April 17, 2009

MEMORANDUM

BULLETIN SP-01-09

To: All Permit Applicants

From: Thomas H. Goldsbury, P.E., C.B.O., LEED AP
Chief, Building Inspection Division

Subject: **Revised Submittal and Inspection Requirements for Residential Swimming Pools and Spas**

The purpose of this bulletin is to make you aware of revised submittal and inspection requirements for residential swimming pools and spas as a result of the Virginia Graeme Baker Pool and Spa Safety Act (the Act). These revisions are regarding entrapment protection only and do not in any way change or revise other swimming pool or spa code or submittal/inspection requirements. While the requirements of the Act have been in force for some time, these revised submittal and inspection requirements will become effective for all residential swimming pools submitted on or after May 18, 2009.

As background, pools/spas must comply with **one** of the following:

Item

1. Have no main drain, or
2. Have one or more un-blockable drains, or
3. Have more than one drain.

If Item 1 or 2 is chosen, the plans should show no drain or provide documentation that the drain provided is un-blockable. If Item 3 is chosen, documentation must be provided to show that the maximum system flow rate does not exceed the allowable flow rate. There are three options to provide this documentation, **Option A** -Simplified Total Dynamic Head (STDH); **Option B** – Total Dynamic Head (TDH); and **Option C** – Maximum flow capacity of the Pump. Listed on the attached spreadsheet, Revised Submittal and Inspection Requirements for Residential Swimming Pools and Spas, are the revised submittal and inspection requirements depending on which option you choose.

When using Options A or B, the attached Simplified Total Dynamic Head Calculation Worksheet, or one similar, must be submitted with your plans. For ease of use, the attached worksheet is in Adobe Acrobat format and has been formatted with a "typewriter" tool. Just click on the typewriter icon and drop it where you need to type. Otherwise print it out and complete it by hand.

Revised Submittal and Inspection Requirements for Residential Simming Pools and Spas

	OPTION A **Simplified Total Dynamic Head**	**OPTION B** **Total Dynamic Head**	**OPTION C** **Maximum Flow Capacity of Pump**
Additional Submittal Requirements	1. A completed site specific Simplified Total Dynamic Head Worksheet 2. Site plan must show location of main drain, pump, pool water volume and distance from pool to pump. 3. Cut sheets showing head loss must be provided for pump, filter, and any other equipment being used in calculation. 4. Pump curve 5. Main drain(s) cut sheet (must be rated more than desired flow rate)	1. Calculation of Total Dynamic Head and maximum flow rate (Volume/Turn-over - cuft/mins.) plus chart confirming pipe sizes required (branch, trunk, & return) per calculations and allowable velocities. 2. Site plan must show location of main drain, pump, pool water volume and distance from pool to pump, and all dimensions and pipe sizes necessary to confirm TDH calculations. 3. Cut sheets showing head loss must be provided for pump, filter, and any other equipment being used in calculation. 4. Pump curve 5. Main drain cut sheet (must be rated more than desired flow rate)	1. Documentation confirming that the maximum flow rate of the pump is not more than that allowed in the system (8 fps for residential pools). 2. Main drain(s) cut sheet (must be rated more than desired flow rate)
Additional Inspection Requirements (all required submittal documents must be on site and available at all inspections)	1. At the initial steel inspection (21), the building inspector will confirm pipe sizes installed are correct. **Therefore enough of the branch, trunk and return lines must be exposed, and size visible for inspection.** 2. At the electrical final (09) inspection, the electrical inspector will confirm the pump location, model, main drain cover and other equipment match the cut sheets. If not installed, the main drain cover should be placed by the pump so the inspector can find it at time of inspection.	Same as Option A	At the electrical final (09) inspection, the electrical inspector will confirm that the pump and main drain cover are correct. If not installed, the main drain cover should be placed by skimmer so inspector can find it at time of inspection.

ANSI/ASP–7 2006 Specifies three methods for determining the maximum system flow rate. The following simplified TDH calculation is one of the methods specified.

Simplified Total Dynamic Head (TDH) Calculation Worksheet

Determine Maximum System Flow Rate:

Minimum Flow Rate Required: 35 gpm Per Skimmer

1. Calculate Pool Volume: _____ (Surf. Area) x _____ (Avg. Depth) x 7.48 (gal./cubic foot) = _____ (Vol. in gal.)
2. Determine preferred Turnover Time in hours: _____ (Hours) x 60 (min. / hr.) = _____ (Turnover in Min.)
3. Determine Max Flow Rate: _____ (Vol. in gal.) / _____ (Turnover Mins.) = _____ (Pool Flow Rate) + _____ (Feature Flow Rate) = _____ (System Flow Rate)
4. Spa Jets: _____ (No. of Jets) x _____ (Jet Flow) gpm per jet = _____ (Total Jet Flow Rate) flow rate.

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

Determine Pipe Sizes:

Branch Piping to be [ ] inch to keep velocity @ 6 fps max. at _____ gpm Maximum System Flow Rate.

Trunk Piping to be [ ] inch to keep velocity @ 8 fps max. at _____ gpm Maximum System Flow Rate.

Return Piping to be [ ] inch to keep velocity @ 10 fps max. at _____ gpm Maximum System Flow Rate.

Determine Simplified TDH:

1. Distance from pool to pump in feet: _____
2. Friction loss (in suction pipe) in _____ inch pipe per 1 ft. @ _____ gpm = _____ (from pipe flow/friction loss chart)
3. Friction loss (in return pipe) in _____ inch pipe per 1 ft. @ _____ gpm = _____ (from pipe flow/friction loss chart)
4. _____ (Length of Suct. Pipe) x _____ (Ft of head/1 ft of Pipe) = _____ (TDH Suct. Pipe)
5. _____ (Length of Return Pipe) x _____ (Ft of head/1 ft of Pipe) = _____ (TDH Return Pipe)

TDH in Piping: _____

Filter loss in TDH (from filter data sheet): _____

Heater loss in TDH (from heater data sheet): _____

Total all other loss: _____

Total Dynamic TDH: [ ]

Selected Pump and Main Drain Cover:

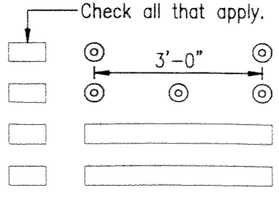
Pump selection [ ] using pump curve for Simplified TDH & System Flow Rate
(Pump model and size in Horsepower)

Main Drain Cover [ ] (System Flow Rate must not exceed approved cover flow rate)
(Make and Model)

Notes: Minimum system flow based on min. flow per skimmer of 35 gpm.

Determine the Number and Type of Required In–Floor Suction Outlets:

Check all that apply.



2 [ ] suction outlets @ _____ gpm max. flow (see note 2).

3 [ ] suction outlets @ _____ gpm max. flow (see note 3).

Aquastar Channel Drain @ 316 gpm max. flow rate.

A & A Channel Drain @ 217 gpm w/ 2 port & 278 gpm w/ 3 ports (see note 4).

TDH Calculation Options

For each pump

Check one.

[ ] Simplified Total Dynamic Head (STDH)
Complete STDH Worksheet – Fill in all blanks.

[ ] Total Dynamic Head (TDH)
Complete Program or other calcs. Fill in required blanks on worksheet & attach calculations.

Notes

1. If a variable speed pump is used, use the max. pump flow in calculations.
2. For side wall drains, use appropriate side wall drain flow as published by manufacturer.
3. Insert manufacturer's name and aproved maximum flow
4. See installation instructions for number of ports to be used.
5. In–Floor suction outlet cover/grate must conform to most recent edition of ASME/ANSI A112:19.8 and be embossed with that edition approval.
6. Pump & Filter make, model and location can not change without submitting a revised plans and TDH worksheet.

Flow and Friction Loss Per Foot
Schedule 40 PVC Pipe

Pipe Size	Velocity – Feet Per Second					
	6 fps		8 fps		10 fps	
1"	16 gpm	0.25'	21 gpm	0.66'	26 gpm	0.94'
1.5"	37 gpm	0.16'	50 gpm	0.28'	62 gpm	0.48'
2"	62 gpm	0.15'	82 gpm	0.25'	103 gpm	0.40'
2.5"	88 gpm	0.09'	117 gpm	0.15'	146 gpm	0.23'
3"	138 gpm	0.09'	181 gpm	0.14'	227 gpm	0.23'
4"	234 gpm	0.06'	313 gpm	0.10'	392 gpm	0.15'
6"	534 gpm	0.04'	712 gpm	0.04'	890 gpm	0.10'

Total Head In Feet Conversion Chart

PSI (Pressure Gauge) / Inches Mercury (Vacuum Gauge)

	0	2	4	6	8	10	12	14	16	18
0	0.0	2.3	4.5	6.8	9.0	11.3	13.6	15.8	18.1	20.3
1	2.3	4.6	6.8	9.1	11.4	13.6	15.9	18.1	20.4	22.7
2	4.6	6.9	9.1	11.4	13.7	15.9	18.2	20.4	22.7	25.0
3	6.9	9.2	11.5	13.7	16.0	18.2	20.5	22.8	25.0	27.3
4	9.2	11.5	13.8	16.0	18.3	20.5	22.8	25.1	27.3	29.6
5	11.5	13.8	16.1	18.3	20.6	22.8	25.1	27.4	29.6	31.9
6	13.9	16.1	18.4	20.6	22.9	25.2	27.4	29.7	31.9	34.2
7	16.2	18.4	20.7	23.0	25.2	27.5	29.7	32.0	34.3	36.5
8	18.5	20.7	23.0	25.3	27.5	29.8	32.0	34.3	36.6	38.8
9	20.8	23.1	25.3	27.6	29.8	32.1	34.3	36.6	38.9	41.1
10	23.1	25.4	27.6	29.9	32.1	34.4	36.7	38.9	41.2	43.4
11	25.4	27.7	29.9	32.2	34.5	36.7	39.0	41.2	43.5	45.8
12	27.7	30.0	32.2	34.5	36.8	39.0	41.3	43.5	45.8	48.1
13	30.0	32.3	34.6	36.8	39.1	41.3	43.6	45.9	48.1	50.4
14	32.3	34.6	36.9	39.1	41.4	43.6	45.9	48.2	50.4	52.7
15	34.6	36.9	39.2	41.4	43.7	45.9	48.2	50.5	52.7	55.0
16	37.0	39.2	41.5	43.7	46.0	48.3	50.5	52.8	55.0	57.3
17	39.3	41.5	43.8	46.1	48.3	50.6	52.8	55.1	57.4	59.6
18	41.6	43.8	46.1	48.4	50.6	52.9	55.1	57.4	59.7	61.9
19	43.9	46.2	48.4	50.7	52.9	55.2	57.4	59.7	62.0	64.2
20	46.2	48.5	50.7	53.0	55.2	57.5	59.8	62.0	64.3	66.5
21	48.5	50.8	53.0	55.3	57.6	59.8	62.1	64.3	66.6	68.9
22	50.8	53.1	55.3	57.6	59.9	62.1	64.4	66.6	68.9	71.2
23	53.1	55.4	57.7	59.9	62.2	64.4	66.7	69.0	71.2	73.5
24	55.4	57.7	60.0	62.2	64.5	66.7	69.0	71.3	73.5	75.8
25	57.8	60.0	62.3	64.5	66.8	69.1	71.3	73.6	75.8	78.1
26	60.1	62.3	64.6	66.8	69.1	71.4	73.6	75.9	78.1	80.4
27	62.4	64.6	66.9	69.2	71.4	73.7	75.9	78.2	80.5	82.7
28	64.7	66.9	69.2	71.5	73.7	76.0	78.2	80.5	82.8	85.0
29	67.0	69.3	71.5	73.8	76.0	78.3	80.5	82.8	85.1	87.3
30	69.3	71.6	73.8	76.1	78.3	80.6	82.9	85.1	87.4	89.6
31	71.6	73.9	76.1	78.4	80.7	82.9	85.2	87.4	89.7	92.0
32	73.9	76.2	78.4	80.7	83.0	85.2	87.5	89.7	92.0	94.3
33	76.2	78.5	80.7	83.0	85.3	87.5	89.8	92.0	94.3	96.6
34	78.5	80.8	83.1	85.3	87.6	89.8	92.1	94.4	96.6	98.9
35	80.9	83.1	85.4	87.6	89.9	92.2	94.4	96.7	98.9	101.2

(TDH Return Pipe)

Date

Contractors Signature

Contractors Printed Name

Contractors Cert. No.

Contractors Telephone No.

Date

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Swimming Pool Specification For:

Scale: None Drn. By: GHS

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