Design Manual
NR/GN/CIV/300/04

Inclusive Design


Buses and Taxis
Guy's Hospital
Way out
Way out
Lift
OAG
LEON

Document Verification

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Introduction

This document is intended to promote a common approach to inclusive design, key standards and procedures that Network Rail expect project teams to apply in designing and delivering the railway built environment.

As the public body responsible for managing and maintaining Britain's national rail infrastructure Network Rail is determined to take a proactive approach in improving standards of inclusive design within the industry.

Our vision is to deliver high quality infrastructure that is inclusive, accessible, convenient and welcoming for everyone, including our workforce. To be at the cutting-edge of inclusive design we need to tap into creative thinking, and find innovative solutions that place people at the heart of the design process.

Inclusive design should be the ultimate goal of every designer, engineer, architect, accountant, sponsor, project, programme, and facility manager. Inclusive design can deliver beautiful buildings that are inspiring and enjoyable to use, but which also deliver our ambition of making transport truly accessible to all.

How to use this document

Purpose
The purpose of this document is to provide guidance in the scoping, design and delivery of inclusive and accessible environments in stations and other occupied buildings across the Network Rail estate.

Scope
The guidance is aimed at project sponsors, developers, designers, project managers, station managers, and anyone involved in the briefing, design, delivery, renewal and maintenance of publicly accessible buildings on the network.

Hint and tips:
To quickly navigate this document click on any of the sections or titles on this page.

To return to the contents page you can click on the Double Arrow symbol.

Section 1
Introduction:

A brief description of inclusive design, why it is important and the social / economic benefits. We also outline our key objectives, accountabilities and approach to design management procedures.

Section 2
Station Environment:

A description of inclusive design issues in the built environment, design consideration and principles that are important.

Section 3
Common Design Elements:

A description of inclusive design issues for common design elements, design consideration and principles that are important.

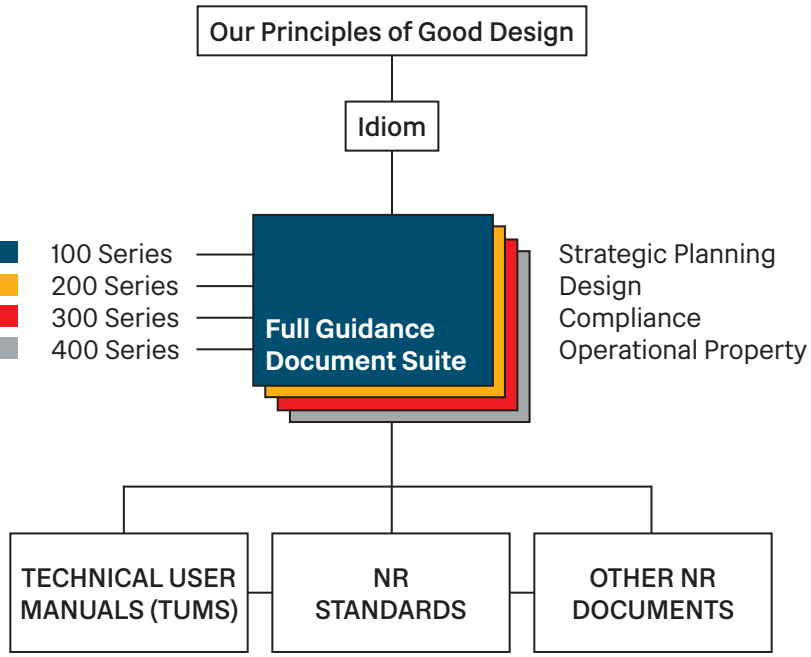
Appendices A–C:

- → Reference Documents
- → Definitions
- → DIA Flowcharts
- → Image Credits
- → Network Rail Contacts

How to use the guidance

The Network Rail Document Suite

You are here



References to other documents

- Code of Practice Guidance
- National Standard
- Network Rail document
- European Standard

Example:

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

NR Guidance Suite Reference

Station Design Guidance
NR/GN/CIV/100/02

This guidance has a Network Rail standards Green status, and the contents do not require derogation

A full list of relevant documents, and other guidance suite documents is contained in the appendix.

Contents

Contents

Image 0.1
Manchester Piccadilly station
An accessible platform

1

Inclusive Design

1.1 What is Inclusive Design?

1.1.1 Spaces and Places For Everyone

The British Standards Institute defines Inclusive design as:

"The design of mainstream structures or services that are accessible to and usable by, as many people as reasonably possible, in a wide variety of situations and to the greatest extent possible without the requirement for special adaptation or specialised design"

Inclusive design is a process that aims to deliver spaces and places for everyone. When achieved it means that everyone benefits from the full range of services and opportunities that Network Rail (NR) can offer.

Inclusive design should consider from the very beginning how buildings and environments can be made easily usable and enjoyable for as many individuals as possible. Designing and managing the built environment in an inclusive way is essential if we are to provide independent access without additional undue effort or special separation so that we maximise independence.

Inclusive design should inherently:

- → Be welcoming to everyone
- → Be responsive to people's needs
- → Be Intuitive and safe to use
- → Be flexible and adaptable
- → Offer choice when a single design solution cannot meet all user requirements
- → Be convenient and dignified to use without undue effort, so as to maximise independence

Inclusive design and accessibility are related terms which overlap, but they are different. Accessibility is enforced through legislation and the requirement to meet minimum standards. This approach is unlikely to deliver a Railway fit for the future.

Inclusive design covers a broader remit, removing barriers that create undue effort, separation or special treatment, enabling everyone to participate equally, confidently and independently in mainstream activities.

Meeting the access requirements of our passengers and other stakeholders is an integral part of what we do. We want to be on the leading edge of inclusive design and in order to achieve this we may require a degree of creativity and lateral thinking to find solutions that everyone can use easily and safely with dignity.

As a national carrier its our duty to identify barriers to access and find new innovative solutions. Where practical we aim to exceed minimum standards, we cannot cover every eventuality but we should deliver what is reasonable to expect. This guidance is intended to assist designers, maintainers and operators by explaining why certain design features should be considered and to provide an overview of current best practice design guidance and standards. It should be read in conjunction with headline documents; *Our Principles of Good Design* and *Everyone Matters — Network Rail's diversity and inclusion strategy* (section 4.1 Access and Inclusion Matters) — the Network Rail Inclusive Design Strategy which gives a broader overview of the process and principles of inclusive design

1.2 Why is Inclusive Design Important?

1.2.1 Delivering A Better Railway
One of our commitments in a '*Better Railway for a Better Britain*' is delivering a railway that is fit for the future.

The rail network does much more than transport passengers. It fosters social inclusion by connecting people to homes, jobs, schools, colleges, hospitals, shops, leisure facilities, families and friends.
An inclusive rail network may assure that everyone can make those connections and play an active role in their community and contribute to their local economy.

The UK's demographic is changing, we are fast becoming an ageing society. By 2041 one in four of the population are set to be over 65. With age comes increasing issues relating to physical and cognitive limitation, as well as disability.

The effects of our ageing population, combined with growing numbers of economically active elderly and people with disabilities, may have a profound effect on the requirements for inclusive design which could create challenges and opportunities for operators and design professionals.

1.2.2 Design should include the needs of marginalised groups and deliver social benefits and commercial opportunities. Inclusive design may be vital to the rail industry going forwards:

- → When our stations are more accessible and we meet more people's needs we may attract a broader range of passengers including people with a range of disabilities and passengers with luggage, pushchairs and bicycles for which level changes can create a barrier
- → When our offices are more accessible we can attract people with disabilities to apply for jobs at at a wider range of locations
- → When our services meet passenger needs more effectively they are less likely to choose other transport modes
- → When passengers have a positive user experiences we build loyalty and a good reputation for NR and the rail industry as a whole

Understanding diversity within the population

Addressing barriers to inclusion early in the design process

Providing convenient easy access to all areas of the station

Creating a flexible design which can be used in different ways

Accommodate all people regardless of their age, gender, mobility, ethnicity

Responding to user groups needs and allowing all user groups able to use the station facilities equally

1.3 The Benefits of Inclusive Design

1.3.1 An Inclusive Estate

Inclusive design should be the ultimate goal of every designer, the client team and facility manager. It has relevance to our whole estate: stations, offices, depots, level crossings and footbridges.

In adopting inclusive design principles, we want our estate to be as easy to use and enjoyable for as many people as possible, reducing barriers that prevent people from accessing our facilities. We believe we can deliver inspiring, creative and beautiful buildings at the cutting-edge of inclusive design.

In developing our principles for inclusive design we have therefore identified **7** key benefits :

1.3.2 Safety

Inclusive spaces and places are safer because they are designed with people's needs and behaviours in mind, for example:

Lifts that are easy to find are more likely to be used by people with luggage and buggies as well as people using wheelchairs, reducing accidents on escalators.

Accessible, well-signed and well-lit footbridges encourage people to cross the track where it is safe to do so and help to reduce the occurrence and fear of crime.

Good lighting and passenger information boards reduce the risk of people gathering in unsafe locations whilst searching for routes or information.

Safely placed seating encourages people to use our stations more independently, reducing the requirement for people to stop, sit or lean where it is unsafe.

Platforms that are easier to find reduce the likelihood of our passengers running for trains, thereby reducing the risks of slips, trips and falls.

Evenly distributed lighting helps people with vision disabilities to get around more easily whilst also reducing slips, trips and falls for everyone.

Induction loops and reliable real-time information assure hearing-aid users receive safety announcements, updates on delays and platform alterations.

Accessible kitchens in our workplaces reduce the risks of burns and spills for all our employees.

1.3.3 Passenger Satisfaction

As we deliver inclusive infrastructure across the network we believe that all of our passengers may be happier with our service as many of the things that support disabled and older passengers, like good signage, lighting, extra seating and unobstructed pedestrian routes may help everyone to move safely and quickly though our stations and in comfort.

Many new technologies such as Augmented Reality (AR) and smartphone technology may assist people with vision disabilities and those with cognitive and sensory disabilities to navigate our stations, becoming useful to everyone.

1.3.4 Future Proofing

The UK's demographic is changing, becoming culturally more diverse and older. With age comes an increased incidence of disability.

Understanding the requirements of this changing demographic may help us to plan for the future and deliver more comfortable and accessible facilities, giving older people and disabled people the confidence to travel by train.

1.3.5 Financial Gains

Cost is often used as a reason for not delivering inclusive design but many elements like clear signage, good lighting are no more expensive. In our experience not considering them costs more in dealing with complaints, legal challenges and issues that can emerge later in a project's life-cycle, causing delays which can damage our reputation and passenger loyalty.

Similarly incorporating inclusive design later in the process may cost more as the project matures. These costs can be minimised by understanding end user requirements from the start of the design process.

1.3 The Benefits of Inclusive Design

1.3.6 Revenue

According to Disability Rights UK, 83% of disabled people have been 'turned away' from buying products or services through a lack of access or unhelpful staff. We aim to address both of these issues providing access through good design and changing our behaviour to provide an inclusive passenger experience.

It also makes good economic sense to provide station environments which are easy to access for disabled passengers, people with luggage or buggies so that everyone can enjoy our facilities, shops and restaurants before boarding their train.

The value of the `purple pound' that is disabled people and their families is worth an estimated £212 billion to the UK economy and older people's spending is estimated to be a further £100bn.

1.3.7 Assurance

Inclusive design is an important part of our assurance process through which we demonstrate many of our legal obligations including but not limited to:

- → The Equality Act 2010
- → National Planning Policy Framework
- → Persons of Reduced Mobility Technical Specification for Interoperability
- → Design Standards for Accessible Railway Stations: A Code of Practice
- → Building Regulations
- → Rail Vehicle Accessibility Regulations

Most notably we have a Public Sector Equality Duty under the Equality Act 2010 to show due regard to eliminate unlawful discrimination, foster good relations and advance equality of opportunity. See Appendix for the full list of standards and guidelines.

NR Standards Reference

Architectural & Layout Acceptance
NR/L2/CIV/003/F004

NR Guidance Suite Reference

Design Advice Panel Project Guidance
NR/GN/CIV/100/01

Station Design Guidance
NR/GN/CIV/100/02

1.4 Socio-economic Benefits

1.4.1 Our Approach

Our approach to designing and managing the built environment is one of care and consideration that reflects the requirements of a diverse range of people and provides a `wraparound' inclusive environment.

Through inclusive design we can help to deliver social inclusion and economic benefits for local communities, users, Network Rail and its key stakeholders.

In 2019 the Design Council undertook an outline Network study titled Railway for Everyone which explored the opportunities and challenges associated with ensuring that rail travel is open and available to as many people as possible.

Strategic design issues were addressed including those related to inclusive design and key socio-economic benefits facilitated through transport infrastructure connectivity:

- → Benefits to People – how access and use of the rail network improves people's lives
- → Benefits to Places – how the rail network benefits places and spaces
- → Benefits to Processes – what efficiencies are provided through the rail network

This study served as a strategic counterpart to the work being undertaken by NR in this area of research and the development of this document.

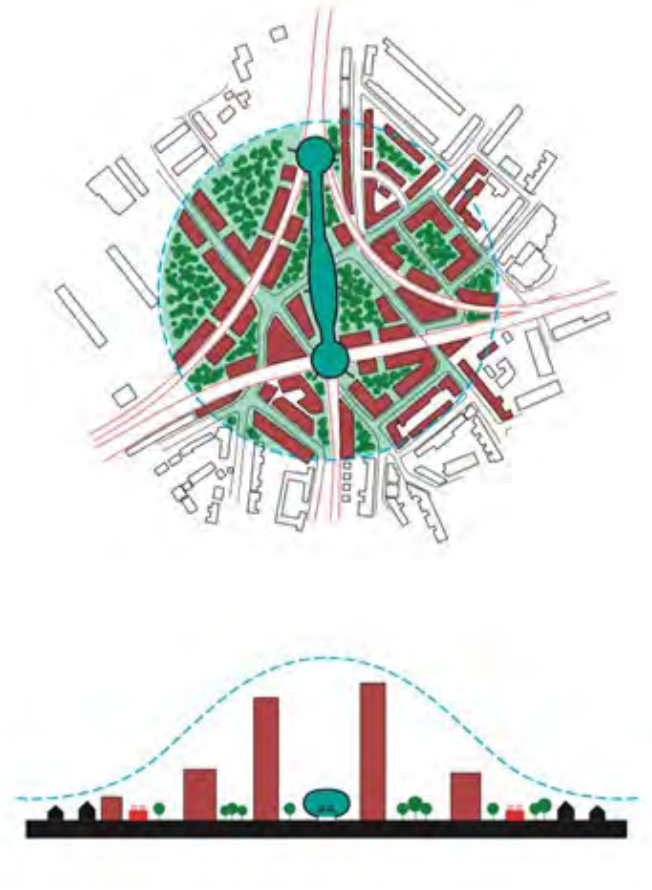


Image 1.1 TOD Concept

1.4.2 People

Investment in transport infrastructure and improved connectivity can deliver many wider social and economic benefits. Rail is one of the safest and most environmentally sustainable forms of transport and can deliver these benefits locally, regionally and nationally. Access to the rail network can improve peoples lives in many ways including:

- → Enables people to live and work in locations otherwise difficult to access
- → Provides access to employment, education and leisure
- → Provides access to wider public services and schools
- → Connects families and communities
- → Enables social mobility for those without a car
- → Helps to support and drive the economy
- → Enables economic activities directly or indirectly

1.4.3 Places

Good public transportation can underpin regional development and the building of new places, creating homes and jobs. It is therefore important to develop coordinated strategic transportation and urban planning that may release socio-economic value and create high quality liveable communities that are environmentally sustainable.

Strategies such as transport orientated development (TOD) can help to deliver improved quality of life, building new stations on brownfield sites, combined with high-density mixed-use business/neighbourhood centres clustered around stations, walkable developments with good access to rail services leading to increased ridership and high quality public spaces. The principle benefits of TOD include:

- → More people able to travel by public transport
- → Less road congestion and reduced greenhouse gas emissions
- → Public spaces where cycles and pedestrians are given priority
- → More open space and green infrastructure
- → Less noise and better air quality
- → Public spaces for local community activities
- → Increased social and economic activity
- → Direct income to communities and local businesses

1.4.4 Processes

To deliver projects that are meaningfully inclusive, people should be placed at the heart of the design processes to create spaces and places for everyone.

Inclusive design should not be an add on, but rather an integral part of the design and development process that is embedded throughout a project.

We are committed to training our staff in the value of an Inclusive approach to design and operational management to create more accessible and inclusive places, processes and products.

Design assurance processes should be implemented to monitor and measure the delivery of inclusive design standards within projects.

1.4.5 Targeted Investment

As the national rail service provider, we understand the benefits of targeted investment in transport infrastructure in terms of improved connectivity and opportunities for transformative development, social inclusion and economic improvements to an area.

Station developments should form part of a broader vision and masterplan for transport connectivity and local development. Station masterplans for the immediate surrounding area should be able to accommodate a wide range of potential development scenarios that may encourage inward investment.

Fully integrated transport oriented development (TOD) close to stations may also produce an appreciable increase in ridership numbers and may be a fundamental part of achieving a viable business case that may attract inward investment, regional growth and prosperity.

Image 1.2
HS2 East Midlands Hub TOD Concept

Rail infrastructure investment creates significant land value uplift within catchment areas that increases the closer the development is to a station. Land that is within a walkable distance (1.5km) may be at a premium.

Policies that support land value capture should be implemented so that communities can recover and reinvest land value increases for the wider economic benefits of the communities. These policies should include:

- → Economic and strategic planning to optimise benefits of investment.
- → Robust business case based on ridership numbers supported by regional growth.
- → Development Corporation with planning & delivery tools to implement the vision.
- → Mechanisms to harness contributions to the cost of infrastructure from key beneficiaries in private and public sectors, including Local Authorities, transport operators and land developers.

1.4.6 Place-making

Inclusive design linked to place making can help to deliver the socio-economic benefits of the rail network and investment in transport infrastructure to the communities that they serve.

Station development should be a contextual response to the site that acknowledges the local heritage and cultural diversity of an area to create a unique place, that local communities can relate to which is vibrant, a catalyst for growth and environmentally sustainable.

The station should be at the heart of communities and a place that welcomes and serves local people and station users. It should embrace the needs of the community and address the local context through attractive and meaningful connections including unpaid public routes through the station.

The station plaza has potential to become a `town square' that can support local businesses such as cafés', shops, health clinics, gyms, crèches etc. Public spaces should be flexible and adaptable, designed and laid out to support a changing programme of activities, such as seasonal markets, temporary pavilions, performance, art installations and meeting places.

1.5 Our Approach and Objectives

1.5.1 A Proactive Approach

As the public body responsible for managing and maintaining UK's rail network infrastructure NR is committed to a proactive approach to improving standards of inclusive design within the industry.

Statutory legislation requires employers, service provider or other organisation to take positive action to enable existing or potential employees or customers to overcome and minimise disadvantages arising from a protected characteristic.

This guidance document describes NR's approach and objectives together with key standards and procedures that we expect project teams to follow in delivering inclusive design consistently.

Underpinning our approach and objectives are 5 key principles:

1.5.2 Consultation

Through active engagement with end users and line-side communities we aim to deliver a higher quality of services. Close engagement may encourage participation by removing perceived barriers and enable us to gather information, understand peoples' needs and improve safety. Care should be taken to assure that engagement forums are structured in gathering peoples' views and providing timely feedback to participants, creating positive relationships.

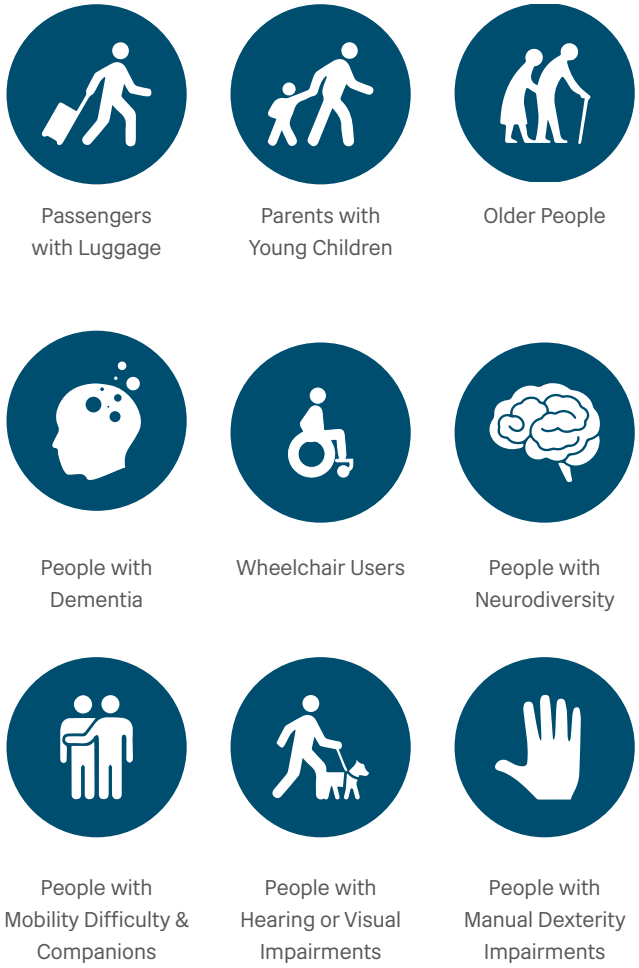
All Network Rail projects should engage with disabled and older people, as well as inclusive design experts. In support of this process we have set up the Built Environment Accessibility Panel (BEAP) to provide expert technical and strategic advice to our project teams, particularly on major, challenging or contentious projects. Guidance may be developed outlining how and when the BEAP can be consulted. The BEAP consists of disabled and older people who are inclusive design experts.

1.5.3 Collaboration

NR aims to improve collaboration across the entire transport network and deliver more inclusive journeys. This means pro-actively considering end users' needs from project inception and thinking about the end to end journey experience.

NR are applying many `lessons learned' from other major rail infrastructure programmes including Crossrail and High Speed rail projects. We are working with public bodies, train operator companies and other modes of transport that interchange with our infrastructure to deliver a more inclusive passenger experience.

NR continues to share good practice and develop our requirements for inclusive design competence into relevant parts of our procurement processes so that our supply chain can work with us to deliver our objectives.



1.5.4 Education

Inclusive design is relevant to everyone who works in the built environment including commissioners, planners, access consultants, designers, architects, engineers, surveyors, accountants and property leaseholders.

In 2016 we launched our inclusive design strategy and implemented new standards which have been rolled out across our estate including; stations, depots, offices and training centres.

Our strategy is raising awareness and developing competencies through targeted training and guidance for those people with specific responsibilities. Training and support is being provided for those responsible for customer assistance, workplace and facility management. Operational management may be key to removing attitudinal barriers.

We are also supporting the work of the Built Environment Professionals Education Project, which looked to embed inclusive design into continuing professional development education and training. The project's vision was that every newly qualified built environment professional would be given the attitude, skills and knowledge required to deliver accessible and inclusive buildings and spaces.

We support the Hidden Disabilities Sunflower lanyard scheme which enables our staff to recognise customers that may be in need of assistance.

Image 1.3
NR customer support

1.5.5 Innovation
We aim to use new technology and innovation to provide a better more inclusive railway infrastructure and to deliver cost effective projects. We actively encourages suppliers and stakeholders to challenge our standards and to apply innovation and creativity to deliver added value.

Applying the principles of inclusive design may often provide new insights into the ways we interact with the environment which creates new ways of thinking and problem-solving.

One area of particular focus is the design of communication systems to help people with disabilities and improve passenger experience. For example the application of digital technology and innovation through smart-phone applications that provide direction instructions such as Augmented Reality and Beacon technology. We are also developing ways of providing more personalised passenger information to make the rail industry more user-friendly.

1.5.6 Integration
Incorporating inclusive design principles within our `business as usual' systems may be key to achieving full integration of this strategy. To this end we are employing a number of processes, guidance documents and engage with relevant governance structures.

Through the Diversity Impact Assessment (DIA) process we demonstrate that we have given due care and attention to our decision making and how our works might affect different people and communities and we build the trust of our passengers and stakeholders.

1.5.7 End-to-End Integration
Initial Industry Plans (IIP's) define key objectives for each control period in terms of delivering efficiencies, better value and sustainable economic growth.

IIP's include inputs from cross-industry groups responsible for coordinating industry plans in relation to inclusive design strategies, safety, performance, sustainability, capacity, asset management, technology and innovation. Through IIP's we assure that inclusive design is integrated into our planned programme of enhancements and renewals.

DIAs are also aligned with our planned programme, project and policy development methodologies including the Governance for Railway Investment Projects (GRIP) process. An important element of embedding inclusive design into our work may be regular, timely reviewing and reporting of each project's intent to meet inclusive design principles and updated design guidance.

1.6 Accountabilities

1.6.1 Diversity and Inclusion Team

The Diversity and Inclusion Team provides guidance to project teams based on their extensive knowledge and expertise, supplemented by professional advice from within NR and from specialist external organisations. We share good practice across routes and functions, monitor performance against local plans and challenge the business to go further. We also coordinate our efforts to influence our stakeholders, partners and policy-making forums and strive to be industry leaders in this field.

The team is accountable for reporting on progress against agreed Key Performance Indicators highlighting gaps in performance and celebrating successes. The team hold Network Rail to account for delivering the inclusive design strategy as part of the business-wide diversity and inclusion programme.

1.6.2 Access and Inclusion Manager

The Access and Inclusion Manager may champion the inclusive design philosophy and principles, produce design guidance and develop procedures for its implementation. They may also provide support, advice and expert guidance to staff and stakeholders to assure the adoption of this approach.

The BEAP chair is usually a member of NR staff and the panel is formed from independent technical experts involved in inclusion and access, with at least half of the members being disabled people.

Image 1.4
A BEAP Review Meeting

1.6.3 Internal subject matter experts
Our Safety Technical and Engineering Directorate, work closely with our Access and Inclusion Manager to assure the quality of our DIA's. For complicated projects or where conflicts arise, a project may be referred to the BEAP and ultimately to the Diversity and Inclusion Programme Board for a decision.

The Buildings and Architecture Team can help to review inclusive design for stations and assure that they meet any technical requirements. Our Station Capacity Manager can also assist in reviewing designs to help manage pedestrian flow in a way that is safe and inclusive.

1.6.4 Diversity and Inclusion Programme Board
The Diversity and Inclusion Programme Board is part of our wider diversity and inclusion governance structure and is responsible for driving the Everyone Matters Programme forward. Members of the Programme Board are individually accountable for their areas of responsibility and delivery within the programme.

1.7 Design Management Procedures

1.7.1 The Application of GRIP

Cost is often used as a reason for not delivering inclusive design. However, many elements like clear signage and good lighting are not necessarily more expensive.

The cost of integrating inclusive design increases dramatically as a project matures. These costs can be minimised by making sure that we have a thorough understanding of the end users requirements at the very start of the design process, and then correctly translate these requirements into detailed project specifications.

To assure that our infrastructure design is inclusive for every passenger and staff member we have prepared a check list of activities to be undertaken as part of the GRIP process.

GRIP 1. Output Definition

- → Designate an inclusive design champion within the client team
- → Set out a process to embed and implement inclusive design principles
- → Identify potential barriers to access and opportunities to include a wider group of user needs within the proposals

GRIP 2. Pre-Feasibility

- → Incorporate key inclusive design requirements into proposals
- → Consult with potential users including disabled people
- → Produce a first draft on the Diversity Impact Assessment to assure key barriers and opportunities are identified

GRIP 3. Option Selection

- → Consider user feedback
- → Demonstrate due consideration of inclusive design within the selection process
- → Update the Diversity Impact Assessment
- → Engage an access consultant

GRIP 4. Single Option Development

- → Address any barriers and demonstrate potential mitigation measures where required
- → Consult with potential users including disabled people
- → Update the Diversity Impact Assessment

GRIP 5. Detailed Design

- → On medium to large projects a stand-alone Inclusive Design Statement or section within a Design and Access Statement can be helpful to describe the detail of how barriers are being addressed and improvement opportunities are being followed within the proposals.
- → Consult with potential users including disabled people.
- → Update the Diversity Impact Assessment
- → Prior to construction, identify potential barriers to access during the construction phase(s), develop mitigation measures and carry out a DIA for each of the phases

- → Ensure the contractor understandings the approach agreed on inclusive design
- → Monitor all aspects of the design to assure compliance with the agreed inclusive design standards
- → Continually assess the success of any temporary mitigation measures in place during construction and address problems where necessary

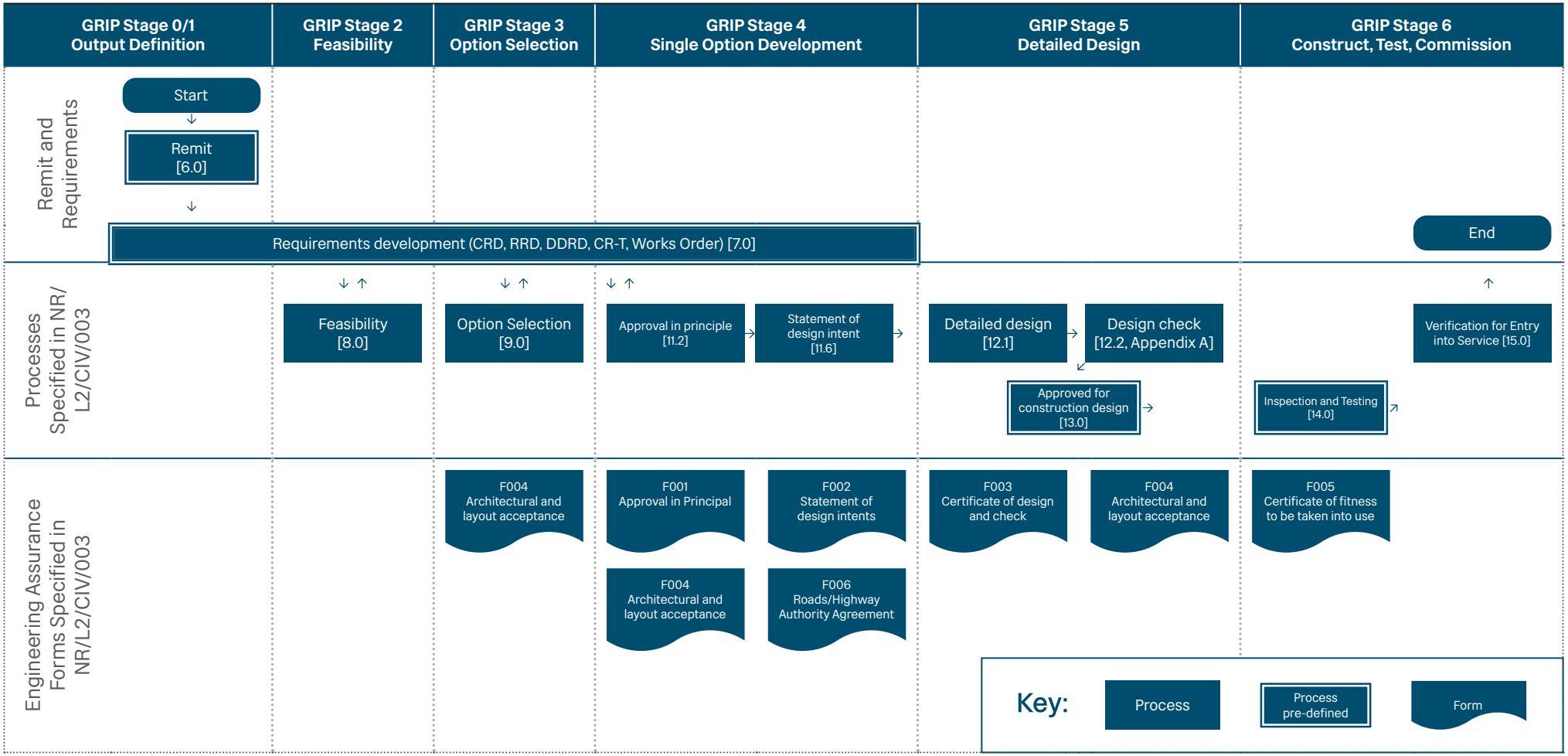
GRIP 7. Hand back

- → Assess the completed project and check that the agreed standards have been met.
- → Identify post occupancy matters for inclusion in Facilities/Operations
- → Handbook and Maintenance Manuals

GRIP 8. Close Out

- → Publish learning points for future projects
- → Ensure any defects are addressed

Engineering and Architectural Assurance of Building and Civil Engineering Works



Note: Timing of processes and outputs by GRIP Stage shown indicatively and may vary to suit the project delivery strategy

1.7.2 Diversity Impact Assessments (DIA)
A Diversity Impact Assessment is a structured information gathering and decision-making process used to assess and record the likely and actual impact of a current or proposed project, policy or function on diversity and inclusion. DIA's should demonstrate due regard in response to Network Rails' Public Sector Equality Duty under the Equality Act 2010

A DIA should anticipate the likely effects of our work on people with the protected characteristics as defined by the Equality Act (age, disability, gender reassignment, pregnancy and maternity, race, religion or belief and sexual orientation, marriage and civil partnerships), in short everyone.

Undertaking a DIA may deliver evidence-based decision making and involves an 8-steps process as illustrated in Appendix B: Process Flowchart. Ideally they should be commenced from start to inform early decision-making. See NR's, *An Everyone Guide to Diversity Impact Assessments, 2015.*

A DIA should be an integral part of programme management and be included in the project plan. The DIA should be undertaken for projects, change programmes, strategies, policies (including design policy), major investment decisions, level crossing closures and renewals.

Potential impacts identified by a DIA should be used to create an action plan to mitigate them, and to demonstrate that we have met our duties under the Equality Act.

For further advice on Diversity Impact Assessments Contact: **Diversityand inclusion@networkrail.co.uk**

1.7.3 Inclusive Design Experts
Project teams should engage with NR experts and appoint accessibility consultants to improve the quality of projects in relation to inclusive design, and develop in-house competence to deliver this work.

1.7.4 Accessibility and Inclusion Statements
Project design teams should be required to prepare a statement that describes how a scheme may address the issues identified in the DIA. The Statement should evolve as design is developed and provide project sponsors with a better understanding of how the designers are addressing issues of accessibility and inclusion. The statement can be stand-alone or form part of a general Design and Access Statement.

1.7.5 Engage the Wider Community
Inclusive design is underpinned legislation. In the UK the Equality Act 2010 places a requirement on service providers to avoid discriminating against people on the basis of any of nine 'protected characteristics'. Consultations should be undertaken with passengers, employees and local communities to understand the requirementss of those with protected characteristics during the design development and delivery of projects.
This approach is more likely to deliver higher quality solutions that address the requirements of all.

All major building works including station designs and other amenities, should consult the BEAP, an independent panel of experts formed to review and advise Network Rail in respect of inclusive design and accessible built environment.

1.7.6 'Our Principles of Good Design'
The vision behind 'Our Principles of Good Design' is to capture opportunities that may add value through good design and to provide guidance to architects and engineers in understanding how to prepare the new Form 4.

Network Rail has established a process for reviewing design submissions via the Design Advice Panel (DAP), a design review panel led by The Design Council at key points in the design development to assure that this new standard has a minimal impact on the delivery of the project.

1.7.7 Environmental and Social Appraisal
The design process should comply with NR/L2/ENV/015 — Environment & Social Minimum Requirements (ESA)

The ESA is part of the Network Rail GRIP Product List and should be completed and updated by the Client from GRIP 2 to 4 to identify the environment and social risks and opportunities associated with the project.

The completed appraisal should be provided to the Designer to inform the Environment & Social Risk Assessment (ESRA) and Environment & Social Management Plan (ESMP), update the Hazard Log and agree on ownership of subsequent activities and control measures identified (e.g. ecology survey).

The Designer may support the Client in reviewing and updating the ESA when required using knowledge gathered during the Hazard Identification process.

The Designer Project Manager is responsible for the delivery of the Client's design requirements including environmental and social activities and deliverables. Many of the themes in the ESA should engender positive impacts for people that are created by going beyond 'fit for purpose' and delivering Social Value that can be measured and reported. Items such as:

- → Being a caring neighbour
- → Connecting communities with the built environment
- → Creating engaged employees and positive industry partnerships
- → Inspiring tomorrows workforce
- → Keeping communities safe
- → Making travel accessible and a great experience
- → Respecting cultural history and rail heritage
- → Supporting Britain's economic development

NR Standards Reference

Environmental and Social Minimum Requirements
NR/L2/ENV/015

Image 1.6
Kings Cross
A step-free station entrance

2

Station Environment

2.1.1.1 Station Plaza

Who & Why
The station should be connected to the surrounding urban context through local transport networks, cycle routes and pedestrian corridors. The urban realm which forms part of the station design should be a contextual response to the unique qualities and constraints of the site.

Immediately outside the principle entrance should be direct access to onward travel interchange facilities and a generous pedestrian plaza for a range of activities including passenger orientation, meeting points for groups traveling together, cafés, shops, pop up retail, external performance areas, public seating, cycle parking etc. Whenever possible trees should be planted to provide shade and improve air quality.

The design of the urban realm should be flexible and adaptable for passengers and local people with a range of cognitive, sensory and mobility disabilities and for passengers with pushchairs, luggage and cycles.

These amenities should support place-making and help to create the station as a destination within the local community.

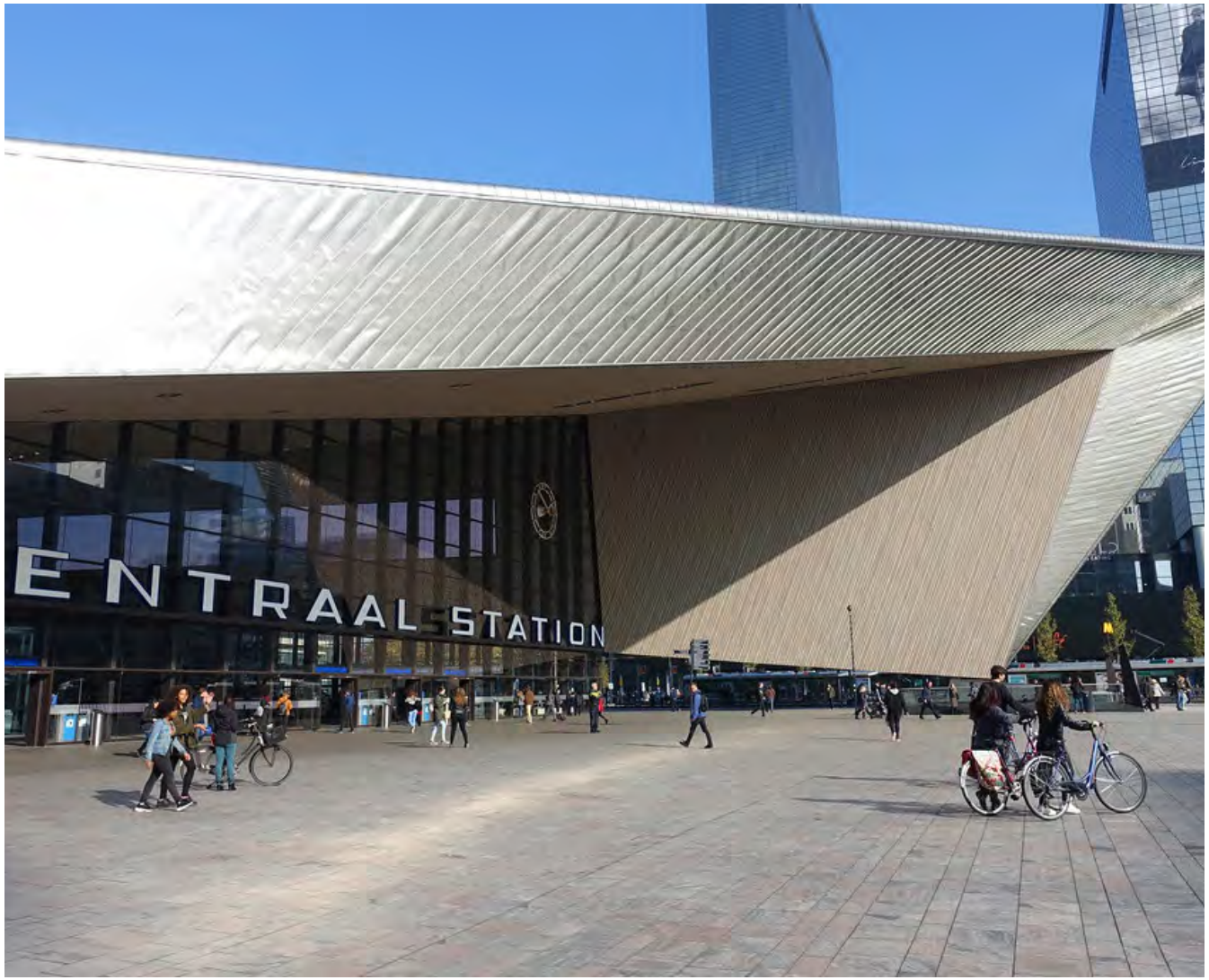


Image 2.1.1
Open step-free public space,
Rotterdam Centraal, Netherlands

2.1.1.2 Design Considerations

In the early stages of design it is important to apply an holistic approach to inclusive design. It is vitally important that the initial planning carefully considers the needs of people with a range of requirements and disabilities to assure that site layout is both functional and accessible for everyone.

The urban realm surrounding the station should be functional and safe. Vehicle and cycle access should be carefully considered to assure that there is no conflict with pedestrian areas. Bus, taxi and private car drop off areas should be close to the principal station entrance so that interchange travel distances are minimised.

The principle entrances should be clearly expressed by the architecture to aide intuitive wayfinding. Views and pedestrian routes to the entrance should be simple, direct and clearly defined within the landscape. All routes should ideally be step free.

The detail design of materials and finishes in the urban realm should carefully consider the needs of a wide range of disabilities to provide a safe and comfortable environment.

Public seating should be ergonomically designed for a wide range of sizes and disabilities. Select materials and finishes to be robust and hard wearing but also to provide visual contrast, tactile markings that highlight potential hazards and handrails to aide and guide people with disabilities. External lighting, wayfinding signage and assistance points should be provided to help people with auditory and visual disabilities.

Security requirements to combat terrorist attacks can create conflicts with inclusive design in the urban realm, such as bollards protection for errant vehicles. Designers should have an awareness of these issues and address any such conflicts according to the principles of inclusive design.

(See also section 1.4 Socio-Economic Benefits)

NR Guidance Suite Reference

Station Design Guidance
NR/GN/CIV/100/02

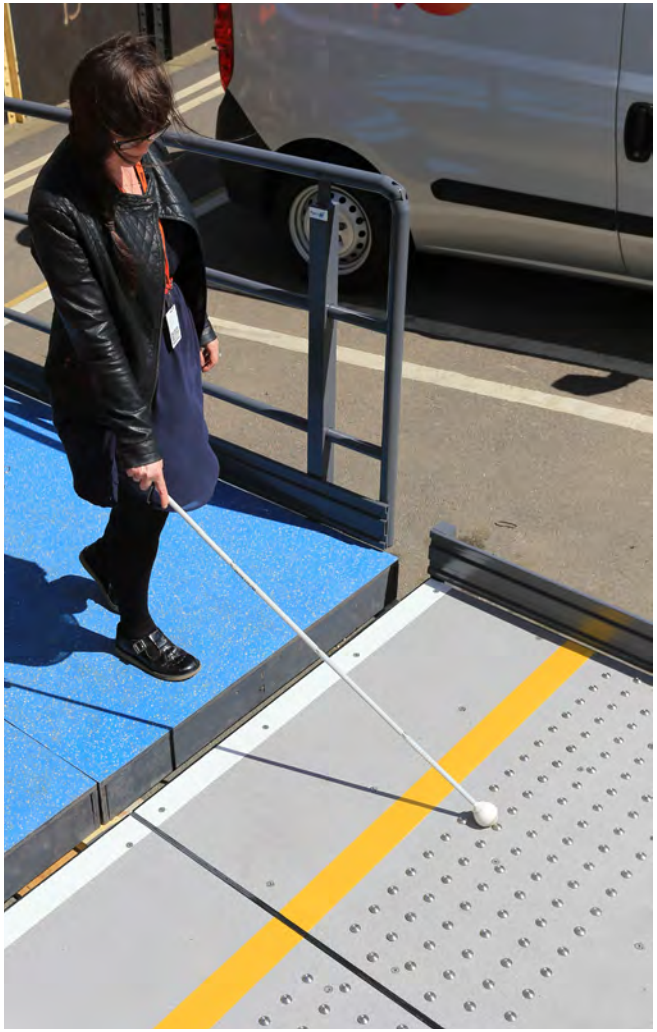


Image 2.1.2
Step and ramp gradient testing

2.1.2.1 External Routes

Who & Why

External routes from vehicle set-down areas, including bus stops, taxi ranks, and blue-badge parking to the station entrance can be a significant barrier for many disabled and elderly people affecting their ability to use the station.

The accessibility of these routes is an important design consideration. Long distances, changes in level and obstructions can make it difficult or impossible for disabled people to reach a station independently.

Research shows that 30 per cent of disabled people can manage no more than 50m without stopping for a rest.

Mobility varies greatly between individuals with age and disability related issues. Factors such as weather, topography and obstacles can also affect mobility ranges.

Changes in level can cause problems for many disabled people particularly for those with mobility or visual disabilities. A single step can be a barrier to access for many people with mobility disabilities and can present a trip hazard for all.

Gradients of between 1:20 and 1:60 although not steep enough to be considered a ramp can be problematic for some wheelchair users who lack the strength to propel themselves up a slope or have difficulty in slowing down or stopping when descending.

Lack of delineation between vehicle and pedestrian routes can diminish the sense of safety, particularly for people with vision disabilities and add to the confusion on the station approach. Similarly a lack of clear signage and inadequate lighting levels on key routes can create problems for everyone.

2.1.2.2 Station Access Routes
Routes from the key access point to a station should be as short as possible and ideally a maximum of 50m. Where longer routes are unavoidable rest points should be provided at regular intervals with seating.

Longitudinal gradient of access routes should be as shallow as possible. The maximum gradient should be 1:21. For access routes with shallow gradients between 1:60 and 1:20 (not considered to be ramps) level rest areas should be provided. Level landings should be a minimum of 1500mm long (3000mm preferred) and clear of any obstructions. Cross-fall on routes should be no steeper than 1:50.

2.1.2.3 Paving Materials
Paving material should be slip resistant and relatively uniform in tone, avoiding strong contrasting patterns which can be perceived as steps or holes by people with vision disabilities.

2.1.2.4 Visual Contrast/LRV
Visual contrast is defined as the difference in Light Reflectance Value(LRV) of two adjacent surfaces or a component and its background LRV and is expressed on a scale of 0–100, with a LRV of 0 representing absolute black and 100 representing absolute white.

Visual contrast should be provided between pavements, walls and street furniture to help people with visual disabilities safely navigate external routes. (See also section 3.2.2 Colour and tonal contrast)

2.1.2.5 Street Furniture

Street furniture should not form a barrier to free movement of pedestrians. Necessary items of street furniture should be located off routes and grouped together wherever possible

Furniture should be a minimum of 1000mm high and should contrast with its background. Free-standing items of furniture, such as bollards and lighting columns, should have bands of a contrasting tone at 1000mm and 1500mm centres as appropriate.

The provision of a dog spending areas for guide dogs should be provided at larger stations.

2.1.2.6 Level Changes
Potential hazards such as level changes and steps should be indicated with tactile warning surfaces and visual indicators such as colour contrast step nosings.

People with vision disabilities rely on a change in level and often a contrast in tone between carriageway and foot-way to delineate between where it is safe to walk and where it is not.

2.1.2.7 Shared Surfaces

Shared Surfaces where there is no kerb delineation between vehicles and pedestrians are becoming more common. At the time of publishing this guidance The Department for Transport (DfT) has requested that local authorities pause shared surface schemes until more detailed guidance is available to designers to assure due consideration is given to the needs of disabled pedestrians before designing this type of scheme.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment External & Buildings, 2018
BS 8300 -1 & 2: 2018

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Guidance on the Use of Tactile Paving Surfaces, 2015
Department for Transport

Station Public Realm Design Guidance
Transport for London

2.1.3.1 Parking & Set Down Points

Who & Why
The requirements for on-site car parking should be minimised and priority given to good public transport connections, cycle and pedestrian access.

Where parking is provided spaces should be provided for disabled passengers close to the principal station entrance and in accordance with DfT Accessible train station design for disabled people: A Code of Practice.

Many disabled and elderly people rely on taxis and private cars for their journeys to and from stations, since bus stops are often too far from home and too far from the final destination to be a viable transport option. It is often the connection from the station forecourt area that is the most problematic part of their journey.

When designing set-down/pick-up points for taxis and private vehicles it is important to assure that travel distances to the station entrance are kept to the minimum requirement and level access is provided wherever possible.

Image 2.1.3
Paddington Station

2.1.3.2 Design Considerations

The location of the set-down point/pick-up and blue-badge parking should be as close as practical (ideally a maximum of 50m) to the principal station entrance and both should be clearly indicated on the approach to the station. Both of these facilities should be on firm and level ground.

Ideally an area should be set aside for drivers waiting for disabled passengers near the set-down point.

The capacity of the set-down point should be appropriate for the expected demand.

A passenger waiting area should be included in view of the pick-up point with seating and ideally weather protection.

Set-down/pick-up points should be designed to facilitate use by all vehicle types.

An adequate length of straight raised boarding area should be provided to deploy and use a nearside ramp with ease. The area should also be long enough to accommodate the use of rear fixed ramps.

Set-down/pick-up points should be in locations that may not be blocked by parked vehicles.

Dropped kerbs should be provided in strategic locations to allow wheelchair users to move off the carriageway.

The set-down point should be protected from the weather wherever possible. Canopy structures should not impede access to the facility for minibus vehicles, minimum clearance height should be 2.6m.

Help points should be provided in strategic locations near these facilities and at an accessible height to allow disabled people to call for mobility assistance at stations where this service is available.

Standards Reference

Accessible Bus Stops Design Guidance, 2006
Transport for London

Taxi Ranks at Major Interchanges
— Best Practice Guidance, 2006
Transport for London

London Cycling Design Standards, 2014
Transport for London

Workplace Cycle Parking Guide, 2006
Transport for London

Effective Kerb Heights for Blind and Partially Sighted People, 2009
UCL Accessibility Research Group

2.1.4 Blue Badge Parking

2.1.4.1 Blue Badge Parking

Who & Why
Blue badge parking is particularly important at stations with limited local public transport connections and should be provided close to the stations entrance.

Parking spaces are required with hatched area road markings to the side and rear. The areas should not encroach into the carriageway, since the boarding ramps and hoists on accessible taxis and adapted vehicles are generally fixed to the rear or nearside.

Straight and level boarding areas are required to avoid steep boarding ramp gradients and assists ambulant disabled people by helping them to reduce the step height into the vehicle.

Image 2.1.4
London 2012 Olympics Parking

2.1.4.2 Design Considerations

The location of the blue badge parking should be signposted from the station entrance to the car park.

Blue-badge parking spaces should make up a minimum of 5% of the total car park capacity with a minimum of 1 space.

Designated on-street parking spaces, parallel to the kerb, should be 6600mm long × 3600mm wide, this helps to provide safe access off the carriageway and to the rear of the vehicle

Blue-badge parking spaces should be at least 2400mm x 4800mm with a hatched zone 1200mm wide between spaces and between the designated spaces and the carriageway

Ideally at least one larger parking space should be provided, 4800mm wide x 8000mm long, to accommodate adapted vehicles with side or rear access using hoists or ramps.

Ideally, blue badge areas should have a help point particularly in large stations.

Dropped kerbs should be provided close to the blue-badge spaces to allow easy access off the carriageway and onto the surrounding footway.

If there is a charge for blue-badge holders to park at the station, all barriers and ticket machines should be easily accessible to disabled people.

If the designated spaces are occupied for more than 10 per cent of the car park's operating hours, the operator should consider increasing their number.

Standards Reference

Design of an Accessible and Inclusive Built Environment External & Buildings, 2018
BS 8300 -1 & 2: 2018

The Design of Car Parks for Railway Stations
NR/L3/CIV/160

Inclusive Mobility Strategy, 2018
Department for Transport

2.1.5.1 External Stairs

Who & Why
Stairs can often present a barrier to movement for a large number of people, including people with impaired vision, parents with push chairs and passengers with luggage, bicycles and reduced mobility.

However since many ambulant disabled people find well designed steps easier and safer to use than ramps it is undesirable for a ramp to be the only pedestrian access route to a building or footbridge.

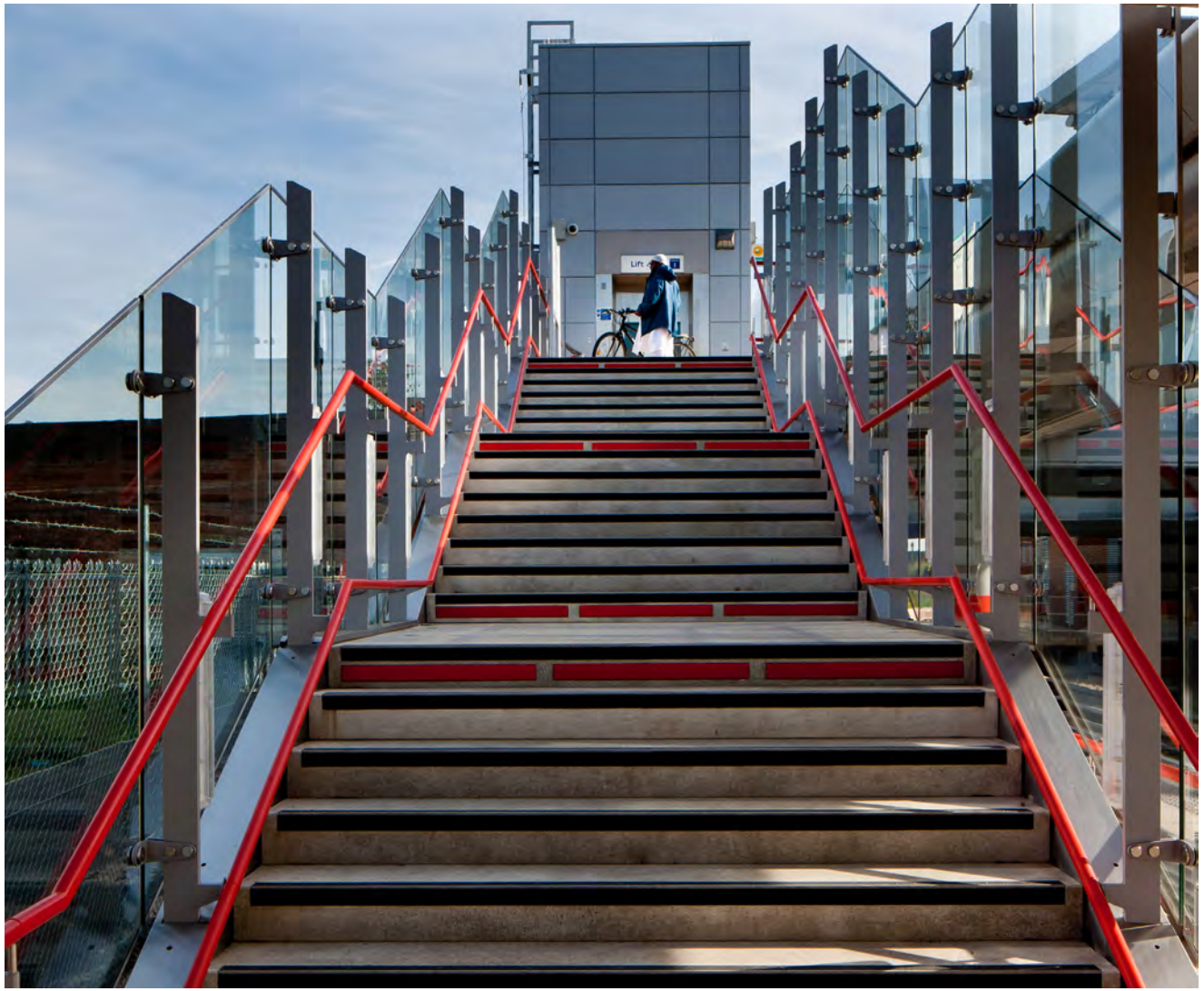


Image 2.1.5
DLR Abbey Road Station

2.1.5.2 Design Considerations

Stairs should be provided in all cases where a vertical change in level is greater than 300mm. For level changes in excess of 2m a lift should be installed. This should be in addition to the provision of stairs to account for the lift becoming non operational.

If the total rise is 300mm or less, it is acceptable to provide a ramp only. This removes the requirement to provide a single step, which can be a tripping hazard.

Landings that are level and clear of obstructions should be provided at the top and bottom of all steps.

Drainage cross-falls should be no steeper than 1:50.

Width between handrails should be no less than 1600 mm.

Steps should be lit to provide a minimum of 150 – 200 lux at tread level.

Steps/landings should be slip resistant.

There should be tactile warning surface at the top and bottom of all steps

Risers and treads should always be uniform in their size.

Steps with deeper treads are safer to use. 300 – 450 mm is the recommended range with 450mm the preferred.

The rise of the step should be between 150 – 180 mm.

Tapering risers are a tripping hazard and should be avoided, for example where steps join a slope.

Step nosings should be readily apparent. There should be 30 points minimum LRV difference between the nosing and the tread and riser. On the tread the contrasting nosing should be 50 – 65 mm deep and on the riser it should be 30 – 55 mm.

The number of steps in each flight should be equal where there is more than one flight of steps in a staircase. The maximum number of steps in a flight with goings of 350mm or more is 20.

Lighting should provide 150 – 200lux at stair level.

Refer to DfT CoP and BS 8300-1 & 2: 2018 for detailed guidance.

See also sections:

→ 2.6 Bridges & Underpasses

→ 3.2.4 Handrails

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Guidance on the Use of Tactile Paving Surfaces, 2015
Department for Transport

2.1.6 External Ramps and Gradients

2.1.6.1 External Ramps and Gradients

Who & Why
Changes in level can cause problems for people with disabilities particularly those with mobility or visual disabilities and people travelling with young children, luggage and bicycles.

Providing a ramps is one solution but should only be used to overcome localised changes in level of up to 2m.

A ramps is defined as sloping surfaces with gradients of 1:20 or steeper and ideally should not be part of primary circulation routes. Steeper gradients or long ramps can require excessive effort for some disabled people which may prevent them from traveling independently.

Many elderly and disabled people find it easier and safer to use well designed steps than a ramp which increase travel distances due to the length of a ramp.

Blind and partially sighted people can have difficulty seeing ramps which can also lead to slips and trips.

Image 2.1.6
Melbourne West Footscray Station, Australia

2.1.6 External Ramps and Gradients

2.1.6.2 Design Considerations

Where changes in level cannot be avoided and ramps are provided, they should be designed to be as shallow as possible and have appropriate handrails and surfaces to make them safe and easy to use.

Gradients are preferable to ramps and sometimes they require less space because landings are not necessary.

Where ramps are provided there should also be a choice of stairs unless the rise is less than 300mm. There should be no fewer than 3 steps in a flight.

The total rise for any series of ramps should not exceed 2m. A lift should be provided wherever practical for a rise greater than 2m.

The shallower the gradient the easier the ramp is to use and the longer the permissible distance between level landings.

Ramps should be no less than 1500 mm wide.

Landings are required at the top and bottom of ramps a minimum of 1500mm deep, level and clear of obstructions. Drainage cross-falls should be no steeper than 1:50.

Ramps should have a suitable non-slip surfaces when wet and dry (CIRIA3 recommends that wet and dry slip resistance values of between 40 and 70 is generally safe for surfaces in stations).

For handrail design principles refer to section 3.2.4.

Wheeling ramps should be provided to make stairs accessible to cyclists. They enable cyclists to go up or down staircases without having to physically carry their bike.

Lighting should provide 150 – 200 lux at ramp level.

See also sections:

→ 3.1.3 Lighting

→ 3.2.4 Handrails

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

Safer surfaces to walk on an updated guide (T829)
CIRIA C652

Guidance on the Use of Tactile Paving Surfaces, 2015
Department for Transport

2.1.7.1 Station Entrance

Who & Why
Railway stations can be large, complex buildings and it is not always immediately obvious where the entrances are, which can be confusing particularly for people with visual or cognitive disabilities.

Under current European Legislation railway undertakings, station managers, ticket vendors and tour operators are required to provide assistance to disabled persons and persons with reduced mobility.

Station managers or any other authorised person should designate points, within and outside the railway station, at which disabled persons and persons with reduced mobility can announce their arrival and, if required, request assistance.

Image 2.1.7
Victoria Station

2.1.7 Station Entrance

2.1.7.2 Design Considerations

Routes to station entrances should be kept clear of unnecessary clutter, such as street furniture, advertising boards and bicycles racks which can create obstacles for people with vision disabilities.

Station entrances should be designed to have strong visual connections with the surrounding urban realm to aid intuitive wayfinding. This can be achieved by articulation of the building form, through lighting levels and the selection of materials such as glazed façades that provide sightlines into the station building.

The primary entrance should be accessed from the station plaza and be clearly defined with the station name and the National Rail double arrow, which is widely recognised and should be clearly visible at the station entrances.

Secondary entrances should be provide convenient access from car parks and local connections to reduce travel distances for elderly and disabled people.

Entrance thresholds are an important interface between internal and external built environment. At these points it is important that levels and materials are carefully considered to provide accessible routes. Care should be taken to provide adequate weather protection with a canopy and sufficiently sized barrier mats to prevent floor finishes becoming slippery.

Doors should be generous enough to allow groups of people to pass and those requiring personnel assistance or with guide dogs should be afforded comfortable safe access. Entrance doors should open automatically to assist people with push chairs, luggage or bicycles.

Care should be taken to understand peoples' capabilities and limitations and how these vary across the population.

Reference should be made to anthropometric data to develop ergonomics solutions for passengers with a range of disabilities and needs. The station should be easily accessible for older passengers, wheelchair users and people with heights beyond the average range.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.2.1.1 Station Facilities

Who and Why

The station concourse is a hub for both passenger movement and activities. It is the main space through which passengers enter and leave the station. It is also a crossroads for passenger routes, to and from the platform areas and onward travel facilities.

Concourses are often complex busy spaces which passengers with disabilities find difficult to navigate. Ticket barriers often provide additional complexity, dividing the concourse into paid and unpaid areas.

Careful consideration should be given to understanding the access issues that passengers face including those with cognitive, sensory and mobility disabilities. Additionally the requirements of elderly people and passengers with pushchairs, luggage and bicycles should to be understood for the end to end journey through the station.

The concourse should be a generous volume that can accommodate the maximum number of passengers and large groups of passengers waiting for travel information. It should also be a flexible inclusive environment of social and amenity facilities for passengers and local communities including shops, cafés and restaurants and un-programmed activities such as pop up retail and performance art.

Image 2.2.1
Kings Cross Station

2.2.1.2 Design Considerations

Inclusive design principles should be applied during concept design to create simple internal volumes and direct passenger routes with step free access.

Passenger routes should be overlaid with passenger facilities and operational requirements to gain a full understanding of access issues.

Intermodal connectivity should be as seamless as possible for mixed mode commuting from national rail to metro, underground systems and other modes of onward travel including bus, taxi, cycle and other modes.

Volumetric design should provide good sightlines between the station entrances, concourse and platform areas to provide an intuitive understanding of the stations facilities and passenger movement.

Passenger facilities should be conveniently located close to main circulation routes and accessible including; ticketing facilities, information points, toilets, waiting areas, shops, cafés and restaurants.

Resting points should be provided at regular intervals on main circulation routes so that passengers do not have to travel more than 25 m to find a seat.

Telephones, vending machines and seating should be grouped together off the circulation space. CIS screens and wayfinding decision points should be located to avoid obstructing circulation routes.

Dog spending areas should be provided at larger stations for guide dogs and pets traveling on the rail network.

See also sections:

→ 1.4 Socio-economic Benefits

→ 2.2.2 Passenger circulation

→ 2.8.1 Means of escape

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.2.2.1 Passenger Circulation

Who and Why
Typically, disabled and elderly people wish to travel independently like everyone else, but this group of people often find stations complex, noisy and generally stressful environments to negotiate.

The stations' concourse and its platforms form the main arterial routes through a station for arrivals and departures. The accessibility of these areas is vital to the journey experience.

People with mobility disabilities, including wheelchair users, often struggle with the long travel distances from arrival points at the station to boarding their train. Seating at regular intervals and an effective mobility assistance service can assist greatly in this respect.

People with cognitive and sensory disabilities in particularly can find it difficult to find their way within complex station environments. It can be difficult to identify signs and CIS screens from other visual clutter, such as retail advertising. Too much information on signs and generally a lack of a strategic use of signage hinders progress through a station.

People with vision disabilities find it difficult to avoid columns and other free-standing items which do not contrast tonally with their background. Crowds of people waiting at pinch-points on concourses and platforms can block routes through the station making it harder to move safely and easily around a station. The noise levels within stations, although generally unavoidable, can block out important audible information, such as public address (PA) information and add to stress levels.

Under European TSI legislation for lines on the European Network, station buildings and facilities have to comply with the 'Persons with Reduced Mobility' (PRM) requirements which are captured together with other UK legislation in the DfT Code of Practice; Accessible Design Standards for Railway Stations.

Image 2.2.2
Liverpool Street Station

2.2.2.2 Design Considerations

Access routes should be the shortest practical distance, clearly identified with signage and a minimum width of 2000mm.

There should be obstacle free routes from the car park/drop-off point to the entrances, information points, ticket sales facilities, mobility assistance points, waiting areas, WCs and platforms.

Wide span roof structures should be considered to reduce the number of columns located within the station concourse and columns should be positioned to facilitate passenger routes and avoid obstructions.

Necessary free-standing items such as columns should have adequate tonal contrast with the floor colour and the background they are seen against. They should also incorporate a 150mm wide tonally contrasting band with the bottom edge at 1500mm above the floor.

Natural daylight should be used to enhance intuitive wayfinding highlighting key decision points and vertical circulation. Signage should be used to reinforce intuitive wayfinding.

Bollards should only be used where absolutely necessary. These should be a minimum of 1000 mm high and designed to be easily identified from their background.

Where low level railings are required to protect the building fabric their impact on the effective clear width of routes, lifts and other areas should be considered. For example, rails located in lift lobbies below lift controls can block access to the controls, and rails within lifts themselves can significantly reduce the effective size of the lift.

While the use of floor based tactile way-finding systems can be considered in assisting people who are blind or partially sighted to orientate themselves and navigate large open spaces such as station concourses, other alternatives such as smartphone/ aural based wayfinding systems are also available should be evaluated .

Accessible wide ticket gates should be clearly identified with high and low level signs.

See also sections:

→ 2.2.4 Ticket gateline

→ 3.2.1 Floor finishes

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Station Planning and Design Guidelines, 2012
LUL - G371A

Premises — Stairways and Ramps
LUL - S1133

2.2.3 Ticket and Information Counters

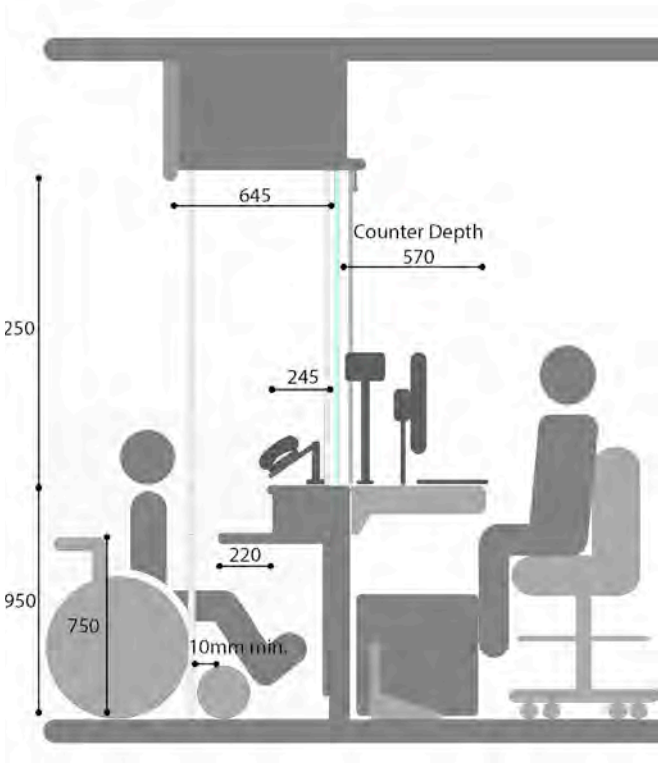


Image 2.2.3
Accessible counter

2.2.3.1 Ticket and Information Counters

Who and Why

Ticket and information counters are an important first point of contact with station staff for buying tickets, planning journeys and arranging mobility assistance.

While tickets can be purchased by a variety of methods, including on-line and from a ticket machine, these methods are not always easily accessible to disabled and older people, and contact with staff is often essential, for example, to understand the different ticket types, discounts, changes and routes. Counters should therefore be designed to assist everyone to communicate and carry out transactions with ease.

Queuing can be difficult for disabled people who cannot stand for long periods without pain or discomfort. Long snaking queues add significantly to distance to reach the counter. Some queuing barriers can be difficult to detect for people with visual disabilities. The design of the counter and the queuing system should be considered together.

Wheelchair users and other mobility aids require enough space to manoeuvre alongside the counter. Wheelchair users and people of short stature should be able to make eye contact with a member of staff behind the counter and be able to carry out transactions by card or cash with ease just as average height standing adults would expect.

The acoustics and the ambient noise level within the ticket counter area is particularly important for people with hearing disabilities to effectively communicate. An induction loop should be provided for hearing aid users. The design of the counter should also consider the needs of people who lip-read, including plain backgrounds behind the counter staff, minimising glare from natural and artificial light, and avoiding excessive reflections from glazed security screens.

2.2.3 Ticket and Information Counters

2.2.3.2 Design Considerations

The use of colour/tone, lighting and signage should be used to highlight the location of ticket and information counters.

Queuing barrier should always be detectable at floor level and consider providing perch seating or an alternative route to by-pass a queue where long queues are common.

A minimum of one counter should be accessible to wheelchair users and people of short stature in all locations. An operational procedure for staffing a single lower counter should be also established. Ideally all counters should be dual height with a knee recess.

The front edge of counters should have a slight upstand to assist people with limited manual dexterity when dealing with tickets and cash.

The acoustics of spaces such as ticket offices should be designed to be conducive to verbal communication and avoiding excessive background noise.

Ticket information screens should be in the line of sight for everyone using a ticket counter and card payment machines should always be in reach.

Ideally all counters should have induction loops and these systems should be clearly signed.

Glazed security screens should be avoided but where they are required non-reflective glass should be specified and lighting should be carefully designed to avoid glare. An amplification system should be provided in addition to an induction loop in these locations.

Counter designs should be flexible to allow for the addition of glazed screens to provide staff with some protection during a pandemic.

PA speakers should be located to provide clear undistorted announcements.

Lighting in the booking office should be no less than 100 lux.

See also sections:

→ 3.1.3 Lighting

→ 3.1.4 Acoustics

→ 3.3.4 Audio induction loops

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Fifth International Rail Human Factors Conference 2015 Inclusive design; ticket sales counters and staff sales workstation for network rail stations
Conference Paper

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.2.4 Ticket Gateline

2.2.4.1 Ticket Gateline

Who and Why
Ticket gatelines are provided in most stations for revenue protection. Where they are provided they create a barrier that can be complex to negotiate for passengers with cog-native, visual and mobility disabilities, often they may require assistance from gateline staff.

Good design involves finding the right balance for project requirements. Inclusive design is similar in this respect but at service providers we also have a duty to:

- → Remove physical features that present a barrier
- → Provide a reasonable means of avoiding the feature
- → Alter it so it no longer presents a barrier
- → Provide a reasonable alternative provision if possible
- → Provide auxiliary aids and services
- → Change policies, practices and procedures if necessary

Image 2.2.4
Accessible Gateline

2.2.4.2 Design Considerations
In the early stages of design the gateline location and setting out should be carefully considered and located to facilitate the simple movement of passengers though the gateline. Any conflicts with passenger flows including run-offs from escalators or secondary revenue activities that impede queuing should be designed out.

If ticket control machines are fitted, a minimum of one of the machines should have a free passageway with a minimum width of 900 mm and should be able to accommodate a wheelchair up to 1250 mm in length. In the case of upgrade or renewal, a minimum width of 800 mm is permitted.

There should also be a non-turnstile entry exit gate for use by persons of reduced mobility located to one side of the gateline.

Ticket readers should be specified which are accessible for passengers with vision disabilities or limited manual dexterity

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Rail Industry Standard for Automatic Ticket Gates
RIS - 7701-INS

2.2.5.1 Seating and Rest Points

Who and Why
People with mobility disabilities have requirements to rest and recover at reasonably frequent intervals, close to pedestrian routes and where passengers may be waiting, such as on platforms and concourses.

Poorly located station furniture, including seating, can obstruct circulation routes and on platforms prevent the effective deployment of ramp access to train.

Location, design and tonal contrast of the furniture with its background may affect how easily people with vision disabilities can avoid colliding with the item.

Image 2.2.5
Utrecht Station
Netherlands

2.2.5 Seating and Rest Points

2.2.5.2 Design Considerations

The seating and rest point provision should aim to provide seating for 10% of passengers waiting during peak times.

Travel distance between seats/resting points should not be more than 50m on accessible routes, platforms and where passengers are expected to wait.

Seating should be located close to general circulation routes but should avoid obstructing routes.

Clear space should be allowed, preferably at both ends of a bench, to accommodate wheelchair users or a pram. This includes the space required to manoeuvre.

Seats should contrast tonally with their background.

The seats should be detectable at a low-level by long cane users and the edges should be rounded to avoid injury if people collide with the seat.

A mix of seat heights should be available where several seats are provided in one location. The seat height should be in the range of 450 – 480mm where only one seat is provided. When there is more than one seat a range of seat heights, 450 – 480 and 580mm should be provided.

A proportion of seats with back and arm rests should be provided.

Arm rests should contrast tonally with the seat and backrest.

Arm rests should be set in 500 – 750mm from the ends of a proportion of benches to allow wheelchair users to transfer on to the bench.

Material/finish to the seats should not be highly reflective and ideally should not be cold to the touch.

See also section 3.2.6 Seating

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.2.6.1 Self-service Machines, CIS and Barriers

Who and Why
All machines intended for self-service, including ticket machines, vending machines, ATMs or self-service checkouts, should be designed to meet the requirements of a wide range of users, including disabled people. Features such as the following should be considered:

- → Location and space around the machine
- → Queuing systems
- → Height of the controls to allow access from a seated or standing position
- → Controls for limited manual dexterity and vision or hearing disabilities

Touch screens, for example, are inaccessible to many people with vision disabilities and a large proportion of card payment controls in retail units are too high for many wheelchair users to use.

Alternative methods of accessing services should also be considered, for example a fully staffed service, although this is not covered in detail here.

Image 2.2.6
Wheelchair accessible help point

2.2.6.2 Design Considerations

Self-service machines should be located away from circulation routes and thought should be given to queuing, both formal and informal queuing.

At least one self-service machine in each location should be at a suitable height for use from a seated position.

Ticket machines, where necessary for wheelchair users and people of short stature, are adjacent to the designated parking bays for disabled people and have controls between 750mm and 1200mm above the ground and a plinth which does not project in front of the face of the machine in a way that prevents its convenient use

Machines should be located on a level area with a minimum unobstructed manoeuvring space of 1500 x 1500mm, 2000 x 2000mm is preferred.

It should be possible to purchase tickets on the train or at the final destination when boarding at unstaffed stations where self-service machines are the only means of buying a ticket.

Ticket machines should offer all of the discounts available at a staffed ticket counter.

ATM's should be located where they are overlooked by passers-by to provide a degree of security.
Signs indicating the location of coin and card slots should be clearly visible on self service machines.
The overall size and height of text and symbols should meet the recommendations as discussed elsewhere in this document.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Access ATMs: UK design guidelines
CAE

2.2.7 Retail and Commercial

2.2.7.1 Retail and Commercial

Who and Why

Access to station retail, such as shops, cafés, kiosks and restaurants is taken for granted by most passengers but is often problematic for disabled people. Retail provides an important income stream for NR but the fit-out and operation of retail units is normally a tenant responsibility. As a service provider we have an obligation under the terms of the Equality Act to work with our neighbours and tenants to remove barriers to all station facilities and services.

The layout of retail displays, chair, tables and other furniture can restrict circulation within retail units for people with mobility aids, including wheelchair users. It can be difficult to carry out transactions at conventional pay counters and self-service counters for a wide range of disabled people for a number of reasons, including background noise, counter heights, circulation space around the counter and the accessibility of the digital payment systems.

Kiosk queues, cafe tables, chairs, advertising boards and display units that spill out onto station platforms and concourses can be an obstacle, particularly for people with vision disabilities, where this is not contained within a defined area. Staff training also has an important role to play in widening access to the services provided from station retail units, although this is outside the scope of this document.

Image 2.2.7
The retail 'street' at St. Pancras Station

2.2.7.2 Design Considerations

Provide a fit-out and operational manual for tenants which includes information on inclusive design and accessibility issues relevant to the station.

The extent of any queuing systems, furniture and displays on platforms and concourses should be considered carefully within the people movement strategy for the station, these should not be located within general circulation routes.

Unnecessary clutter such as free-standing advertising boards should be removed.

All cafe furniture should be grouped together next to the retail unit and contained within a hoarding at least 1000mm high which contrasts tonally with its background and is detectable at a low level with a long cane.

Where physical queuing barriers are used these should meet the same criteria as described for cafe hoardings and utilised in a manner that accommodates wheelchair users.

There should be an 1800mm space between the front of any tills and any display or queue management system.

Counters should be dual height, 760 – 860mm and 950 – 1100mm.

Induction loops should be provided at pay points in noisy locations to assist hearing aid users and induction loop signs should be provided.

Till displays should be in clear view from a seated or standing position. Card payment terminals should be in reach from a seated or standing position.

Aisles to provide a width of 1500 mm, although 1800 mm is preferred.

Displays should be located to allow people to stop and look without blocking circulation. Shelves and other projections should not extend beyond the base of display units.

Fitting rooms should be accessible to ambulant disabled people and wheelchair users.

Customer information screens should not have to compete with retail advertising boards to avoid creating visual confusion.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.3.1 Passenger Circulation

2.3.1.1 Passenger Circulation

Who and Why
With a direct interface with trains platforms can be a very hazardous environment, particularly for passengers with cognitive, sensory and mobility disabilities. The requirements of elderly passengers and those with pushchairs, luggage and bicycles should also be carefully considered.

It is important that passenger movement and activities are carefully considered and planned for to assure that routes are legible and platform operations are efficient and safe.

Platform interchange travel distance can often be challenging for frail elderly and people with reduced mobility and routes can be difficult to navigate for people with cognitive disabilities. Strategically located overbridges or underpasses and wayfinding signage that is easy to read, can help to make these connections simpler.

Image 2.3.1
A busy platform at Kings Cross Station

2.3.1 Passenger Circulation

2.3.1.2 Design Considerations

Platform layouts should be planned with inclusive design principles and accessibility in mind and to provide the most safe efficient passenger movement.

Designers should refer to Railway Group Standard GIRT7020. This document mandates requirements for the design and maintenance of station platforms for their safe interface with track and trains.

Passenger routes should be simple and direct, vertical circulation should be located where it is convenient and reduces travel distance for passengers with mobility issues.

Lifts should be located where they are convenient and accessible and given equal prominence with escalators to encourage passengers with access issues to use them.

Voids should be provided around vertical circulation to provide visual connections between levels, facilitating daylight penetration and assisting intuitive wayfinding.

Clear sightlines should be provided along the platform to aide intuitive wayfinding.

Platform edge clear widths should achieve minimum clear widths of 2.5m and aspire to achieve 3.0m from any obstacle with a length greater than 10m, such as a wall, stair or escalator.

Adequate clear widths should be maintained in areas of the platform where boarding ramps may be deployed to access trains. It should be borne in mind that the location of wheelchair user spaces varies between trains.

Platform circulation should be kept clear of localised obstructions such as structural columns and light posts that can create problems for passengers with visual disabilities.

Platform lighting should provide uniform illumination, and it is recommended that this is a minimum of 100 lux, measured horizontally at floor level, although due care should be taken to the visibility of signals for train drivers.

See also sections:

→ 2.8.1 Means of Escape

→ 3.1.3 Lighting

→ 3.3.1 Wayfinding signage

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Principles for railway health and safety, 2017
ORR

Interface between Station Platforms Trains and Tracks
GIRT7020

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.3.2 Waiting Rooms & Assisted Travel Lounges

2.3.2.1 Waiting Rooms

Who and Why
Waiting rooms and shelters are important for a wide range of rail users including parents with young children and disabled people. These facilities require sufficient space to accommodate wheelchair users and parents with double buggies and suitable seating for ambulant disabled people.

Passengers using the waiting rooms and shelters also require access to train information, including a clear view of customer information screens (CIS) and undistorted PA announcements.

2.3.2.2 Assisted Travel Lounges

Who and Why
Assisted Travel Lounges provide a welcoming waiting space for people with additional mobility and sensory needs. A dedicated team is typically on hand to help.

The lounge is highly visible and transparent, with bright multi-coloured signs to aid the visually impaired, and is located to make it easily accessible during opening hours.

Image 2.3.2
Waiting room at Huddersfield Station

2.3.2 Waiting Rooms & Assisted Travel Lounges

2.3.2.2 Design Considerations

Any waiting area or lounge should be accessible to wheelchair users with a 1000mm wide entrance and generous manoeuvring spaces of at least 1500 x 1500mm.

Waiting areas should provide a minimum of one space for a wheelchair user within the seating configuration. Suitable provision should also be made for passenger luggage and prams/push chairs.

Seating should contrast in tone with the background it is seen against.

Seats should be detectable at a low level for people with vision disabilities and their edges should be rounded to avoid injury from collisions.

Glass walls and doors should feature visible manifestation.

The PA system should provide undistorted coverage of the waiting area and it should be linked to an induction loop for the area.

Lighting inside waiting rooms should be no less than 150 lux.

See also sections:

→ 3.1.3 Lighting

→ 3.3.3 Information help points

Image 2.3.2.2
Assisted Lounge at Birmingham New St

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.3.3 Platform Canopies

2.3.3.1 Platform Canopies

Who and Why
It is important that platform environments provide a safe and comfortable environment for passengers in all weather conditions. Exposure to wind and rain can be unsafe and uncomfortable particularly for the frail elderly and people with mobility and sensory disabilities. Surfaces can become cold to the touch and slippery underfoot.

Large terminus or interchange stations often provide weather protection as part of the main roof. Smaller regional stations may often provide lightweight canopies supported off the platform structure..

Ideally weather protection should be provided along the full length of the platform, however this may not always be possible within the project constraints. For those scenarios localised shelters should be provided.

Structural columns, seating, vending machines, and advertising, should not impede movement along a platform, or restrict the passage of wheelchairs and prams.

Image 2.3.3
A columnless canopy at Groningen Station Netherlands

2.3.3 Platform Canopies

2.3.3.2 Design Considerations

Where canopies are provided at platform level great care should be taken to assure that the canopy edge oversails the train kinematic envelope sufficiently to prevent driving rain onto platform surfaces.

Canopy supports should be located where they do not form an obstruction to passenger circulation. Care should be taken with inclined supports to avoid creating a hazard for passengers with visual disabilities.

Care should be taken in the detail design of canopies to create an inclusive and accessible platform environment. Lighting, speakers, communication systems and signage should all be fully integrated into the canopy design.

Wherever possible opportunities for natural lighting should be incorporated, althrough care should be taken to minimise glare and strong reflectance from surfaces which may affect train drivers, or those sensitive to light.

Lighting levels should be consistent and there should be no sudden differences in lighting levels. Everyone takes time to adapt to brighter or darker conditions, but for people with vision disabilities this can take longer and may cause a real hazard. There should be no areas of strong shadows and higher levels of illumination are desirable for passengers with vision disabilities.

Speakers for public announcements and voice alarms should be integrated into canopies or service booms. Soffits should incorporate acoustic treatment to achieve the required rapid speech transmission index and speech intelligibility for passengers with hearing disabilities.

All canopies should be designed to provide safe access for cleaning and maintenance of drainage outlets and roof finishes.

See also section 3.1.4 Acoustics

Standards Reference

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.3.4 Platform Edge Detail

2.3.4.1 Platform Edge Detail

Who and Why
Platform edges are potentially dangerous areas for frail elderly and passengers with disabilities having a direct interface with trains. Typically there are no platform edge screens and passengers can be subject to slipstream stream forces from fast moving trains.

Many platforms do not provide level access and require auxiliary facilities on board trains or on the platform to allow wheelchair users to board or alight from trains

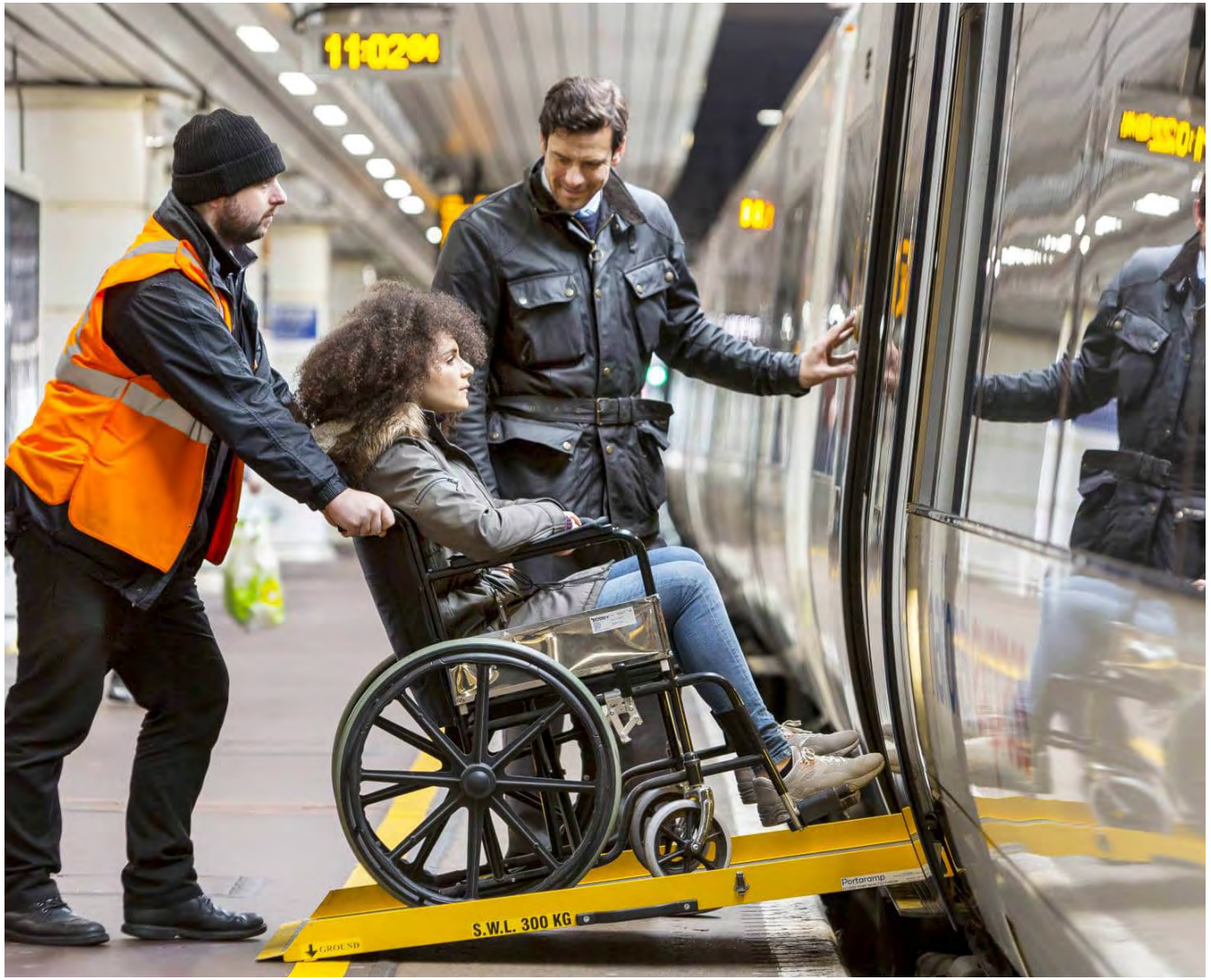


Image 2.3.4
Assisted travel wheelchair access

2.3.4 Platform Edge Detail

2.3.4.2 Design Considerations

Platform edges should incorporate visual and tactile warning materials. These should be consistent across platforms and concourses. Narrow bands and blocks of tonally contrasting colours should be avoided, since these can be perceived as steps, holes or changes in level to people with impaired vision or those with cognitive disabilities.

Platforms should slope away from the edge and provide adequate surface access drainage to avoid standing water. Finishes should be specified with adequate slip resistance to avoid slips and trips.

Where auxiliary facilities are provided on-board a train or wheelchair boards are provided for boarding or alighting the train a clear space should be provided on the platform for this activity to take place.

See also section 3.2.1 Floor finishes

2.3.4.3 Tactile Warning Surfaces

Platform edges should incorporate visual and tactile warning surfaces which start at the boundary of the danger area, furthest from the edge of the platform. These surfaces provide advance warning of the danger area to people with visual or cognitive impairment. The tactile surface should be maintained along the entire length of the platform.

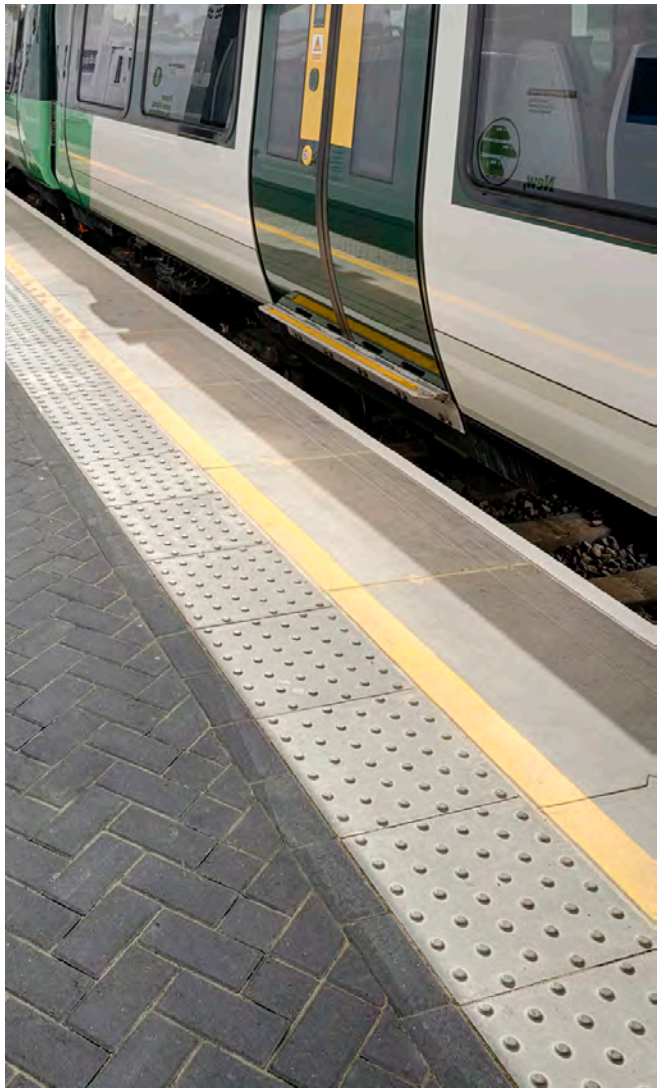


Image 2.3.5
Platform blister tactiles and visual warning line at London Bridge

Standards Reference

Interface between Station Platforms Trains and Tracks
GI/RT7016

RSSB Guidance on Station Platform Geometry
GI/GN7616

DfT Code of practice for Accessible stations

BS 6465-4

PRM TSI 4.2.1.12

2.4.1 Accessible Toilets (Independent use)

2.4.1.1 Accessible Toilets (independent use)

Who and Why
Unisex accessible toilets, baby changing facilities, gender-neutral toilets and Changing Places should all be located within close proximity to each other.

Accessible WCs are required for a wide range of people, many of whom have hidden disabilities and are not just for wheelchair users. For example, people with colostomy bags, blind and partially sighted, people who need to take medication and many more.

Many disabled and older people receive little warning of when they need to use the toilet and so having easy access to well designed, clean and accessible facilities is often a key factor in deciding whether or not to leave home.

It is important that accessible toilets are laid out prescriptively to the guidance to maximise the effectiveness of the facility in meeting the needs of the widest range of disabled people. Extra clutter, such as large bins should not be added that obstruct the use of the facility.

Accessible WCs are generally unisex to cater for people who may require assistance from someone of the opposite sex. Accessible WCs designed for independent use have an off-centre layout with a hand rinse basin which can be reached from the WC.

Image 2.4.1
Toilet cubicles with tonal contrast to aid the visually impaired at Victoria Station

2.4.1 Accessible Toilets (Independent use)

2.4.1.2 Design Considerations

Network Rail recognises that historically gender based toilet provision is not equitable. 50:50 male / female provision does not take account of females typically requiring more time to use sanitary facilities and increasingly people identify themselves as non-binary and may want to use gender neutral toilet facilities.

Single sex toilet facilities should have at least one enlarged cubicle suitable for ambulant disabled people. There should be an adequate even spread of light across the facility including within the cubicles.

Where cubicle doors open inwards it should be possible to open the door outwards in the event of an emergency. Ambulant disabled cubicle doors should open outwards and it should be possible to unlock the cubicles from the outside in the event of an emergency.

Door locks, handles, flush controls, taps and all switches and controls should be easy to operate with a clenched fist. There should be adequate tonal contrast between floor/walls and sanitary ware and the background it is viewed against. It should be possible to easily identify the cubicle doors in a row of cubicles.

The front edge of urinals should be no higher than 500mm above the floor and one urinal should be 380mm high for people of short stature, children and if the facility is accessible to a wheelchair user.

Paper towels and hand driers should be located in close proximity to the wash hand basins

Consideration should be given to providing for a convenient cleaners room as required in BS 6465-4-2010 — Section 10.2

Accessible WCs should be available during the hours when train services are provided. They should be located in logical easily accessible locations, such as near the single sex toilet facilities, near the ticket office or station entrance.

The maximum horizontal travel distance to an accessible WC should be 40m. The room should be no smaller than 1700mm wide x 2200 mm long with an outward opening door that provides a clear effective width of 900 mm.

Where there is more than one accessible WC there should be a mix of left and right transfer layouts which should be clearly identified.

The WC flush should be located on the transfer side of the WC pan.

The tap on the finger rinse basin should be close to the WC pan.

A mirror should be provided starting at 600mm above the floor. Not placed directly opposite the WC pan.

An emergency pull cord should hang close to the hand rinse basin within reach of the WC and from the floor. A reset button should be provided in reach from the WC pan.

NR Guidance Suite Reference

Public Toilets in Managed Stations Design Guidance
NR/GN/CIV/200/04

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010
BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

2.4.2 Ambulant WC Cubicle

2.4.2.3 Ambulant WC Cubicles

Who and Why
The majority of disabled people do not require a unisex accessible WC; many disabled people who are ambulant prefer to use cubicles designed for ambulant disabled people or enlarged cubicles, in single sex facilities. In addition many older people do not see themselves as being disabled but struggle to use standard WC cubicles.

Parents assisting young children and those travelling with luggage also benefit from the extra space within cubicles designed for ambulant disabled people or enlarged cubicles.

People with vision disabilities may require to be able to use whatever residual sight they have to identify where sanitary fittings and other key features are located. People with limited manual dexterity often find it difficult to dry their hands using hand dryers, especially 'blade' type dryers.

Activity space [800 x 750]

Disposal bin space [210 x 540]

Dimensions in millimetres

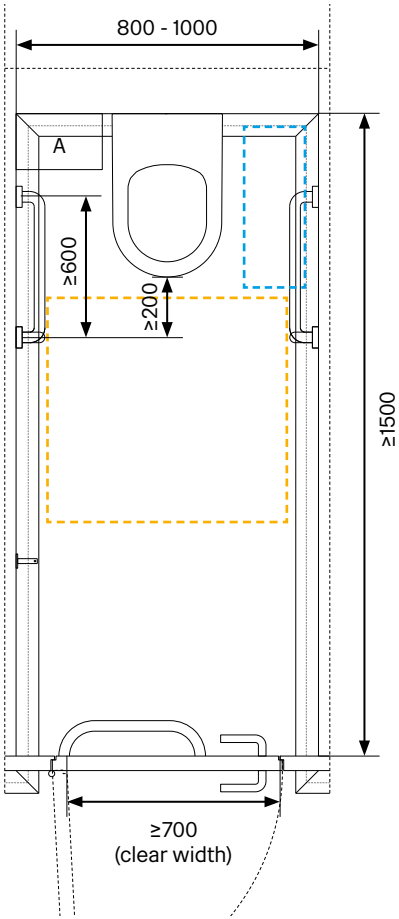


Fig. 2.4.2a Ambulant cubicle with width 800 - 1000 mm

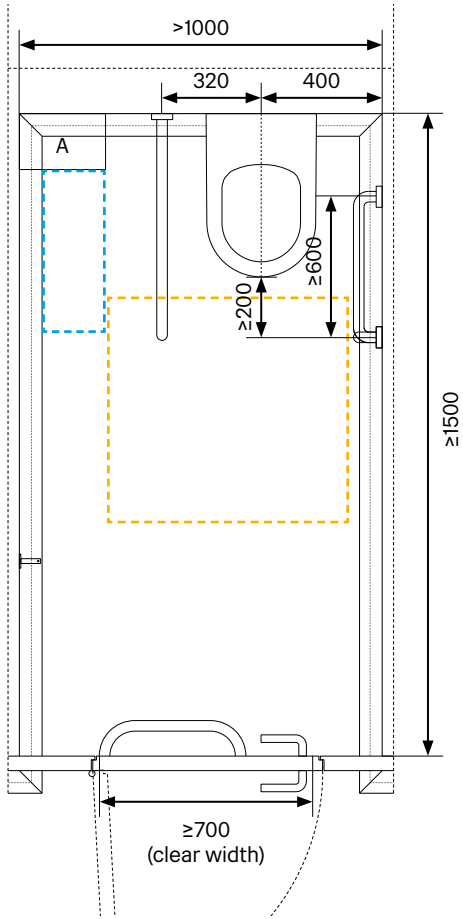


Fig. 2.4.2b- Ambulant cubicle with width >1000 mm

2.4.2 Ambulant WC Cubicle

2.4.2.4 Design Considerations:

Accessible WC compartments for people with ambulant mobility disabilities, often referred to as 'ambulant cubicles', should make up 10% of cubicles (with a minimum of one). Where more than one ambulant cubicle is provided, left and right handed doors are to be provided.

Ambulant cubicles should be a minimum of 800 mm in width, and have a minimum clearance of 750mm between the WC pan and internal door face (activity space). Doors should be outward opening with a minimum clear width of 700 mm.

Ambulant cubicles 800 mm – 1000 mm in width should be designed in accordance with Fig. 46 of BS8300-2:2018. For cubicles >1000 mm the arrangement of grab rails and WC pan should be designed in accordance with Fig. 39 of BS8300-2:2018.

The placement of ambulant cubicles should be considered as the outward opening door may affect circulation. For this reason, ambulant cubicles are often located at the end of a run of cubicles, however, proximity to the WC entrance/exit should be considered for any persons of reduced mobility.

Where WC cisterns cannot be used as a shelf, a separate shelf surface should be provided, 950 mm above finished floor level, for colostomy bag changing. The provision of a shelf should be considered against security requirements on an individual station basis.

Toilet paper dispensers should be provided in any reasonable position that does not impinge on grab rails.

Refer to NR Guidance — Public Toilets in Managed Stations for more details

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010
BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

2.4.3 Changing Places

2.4.3.1 Changing Places

Who and Why
A Changing Places (CP) toilet is specifically designed for people with complex and multiple disabilities who require assistance to use a toilet. The provision of these facilities is essential in empowering a whole group of disabled people and their families to venture out into society.

A network of these facilities is developing across the UK and they should be provided at all new Category A stations and as part of the refurbishments of major interchange stations. CP is not a replacement for a unisex accessible WC, the layout of these facilities caters for assisted use and is not designed for independent use.

Image 2.4.3
Changing Places

2.4.3 Changing Places

2.4.3.2 Design Considerations:

CP facilities should be located in an obvious location with privacy and close to a staffed area.

Ideally the CP should be close to the other sanitary facilities.

CP rooms should be a minimum of 3m x 4m with a ceiling height of 2.4m to accommodate a ceiling tracked hoist. The door should provide a minimum of 1000mm clear width.

Ceiling tracked hoist should provide access between wheelchair, WC and changing bench. The hoist should meet the requirements of BS EN ISO 10535 with a minimum safe working load of 200kg.

Provide a height adjustable wall mounted or movable adult changing bench with a safe working load of 200kg.

Large sanitary and waste disposal bins ideally should be recessed into the wall. Sanitary disposal bins should be large enough to take adult sized pads.

Height adjustable wash basin should be provided.

Peninsular WC layout should be provided to facilitate assisted use with hinged drop down support rails on both sides of the WC.

It is desirable to incorporate a shower within the facility.

Curtain or privacy screen should be included to maintain the dignity of a person using the WC.

Facilities should be heated with ventilation extraction fans that are as quiet as possible.

Lighting should provide a minimum of 300lux at changing bench level.

Alarm cords should be strategically located and placed at a height that is easily reachable for wheelchair users.

See also section 3.1 Internal Environment

Standards Reference

Changing Places: the practical guide
Changing Places Consortium

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010
BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.4.4 Baby Changing Facilities

2.4.4.1 Baby Changing Facilities

Who and Why
Accessible unisex baby-changing facilities should be provided at all stations. Where they are provided in larger busier stations they should be separate from toilet facilities to assure that the toilet is available for those who most require it.

Maternity is one of the protected characteristics covered under the Equality Act. Providing suitable facilities for baby change and breast feeding are important for parents travelling with young children. These facilities should not be incorporated within accessible WC facilities, since this can increase the waiting time for disabled people to use the facilities.

Breastfeeding mothers require a clean, relatively warm area with a degree of privacy. The breastfeeding area should be close to the baby change facility but ideally not combined with the change facility. Ideally the area should be restricted to parents and their children but this may not be possible to achieve in small stations.

Image 2.4.4
Baby changing facility

2.4.4 Baby Changing Facilities

2.4.4.2 Design considerations

Baby changing facilities should be located on an accessible routes free from obstacles, well-lit and clearly signed.

A unisex accessible baby change facility should have the following features:

Minimum 2m x 2m space large enough to accommodate a changing table, nappy bin and wheelchair access.

Sliding doors should be considered to make access easier for pushchair.

Changing table should be suitable for use from a standing or seated position and should be fixed at heights that is accessible for all (folding versions are not accessible).

Changing table should accommodate older children who wear nappies.

Drop-down seat with harness should be provided for small children.

Shelf space for belongings and cleaning materials.

Warm water, disposal bin and all surfaces should be easy to clean. Paper roll dispenser should be easy to use with one hand, for lining the table and cleaning surfaces.

There should be adequate visual contrast between the main features, equipment and controls and their background, including door handle and lock, grab rails, toilet seat, flush, taps, push buttons, wash hand basins, hand dryers and controls.

All appliance should be capable of being used by someone with limited manual dexterity.

The use of colour and finishes should be considered to create a welcoming ambience.

Enlarged toilet cubicles that incorporate a baby changing units can also be used by people who require more space and by people with luggage.

Refer to DfT CoP for more detailed design guidance.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010
BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

2.4.5 Family Toilets

2.4.5.1 Family Toilets

Who and Why
Family toilets should be provided to enable a parent or carer, young child and baby to all use the same facility.

It is also advantageous to provide baby changing facilities within separate-sex areas including family toilets and enlarged cubicles, which should be designed for the needs of a wide range of disabilities and passengers with pushchairs and luggage.

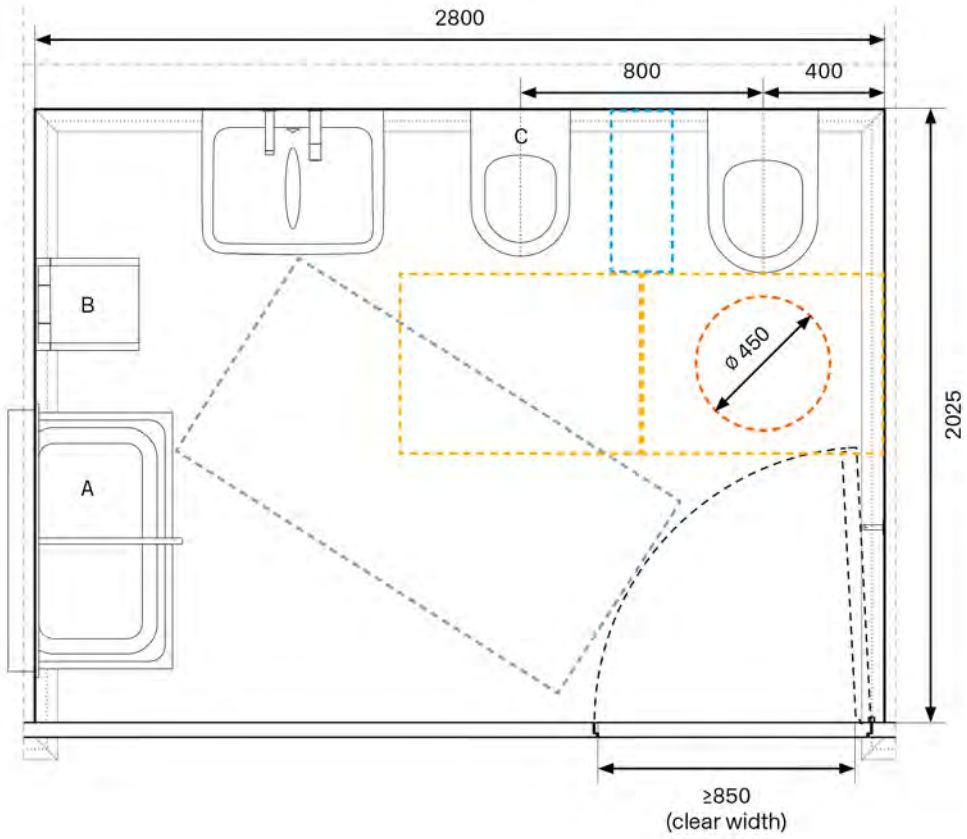


Image 2.4.5
Family toilet

2.4.5 Family Toilets

2.4.5.2 Design considerations

Family Toilets are the preferred option to provide baby-changing within separate-sex facilities, however, the space requirement for a family toilet should be carefully considered along with other demands for space.

Family toilets should contain the following facilities;

A screened WC, washbasin and baby-changing unit with adjacent toddler seat.

An additional, smaller, WC for children where space allows.

It is preferable to provide both a wall mounted toddler seat with restraints and an additional, smaller, WC pan for children where space permits.

The facility should have sufficient internal space to accommodate a double buggy

It should be accessible to people with mobility disabilities, fitted with grab rails, and an outward opening door.

Doors should provide a minimum clear width opening of 850 mm.

An alternative layout for a family toilet is shown in Figure 27 of BS 6465-2:2017.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings

Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010

BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018

BS 8300 -1 & 2: 2018

2.4.6 Multi-faith Prayer Facilities

2.4.6.1 Multi-faith Prayer Facilities

Who and Why
Network Rail are taking steps towards creating a built environment that is more supportive of people of faith by creating a Multi-Faith network, and raising awareness of religious practices.

Multi-Faith rooms assure that passengers and staff who are observing their religion can do so in a safe environment.

Prayers are said a number of times of the day by different faith groups. Men and women should often pray separately.

Some faith groups wash before prayer, so the provision of a Wudu ablution areas is important and provision should be made for disabled people. If provided it is recommended that there are separate prayer facilities for public and staff use.

Image 2.4.6
Wudu ablutions

2.4.6 Multi-faith Prayer Facilities

2.4.6.2 Design Considerations

Provide either two rooms, or a room divided into two areas with two entrances to provide facilities for single sex prayer.

The room should have a suitable degree of privacy and sound insulation. The room décor should be neutral and conducive to quiet contemplation.

The facility is likely to be used by followers of more than one faith, therefore there should be no religious symbols or images within the room.

The direction of Mecca should be indicated within the room.

The prayer facility should be close to the ablutions. The ablutions should be provided within the WC accommodation or within the staff wash facilities.

Faith wash cubicles should ideally be provided within full height compartments, rather than within cubicles with gaps at floor and ceiling level.

A wash cubicle should have the following equipment:

- → Non-fixed or fold down adjustable height seat with arm rests which includes a horizontal grab rail adjacent to the seat
- → Drop-down horizontal grab rail on the rear wall and an adjustable/detachable shower head to wash face, arms and feet
- → Sunken trough/footbath
- → Low shelf for dry storage of clothes

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Sanitary installations. Code of practice for the provision of public toilets, 2010
BS 6465-4

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2

2.5.1 Lifts and Escalators

2.5.1.1 Lifts and Escalators

Who and Why
Lifts are an essential feature for people who are unable to negotiate steps, including wheelchair users and some ambulant disabled people at changes in level greater than 2m and where there is no space to provide a suitable ramp. Lifts are also helpful for older people, families with young children and people with large pieces of luggage.

Lifts should be designed to be obvious on the approach to stairs and escalators at both the top and the bottom.

Lifts should be accessible for all users including people with mobility equipment. Through lifts with a door at each end of the lift are safer and easier to use for wheelchair user, since there is no requirement to turn around within the lift.

Escalators are useful additions to stairs and lifts but they cannot be used by wheelchair users, assistance dog users and people who lack the confidence to use them. In addition, NR encourages people with luggage to use lifts rather than escalators for safety reasons. Escalators should only supplement other methods of vertical circulation and these should be clearly signed.

Image 2.5.1
Through Lift and Escalators
London Bridge Station

2.5.1.2 Design Considerations

Lifts should be located were they are convenient and accessible and given equal prominence with escalators to encourage passengers with access issues to use them.

Lifts should be located as close as possible to stairs and escalators to provide passenger with options that are convenient to take.

It is important that lift size and clear door opening width is appropriate for the intended pedestrian flow.

Lifts should be a minimum of Type 2 design (1600mm x 1600mm) with Type 3 (2000mm x 1400mm) preferred.

All lifts should provide no less than 1100mm clear opening width.

Through lifts are preferred as they remove the requirement for wheelchair users to turn. Where this is not possible lifts should ideally be large enough for a wheelchair user to turn around within the lift and a mirror should be provided on the wall opposite the door to assist wheelchair users when reversing.

Sheltered waiting areas should be provided on platforms near lifts with seating and space for wheelchair users.

Wherever escalators are installed a clearly signposted alternative lift access should be provided.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Safety of escalators and moving walks, 2017
BS EN 115-1

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Specification for new and upgraded lifts
NR/L2/CIV/196

2.5.2.1 Internal Stairs

Who and Why
The design of stairs is very important. Poorly designed stairs can create a barrier for a large proportion of passengers including the frail elderly and those with cognitive, sensory and mobility disabilities.

Stairs should form an integral part of the main circulation system between levels of the building and as such they should be located where they are convenient and designed to be accessible.

Image 2.5.2
Victoria Station

2.5.2 Internal Stairs

2.5.2.2 Design Considerations

Staircases should have a minimum clear width of 1600mm measured between the handrails. The minimum width requirement does not take into account additional width that may be required for passenger flows.

Staircases should have clear headroom of 2300 mm over the entire width of the staircase.

A suitable warning should be provided at the top and bottom of stairs for people who are blind or partially sighted through the use of visual contrast and/or surface materials.

A corduroy hazard warning surface is only recommended for an internal stair that is directly in line with an access route.

The frictional resistance characteristic of the warning surface should be comparable with the surface used for the flooring and the stairs.

Escape stairs should be designed to the same standard as general circulation stairs, including contrasting nosings.

Steps and stairs should be well lit, without glare. It is recommended that lighting levels are designed to increase to 150-200 lux at stairs, and that the transition from lower ambient surrounding light levels should be smooth rather than sudden.

See also sections:

→ 3.1.3 Lighting

→ 3.2.4 Handrails

→ 3.2.2 Colour and tonal contrast

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.5.3.1 Internal Ramps

Who and Why
Changes in floor levels along primary circulation routes should be avoided if at all possible. Where changes in level cannot be avoided and graded routes are required they should be designed to be as shallow as possible.

Steep ramps can create trip and slip hazards and often require excessive effort for some disabled people to access independently.

Image 2.5.3
Internal concourse gradient at Avignon Station , France

2.5.3.2 Design Considerations

It is recommended that ramps slope at a consistent angle at a gradient of not more than 1:20. Ramps steeper than 1:20 can be very difficult for some people who propel their wheelchair themselves, or for those who provide assistance by pushing the chair from behind.

Ramps with a rise greater than 300mm should have alternative stairs provided.

Landings should be at least the width of the ramp (minimum 1500 mm) and at least 1500mm long clear of any door swing or other obstruction. The width of the ramp should be maintained throughout any change of direction.

A visually contrasting surface should be provided to indicate its presence, with light reflectance values (LRV) of 30 points or more.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design Standards for Accessible Railway Stations, 2015
Department for Transport

2.6.1.1 Safe Access

Who and Why
Bridges and underpasses provide important connections between platforms and between communities which would otherwise be disconnected by railway tracks. Vulnerable people can often find these environments off-putting particularly if they have high solid parapets, since these structures often create hidden areas where they cannot be seen.

Passengers with luggage are advised to use lifts rather than steps for safety reasons. Lifts should be the first choice solution for a rise of 2m or greater. Long ramps can add significantly to the travel distances and steep gradients are a barrier to many disabled people. The reliance on a single lift can make important routes vulnerable to being severed for many disabled and older people who cannot negotiate steps.

Image 2.6.1
DLR Star Lane Station

2.6.1.2 Design Considerations

The design of bridges and subways may to a large extent be driven by site conditions and constraints. When developing initial concepts designers should consider using the NR standard footbridge designs of which there are two, the Beacon and the Ribbon design. See NR Guidance for Footbridges & Subways for details.

Bridges and underpasses should be designed with safety in mind, well-lit, clear sightlines, preferably with natural surveillance from adjacent buildings and CCTV cameras provided where necessary.

Underpasses should be at least 4800 mm wide with a headroom of 3000 mm.

Bridge parapets should be designed to provide views out for people both standing and seated when health and safety requirements may allow.

When footbridge gradients exceed 1:30 handrails should be provided on both sides.

Seating and rest points should be provided on longer bridges and subways at regular intervals no more than 50 m apart.

Access via lifts, ramps and steps should be designed in accordance with the Approved Document Part K, section 2.

Stepped, slopped and ramped approaches should ideally be provided with weather protection.

Routes leading to bridges and underpasses should always be lit after dark to provide a safe environment that is suitable for people who are blind or partially sighted.

Bridges and subways should be evenly lit, to provide a minimum of 10 lux for open bridges and 100 lux for enclosed.

Image 2.6.1.1
Ribbon Bridge with inclusive waiting area and visible lift entrance.

NR Guidance Suite Reference

Footbridges & Subways
NR/GN/CIV/200/07

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part Q

Design Standards for Accessible Railway Stations, 2015
Department for Transport

Secure Stations Scheme — Guideline 8: Crime Reduction Strategy
Department for Transport

Secured by Design Principles, 2004
Association of Chief Police Officers (ACPO)

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.7.1 Offices and Control Rooms

2.7.1.1 Offices and Control Rooms

Who and Why

The Equality Act requires employers to make reasonable adjustments within the workplace when employing and retaining disabled employees. The majority of disabled people acquire their disabilities later in life through illness, accident or the ageing process. The staff who occupy an office today may not include anyone who identifies as being a disabled person, but this could change over time.

To maximise inclusion and avoid unnecessary major adjustments even factors such as, the choice of furniture, colour schemes, travel distances, the design of tea-making facilities and emergency egress should be considered as early as possible when designing new, (or refurbishing existing) office space.

Workplace environments should not only be functional they should also support the well-being of the occupants. Care should be taken to apply inclusive design principles which identify the specific needs of people with disabilities.

Image 2.7.1
Station Control Room

2.7.1.2 Design Considerations

Offices and control rooms should be designed to be operational 24/7, 365 days a year. They should be designed to be inclusive and accessible to accommodate users with different characteristics and capabilities in accordance with the 'Equalities Act 2010' and BS 8300.

Operational buildings should have lifts to all floors. A minimum of 2 lifts should be provided for the building to allow for some contingency during a breakdown.

There should be access controlled lifts near to the operating floor.

The lift location should take into account the circulation layout to provide easy access to all parts of the floor.

Each control room project should appoint a project lead for ergonomics who should coordinate liaison with operations and maintenance representatives.

An Ergonomics Integration Manager should instruct personnel to conduct analysis to develop specific ergonomic room layout requirements.

The operating floor design should require interface activities with end-user representatives from a Route Working Group and key stakeholders.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

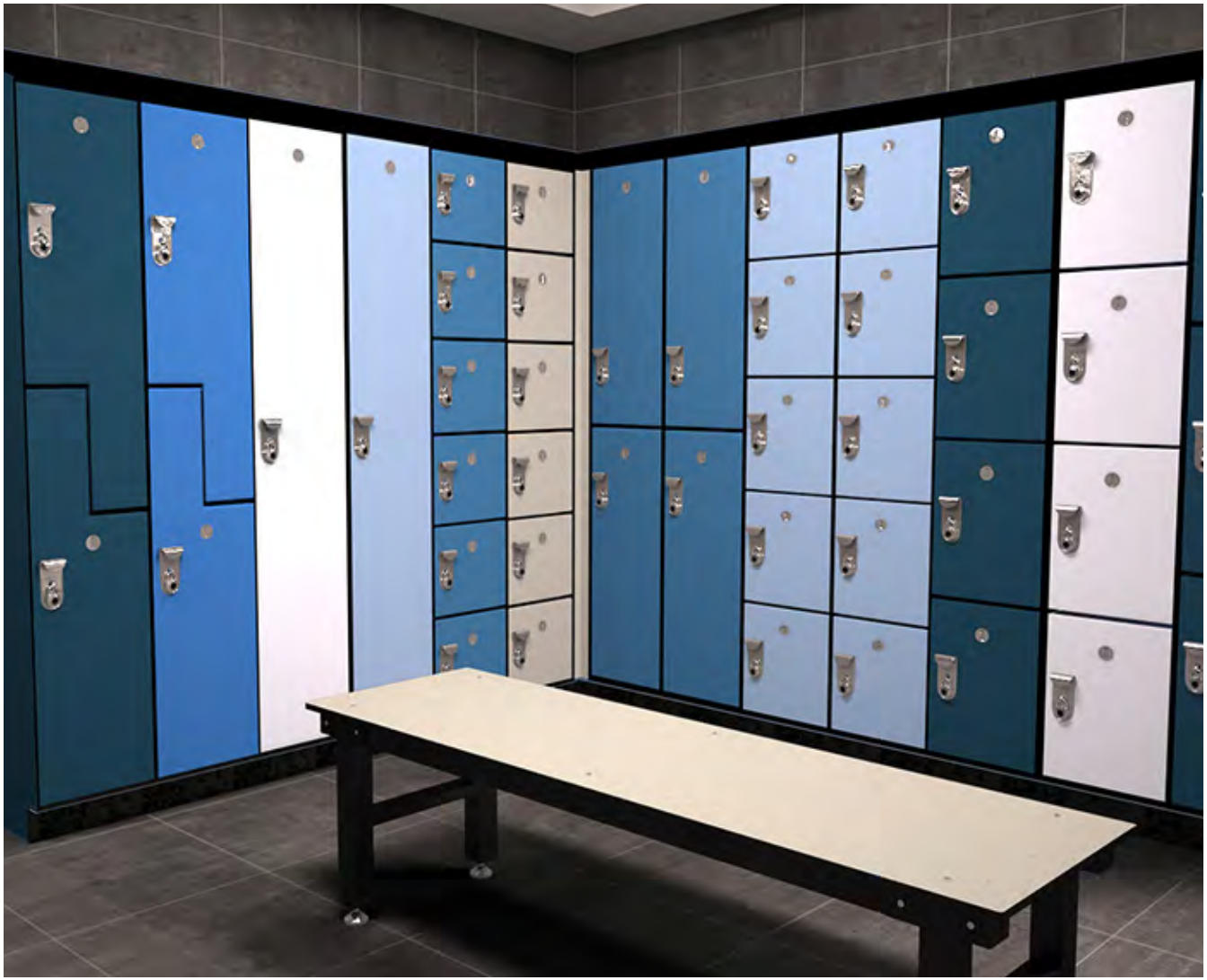
IWELL v2 Building Standard
International WELL Building Institute Standards

Incorporating Ergonomics Guidance Note
NR/E/G/00027

Specification for Rail Operating Centres
NR/L2/OPS/253

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

2.7.2 Staff Changing Facilities



2.7.2.1 Staff Changing Facilities

Who and Why
It is important that staff performing certain roles have access to suitable change facilities. The changing facility may require associated WC's, showers and lockers as well as a room to change in depending on the circumstances. Provision should be made for disabled and non-disabled members of staff with a minimum of one separate unisex accessible facility.

The design and quality of accessible changing facilities should be of a similar standard to all other changing facilities.

Image 2.7.2
Staff changing facility

2.7.2.2 Design Considerations

Confirm there is sufficient manoeuvring space clear of any door swing or obstruction of at least 1500 mm^2 within any changing or shower area.

Direct access between changing and shower area.

Space to allow a wheelchair user to transfer to a shower seat.

Benches should have a depth of 500mm and a height in the range of 450 – 475 mm.

Coat hooks at 1050 and 1400 mm above the floor.

Mirrors at a height range for standing and seated users.

Any water for hand washing/showering should be no hotter than 43°C at outlet.

A shower seat and a drying seat should be provided. Adjustable height shower heads should be provided for those seated in shower areas.

There should be no upstand between the dry and wet area within accessible shower rooms.

Where there is a bank of lockers it should be possible to readily identify individual lockers by colour and tone.

Locks should be located within the height range of 750 – 1000mm above the floor for accessible lockers.

A DIA should be undertaken when determining the number of WC cubicles to assigned to male and female toilets.

See also section 2.4 Toilets, Family and Prayer Rooms

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Design of an Accessible and Inclusive Built Environment .External & Buildings, 2018
BS 8300 -1 & 2: 2018

Accessible Facilities
Sports England

2.8.1.1 Means of Escape

Who and Why
In the event of a fire and station evacuation the elderly and people with disabilities are some of the most vulnerable people.

It is important that when developing fire and life safety strategy that due care and attention is given for inclusive design principles and the safe evacuation of all passengers and staff with reduced mobility and other sensory disabilities.

The fire strategy should be integral to the architectural concept. Means of escape should enabled using the lifts, escalators, stairs and protected routes, supported by fire protection systems to facilitate egress.

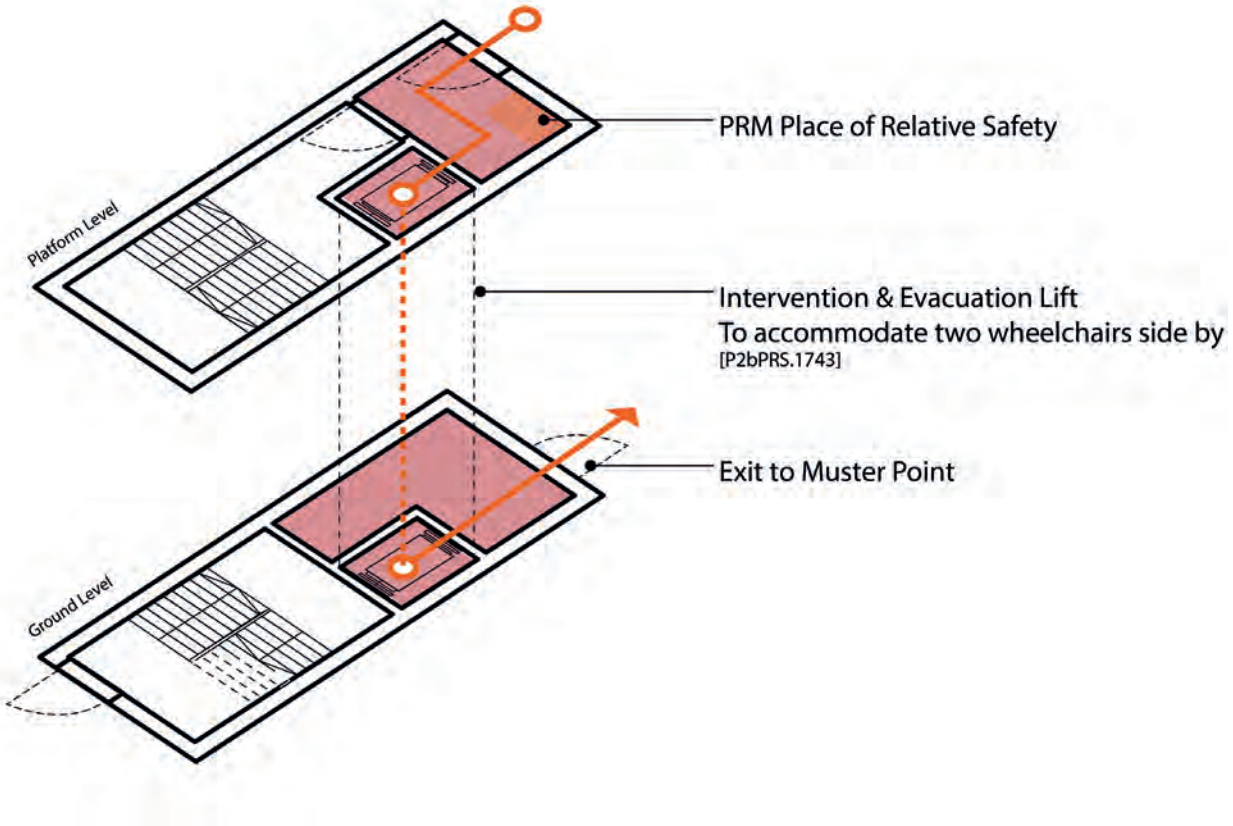


Image 2.8.1
Evacuation lift and stair

2.8.1.2 Design Considerations

The fire strategy design should enable the safe evacuation of people with disabilities. Manned stations this may provide managed evacuation by trained staff. Staff may be trained in the use of evacuation chairs though self evacuation is preferred

People with reduced mobility should be able to evacuate without the requirement for assistance using lifts, escalators and stairs. Escape routes should be provide with suitable levels of fire protection, back up power supplies and emergency call points for person waiting for assistance to speak directly with personnel in control of the evacuation.

Places of relative safety should be provided for people who can't self evacuate. These should be both separated from a fire/smoke by a fire-resisting construction and provided with a safe route to a storey exit.

Minimum escape distance and egress times for evacuation are key metrics for the fire strategy and inform the station planning and the location of fire fighter cores and escape routes.

Smoke from either a train or baggage fires may require to be dispersed either by mechanical ventilation or natural ventilation openings in platform canopies to enable the safe evacuation of passengers and staff.

Emergency egress requirements from support accommodation areas should provide audio alarm systems that incorporate flashing lights/beacons for those with hearing or sight disabilities.

Conventional passenger lifts should be used as part of the evacuation strategy for people with disability that require assistance. Specify appropriate structural, electrical and fire protection so that the lift is capable of being taken under control by a trained and authorized person.

Managed evacuation strategies should be developed for disabled people that are unable to use stairs, but also people with sensory disabilities or who are neurodivergent issues.

All escape routes to be clearly signed, including routes to refuges and muster points.

Standards Reference

The Building Regulations 2010: Fire Safety
Approved Document B

Fire precautions in the design, construction and use of buildings — Part 8: Code of practice for means of escape for disabled people
BS 5588-8

Application of fire safety engineering principles to the design of building, 2019
BS 7974

Fire Safety in design, management and use of building, 2008
BS 9999

Fire Safety in design, management and use of rail infrastructure 2020
BS 9992:2020


EUROSTAR
4008


16:22
Vlaardingen Centrum
Sprinter
Volgende trein: 16:31 SPR Hoek v H Haven
16:18
Venlo
Intercity
via Dordrecht, Breda, Tilburg, Eindhoven
Volgende trein: 16:12 T Breda +20 minuten
3b
4b


Help Point
1:53 Hornsby
via Central
Riverstone
Schofields
Quakers Hill
Marayong
Emergency
Push
Information
Push


LONDON BRIDGE


Turn Right
30m
Big PM Dept

3

Common Design Elements

3.1.1.1 Air quality

Who and Why
Breathing air that is polluted or carries airborne diseases is increasingly a problem for public health and in particular for people with breathing disabilities and elderly people with long term illness that make breathing difficult.

Within the context of enclosed and often crowded railway stations passengers and staff can be exposed to poor air quality from diesel train exhaust and from airborne metal particles from brake linings and friction between wheels and rails.

Enclosed railway stations where ventilation is inadequate could have consequences for public and occupational health.

It is also important to control air quality for indoor environments replenishing used oxygen and removing carbon dioxide. It is equally important to limit the amount of indoor- sourced pollutants through the design and specification of material and systems and out-door sourced pollutants through ventilation and air filtration systems.

All new construction and major refurbishment schemes should comply with relevant industry standards for a healthy internal environmental through the specification and installation of appropriate ventilation, equipment and finishes.

Image 3.1.1
NR offices Baskerville House

3.1.1.2 Design Considerations

Ensure that enclosed platform areas have adequate ventilation through natural or mechanical means, including roof vents and cross ventilation.

Carefully consider material specifications to avoid volatile organic compounds, combustion by-products and airborne particulate matter which are known to trigger nausea, headaches, asthma, respiratory irritations and allergies.

Mechanical ventilation systems should provide high quality air through the filtration of pollutants. Reduce indoor exposure to particulate matter from source outside the building. Particulate filters are an effective measure for reducing allergic respiratory and cardiovascular disease.

When local conditions and weather support high air quality then design for the use of natural ventilation strategies and operable windows should be adopted. Natural ventilated buildings have fewer incidents of sick building syndrome and support occupant health and well-being.

Internal Environment

	Human Factors	Health Risk
Air Quality	*Fresh Air Levels*	*Air Pollution*
Thermal Comfort	*Air Temperature*	*Thermal Stress*
Lighting	*Lighting Levels*	*Poor Visibility*
Acoustics	*Audibility Orientation*	*Noise Exposure*

Standards Reference

The Building Regulations 2010: Ventilation
Approved Document Part F

WELL v2 Building Standard
International WELL Building Institute Standards

Indoor environmental input parameters for design and assessment of energy performance of buildings, 2007
BS EN 15251

3.1.2.1 Thermal Comfort

Who and Why
It is important that all passengers and staff feel comfortable in our built environment. The sensation of feeling too hot or too cold can be a problem for many people, particularly those with physical disabilities and frail elderly who often find it difficult to cope with extremes of temperature which can affect them both physically and mentally.

Within our estate we have a wide range of environments including; station concourses, platforms, offices, control rooms and maintenance facilities. Many are exposed to ambient air temperature and weather conditions such as platform areas for which comfortable waiting rooms should be provided.

Within our workplace environments including; offices, control rooms, depots, maintenance sheds etc. thermal comfort has a large impact on the way people experience their jobs, productivity and overall health and well-being

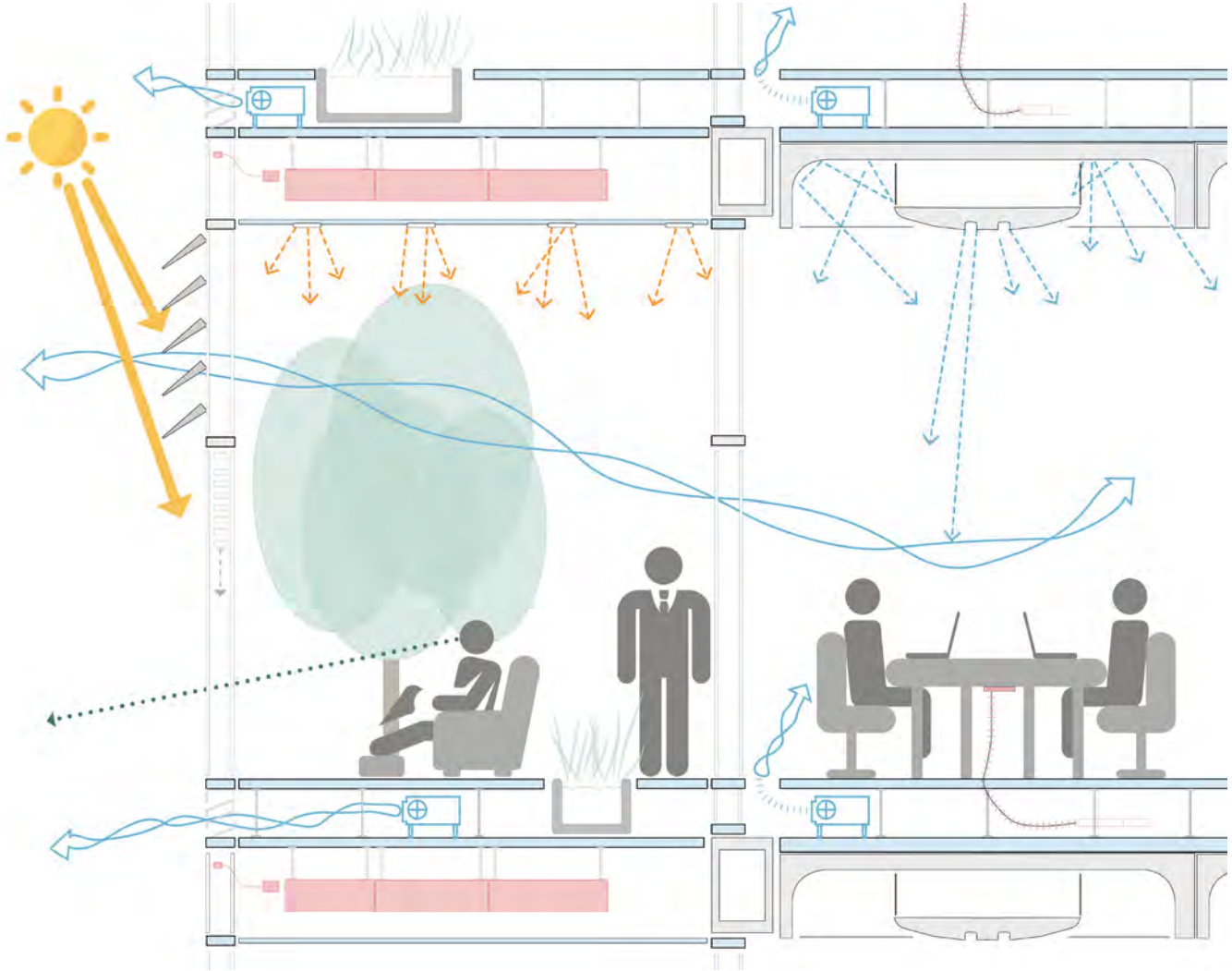


Image 3.1.2
Thermal comfort concept

3.1.2.2 Design Considerations

Thermal comfort is dependent on more than just air temperature, the following criteria should be carefully considered in the design:

- → Air speed
- → Temperature
- → Thermal radiation
- → Relative humidity

Consideration should also be given to the activities and clothing that are likely to be worn in each environment, for example in public areas of a station passengers may dressed for the ambient air temperature, so there should be no requirement to heat these spaces, but waiting areas should be provided for passengers that require them with heating and cooling systems.

Within workplace environments such as operations support accommodation single thermal conditions may not suite everyone. This is due to variations in people's metabolism, clothing and temperature preferences. The only way to address this issue is to provide individual control of the thermal environment, however this may not be achievable within the project requirements.

Designer should assure that appropriate thermal comfort levels are achieved according to current CIBSE technical guidance.

NR Guidance Suite Reference

Workplace DNA
NR/GN/CIV/400/05

Standards Reference

The Building Regulations 2010: Conservation of fuel and power
Approved Document Part F

WELL v2 Building Standard
International WELL Building Institute Standards

Indoor environmental input parameters for design and assessment of energy performance of buildings, 2007
BS EN 15251

AM 11 Building Energy and Environmental Modelling
CIBSE

3.1.3.1 Lighting

Who and Why
All passengers and staff requires adequate light levels to use stations easily and safely but people with sensory disabilities are more adversely affected by inadequate lighting.

People with vision disabilities require an adequate even spread of light to maximise the use of their residual sight to read and navigate within environments. Their eyes also take longer to adjust to changes in light levels, hence the requirement for an even spread of light. Low and very high light levels can reduce the definition between contrasting colours and high light levels can cause glare which is particularly problematic to people with vision disabilities and people who lip-read. People who lip-read require adequate light to read lip movements and facial expressions.

Light is required on the horizontal plane to illuminate routes, steps and ramps as well as on the vertical plane to illuminate features such as entrances, signage and peoples' faces. The latter is important for security and gives a feeling of safety.

Reflective surfaces can be problematic for people with vision disabilities, since they can create glare and give the illusion of steps or other features which can be disorientating.

Artificial lighting can be required during the day as well as during the hours of darkness to maintain suitable levels of illuminance. The colour rendering quality of the light is particularly important for people with vision disabilities in order to distinguish between colours, daylight is the best quality of light and low-pressure sodium and coloured light should be avoided.

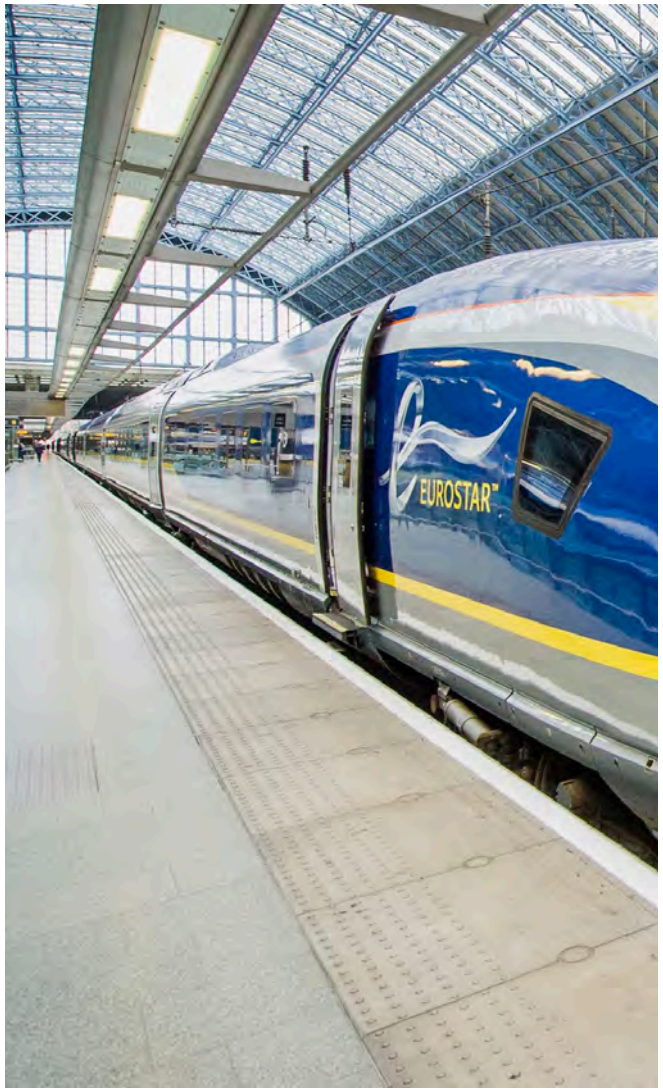


Image 3.1.3
Platform edge lighting
St. Pancras Station

3.1.3.2 Design Considerations

Particular attention should be paid to main circulation routes, entrance/exit points and places where people may be expected to interact with others.

Artificial lighting systems should be designed to maintain a level of illumination that is comfortable and provides a safe environment that is suitable for people who are blind or partially sighted

Artificial lighting for main circulation routes including platforms should be designed to achieve an illuminance at floor level of at least 100 lux measured horizontally at floor level, although due care should be taken to the visibility of signals for train drivers.

Transitional lighting should be considered for areas such as entrance lobbies where there are changes in illumination levels between inside and outside buildings.

Both natural and artificial light should be controlled to avoid glare. confusing reflections, pools of bright light and strong shadows

Solar film or other methods of controlling glare should be provided on south facing external glazing particularly on staircases and circulation routes

External glazing particularly on staircases and circulation routes. Ticket counters and staffed information points should not back onto lighting features or large areas of external glazing, since lip-readers may find it harder to read the faces of staff.

Artificial light should be as close to daylight as possible.

The illuminance on interior surfaces, the quality of the lighting, good colour rendering and the avoidance of glare are key factors to be considered.

Activities that involve reading or operating equipment may require higher illuminance levels or dedicated task lighting.

Standards Reference

Rail Industry Standard for Lighting at Stations
NR - RIS-7702-INS

Lighting applications. Emergency lighting, 2013
BS EN 1838

SLL Lighting Handbook, 2018
CIBSE

WELL v2 Building Standard
International WELL Building Institute Standards

Image 3.1.4
Acoustic ceiling
LUL London Bridge Station

3.1.4.1 Acoustics

Who and Why
A good acoustic environment is essential for hearing-impaired people to be able to communicate and move around buildings

It is important to understand the challenges that people with hearing disabilities face when navigating a busy railway station and to make suitable provision for addressing them within the design process.

Poor acoustics make it difficult to hear public announcements and can be disorientating for everyone but particularly for those with hearing disabilities. Environments that are too reverberant and noisy can lead to sensory overload.

3.1.4.2 Design Considerations

Echoes can be confusing and therefore should be eliminated wherever possible. The spatial qualities of noisy areas, for example restaurants, should minimise echo and reverberated sound.

Designers should avoid specifying too many hard surfaces in areas where audio communication is important and provide adequate sound insulation incorporated into the finishes to minimise, sound reverberation and intrusive noise, both from outside and within the building.

Acoustic characteristics should be developed for each space and materials specification to achieve the desired outcome.

Areas of communication should acoustically isolated from other areas or building functions that generate large amounts of noise. Barriers, sound absorbent surfaces or buffer zones should be used to contain high levels of noise. A combination of horizontal and vertical absorbers may assist in achieving better reverberation than using only one of the two.

Areas that have distinctive acoustic qualities can be more easily interpreted and memorised, by partially sighted and blind people helping them to navigate the building.

A strategic and consistent use of different floor surfaces can create subtle but helpful sound contrasts and can indicate, for example, circulation routes, seating areas, different function areas.
Designers should develop strategies for assistive listening systems and their placement. Understand the acoustic characteristics of each space and develop an integrated design proposal in the early stages of design.

Assistive listening such as induction loop systems should be installed in rooms and spaces designed for meetings and customer service or reception counters.

Where public address systems are installed near counters or reception desks, suitable ceiling, wall and floor materials should contribute to an acoustic environment that helps orientation and enables the information to be clearly heard.

Standards Reference

Acoustics — Measurement of room acoustic parameters — Part 1: Performance spaces, 2009
ISO 3382-1

Sound systems equipment Part 16: Objective rating of speech intelligibility by speech transmission index
BS EN 60268-16

Design of an accessible and inclusive built environment. External & Buildings.
BS 8300-1 & 2: 2018

WELL v2 Building Standard
International WELL Building Institute Standards

3.2.1.1 Floor Finishes

Who and Why
Stations are one of the most demanding environments for floor finishes due to high passenger footfall. The design and specification should be robust and durable, with materials like terrazzo or natural stone typically able to provide suitable characteristics.

Floor finishes should be designed with passenger safety in mind. They should provide adequate slip resistant and incorporate tactile and visually contrasting surfaces to indicate the presence of steps, ramps and level changes. Injuries to passengers resulting from slips, trips and falls are a serious issue with the potential to generate both claims and reputational damage to NR and train operator companies (TOC's).

Changes in level generally cause problems for many disabled people, particularly people with mobility or visual disabilities. Even a single step can prevent access for someone who has mobility impairment and can present a trip hazard. With large numbers of people moving through our stations it is important to assure that everyone can do so safely.

Image 3.2.1
Tactile flooring

3.2.1.2 Design Considerations

In the early stages of station planning care should be taken to establish finished floor levels that provide step free access from station set down area to platform.

Hard floor finishes in public areas should be robust, durable and designed for a minimum life without replacement or maintenance of 20 years. Specification should confirm that a minimum slip resistance value of 40 SRV is achieved.

Care should be taken to achieve the right balance between slip resistance and ease of cleaning. Generally, the higher the slip resistance value, the more difficult the product is to clean as the surface is inevitably rougher which has a detrimental effect on the floors operational life.

Barrier matting should be provided to entrance points ensuring that floors remain dry and slip resistant.

Mat wells should be designed so that that matting is firm, fixed and flush with surrounding levels to avoid creating a trip hazard.

Matting and carpets should have a shallow, dense, non-directional pile.

High gloss finishes should not be specified as they can appear wet and therefore 'slippery.' They can also cause reflective glare which can be a problem for everyone but particularly for partially sighted people. Specifications should confirm that light reflectance values (LRV) comply with BS8493:2008+A1:2010.

Strong patterns should not be avoided as they can cause confusion for people with visual disabilities and dementia.

Attention should be given to flooring details at changes in level ensuring that they are

Tactile markings can assist people who are blind or partially sighted to avoid hazards and navigate large open spaces. For more details refer to DfT Guidance on the use of tactile paving surfaces.

Designers should confirm that they comply with current guidance and standards and provide adequate visual contrast in terms of light reflectance value (LRV).

Standards Reference

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Interim changes to the guidance on the use of tactile paving surfaces
Department for Transport

Guidance on the planning and management of station flooring in public areas
BLDG-SP80-001

3.2.2 Colour and Tonal Contrast

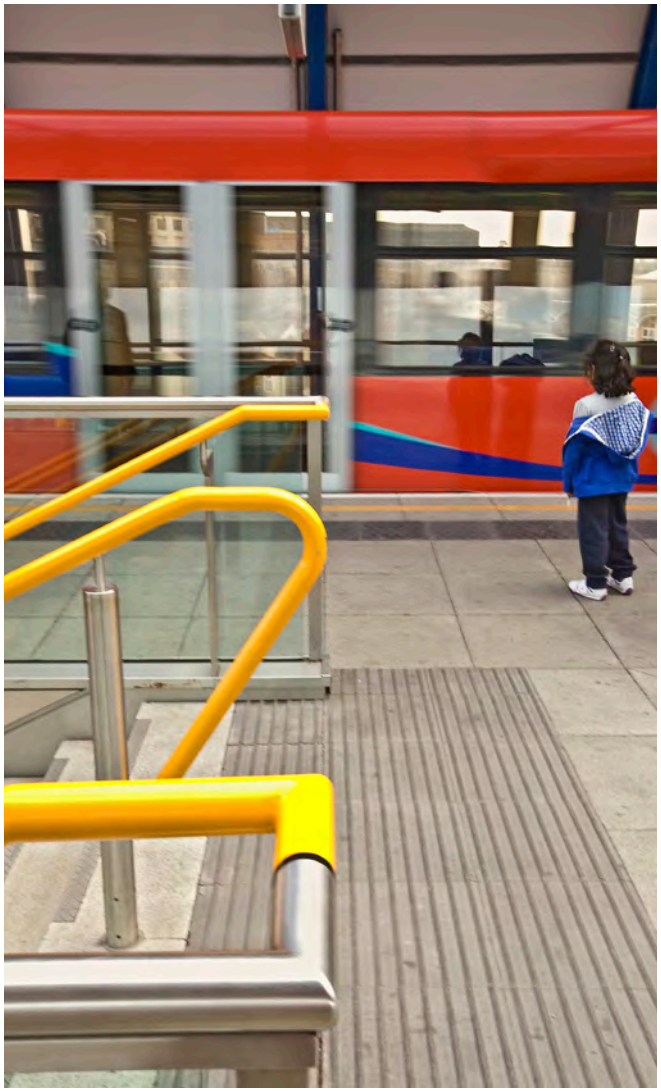


Image 3.2.2
Tonal contrast paving
DLR London City Airport Station

3.2.2.1 Colour and Tonal Contrast

Who and Why

To make an environment inclusive to a wider group of people it is important to consider more than just the layout and physical features. Lighting and the choice of the colour and tone of adjacent materials are necessary to how people with vision disabilities interact with spaces and how confident, safe and secure they feel in moving through an environment.

Appropriate use of colour and tonal contrast greatly assists people with vision disabilities and should not add to the cost of a new build or refurbishment project. The lack of tonal contrast or poor use of colour can be as equally disabling to people with vision disabilities as a flight of steps is to a wheelchair user.

The difference in light reflectance between colours, i.e. the difference in light and dark or tonal contrast, is more recognisable to people with vision disabilities than necessarily the difference between the colours themselves. For example, yellow and black are not necessarily more distinguishable combinations that white and dark blue.

Colour schemes should be chosen that provide a luminance contrast between 'critical surfaces' — between floor and walls, doors and walls, ceiling and walls and between important features such as door handles, contrasting bands on columns and sanitary ware and their background.

To establish the appropriate colour pallet of materials for a space the Light Reflectance Value (LRV) of a material colour may be available from the manufacture within the quoted colour notation, such as a RAL or BS number. Black and white photographs can be helpful, as a rule-of-thumb, to demonstrate the luminance contrast between natural materials such as wood and stone.

When spaces and places are designed with adequate tonal contrast it can increase a person with vision disabilities sense of well-being, maximise their ability to move around a space independently and reduce the effort required. Care should be taken to maintain adequate tonal contrast between adjacent surfaces when redecorating or rebranding a station. For example, when a TOC changes livery colours.

3.2.2 Colour and Tonal Contrast

3.2.2.2 Design Considerations

Use light reflectance values (LRV) to determine the correct levels of contrast. Absolute black has a value of 0 with absolute white a value of 100.

- → LRV of a wall should be 30 points different to that of the adjoining floor or ceiling
- → Doors should contrast with the adjoining surface
- → Pay attention to important features
- → Sanitary ware/wall colours
- → Stair nosings/ treads and risers
- → Handrails/wall or balustrade
- → Door furniture/door and door edge/door
- → Switches and controls/wall

The surface should be a matt finish or low sheen to avoid reflective glare. Floors should not have a reflective surface. When light reflects from it, it can be perceived by some that the surface is slippery.

Large areas of uninterrupted glazing should have manifestation (permanent marking) at two heights and in two tonally contrasting colours contrasting with the background on either side of the glass. Refer to Approved Document Part K for detailed requirements.

The use of busy high contrast geometric patterns should not be used, since this can be disorientating to people with cognitive disabilities, people who walk with crutches or sticks who should focus on placing their feet, as well as those with impaired vision. The use of contrasting bands or areas of dark against light can be perceived as a change in level or a hole and should be avoided.

Standards Reference

The Building Regulations 2010: Conservation of fuel and power
Approved Document Part F

Design standards for accessible railway, 2015
Department for Transport

Project Rainbow Research
Reading University & RNIB

Building construction — Accessibility and usability of the built environment
ISO 21542

Protection from falling, collision and impact
Approved Document Part K

3.2.3.1 Doors and ironmongery

Who and Why
Doors can present a barrier to many building users and should only be provided where absolutely necessary. Finding a door within a wall or entrance facade is particularly difficult for people with vision disabilities. Therefore, there should always be adequate tonal contrast to identify a doorway from the surrounding walls. The clear opening width and the force required to open a door are important factors in determining who can use a door independently.

Sliding automatic doors are the only truly inclusive type of door. Revolving doors exclude many disabled people, including assistance dog users and hinder parents with children and people with luggage, even when combined with an associated pass door results in a less than inclusive solution.

Hinged/swing doors can require significant strength and manual dexterity to open. The space around this type of door can have an impact on how easy and safe these doors are to use. Wheelchair users and people with other mobility aids may find it difficult or impossible to use this type of door if there is no space on the leading edge of the door or if lobbies are too small to accommodate them clear of the door swing. The latter is also true for parents with pushchairs and people with luggage. The leading edges of doors can present a hazard, particularly for people with vision disabilities.

Image 3.2.3
Colour and tonal contrast

3.2.3 Doors and ironmongery

3.2.3.2 Design Considerations

Doors should be readily identifiable from the surrounding surfaces with a minimum of 30 points luminance/tonal difference from the adjoining surfaces.

Glazed doors and screens with large areas of uninterrupted glazing require manifestation at two heights with two tonally contrasting colours that contrast with the background on either side of the door. Refer to Approved Document Part K for detailed requirements.

Vision panels should be provided in doors in regular use, (unless for reasons of security, privacy or functionality) and these should start at 500mm above the floor and extend upwards for at least 1000mm.

Entrance doors and lobby doors associated with entrances should provide a minimum clear width of 1000mm.

Internal doors should provide a minimum of 900mm and double leaf doors at least one leaf should meet this requirement.

A minimum clear space of 300mm should be provided between the latch side of the door and the nearest obstacle to both the push and pull side of the door.

Doors should provide a maximum opening force of no more than 30N on the leading edge, which can be difficult to achieve on entrance doors. Therefore, automation should be considered.

Door furniture should contrast tonally with the door with a minimum of 15 points LRV difference between the two.

Door thresholds should be level and i should be possible to open a door using a clenched fist from a seated or standing position.

Lobbies between doors should be avoided where possible and where required they should be large enough for everyone to clear one door before opening another.

Doors on obstacle-free routes, footbridges and subways should ideally provide a 1600mm clear width opening.

Standards Reference

The Building Regulations 2010: Conservation of fuel and power
Approved Document Part F

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Design standards for accessible railway, 2015
Department for Transport

Inclusive Mobility — Access to Pedestrian and Transport Infrastructure
Department for Transport

Protection from falling, collision and impact
Approved Document Part K

3.2.4.1 Handrails

Who and Why
Steps and ramps are difficult to negotiate for many disabled and older people. Handrails make it safer and easier for this group of people to negotiate changes in level. Many use handrails for balance or support. Blind and partially sighted people use handrails to identify where changes in level begin and end.

Care should be taken in the detail design to apply a consistent and high quality approach ensuring that handrails inside and outside the station building.

Image 3.2.4
Accessible handrails
Victoria Station

3.2.4 Handrails

3.2.4.2 Design Considerations

Handrails should be provided on both sides of steps and ramps, since many disabled and older people require to use a particular hand when ascending or descending a change in level. The rail should be continuous for the full length of the stair or ramp. Where there are central handrails these should break at landings.

Handrails should contrast tonally with their background they are seen against to assist people with vision disabilities.

Handrails should be round or oval in profile and comfortable to grip with adequate slip resistance.

Support brackets should not interfere with the gripping surface and there should be adequate space between the handrail and the wall.

Handrails should be fixed at 900 – 1000mm above the surface of the ramp or pitch line of the stair. At landings the handrail should be at 900 – 1100mm above the finished surface.

Additional lower handrails at 600mm can be provided only if there is full-height structural guarding to prevent falling.

Ends of the handrails should project horizontally beyond the top and bottom of the steps/ramp by at least 300mm.

Ends of the handrails should be designed to prevent bags or clothing being caught.

Handrails should be capable of supporting the full load of users.

Handrail should not be excessively cold or hot to touch, since people with arthritis and poor circulation can find cold surfaces painful to touch.

Surface finish should be matt to avoid glare.

Stairs and ramps wider than 4000mm an additional central handrail is recommended.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

Fifth International Rail Human Factors Conference 2015 — Inclusive design; ticket sales counters and staff sales workstation for network rail stations
BS 8300 -1 & 2 : 2018

3.2.5 Glazed Screens and Balustrades

3.2.5.1 Glazed Screens and Balustrades

Who and Why
Typically glazed screens and balustrades are specified in station environments to provide create clear sightlines which aide intuitive wayfinding and aide security surveillance.

Poorly designed glazed screens and balustrades can be a hazard for many passengers' particularly those with cognitive disabilities and visual disabilities. They can be hard to see and create glare from the sun and reflections from artificial lighting.

Image 3.2.5
Visual contrast manifestations St Pancras Station

3.2.5 Glazed Screens and Balustrades

3.2.5.2 Design Considerations

Glazed screens and balustrades should be clearly identified with permanent visually contrasting manifestations within two zones, between 850mm and 1000mm and between 1400mm and 1600mm above floor level

Manifestation should provide visual contrast with the surface behind it in all light conditions and may typically take the form of a continuous or broken line or logo patterning on the glass. The design should be consistent across the network.

If glazed screens have fully glazed frameless doors they should be clearly identifiable on the approach from both sides. Care should be taken to assure that the design of the doors is such conditions is visually distinguished from the adjacent glazing.

Edges of a glass doors should be clearly visible when the door is open.

Standards Reference

Protection from falling, collision and impact
Approved Document Part K

Fifth International Rail Human Factors Conference 2015 — Inclusive design; ticket sales counters and staff sales workstation for network rail stations
BS 8300 -1 & 2 : 2018

3.2.6.1 Seating and Rest Points

Who and Why

Mobility ranges vary greatly between disabled people and can be greatly affected by topography and the weather. People with mobility disabilities require to rest and recover at reasonably frequent intervals, close to pedestrian routes and where passengers may be waiting, such as on platforms and concourses.

Poorly located station furniture, including seating can obstruct routes and prevent the effective deployment of ramps between train and platform. The location, design and contrast between the colour and tone of the furniture and its background may affect how easily people with vision disabilities can avoid colliding with the item.

Image 3.2.6
Passenger seating

3.2.6 Seating and Rest Points

3.2.6.2 Design Considerations

Travel distance between seats/resting points should not be more than 50m on routes, platforms and where passengers are expected to wait.

Seating should be located close to general circulation routes but should avoid users obstructing routes.

Provide a clear space of 1350mm sq, preferably at both ends of a bench, to accommodate wheelchair users or a pram and space to manoeuvre in to it

The seats should contrast tonally with their background

The seats should be detectable at a low-level by long cane users and the edges should be rounded to avoid injury if people collide with the seat.

Provide a mix of seat heights where several seats are provided in one location.

The seat height should be in the range of 450 – 480mm where only one seat is provided. When there is more than one seat a range of seat heights, 450 – 480 and 580mm should be provided.

Provide a proportion of seats with back and arm rests

Arm rests should contrast tonally with the seat and backrest

Arm rests should be set in 500 – 750mm from the ends of a proportion of benches to allow wheelchair users to transfer on to the bench.

Material/finish to the seats should not be highly reflective and ideally should not be cold to the touch.

Standards Reference

Fifth International Rail Human Factors Conference 2015 — Inclusive design; ticket sales counters and staff sales workstation for network rail stations

Design of an Accessible and Inclusive Built Environment External & Buildings, 2018

BS 8300 -1 & 2: 2018

Inclusive Mobility — Access to Pedestrian and Transport Infrastructure

Department for Transport

3.3.1.1 Wayfinding Signage

Who and Why
Signage is an important tool to many disabled people. People who are deaf or hard of hearing require signage that is easy to read and understand. For this group asking questions may not be an option because of difficulties understanding the reply.

People with impaired vision and learning difficulties may also require additional signage information to provide for their requirements. Often the use of symbols may be a big help not only to the groups mentioned but also people whose first language is not English.

Reading signage can be compared to proof reading. The author understands what has been written but the new reader understands the information in another way. It is important that the placement of signage and content is proof read from the users' perspective. The use of directional arrows in particular requires careful consideration to avoid causing confusion.

Image 3.3.1
Rotterdam Centraal Station, Netherlands

3.3.1.2 Design Considerations

Key location information should be provided including sign directories, orientation signage and plans, they should be both visual and in tactile form. Where practicable, audible information is recommended.

Directional signage should be placed where it is clearly and care taken to avoid wayfinding signage gaps in the route. Accessibility information should also be available in a range of formats, including large print and audio.

Consider how the sign is to be lit. Will luminaires cause glare or reflection. Ensure the sign background does not interfere with the reading of the sign. For example a large window behind a sign may well put the sign in to shadow.

The sign board should contrast tonally against the background it is seen against. The text should contrast tonally against the sign board. 70 points LRV difference is recommended. The font used should be sans-serif.

Do not rely solely on text. The provision of recognised symbols & pictograms should be considered. Keep the signage text concise.

Keep the placement and sign design consistent throughout the station.

Arrows with text should be justified in the direction of the pointing arrow. Arrows pointing up or down should be left justified.

Text to signage should be written in Title Case (first letter of each word a capital with the remainder lower case). Rail Alphabet 2 font should be used in accordance with new Wayfinding Guidance introduced by NR.

Wayfinding signage should allow decision making to be made as early as possible.

The following information should be provided, wheelchair specific routes, wheelchair accessible WC's and other amenities. If there is train configuration information on the platform, the location of wheelchair boarding and induction loops should be confirmed.

Any LED or dot-matrix displays should provide a clean letter shape.

Digital advertising material particularly with moving images can be distracting to many disabled people and can be problematic for people who are neurodiverse. Advertising should not conflict or distract from Station Wayfinding.

See also sections:

→ 2.2.1 Station facilities

→ 2.2.2 Passenger circulation

NR Guidance Suite Reference

Wayfinding
NR/GN/CIV/300/01

Standards Reference

Graphical symbols and signs - Public information symbols
BS ISO 7001:2007 + A4:2017

Design standards for accessible railway stations, 2015
Department for Transport

Sign Design Guide
JMU and the Sign Design Society

The Colour, Light and Contrast Manual
Keith Bright and Geoffery Cook

3.3.2.1 Display Screens

Who and Why
Display screens provide passengers with real-time information for train departures, destinations, platform allocations, delays.

Typically display times are set to correspond with the amount of information that are meant to be read and understood. Consideration should be given to people with visual impairment and or cognitive disabilities, to assure they have enough time to read and understand the information before it changes.

The location of display screens should be carefully considered to reduce the incidence of glare which can cause visual discomfort and reduce the legibility particularly for passengers with visual disabilities.

Image 3.3.2
Display screens\
St. Pancras Station

3.3.2.2 Design Considerations

The main display screen should be located in the station course and supplemented by summary boards and information screens strategically located on platforms and in waiting areas to assure that passengers are never too far from up to date information.

Provide good luminance contrast between the text and the background to improve the quality of the display. It should also meet the contrast standards described for fixed signs.

It is recommended that low-level screens are provided where suspended screens are used. This may benefit wheelchair users and people who find it difficult or uncomfortable to look up for long periods of time.

Any low-level screens should be mounted consistently at all stations, for example next to the ticket counter or customer information desk. Care should be taken so that they are not obscured by queues.

Glare from lighting can be a major cause of discomfort, particularly for people who are sensitive to bright sources of light. To help alleviate this problem, it is recommended to avoid mounting plasma screens where they are within the same field of view as light sources or areas of external glazing.

Mounting plasma screens at a lower level on the main concourse may help to reduce reflections and direct glare from the roof lights.

Information screens should be positioning to avoid locations close to advertising screens, which can create visual overload and make it difficult for people with visual disabilities to read.

Screens should be manufactured from a material that is as matt as possible so as to help reduce veiling reflections.

High-level screens should be fixed at an angle between 5 and 15 degrees, depending on the mounting height

For wayfinding, customer information systems (CIS) and signage design guidance refer to NR/GN/CIV/300/01.

Standards Reference

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300-1 & 2: 2018

Design Standards for Accessible Railway Stations, 2015
Department for Transport

3.3.3 Information Help Points

3.3.3.1 Information Help Points

Who and Why
Staff are not always available to give help passengers and provide information which can be more of a concern for people with sensory or cognitive disabilities such as dementia. For these instances help points are required so that customers can talk directly to the enquiry offices or other points of assistance.

People with vision disabilities can find it difficult to find them and use them. Tactile information should be provided to identify help points. Tonal contrast with the background should also be applied to make them more visible. New installations should also be fitted with audio induction loops to aide people with hearing disabilities.

Under European Regulations on passenger rights station managers or any other authorised person should provide designate points, within or outside the railway station at which disabled persons and PRM's can announce their arrival at the station and seek assistance if required.

Passengers with disabilities or particular requirements can book assistance in advance of their journey through the National Rail Enquiries website.

We want our all our customers to have easy access to our stations and trains and to enjoy the benefits of an inclusive journey experience.

Image 3.3.3
Accessible help point

3.3.3.2 Design Considerations

During the early stages of planning a strategy should be developed customer information including the location of help points.

Help points should provide passengers with better access to train information and improved security.

Suggested locations include blue badge parking, drop off and pick up areas, accessible facilities and platforms. Care should be taken not impede circulation routes.

Controls should be located within comfortable reach in the range of 700 mm and 1200 mm from the finished floor level.

Minimum force should be required to operate the controls.

Buttons should be a minimum diameter of 20 mm and contrast with the background and functions described both in text and tactile form.

Staff providing the help should be clearly audible taking into consideration localised acoustic considerations.

A light should confirm to hearing impaired people that their call has been answered.

Standards Reference

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2: 2018

Rail passenger rights and obligations, Article 24
1371/2007/EC

3.3.4 Audio Induction Loops

3.3.4.1 Audio Induction Loops

Who and Why
One in six people in the UK have some form of hearing loss and this is expected to rise with the ageing population. More than 900,000 people in the UK are severely or profoundly deaf. There are over 350,000 deafblind people in the UK.

Stations are noisy environments which have the effect of increasing the audibility issues for this population. It is important that everyone gets the same information and disabled passengers may require extra information to enable them to undertake and complete their journey in reasonable safety and comfort.

All public address systems and customer interface points should be linked to induction loops that cover the main public areas of the station including; ticket office, waiting rooms, around customer information systems (CIS).

Audio-frequency induction loop systems allow hearing impaired people to hear more clearly. Most hearing aids have a 'T' or 'MT' switch which allows them to pick up the electromagnetic field generated by an induction loop system. The hearing aid converts this signal into a sound suited to its user's specific hearing requirements. An induction loop system transmission greatly reduces background noise, competing sounds, reverberation and other acoustic distortions that reduce clarity of sound.

Image 3.3.4
Audio induction loop

3.3.4.2 Design Considerations

Wherever public announcements are made or verbal interaction is required, Induction Loops should be provided and be clearly signposted.

Customer information counters, service desks and information points should be equipped with hard-wired induction loops system.

Induction loops should be clearly signposted so that users know when they are in an area where they can switch their hearing aid to “T”.

Station operators should carefully consider when installing induction loops whether the areas are likely to experience electrical interference before installation.

There may be a difficulty in looping large areas. One solution would be to have a series of listening areas, an approach that has been adopted by some airports.

Where induction loop systems have been installed signs should be provided to make it clear that these systems have been installed.

Good signage and lighting are important for the hearing impaired (those with good vision) to aid their orientation.

Standards Reference

Code of practice for audio-frequency induction-loop systems

BS 7594

Design of an accessible and inclusive built environment. External & Buildings.

BS 8300-1 & 2: 2018

3.3.5.1 PA/VA Systems

Who and Why
When traveling through a railway station finding the correct platform and boarding the right train can be a stressful experience for everyone, this can be even more of a challenge for passengers with hearing disabilities.

Clear PA announcements for train departure times, platform allocation and destination are essential and require to be conveyed to everyone including people with sensory disabilities. It is also important to assure that voice alarm (VA) messages such as a station evacuation are clearly conveyed to everyone to assure the safe evacuation of all passengers and staff.

Image 3.3.5
PA/VA services boom
St. Pancras Station

3.3.5.2 Design Considerations

Careful consideration should be given to the location of PA/VA systems and ensuring that speakers are placed frequently throughout the station to reach all public areas. Speakers should be sited away from reception areas and volume adjusted to enable staff to be heard.

Aural announcements may be given priority to convey any variations from the normal timetable; emergencies, revised platforms, cancellations or late running and details of longer distance or special services.

Audio announcements should also be displayed on departure screens to inform people for which English is not their first language that something has changed, so that they can seek assistance. Where the text of these screens is coloured, the emergency announcement should use text of a different colour.

Emergency voice alarms should be both visual and aural. Flashing beacons can be helpful, but their use requires professional advice, and great care should be taken to assure that strobing does not disadvantage people with epilepsy.

All systems that relay recorded or live information such as help points, should be equipped with an audio induction loop.

Standards Reference

Access to and use of buildings Volume 2 Buildings other than dwellings
Approved Document Part M

3.3.6 Lift Controls

3.3.6.1 Lift Controls

Who and Why
Passenger lifts should be designed so that everyone including people with disabilities have the same level of services and can move independently around the built environment.

Operating lift controls can be confusing particular for blind or partially sighted people. New lift installations should be designed and specified for a wide range of needs and disabilities including hearing and visual disabilities that may require audio and tactile controls and wheelchair users that may require the lift controls to be within easy reach from a seated position.

Image 3.3.6
Braille lift controls

3.3.6.2 Design Considerations

Controls and communications systems should be designed to comply with current European Standards for Accessible Elevators.

Through car lifts should have two controls panels one next to each door set.

Buttons should be at least 20mm in size and should protrude slightly from the wall so that they can be operated by an elbow, fist or palm of the hand. They should also be within easy reach of wheelchair users at between 700 mm and 1200 mm from the floor.

Controls that have an embossed markings and braille on the face of the control button, or adjacent to the button. Buttons should contrast in colour with the panel on which they are located, which should contrast with the lift wall.

Visual level indicators and voice announcement should be provided and where appropriate also indicate the facilities available on each floor.

Emergency two-way intercom should be fitted with an inductive coupler. Confirmation that any requested action has worked, through illumination and an aural signal.

'Help is Coming' signs that illuminates when the alarm is answered should also be provided.

Standards Reference

Design of an Accessible and Inclusive Built Environment. External & Buildings, 2018
BS 8300 -1 & 2

Accessible Elevators
EN 81-70

Guidance Note for New and Upgraded Lifts
NR/GN/RMVP/27230

Specification for New and Upgraded Lifts
NR/GN/RMVP/27228

3.3.7.1 Digital Technology

Who and Why
Location based Smartphone applications such as Augmented reality enable people to pre-plan their journeys. People with cognitive, sensory and mobility disabilities can research an unfamiliar station to understand what facilities are available to help them plan their routes in advance of their journey.

Augmented reality apps can also be very useful for people with disabilities superimposing digital information onto a real-world setting. Using a Smartphone mobile device, they can navigate their way around complex railway stations and receive information in real-time.

Information provided on display screens should where practicable be complemented by audible information for people who are blind or partially sighted. There are a number of Smartphone based technologies available to support this.

Bluetooth low energy (BLE) beacons installed into the built environment transmits radio signal at periodical intervals linked to a hand held device to locate people with more precision than equivalent GPS based systems.

When a device estimates how far away the beacon is, it prompts a number of things to happen depending on the code used in the app. For example, in audio-based wayfinding for vision impaired people the relevant audio instruction can be triggered.

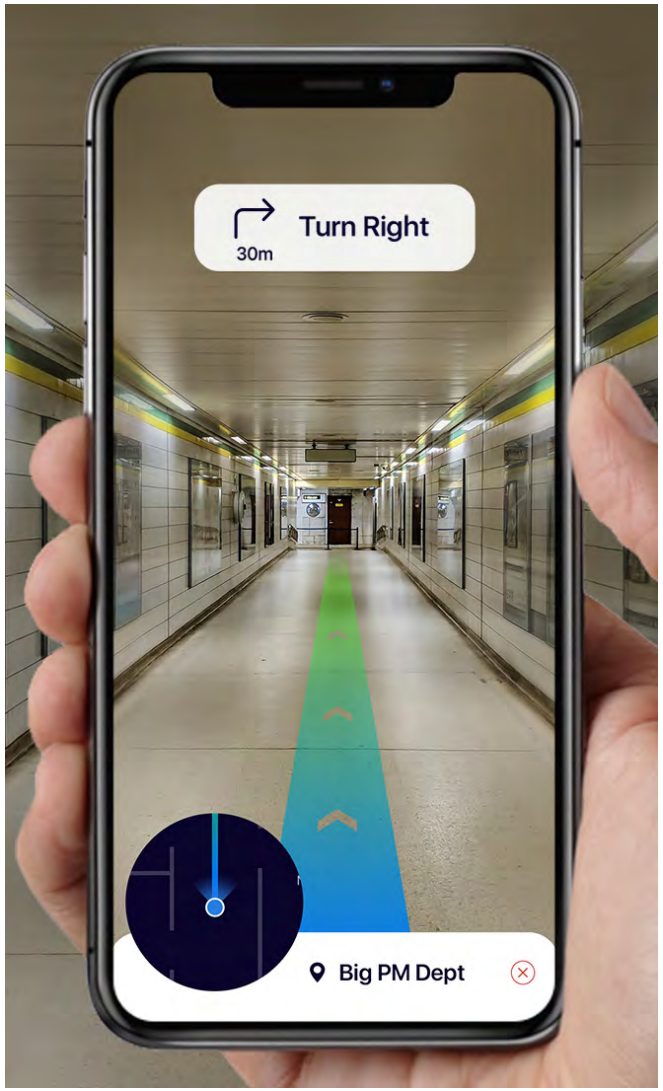


Image 3.3.7
Augmented reality wayfinding aide

3.3.7.2 Design Considerations

As a national carrier we want explore the benefits of new technologies such as bluetooth Beacons and how they can be applied to enhance the principles of inclusive design for a broad range of people as a wayfinding tool, aide for emergency evacuation and a means of communicating information to our customers.

Station operators and designers should undertake a cost benefit analysis of the systems available on the market before investing.

The location and orientation of the beacons should strictly follow manufacturer technical guidance.

Some beacons might not emit an all-round symmetrical signal, depending on which way the beacon antenna is facing.

Beacons should be placed close to landmarks or point of interests that people are likely pass through or interact including:

- → Entrance doors
- → Pathways
- → Escalators
- → Stairs
- → Lifts
- → Ticket control gates

Beacons should be fixed above head height to avoid interference from human body mass, likely to absorb beacon's signal in busy environments.

Standards Reference

Fire detection and fire alarm systems for buildings – Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises

BS 5839

The Building Regulations 2010: Electronic communications

Approved Document Part R

Standards, Guidance and Legislation

Reference Documents

Appendix A
Reference Documents

European & National Standards

Accessible Elevators: EN 81-70 Compliant Solutions

Accessible Sports Facilities, Sport England,

ACPO Secured by Design Principles

Building Regulations Approved Documents

Approved Document Part M Access to and use of buildings Volume 2 Buildings other than dwellings

BS 5839 Part 1 Fire Detection and Systems for Buildings – Code of for System Design, Installation, Commissioning and Maintenance.

BS 6465-4:2010 Sanitary installations. Code of practice for the provision of public toilets

BS 7000-6:2005 Design management systems. Managing inclusive design

BS 7594: 2011 Code of practice for audio frequency induction loop systems

BS 7671:2018/A1:2020 Requirements for Electrical Installations. IET Wiring Regulations

BS 7974 Code of practice for Fire Safety Engineering

BS 8300-1 & 2: 2018 Design of an accessible and inclusive built environment. External & Buildings

BS 7001:2007 Graphical symbols and signs — Public information symbols

BS 9992:2020 Fire safety in the design, management and use of rail infrastructure

BS 9999:2008 Fire Safety in design, management and use of building

BS EN 115-1:2017 Safety of escalators and moving walks

BS EN 15251:2007 Indoor environmental input parameters for design and assessment of energy performance of buildings

BS EN 60268-16: 2011 Sound systems equipment Part 16: Objective rating of speech intelligibility by speech transmission index

CABE Building for Life: Great Places to Live

CABE Delivering Quality Places

CABE The Value of Urban Design

CABE Urban Design Principles

CAE Access ATMs: UK design guidelines
Changing Places Consortium — Changing Places the practical guide

CIBSE AM 11 Building Energy and Environmental Modelling

CIBSE SLL Lighting Handbook, 2018
CIRIA C652 Safer surfaces to walk on an updated guide (T829)

DfT Design Standards for Accessible Railway Stations March 2015

DfT Guidance on the Use of Tactile Paving Surfaces, 2015

DfT Inclusive Mobility — Access to Pedestrian and Transport Infrastructure

DfT Secure Stations Scheme — Guideline 8: Crime Reduction Strategy

DfT Shared Space,

DfT The Inclusive Transport Strategy: Achieving Equal Access for Disabled People

DPTAC – Disabled Persons Protection Policies

Fifth International Rail Human Factors Conference 2015 Inclusive design; ticket sales counters and staff sales workstation for network rail stations. Conference Paper.

Guidance on the planning and management of station flooring in public areas. Performance requirement guidance BLDG-SP80-001

Appendix A
Reference Documents

HM Government — Working Together to Protect Crowded Places

International WELL Building Institute Standards

ISO 3382-1:2009 Acoustics — Measurement of room acoustic parameters — Part 1: Performance spaces

London Cycle Design Standards London Travel Watch Station Standards Report

National Planning Policy Framework

ORR Principles for railway health and safety 2017

ORR Accessible Travel Policy Guidance

Passenger surveys available from the websites of: PTEG, London Travel Watch, Passenger Focus

Persons with reduced mobility — PRM TSI NIP

Project Rainbow Research, Reading University & RNIB

RIS 7701 Rail Industry Standard Automatic Ticket Gates

RIS-7702-INS Rail Industry Standard for Lighting at Stations

Railway Group Standard GI/RT7016 Interface between Station Platforms, Track and Trains

Rail Vehicle Accessibility Regulations

RSSB Guidance on Station Platform Geometry GI/GN7616

Sign Design Guide – JMU and the Sign Design Society

Station Design Principles for Network Rail BLDG-SP80-002

TfL Accessible Bus Stops – Design Guidance, 2006

TfL Cycle Parking Standards

TfL Interchange Best Practice Guidelines

TfL Interchange Signs Standards

TfL London Cycling Design Standards, 2014

TfL Station Public Realm Design Guidance

TfL Streetscape Guidance for the Transport for London Road Network (TLRN)

TfL Taxi Ranks at Major Interchanges – Best Practice Guidance, 2006

TfL Workplace Cycle Parking Guide, 2006

The Colour, Light and Contrast Manual – Keith Bright and Geoffrey Cook

The Equality Act 2010

UCL Accessibility Research Group - Effective Kerb Heights for Blind and Partially Sighted People, 2009

Appendix A
Reference Documents

Network Rail Standards

NR/GN/CIV/400/05 Workplace DNA Design Manual

NR/GN/CIV/200/07 Stations Footbridges and Subways

NR/GN/CIV/200/04 Public Toilets in Stations Design Manual

NR/GN/CIV/100/05 Heritage Care and Development Design Manual

NR/GN/CIV/300/01 Wayfinding Design Manual

NR/GN/RMVP/27230 Guidance note for new and upgraded lifts

NR/GN/TEL/50017 CCTV for Stations

NR/L1/FIR/100 Fire Safety Policy

NR/L1/INI/PM/GRIP/101 GRIP – Policy Manual and Project Management

NR/L2/CIV/003/F1990 Technical Design Requirements for BS EN

NR/L2/CIV/150 Station Wayfinding design and assurance procedure

NR/L2/ERG/24020 Engineering assurance requirements for Ergonomics

NR/L2/OHS/005 High Street Environment & Work Outside Network Rail

NR/L2/OHS/00117 Specialist Risk Assessment – New and Expectant Mothers

NR/L2/RMVP/27176 — Design of retention toilet servicing facilities

NR/L2/RMVP/27228 Specification for new and upgraded lifts

NR/L3/CIV/ 030 Platform Components and Prefabricated Construction

NR/L3/CIV/060 CIS Information

NR/L3/CIV/151 Technical Approval of Standard Designs and Details for Building and Civil Engineering Works

NR/L3/CIV/160 The Design of Car Parks for Railway Stations

NR/L3/CIV/ 162 Platform Extensions

NR/L3/OCS/044/FS14K Managed Stations Environmental Management

Processes

B

Definitions
DIA Process Flowchart
DIA Consultation Flowchart

Appendix B
Definitions

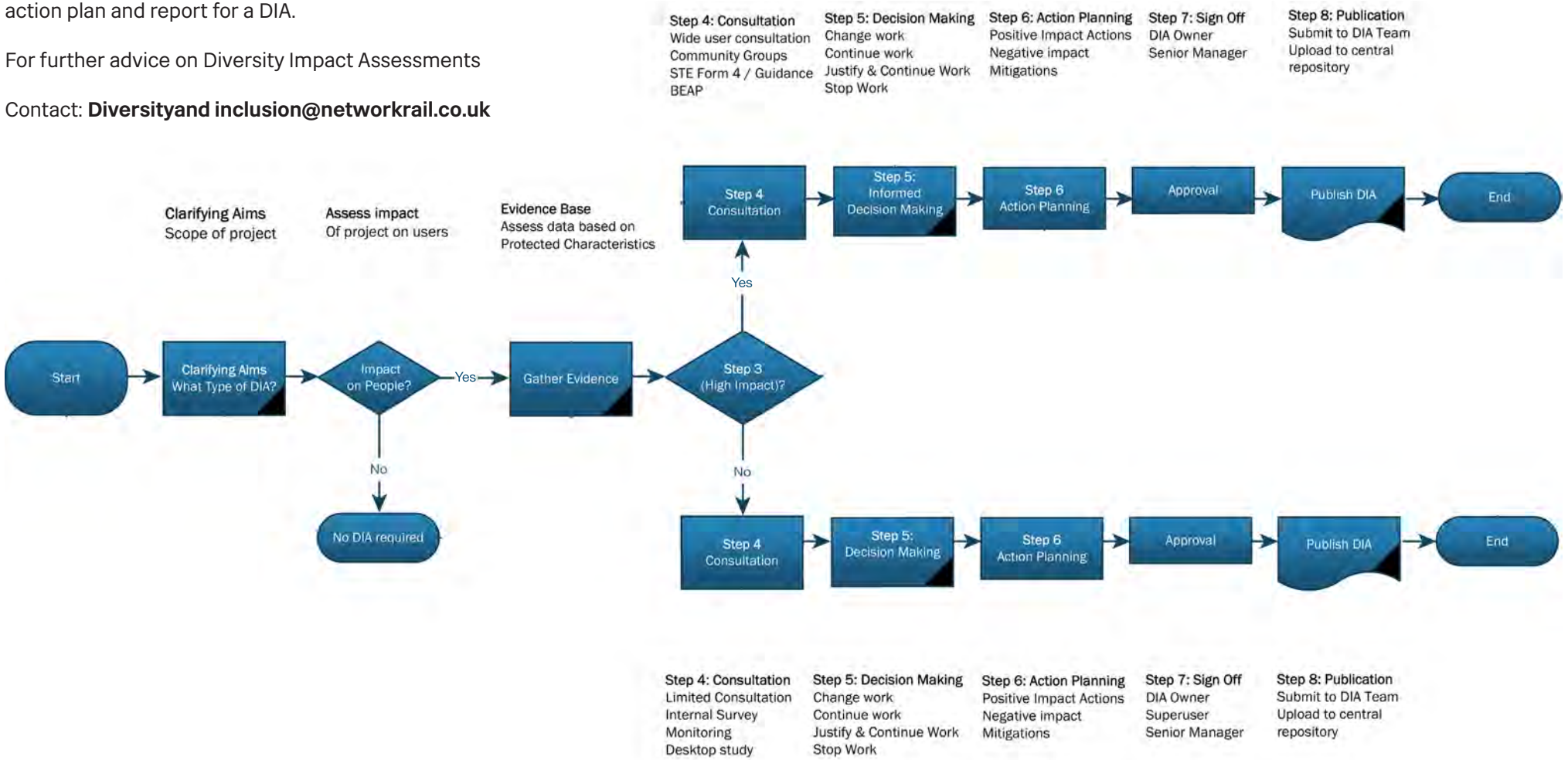
AR	Augmented Reality
ACPO	Association of Chief Police Officers
BEAP	Built Environment Access Panel
BLE	Blue Tooth Low Energy
BS	British Standards
CABE	Commission for Architecture and the Built Environment
CCTV	Closed-circuit Television
CIBSE	Chartered Institution of Building Services Engineers
CIS	Customer Information Screens
CP	Changing Places
DfT	Department for Transport
DIA	Design Impact Assessment
ESA	Environment & Social Minimum Requirements
EN	European Norm
GPS	Global Positioning System
ISO	International Standards Organisation
LRV	Light Reflectance Value
LUL	London Underground Ltd
NR	Network Rail
PA	Public Address
RSSB	Rail Safety and Standards Board
TOC	Train Operator Companies
VA	Voice Alarm
WC	Water Closet

Appendix B
DIA Process Flowchart

Diversity Impact Assessment Process
The process flow diagram on this page illustrates the successive steps of assessment that should be completed in order to gather evidence to produce an action plan and report for a DIA.

For further advice on Diversity Impact Assessments

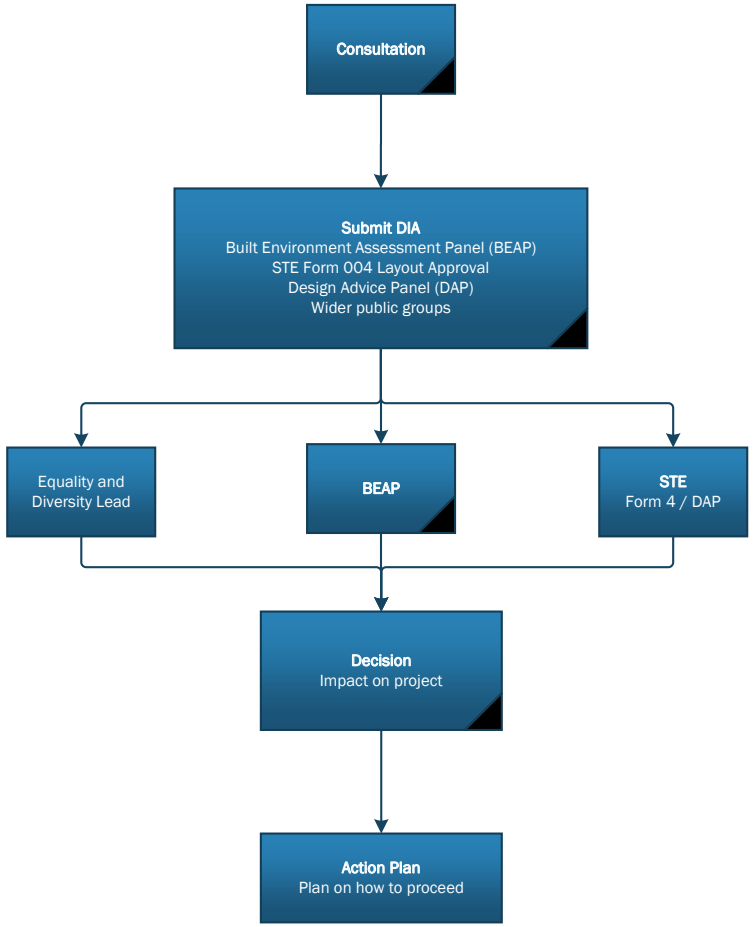
Contact: **Diversityand inclusion@networkrail.co.uk**



Appendix B
DIA Consultation Flowchart

Consultation (Step 4)
Consultation forms a key part of the DIA assessment process leading to an Action Plan. Getting answers to questions should be easier if those affected by works are consulted. There are staff networks within NR who can be consulted and a number of expert advisory organisations. Consider how best to consult experts, such as the BEAP and DAP, on particular diversity and inclusion issues.

It is worth noting that money and time can be saved by running joint consultations with a similar project, or a project in the same area.



Specifications, Schedules & Lists

C

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St Pancras
Time: Departures to: Plat: Comments:
19:25 Ramsgate - Expected at 19:33
Calling at: .... Sittingbourne, Faversham, Whitstable, Chestfield, Herne Bay, Birchington on Sea ....
19:37 Sandwich via - On time
Calling at: Stratford Int'l, Ebbsfleet, Ashford Int'l, Folkestone West, Folkestone Ctl, Dover Priory ....
Welcome to
St Pancras International
Welcome to
St Pancras Station
COFFEE & TEA
PAY HERE
COFFEE & TEA
FRESH & SEASONAL FOOD
SOURCED
MARKET

Appendix C
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Page

Image:

Section 1

Page

Image:

Section 2

Page

Image:

Section 3

Page

Image:

Inside Cover Images

Front The station plaza has potential to become a public space supporting local businesses
© Chris Lawrence / Alamy Stock Photo

Back The station should be a destination that welcomes and serves local communities
© Alena Kravchenko / Alamy Stock Photo

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Appendix C

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NetworkRail
Here to help

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