

Lift Shaft Builders Guide



Important! Please pass copies of this booklet to all architects, builders and sub-contractors involved in constructing the elevator shaft, pit, entrances and machine room

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Overview

Important! Please pass copies of this booklet to all architects, builders and sub-contractors involved in constructing the elevator shaft, pit, entrances and machine room



This booklet outlines the construction, wiring and finishing details for the lift pit, shaft and entrances, as well as the requirements for the small machine room that houses the Powerglide HPU and PLC.

A lot of the requirements outlined in this booklet are to ensure the installation meets the relevant New Zealand Building Code Standard for this installation.

Powerglide elevators will provide builders working drawings to accompany this document. The builders working drawings will

outline dimensions that are specific to a project, such as cylinder hole depth, lift shaft size etc. This guide should be used in conjunction with the Builders Working drawings to build a lift shaft that functions well for the installation of the lift, and looks good for the lift passengers.

It is very important that the main building contractor has read this guide completely before any building work commences on the lift shaft or machine room.

What's included with the elevator?

Below outlines what equipment and services are included with a Powerglide Elevator and what equipment and services must be supplied by the owner, the builder and the electrician. These items will be dealt with in more detail in this guide.

Description	Powerglide	Builder	Electrician
Lift rails, carriage and car, supplied and installed	✓		
Hydraulic Power Unit (HPU) and PLC Computer supplied and installed	✓		
Lift shaft landing doors supplied and hung		✓	
Landing door night latch, flush pull and internal door stop supplied	✓		
Landing doors prepared for night latches and flush pulls, and hardware fitted		✓	
Landing door jamb prepared for electric strike		✓	
Landing door electric strike supplied	✓		
Landing door external pull hardware supplied and fitted		✓	
Lift pit built as per this guide		✓	
Lift shaft built as per this guide		✓	
Lift car interior decorated (paint, carpet, glass etc)		✓	
Lockable cupboard for PLC and HPU		✓	
20 amp single phase Non-RCD power supply in HPU/PLC cupboard			✓
Lighting inside lift car and lift shaft supplied and fitted	✓		
Telephone jack in HPU/PLC cupboard for lift car phone*			✓
Telephone inside lift car supplied, fitted, and connected to HPU/PLC cupboard*	✓		
Hand rail inside lift car supplied and fitted*	✓		
Automatic door openers supplied, fitted and connected*	✓		
Independent lift inspection and PS2 documentation (for Building Consent)	✓		
Application for Building Consent and Code of Compliance with local building authority		✓	

*These items are only required for commercial disabled access installations, but can be fitted to residential installations if required. Although not required, a telephone jack inside the HPU/PLC cupboard is advised for all installations in case a phone is to be fitted at a later date.

Building – Work to be completed by the builder

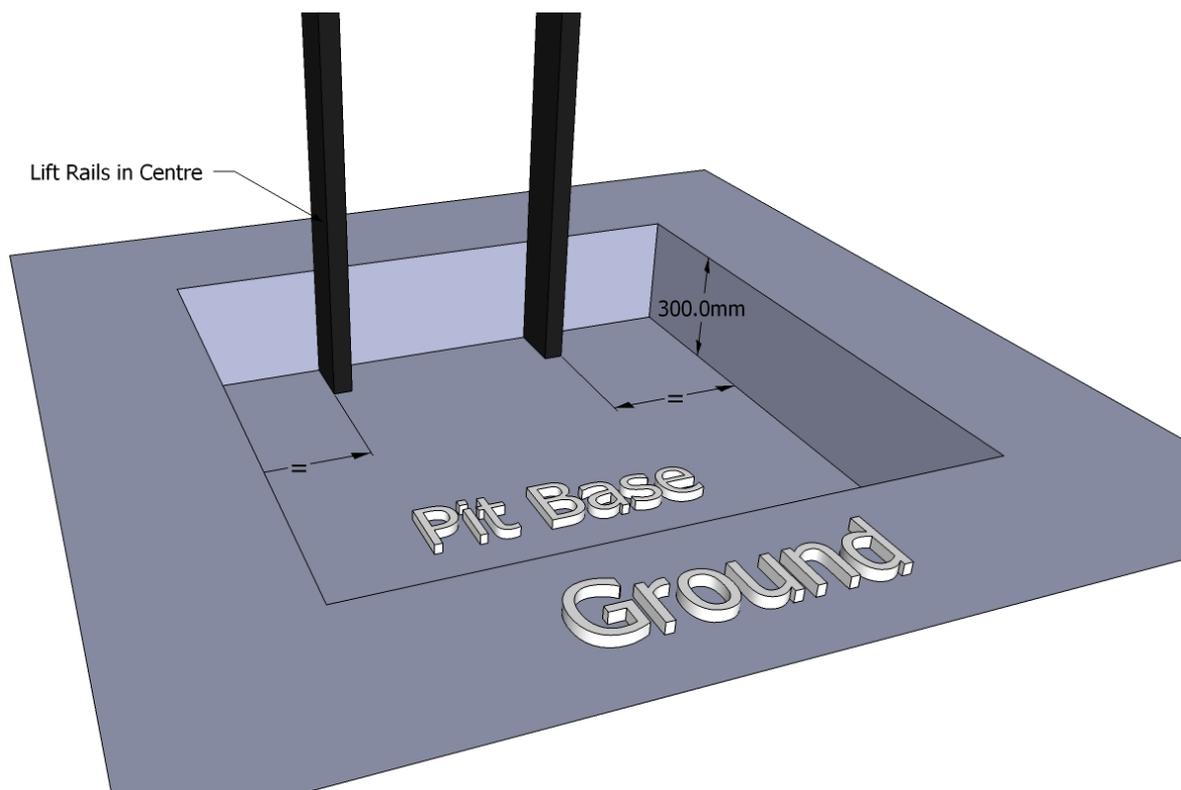
The building work required creating a lift shaft and machine room for a Powerglide Elevator is broken up into 4 main steps...

1. **Lift Pit** – A concrete recess either built into the new foundation of a home, or cut into an existing foundation
2. **Lift Shaft** – The shaft (which is like a long wardrobe) inside which the Powerglide Elevator will travel up and down. The shaft can be built from any material (block, timber etc)
3. **Landing Doors** – These are the doors that will be used to access the elevator. They are to be leaf doors, hung flush with the inside of the shaft, and hinged to open outwards
4. **Machine Room** – This is where the hydraulic power unit (HPU) and programmable logic computer (PLC) will be installed. These are connected to the lift by a hose and several electrical cables, all supplied as part of the elevator assembly



Lift Pit Construction – Up to 3600mm of Travel

This is the pit you will create if your lift is traveling up to 3600mm. This would be the case for most 2 level dwellings.



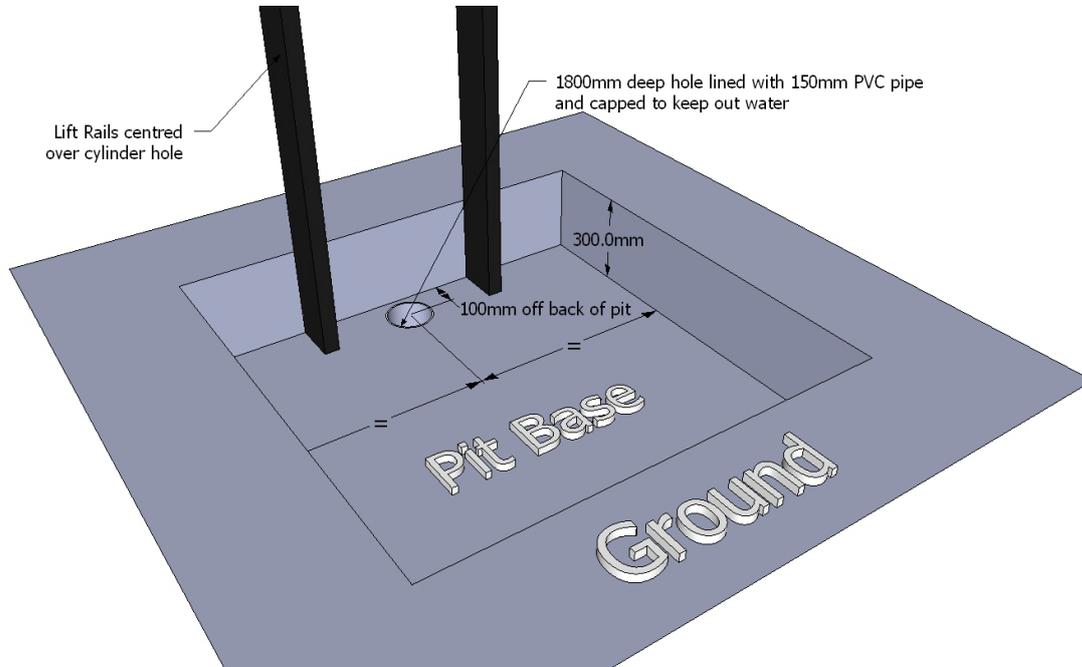
Pit Depth: The pit should be no less than 300mm deep

Pit Floor Strength: The pit floor should have an ultimate bearing capacity of 300kpa, and should be at least 100mm thick. This floor will support most of the load of the elevator and its passengers

Sump: A sump in the pit is not a requirement of Powerglide Elevators as our system runs on oil, not water. However, it may be a requirement of your local building authority. Powerglide can provide a water sensor and alarm for this purpose if required.

Lift Pit Construction – 3601mm to 7300mm of Travel

This is the pit you will create if your lift is traveling up between 3600mm to 7300mm. This would be the case for most 3 level dwellings.



Pit Depth: The pit should be no less than 300mm deep

Pit Floor Strength: The pit floor should have an ultimate bearing capacity of 300kpa, and should be at least 100mm thick. This floor will support most of the load of the elevator and its passengers

Cylinder Hole Position: The cylinder hole will generally be in the centre of the wall that is to have the lift rails located (the left wall in the above drawing), and should be 100mm out from this wall (to the centre of the hole)

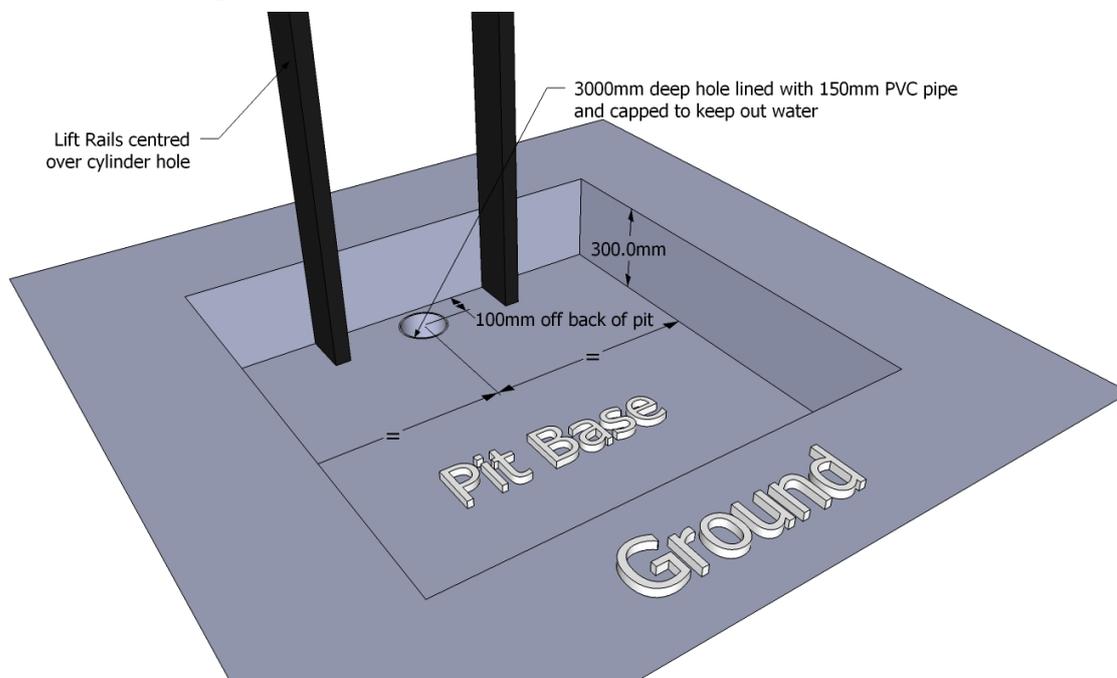
Cylinder Hole Diameter: The hole, once bored, should be lined with a 150mm OD PVC pipe, capped on the bottom to keep water and dirt out of the hole. We suggest leaving at least 100mm of pipe protruding above the base of the pit to stop water and debris falling into the hole. Powerglide will cut this off flush when they install the elevator

Cylinder Hole Depth: The depth of the hole (to the capped bottom of the 150mm OD PVC pipe) should be at least 1800mm. This depth is measured from the pit base level.

Sump: A sump in the pit is not a requirement of Powerglide Elevators as our system runs on oil, not water. However, it may be a requirement of your local building authority. Powerglide can provide a water sensor and alarm for this purpose if required.

Lift Pit Construction – 7301mm to 9,800mm of Travel

This is the pit you will create if your lift is traveling up between 7301mm to 9,800mm. This would be the case for most 4 level dwellings.



Pit Depth: The pit should be no less than 300mm deep

Pit Floor Strength: The pit floor should have an ultimate bearing capacity of 300kpa, and should be at least 100mm thick. This floor will support most of the load of the elevator and its passengers

Cylinder Hole Position: The cylinder hole will generally be in the centre of the wall that is to have the lift rails located (the left wall in the above drawing), and should be 100mm out from this wall (to the centre of the hole)

Cylinder Hole Diameter: The hole, once bored, should be lined with a 150mm OD PVC pipe, capped on the bottom to keep water and dirt out of the hole. We suggest leaving at least 100mm of pipe protruding above the base of the pit to stop water and debris falling into the hole. Powerglide will cut this off flush when they install the elevator

Cylinder Hole Depth: The depth of the hole (to the capped bottom of the 150mm OD PVC pipe) should be 3000mm from the pit base level.

Sump: A sump in the pit is not a requirement of Powerglide Elevators as our system runs on oil, not water. However, it may be a requirement of your local building authority. Powerglide can provide a water sensor and alarm for this purpose if required.

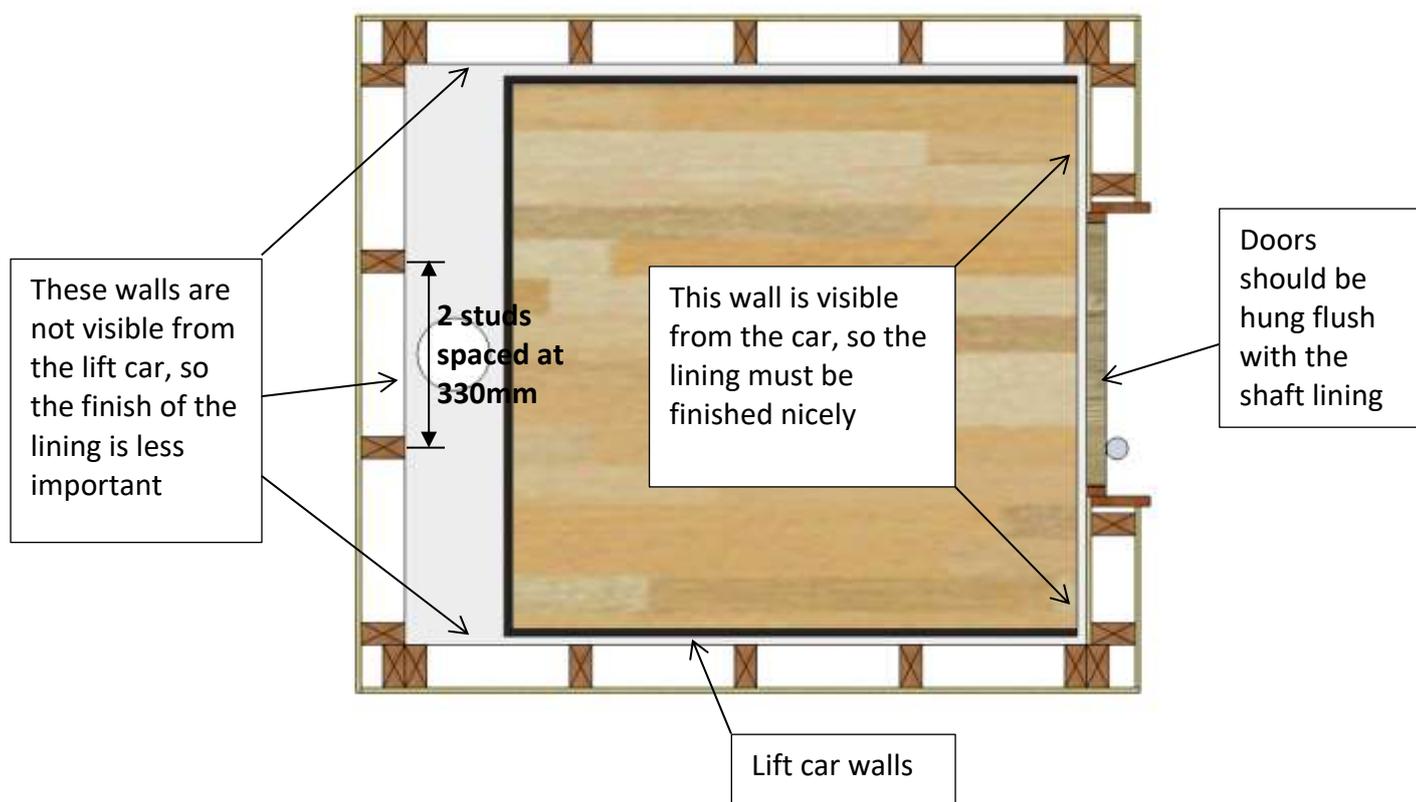
Lift Shaft Walls

The lift shaft walls can be constructed from any material. Below outlines the two most common wall types, and how they should be built. If a glass shaft is to be used, please contact Powerglide Elevators for detail on glass shaft construction.

Important! So we can run our wires through the lift shaft walls, we require either the inside lining or outside lining of the door walls to either be left off, or to be removable. If this is not possible, please contact Powerglide Elevators for an alternative solution

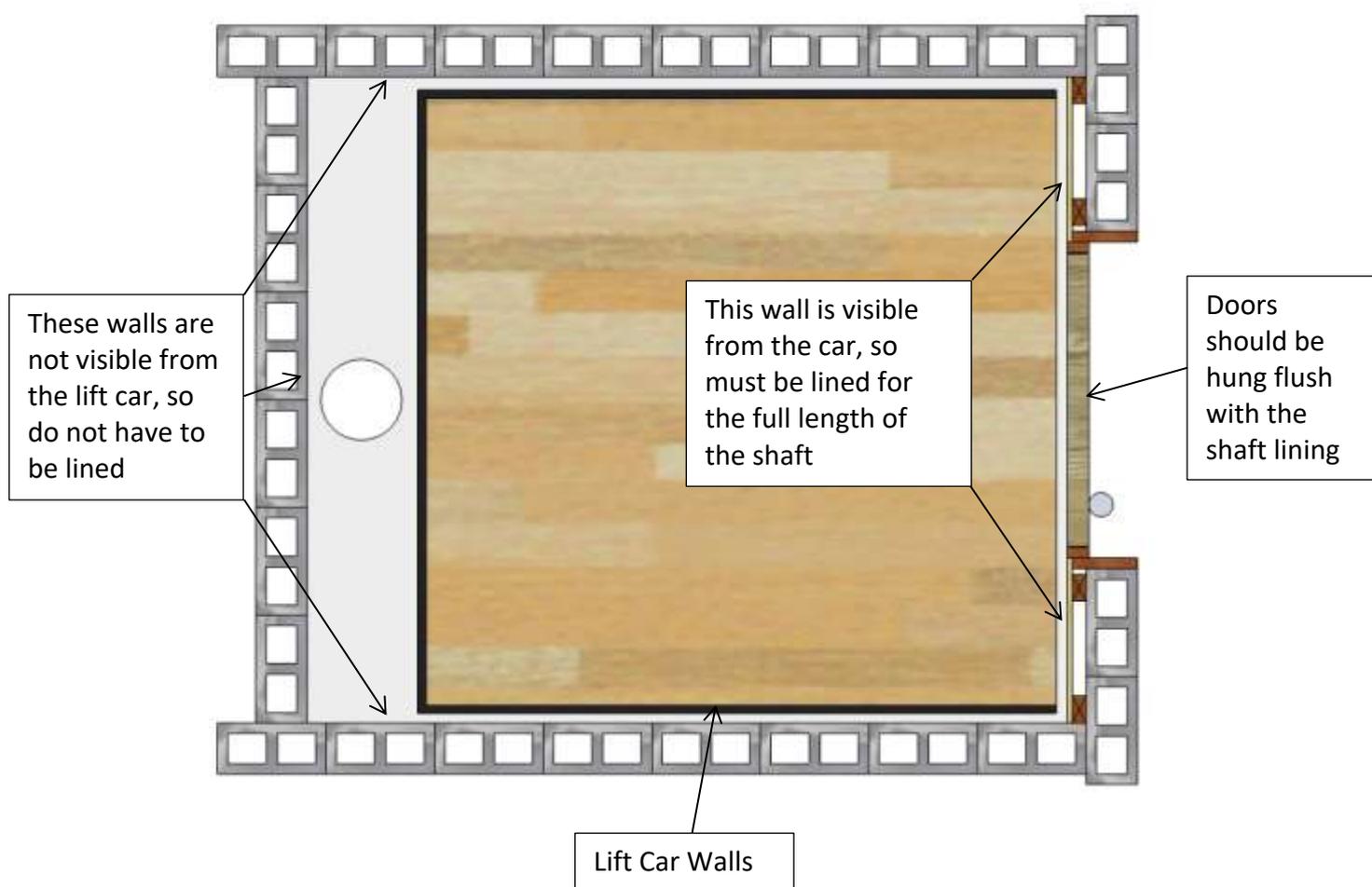
Timber Lift Shaft Walls

- Timber lift shaft walls can be made using any timber 90mm x 45mm or larger
- Lift shaft walls have to be lined on all sides (this is a NZ Building Code requirement)
- The lift shaft lining can be any material (gib, custom wood, plywood etc)
- The lining should be fitted to be flush with the side walls of the concrete pit
- The lift shaft walls should be straight, plumb and inline over the full height of the lift shaft



Block on Concrete Lift Shaft Walls

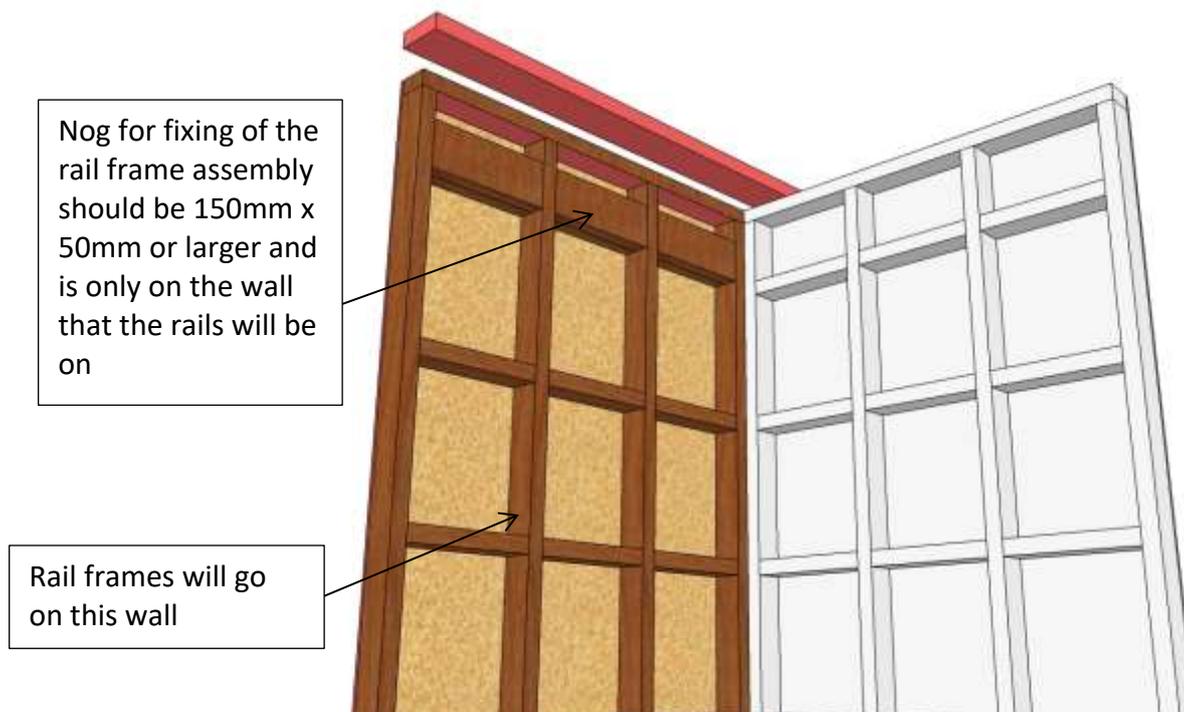
- Block or concrete can be made using any size block or concrete slab
- Lift shaft walls only have to be lined on sides that will be visible from inside the lift (which is generally the sides that have landing doors)
- The lift shaft lining can be any material (gib, custom wood, plywood etc)
- The lining should be fitted to be flush with the side walls of the concrete pit
- The lining should be packed out from the block or concrete to allow for wiring coming from the door jamb hardware to be run down into the lift pit
- The lift shaft walls should be plumb, straight and in line over the full height of the lift shaft



Top of Lift Shaft

The important items in the top of the lift shaft are...

1. Powerglide Elevators will fix the top of their rail frame assembly to one wall at the top of the lift shaft, and this wall should have a heavy nog placed at a height provided by Powerglide Elevators (this height will be shown in the custom builders working drawings). This nog should be 150mm x 50mm or larger timber. This nog is not required for block or concrete lift shafts
2. The ceiling height from the floor level of the top floor should be no less than 2400mm (when 2000mm landing doors are to be used) or 2500mm (when 2200mm landing doors are used). No ceiling is required in the lift shaft unless the lift car has no ceiling. If this ceiling height is not possible please contact Powerglide Elevators for an alternative solution.



Landing Doors

Because Powerglide Elevators manufacture a lift car that does not have doors, landing doors must be provided by the builder to the following specifications...

- Any style of hinged leaf door (solid, hollow, glass etc)
- Any width of opening (must be no smaller than 760mm)
- Any height (please advise Powerglide if you intend to use doors higher than 2000mm)
- Hung flush with the inside of the door jamb
- Built with 20mm packer on all 3 internal edges of the door jamb as shown below
- Hinged to open outwards, so will not open past 90 degrees
- Powerglide will supply Legge 990 night latch hardware for landing doors (unless the door is solid glass). This hardware is to be fitted by the builder.
- Powerglide will supply a flush door pull for the inside of the lift door, and this is also to be fitted by the builder.
- Powerglide will provide stainless steel door stops for the inside of the lift shaft to stop the door swinging into the lift car. Powerglide will supply these with the builders kitset but these can be fitted by either the builder or by Powerglide

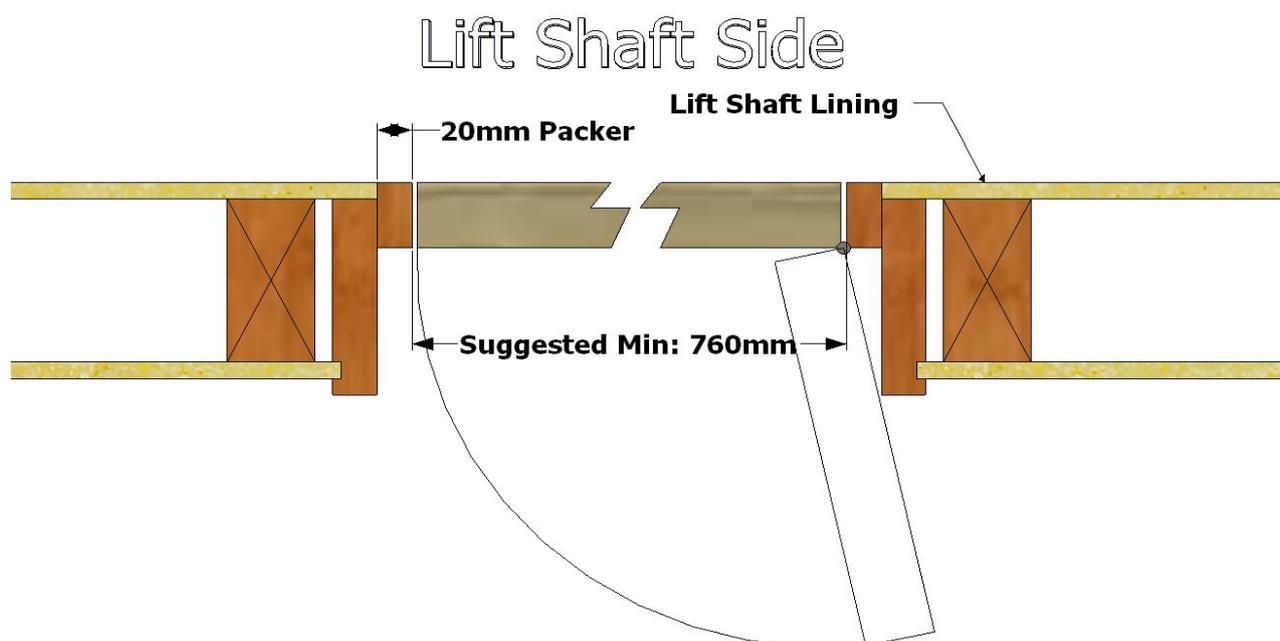


Figure 6 – Timber Landing Door Plan View

Figure 6 shows the suggested method for lining up to the door jamb on the inside of the lift shaft. However, any method that achieves a flush surface on the inside of the shaft is acceptable.

The 20mm packer on the opening side is for the electric door strike (see figure 7) and reed switch (see figure 8) to be fitted.

If a glass shaft and door is to be used, please contact Powerglide Elevators for details on glass door preparation.

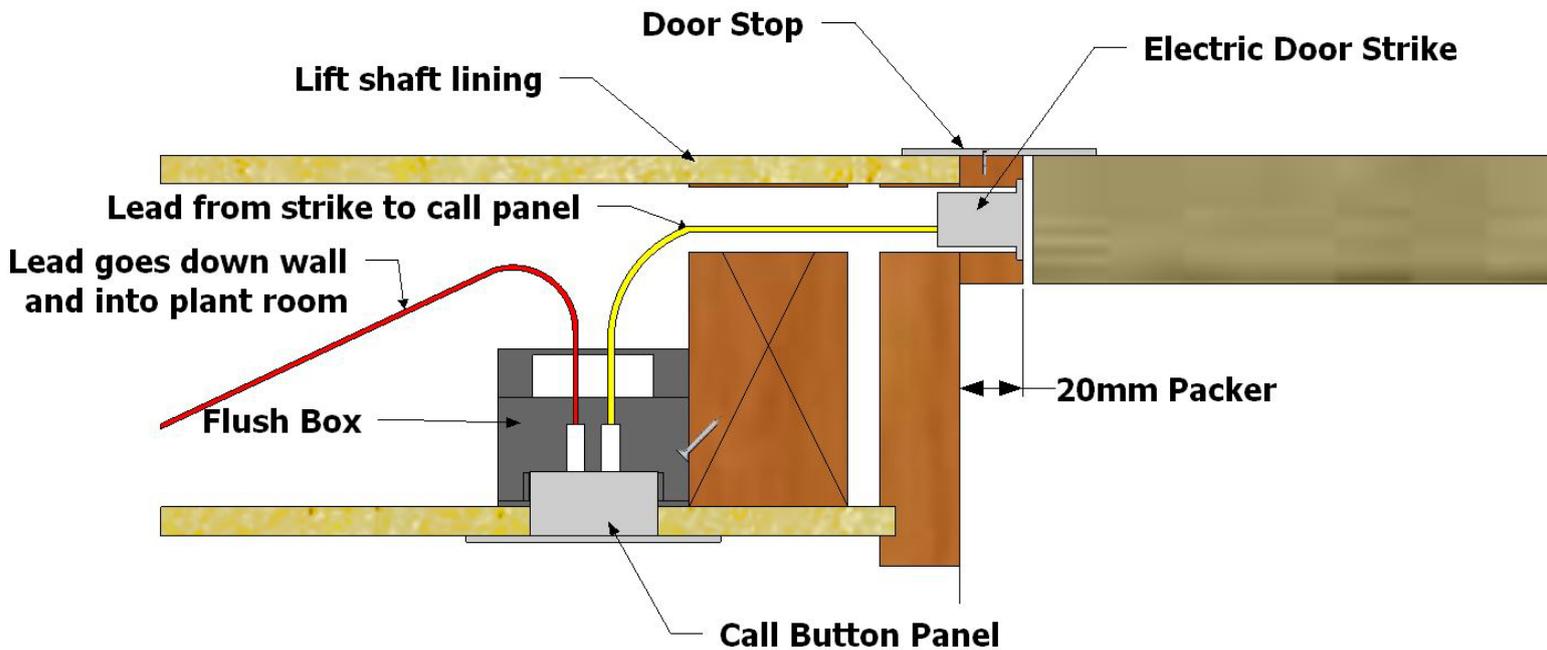


Figure 7 – Door Strike, wiring and flush box preparation

Figure 7 shows the door jamb area prepared for the electric door strike, wires and call button flush box.

Powerglide Elevators will send a builders kit that will contain the night latch door hardware, a sample door strike, flush door pulls, stainless door stops and flush boxes.

Door Strike Preparation: The door strike is to be fitted flush with the 20mm packer, as shown. This needs to be lined up with the night latch hardware at a height of approximately 1000mm off the floor. The 20mm packer should be cut out to be flush with the jamb to allow the latch to pass easily through the strike (see inset above)

Flush Box Preparation: The flush box is to be fixed to a stud at a height of approximately 1100mm off the floor.

Wire Hole Preparation: A 20mm hole should be drilled through the centre of the door strike cavity and through to the void behind the door frame as shown. Powerglide will connect the wires from the door strike to the call button through this hole, as shown in figure 7.

Door Stop Installation: The door stop can be mounted any height on the door, **but not at the same height as the door strike. If in doubt, leave this for Powerglide to fit.**

Door Pull Installation: The door pull can be mounted at any height that is comfortable for the lift passengers to pull the door shut.

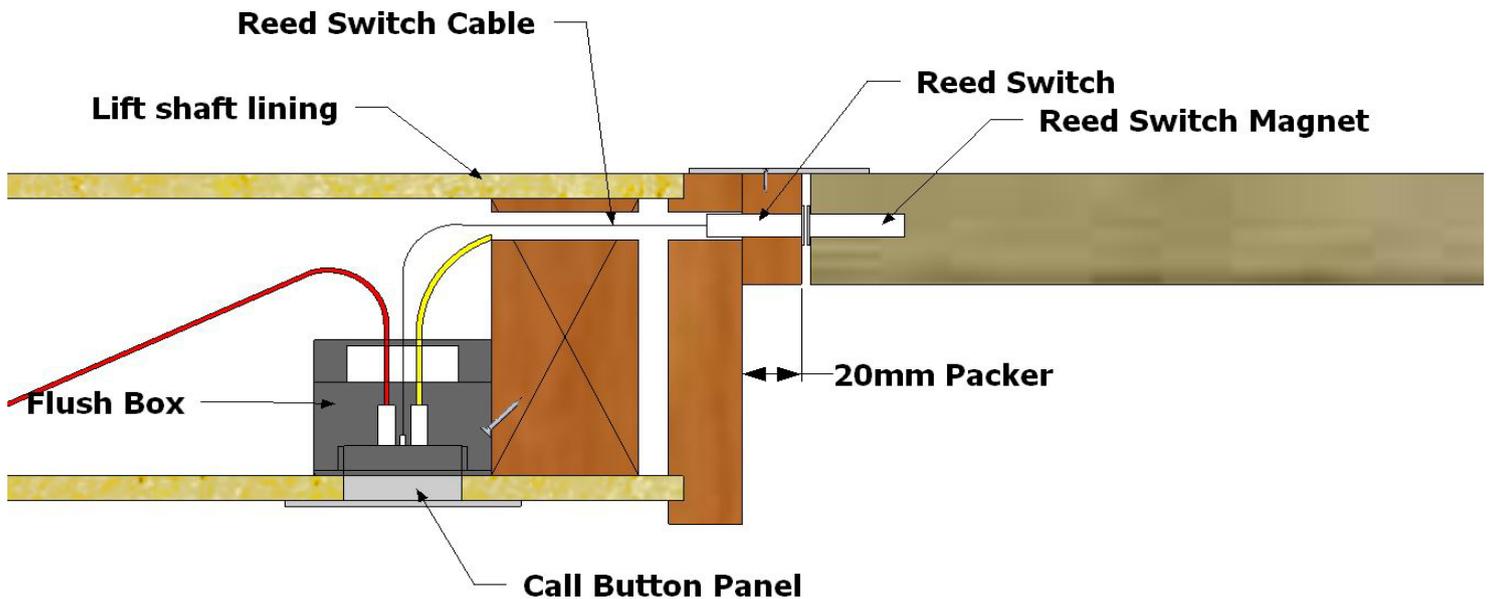


Figure 8 – Door Jamb Preparation for Reed Switch

Figure 8 shows how the door jamb and door are prepared for the reed switch and magnet.

The reed switch and magnet both require a 3/8" (9.5mm) hole into which they will fit tightly and be held in place. Powerglide Elevators will drill these holes and fit the reed switch and magnet.

Although Powerglide Elevators will install the reed switch and magnet, allowance must be made to run the wire from the reed switch to the call button, as shown.

In the case of a timber shaft, if the lining is left off or removable, this job very easy.

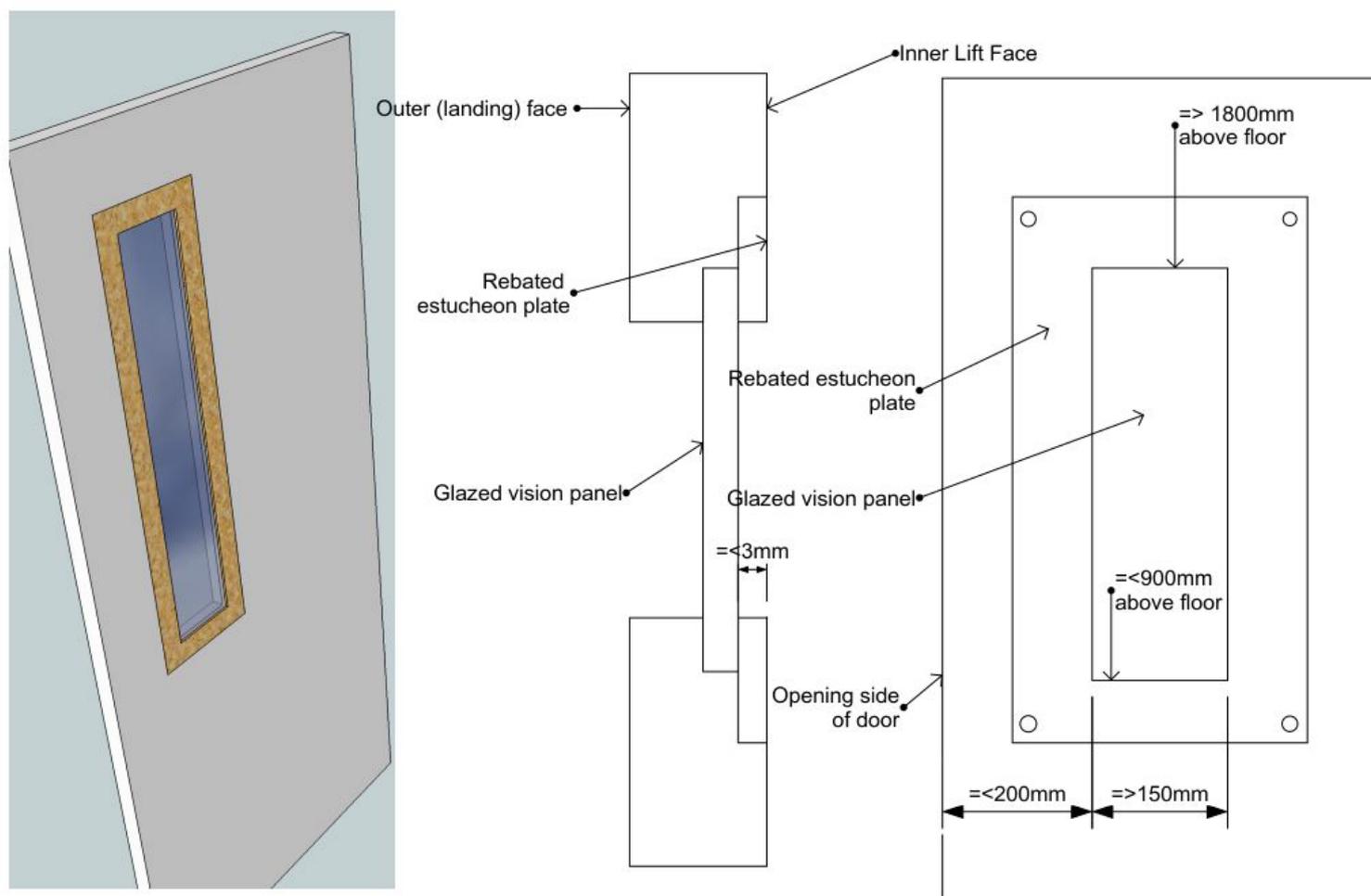
In the case of a block or concrete wall, a hole must be drilled behind the door jamb through the concrete or block so we can feed the wire through to the call button. This hole should be no smaller than 9.5mm.

Powerglide Elevators will fit the reed switch approximately 50mm above the door strike, so any hole behind the door jamb for the wires should be at the same height.

***For more detailed door preparation please see separate
“Landing Door Preparation” instructions. Contact Powerglide
Elevators to obtain a copy of this***

Door Requirements for Commercial Disabled Access

The NZ Building Code standard of NZS4334:2012 calls for a vision panel in the doors of commercial disabled access elevators. Figure 9 below shows the minimum size of these vision panels...



Important! The NZS4334:2012 standard also calls for automatic door openers and closers. Powerglide will include the cost of the supplying and fitting these door openers, but solid doors are required for the mounting of the door opener brackets to the door.

Machine Room

Powerglide Elevators use a Hydraulic Power Unit (HPU) to supply hydraulic pressure to the hydraulic cylinder which in turn pushes the car up and down the lift shaft.

To control the HPU and all door locks, lights, safety devices etc we use a Programmable Logic Computer (PLC). The PLC is connected to the HPU with cables, and is also connected to the lift car and each door with cables.

The machine room should be no smaller than 600mm wide x 500mm deep x 1300mm high. If this is not possible please contact Powerglide Elevators

Machine Room Size:

The machine room must be large enough to house the HPU (which will be fixed to the floor) and PLC (which is generally mounted to a wall above or near the HPU). When stacked on top of one another (as shown in figure 10) the total height required is 1300mm. If you do not have this height available in your machine room, please contact Powerglide Elevators for an alternative solution.

Machine Room Location:

The machine room is generally situated on the bottom level and close to the lift shaft, often under stairs, in a cupboard, or in the garage. However, if necessary it can be situated as far away as 10m from the lift shaft.

Machine Room Requirements:

The machine room must be key lockable (can be a cupboard) and display a warning sign (supplied and fitted by Powerglide). It must not be used for any other purpose (storage, broom cupboard etc) but a separate lockable cupboard can be fitted inside a storage cupboard.

Getting the cables and hose to the lift shaft:

Two separate 50mm (minimum) holes are required to go from the machine room to the lift shaft. If the machine room is adjacent to the lift shaft, this may be as simple as drilling two holes through the wall.

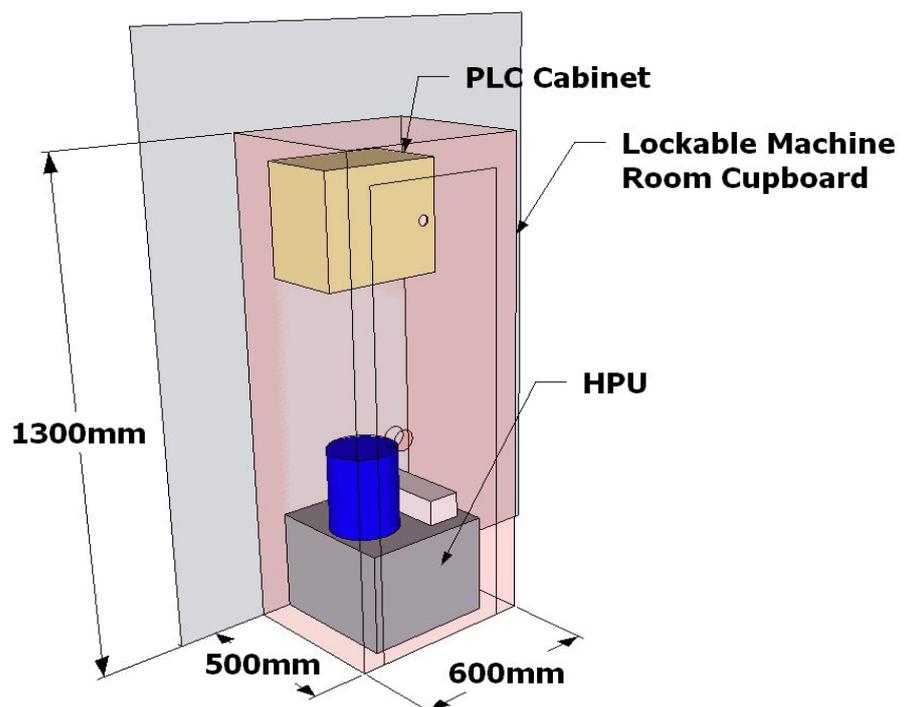


Figure 10 – HPU and PLC

If the machine room is some way from the lift shaft, then an alternative solution (50mm minimum pipes set into the foundation is one solution). The hydraulic hose that connects the HPU to the hydraulic cylinder

inside the shaft is very stiff and won't go around sharp bends. Therefore only 45 degree bends should be used if a pipe is to be used.

Important! If you have no suitable location on the bottom level for the machine room please contact Powerglide for an alternative solution

Electrical Power Requirements

The only outside power supply required for the entire lift is the power supply that goes into the machine room.

The power supply must be...

- 20 amp single phase
- Dedicated and permanent supply (to be wired permanently once PLC has been installed)
- Non-RCD
- An isolating switch



The permanent supply outlet should be at a similar height to a regular domestic power point, and should be located within 500mm horizontal of the PLC. Power to the HPU comes from the PLC.

That's it!

Building the lift shaft for a Powerglide Elevator is very simple if this booklet is read and understood.

Below is a builder's check list. Before Powerglide comes on to site to install the elevator, one of our engineers will call you and go over this check list with you.

Remember, It is very important that the main building contractor has read this guide completely before any building work commences on the lift shaft or machine room.

Builders Guide and Check-List

The tables below show the Powerglide Elevators lift shaft requirements. The below items are either required by Powerglide Elevators to enable the elevator to be installed properly, or by the NZ Building Code to ensure the installation is compliant with local council regulations (these apply to all domestic elevators installed in Australia and NZ).

This check list should be read in full by the builder before construction on the lift shaft commences as it will highlight some of the requirements that may easily be forgotten.

At the completion of the building work, we would ask the builder to go through this check-list to make sure everything is completed. Your Powerglide Elevator installer will go over the check list with you before we come to site to install the elevator.

If you have any questions, or would like to go over this check list with a Powerglide Elevators technician then please call us on (07) 927 2420

Lift Pit

Requirement	CKD
The ground beneath the lift pit has an ultimate bearing capacity of 300kPa minimum	
The lift pit is 300mm deep (or at depth agreed by Powerglide Elevators prior to construction)	
The lift pit corners are exactly 90 degrees square to each other	
The lift pit floor is level, flat, and at 90 degrees to the walls of the lift shaft	
If specified, a round cylinder hole is bored at a distance of 100mm from the back wall (where the rail assembly will be) to the center of the hole	
The cylinder hole is lined to a finished inside diameter of 150mm (6") and capped on the bottom to keep water out.	
The cylinder hole is at the depth as shown on the pit drawing	

Electrical, Lift Controller and Miscellaneous

Requirement	CKD
A lockable cupboard or similar area has been allowed for the installation of the HPU and PLC	
A 20 amp single phase non-RCD connection with isolating switch is supplied in the location of the lift controller PLC and HPU	
The main power supply isolating switch is identified as such	

Lift Shaft built with Timber Framing

Requirement	CKD
A nog or similar has been fitted at the requested height for Powerglide to fix the top of the rail frame assembly	
Lift shaft walls (on sides with doors) are plumb over the full height of the wall	
Lift shaft walls (on sides without doors) are plumb over the full height of the wall	
Lift shaft walls (with doors) are lined flush	
Lift shaft landing doors are hung flush with the inside of the lift shaft wall lining	
Stainless steel flush door pulls have been fitted into inside side of door	
Outside or inside wall of lift shaft (on door sides) has been left unlined to allow access for Powerglide technician to run his wiring. If not possible, an alternative solution has been discussed and agreed by Powerglide Elevators to run wiring	
Night latch door hardware has been fitted to landing doors	
Door jamb has been prepared for the electric door strikes (supplied by Powerglide) as per drawings supplied in the Architects and Builders Guide	
Lift shaft ceiling height is no less than 2400mm (for 2000mm doors) or 2500mm (for 2200mm doors) from the level of the top floor	

Lift Shaft built with blocks

Requirement	CKD
Lift shaft walls (on sides with doors) are plumb over the full height of the wall	
Lift shaft walls (on sides without doors) are plumb over the full height of the wall	
Lift shaft interior walls (with doors) are fitted with battens, ready to have lining material fitted once wiring is completed by Powerglide Elevators	
Lift shaft landing doors are hung flush with the finished inside of the lift shaft wall lining	
Stainless steel flush door pulls have been fitted into inside side of door	
Night latch door hardware has been fitted to landing doors	
Door jamb has been prepared for the electric door strikes (supplied by Powerglide) as per drawings supplied in the Architects and Builders Guide	
Lift shaft ceiling height is no less than 2400mm (for 2000mm doors) or 2500mm (for 2200mm doors) from the level of the top floor	