



**December 4, 2018**

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

**Re: City of Lee's Summit, MO  
Senior Living Community**

Dear Mr. Auman:

An analysis was completed to determine the effect of proposed growth on the South Prairie Lee Interceptor. The proposed growth consists of the development of approximately 10.9 acres located south of Highway 50 and east of Ranson Road.

A proposed development map was submitted for the property at Highway 50 and Ranson Road. The proposed development consists of Memory Care facility, Independent Living facility, and Assisted Living units.

Flows were projected for the existing condition using the City of Lee's Summit Design Criteria with the revised k factors for the South Prairie Lee Watershed established in the 2012 Wastewater Master Plan Update. For the proposed development, flow projections were made utilizing the City of Lee's Summit design criteria. The projected flow for the development is 0.155 MGD, as indicated on the attached worksheet.

It was assumed that the flow would enter the collection system at Manhole 68-164. The South Prairie Lee Interceptor was evaluated from the point of entry to MH 26-298, just prior to its discharge at the Scruggs Road Lift Station. The extents of the analysis are indicated on the attached Figure 1.

The Scruggs Road Pump Station pumps to the Tudor Road Pump Station. The 2007 Wastewater Master Plan recommended upgrades to the Scruggs Road Pump Station to increase capacity to 16 MGD, as well as improvements to the force main, gravity interceptor, and excess flow holding basin. The Master Plan also recommended improvements to the Tudor Road Pump Station to expand the capacity to 24 MGD. The Master Plan should be referenced for future planning of these facilities.

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In the 2007 Wastewater Master Plan, a significant portion of the South Prairie Lee Interceptor was indicated as necessitating improvements to accommodate additional flow from future growth. In this analysis, the focus was on identifying improvement alternatives that would offset the projected flow from the future development. The intent of this exercise was to find a solution that would allow the development to move forward but would not cause conditions to worsen in the South Prairie Lee Interceptor. By upsizing/paralleling segments in the South Prairie Lee Interceptor, the hydraulic grade line at the approximate point in the sewer system where the future development would tie-in is reduced to the same elevation as it was prior to its development.

The attached Table 1 compares the hydraulic grade line under existing conditions, which is the baseline, to the hydraulic grade line of existing conditions plus the proposed development. A positive surcharge depth versus the manhole top indicates the hydraulic grade line is above the manhole rim elevation. A number of segments indicate an increase greater than one foot from the hydraulic grade line for existing conditions: MH 164 through MH 33-193 and MH 33-28 through MH 33-230.

Table 1 also compares the hydraulic grade line assuming the upsizing of segments to increase capacity. Three segments were identified, as indicated on Figure 1: MH 68-010 to MH 68-009, MH 33-192 to MH 33-193, and MH 33-230 to MH 33-370. It is recommended that these segments be upsized to offset the projected flow from the proposed development. A cost estimate is attached. It is our recommendation that the developer be responsible for the construction costs associated with the upsizing these segments, completed under a future CIP project by the City.

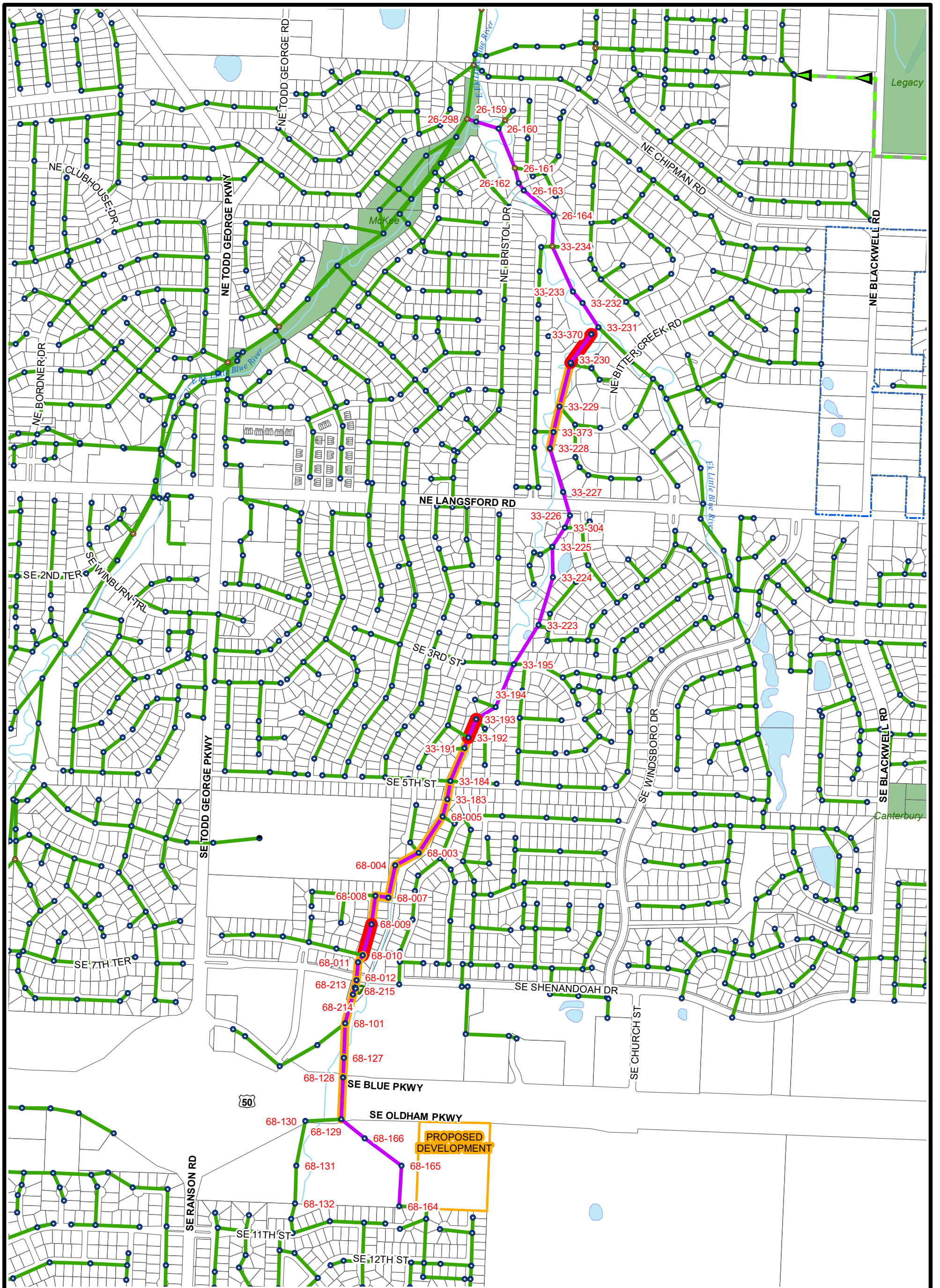
If you have any questions, please feel free to contact me at 816-347-1164.

Sincerely,



Amanda Bagwell, P.E.  
Project Manager

CC: Pat Young, HDR



**Legend**

	Project_Location		Forced Mains
	Access Tee	<b>Gravity Mains</b>	
	Drop		Segments Identified for Capacity Increase
	Standard		Capacity Impacted Segments
	Manholes Buried		Analyzed Sections
	Pump Stations		Unanalyzed Sections



**City of Lee's Summit, Missouri  
South Prairie Lee Watershed**

**Figure 1  
Senior Living Community  
Analysis**

**Table 1**  
**City of Lee's Summit, Missouri**  
**South Prairie Lee Interceptor Improvements**

		Ex Condition		Existing Condition with Senior Living Community (SLC)		Existing Condition Plus SLC with Proposed Upsized Segments	
Upstream ID	Downstream ID	Existing Diameter	Surcharge Depth vs Manhole Top (ft)	Existing Diameter	Surcharge Depth vs Manhole Top (ft)	Revised Diameter	Surcharge Depth vs Manhole Top (ft)
26-159*	26-298*	24	-10.35	24	-10.34	24	-10.34
26-160*	26-159*	24	-12.85	24	-12.82	24	-12.82
26-161*	26-160*	24	-11.58	24	-11.51	24	-11.51
26-162*	26-161*	24	-17.33	24	-17.33	24	-17.33
26-163*	26-162*	24	-17.35	24	-17.35	24	-17.35
26-164*	26-163*	24	-16.54	24	-16.54	24	-16.54
33-234	26-164*	24	-14.50	24	-14.50	24	-14.50
33-233	33-234	24	-12.53	24	-12.53	24	-12.53
33-232	33-233	15	-10.83	15	-10.59	15	-10.59
33-231	33-232	15	-9.05	15	-8.51	15	-8.51
33-370	33-231	15	-6.64	15	-6.02	15	-6.02
33-230	33-370	15	-4.82	15	-3.99	18	-5.47
33-229	33-230	15	-7.99	15	-6.90	15	-8.38
33-373	33-229	15	-7.25	15	-5.98	15	-7.25
33-228	33-373	15	-7.86	15	-6.50	15	-7.77
33-227	33-228	15	-7.56	15	-7.16	15	-7.56
33-226	33-227	15	-6.52	15	-6.52	15	-6.52
33-304	33-226	15	-7.90	15	-7.82	15	-7.82
33-225	33-304	15	-5.19	15	-5.19	15	-5.19
33-224	33-225	15	-9.15	15	-8.90	15	-8.90
33-223	33-224	15	-7.18	15	-6.69	15	-6.69
33-195	33-223	15	-5.29	15	-4.57	15	-4.57
33-194	33-195	21	-7.40	21	-6.77	21	-6.77
33-193	33-194	12	-6.44	12	-5.48	12	-5.48
33-192	33-193	12	-5.16	12	-3.94	15	-5.39
33-191	33-192	12	-4.92	12	-3.51	12	-4.97
33-184	33-191	12	-4.08	12	-2.18	12	-3.63
33-183	33-184	12	-3.31	12	-1.16	12	-2.62
68-005	33-183	10	-3.72	10	-0.96	12	-5.26
68-003	68-005	10	-7.22	10	-3.70	10	-8.00
68-004	68-003	8	-6.02	8	-1.00	10	-9.37
68-007	68-004	8	-4.52	8	2.29	8	-6.07
68-008	68-007	8	-5.00	8	2.46	8	-5.90
68-009	68-008	8	-6.77	8	2.07	8	-6.29
68-010	68-009	8	-5.86	8	4.43	12	-8.10
68-011	68-010	8	-6.85	8	3.79	8	-8.74
68-012	68-011	8	-5.38	8	6.06	8	-6.47
68-213	68-012	8	-5.37	8	6.40	8	-6.13
68-214	68-213	8	-6.12	8	5.96	8	-6.57
68-101	68-214	8	-6.61	8	6.73	8	-5.80
68-127	68-101	8	-7.54	8	7.05	8	-5.48
68-128	68-127	8	-9.68	8	5.64	8	-6.89
68-129	68-128	8	-18.30	8	-1.48	8	-14.01
68-166	68-129	8	-24.44	8	-7.21	8	-19.74
68-165	68-166	8	-28.63	8	-12.34	8	-24.87
68-164	68-165	8	-29.70	8	-14.45	8	-26.98

\*Manhole ID's were taken from GIS and vary from Manhole ID's from record drawings, which were, respectively, from downstream to upstream: 26-048, 26-298, 26-041, 26-044, 26-083, 26-084, and 26-085

 Segment Identified for Upsizing  
 Surcharge increase greater than 1 foot from existing condition



**ENGINEER'S PRELIMINARY COST ESTIMATE OF PROBABLE CONSTRUCTION COSTS**  
**SENIOR LIVING COMMUNITY**  
**LEE'S SUMMIT, MO**

December 4, 2018

Item No.	Description	Quantity	Unit	Unit Price \$	Price \$
1.	Mobilization (3% max of total bid)	1	LS	\$6,000.00	\$6,000.00
2.	Demolition, Clearing & Grubbing	1	LS	\$5,000.00	\$5,000.00
3.	18" Sanitary Sewer (PVC)	295	LF	\$178.00	\$52,510.00
4.	15" Sanitary Sewer (PVC)	165	LF	\$166.00	\$27,390.00
5.	12" Sanitary Sewer (PVC)	290	LF	\$153.00	\$44,370.00
6.	4' Dia. Manhole (8'-12' Depth)	6	EA	\$4,800.00	\$28,800.00
7.	Connection to Existing Sewer Lateral	10	EA	\$600.00	\$6,000.00
8.	Sod	100	SY	\$5.00	\$500.00
9.	Seed and Mulch	1	AC	\$2,000.00	\$2,000.00
10.	Bypass Pumping	1	LS	\$30,000.00	\$30,000.00
11.	Erosion Control	1	LS	\$5,000.00	\$5,000.00
				<b>SUBTOTAL:</b>	<b>\$207,570.00</b>
				CONTINGENCY (15%):	\$31,200.00
				<b>TOTAL CONSTRUCTION:</b>	<b>\$239,000.00</b>
				Legal, Easements, Engineering, Inspection (20%):	\$47,800.00
				<b>PROJECT TOTAL:</b>	<b>\$287,000.00</b>