

System Engineering Workshop

Write/attach your group discussion results here according to your group number.

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Group 1

requirement from regulation for wheelchair ramp

R1 The Australian standards require the maximum gradient of a ramp, intended to be used by wheelchair users, with a length greater than 1900mm, to be **no greater than 1:14**.

Requirment list

For Ramp,
3.9.1.3 Ramp construction requirements
3.9.1.4 slip resistance requirements
3.9.1.6 for doorway of backdoor

Activity 5

option B is better

According to NCC p2.5.1, we need a safe stairway gradient to satisfy safety performance requirements. We could use the slope relationship from p3.9.1 to validate wether it satisfy the requirement.

Group 2

Activity 3

R1: The stair to the first floor must have a suitable landing in accordance with 2.5.1 of NCC standards.
R2: The stair must be slip-resistant for walking.
R3: The stair must have handrails to assist customers.
R4: The wheelchair ramp should take loading forces in accordance with AS/NZS 1170.1.
R5: The wheelchair ramp should have a gradient not steeper than 1:8.
R6: The wheelchair ramp should be provided with landings complying with 3.9.1.3 at the top and bottom of the ramp and at intervals not greater than 15 m.

Activity 5

option B satisfies the requirement.

both satisfy the requirement for Risers -- 115-190cm and satisfy the requirement for Going -- 240-355cm
A's slope relationship is 540, which is below the minimum requirement
B's slope, however is 620, thus B satisfy the requirement.

Group 3

Activity 3

R1. The stair must have 16 risers with the height of 150mm.
R2. The length of the going shall be 300mm.

R3. The back door shall have a ramp.

R4. The ramp shall be capable to take a load according to the AS/NZS1170.1.

R5. The ramp shall have a gradient of 1:10.

Activity 5

(a)
Option A and B both satisfy the going and riser requirements. Option A is better because the riser is similar while the option B has different riser.

(b)
The gradient for option B is better.

Group 4

Activity 3

- Requirement 1
- a. The stairs must have suitable handrails or ramps to provide assistance and stability to people walking to the first floor.
 - b. The stairs must not contain more than 18 and not less than 2 risers in each flight.
 - c. The risers must not have any openings that would allow a 125mm sphere to pass through between the treads.

- Requirement 2
- a. The stairs shall have suitable landings at an angle of 20 to 45 but between 30 and 38 degrees and slip-resistant walking surfaces on-ramps for those with wheelchairs or disabilities.
 - b. The stairs shall be designed to take loading forces in accordance with AS/NZs1170.1
 - c. The ramp shall have a maximum gradient of 1:14 and 1:10 for a steeper gradient.

Activity 5 (2)

By verifying the gradient which needs to have a safe walking surface.

Activity 5 (1)

Option B is better. It satisfies the Riser requirement of 115 to 190 and the going requirement from 240 to 355. The conditions also satisfy the 125mm sphere which does not pass through treads.

Group 5

R1.1.3

The stairs to the first floor shall have a sloop relationship (2Riser+Going) between 550 and 700mm according to NCC 3.9.1.1.

R1.1.2

The stairs to the first floor shall have a going dimension between 240 and 355mm according to NCC 3.9.1.1.

R1.1.1

The stairs to the first floor shall have riser dimension between 115 and 190mm according to NCC 3.9.1.2.

R1.2.1

The ramp must be slip-resistance in compliance with NCC P2.5.1 (iv).

R1.1:

The stairs must connect to the first floor with even surfaces and comply with NCC 3.9.1.2-3.9.1.5 and AS/NZS 1170.1.

Activity 3

- R1.2.1 The ramp must be designed to take loading forces in accordance with AS/NZS 1170.1.
- R1.2.2 The ramp must have a gradient not steeper than 1:8.
- R1.2.3 The ramp must be provided with landings complying with 3.9.1.5 at the top and bottom of the ramp and at intervals not greater than 15 m.

Activity 5

NCC 2.5.1 Safe Gradient
(a)
walking surfaces must have safe gradients; and

Activity 5

- B-NCC 3.9.1.3 Ramps
- (b)
have a gradient not steeper than 1:8; and
 - (c)
be provided with landings complying with 3.9.1.5 at the top and bottom of the ramp and at intervals not greater than 15 m.

Group 6

Activity 3

The builder building the stairs to the first floor for the customer should be legal during the inspection, as per the NCC standards.

The stairs to the first floor must be built as per standards that satisfy the NCC requirements.

The builder building the stairs to the first floor for the customer must follow the fire safety standards according to the NCC.

the stairs shall provide access to wheelchairs as per part D3 of the ncc code of conducts.

Activity 5

Both staircases satisfies in the first requirement as all calculations and design meets all standards

2nd one we don't find the answer.
