Current Standards for Footways and Carriageways With Gradients Steeper than 1 in 20 (Ramps)

Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure Department for Transport. Dec 2021.

Whilst described as a best practice guide this sets out requirements to ensure that any infrastructure works comply with the requirements of the Equality Act 2010.

4.3 An environment that appears to be relatively flat might nevertheless present problems for some. For example, a continuous shallow slope that runs for a considerable distance might be an obstacle for users of a manual wheelchair, or people who can negotiate gradients over a short distance only, before experiencing pain, breathlessness or fatigue. If a level route is not feasible, then gradients should not exceed 1 in 20.
Even if a pedestrian route has no slopes in excess of 1 in 20, it is important that there are level sections, or 'landings', at regular intervals. This is to provide people with an opportunity to rest; where possible accessible seating should be provided on such landings. A level landing should be provided for every 500mm that the route rises. The length of each landing should be equal to at least the width of the ramp. Gradients steeper than 1 in 20 can be managed by some wheelchair users, but only over very short distances (1000mm or less), for example on a ramp between a bus entrance and the pavement. Even over these short distances the maximum gradient used should be no more than 1 in 10. As a general rule, however, 1 in 12 should be the absolute maximum. Not only is the physical effort of getting up a steeper gradient beyond many wheelchair users, but there is also a risk of the wheelchair toppling over.
5.2 repeats many of the requirements of 4.3
5.2 A ramp should have the lowest practicable gradient. 1 in 20 is the preferred gradient and 1 in 12 is the absolute maximum acceptable.
BS 8300-2 explains that the preferred gradient should only be used up to a maximum length of 3000mm, and that the maximum gradient of 1 in 12 should only be used to a maximum length of 2000mm. It also provides detailed guidance on the relationship between the going, gradient and rise of ramps.
A slightly steeper gradient of 1 in 10 is acceptable over very short distances, for example a ramp covering a distance of 600mm. Gradients steeper than 1 in 10 are physically difficult to manage for some wheelchair users, and may cause a wheelchair to over-balance.
If more than one flight is needed, there must be rest places between the flights. These should be level if under cover (1 in 50 gradient if outside, to drain surface water) and their length should be at least 1500mm and at least equal to the full width of the ramp. The landings at the foot and head of a ramp should be at least 1200mm long, and should be the full width of the ramp. Each individual flight of a ramp should have a length of no more than 10 metres and a rise of no more than 500mm.

Traffic Advisory Leaflet 6 / 02 : Inclusive Mobility: A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure. 2002

Issued after publication of the pre-cursor to the 2021 Inclusive Mobility guidelines, (same title Jan 2002), this DfT guidance advises that the Inclusive Mobility Guidance should be followed to ensure compliance with the then corresponding leglislation, the Disability Descrimination Act 1995.

British Standard 8300 - 1 Design of an Accessible and Inclusive Built Environment

Part 1: External environment — Code of Practice

9.2 Ramps
If a change in level along pedestrian routes is unavoidable, it is necessary to provide gently sloping or ramped options. However, as some people with an ambulant mobility impairment have difficulty using ramps, it is undesirable for a ramp to be the only route.
The key issues in the design of gently sloping or ramped access routes are the gradients of flights and the distances between landings. Where the gradient is too steep or an individual flight too long, a wheelchair user might not have sufficient strength to use the slope. In the same situation, a companion who is pushing a wheelchair user is also likely to encounter the same difficulties. If the gradient is too steep, there is also the danger of a wheelchair user falling out forwards when going downhill, or of a wheelchair tipping over backwards when going uphill. Control and braking are also difficult on steep gradients.
9.2.2 No individual flight of a ramp should have a going greater than 10 m or a rise of more than 500 mm.
Maximum Length of Ramp and Change in Levels
1 in 20 Max height change 500mm. Length between landings 10m
1 in 17.5 Max height change 430mm. Length between landings 7.5m
1 in 15 Max height change 335mm. Length between landings 5m
1 in 13.5 Max height change 260mm. Length between landings 3.5m
1 in 12 Max height change 150mm. Length between landings 2m
9.2.4 Landings
Landings should be provided at the foot and head of a ramp. They should be at least the width of the ramp and not less than 1500 mm long, clear of any door swing or other obstruction. Any intermediate landings along a series of flights in a straight line should be at least 1500 mm long, clear of any door swing or other obstruction. If an intermediate landing is a quarter-turn or half-turn landing, the width of the ramp should be maintained throughout the turn or turns. Intermediate landings at least 1800 mm wide × 1800 mm long should be provided as passing places where there is no clear line of sight between one end of the ramp and the other, or where there are three or more flights

British Standard 5906 Waste Management in Buildings - Code of Practice. 2005

Paths between the container chambers and collecting vehicles should be free from kerbs or steps or inclines with a gradient of more than 1:12, and be non-slip.

Building Regulations Approved Document B: Fire Safety Vol 1 Dwellings (Versions up to 2006 Edition)

Hardstandings for high reach appliances should be as level as possible and should not exceed a gradient of 1 in 12 (note to Diagram 49)

Building Regulations Approved Document M: Access to and Use of Buildings

Volume 1 (Dwellings) 2015 Edition, 2016 Amendments

1.2 ... the provisions apply to the approach route between the nearest point at which a visitor, including a disabled person, would expect to get in and out of a car. This point of access may be within, or outside the plot of the dwelling.
The gradient of pedestrian routes should ideally be no more than 5% (1 in 20), although topography or other circumstances may make this difficult to achieve. However, as a general rule, 8% (1 in 12) should generally be considered as a maximum, which is the limit for most wheelchair users, as advised in "Inclusive Mobility" (DfT)
External Ramps Forming Part of an Approach Route
1.7 A Ramped Approach should comply with all of the following:
a, For gradients up to 1 in 15, no more than 10m long. For gradients up to 1 in 12, no more than 5m long.
b, Every flight has a minimum width of 900mm.
c, Every flight has a top and bottom landing.
d, An intermediate landing is provided between individual flights and at each change of direction,
e, Every landing is a minimum of 1200mm long.

Building Regulations Approved Document H: Drainage and Waste Disposal

2015 Edition - H6 Domestic Developments

1.10 For waste containers up to 250 litres, steps should be avoided between the container store and collection point wherever possible and should not exceed 3 in number. Slopes should not exceed 1 in 12. Exceptionally this may be exceeded provided that the lengths are not excessive and it is not part of a series of slopes.

Manual for Streets 2007

6.4 Cycling Guidance
6.4.11 The maximum gradients should generally be no more than 3%, or 5% (1 in 20) maximum over a distance of 100 m or less, and 7% (1 in 12) maximum over a distance of 30 m or less.

Manual for Streets 2 2010

The gradient of pedestrian routes should ideally be no more than 5%,(1 in 20) although topography or other circumstances may make this difficult to achieve. However, as a general rule, 8% (1 in 12) should generally be considered as a maximum, which is the limit for most wheelchair users, as advised in "Inclusive Mobility" (DfT)

Local Transport Note 1 / 20 Cycling Infrastructure 2020

Longitudinal Gradient
5.9.7 Unlike motor traffic, human physiology means that people can cycle steep gradients that are fairly short but are not capable of maintaining high levels of effort for longer distances. Cycle routes should therefore, where possible, be designed in such a way that the steepness and maximum length of longitudinal gradients meets the requirements of Table 5-8
Table 5-8: Maximum length for gradients

Gradient %	Maximum length (m)
2.0 (1 in 50)	150
2.5 (1 in 40)	100
3.0 (1 in 33)	80
4.0 (1 in 20)	50
5.0 (1 in 20)	30

5.9.9 As well as the length of the gradient, the speed of travel is another important factor to consider. Steep gradients can lead to high speeds for descending cyclists or low speeds for climbing cyclists, which can create hazards for all users of the route. Stopping distances also increase on down gradients in excess of 3%.
5.9.10 Where height differences at new build sites suggest longer lengths of gradients than those given in Table 5-8 earthworks designs should be adjusted or the horizontal alignment adjusted to limit the length or severity of the gradient. Level sections of 5.0m minimum length can be used between gradients to achieve compliance with Table 5-8.

Guidelines for Providing for Journeys on Foot. Institution of Highways and Transport 2000

5.13 On any pedestrian route, longitudinal gradients should not exceed 1 in 20 (5%) generally. In exceptional circumstances ramps can be as steep as 1 in 12 (8%), but this gradient will cause an evident nuisance to people with a mobility impairment. Handrails should be provided on both sides if an even steeper ramp cannot be avoided.

Revised Guidelines Reducing Mobility Handicap. Institution of Highways and Transport 1991

2.4 Any external slope with a gradient of more than 5% should be regarded as a ramp. Every effort should be made to keep longitudinal slopes as shallow as possible, and whenever practical to achieve a slope of 5% or less. Where this cannot be achieved, the maximum gradient should never exceed 8% (1 in 12), and even this gradient causes difficulties for many disabled people including those in powered wheelchairs. Ramps should be provided with handrails along both sides and should be not more than 6m long between level resting platforms.

Health and Safety Executive: Roadways / Site Traffic Control / Immobilisation of Vehicles

August 2025

The maximum longitudinal gradient should be 1 in 12 and the minimum channel gradient should be 1 in 125.

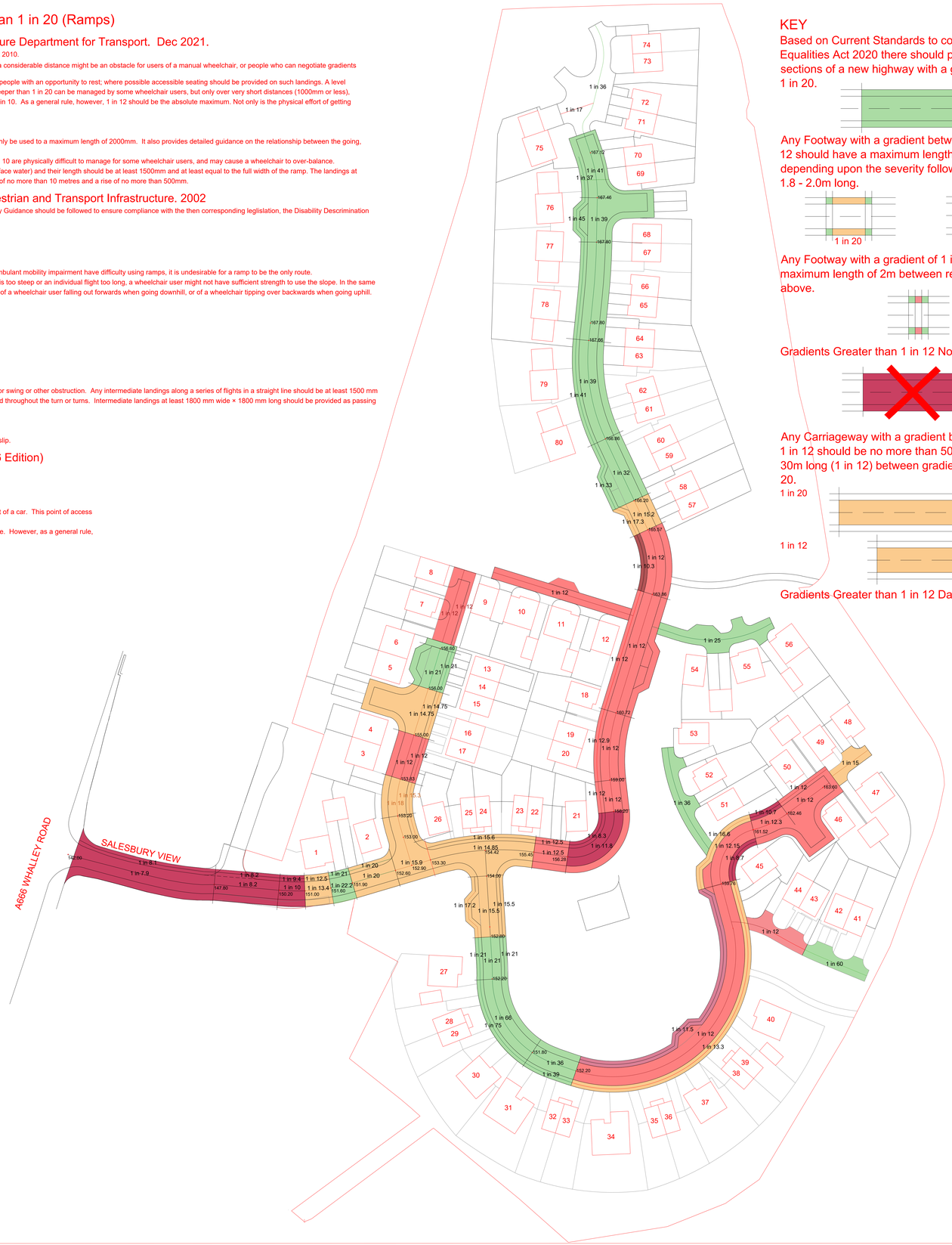
Creating Civilised Streets Lancashire County Council 2010

5.6 Designing for Walking

5.6.4 Reasonable gradients for comfort should follow guidance set out within "Inclusive Mobility" (DfT). Although the local topography may determine steeper gradients, ideally gradients should be no greater than 2.5% (1 in 40). Gradients in excess of this result in most wheelchair users experiencing mobility difficulties.

5.7 Designing for Cycling

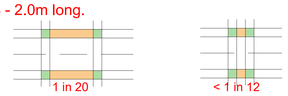
5.7.4 Gradients should be a maximum of 3% (1 in 33), although where topography dictates, the limiting gradient is 7% (1 in 12) over 30m.



KEY

Based on Current Standards to comply with the Equalities Act 2020 there should preferably be no sections of a new highway with a gradient greater than 1 in 20.

Any Footway with a gradient between 1 in 20 and 1 in 12 should have a maximum length of 10.0 - 2.0m depending upon the severity followed by rest areas 1.8 - 2.0m long.

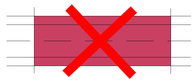


to scale

Any Footway with a gradient of 1 in 12 should have a maximum length of 2m between resting areas, size as above.

to scale

Gradients Greater than 1 in 12 Not Compliant



Any Carriageway with a gradient between 1 in 20 and 1 in 12 should be no more than 50m long (1 in 20) to 30m long (1 in 12) between gradients less than 1 in 20.

1 in 20

to scale

1 in 12

to scale

Gradients Greater than 1 in 12 Dangerous for Cyclists

General Notes

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