A best practice guide for office and industrial development in South Yorkshire
Foreword

Much has been written about the quality of the built environment in town centres and residential areas but little attention has been focused on the quality of office and industrial development. However, the buildings and places where people work have a huge impact on those who use them, the communities that surround them and the natural environment. They also make an impact on the performance of the businesses that occupy them and send a strong message to those who visit or pass through an area about how attractive a place it is to live, work and invest.

South Yorkshire’s economy is undergoing a major transformation, with the support of £700million in European Structural Funds delivered through the Objective 1 Programme. The economic activity stimulated by this investment will generate demand for new, expanded and improved offices and industrial premises. However, a quick look across much of South Yorkshire reveals a picture all too common across the UK - past economic development has often provided jobs but with little thought for the wider impact of new sites and premises.

This guide - produced by the Objective 1 Programme Directorate and Yorkshire Forward (the regional development agency) in partnership with the area’s four local authorities and CABE (Commission for Architecture and the Built Environment) and SYPT (South Yorkshire Passenger Transport Executive) - seeks to redress this imbalance. It encourages a high standard of urban design and architecture in new development that will deliver a step-change in both the quality of South Yorkshire’s built environment and its economy.

Better Places to Work in South Yorkshire develops the issues contained in By Design, Urban Design Compendium 2000 and recent work by the Urban Design Group 2000, English Partnerships/Housing Corporation, BRE (Building Research Establishment) and the Construction Industry Council 2000 in the context of office and industrial development. It also takes into account the key principles set out in the Urban White Paper and the Green Paper on Planning (2002). The guide sets out the principles of good design, demonstrates the value these add, and identifies the key issues at each stage of the design process from overall site planning through to the servicing of individual buildings. Case studies of exemplar schemes from across the country and further afield are used to showcase best practice. As well as bringing the guidance to life, the case studies show that good design makes economic sense and delivers very specific social and environmental benefits to a range of stakeholders.

The advice found on these pages forms part of a series of complementary guidance for South Yorkshire that stresses the importance of urban design in all sectors of development. This advice includes the Better Places to Live in South Yorkshire and the Technical Appendix to Better Places to Work in South Yorkshire and Better Places to Live in South Yorkshire. At the local level, individual planning authorities have produced frameworks for parts of their area such as the Sheffield City Centre Urban Design Compendium. Better Places to Work in South Yorkshire should be read in conjunction with these other guidance document as well as the statutory planning policies contained in the relevant unitary development plan.
South Yorkshire is changing. Objective 1 presents the opportunity for the quality of office and industrial development to become a primary consideration, leaving a legacy of well designed, enduring development which adds to South Yorkshire’s character and helps reposition its property market offer. We hope that you will be inspired by the message this guide contains and will join us in the vitally important task of ensuring that new development make places throughout South Yorkshire work better, feel better and are better.

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1. Introduction
1.1 Purpose of the guide

The aim of Better Places to Work in South Yorkshire is to raise the quality of new, expanded and refurbished offices and industrial premises in South Yorkshire. It seeks to do this by:

- Setting out the principles of good design
- Showing how good design adds value
- Highlighting the importance of different roles in the development process
- Demonstrating that good design is not always more expensive, particularly over the lifetime of a project
- Showcasing good practice
- Signposting further advice and support.

Better Places to Work in South Yorkshire acknowledges the huge diversity of office and industrial development that will take place across South Yorkshire over the lifetime of the Objective 1 Programme in terms of location, use, scale and property market conditions. The optimum design solution will vary from project to project. Reflecting this, the guide encourages creativity and innovation rather than attempting to prescribe particular design styles or minimum standards. It presents a framework and checklist of issues to be explored and addressed at all stages of the design and development process, from initial concept through to internal layout. Practical examples are given of how other schemes have responded successfully to similar challenges.
Better Places to Work in South Yorkshire is aimed at those involved in bringing forward office and industrial schemes in South Yorkshire, particularly those seeking European support through the Objective 1 Programme. This includes:

- **investors and developers** responsible for initiating projects, setting the brief, submitting applications and overseeing project delivery
- **design teams** of architects, planners, surveyors, engineers, agents and so on brought together to translate the project brief into a deliverable scheme
- **the four local planning authorities** of Barnsley, Doncaster, Rotherham and Sheffield that process applications for planning permission
- **delivery organisations** including Yorkshire Forward, Barnsley Development Agency and Sheffield One that assist delivery of the Objective 1 Programme by supporting project development
- **project appraisers** responsible for assessing and scoring applications seeking financial support to bridge the gap between project cost and value in proposed developments
- **local communities** affected by projects proposed in and around their area
- **special interest groups** interested in specific aspects of a proposed scheme such as local heritage, nature conservation and disability access.

For all these stakeholders Better Places to Work in South Yorkshire establishes a common framework of issues to be considered and responded to during the design and development process.

However, the guide will be of wider interest and use beyond those schemes seeking Objective 1 support. Such projects will only account for a fraction of the total development that will take place in South Yorkshire over the Programme’s lifetime. However, the quality standard that supported projects set will become the market norm, demanded and expected by investors and occupiers. The issues raised in Better Places to Work in South Yorkshire will be relevant to all new, expanded and refurbished office and industrial developments, regardless of how they are funded.
1.3 How the guidance is applied

1.3.1 All office and industrial schemes

**Better Places to Work in South Yorkshire** has been endorsed as design guidance by each of South Yorkshire’s local authorities of Barnsley, Doncaster, Rotherham and Sheffield. As such, it represents a common aspiration for high quality new development across South Yorkshire.

Local planning authorities will use the guide, in addition to the policies of the unitary development plan and relevant supplementary planning guidance, to inform discussions and negotiations with developers and their design teams. Schemes that embrace the good practice set out in this guide are likely to progress more smoothly through the planning application process, with less need for modifications and their associated financial costs and time delays.

1.3.2 Projects seeking Objective 1 funding in South Yorkshire

All capital development projects seeking Objective 1 funding must demonstrate that they have embraced the advice contained in this guide. This is in addition to securing planning permission and satisfying other Objective 1 application criteria such as value for money and demonstrating strategic fit with the Programme’s priorities and measures.

For Objective 1 projects certain elements of the guide which relate to the design process are mandatory. This focus on process, rather than the specification of the end product, reflects the emphasis of the guide on promoting excellence and creativity as opposed to prescribing minimum standards. These mandatory elements are:

- the findings of a context analysis and site appraisal
- a design statement setting out the aspiration and concept for the scheme
- consultation with local communities and, wherever appropriate, their involvement in the design process
- preparation of a travel plan
- consultation with South Yorkshire Police leading, wherever practicable, to the achievement of their Secure by Design certification.
Compliance with these mandatory requirements should be demonstrated through the project’s business plan submitted in support of the application.

In addition to the above mandatory requirements, the checklists at the end of Sections 3-6 will be used as part of the formal Objective 1 appraisal process. Levels of support and intervention rates may be increased for projects that can demonstrate a significant contribution to advancing the guide’s aspirations.
Good Design
What is this Section about?

This Section outlines the principles of good design. It identifies the value that good design adds from the immediate visual delight through to the long-term benefits of economic repositioning and a more sustainable environment.

Why is good design important?

A common understanding of what constitutes good design is essential to provide clarity and a basis of certainty to inform project planning for those involved in bringing forward new schemes. This understanding is the starting point. It needs to be underpinned by a business case which demonstrates the value that good design brings in protecting the environment, enriching the quality of people’s lives and adding long term value to buildings and places.

How is this Section structured?

2.1 Sets out the principles of good design
2.2 Identifies the value that good design adds for key stakeholders
2.3 Considers the factors that contribute to achieving good design
2.4 Explores the cost implications of good design
2.5 Highlights some common urban design pitfalls to be avoided.
The appearance of the built environment is important, but good design is about much more than how things look. It is about uplifting communities and transforming how people feel and behave. It is also about using resources efficiently and imaginatively. In short, good design is about improving the quality of life for everyone.

At the same time, design is a creative activity and definitions of quality are elusive. It cannot be reduced to codes or prescriptions, and even where there appear to be codes, such as in classical architecture, the best examples sometimes break or transcend the rules. It is, however, possible to distinguish good design from bad design.

Good design for office and industrial buildings means urban design and architecture that embraces and balances the following principles:

- **Fit for purpose** - at the basic level, good design will satisfy functional requirements and economic expectations. Projects should be based on a clear, coherent and realistic set of aspirations and intentions - expressed in the requirements of the brief - and the design of the site and building(s) should match up to these. This is the starting point.

- **Responsive to context** - new developments should not be considered in isolation but informed by a thorough analysis of their surroundings. What may work in the centre of Sheffield is unlikely to be the right response in the Dearne Valley.

- **Durable and sustainable** – projects should take a longer term view, particularly in considering the wider environmental impacts over the lifetime of a development.

- **Accessible and legible** – users and visitors to a site should be able to access a site easily and, on reaching it, be able to find their way around. This is about creating inclusive environments where the built form works together with the transport network landscaping strategy and signage to guide different users effectively around the site and buildings.

- **Safe and secure** – occupiers and employees place a high premium on a safe and secure working environment. Building layout, the mix of uses and integration of lighting, landscaping and surveillance measures can help deter crime and make people feel safer.
- **Flexible and adaptable** – the purposes for which a building will be used are likely to change over its lifetime. This places a premium on designing for both flexibility (the ability to accommodate changing requirements without major alterations) and adaptability (the capability of being altered or extended conveniently when necessary). This requires a whole site approach to site layout and phasing as well as to the design of the buildings.

- **Embraced by local people** – new developments impact on the communities that surround them. People’s understanding of an area and site should help inform the design process. Involving local communities in the planning of schemes is also more likely to result in developments that are respected and welcomed by local people.

- **Coherence and integrity** – this is about the overall completeness of a project, from the continuity of frontages and clearly defined public space to well designed signs, awnings, lighting and planting that have a strong design relationship.

- **Good looking** – finally, we should not be afraid to ask of a scheme: is it beautiful? Is the design pleasing to the eye and the mind? If it is, then the resulting lifting of the spirits will be as valuable a contribution to public well being as dealing successfully with the building’s functional needs.

Set in these terms assessing design quality is, to a large extent, an objective process. There will, of course, be some questions that come down to matters of individual taste and preference. However, it will not be often that questions of this kind are the main factors in determining whether a project taken in the round is a good one.

Across all building types the message is the same, when investing in the built environment it is important to consider the impact of design throughout the lifetime of a building, on the place it is located and on the stakeholders involved.

What matters is design quality, not a particular architectural style.
2.2 The value of good design

Good quality urban design and architecture adds value by increasing the economic viability of development and by delivering environmental and social benefits.

The diagram below – adapted from research carried out by CABE – shows the range of tangible and intangible benefits delivered in the short and longer term for key stakeholders.
<table>
<thead>
<tr>
<th>Occupiers</th>
<th>Public Interest</th>
<th>Community</th>
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<td><strong>Short-term Value</strong></td>
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<td>- Happier workforce (better recruitment and retention)</td>
<td>- Regenerative potential (encouraging other development)</td>
<td>- Better understanding of changes to local areas</td>
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<tr>
<td>- Enhanced productivity</td>
<td>- Reduced public/private discord</td>
<td>- Opportunity to engage in shaping schemes</td>
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<tr>
<td>- Increased business (client) confidence</td>
<td></td>
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<tr>
<td>- Fewer disruptive moves</td>
<td>- Reduced public expenditure (on crime prevention/urban management/urban maintenance/health)</td>
<td>- Better security and less crime</td>
</tr>
<tr>
<td>- Greater accessibility to other uses/facilities</td>
<td>- More time for positive planning</td>
<td>- Increased cultural vitality</td>
</tr>
<tr>
<td>- Reduced security expenditure</td>
<td>- Increased economic viability for neighbouring users/development opportunities</td>
<td>- Less pollution (better health)</td>
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<td>- Increased occupier prestige</td>
<td>- Increased local tax revenue</td>
<td>- Less stress (better health)</td>
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<tr>
<td>- Reduced running costs</td>
<td>- More sustainable environment</td>
<td>- Better quality of life</td>
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| **Longer-term Value** | | |
| - Happier workforce (better recruitment and retention) | - Reduced public expenditure (on crime prevention/urban management/urban maintenance/health) | - More inclusive public space |
| - Enhanced productivity | - More time for positive planning | - A more equitable and accessible environment |
| - Increased business (client) confidence | - Increased economic viability for neighbouring users/development opportunities | - Greater civic pride (sense of community) |
| - Fewer disruptive moves | - Increased local tax revenue | - Reinforced sense of place |
| - Greater accessibility to other uses/facilities | - More sustainable environment | - Higher property prices |

“People work more productively in well designed offices”

Agree: 77%
Disagree: 7%
MORI, 2002
There are no prescriptions for success. The guidance contained in this document will help inspire and inform the development of good quality, well designed projects in South Yorkshire. But it will not achieve this on its own. The best examples of quality urban design and architecture tend to be characterised by a combination of the following factors:

- **Commitment of the client** - a good client is a patron; the defining characteristic is a commitment to excellence. A successful project will owe as much to this commitment as to the skill and ingenuity of the design team.

- **Appointing the right design team** - good design flows from the appointment of skilled and multi-disciplinary teams. These are the people who, after careful analysis of the opportunities, will bring to the project the creativity and technical expertise to produce imaginative but deliverable schemes.

Design teams should be assembled in response to the specific requirements of a project to ensure that the full range of skills and specialist expertise is available. This may include: architecture, engineering, quantity surveying, urban design, planning, landscape architecture, environmental specialists, transportation planning and energy consultants.

These skills need to be engaged and brought together at the right stages of development to ensure a holistic approach to dealing with the constraints and opportunities faced by each discipline. This will avoid, for example, a site’s transport engineering approach unnecessarily dictating its landscape strategy.

- **A commitment to excellence** - needs to run all the way through a project from inception through to construction if the result is to be a success. It is therefore important that a team is established that works well together from the concept stage onwards.

- **Engaging the right partners** - the relationship between client and design team is crucial but this needs to be complemented by consulting and involving the right external partners from the public, community and voluntary sectors. This process can inform the design process by adding valuable local knowledge of an area and site, a tailored interpretation of the local planning...
policy context or a user perspective. Who to consult will depend on the scheme but is likely to include:

- **The local planning authority** should be consulted at an early stage on all proposed developments which require planning permission. This will ensure that the design team are fully aware of all local policies and land-use allocations together with any particular current issues that may impact on the shape of development.

- **Statutory consultees** may hold useful information on the condition of a site or assets in and around a proposed scheme which may be protected. The Environment Agency, for example, can advise on proposals which may impact on a flood plain and English Heritage and English Nature on issues around protected historic or environmental assets respectively. Similarly consultation with the highway authorities and SYPTE will enable the full range of transport issues on sustainable development to be considered.

- **Potential funders** such as the Objective 1 Programme Directorate and Yorkshire Forward as well as local organisations involved in supporting delivery such as Sheffield One and Barnsley Development Agency. Design quality is likely to be a key criteria in determining applications for support and early consultation can help identify any potentially difficult issues. There is little point, for example, in obtaining planning permission only to discover that amendments will be necessary to satisfy the requirements of a particular funder.

- **Local communities** will be consulted on all schemes which require planning permission. In addition, proactive engagement with local people can both improve understanding of proposals and help inform the design process through their knowledge of local issues such as drainage and how a site is currently used throughout the day.

- **Special interest groups** are likely to be active in most areas, particularly around issues such as the natural environment, built heritage and disability access. Consultation with such groups may help understand the site and its context as well as informing consideration of development options.

“"The challenge is to influence the development process, not only in high-profile sites but wherever urban change is reshaping places".”

Robert Cowan, Urban Design Group
2.4 The cost implications of good design

It is often claimed that incorporating good, sustainable design features in a building programme is too expensive and end users are unwilling to pay these ‘extra costs’. However, studies estimate that over the course of a building’s lifetime:

- Design and construction expenditures will account for 5 - 10% of cost
- Land acquisition, planning, disposal and other activities accounting for 5 - 35%
- Operations and maintenance costs will account for 68-80% of costs

This highlights how investment in good design features can have a significant impact on the major costs associated with buildings - the running costs.

Integrating sustainable design elements into projects must be done as an integral part of the design and not as an afterthought. Incorporation of good design elements later in the process can significantly increase costs.

There are better ways to value good design than just in terms of bricks and mortar. Well designed educational facilities result in better motivated pupils and teachers; good working environments and reduce health problems; thoughtfully designed houses can be safer and engender more community spirit and cooperation. All these benefits are delivered at a cost but the benefits balance and more often than not, outweigh these costs.

2.5 Avoiding the pitfalls

Projects which fail to produce good urban design or architecture do so for their own specific reasons. However, there are common threads that can be drawn from projects which are less successful than they could have been. In many cases, these are simply the lack of, or the opposite of, the qualities of good design and the design process set out above. Potential pitfalls may include:

- Lack of evidence of client commitment to a quality outcome
- Lack of a clear brief
- Contradictory aims and objectives
Lack of viability
No evidence of understanding the nature of the site
Adequate contextual analysis, but no evidence of it informing the site layout or design
Projects which fail to consider their context within the public realm
Lack of clarity about what is the private domain and what is public
No effort to consider landscape as an integral element of the overall site strategy
Lack of consideration to longer term use and management of the site
Failure to engage with key external bodies at an early stage
No effort to consider public transport as part of the overall movement strategy
Failure to consider overall aesthetic impact of the scheme.

2.6 References

Design Review (2002) CABE

From Design Policy to Design Quality (2002) RTPI


The Value of Good Design: how buildings and spaces create economic and social value (2002) CABE

The Value of Urban Design (2001) CABE/DETR


Context
What is this Section about?

This Section is about responding to the surroundings of a development site in order to produce a scheme that sits and fits respectfully into its setting. It sets out a framework for undertaking a context analysis, identifying key features of a locality that should be considered.

Why is an understanding of context important?

Appreciating and responding to a site’s context is of fundamental importance in order to allow places to grow and change over time in a manner that strengthens and contributes to the host environment. At its most basic, a context analysis will inform the relationship between the public and private realms. It will help to display the hierarchy of the built form thereby assessing the impact that the scale of the proposed development will have on the surroundings. By considering the landscape in all its forms, a context analysis will inform how landscape features can guide new development. A context analysis will also help to ensure that development connects physically and functionally within its locality to help create an accessible addition to the built form or landscape.

How is this Section structured?

3.1 Illustrates the huge diversity of environments in South Yorkshire

3.2 Identifies target areas for investment

3.3 Describes the key issues to be considered in undertaking a context appraisal

3.4 Presents a series of case studies that demonstrate how to carry out a context appraisal for urban, rural and business park contexts.
At a glance, South Yorkshire:

- comprises the four local authority areas of Barnsley, Doncaster, Rotherham and Sheffield
- covers an area of 1,599 sq km, two thirds of which is rural
- is home to 1.3 million people, with a workforce of about 600,000
- accommodates 30,000 businesses, with particular strengths in manufacturing, construction, transport and communications
- includes environments as diverse as millstone grit moorland, low lying wetlands and historic woodlands
- and settlements as diverse as Sheffield, England’s fifth largest city outside of London, Doncaster, the largest metropolitan borough in Britain and small rural settlements like Thorpe Salvin and Hooton Pagnell.
New office and industrial developments will be brought forward in locations across South Yorkshire over the next five years. However, the local authorities, Objective 1 Programme and Yorkshire Forward have adopted a geographically targeted approach to focusing their investment in new schemes. This approach targets South Yorkshire’s four main urban areas - the centres of Barnsley, Doncaster, Rotherham and Sheffield - and three Strategic Economic Zones (SEZs). Only sites and premises located within these seven target areas are eligible for European support through the Objective 1 Programme in South Yorkshire.

In addition, the key partners have also adopted an approach to economic regeneration based on cluster development. A cluster is a group of organisations that buy or sell from each other, have customers in common, or use the same infrastructure or skills. The clusters that are being targeted are: advanced manufacturing and metals, bioscience, creative and digital industries, environmental and energy technologies and business, professional and financial services, food and tourism.

Some of these clusters have very specific accommodation needs, such as bioscience, that will require unique specifications. However, for most schemes, particularly speculative development, flexibility, adaptability and quality will be the crucial requirement in attracting a broad range of potential occupiers.
Dearne Valley

M18 Corridor

Technology Corridor

Strategic Economic Zones

Urban Centres

1

2

3 Rotherham

4 Sheffield
3.3 Undertaking a context appraisal

The objectives of a context appraisal are to help create development which relates to an area’s history and geography, and which sits comfortably in the pattern of the existing development and landscape. The task is even more urgent for the large brownfield sites, particularly those dislocated from the urban settlements, to prevent further fragmentation and erosion particularly of the strategic economic zones. While urban developments will readily find clues to appropriate form, the 'out of town' brownfield sites can look for their lead in the landscape and the industrial heritage. The art of place making becomes more critical than the design of individual buildings especially if the new generation of business and industrial parks are to enrich and enliven their localities and become more accessible by a variety of transport modes.

A context analysis comprises consideration of the following issues:

- Form and architecture of the surrounding development
- The landscape and topography
- Linkages and movement
- Land uses
- History and community associations.

3.3.1 Form and architecture of the surrounding development

The development pattern of each South Yorkshire town and village is a key component of local distinctiveness. For development within or on the edges of urban settlements, an examination of the following characteristics of the built environment and the public realm will provide valuable clues for new development:

- Scale and mass of buildings - their height and bulk
- Pattern of development - the ratio of buildings to open space, the relationship between buildings, roads and view corridors
- The landscape setting
- Historic plot shape, size and rhythm (degree of development across contiguous plots)
- Orientation of fronts and backs of buildings adjoining the site
- The relationship between buildings and the landscape
- Building materials and details - including features such as size of window openings
Colour and texture of buildings and the surroundings
Details of the public realm - including paving and drainage structure
Protected structures or archaeological assets

Understanding this morphology and character of the surrounding built environment and the nature of the wider setting will provide important information on how a new building should be designed to respect its context. Establish the elements of local distinctiveness, both the form and function of the place and the way it is used. How can these be reflected in development?

There is no substitute for spending time in an area, making notes, sketching and taking photographs, talking with local people and agencies who know the place. Aerial photos and Ordnance Survey maps, both historic and current, are invaluable tools for analysing the morphology of a place.

3.3.2 The landscape and topography

The natural setting includes the overall character of the landscape as well as the role it may have in the biodiversity of the area - its ecological and wildlife value. Elements that are of importance in the landscape setting are not always visible, such as underlying geology, soil pattern and wildlife habitat. Much is likely to be already known about an area’s geology and ecology from past surveys. Beyond this there is also the broader
consideration, particularly in edge or out of town sites, of the landscape character that surrounds it.

It is important that general or specific local characteristics around or within the site are noted so that they may later inform the landscape strategy for the site. This might include a strong presence of woodland in the area, or of meadows determined by the topography. This is closely linked to the need for an ecological survey to assess the presence of species on the site and for the need to clearly understand the general sub-region within which a development is to take place.

Working with the landscape can significantly improve a development and help create places that fit well into their context or contribute to it in a positive way. The sites prominence in terms of views and visibility will be one of a number of key design considerations raised by this process.

Depending on the scale of a proposed development, an environmental assessment (EA) may be required. This will include a thorough examination of issues such as ecology, archaeology and contamination.

The integration of environmental assessments into the design and evaluation process will improve the environmental quality of new development and increase its sustainability by:

- Considering all environmental issues when preparing development and design proposals
- Examining alternative solutions
- Highlighting the environmental effects of proposed developments
- Proposing appropriate mitigating measures.

The purpose of the EA is to ensure that the environmental effects of a proposed development are fully considered, together with the economic or social benefits of the development, before a planning application is determined. The EA is thus an anticipatory and participatory management tool. The extent to which environmental issues have been addressed with demonstrable mitigating measures should be considered as part of preparing a scheme. Even where a full EA is not formally required, it is good practice to scope relevant issues with the local planning authority and produce a voluntary environmental statement.
3.3.3 Linkages and movement

A network of roads, lanes, tracks, bridleways, footpaths and cycle-ways link South Yorkshire’s towns and villages. Linking a new development to the local infrastructure is vitally important - successful development depends on good access and connections for everyone, by all forms of movement. An examination of the site context will identify where the appropriate or desirable access points into the development should be and the desired movement patterns across the site. Where are people going? Who is going into the site? Are there routes for the general public which must be safeguarded or created as well as routes for those visiting the site? Are they going through the site to reach another place or if this does not exist could it be created or encouraged? A movement assessment of the existing and desired movement patterns carried out in the earlier stages should help to answer these questions and should be used to help define the nature of the proposals.

Generally the more access points and connections in and out of the site the more permeable the development will be, the more likely it is to be used as a through-route and therefore to be naturally busy and consequently more natural surveillance will be generated. This will be of benefit to any one on the site who will feel safer as well as creating a certain amount of natural protection to property.
New development should build on and reinforce existing movement networks - this is a key component of sustainable development. Travel plans will be an important part of new development. Developers and end users are increasingly bound to address issues relating to private car dependency through measures which may include car pooling schemes and provision of cycle routes and storage.

The new development may also benefit the locality as a whole, for instance by the extension of a bus route, or a more direct footpath along a natural desire line.

Government planning guidance in PPG13, Transport (2001), places particular emphasis on accessibility to development by public transport, walking and cycling, as part of a more integrated approach to planning and transport. To help implement this, PPG13 advises that developers should submit Transport Assessments (TAs) alongside planning applications. Government guidance on the preparation of TAs completed in 2001 and awaits publication. Some local authorities have their own guidance on the preparation of TAs. In brief, the TA should provide an analysis of how the development is expected to work in terms of access by people and goods. This involves three key stages:
Stage 1 sets out the demand for access. How many people will arrive and leave the site? Where will they come from or go to (the catchment area of the scheme)? What means of travel will they use?

Stage 2 describes aspects of the proposal that have been geared towards minimising travel and providing people with realistic alternative means of travel.

Stage 3 describes the impact of the resultant travel demand on transport infrastructure (e.g. public transport capacity, road capacity, parking). It also describes what measures are proposed as part of the scheme to ameliorate any adverse impacts. The amount of any parking to be provided would be an output of this analysis.

Forthcoming guidance will stress that the preparation of TAs will be likely to involve an iterative process between the three stages. During this process, the scheme may be modified to ensure that it meets relevant policies and targets, especially in terms of the share of generated travel to be undertaken by car. Such modifications could involve changes to the proposed location, scale, or use of the development.

TAs are wholly different from the former Traffic Impact Assessments (TIAs), which were concerned only with stage 3 of the process, and in practice focused almost exclusively on road capacity issues.

3.3.4 Land uses

A careful examination of existing land uses on and around the site will help developers and designers to make appropriate decisions with regard to possible land uses on the site. This will involve:

- Checking the planning history of the site and surrounding sites through the local authority planning registers
- Assessing the unitary development plan designations
- Examining historical Ordnance Survey maps
- Consulting the Sites and Monuments Record.

City and city edge locations where transport and access are available may allow for the provision of a range of uses. An assessment of the surrounding context and market appraisal will help inform the possibilities for such uses. It is important to bear
in mind when making such appraisals the possibility of also including housing and other uses. If a sufficiently attractive, lively environment is created the development will generate a certain amount of its own demand.

Often sites may seem unsuitable for accommodating a range of uses because at present they are disconnected from the main urban area or the existing infrastructure may not provide easy and direct links, whether vehicular or pedestrian. This is the case in many of the former colliery areas, which although often not far from existing conurbations, direct pedestrian routes from the towns to the valley have been broken. Making an assessment of possible links within that area at a strategic and/or local level could help assess whether new links could help make a variety of uses viable. Historic maps may sometimes provide a useful hint as to former movement patterns which have been broken by modern infrastructure. A very simple, pedestrian link into the existing town in an urban-edge location can sometimes be enough to unlock a site’s potential.

Business and industrial parks tend to be monofunctional. Very few have any other facilities, not even a shop or a pub for those who work there. This is partly the result of the restricted 9-5 life of the place which makes other uses unviable. Considering other uses such as housing, leisure or retail can create more sustainable developments because fewer journeys become necessary. It also creates livelier places, new neighbourhoods where people can meet many of their day-to-day needs. Similarly, linking to new development back into adjacent settlements can produce these benefits.

Even smaller sites in suitable locations can contribute to the general mix of uses in the city by including other uses. Ground floor uses in particular may be given over to retail or entertainment helping enliven the public realm. Alternatively office schemes can make more effective use of their ground floors by placing their reception/leisure area here.

3.3.5 History and community associations
An understanding of the human geography and social dynamics of a place is as important as the physical attributes of the context. An appreciation of what is valued within a community can inform a design solution. It is therefore important to consider:
Local landmarks or traditional features
- Particular local skills or crafts
- Local opinions and initiatives
- Local traditions and events
- Artistic references, such as sculptures and murals

The best way to find out about a place is to engage with local people, special interest groups and other stakeholders as part of a public participation strategy, beginning at the early stages of the design process. This will not only inform the design process but will also inform people about a project and involve them in the design process.

Past economic activity shaped many of South Yorkshire's settlements
Butcher Works, Arundel Street Sheffield
3.4.1 Camborne-Pool-Redruth context analysis

Summary: This case study demonstrates the process of undertaking a context appraisal. An aerial photograph gives an immediate visual appreciation of the area followed by a map showing the study area plus the sphere of influence. The swot analysis clearly highlights the strengths, weaknesses, opportunities and threats. A series of maps then builds up the case for impending change.

SWOT Summary

Strengths
- Recent positive experiences in regeneration
- Community enthusiasm and skills
- Distinctive Cornish identity
- Major education and training facility
- Relatively large resident population
- Heritage assets and proximity to major tourist destinations
- Land availability and environmental quality
- Road accessibility to employment sites
- Good trunk road and rail links

Weaknesses
- Low GDP, low wages, low household incomes
- Small Business Economy lacking representation in growth sectors
- Low skills, particularly in growth sectors
- Poor educational attainment
- Pockets of deprivation and social exclusion
- Poor quality employment sites and premises
- Poor image of the area to potential investors; developers, house purchasers
- Land contamination and dereliction
- Recent developments (such as the Big W) dependent on the car
- Over provision of parking Camborne & Redruth
- Difficult entrances to Camborne and Redruth
- Poor cycling and walking and interchange facilities

Opportunities
- Potential growth in e-business
- Potential for growth in new industries and high tech sectors including renewable energy, geoscience, environmental industries
- Expanding leisure/sports markets
- New tourism markets
- Derelict land
- Objective 1 funding and South West regional development agency priority area
- Potential of Strategy and Masterplan to raise the profile of the area and address fundamental problems
- Potential to integrate land use and transport planning, and concentrate on development on the A3047 corridor and in Camborne and Redruth
- UNESCO bid for World Heritage status

Threats
- Competition from e-business (based elsewhere)
- Lack of matched funding
- Tradition of outward migration
- Competition in housing from retirees and second homes
- Development of Truro as primary business, professional and retail centre
- Deteriorating heritage buildings
- Continued environmental degradation and low-quality new development
Integrating public transport and landuse planning
3.4.3 The Tannery context analysis.

**Case Study**

**St Mildred’s Tannery, Canterbury**

**Llewelyn-Davies**

**Canterbury City Council & Bellway Homes**

**3.5 hectares**

**Summary:** A context appraisal of a sensitive urban site located within the boundary of the historic city wall of Canterbury. The context analysis considers fundamental issues including the site and its setting, movement and connection plans of the city centre and the ecological designations.

The preparation of a development brief to inform the future layout, land uses and morphology of this historically sensitive site located within the line of the city’s Roman wall required as a starting point for the undertaking of a context appraisal. This enabled the design team to understand the city’s requirements for the site and design a new development which fitted strategically within the historic core while improving on key aspects including links and connections, protecting the cathedral’s view corridor and having regard to landscape and ecological considerations.
3.4.4 David Mellor Cutlery Factory

**Summary:** This case study demonstrates how the design of an industrial building has taken its cue from the former industrial use on the site, used traditional materials evident elsewhere in the locality and left the mature landscape undisturbed. The result is a building which responds most sensitively to its context.

On the site of a redundant gas works yet close to people’s homes and within an area of outstanding environmental merit, both the industrial use and modern design of the building are demonstrably compatible within this sensitive location. The tradition of the workplace being located close to homes is one supported by the client and considered to be an enhancement to the quality of life of local people. Set within a mature landscape, the building capitalised on the 'gap' left by the former industrial structure. Planning permission was granted primarily because the building reuses the old gasholder’s foundations, hence the circular form, and leaves the landscape undisturbed. The external wall is made using local stone and the roof covering is of traditionally detailed lead. This building draws on a strong local vernacular of Derbyshire’s industrial legacy. The result has the simplicity and power of the best 19th century industrial buildings - the sort that inspired the pioneers of the modern movement.
3.5 References

Sustainable Settlements: a guide for planners, designers and developers (1995) *Barton, Davis & Guise, University of the West of England and Local Government Management Board*


3.6 Checklist

Has a context analysis been undertaken that addresses the following areas:

<table>
<thead>
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<th>Form of architecture and the surrounding development:</th>
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<td>Scale and mass of adjoining buildings</td>
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<td>Building pattern</td>
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<td>Public realm</td>
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<td>Materials, colour &amp; texture</td>
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<td>Historic buildings and archaeology</td>
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<th>Landscape and topography:</th>
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<td>Landscape characteristics</td>
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<td>Ecological and biological features</td>
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<td>Underlying geology and soil</td>
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<td>Environmental impact</td>
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<th>Linkages and movement:</th>
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<td>Existing movement networks</td>
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<td>Travel Plan</td>
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<th>History and community associations:</th>
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<td>Local views &amp; landmarks</td>
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<td>Local construction skills and crafts</td>
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<td>Historic and artistic associations</td>
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Site
What is this Section about?
This Section outlines the principles required for effective site planning and design. It is about locating a building or complex on a site and within the landscape, how it is reached by foot, cycle, or vehicle, and where the service and car parking areas are located. This involves the interfaces between architectural, landscape and engineering design, between the public realm and the private realm, as well as how the proposals fit into the context analysis outlined earlier and how the scheme can be designed to be economically and environmentally sustainable.

Why is site planning and design important?
It is a key step in the design process. A building sited to fit comfortably in its setting, easy and direct to reach and which points clearly to where the main entrances are provides the framework for architectural design. It is also about the quality of the fit with the access arrangements, landscape and built form context. Unless these elements come together, a design of sustainable quality cannot be achieved.

How is this Section structured?
4.1 Appraising the site
4.2 Refining the brief
4.3 Creating the structure
4.4 Locating the building(s)
4.5 Access and circulation
4.6 Landscape strategy
4.7 Water, drainage and flood risk
4.8 Servicing
4.9 Safety and security
4.10 Phasing
4.11 Case studies
Whereas a context analysis considers a site’s wider setting, a detailed site appraisal will be required to improve understanding of its current condition, constraints and potential. This is likely to involve considering issues such as:

- current and past uses
- planning policy and allocations
- ground conditions and contamination
- orientation and climate
- water table, drainage and flood risk
- landscape and ecology
- visibility, aspect and prospect
- archaeology, morphology and building heritage
- wayleaves (overhead lines, pipelines, footpaths etc)
- availability of service infrastructure (energy, waste, ICT).

4.2 Refining the brief

There will of course have been a broad plan for the site underpinning the decision to acquire or take an option on the site by the developer. This will need to be revisited and refined to a more detailed level in order to inform the next stage of project planning.

The context analysis and site appraisals should inform this process of refining and finalising the site brief. Opportunities and constraints maps are a useful mechanism at this stage to summarise and illustrate the issues that have emerged. This needs to be considered alongside knowledge of market needs and demand.

This will enable the design team to form a view on what is both possible, deliverable and the most appropriate form of development for the site. The final brief should include a design statement which clearly sets out the aspirations for the development.

In terms of site use, South Yorkshire has target growth clusters (see Section 3). A small number of key sites will be brought forward to meet the specific requirements of these clusters, for example advanced manufacturing activities will be concentrated around the Advanced Manufacturing Park at Waverley,
Rotherham. Other schemes will be for specific projects commissioned by a client for their own end-use which will be designed as a direct response to the client’s specific requirements.

However, for the vast majority of office and industrial premises developed in South Yorkshire in the foreseeable future, a clear target market, beyond broad use classes, will not be known. In these circumstances, the brief must focus on the need for creating quality developments with maximum flexibility and, where schemes will be phased, allowing scope to tailor future build to any particular niche that may emerge.

4.3 Creating the structure

Having finalised the brief, the next step is to decide how to accommodate the anticipated range of uses and activities on the site. There are essentially two broad models:

- Urban block or grid
- Parkland

Neither option is totally exclusive and many schemes will inevitably combine some elements of both.

4.3.1 The urban block or grid model

The grid is the time honoured way of creating a highly permeable network of routes, which can draw on existing routes and create new ones to complement them.

The movement framework is likely to be closely related to the grid, where streets accommodate all forms of transport in the traditional way. Some routes may be pedestrianised and in conjunction with the landscape strategy form green pedestrian corridors with the possible inclusion of public transport.

A grid structure is very flexible and useful whether the development is to be urban or is in a parkland setting. The grid may be formal and rectilinear or more irregular according to location, land uses and...
landform. It can be used in a variety of locations, for example:

- Central urban areas where it can be locked into existing street patterns
- City and town edge locations where it can also be grafted onto existing street grids
- Out of town areas where a looser grid can help to give structure to a parkland setting

It is crucial to achieve the right grid dimensions for the likely uses or mix of uses and an appropriate built form. The grid must be sized to allow:

- The anticipated uses to be accommodated
- Perimeter development that enables buildings to front onto all sides of the block and that servicing and car parking space are provided in the central areas between blocks
- An element of flexibility in terms of alternative uses, building layouts and future expansion needs

The grid is not necessarily all roads; elements can be footpaths or shared surfaces especially across open space and alongside waterfronts. A key element of the plan will be articulating the grid with routes of appropriate scales; urban avenues and wide streets suitable for bus routes for example and smaller local streets, cycle and footpaths.

Where there is existing development around the site the grid should extend into the existing street pattern. This may suggest an irregular grid. Topography may also lead to an irregular grid pattern where the streets may need to work around the levels or features such as existing mature trees.

4.3.2 The Parkland model

With the parkland form, buildings sit in the landscape and are accessed via a freer form of roads and footpaths. Through the use of landscape architecture, buildings are integrated within a landscape structure which in itself directs, orientates and
provides the setting within which activities and structures occur. The pattern of development tends to be loose with the emphasis as much on the setting as the buildings themselves.

4.3.3 Generating the concept

The approach needs to be based on the previous context analysis, site appraisal and the development and marketing objectives of the brief. The concept will evolve from:

- A response to the landscape, landform and environment of the site
- Where the focal heart of the scheme will be
- Connections with the surroundings

The development philosophy will be different depending on the site and the intended end product. The landscape and movement frameworks are key components providing the setting into which buildings can be inserted. There is a tendency to assume that buildings create a sense of place but if the development framework is well conceived, a sense of place will begin to emerge regardless of the architecture.

Many business or industrial parks fail to pursue either the grid or the parkland model with any cohesive vision. Such schemes typically appear dropped in the landscape, surrounded by car parking, and with scant regard to their setting, relationships of buildings to each other, or the face they present to the public.

General guidelines for both models include:

- Evolving the layout, that could be either formal or irregular depending on the site, topography and expected built form. This will involve testing the form and scale to ensure it is fit for the possible buildings and their ancillary spaces (eg parking and service areas)
- Developing a landscape/townscape strategy which is clear, strong, fits with the setting and can create a quality framework for development

The actual process will involve the production of a series of first concept plans; rough sketches of alternatives that are loose, aspirational, explorative. These concepts will begin to define the alternatives:

- The open space and landscape forms that are possible
- The access and circulation systems
The boundaries, gateways, and landmarks
The means and forms of linkages to the surroundings
The location and nature of the heart of the scheme
The location, scale and form of the development blocks and their use potential
The phasing possibilities

A multi-professional design approach is essential at this stage and a vocabulary of design, equipment and materials has to be established and used consistently and comprehensively. Using this approach will produce distinctive places that fit their setting and provide a framework within which the architecture of individual buildings can be developed.

4.3.4 Assessing the concepts

Selecting the core concept for continuing development is best done by a mixture of technical analysis and consultation both at a client group and a community dialogue level. The best solution will rarely be a simple choice; more often it is a hybrid with particular and worthwhile characteristics that have arisen from the consultations involved.

A SWOT or similar analysis of the alternatives is often useful, testing against criteria which have been derived from the nature of the alternatives such as value creation, cost-effectiveness, deliverability, phasing and funding, and the sense of place.

When assessing the options a quality framework will be one which has clear legibility and orientation; a sense of place. A successful townscape or landscape strategy will create a place which is easily read by a first-time visitor. This is probably a good test of a layout; whether a visitor could arrive and know, without directions, where the main space or building is on the site and orientate themselves with minimum directions around the place from that starting point.

4.4 Locating the building(s)

A key principle is to front-up; to the park, the street, or the avenue. There should also be a clear distinction between public fronts and private backs. Put public activities wherever possible overlooking the street. Buildings which front streets, squares and
open spaces present their public face to the outside world and give life to it. Where this principle is not followed, stand-alone buildings often expose blank sides, car parks and rear servicing to the street.

The uses along the street must be as active and lively as possible. This can be supported by relegating uses which are unsightly, such as servicing, to the rear of the building and allowing uses which promote overlooking and street life, such as offices, receptions, and if appropriate shops or residential windows, to the front.

Generally, lining the perimeter as much as possible will create a stronger urban design character. Buildings in the middle of development blocks end up surrounded by parking and do not contribute to create a strong built-edge for the street. It is important that all sides of the perimeter have building frontage otherwise some streets will have service areas or car parking exposed to one street. The more continuous the development frontages along the block edge the better. Adhering to a common building line can do this. This will make streets and spaces bolder.

Complete enclosure is often difficult to achieve for some uses or in looser developments. In these situations a rhythm of frontages should be created while maintaining the perimeter concept. Buildings should still be positioned on the edge of the development block with walls, gates and landscape features used to close the gaps wherever possible.

Pavilion buildings in a very open parkland setting should also be positioned to create clear fronts and backs. There is still a common building line in the clustering on such buildings even if it is looser and less obvious. A parkland setting presents opportunities for orientating buildings to maximise solar gain providing natural light and heat. There are also ways of allowing the landscape to dominate which are qualitative rather than quantitative.

4.5 Access and circulation

Accessibility and movement across the site needs to be assessed at a strategic level before more detailed issues can be decided with regard to car parking and service requirements.
The movement strategy needs to order the various routes within the site and produce a coherent framework for different movement systems. It must look at public transport networks, vehicular linkages, pedestrian and cycle movement. General guidelines include:

- Encourage links to public transport networks and where developments are particularly large in scale or major traffic generates the penetration of public transport into the site
- Give priority wherever sensible to pedestrians
- Provide transport choices wherever possible

The importance given to certain routes will be closely connected to the location of the focal heart. The heart if it is to be the real focus must be on a major route and public transport nodes should be very near. Context analysis is needed to understand existing movement patterns and how these are likely to be changed by proposals. The focal heart of the scheme may indeed be a main organising avenue and this frequently works well, especially in urban settings.

Streets should be designed to ensure that wherever possible they are:

- Comfortable and safe for pedestrians
- Not dominated by any one function
- Visually simple and clutter free, with utilities and extraneous advertising subordinate to other uses
- Sympathetic to local character in design and detail
- Designed for appropriate, ordered provision for access, deliveries and vehicle storage

Car parking approaches and policies should be explored at the concept planning stage. Within the framework, there are several generic solutions which ensure that cars are not allowed to dominate.

The possible approaches could involve rear courts or multi-storey parking with other uses wrapped around. Ideally parking areas would be shared for the users of the block to allow for a consistent treatment of the area. If the court yards are planted to create groves, and combined with gardens or features such as fountains, the negative impact of car parking can be significantly reduced and the dominance of the cars reduced accordingly.

If parking is to the rear, care needs to be taken about where to position the entrances. A common solution particularly where
buildings are stand-alone, is to place the buildings main frontage and entrance to the road, but the main building entrance at the back near the car park.

There should be pedestrian access to a front entrance. Such a solution must clearly delineate the route to the primary entrance regardless of the mode of travel or point of arrival. For example, this could involve an entrance foyer which can be entered from the front and the back.

Where there is a less continuous frontage, parking can (with great care) be placed to the sides of buildings. However, if this is done the building line must be strong and other methods may be needed to reduce the impact of the cars such as lowering the car parking in relation to the road and building.

Basement parking is an expensive but very effective solution, eliminating the negative visual impact of cars. In addition, significant level changes can be used to advantage for underground parking.

A communal parking area for a number of buildings is often a very cost-effective solution. Wrapping the buildings around a landscaped square within which the cars can sit can do this. And finally, do not forget that streets and spaces can be made to accommodate parking in a civilised and inconspicuous way. Visitor parking in particular can often be placed here.

4.6 Landscape strategy

Landscape means many things in this context; it is the open spaces, water, the movement corridors; it is parks, squares and streets; it is street furniture; it is hard and it is soft; and it is habitat and the opportunity to develop a sustainable development approach to the site. The landscape structure will translate the initial concept into a coherent network of open spaces addressing their quality and interconnectivity. The urban design challenge at this stage is that this structure is coherent and works across the site.

A key principle is to treat everything as landscape and not to confuse landscape and landscaping. The task is to create a sequence of spaces whether they are framed and animated by buildings, trees, water or other features, or whether they are hard or soft. With large scale buildings, ensure a large scale landscape design response. A big well designed shed works
best in an almost 'natural' landscape; small scale shrub and flower beds can appear pathetically inadequate.

The preparation of the landscape strategy involves a series of steps:

- Work with what is already on the site and enhance its best qualities. A group of mature trees can anchor a new development, or suggest a park. Views to points of interest beyond the site may suggest that view point or view corridor should be a special place within the development.

- Think about which kind of open space is most suited to each part of the development bearing in mind the intrinsic landscape nature of the site.

- With these considerations in mind create an ordered sequence of open spaces with appropriate landscaping design concepts which help organise the site as a whole, and give character and identity to its different areas.

There are many types of open space. Some can be focal points, others movement corridors or part of the development setting. Generally, it is best that quality rather than quantity is the driving principle of landscape design and it is necessary to think about what sort of space, or spaces, how they work together and how they will be owned, used and maintained.
4.7 Water, drainage and flood risk

Water is involved in many aspects of the development process and requires careful consideration at a variety of levels from drainage and flood risk through to internal water use and landscaping. Water can be used to great visual effect both in urban and parkland settings. It makes a natural focal point or enhancement of a focal point as a pond, lake, or fountain but can also be used in movement corridors as a flowing stream, canal or just a small flowing feature. Its management should generally be carefully assessed so that is both visually pleasing but is also made to work for the development and the environment for recycling, water storage, and drainage.

Flooding is a real issue in South Yorkshire and is likely to become a much more recurring problem in the years ahead. It has to be taken seriously to ensure the future sustainability of development. If given careful consideration from the start of the development process any risks can be dramatically reduced. As PPG25 states ‘development throughout a river catchment can have a significant impact on flooding simply by increasing run-off. All built development tends to extend the area of impermeable ground, from which water runs off rather than percolating into the ground. This can increase both the total and the peak flow from built-up areas, resulting in increased flows downstream and thus increasing the risk of flooding’.

PPG25 aims to strengthen the co-ordination between land-use and development planning and the operational delivery of flood defence strategy. It emphasises that there are many benefits to managing flood risk in a way that is more in tune with nature than the more common hard engineering solutions.

The insurance industry has become increasingly concerned about flooding and the scale of claims which can result. Insurance companies are using increasingly sophisticated techniques to identify risk before insurance is offered. Developers are advised to seek the views of insurers at an early stage.

Projects that will need to give particular consideration to flood risk include those for development:

- within a river floodplain or washland shown on the indicative flood plain map prepared by the Environment Agency
- within or adjacent to any watercourse, particularly where
there might be potential for flash flooding
- adjacent to or including any flood bank or other flood control structure
- situated in an area where the Environment Agency has indicated that there may be drainage problems
- likely to involve the culverting or diverting of any watercourse
- of such size or nature relative to the receiving watercourse or drainage system that there could be a significant increase in surface water run-off from the area

Traditional hard-engineering solutions channel precipitation as quickly as possible from the surface into underground pipes, which then feed into natural watercourses. This tends to increase flood risk by delivering water to rivers more quickly than under natural conditions. Sustainable Drainage Systems (SuDS) address this by working in harmony with the natural water cycle to ensure that water moves through the system more slowly, thereby reducing flood risk.

There are essentially four main techniques:
- filter strips and swales - vegetated surface features that drain water off impermeable surfaces, as the rain water seeps through the vegetation the flow is slowed and the water filtered
- infiltration devices - designed for limited storage and disposal or rain water directly into the ground. These are most effective where the soil is highly permeable and there is a low water table
- filter drains and permeable surfaces - having a permeable surface to footpaths, access roads and car parking allows water to pass through the surface and into a filter drain. When choosing the type of permeable surface the structural strength required to support traffic loads should be considered
- basins and ponds - these features store water on the surface, either as temporary flood basins, or as permanent ponds which can perform drainage and landscaping functions

The use of SuDS has cost advantages, reducing construction costs by 10-15%, avoiding the need to install expensive connections to storm sewers and removing the need for
specialist maintenance contractors. SuDS can also help create attractive environments which add value to the development and provide community, ecological and image benefits. However, commitment to long term maintenance and management is essential and must be negotiated early with the local planning authority and water utility company.

4.8 Servicing

4.8.1 Energy
An important and complex question is how to supply energy to the site. With more and more options available ranging from the conventional to alternative energy sources such as biomass, photovoltaic panels and wind turbines it is important to carry out analysis of the possibilities.

4.8.2 Information and communication technologies (ICT)
There is a need to ensure that the communications and other ICT infrastructure across South Yorkshire available for key development sites is not only adequate or scaleable to meet future needs but also offers choice, competition and resilience. Infrastructure is only one of several factors affecting location, it is vitally important for certain ICT-intensive sectors and is increasingly important as part of what a property has to offer.

ICT is a key driver of economic change. The pace of innovation, the uptake of new devices and the social integration of new telecommunications infrastructures and services is unprecedented. Particularly rapid developments are currently taking place in mobile telephony, cable, fibre-optics, wireless and satellite applications. ICT is changing the way people and institutions use physical space and translate this use into specific demands concerning the development and arrangement of space.

Although ICT largely involves virtual movements and transactions, physical impacts relating to space and networks will depend on:

- Nature of target users - ICT intensive users will have much higher requirements. However, increasing size of new software and extension of internet based services will mean that general need will rise even in areas such as distribution and warehousing. The Creative and Digital Industries cluster is a target growth area for developments in South Yorkshire.
For ICT-intensive users the major locational factors are the local presence of skilled and creative people, and the added value of knowledge institutes in terms of research, development and education. For such companies, the provision of adequate ICT infrastructure is likely to be a qualifying factor in locational decisions rather than a deal maker.

Scale of development - large business parks will essentially involve laying out new infrastructure and will potentially generate sufficient demand for direct working with telecommunication companies if the business case is strong enough.

Many issues around ICT connectivity, particularly in terms of infrastructure provision, are determined either by wider policy or market needs. For instance, the development of electronic infrastructures or the provision of bandwidth is more influenced by the principle of obtaining a return on investment for the telecommunication companies. At the level of individual site development the arrangement of space and internal networks need to be considered.

4.9 Safety and security

Site planning must have regard for both the public passing by the site as well as those potential users of the development, and over a 24/7 period. While the use of CCTV is a matter for the owner, occupier and/or the public authorities, natural surveillance generally proves a more effective and safer measure than mechanical provision. One response to security is to provide heavily gated developments. However, the disadvantage of this rather extreme measure is the impact such long runs of dead frontage has on enlivening the public realm. It can also give the impression that crime is a bigger problem than it actually is which in turn can deter future occupiers and investors. Boundary treatments should be an integral part of the design of the development. Entrances clearly marked and well lit, ground floor activity and a range of uses and operating hours all help to provide a safer and more secure environment.
4.10 Phasing

The cash flow profile of a development can be critical to the profitability, even viability, of a scheme. Where a development starts in relation to existing and new infrastructure, the timing of expenditure on site preparation and services, and the extent to which a scheme is phased in relation to market interest all come into play. There are other elements, such as the provision of construction routes, planning conditions and obligations, that can incur cost and delay risks. There can be a tension between the most cost-effective development schedule and the environmental impact and thus acceptability of the project. These can pose difficulties between the developer and the planning authority.

Thus it is important to determine a phasing strategy as part of producing the masterplan for a site. It is no use having a potentially splendid end product if there is not a clear and acceptable pathway to its production overtime. The analysis of the factors that can determine the staging and phasing of a project needs to start early in the design effort. It is likely to be critical to the quality of the scheme in economic, environmental and design terms.
4.11.1 The Tannery - Site Appraisal

Summary: A context appraisal of a sensitive urban site located within the boundary of the historic city wall of Canterbury, the context analysis considers fundamental issues including the site and its setting, movement and connection plans of the city centre and the ecological designations. These issues will directly inform the site analysis.

Details:

A thorough site appraisal was carried out at the beginning of the development brief process to inform the future layout, form and uses in this urban and historically sensitive location within the boundary of the Roman city wall.

The site has major constraints from its designation as a site of archaeological significance, its location within a flood plain, high levels of contamination and its conservation area status. The site analysis examined the effects of such constraints and was instrumental in shaping the development options and the final detailed design.
Spread and status of historic buildings

Archaeological and contamination estimated locations

Flood Risk plain

Ecological features
### Granta Park

<table>
<thead>
<tr>
<th>Location</th>
<th>Cambridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Team</td>
<td>Eric Parry (architects), Latz and Partners (landscape architects)</td>
</tr>
<tr>
<td>Client</td>
<td>Grants Park Ltd (MEPC and TWI Ltd)</td>
</tr>
<tr>
<td>Project</td>
<td>86 acres research and development park</td>
</tr>
</tbody>
</table>

**Summary:** Granta Park is an impressive development of the parkland model with a strong ecological concept that can be carried through to detailed design.

**Details:**

Granta Park is situated in a rural setting in Cambridgeshire with an emphasis on an appreciation and preservation of existing wildlife habitats as well as the creation of new ones. Otters use the Granta River that runs along the north of the site and several species of dragonfly are commonplace while skylarks nest in the meadow and wildlife enthusiasts are encouraged to put up nesting boxes to attract owls to the woodland areas.

As well as the park being a location for wildlife habitats it is also a key open space that organises the location of the development and movement systems, while setting up changing views and perspectives as you move around the site. There is an adopted design guide that developers must adhere to and no development is allowed to compromise the quality and ecological emphasis of the park. Consequently, this acts as a powerful marketing tool for the park as a whole as well as for the individual companies within it. This is particularly important in a park where the buildings themselves, although well designed, are not of a particularly high specification.

The ecological concept is carried through to the use of water and positioning of the buildings. Water is a characteristic feature for every development zone which is provided by the collection and reuse of rainwater. The masterplan has carefully located the development zones in relation to the contours which allows water drainage to be an integral rather than hidden part of the landscape.
The positioning of buildings must respect the quality of the site and must comply with the following:

- Locating in the designated building zones
- Buildings are expected to be orthogonal to the boundaries ensuring that they are orthogonal to one another within each building zone. This maintains a strong structure to each development block
- Sight lines and vistas across the lake and from the entrance are protected and mean that buildings which are on these sight lines are subject to greater regulation than other less strategically positioned buildings
- The positioning of parking and services must respect sightlines and shared territory

With regard to the buildings themselves:

- All buildings are 2 storeys unless they provide landmarks or key features
- Proposed buildings must aim to maximise use of natural light, natural passive ventilation with efficient plant and thermal performance above regulation standards
- Proposed buildings must contain adaptable generic spaces
- Selection of materials from a specified palette of appropriate materials to ensure a consistency across the site
- Guidance on elevations, roofs and flues/chimneys is extensive to promote design integrity

The management of vehicles is a key component of the success of the park’s environment. A large proportion of vehicles on the site are located in communal parking groves allowing a completely car free environment for the buildings themselves and a true parkland atmosphere of the main park area. Suitable materials for parking areas, screening of parking areas and compatibility with the aims of the original masterplan are all required.

The high levels of security which are needed around the site has resulted in an unfortunate lack of links with its surroundings.
Summary: South Yorkshire has extensive areas of low lying land including ecologically sensitive wetlands in both the Dearne Valley and around Barnsley. This case study has been selected to demonstrate how architecture and landscaping have been deployed to integrate a substantial building into a sensitive environment creating not only a new landmark and attractor but reinforcing the area’s physical character.

Details:
Located on ecologically sensitive low lying wetlands between the River Stern and the Gloucester and Sharpness canal, this 950sq m visitor centre is an environmentally friendly building sitting happily in its context. The landscape of the locality is flat and relatively monotonous.

The horizontality of the building responds with discretion to the low-lying wetlands, with gentle roof pitches. Vertical elements interrupt the horizon with panache including a 16m high viewing tower. The buildings are clad with brick and timber on the ground floor and timber above, used to great effect to reiterate the horizontal context of the site and its landscape. Reedbeds have been added for recycling grey water.

Cost:
A millennium funded project at a cost of £3.5m, approximately £950 per sq m.
The buildings integrate well within their sensitive landscape.
4

4.11.4 Chiswick Park

Summary: This is a good example of a high quality business park based on a grid but set within a structured landscaped setting. The buildings are relatively tightly packed together making good use of land as a scarce commodity. But there is also a sense of spaciousness due to the creation of an inner communal space and legibility of the layout and fine landscaping.

Details:

The strong common building line of the pavilions creates an "inner garden" as the focal point to the development. The key feature is the lake that is surrounded by canopied wooden boardwalks allowing entrance to the buildings.

The "inner garden" is highly designed with waterfalls, architectural features and sculptural objects. This inner garden is connected to an outer landscape park that facilitates circulation for pedestrians, cyclists and vehicles. The outer landscape extends as green fingers between the buildings to link the two spaces.

The park is car-free zone, which maximises the site’s potential. Most parking is dealt with by the provision of undercroft accommodation as well as perimeter parking, which is linked to the buildings via the green fingers of parkland.

Cost:
Target cost plan of £95 per sq ft to Category A standard.

Location: Chiswick High Road, London
Design Team: Richard Rogers Partnership (architects), West 8 (landscape architects), Ove Arup (engineers)
Client: Stanhope plc
Project: 33 acre business park

Pedestrian movement routes
Building plots
Successful use of both hard and soft landscaping to both reinforce the grid and provide an outstanding public realm.
Summary: This large manufacturing facility demonstrates how buildings of a substantial scale benefit from quality architecture and landscaping making best use of a flat, former industrial site through extensive structural landscaping. The resulting place making is of a high order.

Details:

With a floor area of 100,000 sq m, the development has been built on part of a derelict power station site which has been developed as an industrial plant. The brief called for a building which reflected BMW image. The architects response was to design the building as crisp and clean-lined as possible using high quality engineered cladding systems to reflect BMW’s overall design ethics. This is emphasised by the extensive landscaping which also includes a beautiful internal open courtyard (provided for fire separation) visible from the working areas and available as a staff amenity. The landscaping, including ground modelling, provides an overall physical framework to a previously flat site and reinforces the spatial definition created by structural planting. The work was undertaken on a partnering basis, with the general contractors and the main services sub-contractors working alongside the design team from a very early stage. The client was also heavily involved throughout. 100,000 sq m plus infrastructure - £75 million
The buildings are enhanced by their fine landscape setting.
**Summary:** Edinburgh Park is a good example of a business park laid out on a grid pattern with strong design control in which sit clusters of speculative office buildings.

**Details:**

The grid pattern is a robust form of layout that is easily understood. It creates a formal central space, which is framed by the buildings onto which their frontages face. All parking and access roads to parking have been to the back and perimeter of the site. This creates an attractive central park that is pedestrian only.

At the entrance to the site the two large buildings form an impressive gateway and, therefore, sense of arrival. This is emphasised by the narrowing of the entrance, which then opens out into the rest of the park.

The formal planting reinforces the grid pattern, with strong tree lines planted throughout the car parking area and the formal avenues in the central park. This is balanced with the use of water that has been used in a more organic and relaxed fashion.
Landscaping enhancing both legibility and the setting of the buildings
4.12 References

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(2001) *CABE and English Heritage*

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Paving the Way - how we achieve clean, safe and attractive 
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framework for developers and local authorities (2002) *BRE, 
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4.13 Checklist

Has a site appraisal been adequately carried out?  

Urban Block or Grid Model
- Does the structure create enclosed streets and spaces rather than roads with buildings off them?  
- In urban locations is it possible to thoroughly integrate the development into the surrounding street pattern, without any destructive boundaries?  
- Does the structure allow for frontage to all streets?  

Parkland Setting
- define the edges of the development in a powerful way?  
- If pavilion buildings are required, how do the buildings relate to one another?  
- Is the frontage maintained with landscaping and other devices?  

Movement
- Have formal landscaping elements been considered to make the overall structure legible?  

Landscape
- Is the landscape character appropriate to the character of the development?  
- Is there evidence of life-cycle costings considerations?  
- Have safety and security issues been adequately addressed?  

Servicing
- Are public, private and servicing areas carefully divided and defined?  
- Are they effectively screened?
5 Buildings
What is this Section about?

This Section promotes an approach where the quality of the best contemporary building in South Yorkshire becomes the norm. This can avoid good schemes being compromised by poorly designed neighbours. It provides guidance on a range of business building types including the big box, smaller industrial units, the office and iconic buildings.

Why is good building design important?

A good building delights, is embraced by local people, and is ultimately closely related to the image and marketability of both the company that occupies it and the region it’s located in.

Industrial and warehouse buildings are often substantial masses, visible from great distances. It is critical that they are not scars on the landscape but recognised as being an important part of the quality of the area. Good quality smaller buildings are equally important in their effects on the public realm and place making. Well designed buildings attract custom, invite greater care, use less energy, provide a better working environment and promote a company and an area’s image. They are adaptable, flexible and able to respond well to changing employment and market trends.

How is this Section structured?

5.1 Building types
5.2 Context
5.3 Resource and energy efficiency
5.4 Adaptability
5.5 Materials and detailing
5.6 Elevation and roof treatment
5.7 Servicing
5.8 Lighting
5.9 Public realm interface
5.10 Access and legibility
5.11 Case studies
Well designed buildings require skilled architects. While this may not guarantee design excellence, what is guaranteed is failure without them. Distinctiveness will only come through purposeful design with each building or complex specifically tailored to its site. Fortunately, there are some excellent recent examples of this approach. These examples of good practice should be used to reject the awful.

The range of building types, the diverse business and industrial sectors covered and the sheer variety of different development settings in the region will inevitably result in a huge range of building designs. By considering the context of each site, fundamental design considerations will have already informed some of the key design parameters.

This chapter provides guidance on the design of the buildings themselves. It focuses on four generalised building types - the big box (large industrial and storage buildings), smaller industrial units, office buildings and icon buildings.

5.1.1 The big box

Large industrial buildings associated with storage, distribution and general industrial, the big box is a mono-functional container which is highly dependent on heavy goods servicing with a low person to floor space ratio. Key dimensions are generally determined by the function or mechanisms of the process to be accommodated within them so dimensions will differ according to function or end user. The prime considerations for the developer and user are access to the major road and sometimes rail networks and lower cost land. Although usually one to two storeys high, the floor to ceiling heights are often far greater than those required for other uses. The floor plate is likewise relatively large and the land take to cater for the combined floorplate and scale of the required servicing is extensive. These factors inevitably result in a building which has a significant visual impact on the environment. Yet throughout the country, it is the exception to find a big box which has actually been designed as architecture in its own right. They have somehow escaped the
appraisal and design requirements increasingly applied to all other sectors and building typologies and have incrementally scarred the British landscape.

5.1.2 Smaller industrial units
By this we refer to developments which provide one or a series of small units, generally one to two storeys with floor spaces between 60-150sq m. They may comprise managed workspaces, incubation or graduation units. Generally located closer to existing urban areas or smaller settlements compared to the big box they are an important building type for a diversifying and changing economy providing flexibility in terms of cost, location and form.

5.1.3 The office building
The majority of these buildings will be developed within an existing urban or edge of urban location with a design response focused on knitting development into an existing fabric or built form. These buildings will therefore inevitably be specifically and highly tailored to their sites. They must address a far more active public realm than the big box and small industrial buildings and have a high regard for the impact they produce on their neighbouring buildings. The need for adaptable and sustainable buildings becomes a fundamental consideration as does the quality of the design in order that the host environment is incrementally improved and the building suitable for a range of ever changing functional requirements.

5.1.4 Iconic buildings
These are one-off buildings where the scale and impact of the building are acknowledged and flaunted resulting in a landmark development. They orientate, help brand a region and delight the public. Icon buildings have architecture with attitude.

The following sections provide generic guidance that applies to all of the above buildings types, although the emphasis will vary depending to both the typology and sector planned.
5.2 Context

A good building relates to its context. This can be a matter of fitting in with the established scales, rhythms and proportions or a carefully designed contrast to them. The buildings scale will be largely dependent upon the size of the site but also its position within the hierarchy of the built form. For example, at a gateway location, the building mass should reflect this context while having regard to nearby buildings. A gateway position demands a greater mass than its neighbours. By comparison, a mid terrace infill may require a ‘quieter’ building which is more responsive to the prevailing storey heights and articulations.

The most important contextual considerations for small-scale industrial units are the connections from the building (and its site) to the neighbouring properties and town as well as the interface between the development and the visible public realm. The facades should at least acknowledge their visibility and not accommodate unsightly services or servicing functions. entrances for both the pedestrian and the service vehicles should be clearly displayed for both ease of use and safety considerations.

The big box, though, has greater difficulty in achieving a contextual relationship with its setting. The combined height and land-take result in a major impact on any locality. Most of these huge buildings are therefore inevitably out of context with the vernacular and landscape except for the old, big industrial buildings such as Magna. As with these giants of a previous era, an honest approach which responds to the sheer scale and volume of the building is required. An applied domestic vernacular looks dishonest and ill-fitting.

The icon building makes no attempt to be contextually relevant. Through design excellence it maximises on the benefits derived by the visual impact of its sheer scale. The Magna building has become an icon through its adaptation from vast industrial shed to a regional landmark and attraction. It now positively promotes the region and has become an effective branding or marketing tool. Icon buildings animate, orientate and delight. South Yorkshire is a large and diverse region. There is room for more.

5.3 Resource and energy efficiency

To redefine working environments today and in the future, sustainable, low energy and environmentally neutral technologies are fundamental inclusions to any new building.
Environmental considerations include:

- Grey water systems coupled with reduced water consumption. Systems designed to collect rainwater from roofs for recycling combined with, for example, the installation of low flush toilets, spray taps etc.
- Utilisation of solar power including the use of, or allowance for future use of, photovoltaic panels.
- Solar orientation - minimise areas of overshadowing and therefore maximise solar heating and daylight to save on energy and artificial light.
- Use of ‘conservatories’ which can be ‘opened up’ to become decks and balconies in summer as an amenity for workers.
- Incorporation of natural ventilation systems using stack ventilation with heat recovery.
- Use of high levels of insulation.
- Use of building materials derived from sustainable sources.

An energy efficient environment is increasingly becoming expected as an integral part of a broader sustainable approach, not only in terms of the healthier environment it produces for the workforce but in terms of broader energy conservation issues.

Commercial buildings produce a large proportion of energy consumption in the UK. The property industry is beginning to acknowledge the benefits of taking sustainability seriously. Although sustainability is a far wider concern, this is most evident in the energy conservation issues inside a building where energy savings and increased profitability are directly and very evidently linked. The aim is to produce a building which:

- Consumes less energy.
- Uses materials with low embodied energy.

Environmental sustainability is therefore closely related to the efficiency of services and the possibility of using natural alternatives and also with construction and the choice of materials.

5.3.1 BREEAM

Several organisations provide advice on environmental sustainability issues. Particularly useful is the Building Research Establishment (BRE) which provides numerous programmes and tools to advise, assess and promote environmental sustainability in commercial buildings. In particular, they have
developed BREEAM, the Building Research Establishment Environmental Assessment Method, which has been accepted in the construction industry and which provides advice and assessment of commercial buildings at every stage of design and through to building management. The use of BREEAM is not mandatory but allows for planning and monitoring of sustainable products and procedure. The BRE also produces an Office Toolkit to consider and monitor environmental impacts.

BRE’s assessment is based on six performance indicators: operational energy; embodied energy; transport energy; waste; water and bio-diversity. The internal areas of the building will mostly be affected by operational energy ratings but also embodied energy, waste and water ratings.

5.3.2 Building Regulations Part L

The need for attention to efficient energy use is laid out in the revised Part L of the Building Regulations, 2002. In summary Part L principally examines:

- Heat-loss
- The use of energy efficient space and water heating systems
- The use of energy efficient lighting systems
- The installation of meters and monitoring devices

The regulations require the provision of u-value and carbon performance ratings for approval by the building control officer. These may be carried out by the architect although specialists are often employed.

5.3.3 Solar positioning

Overheating and solar glare can be particular problems in extensively glazed buildings or those with intensive computer use. This is set to become an increasing issue set against the latest climate change scenarios from the UK Climate Impacts Programme which anticipate increasingly fluctuating climate patterns.

Key considerations should include:

- Orientation of the facades - a south and north facing building is easier to shade than an east-west facing one
- Glazed areas - the use of advanced ‘heat mirror’ glazing or mid-pane blinds
- Shading by architectural features like overhangs
Installing external shading, which can be difficult to retrofit and has an impact on the buildings appearance (eg in 'brise soleil' form)

Night ventilation

Compliance with the new Building Regulations Part L requirement limiting solar overheating

Avoidance of excessive solar gain by including roof overhangs, recessed window openings, external (often moveable) solar shades and ensure appropriate window size and orientation

Incorporation of high levels of thermal mass - this reduces night-time temperatures which are used to pre-cool buildings before occupation

Designing mixed mode buildings that can be either naturally ventilated or cooled mechanically depending on the outdoor and indoor conditions

Employing less energy intensive air conditioning systems that may be used more flexibly, such as on a floor by floor or zone by zone basis

In new buildings, passive cooling technology can be used to minimise the need for air conditioning

5.3.4 Solar energy

The Climate Change Levy is having a dramatic change on costs to business. On-site renewable power generation offers the prospect of Levy Exemption Certificates to reduce a site’s electricity costs and reduce an occupier’s carbon emissions to help meet environmental targets.

Despite government grants offering 50% of installation costs for businesses installing photovoltaic cells, it is still an expensive outlay with a relatively long payback time. As such, there is still a price barrier in terms of the payback of solar energy compared to the price of polluting electricity. However, the next surge in sales will be when the mass market is developed enough for the price of photovoltaic cells to fall - experts predict by 2010. In the mean time, there is political and public relations value in building a flagship photovoltaic installation - which, at this stage of market development in the UK, attracts a lot of interest.
5.3.5 Rainwater and greywater recycling

Rainwater and greywater recycling systems are the most common forms of reusing water. Rainwater is most commonly collected for flushing toilets and applications where the water is to come into contact with people. Greywater recycling from bath, showers, dishwashers or washing machines, is more complicated to collect and it is more difficult to achieve the necessary quality to render it fit to come into contact with people.

Rainwater is generally collected from roof areas using rainwater harvesting equipment, disinfected, filtered and then pumped into a header tank which will then feed a buildings toilets. The costs of treatment systems may come down as the technology is more widely adopted which will make greywater recycling more affordable than at present.

5.3.6 Wind turbines

The installation of a wind turbine on site could be considered provided that:

- Site occupiers will have a reasonably high demand for electricity (individually or collectively) - a minimum baseload of 1MW
- The site is fairly exposed and has a good wind regime with high long-term annual mean wind speed
- Any turbines are located at a safe distance from buildings and other areas of activity
- A long-term commitment can be given to using the land for the turbine without competing pressures e.g. for additional or extended buildings - turbines can be installed for up to 25 years

Wind turbines can help occupiers to minimise the penalties of green taxation, cut costs from essential processes and present shareholders, employees and other stakeholders with evidence of environmental action.

5.3.7 Embodied energy and life-cycle costing

Embodied energy is the energy consumed in the production of a building. It includes:

- The energy used to acquire the natural resources for building products, for instance mining
- The energy used to manufacture a product or piece of equipment, for instance the production of steel and
5.4 Adaptability

Good buildings tend to be adaptable over time. This is an integral part of designing a sustainable building. Adaptable buildings enable businesses to grow, move and alter in accordance with an ever-changing economy.

Designing industrial units adaptable to differing occupier size requirements is therefore a sustainable approach. In order to achieve flexibility, the following are important:

- Free up open space particularly in work areas with as few structural hindrances as possible
- Repeated use of modular space to act as a foundation for many alternative detailed options
- Intensified use of space: getting the most out of the space available. This requires dealing carefully and economically with circulation and differentiating between work areas and communal areas

So far as possible, the space planning should avoid being overly bespoke. Buildings with limited flexibility will become redundant either for their original users as their needs change or for future users.

Designing to allow for extension, expansion and sub-division is a critical element of flexibility in both industrial and office accommodation. The plan of the shell must reflect the market demand for tenancy size but also be flexible enough to accommodate a situation which is different in the short-term i.e. as a company may grow, or in the long term, for instance if the market demand alters.
For the building to accommodate expansion easily, the initial plan is critical, for instance with regard to the position of fire escape staircases. To accommodate sub-division the initial plan must foresee a range of variations such as the position of the access staircases and lift cores, which, if carefully located, can serve a large number of potential units. If badly located it may restrict the floor to one occupier.

This rationalisation should extend to future phases if they are foreseen. If the building or development is phased over a long period, an accommodation strategy may be required to plan the physical building requirements over time and assess these in terms of likely future funds. Future phases should be accommodated, this avoids haphazard, piecemeal development that often tends towards duplication of services, spaces that work less effectively and waste funds, both in construction and in running costs.

5.5 Materials and detailing

Materials can be sourced from every region in the world. Technological advances have also offered up an ever increasing range of man made materials. Matching materials is no longer the issue. A good designer will source appropriate materials with regard to sustainable origins, lifetime costing and fit for purpose considerations. Both the developer and the determining authorities should not be afraid to embrace new materials where appropriate. After all, it is the way they are applied and the attention to detailing that is the primary consideration in all but the most historically sensitive locations.

Materials should be selected according to the architectural idiom. This is not a matter of style or a question of whether the materials are as old as time or the product of the latest technology. Detailing of the chosen material is critical - more important than the material itself. Use of a variety of materials including textures and colours can help to reduce the impact of scale of larger buildings including the big box by providing focal points, or as a technique to better marry the building with its surrounds such as the use of indigenous materials in part which can help better anchor it to the terrain. Inversely, overdoing the range of materials can be disastrous.
5.6 Elevation and roof treatment

Elevations can be articulated in many ways. The important thing is that the modelling is reflected in the selection of materials and detailing in a process where a harmonious and composed design emerges. The search must be for a fitting contemporary architecture, at ease in itself and with its setting. There should be neither the need nor the tendency to import standard responses or copying vernacular.

- Rhythm - consider breaking up the mass with a rhythmic design to the elevations
- Fenestration - steer clear of the domestic. Reflect the scale of the building as well as the function of the fenestration. Fenestration can be used to reduce the impact of the mass of a building or group of buildings by adding rhythm, textural changes, lightening the ‘weight’ of the elevation and orientation through signalling the entrances or reception areas
- Marketing - the elevational articulation can also be used as an effective marketing and promotion device

Highly visible often from considerable distances, the roof-line is particularly sensitive in how it impacts on the locality. Certain historic locations will dictate the roof line, detailing and materials. But for most development, there is more freedom to design. However, this fundamental design consideration, the impact of the roof when viewed from both near and afar, is too often neglected. New development must address the roofscape impact by designing the roof as an integral building component.

In particular, it is often the first sight one gets of the big box in the landscape. Does it delight or respond to the surroundings? Lifting the roof line is an effective design device for lightening what are often very large spans. Articulating the roof with service pop-ups or camouflaging it with colour are also potential design solutions for addressing the impact of the roof.

The design of the roof will also affect the building profile. Seen from afar, a well articulated profile will add visual interest and help reduce the impression of the mass of the large building while adding some visual relief or delight for the smaller industrial units.
5.7 Servicing

Screen it or feature it. Enclose part of the servicing function within the structure as an integral building component, set it to the rear of the building or on the least publicly visible side; landscape the service yards and let the trees do the screening. Cycle and waste stores should also be integral design features as opposed to after-thoughts. They should be part of the ‘family’ of design applied to the building as a whole, contributing to rather than detracting from its integrity. Designed well, they can become features in their own right and in doing so will further help to mitigate against the impact of the sheer scale of the big box on its locality.

5.8 Lighting

Lighting should not add to the problems of night light saturation which is diminishing our star-scape. But if night lighting is required, it should be designed to light up the key features of a building such as the entrance, the profile or the roof line. Specialist advice pays off here.

5.9 Public realm interface

The interface between public and private realms, from the pavement edge to the building face is a highly sensitive transition zone which must be dealt with by the designer as an integral component of the building’s facade.

It is at ground floor level in particular where the impact of a building is at its most intensive and intimate relationship with the public. Every effort is required to ensure the ground floor acknowledges this most public of interfaces. Integral components will always include signage, numbering, boundaries, entrances, fenestration and landscaping.

The use of the ground floor should also be considered in order to achieve the maximum animation at this sensitive interface. Receptions, cafes and office functions in the big box should be located in relation to the primary frontage.
5.10 Access and legibility

The planning of buildings needs to assist legibility and circulation. It needs to avoid confusion over fronts and backs and where entrances occur. In urban centres in particular, entrances provided for pedestrians at street level must be welcoming.

The position and detailing of the entrances is particularly critical for buildings in urban centres which sit within an established context. Building entrances must reflect their function and be immediately obvious to both the passer-by and the building user. This also reduces the reliance on street signage. Access for those with physical disabilities should be provided as a matter of course whether this be through the use of flush levels, sufficiently wide doorways or elegant ramps.

Vehicular entrances must consider public safety on a par with functional efficiency. The pavement is the domain of the pedestrian. Vehicular crossovers must be designed to reflect the duality of pavement use and signify to both drivers and pedestrians that they are now sharing the surface. Again, a clearly designed demarcation will reduce the need for additional signage.

Location of entrances is an equally critical consideration when designing the big box and the smaller industrial units. The entrance helps orientate the building on its site and the public’s use, albeit limited. Detailing as a design feature can help to reduce the impact of the building by providing both a focus and a feature.

Signage should be an integral design consideration and not another piece of site or building clutter. The bill board approach on the road-side verge fails miserably as both a design solution or a mitigating measure. Architecture promotes and signals far more effectively than signage. Applied signage should be considered and provided for as an integral part of a building's design. Designed well, it can actually reduce the impact of the big box or the smaller industrial units by providing a focal point and breaking up the mass of the building.
Summary: Allies and Morrison have proved that it is possible to produce a high quality speculative office block.

Details:

Nunnery Square is situated on a site between the city centre and the vast Meadowhall shopping centre. It was, therefore, essential to create a sense of place and orientation within which the building sits. Nunnery Square has a central oblong shaped lawn lined with hedges and pruned trees. The buildings face this space that define a new urban square. Extending away from the square are the private domains of the individual buildings. Parking, largely hidden from the square, occupies the residual land to the site perimeter.

The building provides 25,000 sq ft of space arranged over 3 floors with a simple floor layout. However, it is its skin that makes the building interesting. The cladding exactly reflects the internal arrangement of the structures 1.5m grid. A cage of metalwork is placed on the outside to provide access for window cleaning and support for solar control screens. The whole external structure is in white.

The result is a sophisticated facade with very practical uses that gives depth to a building that has only 15m wide floorplates.

Cost:
Contract Value £12.5m
5.11.2 Motorola Building

Summary: A manufacturing and headquarters building, visible from the motorway and surrounding main roads, the building has become a local landmark enlivening its harsh setting and promoting the company’s image.

Details:

To provide a building to house the American mobile phone company’s worldwide manufacturing and European office headquarters. It had to be flexible, allow for future expansion and be capable of construction within one year. It also accommodates laboratories, an auditorium, training facilities and restaurant.

The building was required to promote the company’s image and provide good visibility from the adjacent motorway and main roads. It was based on a modular, large-span, steel framed industrial shed with overhead services distribution to give maximum flexibility in the layout of industrial production lines.

Cost:
£116 m
Case Study

5.11.3 Orange Call Centre

Heavily glazed south facing frontage

Summary: "... a genuinely flexible, multi-purpose building which could be used for warehousing, industry, leisure of offices. Hopefully it will therefore have a long and useful life". Nicholas Grimshaw, Architect. An exemplary ‘big box’ of outstanding design produced within a restricted budget.

Details:

The Orange Call centre has been built as a hybrid; a flexible multi-purpose building, which could be used for a computer-reliant, densely populated communications centre as well as for warehousing, industry, leisure or offices purposes. Orange was a very design-aware brand, aggressively marketed as a lifestyle necessity on the basis of its technology and its consumer support. As a fast expanding company Orange demanded a call centre according to its image and its needs. The budget for the building was basically the same as for a standard warehouse/industrial shed, demanding much creativity and designer skills to be able to build an interesting shed.

The architect designed a 7.2 high metre industrial shell, which due to refining the structure, tweaking the envelope and making use of the volume by introducing unexpected elements. It is an exemplary treatment of the 'big box'. To reduce costs, the frame has been kept as skinny as possible thus saving weight, so releasing more money to spend on internal detailing.

In order to get a more sustainable building the north-facing frontage has been kept blank with the exception of three long and narrow windows to allow some daylight penetration. The whole of south-facing frontage is glazed and provided with sun-shading louvers, which besides working as sun protection, contribute to the remarkable appearance of the building. The name of the company has been screened on the glass frontage and is, although the size of the letters is enormous, surprisingly recessive and clean.

Details:

Internal spaces
Internal layout plan

North-South Section

East-West Section

North facing elevation
Summary: The brief was to redefine the typical image of office/warehouse buildings by maximising the impact of the office content.

Details
The building comprises of 190,000 square feet of which 20% is office space. They are arranged over three floors at the front of the building, which hides and reduces the impact of the large warehouse space at the rear. The front façade is fully glazed, which creates a high quality impression, and beyond is a simple streamlined envelope of the warehouse. This is clad in horizontal metallic silver profiled metal sheeting. The design strategy was to establish a hierarchy of materials expressed to relate to the uses.

The offices are finished to a Grade A specification, including comfort cooling, raised access floors, a triple height reception and full height glazing. The two wings either side of the reception void are serviced centrally by lift, toilets and kitchen facilities on all floors, resulting in a clear office space of 10x42m.

The project was finished a week early and met the brief of providing a cost effective solution, the benefits of which have resulted in a competitive rental price.

Cost: £285 per m2
Summary: The brief was to design a conference and arrivals facility for the Earth Centre, which demonstrated sustainable building practice and low energy consumption.

Details
The building is designed to maximise heat gain throughout the winter months and minimise it during the summer months. The foundations of the buildings were formed into an insulated concrete tank that stores heated water from the solar roof panelling, thus enabling the building to store warmth from winter to summer. However the super insulated walls keep the building cool in the summer due to natural ventilation system of wind cowls and interior surface finishes to expose areas of thermal mass to radiant cooling.

The buildings energy is generated from solar panelling and therefore the buildings are orientated to maximise solar gain but overhanging eaves reduce the risk of overheating during the summer.

Care was taken in the specification of materials to omit PVC and toxic products. To reduce the embodied energy of the building materials were reclaimed where possible. Gabions filled with crushed concrete from local demolition sites were used as structural walls and that provide huge amount of thermal mass and insulation. Energy intensive metals such as aluminium were used sparingly, only when strength and low weight were required. All the steel sections were reclaimed also directly from local demolition sites and fabricated into new components on site.

The building is a practical response to the wider issues of the building industry and its impact on the environment.
Summary: A high quality speculative building delivered at low-cost and designed for flexible office/science laboratory use and multiple tenancies.

Details:

The building, completed in 2001, provides 3,390 sqm gross of Grade A office/laboratory space on two floors, including kitchen, shower facilities, gymnasium and restaurant.

The floor plates were arranged so that laboratory use could occupy the north and south areas of each level with provision for general office space in the highly glazed east and west areas overlooking the surrounding landscaped area.

To maximise flexibility of use and layout a 1.5m grid was adopted enabling partitions to be placed in a variety of locations. Additional features incorporate to maximise flexibility of use and layout include:

- deep ceiling voids (1000mm-1200mm deep) to accommodate mechanical lab fit-out
- high sill heights to allow for perimeter laboratory benching
- lab waste stacks installed at regular intervals around the perimeter of the building to allow for the installation of laboratory sinks
- shallow floor voids (150mm) throughout the building to accommodate office and data cabling.

These features are provided within a impressive building with high quality masonry and curtain wall finish and set in an attractively landscaped lake area.
An important part of the brief was to provide a range of accommodation from small office sublets through to a full laboratory fit-out. This allows the building to be occupied by a single user or tenants on a two per floor basis. Such accommodation allows companies to grow within the existing building rather than having to relocate. To enable this, a high degree of flexibility of internal planning was incorporated supported by a large open roof plant area for tenant use.

Nicholas Hare Architects worked with the client’s established team of consultants to produce a simple yet elegant building in a beautiful landscape using the knowledge gained on previous projects at the Oxford Science Park.

Andrew Mulroy - Nicholas Hare Architects
### 5.12 References

<table>
<thead>
<tr>
<th>Reference</th>
<th>Author(s)</th>
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<tbody>
<tr>
<td>Code of Practice - rights of access to goods, facilities, services and premises (2002)</td>
<td>Disability Rights Commission</td>
</tr>
<tr>
<td>Designing for Accessibility (1999)</td>
<td>Centre for Accessible Environments</td>
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</table>
## 5.13 Checklist

<table>
<thead>
<tr>
<th>The big box</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
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<tbody>
<tr>
<td>Is the architecture appropriate to the context?</td>
<td></td>
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<tr>
<td>Is the architecture appropriate to the scale and use?</td>
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<table>
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<tr>
<th>Does the building address these sustainability issues:</th>
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<tr>
<td>Resource and energy efficiency?</td>
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<tr>
<td>BREEAM?</td>
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<tr>
<td>Part L, Building Regulations?</td>
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<th>Are services handled successfully?</th>
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<tr>
<td>Does the ground floor relate well to the public realm?</td>
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<tr>
<td>Is the choice of materials appropriate to the context and typology?</td>
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<tr>
<td>Are public and private servicing arrangements carefully defined?</td>
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<tr>
<td>Have the materials been well detailed?</td>
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<table>
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<tr>
<th>Is the building well designed in relation to its:</th>
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</thead>
<tbody>
<tr>
<td>Treatment of elevations?</td>
</tr>
<tr>
<td>Position and detailing of entrances?</td>
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<tr>
<td>Roof?</td>
</tr>
</tbody>
</table>

| Is the landscaping design appropriate to the scale of the building? |     |    |     |
| Is lighting used with care and for best effect? |     |    |     |
| Is the signage integral to the design? |     |    |     |
| Are the boundary treatments well designed? |     |    |     |
What is this Section about?
This Section is about good internal design. It is about the need to provide an internal environment which meets current and future expectations, whether they are technical or organisational.

Why is interior design important?
Architecture involves a fusion of internal planning and external expression. In bringing these strands together, it is important to recognise the changing nature of the workspace and its use.

There are trends toward a higher quality environment triggered by an increasingly professional workforce with a greater say in their working patterns and workplace.

At the same time, flexibility is required. The characteristics of the working environment are constantly changing, influenced by new technology, changing technical requirements, work patterns and employee expectations.

By planning for these emerging trends, South Yorkshire will raise its competitive edge in a fluctuating market place.

How is this Section structured?
6.1 Understanding occupier requirements
6.2 Current trends
6.3 Creating flexible and adaptable space
6.4 Inclusive environments
6.5 Services
6.6 Public and private areas
6.7 A healthy environment
6.8 Energy and resource consumption
6.9 Case studies
6.1 Understanding occupier requirements

Good internal design requires as clear an understanding as possible of the needs and organisational behaviours of the occupier.

Where a development is commissioned by the end occupier, a very thorough understanding of the organisation will be possible enabling a clear brief to be drawn up and agreed. This will involve an assessment of present day working patterns, space requirements, financial constraints and, critically, some thinking by both architect and occupier on future aspirations.

Where a development is speculatively built but with a clear focus on a target sector, thorough research of current requirements and future trends for that sector will be essential. For example, biotech facilities require a mix of wet and dry space while ICT incubators demand a high energy and ICT specification.

Where a building is entirely speculative with no real target sector, it must be designed as flexibly as possible, to be marketable to as wide a range of potential occupiers as possible. In South Yorkshire, many schemes are, and will continue, to be speculatively built with the initial phase being loosely targeted to a specific sector.

6.1.1 Design process

Whatever the building type, the process of design will not be linear with each step completed and finished. It will be circular and iterative. The process will involve:

- Understanding the user organisation or targeted sector
- Creating a brief
- Establishing broad space planning principles to answer basic space requirements and arranging these to best suit the organisation or sector
- Addressing more detailed internal space planning issues

The process involves juggling these issues with the resulting and desired built-form and its effects on other areas of design such as external spaces. Technical requirements and building regulations will influence much of the design strategy but should not dictate it.

Each element of the design process will have an impact on the other. For instance, the resolution of detailed space
requirements may result in the need to revise overall space planning or even a revision of the brief. It is important that all concerns are resolved and revised alongside one another until the right balance exists.

6.1.2 A best value solution

It is important to assess a solution in terms of its long-term best value. Immediate cost-effectiveness is often used as the ultimate constraint. Such an approach ignores the long-term gain of a high quality environment or pay back for early investment whether this is to do with quality of materials or the use of different technologies. Lifetime costings rather than immediate construction costs should be favoured.

Long-term value includes the more easily measurable long-term gains from energy conservation and other environmentally sustainable methods to the less easily quantifiable benefits derived from a high quality environment such as increased productivity and improved company profile.

6.2 Current trends

The workplace is a constantly evolving environment: changes in working patterns, ICT innovation, changes in technology, environmental innovation and rising standards mean that whilst providing for today’s expectations the workplace must also cater for an essentially unpredictable future.

The current trend from manufacturing towards knowledge-based work and a range of service activities is expected to continue. Knowledge-based professionals have more power over the quality of their environment and this brings an emphasis on higher quality and less hierarchical space.

Increased workforce power and changing technology are affecting work patterns and the locational aspects of work resulting in a more dispersed workforce.

The trends to date have brought demand for increased areas of high quality public and shared common space in buildings, with individual workstations reduced in size and possibly shared. These changes have been in response to the trend towards working from a variety of different locations.

Existing trends show that the quality of the environment is
expected to be high in office-based work and should be:

- Geared to work patterns
- Socially stimulating
- Visually pleasing
- Healthy
- Environmentally sustainable
- Technologically sophisticated

This applies primarily to office-based work, although increasingly the administrative parts of manufacturing operations will require higher quality points of contact with clients. There are now manufacturing companies who exhibit and celebrate the manufacturing element within the reception and public areas of their buildings as well as through the architecture.

6.2.1 Work Space geared to working patterns

Working environments have moved away from the simple differentiation of open plan or cellular space and are increasingly designed to reflect the nature of the work carried out and the fact that different tasks require different spaces. It is important to understand the exact nature of the work carried out by an organisation, or allow for maximum adaptability when designing speculatively. The den, the hub, the hive and the cell are commonly accepted work pattern types and these affect the local distribution of working spaces and whether these are arranged in clusters or corrals.

This will affect other concerns for instance the storage strategy of the business which will vary according to the working patterns or the targeted sector. Storage must be considered: for general use, archives, team based storage and personal use. In office developments where hot desking is envisaged, 'garages' can be used where personal mobile units are stored until they are needed at a workstation.

The trend is also moving away from business functions (development, production,
marketing and sales) integrated on a single site and towards networks based on highly specialist and often spatially separated modules. Two types of business unit can be differentiated:

- Organising centres, where there is a high degree of interaction between employees and also with visitors. Under these circumstances the key design requirement is for good quality common space enabling both formal and informal meetings, with good access and proximity to other external places.

- Back offices/production/distribution facilities, where the focus is on efficient delivery. The space must be sufficiently flexible to allow for changes in layout as the product or service changes.

Many operations contain elements of both forms. The degree of flexibility required is likely to be higher for the organising centre where there might be a need to accommodate prototype or early stage production and or distribution, before this is contracted out to specialist providers.

A number of commentators expect activities to be increasingly organised in small-scale units, in safe environments in key locations, with good client contact and key trusted employers. IT will facilitate networking with other parts of the business and with suppliers and customers.

Although there will continue to be specific requirements for industrial processes, many firms will need a high standard shell, offering a quality environment that can be redesigned to accommodate growth and meet changing operational needs, encompassing changes in product, process innovation and redeployment of the workforce.

If it is to shift its economy towards higher value-added functions, South Yorkshire will need to attract and retain organising centres as well as back office/production/distribution facilities. Higher quality design is part of a virtuous circle, in which demand for higher level activities provides opportunities to realise higher standards. These, in turn, reinforce the expectations of businesses and local people.

These market predictions reinforce the need for space to meet high quality present-day expectations whilst also being flexible enough for future changes.

The Igus Factory, Cologne, provides space which lends itself to adaption and expansion and contains carefully planned service runs.
6.3 Creating flexible and adaptable space

Everything in new-build modern office workspace and, to a large extent, manufacturing and industrial design aims towards flexibility. The aim must be to provide space that is as free and open as possible and which can be used in whatever manner the occupier chooses. This is particularly relevant to the speculative market.

It is increasingly common to differentiate between the shell of the building and those elements that fit within it (services, workstations etc). The shell will essentially be permanent whereas the elements within it will be less fixed. The key must be to make the dimensions and layout of the shell as flexible as possible and the more temporary elements as adaptable as possible. The shell must allow for:

- Organisational and cultural change - general space-planning must allow for layout change in the most economic way and in a way least disruptive to work time loss recognising the likelihood of fundamental shifts in working patterns or ultimately a change of use
- Technical flexibility - services and technology must be fully operational whatever the internal layout and however it may be altered. Services and technology must also be incorporated to allow for long-term advances
- A quality working environmental - a responsive, personally adjustable, environment is needed to ensure a healthy workplace

In order to achieve flexibility, the following are important:

- Provide free areas of open space, particularly in work areas, with as few structural hindrances as possible
- Consider the use of modular space as a foundation for many alternative detailed options
- Recognise the potential need for an intensified use of space: getting the most out of the space available by dealing carefully and economically with circulation and differentiating between work areas and communal areas

The ability to expand and sub-divide is a critical element of flexibility in both industrial and office accommodation.
6.4 Inclusive environments

6.4.1 Access & circulation

Part M of the Building Regulations and the Disability Discrimination Act 2004 requirements - the building must satisfy these regulations that relate to universal access. How it satisfies these requirements will directly affect the quality of the environment both in terms of its visual impact and in terms of its social impact. The design team should be familiar with these standards and it is important that such compliance is addressed at the earliest stage as incorporating these standards late in the design is likely to create awkward compromises.

The standards address measures to assist movement around buildings for disabled people including the visually impaired and examines access, horizontal and vertical movement around the building and details such as handrails, corridors and doorways and stairs. Addressing issues early on will mean that specific access and other requirements are incorporated into the design so that they are neither visually incongruous nor create a sense of division between the able-bodied and the disabled users.

Visual distinction of elements within the building, particularly such elements as door handles, is encouraged to assist those with visual impairments.

6.5 Services

General services that need to be included are:

- Heating (pipes or ducts depending on the system and boilers)
- Electrical cabling
- Gas
- Water supply and waste disposal
- Ventilation
- IT cabling: including intranet
- Other specialist service requirements particularly for manufacturing

And may soon also involve new service requirements which are explored later in the chapter brought about by:
Alternative energy sources, especially the use of photo voltaics, natural ventilation etc

- New ICT solutions (possibly wireless)
- Greater use of building and service control by intranet

Services must be:
- Adaptable for organisational or use changes or for the less predictable changes in technology
- Accessible for easy, safe maintenance and easy alteration

Service provision is generally categorised into three stages: primary vertical stacking through the floors; secondary horizontal provision; tertiary provision to individual service points.

Providing clearly identified and logical zones for building services, which also accommodate subdivision, is good practice. The services must also be positioned so as not to obstruct the clear workspace they serve. Generally, by putting the service stacks on the outside maintains very open plan workspaces and allows easy access to services. But this can be expensive. The key is to ensure that they are positioned to create the least disruption to the flexibility or the future flexibility of the space they serve. Horizontal distribution of services in floor or ceiling voids should also be strategically located for best efficiency and for varied workspace layouts.

Locating toilets, lifts, staircases and service stack areas together often ensures disruption is minimised particularly for escape staircases. It is also sensible as it reduces water service runs to the toilet facilities.

Ensure that spaces are not ruined when services need to be maintained or altered or which cannot be adapted to different or new technology.

Tidy provision of services from under-floor voids to each user can be achieved with floor outlets and hitching posts. These can be made available throughout the building, not only in work areas but also for use by visitors. Equally, places to store and recharge mobile phones should be built into a design at an early stage. Furniture designed to incorporate wiring in table legs for instance, helps to remove clutter from the workplace.

Services can be hidden or exposed at ceiling level. High quality
spaces can be created with exposed services, but they have a distinctive character suitable only to some users. For speculative design a very clear idea of the targeted market is needed to apply this.

Current innovations suggest that the following may be important in the future:

- Application Service Providers (ASP) - provide and keep key parts of software that are accessed by the customer through the Internet. The service also provides key technological and IT help. ASP clearly will bring changes to the office and to the IT workforce. The spatial and cultural effect of ASPs means that remote working through the Internet from home or other locations would become easier. The use of specialist ASP consultant may also shift the balance towards a smaller core staff employed directly by a company.

- Internet and building management - the internet now means that looking after buildings does not have to be carried out in the building and the potential is expanding.

### ICT connectivity package for e-locations

<table>
<thead>
<tr>
<th>Features</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Bandwidth</td>
<td>10 Megabits per second available to each occupier.</td>
</tr>
<tr>
<td></td>
<td>Capacity to scale up to 155 megabits per second.</td>
</tr>
<tr>
<td>Resilience</td>
<td>Physical resilience - BT plus a minimum of two other carriers offering physically separate links back to the core networks.</td>
</tr>
<tr>
<td></td>
<td>Commercial resilience - BT plus a minimum of two other commercially separate carriers.</td>
</tr>
<tr>
<td>Quality of Service</td>
<td>Availability - ability to provide up to 99.9% availability if required</td>
</tr>
<tr>
<td></td>
<td>Latency levels - ability to provide industry standard latency levels.</td>
</tr>
<tr>
<td></td>
<td>These are approximately a round trip latency of 60 ms within a country, 85 ms within Western European countries and 120 ms between Western Europe and the United States.</td>
</tr>
<tr>
<td>Certainty</td>
<td>Minimum of ducting to the site and resilient on site ducting</td>
</tr>
<tr>
<td>Price</td>
<td>Ability to achieve 10-20% cost savings in comparison with BT’s standard tariffs</td>
</tr>
<tr>
<td></td>
<td>Enabled by the ability to choose between three different tele-communications companies.</td>
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Available services via the Internet could be:
- Energy management
- Maintenance
- Alarms
- On-line payment for services
- Control of services
- Bluetooth technology

This is essentially wireless technology. The intention is to make all equipment, computers and laptops, phones, printers etc., communicate with one another without the need for wires in short-range so-called Personal Area Networks (PANS). The system relies on low-range radio waves. At present Bluetooth headsets for mobile phones are available and enable calls to be received without being immediately near the handset itself. In the office itself this technology will effectively remove wiring from the immediate environment and make mobility within the office itself much easier. It reinforces the possibilities of hot desking. Eventually as the range of the radio increases, it may mean there is no need for horizontal wiring ducts for network cables in raised floors.

Sophisticated ICT provision - fast, efficient reliable technology is an expected part of a high quality environment. Concerns include bandwidth or capacity, resilience, quantity and quality of ducting and quality of service. These concerns apply at site layout stage as well as in the detailed building stages.

6.6 Public and private areas

The layout of the internal areas of a building can have an important effect on the social structure and atmosphere of an organisation. The disposition of work spaces, communal facilities such as kitchen facilities or staff rooms, and the distribution and planning of main staff areas affect the relationships of employees to one another and to employers. The success of a company can be significantly boosted if the environment encourages an attitude of inclusivity within the workforce.
The distribution and character of conference and meeting rooms and reception areas affect the image of the company, regardless of sector. The way in which the public and private areas work together can greatly affect the atmosphere of the company. It is essential that there is clarity between areas that are public and areas that are private otherwise the building becomes difficult to use.

Shared public or communal spaces in the form of internal streets or atria offer a transparent and friendly insight of the company for visitors. This might apply for instance to reception areas where a reception atrium with working areas look down onto it, or where part of the industrial process of the business is made visible in public areas. In urban areas and in the limited number of business activities where it is appropriate, this principle might be extended with public uses, for the general public rather than for business visitors, integrated into the workplace, for instance a bookshop and café related to the business field. Many successful businesses incorporate art galleries into their reception areas with changing exhibitions that allow public use and involvement, bringing the business into the life of the area and the public into the life of the business.

6.7 A healthy environment

6.7.1 Use of light

The use of light in conjunction with material choice and colour will play a large part in the quality of a space. In atria and reception areas, more dramatic light is often more appropriate than in work areas.

6.7.2 Day lighting

Light levels need evaluating, modelling and assessing in complex buildings. Glare, luminance, brightness and contrasts all must be taken into consideration. The position of windows and the direction of light need careful consideration as well as the building’s orientation.

6.7.3 Ventilation

Natural ventilation creates a greater sense of well being especially if it includes openable windows and personally adjustable ventilation devices.
6.7.4 Shading
Shading can deal with glare and over-heating. However interior personally adjustable blind systems are usually untidier and less efficient for heat regulation than systems that stop the heat before it penetrates the envelope.

6.7.5 Sound
Sound is an important consideration which must be judged according to the use and nature of the different spaces. Some spaces such as reception areas can have a general hum of activity and may be judged to be better for this. Some meeting rooms equally may be planned to be informal and a general level of background noise will help with this. Other meeting and boardrooms may need to be perfectly quiet. Getting this right is important to the required quality of spaces and it should be borne in mind that it is possible to create places that are acceptably quiet without physically cutting them off from other spaces. Flexibility of spaces or (the more easily achieved) variety of space types gives the user more choice to adjust the environment according to the work requirement.

6.7.6 Health
A good internal design must sustain the physical well-being of its users. The so-called 'sick building syndrome' is thought to be the result of large-scale environmental control within a building of lighting, heating and ventilation and this often results in a mechanically and electrically controlled environment. The healthier and more sustainable alternative is to allow the user to judge and adjust their own environment where this is possible and to use natural traditional solutions; openable windows allowing natural light and natural active ventilation, adjustable artificial lighting for personal use and, although less easily incorporated, adjustable heating.

The use of natural passive ventilation is also both environmentally sustainable in the long-term and healthier for its users. Judgement needs to be made about where personal adjustment and central control begin and end. This will depend on the building size and type, but generally some level of personal control, particularly for ventilation and lighting is critical in sustaining the user’s general well being.

6.8 Energy and resource consumption
Energy consumption is closely connected to the provision and
efficiency of many of the services and their natural alternative. It will include using:

- More efficient systems for lighting, heating and whatever mechanical ventilation. This means more efficient plan, more adjustable zoned systems (so that some areas can be closed down when not in use)
- Using natural, passive alternatives to cut down energy use by, for instance, maximising daylight, using natural ventilation and maximising solar gain through passive solar design
- Using alternative energy sources. Options include solar energy for water heating or electricity creation (photovoltaics), wind power for electricity generation, small scale hydro power where appropriate or combined heat and power or the more indirect method of choosing green electricity from the supplier
- Reducing the pressure on or the need for mechanical services, for instance, through the use of solar shading
- Recycling and managing waste from the building. This includes grey water recycling

Dealing with these issues early in the design process is important. Orientation and shape decided at an early stage will affect these needs and so must be carefully considered. Water recycling depends also on strategic decision making at the site stage. Solar shading for instance does not necessarily involve shading devices added to the elevation but may be created through the building profile or orientation. The resulting layout must be carefully judged to achieve a healthy balance of good daylight and solar gain without overheating.

The need for attention to energy use is laid down in the revised Part L of the Building Regulations published in 2002 and summarised in Chapter 5.

Sustainable solutions can dramatically improve the environment of the work place, but the solution must be understood in its entirety. Judgement and knowledge are needed to ensure that the technology or measures chosen are appropriate for a range of working practices. Night cooling for instance, as used in the Wessex Water Headquarters near Bath, is only possible because the building is empty at night. A 24-hour company would find this system more difficult to operate successfully.
**Location**: Cologne, Germany  
**Design Team**: Nicholas Grimshaw and Partners  
**Client**: Igus GmbH

**Summary**: A flexible office design which can change with the company’s needs.

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**Details**

“There’s something different going on here”  
Frank Blasé, Igus President.

What’s different is the plant’s flexible design. Igus – a company specialising in innovative plastics machine parts – develops up to 2,500 new products and model variations a year and is in a state of almost constant innovation and change. The brief developed for its new flagship factory reflected this operating environment, requiring a space that would allow for rapid expansion and constant modification of the building fabric.

The design team responded with a site plan and building that maximises flexibility through:

- **the plan** - the building structure is based around four masts which rise from enclosed courtyards to support the roof. This creates a space below – about the size of three football pitches – which provides a largely uninterrupted production floor.

---

“Beautifully machined anodised clamps hold the ribbed aluminium cladding panels to the vertical sup-posts.”

“...the final product not only fulfils the brief but also opens up other possibilities for the future. We could make a supermarket out of the building without having to alter it radically; it could be a research and development facility... or it could be an office building”  
Frank Blasé, Igus President.
the cladding – clamps are used instead of fixings allowing the exterior panels, windows, louvers and doors to be secured interchangeably to the vertical sup-posts

the offices - office and ancillary functions are housed in a series of elevated, sound-proofed pods. Each pod can be moved on air skates to any point defined by the building grid. The pods are connected to the roof domes for daylight and ventilation, and to the main building network using flexible ducts. Their modular design - nine-metre, square pods have a tubular steel structure supported by circular column legs with wide feet spreading the load so that no local foundation is needed – enables them to stand alone or be joined in groups to create internal villages of related functions

the furniture - specially designed and made furniture elements join together with the proprietary shelving system to be completely interchangeable with the factory shelving and cladding. In addition, little on the plant floor is welded down, so machines and modular furniture can be rearranged at a moments notice

the servicing – a service distribution system using a first floor walkway and exposed overhead electrical wiring allows for easy access

the phasing – allowing for a possible seven phase extension which could enlarge the factory from its original 7,400 sqm to 24,000 sqm

In it’s first five years of occupation, Igus made about 50 significant changes to the factory’s configuration with one department occupying four locations in two years because demand for its products required additional staff and space.
6.9.1 CLC @ Brislington

Details:
The CLC @ Brislington is one of two identical learning centres that were built, as part of Bristol’s three-year Excellence in Cities Programme, to raise educational achievement.

The brief was to design a high quality, stimulating environment that would enhance information and communications technology training with the flexibility to deliver this in a range of ways.

The building is beautifully simple. A ramp gives shared access to a central entrance space used for both circulation and as a social space lit by an open-top stairwell. The first floor uses large sliding panels and floor to ceiling storage units that can be pivoted to subdivide the large open space into a series of different sized areas.

To reduce the glare on computer screens from direct daylight, the first floor is clad in translucent glazing that still allows in high levels of natural light. The glazing requires no secondary framing and was therefore easy to erect on site. The glazed angle projection provides more daylight into the centre of the building and also provides views out. This approach to maximising natural light while minimising computer screen glare could be equally well applied to buildings used for many ICT intensive uses such as call centres.

“The City Learning Centre is an excellent example of just what can be achieved, even within the constraints or a relatively small budget and tight time frame”

Lord Falconer, Minister of State for Housing, Planning and Regeneration

Photographed by Alan Wilson for Bristol City Council
In contrast, the ground floor has a more closed façade to reduce distraction from external movement and increase security. A steel frame and rendered blockwork provide a robust and protected ground floor.

The building was completed on a tight budget and delivered to a tight timescale - just 10 months from concept and the appointment of the design team to the buildings completion in February 2002.

**Contract value:**
£1.15 million

“The tremendous enthusiasm of the client, funding agency, and the design and construction team has been rewarded with a practical, adaptable and delightful building...for a minimum cost. It is a superb example of a functional building”

The judges, The Prime Minister’s Award for Better Public Buildings

Photographed by Alan Wilson for Bristol City Council

Photographed by Alan Wilson for Bristol City Council
6.9.2 Wessex Water Headquarters

**Summary:** The building is the greenest commercial office building in the UK although at £21.5 million it was expensive to build but running costs are proving environmental sustainability can result in financial benefits.

**Details**

Environmentally sustainable solutions have been considered at every stage of this building’s life from design to construction and operation, but should be seen in the light of a strategy by the company to address the long-term durability of the business, ie its sustainability in the broadest sense. It is perhaps for this reason that this building is truly sustainable; not only is it very efficient in energy terms but it also addresses issues of social sustainability creating a working environment described by The Guardian as a workers’ paradise.

The BRE gave it an Environmental Performance index of 8, its highest ever score under BREEAM 98 and a ‘very good’ rating during the design stages. The Centre for Sustainable Construction at BRE advised on the choice of materials with low embodied energy and low waste values. Options were carried out to compare whole life environmental analyses.

In terms of operation, it has an energy rating of approximately 100KWh/m² well below the BRE best practice figure of 150. This is an expensive state of the art building at £21.5m but running costs are a third of the average office headquarters building. The architects have created a low energy highly flexible building which uses nature as as its energy generator wherever possible. The building recycles about 80% of its water and heats it using solar panels. It is passively cooled at night and ventilated with very little mechanical air-conditioning and is orientated to minimise solar gain and catch prevailing winds. It has innovative ceiling coffers which absorb heat.

Offices areas are connected by atria and impressive stairways
The need for solar shading becomes an elegant part of the design.

Nature is used wherever possible to ventilate heat and to light the internal environment.

Rooflights and unsightly services are carefully hidden from view on the roof.
6.9.3 Milton Park, Abingdon, Oxfordshire

<table>
<thead>
<tr>
<th>Location</th>
<th>Milton Park, Abingdon, Oxfordshire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Team</td>
<td>Nicholas Hare Architects</td>
</tr>
<tr>
<td>Client</td>
<td>Lansdown Estates Ltd</td>
</tr>
<tr>
<td>Area</td>
<td>4574 sqm</td>
</tr>
<tr>
<td>Period</td>
<td>October 1991 - September 1992</td>
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</tbody>
</table>

Summary: The Business Development Centre was designed to attract small but developing business in the design sector.

Details

The target market for this development comprised small firms in the high tech sector, with between 5-50 staff engaged in R&D, high value added manufacturing, computer software and general corporate functions. Therefore there was a range of unit sizes was required from 70sqm to 600sqm with maximum flexibility for change and a high level of servicing.

Nicholas Hare Architects prime aim was to achieve a sense of identity and community, therefore the buildings are arranged around a central courtyard with all the front doors facing onto it.

The basic building unit is 14.5m wide x 21m long on two floors. The central cores are defined by the four chimneys which carry the risers for wet and dry services. The space around the cores can be divided into a maximum of four different offices using a flexible cellular partition system that the lighting grid follows as well.

It was necessary to provide individual control for heating to small areas with an overriding control to prevent wastefulness. This was achieved by installing an electric convector-based heating system incorporating local control to each heater, coupled with a centralised overall building heating control.
6.10 References

Part L Building Regs
The Building Regulations. *Part L Energy Efficiency Provisions*

Part M Building Regs

DDA Part m
### 6.11 Checklist

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have the needs and aspirations of the end user or targeted sector been considered?</td>
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<td>Is there evidence that the internal layout acknowledges emerging workplace trends?</td>
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<tr>
<td>Has the flexibility of the building been considered in terms of:</td>
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<tr>
<td>- The shell;</td>
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<td></td>
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<tr>
<td>- Services;</td>
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<tr>
<td>- Expansion and tenancy.</td>
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<tr>
<td>Has the quality of the internal environment been considered in terms of:</td>
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<tr>
<td>- inclusive environments;</td>
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<td>- service and IT provision;</td>
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<td>- public and private area distinctions;</td>
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<tr>
<td>- the health of the users;</td>
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<td></td>
<td></td>
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<tr>
<td>- energy and resource consumption.</td>
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</table>
Acknowledgements

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<table>
<thead>
<tr>
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<th>Organization</th>
</tr>
</thead>
<tbody>
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<td>Sophie Moreton</td>
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<td>Barnsley Metropolitan Borough Council</td>
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<tr>
<td>Ian Davidson (enabler)</td>
<td>Commission for Architecture and the Built</td>
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<tr>
<td></td>
<td>Environment</td>
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<tr>
<td>John Martin</td>
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<td>Janet Gingell</td>
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</tbody>
</table>

Compiled by Carrie Goodwin and Eleanor Wilson

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