



NCC Group Plc Consultancy Report



Northwards Housing

ICT Infrastructure – In-House Provision

Business Case

Consultancy
NCC Group plc
Manchester Technology Centre
Oxford Road, Manchester M1 7EF

Tel: +44 (0) 161 209 5200

Fax: +44 (0) 161 209 5100

consultancy@nccgroup.com

Commercial in Confidence

Prepared by: Phil Riley

Mobile: (07973) 877 197

E-mail: phil.riley@nccgroup.com

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1. Management Summary

1.1 Background

- 1.1.1 Northwards Housing currently uses a number of ICT infrastructure services which are provided by Manchester City Council's (MCC) Corporate Technology Unit (CTU). These include:
- Wide Area Network (WAN) – The network which interconnects Northwards Housing's offices and also provides the connection back to MCC to access the Universal Housing application
 - Local Area Network (LAN) – The internal building network to which the users' PCs, printers and other technology devices connect
 - Telephone Network – The IP Telephone system in use in Hexagon House and three other locations and which it had been intended would be rolled out to all Northwards Housing's offices in the short term
 - Server Hosting – As well as the Universal Housing system, MCC provide the server room environment for all of Northwards Housing's servers, including file storage and backup
- 1.1.2 This Business Case examines the rationale for Northwards Housing to take control of its own ICT infrastructure. In practice this means that Northwards Housing will take control for the supply, location and management of the above items.
- 1.1.3 A link to the MCC network will continue to be required as Universal Housing remains a shared resource with the Council.
- 1.1.4 Indicative costs indicate that a budget of £1,200,000 over 5 years will be required for this project. This compares favourably with current MCC costs currently of £ 247,500 per annum and which are likely to increase over coming years.
- 1.1.5 The outcome for Northwards Housing achieved by moving to its own ICT Infrastructure will be increased flexibility and the ability to determine how it's ICT will be provisioned including priorities and timescales. Rather than being dependent on a Council provided SLA, Northwards Housing will have greater flexibility to react to any changes in its business requirements, e.g. project work. Northwards Housing will also be able to benefit from economies in a marketplace which is very competitive.



1.2 Principal Recommendations

1.2.1 The implementation of a modern business quality network which supports both data (computers) and voice (telephones) is a common strategic goal in all sizes of organisation. Enabling flexible access to all to computer and phone networks both improves the efficiency of staff and the experience of customers. In recent years technology has advanced and costs reduced; this means a corporate data and voice network, once in the financial reach of only the largest of corporates, is now affordable for all organisations irrespective of size. The proposal for Northwards Housing to implement a data and voice network connecting its principal offices and also providing connectivity for smaller offices, homeworkers, etc is commensurate with best practice both in this market sector and across UK businesses.

1.2.2 In order to drive maximum benefit from the investment without having to engage in complex supplier management arrangements, it is recommended that Northwards Housing should tender for a solution encompassing the full scope of these network requirements provided by a single supplier. The ability to support the key server and storage infrastructure could potentially be a further advantage.

Whilst it would be possible to consider multiple vendors for the various infrastructure components, this would lead to complex supplier management. In particular when issues do arise there is not a single contact to manage and resolve the problem. With its limited technical resources Northwards Housing must not be in the position where it has to get involved in problem management to the extent that it has to control and arbitrate between several suppliers each responsible for a particular aspect of the infrastructure. At procurement, combining all equipment, circuits and services into a single contract provides substantial contract value for bidders, which in turn will provide the best competitive pricing to the tender response.

1.2.3 The value of the contract means that Northwards Housing will either have to engage in a full OJEU procurement or use a framework agreement. Similar contracts in the public sector (Local Government) have recently been negotiated using the NHS Purchasing and Supply Agency (PASA) framework and this may be a vehicle that Northwards Housing wishes to consider. Northwards Housing will need to adhere strictly to the PASA terms and conditions and there can be no variation of these.



2. Current Situation

2.1 Arrangements with Manchester City Council

2.1.1 Northwards Housing currently has an arrangement with Manchester City Council (MCC) Corporate Technology Unit (CTU) to host servers and provide network services including telephone extensions on the MCC voice network at four locations.

2.1.2 The service charge is £750 per year per user. In the last fiscal year this was calculated on the basis of 330 users, i.e. a total cost of £ 247,500.

2.1.3 Excluded from the above are:

- Annual maintenance costs for the non VoIP phone systems
- Call costs for office phones
- Mobile phone costs
- Desktop equipment purchase
- Software
- Leasing costs of Xerox Multifunctional Devices (MFD) which are Northward's main printers
- New project costs

2.1.4 There is concern that the service level received from CTU is inflexible and is often not in line with user expectation. In particular the ability for CTU to react to project requirements for Northwards Housing can at best be described as "poor". The cost of the service increased substantially in 2008/9 without any of these areas of under performance improving.

Ultimately this means that Northwards Housing ICT services will lack flexibility and responsiveness in delivering business change and improvement..



2.2 Northwards Housing Sites

2.2.1 The principal sites at which ICT resources are located are:

Address	Users	PCs	Printers	MFD	Phones
Whitemoss Rd, The Housing Office, White Moss Road, Blackley M9 2LA	41.5	49	3	2	44
Monsall St, The Housing Office, No. 1 Monsall Street, Collyhurst M40 8QZ	23	33	2	2	26
Cheetham Hill, The Housing Office, 549 Cheetham Hill Road, Cheetham Hill M8 9NW	37	49	3	2	40
Neighbourhood Wardens, 2nd Floor, Wilsons Business Park, Monsall Rd, Newton Heath M40 8WN	27	10	1	1	8
Home Improvements, Unit 11, Hendham Vale Industrial Park, Vale Park Way M8 0AD	57	55	4	1	57
Home Improvements, Unit 7, Vale Park Industrial Estate, Hazelbottom Road, Crumpsall M8 OGF	7	8	2	1	7
Home Improvements, Unit 19-21 Ground Floor Admin Block, Riverpark Trading Estate, Riverpark Road M40 2XP	10	17	1	1	10
Home Improvement, Technical Services, Parkside, Sheepfoot Lane, Prestwich M25 OBW	19	32	3	1	19
Head Office, 6th Floor, Hexagon Tower, Crumpsall Vale, Blackley M9 8ZS	70	78	2	3	70
Totals	291.5	331	21	14	281



2.3 Ownership of Assets

2.3.1 Servers

2.3.1.1 The Universal Housing application is shared with MCC. It is envisaged that this arrangement will survive any new arrangements proposed in this report. The requirement for a network link from Northwards Housing to the CTU Data Centre at Daisy Mill will continue.

2.3.1.2 Northwards Housing own the following servers currently located in the CTU Data Centre at Daisy Mill:

- ✧ IIS - HP Proliant DL360
- ✧ Notes - HP Proliant DL380
- ✧ File and Print - HP Proliant DL380, 840Gb HD, 710 used
- ✧ Finance - HP Proliant DL380
- ✧ HR - Proliant DL360

As part of this project, these devices will be removed from CTU and installed in a Northwards Housing server room location.

2.3.2 Network links from CTU at Daisy Mill to each of the principal Northwards sites (2.2.1) are provided by CTU. In some cases these are dedicated resources for Northwards and in other cases these are a joint MCC and Northwards Housing resource, e.g. where there is joint occupancy of premises. Circuits to Hexagon Tower, Cheetham Hill and Whitemoss Road are currently rated at 100mpbs; other circuits are rated at 10mbps; these are deemed fit for purpose by Northwards Housing. It is not anticipated that any of these links will survive the new arrangement as the WAN will become part of the new infrastructure owned by Northwards Housing.

2.3.3 CTU currently provide telephony for Northwards Housing at four offices:

- Head Office - Hexagon Tower
- Home Improvements - Unit 11
- Home Improvements - Unit 7
- Home Improvements - Unit 19-21 Ground floor admin block

These sites use CTU's Nortel IP Telephony system within the service charge (2.1.2). Some seventy handsets on this system are the property of Northwards Housing.



- 2.3.4 All desktop equipment (PCs, laptops, etc) and printers are owned by Northwards Housing. Northwards Housing also own all licenses for desktop software, e.g. Microsoft Office.
- 2.3.5 Some routers, switches, patch panels and other networking equipment are owned by Northwards Housing; however the status of a considerable amount of equipment is currently unknown. The indicative budget cost provided (1.1.4) has been based on the provision of all new routers and switches but have assumed that existing patch panels will be retained.
- 2.3.6 All security appliances including firewalls, VPN access, etc are owned and controlled by CTU.
- 2.3.7 The server delivering virus patches to desktop computers is owned by Northwards Housing. Virus patches to servers and all Microsoft updates are delivered by CTU.

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3. Infrastructure Requirements

3.1 High-Level Requirements

3.1.1 The principal infrastructure requirements for Northwards Housing to bring its ICT Infrastructure in-house are:

- Network, i.e. inter-building data circuits
- Telephony
- E-Mail Service
- Internet connection
- Security devices to ensure that the network cannot be inappropriately accessed
- Server room services
- Professional services to implement and support the system

3.2 Network

3.2.1 A network will be constructed connecting the nine principal Northwards Housing sites (2.2.1) using high grade network connections. It is possible that this network could be provisioned around a “hub” service based on the server hosting location, see 3.7. It is common place to enter server hosting arrangements with companies who provide network services or for the hosting site to have a substantial connection to the network which may be securely shared with other organisations.

3.2.2 It is likely that any new network will make use of Multi Layer Protocol Switching (MPLS) services. This effectively creates a virtual private network connecting geographically diverse sites. The telecommunications provider supplies a resilient high speed network which is then split into a number of secure segments for its customers. This method of providing WAN infrastructure is generally cheaper and more resilient than providing fixed point-to-point lines and provides flexibility to connect smaller offices, homeworkers, etc.

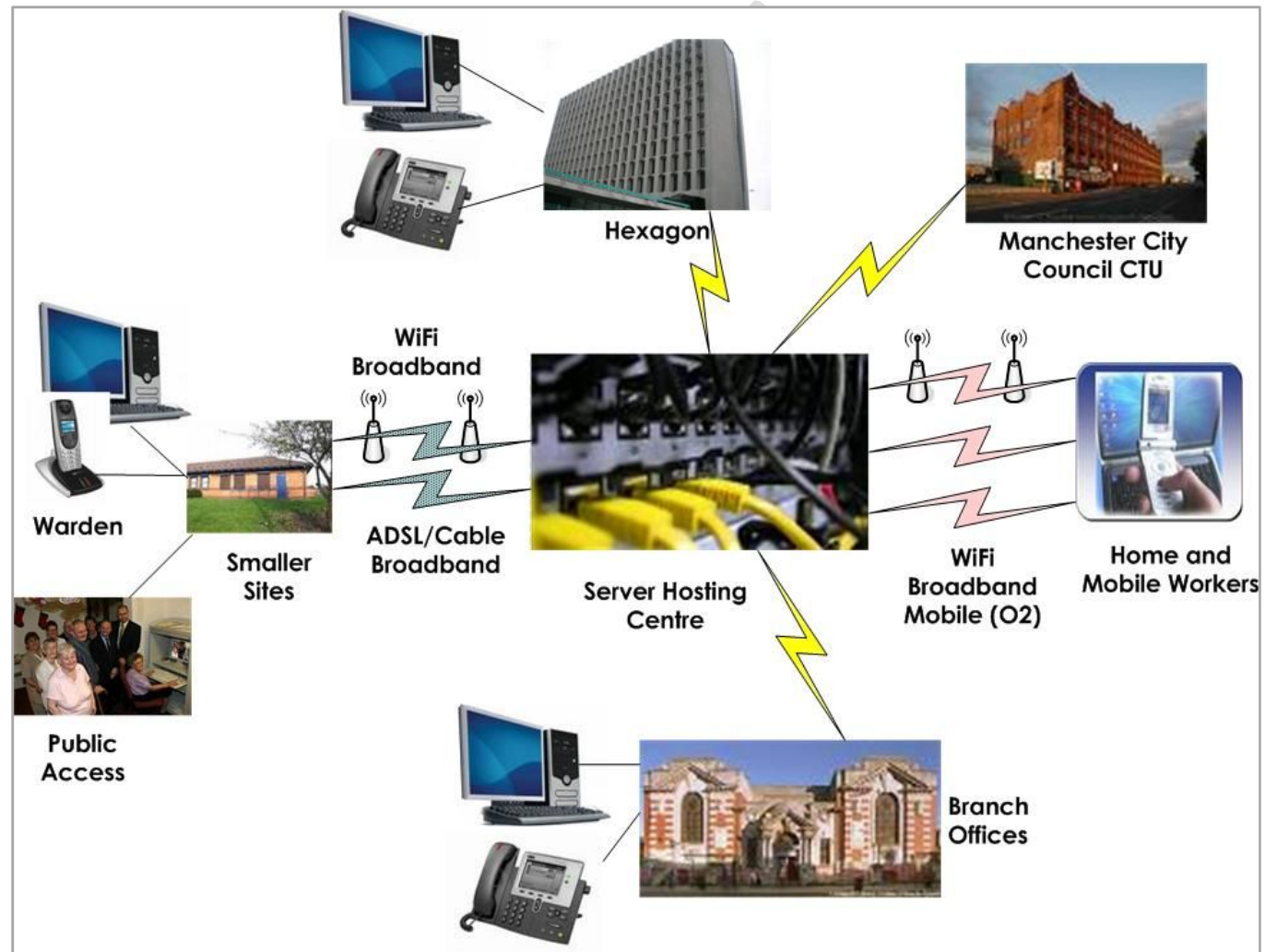
It is recommended that in tendering, an “outputs based” specification is produced, so that bidders are free to propose what they consider as the most appropriate architecture, design and services to drive innovation.



- 3.2.3 Northwards Housing intends to introduce applications which can be used by staff whilst mobile, e.g. by using laptop computers, handheld devices or smart phones. Costs have not been included in the budget, but with the proposed architecture it will be straightforward to introduce connectivity in a number of ways, including:
- 3.2.3.1 3G data services from O2 or another mobile provider. These would either be used using a “smart phone” such as a Blackberry or XDA or using a data card or USB stick in a laptop computer.
 - 3.2.3.2 It is possible that bidders may propose the use of wireless (WiFi) technologies in some areas. The use of wireless will depend on the geography and construction of buildings. Where it is suitable to deploy wireless it is possible to make substantial savings as the network is owned by Northwards Housing. Wireless could also allow Northwards Housing to be proactive in promoting Internet access to its customers.
- It is recommended that these services are included as “optional items” in the tender so that Northwards Housing can assess the technical capabilities of bidders to provide this functionality as and when required.
- 3.2.4 The network will be capable of connecting small offices (e.g. Scheme Managers) and homeworkers. Initially the requirement is for connection of PCs, but in the longer term this should also allow connection to the corporate voice network.
- 3.2.5 A connection to CTU will need to be maintained for access to Universal Housing (2.3.1.1). Options include repurposing the existing line between Hexagon Tower and CTU; however this would mean that Hexagon Tower then becomes a single point of failure. An alternative to connect CTU as part of an MPLS network (3.2.2) may also be explored.



3.2.6 The network may be typically designed as shown below.





3.3 Telephony

- 3.3.1 The telephone network will connect the principal sites (2.2.1). This will deploy technology known as “IP Telephony” (IPT) which allows the both telephones and PCs to share the same inter-building network described above. It is based on hardware which is similar to the servers on which other business applications run.
- 3.3.2 Northwards Housing currently uses CTU’s Nortel IPT system in four locations. Around 70 of the handsets connected to this belong to Northwards Housing. There may be a saving therefore if a Nortel system is chosen by Northwards Housing as this would mean that these handsets could be retained.
- 3.3.3 By installing an IPT system it will be possible to incorporate all staff into the corporate voice network, i.e. including Scheme Managers and homeworkers.
- 3.3.4 The current contract with O2 for mobile phones will be retained.
- Connectivity options to optimise costs between the office phone network and the mobile network need to be considered. This could potentially utilise the contract facility which allows for free calls between O2 connections. This should be included in the tender as an “optional item” but has not been included in the budget cost (1.1.4)
- 3.3.5 A major advantage of IPT is that because it is run on the same network, a single cable run to the desktop supports both PC and phone, significantly reducing the costs of cabling a new or refurbished building. This provides significant pay-back in an organisation which may move offices from time to time.



3.3.6 IP networks were traditionally designed to support computer applications and a number of issues arise when connecting telephones:

3.3.6.1 For data only networks, it is not important if information is delayed by a few milliseconds, e.g. at times when the computers are very busy. Voice communications are very different and require a sustained throughput otherwise the conversation becomes stuttered, rather like a mobile phone call in a very poor reception area. To achieve this traffic is segmented to ensure that appropriate levels of priority are applied to the telephone conversations so they are not degraded. This is known as Quality of Service (QoS).

3.3.6.2 Telephone handsets were traditionally powered from the corporate telephone system. Servers in an IPT system have no power so the handsets either have to be powered from the IP network to which they are connected or by plugging into standard 13 amp sockets at the desktop. The later is cumbersome and the preferred option is to use Power over Ethernet (PoE) where power is supplied through the network connection.

Any new network equipment supplied as part of this project, together with the circuits to be installed as the new WAN will provide the necessary levels of QoS and PoE to support IPT in the nine principal sites. It is understood that any equipment reused is relatively new, however it will be necessary to verify that this existing kit has the above capabilities to support a converged voice and data network.



3.3.7 With IPT users have a choice of:

- 3.3.7.1 A desktop phone – This is a “standard” phone and will be little different to the handsets with which users are already familiar. Many users prefer a desktop phone as this is “culturally” what they are used to, and in costings for the budget for this project it has been assumed that most users will fall into this category.
- 3.3.7.2 A “mobile” phone – Typically using a technology such DECT or WiFi, users such as caretakers can be provided with IPT phones which allow them to roam within a campus.
- 3.3.7.3 A softphone – This means using the users PC or laptop as a phone. A handset or headset is connected to the USB phone and the users hold conversations in the usual way. Softphones can be cheaper to implement than desktop phones, however there are only operable when the PC is switched on. Across the industry, mobile users are beginning to express a preference for softphones as it means they use the same phone no matter which office they are in or indeed if they are working from home.
- 3.3.7.4 A “converged” phone which is the office phone when in a company office and a standard mobile phone outside. Inside the premises a WiFi connection is used. The advantage is the users have a single device. However sound quality may not be as good as a desktop phone.
- 3.3.7.5 Mobile twinning – Users have a single number which is both the desktop and mobile phone. When a call is received it will ring at both and can be answered at either. Calls can also be seamlessly switched between the two environments during a call. Mobile phones can easily be synchronised with the corporate telephone directory and functionality introduced to allow them to have major corporate network access, e.g. to transfer calls, make enquiry calls, hold conferences, etc.

Budget costing has been on the basis of 350 standard handsets.



3.3.8 Other telephone services may need to be considered including:

- 3.3.8.1 Voice mail which may be implemented as a standalone solution or integrated with e-mail so that users have a single repository for both voice and e-mail messages – this can be extended to other message types such as fax and SMS text messages.
- 3.3.8.2 Call centre technology which will be applicable if Northwards Housing moves towards an in-house call centre model; the call centre service is currently provided by MCC.
- 3.3.8.3 Voice Recording.
- 3.3.8.4 Conferencing and collaboration allowing users to hold conferences and share documents reducing travel between offices. Tools allow one-to-one meetings using simple “web cam” technology or more complex “meeting room” video conferences.

3.4 E-mail

3.4.1 Northwards Housing currently uses a Lotus Notes e-mail system provided by CTU. As part of this project, Northwards Housing wishes to deploy Microsoft Exchange. Desktop licenses for Microsoft Outlook are already provisioned. The equipment and services required are:

- 3.4.1.1 Exchange server hardware, two servers recommended for resilience, which may be procured as part of this project or through existing supply channels available to Northwards Housing.
- 3.4.1.2 Configuration of Exchange to replacing existing Lotus address book
- 3.4.1.3 Conversion of existing e-mail data stored in Lotus Notes

No provision is made for conversion of any Lotus Notes applications; this is understood not to be an issue for Northwards Housing.

3.4.2 Northwards Housing wants to use this opportunity to deploy an e-mail archiving solution. This is to retain all e-mails send and received within the organisation for compliance purposes.



3.4.3 Northwards Housing has a number of Blackberry devices which receive e-mail from MCC's Blackberry Enterprise Server over the T-Mobile network and is keen to retain these as they are well accepted by the users.

It is anticipated that for cost reasons, the new solution will provide a service which uses the O2 network through a hosted service. However is a cost-effective proposal to deploy a Blackberry Enterprise Server (BES) in Northwards Housing's hosted server configuration, this would warrant consideration.

3.5 Internet Connection

3.5.1 The Internet connection will be required for

- Web browsing
- Email transmission and receipt
- Virtual Private Network (VPN) access by small offices, mobile workers and homeworkers

3.5.2 Some residential accommodation would benefit from the ability to provide Internet browsing for residents in a public area.

3.6 Security

3.6.1 Northwards Housing will require a Firewall to protect its network from malicious attack from external connections possible over the Internet.

3.6.2 An application which manages site filtering and security will be required, e.g. to ensure that staff do not access inappropriate Internet sites and to log sites visited.

3.6.3 A solution will be required to secure connections by staff using the Virtual Private Network (VPN). These will be mobile staff and homeworkers and may also include small offices depending on the network services proposed by the supplier. There are options for this:

3.6.3.1 Single factor authentication – The user is given access to the VPN service and then logs onto the system with their usual logon id and password

3.6.3.2 Dual factor authentication – Additionally the password comprises of a second piece of information which could be a randomly generated number, a USB token or card, fingerprint, etc



3.6.3.3 Digital certificate – The PC, phone or other device connected to the VPN has a certificate which authenticates it to the network. If the device is stolen the certificate can be quickly revoked

Given the sensitive nature of Northwards Housing's information, dual factor authentication is recommended.

3.6.4 Northwards Housing currently has a server which pushes virus check updates to all desktop PCs. This could be extended to also provide updates to servers.

A solution will be required to deliver Microsoft patches to both desktops and servers as this service is currently provided by CTU.

3.7 Server Room

3.7.1 Whilst some office space had been identified at Hexagon Tower this was considered unsuitable both because of size and because of the risk due to proximity of water tanks.

3.7.2 The solution recommended is to use "server hosting" where the servers are located at the service provider's premises. This has the advantage that Northwards Housing does not have to equip a server room. Server room build is costly as provision needs to be made for fire extinguishant, fire proofing, air condition, resilient power supplies, security, monitoring devices, etc. The hosting provider will also ensure that systems are appropriately backed up.

3.7.3 To minimise network costs, it is recommended that bidders for this tender are required to provide a server hosting solution based in Greater Manchester.

3.7.4 Whilst hosting has a cost, this must be considered against the build costs and the ongoing support costs of the devices above. Further if Northwards Housing move office, there is little disruption or cost to the ICT service which continues to function from its hosted location.

3.7.5 The proposals are made on the basis of a single server room housing the main PC and telephony equipment. Northwards Housing needs to consider business continuity for both PC and phone services. Server hosting solutions have resilience to provide a high level of business continuity. A "hot standby" solution which provided close to 100% availability would be unaffordable.



3.8 Professional Services

3.8.1 The appointed supplier will be responsible for:

- 3.8.1.1 Project Management
- 3.8.1.2 The design of the network
- 3.8.1.3 Ordering all data and telephone circuits from suppliers and co-ordinating the installation of these
- 3.8.1.4 Installing and configuring all data and voice hardware and telephone handsets
- 3.8.1.5 Testing all data and voice connections
- 3.8.1.6 Training Northwards Housing
- 3.8.1.7 Ongoing maintenance support of the systems including rectification of faults and provision of patches.

It is assumed that Northwards Housing will keep spare data switches and telephone handsets; if a device fails Northwards Housing will replace the device and then return the faulty device for repair. This will help to minimise support costs.

3.8.2 Optional services which may be considered are

- 3.8.2.1 Assistance with the relocation of the services from CTU, Daisy Mill
- 3.8.2.2 Ongoing assistance and support with the running of the systems; it is anticipated that Northwards Housing staff will be trained to perform day-to-day maintenance tasks, but more complex issues may be better covered by an experienced third-party – it is common for organisations like Northwards Housing to include a few days which can be called off during the year to assist with such issues



4. Limitations

This review is reliant on the management and technical information provided to NCC Group by Northwards, or its agents, being complete and accurate.

Where information is lacking, or further research is required, this has been highlighted in the relevant sections.

NCC Group is a totally independent organisation. The identification of suppliers and products in no way represents an endorsement of that supplier or its product range.

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