Western States Fire Protection Co. | National Fire Suppression Division

501 SUNSHINE ROAD
KANSAS CITY, KANSAS 66115
(913) 321-9208 ● (913) 321-9031 FAX

February 18, 2019

Mr. Scott Auman
Stark Wilson Duncan Architects Inc.
315 Nichols Road, Suite 228
Kansas City, MO 64112

RE: WATER SUPPLY
LEE'S SUMMIT SENIOR COMMUNITY
LEE'S SUMMIT, MISSOURI

Dear Mr. Auman,

The proposed single feed water main extension from 1000 SE Princeton Drive to proposed SE Oldham Parkway main entrance will provide over 2600 GPM @ 20 PSI. This exceeds the fire-flow requirements listed in IFC Appendix B including the reduction for fire sprinklers. The proposed single feed water main extension is also sufficient to meet the anticipated 488 GPM attic fire sprinkler system hydraulic demand, including 100 GPM fire department hose allowance.

My attached water model/hydraulic calculations and sketch are based upon the following:

Assumed water supply at Ranson Road and 12th Street:
I used the available fire hydrant flow test information from flow testing at 2100 SE Blue Parkway, adjusted for elevation plus a 10% reduction to the residual pressure. With the Ranson Road/ 12th Street location being closer to the water tower, the actual pressures and flow should exceed what I have utilized.

Existing water mains in the residential neighborhood south of the proposed facility:
I have utilized interconnected 8" watermains.

New proposed water main extension:
A single feed 12" water main extension from the existing dead-end road at 1000 SE Princeton Drive to the proposed main entrance to the facility at SE Oldham. My calculations include a single-feed "dead-end" type arraignment with supply coming from Princeton Drive only. My calculations do not include a looped supply with the proposed main extension connection back to the existing main in SE Ranson Road.

Contact me with any questions at craig.barulich@wsfp.us or 193-321-9208.

Sincerely,

Craig Barulich, CET
Contract Sales Representative

WESTERN STATES FIRE PROTECTION CO.
NATIONAL FIRE SUPPRESSION DIVISION

Job Name	:	LEE'S SUMMIT SENIOR - WATER MODEL
Drawing	:	
Location	:	
Remote Area	:	
Contract	:	
Data File	:	LEES SUMMIT SENIOR WATER MODEL.WXF

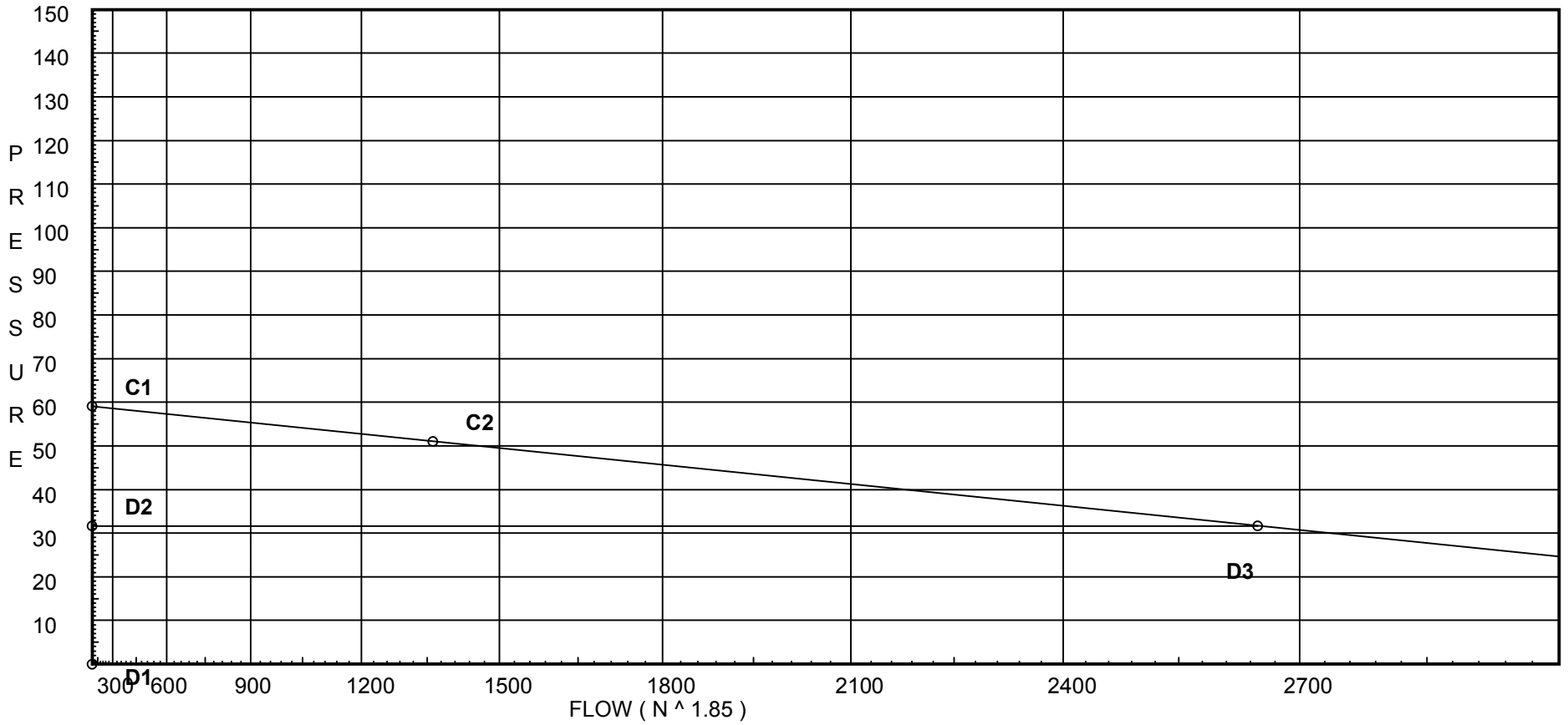
Water Supply Curve C

Your Company Name
LEE'S SUMMIT SENIOR - WATER MODEL

Date

City Water Supply:
- C1 - Static Pressure : 59
- C2 - Residual Pressure: 51
- C2 - Residual Flow : 1363

Demand:
- D1 - Elevation : -11.694
- D2 - System Flow : _____
- D2 - System Pressure : 31.618
- Hose (Demand) : 2649
- D3 - System Demand : 2649
- Safety Margin : 0.031



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	59.0	51	1363.0	31.649	2649.0	31.618

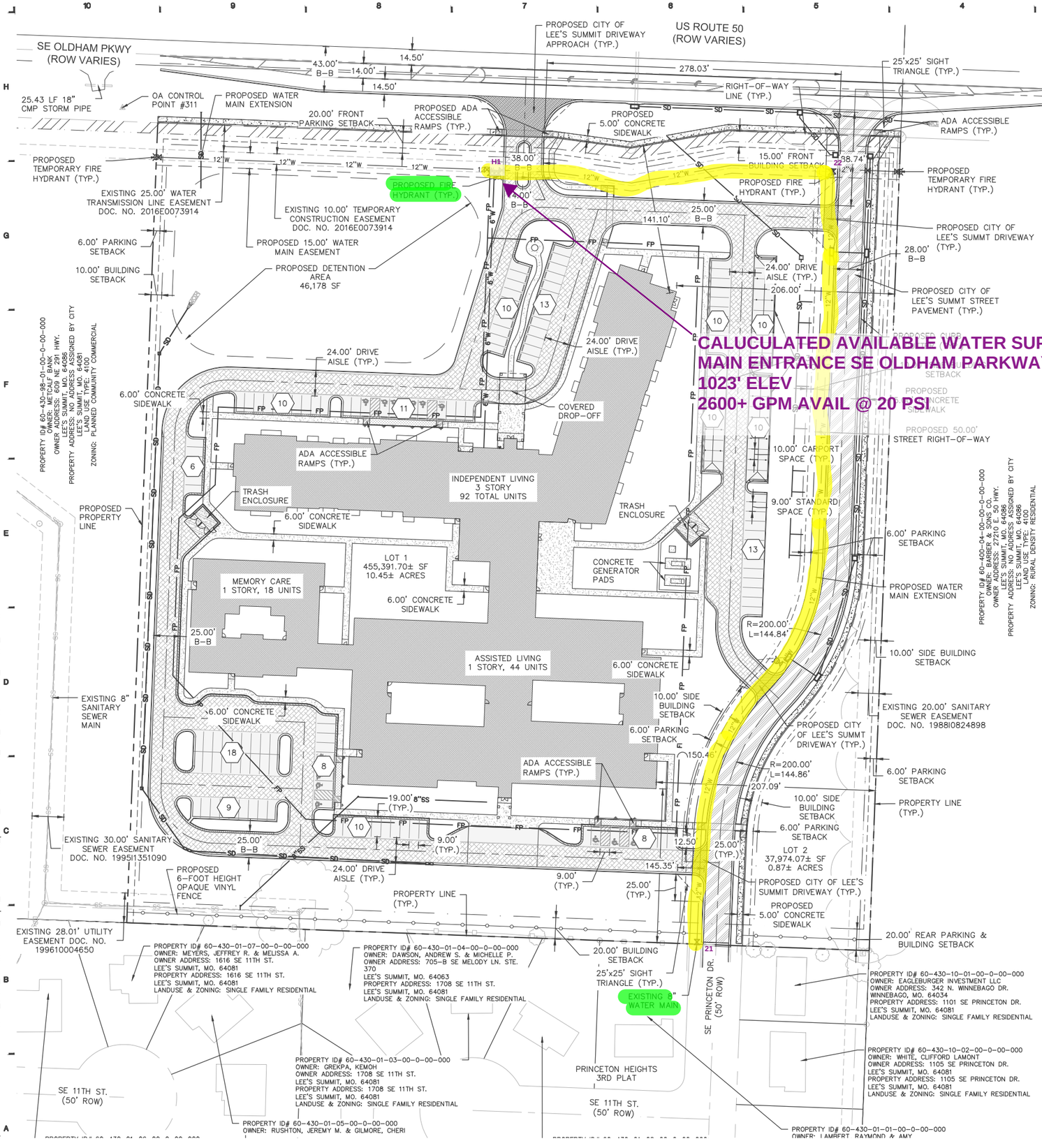
NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
H1	1023.0		0.0	2649.0	
22	1050.0		-9.56		
21	1050.0		-4.87		
A	1050.0		31.57		
1	1050.0		30.77		
2	1050.0		28.96		
3	1050.0		23.12		
4	1050.0		21.55		
5	1050.0		20.86		
6	1050.0		17.89		
7	1050.0		11.12		
8	1050.0		14.48		
9	1050.0		17.21		
10	1050.0		18.06		
11	1050.0		23.78		
12	1050.0		28.95		
3A	1050.0		22.58		
3B	1050.0		22.59		
3C	1050.0		21.66		
6A	1050.0		18.78		
TEST	1050.0		31.62		

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact / Pf/Ft	Pt / Pe / Pf	******* Notes ******
H1	1023	H2649	2649.00	12	T	93.767	320.000	140	0.0	
to					G	9.377	103.144		-11.694	
22	1050		2649.0	12.34		0.0	423.144	0.0050	2.135	Vel = 7.11
22	1050		0.0	12	T	93.767	770.000	140	-9.559	
to					G	9.377	159.404		0.0	
21	1050		2649.0	12.34	2L	56.26	929.404	0.0050	4.688	Vel = 7.11
21	1050		0.0	8	G	6.326	445.000	140	-4.871	
to						0.0	6.326		0.0	
7	1050		2649.0	8.27		0.0	451.326	0.0354	15.986	Vel = 15.82
			0.0							
7			2649.00						11.115	K Factor = 794.56
A	1050		-1187.43	12	T	93.767	590.000	140	31.567	
to					G	9.377	103.144		0.0	
1	1050		-1187.43	12.34		0.0	693.144	-0.0011	-0.792	Vel = 3.19
1	1050		0.0	8	T	55.354	165.000	140	30.775	
to					G	6.326	61.680		0.0	
2	1050		-1187.43	8.27		0.0	226.680	-0.0080	-1.820	Vel = 7.09
2	1050		13.09	8	T	55.354	680.000	140	28.955	
to					G	6.326	61.680		0.0	
3	1050		-1174.34	8.27		0.0	741.680	-0.0079	-5.833	Vel = 7.01
3	1050		601.16	8	T	55.354	690.000	140	23.122	
to					G	6.326	61.680		0.0	
4	1050		-573.18	8.27		0.0	751.680	-0.0021	-1.568	Vel = 3.42
4	1050		0.0	8	T	55.354	270.000	140	21.554	
to					G	6.326	61.680		0.0	
5	1050		-573.18	8.27		0.0	331.680	-0.0021	-0.692	Vel = 3.42
5	1050		-451.75	8	T	55.354	425.000	140	20.862	
to					G	6.326	61.680		0.0	
6	1050		-1024.93	8.27		0.0	486.680	-0.0061	-2.976	Vel = 6.12
6	1050		-375.46	8	T	55.354	560.000	140	17.886	
to					G	6.326	61.680		0.0	
7	1050		-1400.39	8.27		0.0	621.680	-0.0109	-6.771	Vel = 8.36
7	1050		2649.00	8	T	55.354	320.000	140	11.115	
to					G	6.326	61.680		0.0	
8	1050		1248.61	8.27		0.0	381.680	0.0088	3.362	Vel = 7.46
8	1050		-679.54	8	T	55.354	1225.000	140	14.477	
to					G	6.326	102.800		0.0	
9	1050		569.07	8.27	2L	41.12	1327.800	0.0021	2.734	Vel = 3.40
9	1050		0.0	8	T	55.354	350.000	140	17.211	
to					G	6.326	61.680		0.0	
10	1050		569.07	8.27		0.0	411.680	0.0021	0.847	Vel = 3.40
10	1050		231.58	8	T	55.354	1375.000	140	18.058	
to					G	6.326	102.800		0.0	
11	1050		800.65	8.27	2L	41.12	1477.800	0.0039	5.722	Vel = 4.78
11	1050		674.01	8	T	55.354	370.000	140	23.780	
to					G	6.326	61.680		0.0	
12	1050		1474.66	8.27		0.0	431.680	0.0120	5.174	Vel = 8.81

Node1 / to / Node2	Elev1 / Elev2	K Fact	Qa / Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt / Pe / Pf	******* Notes ******
12	1050		-13.09	8	T	55.354	160.000	140	28.954	
to					G	6.326	61.680		0.0	
A	1050		1461.57	8.27		0.0	221.680	0.0118	2.613	Vel = 8.73
			0.0							
A			1461.57						31.567	K Factor = 260.14
2	1050		-13.09	8	T	55.354	585.000	140	28.955	
to					G	6.326	61.680		0.0	
12	1050		-13.09	8.27		0.0	646.680	0	-0.001	Vel = 0.08
			0.0							
12			-13.09						28.954	K Factor = -2.43
3	1050		-601.16	8	T	55.354	175.000	140	23.122	
to					G	6.326	61.680		0.0	
3A	1050		-601.16	8.27		0.0	236.680	-0.0023	-0.539	Vel = 3.59
3A	1050		649.83	8	T	55.354	400.000	140	22.583	
to					G	6.326	61.680		0.0	
3B	1050		48.67	8.27		0.0	461.680	0	0.010	Vel = 0.29
3B	1050		625.34	8	T	55.354	360.000	140	22.593	
to					G	6.326	61.680		0.0	
11	1050		674.01	8.27		0.0	421.680	0.0028	1.187	Vel = 4.03
			0.0							
11			674.01						23.780	K Factor = 138.22
3A	1050		-649.83	8	T	55.354	290.000	140	22.583	
to					G	6.326	61.680		0.0	
3C	1050		-649.83	8.27		0.0	351.680	-0.0026	-0.926	Vel = 3.88
3C	1050		1275.17	8	T	55.354	320.000	140	21.657	
to					G	6.326	61.680		0.0	
3B	1050		625.34	8.27		0.0	381.680	0.0025	0.936	Vel = 3.74
			0.0							
3B			625.34						22.593	K Factor = 131.56
3C	1050		-823.42	8	T	55.354	645.000	140	21.657	
to					G	6.326	61.680		0.0	
6A	1050		-823.42	8.27		0.0	706.680	-0.0041	-2.881	Vel = 4.92
			0.0							
6A			-823.42						18.776	K Factor = -190.03
3C	1050		-451.75	8	T	55.354	510.000	140	21.657	
to					G	6.326	82.240		0.0	
5	1050		-451.75	8.27	L	20.56	592.240	-0.0013	-0.795	Vel = 2.70
			0.0							
5			-451.75						20.862	K Factor = -98.91
6	1050		375.46	8	T	55.354	850.000	140	17.886	
to					G	6.326	82.240		0.0	
6A	1050		375.46	8.27	L	20.56	932.240	0.0010	0.890	Vel = 2.24
6A	1050		-823.43	8	T	55.354	460.000	140	18.776	
to					G	6.326	82.240		0.0	
10	1050		-447.97	8.27	L	20.56	542.240	-0.0013	-0.718	Vel = 2.68
			0.0							

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
10			-447.97						18.058	K Factor = -105.42
8	1050		679.54	8	T	55.354	1150.000	140	14.477	
to					G	6.326	102.800		0.0	
10	1050		679.54	8.27	2L	41.12	1252.800	0.0029	3.581	Vel = 4.06
			0.0							
10			679.54						18.058	K Factor = 159.91
A	1050		2649.00	12		0.0	10.000	140	31.567	
to						0.0	0.0		0.0	
TEST	1050		2649.0	12.34		0.0	10.000	0.0051	0.051	Vel = 7.11
			0.0							
TEST			2649.00						31.618	K Factor = 471.10



BUILDING SETBACKS:

FRONT = 15' MINIMUM
REAR = 20' MINIMUM
SIDE = 10' MINIMUM

PARKING SETBACKS:

NORTH = 20' MIN. ALONG STREET FRONTAGE
EAST = 6' MIN. FROM SIDE PROPERTY LINE; ALONG STREET FRONTAGE
SOUTH = 20' MIN. FROM RESIDENTIAL DISTRICT (LANDSCAPE BUFFER
WEST = 6' MIN. FROM SIDE PROPERTY LINE

GREEN SPACE:

PERIMETER GREEN = 20' MINIMUM LANDSCAPE STRIP ALONG STREET FRONTAGE

INTERIOR GREEN REQUIRED = 5% OF VEHICULAR USE AREA (REFER TO PLANTING PLAN FOR ADDITIONAL INFORMATION)

ZONING:

ZONING EXISTING: CP-2 PLANNED COMMUNITY COMMERCIAL
EAST: AG - AGRICULTURE
SOUTH: R-1 SINGLE FAMILY RESIDENTIAL
WEST: CP-2 PLANNED COMMUNITY COMMERCIAL
NORTH: HIGHWAY 50 AND CP-2 PLANNED COMMUNITY COMMERCIAL

SITE AREA:

TOTAL SITE = 533,061.97 SQUARE FEET OR 12.24 ACRES±
STREET R/W TO BE DEDICATED: 0.91 ACRES
NET LAND AREA REMAINING: 11.33 ACRES
LOT 1 = 10.45 ACRES
LOT 2 = 0.87 ACRES

PRESENT USE:

UNDEVELOPED

PROPOSED USE:

SENIOR LIVING COMMUNITY

BUILDING HEIGHT:

HEIGHT ABOVE GRADE:
MEMORY CARE = 21'-0"±
ASSISTED LIVING = 26'-10"±
INDEPENDENT LIVING = 50'-3"±
NUMBER OF FLOORS:
MEMORY CARE = 1 FLOOR (18 UNITS)
ASSISTED LIVING = 1 FLOOR (44 UNITS)
INDEPENDENT LIVING = 3 FLOORS (92 TOTAL UNITS)
MAX. BUILDING HEIGHT = 50'-3"± (3 STORIES)

BUILDING AREA:

GROSS FLOOR AREA RATIO (F.A.R.):
ASSISTED LIVING = 39,875 SF
INDEPENDENT LIVING FLOOR 1 = 38,915 SF
FLOOR 2 = 32,925 SF
FLOOR 3 = 33,585 SF
MEMORY CARE = 12,215 SF
TOTAL BUILDING SF = 157,515 SF
MAX. FLOOR AREA RATIO (F.A.R.):
MAX. F.A.R. ALLOWED = 0.55 F.A.R. = 250,465 SF MAX.
ACTUAL F.A.R. = 0.35 F.A.R.
DWELLING UNITS PER ACRE = 14.74 DU/AC

PARKING:

REQUIRED:
MEMORY CARE: NURSING HOME/ELDERLY CARE
1 FOR EACH 2 BEDS: 18 BEDS = 9 PARKING SPACES
PLUS 1 FOR EACH EMPLOYEE ON MAXIMUM SHIFT: 8
EMPLOYEES = 8 PARKING SPACES

ASSISTED LIVING: NURSING HOME/ELDERLY CARE
1 FOR EACH 2 BEDS: 44 BEDS = 22 PARKING SPACES
PLUS 1 FOR EACH EMPLOYEE ON MAXIMUM SHIFT: 8
EMPLOYEES = 8 PARKING SPACES

INDEPENDENT LIVING: RETIREMENT COMMUNTY
1 FOR EACH DWELLING UNIT: 91 UNITS = 91 PARKING SPACES
PLUS 1 FOR EACH EMPLOYEE ON MAXIMUM SHIFT: 16
EMPLOYEES = 16 PARKING SPACES

TOTAL PARKING SPACES REQUIRED = 153
TOTAL PARKING SPACES PROVIDED = 156

IMPERVIOUS COVERAGE:

VEHICULAR USE AREA = 101,631.70 SF
BUILDING & SIDEWALK = 114,928.29 SF
TOTAL IMPERVIOUS = 216,559.99 SF
TOTAL SITE AREA = 455,391.70 SF (LOT 1)
% IMPERVIOUS = 47.56%

UTILITY COMPANIES:

WATER & SANITARY SEWER:
CITY OF LEE'S SUMMIT CITY UTILITIES
1200 SE HAMBLEN ROAD
LEE'S SUMMIT, MISSOURI 64081
(816) 969-1900

ELECTRIC SERVICE:
KANSAS CITY POWER & LIGHT
TELE: (816) 471-5275

GAS SERVICE:
SPIRE
(800) 582-1234

FIRE DEPARTMENT:
LEE'S SUMMIT FIRE DEPARTMENT
207 SE DOUGLAS STREET
LEE'S SUMMIT, MO. 64063
(816) 969.1300

AMBULANCE SERVICE:
TELE: 911

SCHOOL DISTRICT:
LEE'S SUMMIT OFFICE OF SUPERINTENDENT
(816) 986-1000

COMMUNICATION:
AT&T 1-800-246-8464
CENTURYLINK 1-800-246-4237

LEGEND

PROPERTY LINES
RIGHT-OF-WAY
ROAD CENTERLIN
EASEMENT LINES
PARKING SETBAC
BUILDING SETBA
FOUND MONUMEI
TEMPORARY BEN
EXIST. POWER P
EXIST. ELECTRIC
EXIST. ELECTRIC
EXIST. ELECTRIC
EXIST. GUY WIRE
EXIST. TELEPHON
EXIST. FIRE HYD
EXIST. WATER M
EXIST. WATER V
GAS MARKER
EXIST. GAS MAR
EXIST. CABLE V
EXIST. SANITARY
EXIST. FLARED E
EXIST. DECIDIOUS
EXIST. SIGN
PROP. SANITARY
PROP. FIRE HYD
PROP. GATE VAL
PROP. SIGN
PROP. FIRE DEP
EXIST. OVERHEAI
EXIST. UNDERGR
EXIST. GAS LINE
EXIST. STORM SI
EX. WOOD FENCE
PROP. PUBLIC S
PROP. SANITARY
PROP. STORM SI
PROP. UNDERGR
PROP. PUBLIC W
PROP. IRRIGATIO
PROP. WATER SI
PROP. FIRE PRO
PROP. FENCE
EXISTING CONTO
PROPOSED CONT
SPILL CURB (TYI
STANDARD CURE
BACK OF CURB

BENCHMARKS:

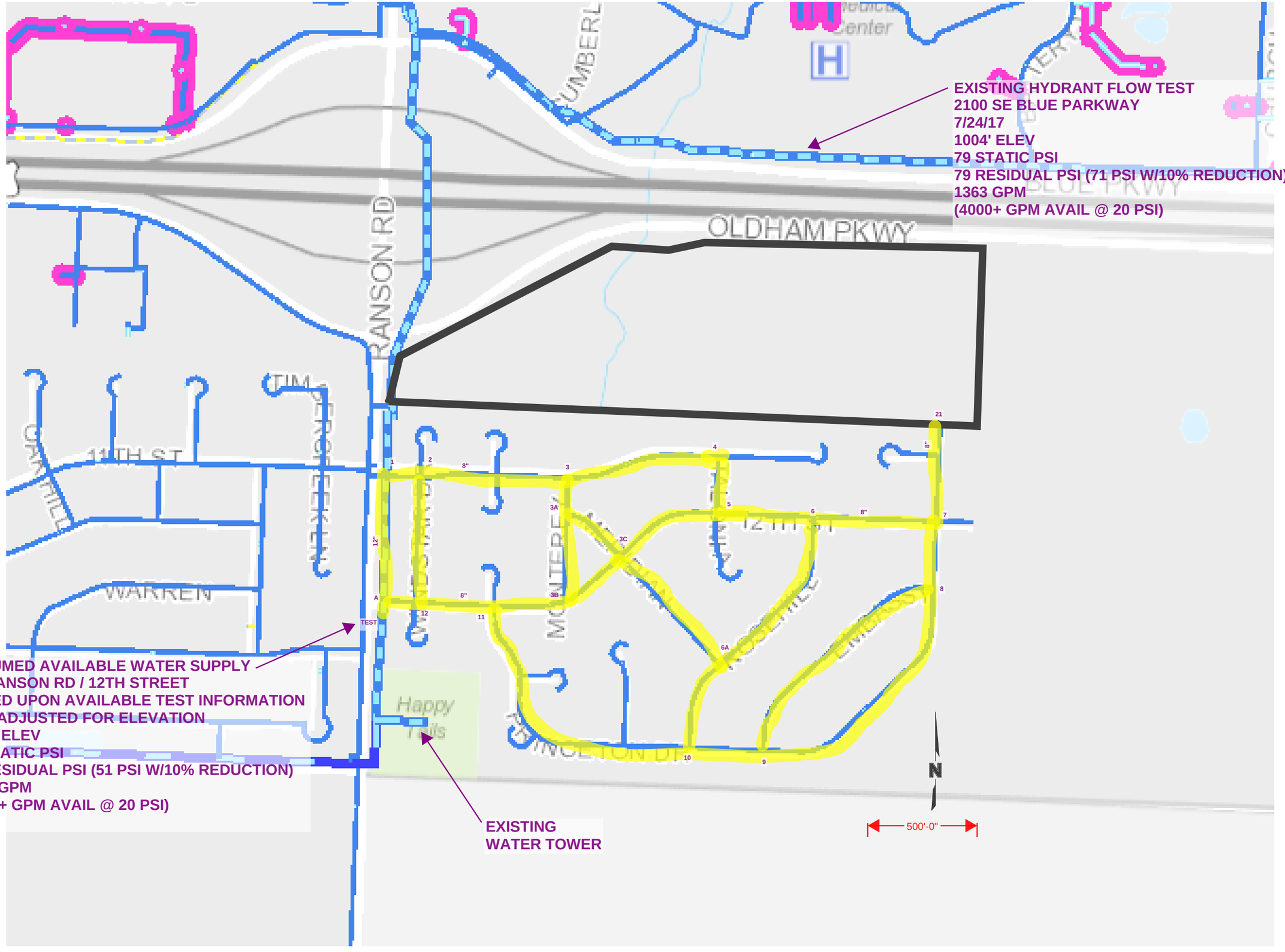
MO DNR JA-45: KC METRO ALUMINUM
CONCRETE 3"± BELOW PAVEMENT ON T
SE RANSON ROAD STAMPED "JA-45"
ELEV.=1046.26'
PUBLISHED COORDINATES (1988 ADJUST
N: 303273.664M
E: 863885.886M
GRID=GROUND
N: 994990.3460
E: 2834265.6110
CAF: 0.99989860A

BENCHMARK #41314:
NORTHING: 995857.9570
EASTING: 2835453.8010
SET SQUARE CUT IN CENTER OF CONCR
FOR REINFORCED CONCRETE BOX
ELEVATION=1007.13' (NAVD 88)

OA CONTROL POINT #310
NORTHING: 995873.4445
EASTING: 2835537.7320
FOUND 1/2" REBAR W/CAP 8' SOUTH C
EAST OF REINFORCED CONCRETE BOX
ELEVATION=1008.08' (NAVD 88

N

0' 25' 50' 100'
SCALE IN FEET


EXISTING HYDRANT FLOW TEST
2100 SE BLUE PARKWAY
7/24/17
1004' ELEV
79 STATIC PSI
79 RESIDUAL PSI (71 PSI W/10% REDUCTION)
1363 GPM
(4000+ GPM AVAIL @ 20 PSI)
OLDHAM PKWY
RANSON RD
11TH ST
WARREN
12TH ST
TEST
ASSUMED AVAILABLE WATER SUPPLY
SE RANSON RD / 12TH STREET
BASED UPON AVAILABLE TEST INFORMATION
AND ADJUSTED FOR ELEVATION
1050' ELEV
59 STATIC PSI
59 RESIDUAL PSI (51 PSI W/10% REDUCTION)
1363 GPM
(3200+ GPM AVAIL @ 20 PSI)
EXISTING
WATER TOWER
Happy Trails
N
500'-0"