

Case Study: Data Centre



Data Centre Move



About

Together Housing Group are one of the biggest housing associations in the North of England with over 38,000 homes mainly across the Yorkshire and Lancashire areas. Together Housing is a non-profit making organisation and any money they make is invested back into the association for the benefit of our residents and local communities. As well as houses to rent, they also build and manage homes for sale, sheltered accommodation and extra care.

Challenge

Together Housing Group requested that UPS Systems plc move their existing data centre from Halifax to Wakefield. We were chosen because of our extensive knowledge surrounding data centres and backup power. Cheaper quotes were supplied from other companies but when these companies looked at the site and the structure they didn't appear to have the necessary experience to do the job correctly. Our proposal was designed around Together Housing Group's specific needs and the unique solution we proposed was most suitable for them.

The new set up is using 5 server racks and 1 communications rack with InRak air-conditioning units sitting on each end of the IT equipment. This will all be supported by N+1 40kVA UPS system and a 110kVA Standby generator in the event of a power cut. In the event of a fire, there is also fire suppression installed inside the data centre. This will prevent localised fires and stop larger ones from spreading. Any potential problems will be picked up by the environmental monitoring system that will also be in place, which will monitor air conditioning, overheating or UPS failures. The security of all of the equipment will be monitored by surveillance systems that will be put in place to look after the data centre. The specification of the data centre is for top quality equipment to be used at all times.



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Week 1

Work began on the data centre move on 26th February 2018 when the site in Wakefield was prepared. After being passed a blank room, ready for installation, our engineers got underway preparing the initial electrical infrastructure of the data centre. The first step was to do all the cable runs from the distribution board located downstairs and up into the data centre room on the second floor. The incoming supply is in the corner of the room to ensure ease of installation with a direct run of cable between the two floors of the building.

Whilst a couple of engineers started to work on the cable runs, it was down to others to start preparing the cable tray. All of the cables will be tied into the cable tray, making it an important part of the electrical infrastructure. Cable trays are used as an alternative to open wiring or electrical conduit systems. This system will provide the data centre with complete security and safety because it covers all of the wires and protects them from any kind of damage.



Before continuing with the cable work all of the LED panel lights were all fitted. The main reason for using LED lighting is because of the reduced amount of heat they generate when compared with more traditional forms of lighting. This project is based on a 36kW energy room and with 5 server racks and 1 communications rack. All this equipment produces a lot of heat, therefore it is important that the lights give off as little as possible. The other factor in using LED lighting that they will consume less energy, reducing the monthly costs of running the data centre.



The final steps taken in week one was to start running the cables for the distribution boards and cables to run out to the sockets. This is where the power will be supplied to the server and communication racks and fed back to the distribution boards. The end of the week should have seen more progression, but due to the Beast from the East and Storm Emma, there were a few delays. The whole project included extra time for unplanned disruption, so the final completion date of the project should not be affected.

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Week 2

The second week of the project, commencing 5th March 2018, began with the completion of the works started last week. The cables which had previously been drawn through the building from the main intake room were continued through to the upstairs Data Centre and terminated into the new Schneider Electric essential distribution boards. The 32A rated IEC Commando Sockets and earthing works were completed at this time as well. Following the completion of these cabling works, the delivery of the racks was requested. The distribution boards and associated cabling were tested for insulation resistance and polarity at this stage to prove their correct installation and ensure there are no problems that could cause delays further on in the project.

On arrival, the new Rittal TSIT Racks were positioned in the most efficient way possible, not only allowing the data centre to fit in the room as designed, but to accept any expansion if it was required. Together Housing Group wanted to not only relocate their existing data centre but needed the ability to expand their operation in regards to the compute requirements to facilitate the operation of their business.

Within the new electrical intake room, the electrical connections from the external standby generator, Automatic Change Over system and main essential LV panel were installed and tested. The new parallel redundant 40kVA UPS system from Riello will be positioned in a separate room so it is easier to maintain and let it be bypassed if there are any problems. These new UPS modules will each come complete with external maintenance bypass panels to provide a safe environment.



Week 3

As the Together Housing Project is back on schedule, following the delays caused by Beast from the East and Storm Emma, UPS Systems plc will not be onsite for Week 3. The main contractor will be finishing work on the building. This consists of putting the communication cables in before finishing the floor. Then the decoration will be finished, ready for us to return to the site for Week 4.



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Week 4

The start of Week 4 was started with the preparation for the arrival of the 110kVA JS Power Generator, installation of Fire Suppression and the delivery of the 36kW Airedale InRak Air-conditioning units.

For the generator it was important that a solid plinth was created to give the generator a solid platform, otherwise this could mean the equipment will sink into the ground when running. The first job was to dig away the existing mound of dirt, which was outside of the protected fencing. As you can see from the picture, we have been able to cut this down so that this is close to level with the existing tarmac in the car park. As this is outside of the current path within the fencing, it will be important that the fencing is extended once the generator is dropped into place in the coming weeks. To allow the generator to be connected to the rest of the equipment, a 500mil trench has been dug alongside the drainage that has proved a difficult task to work by. The trench will be the home of all the necessary cabling to and from the generator and into the data centre, to ensure no equipment goes down.



Inside the data centre before the installation of the air con, we have had to install all of the fire suppression to ensure the safety of the users within the building should any hazards occur. Fire suppression systems use a mix of wet agents and dry chemicals to suppress equipment fires. When fires are stopped early loss of life is minimal since fire-related deaths occur once the fire has moved past the early stages. Building and internal system damage is also reduced if the fire isn't given time to spread, making fire suppression systems almost as important in areas where there are rarely people, but there is lots of key equipment, like in a data centre.



The air-conditioning units also arrived this week. These two Airedale InRak units will be sitting at either end of the five server racks and the single comms rack. These units have been specifically built to deal with the needs of Together Housing Group, as they will require the room to deal with the heat demands of a maximum 36kW. With the InRak solution, this will provide cool air to the front of the equipment that will then circulate round to the back of the units. Containment will be built on top of the racks and air con units to stop the cold and warm air mixing over the top and the bottom of the equipment.

Outside the refrigeration engineers have been working to install the piping from the air-conditioning units down and outside to the condensers.

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Week 5

During Week 5 the focus has been on finishing off the works outside to ensure the generator plinth is completed ready for the drop of the 110kVA generator. The trench that had been dug around the back of the building has now had all the necessary cabling placed down and routed to the generator plinth so that when the generator is dropped in it can be terminated on the same day. It is important that the generator has a sturdy platform because the weight of it with lube oil and coolant will be around 1,700kG. Also, when the machine is running the high amount of vibrations that will cause a major downward force. Not having a suitable plinth would mean the generator would sink into the ground that sits beneath it.

In addition, this week, the refrigeration team worked to ensure that the necessary pipework was in place for the condensers outdoors. The pipework runs up the side of the building into the data centre and into the 2 x InRak air-conditioning units that were delivered in Week 4.



Week 6

Week 6 began with ensuring that inside the data centre was close to the point where data migration would be able to happen on schedule. The installation of the 2 x Airedale InRak units have now been positioned on each end of the comms and servers rack ready for the refrigeration team to connect up and into the back of each unit.

The installation of the pressure release vent has now been finished and will safeguard the room if there are any fires within the data centre.

All of the electrical switchboard work has now been completed and all of the connections in place ready for when the data centre goes live.



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Week 7

Week 7 started with the arrival of the generator. The generator plinth was now surrounded by fencing to ensure that it was safe and secure. The generator was lowered on to the plinth from the back of a lorry, whilst being monitored by our engineers. Once the generator was safely located it was connected up to the previously installed wiring from the cabling work in the trench.

The final part of the install could now be completed - the testing. To ensure that all the new systems would work in a power failure, everything was extensively tested. To ensure the project is complete the final stage of the data centre move is to start populating the racks. Once this has been done, all systems will be in place and the flooring can be secured underneath the racks. Testing of the room will be completed once all data cables have been run into the room, flooring is all tightened up and an integrity test can be done in the room.



Outcome

With the data centre move complete, Together Housing Group now has a brand new data centre that can adapt to the changes in the future.

The new location provides the capabilities for environmental monitoring system, which will monitor air conditioning, overheating or UPS failures. The security of all of the site will be monitored by surveillance systems that has been put in place to look after the data centre. As was specified, only top quality equipment has been used at all times.

UPS Systems plc have been in the backup power sector for 25 years. With experience from small one UPS applications, to large sites for multi-national companies we can find the right solution for you application.



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