

City of Fort Worth, Texas Stormwater Capital Projects Showcase



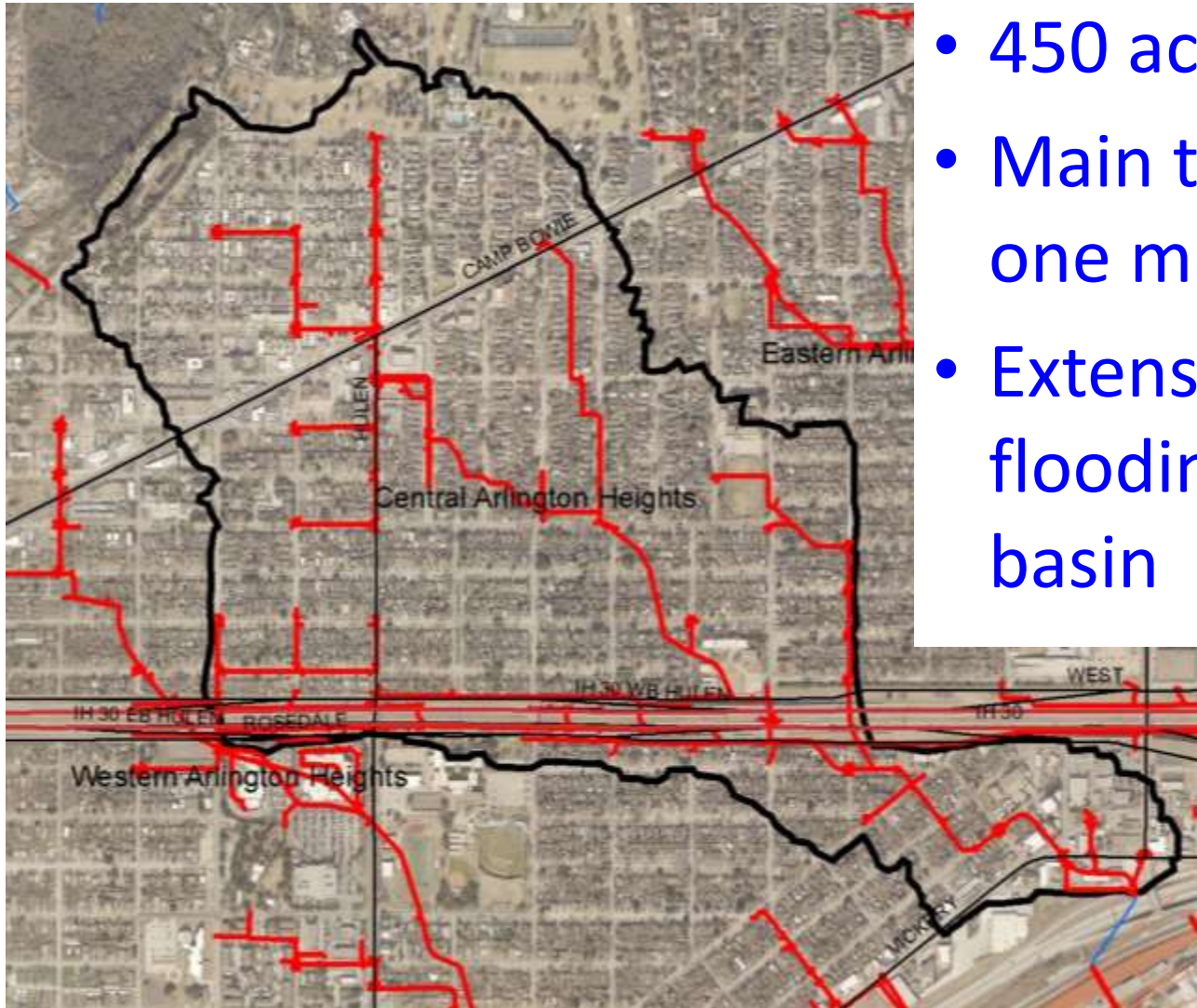
Steven E. Eubanks, P.E., CFM, City of Fort Worth, Texas

Major Projects

1. Central Arlington Heights



Central Arlington Heights pipe basin



- 450 acre watershed
- Main trunk almost one mile long
- Extensive home flooding in upper basin

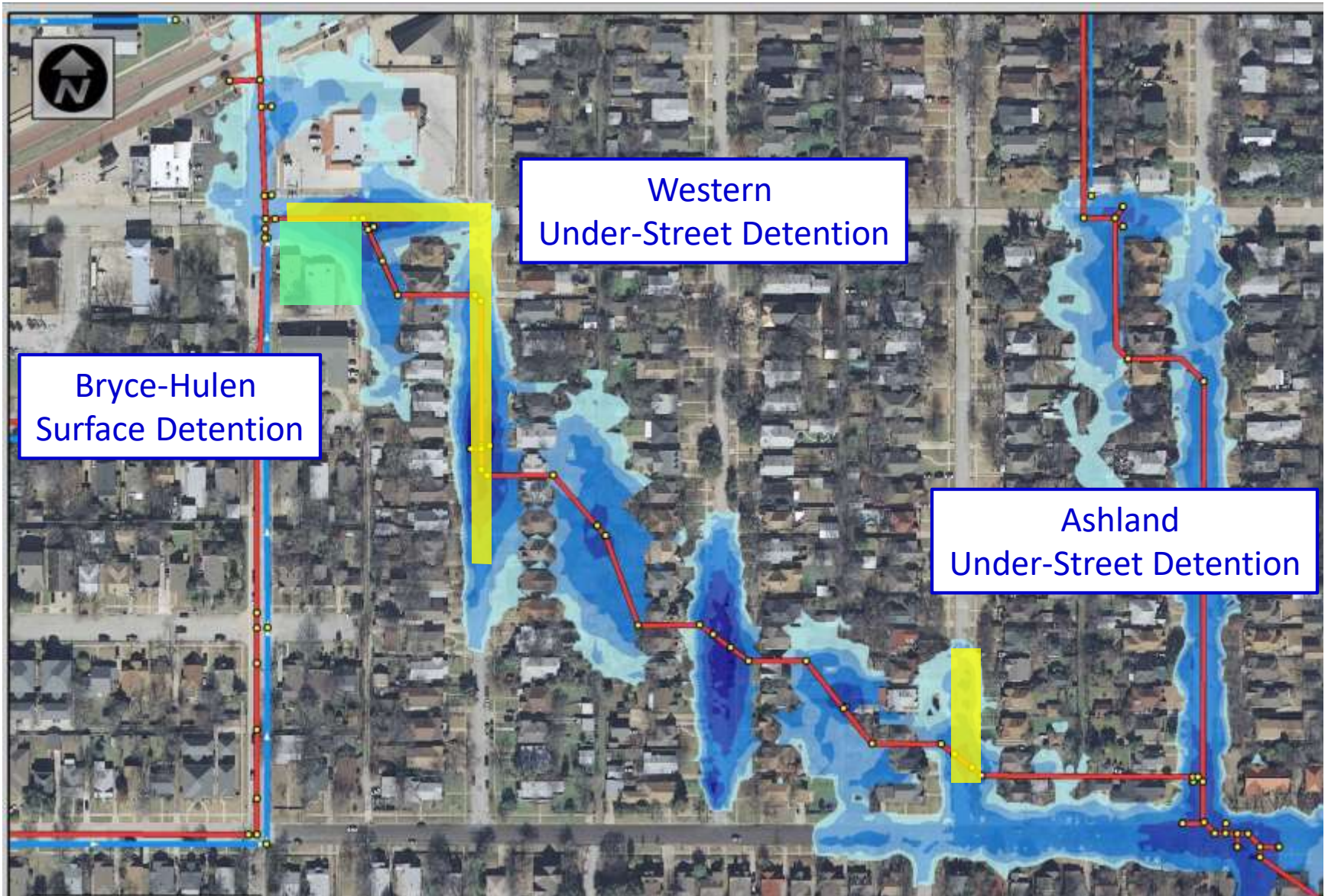
June 28, 2004 – Central Arlington Heights



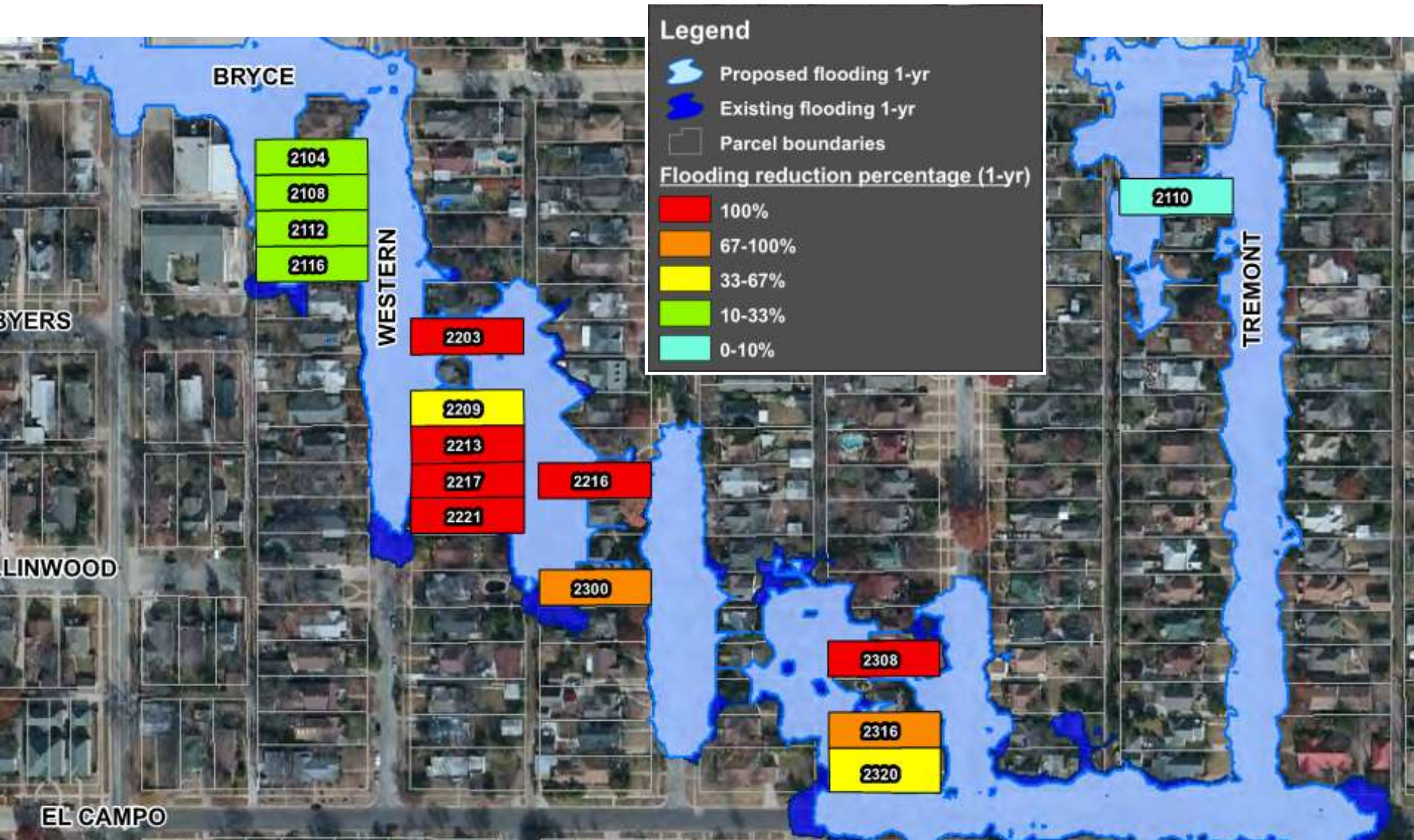
Central Arlington Heights



Proposed Under-Street Detention



Modeled Flood Reduction



BCA for Planned Detention Projects

	Damages	Cumulative Benefits	Cumulative Cost	Cumulative BCR
Existing Conditions	\$ 36,503,254	--	--	--
Ashland Detention	\$ 35,220,075	\$ 1,283,180	\$ 975,000	1.32
Ashland Detention + Western Detention	\$ 32,332,898	\$ 4,170,356	\$ 3,177,284	1.31
Ashland Detention + Western Detention + Hulen/Bryce Detention	\$ 30,759,546	\$ 5,743,708	\$ 4,084,284	1.41





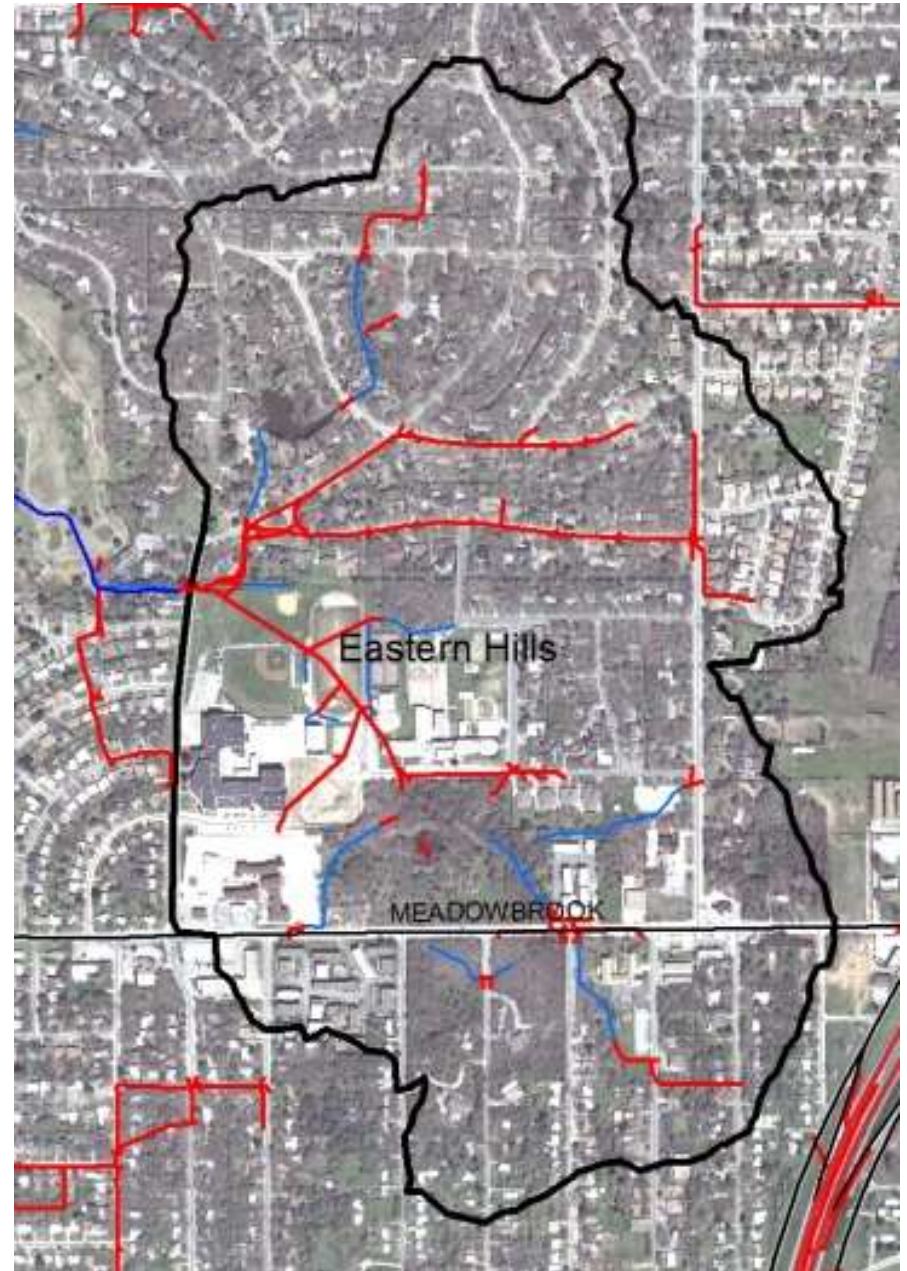
Major Projects

1. Central Arlington Heights
- 2. Eastern Hills**



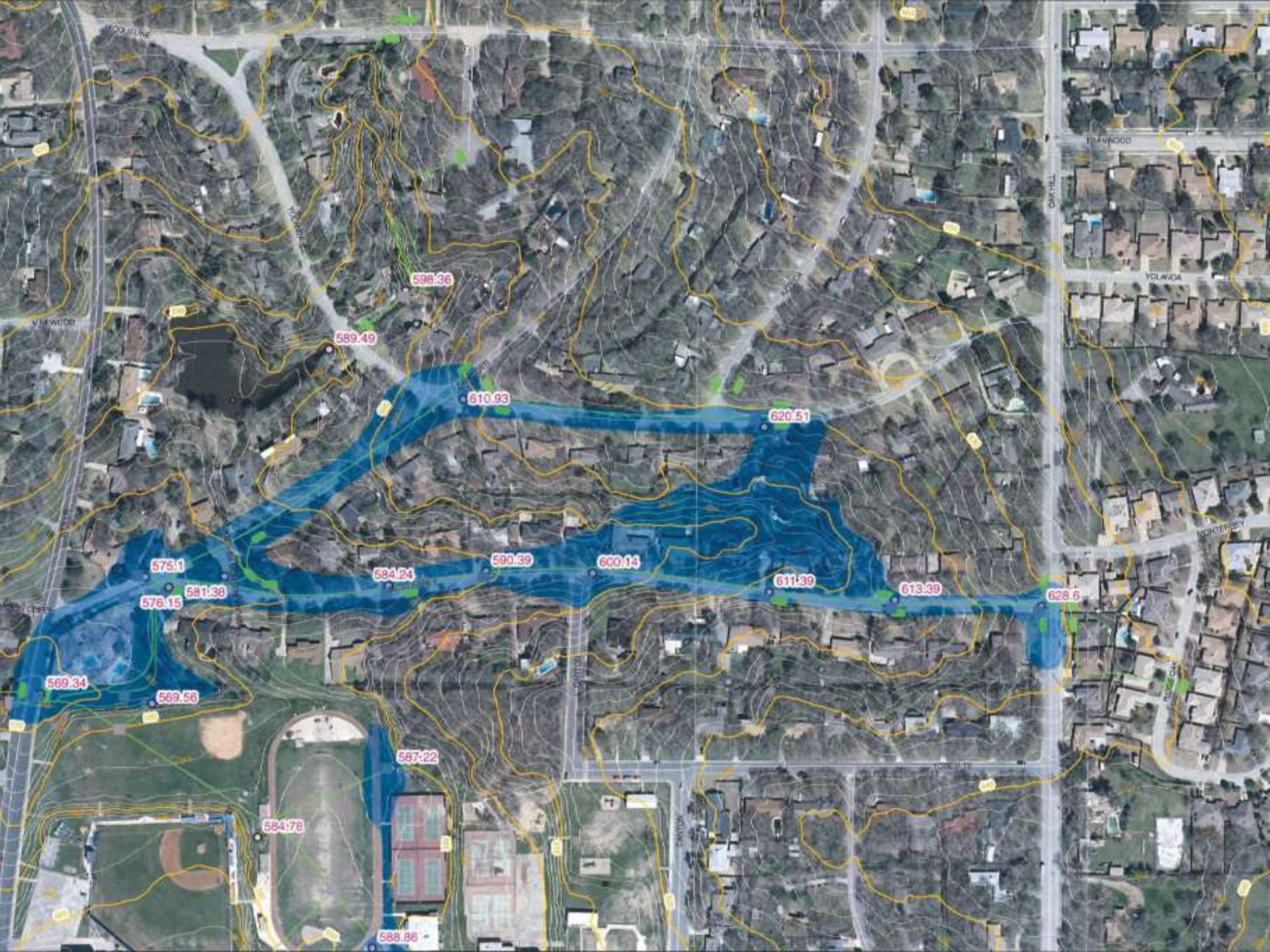
Eastern Hills

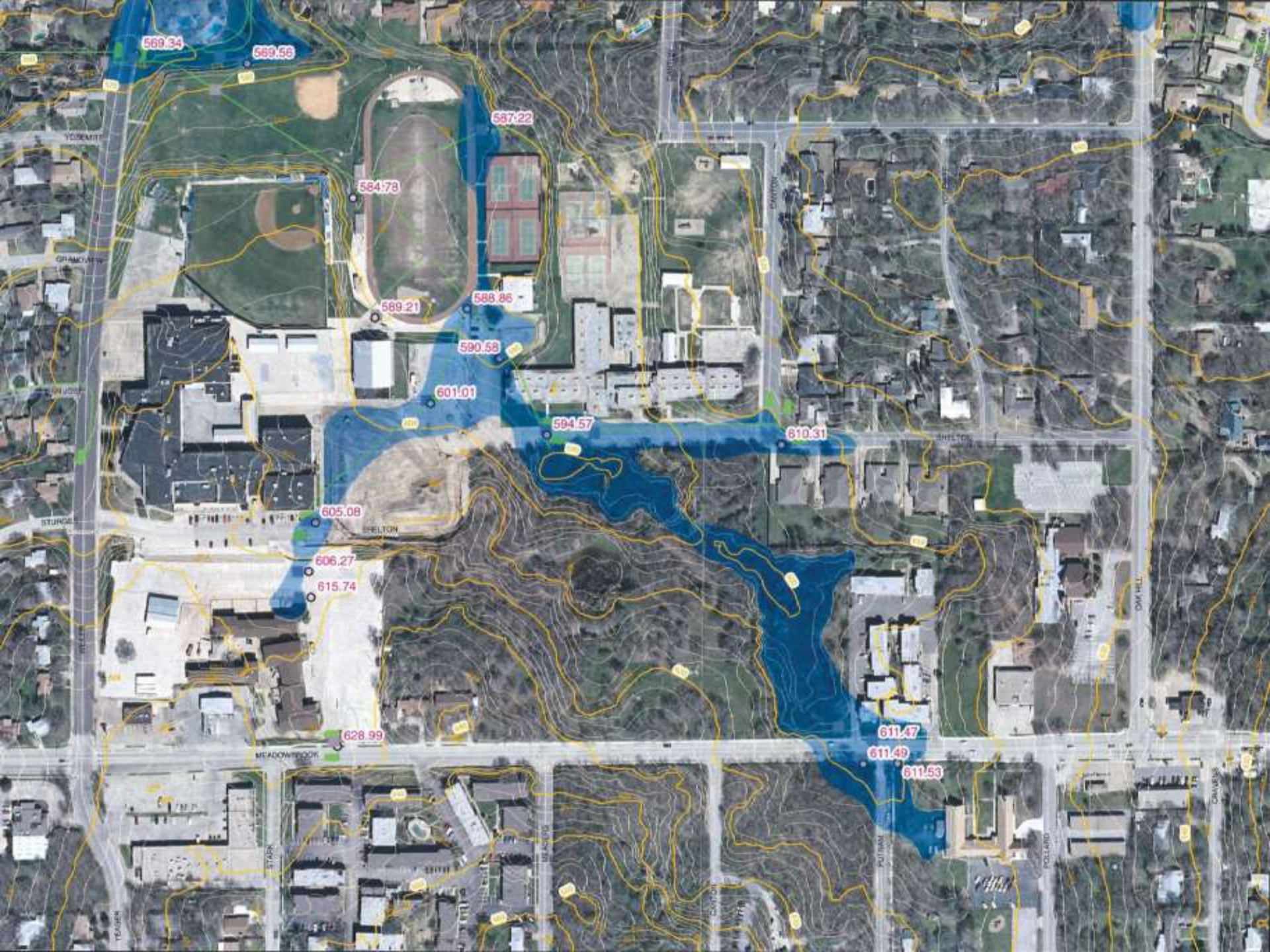
- Undersized storm drain system
- Home and school flooding
- Effectively two systems converging just before outfall
- South system has sections of open channel








Ground Zero = “Jeff’s wall”










 Watershed Boundary	 Existing Storm Drain Lines	 Proposed Storm Drain Lines	 Directly Helped	 Indirectly Helped	<table border="1"> <tr> <td>55</td> <td>Res</td> <td>Com</td> </tr> <tr> <td>54</td> <td>54</td> <td>5</td> </tr> <tr> <td>82</td> <td>82</td> <td>0</td> </tr> </table>	55	Res	Com	54	54	5	82	82	0
55	Res	Com												
54	54	5												
82	82	0												

1 inch equals 350 feet



CITY OF FORT WORTH
 2004 CIP
 WATERSHED PLANNING
 STUDY

EASTERN HILLS
 DRAINAGE SYSTEM

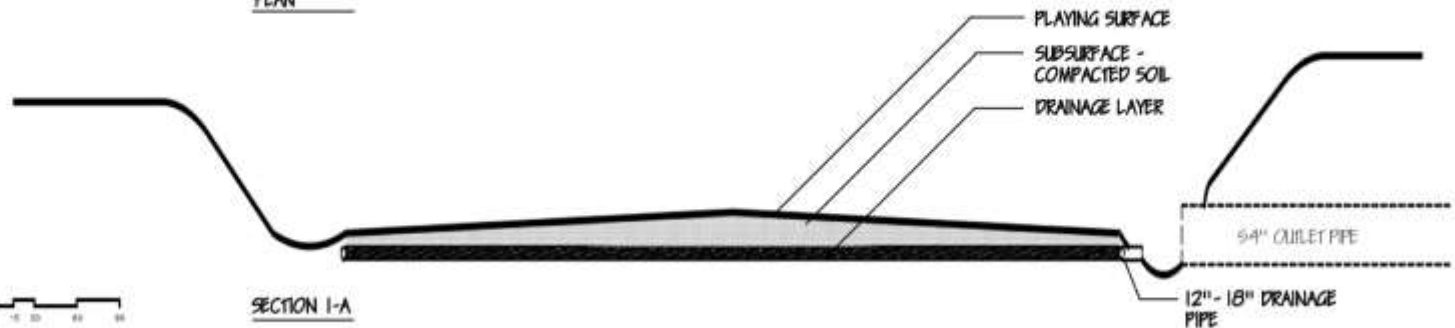
PROPOSED
 MULTI-PURPOSE
 STORM WATER
 DETENTION POND

BENEFITS INCLUDE:

- REDUCED FLOODING DOWNSTREAM
- IMPROVED STORM WATER QUALITY
- MULTI-SPORT ATHLETIC FIELD



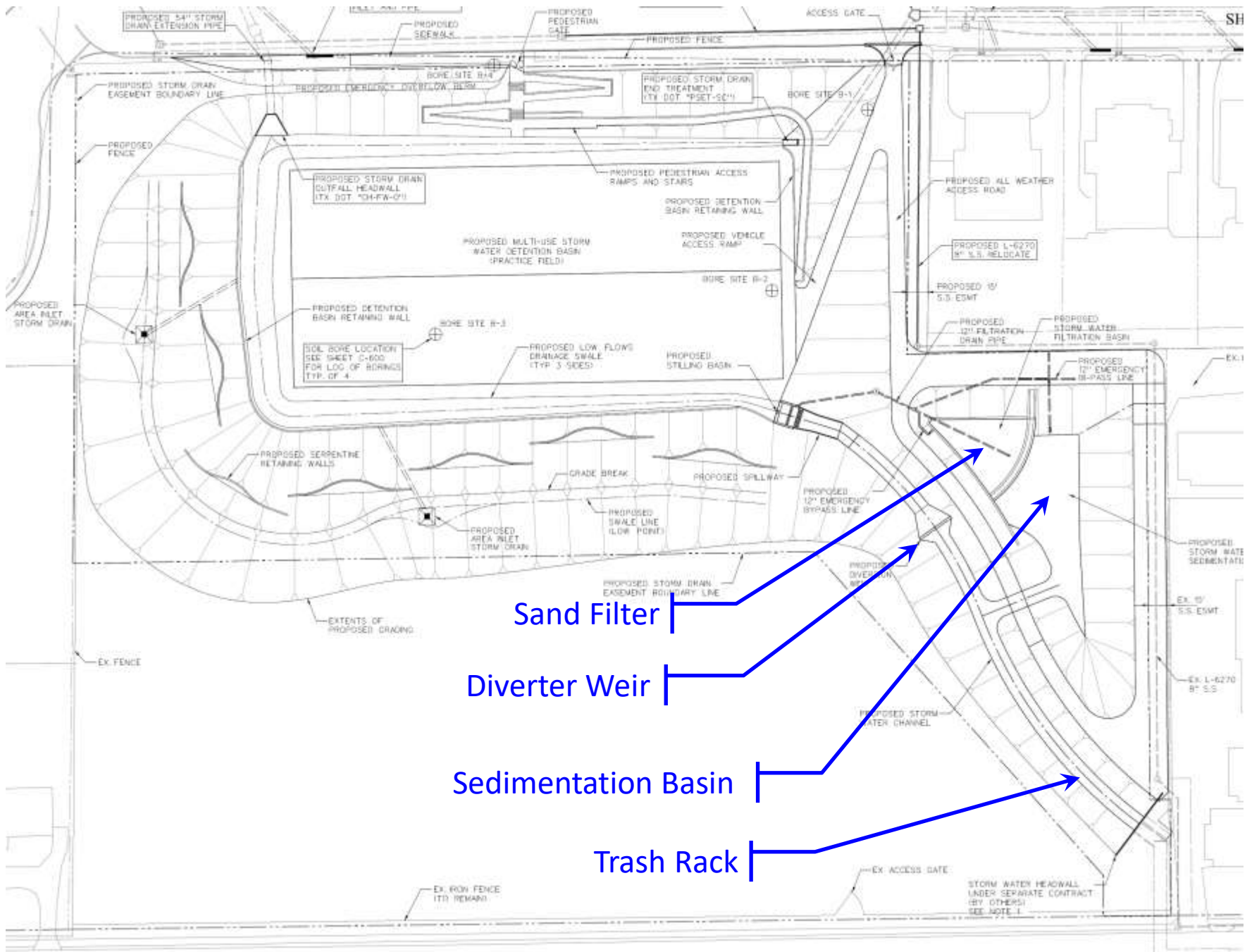
PLAN



Scale: 1" = 30'-0"

CFW-FWISD Master Agreement

- FWISD grants easement at no cost
- City installs basin and some amenities: lighting, planting, irrigation, access, etc.
- City installs water quality features to keep trash from washing into basin
- Routine maintenance by FWISD
- WQ maintenance & major repairs by City

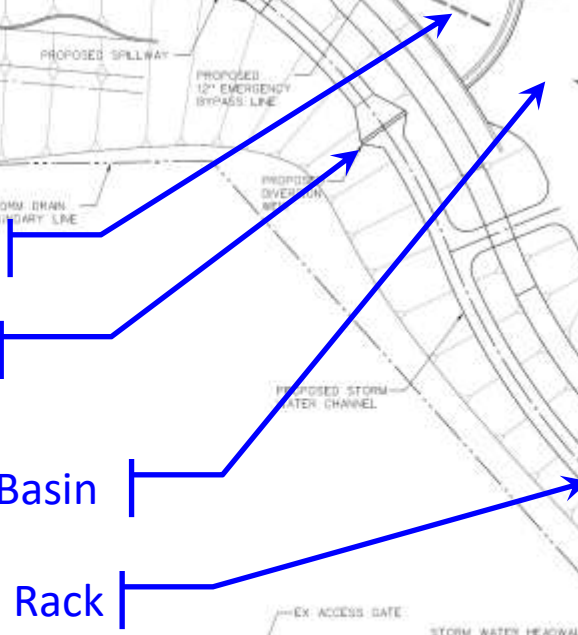


Sand Filter

Diverter Weir

Sedimentation Basin

Trash Rack

















Major Projects

1. Central Arlington Heights
2. Eastern Hills
- 3. Luella Merrett**



Luella Merrett Detention Basin

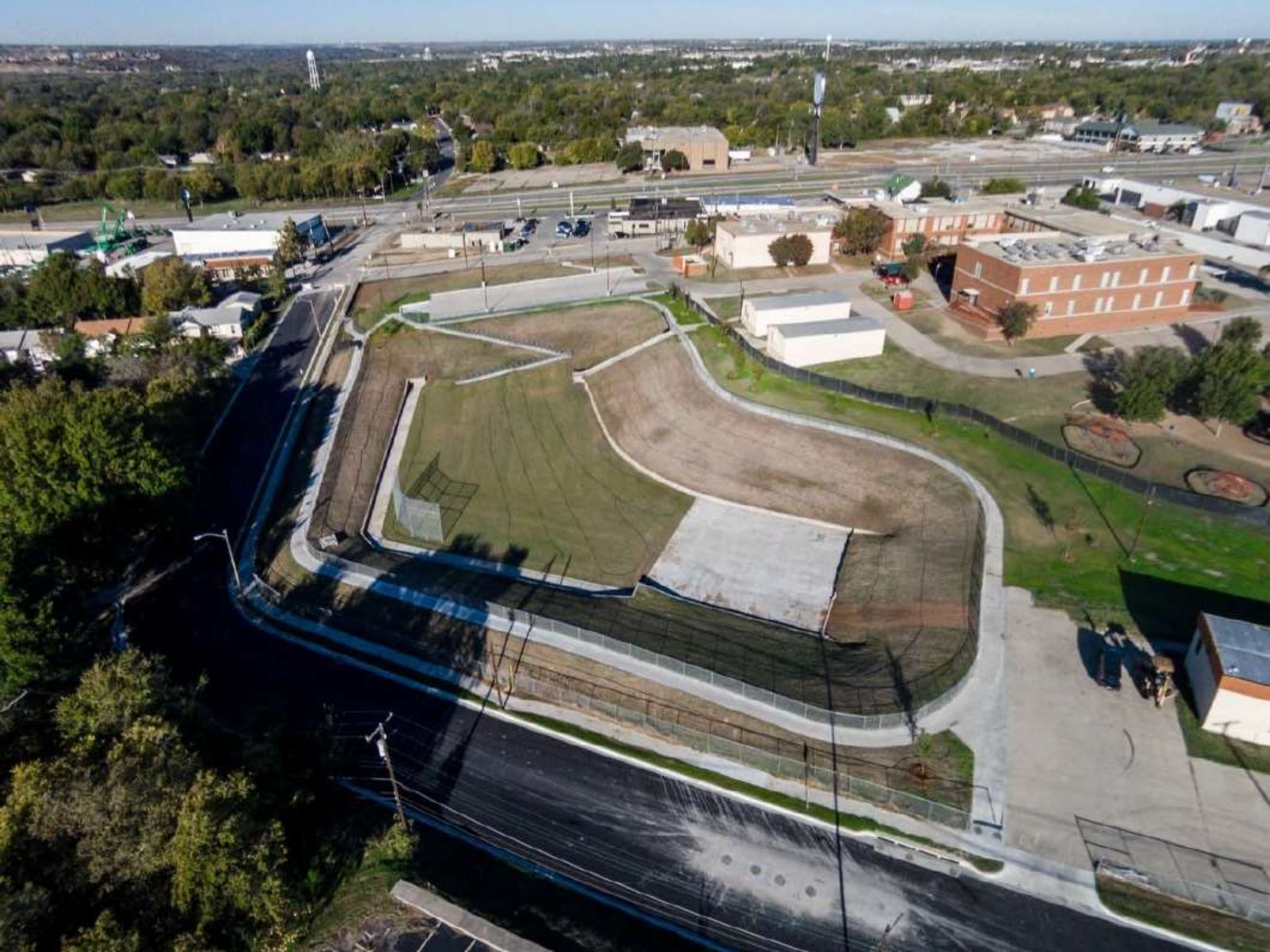
- Flooding due to small pipe at mid-block sump
- Lots of impervious area in watershed
- Pipe capacity improvements \$2 million +



Luella Merrett Detention Basin

- Sloping play field at school suitable for detention
- Principal liked idea because of success of Eastern Hills











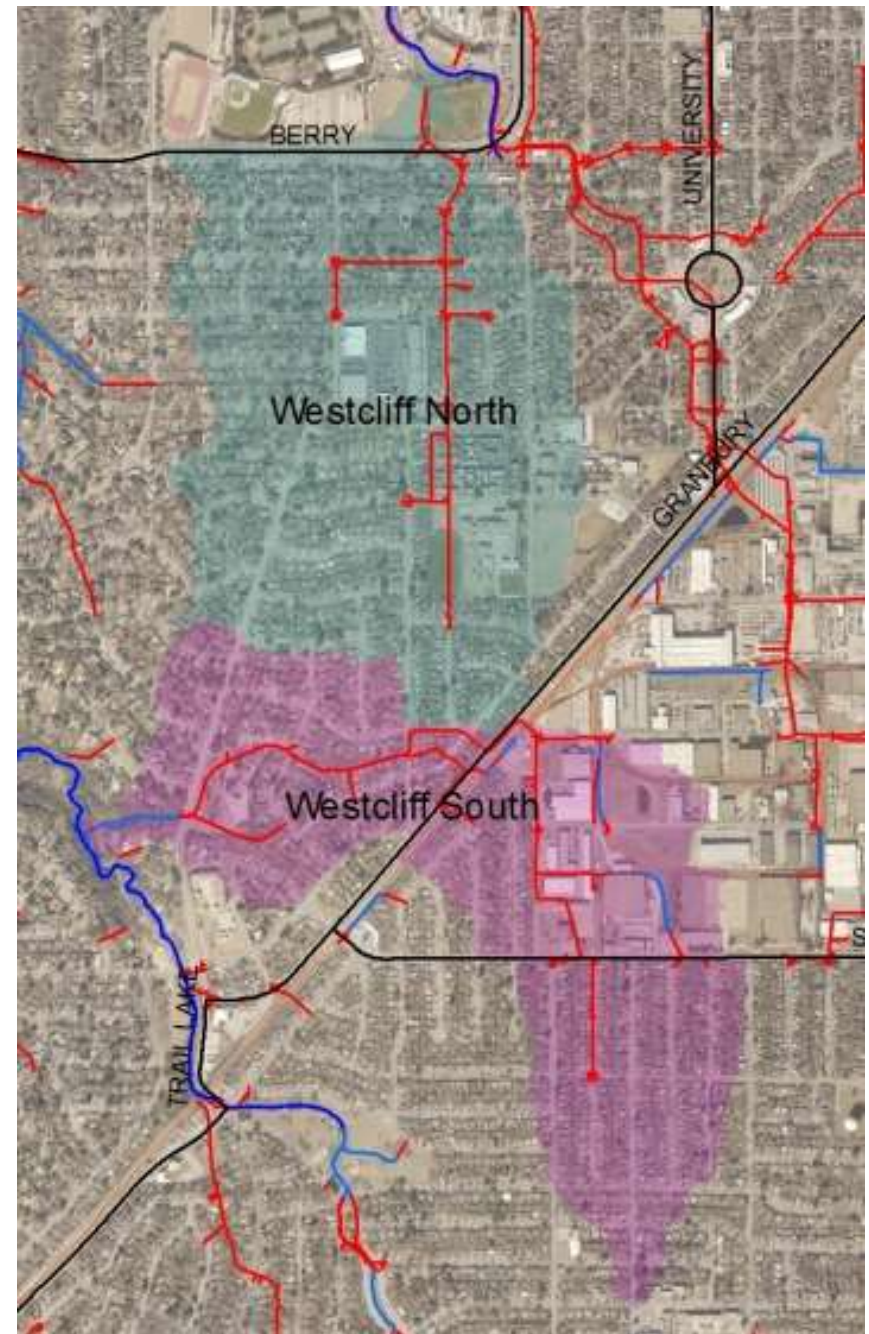


Major Projects

1. Central Arlington Heights
2. Eastern Hills
3. Luella Merrett
4. **Westcliff**

Westcliff

- Two adjacent pipe systems
- Home, church and apartment flooding in both basins
- Are they related?
- How do we fix them?





Westcliff North Basin

Home
flooding on Boyd

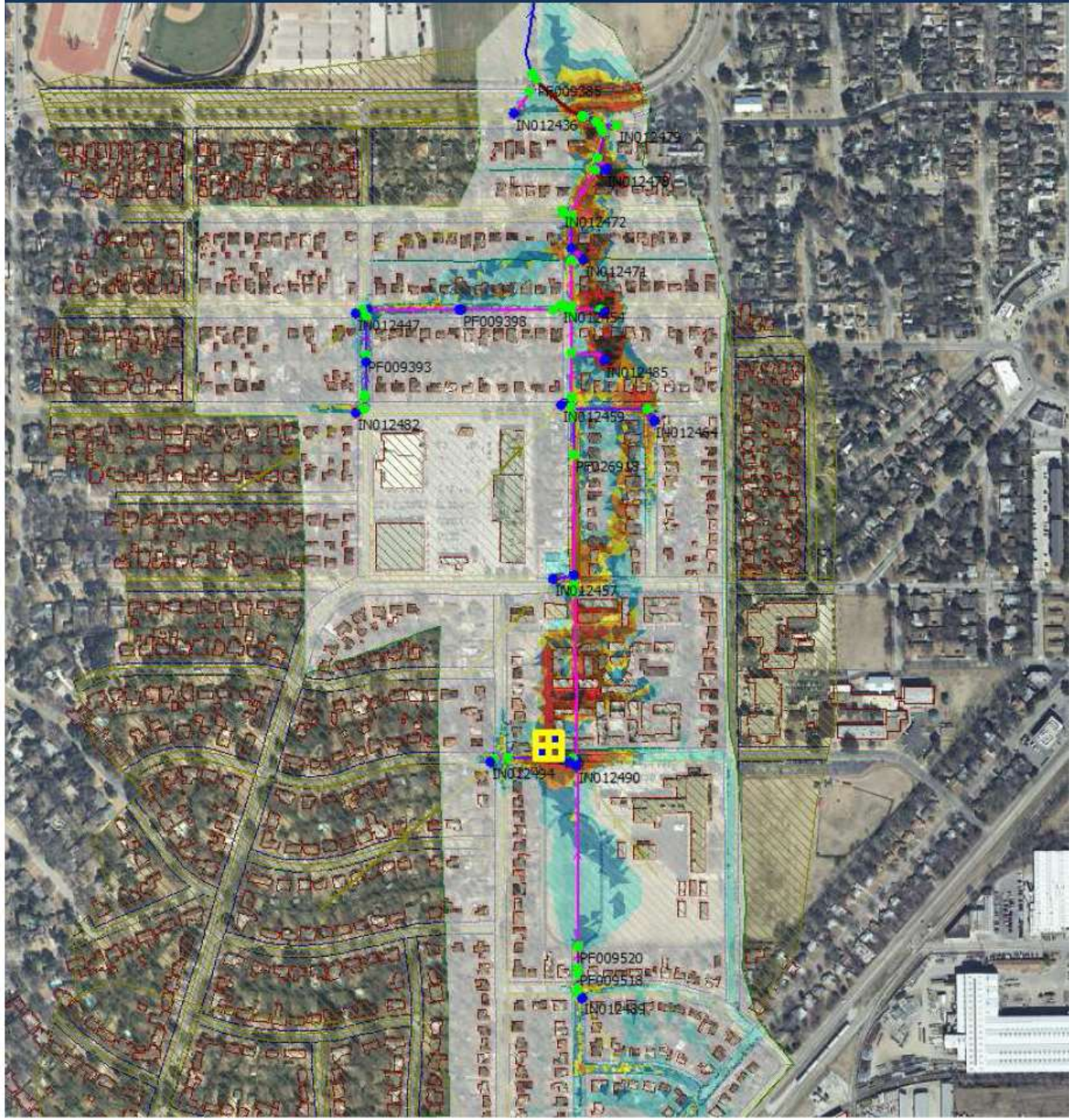
Westcliff Manor
Apts., 6/28/04
(31 units flooded)



Westcliff South Basin

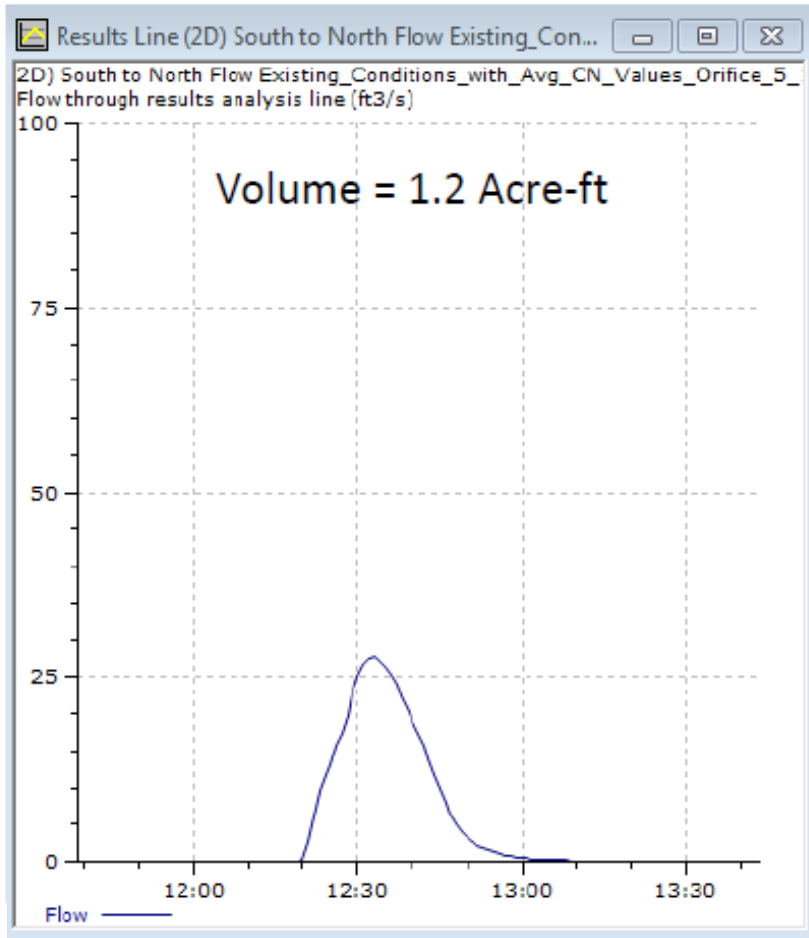


Value	Colour
0	White
0.025	Light Cyan
0.25	Blue
0.5	Yellow
0.75	Orange
1	Brown
1.5	Red
2	Black

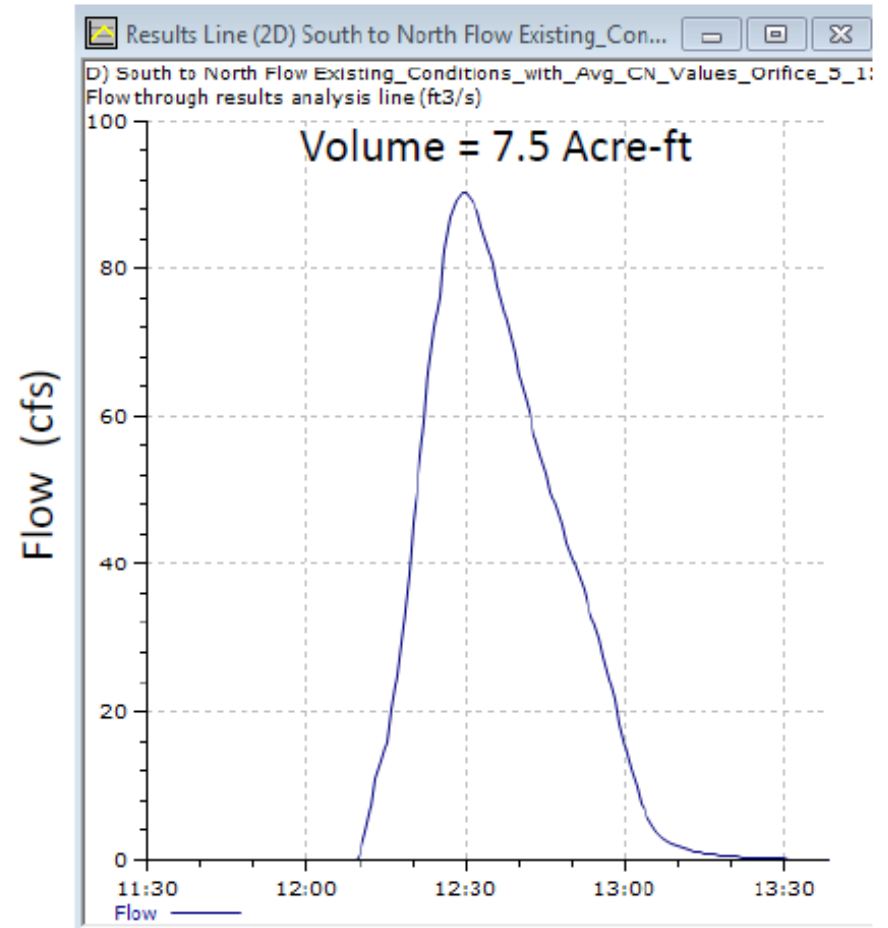


Hydrograph of Spillover Flow

5 Year 24 Hour



100 Year 24 Hour



Flooded Structures

North

South

Summary of Flooded Structures and Estimated Depth of Flood for the 100 Year and 5 Year 3 Hour Design Events Based on InfoWorks SD Model Design Storm Simulations									
Address	District	Approx. Ground Elevation (IW SD Model)	Assumed FFE Above Ground Elev. (ft)	Approx. FFE	100 Year 3 Hour Design Storm		5 Year 3 Hour Design Storm		
					Simulated Max Water Elev. (IW SD Model)	Water Depth Above FFE (ft)	Simulated Max Water Elev. (IW SD Model)	Water Depth Above FFE (ft)	
3737 CAROLYN RD	WC North	668.0	1	669.0	669.3	0.3			
3415 SOUTH HILLS AVE-1	WC North	667.0	0.5	667.5	668.6	1.1			
3415 SOUTH HILLS AVE-2	WC North	666.7	0.5	667.2	668.3	1.1			
3415 SOUTH HILLS AVE-3	WC North	667.6	0.5	668.1	668.2	0.6			
3415 SOUTH HILLS AVE-4	WC North	665.4	0.5	665.9	666.9	1.0			
3415 SOUTH HILLS AVE-5	WC North	664.9	0.5	665.4	666.7	1.2	665.5	0.1	
3415 SOUTH HILLS AVE-6	WC North	664.9	0.5	665.4	666.7	1.3	665.4	0.0	
3415 SOUTH HILLS AVE-7	WC North	665.3	0.5	665.8	666.7	0.8			
3415 SOUTH HILLS AVE-8	WC North	665.9	0.5	666.4	666.7	0.3			
				0.5	665.9	666.6	0.8		
				0.5	665.3	666.7	1.4	665.5	0.2
				0.5	665.3	666.6	1.3	665.4	0.1
				0.5	665.9	666.5	0.5		
				0.5	665.3	666.5	1.1		
				0.5	665.3	666.3	1.1	665.3	0.1
				0.5	665.8	666.4	0.6		
				0.5	665.8	666.0	0.2		
				0.5	665.1	666.3	1.2	665.3	0.1
				0.5	664.4	665.0	0.6		
				0.5	664.2	666.2	0.0		
				0.5	664.3	666.0	0.7		
				0.5	663.7	664.9	1.2	663.9	0.2
				0.5	663.3	664.7	1.5	663.5	0.2
				0.5	669.4	659.4	0.1		
				0.5	669.8	660.6	0.8		
				0.5	660.0	660.7	0.6		
				1	665.6	655.6	0.0		
				1	664.2	656.5	0.4		
				1	667.0	657.1	0.1		
				1	668.1	658.6	0.4		
				1	668.2	658.8	0.6		
				1	669.4	659.5	0.1		
				1	669.6	659.6	0.0		
				1	662.0	652.4	0.4		
				1	661.6	652.7	1.0		
				1	661.6	652.7	1.0		
				1	665.3	646.1	0.8		
				1	645.7	646.5	0.8		
				1	647.9	648.0	1.1		
3429 HELLTOP RD	WC North	646.9	1	647.9	648.0	1.1			
3432 HELLTOP RD	WC North	644.7	1	645.7	646.4	0.7			
3422 WESTCLIFF RD S	WC North	634.9	1	635.9	637.6	1.7	636.3	0.4	
3426 WESTCLIFF RD S	WC North	634.9	1	635.9	637.6	1.7	636.3	0.4	
3429 WESTCLIFF RD S	WC North	640.1	1	641.1	641.8	0.7			
3433 WESTCLIFF RD S	WC North	639.5	1	640.5	641.9	1.4			
3401 BELLAIRE DR S	WC North	634.9	1	635.9	636.2	0.3			

Summary of Flooded Structures and Estimated Depth of Flood for the 100 Year and 5 Year 3 Hour Design Events Based on InfoWorks SD Model Design Storm Simulations								
Address	District	Approx. Ground Elevation (IW SD Model)	Assumed FFE Above Ground Elev. (ft)	Approx. FFE	100 Year 3 Hour Design Storm		5 Year 3 Hour Design Storm	
					Simulated Max Water Elev. (IW SD Model)	Water Depth Above FFE (ft)	Simulated Max Water Elev. (IW SD Model)	Water Depth Above FFE (ft)
3328 W SEMINARY DR	WC South	713.4	0.5	713.9	714.0	0.1		
3328 W SEMINARY DR	WC South	712.0	0.5	712.5	713.0	0.5		
3328 W SEMINARY DR	WC South	711.8	0.5	712.3	712.9	0.6	712.3	0.0
3328 W SEMINARY DR	WC South	710.4	0.5	710.9	711.7	0.8	711.2	0.3
3328 W SEMINARY DR	WC South	707.5	0.5	708.0	708.5	0.5		
3250 W SEMINARY DR	WC South	708.0	0.5	708.5	709.9	1.3		
4100 SURREY ST	WC South	688.9	1	689.9	690.0	0.1		
4206 SURREY ST	WC South	688.1	1	689.1	689.1	0.0		
4124 CHEROKEE TR	WC South	689.8	1	690.8	691.1	0.2		
4141 WINFIELD AVE	WC South	684.6	1	685.6	685.7	0.1		
4201 WINFIELD AVE	WC South	681.6	1	682.6	682.7	0.1		
4159 CAROLYN RD	WC South	684.3	1	685.3	685.7	0.4		
4121 ANITA AVE	WC South	669.6	1	670.6	672.8	2.3	671.1	0.5
4121 ANITA AVE	WC South	670.1	1	671.1	672.6	1.5		
4125 ANITA AVE	WC South	669.7	1	670.7	672.9	2.2	671.1	0.5

Impacted Structures

15

4

Impacted Structures

45

10

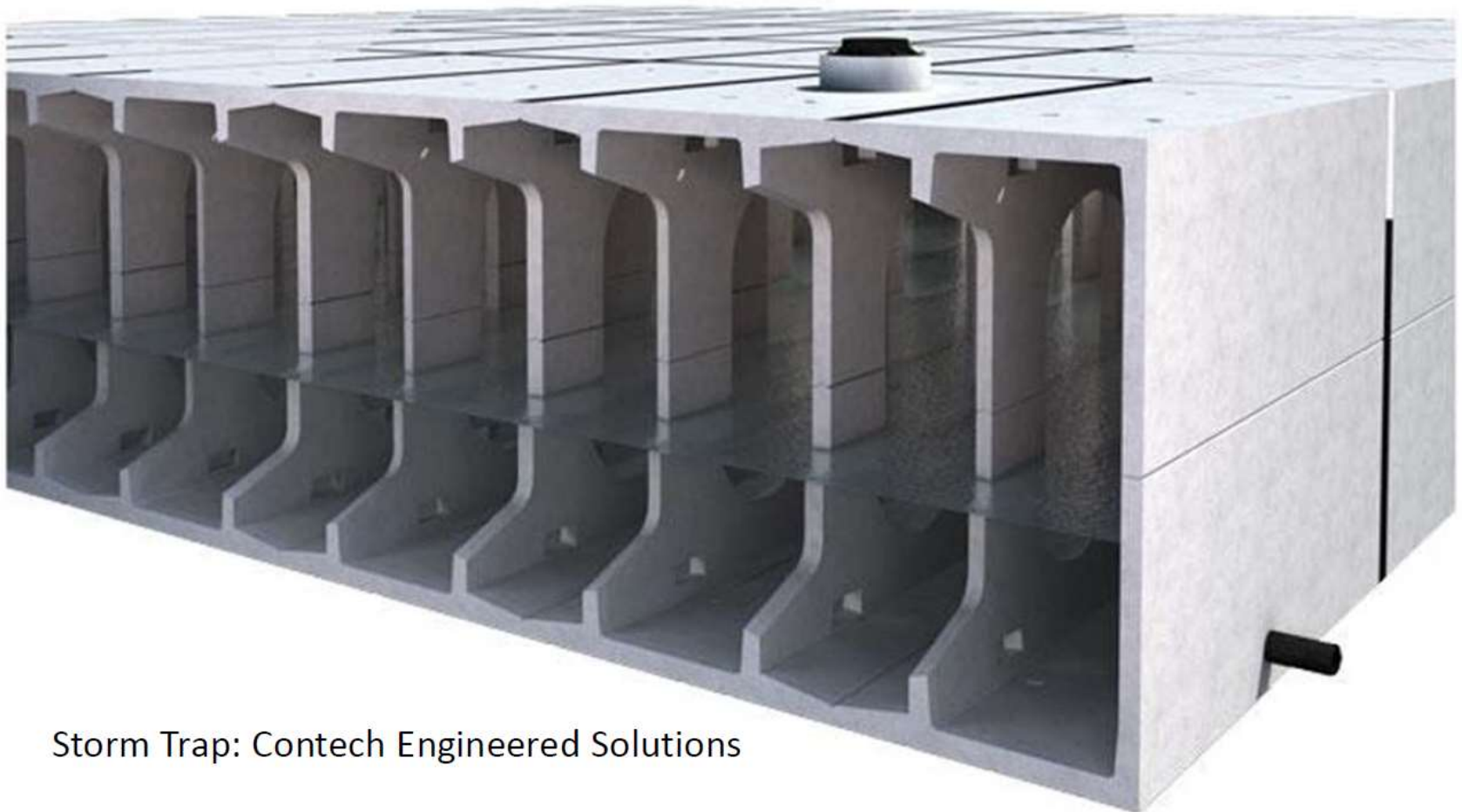


North Storage Structure Conceptual Layout



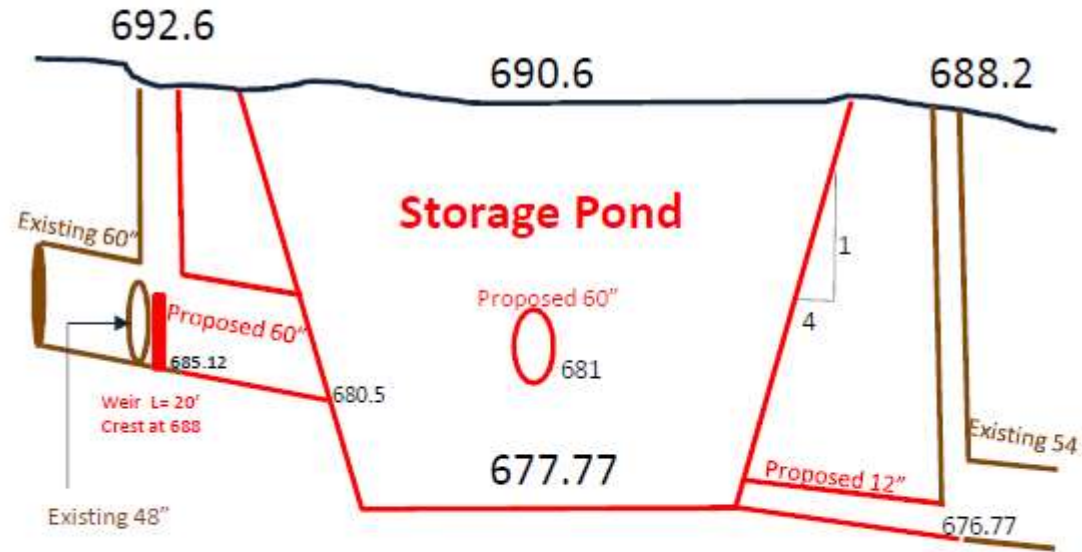
North Storage Structure – Potential Construction Method 1

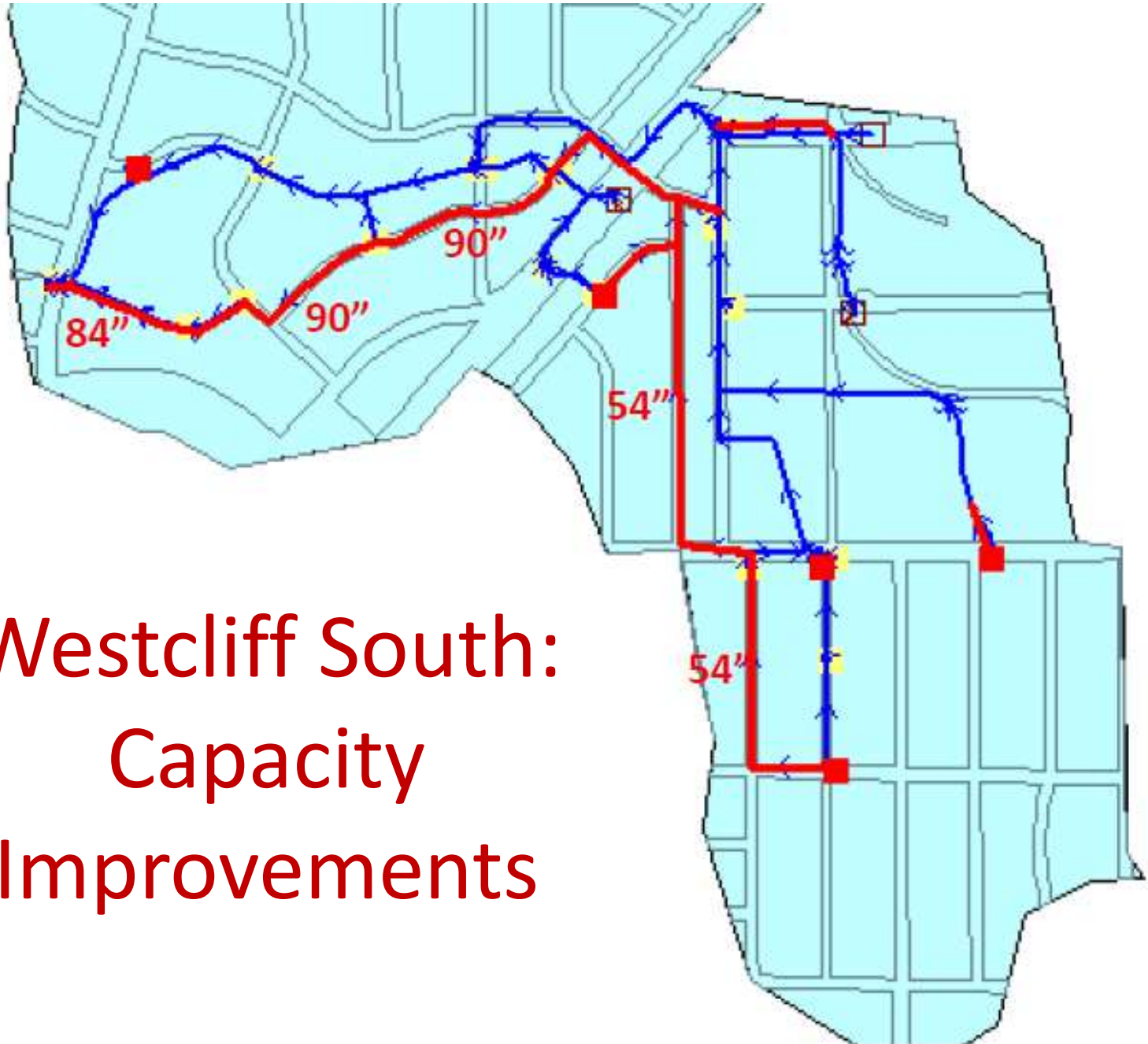
URBANGREEN™ 



Storm Trap: Contech Engineered Solutions

South 1 Storage Pond Conceptual Layout





Westcliff South: Capacity Improvements



Fort Worth Stormwater Capital Project Showcase

QUESTIONS?