

ALL METAL PARTS SPECIFIED IN 680.26(B) MUST BE BONDED TO AN EQUIPOTENTIAL BONDING GRID WITH A SOLID COPPER CONDUCTOR NOT SMALL THAN 8 AWG. THE TERMINATION OF THE BONDING CONDUCTOR MUST BE MADE BY EXOTHERMIC WELDING, LISTED PRESSURE CONNECTORS, OR LISTED CLAMPS THAT ARE LABELED AS SUITABLE FOR THE PURPOSE. THE QUIPOTENTIAL BONDING GRID MUST EXTEND UNDER PAVED WALKING SURFACES FOR 3 FEET HORIZONTALLY FROM THE WATER (680.26(C)).

THE STRUCTURAL REINFORCING STEEL OF A CONCESTE PERMANENTLY INSTALLED POOL, OUTDOOR SPA, OR OUTDOOR HOT TUB, TIED TOGETHER BY THE USUAL STEEL TIE WIRES.

THE EQUIPOTENTIAL BONDING GRID CAN BE CONSTRUCTED WITH 8 AWG BARE SOLID COPPER CONDUCTORS BONDED TO EA OTHER AT ALL POINTS OF CROSSING BY EXOTHERMIC WELDING, LISTED PRESSURE CONNECTORS OF THE SET SCREW OR COMPRESSION TYPE, LISTED CLAMPS, OR OTHER LISTED FITTINGS (250.8).

EXCEPTION: THE EQUIPOTENTIAL BONDING GRID SHALL NOT BE REQ'D TO BE INSTALLED UNDER THE BOTTOM OR VERTICALLY ALONG THE WALLS OF VINYL LINED POLYMER WALL, FIBERGLASS COMPOSITE, OR OTHER POOLS CONSTRUCTED OF NON-CONDUCTIVE MATERIALS.

DECK

WATER LEVEL

OPTIONAL
8x8 FTG W/
(1) #3 CONT.

4"

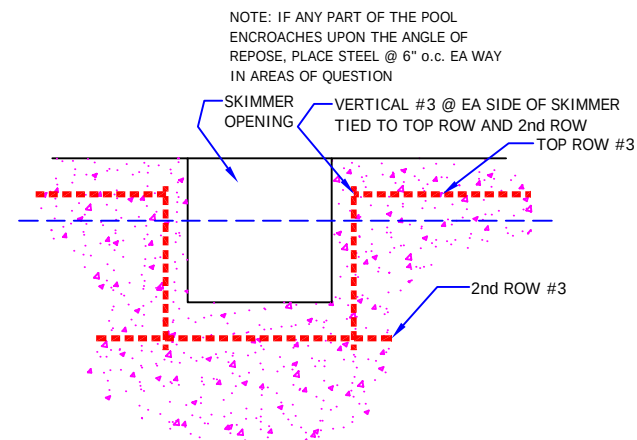
6" WALL &
FLOOR, 4000
PSI

#3 STEEL REBAR
12" O.C. EA WAY

NOTE: SOIL MUST BE COMPACTED
TO 90% IN MAX 12" LIFTS

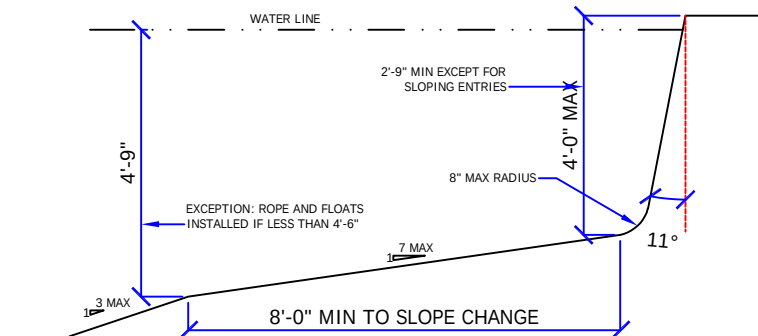
6x6 #10-10 WIRE
MESH, REFER TO NEC
FOR BONDING &
GROUNDING REQ'MNTS

**TYPICAL
WALL
SECTION**



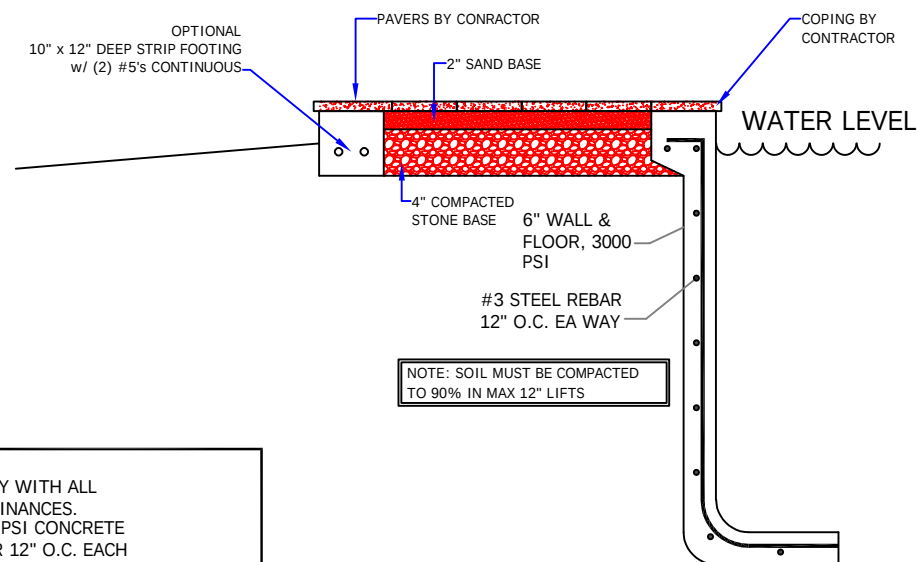
GENERAL NOTES:

- 1) Per UL listing, pool motors require GFCI protection
- 2) FSPA requires the motor controller to be capable of 2 speeds, a time clock will not satisfy this unless it has 2 trip settings.
- 3) If heater installed (other than solar), it must comply with FBC-EC403.9.1 & have a cover per 403.9.3 (this applies to mechanical (not solar) heaters---cover required)
- 4) Outdoor swimming pools shall be provided with a barrier complying with Sections R4501.17.1.1 through R4501.17.1.14.
- 5) NEC 680.26(C) requires a conductive metal part of 9 sq., in. in direct contact with the pool water.
- 6) R4501.17.1.9 All doors and windows providing direct access from the home to the pool shall be equipped with an exit alarm complying with UL 2017 that has a minimum sound pressure rating of 85 dB at 10 feet.



ENGINEERING NOTES:
1. ALL WORK IS TO COMPLY WITH ALL
APPLICABLE CODES & ORDINANCES.
2. CONSTRUCTED OF 4000 PSI CONCRETE
OR EQUAL WITH #3 REBAR 12" O.C. EACH
WAY, TIED AT EVERY OTHER INTERSECTION.
MIN COVER FOR REBAR IS 2.5"
MIN OVERLAP IS 18".
3.N/A

- FENCE REQUIREMENTS:
1. MINIMUM 48" HEIGHT
 2. 2" MAX VERTICAL CLEARANCE BETWEEN GRADE & BARRIER BOTTOM.
 3. MAX OPENING SHALL NOT ALLOW PASSAGE OF 4" SPHERE.
 4. FENCE POSTS WILL BE LOCATED ON POOL-SIDE OF FENCE.
 5. GATE WILL BE SELF-LOCKING WITH APPROVED LOCKING DEVICE.



REMEDIES FOR THE ANGLE OF REPOSE VIOLATION:

1. IF POOL WALL IS UP TO 18" AWAY FROM THE HOUSE FOUNDATION. ALL VOID NEEDS TO BE FILLED IN WITH CONCRETE AND STEEL IN POOL WALL NEEDS TO BE #3 BAR @ 6" O.C.
2. IF POOL WALL IS UP 18" - 3' AWAY FROM HOUSE FOUNDATION. ALL VOID NEEDS TO BE FILLED WITH CLEAN SOI AND COMPACTED IN LIFT OF 12", AND STEEL IN POOL WALL NEEDS TO BE #3 BAR @ 6" O.C.
3. IF POOL WALL IS 3' - 5' AWAY FROM THE HOUSE FOUNDATION. ALL VOID NEED TO BE FILLED WITH CLEAN SOIL AND COMPACTED IN LIFT OF 12", AND STEEL IN POOL WALL NEEDS TO BE #3 BAR @ 12" O.C.

[illegible]

28" MIN.

1" Ø MIN.
1.9" Ø MAX.

RAIL ANCHOR
SET IN
CONCRETE

#8 GROUND
WIRE & CLAMP

10" - 12"

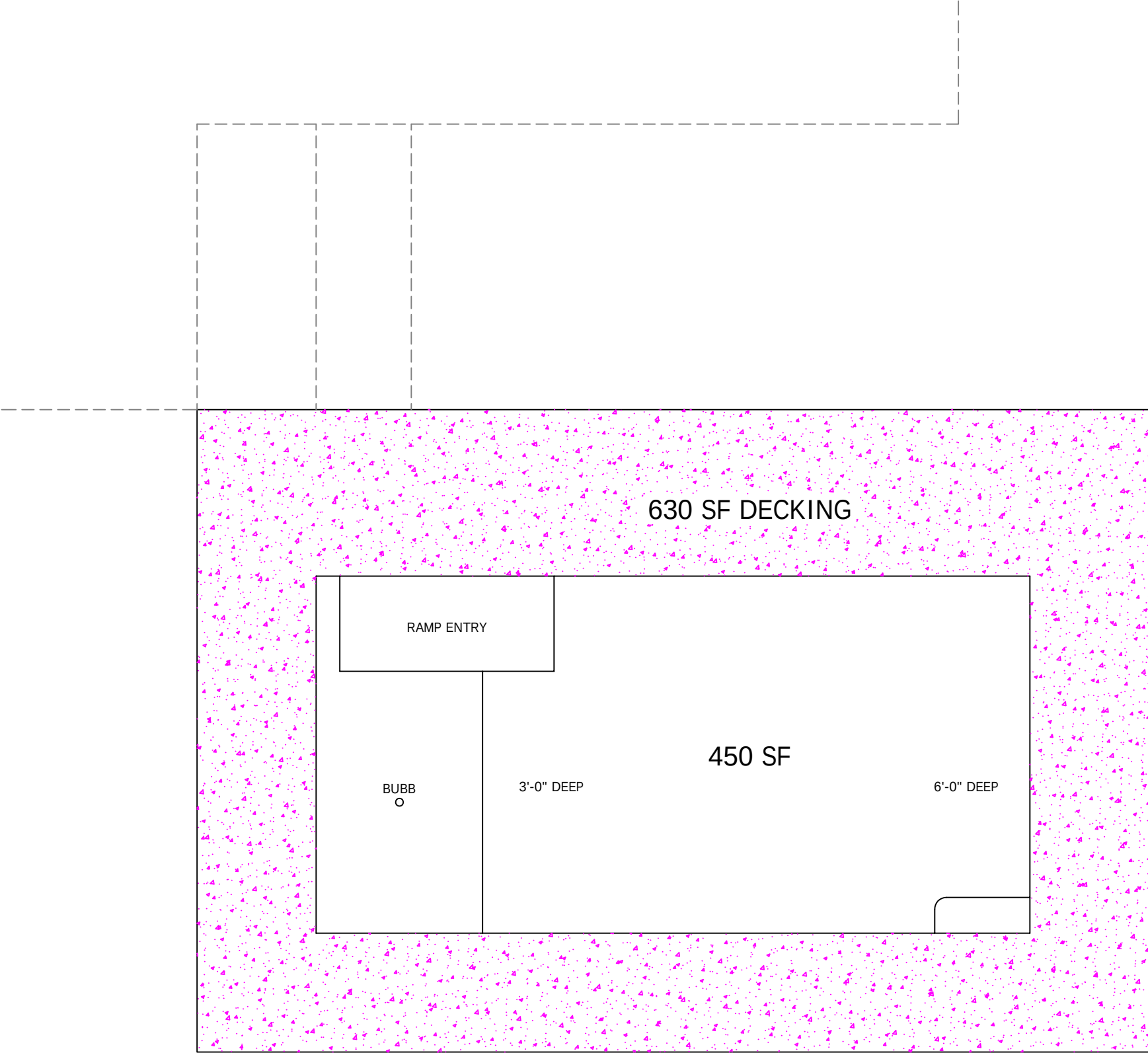
1" MAX.

AFTER 48" OF
WATER DEPTH
NO MORE STEPS
ARE REQUIRED

TOP AND
BOTTOM
RISER MAY
VARY

INTERMEDIATE RISERS
SHALL BE UNIFORM

3/16" = 1'-0" SCALE



Riddle Consulting Engineers, Inc.



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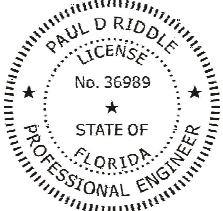
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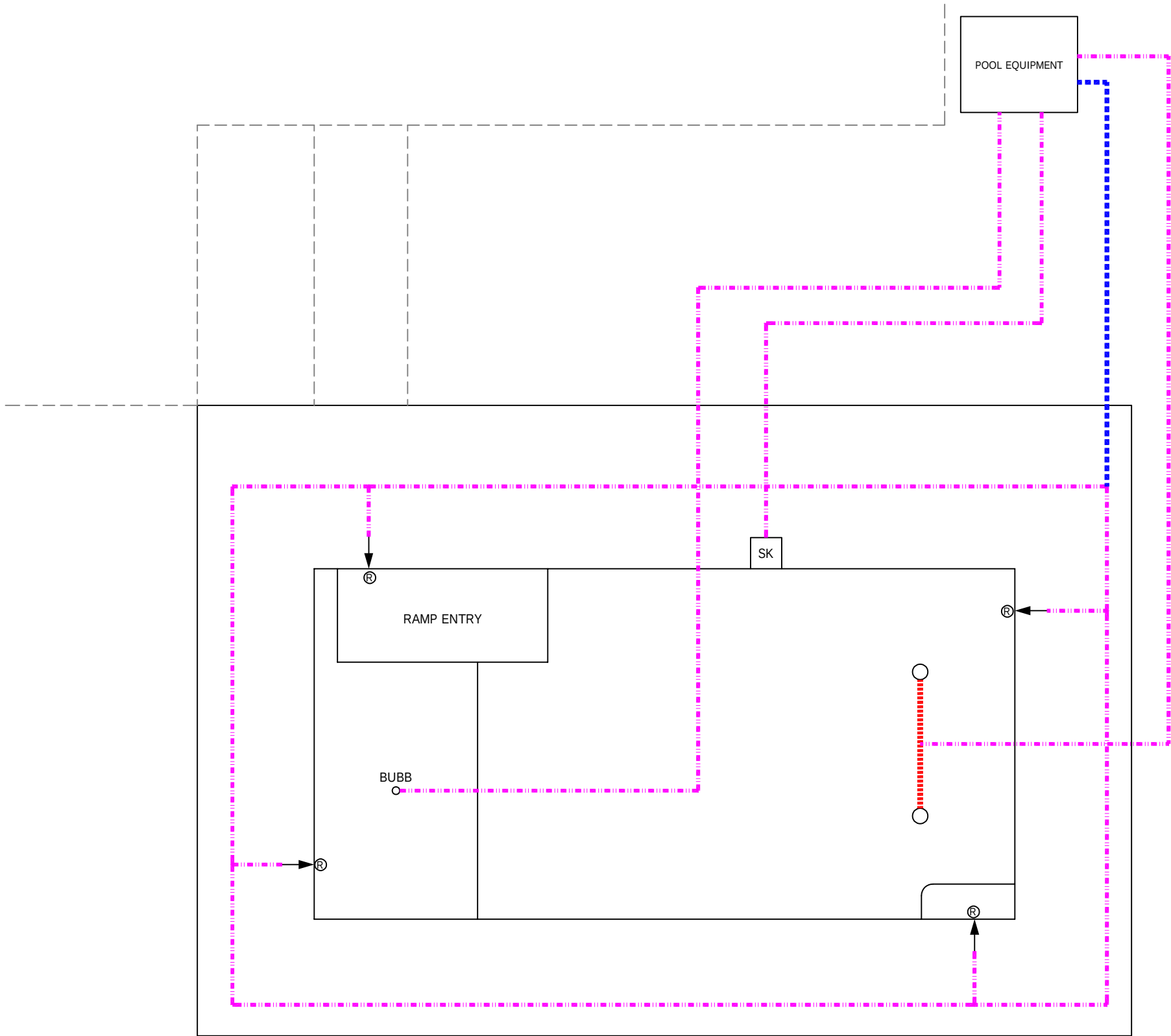
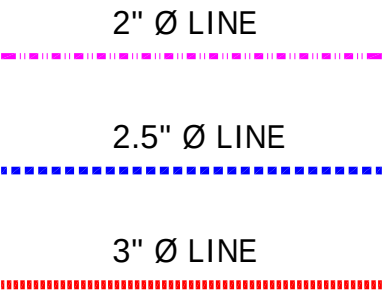
A CUSTOM DESIGN FOR
THE SPARKS
RESIDENCE
AQUATIC ART POOLS AND SPAS

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3/16" = 1'-0" SCALE

PIPING KEY



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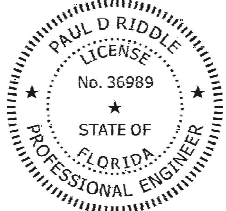
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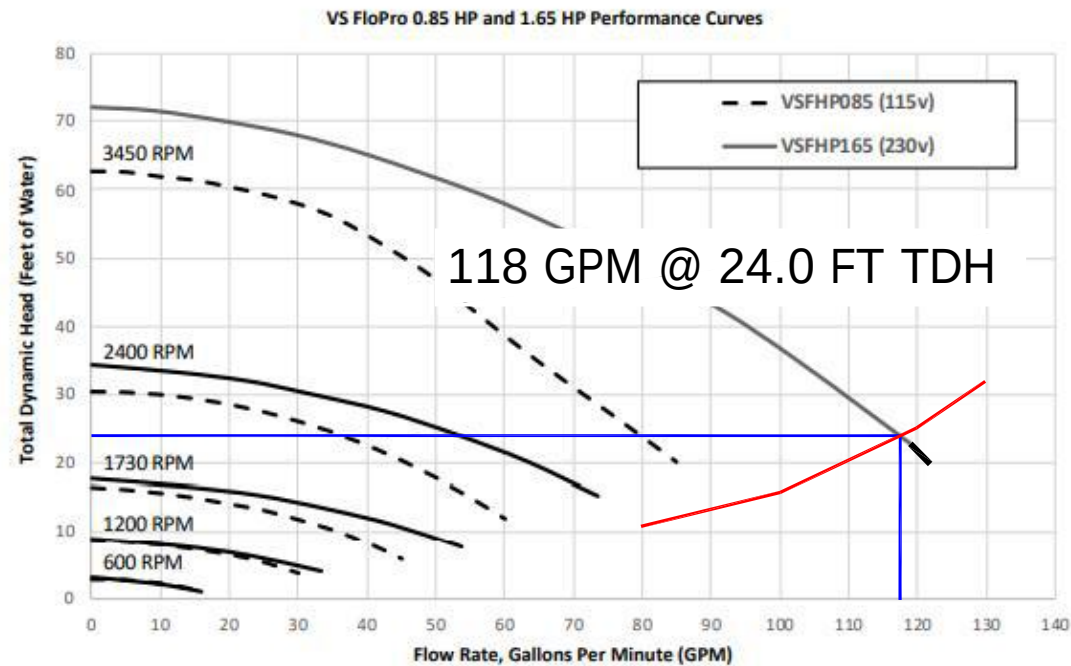
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SPECIFICATIONS

Model No.	THP	WEF ³	Voltage	Max Watts	Amps	Union Size	Rec. Pipe Size ⁴	Carton Weight	Overall Length
VSFHP165JEP	1.65	9.118	230VAC	1,600 W	10.5	2" x 2"	1 1/2 - 2 1/2"	46 lbs	24"
VSFHP165AUT									
VSFHP085JEP	0.85	11.900	115VAC	975 W	10.0	2" x 2"	1 1/2 - 2"	46 lbs	24"
VSFHP085AUT									

PERFORMANCE



AQUATIC ART

8/10/2026

SPARKS POOL

MINIMUM FLOW REQ'D = 62.08 GPM
POOL VOLUME : SURFACE AREA X AVG DEPTH X 7.48 GAL / CF
VOL = 450 SF X 4.5 FT DEEP 15147 Gallons
TURNOVER TIME: No. Hours X 60 min / hc e
6 hours x 60= 360 minutes
MAX POOL FLOW RATE: GALLONS / TURNOVER = FLOW RATE
15147 GAL / 360 minutes = 42.075 GPM

POOL FEATURES
JETS, SHEER DE 1 WATER FEATURE GPM EA = 20 GPM
TOTAL SUGGESTED POOL FLOW RATE: 62.08 GPM

V = 1.318 C R^{1.63} S^{1.54}
SUPPLY (RETURN) PIPING
2.5 in = NOMINAL DIAMETER
2.45 in = D ACTUAL diam
0.2038 ft = D diam
140 = C, coefficient of roughness
4.6951 in² = A pipe
0.0326 ft² = A pipe
118.00 gpm / line 0.2629234 cfs
118.00 gpm = TOTAL FLOW IN 1 LINES
0.2629 cfs = Q flow M
8.0639 f/sec = V = Velocity
0.0509 ft = R = Hydraulic Radius = A / P

SUCTION PIPING
2 in = NOMINAL DIAMETER
2.05 in = D ACTUAL diam
0.1706 ft = D diam
140 = C, coefficient of roughness
3.2910 in² = A pipe
0.0229 ft² = A pipe
59.00 gpm = 0.1314617 cfs
2 No of Suction Pipes
0.1315 cfs = Q flow rate
5.7522 f/sec = V = Velocity
0.0426 ft = R = Hydraulic Radius = A / P

0.0979 ft/ft = S hydraulic gradient
18 ft = pipe length average
1.76 ft = hf = head loss due to friction
0.76 psi
0.00763

0.0644 ft/ft = S hydraulic gradient
37 ft = pipe length average
2.38 ft = hf = head loss due to friction
1.03 psi
0.0103227

BRANCH P model	FLOW GPM	STR FT	PSI
2 in @ 6 fps max BRANCH =	61.54 GPM		
2 in @ 8 fps max TRUNK =	82.06 GPM	80.00	11.0
2 in @ 10 fps max RETURN =	102.57 GPM	100.00	16.8
3 in @ 3 fps max RETURN =	67.95 GPM MAIN	120.00	25.4
	DRAIN	130.00	31.6
		140.00	38.1
			16.49

OTHER PRESSURE LOSSES per mnfg
6.98 FT = FILTER TDH LOSS
FT = HEATER TDH LOSS
6.98 FT = TOTAL TDH LOSS
JANDY PRO SERIES CS150-250 CARTRIDGE FILTER

MINOR LOSSES (SUPPLY & SUCTION COMBINED)	K	h (lost) ft	
h (lost) = KL * V ² / (2*g)			
2 ea = # tees thru side outlet	1.75	3.53	PAUL D. RIDDLE
2 ea = # gate valves	1	2.02	P.E. No. 36989, FL
1 ea = # check valves	0.2	0.20	RIDDLE CONSULTING ENGINEERS
0 THERAPY JET	21.73	0.00	1720 SE COUNTY HWY 484
0 ea = # 45 deg ELL	0.4	0.00	BELLEVIEW, FLORIDA 344TO
6 ea = # 90 deg ELL	0.75	4.54	CERT OF AUTH: 4759
0 ea = Reducer D2=	0.5	0.0871791	
		0.00	D1/D2= 4.89
		TOTAL =	10.30 ft

ELEVATION DIFFERENCE
0.00 ft = delta Z
model
2.57 FT = TOTAL FRICTION HEAD LOSS AFTER SPLIT @ LOOP
23.99 FT = TOTAL HEAD LOSS IN SYSTEM @ 118.00 GPM
10.39 PSI

PUMP SELECTION : JANDY 1.65 VS PUMP
model: VARIABLE SPEED
SUCTION OUTLET COVER: MUST EXCEED 118.00 GPM FLOW RATE
model 32" CHANNEL DRAIN OR 2 OUTLET COVERS

SYSTEM FLOW RATE MUST NOT EXCEED APPROVED COVER FLOW RATE O.K.
PER FBC 2023 8TH EDITION ANSI / APSP 13
MOTOR TO BE GFCI PROTECTED PER NEC 680.21©

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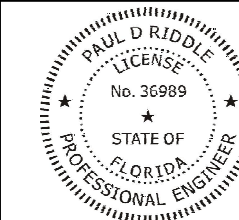
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