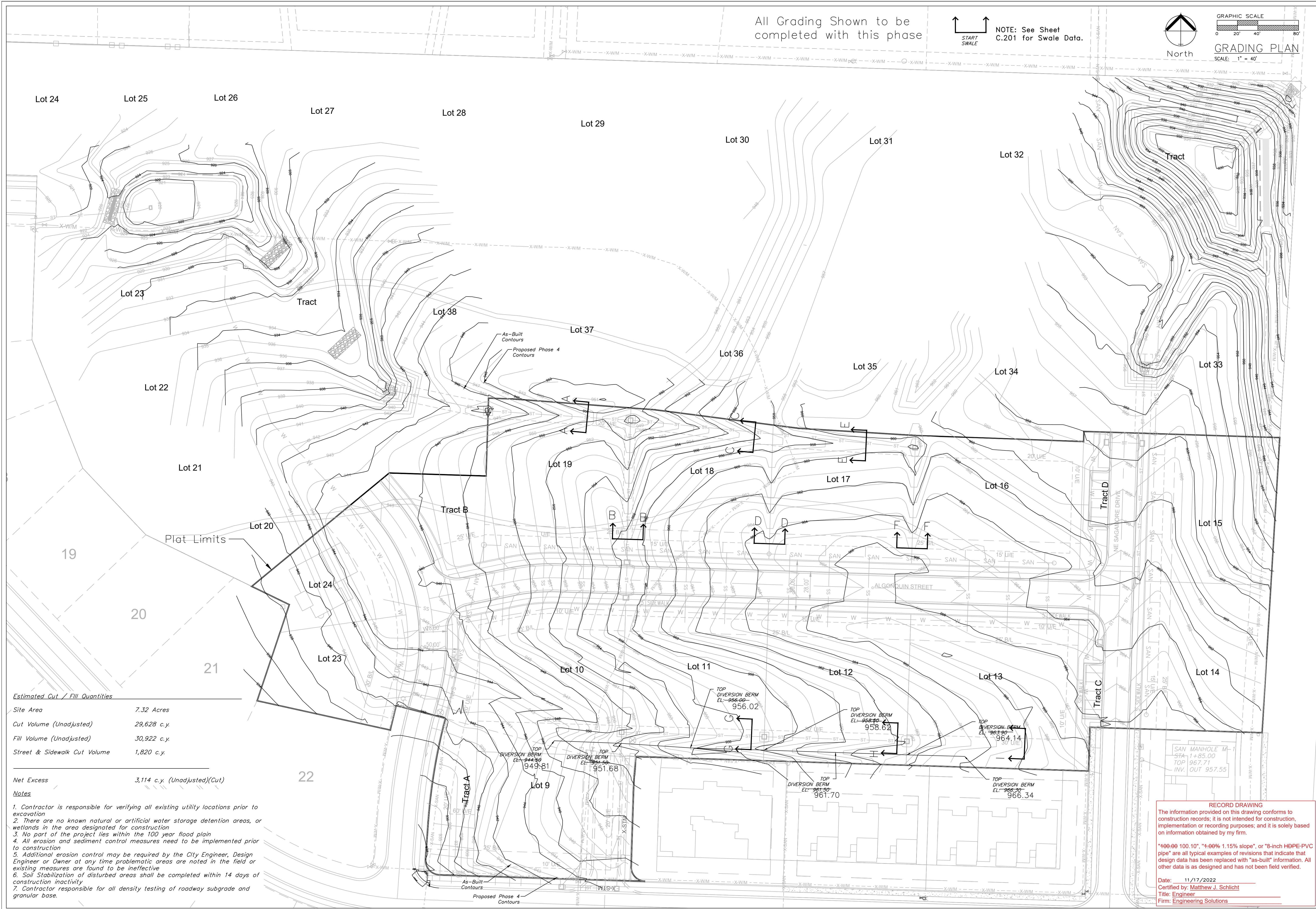




ENGINEERING SOLUTIONS
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50 SE 30TH STREET
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Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
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Engineering CA2821

THE TOWNHOMES OF CHAPEL RIDGE-2ND PLAT
LOTS 9-19 & TRACTS A-D
Lee's Summit, Jackson County, Missouri

Project: VILLAS OF CHAPEL RIDGE-LSMO
Issue Date: April 10, 2020

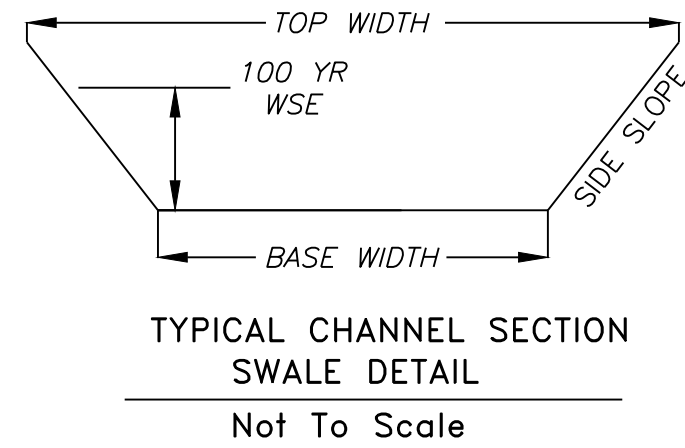
Master Drainage Plan 1 of 3:
Grading Plan
Construction Plans for:
THE TOWNHOMES OF CHAPEL RIDGE-2ND PLAT
LOTS 9-19 & TRACTS A-D
Lee's Summit, Jackson County, Missouri

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

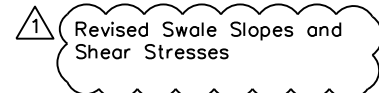
REVISIONS

6/25/2021	As-Built
8/18/2021	As-Built
8/31/2021	As-Built
9/9/2021	As-Built
11/17/2022	As-Built

C. 200



NOTE: Swale sections extend the entire length between upstream and downstream structures with the exception of a transition at each structure.



100 YEAR OVERFLOW SWALE SECTIONS

Section	100 Yr. Runoff (c.f.s.)	Bed Slope (%)	As-Built Slope	Base Width (ft)	Side Slope (1:V)	100 Yr WSE (ft)	Sectional Area	Velocity 100Yr. (f.p.s.)	Hydraulic Radius (ft)	Shear Stress (p.s.f.)	As-Built Shear Stress
A-A	1.35	6.67	6.67	4	5	0.11	0.50	2.70	0.10	0.42	0.42
B-B	2.37	6.67	6.77	6	5	0.13	0.86	2.74	0.12	0.49	0.50
C-C	3.60	6.67	6.70	4	5	0.20	1.00	3.60	0.17	0.69	0.69
D-D	2.50	6.67	7.07	6	5	0.13	0.86	2.89	0.12	0.49	0.52
E-E	3.60	2.72	2.79	6	5	0.21	1.48	2.43	0.18	0.34	0.32
F-F	1.03	6.67	7.56	6	5	0.08	0.51	2.01	0.08	0.34	0.35
G-G	3.00	6.00	5.56	5	3	0.18	1.00	3.01	0.16	0.51	0.56
H-H	3.73	4.16	3.57	5	3	0.21	1.27	2.94	0.18	0.46	0.41
I-I	3.37	4.00	4.69	5	3	0.20	1.12	3.01	0.18	0.45	0.52

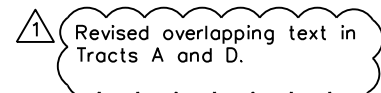
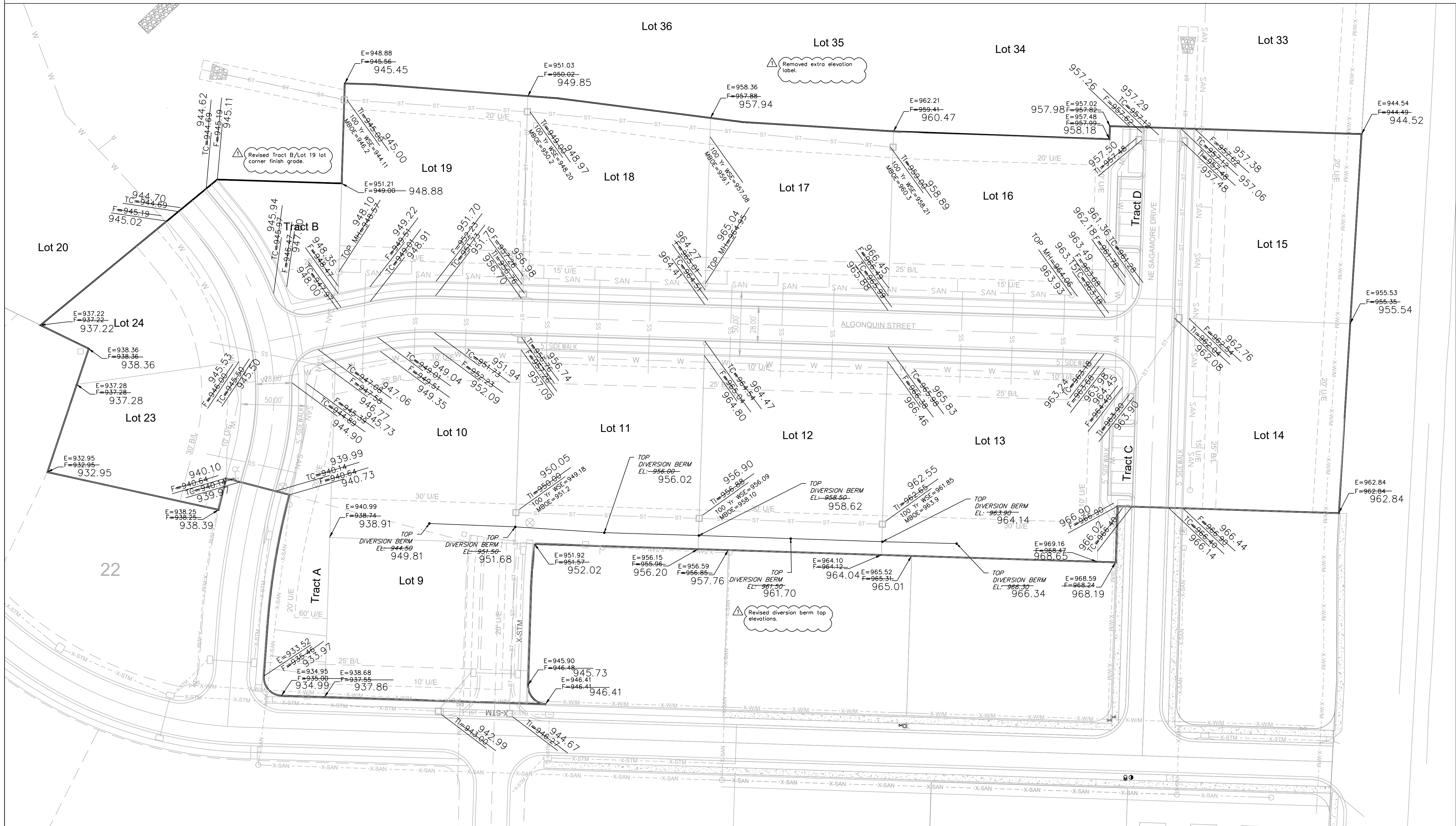
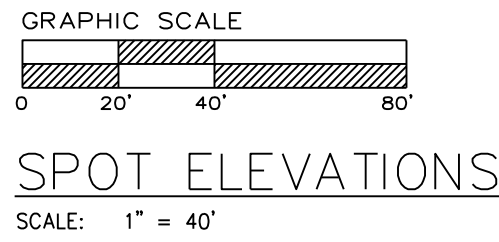
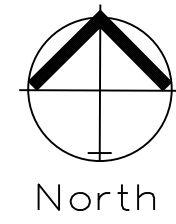
NOTE: Swale should be lined with "Straw with Net" turf reinforcement (Curlex Blanket or Eqv.) . Per Table 5607-1 in APWA Manual

Townhomes	Basement Type	MBOE Lt.	MBOE Rt.
9	Full	940.8	951.0
10	Daylight	951.2	940.8
11	Daylight	958.1	951.2
12	Daylight	963.9	958.1
13	Full	966.0	963.9
14	Daylight	957.4	964.9
15	Walkout	946.5	957.4
16	Walkout	960.3	960.0
17	Walkout	959.1	960.3
18	Walkout	950.2	959.1
19	Daylight	946.2	950.2

Estates	Basement Type	MBOE Lt.	MBOE Rt.
23	Walkout	935.0	939.3
24	Walkout	939.3	939.2

Note:

AS GRADED PLOT PLAN REQUIRED FOR EACH LOT.



RECORD DRAWING

The information provided on this drawing conforms to construction records; it is not intended for construction, implementation or recording purposes; and it is solely based on information obtained by my firm.

"100-00 100.10", "4-00% 1.15% slope", or "8-inch HDPE-PVC pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been field verified.

Date: 11/17/2022

Certified by: Matthew J. Schlicht

Title: Engineer

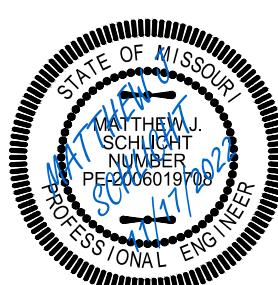
Firm: Engineering Solutions

Master Drainage Plan 2 of 3:

Spot Elevations
Construction Plans for:
THE TOWNHOMES OF CHAPEL RIDGE-2ND PLAT
LOTS 9-19 & TRACTS A-D
Lee's Summit, Jackson County, Missouri

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REVISIONS

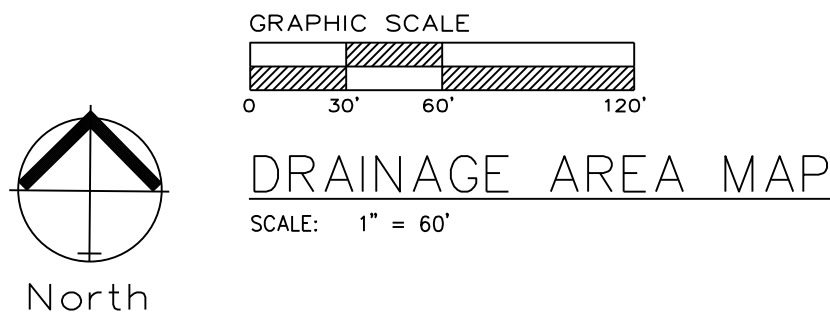
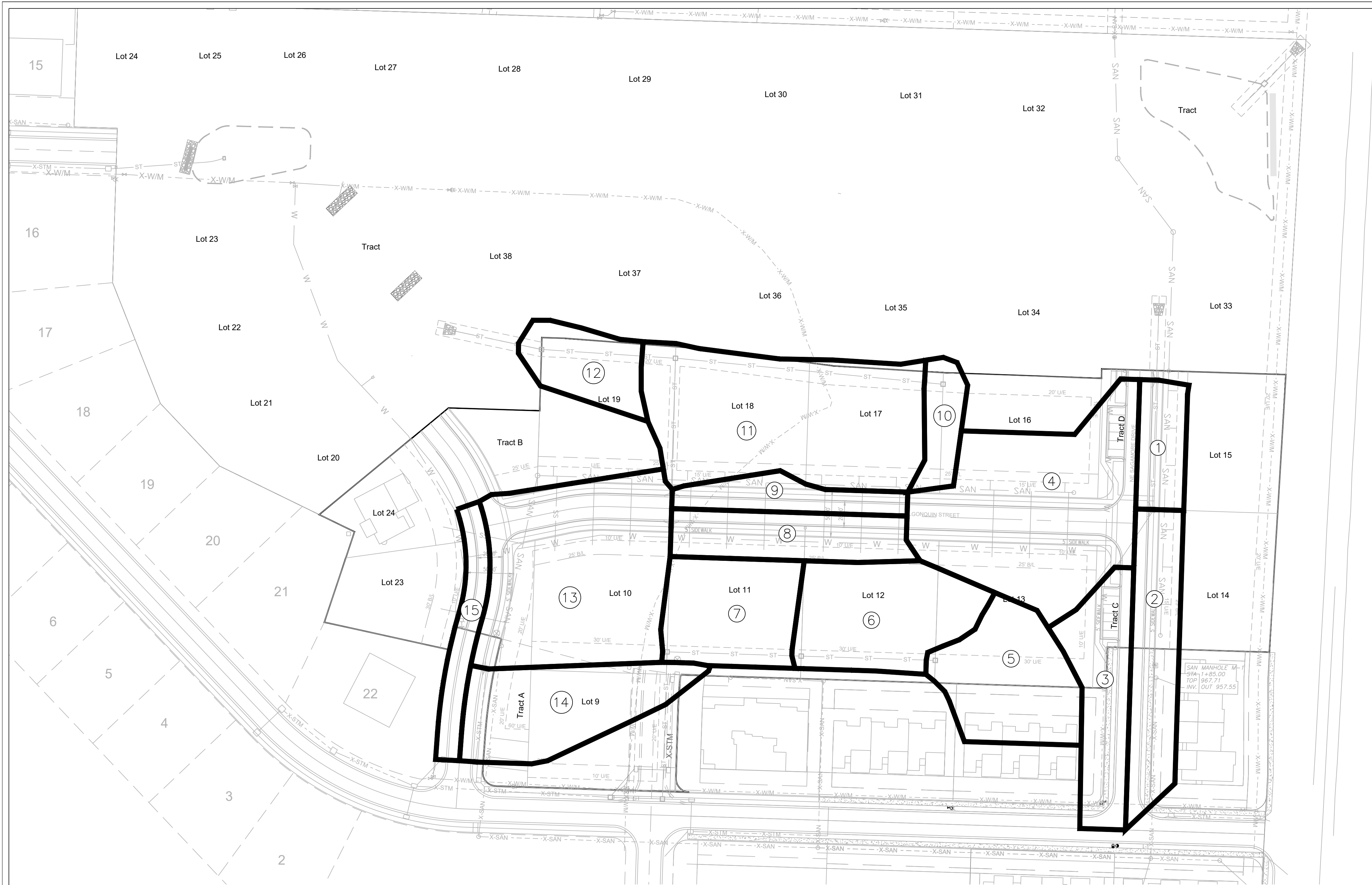
6/25/2021 As-Built

8/18/2021 As-Built

8/31/2021 As-Built

9/9/2021 As-Built

11/17/2022 As-Built



APWA STORM DRAINAGE "TC" COMPUTATIONS FOR : VILLAS OF CHAPEL RIDGE 2ND PLAT																																																			
yellow areas are self computing overwrite if necessary				Surface types:				Asph/Conc/Bus/Com				Dirt				Grass/Park				Lake				MultFam				SnglFam				Undev				Other															
				SURFACE CODES				A				B				C				D				G				L				M				S				U				Z							
TOTAL WATERSHED				"C" Values				0.90				0.87				0.60				0.30				0.90				0.66				0.51				0.3															
				OVERWRITE				Length - DnElev or Slope if necessary				SURFACE CODE				P=Paved/Overwrite Slope or Elevations U=Unpaved if necessary				Cal Overland Flow T(T)				Used Min 5 Max 15 T(T)				Cal Channel One T(T)				Cal Channel Two T(T)				Total T(T) @ 10				AREA ID											
AREA ID				TOTAL SQ.FT.				TOTAL ACRES				WTRSHD LENGTH				UP ELEV				DN ELEV				SURFACE CODE				"C" VALUE				OVR/LN LENGTH				UP ELEV				DN ELEV				SLOPE %				VELOCITY F/TS			
POST																																																POST			
1				6734.45	0.15	171.71	962.75	956.48	M	0.66	36.7	962.8	962.00	2.0	P	135.0	962.0	956.5	4.09	4.1	3.8	5.0	0.5	0.0	5.5	1																									
2				15497.29	0.36	321.00	969.90	961.04	M	0.66	36.0	969.9	969.15	2.1	P	285.0	969.2	961.0	2.85	3.4	3.7	5.0	1.4	0.0	6.4	2																									
3				14565.88	0.33	115.82	968.20	962.90	M	0.66	60.5	968.2	966.00	3.6	P	55.4	966.0	962.9	5.60	4.8	4.0	5.0	0.2	0.0	5.2	3																									
4				38022.54	0.87	290.56	968.20	956.48	M	0.66	100.0	968.2	963.50	4.7	P	190.6	963.5	956.5	3.68	3.9	4.7	5.0	0.8	0.0	5.8	4																									
5				17621.66	0.40	168.61	970.50	961.65	M	0.66	100.0	970.5	967.15	3.4	U	68.6	967.2	961.7	8.02	4.6	5.3	5.3	0.3	0.0	5.5	5																									
6				19480.08	0.45	219.25	968.00	955.58	M	0.66	100.0	968.0	962.00	6.0	U	119.3	962.0	955.6	5.38	3.7	4.4	5.0	0.5	0.0	5.5	6																									
7				15534.05	0.36	183.86	964.00	949.00	M	0.66	100.0	964.0	955.00	6.0	U	83.9	955.0	949.0	7.15	4.3	3.8	5.0	0.3	0.0	5.3	7																									
8				12379.23	0.28	279.25	967.30	955.76	M	0.66	33.5	967.3	966.50	2.4	P	245.7	966.5	955.8	4.37	4.2	3.4	5.0	1.0	0.0	6.0	8																									
9				7326.23	0.17	257.20	966.50	955.76	M	0.66	11.5	966.5	966.20	2.6	P	245.7	966.2	955.8	4.25	4.2	2.0	5.0	1.0	0.0	6.0	9																									
10				5324.92	0.12	125.42	966.50	958.00	M	0.66	47.2	966.5	963.80	5.7	U	78.3	963.8	958.0	7.41	4.4	3.0	5.0	0.3	0.0	5.3	10																									
11				38079.28	0.87	354.14	966.50	948.00	M	0.66	100.0	966.5	960.50	6.0	U	254.1	960.5	948.0	4.92	3.6	4.4	5.0	1.2	0.0	6.2	11																									
12				9008.94	0.21	139.74	955.00	944.00	M	0.66	100.0	955.0	946.50	8.5	U	39.7	946.5	944.0	6.29	4.0	3.9	5.0	0.2	0.0	5.2	12																									
13				36460.35	0.84	346.50	957.50	939.00	M	0.66	36.5	957.5	956.50	2.7	P	310.0	956.5	939.0	5.65	4.8	3.4	5.0	1.1	0.0	6.1	13																									
14				18586.66	0.43	304.64	955.00	932.80	M	0.66	100.0	955.0	946.60	8.4	U	204.6	946.6	932.8	6.74	4.2	3.9	5.0	0.8	0.0	5.8	14																									
15				6741.28	0.15	280.50	946.50	932.50	M	0.66	11.5	946.5	946.20	2.6	P	269.0	946.2	932.5	5.09	4.6	2.0	5.0	1.0	0.0	6.0	15																									