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## STANDARD ICF DOMESTIC SWIMMING POOL

### SPECIFICATION ZEGO/3/5

#### A. INTRODUCTION

1. This Specification and associated Drawings are for a standard design of domestic swimming pool using ZEGO Insulated Concrete Forms.
2. Site Specific Drawings and Information must also be provided for each job, as required by the Standards Australia Code AS 2783 "Use of reinforced concrete for small swimming pools".
3. In what follows, drawing references are to R S Hemphill Pty Ltd Drawings for Job No ZGO/3/5, Numbers 01 to 11.
4. The size and shape options are
  - Monolithic rectangle maximum 12.5 m long and 5.0 m wide
  - Monolithic free form maximum 12.5 m long and 5.0 m wide at the widest point.
  - Lap Pool rectangular 25.0 m long by maximum 5.0 m wide, with a movement joint across the middle.

The maximum depths of all pools is 2.1 m.

These Options are shown on Drawing No 01.

5. The Foundation Options are
  - Rock, or Soil of Class A, S or M to AS 2870, and having a Safe Bearing Capacity of 100 kPa or greater, in which case the pool may be founded directly on this material.
  - Soil of Class H, E or P to AS 2870, or any soil having a Safe Bearing Capacity less than 100 kPa, in which case a pier foundation as shown on Drawing 09 may be used in some circumstances, or a special engineering design may be required.
6. The Backfill Options are
  - "Very Good Ground" - Sandy silt having soil parameters specified on Drawing 05 and proven by test.
  - "Good Ground - Sand" - Sand, sandy fill or gravel, having soil parameters specified on Drawing 06
  - "Good Ground - Sandy Clay" - Stiff sandy clay or sandy clay fill, having soil parameters specified on Drawing 07
  - "Poor Ground or Partially Out of Ground" - Moderately expansive clays having soil parameters specified on Drawing 07, or questionable relief valve operation or drainage.

7. Coping may be Non - Structural or Structural. Structural coping supports the top of the pool wall along short sides (ends), avoiding the need in some cases for double leaf wall construction at the deep end.

## **B. DISCLAIMER**

This Specification and associated Drawings have been prepared to assist Architects, Designers, Engineers, Owners, Builders and Building Inspectors to determine the correct reinforcement and other data for domestic swimming pools using ZEGO Pty Limited "Magu" Insulated Concrete Formwork Polystol "F" units. It also contains general information for initial guidance in commonly met and straightforward situations. Neither ZEGO Pty Limited nor its Consultants have any knowledge or control over the manner in which this information might be used, and cannot be aware of specific situations where it might be used. The Authors, Editors and Publishers of this Publication shall not be held liable or responsible in any way whatsoever and expressly disclaim any liability or responsibility for any loss or damage consequences incurred as a result of any kind of use of this Publication. Use of this Manual and the inclusion of a Certificate as to the compliance of its contents with various Codes does not absolve Building Designers, Project managers and others directly connected with and having responsibility for specific projects from their statutory or common law responsibilities. Accordingly, it is strongly recommended that where a possibility exists that any erroneous use of ZEGO Pty Limited "Magu" ICF's or of this Manual could result in significant losses, the advice of a Structural Engineer should be sought.

## **C. VALID FOR GENUINE ZEGO ICF's ONLY**

The Specification and Drawings are valid only when Genuine ZEGO "Magu" ICF's as shown are used as formwork to set the dimensions and configuration of the structural concrete. Other formwork products may have significant differences in dimensions and conformation to ZEGO "Magu" ICF's and it is thus essential that only ZEGO "Magu" ICF's be used. The Certification accompanying this Specification is not valid for other products.

ZEGO "Magu" ICF's are readily identified as to genuine source by the logo stamps on each ICF unit. These stamps comprise a circle 38 mm in diameter embossed at intervals along the top face of the ICF unit and inscribed with the words [www.zego.com.au](http://www.zego.com.au) as shown below. If this stamp is not present, the construction should be rejected.



## **D. USE OF SPECIFICATION AND DRAWINGS**

1. The Specification, Drawings and ZEGO "Magu" Domestic Construction Manual shall be read and understood together and in their entirety

2. The Specification, Drawings and ZEGO "Magu" Domestic Construction Manual is intended for use by those with a general knowledge of sound domestic construction practice, and with a responsible attitude to construction.
3. **Silence of the Specification:** The apparent omission of reference to members, components, materials, workmanship and the like including items not shown but necessary for the construction, shall not be taken to mean they are not required. The Specification and Drawings have been prepared on the basis that users will have sufficient knowledge and experience to include all such items and to ensure that they comply with the current Building Act, current SAA Codes and recognised correct practice.

#### **E. BASES OF DESIGN**

1. **The Design Standards used** to prepare the Designs, and the Construction Provisions of which are to be applied to Construction, are as follows.
  - AS 2783 - 1992 "Use of reinforced concrete for small swimming pools".
  - AS 3600 - 2001 "Concrete structures"
  - AS 4678 - 2002 "Earth retaining structures"
  - AS 1170.1 - 2002 "Structural design actions Part 1: Permanent, imposed and other actions"
  - AS 2870 - 1996 "Residential slabs and footings - Construction".
2. **The Exposure Classification** assumed in the standard detailing is B1, with concrete strength as specified in AS 2783 Clause 9.2 (25 MPa) and cover as specified in AS 2783 Clause 16.3 (40 mm walls (formed) and 60 mm floor).
3. **Flotation of the pool** is prevented by the use of a reliable hydrostatic relief valve in the deepest part of the pool, installed as shown on Drawing 03, and complying with ,

#### **F. DOCUMENT LIST**

The following comprise the Documents for Construction, all of which must be read together and in their entirety.

- This Specification ZEGO/3/5
- R S Hemphill Pty Ltd Drawings for Job No ZGO/3/5
  - 01 Scope of Pools Covered
  - 02 General Arrangement
  - 03 Foundation and Backfill
  - 04 ICF Coursing
  - 05 Floor and Wall Structure - Very Good Ground
  - 06 Floor and Wall Structure - Good Ground - Sand
  - 07 Floor and Wall Structure - Good Ground - Sandy Clay
  - 08 Floor and Wall Structure - Poor Ground and Partially Out of Ground
  - 09 Structure on Piers or Footings
  - 10 Miscellaneous Details
  - 11 Coping Details
- ZEGO "Magu" Domestic Construction Manual
- Site specific Drawings and Information prepared for the particular Project

#### **G. SITE SPECIFIC DRAWINGS**

Site specific Drawings must be prepared, in accordance with AS 2783 Clause 6.3, to show the following details not covered or not specified in these Specifications, Drawings and the ZEGO Manual

- Location of the pool on the site
- Fully dimensioned plan and section
- Relationship of the top of the pool to a fixed datum
- Height of the top of the pool at each corner, or at four points spaced equally around the perimeter, above the ground level.
- The lining or internal finish required
- The Design Bearing pressure and AS 2870 Classification of the supporting strata

Site specific Drawings must also show

- Cross reference to these Specifications ZEGO/3/5, Drawings R S Hemphill Pty Ltd Job No ZGO/3/5 Drawings 01 to 11, and the ZEGO "Magu" Domestic Construction Manual
- Description of backfill to be used.
- Which of the ZEGO options to be used
  - Foundation - direct on Class A, S or M over 100 kPa or on piers through Class H, E or P
  - Surrounding natural material
  - Backfill type
- In respect of Foundation, Surrounding Natural Material and Backfill Type, which of the detail options are to be used?
  - Backfill construction - Dwg 03 - Standard, Out of Ground, Against Vertical Cut or Clay/Problem Condition
  - Floor and Wall Structure - which of the alternatives as Drawings 05 (Very Good), 06 (Good - Sand), 07 (Good - Sandy Clay) or 08 (Poor or partially out of ground)
  - Floor structure - whether Piers or Strip Footings Drawing 09 is to be used
  - Coping - whether structural coping is to be used, and if so, on which walls.
- Paving surrounds, jointing against coping, drainage and construction
- Layout of water inlet and return system, and location of skimmer, filter, pump and outlets
- Layout of pool lighting (if any) and electrical supply
- Layout of any heating installations
- Layout of safety fencing and gates.

## **H. CONSTRUCTION SPECIFICATIONS**

### **PRELIMINARIES**

1. Do not commence work before obtaining all statutory approvals, and comply with all statutory requirements for licensing, signage on site, environmental safeguards and the like. Prevent escape off site of polystyrene pieces and fragments - catch, bag and remove off site to authorised tip. Pay all insurances and obtain certificates.
2. Comply with all construction requirements of As 2783

**BASE**

3. If generally sound (Class A, S or M and over 100 kPa safe working capacity), remove any unsound material and soft spots, fill with sound material, and compact.
4. If base material is unsound, pool must be founded on piers or strip footings as on Drawing 09. Piers or strip footings must seat on 400 ka material.
5. Keep dry and protect all footing excavations and all slab subgrades. In the event of rain during construction, pump out the excavation of all standing water before further construction and keep pumped out.
6. For a clay or other low permeability base spread 50 mm sand bed.
7. Place no fines gravel (20 mm to 40 mm) in a minimum 600 x 600 x 600 cube around the hydrostatic relief valve.
8. Optional - install 100 mm insulating foam base laid in slabs to form even and uniform bearing on the subgrade and for the floor slab. Foam to have minimum compressive strength 100 kPa without excessive deformation.

**CONCRETE, FORMWORK AND REINFORCEMENT**

9. All concrete to AS3600, no admixtures without approval.
10. Concrete:

	In Slab	In ICF's
	-----	-----
Grade	N25	N25
Slump, mm	80	120
Max aggt	20	10
-	-----	-----

11. Cover:      Slab    60 mm  
                  In ICF's    40 mm  
:                Copping    40 mm
12. Joints limited to the locations and details shown.
13. Reinforcement is represented diagrammatically.  
Symbols:  
Y=Deformed bars to AS1302  
R=Structural grade plain bar to AS1302  
F=Hard drawn steel wire reinforcing fabric to AS1304.  
The number following the bar symbol is the nominal bar diameter in millimetres.
14. Reinforcement splices are limited to those shown on the Drawings.
15. Welding of reinforcement is not permitted
16. All reinforcement shall be wired to and supported off approved purpose made bar chairs at a maximum spacing of 1000 mm centres both ways to provide the correct cover.
17. Install accurately all starter bars shown on the Drawings to plus or minus 5 mm in any direction and fix firmly in place, before placing floor slab concrete.  
Attend on site while concrete is being placed and ensure that any movement of Starter Bars is rectified. If after pouring and initial set, it is found that isolated Starter Bars (ie not more than one bar in 5) have been misplaced or omitted, straight Y12 bars may be drilled for and epoxy'd in, to an embedment depth of 100 mm and projecting starter length of 400 mm.

18. Pour and compact to AS 3600. Cure floor concrete 7 days minimum using continuous moist curing, maintaining dampness throughout the curing period, with plastic film, wet sand or continuous immersion.

#### **ICF BLOCKS**

19. ZEGO ICF's are laid with the male "nodules" and ZEGO logo facing upwards.
20. Wedge ICF's level with timber or foam wedges, to course as shown on Drawing 04.
21. At shallow end/deep end transition, cut base of lower ZEGO ICF to contour of slab.
22. Apply ENERFOAM 42, RAMSET FOMOFILL, HILTI CF126 or other appropriate proprietary foam as adhesive and gap filler to the side of ICF's even when hard on the surface. Apply around wedges to avoid shifting when pouring concrete. These foam adhesives are for filling and bonding to limit movement and slurry leakage when concreting.
23. Do not construct if winds exceed, or are likely to exceed, 70 km per hour during the period of ICF laying, concrete pouring or concrete initial set. (*A 70 km/hour wind is a "fresh to strong gale" which noticeably impedes walking progress, breaks twigs off trees and may break off large branches*).
24. Gauge courses as required prior to laying, refer Drawing 04.
25. Erect wall braces at 1800 centres and plumb to ensure the wall itself is laid plumb. *Proprietary wall braces such as Wall Brace Australia Pty Limited are available for purchase or hire [www.wallbraceaustralia.com.au](http://www.wallbraceaustralia.com.au)*. Lay ICF's course by course, retaining against wall brace using 2 strands of 1.25 mm annealed tie wire at each trestle horizontally and every two courses i.e. 600 vertically, tie wire holding small piece of steel or timber inside block.
26. At wall corners and intersections and at top course of double leaf sections knock out ICF unit face shells to ensure core concrete when poured is monolithic and continuous around corners and across the intersections, as shown in the ZEGO "Magu" Manual and on Drawing No10.
27. Pour concrete in accordance with AS 3600, ensuring concrete is migrating horizontally along the wall, completely filling all voids and not segregating. Ensure complete filling is by natural flow of the concrete. Do not use vibrators, rods, tamping or other mechanical means that could damage the ICF face shells or cross webs. Pour at the rate of 3 courses (900 mm) per hour per pass eg 2700 mm high 30 hours minimum. On reaching the top, drop in "L" bars for Coping, wait for 15 to 30 minutes to enable the concrete to settle, then top off and rod the topping down 600 mm into the rest of the pour. Rough screed off for a cold joint with coping concrete.
28. Form, reinforce and pour the Coping, as shown on Drawing 11. Note that if a structural coping is used for end walls, the skimmer must be placed in the non structural side walls.

#### **BACKFILL**

29. After the walls have cured for minimum 7 days, backfilling may commence. Backfill shall be as selected appropriate for whichever of the designs on Drawings 05, 06, 07 or 08 has been nominated.
30. If surrounding natural material is Type H or E expansive clay, place foam rubble against the wall to absorb clay expansion, as shown on Drawing 03.

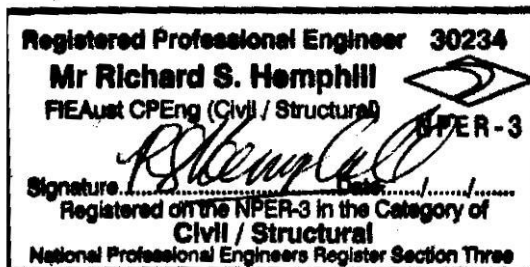
31. Place the backfill in 200 mm layers, compacting each layer before placing the next layer.

### **SURROUNDING PAVING**

32. Either dry lay segmental paving on a compacted firm and stable base with a 50 mm sand bed, or construct solid monolithic paving to a specifically engineered design. Whichever paving is used, ensure there is a movement joint minimum 20 mm between the paving and the swimming pool coping.
33. Paving surround shall drain away from the pool and pool backfill zone.

### **NON STRUCTURAL ELEMENTS**

34. Water inlet and return system, skimmer, filter, pump and outlets shall be fit and adequate for purpose and shall comply with Australian Standards including the following
- AS/NZS 3136: 2001 "Approval and test specification - Electrical equipment for spa baths and spa and swimming pools"
  - AS 3633 - 1989 "Private swimming pools - Water quality"
35. Pool lighting (if any) shall be fit and adequate for purpose and shall comply with Australian Standards including the following
- AS/NZS 3136: 2001 "Approval and test specification - Electrical equipment for spa baths and spa and swimming pools"
  - AS/NZS 60598.2.18:1998 "Luminaires - Particular requirements - Luminaires for swimming pools and similar applications".
36. Solar heating (if any) shall be fit and adequate for purpose and shall comply with Australian Standards including the following
- AS 3634 - 1989 "Solar heating systems for swimming pools"
37. Electrical heating (if any) shall be fit and adequate for purpose and shall comply with Australian Standards including the following
- AS/NZS 3136: 2001 "Approval and test specification - Electrical equipment for spa baths and spa and swimming pools"
38. Safety fencing and gates shall be fit and adequate for purpose, shall be genuinely and reliably child proof and shall comply with Local Authority and any other statutory requirements and with Australian Standards including the following
- AS 1926.1 - 1993 "Swimming pool safety - Fencing for swimming pools"
  - AS 1926.2 - 1995 "Swimming pool safety - Location of fencing for private swimming pools"
  - AS 2820 - 1993 "Gate units for private swimming pools".



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