Drainage Calculations

Water Quantity - Existing Site PRE DEVELOPMENT

Total Project Area	=	17.110	ac	acres X 43560 = sf
Pervious Area	=	9.485	ac	
Impervious Area	=	7.625	ac	
% Impervious	=	44.5%		
Rainfall for 25yr/24hr event	=	9	in	
Rainfall for 25yr/3day event, P	=	12.23	in	
Depth to Water Table	=	1	ft	
Pre-developed Soil Storage Capability, SC	=	0.45	in	see table
Soil Storage, S = (SC) (1-% Impervious)	=	0.25	in	

$$Qpre = \frac{(P - 0.2S)^2}{(P + 0.8S)} = 11.94 \text{ in}$$

Water Quantity - Proposed Site POST DEVELOPMENT

Total Project Area	=	17.110	ac
Pervious Area (ACRES)	=	8.588	ac
Impervious Area (ACRES)	=	8.522	ac
% Impervious	=	49.8%	
Rainfall for 25yr/24hr event	=	9	in
Rainfall for 25yr/3day event, P	=	12.23	in
Depth to Water Table	=	1	ft
Post-development Soil Storage Capability, SC	=	0.45	in see table
Soil Storage, S = (SC) (1-% Impervious Area)	=	0.23	in

$$Qpost = \frac{(P - 0.2S)^2}{(P + 0.8S)} = 11.96 \text{ in}$$

Post Development - Pre Development for Water Quantity Requirement

Qpost runoff - Qpre runoff =	0.03	in
Volume = (Q runoff) (Total Area - Surface Water) =	0.47	ac-in

Water Quality Calculation - Treatment Volume Requirement

Total Project Area	=	17.110	ac	745,312	sf
Surface Water + Pool Area	=	0.078	ac	3,383	sf
Roof Area	=	3.548	ac	154,554	sf
Pavement/Concrete/Walkways	=	4.886	ac	212,826	sf
Pervious area	=	8.588	ac	374,549	sf
Site Area for Water Quality = (Total area - (water surface +pool +roof areas))	=	13.484	ac	587,375	sf
Impervious Area for Water Quality = (Site area for Water Quality - Pervious area)	=	4.886	ac	212,826	sf
% Impervious for Water Quality = Impervious Area for Wtr Qual/ Site Area for Wtr Qual	=	36.2%			

A) One inch of runoff from Total Upland Project = 17.11 ac-in

B) 2.5 inches times percent impervious

2.5" x % Impervious for Water Quality	=	0.91	inches
(2.5")(% imperv)(Total Area - surface water)	=	15.43	ac-in

Comparison 1" vs. 2.5" times % impervious: 15.43 < or > 17.11 ac-in

25% CREDIT FOR DRY RETENTION SWALES: 11.57 12.83

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Comparison Water Quantity vs. Water Quality

Volume = (Q runoff) (Total Area - Surface Water) =	0.47	ac-in
Water Quality Treatment Volume =	17.11	ac-in
Comparison Water Quantity vs. Water Quality:	0.47	< or > 17.11

Summary POST - PRE Development Runoff, Water Quantity & Water Quality

(Total Area - surface water)(Qpost - Qpre) Volume =	0.47 ac-in
1" Project Water Quantity Treatment Volume =	17.110 ac-in
2.5" % Impervious Water Quality Treatment Volume =	15.429 ac-in

Depth to Water Table	Noncompacted Storage	Compacted Storage
1	0.6	0.45
2	2.5	1.88
3	6.6	4.95
4	10.9	8.18

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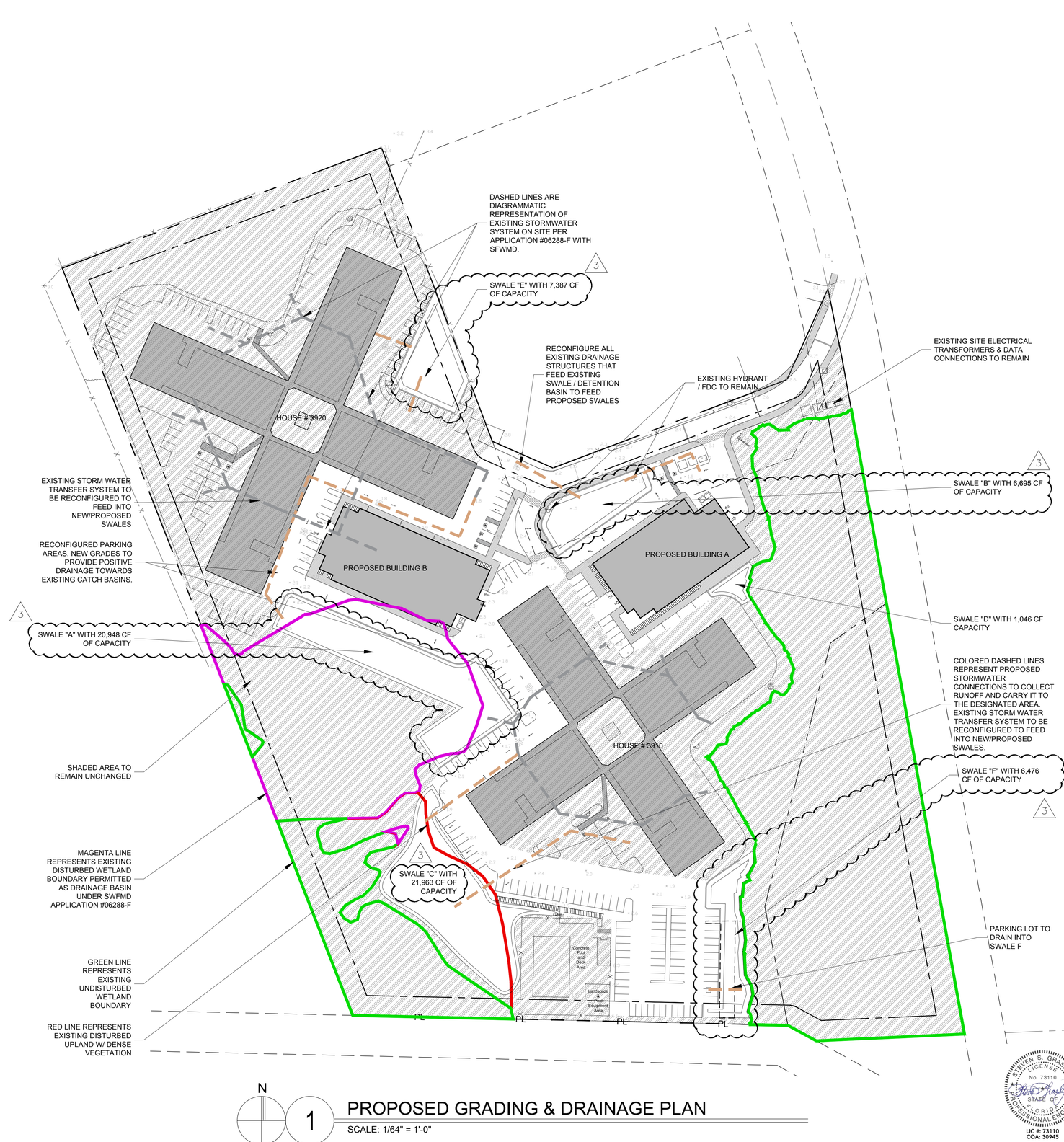
STRUCTURE	TOP AREA	BOTTOM AREA	DEPTH	CAPACITY (CF)	CAPACITY (AC-FT)	CAPACITY (AC-IN)
Swale A	19156	15757	1.2	20,948		
Swale B	6617	4541	1.2	6,695		
Swale C	19799.2	16806.4	1.2	21,963		
Swale D	1369	722	1	1,046		
Swale E	7181	5131	1.2	7,387		
Swale F	6963	3831	1.2	6,476		
TOTAL				64,515	1.50	17.78



1 PROPOSED GRADING & DRAINAGE PLAN

SCALE: 1/64" = 1'-0"

STEVEN S. GRANT LICENSE No 73110 STATE OF FLORIDA PROFESSIONAL ENGINEER

LIC #: 73110
COA: 30945