LONE STAR ENGINEERING & INSPECTIONS

PRE T_c CALCULATIONS:

T_c PRE = 20.8 MIN = 0.320 HR ; 1.93 MIN WHERE:
$T_{c,1}$ = (0.0107(0.6L)^0.6) / (S^0.5*n^0.6) (EQ# 2.3)
$T_{c,2}$ = (0.0107(0.5(L)(0.5L))^0.6) / (4.0*S^0.5*n^0.6) = 0.520 HR
$T_{c,3}$ = (1L / 60x(1.9*PAVEDn)^0.5) (EQ# 2.4 & 2.6)
$T_{c,4}$ = (1(S) / 60x(0.6+0.6S))(EQ# 2.7) = 1.93 MIN

POST T_c CALCULATIONS:

T_c PRE = 22.0 MIN = 0.237 HR ; 7.78 MIN WHERE:
$T_{c,1}$ = (0.0107(0.6L)^0.6) / (S^0.5*n^0.6) (EQ# 2.3)
$T_{c,2}$ = (0.0107(0.5(L)(0.5L))^0.6) / (4.0*S^0.5*n^0.6) = 0.237 HR
$T_{c,3}$ = (1L / 60x(PAVEDn)^0.5) (EQ# 2.4 & 2.6)
$T_{c,4}$ = (300 / 60x(20.5)(0.6S)(0.6S)^0.5) = 7.78 MIN

25YR PRE-DEVELOPMENT CONDITIONS:

Q_{PRE} = 16.41 CFS WHERE:
Q_{PRE} = C_{25}CiA WHERE (EQ# 2.2)
C_{25}=0.8, C=0.3, I=6.30 IN/H, A=8.8 ACRES

100YR PRE-DEVELOPMENT CONDITIONS:

Q_{PRE} = 26.09 CFS WHERE:
Q_{PRE} = C_{100}CiA WHERE (EQ# 2.2)
C_{100}=1.25, C=0.3, I=7.80 IN/H, A=8.8 ACRES

25YR POST-DEVELOPMENT CONDITIONS:

Q_{POST} = 32.92 CFS WHERE:
Q_{POST} = C_{25}CiA WHERE (EQ# 2.2)
C_{25}=0.8, C=0.8, I=6.72 IN/H, A=8.8 ACRES

100YR POST-DEVELOPMENT CONDITIONS:

Q_{POST} = 46.91 CFS WHERE:
Q_{POST} = C_{100}CiA WHERE (EQ# 2.2)
C_{100}=1.25, C=0.8, I=8.31 IN/H, A=8.8 ACRES

25YR DETENTION CALCULATIONS:

B = 15.8446 SEC WHERE:
B = (4*I60(D/V_a) / (0.6x(Q_{POST})^2) (EQ# 7.1)
B = (4*I60(D/V_a) / (0.6x25.04)

S = 2.82 ACRE-FT WHERE:
S = (0.5xB)(Q_{POST} - (Q_{out}) (0 / 4*I60) (EQ# 7.2)
S = (0.5x15.8446)(25.04 - 0.33) / 4*60

100YR DETENTION CALCULATIONS:

B = 14.0657 SEC WHERE:
B = (4*I60(D/V_a) / (0.6x(Q_{POST})^2) (EQ# 7.1)
B = (4*I60(D/V_a) / (0.6x46.25)

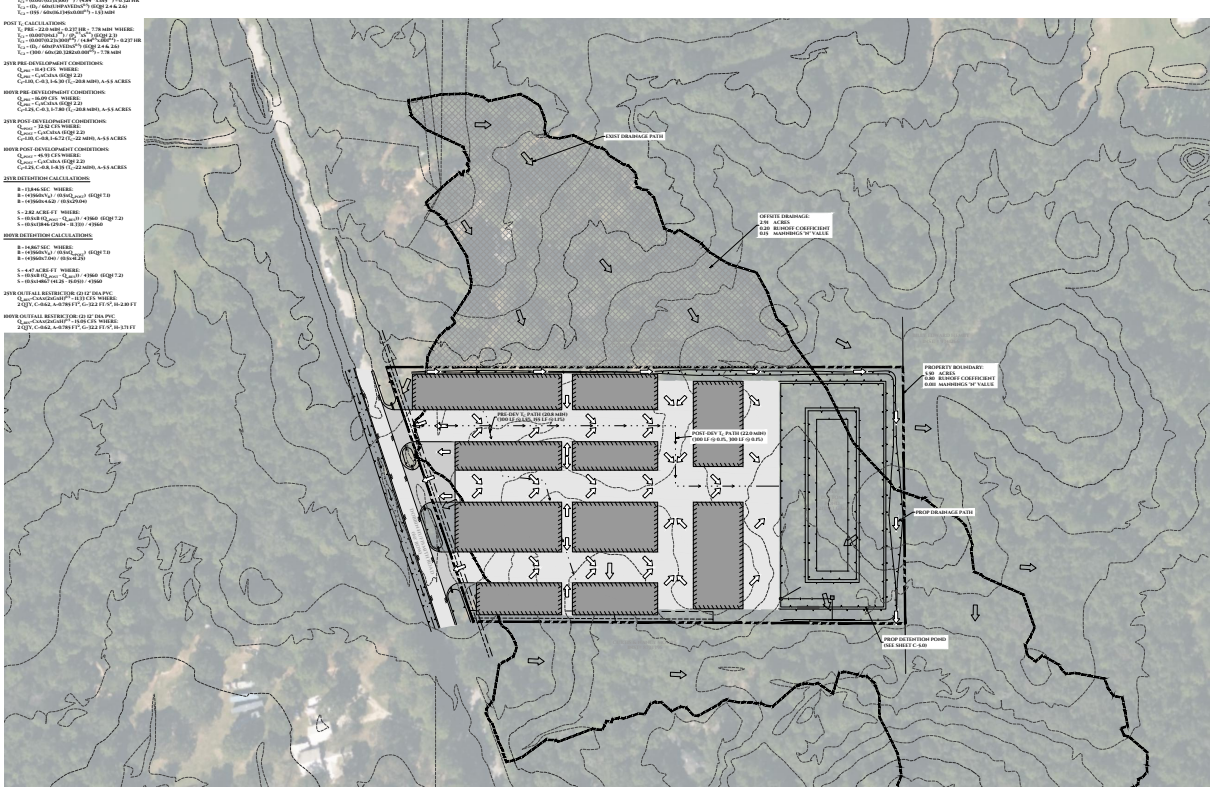
S = 4.47 ACRE-FT WHERE:
S = (0.5xB)(Q_{POST} - (Q_{out}) (0 / 4*I60) (EQ# 7.2)
S = (0.5x14.0657)(46.25 - 0.33) / 4*60

25YR OUTFALL RESTRICTOR: (2) 12" DIA PVC

Q_{out}=CAx(2GH)^0.5 ; (1.3) CFS WHERE:
2 QTY, C=0.62, A=0.7854 FT², G=32.2 FT/S², H=2.83 FT

100YR OUTFALL RESTRICTOR: (2) 12" DIA PVC

Q_{out}=CAx(2GH)^0.5 ; (9.0) CFS WHERE:
2 QTY, C=0.62, A=0.7854 FT², G=32.2 FT/S², H=3.73 FT



EXTREME EVENT OVERFLOW:
Q_E = 3.13 x B x H = 13.21 = 39.32 CFS WHERE:
B = 10.17 ft, H = 1.3 ft

SCALE 1"=40'

N

GRAVITY PIM(PTD) WET BOTTOM					
	ELEV (FT)	AREA (SF)	DEPTH (FT)	VOLUME (CF)	TOTAL (CF)
	164.00	9,750.04	0.00	1.00	0.00
	165.00	11,947.69	0.00	0.00	0.00
	166.00	15,037.34	0.00	0.00	0.00
	167.00	14,750.98	0.00	0.00	0.00
	168.00	19,992.83	0.00	0.00	0.00
	169.00	21,086.48	0.00	0.00	0.00
	170.00	23,238.63	0.00	0.00	0.00
	171.00	25,263.77	1.00	24,200.95	24,200.95
	172.00	27,461.42	1.00	26,362.60	50,563.55
	173.00	29,736.07	1.00	28,596.25	79,159.79
	174.00	32,072.72	1.00	30,904.90	110,064.69
	175.00	34,486.37	1.00	33,279.55	143,344.22
	176.00	36,972.01	1.00	35,729.19	179,073.42
	177.00	39,529.66	1.00	38,250.84	217,324.26
	178.00	42,159.31	1.00	40,844.49	258,168.74
	179.00	44,860.96	1.00	43,510.14	301,678.88

PROPOSED POND VOLUMES

REV	BY	DATE	DESCRIPTION
0	KMM	09/24/2021	ISSUED FOR CONSTRUCTION

KG'S RV STORAGE
27822 DOBBIN-HUFFSMITH RD, MAGNOLIA, TX 77354
CIVIL
DRAINAGE PLAN

2229 FM 1488 Ste B
Suite 140-408
Conroe, TX 77384
LONE STAR ENGINEERING & INSPECTIONS
F: 18242
(832) 855-1836

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY CHRISTOPHER S. REYNA P.E. TX 125200 LONE STAR ENGINEERING & INSPECTIONS A TEXAS FIRM F-18242 SEPTEMBER 24, 2021

CHRISTOPHER S. REYNA 125200

DRAWN BY:	DATE:
KMM	11/10/2020
SCALE:	1"=60'-0"
PROJECT NO:	200730E
SHEET NO.	REV. NO.
C-5.3	0

ISSUED FOR CONSTRUCTION
SEPTEMBER 24, 2021

LONE STAR ENGINEERING & INSPECTIONS