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)

1. Calculate Pool Volume: 420 (Surf. Area) x 4.5 (Avg. Depth) x 7.48 (gal./cubic foot) = 14,137 (Vol. in gal.)
2. Determine preferred Turnover Time in hours: 8 (Hours) x 60 (min. / hr.) = 480 (Turnover in Min.)
3. Determine Max Flow Rate: 14137 (Vol. in gal.) / 480 (Turnover Mins.) = 29.45 (Pool Flow Rate) + .58 (Feature Flow Rate) = 30.03 (System Flow Rate)
4. Spa Jets: 7 (No. of Jets) x 1.04 (Jet Flow) gpm per jet = 7.28 (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:

1. Distance from pool to pump in feet: 15'
2. Friction loss (in suction pipe) in 2" inch pipe per 1 ft. @ 82 gpm = .10 (from pipe flow/friction loss chart)
3. Friction loss (in return pipe) in 2" inch pipe per 1 ft. @ 103 gpm = .16 (from pipe flow/friction loss chart)
4. 15 (Length of Suct. Pipe) x .10 (Ft of head/1 ft of Pipe) = 1.5 (TDH Suct. Pipe)
   15 (Length of Return Pipe) x .16 (Ft of head/1 ft of Pipe) = 2.4 (TDH Return Pipe)

COLUMBIA COUNTY BUILDING DEPARTMENT Received for FILE COPY Code Compliance PLANS EXAMINER

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 loss: 40.8

Total Dynamic Head (TDH): 59.5

Selected Pump and Main Drain Cover:

Pump selection: VSSVRS PENTAIR 011017 (Pump model and size in Horsepower) using pump curve for TDH & System Flow Rate

Main Drain Cover: 642-132X WATER WAY (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 @ [ ] gpm max. flow (see note 3).

32" [642-132X] channel drain @ [170] gpm w/ [2"/2"] 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.

☐ Maximum Flow Capacity
of the new or replacement pump.

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 & Heater make and model cannot 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	Velocity – Feet Per Second					
	6 fps		8 fps		10 fps	
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	0.09'	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)

PSI (Pressure 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

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

6-19-12
Date

Michael Canto
Contractors Signature
MICHAEL CANTO
CPC 1457306
352·332·7665

Date

Voice (352) 332-7665
Fax (352) 332-0266
mike@funstatepoolsinc.com

Fun State Pools Inc.
352•POOL

Michael Canto

www.funstatepoolsinc.com
3601 N.W. 97th Blvd. • Gainesville, Florida 32606

Swimming Pool Specification For:
NORTON RESIDENCE
2663 TUSTENUGGEE AVE
LAKE CITY FL. 32025

Fun State Pools Inc.
332·POOL

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

REF. NO. _____

POOL SHAPE GRECIAN JOB NO. _____
SIZE 14'x16'x30' DEPTH 3' TO 6' PERM 85' AREA 420
DECK _____ DECK SURFACE PAVER DECK-O-DRAIN YES
COPING YES CANTILEVER NO
TILE 6"x6" COLOR YES - OWNER
STEP COLOR NO COLOR NO
TURNOVER 8hr FILTER TYPE PLM SIZE 150 PUMP VS SVRS
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 SALT TIMER YES FILL LINE NO
CLEANING EQUIPMENT MANUAL SWIMOUT YES SIZE 1" JETS —
ROPE & FLOATS NO ROPE ANCHORS NO
AUTOMATIC CLEANING SYSTEM LEGEND POOL HEATER 333,000 BTU GAS
GAS LINE BY: OWNER SLIDE NO SIZE NO

SPA SPECIFICATIONS

SIZE 7'x10' Dia. Cut DEPTH 3' JETS 7
BLOWER NO SKIMMER NO LIGHT YES
SPILLWAY YES HEATER YES MAIN DRAIN YES
SCREEN ENCLOSURE NO SCREEN ROOF _____ DOORS 1
ALUM. ROOF _____ GUTTER _____
REMOVE FENCE OWNER REPLACE FENCE OWNER TEMP. FENCE OWNER
TREE REMOVAL OWNER STUMP REMOVAL OWNER
SHRUBS OWNER SAVE _____ HAUL AWAY OWNER
SEPTIC TANK OWNER SEWER LINE OWNER
POWER LINE OWNER RELOCATE OWNER
GAS LINE OWNER WATER LINE OWNER
SPRINKLERS OWNER REROUTE OWNER CAP OWNER
PHONE LINE OWNER ACCESS PERMISSION OWNER
RETAINING WALL OWNER

Custom Design...FUN-STATE POOLS

NAME JACK & CHARESE NORTON
ADDRESS 2663 TUSTENUGGEE AVE
CITY LAKE CITY PHONE: CHARESE CELL 386·303·1108

Part 2 of contract dated _____ for pool at:
LOT ACREAGE BLOCK _____ SUB _____
BOOK _____ PAGE _____
ALSO DESCRIBED AS # 32-4S-17-08929-000
CUSTOMER'S SIGNATURE _____
DWN BY Tom Bush DATE 6-12-12 CHK BY _____

PLOT PLAN
SCALE: 1/8" = 1'0"

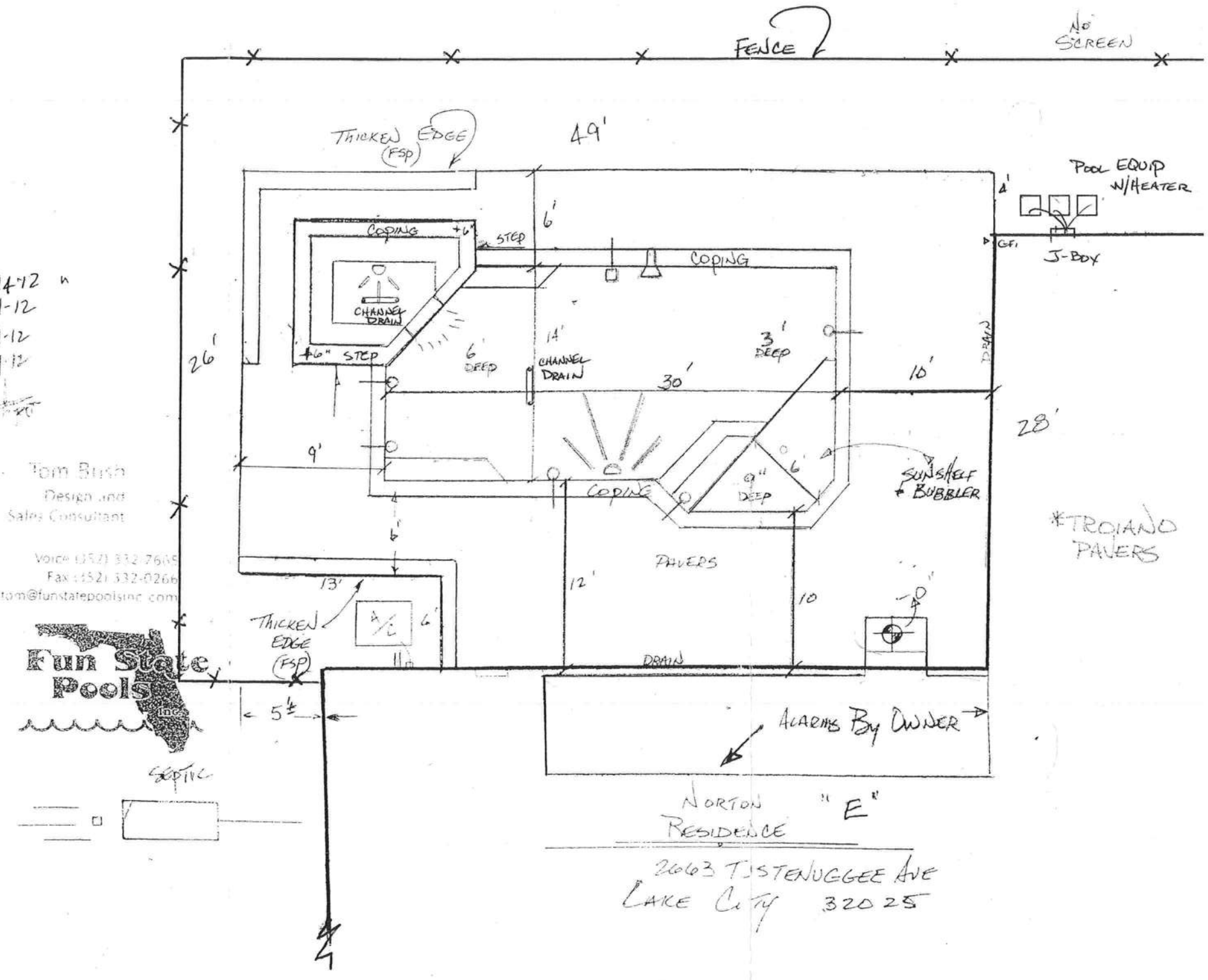
* VARIABLE SPEED

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

EXCAVATED SOIL TO REMAIN ON SITE

WELL

ACCESS



* TROJANO PAVERS

NORTON "E"
RESIDENCE
2663 TUSTENUGGEE AVE
LAKE CITY 32025

Tom Bush
Design and
Sales Consultant
Voice (352) 332-7605
Fax (352) 332-0266
tom@funstatepoolsinc.com

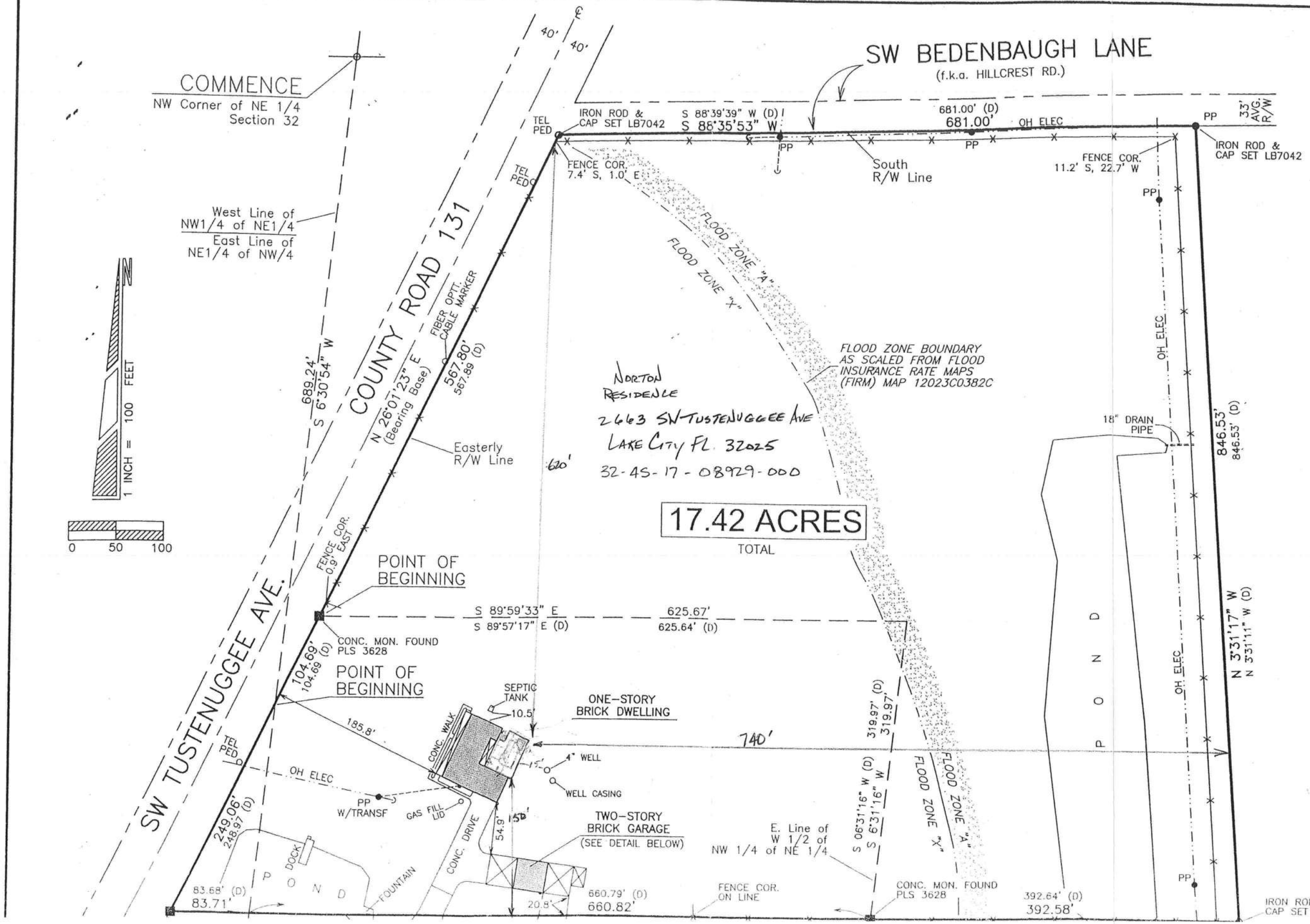
Fun State Pools Inc.

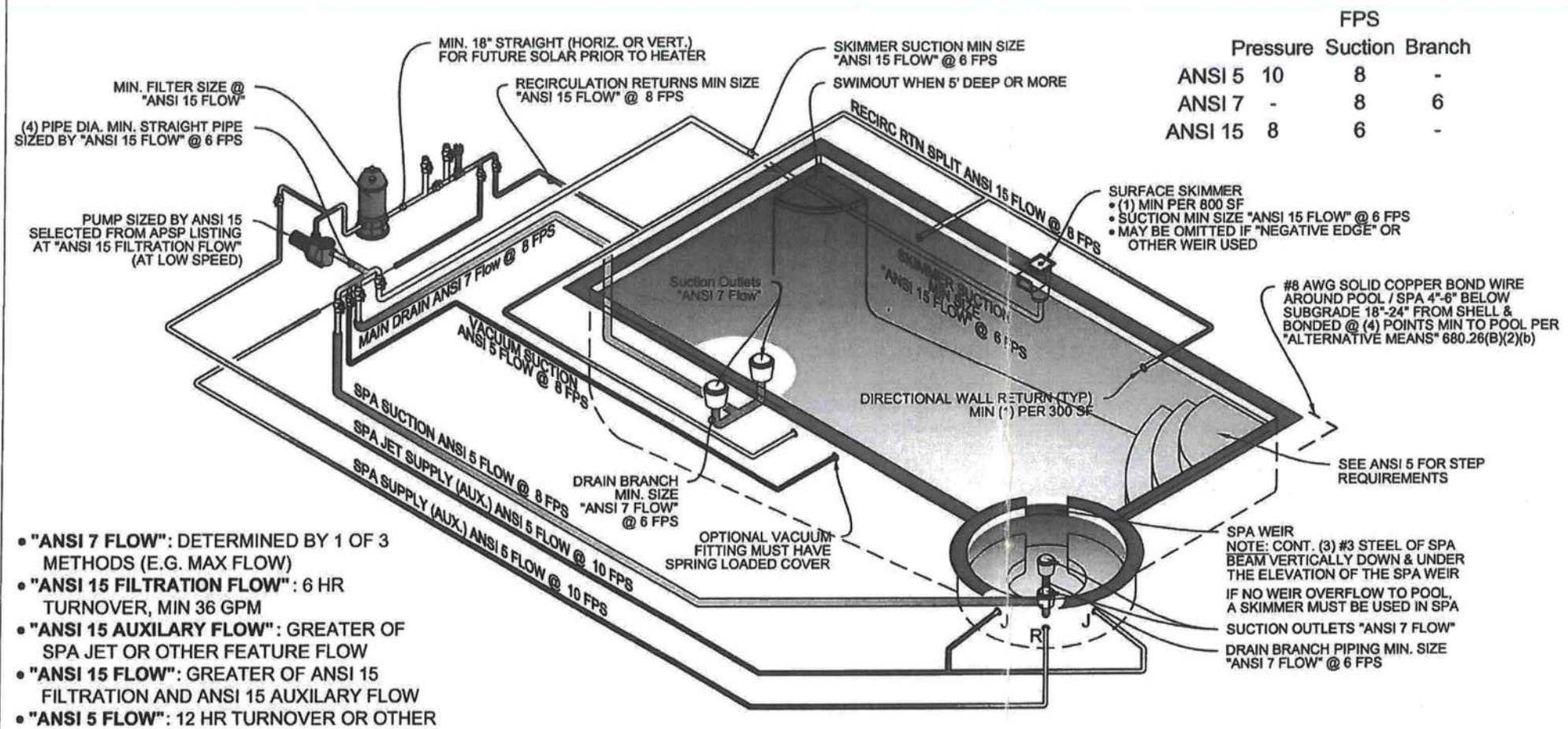
DIRECTION

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

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.


SW BEDENBAUGH LANE
(f.k.a. HILLCREST RD.)
COMMENCE
NW Corner of NE 1/4
Section 32
West Line of
NW1/4 of NE1/4
East Line of
NE1/4 of NW/4
COUNTY ROAD 131
SW TUSTENUGGEE AVE.
S 6°30'54" W
689.24'
N 26°01'23" E
(Bearing Base)
567.80'
567.89' (D)
FIBER OPTT. CABLE MARKER
TEL PED
IRON ROD & CAP SET LB7042
S 88°39'39" W (D)
S 88°35'53" W
681.00' (D)
681.00'
OH ELEC
PP
33' AVG. R/W
FENCE COR. 7.4' S, 1.0' E
FENCE COR. 11.2' S, 22.7' W
South R/W Line
Easterly R/W Line
FLOOD ZONE "A"
FLOOD ZONE "X"
FLOOD ZONE BOUNDARY AS SCALED FROM FLOOD INSURANCE RATE MAPS (FIRM) MAP 12023C0382C
NORTON RESIDENCE
2663 SW TUSTENUGGEE AVE
LAKE CITY FL 32025
32-4S-17-08929-000
17.42 ACRES
TOTAL
18" DRAIN PIPE
846.53'
846.53' (D)
N 3°31'17" W
N 3°31'11" W (D)
POND
1 INCH = 100 FEET
0 50 100
FENCE COR. 0.9' EAST
POINT OF BEGINNING
S 89°59'33" E
S 89°57'17" E (D)
625.67'
625.64' (D)
CONC. MON. FOUND PLS 3628
104.69'
104.69' (D)
POINT OF BEGINNING
SEPTIC TANK
10.5'
ONE-STORY BRICK DWELLING
740'
185.8'
CONC. WALK
4" WELL
WELL CASING
15'
OH ELEC
PP W/TRANSF
GAS FILL LID
249.06'
248.97' (D)
TEL PED
TWO-STORY BRICK GARAGE
(SEE DETAIL BELOW)
54.9'
150'
CONC. DRIVE
DOCK
FOUNTAIN
83.68' (D)
83.71'
660.79' (D)
660.82'
20.8'
E. Line of W 1/2 of NW 1/4 of NE 1/4
S 06°31'16" W (D)
S 6°31'16" W
319.97' (D)
319.97'
FLOOD ZONE "X"
FLOOD ZONE "A"
FENCE COR. ON LINE
CONC. MON. FOUND PLS 3628
392.64' (D)
392.58'
IRON ROD & CAP SET LB7042

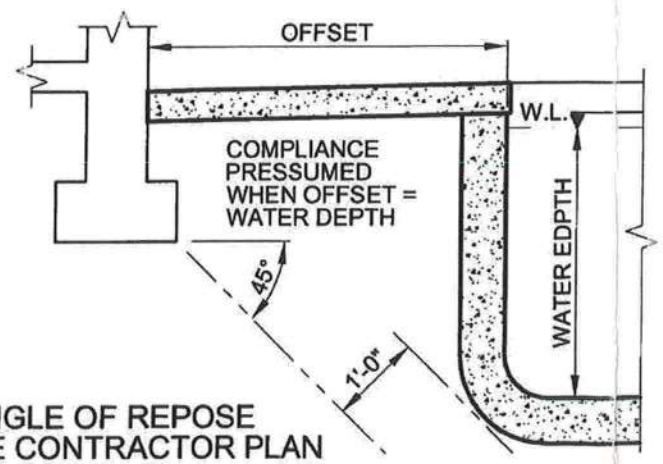


	FPS		
	Pressure	Suction	Branch
ANSI 5	10	8	-
ANSI 7	-	8	6
ANSI 15	8	6	-

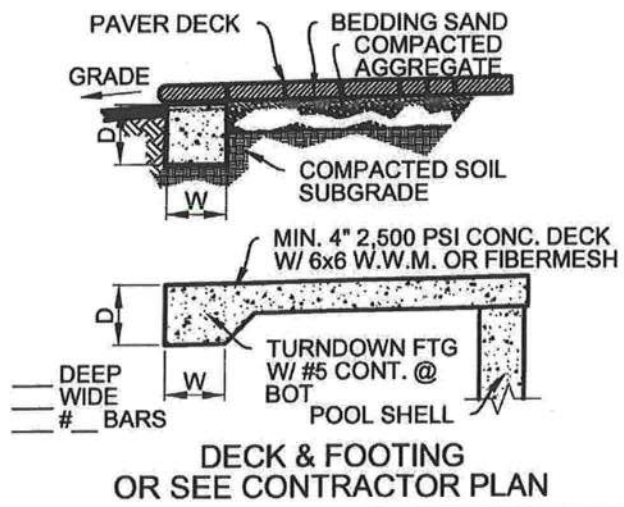
- **"ANSI 7 FLOW"**: DETERMINED BY 1 OF 3 METHODS (E.G. MAX FLOW)
- **"ANSI 15 FILTRATION FLOW"**: 6 HR TURNOVER, MIN 36 GPM
- **"ANSI 15 AUXILARY FLOW"**: GREATER OF SPA JET OR OTHER FEATURE FLOW
- **"ANSI 15 FLOW"**: GREATER OF ANSI 15 FILTRATION AND ANSI 15 AUXILARY FLOW
- **"ANSI 5 FLOW"**: 12 HR TURNOVER OR OTHER "ESTIMATED/ DESIGN" FLOW

PIPE FLOW AT GIVEN VELOCITY (GPM)

PIPE	6 FPS	8 FPS	10 FPS
1"	16	22	26
1-1/2"	38	51	62
2"	63	84	102
2-1/2"	90	119	146
3"	138	184	226
4"	238	317	391
6"	540	720	890



ANGLE OF REPOSE
OR SEE CONTRACTOR PLAN



DECK & FOOTING
OR SEE CONTRACTOR PLAN

EXAMPLE RESIDENTIAL POOL / SPA SCHEMATIC PLAN & NOTES

SCALE: N.T.S.

POOL ONLY ☐
SPA ONLY ☐

NOTES:

- 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

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC
13410 2nd Ave. NE, Bradenton, FL 34212
Office: 941-749-0311, Fax: 941-746-7391
kent@kimesengineering.com
P.E. 33678, C.A. 27189

DATE:	REVISIONS:

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

STATE OF FLORIDA — KENT J. KIMES — LICENSE No. 33678 — PROFESSIONAL ENGINEER

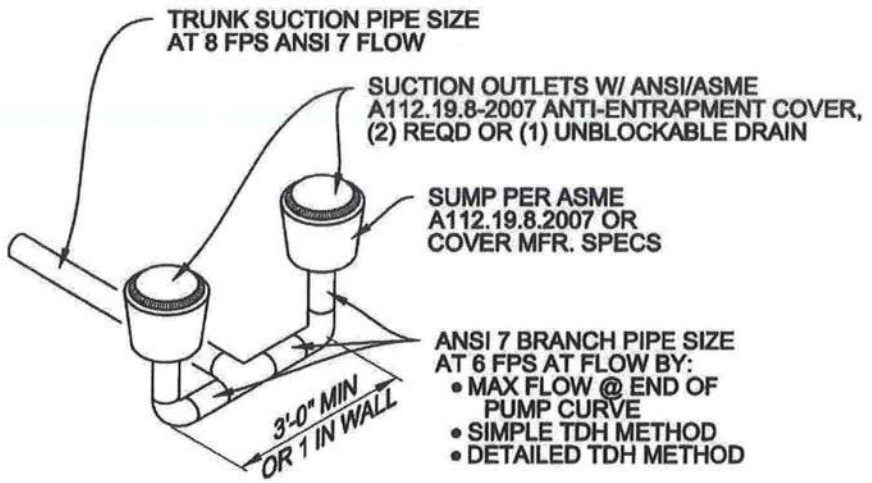
TYPICAL PLAN & SECTIONS FOR RESIDENTIAL POOL/SPA

S1

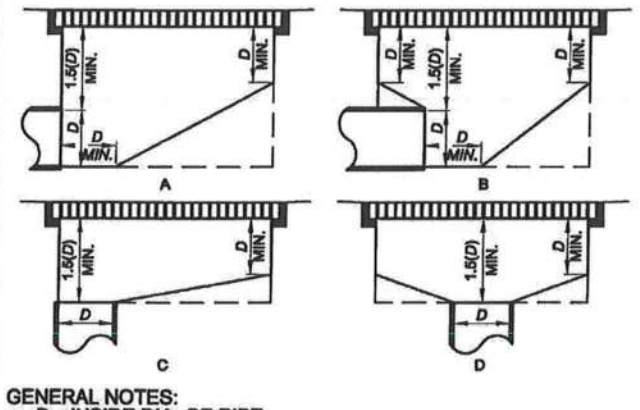
SHEET OF

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

\\SBSDC\Company Shared Docs\File Cabinet-Kent\1 Pool Changes 2011 & 2012\1-2010 KE Std Eng r 4-13-12.dwg



MAIN DRAINS MAY BE OMITTED ENTIRELY



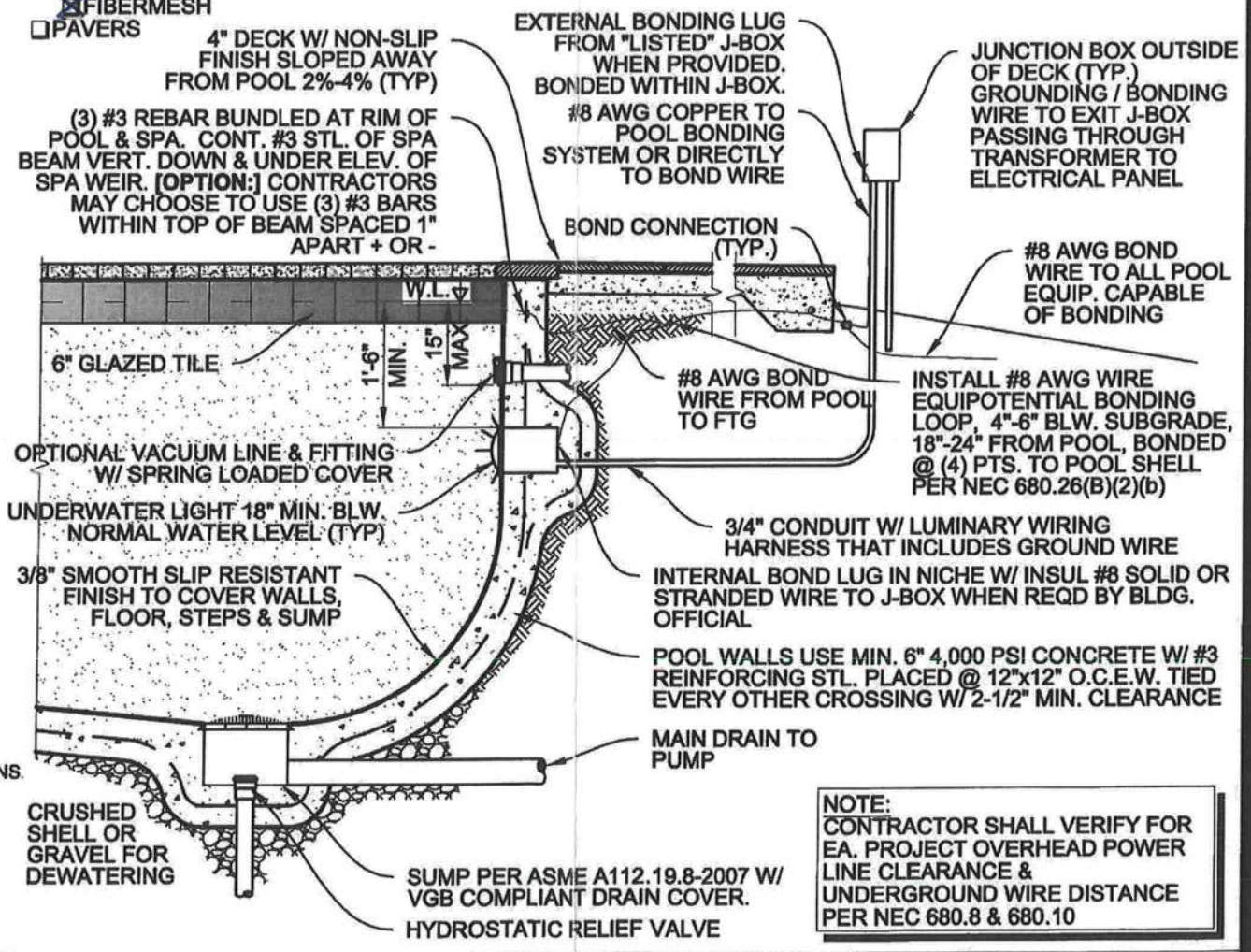
GENERAL NOTES:
a. *D* = INSIDE DIA. OF PIPE
b. ALL DIMENSIONS SHOWN ARE MINIMUMS.
c. ALL HIDDEN LINES INDICATE SUGGESTED SUMP CONFIGURATIONS.

NOTES:
- FIELD BUILD SUMPS MEETING THESE CRITERIA REQD WHEN MFR POTS NOT USED
- MAY OMIT IF LISTED COVER DOCUMENATION STATES OTHER CLEARANCE TO SUCTION PIPE REQD

SUMP SECTIONS PER ASME A112.19.8-2007

SCALE: N.T.S.

DECK TYPE:
☒ CONCRETE
☐ 6x6 W.W.M.
☒ FIBERMESH
☐ PAVERS



NOTE:
CONTRACTOR SHALL VERIFY FOR EA. PROJECT OVERHEAD POWER LINE CLEARANCE & UNDERGROUND WIRE DISTANCE PER NEC 680.8 & 680.10

POOL DEEP END SECTION

SCALE: N.T.S.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's first. It's free. It's the law.
www.callsunshine.com

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

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

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC
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Office: 941-749-0311, Fax: 941-746-7391
kent@kimesengineering.com
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JAMES KENT KIMES LICENSE NO. 33678 STATE OF FLORIDA PROFESSIONAL ENGINEER

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)