



DIVISION: 13 00 00—SPECIAL CONSTRUCTION
Section: 13 11 13—Below-Grade Swimming Pools

REPORT HOLDER:

Trivector Manufacturing – div. Only Alpha Pool Products, Structural Armor WRS, Evolution dba Stealth Semi In-ground, Stealth Semi On-ground, Omega, The Funtastic Pool, Hydrosphere, Affordable Fun In-ground, Garden Gem, Titan, Trimax, Fuzion 5010, Structural Armor, Structural Armor WRS, Evolution Residential and Evolution Commercial

EVALUATION SUBJECT:

ONLY ALPHA PRODUCTS IN-GROUND, SEMI ON-GROUND OR ON-GROUND COMPOSITE OR STEEL WALL SWIMMING POOLS OR AQUACULTURE TANKS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, 2012, and 2009 *International Building Code*® (IBC)
- 2024, 2021, 2018, 2015, 2012, and 2009 *International Residential Code*® (IRC)
- 2024, 2021, 2018 and 2015 *International Swimming Pool and Spa Code*® (ISPSC)
- 2024, 2021, 2018, 2015, and 2012 *Uniform Swimming Pool, Spa and Hot Tub Code*® (USPSHC)
- 2022, 2019, 2016, 2013 and 2010 *California Building Code*® (CBC)
- 2022, 2019, 2016, 2013 and 2010 *California Residential Code*® (CRC)
- 2023, 2020 and 2017 *Florida Building Code*® (FBC)
- 2023, 2020 and 2017 *Florida Residential Code*® (FRC)

Compliance with the following standards:

- ANSI/APSP/ICC 4-2012, Standard for Aboveground / Onground Swimming Pools
- APSP/ANSI 5-2011, Standard for Residential Inground Swimming Pools
- AC279, ICC-ES Acceptance Criteria for Vinyl-lined Residential Swimming Pool, approved date October 2005 (editorially revised April 2009)

2.0 USES

The composite or steel wall swimming pools are permanently installed in-ground semi on-ground or on-

ground for recreational use as swimming pools and aquaculture tanks in residential and commercial applications with water circulated through a filter in a closed system. The pools comply with ANSI/ APSP/ANSI-4 and ANSI/ APSP/ANSI-5 as Type 0 pools. Diving equipment is prohibited.

3.0 DESCRIPTION

The composite or steel wall swimming pools and aquaculture tanks for in-ground semi on-ground or on-ground consist of wall panels, frames and supports, vinyl liners, pe/pvc liners or alternate coatings such as paint or aquabright, and associated accessories (e.g., pool steps, copings, skimmer, filters, and lighting luminaires). Rigid fiber reinforced composite panels which are comprised in straight, concave or convex radius contain rib structure specific to panel design. Steel panels are comprised of 14-gauge galvanized steel in straight concave or convex radius with integral vertical ribs specific to panel design. Frames and brace supports are comprised of polyethylene or steel. The vinyl liner, pe/pvc liner and coatings are optional. Pool designs are available in various configurations and sizes. The dimensions for recognized configurations are shown in Table 1.

4.0 DESIGN AND INSTALLATION

The composite or steel wall swimming pools and aquaculture tanks for in-ground semi on-ground or on-ground must be installed in accordance with this report and the manufacturer's published installation instructions. All plumbing and electrical work must comply with the codes in effect at the construction site.

The swimming pools/tanks must be installed in soils with maximum equivalent fluid pressures of 35 pcf (561 kg/m³) under nonsaturated conditions and 45 pcf (721 kg/m³) under saturated conditions. The swimming pools or tanks may be installed without a soil investigation by a registered design professional, subject to the code official's approval, provided none of the following conditions is encountered at the site:

1. The existence of groundwater within the pool excavation.
2. The existence of uncompacted fill in contact with any portion of the pool.
3. The existence of expansive-type soils.
4. The existence of any soil types with an angle of repose that will not support the walls of the excavation at desired slopes.
5. Danger to adjacent structures posed by the proposed pool location.

6. The existence of any cracks or openings in soil that would not confine sand bedding.
7. The setback between pools and slopes does not comply with Section 1808.7 of the IBC.

If any of the above conditions are encountered, excavation must cease immediately. The specified conditions at the site must then be reviewed, and recommendations made by a registered design professional. The code official must approve the registered design professional's recommendations before work is resumed. Details specifically for installations in expansive, clay, or adobe soils apply only when supported by the registered design professional's recommendations and approved by the code official.

The pool excavation profile must coincide with the contours of the pool. The site for the pool must be initially excavated to the required grade below the vertical wall panel depth. The site must be then over-excavated approximately 2 feet (610 mm) around the perimeter of the pool along its vertical wall panel line to permit installation of the wall panels and back braces. Excavation and fine grading of pool bottom and side slopes is then completed.

Fiber-reinforced composite and steel pools panels are bolted together at the edges with grade 5 or better galvanized bolts, nuts, and washers. Straight and curved runs of pool wall are braced at each bolted panel edge with steel turnbuckle support braces on the soil side of the pool panel. The composite or steel pool wall panel can sit on-soil grade that is continuous below the pool panels. The composite pool panel can also sit on a 6" thick reinforced concrete slab-on-grade that is continuous below the pool panels. The base of the braces and the pool panels at straight and curved runs of the pool wall are encapsulated in a 6" deep reinforced concrete backfill above the base of the panel (6" total concreted thickness behind steel or composite panels on-soil option, 8 - 12" total concrete thickness behind composite panels with on-slab option). Plumbing and associated accessories must be installed.

After the pool interior finishes, panel cap, and other nonstructural components of the pool have been installed, the pool walls are then backfilled with clean, well-draining pea gravel (2'-0" minimum horizontal width around perimeter) fill weighing a maximum of 95 lb/ft³. The fill is to be compacted with light equipment such as a plate compactor or similar equipment and is not to be compacted with heavy equipment. Concrete [minimum 2,500 psi (17.2 mPa) compressive strength at 28 days] is placed behind the panels around the perimeter of the pool including the area behind any walk-in staircases, to fill the width of the excavation not exceeding 24". Pool base vermiculite, concrete or grout (sand & cement mixture) must be placed over the pool bottom to a depth of no less than 2 inches (51mm) and not to exceeding 3 inches (76 mm), with a smooth trowel-finished. The concrete slab-on-grade at composite panels, concrete backfill at on-soil steel/composite panels, and the pea gravel backfill provide the pool panel walls stability against overturning and sliding from soil pressures and seismic forces.

Curved steel pool panels do not require vertical stiffeners, however flat steel pool panels do require vertical stiffeners. Flat steel pool panels are required to be stiffened per the following guidelines to resist lateral loads:

42" Steel Pool Panels

1. No area in a panel can exceed a horizontal linear length of 32" from the edge of a panel to a vertical stiffener on any 42" tall panel platform.

2. No area in a panel can exceed a horizontal linear length of 32" from vertical stiffener to vertical stiffener on any 42" tall panel platform.

52" Steel Pool Panels

1. No area in a panel can exceed a horizontal linear length of 24" from the edge of a panel to a vertical stiffener on any 52" tall panel platform.
2. No area in a panel can exceed a horizontal linear length of 24" from vertical stiffener to vertical stiffener on any 52" tall panel platform.

The wall panels and connections were analyzed for dead, water, soil, and seismic loads per load combinations as specified in ASCE 7-16, the 2024 International Building Code, the 2022 California Building Code, and 2023 the Florida Building Code. The controlling load combination for the pool structural members and connections is when the completed pool with backfilled walls is drained, and an earthquake occurs. These calculations verify the capacity of the fiber-reinforced composite pool and steel panels and connections. Design or analysis of the pool interior finishes, waterproofing system, plumbing system, pool panel cap, and other non-structural components is by others. Design of the pool concrete slab-on-grade at composite panels and concrete backfill at steel/composite panels is by others.

The vinyl liner, pe/pvc liner or coating must be installed according to the manufacturer's instructions to ensure a smooth, waterproof surface that conforms to the pool walls and bottom surfaces. The backfill placement and filling of the pool are to be accomplished concurrently in order to prevent uneven loading on the pool panels and avoid potential collapse of the pool wall.

After completion of the backfill, the bond beam and decking must be installed in accordance with the manufacturer's published installation instructions and approved by the code official.

Models, listed in Table 1, intended for installation up to 4 feet (1.2 m) steel wall on-ground and semi on-ground have vertical steel support.

Notice: *The on-ground tank models are designed to be placed on a leveled concrete floor and shall will never be installed inside the ground.*

5.0 CONDITIONS OF USE

The in-ground semi on-ground or on-ground pools or tanks described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The pools or tanks must be constructed and installed in accordance with this report and the manufacturer's published installation instructions. In the event of conflict, this report governs.
- 5.2 Electrical, mechanical, and plumbing installations must comply with the applicable codes in effect at the construction site.
- 5.3 Setback between pools and slopes must comply with IBC Section 1808.7 or IRC Section R403.1.7.
- 5.4 A barrier must be installed in accordance with IBC Section 3109.4 or IRC Section AG105, and ISPSC Section 305, as applicable.
- 5.5 Slip resistance and vinyl liner are outside the scope of this evaluation report. Reports of slip resistance tests that demonstrate compliance with Section 8.1 of APSP/ANSI-5 must be submitted for approval by the

code official.

5.6 Diving equipment may not be installed.

5.7 Suction outlets must be designed and installed in accordance with IBC Section 3109.5, ISPS Section 310 and IRC Section AG106.1.

6.0 IDENTIFICATION

Each pool or tank bears a label with the brand name; the manufacturing plant location, a bar code for traceability; the model number; and the evaluation report number (ESR-4507).

A permanent sign, bearing the following statement, must be attached to the pool plumbing equipment:

Notice: The pool must remain full of water at all times. Pool may be damaged if the water level is allowed to drop below the skimmer. When appreciable drawdown is noticed or if it becomes necessary to drain the pool, the manufacturer must be contacted for instructions.

A permanent label must be attached adjacent to the above sign indicating the name, address and telephone number of the products distributor.

6.1 The report holder's contact information is the following:

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TABLE 1 – FREEDOM AND FREEFORM DESIGNS

(Pool and tank designs are available in various configurations and sizes)

	Distance between walls ¹	DEPTH	POOL TYPE
Minimum	2'	3'	O
Maximum	150'	10'	O

For **SI**: 1 foot = 304.8 mm

Note 1: The span between two facing walls shall remain within the dimensions (min/max) listed in table. This table is not applicable to any landing and beach entry areas.