Lift Station Analysis for
The City of Maitland, FL

Maitland Concourse North PD
Maitland, FL

Prepared by:

Kimley-Horn and Associates, Inc.
Orlando, Florida
049183005

June 29, 2016

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Lift Station Analysis for
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Maitland Concourse North PD
Maitland, FL

Prepared for:

BPL Maitland Concourse North, LLC

Prepared by:

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Orlando, Florida
049183005

June 29, 2016

Brian S. Ashby, P.E.
FL P.E. # 80456

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EXECUTIVE SUMMARY

The subject property is located along the north side of Maitland Blvd, east of the intersection of Maitland Blvd and Concourse Parkway South, and west of the intersection of Maitland Blvd and West Lake Faith Drive, in the City of Maitland, Florida (Section 25, Township 21S, Range 29E). The proposed development, *Maitland Concourse North PD,* is a mixed use planned development consisting of a multi-family residential development with 350 dwelling units, with an associated 2,970 SF pool house and 4,770 SF club house, 127,900 SF of retail, a 135 room hotel, and 425,000 SF of office.

Proposed Lift Station

The lift station design complies with design criteria set forth by the City of Maitland and the Florida Department of Environmental Protection. Estimates of wastewater flow have been based on the Levels of Service (LOS) and ERU factors found in the Orange County Utilities Standards and Construction Specifications Manual, dated February 2011. The development will generate an average daily wastewater flow of 224,116 GPD. For lift station design purposes, a peaking factor of 3.5 has been applied to the average daily flow resulting in a peak hour flow of 784,407 GPD or 544.7 GPM. Please refer to **Appendix A** for wastewater flow determination.

Per direction from the City of Maitland, the proposed tie-in location is an existing 6” PVC dry force main within an 18” sleeve that runs under Maitland Blvd. This existing 6” force main under Maitland Blvd is proposed to be extended south in order to tie into the existing 6” force main along Sandspur Road. The proposed duplex lift station will discharge through 1,168 LF of 6-inch PVC force main before connecting to the existing 324 LF of dry 6” PVC force main, which will be extended another 376 LF to the existing 6” force along Sandspur Road. The existing 6” force main along Sandspur Road discharges to an existing manhole located along Sandspur Road.

The wastewater pump chosen for the subject site is:

(2) FLYGT NP-3202.180 HT-456, 326 mm, 3 Phase, 60 HP, 1770 RPM, 460 V, 6” discharge

The operating conditions are: 714 GPM @ 161-ft TDH

The control elevations are:

TOP ELEVATION	80.50
ALARM EL.	61.95
LAG PUMP ON EL.	60.95
LEAD PUMP ON EL.	59.95
INFLUENT INVERT EL.	62.45
PUMP SHUTOFF EL.	54.95
WET-WELL BOTTOM EL.	52.95

Considerations were also made for the uplift forces due to water pressure (buoyancy). Please refer to Buoyancy (uplift) Calculations located in **Appendix B** for details. The bottom of the concrete wet-well is set in a 12” thick circular, bottom slab with a 20” extension out beyond the wet-well. The weight of the wet-well + bottom slab + top slab + soil over slab is 178,560-lbs. The uplift force was calculated at 100,814-lbs. Therefore, the proposed lift station is adequately designed, with a factor of safety of 1.77, and will not be uplifted due to water pressures. Additionally, the added dead loads within the lift station were not considered, which provide an added degree of safety against uplift.

APPENDIX A

WASTEWATER FLOW CALCULATIONS

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Made By: BAL DATE: 5/11/2016
Checked By: JAM DATE:
KHA Project Number: 049183005

Maitland Concourse North PD

Sanitary Wastewater Demand Determination

(per O.C.U. Standards and Construction Specifications Feb. 2011)

Building	UNITS / AREA(SF)	LEVEL OF SERVICE UNIT		ERU per UNIT	TOTAL ERUs	GPD			GPM		
						ADF	MDF	PHF	ADF	MDF	PHF
Residential											
BLDG-1	14	1	per Unit	0.833	12	3,499	6,997	12,245	2.4	4.9	8.5
BLDG-2	14	1	per Unit	0.833	12	3,499	6,997	12,245	2.4	4.9	8.5
BLDG-3	12	1	per Unit	0.833	10	2,999	5,998	10,496	2.1	4.2	7.3
BLDG-4	14	1	per Unit	0.833	12	3,499	6,997	12,245	2.4	4.9	8.5
BLDG-5	12	1	per Unit	0.833	10	2,999	5,998	10,496	2.1	4.2	7.3
BLDG-6	12	1	per Unit	0.833	10	2,999	5,998	10,496	2.1	4.2	7.3
BLDG-7	14	1	per Unit	0.833	12	3,499	6,997	12,245	2.4	4.9	8.5
BLDG-8	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
BLDG-9	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
BLDG-10	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
BLDG-11	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
BLDG-12	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
BLDG-13	43	1	per Unit	0.833	36	10,746	21,491	37,610	7.5	14.9	26.1
Sub-Total	**350**					**87,465**	**174,930**	**306,128**	**60.7**	**121.5**	**212.6**
Retail/ Restaurant											
Retail-1 (11,425sf Total, 6,425sf Retail)	6,425	1000	square feet	0.333	2	642	1,284	2,247	0.4	0.9	1.6
	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	100	1	per Seat	0.100	10	3,000	6,000	10,500	2.1	4.2	7.3
Retail-2 (20,360sf Total, 13,360sf Retail)	13,360	1000	square feet	0.333	4	1,335	2,669	4,671	0.9	1.9	3.2
	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	180	1	per Seat	0.100	18	5,400	10,800	18,900	3.8	7.5	13.1
Retail-3 (26,401sf Total, 19,401sf Retail)	19,401	1000	square feet	0.333	6	1,938	3,876	6,784	1.3	2.7	4.7
	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	180	1	per Seat	0.100	18	5,400	10,800	18,900	3.8	7.5	13.1
Retail/Restaurant-4 (11,709sf Total, 6,000sf Retail)	2,909	1000	square feet	0.333	1	291	581	1,017	0.2	0.4	0.7
	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	250	1	per Seat	0.100	25	7,500	15,000	26,250	5.2	10.4	18.2
Retail-5	4,144	1000	square feet	0.333	1	414	828	1,449	0.3	0.6	1.0
Retail-6	31,409	1000	square feet	0.333	10	3,138	6,276	10,982	2.2	4.4	7.6
Retail-7 (7,727sf Total, 3,500sf Retail)	3,500	1000	square feet	0.333	1	350	699	1,224	0.2	0.5	0.8
	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	70	1	per Seat	0.100	7	2,100	4,200	7,350	1.5	2.9	5.1
Retail/Restaurant-8	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	50	1	per Seat	0.100	5	1,500	3,000	5,250	1.0	2.1	3.6
Retail/Restaurant-9	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	100	1	per Seat	0.100	10	3,000	6,000	10,500	2.1	4.2	7.3
Retail/Restaurant-10	100	1	per Seat	0.075	8	2,250	4,500	7,875	1.6	3.1	5.5
	140	1	per Seat	0.100	14	4,200	8,400	14,700	2.9	5.8	10.2
Retail/Restaurant-11	60	1	per Seat	0.075	5	1,350	2,700	4,725	0.9	1.9	3.3
Sub-Total						**59,557**	**119,113**	**208,448**	**41.4**	**82.7**	**144.8**
Residential Amenities											
Pool House	2,970	1,000	square feet	0.333	1	297	593	1,038	0.2	0.4	0.7
Club House	4,770	1,000	square feet	0.333	2	477	953	1,668	0.3	0.7	1.2
Sub-Total	**7,740**					**773**	**1,546**	**2,706**	**0.5**	**1.1**	**1.9**
Hotel											
Hotel	135	1	per Room	0.833	112	33,737	67,473	118,078	23.4	46.9	82.0
Sub-Total	**135**					**33,737**	**67,473**	**118,078**	**23.4**	**46.9**	**82.0**
Office											
Office	425,000	1,000	square feet	0.334	142	42,585	85,170	149,048	29.6	59.1	103.5
Sub-Total	**425,000**					**42,585**	**85,170**	**149,048**	**29.6**	**59.1**	**103.5**
Total						**224,116**	**448,233**	**784,407**	**155.6**	**311.3**	**544.7**

ERU is 300 gallons per day	292
Average Daily Flow (ADF)	173
Max Daily Flow (MDF) = ADF x 2.0	2

Peak Hour Flow (PHF) = ADF x Peaking Factor

i. Peaking Factor of 4.0, for flows up to 100,000 GPD

ii. Peaking Factor of 3.5, for flows between 100,001 GPD to 250,000 GPD

iii. For accumaltive flows, the corresponding peaking factor must be used

APPENDIX B

LIFT STATION CALULATIONS

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Checked by BAL DATE: June 29, 2016
Made by: BSA DATE: June 29, 2016
KHA Project Number: 149581003

PROJECT: **Maitland Concourse North PD**
PERMIT NO.: -

DESIGN PHF CONDITIONS / DUTY POINT

A. SANITARY SEWER FLOW CALCULATIONS

FLOW SOURCE	ADF (GPD)	ADF (GPM)	PEAK FACTOR	PHF (GPD)	PHF (GPM)
Multifamily	87,465	60.74	3.5	306,128	212.59
Retail/Restaurant	59,557	41.36	3.5	208,450	144.76
Residential Amenities	773	0.54	3.5	2,706	1.88
Hotel	33,737	23.43	3.5	118,080	82.00
Office	42,585	29.57	3.5	149,048	103.51
TOTAL	**224,117**	**155.6**		**784,410**	**544.7**

DESIGN PEAK TOTAL FLOW = 544.7 GPM

B. CONTROL ELEVATIONS

WET-WELL DIAMETER: 8.0 FEET.
LOWEST GRAVITY INVERT ELEVATION: 62.45 FT. NGVD

ALARM INTERVAL / ELEVATION:	0.50	ft. =	61.95	FT. NGVD
LAG PUMP INTERVAL / ELEV.:	1.00	ft. =	60.95	FT. NGVD
LEAD PUMP INTERVAL / ELEV.:	1.00	ft. =	59.95	FT. NGVD
SHUTOFF INTERVAL / ELEV.:	5.00	ft. =	54.95	FT. NGVD
WET-WELL BOTTOM / ELEV.:	2.00	ft. =	52.95	FT. NGVD

C. TOTAL DESIGN HEAD CALCULATION/MINOR LOSS DETERMINATION

		STATION LOSSES		DISCHARGE F.M.	
	PIPE DIAMETER	6.00	inches.	6.00	inches.
	PIPE LENGTH	25.00	feet.	1868.00	feet.
	DESIGN "C" FACTOR	130	DIP	120	PVC
TYPE	COEFFICENT	NUMBER	K TOTAL	NUMBER	K TOTAL
1. BEND 90	0.30	2	0.60	4	1.20
2. BEND 45	0.23	4	0.92	8	1.84
3. CHECK VALVE	2.50	1	2.50	0	0.00
4. PLUG VALVE	0.90	2	1.80	1	0.90
5. TEE-BRANCH	1.80	0	0.00	0	0.00
6. TEE-STRAIGHT	0.60	2	1.20	1	0.60
7. REDUCER	0.25	1	0.25	0	0.00
8. OUTLET LOSS	1.00	0	0.00	0	0.00
	TOTALS =		7.27		4.54

D. HEAD LOSS DETERMINATION

	STATION LOSSES		DISCHARGE F.M.	
DESIGN FLOW	714.0	GPM	714.0	GPM
VELOCITY	8.10	FPS	8.10	FPS

VELOCITY HEAD	1.02	FEET.	1.02	FEET.
MINOR LOSSES	7.41	FEET.	4.63	FEET.
FRICTION LOSS	0.99	FEET.	85.84	FEET.

ELEVATION @ F.M. TIE-IN[1] =	92.50	FT. NGVD		
PRESSURE @ F.M. TIE-IN =	10.00	PSI		
HYDRAULIC GRADE LINE ELEVATION =	115.58	FT. NGVD		
HIGHEST POINT IN SYSTEM =	92.50	FT. NGVD		
INFLUENT PIPE INVERT =	62.45	FT. NGVD		
PUMPS OFF ELEVATION =	54.95	FT. NGVD		
STATIC HEAD =	60.63	FT.		
TOTAL DYNAMIC HEAD =	159.50	FT. at	714.00	GPM

Notes:

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Checked by BAL DATE: June 29, 2016
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KHA Project Number: 149581003

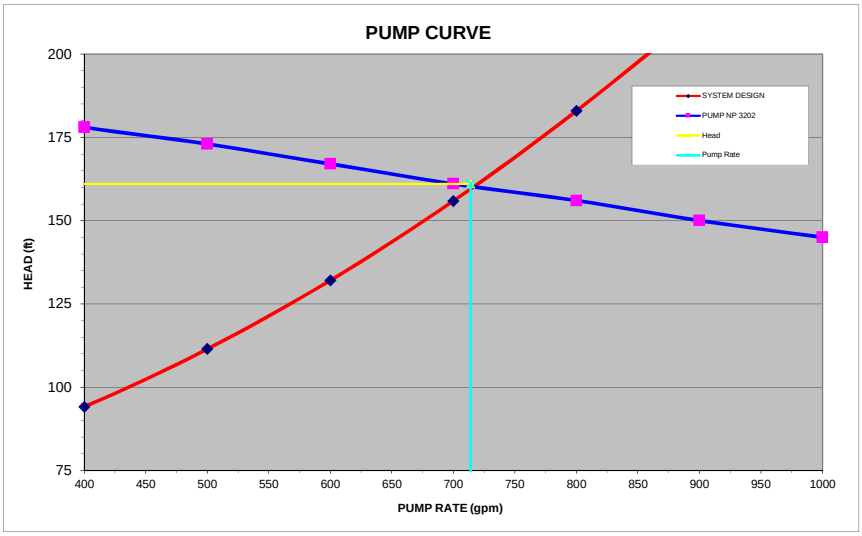
PROJECT: **Maitland Concourse North PD**
PERMIT NO.: -

DESIGN PHF CONDITIONS / DUTY POINT

E. PRELIMINARY SYSTEM HEAD CURVE GENERATION

SET INITIAL FLOW : 0.0 GPM
SET INCREMENTAL FLOW : 100.0 GPM

FLOW (gpm)	PUMP NP 3202	STATION LOSSES FRICTION	STATION LOSSES MINOR	DISCHARGE F.M. FRICTION	DISCHARGE F.M. MINOR	SYSTEM HEAD
0.0	203.00	0.00	0.00	0.00	0.00	60.63
100.0	197.00	0.03	0.15	2.26	0.09	63.15
200.0	191.00	0.09	0.58	8.15	0.36	69.82
300.0	184.00	0.20	1.31	17.26	0.82	80.21
400.0	178.00	0.34	2.33	29.39	1.45	94.13
500.0	173.00	0.51	3.63	44.41	2.27	111.45
600.0	167.00	0.72	5.23	62.22	3.27	132.07
700.0	161.00	0.96	7.12	82.75	4.45	155.91
800.0	156.00	1.22	9.30	105.94	5.81	182.90
900.0	150.00	1.52	11.77	131.74	7.35	213.01
1000.0	145.00	1.85	14.53	160.09	9.08	246.17
1100.0	140.00	2.20	17.59	190.96	10.98	282.36
1200.0	134.00	2.59	20.93	224.31	13.07	321.52
1300.0	129.00	3.00	24.56	260.11	15.34	363.64
1400.0	126.00	3.44	28.49	298.33	17.79	408.68
1500.0	121.00	3.91	32.70	338.94	20.42	456.61
1600.0	116.00	4.41	37.21	381.93	23.24	507.41
1700.0	111.00	4.93	42.01	427.26	26.23	561.05
1800.0	107.00	5.48	47.09	474.91	29.41	617.52
1900.0	101.00	6.06	52.47	524.87	32.77	676.79
2000.0	97.00	6.66	58.14	577.11	36.31	738.85
2100.0	90.00	7.29	64.10	631.63	40.03	803.67



PUMP: NP 3202 HT 3~ 456

DESIGN PHF CONDITIONS ARE: 714.0 GPM at 161.00 FT. OF HEAD.

	ADF		PHF	
INTERVAL OFF =	12.08	MINUTES	3.45	MINUTES
PUMP RUN TIME =	3.37	MINUTES	11.11	MINUTES
CYCLE TIME =	15.45	MINUTES	14.56	MINUTES

DESIGN HGL
(HIGH HEAD CONDITION)

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Checked by BAL DATE: June 29, 2016
Made by: BSA DATE: June 29, 2016
KHA Project Number: 149581003

PROJECT: **Maitland Concourse North PD**
PERMIT NO.: **-**

DESIGN HGL / HIGH-HEAD CONDITIONS

A. SANITARY SEWER FLOW CALCULATIONS

FLOW SOURCE	ADF (GPD)	ADF (GPM)	PEAK FACTOR	PHF (GPD)	PHF (GPM)
Multifamily	87,465	60.74	3.5	306,128	212.59
Retail/Restaurant	59,557	41.36	3.5	208,450	144.76
Residential Amenities	773	0.54	3.5	2,706	1.88
Hotel	33,737	23.43	3.5	118,080	82.00
Office	42,585	29.57	3.5	149,048	103.51
TOTAL	**224,117**	**155.6**		**784,410**	**544.7**

DESIGN PEAK TOTAL FLOW = 544.7 GPM

B. CONTROL ELEVATIONS

WET-WELL DIAMETER: **8.0** FEET.
LOWEST GRAVITY INVERT ELEVATION: **62.45** FT. NGVD

ALARM INTERVAL / ELEVATION:	**0.50**	ft. =	**61.95**	FT. NGVD
LAG PUMP INTERVAL / ELEV.:	**1.00**	ft. =	**60.95**	FT. NGVD
LEAD PUMP INTERVAL / ELEV.:	**1.00**	ft. =	**59.95**	FT. NGVD
SHUTOFF INTERVAL / ELEV.:	**5.00**	ft. =	**54.95**	FT. NGVD
WET-WELL BOTTOM / ELEV.:	**2.00**	ft. =	**52.95**	FT. NGVD

C. TOTAL DESIGN HEAD CALCULATION/MINOR LOSS DETERMINATION

		STATION LOSSES		DISCHARGE F.M.	
	PIPE DIAMETER	**6.00**	inches.	**6.00**	inches.
	PIPE LENGTH	**25.00**	feet.	**1868.00**	feet.
	DESIGN "C" FACTOR	**130**	**DIP**	**120**	**PVC**
TYPE	**COEFFICENT**	**NUMBER**	**K TOTAL**	**NUMBER**	**K TOTAL**
1. BEND 90	0.30	**2**	0.60	**4**	1.20
2. BEND 45	0.23	**4**	0.92	**8**	1.84
3. CHECK VALVE	2.50	**1**	2.50	**0**	0.00
4. PLUG VALVE	0.90	**2**	1.80	**1**	0.90
5. TEE-BRANCH	1.80	**0**	0.00	**0**	0.00
6. TEE-STRAIGHT	0.60	**2**	1.20	**1**	0.60
7. REDUCER	0.25	**1**	0.25	**0**	0.00
8. OUTLET LOSS	1.00	**0**	0.00	**0**	0.00
	TOTALS =		7.27		4.54

D. HEAD LOSS DETERMINATION

	STATION LOSSES		DISCHARGE F.M.	
DESIGN FLOW	**714.0**	**GPM**	**714.0**	**GPM**
VELOCITY	**8.10**	**FPS**	**8.10**	**FPS**

VELOCITY HEAD	1.02	FEET.	1.02	FEET.
MINOR LOSSES	7.41	FEET.	4.63	FEET.
FRICTION LOSS	0.99	FEET.	85.84	FEET.

ELEVATION @ F.M. TIE-IN =	**92.50**	FT. NGVD		
PRESSURE @ F.M. TIE-IN =	**10.00**	PSI		
HYDRAULIC GRADE LINE ELEVATION =	**115.58**	FT. NGVD		
HIGHEST POINT IN SYSTEM =	**92.50**	FT. NGVD		
INFLUENT PIPE INVERT =	**62.45**	FT. NGVD		
PUMPS OFF ELEVATION =	**54.95**	FT. NGVD		
STATIC HEAD =	**60.63**	FT.		
TOTAL DYNAMIC HEAD =	**159.50**	FT. at	**714.00**	GPM

Kimley»Horn

3660 Maguire Blvd., Suite 200
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Checked by BAL DATE: June 29, 2016
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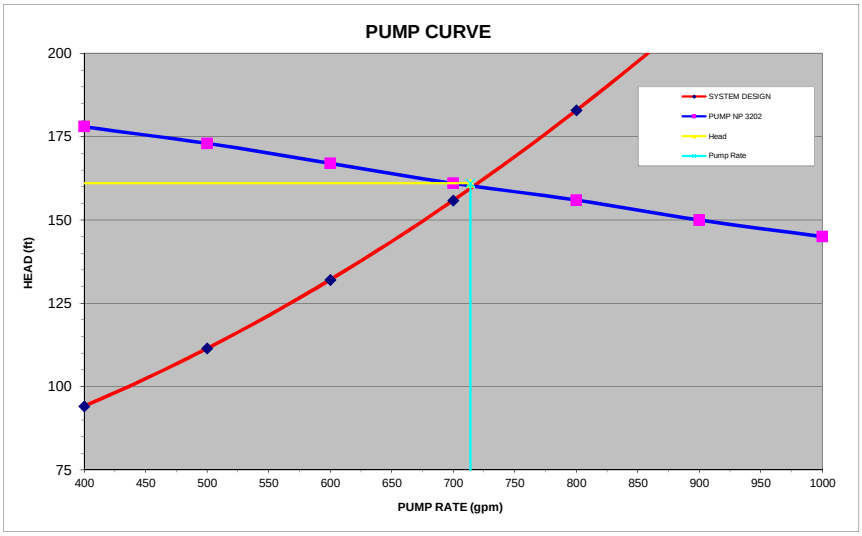
DESIGN HGL / HIGH-HEAD CONDITIONS

E. SYSTEM HEAD CURVE GENERATION (HIGH-HEAD)

SET INITIAL FLOW : **0.0** GPM
SET INCREMENTAL FLOW : **100.0** GPM

FLOW (gpm)	PUMP NP 3202	STATION LOSSES FRICTION	STATION LOSSES MINOR	DISCHARGE F.M. FRICTION	DISCHARGE F.M. MINOR	SYSTEM HEAD
0.0	**203.00**	0.00	0.00	0.00	0.00	**60.63**
100.0	**197.00**	0.03	0.15	2.26	0.09	**63.15**
200.0	**191.00**	0.09	0.58	8.15	0.36	**69.82**
300.0	**184.00**	0.20	1.31	17.26	0.82	**80.21**
400.0	**178.00**	0.34	2.33	29.39	1.45	**94.13**
500.0	**173.00**	0.51	3.63	44.41	2.27	**111.45**
600.0	**167.00**	0.72	5.23	62.22	3.27	**132.07**
700.0	**161.00**	0.96	7.12	82.75	4.45	**155.91**
800.0	**156.00**	1.22	9.30	105.94	5.81	**182.90**
900.0	**150.00**	1.52	11.77	131.74	7.35	**213.01**
1000.0	**145.00**	1.85	14.53	160.09	9.08	**246.17**
1100.0	**140.00**	2.20	17.59	190.96	10.98	**282.36**
1200.0	**134.00**	2.59	20.93	224.31	13.07	**321.52**
1300.0	**129.00**	3.00	24.56	260.11	15.34	**363.64**
1400.0	**126.00**	3.44	28.49	298.33	17.79	**408.68**
1500.0	**121.00**	3.91	32.70	338.94	20.42	**456.61**
1600.0	**116.00**	4.41	37.21	381.93	23.24	**507.41**
1700.0	**111.00**	4.93	42.01	427.26	26.23	**561.05**
1800.0	**107.00**	5.48	47.09	474.91	29.41	**617.52**
1900.0	**101.00**	6.06	52.47	524.87	32.77	**676.79**
2000.0	**97.00**	6.66	58.14	577.11	36.31	**738.85**
2100.0	**90.00**	7.29	64.10	631.63	40.03	**803.67**
2200.0	**0.00**	7.94	70.35	688.40	43.93	**871.25**
2300.0	**0.00**	8.63	76.89	747.40	48.02	**941.56**
2400.0	**0.00**	9.33	83.72	808.63	52.28	**1014.59**
2500.0	**0.00**	10.06	90.84	872.06	56.73	**1090.32**
2600.0	**0.00**	10.82	98.26	937.69	61.36	**1168.75**



PUMP: **NP 3202 HT 3~ 456**

OPERATING CONDITIONS ARE: **714** GPM at **161.00** FT. OF HEAD.

	ADF		PHF		MINIMUM	
INTERVAL OFF =	12.08	MINUTES	3.45	MINUTES		
PUMP RUN TIME =	3.37	MINUTES	11.11	MINUTES	2.63	MINUTES
CYCLE TIME =	15.45	MINUTES	14.56	MINUTES	10.53	MINUTES

RUN-OUT
(LOW HEAD CONDITION)

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Checked by BAL DATE: 6/29/2016
Made by: BSA DATE: 6/29/2016
KHA Project Number: 149581003

PROJECT: **Maitland Concourse North PD**
O.C. PERMIT NO.: **-**

RUN-OUT / LOW HEAD CONDITIONS

A. SANITARY SEWER FLOW

DESIGN PEAK TOTAL FLOW = 544.7 GPM

B. CONTROL ELEVATIONS

WET-WELL DIAMETER: 8.0 FEET.
LOWEST GRAVITY INVERT ELEVATION: 62.45 FT. NGVD

ALARM INTERVAL / ELEVATION:	0.50	ft. =	61.95	FT. NGVD
LAG PUMP INTERVAL / ELEV.:	1.00	ft. =	60.95	FT. NGVD
LEAD PUMP INTERVAL / ELEV.:	1.00	ft. =	59.95	FT. NGVD
SHUTOFF INTERVAL / ELEV.:	5.00	ft. =	54.95	FT. NGVD
WET-WELL BOTTOM / ELEV.:	2.00	ft. =	52.95	FT. NGVD

C. TOTAL DESIGN HEAD CALCULATION/MINOR LOSS DETERMINATION

		STATION LOSSES		DISCHARGE F.M.		Force Main #1	
	FM DIAMETER	6.00	inches.	6.00	inches.	6.00	inches.
	PIPE LENGTH	25.00	feet.	1868.00	feet.	1844.00	feet.
	DESIGN "C" FACTOR	130	DIP	120	PVC	120	PVC
TYPE	COEFFICENT	NUMBER	K TOTAL	NUMBER	K TOTAL	NUMBER	K TOTAL
1. BEND 90	0.30	2	0.60	4	1.20	0	0.00
2. BEND 45	0.23	4	0.92	8	1.84	3	0.69
3. CHECK VALVE	2.50	1	2.50	0	0.00	0	0.00
4. PLUG VALVE	0.90	2	1.80	1	0.90	0	0.00
5. TEE-BRANCH	1.80	0	0.00	0	0.00	1	1.80
6. TEE-STRAIGHT	0.60	2	1.20	1	0.60	0	0.00
7. REDUCER	0.25	1	0.25	0	0.00	1	0.25
8. OUTLET LOSS	1.00	0	0.00	0	0.00	1	1.00
		0	0.00	0	0.00	0	0.00
		0	0.00	0	0.00	0	0.00
		0	0.00	0	0.00	0	0.00
	TOTALS =		7.27		4.54		3.74

D. HEAD LOSS DETERMINATION

	STATION LOSSES		DISCHARGE F.M.		Force Main #1	
DESIGN FLOW	590.0	GPM	590.0	GPM	590.0	GPM
VELOCITY	6.69	FPS	6.69	FPS	6.69	FPS

VELOCITY HEAD	0.70	FEET.	0.70	FEET.	0.70	FEET.
MINOR LOSSES	5.06	FEET.	3.16	FEET.	2.60	FEET.
FRICTION LOSS	0.70	FEET.	60.32	FEET.	59.54	FEET.

ELEVATION @ F.M. TIE-IN =	88.23	FT. NGVD		
PRESSURE @ F.M. TIE-IN =	0.00	PSI		
YDRAULIC GRADE LINE ELEVATION =	88.23	FT. NGVD		
HIGHEST POINT IN SYSTEM =	91.25	FT. NGVD		
INFLUENT PIPE INVERT =	62.45	FT. NGVD		
PUMPS OFF ELEVATION =	54.95	FT. NGVD		
STATIC HEAD =	36.30	FT.		
TOTAL DYNAMIC HEAD =	167.68	FT. at	590.00	GPM

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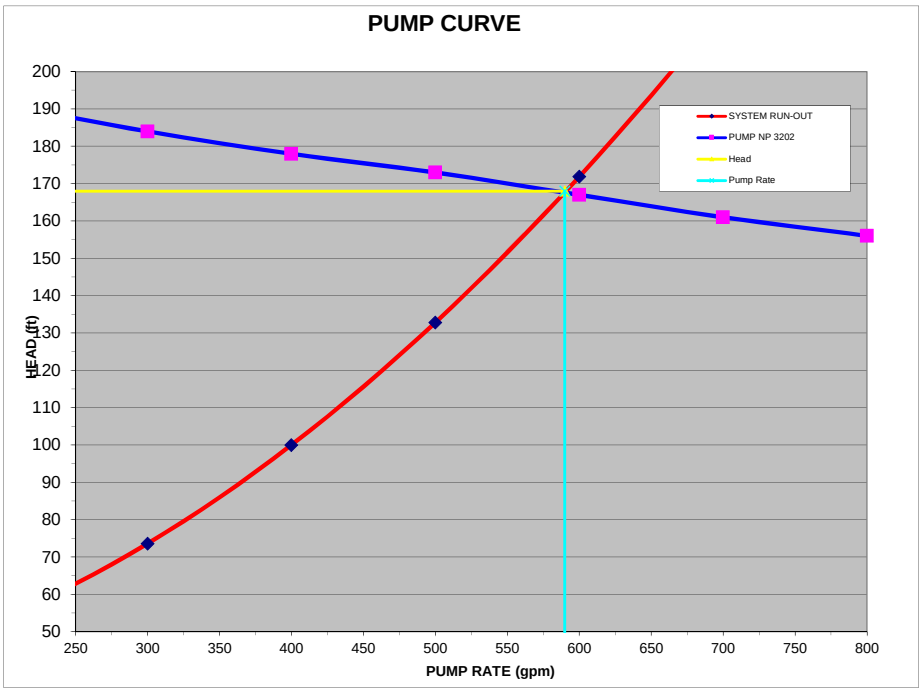
PROJECT: **Maitland Concourse North PD**
O.C. PERMIT NO.: **-**

RUN-OUT / LOW HEAD CONDITIONS

E. SYSTEM HEAD CURVE GENERATION (RUN-OUT)

SET INITIAL FLOW : 0.0 GPM
SET INCREMENTAL FLOW : 100.0 GPM

FLOW (gpm)	PUMP NP 3202	STATION LOSSES FRICTIO	STATION LOSSES MINOR	DISCHARGE F.M. FRICTION	DISCHARGE F.M. MINOR	Force Main #1 FRICTIO	Force Main #1 MINOR	SYSTEM HEAD
0.0	203.00	0.00	0.00	0.00	0.00	0.00	0.00	36.30
100.0	197.00	0.03	0.15	2.26	0.09	2.23	0.07	41.13
200.0	191.00	0.09	0.58	8.15	0.36	8.05	0.30	53.84
300.0	184.00	0.20	1.31	17.26	0.82	17.04	0.67	73.59
400.0	178.00	0.34	2.33	29.39	1.45	29.01	1.20	100.01
500.0	173.00	0.51	3.63	44.41	2.27	43.84	1.87	132.83
600.0	167.00	0.72	5.23	62.22	3.27	61.42	2.69	171.85
700.0	161.00	0.96	7.12	82.75	4.45	81.69	3.66	216.93
800.0	156.00	1.22	9.30	105.94	5.81	104.58	4.79	267.95
900.0	150.00	1.52	11.77	131.74	7.35	130.04	6.06	324.78
1000.0	145.00	1.85	14.53	160.09	9.08	158.03	7.48	387.35
1100.0	140.00	2.20	17.59	190.96	10.98	188.50	9.05	455.58
1200.0	134.00	2.59	20.93	224.31	13.07	221.42	10.77	529.39
1300.0	129.00	3.00	24.56	260.11	15.34	256.77	12.64	608.71
1400.0	126.00	3.44	28.49	298.33	17.79	294.49	14.66	693.50
1500.0	121.00	3.91	32.70	338.94	20.42	334.59	16.82	783.69
1600.0	116.00	4.41	37.21	381.93	23.24	377.02	19.14	879.24
1700.0	111.00	4.93	42.01	427.26	26.23	421.77	21.61	980.10
1800.0	107.00	5.48	47.09	474.91	29.41	468.81	24.23	1086.23
1900.0	101.00	6.06	52.47	524.87	32.77	518.13	26.99	1197.58
2000.0	97.00	6.66	58.14	577.11	36.31	569.70	29.91	1314.13
2100.0	90.00	7.29	64.10	631.63	40.03	623.51	32.98	1435.84



OPERATING CONDITIONS ARE: 590 GPM at 168.00 FT. OF HEAD.

	ADF		PHF		MINIMUM
INTERVAL OFF =	12.08	MINUTES	3.45	MINUTES	

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O.C. PERMIT NO.: **-**

RUN-OUT / LOW HEAD CONDITIONS

PUMP RUN TIME =	4.33	MINUTES	41.53	MINUTES	3.19	MINUTES
CYCLE TIME =	16.41	MINUTES	44.98	MINUTES	12.75	MINUTES

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PROJECT: **Maitland Concourse North PD**

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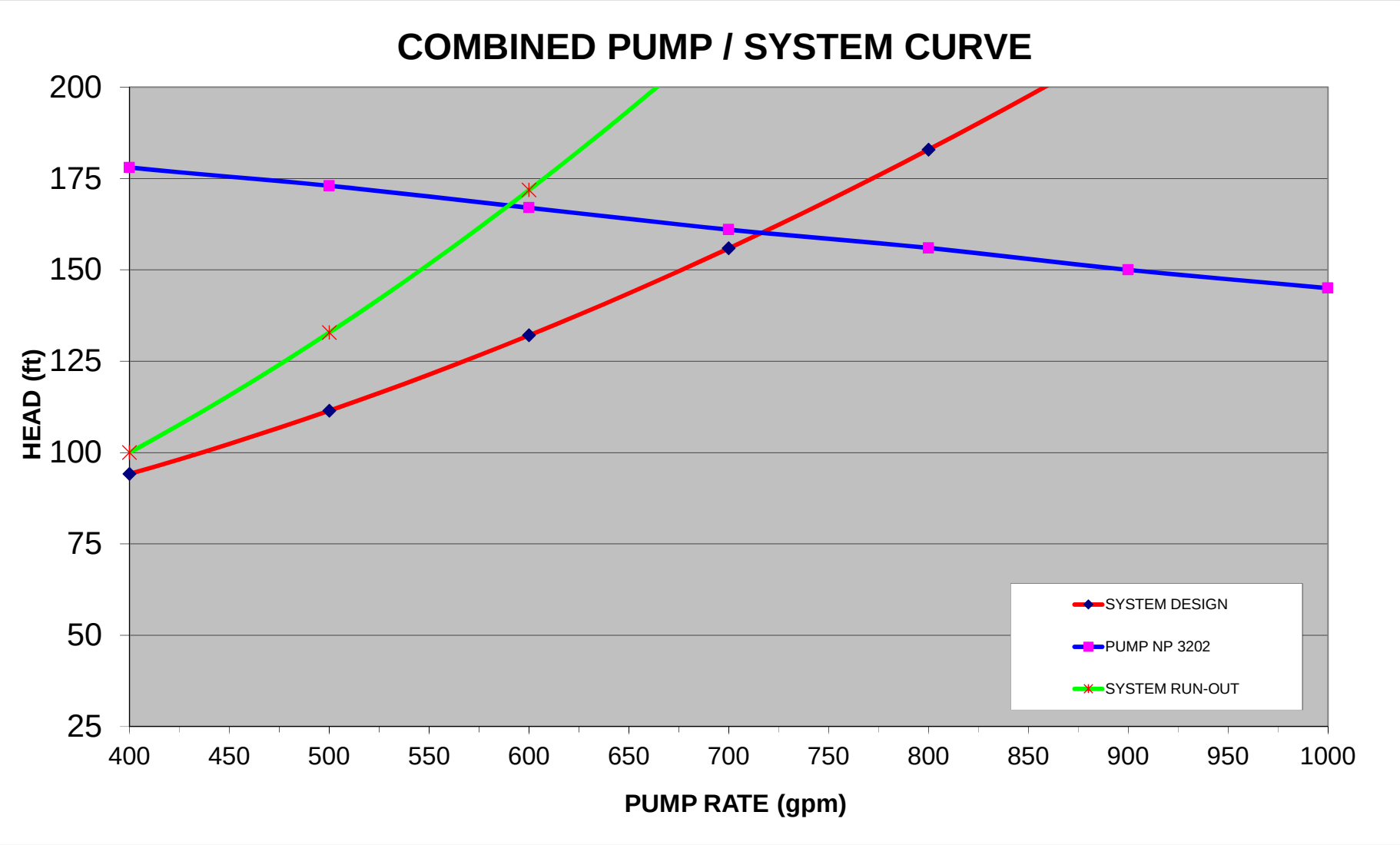
KHA Project Number: 149581003



BOUYANCY (UPLIFT) CALCULATIONS

Kimley»Horn

3660 Maguire Blvd., Suite 200
Orlando, Florida 32803

Checked by BAL DATE: June 29, 2016
Made by: BSA DATE: June 29, 2016
KHA Project Number: 149581003

PROJECT: **Maitland Concourse North PD**
O.C. PERMIT NO.: **-**

LIFT STATION BOUYANCY CALCULATIONS

WET-WELL DIAMETER:	8.0	FEET.
LOWEST GRAVITY INVERT ELEVATION:	62.45	FT. NGVD
ALARM ELEVATION:	61.95	FT. NGVD
LAG PUMP ON ELEV.:	60.95	FT. NGVD
LEAD PUMP ON ELEV.:	59.95	FT. NGVD
PUMP SHUTOFF ELEV.:	54.95	FT. NGVD
WET-WELL BOTTOM ELEV.:	52.95	FT. NGVD

THE TOP OF THE LIFT STATION ELEVATION =	**80.50**	NGVD		
ACCESS COVER DIMENSIONS:	**44.50**	INCHES x	**28.50**	INCHES.
USE A WALL THICKNESS OF	**1.00**	INCHES	(fiberglass)	
USE A BOTTOM SLAB THICKNESS OF	**12.00**	INCHES		
USE A BOTTOM SLAB LIP OF	**20.00**	INCHES (FOR CIRCULAR SLAB)		
CONCRETE DENSITY:	**150.00**	lbs/C.F.		
SOIL DENSITY:	**110.00**	lbs/C.F.		

o CYLINDER:

WEIGHT OF CYLINDER =	0	lbs

o TOP SLAB:

WEIGHT OF TOP SLAB =	0	lbs	(Assume no weight for factor of safety)

o BOTTOM SLAB (CIRCULAR):

AREA OF SLAB WITH A LIP =	103.87	S.F.
x SLAB THICKNESS =	1.00	FT.
VOLUME OF BOTTOM SLAB =	103.87	CF
x	150	lbs/C.F.
WEIGHT OF BOTTOM SLAB =	15,580	lbs

o SOIL ABOVE LIP:

AREA out=	103.87	S.F.
- AREA in =	52.38	S.F.
	51.49	S.F. OF SOIL/L.F. OF DEPTH
	51.49	S.F. OF SOIL/L.F. OF DEPTH
x	27.47	FT. OF CYLINDER DEPTH
	1414.18	C.F. OF SOIL
x	110	lbs/CF OF SOIL
WEIGHT OF SOIL =	155,560	lbs

TOTAL DOWNWARD FORCES = 171,140 lbs

THE TOTAL VOLUME OF WATER TO THE TOP OF THE LIFT STATION IS:

AREA out=	52.38	S.F.
x	27.55	FT. (TOTAL WET-WELL DEPTH)
VOLUME of Cylinder =	1443.12	C.F. OF FIBERGLASS WET-WELL
VOLUME of Bottom-slab =	103.87	C.F. OF CONCRETE
	1546.98	C.F. OF WATER DISPLACED
x	62.4	lbs/C.F. OF WATER
TOTAL UPLIFT FORCES =	**96,532**	**lbs**

FACTOR OF SAFETY = 1.77 > 1.5

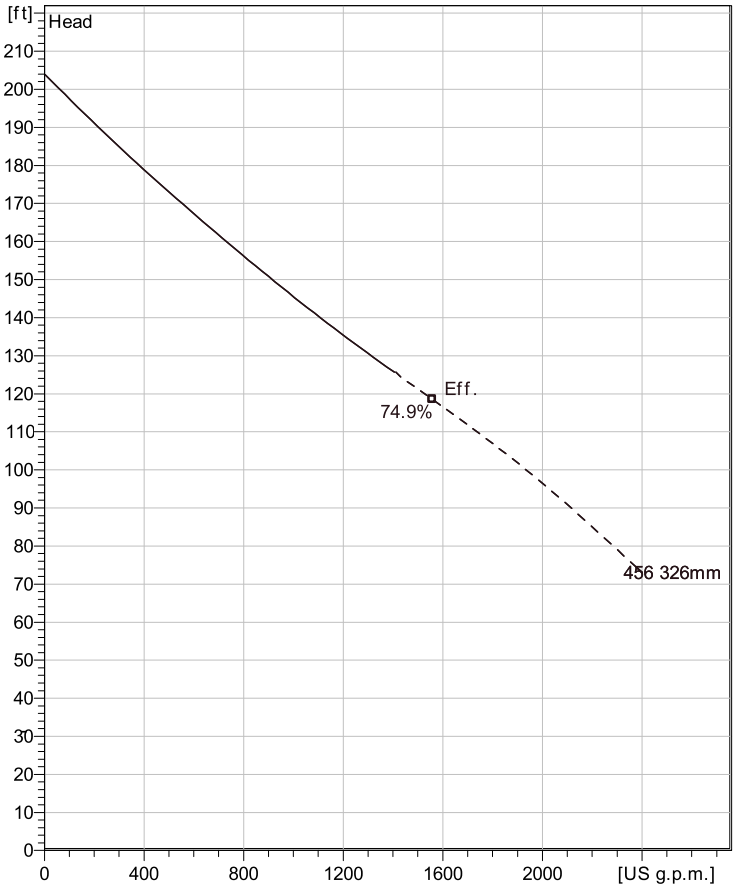
THE PROPOSED LIFT STATION IS OK AS DESIGNED AND WILL NOT BE UPLIFTED DUE TO WATER PRESSURES.
ADDITIONALLY, THE ADDED DEAD LOADS WITHIN THE LIFT STATION WERE NOT CONSIDERED.
THUS, AN ADDED DEGREE OF SAFETY AGAINST UPLIFT IS INHERENT.

APPENDIX C

PUMP SPECIFICATIONS

NP 3202 HT 3~ 456

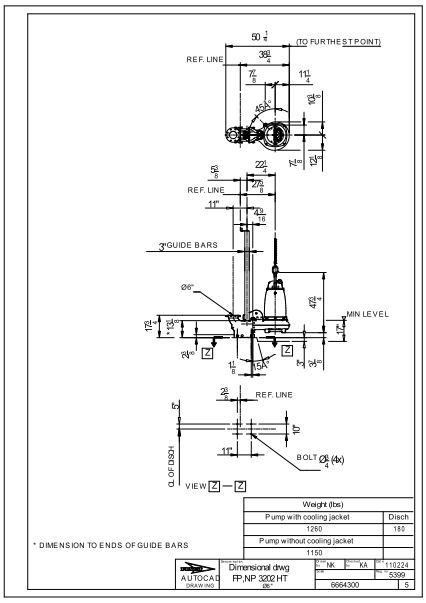
Technical specification



Water, pure *Curve ISO*

Note: Picture might not correspond to the current configuration.

Installation: P - Semi permanent, Wet



General

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Impeller

Impeller material	Grey cast iron
Discharge Flange Diameter	5 7/8 inch
Inlet diameter	5 7/8 inch
Impeller diameter	326 mm
Number of blades	2

Motor

Motor #	N3202.180 30-24-4AA-W 60hp
Stator variant	7
Frequency	60 Hz
Rated voltage	380 V
Number of poles	4
Phases	3~
Rated power	60 hp
Rated current	82 A
Starting current	530 A
Rated speed	1770 rpm
Power factor	
1/1 Load	0.90
3/4 Load	0.88
1/2 Load	0.81
Efficiency	
1/1 Load	91.5 %
3/4 Load	92.0 %
1/2 Load	92.0 %

Configuration

Project	Project ID	Created by	Created on	Last update
			2016-05-23	

NP 3202 HT 3~ 456

Performance curve

Pump

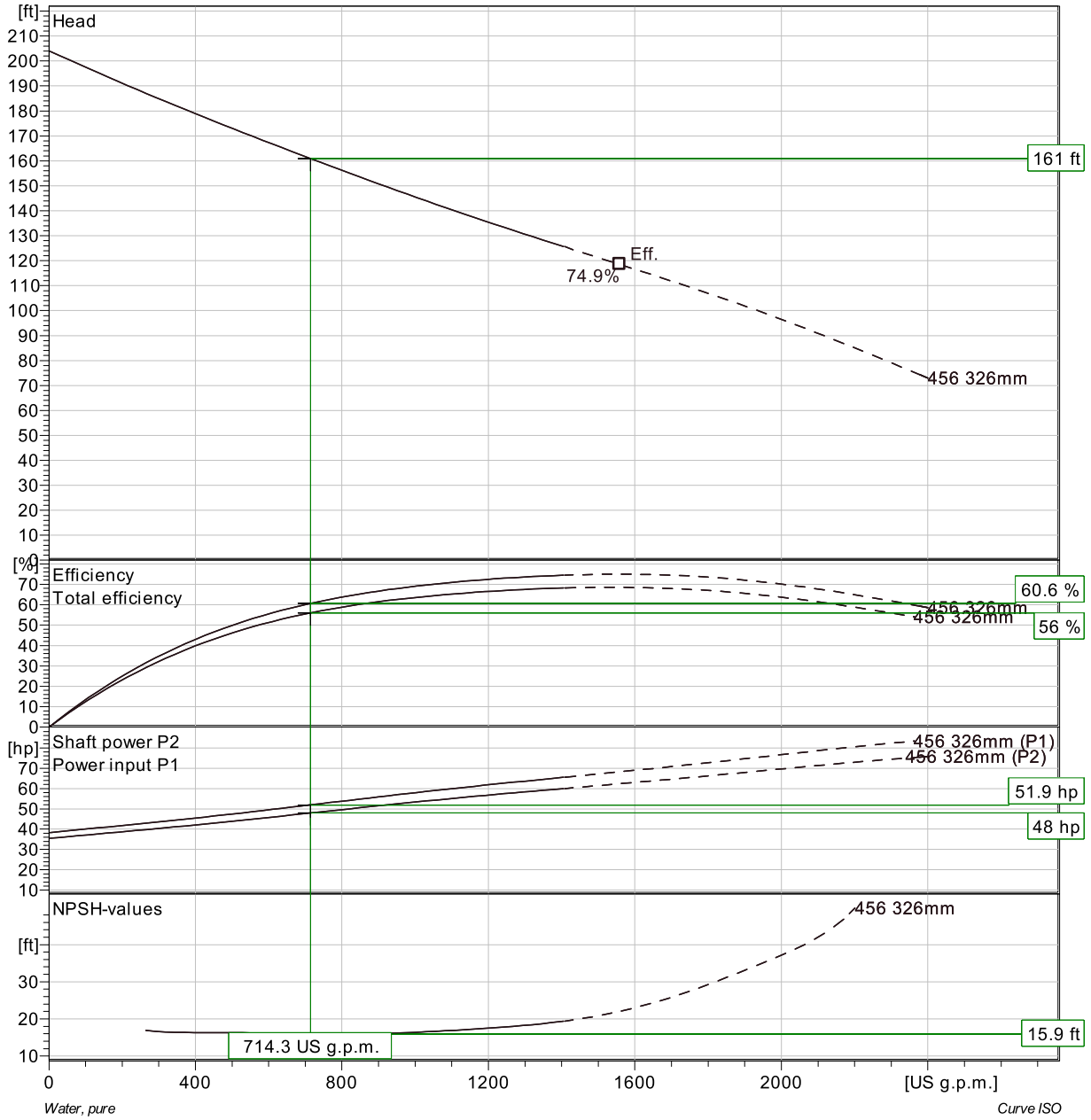
Discharge Flange Diameter	5 7/8 inch
Inlet diameter	150 mm
Impeller diameter	12 13/16"
Number of blades	2

Motor

Motor #	N3202.180 30-24-4AA-W 60hp
Stator variant	7
Frequency	60 Hz
Rated voltage	380 V
Number of poles	4
Phases	3~
Rated power	60 hp
Rated current	82 A
Starting current	530 A
Rated speed	1770 rpm

Power factor	
1/1 Load	0.90
3/4 Load	0.88
1/2 Load	0.81

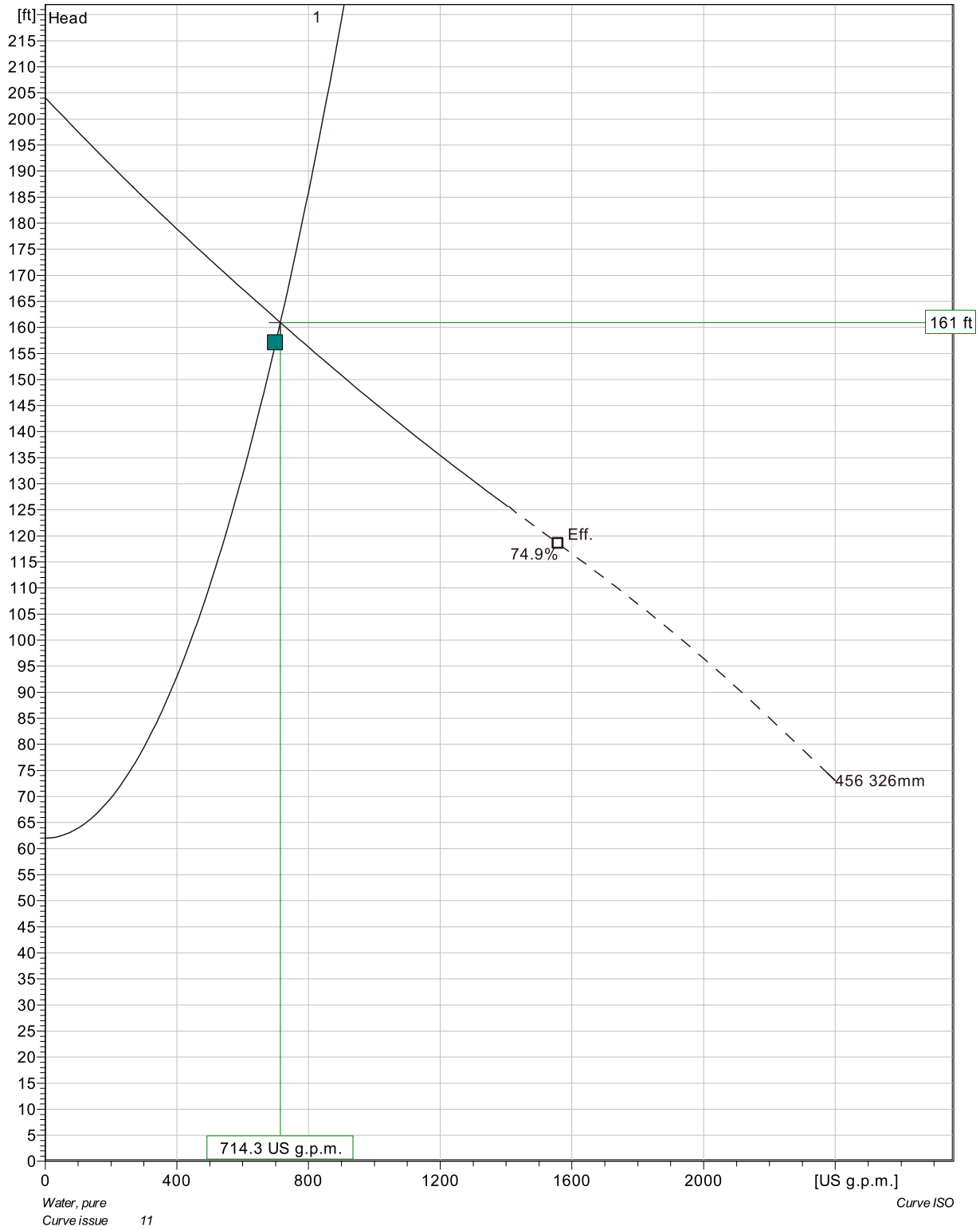
Efficiency	
1/1 Load	91.5 %
3/4 Load	92.0 %
1/2 Load	92.0 %



Project	Project ID	Created by	Created on	Last update
			2016-05-23	

NP 3202 HT 3~ 456

Duty Analysis

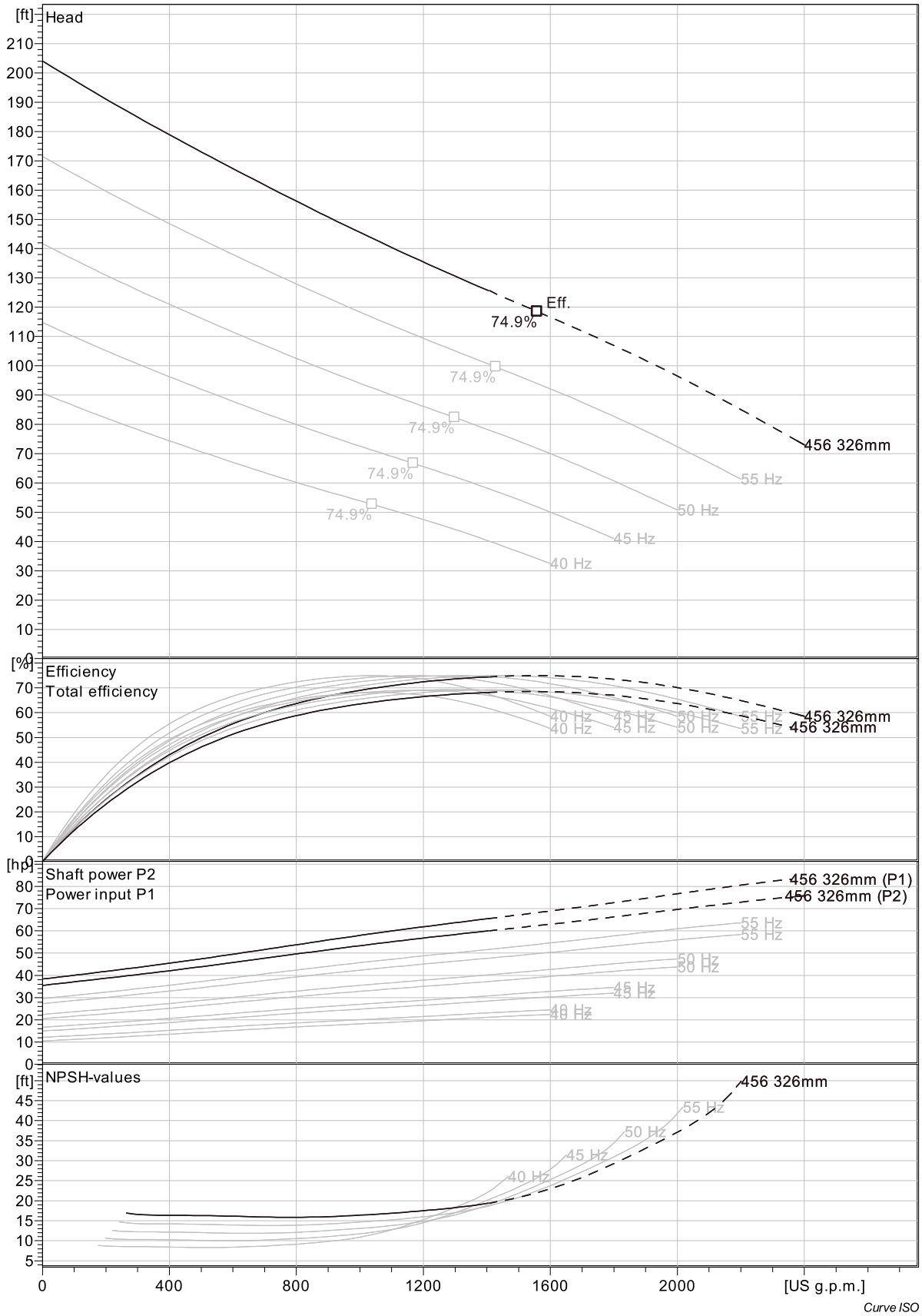


Pumps running /System	Individual pump Flow	Head	Shaft power	Total Flow	Head	Shaft power	Pump eff.	Specific energy	NPSHre
1	714 US g.p.m.	161 ft	48 hp	714 US g.p.m.	161 ft	48 hp	60.6 %	904 kWh/US MG	15.9 ft

Project	Project ID	Created by	Created on	Last update
			2016-05-23	

NP 3202 HT 3~ 456

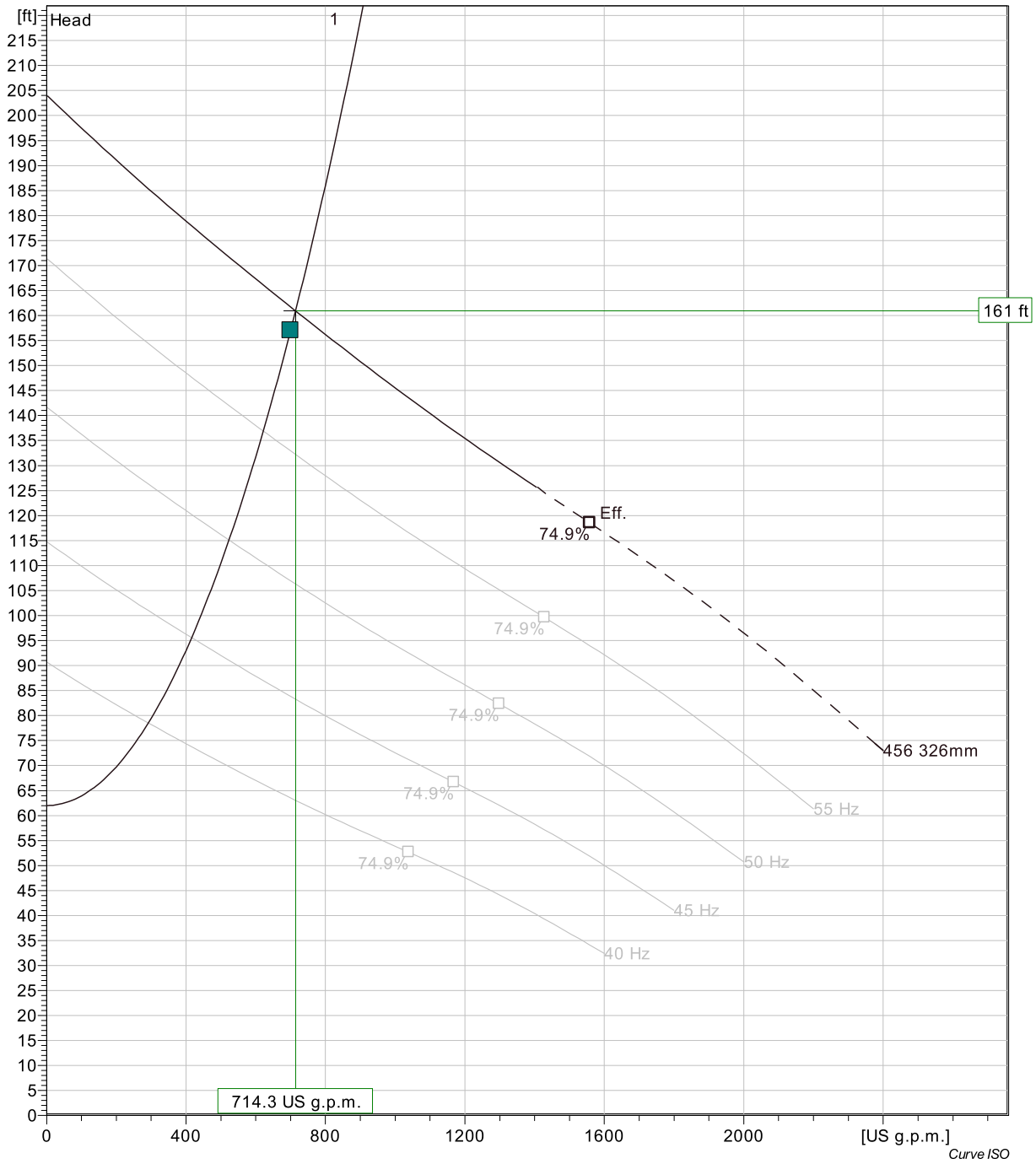
VFD Curve



Project	Project ID	Created by	Created on	Last update
			2016-05-23	

NP 3202 HT 3~ 456

VFD Analysis

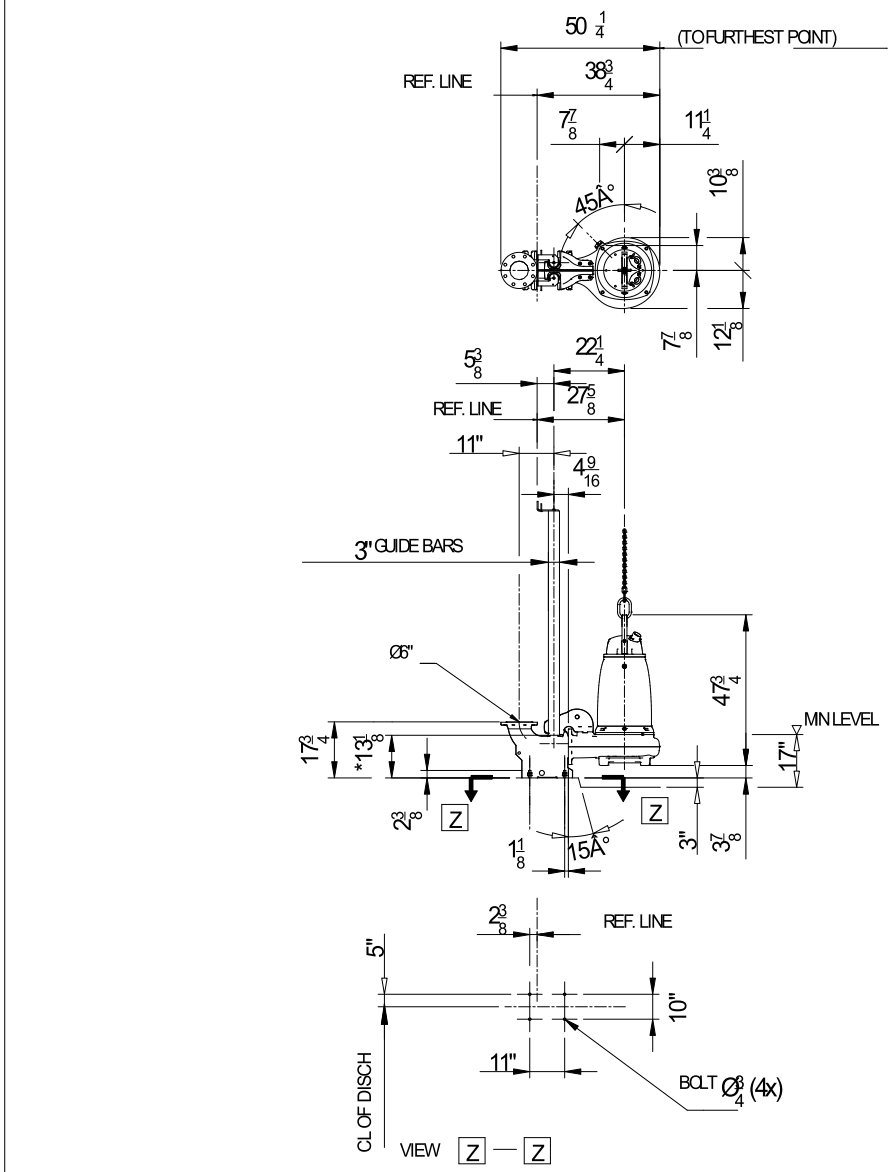


Pumps running /System	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hyd eff.	Specific energy	NPSHre
1	60 Hz	714 US g.p.m.	161 ft	48 hp	714 US g.p.m.	161 ft	48 hp	60.6 %	904 kWh/US MG	15.9 ft
1	55 Hz	622 US g.p.m.	137 ft	36.4 hp	622 US g.p.m.	137 ft	36.4 hp	59.1 %	786 kWh/US MG	13.9 ft
1	50 Hz	523 US g.p.m.	115 ft	26.8 hp	523 US g.p.m.	115 ft	26.8 hp	56.9 %	690 kWh/US MG	12 ft
1	45 Hz	416 US g.p.m.	95.6 ft	18.9 hp	416 US g.p.m.	95.6 ft	18.9 hp	53.1 %	622 kWh/US MG	10.2 ft
1	40 Hz	292 US g.p.m.	78.5 ft	12.7 hp	292 US g.p.m.	78.5 ft	12.7 hp	45.8 %	612 kWh/US MG	8.54 ft

Project	Project ID	Created by	Created on	Last update
			2016-05-23	

NP 3202 HT 3~ 456

Dimensional drawing



Weight (lbs)	
Pump with cooling jacket	Disch
1260	180
Pump without cooling jacket	
1150	

* DIMENSION TO ENDS OF GUIDE BARS

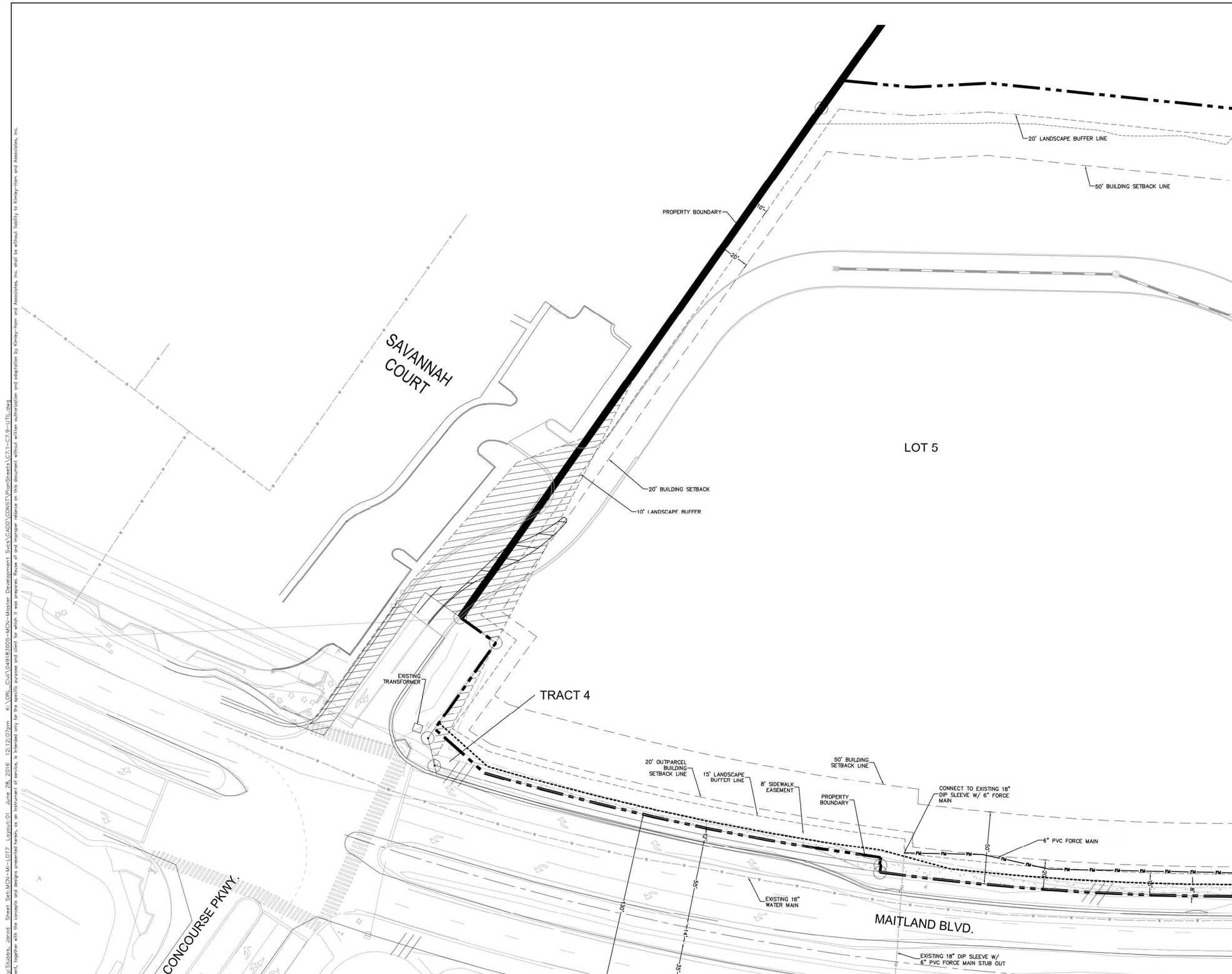
AUTOCAD DRAWING	Denomination: Dimensional dwg FP,NP 3202 HT Ø6"	Drawn by NK	Checked by KA	Date 110224
		Scale		Reg no 5399
		6664300		5

Project	Project ID	Created by	Created on	Last update
			23.05.2016	

APPENDIX D

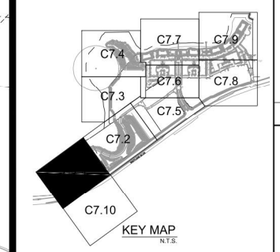
UTILITY PLAN SHEETS

LIFTSTATION DETAIL SHEET



NORTH

GRAPHIC SCALE IN FEET
0 15 30 60



KEY MAP
N.T.S.

MATCHLINE, SEE SHEET C7.2

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

1. UTILITY CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS AND DOCUMENTATION AS REQUIRED BY THE CITY OF MAITLAND.

2. BUILDING CONSTRUCTION WILL BE PHASED. PHASING PLAN SHALL BE PROVIDED AT A LATER DATE ONCE CONSTRUCTION SEQUENCE HAS BEEN DETERMINED.

No.	REVISIONS	DATE	BY

Kimley»Horn
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PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA 00000696

LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM
DATE:

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.1

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:01 June 28, 2016 12:12:07pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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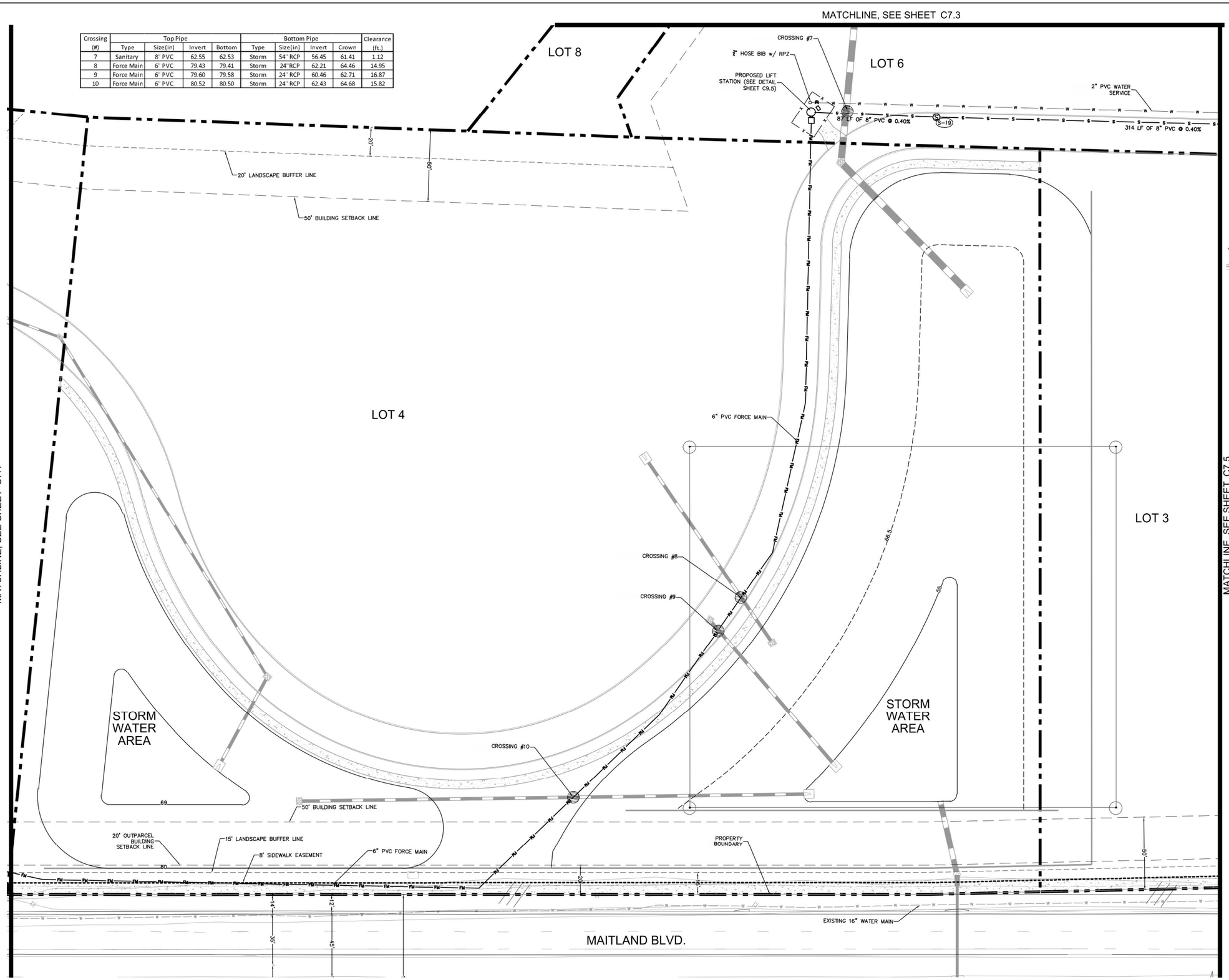
Crossing	Top Pipe				Bottom Pipe				Clearance
(#)	Type	Size(in)	Invert	Bottom	Type	Size(in)	Invert	Crown	(ft.)
7	Sanitary	8" PVC	62.55	62.53	Storm	54" RCP	56.45	61.41	1.12
8	Force Main	6" PVC	79.43	79.41	Storm	24" RCP	62.21	64.46	14.95
9	Force Main	6" PVC	79.60	79.58	Storm	24" RCP	60.46	62.71	16.87
10	Force Main	6" PVC	80.52	80.50	Storm	24" RCP	62.43	64.68	15.82



LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

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2. BUILDING CONSTRUCTION WILL BE PHASED. PHASING PLAN SHALL BE PROVIDED AT A LATER DATE ONCE CONSTRUCTION SEQUENCE HAS BEEN DETERMINED.

SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-19	SANITARY MANHOLE TOP: 81.90 NE. INV IN: 62.89 SW. INV OUT: 62.79

No.	REVISIONS	DATE	BY

Kimley»Horn
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PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA 00000696

LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 75537
DATE: ____

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.2

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:02 June 28, 2016 12:12:33pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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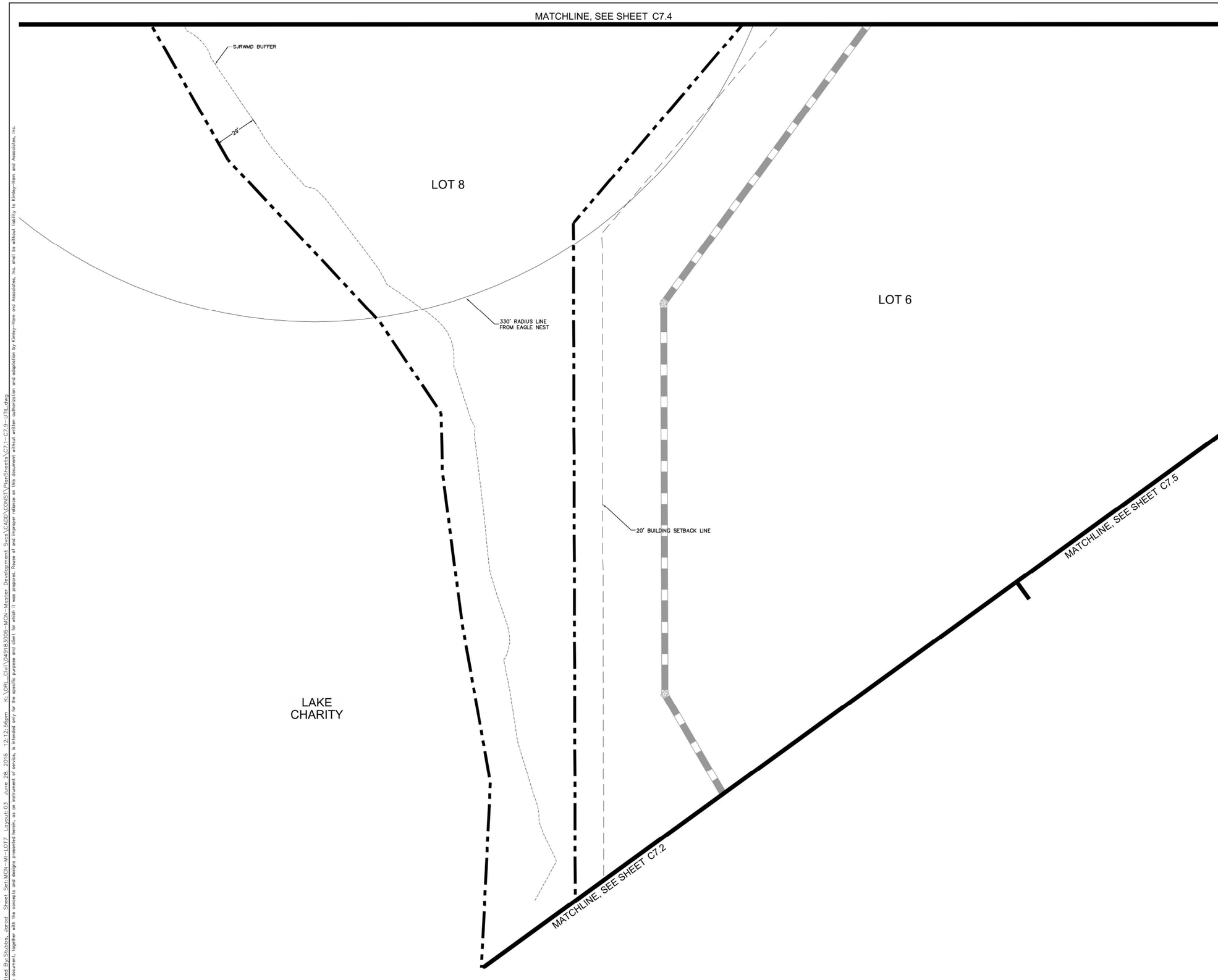

NORTH

GRAPHIC SCALE IN FEET
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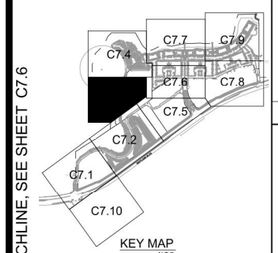

KEY MAP
N.T.S.

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

1. UTILITY CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS AND DOCUMENTATION AS REQUIRED BY THE CITY OF MAITLAND.

2. BUILDING CONSTRUCTION WILL BE PHASED. PHASING PLAN SHALL BE PROVIDED AT A LATER DATE ONCE CONSTRUCTION SEQUENCE HAS BEEN DETERMINED.

No.	REVISIONS	DATE	BY

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LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537
DATE: ____

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.3

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:03 June 28, 2016 12:12:56pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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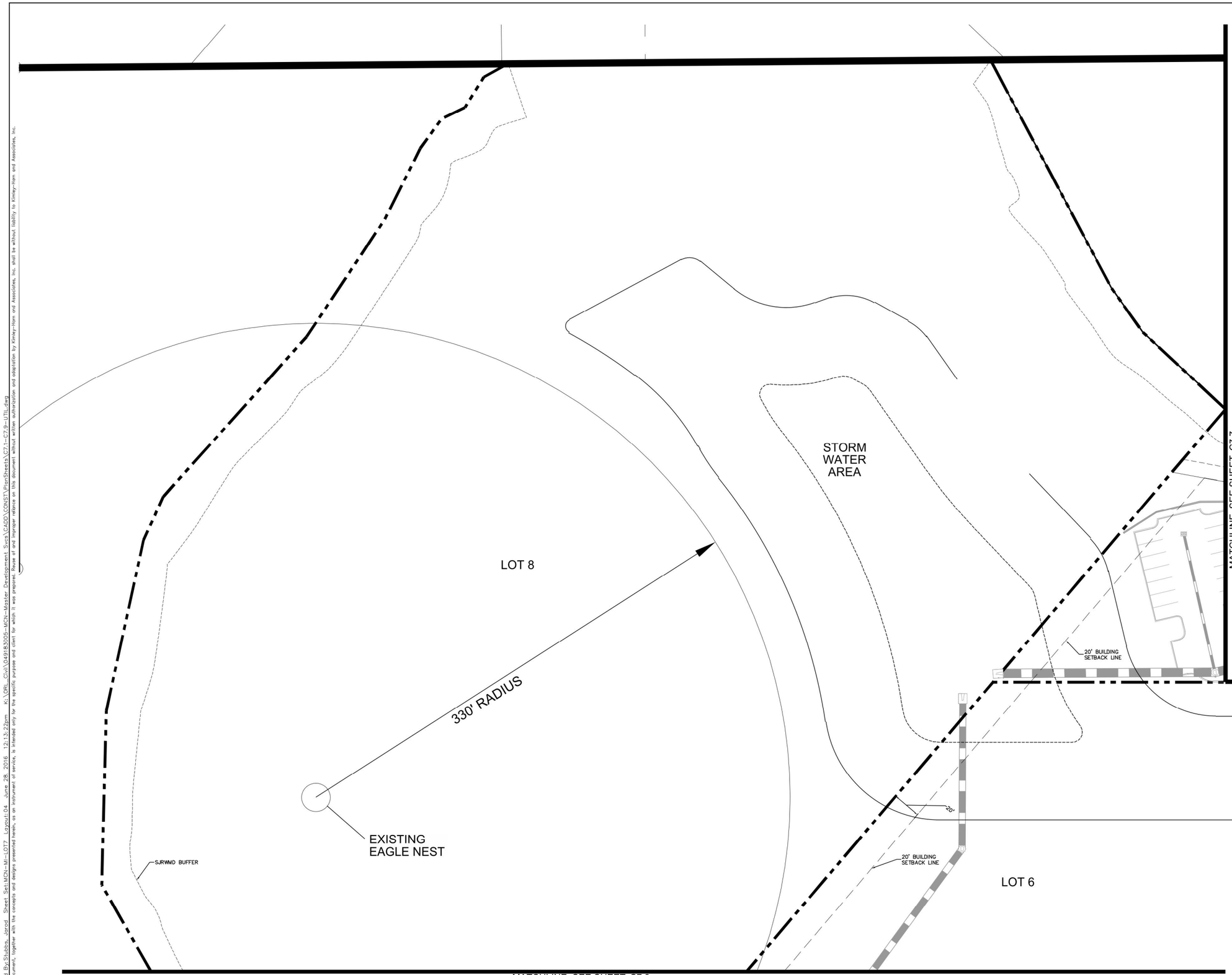

NORTH

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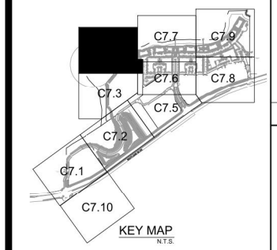

KEY MAP
N.T.S.

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
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- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
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- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

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LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM
DATE: ____

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.4

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:04 June 28, 2016 12:13:22pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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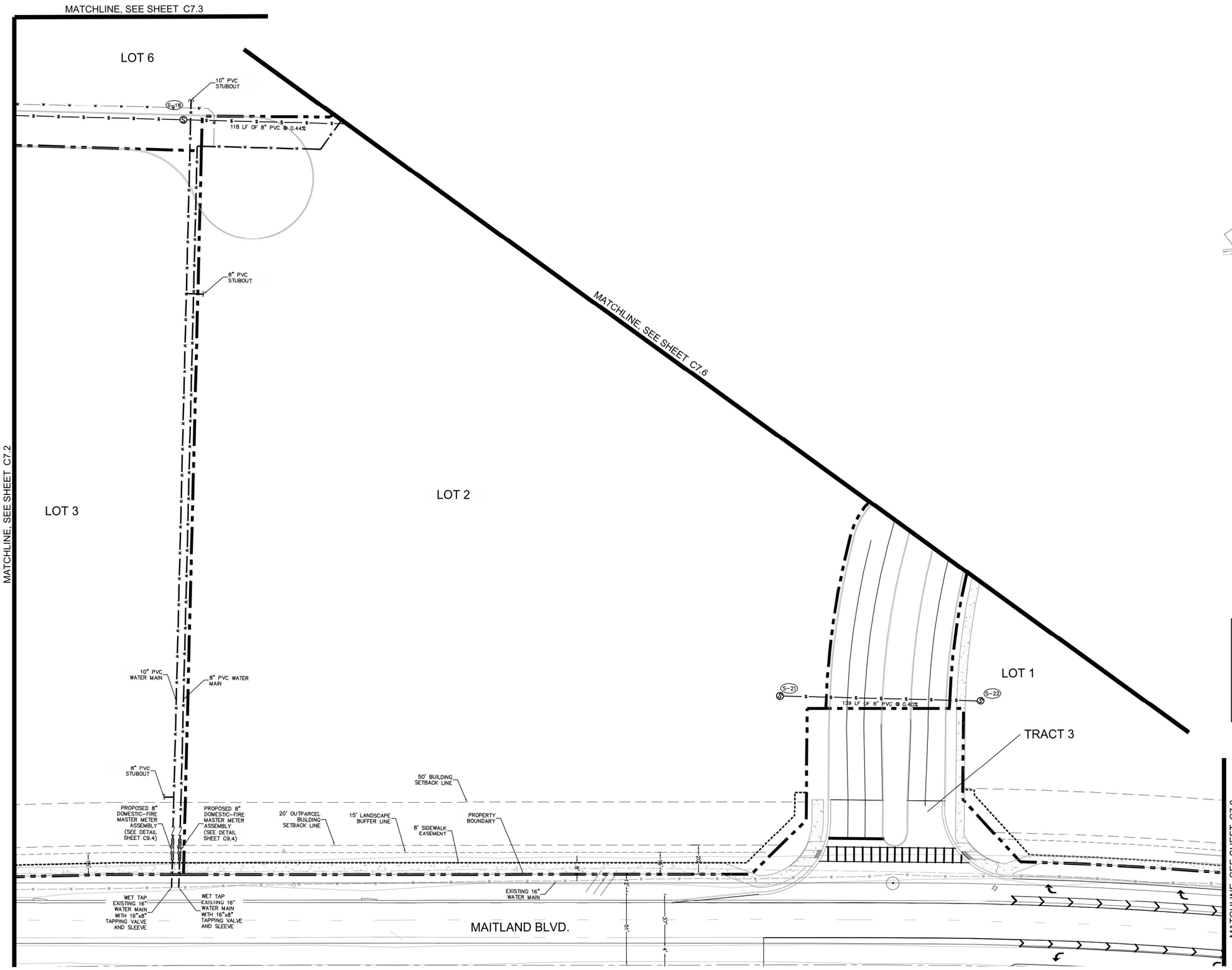

NORTH

GRAPHIC SCALE IN FEET
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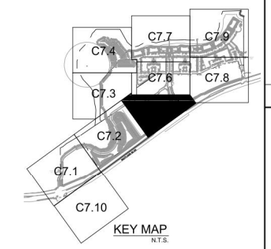

KEY MAP
N.T.S.

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
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- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

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SANITARY SEWER STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
S-18	SANITARY MANHOLE TOP: 89.06 NE. INV IN: 64.25 SW. INV OUT: 64.15
S-21	SANITARY MANHOLE TOP: 92.50 NE. INV IN: 85.44
S-22	SANITARY MANHOLE TOP: 92.50 SW. INV OUT: 86.00

No.	REVISIONS	DATE	BY

Kimley»Horn
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BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 75537
DATE: ____

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.5

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:05 June 28, 2016 12:13:52pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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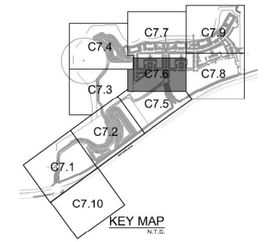
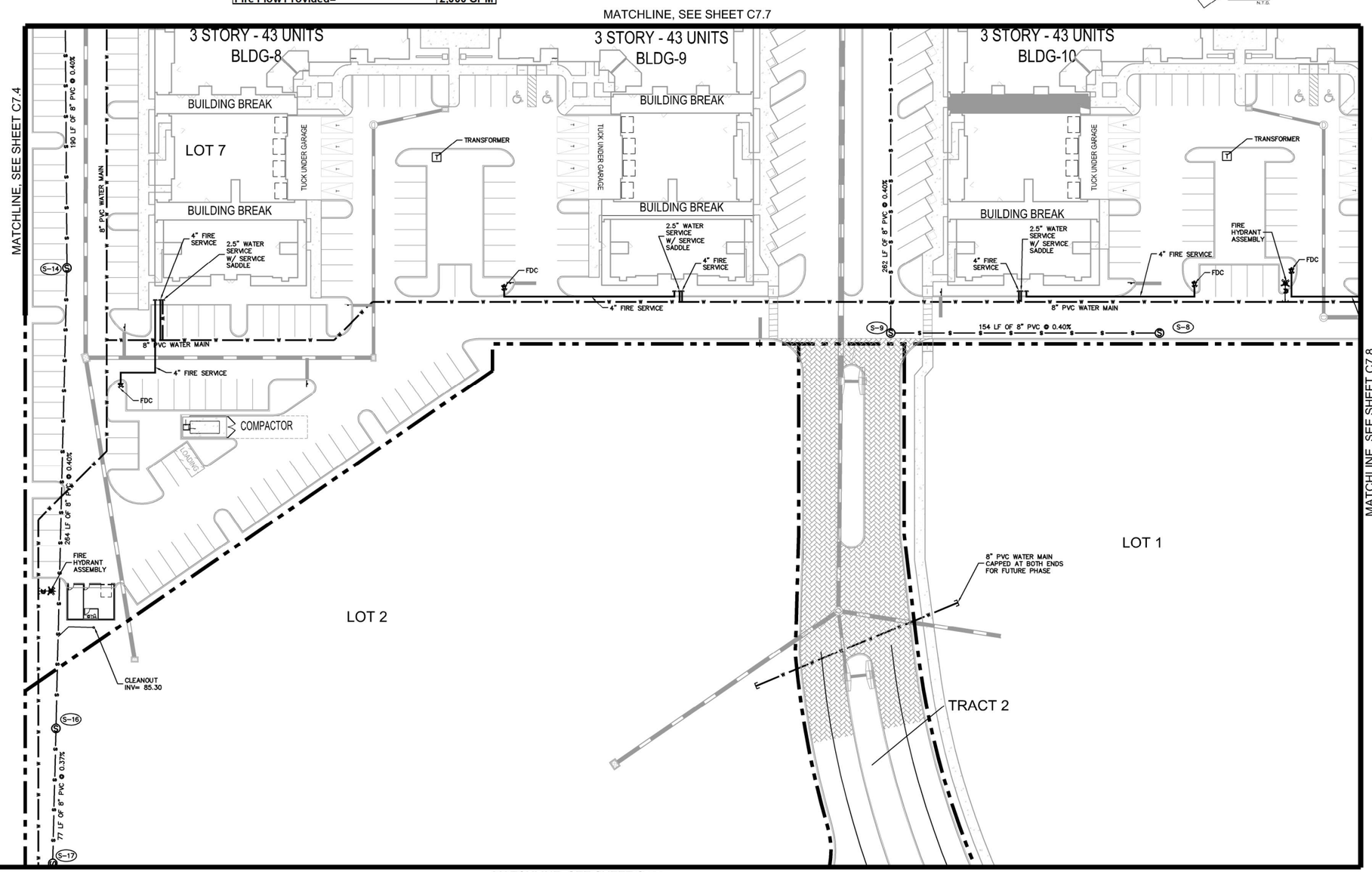
MULTIFAMILY BUILDING "8" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	57,024 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

MULTIFAMILY BUILDING "9" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	57,024 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

MULTIFAMILY BUILDING "10" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	57,024 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	**DETAILS:**
S-8	SANITARY MANHOLE TOP: 85.64 W. INV OUT: 70.77
S-9	SANITARY MANHOLE TOP: 86.31 E. INV IN: 70.16 N. INV OUT: 70.06
S-14	SANITARY MANHOLE TOP: 84.84 N. INV IN: 66.40 S. INV OUT: 66.30
S-16	SANITARY MANHOLE TOP: 89.02 NE. INV IN: 76.65 N. INV IN: 65.25 S. INV OUT: 65.15
S-17	SANITARY MANHOLE TOP: 90.13 N. INV IN: 64.86 SW. INV OUT: 64.76





NORTH

GRAPHIC SCALE IN FEET
0 15 30 60

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

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No.	REVISIONS	DATE	BY

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LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM
DATE: ____

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.6

Plotted By:Ramsburg, Derek Sheet Set:MCN-MI-LOT7 Layout:06 June 28, 2016 03:37:54pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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MULTIFAMILY BUILDING "5" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

CLUB HOUSE NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	3365 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	1,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

POOL HOUSE NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	3365 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	1,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

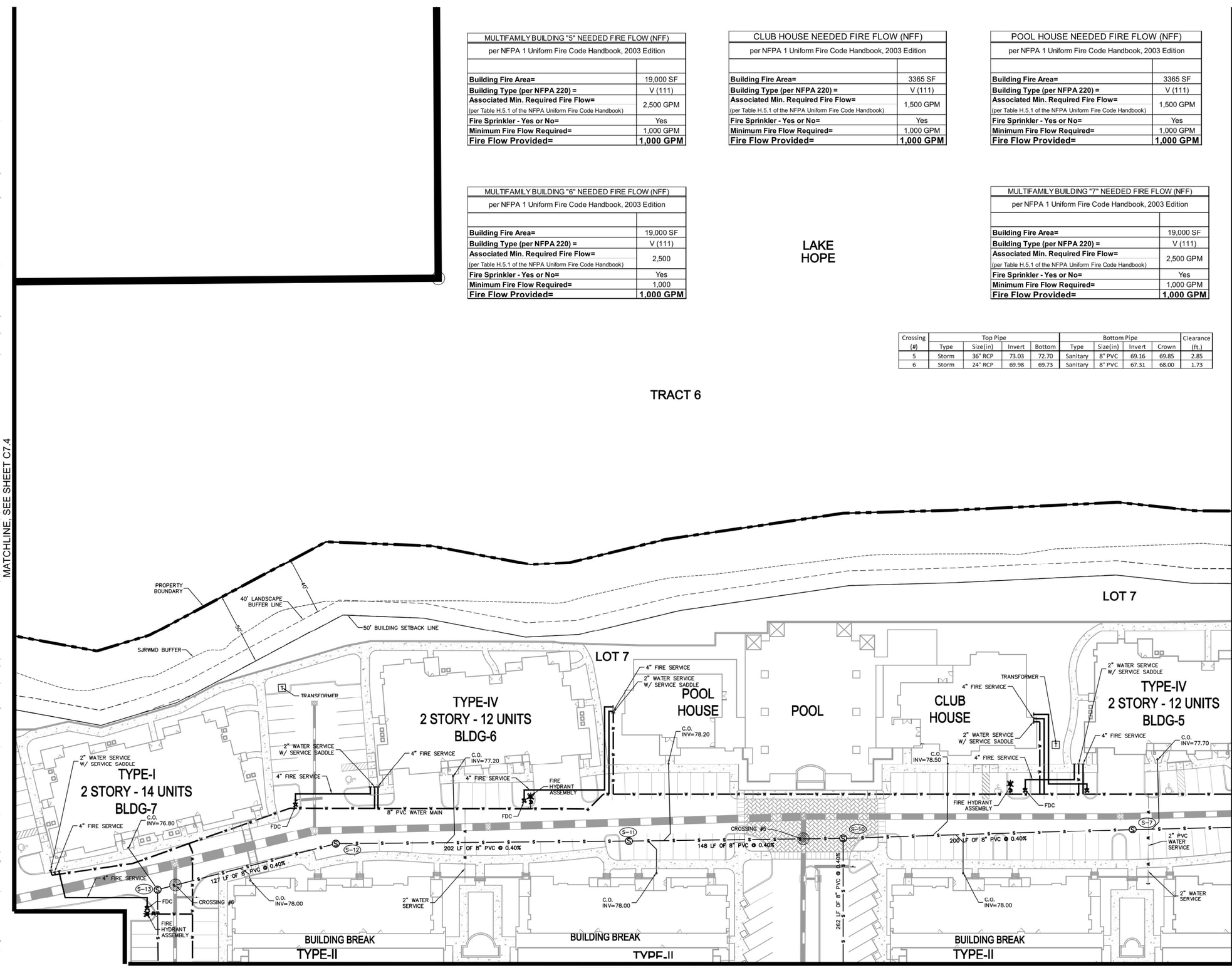
MULTIFAMILY BUILDING "6" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000
Fire Flow Provided=	**1,000 GPM**

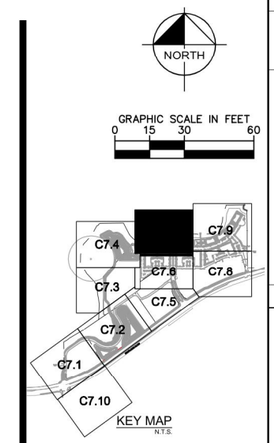
LAKE HOPE

MULTIFAMILY BUILDING "7" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

Crossing	Top Pipe				Bottom Pipe				Clearance
(#)	Type	Size(in)	Invert	Bottom	Type	Size(in)	Invert	Crown	(ft.)
5	Storm	36" RCP	73.03	72.70	Sanitary	8" PVC	69.16	69.85	2.85
6	Storm	24" RCP	69.98	69.73	Sanitary	8" PVC	67.31	68.00	1.73

TRACT 6





LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
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- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
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SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-7	SANITARY MANHOLE TOP: 79.76 E. INV IN: 70.37 W. INV OUT: 70.27
S-10	SANITARY MANHOLE TOP: 81.29 E. INV IN: 69.47 S. INV IN: 69.01 W. INV OUT: 69.37
S-11	SANITARY MANHOLE TOP: 80.77 E. INV IN: 68.78 W. INV OUT: 68.68
S-12	SANITARY MANHOLE TOP: 80.38 E. INV IN: 67.87 W. INV OUT: 67.77
S-13	SANITARY MANHOLE TOP: 79.52 E. INV IN: 67.26 S. INV OUT: 67.16

MATCHLINE, SEE SHEET C7.9

MATCHLINE, SEE SHEET C7.4

MATCHLINE, SEE SHEET C7.6

MATCHLINE, SEE SHEET C7.8

No.	REVISIONS	DATE	BY

Kimley»Horn
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LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537
DATE:

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
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DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.7

Plotted By:Ramsburg, Derek Sheet Set:MCN-MI-L077 Layout:07 June 28, 2016 03:45:22pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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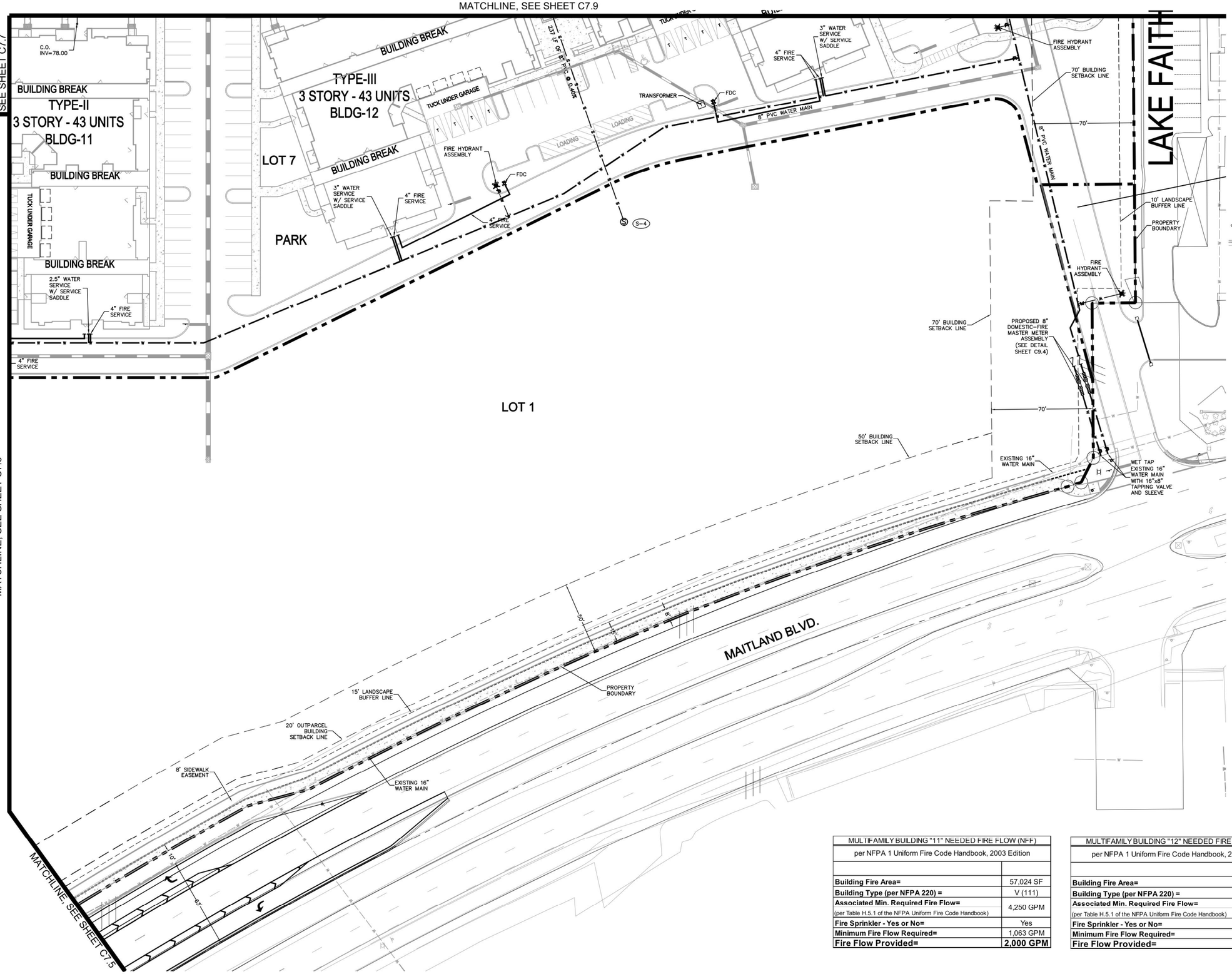
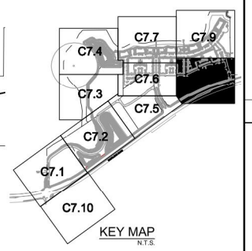


NORTH

GRAPHIC SCALE IN FEET
0 15 30 60



KEY MAP
N.T.S.

LEGEND

- EXISTING SANITARY MAIN
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SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-4	SANITARY MANHOLE TOP: 85.23 N. INV OUT: 73.42

MULTIFAMILY BUILDING "11" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	57,024 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

MULTIFAMILY BUILDING "12" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	54,723 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.8

Plotted By:Ramsburg, Derek Sheet Set:MCN-MI-L07 Layout:08 June 28, 2016 03:42:20pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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MULTIFAMILY BUILDING "1" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

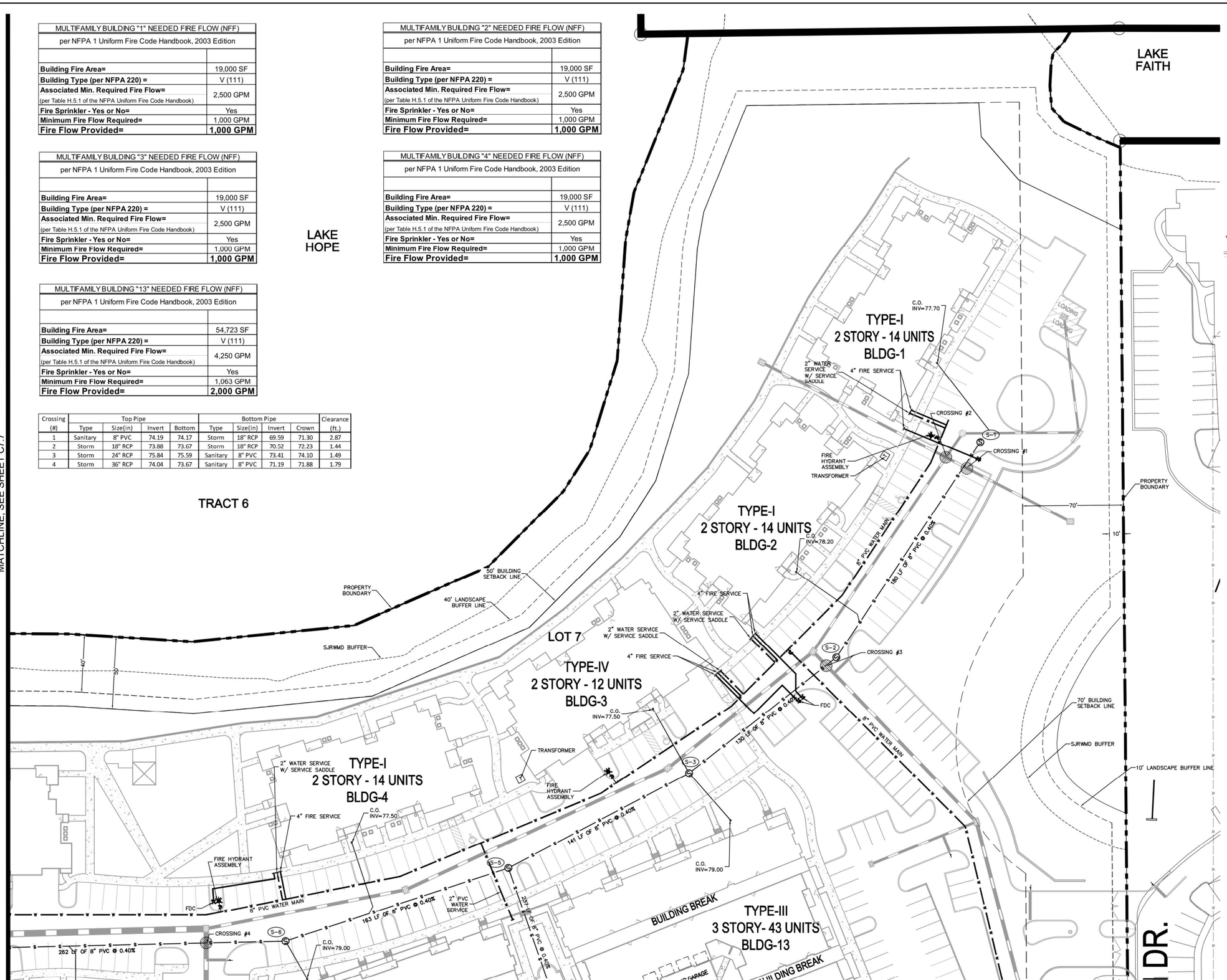
MULTIFAMILY BUILDING "2" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

MULTIFAMILY BUILDING "3" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

MULTIFAMILY BUILDING "4" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	19,000 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	2,500 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,000 GPM
Fire Flow Provided=	**1,000 GPM**

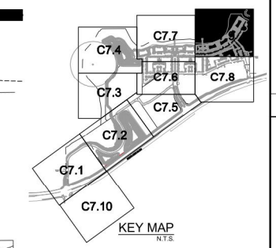
MULTIFAMILY BUILDING "13" NEEDED FIRE FLOW (NFF)	
per NFPA 1 Uniform Fire Code Handbook, 2003 Edition	
Building Fire Area=	54,723 SF
Building Type (per NFPA 220) =	V (111)
Associated Min. Required Fire Flow= (per Table H.5.1 of the NFPA Uniform Fire Code Handbook)	4,250 GPM
Fire Sprinkler - Yes or No=	Yes
Minimum Fire Flow Required=	1,063 GPM
Fire Flow Provided=	**2,000 GPM**

Crossing	Top Pipe				Bottom Pipe				Clearance
(#)	Type	Size(in)	Invert	Bottom	Type	Size(in)	Invert	Crown	(ft.)
1	Sanitary	8" PVC	74.19	74.17	Storm	18" RCP	69.59	71.30	2.87
2	Storm	18" RCP	73.88	73.67	Storm	18" RCP	70.52	72.23	1.44
3	Storm	24" RCP	75.84	75.59	Sanitary	8" PVC	73.41	74.10	1.49
4	Storm	36" RCP	74.04	73.67	Sanitary	8" PVC	71.19	71.88	1.79



NORTH

GRAPHIC SCALE IN FEET
0 15 30 60



KEY MAP
N.T.S.

LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELE.COMM. LINE
- EXISTING OVERHEAD LINE
- EXISTING FIBER OPTIC LINE
- EXISTING NATURAL GAS LINE
- EXISTING STORM PIPE
- PROPOSED WATER LINE
- PROPOSED POTABLE WATER SERVICE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM PIPE
- PROPOSED FORCE MAIN
- PROPOSED STORM INLET

NOTES:

1. UTILITY CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS AND DOCUMENTATION AS REQUIRED BY THE CITY OF MAITLAND.

2. BUILDING CONSTRUCTION WILL BE PHASED. PHASING PLAN SHALL BE PROVIDED AT A LATER DATE ONCE CONSTRUCTION SEQUENCE HAS BEEN DETERMINED.

SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-1	SANITARY MANHOLE TOP: 78.58 SW. INV OUT: 74.27
S-2	SANITARY MANHOLE TOP: 79.25 NE. INV IN: 73.55 SW. INV OUT: 73.45
S-3	SANITARY MANHOLE TOP: 79.21 NE. INV IN: 72.93 SW. INV OUT: 72.83
S-5	SANITARY MANHOLE TOP: 79.85 NE. INV IN: 72.26 S. INV IN: 72.47 W. INV OUT: 72.16
S-6	SANITARY MANHOLE TOP: 79.79 E. INV IN: 71.51 W. INV OUT: 71.41

No.	REVISIONS	DATE	BY

Kimley»Horn

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LICENSED PROFESSIONAL
BRENT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537
DATE:

KHA PROJECT 049183005
DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.9

Plotted By:Ramsburg, Derek Sheet Set:MCN-MI-L017 Layout:09 June 28, 2016 03:44:47pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C7.1-C7.9-UTIL.dwg
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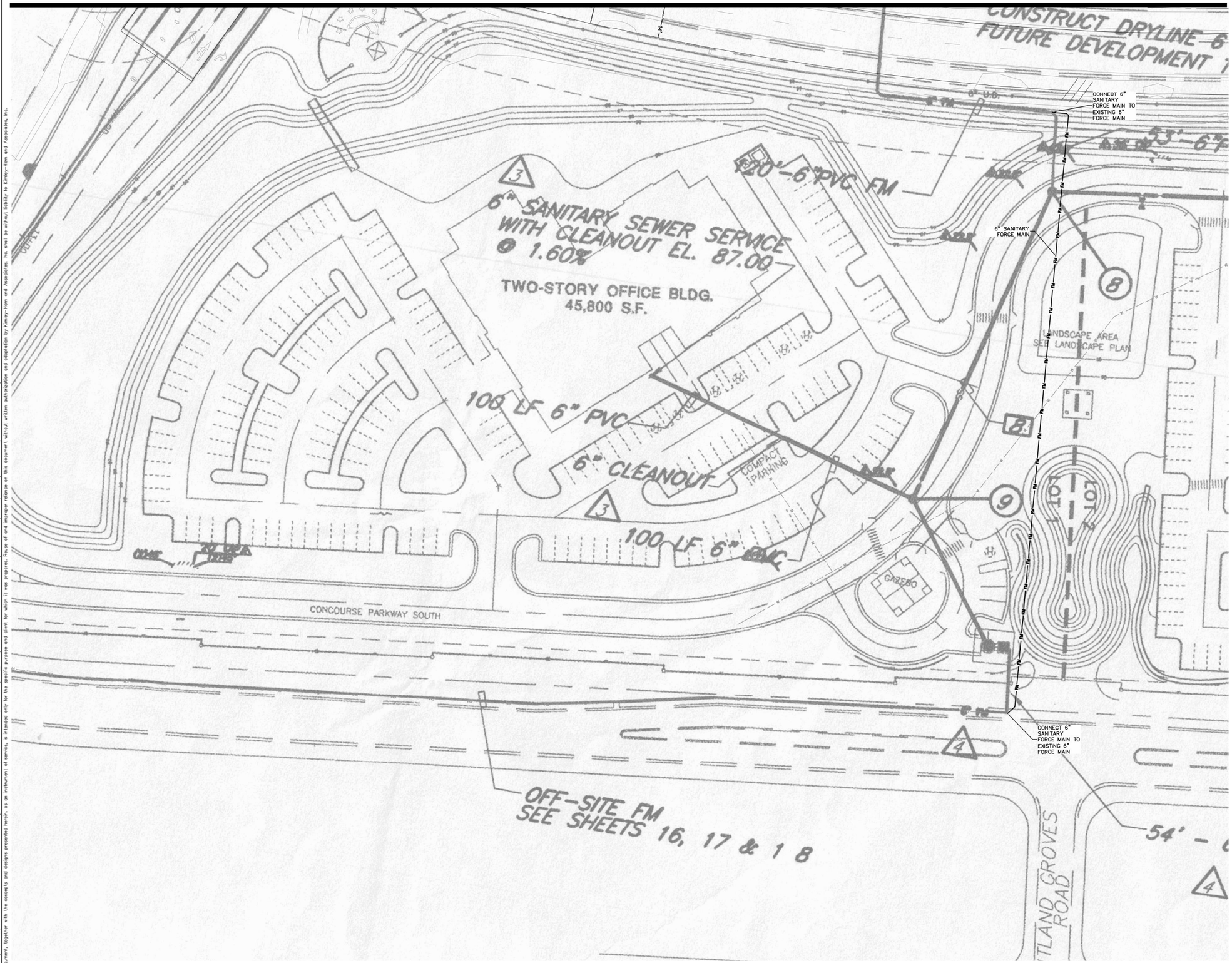
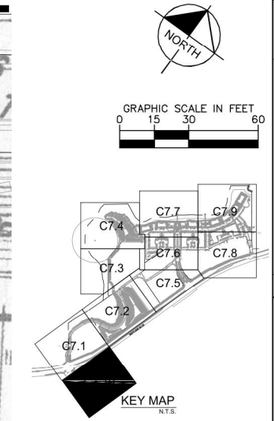
MATCHLINE, SEE SHEET C7.1





LEGEND

- EXISTING SANITARY MAIN
- EXISTING REUSE MAIN
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DATE 06/29/2016
SCALE AS SHOWN
DESIGNED BY JAM
DRAWN BY KAS
CHECKED BY JAM

UTILITY PLAN

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C7.10

Plotted By:Stubbs, Jarod Sheet Set:MCN-MI-LOT7 Layout:10 June 28, 2016 12:16:17pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CINST\PlanSheets\C7.1-C7.9-UTL.dwg
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SCOPE: Supply one complete H-20 LP Pre-Fab Lift Station, per design.

Pumps shall be capable of pumping domestic & commercial sewage.

Complete system shall be supplied by:

XYLEM, INC

The H-20 Load Rated Fiberglass Wetwell Must Be Manufactured By L.F. Manufacturing, Giddings, Texas, Which Includes A Written 20 Yr. Warranty

Certification of the wetwell H-20 load rating must be supplied with submittals. H-20 certification must be signed and sealed by an engineer registered in the State of Florida.

After the H-20 load rated wetwell has been installed, the ASTM Certification Number and Serial Tracking Number must be visible.

PUMPS: The submersible pumps shall be manufactured by Flygt Corporation. "The pumps shall be installed in the H-20 GP FRP wetwell utilizing a dual slide rail system. The pumps shall be capable of handling solids, fibrous materials, heavy sludge, and other matter typically found in wastewater. Major pump components shall be grey cast iron, ASTM A-48, Class 35B. The pump motor shall be NEMA B design and housed in an air-filled watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation by use of the trickle impregnation method. The motor shall be heat-shrink fit into the stator housing. The use of bolts, pins, or other fastening devices is not acceptable. The cable entry seal shall consist of a cylindrical elastomer grommet flanked by washers. Epoxies, silicones, or other sealing systems are not acceptable. Thermal switches set to open at 125 degrees C shall be embedded in the stator end coils to monitor the temperature of each phase winding. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

The pump shall be provided with a dual mechanical seal. Both upper and lower seal assemblies shall consist of a stationary tungsten-carbide ring and a rotating tungsten-carbide ring. Other seal materials are not considered acceptable."

DUPLEX CONTROL PANEL:

Control panel shall be assembled and built by a TUV (UL508A CERTIFIED) manufacturing facility.

The Enclosure shall be NEMA 4X, minimum 30" high x 30" wide x 10" deep Fiberglass with padlockable draw latches.

The enclosure shall have external mounting feet to allow for wall mounting. All hardware shall be stainless steel.

The following components shall be mounted through the enclosure:
1- ea. Red Alarm Beacon (Light)
1- ea. Alarm Horn
1- ea. Generator Receptacle w/ weatherproof cover
1- ea. Alarm Silence Pushbutton

The backpanel shall be fabricated from .125, 5052-H32 marine alloy aluminum. All components shall be mounted by machined stainless steel screws.

The following components shall be mounted to backpanel:
2- ea. Motor Contactors
1- ea. Volt Monitor (Single Phase) Phase Monitor (Three Phase)
1- ea. Control Transformer (480 Volt Only)
1- ea. Silence Relay
1- ea. Duplex Alternator
1- ea. Model BOAC5AH Battery Back-Up w/ Smart Charger (Per DEP)
20- ea. Terminals For Field Connections
6- ea. Terminals For Motor Connections (Single Phase Only)
3- ea. Grounding Lugs

The innerdoor shall be fabricated from .080, 5052-H32 marine alloy aluminum. The innerdoor shall have a continuous aluminum piano hinge.

The following components shall be mounted through the innerdoor:
1- ea. Main Circuit Breaker
1- ea. Emergency Circuit Breaker
1- ea. Mechanical Interlock For Emergency And Main Breakers
2- ea. Short Circuit Protectors
1- ea. Control Circuit Breaker
1- ea. Hand-Off-Auto Selector Switches
2- ea. Pump Run Pilot Lights
1- ea. Power On Pilot Light
2- ea. Elapse Time Meters (Non-Resetable)
1- ea. GFI Duplex Convenience Outlet

COMPONENT SPECIFICATIONS:
All circuit breakers shall be molded thermal magnetic.
The mechanical interlock shall prevent the normal and emergency main breakers being energized at the same time.
An emergency generator receptacle shall be supplied in accordance with DEP standards. The generator receptacle shall be adequately sized to meet the equipment operating conditions.

NEUTRAL TO BE SUPPLIED FOR BOTH 230V 3PHASE OR 230V SINGLE PHASE POWER

All motor short circuit protection devices must provide for undervoltage release and class 10 overload protection on all three phases. Visable trip indication, test, and reset capability must be provided without opening inner door.
Open frame, across the line, contactors shall be rated per IEC standards and properly sized per the motor requirements.
Contactors shall provide for safe touch power and control terminals.
Lightning Arrestor shall meet or exceed the requirements of ANSI/IEEE Std. C62.21-1984 section 8.6.1. and 8.7.3 shall be supplied by electrician and mounted on the bottom side of the switch disconnect ahead of the pump control panel.
A voltage monitor shall be supplied for single phase service.
A phase monitor shall be supplied for (3) phase service.
A green pilot light shall be supplied for each motor. The pilot light shall illuminate each time the motor is called to run.
Each pump shall have an Elapse Time Meter to record the accumulated run time. The ETM shall be 2" diameter, non-resettable, six digit, totally encapsulated unit.
A Red pilot light shall be supplied for control power. The pilot light shall illuminate when the control power is available inside the control panel.
Relays shall be ice-cube plug in type. Relay contacts shall be rated 10 amp minimum, DPDT.
Twenty (20) terminals shall be supplied for field connections. The terminals shall be rated 25 amps minimum.
Each motors over-temperature contact shall be connected to the terminal strip and shall open a contact to de-energize the appropriate motor upon a high temperature within the motor.
A 15 Amp GFI duplex receptacle shall be supplied and mounted on the innerdoor.
Ground lugs shall be supplied and appropriately sized for each motor and for service entrance.

Nameplates for the innerdoor and back panel shall be of a graphic design, specifically depicting the intent for each device.

MISCELLANEOUS: All wiring on the backpanel shall be containted within the wiring duct. All wiring between the innerdoor and the backpanel shall be contained with in a plastic spiral wrap.
Each wire shall have a wire number at each end to correspond to the as built drawing for field troubleshooting.
The control panel shall be assembled by a TUV (UL508A Certified) manufacturing facility.

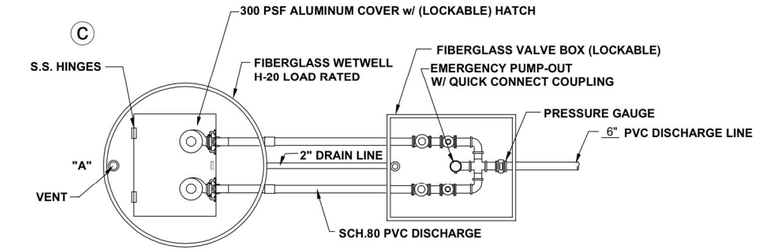
PUMP DATA		ELEVATIONS	
PRIMARY PUMP CAPACITY	714 GPM	TOP OF WETWELL	80.50'
PRIMARY TDH	161 'TDH	INLET INVERT	62.45'
PUMP MANUFACTURER	FLYGT	HIGH LEVEL ALARM (HLA)	61.95'
PUMP MODEL #	NP 3202.180	2nd PUMP ON (LAG)	60.95'
R.P.M.	1770	1st PUMP ON (LEAD)	59.95'
HORSEPOWER	60	PUMPS OFF (OFF)	54.95'
ELECTRICAL/ VOLTS / PHASE	460 V / 3 PH	BOTTOM OF WETWELL	52.95'
PUMP DISCHARGE SIZE	6"	WETWELL DIAMETER	96"
IMPELLER CODE	326 mm		

FASTNERS & APPURTANCES: All fasternes, lifting cables, float cable bracket, hinges, and appurtances shall be made of AISI 304SS.
A 304SS slide/latch assembly shall be provided tor holding the doors open on the wetwell and valve box.
Slide rails shall be made of SCH.40 AISI 304SS pipe.
Pump lifting cables shall be made of AISI 304 SS.

H-20 LOAD RATED WETWELL WITH LIFTING LUGS:
The fiberglass wetwell must be H-20 load rated with integral lifting lugs, fiberglass slope in bottom of wetwell and valve box.
Certification of the H-20 load rating must be supplied at the time of submittals to Engineer.
The wetwell shall be manufactured of fiberglass reinforced polyester (FRP) of depth and diameter as shown on the lift station elevation detail. The wall thickness shall be adequate for the depth of the wetwell to maintain the H-20 LOAD RATING.

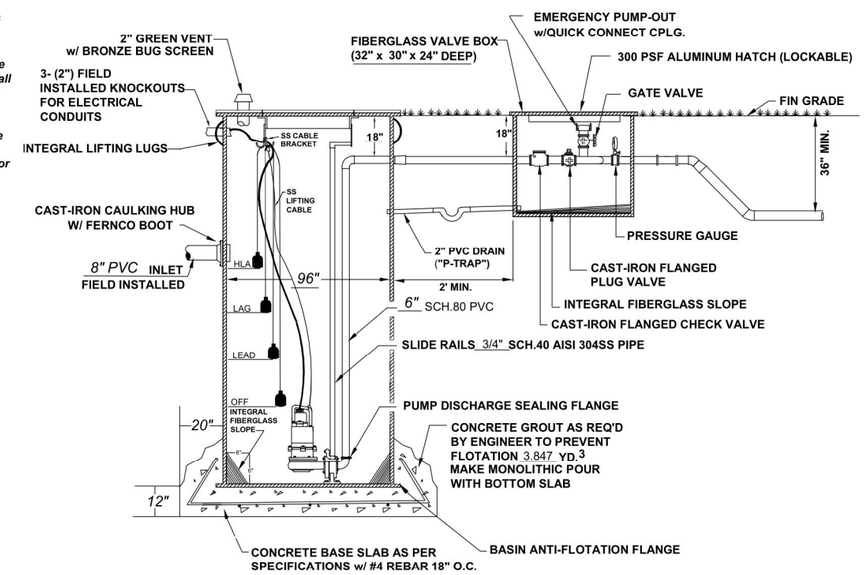
EXECUTION:
Installation shall be in strict accordance with the manufacturer's recommendations in the locations shown on the drawing.

INSPECTION & TESTING: A factory representative shall be provide for a one (1) time start-up and shall have complete knowledge of the proper operation and maintenance of complete system.
Megger the motors. The pump motors shall be megged out prior to the start-up to ensure that the insulation of the pump motor/cable is intact.
The pump controls and pumps shall be checked for mechanical reliability and proper operation.

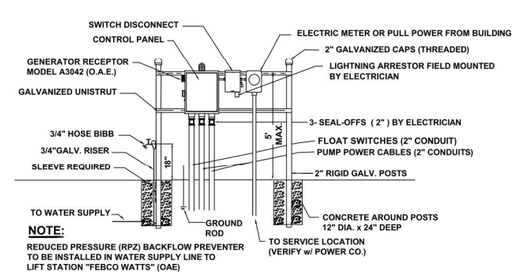


NOTE: PUMP CONTROL PANEL SHALL BE LOCATED 3 FEET MINIMUM FROM WETWELL PERIMETER AT POINT "A"

LIFT STATION PLAN

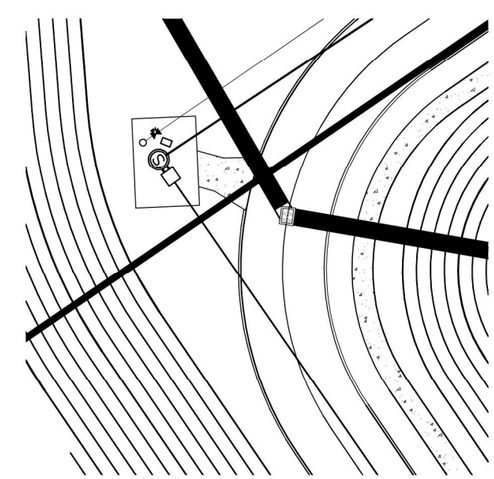


LIFT STATION SECTION



NOTE:
REDUCED PRESSURE (RPZ) BACKFLOW PREVENTER TO BE INSTALLED IN WATER SUPPLY LINE TO LIFT STATION "FEBCO WATTS" (OAE)

ELECTRICAL RISER



LIFT STATION PLAN

Plotted By:Ramsburg, Derek Sheet Set:MCN-MI-LOT7 Layout:DETAILS June 29, 2016 02:01:34pm K:\ORL_Civil\049183005-MCN-Master Development Svcs\CADD\CONST\PlanSheets\C9.5-LS-DETAILS.dwg
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LIFT STATION DETAILS

MAITLAND CONCOURSE NORTH
MASTER INFRASTRUCTURE &
LOT 7 RESIDENTIAL

CITY OF MAITLAND FLORIDA

SHEET NUMBER
C9.5