# GD05

**Utility Management, Metering and Incoming Supply Agreements.**

UNIVERSITY OF LEICESTER

## Document Control

| Rev | Date | By | Comments |
|---|---|---|---|
| A | Jun'16 | L. Davies | Technical Review Update |
| B | Oct'17 | L. Davies | Technical Review Update |
| C | Dec 17 | UoL | Sign off for release |
| D | Sept 20 | UoL | Minor updates |
| F | Nov 20 | UoL | Minor additions and Incoming Supply Protocols |
| G | March 22 | UoL | Better definition of where metering is required |
| H | Nov 23 | UoL | Minor updated on data collection method and update on suppliers/contractors |



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## Design Guidance

1. As part of any large-scale refurbishment or new build development TM22, TM39 and BREEAM metering schedules ,(ie a full list of metering points), shall be completed as part of the design process and submitted to the UOL energy monitoring team at RIBA stage 3 for review/approval. Performance specified projects shall ensure that the design subcontractor completes the metering strategy schedule as part of the final design.
2. Additional quality monitoring will be needed for certain items being metered. All whole building level metering will require such quality monitoring and this will require ModBus outputs in addition to pulse output metering for all items monitored. Such items will include power management, heat flow etc.
3. Upon agreement with the University the agreed metering schedules shall be progressed into a design proposal and full details shall then be included within the tender specification for installation during site procurement works. These details shall include all design details of components and connections required.
4. As a minimum metering shall be provided as follows and shall be fully discussed and documented at RIBA stage 3 for agreement with the University.
    a. On all incomers to electrical panels to meet building regulations. This is to include all major panels not just those above 50kW rating and all panels serving above 1000m2 irrespective of load.
    b. On all items of equipment where the load exceeds the parameters given in building Regs L2.
    c. As TM39 which includes motor control centres feeding pumps and fan loads 10KW, boiler installations greater than 50kW; chiller installations greater than 20kW and electric humidifiers greater than 10kW.
    d. Where we have specific needs which will include but not be limited to any oil supplies, biofuel, Solar PV, CHP, heating only heat pumps, car (EV) chargers, specific tenant requirements, low and zero carbon technology, any source of power generation, G59 requirements etc.
    e. As a minimum metering must enable data to be gathered to show the building loads split between
        i. Power between lighting, fans, pumps, plug in loads, cooling, server rooms, catering, external lighting and EV.
        ii. Natural gas between space heat, hot water heating and catering.
        iii. Water metering for domestic, labs and catering.
    f. All external lighting which can be covered by integration with the Telensa system if installed.
    g. If there is SWA main distribution to local boards the metering should be provided by multi functional modbus and pulsed output meters at each outgoing way on main board itself.
    h. If there is busbar distribution then metering should be provided by multifunction modbus and pulsed output meters at the main panel outgoing busbar way PLUS local multifunction modbus and pulsed meter at either the busbar tap off or integral within the local floor board.
    i. To reinforce all meters need to be modbus plus pulsed output.
    j. We must monitor at least 90% of building power needs to meet building regulations.
    k. Schneider PM8000 series meters should be provided at any main incoming panel
    l. Schneider PM5000 series meters should be provided at local floor panels
5. Metering systems shall be of the following types throughout the university and connected to these networks.



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a. Databird and Demma systems will need to be connected to pulsed meter outputs.
b. Power Monitoring Expert (PME) will interface with Modbus enabled systems. Modbus Utility meters will connect to PME interface via University LAN (Datapoint should be requested).
c. Non-residential building data collection service
    - connect to PME (for all utilities meters except water) & Databird (Water)
    - Whole non-residential building heat metering data – connect to PME and BMS system networks
d. Residential building data collection service
    - connect to PME (for all utilities meters except water) & Demma Energy (Water)
    - Whole residential building heat metering data – Connect to PME and BMS system networks.

6. Power quality monitoring of energy systems, all buildings – Connect to PME (Schneider Electric) network only.
7. The electrical subcontractor will be expected to undertake all field wiring of metering devices back to an agreed marshalling point (LAN to enable PME connection) and all such cables will be required to run in containment alongside other data cabling on site.
8. Upon project completion calibration and commissioning certificates shall be provided for all types of meters (including heat, gas and water meters) and collated within the electrical O&M manuals under the respective section.
9. Any whole building level, recharge or sustainable (EV, PV, ASHP, etc.) metering shall be MID approved.
10. All suppliers incoming meters (confirm with UOL Carbon and Energy Team) for electricity, gas, water, heat should be connected to Databird (non-residential) or Demma (residential) by engagement with the incoming utility supplier.
11. All metering systems shall be compatible with the relevant system (PME, Databird or Demma) head end graphics interface and shall include for any additional software modifications necessary.
12. Metering of specialist services such as bio fuel and oil, EV charging, CHP, low and zero carbon technologies and specific tenant requirements shall be discussed with the UOL energy management team during the detailed design process.
13. Incoming utility supplies, including connections to the district heating network, require very early consideration by the design team with discussions regarding the same commencing at RIBA stage 1. This will apply to both new builds and refurbishment projects where external incoming demands are increased.
14. For refurbishments it will be necessary to determine how the overall maximum demands for incoming services are impacted by the development. Metering of the existing demands may be necessary to help determine this.
15. The process required for the above will be as follows.
    a. For the sake of clarity, the term “utility provider” or similar used below also includes the central campus district heating provider Leicester District Energy Company.
    b. At RIBA stage 1, refined at stage 2, the design team will need to consider the availability of supplies to ensure that the project can be serviced with adequate incoming power, water, heat, data etc etc.
    c. RIBA stage 1 site selection criteria must consider whether adequate supplies are available by early discussions with utility providers. High level capacity demands for each service must be calculated and discussions with utility providers will be based around these demands. The design team will be expected to lead these discussions with the statutory suppliers. Confirmations must be obtained that the required service capacities are available.
    d. At RIBA stage 2 more detailed demand capacity calculations must then be undertaken for each service and these are then to be used by the design team to obtain an outline budget quotation from the relevant statutory supplier for the incoming service provision. The consultant designer will be expected to provide these quotations to the University for information.
    e. At RIBA stage 4 a formal quotation is to be obtained from each statutory provider. This is to be based upon final design information and the design team, or Contractor if design and build, will be expected to lead this process and act as the University Agent in completing the paperwork.
    f. In all cases any Utility Providers costs required for providing the above quotations are to be met by the parties obtaining these quotes for later recovery back from the University.



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g. At the end of the above processes the University will be in possession of a formal quotation, obtained via its agents as described above, upon which an order can be placed for the incoming Utility supply.
h. When this process is completed the University internal Project Manager will place the necessary order and complete all necessary paperwork and forms that the relevant Utility Provider requires to process the installation works and subsequently provide the physical incoming services.
i. In parallel with item “h” above the University internal Project manager will also contact the appointed Energy Broker to progress suitable choices for the supply of electric and natural gas for the utility service required and set up that supplier agreement.
j. In parallel with item “h” above the University internal Project manager will also contact the internal University Carbon and Energy team to progress suitable choices for the supply of water for the utility service required and set up that supplier agreement.



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## Design Components

| Item | Manufacturer | Comments |
|---|---|---|
| Energy Broker | The Energy Consortium (October 2022 onwards) | |
| Utility Suppliers | Half Hourly Electrical Supplies (over 100kVA) | EDF |
| | Non Half Hourly Electrical Supplies (over 100kVA) | EDF |
| | Gas | Corona Energy |
| | Water (resident) | Severn Trent |
| | Water (non residential) | Wave |
| | Central Campus District Heat Networks | Leicester District Energy Company |



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| Mechanical Metering | Kamstrup (Heat) Sontex (Heat) | Water, gas and electricity meters shall be monitored by a separate monitoring system managed by the University Environment Team. Utility metering shall not normally be included in the Controls Package. The contractor shall ensure adequate allowances are made within the tender to employ the University preferred specialist to install, commission and reconfigure the head end data collection network.<br><br>For meters provided by the mechanical subcontractor the following shall be provided as a minimum:<br>• Water - Pulsed output (volt free)<br>• Gas - Pulsed output (volt free)<br>• Heat - Modbus/Pulsed output (volt free)<br><br>The mechanical design engineer shall ensure that final meter specification is agreed with the preferred electrical metering specialist prior to specification. Meters shall be supplied c/w calibration certificate to facilitate setup of final pulse monitoring. Heat meters shall be RHI compliant EN1434 Class2/MI004 approved.<br><br>Where a meter is split with a 3rd party such as a non-university landlord or utility shipper the meter shall be supplied with a pulse splitter to ensure monitoring by the university metering network is not overlooked. |



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| LV Metering | Schneider PM5000/8000<br><br>Autometers<br><br>ND Cube 400 | Digital Functional displays of the following as a minimum: V/A/Hz/kWh/MD/System PF.<br><br>All meters to have RS485 communication protocol (Modbus). Bus cabling to all meters to be wired back to data collectors located to suit the relevant network requirements. All data collectors to be provided with an RJ45 data outlet connected to the local LAN to enable PME connectivity.<br><br>Electrical metering shall be provided in accordance with Pt L guidance & TM39 including but not limited to the provision for split metering of lighting, power, renewable, and specialist facilities.<br><br>GPRS provision including transmission equipment to be provided for off-site data collection.<br><br>Wiring to all mechanical metering to be undertaken by the electrical subcontractor and logged by the metering collection service also including gas, water and heat meters.<br><br>University of Leicester shall be given 60 days' notice for application of the utility shipper meter requirements in all cases.<br><br>Metering for renewable technologies shall be RHI compliant to EN1434 Class 2/MI004.<br><br>All metering systems shall be compatible with the head end graphics interface and shall include for any additional software modifications necessary to ensure the above. |



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## Framework Contractors

| Service | Specialist | Address & Contact Details |
|---|---|---|
| Metering | Schneider Power Monitoring Expert (PME) | **ADI**<br>66 Melchett Road,<br>Kings Norton Business Centre,<br>Kings Norton,<br>Birmingham<br>B30 3HX<br>Contact: David Barnes<br>Tel: 01214512255<br>Mobile 07805628119<br>Email: dbarnes@adiltd.co.uk<br><br>**Learnd**<br>Comfort House,<br>10 Charter Point Way,<br>Ashby-de-la-Zouch<br>LE65 1NF<br>Contact: Nigel Miles<br>Tel: 01214512255<br>Mobile 07800720610<br>Email: nigel.miles@se.com<br><br>**Schneider**<br>University of Warwick Science Park<br>Sir William Lyons Road<br>Coventry<br>CV4 7EZ<br>Schneider Electric<br>Contact: Nigel Miles<br>Tel: 01214512255<br>Mobile 07800720610<br>Email: nigel.miles@se.com |



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|---|---|---|
| | Databird Network | **Energy Metering Technology Ltd**<br>Lloyd House<br>57 High Street<br>Burnham<br>Slough<br>SL1 7JX<br>Contact: Sarah Boughton-Smith, Managing Director.<br>Tel: 01628 664056<br>Mob: 07727 042143<br>Email: Sarah@meteringtech.com |
| | Demma Network | **Demma Group Ltd**<br>The Pavillion<br>Colesale Manor Office Campus<br>South Drive<br>Birmingham<br>B46 1DL<br>Contact: Mr Andrew King<br>Tel: 0121 749 1212<br>Mob: 07568 432421<br>Email: andrew.king@demma.co.uk |



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