Data centres are a relatively new type of property that have specific features relating to their locational requirements, construction, services and rental income.

The valuer of a data centre will need to exercise a significant element of judgment in arriving at the valuation figure, backed by a detailed knowledge and experience of this type of property and an ability to analyse the complex cash flows that data centres frequently produce.

The aim of this guidance note is to assist valuers who are instructed to provide Market Value, or market rent, for properties used as data centres. It includes a glossary of terms and discusses:

• data centre requirements;
• terms of leases and licenses;
• inspection and measurement; and
• valuation considerations.
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RICS (Royal Institution of Chartered Surveyors) is the leading organisation of its kind in the world for professionals in property, land, construction and related environmental issues. As part of our role we help to set, maintain and regulate standards – as well as providing impartial advice to governments and policymakers.

To ensure that our members are able to provide the quality of advice and level of integrity required by the market, RICS qualifications are only awarded to individuals who meet the most rigorous requirements for both education and experience and who are prepared to maintain high standards in the public interest.

Members who qualify as valuers are entitled to use the designation ‘Chartered Valuation Surveyor’ and, in addition to compliance with the general rules of conduct applicable to all members, must also comply with the RICS Valuation Standards, generally referred to as the ‘Red Book’.

This guidance note describes the standard of work that is expected of a reasonable, competent valuer experienced in the subject to which this note relates.

RICS has in place a regulatory framework. Where a valuer undertakes work that has to comply with the Red Book that valuer is also required to register with RICS. Registration enables RICS to monitor compliance with the valuation standards and take appropriate action where breaches of those standards have been identified. For further details, please see www.rics.org/vrs.

Acknowledgments

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- Paul Batho MA FRICS (lead author)
- Paul Gander (DataCentreInvestments.com)
- Nick Knight (CB Richard Ellis)
- Chris Strathon (Jones Lang LaSalle)
- Mark Trevor (GVA Grimley)
- Richard Wellbrock (Global Switch).
This is a guidance note. It provides advice to RICS members on aspects of their work. Where procedures are recommended for specific professional tasks, these are intended to represent ‘best practice’, i.e. procedures which in the opinion of RICS meet a high standard of professional competence.

Although members are not required to follow the advice and recommendations contained in the note, they should note the following points.

When an allegation of professional negligence is made against a surveyor, a court or tribunal is likely to take account of the contents of any relevant guidance notes published by RICS in deciding whether or not the member had acted with reasonable competence.

In the opinion of RICS, a member conforming to the practices recommended in this note should have at least a partial defence to an allegation of negligence if they have followed those practices. However, members have the responsibility of deciding when it is inappropriate to follow the guidance.

Alternatively, it does not follow that members will be found negligent if they have not followed the practices recommended in this note. It is for each surveyor to decide on the appropriate procedure to follow in any professional task. However, where members do not comply with the practice recommended in this note, they should do so only for a good reason. In the event of a legal dispute, a court or tribunal may require them to explain why they decided not to adopt the recommended practice. Also, if members have not followed this guidance, and their actions are questioned in an RICS disciplinary case, they will be asked to explain the actions they did take and this may be taken into account by the Panel.

In addition, guidance notes are relevant to professional competence in that each member should be up to date and should have knowledge of guidance notes within a reasonable time of their coming into effect.
1 Introduction

1.1 Data centres were established in the 1990s in response to the rapidly growing demand for off-site data storage from commercial organisations and governments. More recently, developments in technology and innovations in the use of computers – for example, the introduction of social networking sites and the growth of video-on-demand (VOD) TV – have led to an expansion of data storage requirements. In a relatively short time period, data centres have become an essential element in the functioning of the modern world economy.

1.2 Occupiers’ requirements in terms of power supply, security and data accessibility have meant that buildings used for the purpose of housing data centres have become highly specialised in terms of their location, construction, security and service requirements. The way in which these buildings generate income also differs from conventional commercial property. They have therefore become recognised as a distinct type of property in their own right, subject to a specific valuation approach.

1.3 Though vitally important in modern developed economies, the number of buildings used as data centres is relatively small. Transactional evidence can therefore be limited and this, coupled with the wide variation in facilities offered by individual units, means that valuation using conventionally gathered comparable evidence is often impossible.
2  Aims and objectives

2.1 This guidance note is designed to assist valuers who are instructed to provide a Market Value for properties used as data centres. It does not cover valuations for any basis other than Market Value and market rent.

2.2 Data centres are found in all major developed countries, and while local variations resulting from differing market conditions may be found, the aim of this guidance note is to summarise the main principles that are relevant to this type of property worldwide. This guidance note is applicable globally.

2.3 As data centres have become recognised as a unique property type and have a relatively short history, many valuers will have had only limited experience with them. This guidance note therefore summarises their key specifications and requirements so that they may be distinguished from other less highly specified property.

2.4 Leases usually incorporate provisions that are also unique to this type of property and can have a significant effect on value. They are therefore examined in detail.

2.5 Having identified the key features of data centres that distinguish them from other property types, this guidance note then outlines the recommended approach to obtaining and applying evidence in order to arrive at an opinion of the Market Value or market rent.
3 Market for data centres

3.1 The concept of the data centre originated from the large, climate-controlled computer rooms operated particularly by larger businesses and the financial services sector in the 1980s. Advances in computer technology and a rapidly growing demand for electronic data storage generated a requirement for collections of servers in an air-conditioned environment, very often within a building owned by the company using the facility.

3.2 During the 1990s companies became increasingly dependent on their data storage facilities, leading to concerns over security, backup and reliability of operation. Coupled with this was a growing requirement for data storage from an ever-increasing range of new organisations established during the dot-com boom at the turn of the millennium.

3.3 These demands led to the establishment of purpose-built data centres, which were usually located remotely from the operators whose data they stored. Such centres were typically in either purpose-built accommodation or existing buildings that were extensively adapted for this purpose.

3.4 When the dot-com bubble burst at the beginning of the twenty-first century, this led to a reduction in demand for data centre space at a time when development was at its height. However, following the 9/11 crisis the financial services sector became much more aware of data security issues, and the resultant demand for high-quality secure space restored the market’s equilibrium.

3.5 While the financial services sector continues to be a major user of data centre space, there has been growing demand from other parts of the corporate sector and smaller businesses. Innovative developments such as the growth of online social networking, the boom in e-retailing and the popularity of VOD TV have created a further increase in data storage requirements. Current indications are that this trend is likely to continue.

3.6 As the market for data centres has begun to mature, a number of data centre types can now be identified as follows:

- **Corporate**: These are owner-occupied and often purpose-built centres exclusively used by governments or large companies for the storage of their own data.

- **Carrier owned**: These data centres are owned and operated by data carriers and connected to the network of that carrier. Users tend to be the carriers themselves and/or small and medium enterprises (SME) that lease rack space (see the Glossary) in the centre.

- **Wholesale operators**: These data centre owners offer data storage typically to larger companies requiring long-term security and a degree of autonomy over their space. The accommodation was historically let on a shell basis to be fitted out by the tenant with the landlord providing power only, but it is now usually let on a fully fitted basis. Leases are often more than 10 years. Ownership is usually on a freehold basis.

- **Colocation operators**: These companies offer a data storage service to a wide range of customers requiring anything from a part-rack to substantial floor areas for hundreds of racks. Their centres will offer access to a range of carriers (described as ‘carrier neutral’). They can vary substantially in size, from a few hundred to more than 50,000m². In general space is offered fully fitted and with short leases usually in the range of three to five years. Colocation operators usually lease part of a larger centre.

- **Managed services providers**: These companies usually operate from smaller data centres or wholesale space in larger centres. They offer fully fitted out data storage facilities to smaller users.
4 Data centre requirements

Site and power requirements

4.1 A site for a modern data centre must be able to meet the criteria set out in the following paragraphs.

4.2 The location should be accessible to major users but away from the central city core. Financial organisations tend to require their data centres to be within an hour’s journey time from their headquarters. Other users may be less concerned with travel times as the number of visitors to data centres is usually relatively few.

4.3 Power supply to a site for data centre use has two essential elements: capacity and resilience. A high-capacity electric power supply must be available on site. A large data centre can have a power requirement of more than 100 MW, equivalent to demand expected from a town of 100,000 people. Such a high level of power supply to a single site is not commonly available, and the costs of providing it will be very substantial. The availability of a power supply of sufficient capacity is therefore of prime importance to a site’s potential use as a data centre, and hence to its value.

4.4 If there is not an existing supply, the site value will be reduced by at least the cost of bringing an adequate supply to the site and providing a bespoke substation, with due allowance also being made for the time it will take to install the supply.

4.5 For new buildings the power requirement for technical space is usually in the range 1–1.5 kW/m² (net internal area basis). The supply should meet N+1 specification (see the Glossary) by having at least two power feeds and parallel infrastructure, though ideally two separate power supplies on separate rings should be available.

4.6 In relation to connectivity, it is strongly recommended that the site links directly to at least two telecommunications providers (see the Glossary). Multiple data cabling connections are required for most operators.

4.7 An adequate power supply, security, continuity of power supply, assured connection to data carriers and accessibility to customers are the most important criteria to data centre operators. A site or building able fully to satisfy these criteria is likely to have a much higher value than one that cannot. It is therefore essential that the valuer dealing with this type of property fully understands and takes account of these factors.

4.8 In addition, flooding can have a catastrophic effect on the operation of data centres. If the data centre is flooded, electronic equipment is likely to be permanently damaged, and flooding in the surrounding area may cut power supplies and damage data cabling underground. In order to ensure operational continuity, most occupiers will therefore need to be certain that flood risks are minimal. If the owner is unable to provide this assurance, the data centre will have difficulty in attracting tenants.

4.9 The site should also have minimal risk from external factors, including:

- transport hazards, particularly from aviation (if a data centre is located on an airport flight path this can be a significant disadvantage to some occupiers);
- hazardous waste from nearby chemical industries, fallout from nuclear power plant, etc.;
- electro-magnetic interference from power lines, electricity substations, etc.;
- seismic activity; and
- crime and terrorist activity.

4.10 Planning consent is another important factor, as the attitude of local planning authorities to data centre development proposals varies considerably. For example, in the UK there are differences between local planning authorities as to the use class into which data centres should fall. There might also be concerns over environmental issues, given the amount of power consumed and waste heat generated by data centres. Employment issues can also be a factor, given that the number of people employed directly in a data centre is usually very low in comparison with the size of the development.
Building specification, efficiency and cost

4.11 Data centres can be housed in buildings formerly used for industrial, warehouse or office purposes, or in purpose-built structures. Suitability for data centre use will depend on the following key factors:

- clear, open space with minimal intrusion from columns and other structural elements;
- flexible layout allowing efficient subdivision of space for multi-occupation;
- floor loading of at least 4 kN/m² and preferably up to 10 kN/m²;
- slab to ceiling height of at least 3.5m;
- raised access flooring of at least 600mm, although 1000mm may be required for some air-conditioning installations, or more if fresh air cooling is specified;
- automatic fire suppression system in technical areas;
- N+1 power backup utilising batteries and emergency generators, with provision on site for sufficient fuel storage to provide emergency power to cover for a reasonable maximum expectation of mains power interruption;
- air conditioning to provide constant temperature in technical space, with N+1 resilience – current requirements are approximately 22°C (±2°C), though technological advances are likely to permit an increase in this figure;
- physically secure site boundaries with CCTV, controlled access, intruder alarms, etc. ;
- ability to incorporate an appropriate level of security measures for access to the building – this will vary according to the user but may include measures such as security doors, card access, alarms and CCTV; and
- structure with design allowance for loss of at least one major structural element without failure.

4.12 The especially high power requirements of a data centre mean that operational efficiency is of vital importance. The amount of power needed will affect the construction costs of the scheme and its running costs, so efficiency will have a direct effect on value.

4.13 Power Usage Effectiveness (PUE) is the usual measure of data centre efficiency (see the Glossary). The more efficient the data centre, the lower the PUE figure. The valuer should be aware that optimistic claims have been made for PUE figures by data centre operators. In response to this, the Green Grid – the originator of the measure (www.thegreengrid.org) – has taken action to review such claims and introduce a better monitored system of PUE reporting. Due to its direct link to running costs and the growing importance of carbon taxation issues, the PUE rating can have a significant impact on a data centre’s value.

4.14 Build costs for data centres are very high as a result of the high specification and, in particular, the cost of providing the required power supply to the site. The basic cost of a single-storey shell building will usually be comparable to the build cost for an industrial or warehouse building of comparable size, but the cost of a full fit-out that will allow an occupier to install computer equipment can be at least 10 times that amount. Build costs will also have a major impact on site price. As a developer will be seeking a target return on total development expenditure, build costs can also influence the level of required rent and thus the value of the completed centre.

4.15 Plant and equipment installed in a data centre form a major element of the development costs. They will require regular maintenance and refurbishment in order to ensure reliability. Some elements of plant, for example chillers and emergency generators, may need to be replaced at least once during a building’s lifetime. The costs of replacing plant and equipment are usually not directly recoverable from tenants. The valuer will therefore need estimates of the remaining lifespan of a data centre’s essential plant and the future costs of maintenance and replacement. This must be undertaken by an experienced valuer with an understanding of, and access to, all relevant data.

4.16 A grading system for data centres, which categorises them into one of four tiers, has been developed by the USA-based Uptime Institute. This can provide a useful guide to the facilities offered by a particular data centre, while the classification can affect the relative attractiveness of a centre to occupiers and thus the level of rent payable. A summary of this grading system is provided in the Glossary and further details are available from www.uptimeinstitute.org.
5 Leases, licences and service agreements

5.1 For larger occupiers, the contract to use space in a data centre is usually based on a conventional property lease arrangement.

5.2 The length of leases for data centre space can vary widely. In general, large organisations requiring a significant amount of space and purpose-built accommodation will need longer leases to ensure continuity of occupation. Such arrangements may be up to 15 years, while leases of wholesale space may be eight to 10 years for sizeable lettings.

5.3 In general, these leases will provide for full recovery via a service charge of the landlord’s costs of maintaining and managing the structure and common parts of the building on day one of the lease via a service charge. The service charge is likely to be subject to a fixed percentage annual uplift during the course of the lease, so discrepancies between the actual cost of services and the level of recovery may arise. Furthermore, as noted in paragraph 4.15, plant replacement costs are usually not recoverable from tenants.

5.4 Data centres let on a colocation basis may be subject to service agreements stipulating that a tenant will pay a single fee that includes rent and all the landlord’s services. Such agreements are usually for terms of between one and three years and include fixed annual increases. Valuation of accommodation let on this basis should thus take into account the actual cost of services provided, together with due allowance for depreciation and replacement of plant and equipment.

5.5 Power supplied to occupiers is usually metered individually. However, colocation space is often not individually metered, so an average rate per rack may be charged. In some cases there may be a margin between the cost of power supplied to the landlord and the rate charged to tenants. If this is significant it should be accounted for in the valuation.

5.6 The developer of a data centre will seek an appropriate level of return on development costs and will therefore attempt to ensure that net rent at least matches the required return. Rent can therefore vary significantly depending on site cost, the costs of providing power to the site and the specification of the accommodation. The key factor in deciding the level of affordable rent from the tenant’s perspective will be the amount of power available per unit of area. The higher this figure, the greater the density of data storage racks and the higher the rent payable per unit area.

5.7 In a strong market, or one where there is little competition, rental levels will often be self-generating with levels dependent on the particular circumstances, specification and operating costs of individual data centres. Rental analysis of comparable transactions on a conventional basis per unit of net internal floor area is therefore of little use, except when comparing rents of individual units within a single centre. Instead, the valuer’s judgment should be based around cost and power supply factors.

5.8 Due to a lack of transactional evidence, rental growth is usually provided via fixed uplifts throughout the term of the lease or by linkage to an accepted inflation index.
6 Inspection and measurement

Site inspection

6.1 During inspection of the site, particular note should be made of the local environmental conditions and potential hazards to data centre use. Flood risk should be assessed both by on-site inspection and through enquiries of the local river, coastal or drainage authorities. The proximity of potential hazards, in particular those identified in paragraphs 4.1–4.10, should also be noted.

6.2 Evidence of the capacity and number of power supplies to the site should be sought, as well as details of links to data cabling services.

6.3 As security will be a major consideration for most data centre users, security measures restricting access to the site should be recorded.

6.4 Site coverage can be more than that for a conventional industrial/warehouse unit because less space is required for delivery and external storage. As data centres employ relatively few staff, less space will also be needed for car parking.

Building inspection

6.5 A very high proportion of the cost of a data centre lies in the services provided. The valuer should make a full assessment of services, including:

- specification, age and capacity of power supply and air-conditioning plant;
- net power supply to raised floor data room space (kW per m²);
- provision of back-up power, including capacity and age; and
- fire detection and suppression equipment.

An on-site inspection should be supplemented with detailed assessment of data provided by the building owner. It is important that the valuer undertakes appropriate checks to verify the accuracy of all data supplied and in particular of power supply and efficiency (PUE) rating figures.

6.6 The building structure is likely to represent a relatively low proportion of the cost of the facility, and its condition is consequently of less importance. However, a number of aspects of the structure will have a significant effect on value.

6.7 Systems for monitoring security and control of access to the building should also be noted.

6.8 Provision of ancillary services, such as private office space and meeting rooms, should be recorded and measured separately.

Measurement

6.9 For the reasons outlined later in paragraphs 7.4–7.8, floor areas of data centres are rarely directly used in assessing rental value. The following area measurements, calculated in accordance with the RICS Code of Measuring Practice, 6th edition (2007), may be required.

6.10 Gross internal area (GIA) may be required in connection with assessment of build or refurbishment costs and in calculating measures of the building’s efficiency.

6.11 Net internal area (NIA) is used to calculate floor areas of individual letting units (but is of less use for space occupied on a collocation basis). While it is rare for a valuer to be able to undertake a comparable analysis of different data centres on a rent per unit area basis, the NIA can be of use when comparing lettings within the same building and in applying a full rental value figure to space that is over- or under-rented at the time of valuation.

6.12 In addition to these measurements, a site area calculation may also be required.

6.13 Net technical area (also known as ‘white space’) is also sometimes used in the context of data centres. This is the enclosed area (usually the raised floor area) where servers can be located and is, in effect, the NIA of server accommodation, excluding the area occupied by major items of plant and machinery, but including down flow units (DFUs) and power distribution units (PDUs).
7 Valuation considerations

Basis of value

7.1 The basis of value will depend on the purpose of the valuation. Assuming that the valuation is required for the purchase or sale of an interest in the property by an occupier or investor, or is for company accounts purposes or loan security, the basis should be Market Value as defined in valuation standard (VS) 3.2 of the RICS Valuation Standards (the ‘Red Book’), 7th edition (2011). Alternatively, a market rent figure may be required, as defined in VS 3.3.

7.2 The Market Value of the data centre will generally be a factor of its ability to produce an income, by way of rent, fees or other sources (for example, through profits in the provision of services), from occupiers using the accommodation principally for the purposes of data storage. If let, the valuer will therefore take account of current and, possibly, the expected future net income when assessing its value. The value of a vacant or owner-occupied building will be based on its potential to produce income.

7.3 This guidance note is not intended to cover the valuation of data centres as operational entities or include the value of the occupier’s business. In these circumstances it would be usual to apply the profits method of valuation.

Evaluation of rental value

7.4 The rent that an occupier will be prepared to pay for equipment space within a data centre will depend upon the amount of equipment (usually the number of racks) that the demised space will accommodate.

7.5 The capacity of the space to house equipment will primarily be governed by the:

- amount of power available for tenant’s equipment;
- cooling capacity and power consumption of air-conditioning equipment in the space;
- amount of emergency power generation available to provide adequate backup to the required standard (usually on an N+1 basis); and/or
- bandwidth of data cabling.

7.6 Therefore, technical considerations are likely to outweigh the physical dimensions of the demised space (floor area and clear height) in an assessment of the ability of the space to generate rental income. The most important contributor to value is likely to be the amount of available power to the centre, because of the direct relationship it will have with the centre’s equipment capacity.

7.7 Because of the very high costs of development, a further requirement may be for the data centre operator to be able to generate an adequate return on its investment. While in most property markets it is the level of tenant demand rather than return on cost that determines rental levels, for highly specialised space for which supply is limited, the cost of providing the facility can be more relevant. This is likely to be particularly applicable where purpose-built accommodation is provided for a major operator that is prepared to take a long lease rather than incur development costs itself.

7.8 For these reasons, assessment of rental value by reference to comparable transactions analysed on a rent per unit area basis may be difficult for data centre space. In such circumstances, the valuer should assess rental levels in the context of the building specification and costs, power supply, efficiency, backup and all the other technical factors identified in this guidance note. Security of income, however, will be influenced by more conventional measures, such as the strength and mix of tenant covenants, and the terms and length of leases.

7.9 In multi-let buildings a comparison of rent levels within the building can offer evidence of the rental levels that the market is prepared to pay in that particular building. In such cases, adjustments may be necessary to reflect differing standards of accommodation, technical variations and quantum.

7.10 The valuer should also take account of any other sources of income provided by the building. These may include:

- income from wayleaves and licences allowing occupiers to run cabling through the building outside their demised premises;
• profits on the provision of power and other services;
• letting of meeting rooms and ancillary office space; and
• other licences, such as income from roof-mounted satellite dishes.

From this list, it is clear that the valuer will need detailed financial and technical information in relation to the building and its running costs, in addition to lease details of let space.

Reversionary income

7.11 The valuer should consider the position at the end of existing leases in the property. The following issues are likely to be relevant: rental value, renewal of existing leases and reversionary income levels. These are discussed in more detail in the following paragraphs.

7.12 While it can be difficult to assess the rental value accurately for reasons outlined earlier, a number of factors can be identified as influencing the rent achievable on reversion. A key factor is whether the building owner has ensured that landlord’s fixtures, fittings, plant and services have been maintained and upgraded as required. If it is well maintained and upgraded/replaced regularly, and the fundamentals of building structure remain adequate, the effects of depreciation can be minimised and the property should remain competitive with more recent developments. The valuer will therefore need information concerning the age of equipment, estimated lifespan and plans to refurbish or replace it. Costs of upgrading and estimates of dates when this will be incurred, together with information on the extent to which such costs are recoverable from tenants, will also be required.

7.13 Experience in the market indicates that a relatively high proportion of data centre tenants will renew their leases on expiry rather than move to alternative accommodation. This is due to the costs, delay and potential disruption to services that can arise from transferring data (including possibly the data storage equipment) from one location to another. There is thus a strong incentive for the landlord to ensure that the facilities offered by the data centre remain competitive through a process of ongoing maintenance and replacement, as this should maximise continuity of income from tenants. The valuer should make a judgment on the proportion of leases that are likely to be renewed on expiry, which should be based around factors such as the competitiveness of the accommodation offered, the strength of the tenants’ covenants and the prevailing market conditions.

7.14 Because reversionary income levels are in many cases very uncertain, current practice is for valuers to make little, if any, allowance for potential rental increase from passing levels following the expiry of existing leases, unless there is compelling evidence to indicate that a significant increase is achievable.

Capitalisation

7.15 Several key factors influence the Market Value of data centres. Firstly, there are relatively small numbers of properties, thus the number of investment transactions is low. There is also a lack of a developed investment market. Data centres are not registered by the Investment Property Databank (IPD) as a separate category, and there is limited evidence on yields and discount rates.

7.16 Where net income levels are high, investment lot sizes can also be substantial. This further limits the investment market for data centre properties.

7.17 While income levels can be high, landlord’s outgoings in developing the centre, providing power, air conditioning, backup and other services, and replacing plant are also very high. The valuer must therefore have a clear understanding of cash flows produced and costs incurred before arriving at an opinion of value, which will be based on the net income flow receivable.

7.18 For these reasons, a discounted cash flow (DCF) approach is most likely to be adopted when valuing data centre premises.

7.19 The more conventional approach of capitalising net rental income using an appropriate year’s purchase (YP, or yield) figure is only likely to be realistic for properties let on long leases to a single occupier responsible for a significant proportion of maintenance and upgrading costs.

7.20 The lack of transactional evidence frequently means that the yield applied to a rental income, or the discount rate, growth rate and other assumptions used in a DCF are largely matters of judgment and may not be backed by evidence from the market. In making these assessments, the valuer is likely to take particular account of
the factors that influence the strength and growth potential of the cash flow produced by the data centre. These include:

- strength of tenant covenant(s);
- lease length(s);
- lease terms, especially those relating to recovery of service costs and maintenance/upgrading expenses;
- provision for rental growth, e.g. fixed uplifts or rent reviews;
- for multi-let buildings, the diversity of income sources and lease termination dates; and
- relettability, judged on whether the building and services remain up to date and the location is still acceptable to the market.

7.21 Yields and/or discount rates can be compared with properties in other market sectors offering comparable cash flow characteristics.

7.22 Comparison may also be useful with discount rates applied to non-property investments, in particular equities and bonds, which will allow the valuer to assess whether the investment characteristics of the income flow from the data centre, particularly those relating to income security and growth, are being correctly priced.

7.23 For owner-occupied or vacant data centres, the valuation assumes vacant possession. The valuer should therefore make assumptions on the level and type of demand for the property in the light of which judgments can be made on rental level, time to achieve a letting and whether multi- or single-let occupation is likely. Answers to these questions will be influenced by the location of the property, as well as its size, layout and specification.

Site valuation

7.24 A site cannot be considered suitable for data centre development without sufficient power supply from a substation located on the site. If this is not available, the value of the site will be related to the best alternative use, which is likely to be industrial or warehousing.

7.25 If power has been provided to the site the value will be significantly enhanced. A further increase in value is likely if planning consent for data centre use has been obtained.

7.26 As indicated elsewhere in this guidance note, the costs of developing a data centre are much higher than those for an equivalent industrial or warehouse unit. Therefore a residual valuation approach may not be appropriate when valuing a site for data centre development because of the major impact that small changes in build costs may have on the site value produced. Alternative approaches may be considered, in particular those based on cash flow analysis, though similar issues can arise. The valuer should be aware of these issues and should inform the client of the consequent uncertainty that may exist for any site value figures produced.

Reliance on supplied data

7.27 This guidance note has emphasised that the technical specification of a data centre is likely to contribute significantly to its ability to generate an income from occupiers, and thus to its market rent and Market Value. The valuer must therefore make every effort to obtain full details of the data centre’s specification, as this information will be very likely to influence the reported figure significantly.

7.28 Information on specification will often be provided by third parties. The valuer should take all reasonable steps to ensure the accuracy of this information, but may not be qualified to comment in detail on technical information supplied.

7.29 The power supply available to a site is a prime example of this type of data. The valuer should seek confirmation from the supplier as to the amount of power available on site and whether there are two separate supplies. However, the valuer would not be expected to test the accuracy of such data. The report should state the key assumptions that have been made and, in the event of uncertainty in the accuracy of the data relied upon in arriving at the opinion of value, the valuer should comment on the potential impact on the reported opinion of value of variations from any assumed figures.
8 Summary and conclusions

8.1 Data centres are a relatively new type of property that have features relating to their locational requirements, construction, services and rental income.

8.2 They are capable of generating very large and relatively secure cash flows. The upward trend in demand for secure data storage facilities appears likely to continue. In addition, suitable sites for the development of new data centres which are able to offer access to the very high levels of power supply required will remain in short supply. This combination of factors suggests a strong future performance for data centres as an investment class, though the market at present is in its infancy.

8.3 Data centres have become an essential element in the functioning of today’s web-based economy and are located worldwide. Despite this, the actual number of data centres is relatively low and there is a wide variety of types, users and lease arrangements. This means that evidence of comparable, open market rental or sale transactions is very limited.

8.4 The valuer of a data centre will therefore need to exercise a significant element of judgment in arriving at the valuation figure, backed by a detailed knowledge and experience of this type of property and an ability to analyse the complex cash flows that data centres frequently produce.

8.5 For these reasons, it is essential that the work is undertaken by a valuer who has sufficient experience of this type of property (see VS 1.6, Knowledge and skills, in the Red Book).

8.6 However experienced the valuer, the lack of firm market evidence to support an opinion of value, as well as the significant effect that relatively small variations in some of the judgments made may have on the reported figure, can mean that this figure may be difficult to assess precisely. For this reason the valuer should be particularly aware of the contents of GN 1, Valuation certainty, in the Red Book.

8.7 Data centres are a type of property whose value is derived from certain unique features required by the occupiers for which they are prepared to pay a premium price or rent. The valuer must be able to recognise and price the impact of these features on the property’s value. It should be recognised, however, that data centres are not a unique class of property but rather a specialised form of commercial property. As such, the valuation, while taking account of their specialist nature, will ultimately employ established principles and valuation methodology.
Glossary

**colocation centre** – a centre where many customers locate their equipment.

**data carrier** – the medium through which data is channelled.

**down flow unit (DFU)** – an air conditioning unit that forces air into a raised access floor within a computer room.

**managed service providers** – data storage providers offering outsourced and disaster recovery operations for smaller users.

**N+1** – a measure of redundancy or resilience of data centre systems to component failure. The accepted standard is N+1, which means that a particular number of components will have at least one independent backup. For example, if a data centre requires two uninterruptable power supply (UPS) systems for normal (N) operation, a third will be available in the event that one system fails.

**power distribution unit (PDU)** – a 400-volt tenant’s distribution panel within the tenant’s suite used to supply low power to tenant’s IT cabinets.

**Power Usage Effectiveness (PUE)** – the most commonly used measure of the energy efficiency of a data centre. It is calculated by dividing the total power entering the data centre by the power used by the IT equipment in the centre. In principle, the lower the PUE figure, the more efficient the data centre. The lack of a standard set of testing criteria means that PUE figures should be treated with a degree of caution.

**rack** – a frame of standard design and dimensions used as an enclosure for data storage equipment. A standard rack is 600mm wide. Depth and height can vary.

**technical areas (also known as raised floor areas)** – the parts of a data centre containing, or designed to contain, data storage equipment.

**telecommunications provider** – an organisation that provides access to telephone and related communications services (for example, British Telecommunications in the UK, Deutsche Telekom in Germany or Bell in Canada).

**Uptime Institute grading system** – a system of classifying data centres according to the availability of data from the storage facility. There are four recognised tiers, defined by the California-based Uptime Institute. These range from level 1, which is basically a server room with limited redundancy provision, to level 4, which represents data centre accommodation that has full backup in the event of failure of all key services (power supply, air conditioning, data cabling, etc.). More information can be found at www.uptimeinstitute.org.

**wholesale operators** – data centres providing space for larger organisations requiring a significant amount of space. Such operators will often fit out their own accommodation and take relatively long leases in excess of 10 years.
Valuation of data centres
1st edition, guidance note

Data centres are a relatively new type of property that have specific features relating to their locational requirements, construction, services and rental income.

The valuer of a data centre will need to exercise a significant element of judgment in arriving at the valuation figure, backed by a detailed knowledge and experience of this type of property and an ability to analyse the complex cash flows that data centres frequently produce.

The aim of this guidance note is to assist valuers who are instructed to provide Market Value, or market rent, for properties used as data centres. It includes a glossary of terms and discusses:

• data centre requirements;
• terms of leases and licenses;
• inspection and measurement; and
• valuation considerations.