

ANSI/APSP-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 (Required: 1 skimmer per 800 sf of surf. area)

- Calculate Pool Volume: $\frac{420}{\text{(Surf. Area)}} \times \frac{4.5}{\text{(Avg. Depth)}} \times 7.48 \text{ (gal./cubic foot)} = \frac{14,137}{\text{(Vol. in gal.)}}$
- Determine preferred Turnover Time in hours: $\frac{8}{\text{(Hours)}} \times 60 \text{ (min. / hr.)} = \frac{480}{\text{(Turnover in Min.)}}$
- Determine Max Flow Rate: $\frac{14,137}{\text{(Vol. in gal.)}} \div \frac{480}{\text{(Turnover in Min.)}} = \frac{29,45}{\text{(Pool Flow Rate)}}$ $\div \frac{58}{\text{(Feature Flow Rate)}} = \frac{30.53}{\text{(System Flow Rate)}}$
- Spo Jets: $\frac{7}{\text{(No. of Jets)}} \times \frac{1.04}{\text{(Jet Flow)}} \text{ gpm per jet} = \frac{7.28}{\text{(Total Jet Flow Rate)}}$ 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 2" inch to keep velocity @ 8 fps max. at 82 gpm Maximum System Flow Rate.
Return Piping to be 2" inch to keep velocity @ 10 fps max. at 103 gpm Maximum System Flow Rate.

Determine Simplified TDH:

- Distance from pool to pump in feet: 15
- Friction loss (in suction pipe) in 2" inch pipe per 1 ft @ 82 gpm = .10 (from pipe flow/friction loss chart)
- Friction loss (in return pipe) in 2" inch pipe per 1 ft @ 103 gpm = .16 (from pipe flow/friction loss chart)
- $\frac{15}{\text{(Length of Suction Pipe)}} \times \frac{.10}{\text{(ft of head/1 ft of Pipe)}} = \frac{1.5}{\text{(TDH Suction Pipe)}}$
 $\frac{15}{\text{(Length of Return Pipe)}} \times \frac{.16}{\text{(ft of head/1 ft of Pipe)}} = \frac{2.4}{\text{(TDH Return Pipe)}}$

TDH in Piping: 3.9

Filter loss in TDH (from filter data sheet): 7.0

Heater loss in TDH (from heater data sheet): 7.8

Total all other losses: 40.8

Total Dynamic Head (TDH): 59.5

Selected Pump and Main Drain Cover:

Pump selection V5SVRS D11017
(Pump model and size in Horsepower)

using pump curve for TDH & System Flow Rate

Main Drain Cover

642-132X
WATERWAY
(Make and Model)

(System Flow Rate must not exceed approved cover flow rates)

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.

☐	☐	☐	☐
3'-0"	2	suction outlets @	gpm max. flow (see note 2).
☐	☐	3	suction outlets @
☐	☐	channel drain @	gpm max. flow (see note 3).
32"	☐	170	gpm x / <u>2 1/2"</u> ports (see note 2)

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 codes. Fill in required blanks on worksheet & attach calculations.

☐ Maximum Flow Capacity
of the new or replacement pump.

Notes

- If a variable speed pump is used, use the max. pump flow in calculations.
- For side wall drains, use appropriate side wall drain flow as published by manufacturer.
- Insert manufacturer's name and approved maximum flow.
- See installation instructions for number of ports to be used.
- 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.
- Pump, Filter & Heater make and model cannot be changed, and equipment location cannot be moved closer to pool without submitting a revised plan and TDH calculation worksheet for approval.

Flow and Friction Loss Per Foot Schedule 40 PVC Pipe

Pipe Size	6 fpm	8 fpm	10 fpm
1"	16 gpm 0.14'	21 gpm 0.23'	26 gpm 0.35'
1.5"	37 gpm 0.08'	50 gpm 0.14'	62 gpm 0.21'
2"	62 gpm 0.06'	82 gpm 0.10'	103 gpm 0.16'
2.5"	88 gpm 0.05'	117 gpm 0.08'	146 gpm 0.13'
3"	136 gpm 0.04'	181 gpm 0.07'	227 gpm 0.10'
4"	234 gpm 0.03'	313 gpm 0.05'	392 gpm 0.07'
6"	534 gpm 0.02'	712 gpm 0.03'	

Total Head In Feet Conversion Chart

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	13.8	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	29.8	32.0	34.3	36.5
8	18.5	20.7	23.0	25.3	27.5	29.8	32.1	34.3	36.6	38.8
9	20.8	23.1	25.3	27.6	29.8	32.1	34.3	36.7	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	48.4	50.6	52.9	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	66.7	68.9	71.2
23	53.1	55.4	57.7	59.9	62.2	64.4	66.7	69.0	71.3	73.5
24	55.4	57.7	60.0	62.2	64.5	66.7	69.0	71.3	73.6	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	71.5	73.7	76.0	78.2	80.5	82.7
28	64.7	66.9	69.2	71.5	73.7	76.0	78.3	80.5	82.8	85.0
29	67.0	69.3	71.5	73.8	76.1	78.3	80.6	82.9	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	92.1	94.4	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

NOTE: FIELD TDH MUST BE EQUAL TO OR HIGHER THAN THE CALCULATED TDH.



Michael Canto

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Swimming Pool Specification For:

Robert Residence

2663 TUSTENUGEE AVE

LAKE CITY FL 32025

Date 6-19-12
Michael Canto
CPE 1457306
352-332-7665



332-POOL

3601 N.W. 97th Blvd.
Gainesville, Florida 32606

REF. NO.

POOL SHAPE: CREST JOB NO.

SIZE: 14' x 16' x 3' DEPTH: 3' TO 6' PERM: 85' AREA: 420

DECK: DECK SURFACE: PAVER DECK-O-DRAIN: YES

COPING: YES CANTILEVER: NO

TILE: 6" x 6" COLOR: YES - DUNE

STEP COLOR: NO COLOR: NO

TURNOVER: 8hr FILTER TYPE: PUM SIZE: 150 PUMP: 1/2 S/S

SKIMMER: YES INLETS: 5 MAIN DRAIN: YES

GRAB RAILS: NO HAND RAIL: NO LADDER: NO

POOL LIGHT: YES VOLTS: 120 WATTS: 400

DIVING BOARD: NO SIZE: NO

AUTOMATIC CHLORINATOR: NO TIMER: YES FILL LINE: NO

CLEANING EQUIPMENT: NO SWIMOUT: YES SIZE: 1/2" x 1/2" JETS: 1

ROPE & FLOATS: NO ROPE ANCHORS: NO

AUTOMATIC CLEANING SYSTEM: NO POOL HEATER: 333,000

GAS LINE BY: DUNE SLIDE: NO SIZE: NO BTU GAS

SPA SPECIFICATIONS

SIZE: 7' x 10' DEPTH: 3' JETS: 7

BLOWER: NO SKIMMER: NO LIGHT: YES

SPILLWAY: YES HEATER: YES MAIN DRAIN: YES

SCREEN ENCLOSURE: NO SCREEN ROOF: NO DOORS:

ATTN: ROOF: GUTTER:

REMOVE FENCE: DUNE REPLACE FENCE: DUNE TEMP. FENCE: DUNE

TREE REMOVAL: DUNE STUMP REMOVAL: DUNE

SHRUBS: DUNE SAVE: HAUL AWAY: DUNE

SEPTIC TANK: DUNE SEWER LINE: DUNE

POWER LINE: DUNE RELOCATE: DUNE

GAS LINE: DUNE WATER LINE: DUNE

SPRINKLERS: DUNE REROUTE: DUNE CAP: DUNE

PHONE LINE: DUNE ACCESS PERMISSION: DUNE

RETAINING WALL: DUNE

Custom Design: FUN-STATE POOLS

NAME: Jack + Catherine Norton

ADDRESS: 2663 TUSTENUGEE AVE

CITY: LAKE CITY PHONE: CLARESE CELL 386.303.1108

Part 2 of contract dated: for pool at:

LOT: Acres BLOCK: SUB:

BOOK: PAGE:

ALSO DESCRIBED AS: 327 45-17-08929-000

CUSTOMER'S SIGNATURE:

DWN BY: Tom Bass DATE: 6-12-12 CHG BY:

PLOT PLAN

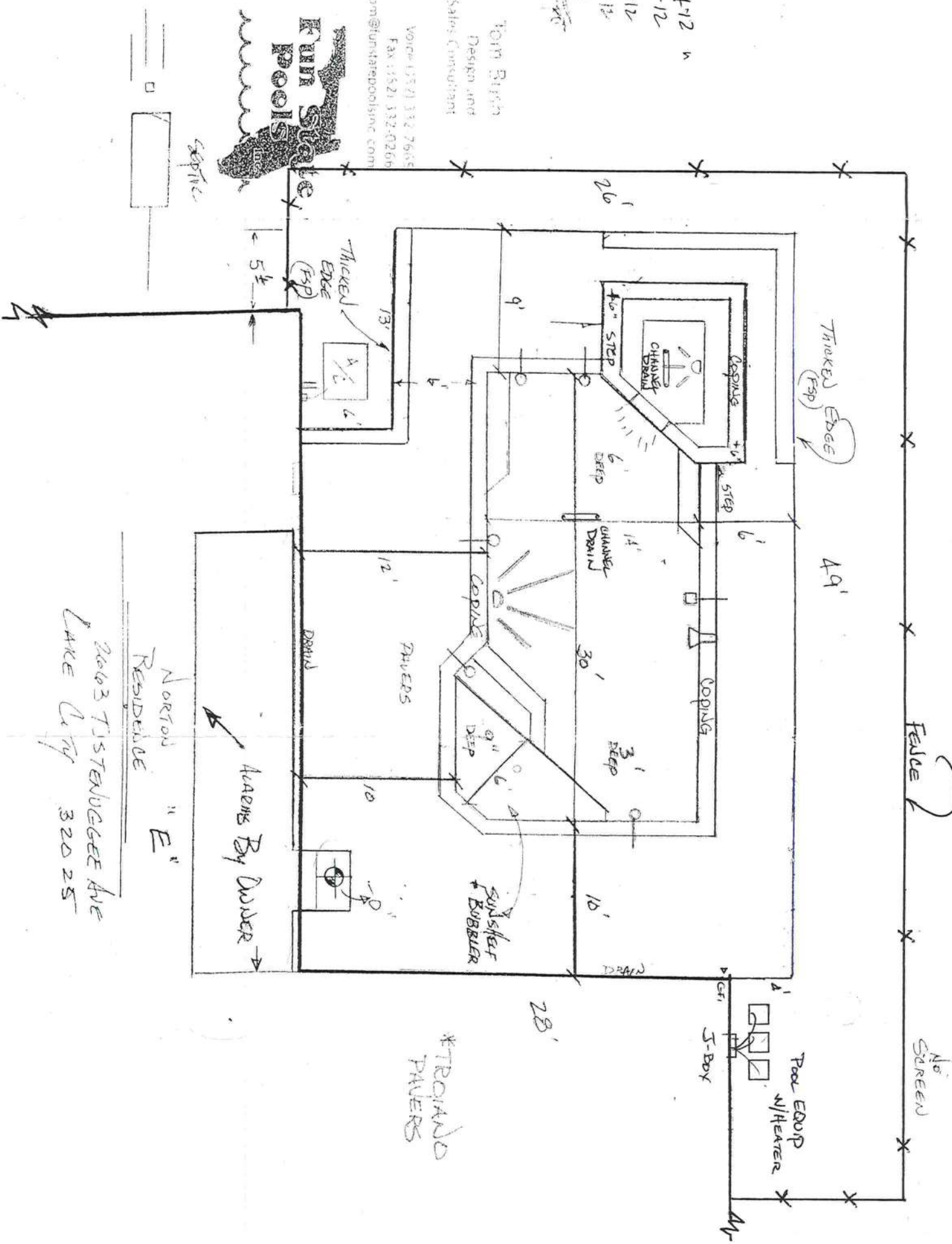
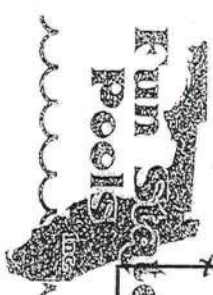
SCALE: 1/8" = 1'0"

*
VARIABLE
SPEED

5-14-12
5-11-12
5-9-12
5-7-12

Tom Bass
Design and
Sales Consultant

Voice: (352) 332-7655
Fax: (352) 332-0206
tom@funstatepools.com



EXCAVATED SOIL TO REMAIN ON SITE

WELL

Access

Note: Angle of repose of
existing foundation shall not
be disturbed by pool
excavation without engineering
approval.

Equipotential Bonding Grid
as per NEC 680-26 (Code)
Note - Pool shall be wired
as per NEC and all metal
within 5' of pool shall be
bonded.

Note: All plan dimensions
are subject to field verification
and modification.

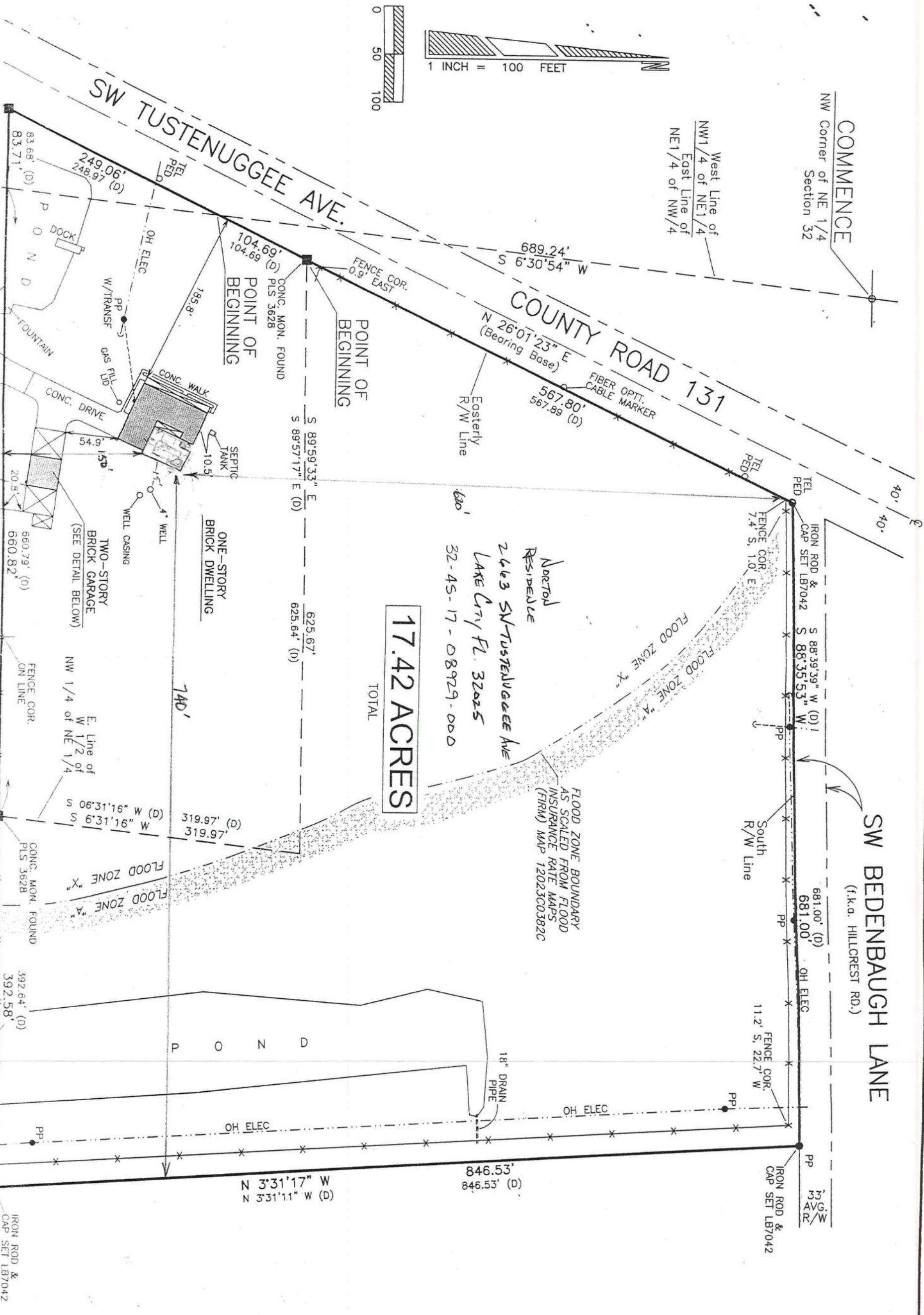
Commence at Columbia Cour of said NE 1/4 of said NW 1/4 of the N to a point on 23" East, along

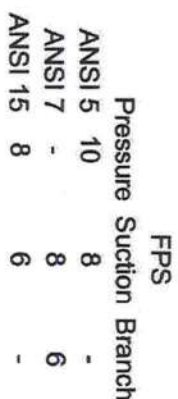
AND

Commence at Columbia Cour of said NE 1/4 of way line of Co of way line, 1 feet, thence S feet, thence N of Hillcrest Ro 681.00 feet to South 26° 01' Beginning. IN

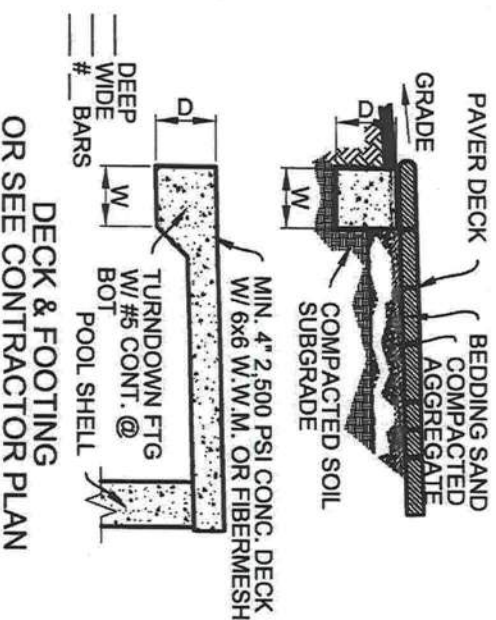
NOTES

- 1.) Monume
- 2.) Bounda by cite
- 3.) Bearing: Ave. at
- 4.) Interior
- 5.) Undergr
- 6.) This sur addition





ANGLE OF REPOSE
OR SEE CONTRACTOR PLAN



EXAMPLE RESIDENTIAL POOL / SPA SCHEMATIC PLAN & NOTES

SCALE: N.T.S.

- This plan is schematic & piping shall be connected to provide a functioning system.
- Pool piping shall hold a static water or air pressure not less than 35 psi for 15 minutes, per R4101.12.1
- Pools shall have pumps selected to provide minimum 12 hr. turnover & maximum 6 hour turnover.
- Determine pipe sizing from attached work sheets.
- Spa piping determined from attached work sheets.
- The dual main drains shall have a minimum separation of 3 ft, unless one is located on the vertical wall or a single unblockable drain is used.
- All suction covers shall meet ANSI/ASME A112.19.8-2007
- All piping shall be NSF-PW approved & meet the requirements of Florida Building Code.
- Electrical equipment, wiring, & installation shall conform to the National Electrical Code 2008 Edition
- Bonding of pool steel & light to footing steel shall be continued to & include all pumps & heaters.
- Temporary fencing shall be installed & maintained until permanent child safety features are installed.
- There shall be a passing electrical & child safety final inspection prior to filling the pool or spa with water.
- Pool shall meet the applicable criteria in ANSI/APSP 3.4, 5.6, 7 & 15 standards.
- Regardless of the criteria here, the project shall comply with all sections of the FBC - Residential, Building, Mechanical, Plumbing & Gas Codes, as applicable respectively & amended.

SEE INFORMATION ATTACHED TO THIS PERMIT
PACKAGE FOR SITE SPECIFIC DETAILS SHOWING ANSI 7
& 15 AND FBC COMPLIANCE

INFORMATION ON THIS SHEET COMPLIES WITH 2010 FBC
INCLUDING 2010 FBC ENERGY CONSERVATION CODE

FUN-STATE POOLS, INC.
FOR USE IN ALACHUA COUNTY



13410 2nd Ave. NE, Bradenton, FL 34212
Office: 941-749-0311, Fax: 941-746-7391
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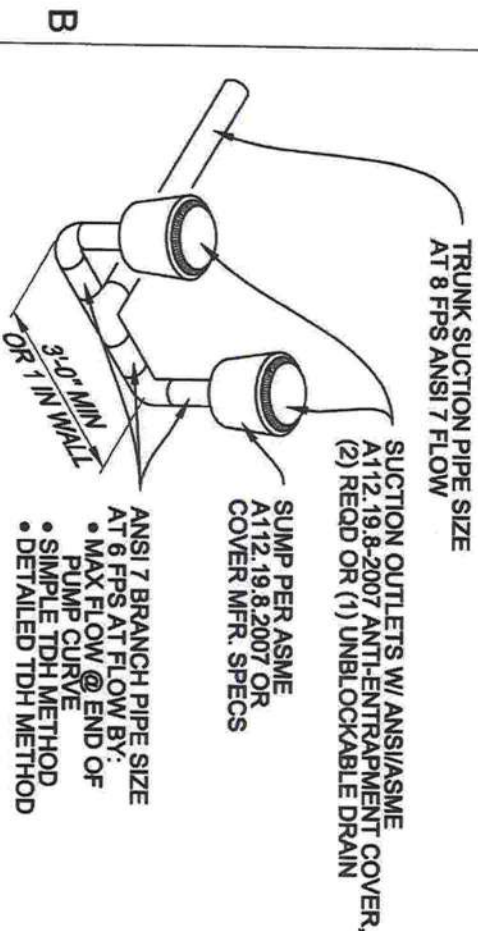
DATE:	13-Apr-12	REVISED:	13-Apr-12
DWG. BY:	MCM	PRINTED:	13-Apr-12
CHKD. BY:	JKK	SCALE:	AS NOTED

**TYPICAL PLAN &
SECTIONS FOR
RESIDENTIAL
POOL/SPA**

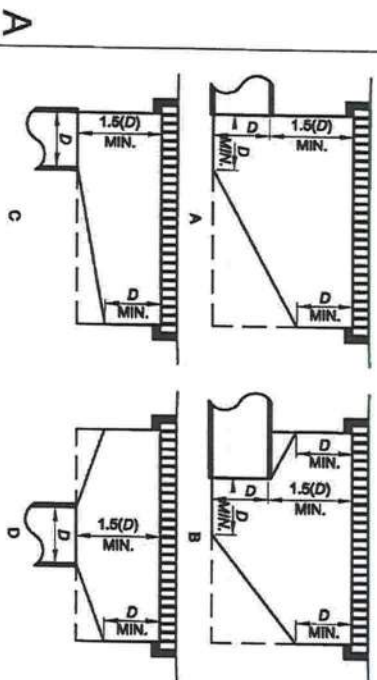
S1

SHEET OF

ORIG. DWG: 17"x11" (ANSI B)

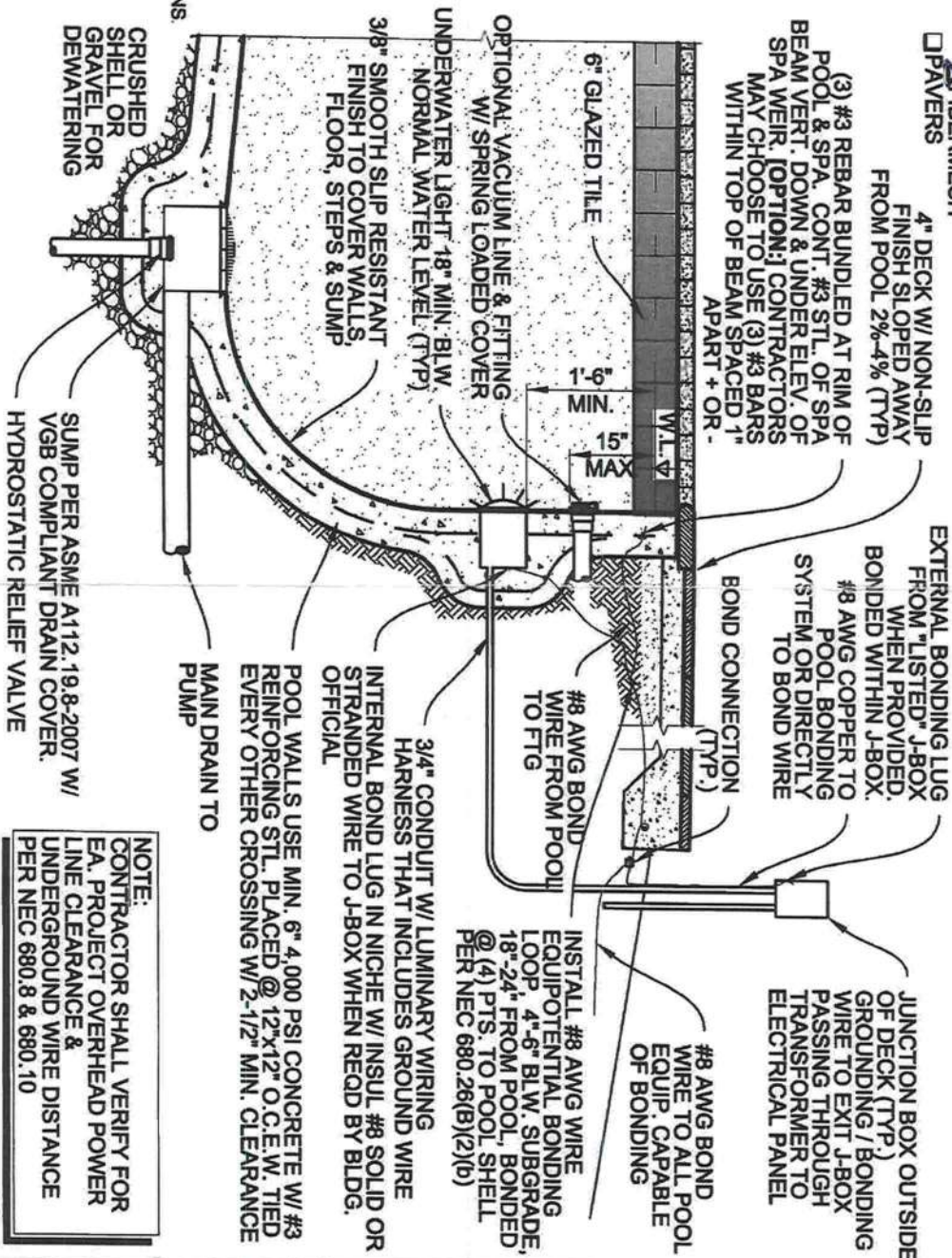


MAIN DRAINS MAY BE OMITTED ENTIRELY



SUMP SECTIONS PER ASME A112.19.8-2007

SCALE: N.T.S.



POOL DEEP END SECTION

SCALE: N.T.S.



NOTE

1. APPROVED PRODUCT SPECIFICATION MAY DIFFER FROM FIELD BUILT SUMPS SHOWN ON THIS PAGE

ADDITIONAL STRUCTURAL NOTES

- Use minimum ASTE A815 Grade 40 Steel
- Lap #3 bars minimum 15"
- Lap #5 bars minimum 25"
- 6" Shell thickness and 2-1/2" concrete coverage are minimums
- Use 4,000 psi concrete
- Contractor / Owner required to:
 - Contact Engineer if pool not placed on undisturbed and de-watered earth that can meet 2,000 psf bearing capacity.
 - When buried debris is encountered or questionable conditions are indicated at the work site prior / during construction, a subsurface consultant shall conduct boring(s) in the area of the pool to confirm soil bearing capacity, clear of buried debris, & verifying ground water level
 - All modified soils & earth fill under perspective pool area shall meet a soil density and compaction minimum of 95% modified proctor without settlement.

INFORMATION ON THIS SHEET COMPLIES WITH 2010 FBC INCLUDING 2010 FBC ENERGY CONSERVATION CODE

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DATE:	REVISIONS:
DWG. BY: MCM	PRINTED: 13-Apr-12
CHKD. BY: JKK	SCALE: AS NOTED
DATE: 13-Apr-12	

TYPICAL PLAN &
SECTIONS FOR
RESIDENTIAL
POOL/SPA

S2

SHEET OF

ORIG. DWG: 17"x11" (ANSI B)