TES

THOMPSON ENGINEERING SERVICES, LLC

MAILING ADDRESS: P.O. BOX 1500, ENGLEWOOD, TN 37329

PHONE: (423)781-7336 • FAX: (423)781-7337 • WEB: WWW.TESENGRS.COM

Wall Panel & Brace Calculations

for

MEGNA POOLS

MEGNA POOLS

821 Brock Road, Unit 1

Pickering, ON L1W3L6

42" Tall 14 Gauge Steel Wall Pools

Installation Address: MEGNA POOLS, 821 Brock Road, Unit 1, Pickering, ON L1W3L6

June 21, 2013

CARL EVERETT THOMPSON, JR.
REGISTERED ENGINEER
AGRICULTURE
6-21-13
COMMERCE
No. 16572
STATE OF TENNESSEE

THOMPSON ENGINEERING SERVICES, LLC
P.O. Box 1500, Englewood, TN 37329
Phone: (423)781-7336 Fax: (423)781-7337
Email:carl@tesengrs.com Website:tesengrs.com

Project			Job Ref.
42" Tall 14 Gauge Steel Wall Pools			
Section			Sheet no./rev.
			2
Calc. by	Date	Chk'd by	Date
D.J.W.	6/21/2013	C.E.T.	6/21/2013

CARL EVERETT THOMPSON, JR. REGISTERED ENGINEER AGRICULTURE COMMERCE No. 16572 STATE OF TENNESSEE 6-21-13

These calculations are in compliance with the folowing national & state codes:

1. International Building Code (IBC) 2003, 2006, 2009 & 2012
2. California Building Code (CBC) 2010
3. Florida Building Code (FBC) 20l0
4. North Carolina Building Code (NCBC) 2012
5. ANSI/APSP/ICC-5 2011 Residential Inground Swiming Pools

Parameter Definitions & Values;

Soil Properties (Assumed); Sandy Silt

Unit Weight of Dry Soil;	W_d	105	lb/ft^3;
Unit Weight of Saturated Soil;	W_s	135	lb/ft^3;
Soil Friction Angle;	ϕ	30 ;	degrees;
Lateral Active Soil Coefficient;	$K_a = (\tan(45° - \phi / 2))^2$	0.333;	
Equivalent Active Unit Weight of Dry Soil.; K_a;* W_d;	$\gamma_d = K_a \times W_d$	35	lb/ft^3;
Equivalent Active Unit Weight of Saturated Soil.; K_a;* W_s;	$\gamma_s = K_a \times W_s$	45	lb/ft^3;
Unit Weigth of Water;	$\gamma_w = 62.4$ lb/ft^3	62.4	lb/ft^3;
Soil & Concrete Friction Factor;	μ	0.45;	
Soil Bearing Capacity;	$Bearing_{\_capacity}$	1500	lb/ft^2;

Diminsions & Material Properties;

Braces, Channels, Pannels & Stiffeners;

Yeild Strength of ASTM-A653 Type B Galvanized Steel;	F_y	30	ksi;
Allowable Bending Stress of Steel;	$F_b = .60 \times F_y$	18.000	ksi;
Allowable Bending Stress of Steel;	$F_{b\ panel} = .75 \times F_y$	22.500	ksi;
Allowable Compressive Stress of Steel;	$F_c = .60 \times F_y$	18.000	ksi;
Allowable Shear Stress of Steel;	$F_v = .40 \times F_y$	12.000	ksi;
Allowable Tensile Stress of Steel;	$F_t = .60 \times F_y$	18.000	ksi;
Panel, Stiffener Thickness (14 Gauge);	t_p	0.0747	in;
Panel Height;	h	3.50	ft;
Water Depth;	h_w	3.00	ft;
Effective Height of Panel;	$h_{eff} = h - t_c$	2.833	ft;
Maximum Radius of Panel;	R	24	ft;
Effective Height / Length of Stiffener,; h_{eff}	L_e	2.83	ft;
Nominal Depth of Stiffener;	D	5.00	in;
Maximum Brace Spacing /Max Panel Lenght;	L_c	8	ft;
Panel Tributary Width to Vertical Stiffeners;	B_{trib}	2.67	ft;

Concrete Bond Beam

Compressive Strength of Concrete;	f'_c	2500	psi;
Thickness of Base Pour;	t_c	8.00	in;
Width of Base Pour;	B_c	2.00	ft;
Unit Weight of Concrete;	γ_c	145	lb/ft^3;

A-307 Bolts

Allowable Tensile Stress;	$F_{t\ fastener}$	19.1	ksi;
Allowable Shear Stress;	$F_{v\ fastener}$	9.9	ksi;

Calculation Assumptions:

a. Controling conditions (i.e. brace spacing, panel dimensions, etc.) forth the 42" high panel system are used in this analysis.

b. The 8 foot long wall panel is the longest panel used with this pool system & contains the largest spacing between horizontal & vertical panel stiffeners. All other panels are shorter in length & have horizontal & vertical stiffeners no greater than that of the 8 foot long wall panel. Full height vertical stifeners considered only.

c. The concrete base pour (i.e. bond beam) provides a minimum of 8 inches of vertical support to the panels, stiffeners & braces.

d. Refer to the last page for more Material/Installation Assumptions.

THOMPSON ENGINEERING SERVICES, LLC
P.O. Box 1500, Englewood, TN 37329
Phone: (423)781-7336 Fax: (423)781-7337
Email:carl@tesengrs.com Website:tesengrs.com

Project			Job Ref.
42" Tall 14 Gauge Steel Wall Pools			
Section			Sheet no./rev.
			3
Calc. by	Date	Chk'd by	Date
D.J.W.	6/21/2013	C.E.T.	6/21/2013

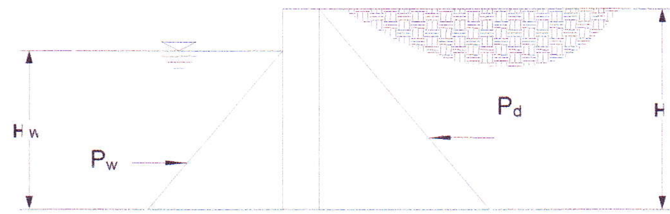
CARL EVERETT THOMPSON, JR. REGISTERED ENGINEER AGRICULTURE COMMERCE No. 16572 STATE OF TENNESSEE 6-21-13

Structural Analysis;

Loading Conditions; (per linear foot of pool Wall)

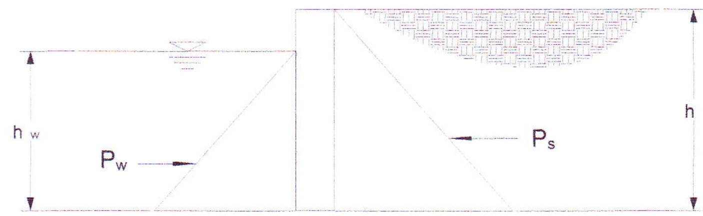
FULL POOL & DRY BACKFILL

Total Lateral Dry Soil Load,; $P_d = (\gamma_d \times h^2)/2 =$ **214.375** lb/ft
Total Lateral Water Load,; $P_w = (\gamma_w \times h_w^2)/2 =$ **280.800** lb/ft
Total Lateral Load Per Unit Length,; $P = P_w - P_d =$ **66.425** lb/ft
Approximate Distributed Panel Load,; $P_{net} = P/h =$ **18.979** psf



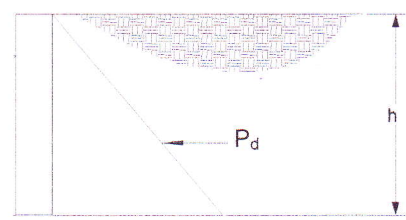
FULL POOL & SATURATED BACKFILL

Total Lateral Dry Soil Load,; $P_s = (\gamma_s \times h^2)/2 =$ **275.625** lb/ft
Total Lateral Load Per Unit Length,; $P = P_w - P_s =$ **5.175** lb/ft
Approximate Distributed Panel Load,; $P_{net} = P/h =$ **1.479** psf;



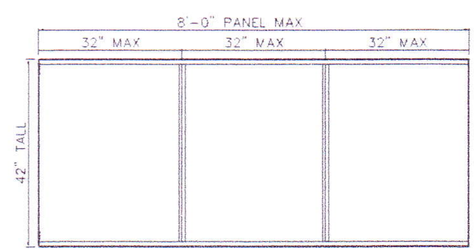
EMPTY POOL & DRY BACKFILL (WORST CASE CONDITION)

Total Lateral Dry Soil Load,; $P_d =$ **214.375** lb/ft
Approximate Distributed Panel Load,; $P_{net} = P_d/h =$ **61.250** psf



FLAT PANEL ANALYSIS

$P' = \gamma_d \times h_{eff}^2 / 2 =$ **140.486** lb/ft
Aproximate Distributed Panel Load,; $P'_{net} = P'/h_{eff} =$ **49.583** psf
Largest Unsupported Panel Area, l x b:; l = 8 ft / 3 = **32.000** in; $b = h_{eff} =$ **34.000** in;
$\beta = .3078 + (b / l - 1) \times ((.3834 - .3078)/(1.2 - 1.0)) =$ **0.3314**
Actual Bending Stress,; $f_b = \beta \times P'_{net} \times l^2 / t_p^2 =$ **20.942 ksi**
%Stressed = $f_b / F_{b\_panel} =$ **93.1** %
Factor of Safety,; $FS = F_{b\_panel} / f_b =$ **1.074**; **>= 1.0 OK**;



Reference for bending stress of panel, *Roark's Formulas for Stress and Strain*, 7th Edition.
Table 11.4 Formulas for Flat Plates with Straight Boundarys and Constant Thickness.
Case #: 8. Rectangular Plate : all edges fixed. Loading Case #: 8a. Uniform over entire plate. (At center of long edge)

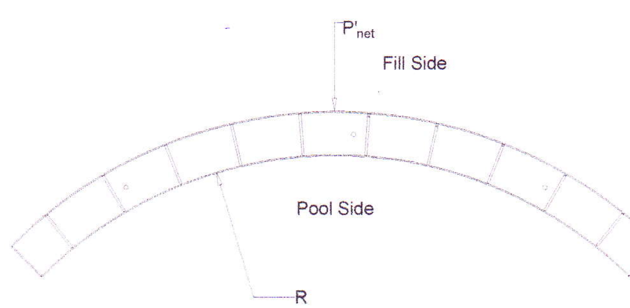
RADIAL PANEL ANALYSIS (24' MAX PANEL RADIUS)

Compression Analysis

$P' = \gamma_d \times h_{eff}^2 / 2 =$ **140.486** lb/ft
Aproximate Distributed Panel Load,; $P'_{net} = P'/h_{eff} =$ **49.583** psf
Actual Compressive Stress,; $f_c = P'_{net} \times R / t_p =$ **1.328** ksi
%Stressed = $f_c / F_c =$ **7.4** %
Factor of Safety,; $FS_c = F_c / f_c =$ **13.559**; **>= 1.0 OK**;

Tension Analysis

Actual Tension Stress,; $f_t = P'_{net} \times R / t_p =$ **1.328** ksi
%Stressed = $f_t / F_t =$ **7.4** %
Factor of Safety,; $FS_t = F_t / f_t =$ **13.559**; **>= 1.0 OK**;



TES
THOMPSON ENGINEERING SERVICES, LLC
P.O. Box 1500, Englewood, TN 37329
Phone: (423)781-7336 Fax: (423)781-7337
Email:carl@tesengrs.com Website:tesengrs.com

Project			Job Ref.
42" Tall 14 Gauge Steel Wall Pools			
Section			Sheet no./rev.
			4
Calc. by	Date	Chk'd by	Date
D.J.W.	6/21/2013	C.E.T.	6/21/2013

CARL EVERETT THOMPSON, JR.
REGISTERED ENGINEER
AGRICULTURE
6-21-13
COMMERCE
No. 16572
STATE OF TENNESSEE

BENDING ALONG VERTICAL AXIS AT VERTICAL STIFFENER

(Assume end are fixed at flanges)

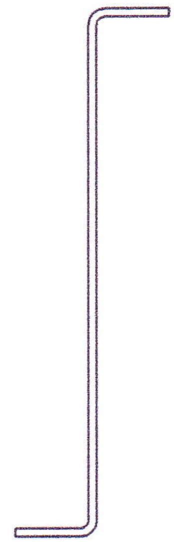
4 7/8" x 3/4" x 14 Gauge Z-Stiffeners

Area: 0.5787 in^2

Moments of inertia: I: 2.0022 in^4

Section Modulus: S = I / C; 1.2603 in^4 / 2.4375 in = 0.517 in^3

Stiffener Section Modulus (*Z-Stiffener*); S_z = 0.517 $_{in3}$



$P' = \gamma_d \times h_{eff}^2 / 2$ = **140.486** lb/ft

Maximum Vertical Stiffener Moment,; $M_s = (2 \times P' \times L_e \times B_{trib}) / (9 \times \sqrt{(3)})$ = **136.194** lb_ft

Actual Bending Stress,; $f_b = M_s / S_z$ = **3.161** ksi

%Stressed = f_b / F_b = **17.6** %

Factor of Safety,; $FS = F_b / f_b$ = **5.694**; **>= 1.0 OK**;

BENDING ALONG HORIZONTAL AXIS AT TOP HORIZONTAL STIFFENER

(Assume panel length governs as maximum spacing between braces)

5" x 1 1/4" x 14 Gauge C-Stiffeners

Area: 0.5286 in^2

Moments of inertia: I: 1.7823 in^4

Section Modulus: S = I / C; 1.7987 in4/ 2.5 in = 0.7195 in^3

Stiffener Section Modulus (*C-Stiffener*),; S_c = 0.7195 in^3

$P' = \gamma_d \times h_{eff}^2 / 2$ = **140.486** lb/ft

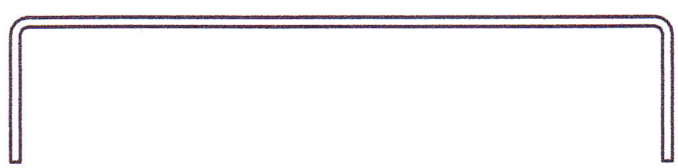
Load Along the Top Flange,; $P_{top} = P' / 3$ = **46.829**

Maximum Bending Moment,; $M_r = (P_{top} \times L_c^2) / 8$ = **374.630** lb_ft

Actual Bending Stress,; $f_b = M_r / S_c$ = **6248.166** psi

%Stressed = f_b / F_b = **34.7** %

Factor of Safety,; $FS = F_b / f_b$ = **2.881**; **>= 1.0 OK**;



TES
THOMPSON ENGINEERING SERVICES, LLC
P.O. Box 1500, Englewood, TN 37329
Phone: (423)781-7336 Fax: (423)781-7337
Email:carl@tesengrs.com Website:tesengrs.com

Project		Job Ref.	
42" Tall 14 Gauge Steel Wall Pools			
Section		Sheet no./rev.	
		5	
Calc. by	Date	Chk'd by	Date
D.J.W.	6/21/2013	C.E.T.	6/21/2013

CARL EVERETT THOMPSON, JR. REGISTERED ENGINEER AGRICULTURE COMMERCE No. 16572 STATE OF TENNESSEE 6-21-13

OVERTURNING ANALYSIS

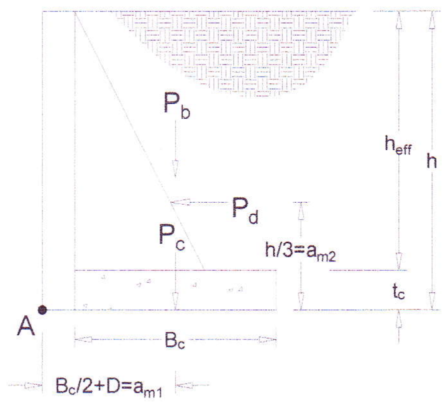
(Moments taken about point A with concrete bond beam in place. Calculated per unit foot of wall)

Resisting Moment Arm,; $a_{m1} = B_c /2 + D =$ **1.417** ft
Overturning Moment Arm,; $a_{m2} = h /3 =$ **1.167** ft

Weight of Backfill,; $P_b = B_c \times h_{eff} \times W_d \times 1$ ft = **595.000** lb
Weight of Concrete,; $P_c = \gamma_c \times t_c \times B_c \times 1$ ft = **193.333** lb
Applied Vertical Load,; $P_{virtical} = P_b + P_c =$ **788.333** lb

Resisting Moment due to Backfill,; $M_{backfil} = P_b \times a_{m1} =$ **842.917** lb_ft
Resisting Moment due to Concrete,; $M_{concrete} = P_c \times a_{m1} =$ **273.889** lb_ft
Sumation of Resisting Moments,; Σ; $M_{resisting} = M_{backfil} + M_{concrete} =$ **1116.806** lb_ft

Lateral Force Due to Backfill,; $P_d = (\gamma_d \times h^2 \times 1 \text{ ft}) / 2 =$ **214.375** lb
Sumation of Overturning Moments,; Σ;$M_{overturn} = M_{soil} = P_d \times a_{m2} =$ **250.104** lb_ft
Overturning Factor of Safety,; $FS_{overturning} = M_{resisting} / M_{overturn} =$ **4.465**; **>= 1.5 OK**;



BEARING ANALYSIS

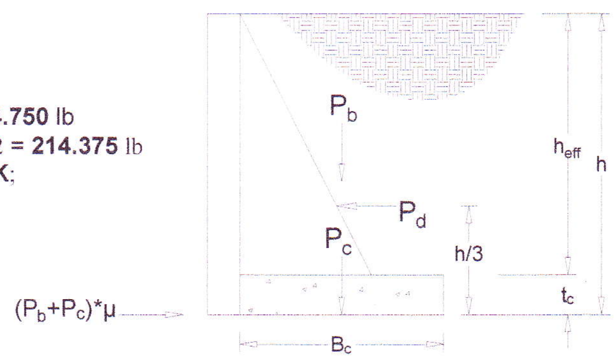
Foundation Load Eccentricity,; $e = M_{overturn} / (P_b + P_c) =$ **0.317** ft; **OK, Resultant in Middle Third**;
Soil Bearing Load,; $Bearing_{\_load} = ((P_b + P_c) / (B_c \times 1 \text{ ft})) \times (1 + (6 \times e) / B_c) =$ **769.323** lb/ft^2
Bearing Factor of Safety,; $FS_{Bearing} = Bearing_{\_capacity} / Bearing_{\_load} =$ **1.950**; **>= 1.0 OK, Actual Load is Less Than Allowable Load**;

SLIDING ANALYSIS

(Concrete bond beam in place. Calculated per unit foot of wall)

Weight of Backfill,; $P_b = B_c \times h_{eff} \times W_d \times 1$ ft = **595.000** lb
Weight of Concrete,; $P_c = \gamma_c \times t_c \times B_c \times 1$ ft = **193.333** lb

Sumation of Sliding Resistance Force,; Σ;$P_{resisting} = \mu \times (P_b + P_c) =$ **354.750** lb
Lateral Sliding Force Due to Backfill,; Σ;$P_{sliding} = P_d = (\gamma_d \times h^2 \times 1 \text{ ft}) / 2 =$ **214.375** lb
Sliding Factor of Safety,; $FS_{sliding} = P_{resisting} / P_{sliding} =$ **1.655**; **>= 1.5 OK**;



TES
THOMPSON ENGINEERING SERVICES, LLC
P.O. Box 1500, Englewood, TN 37329
Phone: (423)781-7336 Fax: (423)781-7337
Email:carl@tesengrs.com Website:tesengrs.com

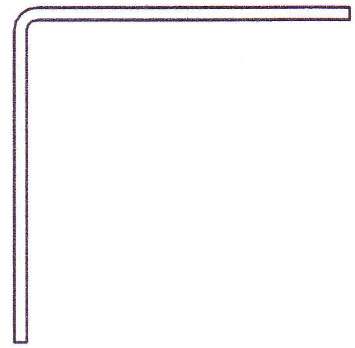
Project			Job Ref.
42" Tall 14 Gauge Steel Wall Pools			
Section			Sheet no./rev. 6
Calc. by D.J.W.	Date 6/21/2013	Chk'd by C.E.T.	Date 6/21/2013

CARL EVERETT THOMPSON, JR. REGISTERED ENGINEER AGRICULTURE COMMERCE No. 16572 STATE OF TENNESSEE
6-21-13

12 GAUGE STEEL BRACE ANALYSIS (WORST CASE)

(Concrete bond beam in place)

2" x 2" x 12 Gauge Angle.



Moments of inertia: I 0.1594 in^4

S = I / C =; 0.1594 in^4 / 1.452 in = 0.1098 in^3

Width of Brace at Top of Bond Beam; B_{brace} = 20 in;

Height of Brace Connection; h_{brace} = 38 in

Area of Brace; A_{brace} = .4004 in^2

Reactions at Bolt Connections

Maximum Horizontal Force Resultant at Brace,; $P_{brace} = P' \times L_c$ = **1123.889** lb

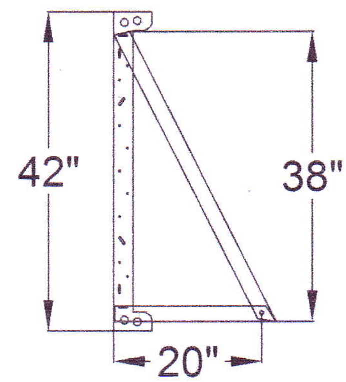
Height of Resultant Force,; $h_{reaction}$ = h - 3 in - $h_{eff} \times 2 / 3$ = **16.333** in

Axial Tensile Force in Diagonal Brace,; $P_{axial} = (P_{brace} \times h_{reaction} / h_{brace}) \times (\sqrt{(B_{brace}^2 + h_{brace}^2)} / B_{brace})$ = **1037.206** lb

Actual Tensile Stress in Diagonal Brace,; $f_t = P_{axial} / A_{brace}$ = **2.590** ksi

%Stressed = f_t / F_t = **14.4** %

Factor of Safety,; $FS_t = F_t / f_t$ = **6.949**; **>= 1.0 OK**;



BOLT ANALYSIS

(Check shear in bolt at brace to panel connection)

3/8"Ø A307 (Zinc Plated) Bolt; Area; $A_{bolt} = (.375 \text{ in})^2 \times \pi / 4$ = **0.110** in^2

Brace to Panel Connection

Max Reaction at Bolts,; $P_{Bolt} = P_{axial}$ = **1037.206** lb

Actual Bolt Shear Stress,; $f_{v\_fastener} = P_{Bolt} / A_{bolt}$ = **9.391** ksi

%Stressed = $f_{v\_fastener} / F_{v\_fastener}$ = **94.9** %

Factor of Safety,; $FS_{v\_fastener} = F_{v\_fastener} / f_{v\_fastener}$ = **1.054**; **>= 1.0 OK**;

Panel to Panel Connection

Bolt Spacing,; Bolt_spacing = 12 in; (Worst Case Spacing)

Aproximate Distributed Panel Load,; $P'_{net} = P'/h_{eff}$ = **49.583** psf

Max Tensile Force,; $T = P'_{net} \times R$ = **1190.000** lb/ft

Actual Bolt Tensile Stress,; $f_{t\_fastener}$ = (T × Bolt_spacing) / A_{bolt} = **10.774** ksi

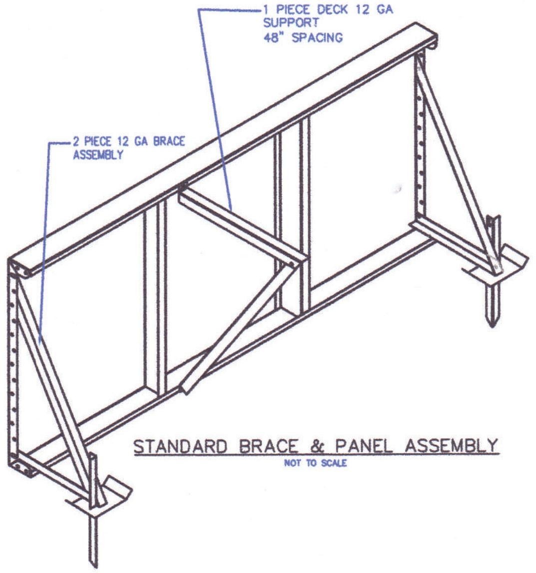
%Stressed = $f_{t\_fastener} / F_{t\_fastener}$ = **56.4** %

Factor of Safety,; $FS_{t\_fastener} = F_{t\_fastener} / f_{t\_fastener}$ = **1.773**; **>= 1.0 OK**;

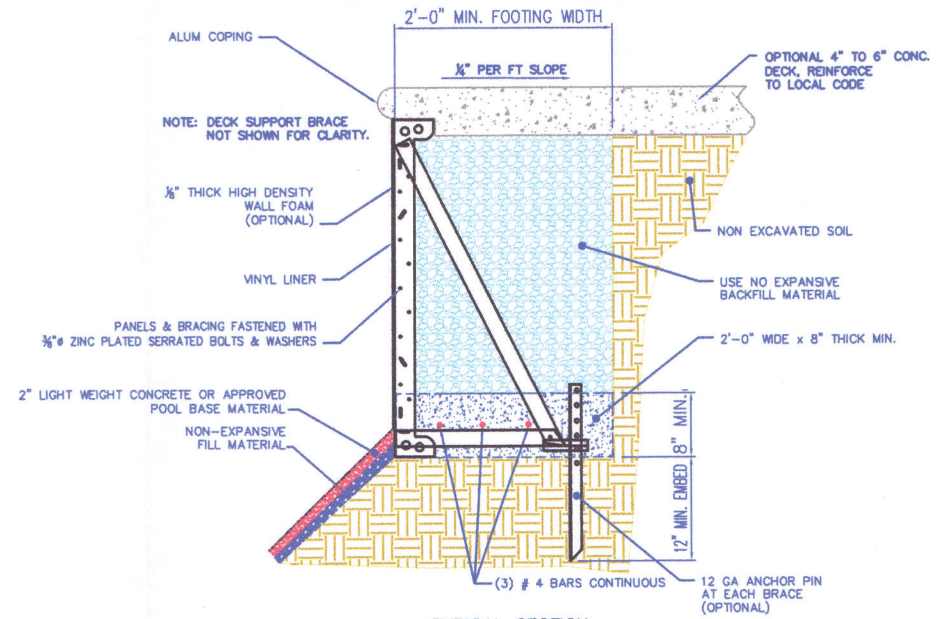
CARL EVERETT THOMPSON, JR. REGISTERED ENGINEER AGRICULTURE COMMERCE No. 16572 STATE OF TENNESSEE 6-21-13

MATERIAL/INSTALLATION ASSUMPTIONS

1. These structural calculations shall be considered void if not complete (page 1-7) & do not contain a raised P.E. review seal & color signature.
2. Soil pressure used in these calculations constitute those soils which are in their active state & have a maximum equivalent fluid pressure equal to 35 lb/ft^2 under non-saturated conditions & to 45 lb/ft^2 under saturated conditions. See Soil Properties section for more soil type assumptions used in these calculations. These calculations do not consider the existence of expansive or adobe-type soils, high ground water table conditions or adjacent uncompacted soil fill conditions. If the existing site soil conditions dictate a different or potentially higher equivalent fluid pressure than those used herein, the pool purchaser/Installer shall contact a local Geotechnical Engineer (Soils Engineer) for additional guidance & direction, prior to pool installation.
3. Wall panel backfill materials shall consist of clean porous soils, free of roots & debris, installed & carefully tamped to eliminate voids, in layers not exceeding 12 in thick. In addition, backfill materials shall not exceed the same equivalent fluid pressure characteristics identified in item 2 above. Lastly, backfilling operations behind the pool panels must be performed in conjunction with the pool filling operations. Although these calculations show that backfill material can be placed behind the pool panels when the pool is empty, these pool panels should not be considered capable of independently withstanding either the pool water's lateral forces or the lateral soil forces (from behind the pool panels).
4. The pool is designed to remain full of water at all times. The pool may be damaged if the water level is allowed to drop below the pool inlet(s). When appreciable drawdown is noticed or if it becomes necessary to drain the pool, contact Megna Pool, or it's agent immediately for instructions. Temporary shoring of the pool panels is highly recommended.
5. Wall panel, brace & panel/brace fastener sizes, thickness, dimensional characteristics, material properties & strength used in these calculations were provided by Megna Pools. These calculations assume that these elements have uniform thicknesses, sizes & material properties/strengths & that they are free of defects. These calculations cover only those elements identified herein & do not cover liners, ladders, steps, slides, decks, railings, etc. This pool system is intended to be installed only by approved distributors/contractors.
6. Pool system is not designed for earthquake or surcharge loading (i.e. neighboring structures, vehicles, trees, equipment, etc.).
7. Finished decks &/or grades shall be constructed in accordance with the pool manufacture's guidelines & be sloped away from the pool copings at a rate not less than 1/4" per linear foot.
8. Concrete bond beam dimensions shall be 8" x 2'-0" minimum.
9. Refer to the pool Manufacturer's Installation Manual for additional restrictions, requirements, guidelines & recommendations.



STANDARD BRACE & PANEL ASSEMBLY
NOT TO SCALE



TYPICAL SECTION
NOT TO SCALE

GENERAL NOTES:

1. All design, detailing, fabricating & construction shall conform to the following codes & specifications:
   a. The International Building Code (2006/2009/2012 Editions). The California Building Code (2010 Edition). The Florida Building Code (2010 Edition). The North Carolina Building Code (2012 Edition).
   b. Structural Design complies with the (Current Edition) International Residential Code.
   c. American Society of Testing & Materials (ASTM) specifications.
   d. All pools are A.P.S.P. (ANSI/APSP/ICC-5 2011) Type 2 & pools comply with APSP/ICC-5, unless otherwise noted.
2. Vertical dimensions on all pools are from steel wall heights.
3. The pool is designed to remain full of water at all times. The pool may be damaged if the water level is unintentionally allowed to drop below the pool inlet(s). When appreciable draw down is noticed or if it becomes necessary to drain the pool, contact Megna Pool, or it's agent immediately for instructions. Temporary shoring of the pool panels is highly recommended.
4. Finished decks &/or grades shall be constructed in accordance with the pool manufacture's guidelines & be sloped away from the pool copings at a rate not less than 1/4" per linear foot.

EXCAVATION NOTES:

1. Surrounding land elevation to be 6" lower than top of pool.
2. Allowed 2'-0" all around pool for working area in excavation. All voids under panels to be filled & compacted in 6" to 8" layers.
3. At no time should compacted backfill exceed water level or vice versa more than 12".
4. Use non-expansive material for backfill (no organic materials or top soil).

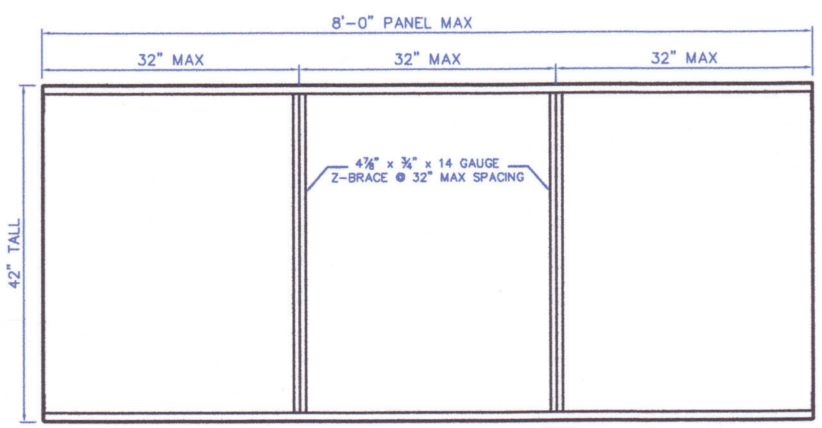
FOUNDATION NOTES:

1. Footing design based on 1,500 PSF soil bearing capacity (minimum).
2. Neither Carl E. Thompson, Jr., P.E., T.E.S., nor Megna Pools, shall be responsible for local foundation design, as local conditions must be investigated to determine proper soil bearing capacity.

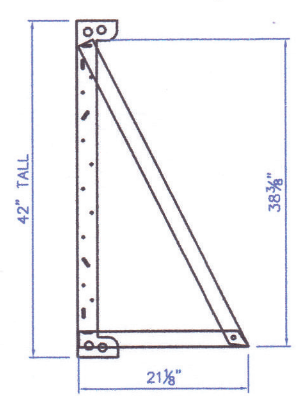
MATERIAL SPECIFICATIONS:

Pool Liner:	PVC Vinyl Liner
Pool Panels:	14 Gauge (0.0747") ASTM-A653 Type B Galvanized Steel
Pool Braces:	12 Gauge (0.1046") ASTM-A653 Type B Galvanized Steel
Concrete:	f'c=2,500 PSI @ 28 days
Reinforcing Steel:	ASTM-A615-GR 60
Light Weight Conc:	Light Weight Aggregate Concrete =75 PCF Conforming to ACI 613A & ACI 318-08

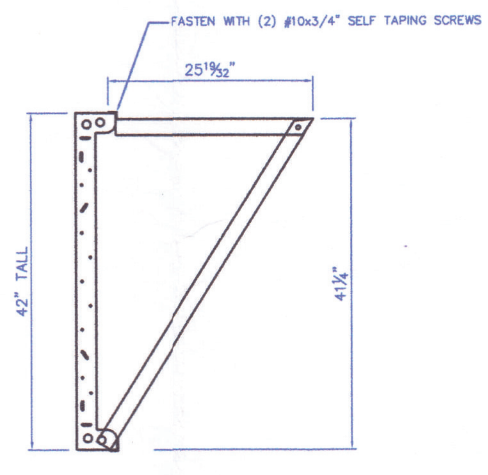
FLAT PANEL TOP VIEW



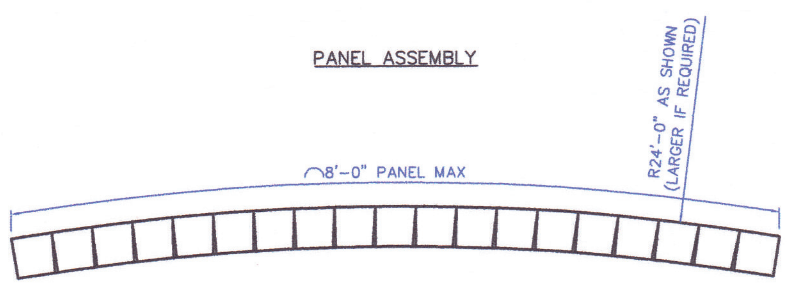
PANEL ASSEMBLY



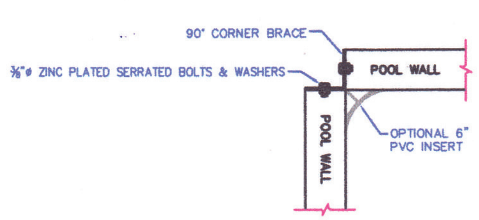
TYPICAL ASSEMBLY – 2 PIECE A-FRAME SUPPORT



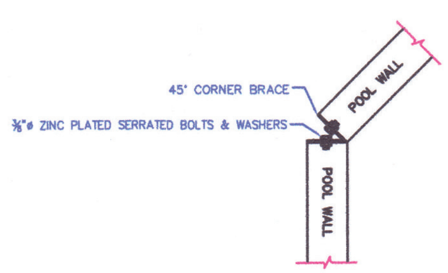
TYPICAL ASSEMBLY – 1 PIECE DECK SUPPORT



RADIUS PANEL TOP VIEW



TYPICAL 90° CORNER ASSEMBLY



TYPICAL 45° CORNER ASSEMBLY

ADDITIONAL NOTES

1. A safety line and buoys must be permanently attached 1 ft on the shallow end side.
2. If underwater lights are installed, all metal must be grounded to local electrical codes.
3. Building foundations shall not be affected by the pool structure. A minimum of 8 ft from any building foundations is required.

This Drawing is valid only for homeowner/installation address listed below, & is null & void unless sealed, signed & dated by C.E.T. Use of this drawing without the express written consent of C.E.T., T.E.S. & Megna Pools is strictly prohibited. See *www.tesengrs.com* for a map of states we are currently licensed.

CARL EVERETT THOMPSON, JR. — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 16572 — STATE OF TENNESSEE — 7-11-13

CARL E. THOMPSON, JR., P.E.

MEGNA POOLS
821 Brock Road, Unit 1
Pickering, ON L1W3L6

42" Tall 14 Gauge Steel Wall Pool Assembly Drawing
Homeowner/Installation Address: Megna Pools, 821 Brock Rd, Unit 1, Pickering, ON L1W3L6

TES
THOMPSON ENGINEERING SERVICES, LLC
P.O. BOX 1500, ENGLEWOOD, TN 37329
PHONE: (423)781-7336 FAX: (423)781-7337

DRAWN BY:	DJW
DATE:	07/11/13
SCALE:	1/2"=1'-0"
MEGNA POOLS#	N.A.
PROJ.#	035913
DWG.#	EB-4258