

PD CEN/TS 16635:2014



BSI Standards Publication

Railway application — Design for PRM Use — Equipment and Components onboard Rolling Stock — Toilets

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National foreword

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**Railway application - Design for PRM Use - Equipment and
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Applications ferroviaires - Conception à l'usage des
personnes à mobilité réduite - Équipements et éléments à
bord du matériel roulant - Toilettes

Bahnanwendungen - Auslegung für eingeschränkt mobile
Personen - Einrichtungen und Komponenten in
Schienenfahrzeugen - Toiletten

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Foreword

This document (CEN/TS 16635:2014) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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Introduction

This document is a Technical Specification for the assessment of the internal space requirements of a universal (wheelchair accessible) toilet.

This document aims to define the assessment and measuring methodology to allow a clear pass/fail assessment and allow successful implementation of the Technical Specification for Interoperability (TSI) for Persons with Reduced Mobility (PRM) [1]. Clause 5 reflects the requirements in the TSI and Clause 6 adds assessment criteria based on those requirements.

This document will be used until the issuing of EN 16585-1, *Railway applications — Design for PRM use — Equipment and components onboard rolling stock — Part 1: Toilets* [2].

1 Scope

This Technical Specification describes the specific 'Design for PRM use' requirements applying to rolling stock on the Trans-European Network (TEN) covered by the TSI for PRM and the assessment of those requirements. Regarding this document, the following statements apply.

- The definitions and requirements describe specific aspects of 'Design for PRM use' required by persons with reduced mobility as defined in the TSI PRM.
- The definitions and requirements of this specification will be used for rolling stock applications.
- This specification only refers to aspects of accessibility for PRM passengers; it does not define general requirements and general definitions for specific components and systems.
- This specification assumes that the vehicle is in the nominal operating condition; any damage or operating failures will not be taken into account when assessing these requirements.
- Where minimum or maximum dimensions are quoted, these are absolute NOT nominal requirements.

Measurement methods and/or assessment procedures needed to establish a clear pass/fail assessment are provided where necessary.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12183: 2014, *Manual wheelchairs - Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

universal toilet

toilet designed to be used by **all** passengers including passengers in wheelchairs

4 Symbols and abbreviations

Table 1 — Abbreviations

Abbreviation	Designation
PRM	Persons with Reduced Mobility
TEN	Trans-European Network
TSI	Technical Specification of Interoperability

Table 2 — Symbols

Symbol	Designation
%ile	Percentile
3D	3 Dimension

5 Requirements – Universal toilet dimensions

There shall be sufficient space inside the toilet compartment to enable a wheelchair as defined in Annex A to be manoeuvred to a position adjacent to the toilet seat, following both approaches shown in Figure 1.



Figure 1 — Wheelchair positions adjacent to toilet seat

In front of the toilet seat there shall be a clear space with a minimum length of 700 mm as shown in Figure 2.

Dimensions in millimetres

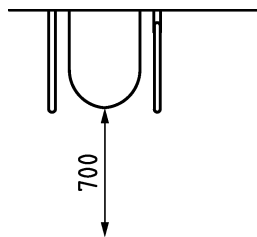


Figure 2 — Clear space in front of toilet seat

All amenities (wash basin, soap dispenser, mirror, water dispenser and hand dryer) shall be readily accessible to a person in a wheelchair.

6 Assessment – Universal toilet internal space

There shall be sufficient space to permit a wheelchair as defined in Annex A to be manoeuvred to a position adjacent to one side of the toilet seat to allow a side transfer as shown in Figure 3 at a position between 0° (parallel to the centreline of the toilet pan) and 40°.

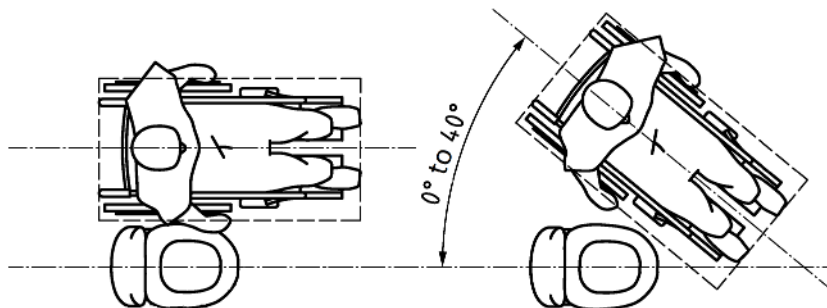


Figure 3 — Example for a lateral or side approach for right hand transfer to toilet seat

Assessment for a side approach:

- Method A: Side transfer wheelchair position is between 0° (parallel to pan centreline) and 40° with a turning circle of 1 500 mm that overlaps a rectangle of 1 250 mm \times 700 mm wheelchair space envelope, see Figure 4. Across the full 700 mm side that would be the front of the wheelchair, see Figure 2. The wash basin may overlap the manoeuvring space by up to 300 mm if complying with knee and toe space requirements as in Figure B.1.

NOTE 1 Allowance for hands either side needs to be considered when assessing manoeuvring.

NOTE 2 See Figure C.3 for examples of current toilet designs with this assessment method overlaid.

- Method B: Movement through door to a position touching the toilet pan at an angle of maximum $\pm 40^\circ$ to its centre line demonstrated through no more than five manoeuvres (after entering the toilet compartment) using the characteristics of the simplified profile of a person in a wheelchair as defined in Figure 5. The wash basin may overlap the manoeuvring space by up to 300 mm if it is complying with knee and toe space requirements in Figure B.1.

NOTE 3 Allowance for hands either side needs to be considered when assessing manoeuvring.

A curvature of up to 50 mm in radius between floor and wall is accepted, see Figure 8. Therefore when assessing compliance of the above, the measurements are permitted to be taken 50 mm above the walking floor.

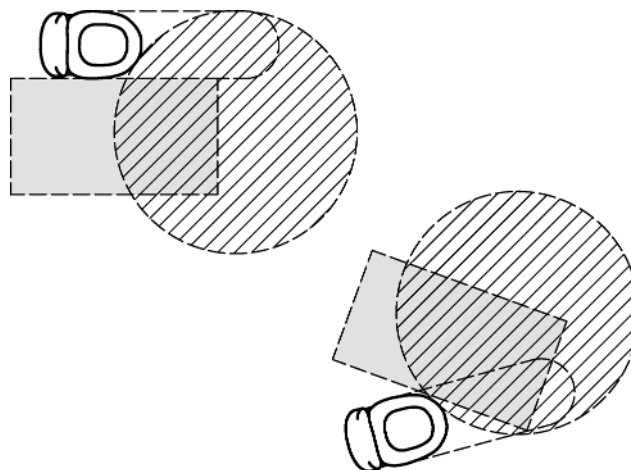
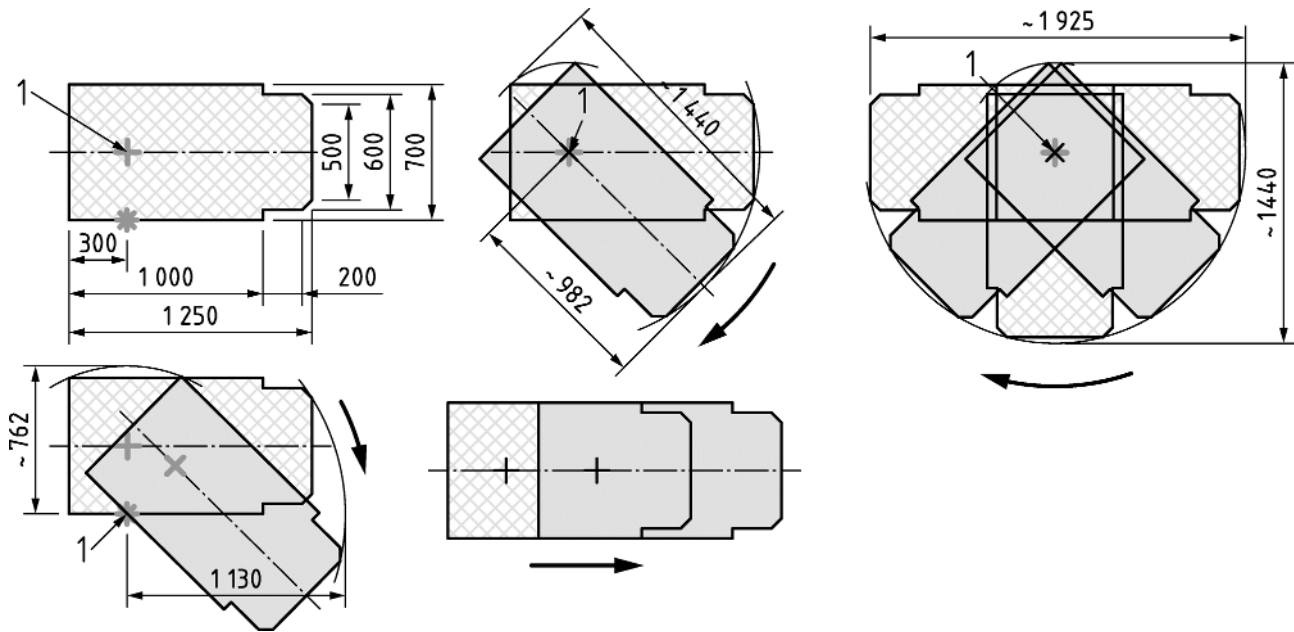


Figure 4 — Examples for method 'A' assessment of side approach

Dimensions in millimetres



Key

- 1 simplified pivot points on rear wheel axis (rear wheel propelled wheelchairs)

Figure 5 — Simplified profile of an occupied wheelchair for use in assessment method B

There shall also be sufficient space inside the toilet compartment to enable a wheelchair as defined in Annex A to be manoeuvred to a diagonal transfer position adjacent to the toilet seat, between 0° (parallel to pan centreline) and 125°, as shown in Figure 6, diagonal approach:

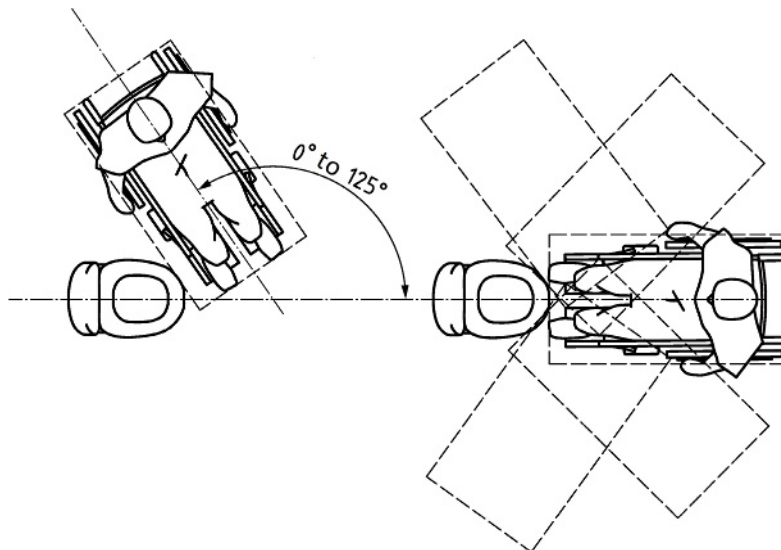


Figure 6 — Options for frontal or diagonal approach for transfer to toilet seat

Assessment for a diagonal approach:

- Method A: The diagonal transfer wheelchair position is between 0° (parallel to pan centreline) and 125°, see Figure 6. There shall be a turning circle of 1 500 mm that overlaps a rectangle of 1 250 mm × 700 mm

which represents the wheelchair space envelope, across the full width of the 700 mm side of the envelope, see Figure 7. The wash basin may overlap the manoeuvring space by up to 300 mm if it is compliant with the knee and toe space requirements as specified in Figure B.1.

NOTE 4 Allowance for hands either side needs to be considered when assessing manoeuvring.

- Method B: Movement through door to a position touching the toilet pan at an angle of maximum $\pm 125^\circ$ to its centre line be demonstrated using the characteristics of the simplified profile of a person in a wheelchair, as defined in Figure 5, through five manoeuvres or fewer after entering the toilet compartment. The wash basin may overlap the manoeuvring space by up to 300 mm if complying with knee and toe space requirements in Figure B.1.

NOTE 5 Allowance needs to be made for hands on both sides when assessing manoeuvres.

A curvature of up to 50 mm in radius between floor and wall is permitted, see Figure 8. Therefore when assessing compliance with the above, the measurements are to be taken 50 mm above the floor.

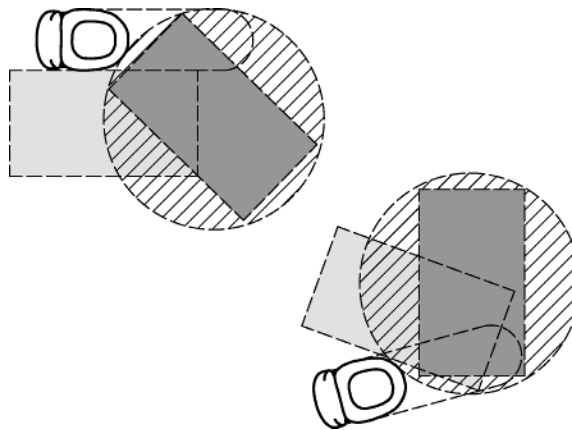


Figure 7 — Examples for method 'A' assessment of diagonal approach

Dimensions in millimetres

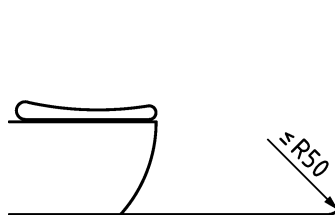


Figure 8 — Acceptable curved surface radius between walls and floor

In front of the toilet seat there shall be a minimum clear space of 700 mm as shown in Figure 9.

- The clear space shall be assessed horizontally from the leading edge of the toilet seat, along the centre axis of the toilet for the full width of the toilet seat from a height of 50 mm above floor to a point 1 450 mm above the floor. The assessment shall be through a drawing or 3D model at the design stage and type test.

Dimensions in millimetres

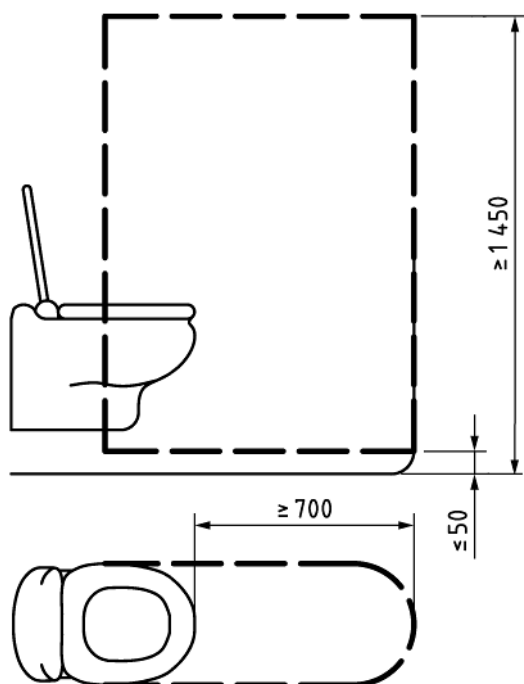


Figure 9 — Space in front of toilet seat

NOTE 6 700 mm as a minimum follows the front curvature of the toilet seat in its full width. An overlap of 50 mm with wash basin and/or handrail (vertical and/or horizontal) is allowed.

Annex A (normative)

Transportable wheelchair

A.1 Engineering limits

This annex identifies the maximum engineering limits for a transportable wheelchair, see also EN 12183:2014.

A.2 Characteristics

The minimum technical requirements are as follows.

Basic dimensions:

- width: 700 mm + 50 mm minimum each side for hands when moving;
- length: (1 200 + 50) mm for feet;
- height: 1 375 mm maximum including a 95th %ile male occupant.

Dimensions in millimetres

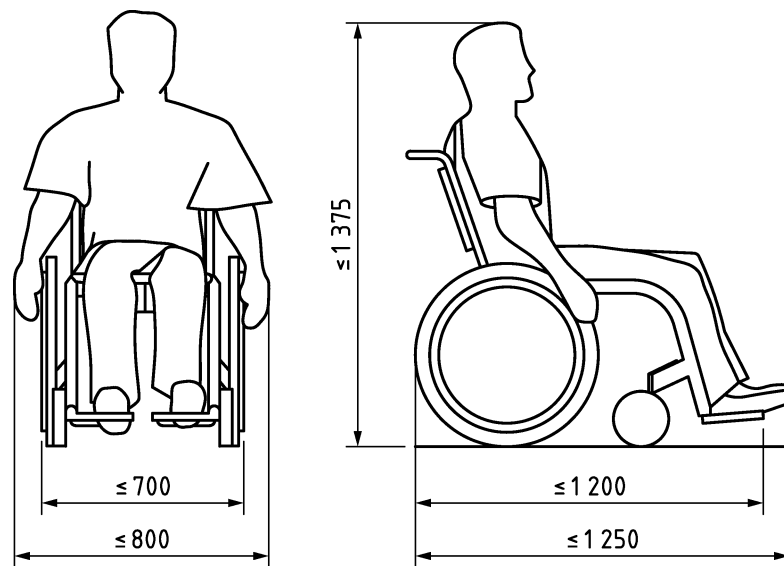


Figure A.1 — Basic dimensions

The turning circle of the wheelchair shall be included in a circle with a diameter of 1 500 mm.

Dimensions in millimetres

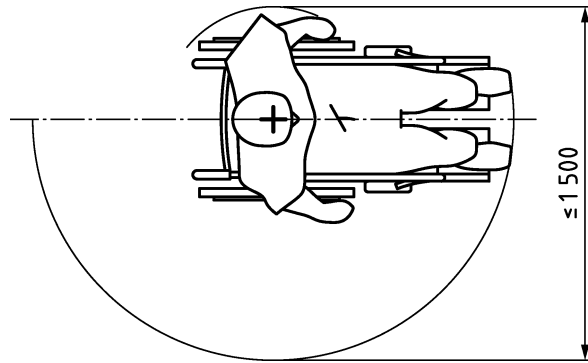


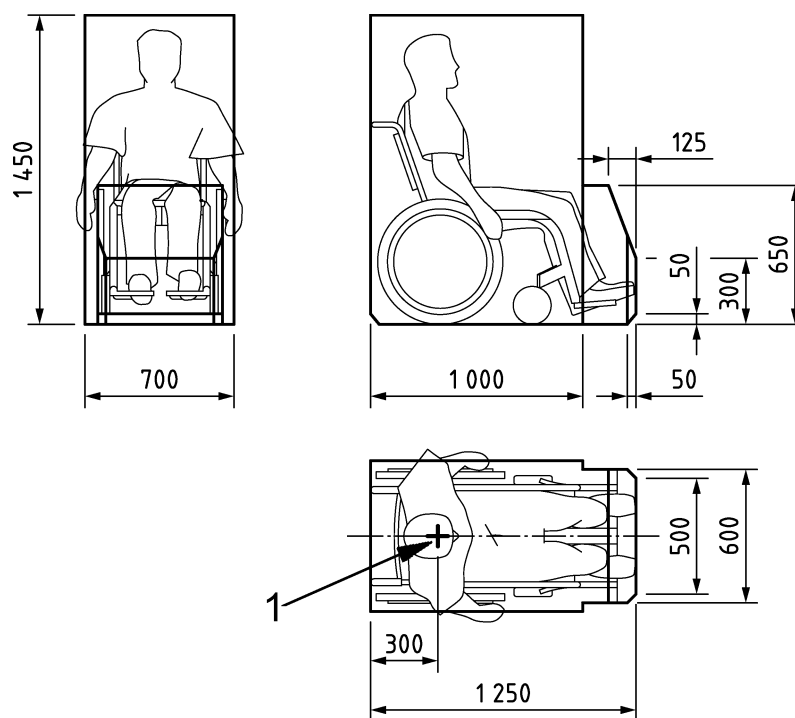
Figure A.2 — Turning circle (turning between walls)

Annex B (normative)

Simplified wheelchair profile

This annex presents simplified profiles that are usable for assessment of space requirements for a person in a transportable wheelchair.

Dimensions in millimetres



Key

- 1 simplified central pivot point on rear wheel axis (rear wheel propelled wheelchairs)

Figure B.1 — Simplified profile of a person in a transportable wheelchair

Annex C (informative)

Wheelchair accessible toilet transfer guidance and examples

Examples of wheelchair accessible toilet guidance and good practice:

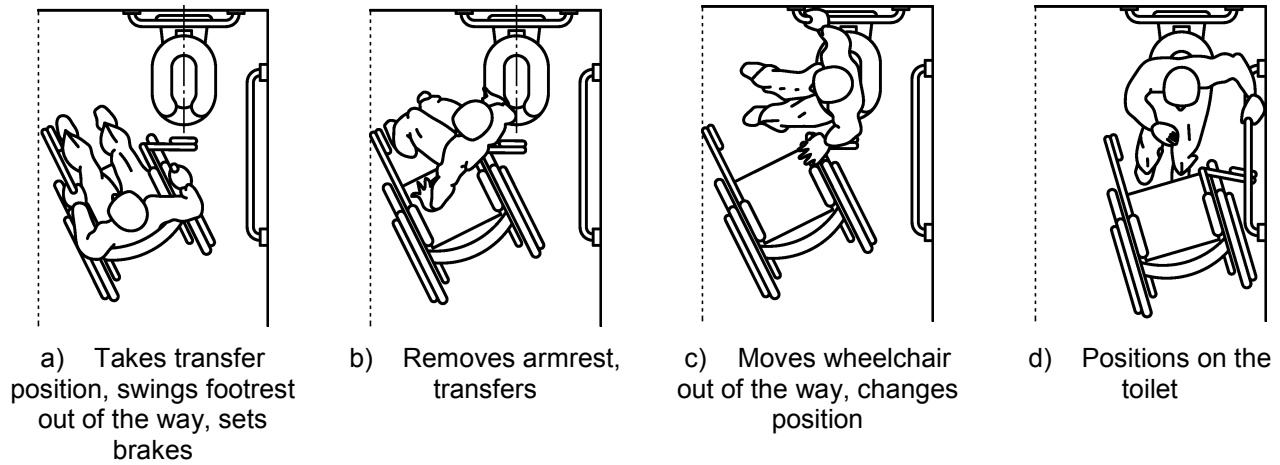


Figure C.1 — Typical diagonal approach transfer

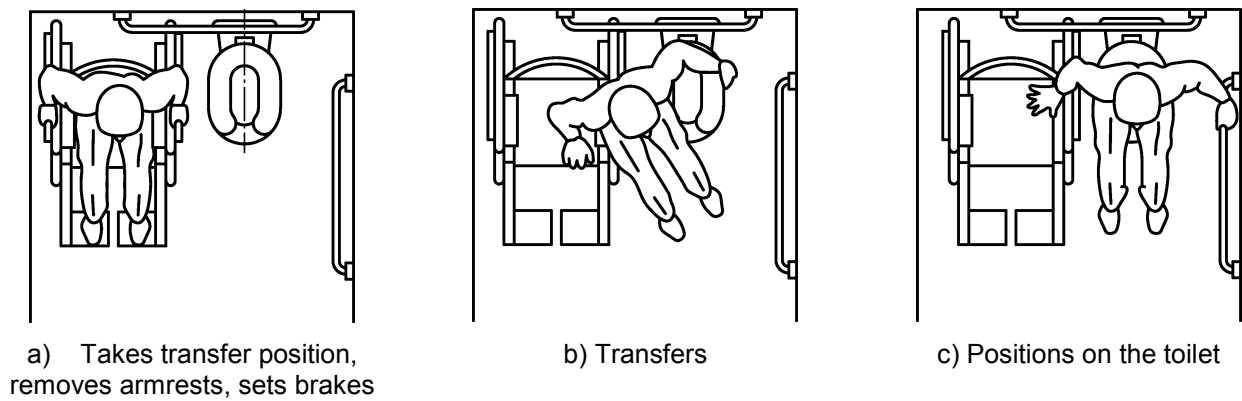
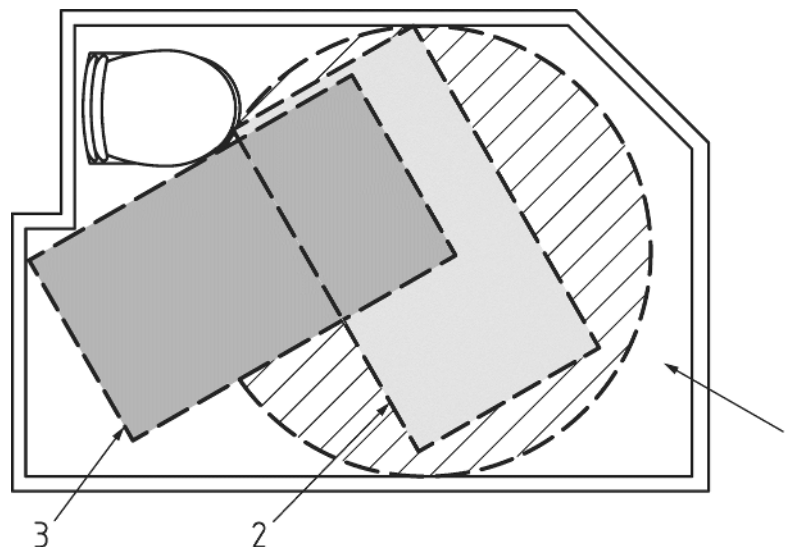


Figure C.2 — Typical side approach transfer



Key

- 1 1 500 mm turning circle
- 2 diagonal transfer position
- 3 side approach position

Figure C.3 — Example of combined transfer position assessment according to method A

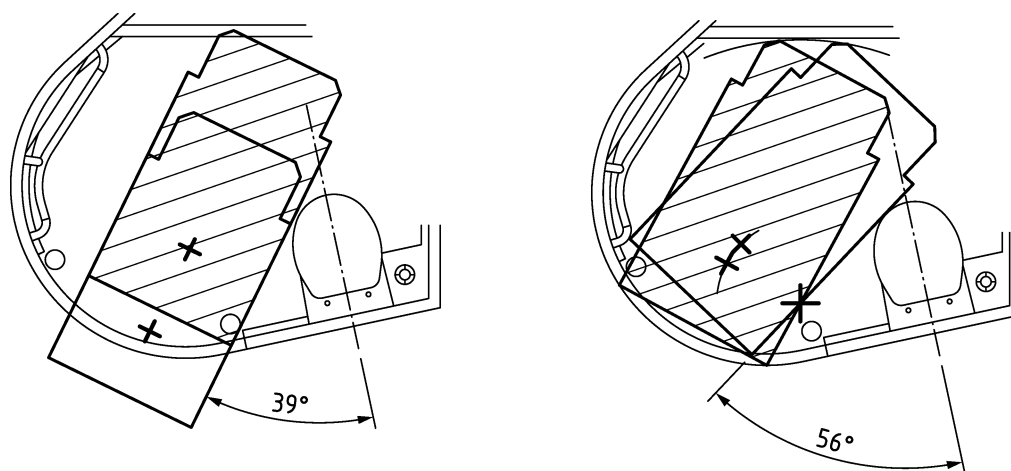
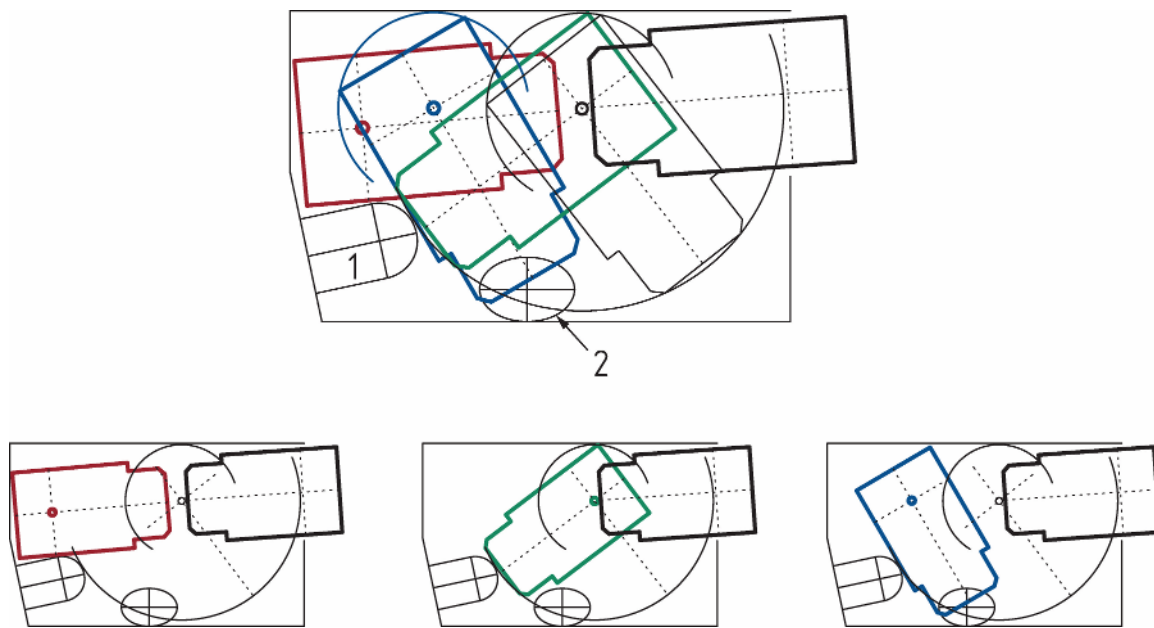


Figure C.4 — Example of transfer position assessment according to method B in the restrictive toilet footprint that mandates method B assessment

Dimensions in millimetres



Key

- 1 toilet seat
- 2 wash basin

Figure C.5 — Example of transfer position assessment type B, turning inside toilet cubicle

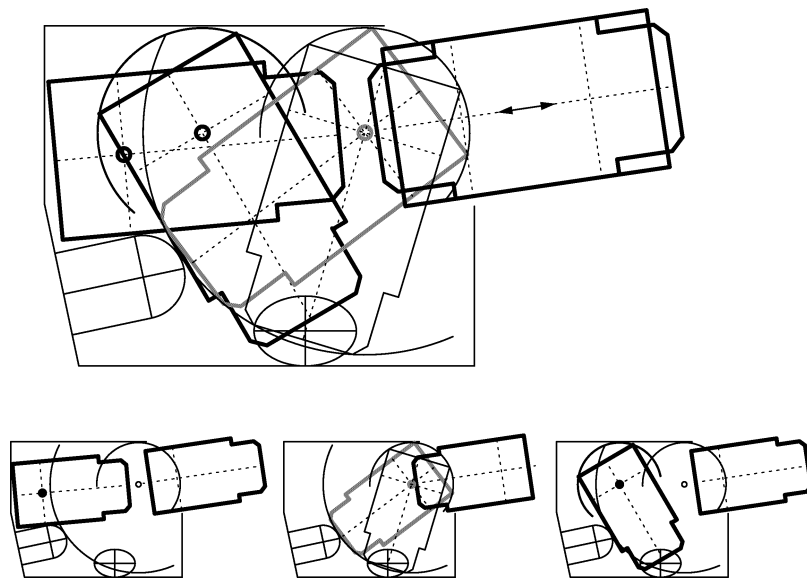


Figure C.6 — Example of transfer position assessment type B, turning outside of toilet cubicle

Bibliography

- [1] 2008/164/EC, COMMISSION DECISION of 21 December 2007 concerning the technical specification of interoperability relating to 'persons with reduced mobility' in the trans-European conventional and high-speed rail system, Official Journal of the European Communities No L 64 of 7.3.2008
- [2] prEN 16585-1, *Railway Applications - Design for PRM Use Equipment and Components onboard Rolling Stock - Part 1: Toilets*

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