TROTTER and ASSOCIATES, INC.
ENGINEERS AND SURVEYORS

Memorandum

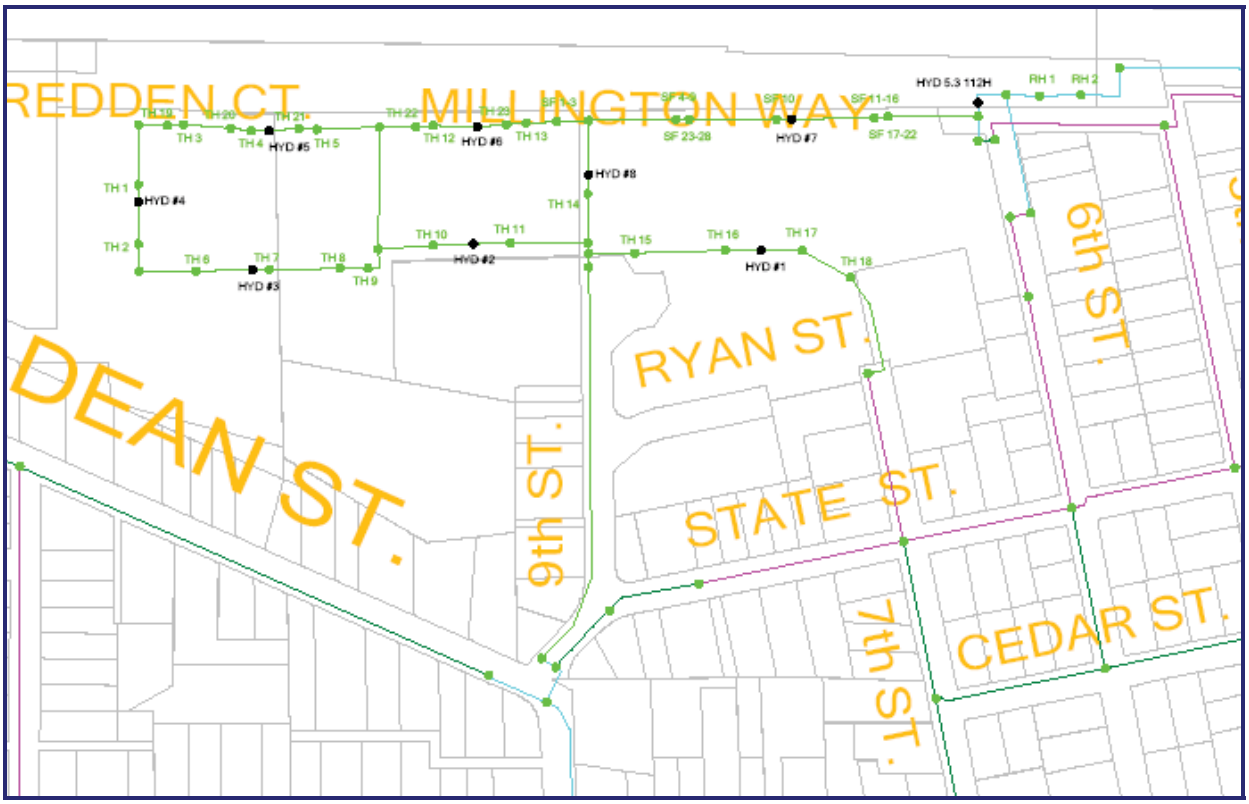
Date: December 27, 2010

To: Chris Tiedt, City of St. Charles Engineering

From: Mike Holland, Trotter and Associates, Inc.

Subject: Lexington Club WaterCAD Modeling

Per your request, Trotter and Associates, Inc. has completed the WaterCAD Modeling of the proposed Lexington Club development project. The model was produced to analyze the proposed water distribution system to determine if sufficient fire flow capacity can be provided for the proposed development with or without requiring the proposed residences to be sprinkled. Additionally it has been requested that the proposed water distribution system be analyzed to determine the effect of increasing portions of the existing and proposed 8" diameter watermain to 10" diameter watermain.



40W201 Wasco Road, Suite D - St. Charles, Illinois 60175 - 630/587-0470 - Fax. 630/587-0475

Based on preliminary engineering plans developed by the Wills Burke Kelsey Associates and a project layout map provided by Lexington Homes, the proposed distribution system was added to the City's current WaterCAD model. The proposed development consists of an 8-inch diameter water distribution system intended to serve 102 2-story townhouses, 12 2-story rowhouses and 28 single family homes.

In order to set-up the WaterCAD model, water usages were estimated and assigned to each of the proposed buildings. These water usages, or demands, were estimated using the IEPA's design criteria for population equivalents (P.E.) of residential buildings. For a townhouse or rowhouse the design criteria is 3.0 P.E. and for a single family home it is 3.5 P.E. One P.E. is equal to 100 gallons per day, so for a townhouse or rowhouse this equates to a total of 300 gallons per day (0.21 gal/min) of water usage and for a single family home this equates to 350 gallons per day (0.24 gal/min) of water usage. Nodes with these demands were then placed on the distribution system in the WaterCAD model at the locations of the various residences. A spreadsheet of these demands are provided in the appendix of this memo.

It was also requested by the City of St. Charles that the WaterCAD model provide an analysis of the effect of changing the proposed 8-inch diameter main that connects Mark St. and runs west to 9th St. and then continues south, to a 10-inch main. Therefore two separate scenarios were created in the WaterCAD Model, one with all 8-inch mains per the engineering plans and one changing the watermain that connects the existing main on Mark St. to the existing main on 9th St. to 10-inch diameter. Once the scenarios were developed a fire flow analysis was run for each scenario to determine what the maximum flow available at each location is while maintaining a minimum of 20 psi residual pressure in the system. It should be noted that the fire flow analysis was run under a Max Day usage which represents the City's system during summer months when water usage is at its highest. Based on historical usage the City has seen water usages of twice what they normally are, therefore under Max Day usage the model's demands are multiplied by 2.0. The results of the fire flow analysis are as follows:

	8" Main	10" Main
	Fire Flow (gal/min)	Fire Flow (gal/min)
RH 1	2,239.19	1,996.19
RH 2	2,304.08	2,056.04
SF 1-3	1,723.10	1,731.33
SF 4-9	1,797.64	1,766.30
SF 10	1,882.86	1,799.78
SF 11-16	1,985.31	1,839.44
SF 17-22	2,002.50	1,845.46
SF 23-28	1,807.38	1,770.44
TH 1	1,606.21	1,728.21
TH 2	1,607.11	1,728.20
TH 3	1,619.65	1,727.89
TH 4	1,640.82	1,728.01
TH 5	1,674.53	1,728.21
TH 6	1,618.73	1,727.68
TH 7	1,641.05	1,727.52
TH 8	1,676.83	1,727.24
TH 9	1,697.91	1,727.46
TH 10	1,709.73	1,724.60
TH 11	1,702.08	1,720.15
TH 12	1,718.89	1,729.60
TH 13	1,720.84	1,730.45
TH 14	1,707.87	1,721.39
TH 15	1,687.44	1,714.68
TH 16	1,652.86	1,728.76
TH 17	1,581.03	1,738.69
TH 18	1,536.36	1,680.39
TH 19	1,616.69	1,728.28
TH 20	1,633.74	1,728.39
TH 21	1,664.11	1,728.56
TH 22	1,718.35	1,729.29
TH 23	1,720.44	1,730.58

Per the 2009 International Fire Code, the fire flow requirement for one and two-family dwellings under 3,600 square feet is 1,000 gallons per minute. However, if a building is equipped with an automatic sprinkler system the fire flow requirement may be reduced by 50% equating to 500 gallons per minute. Based on the above table all of the proposed buildings have a fire flow capacity well above the minimum required fire flow whether it is sprinkled or not.

In comparing the effects of increasing the main size to 10-inch diameter it was noticed that the fire flow capacity increased for all of the townhomes but decreased at the single family homes and rowhouses. This is because the fire flow was limited in the 10-inch scenario at these locations because the residual pressure in the system reached the minimum 20 psi at a location outside of the development. So for example, Rowhouse 1 (RH 1) has a fire flow capacity of 1,996.19 gpm when the residual pressure in the system reached 20 psi. If the pressure in the system was allowed to go

below 20 psi then the fire flow would have increased at this location to get to the minimum 20 psi. This will be further clarified in the following analysis.

The City of St. Charles has stated that hydrants would still be used in the proposed development even if sprinkler systems are provided. Therefore hydrants were placed in the WaterCAD model to analyze the fire flow capacity of the proposed development with a hydrant running at each location. To do this a 1,000 gallon per minute demand was placed on a hydrant and a fire flow analysis was then done to determine the fire flow capacity at the residences within 500 ft of that hydrant while the hydrant is producing 1,000 gpm. The results of this are as follows:

Single Family #1 - #3 (SF 1-3)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
6	1000.0	720.99	22.52	730.23	27.57

Single Family #4 - #9 (SF 4-9)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
7	1000	874.38	23.1	798.39	28.61
8	1000.0	766.82	24.21	752.59	29.02

Single Family #10 (SF 10)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
7	1000.0	893.61	23.38	803.95	29.29

Single Family #11 - #16 (SF 11-16)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
7	1000.0	961.84	25.01	830.4	30.68
5.3 112H	1000.0	1093.76	24.32	886.06	30.42

Single Family #17 - #22 (SF 17-22)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
7	1000.0	974.56	25.08	834.66	30.7
5.3 112H	1000.0	1098.79	24.25	887.49	30.4

Single Family #23 - #28 (SF 23-28)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
7	1000	876.92	23.46	799.33	29.02
8	1000.0	773.22	24.70	755.39	29.47

Townhouse #1 (TH 1)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
4	1000.0	609.37	20.00	727.97	21.35

Townhouse #2 (TH 2)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
4	1000.0	614.51	20.00	727.9	21.53

Townhouse #3 (TH 3)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	652.5	20.01	728.04	22.87

Townhouse #4 (TH 4)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	649.52	20.00	728.08	22.77

Townhouse #5 (TH 5)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	671.39	20.21	727.71	23.73

Townhouse #6 (TH 6)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
3	1000.0	638.74	20.00	727.62	22.41

Townhouse #7 (TH 7)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
3	1000.0	642.76	20.00	727.56	22.56

Townhouse #8 (TH 8)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
3	1000.0	670.65	20.39	726.87	23.92

Townhouse #9 (TH 9)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
3	1000.0	684.16	20.62	727	24.6

Townhouse #10 (TH 10)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
2	1000.0	707.13	21.23	722.72	26.11

Townhouse #11 (TH 11)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
2	1000.0	703.21	21.80	720.92	26.67
8	1000.0	705.45	23.22	721.54	29.16

Townhouse #12 (TH 12)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
6	1000.0	719.37	21.06	729.51	26.05

Townhouse #13 (TH 13)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
6	1000.0	720.16	21.85	730.06	26.86
8	1000.0	717.22	23.21	727.92	28.18

Townhouse #14 (TH 14)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
8	1000.0	711.86	22.96	724.08	28.36

Townhouse #15 (TH 15)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
1	1000.0	692.32	21.92	720.87	26.71
8	1000.0	701.03	23.36	720.14	28.26

Townhouse #16 (TH 16)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
1	1000.0	640.37	20.60	730.47	23.26

Townhouse #17 (TH 17)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
1	1000.0	613.13	20.24	734.08	21.67

Townhouse #18 (TH 18)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
1	1000.0	607.46	20.30	735.84	21.38

Townhouse #19 (TH 19)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	653.82	20.01	728.45	22.9

Townhouse #20 (TH 20)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	650.81	20.00	728.49	22.8

Townhouse #21 (TH 21)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5	1000.0	664	20.08	727.78	23.35

Townhouse #22 (TH 22)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
6	1000.0	719.3	21.11	729.45	26.09

Townhouse #23 (TH 23)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
6	1000.0	719.91	21.47	729.98	26.47

Rowhouse #1 (RH 1)

		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5.3 112H	1000.0	1212.48	26.07	966.74	32.48

Rowhouse #2 (RH 2)

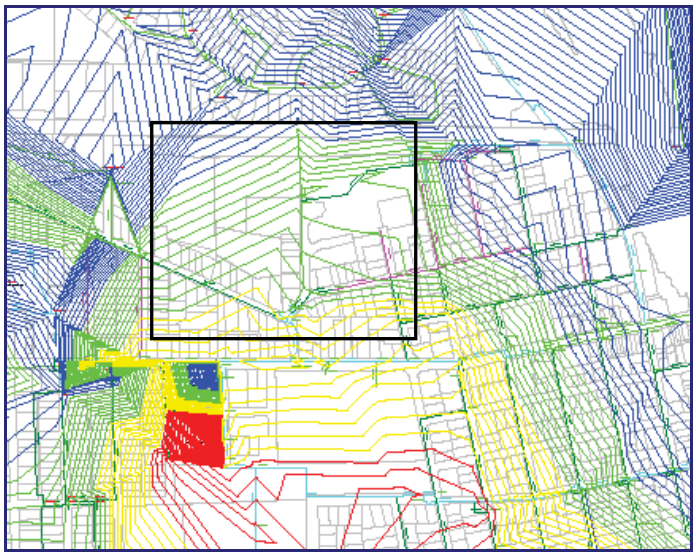
		8" Main		10" Main	
Hydrant #	Flow (gpm)	Fire Flow (gpm)	Pressure (psi)	Fire Flow (gpm)	Pressure (psi)
5.3 112H	1000.0	1259.2	27.91	1007.2	34.3

From this analysis it can be seen that with a hydrant running at 1,000 gal/min each of the proposed residences still has well above the required 500 gal/min of capacity required for a sprinkled home. Under the 10" Main scenario the capacity does increase for all of the townhomes but appears to decrease for the single family homes and rowhouses. As stated previously, this is due to the system pressure outside of the development being at the minimum 20 psi. Using Rowhouse #1 (RH 1) above as an example, when Hydrant 5.3 112H is running at 1,000 gpm the fire flow for the 8" Main scenario is 1,212.48 gpm at 26.07 psi while the fire flow for the 10" Main scenario is 966.74 gpm at 32.48 psi. These results are showing that during a fire event these would be the expected fire flows if limited by the lowest pressure in the distribution system. If the distribution system was allowed to be lower than 20 psi then that would allow the fire flows at this specific location to be increased. However, since all of the fire flow results exceed the minimum required fire flow no further analysis was performed.

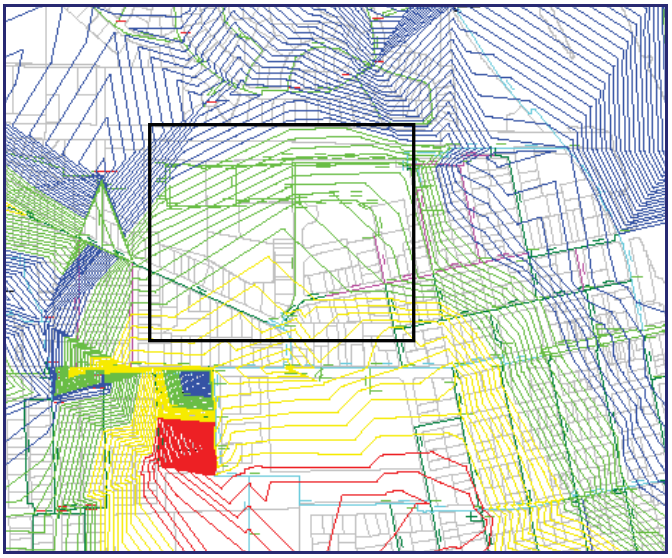
Distribution System Effects:

As part of the WaterCAD analysis for the proposed Lexington Club development, the City of St. Charles also requested that the WaterCAD model be used to investigate what impact the development would have on the system pressure and fire flow in the surrounding area. To do this, the existing model, the 8" main scenario and the 10" main scenario were each run under Max Day demands and contour maps were generated showing system pressure and fire flow capacity.

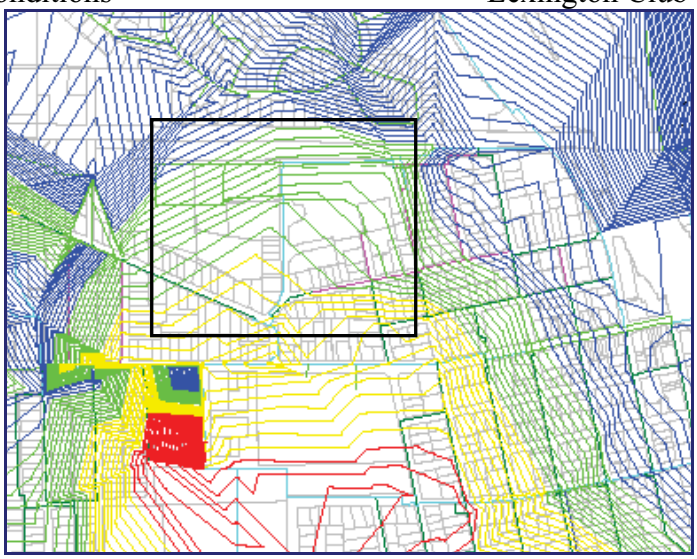
Contour maps showing the system pressure are shown below and also attached in the appendix. The red contours indicate areas of the system below 40 psi of pressure, the yellow contours indicated areas between 40 psi and 50 psi, the green contours indicate areas between 50 psi and 60 psi and the blue contours indicated areas above 60 psi. For clarity a box has been placed around the development area.



Current Conditions



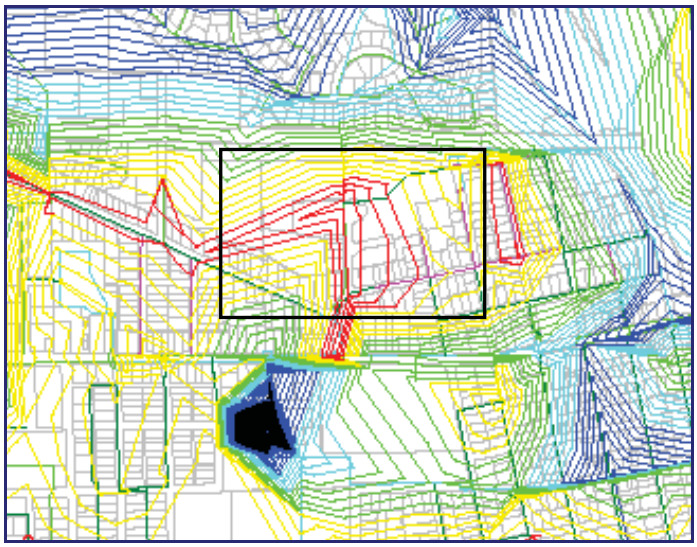
Lexington Club with 8" Main



Lexington Club with 10" Main

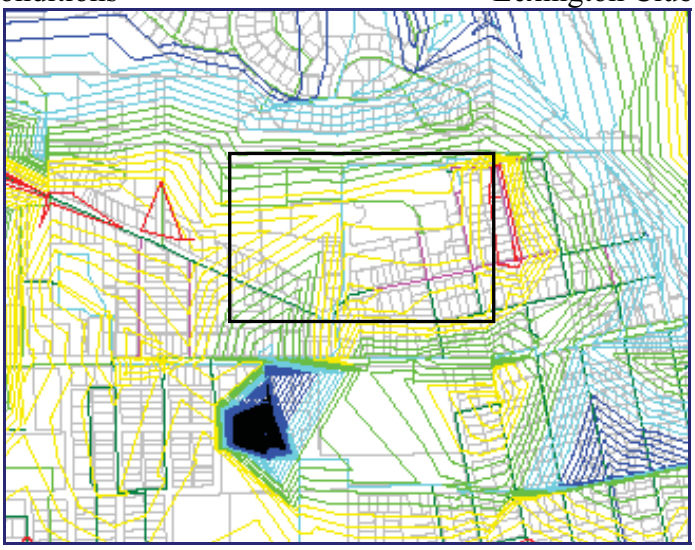
From the system pressure contour maps the system pressure surrounding the development area is expected to have 50-60 psi of system pressure, which is typically an acceptable amount. A slight decrease (approximately 1 – 2 psi) can be seen between the current conditions and proposed development conditions, however since the City's system controls automatically maintain system pressure through monitoring of the level in the water towers, the expected effect on system pressure is minimal. There was not a noticeable effect on the system pressure in changing from the 8" main to the 10" main.

Contour maps showing the system fire flow capacity are also shown below and attached in the appendix. The red contours indicate areas of the system below 1,000 gpm of fire flow capacity, the yellow contours indicated areas between 1,000 and 2,000 gpm, the green contours indicate areas between 2,000 and 3,000 gpm, the light blue contours indicate areas between 3,000 and 4,000 gpm and the dark blue contours indicated areas above 4,000 gpm. For clarity a box has been placed around the development area.



Current Conditions

Lexington Club with 8" Main



Lexington Club with 10" Main

From the fire flow capacity contour maps it can be seen that the area in red on the current conditions contour map indicating a fire flow capacity below 1,000 gpm is greatly reduced in the area immediately surrounding the proposed development for both the 8" main and 10" main scenarios. This is expected due to the upsizing of the existing 6" Main from Mark St. to 9th St. However it does not appear that increasing the 8" Main to a 10" Main significantly affects the fire flow capacity in the surrounding area.

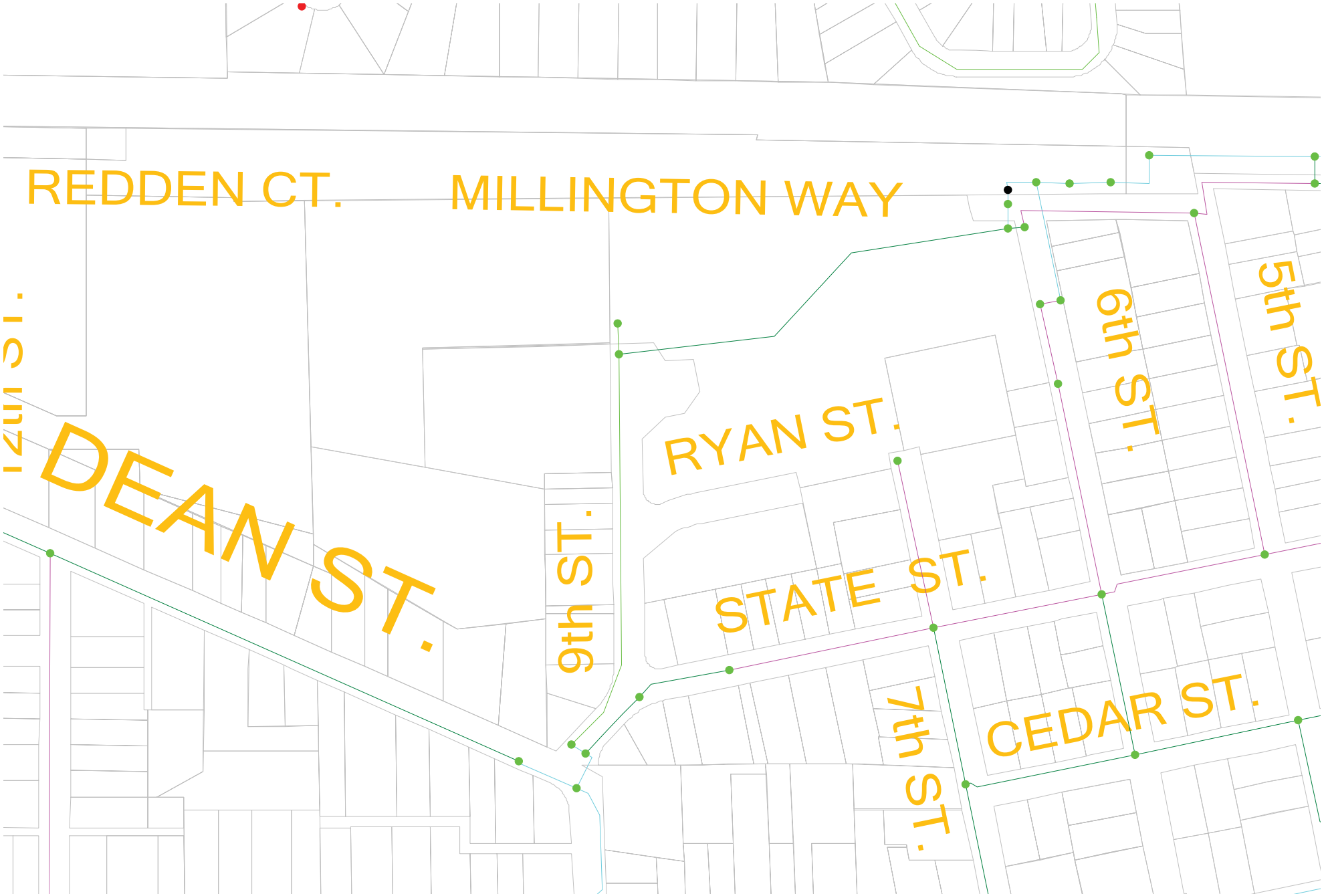
Conclusions:

Based on the WaterCAD modeling for the proposed Lexington Club development the results indicate that the proposed development will have adequate fire flow capacity to meet the minimum fire flow requirements of the 2009 International Fire Code. The WaterCAD model indicates that the proposed development will exceed the required fire flow capacity of 500 gallons per minute for sprinkled homes even with a nearby hydrant running at 1,000 gallons per minute. The model also indicated that if the homes were not sprinkled the proposed distribution system would exceed the required fire flow capacity of 1,000 gallons per minute. The results of the WaterCAD model also show that the proposed development is not expected to have a negative impact on the water pressure in the surrounding system but that the fire flow capacity of the surrounding area would be improved as a result.

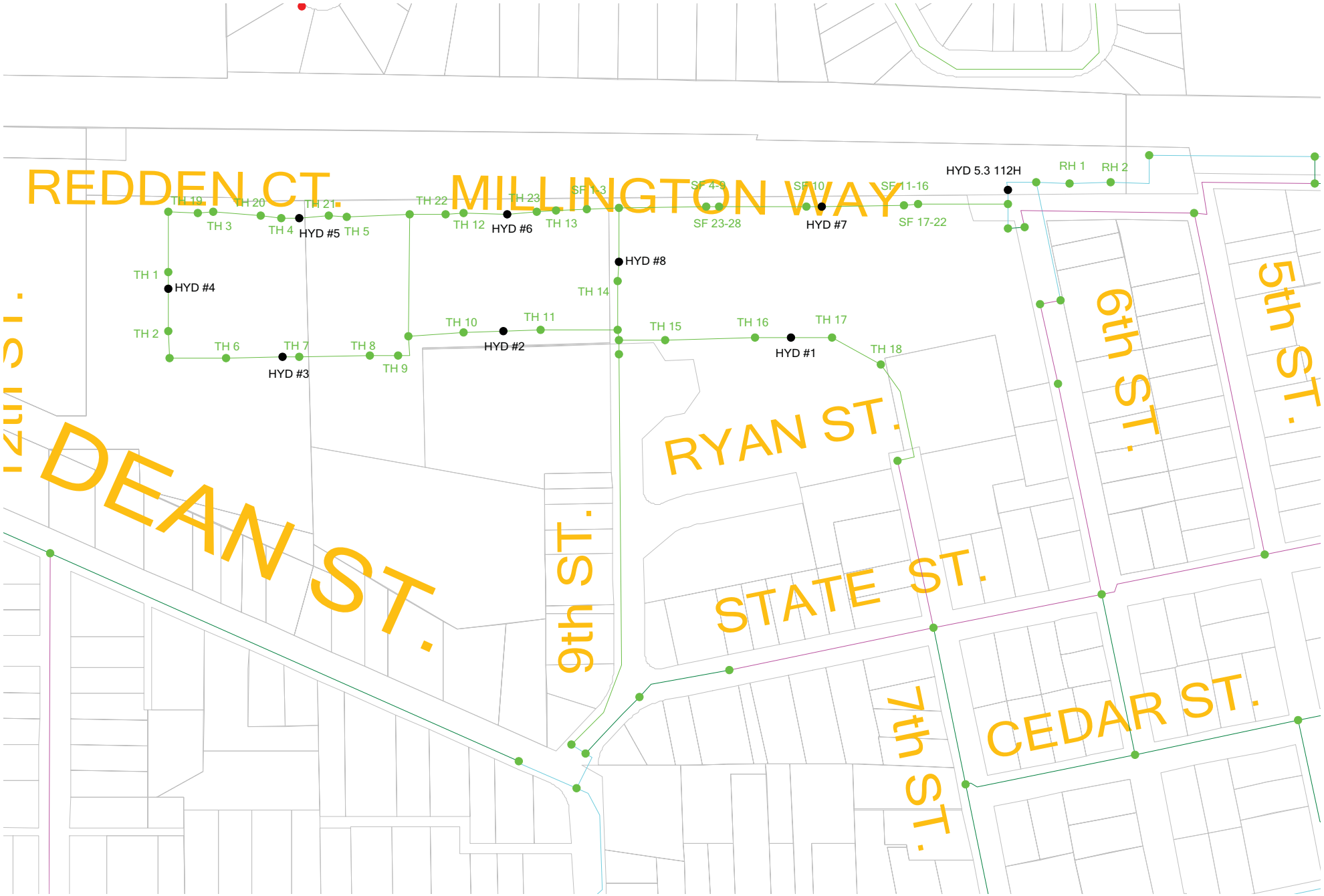
The WaterCAD model did indicate that the fire flow capacity of the proposed development would be improved by increasing the proposed 8-inch diameter main from Mark Street to 9Th Street to a 10-inch diameter main but that this was not necessary in order to meet the minimum fire flow requirements. However, the model also indicated that the distribution system pressure and fire flow capacity in the surrounding areas were not significantly impacted by this increase in watermain size.

Appendix

Scenario: 2006	**Current Conditions WaterCAD Model Layout**
Scenario: Lexington PUD	**Proposed Lexington Club WaterCAD Layout**
Scenario: Lexington 10" Main	**Proposed Lexington Club WaterCAD Layout w/ 10" Main**
Contour Plot – Pressure	**Scenario: 2006 Max Day**
Contour Plot – Pressure	**Scenario: Lexington PUD Max Day**
Contour Plot – Pressure	**Scenario: Lexington 10" Main Max Day**
Contour Plot – Available Fire Flow	**Scenario: 2006 Max Day Fire Flow Analysis**
Contour Plot – Available Fire Flow	**Scenario: Lexington Max Day Fire Flow**
Contour Plot – Available Fire Flow	**Scenario: Lexington 10" Max Day Fire Flow**
Precision GIS	**Existing Water System From City of St.Charles**
Lexington Club – Utility Plan	**Preliminary Engineering Drawing**
Lexington Club – Concept Plan	
Lexington Club Base Demands	


REDDEN CT.
MILLINGTON WAY
DEAN ST.
RYAN ST.
STATE ST.
CEDAR ST.
9th ST.
7th ST.
6th ST.
5th ST.

Scenario: Lexington PUD



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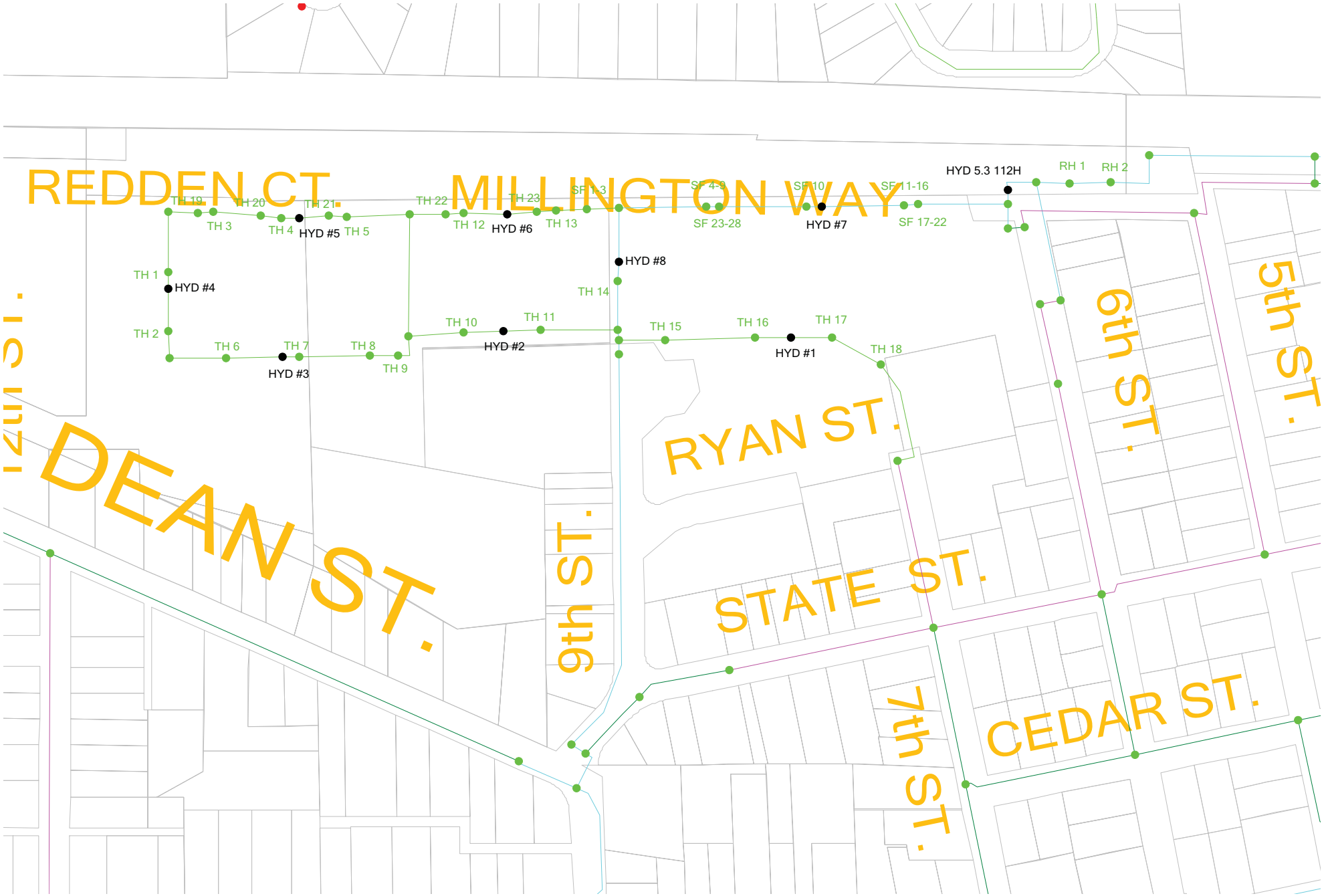
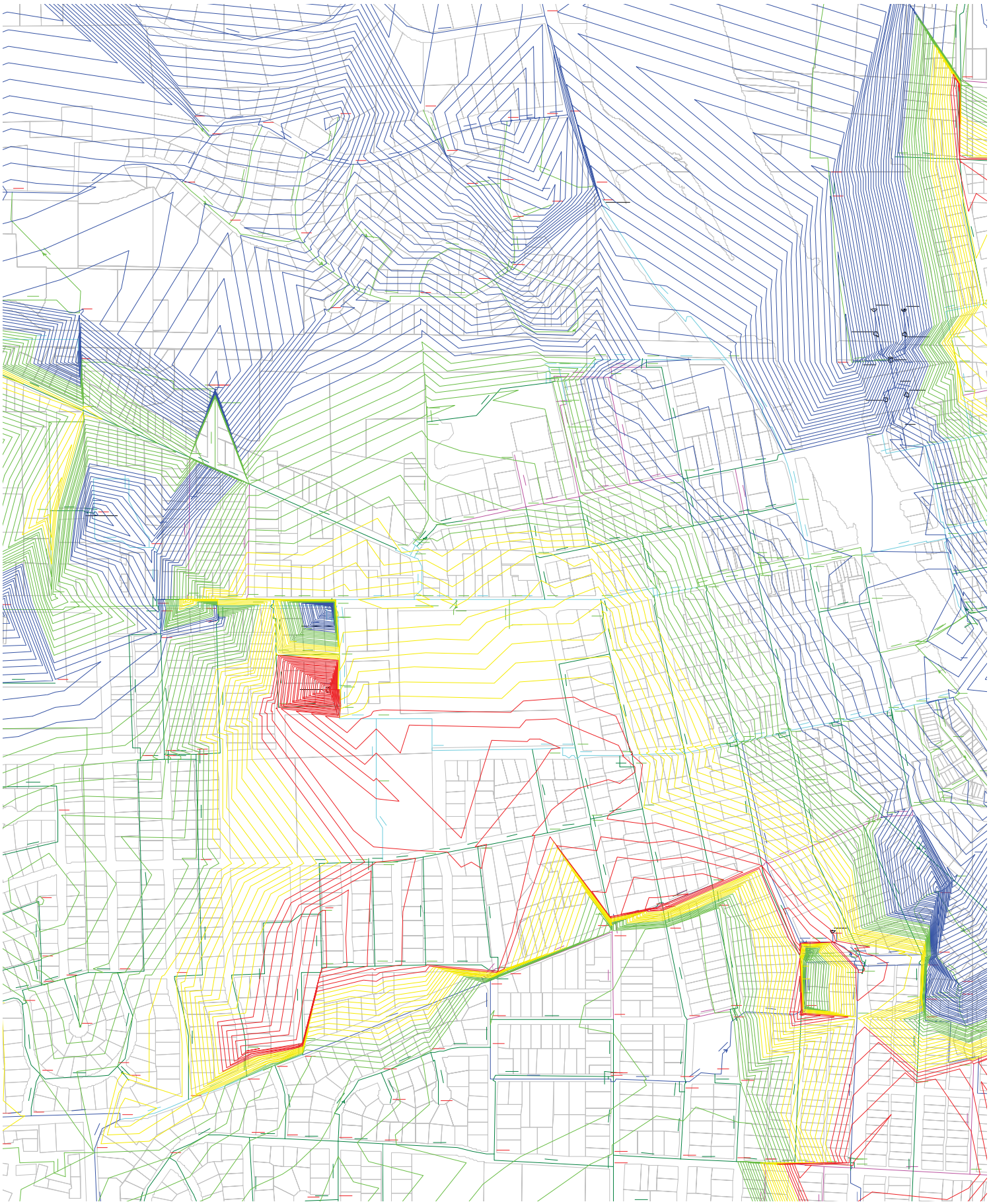
Scenario: Lexington 10" Main

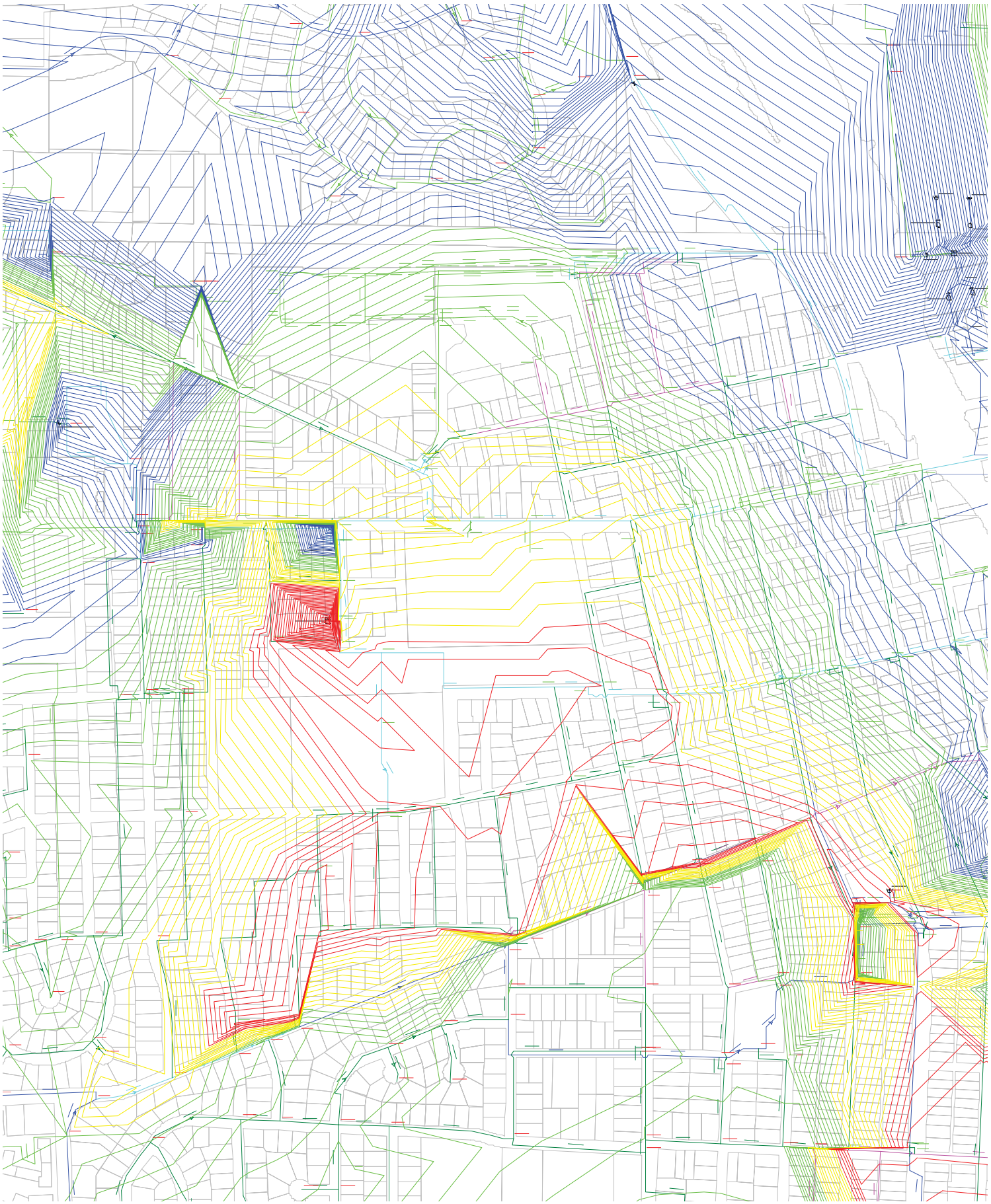


Trotter and Associates
Haestad Methods Solution Center Watertown, CT 06795 USA +1-203-755-1666

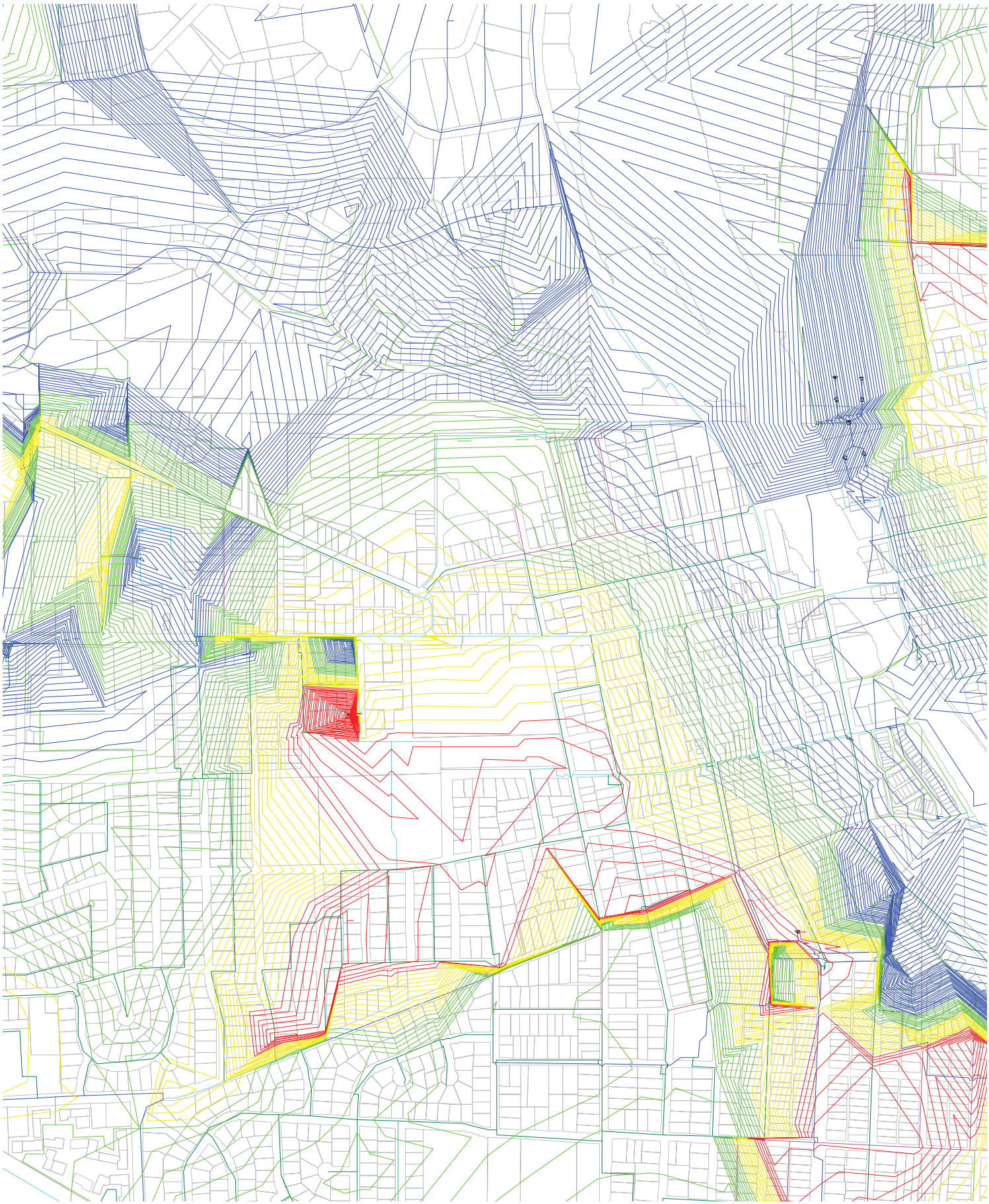
Contour Plot - Pressure
Scenario: 2006 Max Day



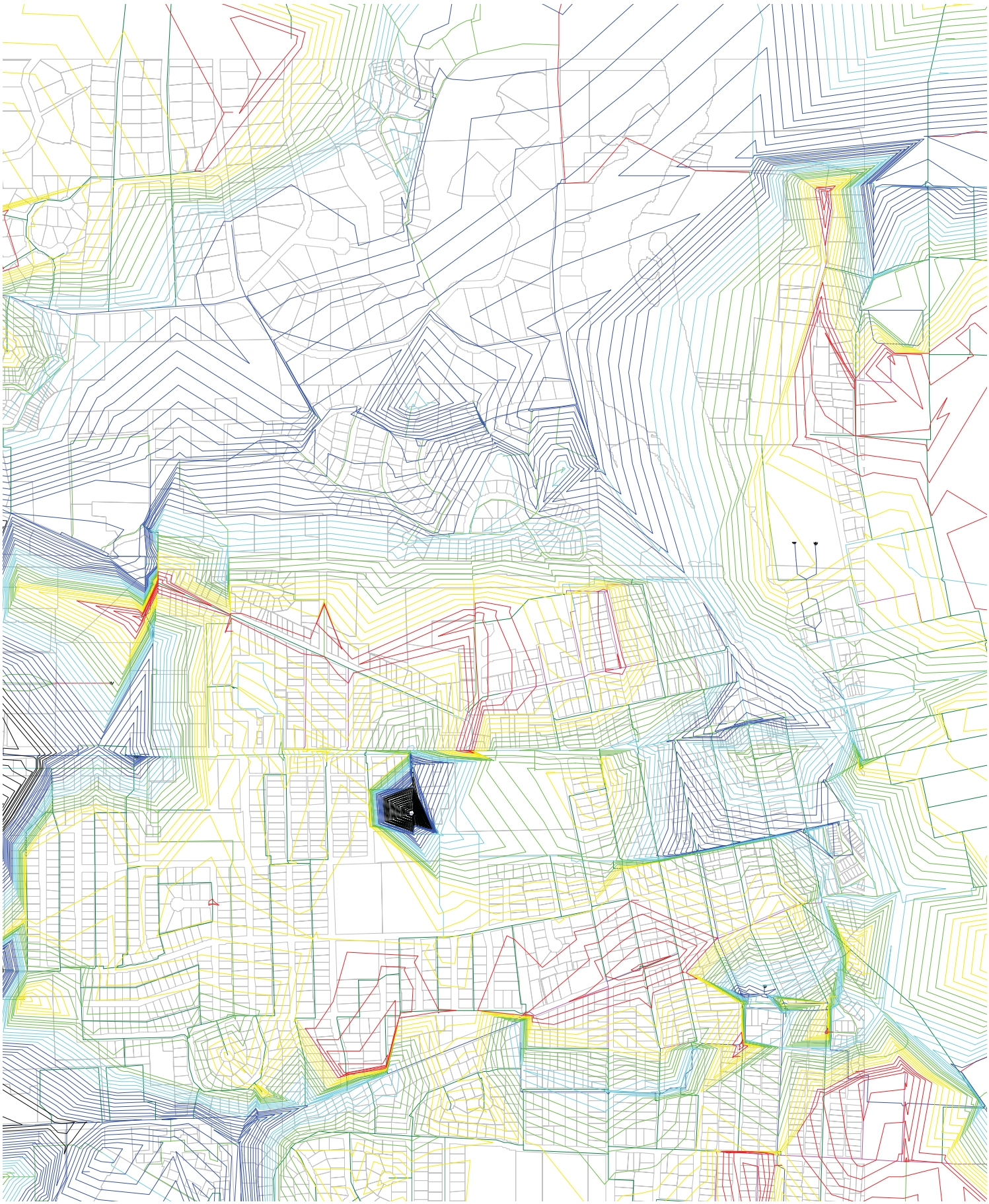
Contour Plot - Pressure
Scenario: Lexington PUD Max Day



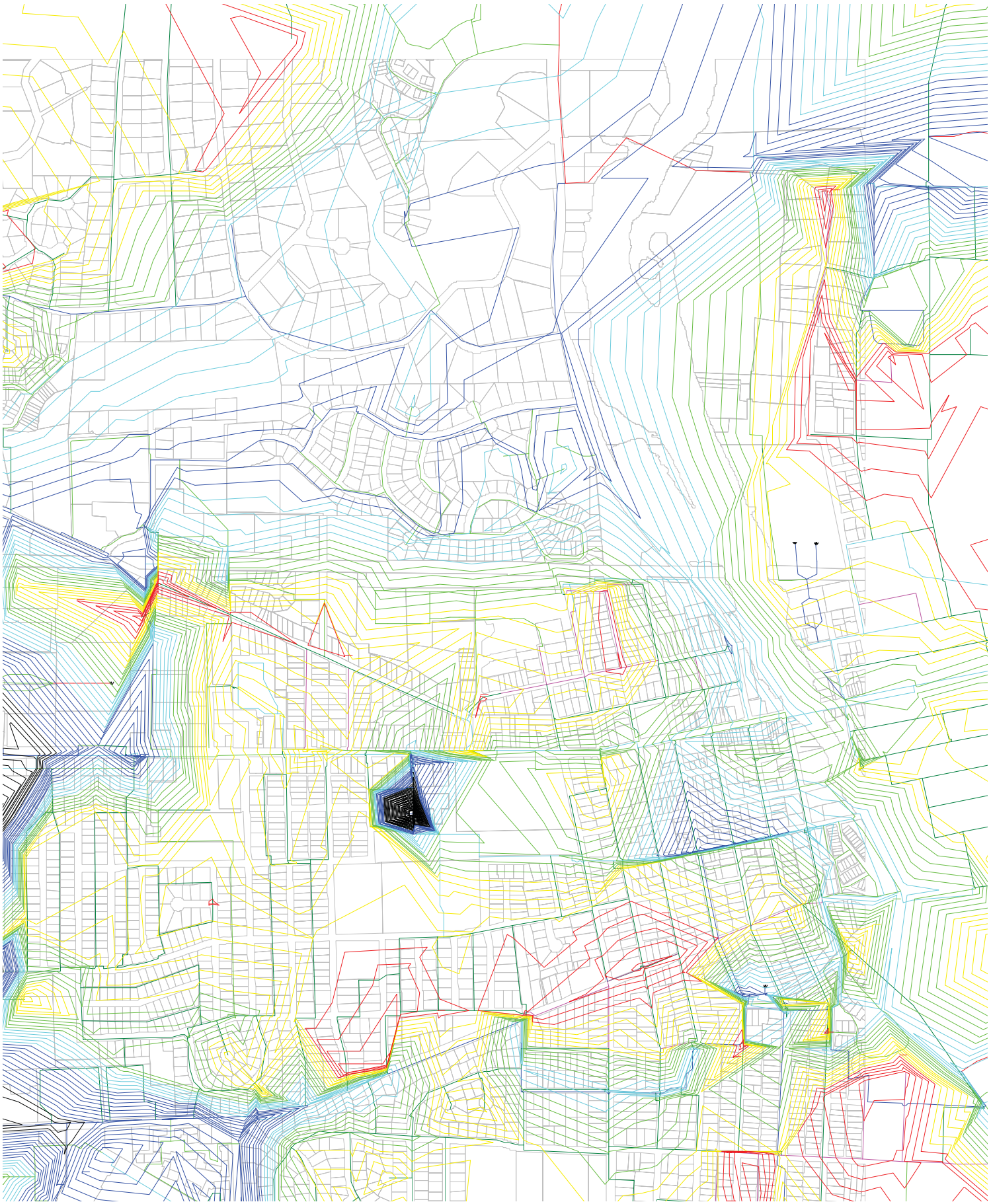
Contour Plot - Pressure
Scenario: Lexington 10" Main Max Day



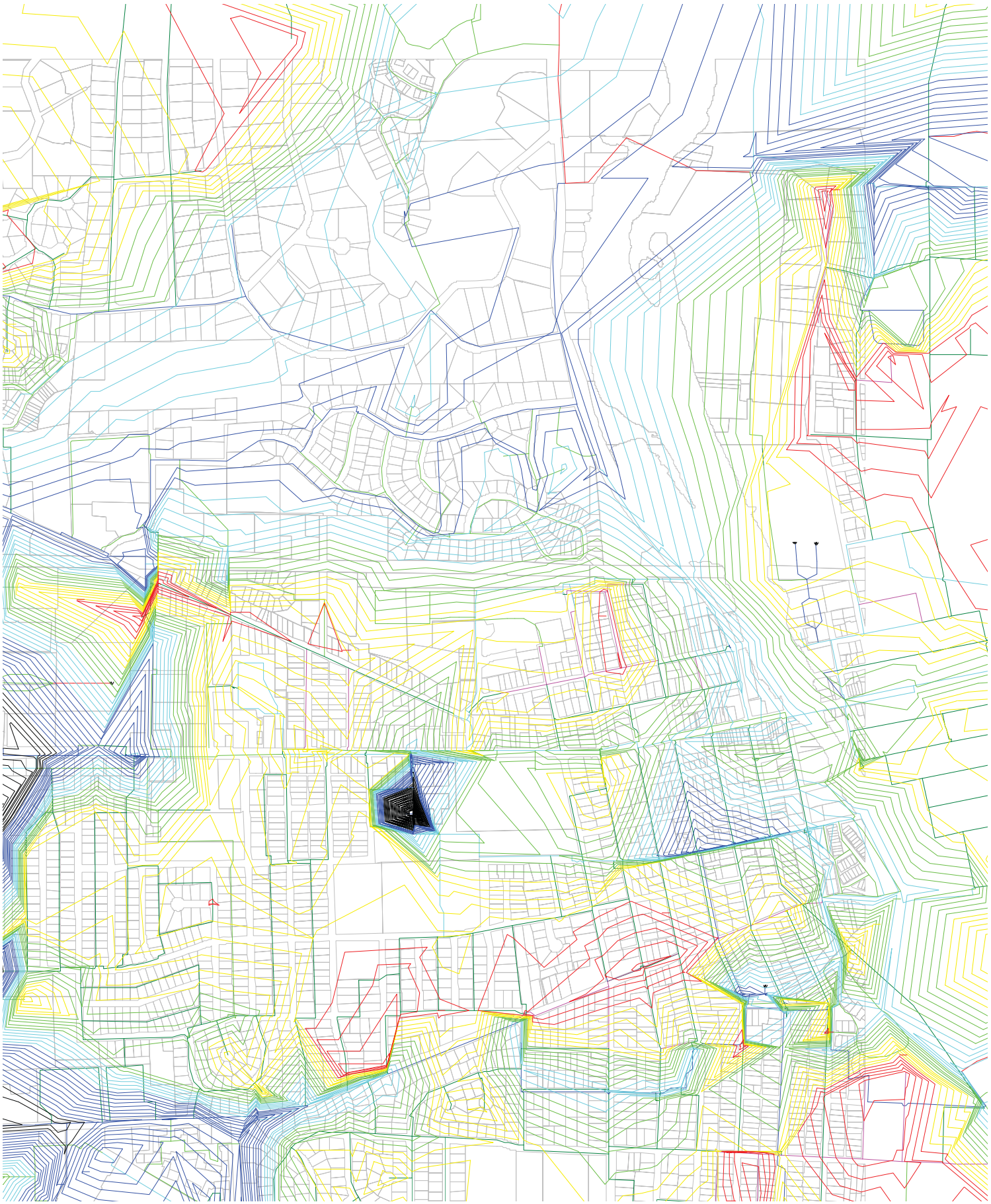
Contour Plot - Available Fire Flow
Scenario: 2006 Max Day Fire Flow Analysis



Contour Plot - Available Fire Flow
Scenario: Lexington Max Day Fire Flow



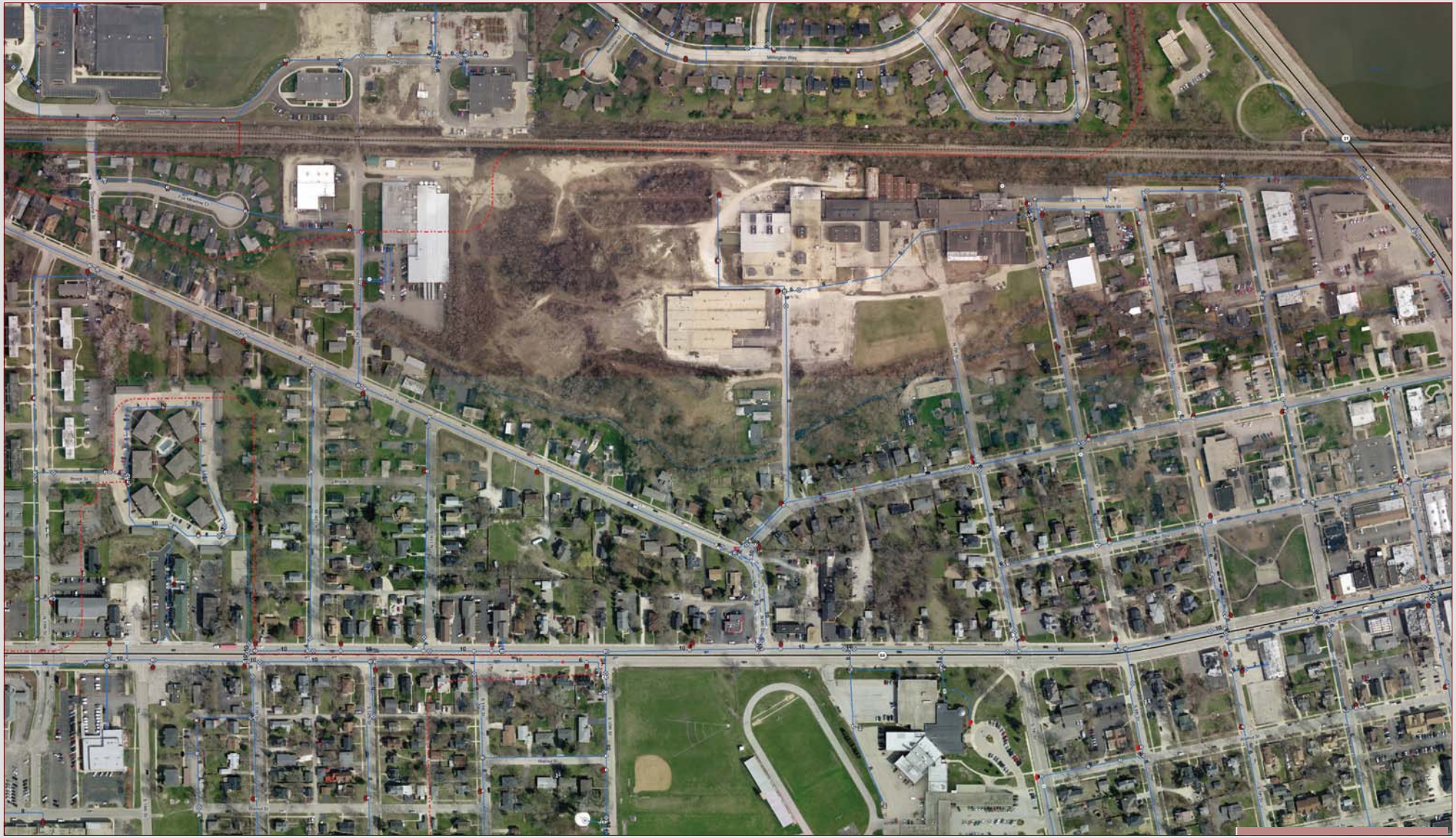
Contour Plot - Available Fire Flow
Scenario: Lexington 10" Max Day Fire Flow



City of St. Charles, Illinois

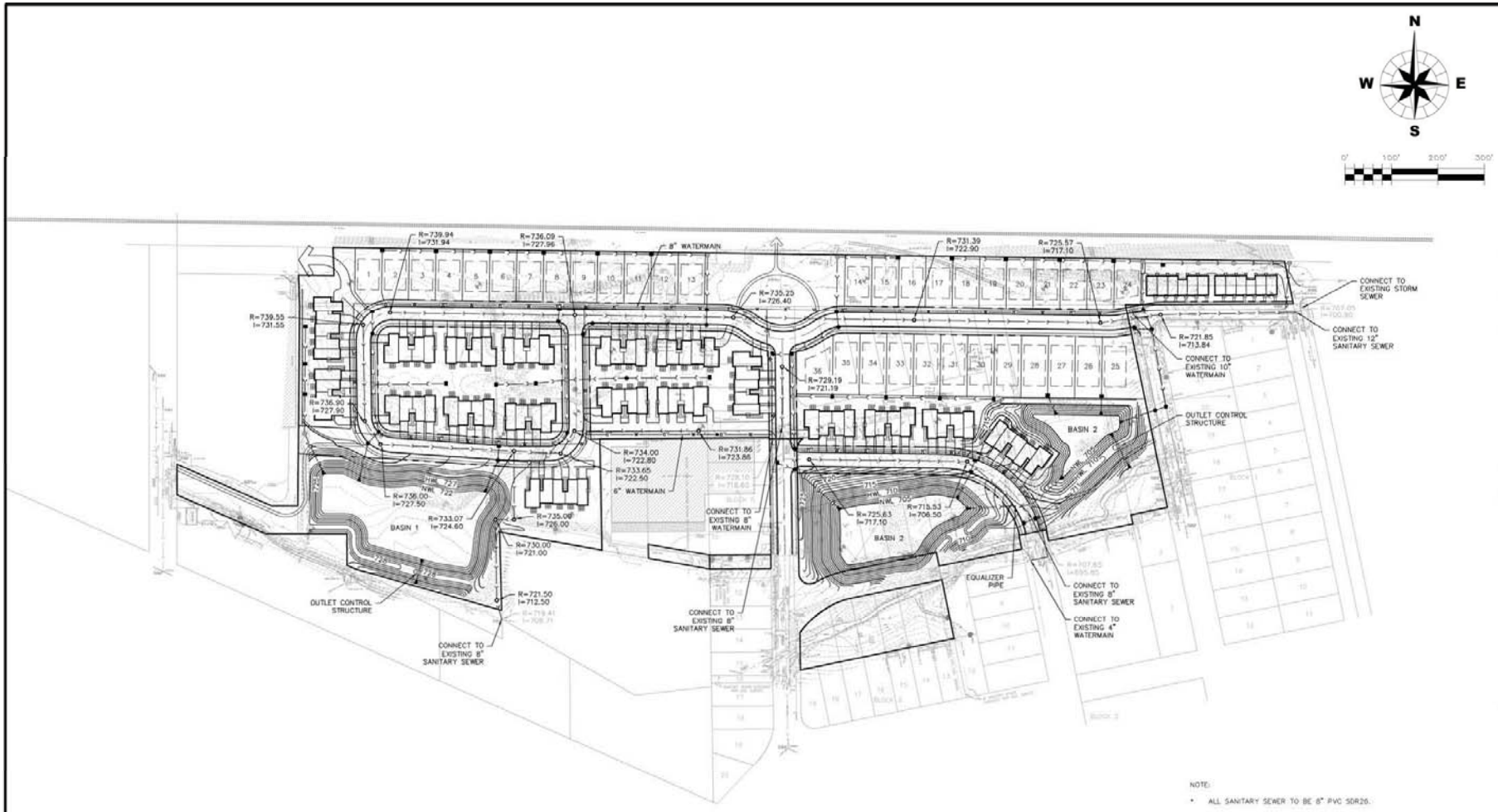
Precision GIS

DONALD P. DEWITTE *Mayor*
BRIAN TOWNSEND *City Administrator*



This map was created using Precision GIS.
Print Date: December 8, 2016 4:29:56 PM CST
By: CSchell

0 130 260 ft.



NOTE:

- ALL SANITARY SEWER TO BE 8" PVC SDR26.

LEXINGTON CLUB

UTILITY PLAN

DESIGN	JWK
DWN	ELH/EAM
CHKD	JCL
SCALE	1" = 100'
06-941C-UT.DWG	

NO.	DATE	NATURE OF REVISION

CLIENT:
LEXINGTON HOMES
1731 N. MARCEY ST., SUITE 200
CHICAGO, IL 60614
(773) 360-0300

WILLS BURKE KELSEY ASSOCIATES LTD.
116 West Main Street, Suite 201
St. Charles, Illinois 60174
(630) 443-7755

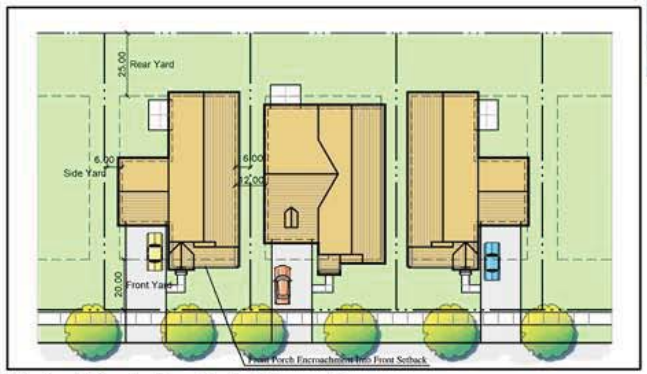
PROJECT NO. 06-941C
DATE: 11/17/2009
SHEET 4 OF 5
DRAWING NO.
UT1

102 2-STORY TOWNHOUSES

12 2-STORY ROWHOUSES

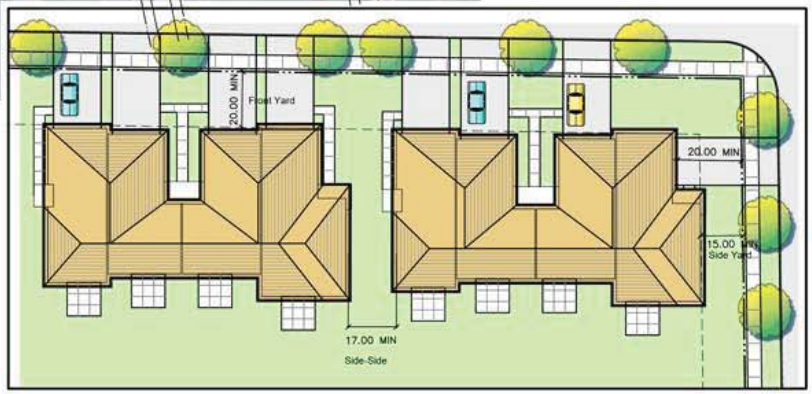
28 SINGLE FAMILY LOTS

142 TOTAL UNITS



Typical Single Family Lot Layout

Scale: 1"=20'



Typical Townhome Layout

Scale: 1"=20'

North

Scale: 1" = 80'

0 40 80 160 320

CONCEPT ONE

April 29, 2010

Lexington Homes
1731 North Marcey Suite 200
Chicago, IL 60614
312-280-0980

The Lexington Club

St. Charles, Illinois

April 29, 2010

BSB DESIGN

Lexington Club Base Demands

Single Family #1 - #3 (SF 1-3)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
3	3.5	10.5	1050	0.73

Single Family #4 - #9 (SF 4-9)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
6	3.5	21.0	2100	1.46

Single Family #10 (SF 10)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
1	3.5	3.5	350	0.24

Single Family #11 - #16 (SF 11-16)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
6	3.5	21.0	2100	1.46

Single Family #17 - #22 (SF 17-22)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
6	3.5	21.0	2100	1.46

Single Family #23 - #28 (SF 23-28)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
6	3.5	21.0	2100	1.46

Townhouse #1 (TH 1)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #2 (TH 2)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #3 (TH 3)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #4 (TH 4)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #5 (TH 5)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #6 (TH 6)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #7 (TH 7)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #8 (TH 8)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #9 (TH 9)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #10 (TH 10)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #11 (TH 11)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #12 (TH 12)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #13 (TH 13)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #14 (TH 14)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #15 (TH 15)				
No. Units	PE/Unit	Total PE	Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #16 (TH 16)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #17 (TH 17)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #18 (TH 18)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #19 (TH 19)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #20 (TH 20)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #21 (TH 21)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Townhouse #22 (TH 22)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
4	3.0	12.0	1200	0.83

Townhouse #23 (TH 23)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
5	3.0	15.0	1500	1.04

Rowhouse #1 (RH 1)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
6	3.0	18.0	1800	1.25

Rowhouse #2 (RH 2)				
No. Units	PE/Unit		Demand (gpd)	Demand (gpm)
6	3.0	18.0	1800	1.25