Renaissance Group
architecture ▪ engineering ▪ planning ▪ interiors
9700 Village Circle, Suite 100, Lakeland, TN 38002 (p) 901.332.5533 www.rgroup.biz

LETTER OF TRANSMITTAL

TO : Tennessee Department of Environment and Conservation: Phillip Simmons

401 Church St., L&C Annex, 6th floor
Nashville, TN 37243

FROM : Wesley Wooldridge
DATE : 03/14/2019
SUBJECT : Arlington Trail Planned Development

Quantity	Date of	Sheet No.	Description
4	09-18-18		Sewer Plan
1	09-18-18		Sewer Fee Calculation Sheet
1	09-18-18		$650.00 Fee Check
1	09-18-18		Cover Letter
1	09-18-18		Hydraulic Calculation Sheet
1	09-18-18		Arlington Approval Letter

Notes :

TN Dept. of Env. & Conservation
MAR 15 2019
Division of Water Resources
WPN 19.0141

THESE ARE TRANSMITTED :

☒ FOR APPROVAL
☒ FOR YOUR USE
☒ AS REQUESTED
☒ FOR YOUR REVIEW AND COMMENT

BY WAY OF : FEDEX

NO. OF PAGES TRANSMITTED INCLUDING COVER SHEET: 53

THANKS

WPN19-0141
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Wesley Wooldridge

COPY TO :File,
:

Mr. Clint Baker
CBaker@Rgroup.biz

Business No. 901-332-5533 **Fax No. 901-332-5534**

March 13, 2019

Phillip Simmons
Tennessee Department of Environment & Conservation
L&C Annex, 6th Floor
401 Church St.
Nashville, TN 37243

Mr. Simmons,

Please find attached our hydraulic design calculations and drawings illustrating the sanitary sewer services planned for Arlington Trail Planned Development in Arlington, Shelby County.

Located on 7 lots encompassing 15.79 acres, the property is bound to the north by Interstate 40, on the east by Airline Rd, on the west by Brooks Branch Rd, and on the south by vacant, Winkler & Sidney Bond property. As planned, the development will include two hotels, a self-storage facility, and 4 outparcels for commercial services/offices. This will include constructing an extension of Arlington Trail; Fair Springs Cove; two, 4-story Hotels; a self-storage facility; storm drainage; private water connections; and public sanitary sewer service with force main.

The proposed, public sanitary sewer extension is designed to gravity flow to a new lift station and force main. The force main will service the whole planned development except for Lots 6 & 7. It will also serve future developments contained within its drainage basin. The force main will carry flow east across Airline Rd, along existing Arlington Trail, and to an existing manhole behind the ACS Administration Building. An additional gravity sewer service will be installed to service Lot 7 and a neighboring property to the south. This service will be connected to an existing manhole in Airline Rd. All gravity sewer service lines will be 8-inch, SDR 26 PVC totaling 1758 L.F. in length. All force main sewer service lines will be 4-inch, SDR 26 PVC totaling 3694 L.F. in length. Ten (10) man-holes will be constructed, 6 additional 6-inch stubs for service, and 6 additional 8" stubs for future extension. 1 lift station and 1 air release valve will be installed for the force main.

We believe the proposed gravity sewer and force main to be in direct compliance with your specifications and development regulations. If you should have any questions regarding the history of the project, included information and plans, please feel free to contact me at 901-332-5533. We look forward to discussing the project in further detail as the application progresses.

Respectfully,

Wesley Wooldridge, PE
Renaissance Group, Inc.

Renaissance Group Inc.
9700 Village Circle, Suite 100
Lakeland, TN 38002

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Phone: (901) 332-5533
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Town of Arlington

5854 Airline Road
PO Box 507
Arlington, TN 38002

P: 901.867.2620
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March 13, 2019

Mr. Wesley Wooldridge, P.E.
Renaissance Group
9700 Village Circle
Suite 100
Lakeland, TN 38002

RE: ARLINGTON TRAILS PD
ARLINGTON, TENNESSEE

Dear Mr. Wooldridge:

I have reviewed your sewer plans for the above referenced project, and they are acceptable to the Town of Arlington. You are hereby authorized to submit these plans to the State of Tennessee Department of Environment and Conservation for their review and approval.

If you have questions or need additional information, please give me a call.

Sincerely,

Steve Hill, P.E.
Town Engineer

SH/ms

cc: Ms. Cathy Durant
Ms. Angela Reeder
Mr. Terry Perkins

Wastewater System: Town of Arlington

Design Flow 16,363 GPD — County: Shelby

Peak Factor 2 — Wastewater Project Number:

n 0.013 n = Coefficient of Roughness — Project: Arlington Trail PD - Lots 1 thru 5 & Remainder of Basin

A D=8 inch, $A=(D/2)^2*PI=(8/2)^2*PI=50.26in^2=(50.26/144)ft^2=0.349028=0.35ft^2$

$Q_{full}=V_{full}*A$

0.002228009 ft^3/s = 1 GPM

1 ft^3/s = 646316.9 GPD

Line No.	From MH	To MH	Length Ft.	Lots Served	Total Lots Served	Average Sewage Flow (GPD)	Maximum Sewage Flow(GPD)	Average Sewage Flow (CFS)	Maximum Sewage Flow (CFS)	Pipe Diameter (in)	Pipe Area Ft^2	Upper MH Elev.	Lower MH Elev.	% Sewage Slope	Sewer Fall (Ft)	Velocity Flowing Full (FPS)	Capacity Flowing Full GPM	Capacity Flowing Full MGD	Capacity Flowing Full CFS
1	1	2	126	2	2	32,726	65,452	0.0506	0.1013	8	0.35	287.73	287.02	0.56%	0.71	2.606	409.327	0.589	0.912
2	2	3	96	1	3	49,089	98,178	0.0760	0.1519	8	0.35	286.92	286.44	0.50%	0.48	2.454	385.577	0.555	0.859
3	3	4	125	1	4	65,452	130,904	0.1013	0.2025	8	0.35	286.34	285.72	0.50%	0.62	2.445	384.032	0.553	0.856
4	5	6	221	2	2	32,726	65,452	0.0506	0.1013	8	0.35	298.27	294.18	1.85%	4.09	4.722	741.809	1.068	1.653
5	6	4	267	1	3	49,089	98,178	0.0760	0.1519	8	0.35	289.73	285.72	1.50%	4.01	4.254	668.256	0.962	1.489
6	4	7	258	1	8	130,904	261,808	0.2025	0.4051	8	0.35	285.62	283.65	0.76%	1.97	3.033	476.486	0.686	1.062
7	7	8	258	1	9	147,267	294,534	0.2279	0.4557	8	0.35	283.55	282.26	0.50%	1.29	2.454	385.577	0.555	0.859
8	8	Lift Sta.	41	1	10	163,630	327,260	0.2532	0.5063	8	0.35	282.16	281.96	0.49%	0.20	2.424	380.846	0.548	0.849
9	Lift Sta.	EX.	3694	1	11	179,993	359,986	0.2785	0.5570	4	0.09	NA*							

*Lift Station Pump designed for 250 GPM

R=The product A/P is also known as the hydraulic radius

$Q = A*1.49/n*R^{2/3}*S^{1/2}$

Q = Discharge (ft^3/Sec)

A = Cross-sectional Area of Flow (ft^2)

n = Coefficient of Roughness

R = Hydraulic Radius (ft) R=A/P R=D/4

S = Slope of Pipe (ft/ft)

P = Wetted perimeter (ft)

Pipe Size (in)	Area (in^2)	Area (ft^2)	Approx. Area (ft^2)
4	12.6	0.0873	0.09
6	28.3	0.1963	0.20
8	50.3	0.3491	0.35
10	78.5	0.5454	0.55
12	113.1	0.7854	0.79
16	201.1	1.3963	1.40
18	254.5	1.7671	1.77
24	452.4	3.1416	3.14
30	706.9	4.9087	4.91

Wastewater System: Town of Arlington

$Q_{full}=V_{full}*A$

Design Flow 16,363 GPD

County: Shelby

0.002228009 ft^3/s = 1 GPM

Peak Factor 2

Wastewater Project Number:

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n 0.013 n = Coefficient of Roughness

Project: Arlington Trail PD - Lot 7 & Neighboring Lot to South

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1	9	10	308	1	1	16,363	32,726	0.0253	0.0506	8	0.35	313.86	312.32	0.50%	1.54	2.454	385.577	0.555	0.859
2	10	EX	58	1	2	32,726	65,452	0.0506	0.1013	8	0.35	312.22	311.91	0.53%	0.31	2.538	398.651	0.574	0.888

*Lift Station Pump designed for 250 GPM

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