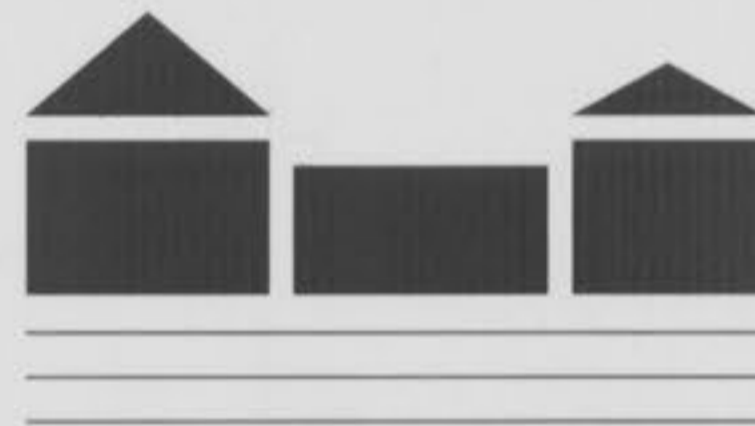


THE ENCLAVE AT WINGHAVEN™ APARTMENTS

FINAL SEWER MEASUREMENTS



BOMASADA GROUP

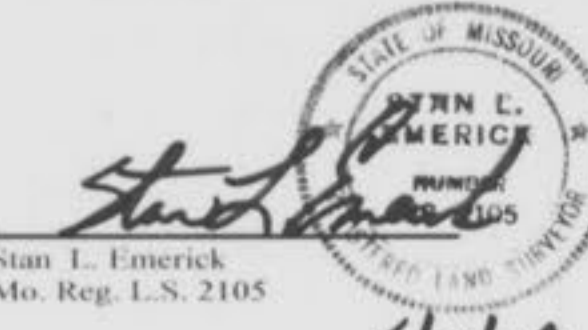
The existing sewer lengths, sizes, flowlines, depths of structures and sewers and locations with respect to existing or proposed easements have been measured. The results of those measurements are shown on this set of Final Measurement Plans. Since the wye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing or proposed easements except as shown in this drawing.

The results of those measurements are shown on this drawing by lining out the planned number and indicating the measured number adjacent to the planned number. All other numbers shown have not been measured or verified.

The location of the sewers were determined by locating the manholes and traversing in a straight line between them.

No hydraulic computations have been done on the measured lines to verify or confirm the capacity, freeboard or design requirements of the sewers.


 Stan L. Emerick
 Mo. Reg. L.S. 2105
 4/01/09



VOLZ



BENCH MARKS

NAVD 1988 BENCH MARK

Elevation 636.23
 Brass monument at the southeastern corner
 of property conveyed to Southwestern
 Bell Telephone Company by Deed
 recorded in Book 866, Page 536.

SITE BENCH MARK

Elevation 615.16
 West bolt, before "Mueller," on fire
 hydrant, on South side of Highway
 N, opposite house # 7501.



PROPERTY N/F OF
 MC EAGLE - O'FALLON, L.C.
 1065/200

PROPERTY N/F OF
 WINGHAVEN RESIDENTIAL, L.L.C.
 2268/1317



The underground utilities shown herein were plotted from available information and do not necessarily reflect the actual existence, or nonexistence, size, type, number, or location of these or other utilities. The general contractor shall be responsible for verifying the actual location of all underground utilities in the field, shown or not shown, prior to any grading, excavation, or construction of improvements. These provisions shall in no way absolve any party from complying with the Underground Facility Safety and Damage Prevention Act, Chapter 319, RSMo.

- NOTES:
1. ALL DIMENSIONS SHOWN ARE TO THE BACK OF THE CURB UNLESS OTHERWISE NOTED.
 2. ALL CURBS SHALL BE BACKFILLED TO THE TOP OF THE BACK OF THE CURB.
 3. DETENTION SHALL BE PROVIDED IN THE LAKE SYSTEM FOR THE "WINGHAVEN DEVELOPMENT".

MATCH LINE SEE SHEET 3

STORM AND SANITARY SEWER FINAL MEASUREMENTS

Enclave at Winghaven

MATCH LINE SEE SHEET 2

MATCH LINE SEE SHEET 4



THE ENCLAVE AT
WINGHAVEN[™]
 APARTMENTS

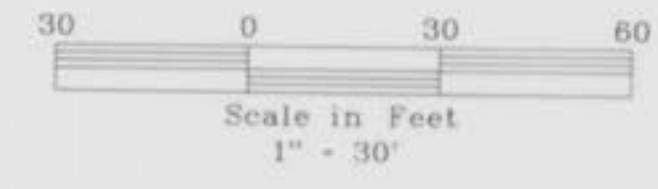
SITE PLAN

Design By: D.A.L.
 Drawn By: J.L.R.
 Checked By: T.J.M.

B-5846

10-21-00
 3

Enclave at Winghaven



PROPERTY N/F OF
MC EAGLE - O'FALLON, L.C.
1065/200

N57° 24' 26" E
24.51'

PROPERTY N/F OF
WINGHAVEN RESIDENTIAL, L.L.C.
2288/1317

PROPERTY N/F OF
WINGHAVEN RESIDENTIAL, L.L.C.
2288/1317

S81° 55' 20" W R=12.00'

S08° 04' 40" E
151.59'

S11° 31' 30" E
54.81'

S04° 27' 30" E
101.58'

S47° 49' 14" W
166.06'

N42° 10' 46" W R=121.00'

214.56'

N30° 34' 51" W
292.14'

MATCH LINE SEE SHEET 3



- NOTES:
1. ALL DIMENSIONS SHOWN ARE TO THE BACK OF THE CURB UNLESS OTHERWISE NOTED.
 2. ALL CURBS SHALL BE BACKFILLED TO THE TOP OF THE BACK OF THE CURB.
 3. DETENTION SHALL BE PROVIDED IN THE LAKE SYSTEM FOR THE WINGHAVEN DEVELOPMENT.

STAN L. EMERICK
Mo. P.L.S. No. 2105
4/1/10

The underground utilities shown herein were plotted from available information and do not necessarily reflect the actual existence, or nonexistence, size, type, number, or location of these or other utilities. The general contractor shall be responsible for verifying the actual location of all underground utilities in the field, shown or not shown, prior to any grading, excavation, or construction of improvements. These provisions shall in no way absolve any party from complying with the Underground Facility Safety and Damage Prevention Act, Chapter 389, RSMo.

AS-BUILT HYDRAULICS

LZ ENGINEERING & SURVEYING, INC.
 849 INDIAN HEAD INDUSTRIAL BLVD.
 LOUIS, MO 63132 (314)426-6212
 948AB THE ENCLAVE AT WINGHAVEN

4-01-**
 11:09:11
 Page 1

STRUCTURES	UPPER		LENGTH	SIZE	FLOWLINE			UPPER STRUCTURE		HYDRAULIC			FRICTION LOSS	VELOCITY		TURN		QUANTITY		***	CAPACITIES			BYPASS			
	UPPER	LOWER			UPPER	LOWER	GRADE	ELEVATION	FREEBOARD	UPPER	LOWER	GRADE		FPS	HEAD GAIN	ANGLE	LOSS	AREA	PI		INCR	TOTAL	PIPE		INLET	GUTTER	
INE 1 7 STRUCTURES																											
SI	7	2GI	6	117.4	12	491.77	491.15	.005	496.17	1.64	494.53	494.48	.0005	.06	1.01	.02	.00	0	.00	.24	3.30	.79	.79	.50'	2.59	4.05	2.13
SI	6	2GI	5	117.1	12	490.95	490.40	.005	496.24	1.76	494.41	494.18	.0019	.22	1.97	.06	.07	5	.00	.23	3.30	.76	1.55	.50'	2.44	4.05	2.13
SI	5	2GI	4	89.2	15	490.20	489.53	.008	496.20	2.02	494.12	494.01	.0012	.11	1.86	.05	.02	90	.04	.22	3.30	.73	2.28	.50'	5.60	4.05	2.13
SI	4	2GI	3	85.3	18	489.33	489.14	.002	496.41	2.40	493.99	493.92	.0008	.07	1.72	.05	.01	16	.01	.23	3.30	.76	3.04	.50'	4.96	4.05	2.13
SI	3	2GI	2	95.7	18	488.94	488.55	.004	496.33	2.41	493.86	493.74	.0013	.12	2.11	.07	.04	43	.02	.21	3.30	.69	3.73	.50'	6.71	4.05	2.13
SI	2	FE	1	103.3	21	488.35	487.67	.007	495.95	2.21	493.61	493.43	.0018	.18	2.77	.12	.08	79	.05	.35	3.30	1.15	6.67	.50'	12.85	4.05	2.13
															INCOMING LINE		2	5	.00			1.78				5.39pv	
INE 2 4 STRUCTURES																											
SI	10	2GI	9	126.1	12	491.51	490.23	.010	496.41	2.10	494.31	494.26	.0005	.06	.97	.01	.00	0	.00	.23	3.30	.76	.76	.50'	3.59	4.05	2.13
SI	9	MH	8	72.6	12	490.03	489.39	.009	496.34	2.08	494.15	493.97	.0025	.18	2.27	.08	.10	31	.01	.31	3.30	1.02	1.78	.50'	3.34	4.05	2.13
H	8	2GI	2	82.5	12	489.19	488.55	.008	497.61	3.64	493.95	493.74	.0025	.21	2.27	.08	.00	27	.03			1.78				3.14	
INE 3 10 STRUCTURES																											
SI	21	2GI	20	84.9	12	492.63	492.85	.003	496.44	1.22	495.22	495.07	.0018	.15	1.93	.06	.00	0	.00	.46	3.30	1.52	1.52	.50'	1.81	4.05	2.13
SI	20	2GI	19	95.4	15	492.65	492.02	.007	496.00	.93	494.96	494.77	.0020	.19	2.37	.09	.08	66	.03	.42	3.30	1.39	2.90	.50'	5.25	4.05	2.13
SI	19	2GI	18	70.7	18	491.82	491.78	.001	496.44	1.67	494.76	494.67	.0012	.09	2.07	.07	.00	8	.01	.23	3.30	.76	3.66	.50'	2.50	4.05	2.13
SI	18	2GI	17	118.8	24	491.58	490.95	.005	496.13	1.46	494.60	494.52	.0007	.08	1.92	.06	.02	90	.05	.27	3.30	.89	6.04	.50'	16.48	4.05	2.13
															INCOMING LINE		7	41	.01			1.48					
GI	17	2GI	16	106.4	24	490.75	490.41	.003	496.63	2.11	494.44	494.33	.0010	.11	2.31	.08	.05	44	.03	.37	3.30	1.22	7.26	.50'	12.79	4.05	2.13
GI	16	2GI	15	72.3	24	490.21	489.82	.005	496.86	2.53	494.21	494.10	.0015	.11	2.78	.12	.06	74	.05	.14	3.30	.46	8.74	.50'	16.62	4.05	2.13
															INCOMING LINE		6	15	.00			1.02					
GI	15	2GI	14	136.5	27	489.62	489.26	.003	496.77	2.67	494.07	493.95	.0009	.12	2.34	.09	.00	22	.03	.17	3.30	.56	9.31	.50'	15.90	4.05	2.13
GI	14	2GI	13	127.7	30	489.06	488.51	.004	495.98	2.03	493.94	493.85	.0007	.09	2.23	.08	.01	0	.00	.50	3.30	1.65	10.96	.50'	26.92	4.05	2.13
GI	13	FE	12	77.2	30	488.31	487.80	.007	496.11	2.26	493.58	493.43	.0019	.15	3.68	.21	.18	5	.00	.39	3.30	1.29	18.08	.50'	33.34	4.05	2.13
															INCOMING LINE		4	72	.05			3.99					
															INCOMING LINE		5	35	.03			1.85				6.93pv	
INE 4 5 STRUCTURES																											
GI	25	2GI	24	90.1	12	492.62	491.42	.013	496.94	1.96	494.98	494.94	.0005	.04	1.01	.02	.00	0	.00	.24	3.30	.79	.79	.50'	4.11	4.05	2.13
GI	24	2GI	23	80.1	12	491.22	490.46	.009	495.67	.73	494.75	494.39	.0044	.36	3.03	.14	.18	34	.01	.48	3.30	1.58	2.38	.50'	3.47	4.05	2.13
GI	23	2GI	22	73.0	15	490.26	489.81	.006	495.86	1.47	494.31	494.18	.0018	.13	2.23	.08	.00	56	.08	.11	3.30	.36	2.74	.50'	5.07	4.05	2.13
GI	22	2GI	13	184.6	18	489.61	488.51	.006	496.02	1.84	494.12	493.85	.0014	.27	2.26	.08	.03	37	.03	.38	3.30	1.25	3.99	.50'	8.11	4.05	2.13
INE 5 2 STRUCTURES																											
GI	26	2GI	13	155.8	12	491.86	488.51	.022	496.16	1.89	494.27	493.85	.0027	.42	2.35	.09	.00	0	.00	.56	3.30	1.85	1.85	.50'	5.22	4.05	2.13
INE 6 2 STRUCTURES																											
GI	27	2GI	16	47.7	12	492.72	490.41	.048	496.03	1.66	494.37	494.33	.0008	.04	1.30	.03	.00	0	.00	.31	3.30	1.02	1.02	.50'	7.84	4.05	2.13
INE 7 2 STRUCTURES																											
GI	28	2GI	18	197.1	15	493.06	491.78	.006	496.06	1.28	494.78	494.67	.0005	.10	1.21	.02	.00	0	.00	.45	3.30	1.48	1.48	.50'	5.21	4.05	2.13

*** AIs # of sides open & depth of sill
 CIs street grade at inlet
 GIs depth over grate

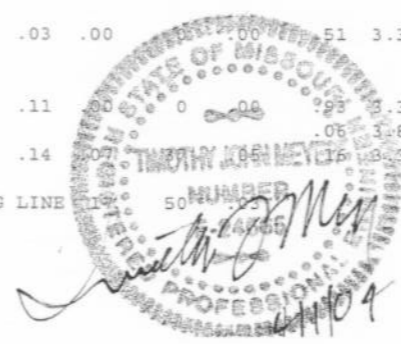
* lower hydraulic elevation when flowing less than full
 C curve loss in pipe
 R radius of curve
 HW entrance control elevation

James J. McCombs
 #11104

STRUCTURES UPPER	LENGTH SIZE		FLOWLINE UPPER LOWER GRADE		UPPER STRUCTURE ELEVATION FREEBOARD		HYDRAULIC UPPER LOWER GRADE		FRICTION LOSS	VELOCITY FPS HEAD GAIN		TURN ANGLE LOSS		AREA PI		QUANTITY INCR TOTAL		***	CAPACITIES PIPE INLET GUTTER			BYPASS								
INE 8 4 STRUCTURES																														
3I	33	2GI	32	89.4	15	491.29	489.72	.018	495.59	1.57	494.02	493.92	.0012	.10	1.80	.05	.00	0	.00	.67	3.30	2.21	2.21	.50'	8.56	4.05	2.13			
3I	32	MH	31	60.3	15	489.52	488.10	.024	496.22	2.30	493.87	493.77	.0015	.09	2.07	.07	.03	34	.02	.10	3.30	.33	2.54	.50'	9.92	4.05	2.13			
3I	31	FE	30	53.9	18	487.90	487.56	.006	496.92	3.15	493.68	493.55	.0023	.13	2.88	.13	.09	0	.00				5.08		8.35					
															INCOMING LINE 9		0	.00				1.75								
															INCOMING LINE 10		65	.01				.79								
INE 9 2 STRUCTURES																														
3I	34	MH	31	128.6	12	491.50	488.10	.026	495.65	1.57	494.08	493.77	.0024	.31	2.23	.08	.00	0	.00	.53	3.30	1.75	1.75	.50'	5.79	4.05	2.13			
INE 10 2 STRUCTURES																														
3I	35	MH	31	56.2	12	491.58	488.00	.064	495.98	2.18	493.80	493.77	.0005	.03	1.01	.02	.00	0	.00	.24	3.30	.79	.79	.50'	8.99	5.40	2.00			
INE 11 9 STRUCTURES																														
3I	45	2GI	44	459.5	21	492.21	491.79	.001	496.21	.88	495.33	495.07	.0006	.25	1.55	.04	.00	0	.00	1.13	3.30	3.73	3.73	.50'	4.79	4.05	2.13			
3I	44	2GI	43	167.9	24	491.59	491.13	.003	496.59	1.52	495.01	494.88	.0008	.13	2.02	.06	.04	0	.00	.28	3.30	.92	6.34	.50'	11.84	4.05	2.13			
															INCOMING LINE 15		79	.02			1.68									
3I	43	2GI	42	137.4	24	490.93	490.58	.003	496.23	1.35	494.78	494.63	.0011	.16	2.43	.09	.05	73	.04	.39	3.30	1.29	7.62	.50'	11.42	4.05	2.13			
3I	42	2GI	41	83.8	27	490.38	490.65	.003	496.21	1.58	494.53	494.44	.0012	.10	2.65	.11	.05	24	.03	.44	3.30	1.45	10.53	.50'	17.58	4.05	2.13			
															INCOMING LINE 14		78	.01			1.45									
GI	41	2GI	40	119.1	30	490.45	490.44	.000	496.09	1.65	494.36	494.27	.0008	.09	2.29	.08	.00	88	.08	.22	3.30	.73	11.25	.50'	3.76	4.05	2.13			
GI	40	2GI	39	144.7	30	490.24	489.96	.002	496.10	1.83	494.20	494.07	.0010	.14	2.59	.10	.04	25	.02	.44	3.30	1.45	12.70	.50'	18.04	4.05	2.13			
GI	39	2GI	38	113.3	30	489.76	489.20	.005	496.46	2.39	493.92	493.75	.0015	.18	3.29	.17	.11	6	.00	.39	3.30	1.29	16.14	.50'	28.84	4.05	2.13			
															INCOMING LINE 13		77	.03			2.14									
GI	38	FE	37	60.0	36	489.00	488.90	.002	496.70	2.95	493.66	493.62	.0007	.04	2.54	.10	.00	33	.06	.18	3.30	.59	17.92	.50'	27.22	4.05	2.13			
															INCOMING LINE 12		70	.02			1.19									
INE 12 2 STRUCTURES																														
GI	48	2GI	38	124.7	12	492.00	489.20	.022	496.38	2.49	493.89	493.75	.0011	.14	1.51	.04	.00	0	.00	.36	3.30	1.19	1.19	.50'	5.34	4.05	2.13			
INE 13 2 STRUCTURES																														
GI	49	2GI	39	119.8	15	492.80	489.96	.024	496.13	1.93	494.20	494.07	.0011	.13	1.75	.05	.00	0	.00	.65	3.30	2.14	2.14	.50'	9.94	4.05	2.13			
INE 14 3 STRUCTURES																														
GI	51	2GI	50	80.9	12	493.29	492.31	.012	497.09	2.36	494.73	494.69	.0004	.03	.92	.01	.00	0	.00	.22	3.30	.73	.73	.50'	3.92	4.05	2.13			
GI	50	2GI	42	82.3	15	492.11	490.58	.019	495.81	1.12	494.67	494.63	.0005	.04	1.18	.02	.02	21	.00	.22	3.30	.73	1.45	.50'	8.81	4.05	2.13			
INE 15 2 STRUCTURES																														
GI	52	2GI	44	106.1	15	492.61	591.79	-.935	495.93	-97.18	593.11	593.04*	.0007	.07	1.37	.03	.00	0	.00	.51	3.30	1.68	1.68	.50'	62.47	4.05	2.13			
INE 16 3 STRUCTURES																														
GI	56	2GI	55	115.1	15	491.73	491.65	.001	496.18	1.82	494.36	494.06	.0026	.30	2.69	.11	.08	0	.00	.30	3.30	3.30	3.30	.50'	1.70	4.05	2.13			
GI	55	FE	54	67.3	18	491.45	491.24	.003	496.55	2.49	493.92	493.75	.0025	.17	2.97	.14	.16	0	.00	.06	3.30	.53	5.25	.50'	5.87	4.05	2.13			
															INCOMING LINE 11		50	.03			1.42									

*** AIs # of sides open & depth of sill

* lower hydraulic elevation when flowing less than full



STRUCTURES UPPER	LOWER	LENGTH	SIZE	FLOWLINE			UPPER STRUCTURE		HYDRAULIC			FRICTION LOSS	VELOCITY			TURN		AREA	PI	QUANTITY		***	CAPACITIES				
				UPPER	LOWER	GRADE	ELEVATION	FREEBOARD	UPPER	LOWER	GRADE		FPS	HEAD GAIN	ANGLE	LOSS	INCR			TOTAL	PIPE		INLET	GUTTER	BYPASS		
INE 17	2	STRUCTURES																									
GI	58	2GI	55	104.5	12	492.15	491.65	.005	497.03	2.80	494.23	494.06	.0016	.17	1.81	.05	.00	0	.00	.43	3.30	1.42	1.42	.50'	2.46	4.05	2.13
INE 18	3	STRUCTURES																									
I	63	CI	62	58.6	12	492.68	491.68	.017	197.64	-298.91	496.55	496.45	.0017	.10	1.85	.05	.00	0	.00	.37	3.30	1.45	1.45	LOW	4.65	4.00	2.00
I	62	MH	2	58.2	12	491.48	490.19	.022	497.12	.67	496.07	495.57	.0087	.50	4.22	.28	.34	90	.04	.06	3.85	1.86	3.32	LOW	5.30	4.00	2.00
																			.15	3.85							
INE 19	2	STRUCTURES																									
I	61	MH	60	9.1	12	494.76	494.56	.022	498.95	3.03	495.92	495.91	.0007	.01	1.18	.02	.00	0	.00	.24	3.85	.92	.92	LOW	5.27	4.00	2.00

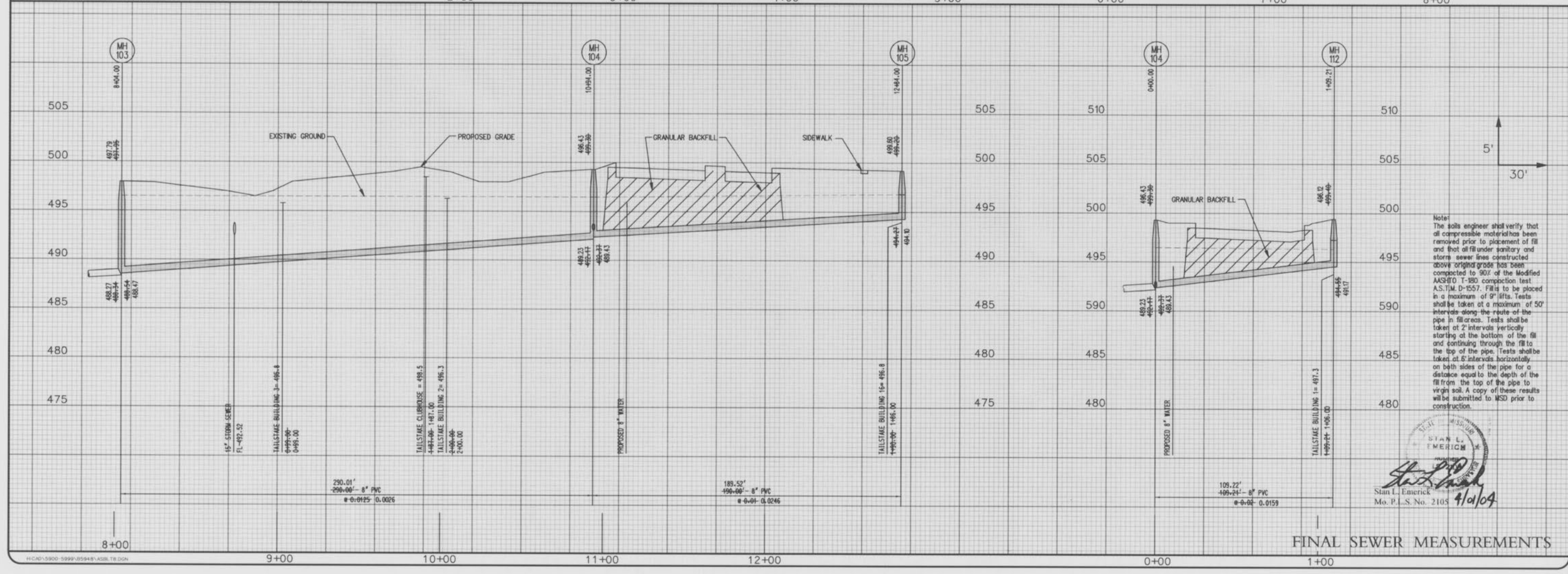
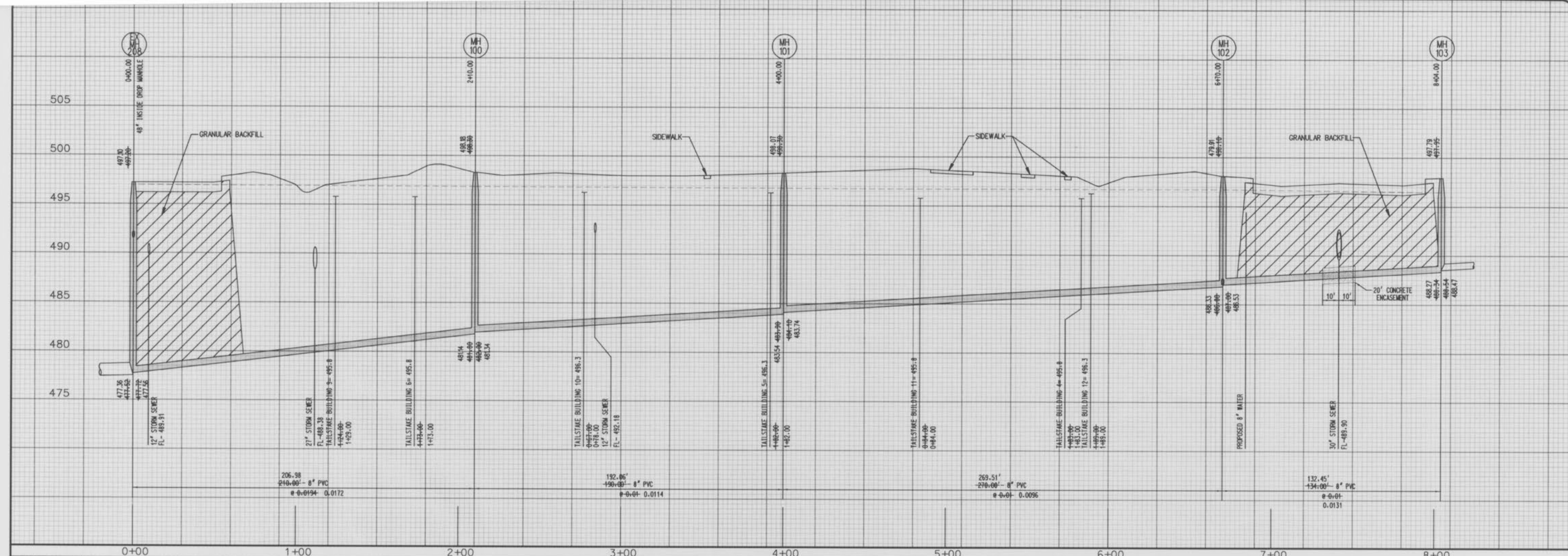
** Als # of sides open & depth of sill
 CIs street grade at inlet
 GIs depth over grate

* lower hydraulic elevation when flowing less than full
 C curve loss in pipe
 R radius of curve
 HW entrance control elevation
 pv partial flow velocity



THE ENCLAVE AT
WINGHAVENTM
APARTMENTS

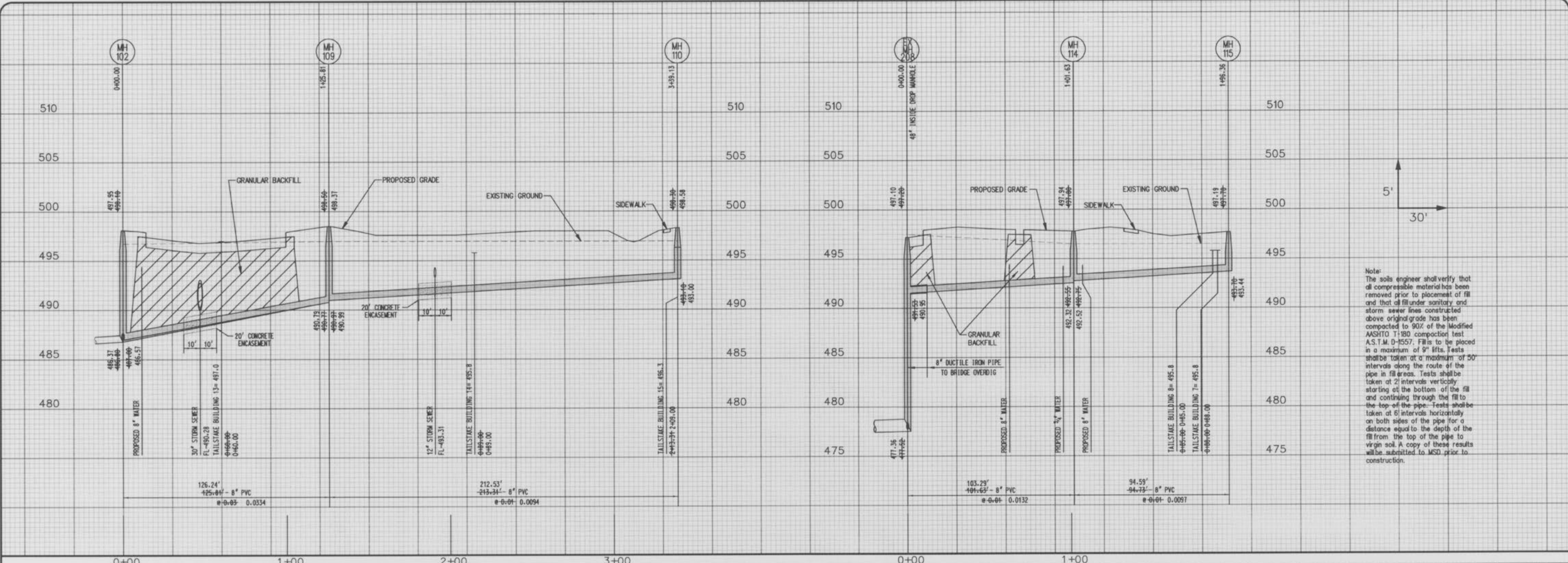
SANITARY PROFILES
Design By: D.A.L./C.W.C.
Drawn By: J.L.F.
Checked By: T.J.M.
B-5548



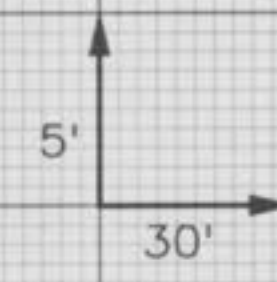
Note:
The soils engineer shall verify that all compressible material has been removed prior to placement of fill and that all fill under sanitary and storm sewer lines constructed above original grade has been compacted to 90% of the Modified AASHTO T-180 compaction test, A.S.T.M. D-1557. Fills to be placed in a maximum of 9" lifts. Tests shall be taken at a maximum of 50' intervals along the route of the pipe in fill areas. Tests shall be taken at 2' intervals vertically starting at the bottom of the fill and continuing through the fill to the top of the pipe. Tests shall be taken at 6' intervals horizontally on both sides of the pipe for a distance equal to the depth of the fill from the top of the pipe to virgin soil. A copy of these results will be submitted to MSD prior to construction.

Stan L. Emerick
Mo. P. L. S. No. 2105
4/10/04

FINAL SEWER MEASUREMENTS

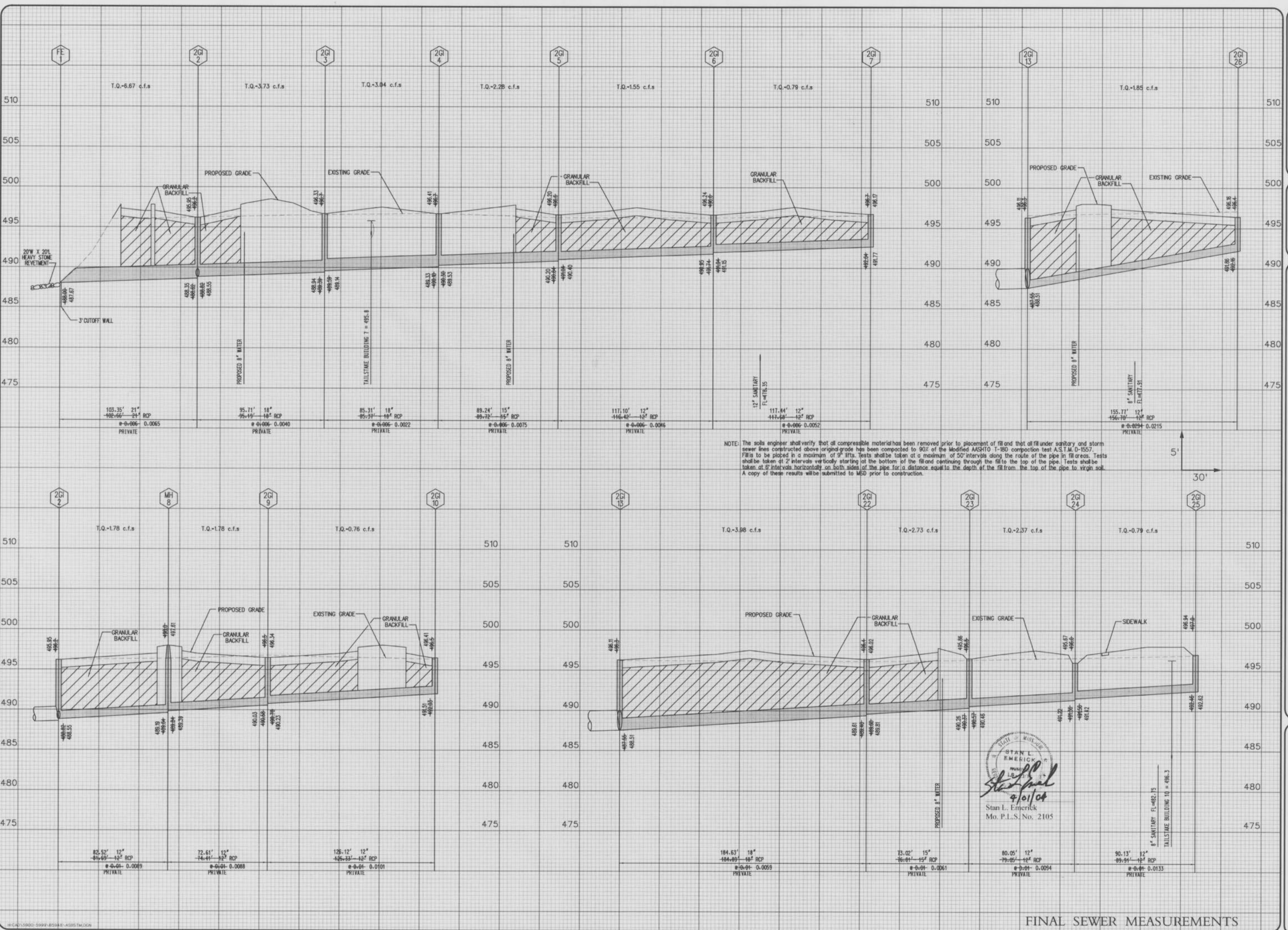


Note:
The soils engineer shall verify that all compressible material has been removed prior to placement of fill and that all fill under sanitary and storm sewer lines constructed above original grade has been compacted to 90% of the Modified AASHTO T-180 compaction test, A.S.T.M. D-1557. Fill is to be placed in a maximum of 9" lifts. Tests shall be taken at a maximum of 50' intervals along the route of the pipe in fill areas. Tests shall be taken at 2' intervals vertically starting at the bottom of the fill and continuing through the fill to the top of the pipe. Tests shall be taken at 6' intervals horizontally on both sides of the pipe for a distance equal to the depth of the fill from the top of the pipe to virgin soil. A copy of these results will be submitted to MSD prior to construction.



STATE OF MISSOURI
STAN L. EMERICK
NUMBER LS-2105
Stan L. Emerick
Stan L. Emerick
Mo. P.L.S. No. 2105
1/11/04

STORM AND SANITARY SEWER FINAL MEASUREMENTS



Stan L. Emerick
 Mo. P.L.S. No. 2105

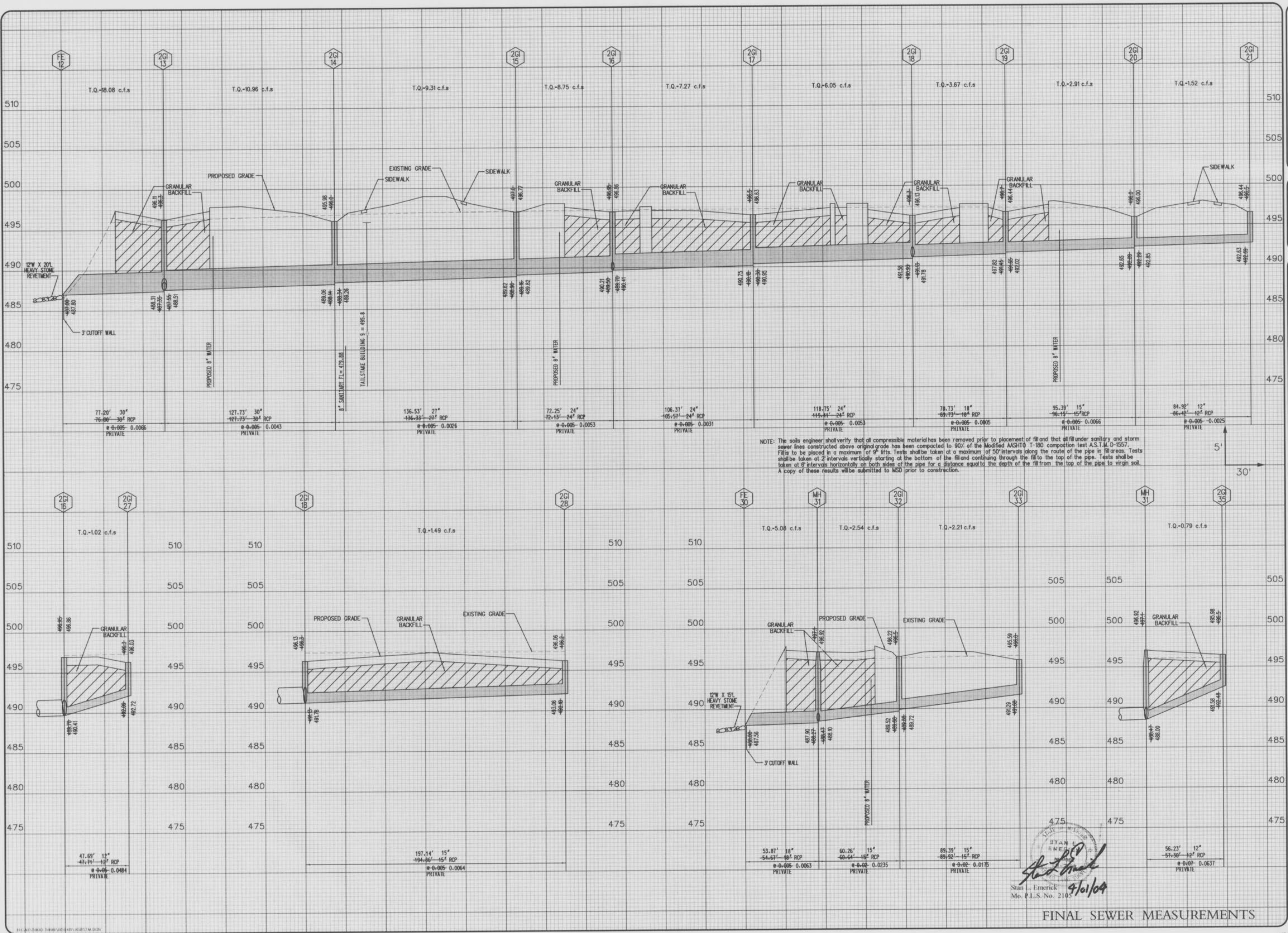
FINAL SEWER MEASUREMENTS

STORM PROFILES

Design By: D.A.L.
 Drawn By: J.L.F.
 Checked By: T.J.M.

B-5948

10



BYANE ENGINEERS
 Stan J. Emerick
 Mo. P.L.S. No. 2105
 9/6/04

FINAL SEWER MEASUREMENTS

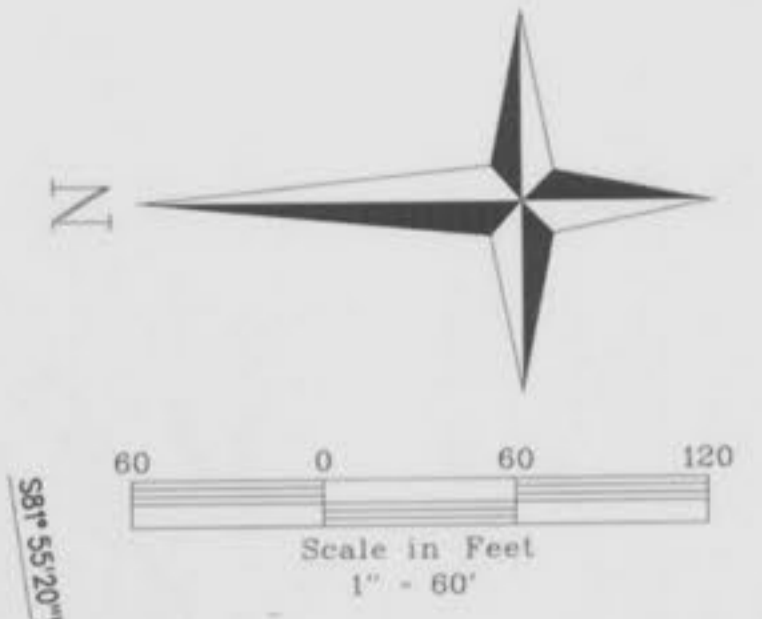
STORM PROFILES

Design By: D.A.L.
 Drawn By: J.L.F.
 Checked By: T.J.M.

B-5948

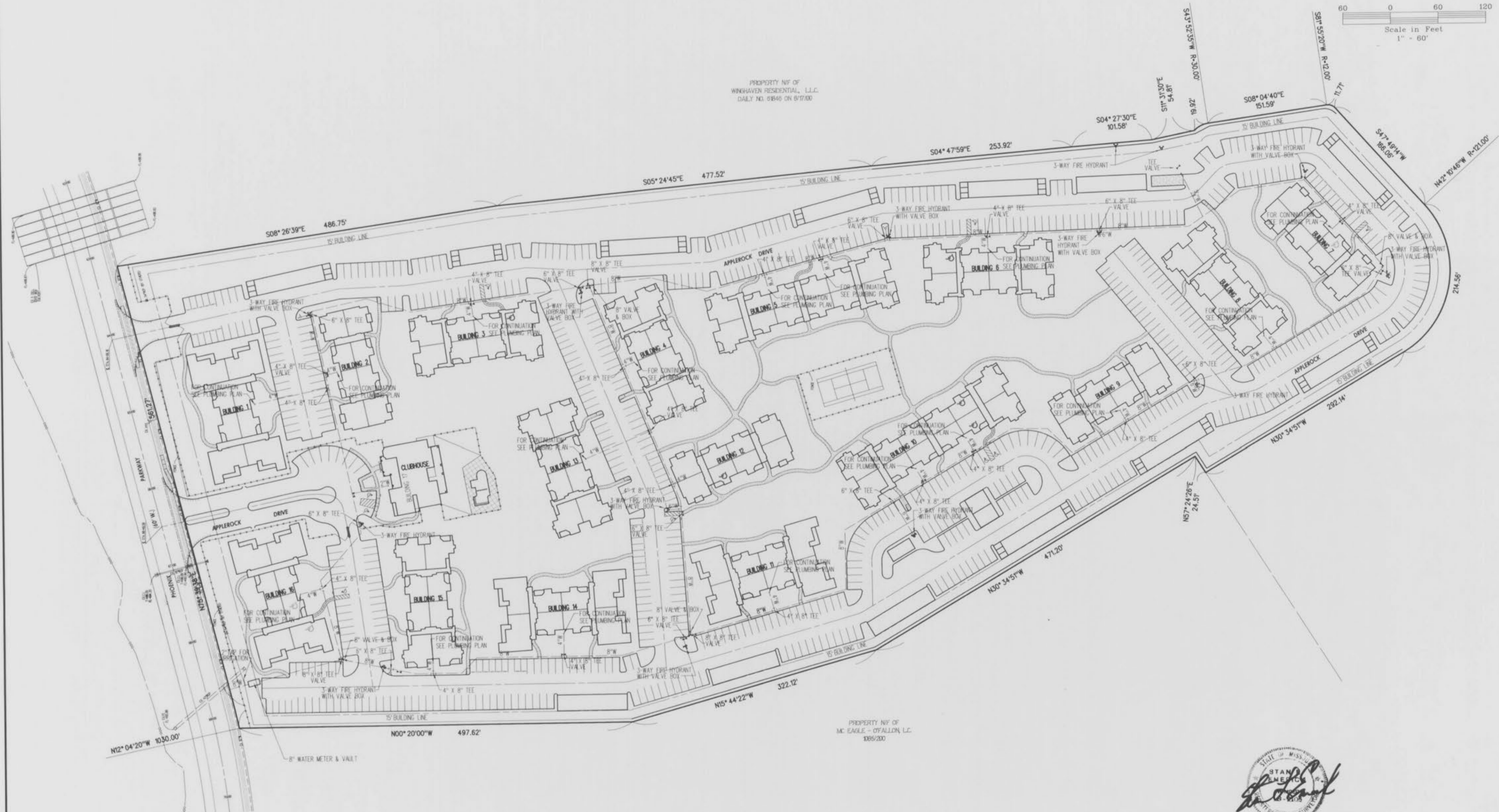
02-06-00

11



PROPERTY INT OF
WINGHAVEN RESIDENTIAL, L.L.C.
DAILY NO. 51840 ON 8/17/00

PROPERTY INT OF
MC EAGLE - OFALLON, L.L.C.
1085/200



THE ENCLAVE AT
WINGHAVENTM
APARTMENTS



Stan L. Emerick
Mo. Reg. L.S. 2105
4/11/04

WATER PLAN
AS-BUILT

Design By: D.A.L.
Drawn By: B.O.B.
Checked By: R.A.

B-5948

15-07-04
17

The underground utilities shown herein were plotted from available information and do not necessarily reflect the actual existence, or nonexistence, size, type, number, or location of these or other utilities. The general contractor shall be responsible for verifying the actual location of all underground utilities in the field, shown or not shown, prior to any grading, excavation, or construction of improvements. These provisions shall in no way absolve any party from complying with the Underground Facility Safety and Damage Prevention Act, Chapter 339, RSMo.

Enclave at Winghaven