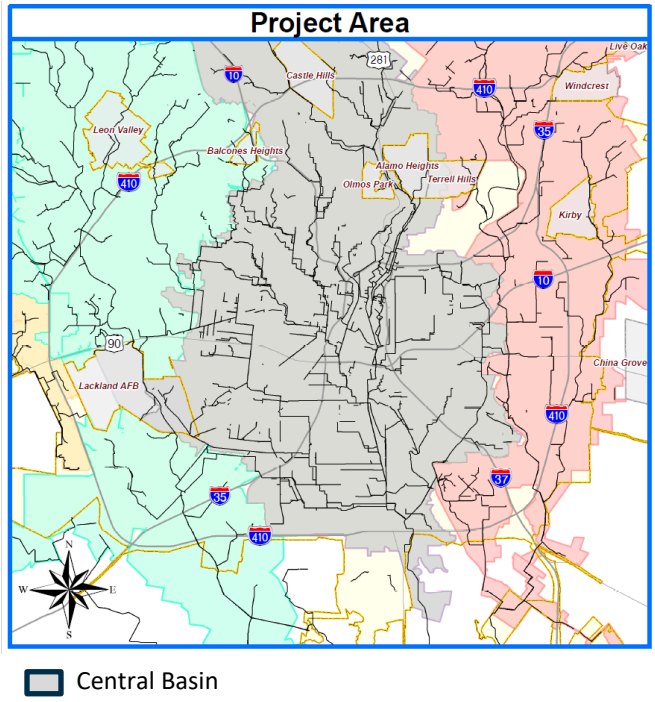
Condition Remedial Measures Selection

Small Diameter

30% Design Package 2

Central Basin – Geographical Location

July 2018



Central Basin

Prepared for:

San Antonio Water System

Innovative approaches
Practical results
Outstanding service

Condition Remedial Measures Selection

Small Diameter

30% Design Package 2

Central Basin – Geographical Location

July 2018

Basin Planning Consultant for the
Sanitary Sewer Overflow Reduction Program (SSORP) Team

Prepared for:

San Antonio Water System

Prepared by:

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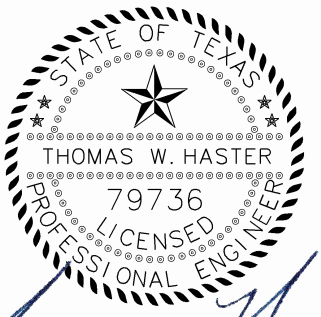

7/13/2018

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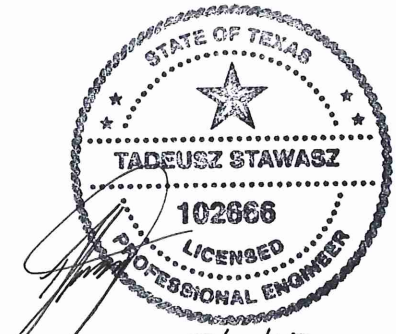

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APPENDICES

1.0 INTRODUCTION

The purpose of the Basin Planning Consultants (BPC) is to provide support to the Sanitary Sewer Overflow Reduction Program (SSORP) team. This was mandated by the 2013 Consent Decree (CD) between San Antonio Water System (SAWS) and the Environmental Protection Agency (EPA). Freese and Nichols, Inc. (FNI) and CP&Y developed 30% design packages for the small diameter D and E assets within the Central Basin chosen by the SSORP team to be rehabilitated. Small diameter pipes are less than 24"; between 6" and 21".

This Package 2 TM contains the 30% design information for the second set of assets selected by the SSORP team. Package 2 was the second highest priority package, and contains Category E assets that coincide with City of San Antonio street improvement projects. All packages being submitted are summarized in **Table 1-1.** This TM documents the constructability issues, desktop studies, and recommended condition remedial measures (CRM) for each pipe. The CRMs were assigned in the 10% design analysis; see *Condition Remedial Measures Selection Small Diameter Technical Memorandum* submitted January 2018. Also included in this TM are design plan maps for each asset which are located within **Appendix A**.

Table 1-1 – Package Summary

Package Number	Number of Assets	Length of Pipe (LF)	Package Description
1	30	9,064	E Pipes - located under roads
2	12	3,815	D and E Pipes that align with City of San Antonio bond projects
3	101	27,459	Similar Geographic Location
4	135	36,702	Similar Geographic Location
5	131	37,184	Similar Geographic Location
6	105	29,310	Similar Geographic Location

2.0 REMEDIAL MEASURES

FNI used the decision guidelines developed by SAWS in the *Guidelines TM* to develop a protocol with which to recommend a remedial measure. This protocol is shown in **Figure 2-1** as a flowchart (decision tree) resulting in a preferred remedial measure.

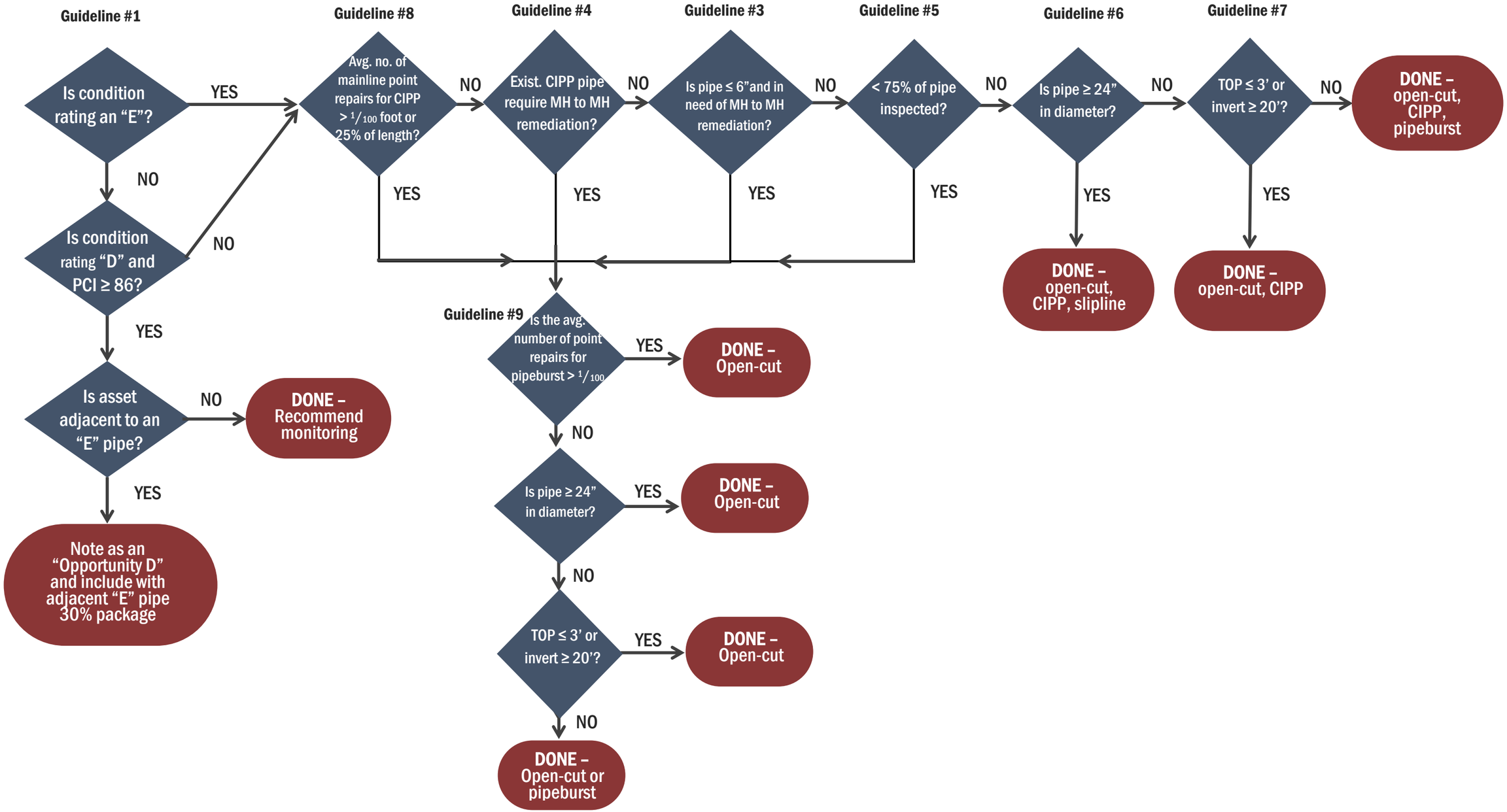

Figure 2.1- Remedial Measure Flow Chart

3.0 ADDITIONAL AND BASE PIPES

The SSORP team separated assets into two groups, Base pipes and Additional pipes. Base pipes are the condition pipes that will be repaired by 2023, per the CD. Additional pipes are assets in the same geographic location as the Base pipe and, if funds allow, will be included in the construction packages for rehabilitation. Base and Additional pipes are quantified separately in the quantity tables. In the plan sheets (C Sheets), Additional pipes have an orange halo. Moreover, the asset data sheets (F Sheets) identify the assets as either Additional or Base.

4.0 ASSUMPTIONS

The following assumptions were applied to maintain a consistent design throughout the 30% design packages.

4.1 LATERALS

A lateral shapefile was created by the BPCs using the defect codes in the PACP database provided by SAWS. This shapefile was used to populate the quantity tables for the number of laterals on each pipe. The defect codes used to identify laterals in the pipe are shown in **Table 4-1**. The location and status of the laterals will need to be determined by the surveyor and final design engineer.

Table 4-1 - Lateral Defect Codes

Defect Code	Definition
TB	Tap Break-in/Hammer
TBA	Tap Break-in/Hammer Activity
TBD	Tap Break-in/Hammer Defective
TBI	Tap Break-in/Hammer Intruding
TF	Tap Factory
TFA	Tap Factory Activity
TFD	Tap Factory Defective
TFI	Tap Factory Intruding
TS	Tap Saddle
TSA	Tap Saddle Activity
TSD	Tap Saddle Defective
TSI	Tap Saddle Intruding

4.2 PAVEMENT REPAIR

The City of San Antonio (CoSA) determines the street repair necessary for disturbed pavement based on the pavement condition index (PCI) of the road. Roads with a PCI greater than or equal to 86 are considered to be in excellent condition and require curb-to-curb restoration (full street restoration). Roads with a PCI less than 50 are considered to be in poor condition and only require repair of the road within the limits of the trench. Roads with a PCI between 50 and 85 are considered to be in fair condition and are evaluated by CoSA on a case-by-case basis.

The estimated quantity of pavement repair for the following CRMs is listed below. For all streets, regardless of the PCI rating; CIPP was assumed to have no pavement repair. For pipes with a CRM of POINT REPAIR, a 20’ length by 10’ width was assumed. For pipes with a CRM of BORE, it was assumed that the bore pit would be 40’x10’ and the receiving pit would be 10‘x10’.

- PCI greater than or equal to 86
    - OPEN-CUT - will require full pavement repair for the full length of pipe, curb to curb.
    - PIPEBURST - will require full pavement repair for the full length of pipe, curb to curb.
- PCI between 50 and 85
    - OPEN-CUT & PIPEBURST - will require pavement repair for the full length of pipe, 10’ wide.
- PCI of less than 50
    - OPEN-CUT - will require pavement repair for the length of pipe and width of the trench. Trench width is typically the diameter of the pipe plus 3’.
    - PIPEBURST - will require pavement repair for 10% of the length of the asset and the width of the trench. Trench width is typically the diameter of the pipe plus 3’.

4.3 POINT REPAIRS

Point repairs were identified two ways; one was to create a shapefile of specific defects (i.e. BVV, HVV, XP, etc) and show them geospatially on a map. The second way was to identify defects in need of a point repair through CCTV review. The point repairs identified through CCTV review only exist for pipes reviewed after the 4/17/2017 OPEN-CUT meeting conducted by SAWS. During this meeting, SAWS requested that the point repairs be identified by a professional after the CCTV review had begun. The BPCs did not identify point repairs using CCTV for any assets prior to this meeting. The point repairs shown on the map (C Sheets) are from the shapefile, while the number of point repairs identified through CCTV review are shown on the data sheets (F Sheets) in the package maps. The point repairs shown on the maps (C Sheets) may not match the number of point repairs identified by reviewers on the F sheets. Only point repairs identified through CCTV review were used for cost estimating. The final design engineer will need to verify the number and location of all point repairs. **Table 4-2** shows the defect codes selected to be shown on the map.

Table 4-2 - Defects Shown on Package Maps

PACP Definition Code	Defect
'BSV'	Broken Soil Visible
'BVV'	Broken Void Visible
'FH4'	Hinge Fracture (4 Fractures)
'FH3'	Hinge Fracture (3 Fractures)
'H'	Hole
'HSV'	Hole Soil Visible
'HVV'	Hole Voids Visible
'IG'	Infiltration Gusher
'JAL'	Joint Align Large
'JOL'	Joint Offset Large
'JSL'	Joint Separation Large
'RBJ'	Roots Ball Joint
'RBL'	Roots Ball Lateral
'RBB'	Roots Ball Barrel
'RBC'	Roots Ball Connection
'XP'	Collapse

4.4 MANHOLES

The quantity of manholes to be rehabilitated were identified by the type of CRM recommended for each asset. The CRM and the associated assumed manhole rehab is listed below.

- CIPP – rehabilitate all manholes
- SLIPLINING – rehabilitate all manholes
- PIPEBURST – rehabilitate all manholes
- OPEN-CUT – install new manhole
- BORE – install new manhole

5.0 QUANTITIES

5.1 ASSETS

The quantities for the remedial measures for Package 2, separated for Base and Additional pipe, are shown in **Table 5-1.**

Table 5-1 - Summary of Package 2 Assets

PREFERRED REMEDIAL MEASURE	Diameter (in)	Base (LF)	Additional (LF)	Total Length (LF)
CIPP & POINT REPAIR	8	370	0	370
CIPP & POINT REPAIR Total		**370**	**0**	**370**
PIPEBURST	8	493	759	1,252
PIPEBURST Total		**493**	**759**	**1,252**
PIPEBURST & POINT REPAIR	8	0	393	393
PIPEBURST & POINT REPAIR Total		**0**	**393**	**393**
REPLACE OPEN-CUT	8	362	0	362
	10	654	0	654
	12	384	0	384
	15	399	0	399
REPLACE OPEN-CUT Total		**1800**	**0**	**1,800**
TOTAL				**3,815**

5.2 PAVEMENT REPAIR

The street repairs are summarized in **Table 5-2**.

Table 5-2 - Pavement Repair for Remediation Measures

Item No.	Item Description	Unit	Quantity
203	Tack Coat	GAL	509
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	1,218
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	5,093
206	Asphalt Treated Base - Milling (0" to 2")	SY	5,093

5.3 BYPASS PUMPING

Bypass pumping data was provided in order to get a high-level cost estimate for the 30% condition design package. Flows in the pipe, number of set ups, upstream (US) suction manhole and downstream (DS) discharge manhole, and the length of the bypass were provided and quantified separately for Base and Additional pipes. For this package there was a total of 6 by-pass pumping set ups for Base pipes and 2 for Additional pipes.

A bypass set up was determined to be a configuration that removes sewage from the pipe that is being rehabbed. Bypass will be designed based on number of pipes adjacent to each other unless there is an Additional pipe that breaks the linked pipe. Bypass for “Additional” pipes are quantified separately.

In order to determine the cost of the bypass pumping set ups, peak wet weather and average day flows (MGD) were provided for each pipe on the F Sheets. For pipes 12" and greater, the flows shown were taken from the FNI model that was run with 30% I/I reduction. Pipes 6" - 10" show peak flows calculated using Manning's Equation assuming full flow in the pipe.

Bypass pumping length was determined by identifying the upstream suction manhole and measuring the length to the downstream discharge manhole. If multiple sewer mains were connected to the pipe, then an upstream and downstream manhole was selected in order to provide a bypass length for cost estimation. These upstream suction manholes and downstream

discharge manholes may not be preferred by the final design engineer and therefore may be modified during final design.

6.0 SITE IMPACT CHECK

Desktop studies to obtain environmental and geotechnical data for each asset were performed. The results of these studies are located in the F Sheets. Along with the desktop studies, a windshield survey was conducted for all assets. Images shown on the F Sheets were taken during these site visits, with Google Earth images were used in areas requiring additional safety (i.e. a busy street) or no access (private property).

7.0 DESIGN PLAN SHEETS

In addition to the desktop studies/survey information; Package 2 design plan sheets include the following information for each asset:

- Pipe COMPKEY
- Package priority number
- UNITID (upstream MH)
- UNITID 2 (downstream MH)
- Number of Laterals (taken from PACP codes provided by SAWS)
- Number of Point Repairs (taken from PACP codes provided by SAWS)
- Pipe Material (identified in 10% Design)
- Pipe Length
- Surveyed Pipe Length (identified in 10% Design)
- Diameter (nominal diameter of pipe in inches)
- Verified Condition (SAWS-provided rating; and indication if consultant disagreed)
- 100-year floodplain
- Sags
- Preferred remedial measure
- Low-Income area

- Street width (if asset is located in a street)
- PCI Rating of street on which asset is located
- Bypass Pumping Data
    - Wet weather flow
        - Obtained from the model for pipes 12” and greater
        - Calculated using Manning’s Equation for pipes less than 12” in diameter
    - Average Day flow
        - Obtained from the model for pipes 12” and greater
        - No data provided for pipes less than 12” in diameter
- Parcels Impacted
- Quantities
    - Pavement to be replaced (full street for linear foot [LF] repair, half street for LF repair, and width of trench for LF repair)
    - Linear footage of pipe to be repaired

8.0 CONCLUSION

Package 2 contains pipes considered the second highest priority by SAWS; pipes that align with CoSA bond projects. The package contains 12 assets totaling 3,815 LF (0.72 miles) of Base and Additional pipe to be rehabilitated.

APPENDIX A

Package Maps

SAN ANTONIO WATER SYSTEM

CENTRAL BASIN CONDITION DESIGN DEVELOPMENT (30%) - PACKAGE 2

San Antonio Water System

SSO REDUCTION PROGRAM

Job No.: SWB16406

JULY 2018

Engineer:

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Texas Firm: F-1741

GEOTECHNICAL ENGINEER
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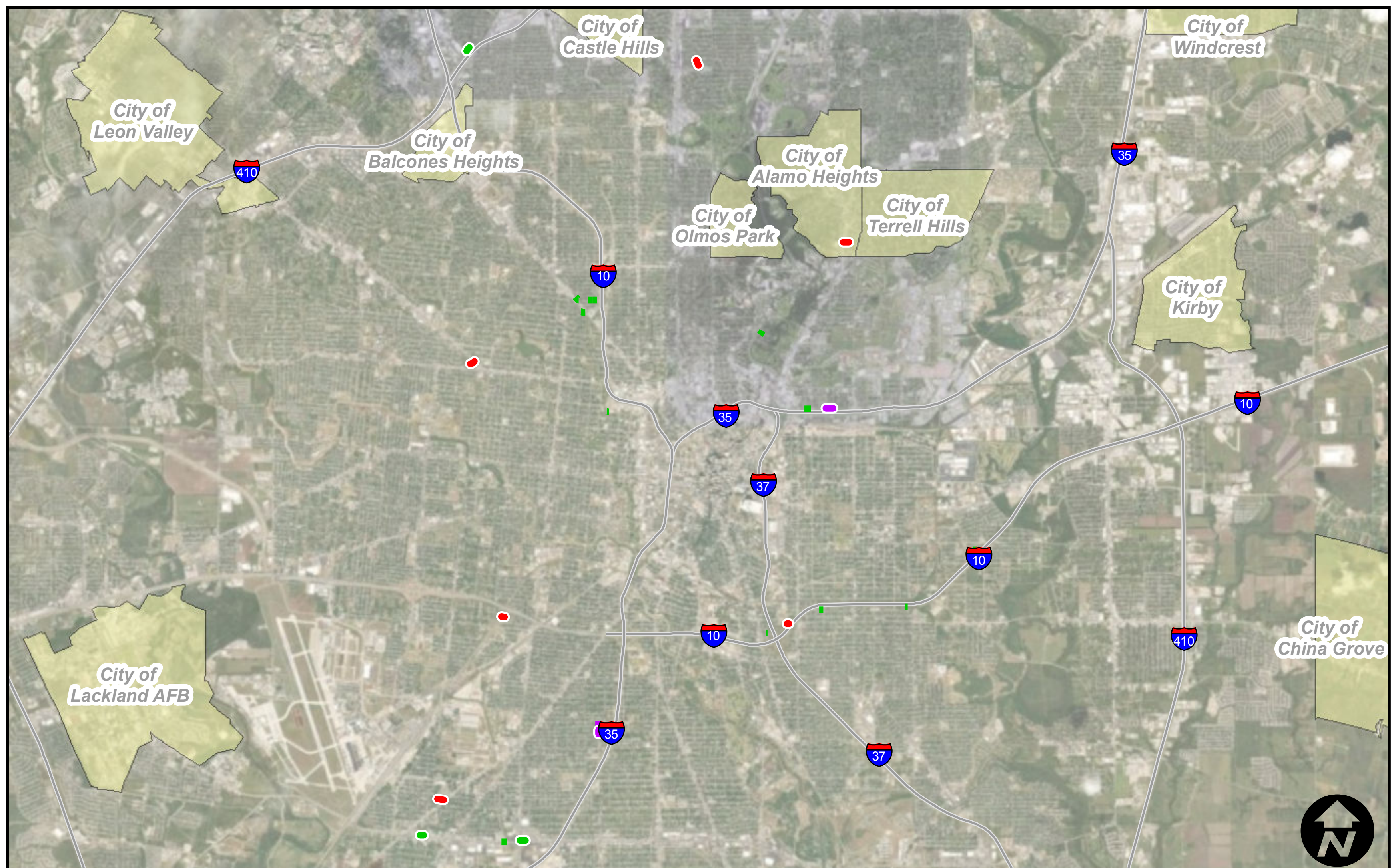
CP&Y



LOCATION MAP

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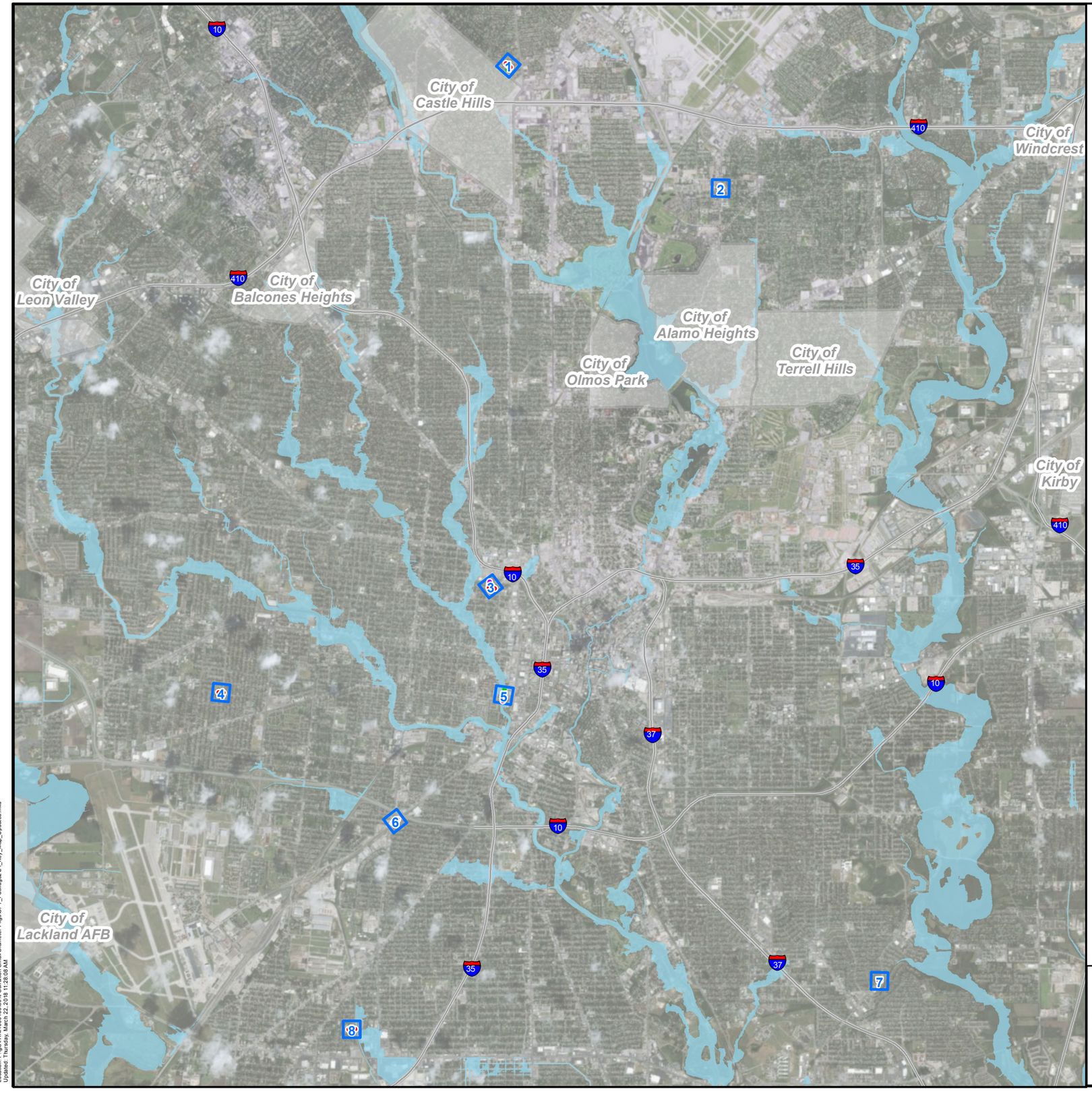

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SCALE IN FEET

LEGEND
- Interstates
- 100Yr Floodplains
- Civil Sheet Number
- City Limit
- Other City

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San Antonio Water System

KEY MAP

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G-1

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San Antonio Water System

SHEET INDEX

Date: 4/11/2018	
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G-2

Base Bid

Item No	Item Description	Unit	Quantity
203	Tack Coat	GAL	470.4
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	1075.2
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	4703.7
206	Milling	SY	4703.7
413	Flowable Fill (COSA)	CY	140.0
550	Trench Excavation Safety Protection	LF	1799.6
848	8" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	362.3
848	10" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	654.3
848	12" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	383.8
848	15" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	399.2
852	Sanitary Sewer Manholes	EA	10
864	Bypass Pumping (Set Up)	EA	6
866	CCTV Inspection	LF	2662.8
900	8" Pipe Bursting (All Depths)	LF	493.2
901	8" Rehabilitation of Sanitary Sewer by Cured-in-Place Pipe	LF	370.0
910	Manhole Rehabilitation	VF	22.1
1103	Point Repairs for 8" Diameter. (0'-10' depth) including up to 20 LF of piping	EA	4
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	24
1109.2	Sanitary Sewer Lateral Connections with Remote Control Device	EA	9

Additional Pipes

Item No	Item Description	Unit	Quantity
203	Tack Coat	GAL	38.9
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	142.6
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	388.9
206	Milling	SY	388.9
864	Bypass Pumping (Set Up)	EA	2
866	CCTV Inspection	LF	350.0
900	8" Pipe Bursting (All Depths)	LF	1152.0
910	Manhole Rehabilitation	VF	51.0
1103	Point Repairs for 8" Diameter. (0'-10' depth) including up to 20 LF of piping	EA	2
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	9

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San Antonio Water System

QUANTITY TABLES PAGE

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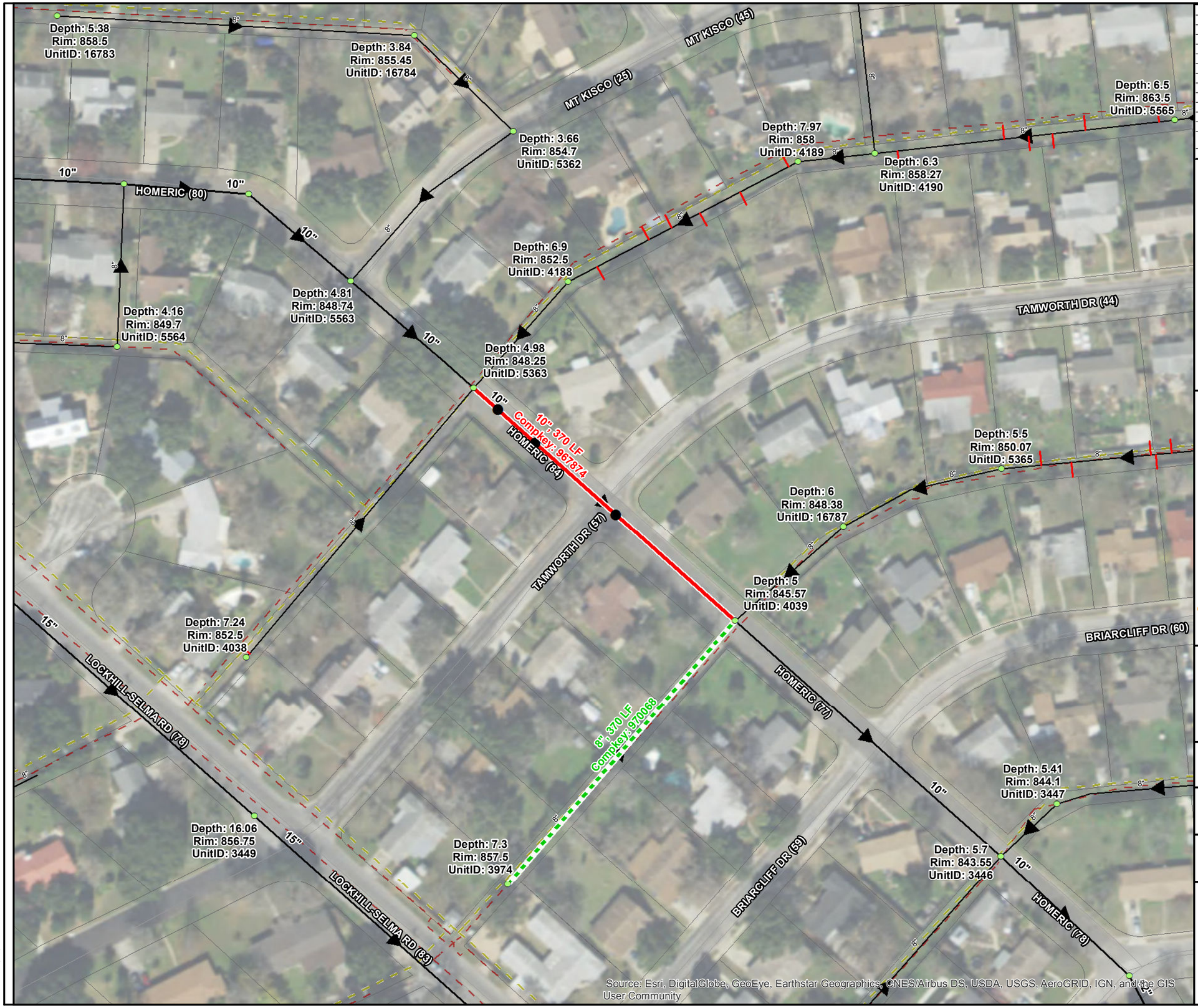

BASE QUANTITIES

ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	41.1
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	246.5
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	411.1
206	Milling	SY	411.1
550	Trench Excavation Safety Protection	LF	370.0
848	10" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	370.0
852	Sanitary Sewer Manholes	EA	2
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	740.0
901	8" Rehabilitation of Sanitary Sewer by Cured-in-Place Pipe	LF	370.0
910	Manhole Rehabilitation	VF	7.3
1103	Point Repairs for 8" Diameter. (0'-10' depth) including up to 20 LF of piping	EA	4
1109.2	Sanitary Sewer Lateral Connections with Remote Control Device	EA	9

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET
1

Title: Compkey: 967874 & 970068

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-1

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Updated: Monday, July 02, 2018 9:04:48 AM

ASSET INFORMATION

SHEET F-1a

CompKey	967874
Final Rehab	REPLACE OPEN-CUT
Basin	CENTRAL

Diameter	10
Length	370.00
Length Surveyed	318.00
☑ 75% Televised	

Upstream MH	5363
Downstream MH	4039
Siphon #	
Sag	yes

US Depth	4.98
DS Depth	5

Material	CP
VerifiedCondition	E
Condition (Consultant)	

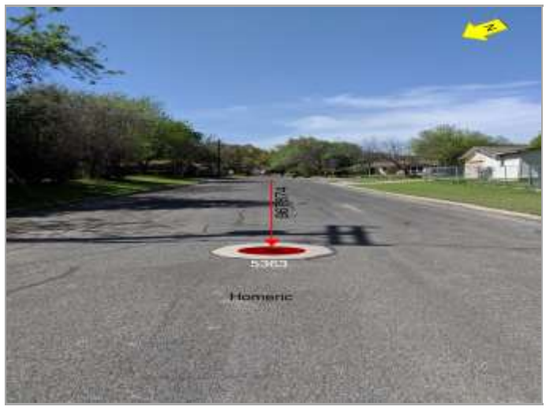
No of Point Repairs	0	yes
No of Laterals	0	

Point Repair Identified by a Professional

Construction Access	Yes	Homeric
Operational Access	Yes	Homeric
Jurisdictional Water	No	None likely.
Exist Utilities	Yes	Crosses 2" gas line at MH #5363, crosses 2" gas line at MH #4039, OHE
Permit Conditions	Yes	CoSA ROW Permit (Homeric)
Endangered Species	No	None likely.
Karst Zones	Yes	Within karst zone 3. Karst survey required.
Critical Habitat	No	No wetlands mapped.
Environmental factors	No	Within transition zone. No action required.
Hazardous Sites	Yes	Brake Check is southeast of the segment and lists two LPST site with significant groundwater contamination. Chico Family Holdings lists IHWCA site and is southeast of the segment. Recommend field investigation for any unreported sites and/or dumps.
Archeolgical Sites	No	No known cultural resources conflict. Coordination with CoSA OHP needed. If work will exceed five acres or 5,000 cubic yards of earth moving, consultation with THC needed.
Geomorphology Issues	No	Potential Ground Water Not Anticipated
Geotechnical issues	No	Geology: Pecan Gap, Rock Excavation Equipment May Not be Required, Potential Sloughing and Caving Not Anticipated

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0



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By-Pass Pumping Information

By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.10
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	5563
DS Discharge Manhole	3446
By-Pass Length	920

Street Repair Data

Street Width	36
Quantity of Street Repair (LF)	370.00

30% Package Number	2
Reason Selected for 30%	Concrete E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

ASSET INFORMATION

SHEET F-1b

CompKey	970068
Final Rehab	CIPP & POINT REPAIR
Basin	CENTRAL

Diameter	8
Length	370.00
Length Surveyed	372.00
☑ 75% Televised	

Upstream MH	3974
Downstream MH	4039
Siphon #	
Sag	No

US Depth	7.3
DS Depth	5

Material	CP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	4	yes
No of Laterals	9	

Point Repair Identified by a Professional

Construction Access	Yes	Located in alley behind Tamworth Dr, unpaved, utility poles. MH 4039 is located in the ROW of Homeric. MH 3974 is located in the alley.
Operational Access	Yes	
Jurisdictional Water	No	
Exist Utilities	Yes	Parallel 2" gas main, utility poles, underground distribution, telephone, and underground cables.
Permit Conditions	Yes	COSA for Homeric
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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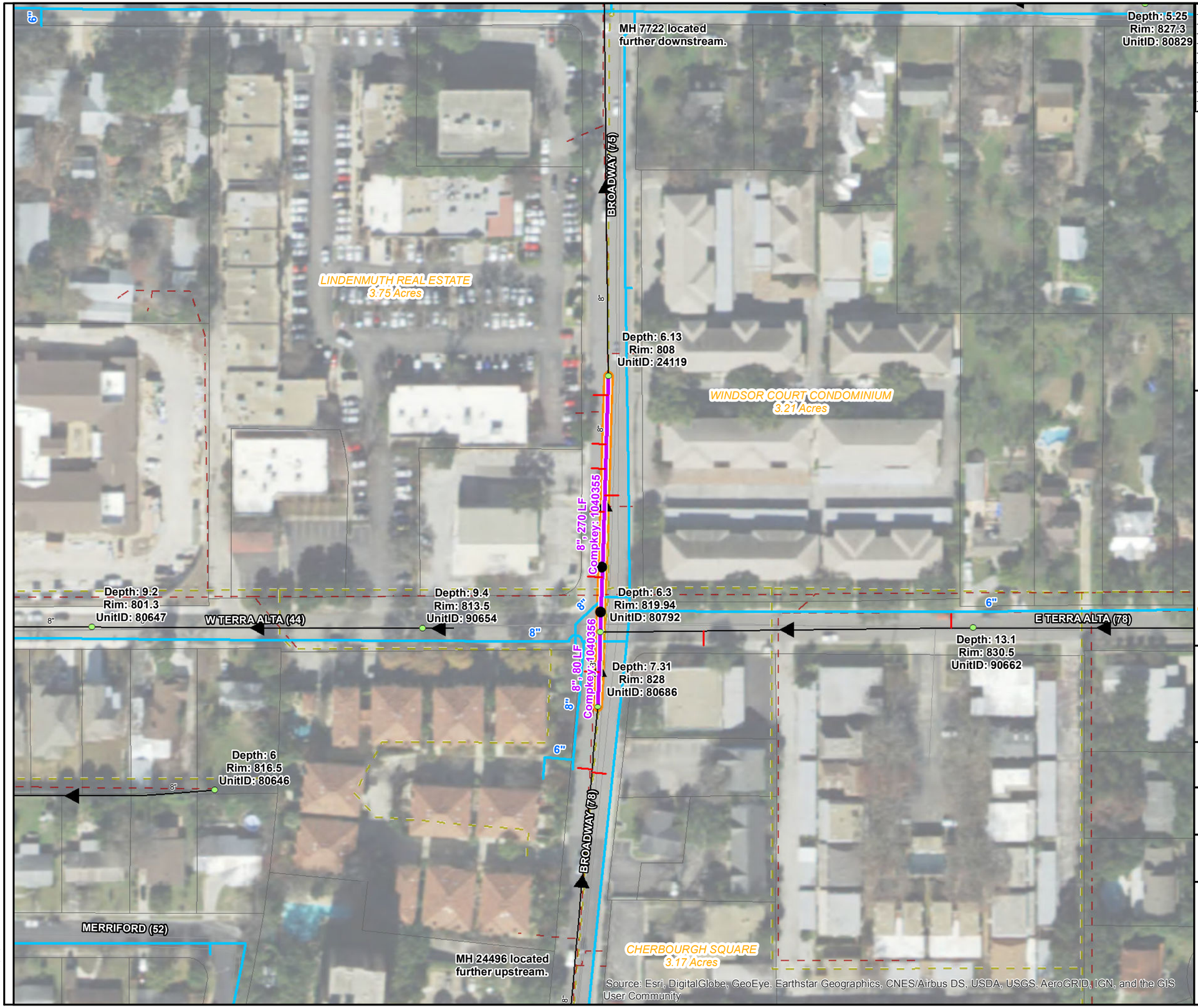
By-Pass Pumping Information

By-Pass Info	
Refer to F Sheet for COMPKEY 967874	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.62
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	*
DS Discharge Manhole	*
By-Pass Length	

Street Repair Data

Street Width	36
Quantity of Street Repair (LF)	80.00

30% Package Number	2
Reason Selected for 30%	Concrete E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No



ADDITIONAL QUANTITIES

ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	38.9
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	142.6
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	388.9
206	Milling	SY	388.9
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	350.0
900	8" Pipe Bursting (All Depths)	LF	350.0
910	Manhole Rehabilitation	VF	19.7
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	7

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

2

Title: Compkey: 1040355 & 1040356

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-2

FREESE AND NICHOLS

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Created By: Freese and Nichols, Inc.
Job No.: SWB 18408
Location: K:\Fwdata\Ft Worth\18408\30% Condition Small Diameter Pkgs\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:05:27 AM

ASSET INFORMATION

SHEET F-2a

CompKey	1040355
Final Rehab	PIPEBURST
Basin	CENTRAL

Diameter	8
Length	270.00
Length Surveyed	260.40
☑ 75% Televised	

Upstream MH	80792
Downstream MH	24119
Siphon #	
Sag	Yes

US Depth	6.3
DS Depth	6.13

Material	CT
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	No	Point Repair Identified by a Professional
No of Laterals	6		

Construction Access	Yes	Located in ROW of Broadway
Operational Access	Yes	Located in ROW of Broadway
Jurisdictional Water	No	
Exist Utilities	Yes	Parallel 4" gas main and 8" water main
Permit Conditions	Yes	COSA for Broadway
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.69
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	24496
DS Discharge Manhole	7722
By-Pass Length	1125

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	270.00

30% Package Number	2
Reason Selected for 30%	Other E
Base or Additional Pipe	Additional Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

ASSET INFORMATION

SHEET F-2b

CompKey	1040356
Final Rehab	PIPEBURST
Basin	CENTRAL

Diameter	8
Length	80.00
Length Surveyed	86.50
☑ 75% Televised	

Upstream MH	80686
Downstream MH	80792
Siphon #	
Sag	Yes

US Depth	7.3
DS Depth	6.3

Material	VCP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	No	Point Repair Identified by a Professional
No of Laterals	1		

Construction Access	Yes	Located in ROW of Broadway
Operational Access	Yes	
Jurisdictional Water	No	
Exist Utilities	Yes	Parallel 3" gas main and 8" water main
Permit Conditions	Yes	COSA for Broadway
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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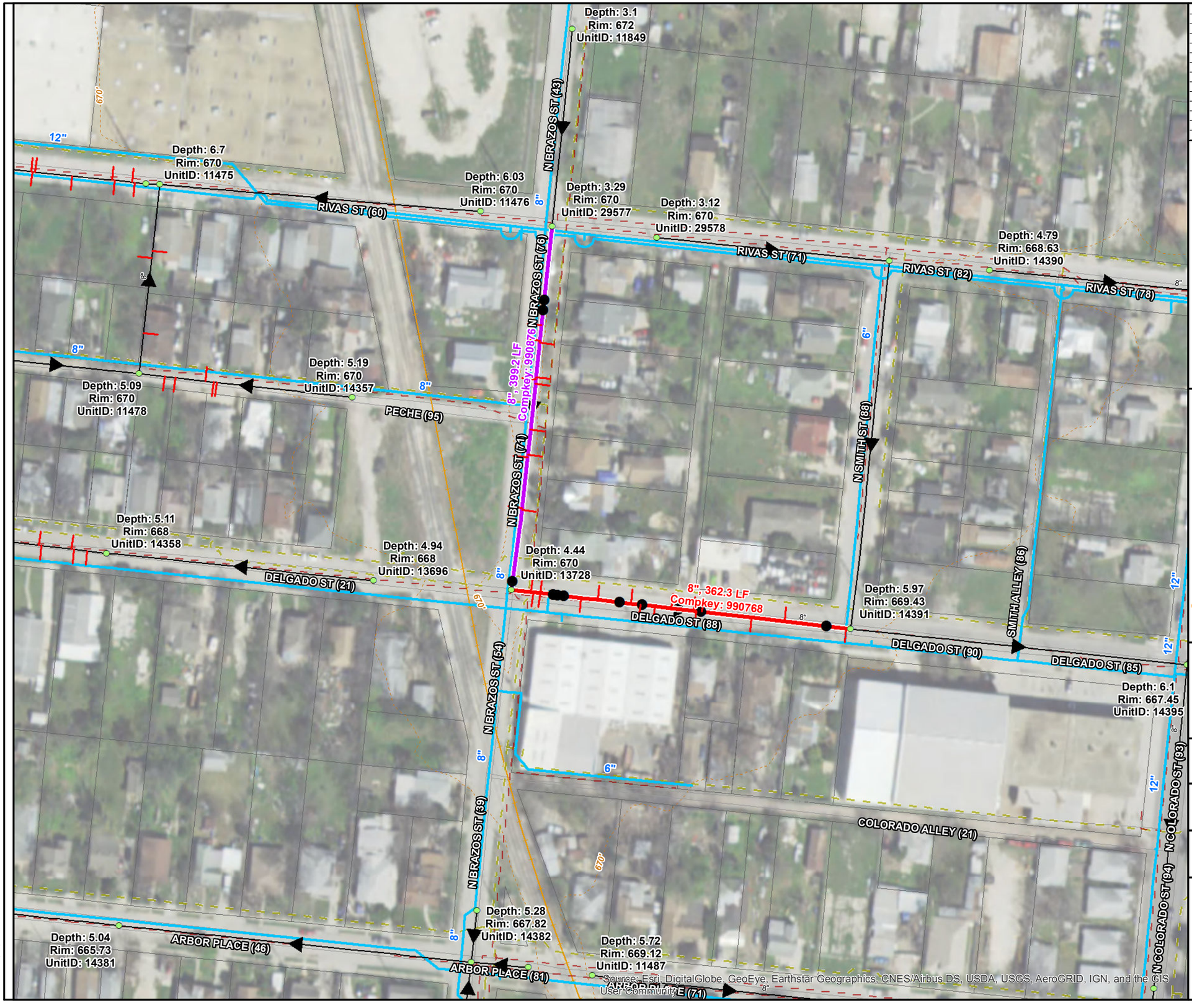
By-Pass Pumping Information

By-Pass Info	
Refer to F Sheet for COMPKEY 1040355	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	1.72
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	*
DS Discharge Manhole	*
By-Pass Length	

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	80.00

30% Package Number	2
Reason Selected for 30%	Other E
Base or Additional Pipe	Additional Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No



BASE QUANTITIES

ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	84.6
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	310.2
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	846.1
206	Milling	SY	846.1
550	Trench Excavation Safety Protection	LF	362.3
848	8" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	362.3
852	Sanitary Sewer Manholes	EA	2
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	761.5
900	8" Pipe Bursting (All Depths)	LF	399.2
910	Manhole Rehabilitation	VF	3.3
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	18

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

3

Title: Compkey: 990876 & 990768

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-3

FREESE AND NICHOLS

CP&Y

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Created By Freese and Nichols, Inc.
Job No.: SWB 95400
Location: P:\95400\138\30% Condition Small Diameter Pkgs\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:08:10 AM

ASSET INFORMATION

SHEET F-3a

CompKey	990876
Final Rehab	PIPEBURST
Basin	CENTRAL

Diameter	8
Length	399.20
Length Surveyed	387.70
☑ 75% Televised	

Upstream MH	29577
Downstream MH	13728
Siphon #	
Sag	No

US Depth	3.29
DS Depth	4.44

Material	CT
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	No	Point Repair Identified by a Professional
No of Laterals	9		

Construction Access	Yes	N Brazos St
Operational Access	Yes	N Brazos St
Jurisdictional Water	No	
Exist Utilities	Yes	Parallel 8" water main, parallel 12" gas main, crosses 2" gas main, crosses 6" water main, OHE, underground communication cables (three Broadwing Communications access manholes along Brazos St). MH #13728 is near railroad tracks.
Permit Conditions	Yes	CoSA ROW (N Brazos St)
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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TEXAS NO:102666 ON DATE: 7/13/18
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By-Pass Pumping Information

By-Pass Info	
Lateral Only	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.42
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	N/A
DS Discharge Manhole	N/A
By-Pass Length	

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	399.20

30% Package Number	2
Reason Selected for 30%	Low Income E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

ASSET INFORMATION

SHEET F-3b

CompKey	990768
Final Rehab	REPLACE OPEN-CUT
Basin	CENTRAL

Diameter	8
Length	362.30
Length Surveyed	362.60
☑ 75% Televised	

Upstream MH	13728
Downstream MH	14391
Siphon #	
Sag	No

US Depth	4.47
DS Depth	5.97

Material	CT
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	No	Point Repair Identified by a Professional
No of Laterals	9		

Construction Access	Yes	Located in the ROW of Delgado St
Operational Access	Yes	Located in the ROW of Delgado St
Jurisdictional Water	No	None likely.
Exist Utilities	Yes	Parallel 8" water main and 2" gas main, large OHE transmission mains
Permit Conditions	Yes	COSA for Delgado
Endangered Species	No	None likely.
Karst Zones	No	Within karst zone 5. No action required.
Critical Habitat	No	No wetlands mapped.
Environmental factors	No	Not within Edwards Aquifer. No action required.
Hazardous Sites		Haven for Hope, located southeast of the segment, lists GWCC and VCP sites. Alazan Apache Property located immediately adjacent to segment and lists IHWCA. Recommend field investigation for any unreported sites and/or dumps.
Archeolgical Sites	No	No known cultural resources conflict. Coordination with CoSA OHP needed. If work will exceed five acres or 5,000 cubic yards of earth moving, consultation with THC needed.
Geomorphology Issues	Yes	Potential Ground Water May be Encountered
Geotechnical issues	Yes	Geology: Terrace Deposit, Rock Excavation Equipment May Not be Required, Potential Sloughing and Caving May Occur

- ☐ Available Grade
- ☐ Available Cover
- ☐ Large Trees
- ☐ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.30
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	29577
DS Discharge Manhole	14395
By-Pass Length	1115

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	362.30

30% Package Number	2
Reason Selected for 30%	Low Income E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

BASE QUANTITIES			
ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	31.6
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	121.1
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	315.9
206	Milling	SY	315.9
550	Trench Excavation Safety Protection	LF	284.3
848	10" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	284.3
852	Sanitary Sewer Manholes	EA	2
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	284.3
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	2

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

4

Title: Compkey: 992512

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-4

FREESE AND NICHOLS

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Created By Freese and Nichols, Inc.
Job No.: SWB16406
Location: P:\gis\FANI1600138\30% Condition Small Diameter Pkgs\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:06:50 AM

ASSET INFORMATION

SHEET F-4

CompKey	992512
Final Rehab	REPLACE OPEN-CUT
Basin	CENTRAL

Diameter	10
Length	284.30
Length Surveyed	222.00
☑ 75% Televised	

Upstream MH	18732
Downstream MH	18565
Siphon #	
Sag	No

US Depth	10.39
DS Depth	11.22

Material	VCP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs		No	Point Repair Identified by a Professional
No of Laterals	2		

Construction Access	Yes	Located in ROW of Eldridge Ave
Operational Access	Yes	
Jurisdictional Water	No	None likely.
Exist Utilities	Yes	OHE, Parallel 8" water main
Permit Conditions	Yes	COSA for Eldridge Ave
Endangered Species	No	None likely.
Karst Zones	No	Within karst zone 5. No action required.
Critical Habitat	No	No wetlands mapped.
Environmental factors	No	Not within Edwards Aquifer. No action required.
Hazardous Sites	Yes	ERNSTX site atop segment indicates that rifle cartridges and lead were dumped and buried within the surrounding soil. SEMS site Eldridge Avenue Lead Site is west of segment lists extensive lead contamination of soil. Recommend lead testing in soil around segment. Recommend field investigation for any unreported sites and/or dumps.
Archeolgical Sites	No	No known cultural resources conflict. Coordination with CoSA OHP needed. If work will exceed five acres or 5,000 cubic yards of earth moving, consultation with THC needed.
Geomorphology Issues	Yes	Potential Ground Water May be Encountered
Geotechnical issues	Yes	Geology: Terrace Deposit, Rock Excavation Equipment May Not be Required, Potential Sloughing and Caving May Occur

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

By-Pass Pumping Information

By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.77
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	18270
DS Discharge Manhole	34645
By-Pass Length	660

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	284.30

30% Package Number	2
Reason Selected for 30%	Low Income E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

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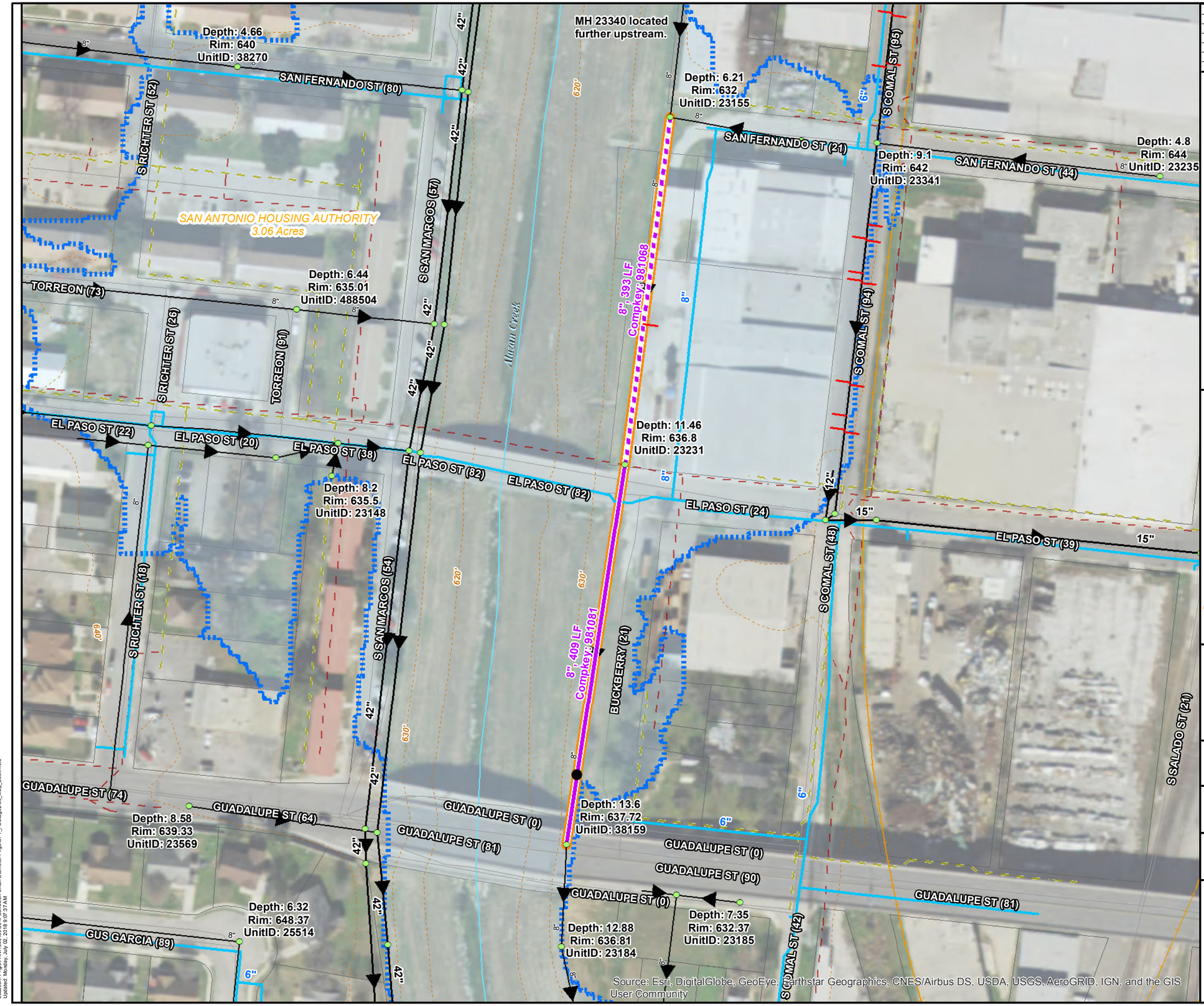

ADDITIONAL QUANTITIES

ITEM	ITEM DESCRIPTION	UNIT	QTY
864	Bypass Pumping (Set Up)	EA	1
900	8" Pipe Bursting (All Depths)	LF	802.0
910	Manhole Rehabilitation	VF	31.3
1103	Point Repairs for 8" Diameter. (0'-10' depth) including up to 20 LF of piping	EA	2
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	2

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET
5

Title: Compkey: 981068 & 981081

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-5

FREESE AND NICHOLS

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Created By Freese and Nichols, Inc.
Job No.: SWB 18406
Location: P:\SWB\18406\130\30% Condition Small Diameter Pkgs\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:07:37 AM

ASSET INFORMATION

SHEET F-5a

CompKey	981068
Final Rehab	PIPEBURST & POINT REPAIR
Basin	CENTRAL

Diameter	8
Length	393.00
Length Surveyed	383.60
☑ 75% Televised	

Upstream MH	23155
Downstream MH	23231
Siphon #	
Sag	yes

US Depth	6.21
DS Depth	11.46

Material	VCP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	2	yes
No of Laterals	1	

Point Repair Identified by a Professional

Construction Access	No	located behind a fenced commercial property. MHs are UTL
Operational Access	No	located behind a fenced commercial propertu
Jurisdictional Water	Yes	Alazan Creek
Exist Utilities	No	
Permit Conditions	No	
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☐ Available Grade
- ☐ Available Cover
- ☐ Large Trees
- ☐ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	2

NOT FOR CONSTRUCTION

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By-Pass Pumping Information

By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.90
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	23340
DS Discharge Manhole	23184
By-Pass Length	1075

Street Repair Data

Street Width	36
Quantity of Street Repair (LF)	40.00

30% Package Number	2
Reason Selected for 30%	Other E
Base or Additional Pipe	Additional Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

ASSET INFORMATION

SHEET F-5b

CompKey	981081
Final Rehab	PIPEBURST
Basin	CENTRAL

Diameter	8
Length	409.00
Length Surveyed	421.90
☑ 75% Televised	

Upstream MH	23231
Downstream MH	38159
Siphon #	
Sag	yes

US Depth	11.46
DS Depth	13.6

Material	VCP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	yes
No of Laterals	1	

Point Repair Identified by a Professional

Construction Access	Yes	El Paso St
Operational Access	Yes	El Paso St. Pipe crosses along bank of Alazan Creek and under two street bridges. MH #23231 is located under brush near the El Paso St bridge. MH #38159 is located beneath the Guadalupe St bridge. Unable to locate MHs.
Jurisdictional Water	Yes	Alazan Creek
Exist Utilities	Yes	Crosses 8" water main. Power lines along Alazan Creek significantly sagging, hanging only 3-4 feet above ground, nearby storm sewer MH
Permit Conditions	Yes	CoSA ROW (El Paso St and Guadalupe St, floodplain development permit, SARA, USACE)
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☐ Site Access by Combo Truck
- ☑ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

By-Pass Info	
Refer to F Sheet for COMPKEY 981068	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	0.56
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	*
DS Discharge Manhole	*
By-Pass Length	

Street Repair Data

Street Width	24
Quantity of Street Repair (LF)	409.00

30% Package Number	2
Reason Selected for 30%	Other E
Base or Additional Pipe	Additional Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

BASE QUANTITIES			
ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	196.2
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	170.6
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	1961.6
206	Milling	SY	1961.6
413	Flowable Fill (COSA)	CY	140.0
550	Trench Excavation Safety Protection	LF	383.8
848	12" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	383.8
852	Sanitary Sewer Manholes	EA	2
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	383.8
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	1

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

6

Title: Compkey: 978096

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-6

FREESE AND NICHOLS

CP&Y

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Created By Freese and Nichols, Inc.
Job No.: SWB16406
Location: P:\gis\FANI1600138\30% Condition Small Diameter Pkgs\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:08:19 AM

ASSET INFORMATION

SHEET F-6

CompKey	978096
Final Rehab	REPLACE OPEN-CUT
Basin	CENTRAL

Diameter	12
Length	383.80
Length Surveyed	370.00
☑ 75% Televised	

Upstream MH	16499
Downstream MH	19414
Siphon #	
Sag	No

US Depth	10.75
DS Depth	11

Material	CP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs		No — Point Repair Identified by a Professional
No of Laterals	1	

Construction Access	Yes	Located in ROW of Frio City Road
Operational Access	Tes	Located in ROW of Frio City Road
Jurisdictional Water	No	None likely.
Exist Utilities	Yes	Parallel 12" gas main and crosses 12" water main
Permit Conditions	Yes	COSA for Frio City Road
Endangered Species	No	None likely.
Karst Zones	No	Within karst zone 5. No action required.
Critical Habitat	No	No wetlands mapped.
Environmental factors	No	Not within Edwards Aquifer. No action required.
Hazardous Sites	Yes	Segment adjacent to CALF site named “Zarzamora.” No further information on the size, age, and contents of site. Recommend further research into facility to assess risk to segment. Recommend field investigation for any unreported sites and/or dumps.
Archeolgical Sites	No	No known cultural resources conflict. Coordination with CoSA OHP needed. If work will exceed five acres or 5,000 cubic yards of earth moving, consultation with THC needed.
Geomorphology Issues	Yes	Potential Ground Water May be Encountered
Geotechnical issues	Yes	Geology: Terrace Deposit, Rock Excavation Equipment May Not be Required, Potential Sloughing and Caving May Occur

- ☐ Available Grade
- ☐ Available Cover
- ☐ Large Trees
- ☐ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

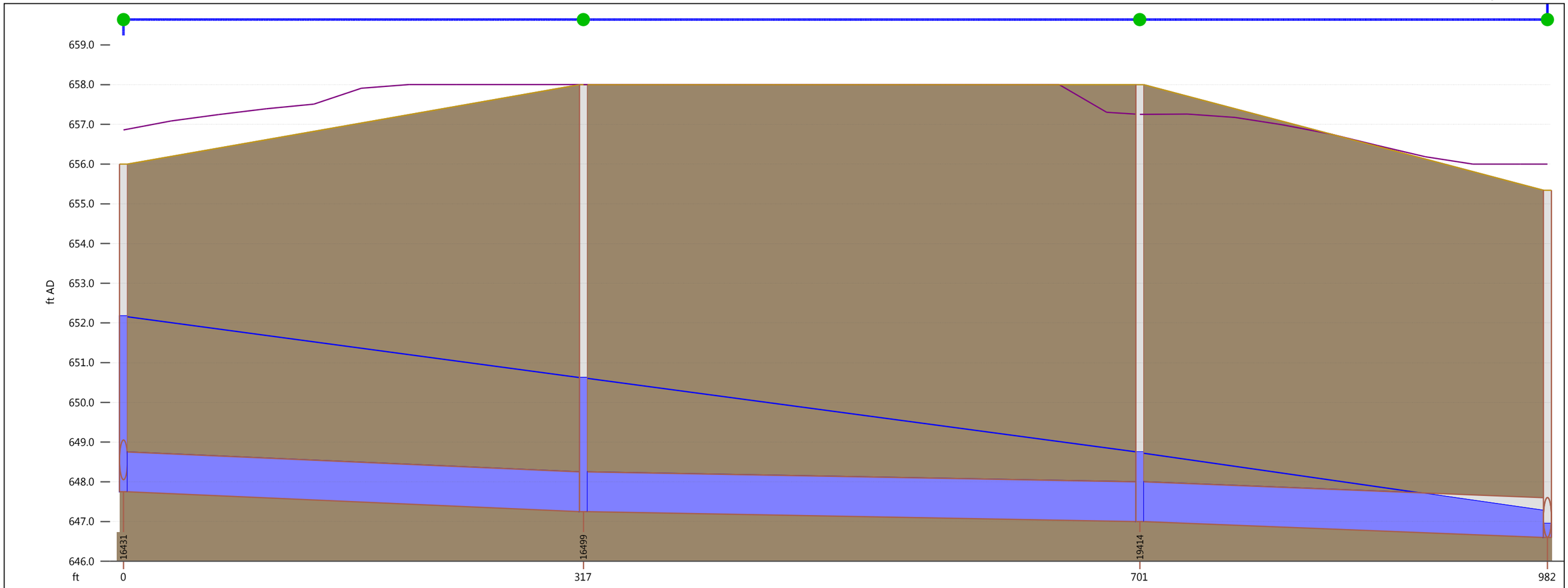
By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	1.59
Avg Day (MGD) - From Model for Pipes > 12"	0.73
US Suction Manhole	16431
DS Discharge Manhole	34916
By-Pass Length	945

Street Repair Data

Street Width	46
Quantity of Street Repair (LF)	383.80

30% Package Number	2
Reason Selected for 30%	Concrete E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

P-6



Link	16431.1	16499.1	19414.1
Asset ID		978096	
width (in)	12.0	12.0	12.0
us inv (ft AD)	647.750	647.251	647.000
ds inv (ft AD)	647.251	647.000	646.601
grad (%)	0.157	0.065	0.142
pfc (MGD)	0.91	0.59	0.87
CC Project Area ID	64-08	64-08	64-08
CC Alternative			
surc	2.00	2.00	2.00
US flow (MGD)	1.5895	1.5895	1.5977
US velocity (ft/s)	2.792	2.860	2.989

Node	16431	16499	19414	34916
ground (ft AD)	656.000	658.000	658.000	655.340
flood dep (ft)	-3.824	-7.376	-9.248	-8.389

San Antonio Water System

LEGEND

Flow Level

Ground Elevation Based on:

Manhole Rim Elevation

2-ft Contours

SAN ANTONIO WATER SYSTEM
CONDITION 30% DESIGN
PROFILE 6: COMPKEY ID 978096

FREESE AND NICHOLS

BASE QUANTITIES			
ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	10.4
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	38.3
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	104.4
206	Milling	SY	104.4
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	94.0
900	8" Pipe Bursting (All Depths)	LF	94.0
910	Manhole Rehabilitation	VF	11.5
1109.1	Sanitary Sewer Lateral Connections with Open Cut	EA	1

POOL DR (30)
POOL DR (89)
POOL DR (18)
SUBLETT DR (40)
HOWERTON DR (38)
PECAN VALLEY DR (81)
PECAN VALLEY DR (79)
PECAN VALLEY DR (83)
PECAN VALLEY DR (80)
KELLIS AVE (49)
KELLIS AVE (53)
BOB BILLA (88)
UNNAMED STREAM
EPWORTH UNITED METHODIST CHURCH
4.47 Acres

Depth: 6.95
Rim: 602.39
UnitID: 27974

Depth: 7.3
Rim: 582.94
UnitID: 29026

Depth: 5.7
Rim: 635.08
UnitID: 28155

Depth: 12.4
Rim: 607.75
UnitID: 28130

Depth: 6.25
Rim: 604.25
UnitID: 29483

Depth: 6.4
Rim: 584.64
UnitID: 42893

Depth: 6.47
Rim: 588
UnitID: 29056

MH 42463 located further upstream.

8", 94 LF
Compkey: 1066449

Depth: 6.7
Rim: 612.86
UnitID: 42465

Depth: 7.46
Rim: 590.3
UnitID: 353895

Depth: 4.8
Rim: 613.39
UnitID: 42464

Depth: 5.14
Rim: 590
UnitID: 29516

Depth: 4.01
Rim: 590.78
UnitID: 29057

Depth: 6.22
Rim: 601.41
UnitID: 27973

Depth: 8.83
Rim: 589.7
UnitID: 29513

Depth: 6.5
Rim: 590.5
UnitID: 353894

Depth: 5.18
Rim: 618.79
UnitID: 28160

Depth: 9.14
Rim: 614.26
UnitID: 28161

Depth: 7.89
Rim: 608.81
UnitID: 28173

Depth: 8.08
Rim: 603.39
UnitID: 42006

Depth: 6.14
Rim: 592
UnitID: 353893

Depth: 7.65
Rim: 605.15
UnitID: 29053

Depth: 7.67
Rim: 594
UnitID: 353892

Depth: 9.98
Rim: 606
UnitID: 29596

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

7

Title: Compkey: 1066449

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-7

FREESE AND NICHOLS

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Created By Freese and Nichols, Inc.
Job No.: SWB 16405
Location: P:\SWB\16405\138\30% Condition Small Diameter Plats\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:09:00 AM

ASSET INFORMATION

SHEET F-7

CompKey	1066449
Final Rehab	PIPEBURST
Basin	CENTRAL

Diameter	8
Length	94.00
Length Surveyed	87.70
☑ 75% Televised	

Upstream MH	42464
Downstream MH	42465
Siphon #	
Sag	No

US Depth	4.8
DS Depth	6.7

Material	CP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs	0	Yes — Point Repair Identified by a Professional
No of Laterals	1	

Construction Access	Yes	Pecan Valley Dr
Operational Access	Yes	Alley between Howerton Dr and Sublett Dr along Pecan Valley Dr. MH #42465 is located in median of Pecan Valley Dr with steep slope. MH #42464 is located in the alley in front of residential driveway.
Jurisdictional Water	No	
Exist Utilities	Yes	Parallel 2" gas main, crosses 6" water main, OHE
Permit Conditions	Yes	CoSA ROW (Pecan Valley Dr and alley)
Endangered Species	NA	
Karst Zones	NA	
Critical Habitat	NA	
Environmental factors	NA	
Hazardous Sites	NA	
Archeolgical Sites	NA	
Geomorphology Issues	NA	
Geotechnical issues	NA	

- ☑ Available Grade
- ☑ Available Cover
- ☐ Large Trees
- ☑ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

By-Pass Info	
Address all laterals upstream	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	1.11
Avg Day (MGD) - From Model for Pipes > 12"	
US Suction Manhole	42463
DS Discharge Manhole	27973
By-Pass Length	200

Street Repair Data

Street Width	28
Quantity of Street Repair (LF)	94.00

30% Package Number	2
Reason Selected for 30%	Concrete E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

BASE QUANTITIES			
ITEM	ITEM DESCRIPTION	UNIT	QTY
203	Tack Coat	GAL	106.5
205.2	Hot Mix Asphaltic Pavement - Type B (10" Compacted Depth)	SY	188.5
205.4	Hot Mix Asphaltic Pavement - Type D (2" Compacted Depth)	SY	1064.5
206	Milling	SY	1064.5
550	Trench Excavation Safety Protection	LF	399.2
848	15" PVC Gravity Sanitary Sewer Pipe (SDR 26-3034, 115 psi)	LF	399.2
852	Sanitary Sewer Manholes	EA	2
864	Bypass Pumping (Set Up)	EA	1
866	CCTV Inspection	LF	399.2
1109	Sanitary Sewer Lateral Connections with Open Cut	EA	2

Depth: 10.67
Rim: 650
UnitID: 940331

Depth: 4.65
Rim: 649.47
UnitID: 19310

Depth: 11.59
Rim: 650.8
UnitID: 18871

Depth: 11.94
Rim: 651.7
UnitID: 19433

Depth: 11.9
Rim: 650.8
UnitID: 18872

15", 399.2 LF
Compkey: 984923

Depth: 10.54
Rim: 649.2
UnitID: 18874

Depth: 5
Rim: 649.09
UnitID: 19434

Depth: 6.4
Rim: 651
UnitID: 91642

Depth: 6.4
Rim: 649.8
UnitID: 91643

Depth: 11.65
Rim: 648.8
UnitID: 92168

Six Mile Creek

GUILD PARK LP
4.51 Acres

SAN ANTONIO SHOE INC
11.18 Acres

W MAYFIELD (99)

WABASH ST (58)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- Manhole
- CIPP
- CIPP & POINT REPAIR
- BORE
- PIPEBURST
- PIPEBURST & POINT REPAIR
- REPLACE OPEN-CUT
- CPS Electric OH Primary
- CPS Gas Distribution Main
- Additional Line
- Potential Point Repair Location
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Water Main
- Laterals
- Road
- Stream
- 10-ft Contour
- Parcel
- 100Yr Floodplains

0 100 200
SCALE IN FEET

8

Title: Compkey: 984923

Project SSO Basin Planning Consultant
30% Condition Small Diameter

Date: 7/11/2018

Sheet C-8

FREESE AND NICHOLS

CP&Y

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Created By Freese and Nichols, Inc.
Job No.: SWB 16406
Location: N:\Projects\160138\30% Condition Small Diameter Rpts\CPY_Package2\05_Map_Book.mxd
Updated: Monday, July 02, 2018 9:09:40 AM

ASSET INFORMATION

CompKey	984923
Final Rehab	REPLACE OPEN-CUT
Basin	CENTRAL

Diameter	15
Length	399.20
Length Surveyed	164.00
☐ 75% Televised	

Upstream MH	18872
Downstream MH	18874
Siphon #	
Sag	No

US Depth	11.9
DS Depth	10.54

Material	CP
VerifiedCondition	E
Condition (Consultant)	

No of Point Repairs		No — Point Repair Identified by a Professional
No of Laterals	2	

Construction Access	Yes	Located in ROW of W Mayfield
Operational Access	Yes	Located in ROW of W Mayfield
Jurisdictional Water	Yes	Adjacent to Six mile Creek. Recommend field investigation to determine presence of unmapped waters and wetlands.
Exist Utilities	Yes	Parallel 15" sewer main
Permit Conditions	Yes	COSA for W Mayfield, railroad
Endangered Species	No	None likely.
Karst Zones	No	Not within a karst zone. No action required.
Critical Habitat	No	No wetlands mapped.
Environmental factors	No	Not within Edwards Aquifer. No action required.
Hazardous Sites	No	No mapped sites of concern. Recommend field investigation for any unreported sites and/or dumps.
Archeolgical Sites	No	No known cultural resources conflict. Coordination with CoSA OHP needed. If work will exceed five acres or 5,000 cubic yards of earth moving, consultation with THC needed.
Geomorphology Issues	Yes	Potential Ground Water May be Encountered
Geotechnical issues	Yes	Geology: Terrace Deposit, Rock Excavation Equipment May Not be Required, Potential Sloughing and Caving May Occur

- ☐ Available Grade
- ☐ Available Cover
- ☐ Large Trees
- ☐ Site Access by Combo Truck
- ☐ Crosses Creek, TxDOT Rd, or Bridge
- ☐ Large WTR Mains
- ☐ Large Gas Mains

Easement Required (number of parcels)	0

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By-Pass Pumping Information

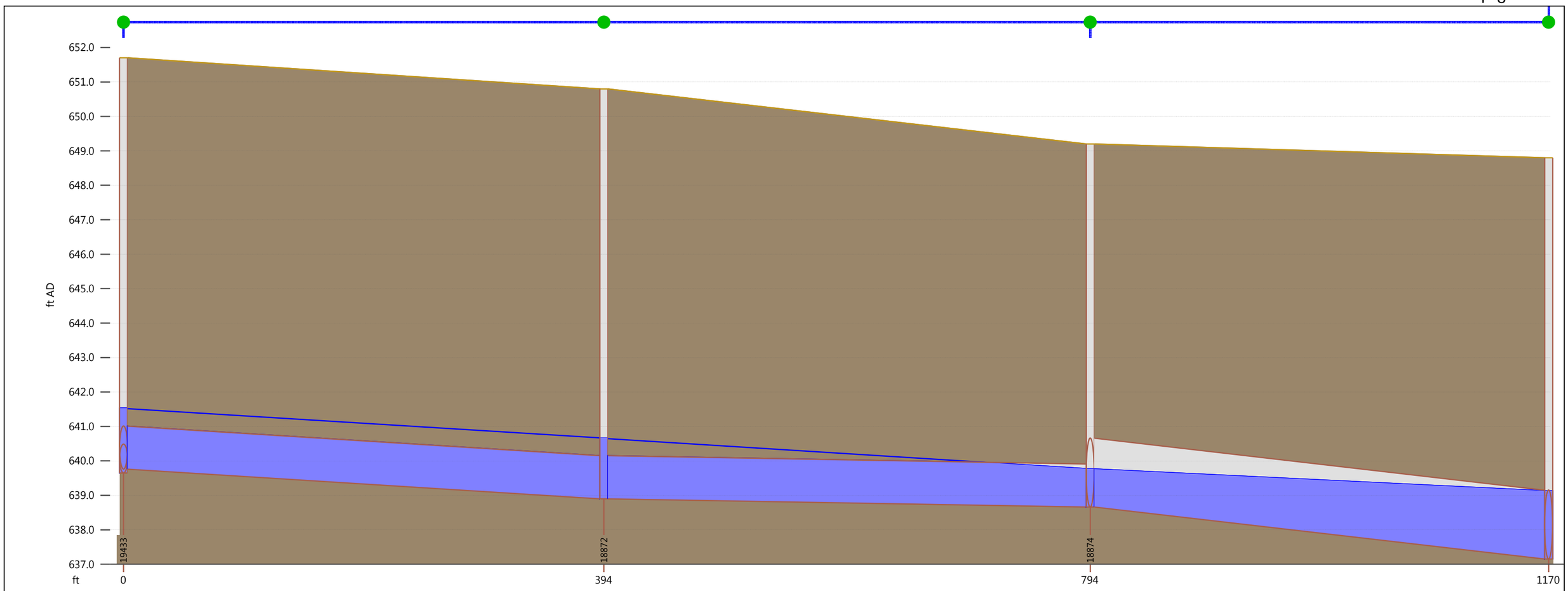
By-Pass Info	
Peak Wet Weather (MGD) - From Model for Pipes > 12" - Calculated for Pipes < 12" with Mannings Assuming Full Flow	1.95
Avg Day (MGD) - From Model for Pipes > 12"	0.18
US Suction Manhole	19433
DS Discharge Manhole	92168
By-Pass Length	1170

Street Repair Data

Street Width	24
Quantity of Street Repair (LF)	399.20

30% Package Number	2
Reason Selected for 30%	Concrete E
Base or Additional Pipe	Base Pipe
Reviewed in 10% Design	Yes
On CPMS Project	No

P-8



Link	19433.1	18872.1	18874.1
Asset ID		984923	
width (in)	15.0	15.0	24.0
us inv (ft AD)	639.760	638.900	638.660
ds inv (ft AD)	638.900	638.660	637.150
grad (%)	0.218	0.060	0.401
pfc (MGD)	1.95	1.02	9.26
CC Project Area ID			
CC Alternative			
surc	1.00	2.00	0.99
US flow (MGD)	1.9456	1.9516	4.8611
US velocity (ft/s)	2.660	2.356	4.356

Node	19433	18872	18874	92168
ground (ft AD)	651.700	650.800	649.200	648.800
flood dep (ft)	-10.163	-10.136	-9.431	-9.671

San Antonio Water System

LEGEND

Flow Level

Ground Elevation Based on:

Manhole Rim Elevation

2-ft Contours

SAN ANTONIO WATER SYSTEM
CONDITION 30% DESIGN
PROFILE 9: COMPKEY ID 984923

FREESE AND NICHOLS