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Project No. : **2432396**
Project Name : **STEEDLEY**
Project Address : **22854 S US HWY 441, HIGH SPRINGS FL 32643**

POOL/ SPA HYDRAULICS WORKSHEET

Columbia County Building Department — Plans Reviewed for Code Compliance — State of Florida

DESIGN CIRCULATION FLOW PARAMETERS:

1. Pool circulation volume :

$V := 606\ ft^2 \cdot 5.5\ ft + 8\ ft \cdot 18\ ft \cdot 8\ in + 9\ ft \cdot 5\ ft \cdot 3\ ft = 26660.57\ gal$

2. Preferred turnover rate: $t := 8\ hr = 480\ min$

3. Pool circulation flow rate : $Q_p := \frac{V}{t} = 55.543\ gpm$

Add water feat. flow rate $Q_{wf} := 30\ gpm$

Total circulation flow rate $Q_c := Q_p + Q_{wf} = 85.543\ gpm$

4. Spa: Number of jets, $n := 6$ [Max.]

$Q_{jet} := n \cdot 12\ gpm = 72\ gpm$

(For single pump pool / spa combo, use the higher of No. 3 or No. 4 in the following calculations for the pool and spa.)

Minimum design flow rate $Q_{min} := 36\ gpm$

Design flow rate $Q := \mathrm{Trunc}\left(\max\left(Q_c, Q_{min}, Q_{jet}\right), 1\ gpm\right) + 1\ gpm = 86\ gpm$

RICHARD EDWARD WALKER LICENSE No. 61240 STATE OF FLORIDA PROFESSIONAL ENGINEER

RICHARD E. WALKER State of Florida, Professional Engineer, License No. 61240. This item has been digitally signed and sealed by Richard E. Walker, P.E. on the date adjacent to the seal using a SHA-1 authentication code. Printed copies of this document are not considered signed and sealed and the signature must be verified on electronic copies.

Digitally signed by Richard E Walker
Date: 2024.12.02 15:21:27-05'00'

Richard E. Walker, P.E. # 61240

PIPE SIZES & SIMPLIFIED TDH:

FLOW AND FRICTION LOSSES PER FOOT - SCH. 40 PVC PIPE						
Pipe size (in)	Velocity					
	6 ft/s		8 ft/s		10 ft/s	
	gpm	ft	gpm	ft	gpm	ft
1	16	0.14	21	0.23	26	0.35
1 1/2	37	0.08	50	0.14	62	0.21
2	62	0.06	82	0.1	103	0.16
2 1/2	88	0.05	117	0.09	146	0.13
3	138	0.04	181	0.07	227	0.1
4	234	0.03	313	0.05	392	0.07
5	534	0.02	712	0.03	890	0.05

Maximum flow rate: $Q = 86\ gpm$

Pipe Sizes Per 2023 FBC, 8th Edition:

Main Drain Branch Piping: 3.0" to keep velocity @ 6fps max at flow rate = $138\ gpm$ max.

Suction/Trunk Piping: 2.5" to keep velocity @ 8fps max at flow rate = $117\ gpm$ max.

Return Piping to be : 2.5" to keep velocity @ 10fps max at flow rate = $146\ gpm$ max.

The distance of the pool equipment pad from the nearest edge of the pool shall not exceed $30\ ft$.

1. Friction loss (in suction/trunk pipe) in 2.5" pipe per ft at $f_{suction} := 0.09$

2. Friction loss (in return pipe) in 2.5" pipe per ft at $f_{return} := 0.13$

3. Length of suction pipe $L_{suction} := 90\ ft$

   TDH in suction pipe $TDH_{suction} := L_{suction} \cdot f_{suction} = 8.1\ ft$

4. Length of return pipe $L_{return} := 150\ ft$

   TDH in return pipe $TDH_{return} := L_{return} \cdot f_{return} = 19.5\ ft$

5. TDH in Piping $TDH_{piping} := TDH_{suction} + TDH_{return} = 27.6\ ft$

6. Filter loss in TDH $TDH_{filter} := 7\ ft$

7. Heater loss in TDH $TDH_{heater} := 13\ ft$

8. All other losses $TDH_{other} := 15\ ft$ ...head losses in fittings, etc

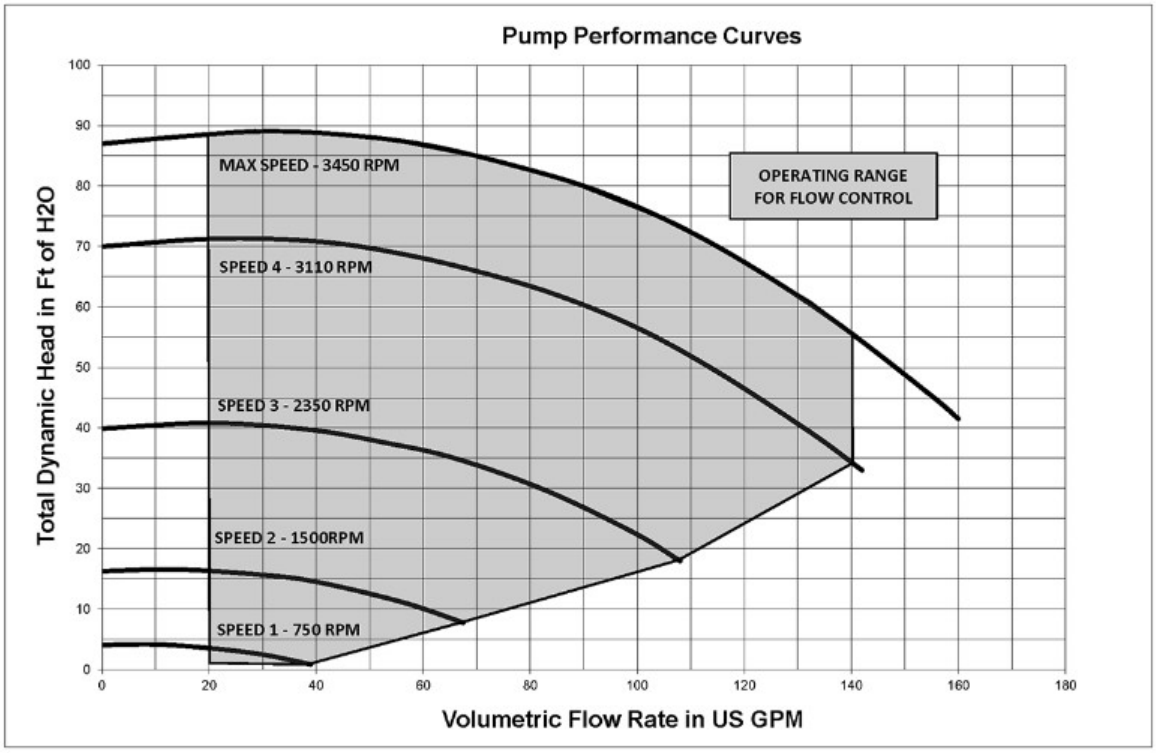
9. Total simplified TDH $TDH := TDH_{piping} + TDH_{filter} + TDH_{heater} + TDH_{other} = 62.6\ ft$

Filter (As Listed or Equal): Pentair CC RP150

Pump (As Listed or Equal):

Manufacturer : Pentair | Model : IntelliFlo VS | Size / HP = 3.0

Maximum flow rate, $Q = 86$ *gpm* Total simplified TDH, $TDH = 62.6$ *ft*



Main Drain Cover (As Listed or Equal):

Manufacturer : CMP | Model : 25506-32X-VGBA

Max. cover flow rate (floor) = 184 gpm | Cover Replacement Date = 7 years

Notes :

1. In flow suction outlets cover/grate must conform to most recent edition of ASME/ANSI A112.19.8 and be embossed with that edition approval. Single drains shall be unblockable. Center to center spacing of multiple drains shall be at least 3'-0".

2. Pump and Filter make, model and location cannot change without submitting a revised plan TDH worksheet.