



Slab On Ground Construction

Carpentry - Residential Construction

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SLAB ON GROUND CONSTRUCTION OVERVIEW

This text introduces a variety of subject matter related to Building and Construction, at a basic level. Descriptions of formwork types, preparation for simple slabs, sequence of setting up forms and environmental on-site controls and examination of slab types. Also covered are termite barriers, slab reinforcement, release agents, transporting/batching/mixing/placing/compaction/curing/finishing of concrete and the methods used to carry out these operations.

Introduction

Slab-on-ground construction is the most commonly used method for residential floor construction as it provides an even, durable, waterproof, maintenance free structure.

Once the site waste management requirements have been assessed and implemented, the slab area is prepared by removing all vegetation, levelling the surface, excavating the perimeter beams (if required), erecting the edge forms, preparing the sub-grade, laying drainage, placing a waterproof membrane, laying the reinforcement and providing termite barriers to slab perimeters and penetrations.

After the forms, reinforcement and appropriate barriers have been placed, the concrete is poured using wheel barrows and planks, chutes or , more commonly, pumped into position from a mobile concrete pump truck at street level. The fluid concrete is then vibrated to remove unwanted air bubbles and the surface is manually screeded to the required levels. After the water sheen has gone, hand and/or mechanical trowelling takes place to burnish the surface, which gives it a dense, hard wearing finish.

The concrete is allowed to set before the curing process begins, which usually takes up to 28 days before it's designed strength is reached. Curing involves a process which prevents excess moisture from escaping, as rapid evaporation creates shrinkage which leads to cracking.

SITE PREPARATION

SITE WASTE MANAGEMENT

As a significant contributor to the production of waste, the Building and Construction Industry has an obligation to take steps to minimise the production of waste and to increase the rate of re-use and recycling. The Building and Construction Industry, Local Council and the Environment Protection Authority (EPA) are working together to reduce wastage and promote re-use/recycling.



Construction Waste

Basically, construction waste is any type of building material, fill, packaging, vegetation, paint or finishing material which is thrown away on a building site.

The estimated wastage from a typical residential building site was around 20 cubic metres (m³). Bricks, roof tiles, timber and plasterboard make up the bulk of residential site waste, ie accounting for approximately 90% of all site waste.

Generation of unnecessary waste from a construction site is not only environmentally undesirable, but it can also end up costing a lot of money. Firstly, there are the costs and hassles of waste disposal. Secondly, there is the initial cost of the wasted materials, and thirdly, the potential profit of the job is reduced by this wastage.

Retaining Site Vegetation

Small trees, shrubs, plants and even grass may be stored on-site, after removal, so they can be re-planted at the end of the project. This saves on additional landscaping costs and preserves the natural vegetation for the area, which birds and other animals rely on for food and shelter.

Stockpiling Soil

Excavated soils, referred to as 'spoil', can be stored on-site in an area which doesn't interfere with construction processes. This retained soil may then be re-used to fill hollows or for general landscaping. Where areas require 'cut and fill' it is usual to use the existing foundation material for filling, which is re-compacted in layers, to avoid differential movement between dissimilar materials, which may occur under slabs and driveways.

The stockpiled soil should be covered with plastic sheeting to prevent erosion and excessive grass growth prior to re-use. The most suitable position on the site would be the lowest corner so that any eroded soil from the pile will be trapped by the sediment control fence. The relevant Australian Standard for residential soil management and use is AS 3798 - *Guidelines on earthworks for commercial and residential development*.

Control of Stormwater

The site surface around the structure should be graded to allow surface stormwater to drain away from the structure and be graded towards a prepared rubble sub-soil drain, placed at the lowest corner of the site.

Sediment Control and Retention

It is a mandatory Local Council requirement for any residential construction that soil and sediment control measures must be taken to prevent surface eroded surface materials ending up in the street gutters and stormwater pits/drains. To prevent this occurring, temporary silt fences must be constructed at the lowest corner or across the lowest side of the building site. These fences may be constructed of closely woven polypropylene, similar to 'Shadecloth', or made up of connecting bails of straw held firmly in position by driving steel star pegs through them. Straw bales or sand bags may also be used in the gutters at the entrance to the stormwater drain openings to prevent silt and debris washing into them.

Designated Wash Out Areas

Wash out areas are designed to detain and filter water and liquid waste products before they reach the stormwater system. This may be done by preparing an area at the lowest corner of the block, excavating a trench and filling it with a variety of graded stone or rubble and sand to form a sub-soil filter bed. It should have a perforated agricultural type pipe installed to allow removal of the filtered water.

All-weather Access

To prevent sub-contractors vehicles and delivery trucks churning up the driveway, which may allow soil to be washed into the street gutters, a layer of crushed rock or road base should be laid and compacted. This will prevent surface erosion, allow access onto the site in any weather and provide a solid base for the future driveway.

Reuse of Building Materials

Where a project involves demolition, extension, renovation, etc. there will always be some material which is removed and not required to be re-installed for that project. Salvage of these components, in agreement with the client, will reduce waste and save the Builder money as they may be re-sold or used in another project. Items in a good condition which are suitable for re-use are windows, doors, fixings, cupboards, roof tiles, special timbers (eg Australian Red Cedar, Mahogany, Baltic pine etc), pressed metal ceilings, leadlight glass, wrought iron gates, electrical fittings, bathroom fixtures, flooring boards, Hot Water units, ceramic tiles and light fittings.

Recycling Waste

This is not always the first choice as it usually generates some cost in it's initial removal from site. After all other avenues have been exhausted, ie re-use, initial waste avoidance, stockpiling, repair etc, then many materials may be recycled. Suitable materials would include cardboard and paper packaging, timber, bricks, roof tiles, concrete, some plastics, plasterboard, glass, steel, aluminium and ceramics.