



FEBRUARY 2019

+Masonry swimming pools



FIRTH MASONRY SWIMMING POOLS

1	PLANNING	4
2	DESIGN	4
3	REGULATIONS	4
4	LAND	4

SPECIFICATION

5	CONSTRUCTION	5
6	SETTING OUT	5
7	EXCAVATION	5
8	DRAINAGE	5
	A. SUBGRADE DRAINAGE	5
	B. POOL DRAINAGE	5
9	FLOOR CONSTRUCTION	5
10	BLOCKWORK	5
11	GROUTING CORES	6
12	FITTINGS	6
13	CURING	6
14	BACKFILL	6
15	COPING	6

INTERIOR FINISH

16	PLASTERING	6
17	PAINTING	6
18	PLUMBING	6
19	PAVING	6
20	FILTERING	6
21	ELECTRICAL	6
22	FENCING	7
23	WALL TO FLOOR DETAIL	7
24	TYPICAL STEP DETAIL	8
25	TYPICAL PLAN LAYOUT	8
26	CORNER DETAIL OF STEEL REINFORCING	9
27	SWIMMING POOL PLANNING MODULE	10



FIRTH MASONRY SWIMMING POOLS

1 PLANNING

NZS 4441:2008 SWIMMING POOL DESIGN STANDARD AND NZS 5826:2000 POOL WATER QUALITY GOVERN THE SAFE OPERATION OF SWIMMING POOLS AND NEED TO BE CONSULTED DURING THE PLANNING, DESIGN AND CONSTRUCTION OF THE POOL.

This information describes the construction of a swimming pool specially designed for “Firth Masonry” and includes full details of wall and floor construction, reinforcing and drainage details.

Should it be desired to alter depth, structure or shape outside the scope of this pamphlet or where adverse site conditions exist, the services of a Structural Engineer should be sought, as each deviation will present its own special requirements.

2 DESIGN

Consider:

- Use
- Size and shape
- Depth
- Finishes and details
- Accommodation of lights, ladders, skimmer boxes
- Water circulation
- Filtration
- Safety - owner controlled access to pool enclosure

The size of the pool is naturally determined by individual requirement but where cost or available space are the limiting factors then a 6m x 3.6m pool is the smallest size recommended. With a recommended water depth of 1.3m and 28,100 litres capacity, this pool is for swimmers only and is not large or deep enough to take a springboard. Diving boards are not recommended in pools less than 9m long and 2.4m deep.

The rectangular shape remains the most practical pool shape and is of course best suited to concrete block construction. However other shapes are possible.

3 REGULATIONS

Determine the planning requirements by consulting the local territorial authority.

Swimming pools require a building consent. Some authorities may require design calculations or a producer statement from a Structural Engineer. Submit two copies of the building plans, showing size of pool, details of construction, drainage and plumbing, site plan showing position of existing building, swimming pool and distances to boundaries.

The basis for the structural design of this swimming pool is AS/NZS 1170 - Structural Design Actions, NZS 4230:2004 Design of Reinforced Concrete Masonry Structures and NZS 4229:1999 Concrete Masonry Buildings not requiring specific design.

4 LAND

Consider the effects of the water table on pool depth and under pool drainage. Consider access and manoeuvring space for excavator and methods of soil disposal.



SPECIFICATIONS

5 CONSTRUCTION

All work shall comply with the compliance documents for the NZ Building Code, NZS 4210:2001 Masonry Construction and NZS 4441:2008 Swimming Pool Design Standard.

6 SETTING OUT

Mark out pool area using timber profiles and string lines.

Set tops of profiles level using dumpy level or water filled hose system. String lines marking outside of pool walls should be accurately placed and checked for squareness.

Peg out area to the excavated. Sides of excavation should be cut approximately 300mm larger all round than the outside wall dimension to allow for back filling and drainage. Indicate depths and where spoil is to be spread if not to be removed from site.

7 EXCAVATION

Allow access of at least 2.4m wide plus manoeuvring room for digger and readymix concrete trucks. Inform excavator of location of underground services, and their respective depths, before work commences. Hand trim bottom of excavation to desired level.

8 DRAINAGE

A - SUBGRADE DRAINAGE

To prevent the possibility of ground water pressure lifting the pool out of the ground when empty, lay a 100mm perforated plastic pipe or equivalent system round the perimeter of pool footing and one cross line under the deepest part of the pool linking the perimeter drain.

Discharge the subgrade drainage system to an outfall or elsewhere but never the pool outlet drain. Ensure adequate falls. Total underslab area should be covered with a 100mm layer of free draining hardfill. If it is not possible to discharge the subgrade drainage system by gravity, fit a hydrostatic pressure release valve to floor. However, even where outfall is available a recommended safety measure would be to still fit a hydrostatic release valve.

B - POOL DRAINAGE

After completion of excavation, set main 38mm copper or PVC outlet drain in position. Levels should be checked at this point to ensure the finished floor will have a slight fall from all directions towards the outlet. Standard copper or PVC fittings are available with manufacturer's installation instructions.

9 FLOOR CONSTRUCTION

Screed and compact levels and falls as required. 100mm of free draining hardfill topped with 25mm of 6.5mm down stabilised hardfill rolled with a vibratory roller to produce a hard unyielding base for the slab.

Lay 125mm thick reinforced concrete slab and integral reinforced wall footings. The floor and footings are to be 20MPa Firth Readymix Concrete containing Xypex additives.

Floor reinforcement consists of 663 HRC mesh sheets, cut, placed and lapped. Set reinforcing 50mm above hardfill. Support on 50mm plastic stools.

Wall footing consists of a thickening round the perimeter of the floor slab with additional reinforcing and wall starter bars as detailed. Tie starter bars to HRC mesh with black iron tie-wires accurately located to ensure that they match the hollow cores of the concrete block walls.

Cut reinforcing bars to lengths required using bolt cutters and form bends to minimum radius of six diameters. Lay concrete slab in one continuous operation without any construction joints. Compact concrete into position and screed with falls to main outlet. Finish surface with steel trowel. Main outlet fitting must be properly bonded into concrete for water tightness. Flood slab with water as soon as it has hardened. Keep slab wet for seven days for full curing.

10 BLOCKWORK

Blockwork is laid by building the corners first and working towards the centre of the wall with each block levelled lengthwise and crosswise and aligned along a string. The first course of the blocks on the footing are threaded around starter bars and laid in a full mortar bed, with only the face shell bedding for the upper courses.

THE VERTICAL RODS ARE TIED WITH BLACK IRON TIE-WIRE TO STARTERS. PLACE HORIZONTAL REINFORCING AS THE WORK PROCEEDS. CLEAN MORTAR FROM CORES AT EACH COURSE. IT IS ESSENTIAL THAT WALLS ARE KEPT TRUE AND PLUMB.

11 GROUTING CORES

Fill cores of each block in accordance with NZS 4210:2001. The grout shall be 17.5 MPa Firth Blockfill.

Note: It is especially important to ensure that the blockwork cores are free of mortar prior to grouting.

12 FITTINGS

Box for or leave openings for fittings previously selected. Lay electrical cords prior to grouting.

13 CURING

Cure block walls for seven days under wet sacking kept damp, before placing and compacting backfill.

14 BACKFILL

Backfill over subgrade drainage with free draining granular material or Pea metal. Do not overstress the walls by operating heavy equipment on the fill, or by impacting against them with large masses of moving earth.

15 COPING

The coping (top edge of wall) should provide:

- A visual edge to the pool
- A non-skid walking surface
- A handhold for swimmers
- A barrier to prevent surface water on surrounding surfaces from draining back into the pool adding dirt and discoloration.

INTERIOR FINISH

16 PLASTERING

Plastering is required to provide a suitable base for painting.

Allow for one bond coat followed by a flanking coat and a finishing coat to achieve a total thickness of 15mm.

A neat easy to clean detail involves tiling the top 150mm of the pool walls between the coping and plaster finish.

17 PAINTING

The plastered finish can be painted with a chlorinated rubber or 2 pot epoxy coating. Chlorinated rubber is a lesser cost and lifespan than a 2 pot epoxy. Painting and surface preparation to be in accordance with the manufacturer's specification to avoid defects such as blistering or peeling.

18 PLUMBING

All pipe work and installation of plumbing systems to be in accordance with the NZ Building Code.

19 PAVING

All variety of materials for pool area paving is available, such as:

- Firth Concrete Paving Slabs
- Firth Bricks (Focus, Pioneer)
- Firth Interlocking Paving
- Treated Timber

The essential features are:

- Non slip
- Adequate drainage from paved areas
- Adequate fall away from pool edge 1:50 is recommended.

20 FILTERING

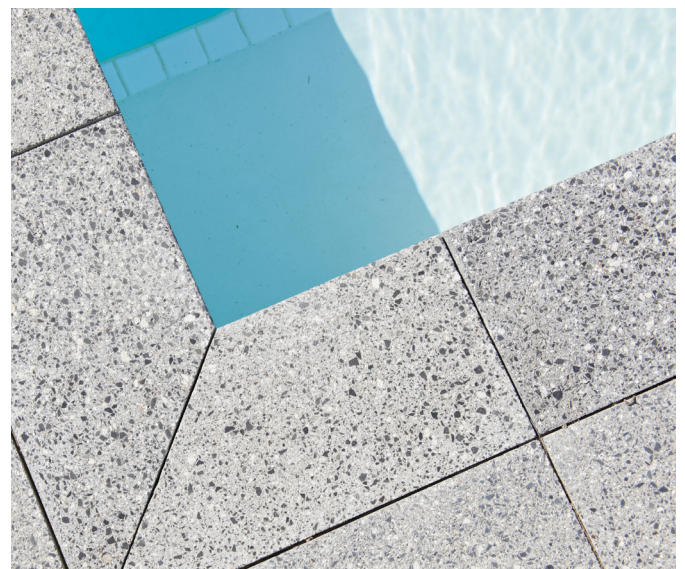
An efficient filter is essential for proper pool maintenance. Types available are:

- Sand Filter
- D E Type Filter
- Cartridge Filter
- Ozone Water Purification

Filteration and water recirculation equipment shall be of approved type and installed in accordance with manufacturer's instructions.

21 ELECTRICAL

All work shall be done by a registered electrician to comply with the Electrical Regulations.



22 FENCING

Fencing around the pool is required by the Territorial Authority and has to comply with the Fencing of Swimming Pools Act. For full information contact your Territorial Authority. In brief, the fence must enclose the pool area. The fence must be at least 1.2m high measured from the ground level outside of the fence. The distance between ground level and the bottom of the fence must not exceed 100mm.

Fences shall be built so to prevent climbing from the outside. All horizontal fence members must be on the inside of the fence and spaced 900mm or more apart. Space between vertical paneling, boards, bars or other such material must not exceed 100mm at any point.

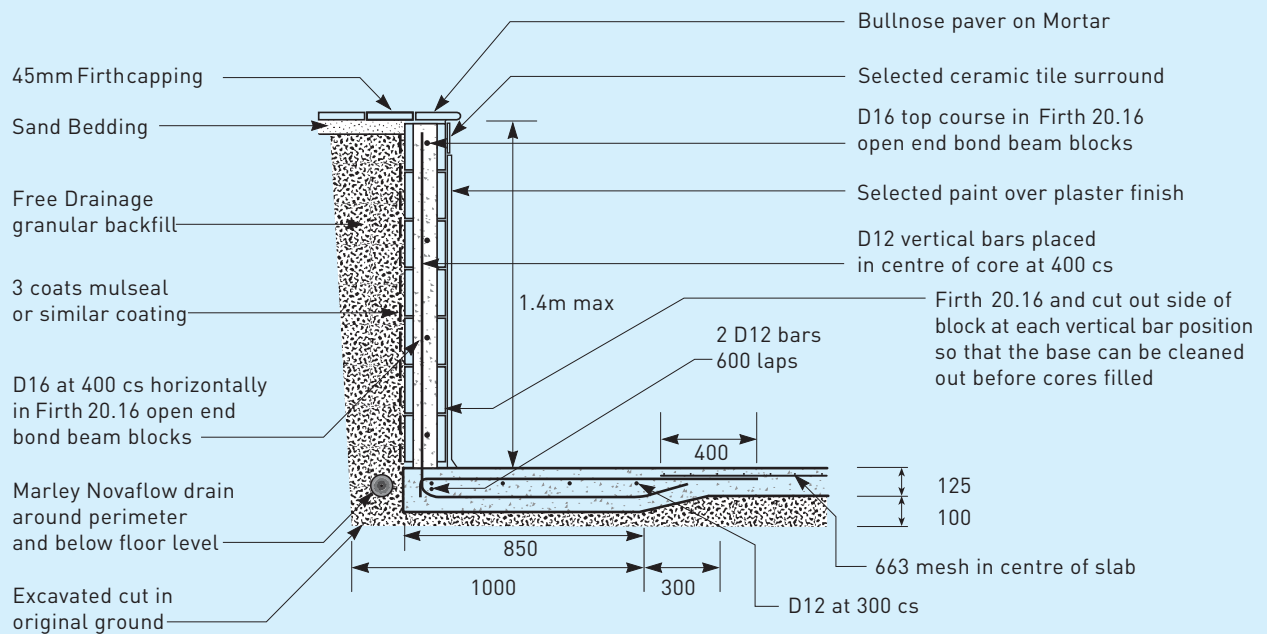
The gate must open outwards and have a latching device not less than 1.2m above finished ground level. The gate must automatically shut with the latch operating from a stationary start at a position of 150mm from the closed position.

DETAILS

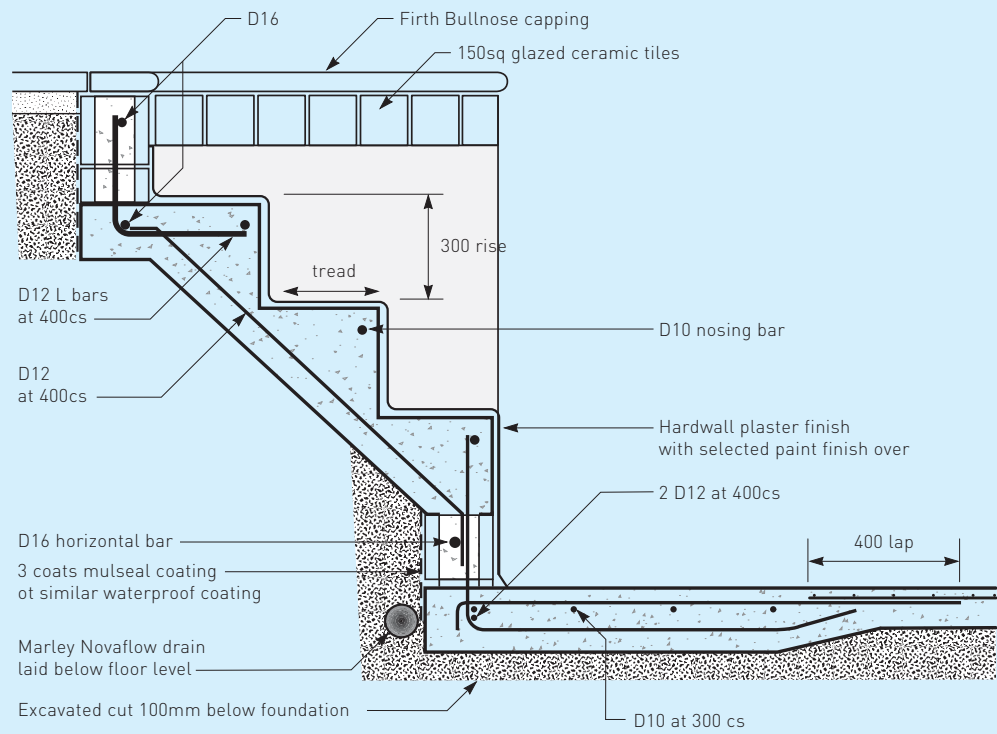
The drawings in this document have been developed assuming the following limitations. Where the operating conditions are outside these limitations seek professional engineering advice.

- No surcharge exists around the pool edge
- Maximum depth of the pool is 1.4m
- The pool is below ground
- The pool will be predominantly full with water. If left for long periods empty, there is a possibility that drying shrinkage could cause cracking
- The maximum length or width is 6.4m

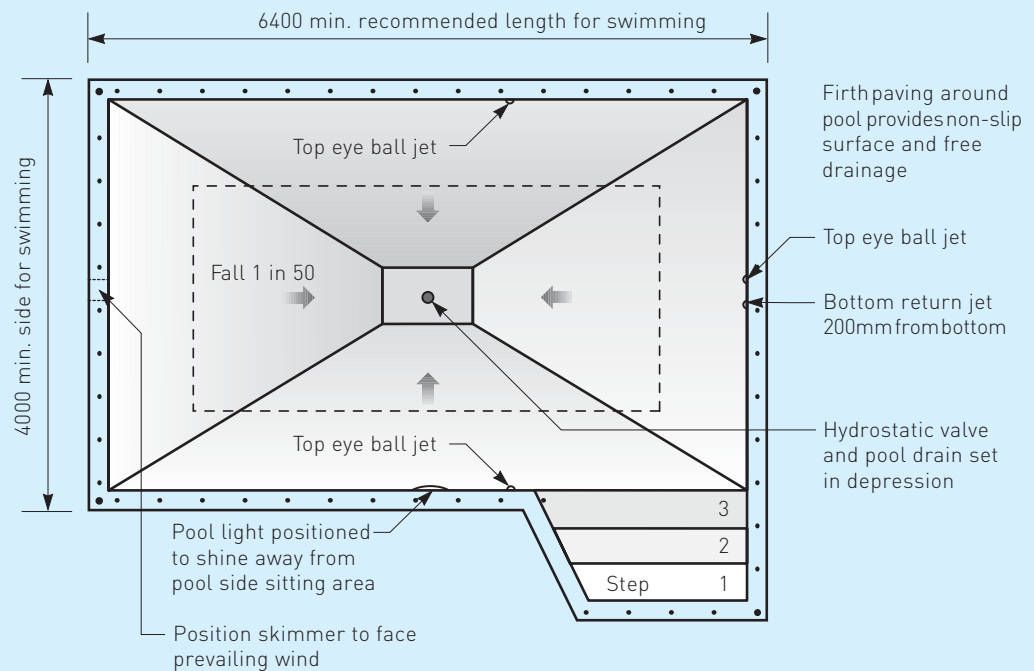
23 WALL TO FLOOR DETAIL



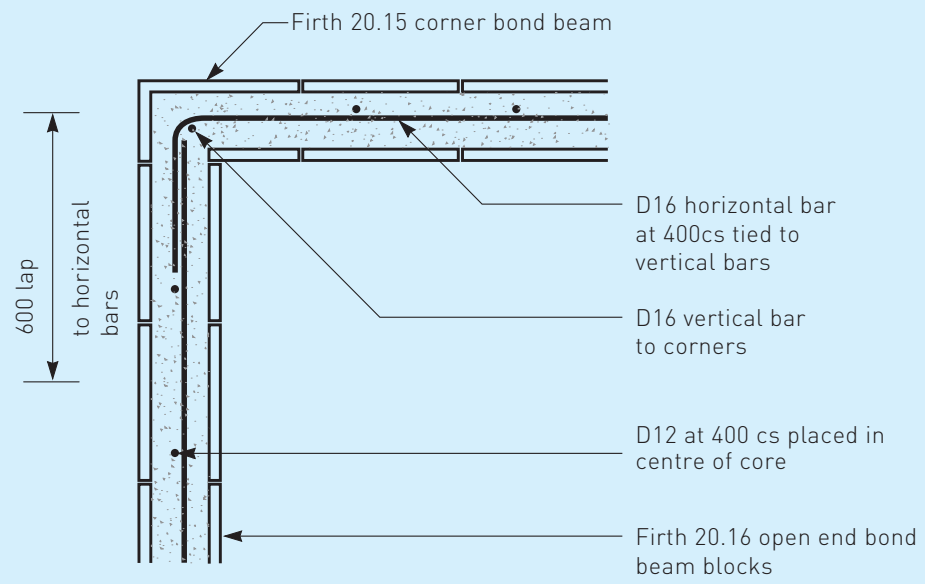
24 TYPICAL STEP DETAIL



25 TYPICAL PLAN LAYOUT



26 CORNER DETAIL OF STEEL REINFORCING

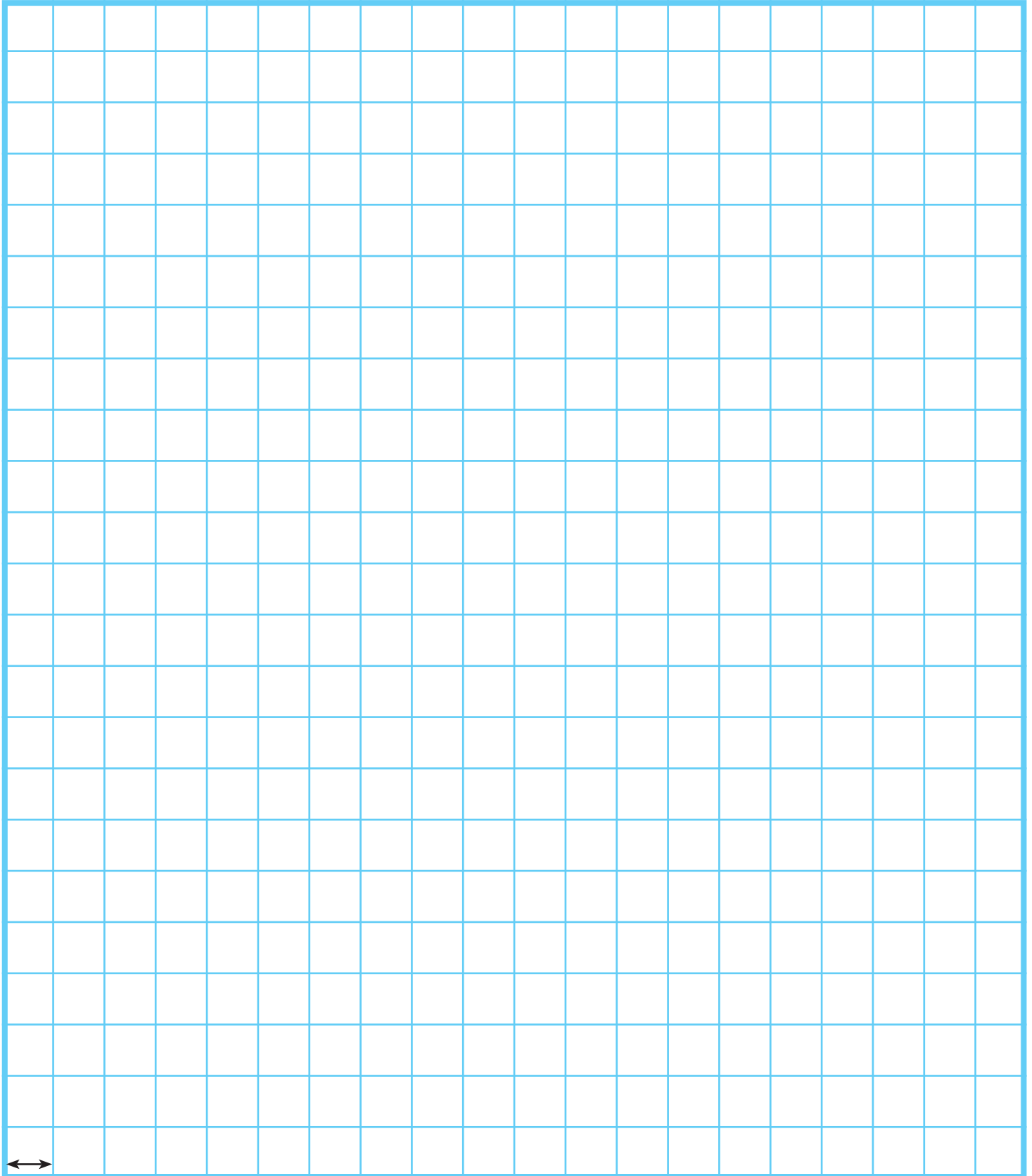


27 SWIMMING POOL PLANNING MODULE

Using block module draw outline of swimming pool showing position of steps, skimmer, lights, filter, jets

NAME

ADDRESS



400 block size

Scale 1:50



CONCRETE & MASONRY PRODUCTS: A SUSTAINABLE BUILDING OPTION & SOLUTION

- ✓ Environmentally compliant manufacturing plants
- ✓ Surplus water and some aggregates recycled
- ✓ Low transport impacts
- ✓ Leftover concrete returned from construction sites
- ✓ Passive solar heated thermal mass makes completed buildings more energy-efficient
- ✓ Most wash water returned from construction sites
- ✓ Highly durable, low maintenance buildings and no rot
- ✓ High degree of noise control
- ✓ Inherent fire resistance
- ✓ Overall longer effective building life
- ✓ Demolished concrete can be recycled as hard fill or aggregate

© Firth Industries 2019. All rights reserved. Content in this document is protected under the Copyright Act 1994. No material may be reproduced in whole or in part without the written consent of the copyright holder.



0800 FIRTH 1 (347841)
FIRTH.CO.NZ

PRODUCTSPEC
productspec.net

masterspec
masterspec.co.nz