



# Slump test concrete

CPCCCO3053



- By the end of this topic, you should be able to:
  - Plan and prepare to slump-test concrete
  - Conduct slump test
  - Clean up after conducting slump test

- You should be familiar with the following before work commences:
  - Codes of Practice relevant to your work
  - Operator manuals and instructions
  - Safety legislation and regulations relevant to your state/territory
  - Site safety plan, policies and procedures
  - Environmental legislations and regulations relevant to your state/territory
  - Australian Standards relevant to your work tasks

<https://ncc.abcb.gov.au/>

NATIONAL  
CONSTRUCTION CODE

## Workplace documents

- **Plans** provide a visual representations of the work to be undertaken. If there are hazards and discrepancies between plans and what is on site, a site manage, supervisor or project manager should be notified.
- **Manufacturer guidelines and specifications** can be available for anything on site, but most likely for materials, tools, equipment, heavy machinery, hazardous substances etc. These documents outline how a product is to be used, handled and maintained.
- **Safety Data Sheets (SDS)** are also documents provided by manufacturers or distributors of hazardous chemicals. These include information such as:
  - the chemical's identity and ingredients
  - health and physical hazards
  - safe handling and storage procedures
  - Personal protective equipment (PPE)
  - emergency procedures (first aid)
  - disposal considerations.
- **Material schedule** identifies the materials required for a project.

## Workplace documents

- **Site safety plan** includes information relating to:
  - Access
  - Emergency procedures
  - PPE
  - Site hazards and risks
  - Safe work procedures
  - Site rules
- **Safe work method statements (SWMS)** are developed to outline the high-risk construction work activities carried out within a workplace. They clarify the procedures or steps to be taken to complete a task safely. The following should be noted:
  - SWMS must be easy to understand, signed and dated by all in attendance;
  - SWMS must be amended if there is a change in the activity and a copy must be given to the principal contractor;
  - All persons affected by changes must be advised of amendments to the work method statement.
- **A Job Safety Analysis (JSA)** is a tool used to identify hazards or potential hazards at the worksite. Other terms used to describe this procedure are job hazard analysis (JHA) and Job Safety and Environment Analysis (JSEA) which includes a risk analysis relating to the environment and safety.
  - Identifies hazards and potential hazards that may be encountered while working.

## Personal Protective Equipment (PPE)

- During concrete work, the appropriate protective equipment must be used/applied.
- You may be expected to wear:
  - safety helmets, sun hats
  - safety spectacles, goggles, face shields
  - ear protection, ear plugs
  - dust masks, respirators
  - gloves, barrier creams
  - safety boots and shoes, rubber boots
  - clothing to protect from sun, cuts, abrasions and burns
- Check PPE before wearing for fit, cleanliness and hygiene.



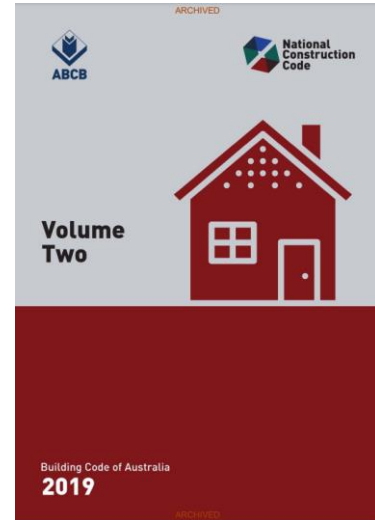
# Workplace documents

- **Work Instructions** can be provided in verbal or written form. When written, these documents are generally presented in the form of procedures that clearly and precisely describe the correct way to perform certain tasks. That is, describe, dictate or stipulate the steps that must be followed to correctly perform any specific activity or **work**.
- **Traffic management plans** and traffic control plans are designed to manage traffic both vehicular and pedestrian on and around the work site.
  - A traffic management plan may include details of:
    - the desired flow of pedestrian and vehicle movements
    - road closures and detours
    - the expected frequency of interaction of vehicles and pedestrians
    - illustrations of the layout of isolation barriers, walkways, signs and general arrangements to warn and guide traffic around, past, or through a work site or temporary hazard, such as placement of bollards, barricades and lights.
    - how short term, mobile work and complex traffic situations will be managed.
  - A traffic management plan could also set out:
    - responsibilities of people managing traffic in the workplace
    - responsibilities of people expected to interact with traffic in the workplace, and
    - instructions or procedures for controlling traffic including in an emergency.
  - Refer to the traffic management plan for safety signage and barrier requirements.
    - Signs and barriers are installed at work areas to alert others to the dangers and stop them from entering high risk areas.



- The Environmental Management Plan (EMP) is used to outline how the local environment is to be protected. An Environmental Management Plan is developed to meet the requirements of the Environmental Protection Act and covers site information for things such as:
  - Cultural and heritage protection
  - Noise and vibration control
  - Sediment, erosion and dust control
  - Chemicals and fuel controls
  - Clean up and waste management
- Environmental Protection includes protecting the environment from any concrete run off – even during wash down procedures.

- The National Construction Code (NCC) sets the benchmark, that means the minimum level to be achieved for safety, health, amenity and sustainability for most buildings in Australia. Published in three (3) volumes, the NCC sets out the legal requirements for the build. States and Territories add and vary sections to meet their legal requirement.
- Part 3.2.3.1 Concrete describes that concrete must comply with AS3600 strength, maximum aggregate and slump requirements.



- What is the slump test for?
  - Undertaken to determine the workability of the concrete, the slump test confirms that the concrete mix is consistent, meets strength requirements and is long-lasting. The slump must meet the specified tolerance set for the job on the plans and specifications.
  - The delivery docket should also match the slump tolerance specified.
- Taking the samples
  - The first sample confirms acceptance of the load, this is taken after 0.2 m<sup>3</sup> of the load has been discharged.
  - To ensure quality throughout, samples should be taken from three (3) places in the load during discharge.
- Slump test should be conducted on a clean, level non-absorbent flat surface.

## Tools and equipment

- Concrete slump test equipment is used to measure the consistency and workability of fresh concrete.
- Tools needed for a standard slump test include:
  - Standard slump cone
  - Sampling scoop
  - Bullet-nosed rod
  - Steel Ruler
  - Slump plate



Image courtesy of: <https://cementconcrete.org/how-to-guide/concrete-slump-test/2171>

## Tools and equipment

- It is essential that tools and equipment are checked for serviceability, and any faults are rectified or reported prior to commencement. This requires you to follow all workplace protocols for rectification and reporting applicable to your organisation. These protocols will require you to complete forms, place signage on equipment, and report faults to supervisors.
- Remember: before you use any equipment identify if there is a maintenance schedule, ensure that there are no discrepancies and that it is signed off.

### DEFECTIVE EQUIPMENT PROTOCOL



## Slump test method

- Clean the cone – ensure it is clean and free from moisture and old concrete from previous tests- to avoid the likelihood of false readings and place the cone on a smooth horizontal, rigid non-absorbent surface – ideally a slump plate.
- Collect your sample in layers, while standing firmly on the foot pieces, fill 1/3 of the cone. Compact by rodding (pushing the steel rod in and out of the concrete- working from the outside to the middle) 25 times. Fill the next 1/3 and rod again. Each time, rod the section just filled. Fill to the top, to overflowing and rod.
- Level off and clean concrete from plate and cone.
- Lift the cone off the sample, lifting straight up slowly and carefully to avoid causing the sample to shear or collapse. Turn the cone upside down beside the concrete and place the rod across the upside-down cone.
- Take measurements and record the average distance to the top of the sample. If tolerance has not been met, take another sample. If the sample shears a second time, the delivery/batch cannot be accepted, and records of slump test results must be made. When recording the slump test, be sure to document the job site, date, ID of tester, slump result and a reference to the applicable Australian Standard.
- Clean testing area and tools according to site requirements to ensure you meet environmental protection requirements and notify the nominated person that the testing has been completed.

See example of slump test in NZ here: <https://www.youtube.com/watch?v=W4UljISP7vI>

- When work is completed the site should be cleaned up.
  - Excess materials used should be recycled or returned to storage.
  - All tools and equipment used on the job should be cleaned in order to maintain them in good condition. Tools and equipment should be checked that they are functioning effectively before storage and routine maintenance tasks are to be completed.
  - Tools and equipment should be stored safely and correctly in accordance with the manufacturer's recommendations and standard work practices, so as not to damage them.
  - Report faults in logbook and in site records
  - All personal rubbish should be placed in a bag and disposed of in the site rubbish bin.

[WARNING]

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