BARRASON'S ENGINEERS
Structural and Civil Consultants

Building Act 1993
Section 238(1)(a)
Building Regulations 2018
Regulation 126

CERTIFICATE OF COMPLIANCE FOR PROPOSED BUILDING WORK

This certificate is issued to:

TBA

This certificate is issued in relation to the proposed building work at:

Non-site-specific design

Nature of proposed building work:

Construction of a generic concrete slab for a Spa World swim spa of maximum 6000 mm length.

Building classification as per NCC 2022

Part of building: BCA Classification: 10b

Prescribed class of building work for which this certificate is issued:

Design or part of the design of building work relating to *Structural matter*

Documents setting out the design that is certified by this certificate:

Document no.	Document date	Type of document	No. pages	Prepared by
2004093	30/11/2022	Drawings REV C	3	Barrason's Engineers
2004093	30/11/2022	Computations	1	Barrason's Engineers

The design certified by this certificate complies with the following provisions of Building Act 1993, Building Regulations 2018, National Construction Code Volume 2 or Australian Standard:

Act, Regulation, Code or Standard	Section, Regulation, Part, Performance Requirement or other provision
NCC 2022 Volume 2	Part 3.2, 3.4 & 3.11 of Volume 2
AS/NZS 1170.0	Structural Design Actions – General Principles
AS/NZS 1170.1	Structural Design Actions – Permanent, imposed and other actions
AS/NZS 1170.2	Structural Design Actions – Wind Actions
AS 2870	Residential Slabs and Footings
AS 3600	Concrete Structures
AS 4100	Steel Structures

I prepared the design, or part of the design, set out in the documents listed above.

I certify that the design set out in the documents listed above complies with the provisions set out above.

I believe that I hold the required skills, experience and knowledge to issue this certificate and can demonstrate this if requested to do so.

Full Name: Andrew Barraclough

Registrations: FIEAUST, CPEng, NER, RBP

Qualifications: BEng MEng PhD

Address: Lvl 2, 2 Pacific Promenade, Pakenham, VIC 3810

Email: admin@barrasons.com.au

Endorsed building engineer area of engineering: Structural
Endorsed building engineer registration no.: PE0000600, RPEQ 22822

Building practitioner registration category and class: C

Signed:

Andrew Barraclough

Date of issue of certificate: 30/11/2022

GENERIC SLAB FOR SWIM SPA

CONSTRUCTION DRAWINGS

Sheet Index

Layout ID	Layout Name
S000	Title Sheet
S001	General Notes
S100	Spa Slab Plan

Barrason's Engineers
E: admin@barrasonengineers.com
T:(03) 5940 2639
W: www.barrasonengineers.com

TITLE: TITLE SHEET

FOR CONSTRUCTION

PROJECT: GENERIC SPA SLAB

CLIENT: SPA WORLD

JOB No: 2004093

DRAWING No:

SCALE:

REVISION	AMENDED DESCRIPTION	DRAWN BY	DATE
A	FOR CONSTRUCTION	B.E.	15.04.20
B	AMENDED NOTES & DIMENSIONS	B.E.	17.04.20
C	AMENDED NOTES & DIMENSIONS	B.E.	30.11.22

GENERAL:

G1. ALL WORK AND MATERIALS TO CONFORM TO THE DRAWINGS, THE SPECIFICATION, AND CURRENT BUILDING CODE OF AUSTRALIA AND AUSTRALIAN STANDARDS.

G2. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS, THE SPECIFICATION AND ALL OTHER WRITTEN INSTRUCTIONS ISSUED DURING THE CONSTRUCTION.

G3. THE BUILDER SHALL CONFIRM ALL RELEVANT DIMENSIONS BEFORE COMMENCING CONSTRUCTION AND/OR FABRICATION. DO NOT SCALE STRUCTURAL DRAWINGS.

G4. ALL DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT/ENGINEER FOR RESOLUTION BEFORE PROCEEDING WITH THE WORKS.

G5. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O. ALL LEVELS ARE EXPRESSED IN METRES.

G6. SUBSTITUTIONS SHALL BE MADE WITH THE ENGINEER'S WRITTEN APPROVAL, BUT NOT AN AUTHORISATION FOR AN EXTRA. ANY CLAIM FOR AN EXTRA MUST BE APPROVED BY THE ENGINEER, ARCHITECT AND/OR OWNER BEFORE COMMENCEMENT OF THE WORK.

G7. THE BUILDER SHALL MAINTAIN THE WORKS IN A SAFE, STABLE CONDITION AND ENSURE THAT NO PART IS OVER-STRESSED DURING CONSTRUCTION.

G8. ALL PROPS AND FORMWORK TO A BEAM OR SLAB SHALL BE REMOVED BEFORE CONSTRUCTING MASONRY WORKS.

G9. ALL NON-LOADBEARING WALLS SHALL BE CONSTRUCTED 20mm CLEAR OF SLAB AND BEAM SOFFITS U.N.O.

G10. NO HOLES, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE WITHOUT THE ENGINEERS WRITTEN APPROVAL

G11. THE ENGINEER ACCEPTS NO RESPONSIBILITY FOR THE THE WORKS CARRIED OUT ON SITE UNLESS INSPECTED AND APPROVED IN WRITING BY THE ENGINEER.

G12. THE STRUCTURAL WORKS HAVE BEEN DESIGNED FOR THE FOLLOWING LOADS BASED ON MAXIMUM SIZE SWIM SPA MODEL SOLD BY SPA WORLD AT FULL CAPACITY

DEAD LOAD	LIVE LOAD
100 kN	5 kN

WIND CLASSIFICATION N/A TO SLAB
WIND DESIGN LOAD PRESSURE 0.8 kPa

G13. WHERE ADDITIONAL CONSTRUCTION LOADS EXCEED THE AN ALLOWABLE LIVE LOAD, THE BUILDER TO NOTIFIED THIS OFFICE BEFORE COMENCING WORKS.

G14. BEFORE STARTING WORKS ON SITE, IT IS THE BUILDER'S RESPONSIBILITY TO ENSURE THE EXISTING UNDERGROUND SERVICES WILL NOT AFFECT THE WORKS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR ANY SITE DESCREPANCIES TO THE DRAWINGS. EXISTING LEVELS ARE TO BE VERIFIED ON SITE.

G15. ALL PROPRIETARY PRODUCTS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

G16. ALL REQUIRED TESTS AND/OR SITE INSPECTION ARE TO THE CONTRACTORS EXPENSE.

FOOTINGS AND SLAB ON GROUND

F1. ALL WORK AND MATERIALS TO COMPLY WITH AS2870.

F2. ALL FOOTINGS SHALL BE FOUNDED ON SOIL WITH A MINIMUM ALLOWABLE BEARING PRESSURE OF 50 kPa. PRIOR TO COMMENCING WORK, THE BUILDER IS TO FAMILARISE THEMSELVES WITH THE CONTENT OF ANY SOIL REPORT.

F3. FOOTING DEPTHS SPECIFIED ON THE DRAWINGS ARE MINIMUM DIMENSIONS ONLY. IF NOT SHOWN, REFER TO THE SOIL REPORT FOR THE REQUIRED FOUNDING DEPTH. STRIP / PAD FOOTINGS ARE TO BE FOUNDED ON ORIGINAL UNDISTURBED GROUND WITH AN ALLOWABLE BEARING CAPACITY OF 100 kPa.

F4. EDGE BEAMS AND LOAD BEARING RIBS SHALL BE FOUNDED ON UNDISTURBED GROUND WITH AN ALLOWABLE BEARING CAPACITY OF 100 kPa. THE INTERNAL SLAB & NON-LOAD BEARING RIBS SHALL BE FOUNDED ON SOIL WITH MINIMUM BEARING CAPACITY OF 100 kPa.

F6. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE AREA BENEATH THE SLABS ON GROUND. THE GROUND SHALL BE PROOF ROLLED WITH A 3 TONNE ROLLER PRIOR TO PLACING COMPACTED FILL. IF SPACE IS CONFINED, A LIGHT WEIGHT DEFLECTOMETER MAY BE APPROPRIATE FOR THE SOIL CONDITIONS. THIS OFFICE SHOULD BE CONTACTED FOR ADVICE. ANY SOFT SPOTS SHALL BE DUG OUT AND REPLACED WITH COMPACTED CRUSHED ROCK OR 15MPa BLINDING CONCRETE. IN ACCORDANCE WITH AS2870 AND AS3798.

F7. UNLESS OTHERWISE SPECIFIED IN THE SOIL REPORT, FILLING USED IN THE CONSTRUCTION OF THE SLAB EXCEPT WHERE THE SLAB IS SUSPENDED SHALL CONSIST OF CONTROLLED FILL OR ROLLED FILL AS FOLLOWS:
a. CONTROLLED FILL IS MATERIAL THAT HAS BEEN PLACED AND COMPACTED IN LAYERS BY COMPACTION EQUIPMENT WITHIN DEFINED DENSITY REQUIREMENT. EXCEPT AS PROVIDED BELOW, CONTROLLED FILL SHALL BE PLACED IN ACCORDANCE WITH AS 3798.
SAND FILL UP TO 0.8m DEEP, WELL COMPACTED IN NOT MORE THAN 0.3m THICK LAYERS BY A VIBRATING PLATE OR VIBRATING ROLLER, SHALL BE DEEMED TO COMPLY WITH THIS REQUIREMENT. A SATISFACTORY TEST FOR SAND FILL NOT CONTAINING GRAVEL SIZED MATERIAL IS THE ACHIEVEMENT OF A BLOW COUNT OF 7 OR MORE PER 0.3m USING THE PENETROMETER TEST DESCRIBED IN AS 1289.6.3.3.
NON-SAND FILL UP TO 0.4m DEEP, WELL COMPACTED IN NOT MORE THAN 0.15m LAYERS BY A MECHANICAL ROLLER OR EQUIVALENT SHALL BE DEEMED TO COMPLY WITH THIS REQUIREMENT.
CLAY FILL SHALL BE MOIST DURING COMPACTION.
b. ROLLED FILL CONSISTS OF MATERIAL COMPACTED IN LAYERS BY REPEATED ROLLING WITH AN EXCAVATOR. ROLLED FILL SHALL NOT EXCEED 0.6m COMPACTED IN LAYERS NOT MORE THAN 0.3m THICK FOR SAND OR 0.3m COMPACTED IN LAYERS NOT MORE THAN 0.15m THICK FOR OTHER MATERIAL
c. THE EXTENT OF CONTROLLED FILL AND ROLLED FILL REQUIRED SHALL BE DETERMINED ON SITE IN ACCORDANCE WITH SECTION 6 OF AS2870 AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR & BUILDER.

F8. WHERE DEPTH OF CONTROLLED FILL IS THICKER THAN THAT SPECIFIED ABOVE, FILL MATERIAL SHALL BE SPREAD AND COMPACTED IN UNIFORM LAYERS NOT EXCEEDING 0.15m THICK. TOP SURFACE LAYER SHALL BE COMPACTED TO MINIMUM 98% STANDARD DRY DENSITY DETERMINED BY METHODS IN ACCORDANCE WITH AS1289. LOWER LAYERS SHALL BE COMPACTED TO 95% STANDARD DRY DENSITY. THE MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE ADJUSTED TO WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT DURING COMPACTION TO ENSURE THAT THE SPECIFIED COMPACTION IS OBTAINED. COMPACTION TESTS SHALL BE CARRIED OUT AT A RATE OF ONE TEST PER LAYER PER 100 SQUARE METRES OF FILL. TESTS ARE TO BE CARRIED OUT BY INDEPENDENT NATA REGISTERED LABORATORIES. SUBMIT REPORT TO THIS OFFICE FOR APPROVAL.

F9. FOUNDATIONS SHALL BE INSPECTED AND APPROVED BY THE ENGINEER OR BUILDING INSPECTOR BEFORE LAYING MEMBRANES AND POURING CONCRETE. IF AN UNUSUAL GROUND CONDITION IS ENCOUNTERED DURING THE SITE EXCAVATION, REPORT TO THIS OFFICE FOR RESOLUTION.

F10. NO EXCAVATION IS TO BE TAKEN BELOW THE BASE OF ADJACENT / EXISTING FOOTINGS. IF IT IS UNAVOIDABLE, FOR THE CASE OF NEW FOOTINGS, BLINDING CONCRETE GRADE 15MPa SHALL BE PROVIDED BENEATH THE NEW FOOTING AND FOUNDING BELOW ANGLE OF REPOSE. FOR THE CASE OF EXISTING FOOTINGS, UNDERPINNING IS REQUIRED. REFER TO THIS OFFICE FOR DETAILS.

F11. ALL FOUNDATIONS ARE TO BE FREE OF WATER AND LOOSE MATERIAL

F12. OVER EXCAVATION IS TO BE FILLED TO THE UNDERSIDE OF FOOTINGS WITH 15MPa BLINDING CONCRETE

F13. TERMITE PROTECTION SHALL BE PROVIDED AS REQUIRED BY AUSTRALIAN STANDARD AND THE LOCAL STATUTORY AUTHORITY.

F14. A 0.2mm POLYTHENE MEMBRANE SHALL BE CONTINUOUS UNDER SLAB AND RIBS LAPPED 200mm MINIMUM WHERE REQUIRED AND TAPED AT ALL SERVICE PENETRATIONS, LAPS AND PUNCTURES. THE MEMBRANE IS TO EXTEND UNDER AND TO THE SIDES OF SLABS, BEAMS AND THICKENINGS.

F15. EXCAVATIONS NEAR THE BUILDING EDGE SHALL BE BACKFILLED IN SUCH A MANNER TO PREVENT READY ACCESS OF WATER TO THE FOUNDATIONS

F16. SYMBOLS ON THE DRAWING FOR REINFORCEMENT ARE AS FOLLOWS :
- Y GRADE 400MPa DEFORMED REINFORCING BARS TO AS 1302.
- N GRADE 500MPa DEFORMED REINFORCING BARS, DUCTILITY CLASS N TO AS 4671
- R GRADE 250MPa PLAIN REINFORCING BARS TO AS 1302
- TM HARD-DRAWN STEEL TRENCH MESH, GRADE 500 DUCTILITY CLASS L TO AS 4671
- RL RECTANGULAR RIB MESH GRADE 500 DUCTILITY CLASS L TO AS 4671
- SL SQUARE RIB MESH GRADE 500 DUCTILITY CLASS L TO AS 4671

F17. FABRIC SHALL BE PLACED NEAR THE TOP OF THE SLAB AND SHALL HAVE A NOMINAL COVER OF 25mm U.N.O.

F18. REINFORCEMENT FABRIC SHALL BE LAPPED SO THAT EACH PAIR OF TRANSVERSE WIRES AT THE EDGE OF ONE SHEET OVERLAPS EACH CORRESPONDING PAIR OF TRANSVERSE WIRES OF THE SHEET BEING LAPPED. REINFORCEMENT SHALL BE SUPPORTED IN POSITION PRIOR TO CONCRETING COMMENCING ON DENSE PRECAST CONCRETE SPACER BLOCKS OR BAR CHAIRS ON GALVANIZED STEEL DISHES (EITHER OF WHICH MUST NOT DAMAGE THE MEMBRANE) AT 900mm MAXIMUM CENTRES EACH WAY TRAMPING IN FABRIC IS NOT PERMITTED

F19 BEAM AND STRIP FOOTING REINFORCEMENT SHALL HAVE A NOMINAL COVER OF 50mm.

F20. TRENCH MESH SHALL BE LAID CONTINUOUSLY AND SHALL BE SPLICED WHERE NECESSARY WITH A MINIMUM LAP OF 500mm

F21. TRENCH MESH SHALL BE OVERLAPPED BY THE WIDTH OF FABRIC AT CORNERS AND INTERSECTIONS. THE ENDS OF TRENCH MESH SHALL TERMINATE WITH A CROSSBAR.

F22. PROVIDE 2N12 x 1200 BARS OR EQUIVALENT TRENCH MESH x 2000 LONG DIAGONALLY ACROSS RE-ENTRANT CORNERS OF SLAB AND TIED TO UNDERSIDE OF TOP FABRIC.

F23. CONCRETE STRENGTH IS TO BE f'c = 25MPA, WITH 65 MAX. SLUMP, COMPACTED USING MECHANICAL VIBRATION. SLAB & RIBS ARE TO BE CAST IN ONE CONTINUOUS POUR AND THE SLAB IS TO BE STEEL-FLOAT FINISHED

F24. ALL CONCRETE IS TO BE CONTINUOUSLY WET-CURED FOR 7 DAYS.

F25. THE GROUND SURROUNDING SLABS SHALL HAVE THE SURFACE AT LEAST 150mm LOWER THAN THE SLAB AND BE SLOPED AWAY FROM THE SLAB EDGE SO THAT WATER WILL DISCHARGE TO SUITABLE DRAINAGE POINTS AND NOT FLOOD THE SLAB SURFACE.

F26. HOT WATER HEATING PIPES MAY BE EMBEDDED IN THE SLAB PROVIDED THAT THE SLAB THICKNESS IS INCREASED BY 25mm AND LAID ON ADDITIONAL SL52 MESH.

CONCRETE:

C1 ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600.

C2 UNLESS OTHERWISE SHOWN THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE AS FOLLOWS:

ELEMENT	CONC. STRENGTH (f'c) MPa	SLUMP mm
FOOTINGS	25	75
SLAB-ON-GROUND	25	65
SUSPENDED SLABS & BEAMS	32	80
MASS CONCRETE	15	-

C3 CONCRETE SHALL BE CURED BY AN APPROVED METHOD FOR AT LEAST 7 DAYS AFTER PLACEMENT.

C4 CONCRETE SHALL BE COMPACTED USING MECHANICAL VIBRATION.

C5 VIBRATION OF FORMS IS NOT ACCEPTABLE AND CONCRETE SHALL NOT BE SPREAD BY VIBRATING.

C6 CONCRETE SECTIONS SHOWN ARE MINIMUM SIZES AND DO NOT INCLUDE FINISHES. SIZES SHALL NOT BE REDUCED IN ANY WAY OR HOLES FORMED OR MADE IN

C7 DEPTH OF BEAMS ARE GIVEN FIRST AND INCLUDE SLAB THICKNESS

C8 SLABS AND BEAMS ARE TO BE POURED CONCURRENTLY U.N.O. AND FINISHED WITH A STEEL FLOAT.

C9 MINIMUM COVER TO ALL REINFORCEMENT INCLUDING FITMENTS SHALL BE AS FOLLOWS, U.N.O:

ELEMENT	FORMED AND NOT EXPOSED TO WEATHER	FORMED ON GROUND & EXPOSED TO WEATHER	NOT FORMED. CAST AGAINST GROUND
INSITU BEAMS	40	50	65
FOOTINGS	-	50	75
PIERS	-	50	75
SLABS ON GROUND	20	30	65
SUSPENDED SLABS	20	30	65
UNDERPINNING	-	50	75

C10 REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND NOT IN TRUE PROJECTION.
SYMBOLS ON THE DRAWING FOR REINFORCEMENT ARE AS FOLLOWS:

C11
- Y GRADE 400MPa DEFORMED REINFORCING BARS TO AS1302
- N GRADE 500MPa DEFORMED REINFORCING BARS, DUCTILITY CLASS N TO AS 4671
- R GRADE 250MPa PLAIN REINFORCING BARS TO AS1302
- W HARD-DRAWN STEEL REINFORCING WIRE, GRADE 500 DUCTILITY CLASS L TO AS 4671
- TM HARD-DRAWN STEEL TRENCH MESH, GRADE 500 DUCTILITY CLASS L TO AS 4671
- RL RECTANGULAR RIB MESH GRADE 500 DUCTILITY CLASS L TO AS 4671
- SL SQUARE RIB MESH GRADE 500 DUCTILITY CLASS L TO AS 4671

C12 ALL REINFORCEMENT AND INSERTS SHALL BE SUPPORTED AND HELD IN THE DESIGN LOCATION BY APPROVED BAR CHAIRS, SPACERS OR TIES. BAR CHAIRS SHALL BE PLACED AT MINIMUM 1000 CENTRES IN TWO DIRECTIONS U.N.O.

C13 WELDING AND THREADING OF REINFORCEMENT IS NOT PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

C14 REINFORCEMENT SHALL BE EVENLY DISTRIBUTED OVER THE WIDTHS SHOWN U.N.O.

C15 PROVIDE 2-N12 x 1200 BARS DIAGONALLY ACROSS RE-ENTRANT CORNERS OF SLABS, TIED UNDER THE TOP FABRIC. U.N.O.

C16 AT SLAB EDGES INCLUDING CONSTRUCTION AND OTHER JOINTS, AT LEAST ONE REINFORCING BAR OR FABRIC WIRE SHALL BE LOCATED PARALLEL TO AND WITHIN 75mm OF THE SLAB EDGE.

C17 CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USED ONLY WHERE APPROVED OR PERMITTED BY THE ENGINEER.

C18 SAWN JOINTS SHALL BE MADE AT A TIME APPROPRIATE TO THE CONCRETE MIX AND CLIMATIC CONDITIONS, GENERALLY BETWEEN 10 AND 20 HOURS OF PLACING THE CONCRETE.

C19 STRIPPING OF FORMS AND REMOVAL OF FORMWORK SHALL TAKE PLACE IN ACCORDANCE WITH A PROCEDURE AGREED TO BY THE ENGINEER.

C20 CONCRETE MUST BE SEPARATED FROM SUPPORTING MASONRY WORK BY TWO LAYERS OF A SUITABLE DE-BONDING MEMBRANE.

C21 SUSPENDED SLABS SHALL BE GIVEN AN UPWARD MID-SPAN CAMBER OF 3mm PER 1000mm U.N.O. BEAMS SHALL BE AS SHOWN ON DRAWINGS.

C22 SPLICES IN REINFORCEMENT SHALL BE MADE IN THE POSITIONS SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE ENGINEER.

C23 HOLDING-DOWN BOLTS SHALL BE SUPPLIED TO THE CONCRETOR FOR CASTING INTO THE CONCRETE AND SHALL BE INSTALLED IN ACCORDANCE WITH THE STEEL HOLDING-DOWN BOLT PLAN.

Barrason's Engineers
E: admin@barrasonengineers.com
T:(03) 5940 2639
W: www.barrasonengineers.com

TITLE: GENERAL NOTES

FOR CONSTRUCTION

PROJECT: GENERIC SPA SLAB

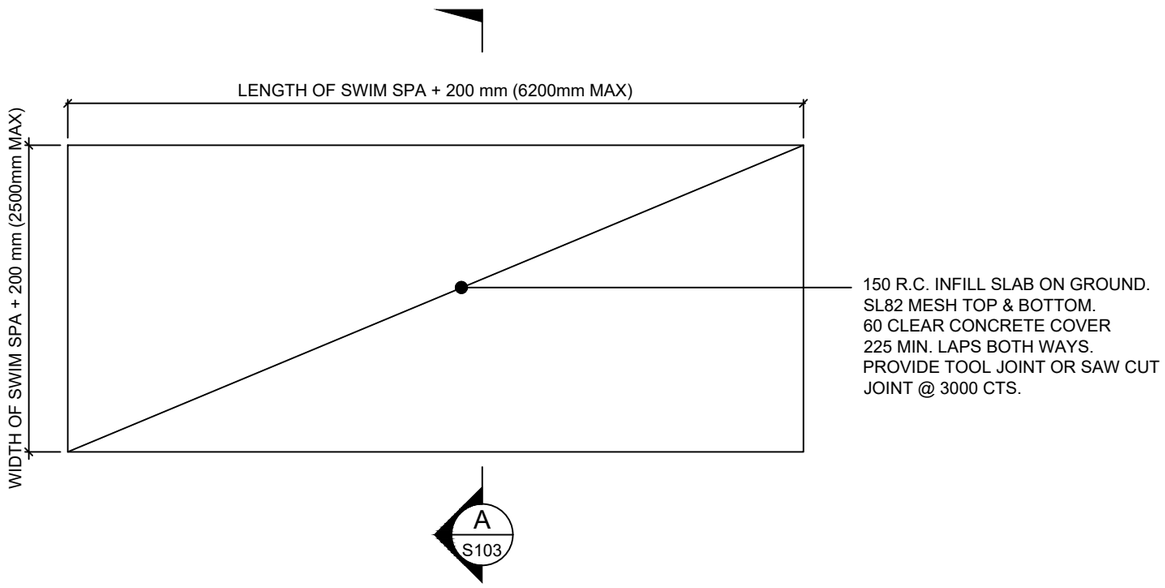
CLIENT: SPA WORLD

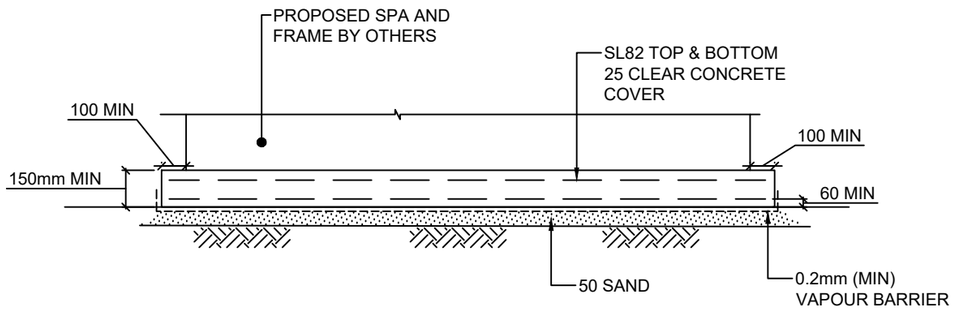
JOB No: 2004093 DRAWING No: S001

SCALE: NOT TO SCALE

REVISION	AMENDED DESCRIPTION	DRAWN BY	DATE
A	FOR CONSTRUCTION	B.E.	15.04.20
B	AMENDED NOTES & DIMENSIONS	B.E.	17.04.20
C	AMENDED NOTES & DIMENSIONS	B.E.	30.11.22

STEP, SETDOWN & FALLS
REFER TO THE ARCHITECT'S DRAWINGS FOR FINISHED FLOOR LEVELS, SIZE AND EXACT LOCATIONS OF STEPS AND SETDOWNS. FALL IN EXTERNAL SLABS MAY BE REQUIRED.





SECTION A S100
SCALE 1:25

NOTES:

- THIS GENERIC DESIGN IS ONLY FOR THE CONCRETE SLAB SUPPORTING ANY SPA WORLD SWIM SPA MODEL
- SLAB DESIGN AND MATERIALS TO COMPLY WITH AS 2870
- SLAB DESIGN BASED ON DISTRIBUTED LIVE LOAD 5 kN AND DEAD LOAD 100 kN. AS PER AS/NZ 1170.1
- SLAB TO BE FOUNDED ON SOIL WITH ALLOWABLE BEARING PRESSURE 50kPa MIN. THIS OFFICE TO BE CONTACTED IF DIFFERS
- TREE EFFECT, PROXIMITY OF ASSETS, GROUND WATER/UNUSUAL MOISTURE CONDITIONS AND CHEMICALLY REACTIVE SOIL HAS NOT BEEN TAKEN INTO CONSIDERATION. THIS OFFICE TO BE CONTACTED FOR SITE SPECIFIC DESIGN IF THESE CONDITIONS EXIST
- SWIMMING POOL AND SPA SAFETY TO FOLLOW THE GUIDELINES OF PN-05-2018 PUBLISHED BY VBA.

Barrason's Engineers
E: admin@barrasonengineers.com
T:(03) 5940 2639
W: www.barrasonengineers.com

TITLE: SPA SLAB PLAN

FOR CONSTRUCTION

PROJECT: GENERIC SPA SLAB

CLIENT: SPA WORLD

JOB No: 2004093 | DRAWING No: S100

SCALE:

REVISION	AMENDED DESCRIPTION	DRAWN BY	DATE
A	FOR CONSTRUCTION	B.E.	15.04.20
B	AMENDED NOTES & DIMENSIONS	B.E.	17.04.20
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PAD FOOTING V5.03

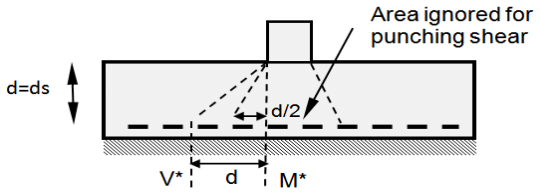
Pad:	**(Pad Footing PF02) 6200mm long x 2500mm wide, 150mm deep**	**OK (0.01)**
	f'c = 25MPa, Bearing = 11kPa < 12kPa	**OK (0.88)**
Reinf't:	**2-SL82 (main wires in main direction), 2-SL82 (main wires in main direction) (BLL bars in L dir.) , 60mm c**	**OK (0.01,0.01,0.01)**
Column:	**5950mm long x 2300mm wide, P* = 213kN**	
	(Designing moment at face of column)	

Geometry

Concrete strength (f'c) =	25	MPa	Column length (CL) =	5950	mm
Pad length (L) =	6200	mm	Column width (CW) =	2300	mm
Pad width (W) =	2500	mm	Column area reduction =	14.40	m²
Pad depth (D) =	150	mm			
Design moment at column face =	Y	(Y)es,(N)o	Outstand in L direction =	125	mm
			Outstand in W direction =	100	mm
Method =	E	(E)lastic/(P)lastic	Pad Area =	15.50	m²

Loading

Dead load (Pdl) =	100	kN (Excluding footing S.Wt)		
Live load (Pll) =	5	kN		
Eccentricity (EccL) =	0	mm		
Eccentricity (EccW) =	0	mm		
S.Wt. density (ρ) =	25.0	kN/m³		
S.Wt. = ρ*L*W*D =	58.1	kN		
P* = 1.35*(Pdl+SWt) =	213	kN		
Allowable bearing pressure =	12	kPa	OK (0.88)	
Max. bearing pressure (Bp) =	11	kPa	Ultimate B.P.(Bp*) =	14 kPa
	(Bearing elastically determined)			



Reinforcement

Unreinforced =	N	(Y)es, (N)o			
Extreme bottom bars in =	L	(W), (L) dir	No. Reinf't layers =	2	
Cover to bottom layer of reinf't =	60	mm	Ductility class =	A	(N)ormal,(L)ow,(A)uto
			Reinf't ductility class =	L	(N)ormal,(L)ow
BLL (in L dir.) =	**2-SL82 (main wires in main direction)**		**BUL (in W dir.) =**	**2-SL82 (main wires in main direction)**	
Bar size =	7.6	mm	Bar size =	7.6	mm
Bar cts/No. per m =	200	mm	Bar cts/No. per m =	200	mm
Steel Strength (fsy) =	500	MPa	Steel Strength (fsy) =	500	MPa
Area steel (Ast) =	454	mm²/m	Area steel (Ast) =	454	mm²/m
Depth to steel (ds) =	86	mm	Depth to steel (ds) =	79	mm
Ast.min = 0.19*(D/ds)²*f'ct.f/fsy*ds =	298	mm²/m	Ast.min =	326	mm²/m

Design capacities

Bending - Cl 8.1 & Cl 15.4.2			alpha (α2 = 1.00-0.003*f'c) =	0.850		(0.67 ≤ α2 ≤ 0.85) Eq 8.1.3(1)
			gamma (γ = 1.05-0.007*f'c) =	0.850		(0.67 ≤ γ ≤ 0.85) Eq 8.1.3(2)
			ø = 1.19-13*kuo/12 =	0.640		(0.60 ≤ ø ≤ 0.64) Table 2.2.2 for L Class
Moment (ML*) =	0.1	kNm/m	øMuo.L =	11.7	kNm/m	OK (0.01)
Moment (MW*) =	0.1	kNm/m	øMuo.W =	10.6	kNm/m	OK (0.01)
			Plain concrete ø =	0.6	Table 2.2.2	
			øMuo.ur =	3.0	kNm/m	
One-way shear - Cl 8.2 & Cl 15.4.3			fcv = f'c$^{1/3}$ ≤ 4MPa =	2.92	MPa	
			Strength factor (øv) =	0.70		Table 2.2.2
1-way shear (VL*) =	0.5	kN/m	øVu.L =	51.1	kN/m	OK (0.01)
β1.L = shear (VW*) =	0.3	kN/m	øVu.W =	48.3	kN/m	OK (0.01)
1.665	β1.W = 1.674		øVu.ur =	26.3	kN/m	
Punching shear - Cl 9.2 & Cl 15.4.3			Shear Perimeter (u) =	16814.4	mm	
Pad load (P*) =	213	kN	βh =	2.6		Cl 9.2.1.5
Column load reduction =	198	kN	fcv =	1.51	MPa	Cl 9.2.3
Punching shear (Vp*) =	15	kN	øVp =	1394.3	kN	OK (0.01)
			øVp.ur =	894.4	kN	