CONFIDENTIAL CLIENT

PROJECT WAVE – THE CLIENT FACILITY

CONFIDENTIAL UK LOCATION

MCS MEP SUBCONTRACTOR AND ENGINEERING DELIVERY PARTNER

REFURBISHING FOR THE FUTURE

A sustainable MEP transformation at the client facility

How evidence-led reuse, targeted upgrades and intelligent controls helped modernise a live, business-critical workplace while reducing waste and embodied carbon.



DIRECTOR'S / CLIENT SUMMARY

MCS Project Wave demonstrates how disciplined MEP validation, asset retention, targeted upgrades and supply-chain control can improve a live technical workplace while reducing carbon, waste and unnecessary capital intervention. MCS retained useful infrastructure, focused replacement only where performance required it and produced a transparent evidence trail distinguishing verified, modelled and estimated outcomes.

54
MEP assets retained

100%
Project-wide landfill diversion

16.86 tCO_2e
Quantified lifecycle reuse benefit

MCS KEY PROJECT FOCUS AREA	OUR SUSTAINABILITY IMPACT
Circular economy and embodied carbon	MCS retained 5 fan coil units, 47 grilles and 2 air-handling units. Together with confirmed raised-floor pedestal reuse, the quantified benefit reached 13.35 tCO_2e upfront and 16.86 tCO_2e over the assessed lifecycle.
Efficient MEP operation	MCS delivered targeted heat-recovery ventilation, VRF heat-pump systems, LED lighting, occupancy detection, wireless controls, updated BMS scheduling and recommissioning.
Electrical resilience and avoided upgrade	MCS rationalised technical demand by 8.75 kW and limited the net UPS increase to approximately 7.5 kW, avoiding an unnecessary wholesale central UPS upgrade.
Delivery and packaging reduction	MCS delivery tracking indicates 240 effectively returned pallets, an estimated 1.92 tCO_2e saving and a calculated 39.5 kg reduction in single-use plastic.
Waste and collaborative delivery	The multidisciplinary project recorded 75.18 tonnes of waste, 99.54% recycling and 100% diversion from landfill. MCS contributed through MEP reuse, segregation, packaging reduction and coordinated contractor interfaces.
Future carbon focus	The MEP product-stage assessment identified electrical installations, particularly lighting, as the principal future optimisation opportunity, informing better product selection and quantity rationalisation.

DIRECTOR-LEVEL TAKEAWAY

MCS enabled a lower-impact refurbishment by combining engineering assurance with practical delivery: validate first, retain where safe, upgrade only where value is clear and document outcomes transparently.

A REFURBISHMENT-FIRST SUSTAINABILITY STORY

the client facility is an early-1990s, business-critical technical facility. Through Project Wave, MCS helped transform selected ground- and first-floor areas into modern accommodation for Occupational Health, Contact Centre, Digital workspace, Cyber, Anti-Piracy and Group Risk functions.

MCS supported the completed refurbishment as MEP subcontractor and engineering delivery partner. MCS avoided a default position of wholesale replacement by combining detailed site validation, condition assessment, performance modelling, selective asset reuse and targeted introduction of efficient new systems.

54
MEP assets retained

100%
Recorded waste diverted from landfill

16.86 tCO_2e
Quantified lifecycle reuse benefit

THE CORE ACHIEVEMENT

MCS helped deliver a more efficient, adaptable and maintainable workplace while preserving useful infrastructure, protecting operational continuity, and avoiding unnecessary material demand.

WHAT MCS CHANGED

- Existing fan coil units, grilles and air-handling plant were retained, relocated or refurbished where suitable.
- Heat-recovery ventilation and VRF heat-pump systems were introduced selectively to meet revised room and occupancy needs.
- LED lighting, occupancy detection, wireless Casambi controls, DALI capability and updated BMS scheduling improved controllability.
- Point-of-use hot water, leak detection and occupancy-linked water controls reduced infrastructure and water-risk requirements.
- Electrical and UPS capacity was rationalised to avoid unnecessary central infrastructure upgrades.

THE PROJECT WAVE CHALLENGE

MCS had to reconcile new workplace layouts and increased technical requirements with existing services whose condition, capacity and record accuracy could not be assumed. The building remained operational, so isolations, sequencing and retained services required careful coordination.



MCS DESIGN COORDINATION

MCS coordinated retained and relocated FCUs, targeted VRF installations, MVHR and air-distribution modifications against the live building constraints.

Validate before replacing	Compare design information with installed conditions, verify routes and capacity, test controls and assess reusable assets.
Protect live operations	Coordinate safe isolations, transient services, technical power resilience and out-of-hours activities.
Improve performance without overdesign	Use ventilation and lighting calculations to right-size plant, refine layouts and avoid unnecessary energy and material use.

MCS ENGINEERING VALIDATION CREATED THE PLATFORM FOR REUSE

MCS treated sustainability as an engineering and delivery method. Surveys, calculations, testing and photographic evidence provided the confidence to retain serviceable systems and focus on new investment where it delivered clear operational value.

MEP FOCUS	WHAT MCS DELIVERED
Air systems	AHU capacity and condition checks; room-by-room fresh air validation; retained-FCU checks; rebalancing and recommissioning.
Electrical	Condition survey, distribution-board capacity review, underfloor-track identification and reuse of suitable circuits and containment.
Lighting	Day 1 and maintained performance calculations, glare checks, layout optimisation and controls review.
Controls	BMS point-to-point checks, sensors, schedules, graphics, heating/cooling tests and trend evidence.
Water and life safety	Water sampling, leak detection, local hot water, fire-alarm and sprinkler condition review and reconfiguration.
Future carbon focus	The MEP product-stage assessment identified electrical installations, particularly lighting, as the principal future optimisation opportunity, informing better product selection and quantity rationalisation.

CLIENT VALUE

Evidence-led validation reduced uncertainty, supported safe reuse, limited disruption and helped ensure that new equipment was matched to actual need.

CIRCULAR ECONOMY: RETAINING VALUE IN EXISTING ASSETS

MCS made refurbishment-first delivery the defining sustainability feature of Project Wave. The verified reuse record confirms 5 relocated fan coil units, 47 relocated grilles, and 2 refurbished air-handling units, a total of 54 retained MEP assets, which is a considerable project achievement.

Quantified embodied carbon savings from confirmed raised-floor pedestal reuse and the conservative five-FCU replacement proxy.

REUSE MEASURE	VERIFIED OR MODELLED BENEFIT	REPORTING POSITION
5 retained FCUs	1.53 tCO_2e upfront; 1.92 tCO_2e lifecycle	Conservative project-specific replacement proxy.
47 grilles and 2 AHUs	Additional benefit not quantified	Excluded from carbon totals to avoid overstatement.
Combined quantified reuse	13.35 tCO_2e upfront; 16.86 tCO_2e lifecycle	Conservative partial total; excludes floor panels, grilles and AHUs.

TARGETED UPGRADES FOR EFFICIENT OPERATION

VENTILATION AND COMFORT

MCS delivered new mechanical ventilation with heat recovery to serve the Group Risk suite and selected support rooms. MCS installed targeted VRF heat-pump systems to support revised Occupational Health, Anti-Piracy, Group Risk and other room layouts. Existing systems continued to serve areas where capacity and conditions were suitable.

1,000 L/S
Contact Centre fresh air

460 L/S
Digital workspace fresh air

480 L/S
Group Risk fresh air

LIGHTING AND CONTROLS

MCS delivered a lighting strategy that combined efficient LED luminaires with retained infrastructure, DALI capability, PIR detection, Casambi wireless control and scene setting. Selected luminaires achieved approximately 118.62 lm/W and 132.13 lm/W. Design calculations assessed initial and maintained performance and generally kept reported ground-floor glare viewpoints below the UGR 19 workplace criterion.

TARGETED UPGRADES FOR EFFICIENT OPERATION

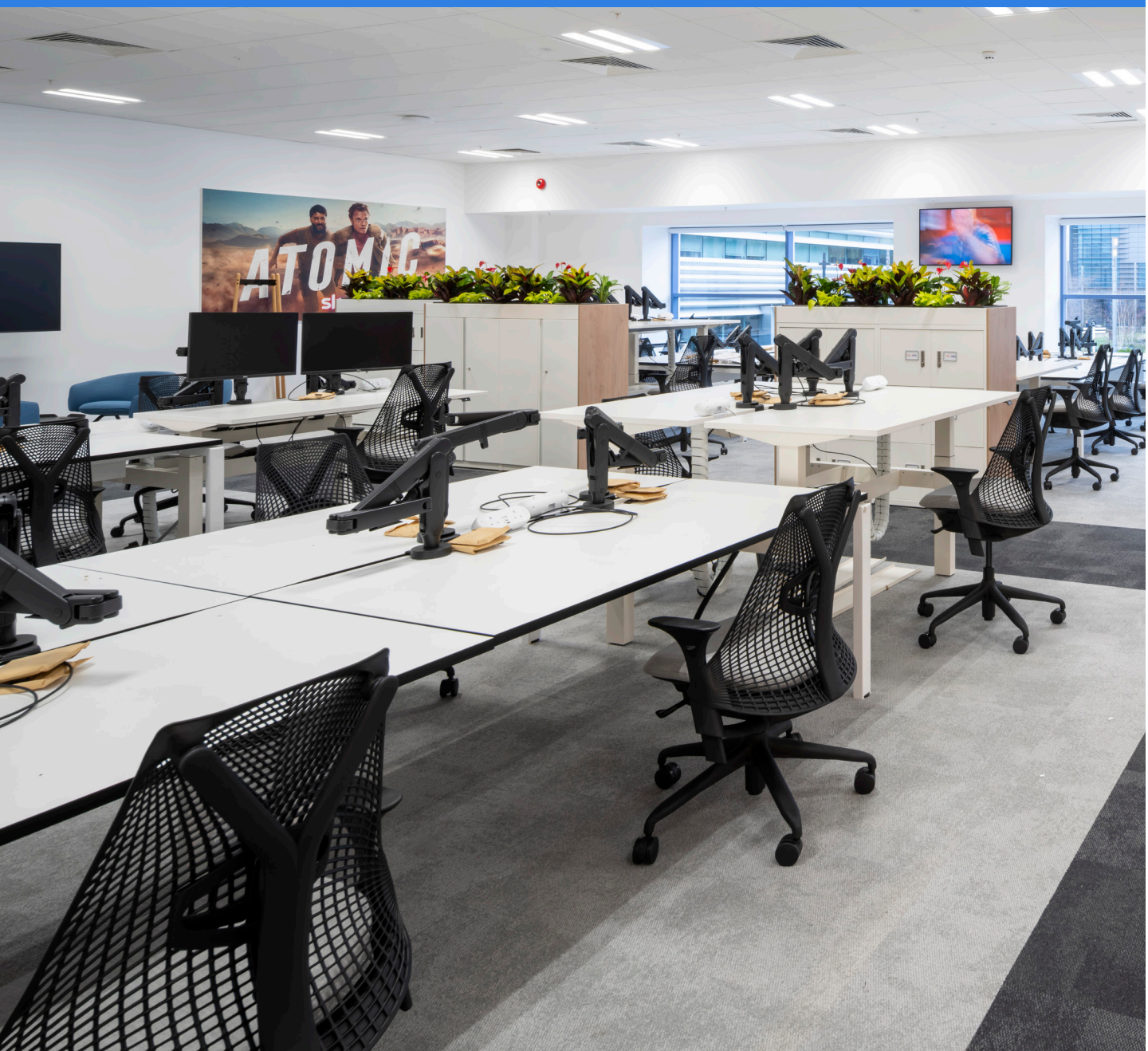
CONTINUED

SMART BUILDING CONTROL – MCS STRATEGY TO SUCCESS

- Updated Trend IQ BMS graphics, controllers and room sensors supported monitoring and control.
- Independent schedules allowed the 12-hour, seven-day Contact Centre to operate separately from normal-hours spaces.
- Point-to-point testing, heating and cooling tests, trend logs and commissioning evidence supported handover assurance.

TRANSPARENT CLAIM

These measures support lower operational demand and better control. No measured post-occupancy energy saving has been claimed because a verified before-and-after dataset was not available.



RESILIENCE, POWER AND WATER EFFICIENCY



MCS ELECTRICAL COORDINATION

MCS coordinated UPS-backed distribution, retained underfloor power and local containment while protecting business-critical electrical resilience.

AVOIDING UNNECESSARY INFRASTRUCTURE

MCS retained the existing distribution strategy and reused suitable circuits, split-metered distribution boards, primary containment, and underfloor power. By reallocating approximately 350 m^2 of supporting space from technical to maintained supplies, the design reduced the anticipated technical demand by 8.75 kW. This limited the resulting net UPS increase was approximately 7.5 kW, just over 1% of capacity on each system, avoiding an unnecessary wholesale central UPS upgrade.

WATER-CONSCIOUS DESIGN

- Point-of-use electric water heaters avoided a new central hot-water distribution network.
- Occupancy-linked solenoid valves were specified at selected water points.
- Leak detection was provided below new sinks and at relevant connections.
- Existing drainage infrastructure was reused where practicable, with local pumped-waste and condensate connections coordinated around the retained building.

WASTE, MATERIALS AND RESPONSIBLE PROCUREMENT

Final recorded waste treatment outcome for MCS Project Wave.

Final waste-contractor records show that 75.18 tonnes were removed from site between August and December 2025. Of this, 74.83 tonnes were recycled and 0.35 tonnes were recovered as refuse-derived fuel. No recorded waste was sent to landfill.

99.54%	0.46%	0 T
Recycled	Energy recovery	Recorded landfill

MCS DELIVERY TRACKING AND PALLET RETURN

MCS used delivery tracking and supply-chain engagement to reduce avoidable packaging and encourage pallet return and reuse. Project records indicate approximately 300 consolidated deliveries, with one wooden pallet assumed per delivery and an 80% return or reuse capture rate. This equates to a conservative effective total of 240 returned pallets.

Effective pallets returned	300 deliveries × 80% return/reuse rate = 240 pallets
Net saving per pallet	10 $kgCO_2e$ gross avoidance less 20% return-handling and transport allowance = 8 $kgCO_2e$
Estimated carbon saving	240 pallets × 8 $kgCO_2e$ = 1,920 $kgCO_2e$, or 1.92 tCO_2e
Single-use-plastic reduction	Recorded project calculation: 39.5 kg, supported by reducing or eliminating 10 mil non-reinforced plastic on equipment deliveries where practicable.

MCS adopted the 8 $kgCO_2e$ net factor as a deliberately cautious project estimate. The source document notes that a typical UK wooden pallet weighs approximately 22–28 kg and that reuse can avoid up to 15 $kgCO_2e$ compared with manufacture of a replacement. MCS reduced this to 10 $kgCO_2e$ gross and then applied a further 20% deduction for return logistics. The resulting 1.92 tCO_2e is therefore presented as an estimated supply-chain benefit rather than a verified product-level lifecycle assessment.

WHY PROJECT-WIDE WASTE REMAINS INCLUDED

The final waste dataset covers the multidisciplinary project rather than MCS works alone. It is retained because it demonstrates the collaborative outcome enabled by coordinated segregation, reuse, packaging reduction and contractor interfaces. The figures are explicitly identified as project-wide and are not claimed as an MCS-only result.

CARBON PERFORMANCE AND FUTURE MEP OPTIMISATION POTENTIAL

MEP product-stage embodied carbon by discipline. Electrical installations dominate, with lighting forming the largest share.

The detailed RICS output reported 37.46 tCO_2e of MEP product-stage carbon. Electrical installations contributed 30.04 tCO_2e, or 80.2%, while lighting alone accounted for approximately 78.5% of the MEP product-stage total. This evidence sharpens the priorities for future projects: rationalise luminaire quantities, select efficient long-life products, improve EPD and PEP coverage, optimise cable and containment, and preserve recoverability information in O&M records.

ASSESSMENT	HEADLINE RESULT	HOW IT SHOULD BE READ
Stage 3, 60-year study	67 $kgCO_2e/m^2$ upfront; 305 $kgCO_2e/m^2$ lifecycle	11.6% below the client's 345 $kgCO_2e/m^2$ stretch benchmark in that assessment.
Final project, 10-year study	Corrected 226.58 tCO_2e upfront; 276.26 tCO_2e lifecycle	Different area, scope and study period, so not a like-for-like trend against Stage 3.
Modelled operational energy	327,184 kWh/year, 208.0 kWh/m^2/year	A modelled reporting metric, not a post-occupancy measurement.



THE MCS VALUE DELIVERED TO THE CLIENT

OUTCOME	VALUE FOR THE CLIENT
Lower embodied impact	Serviceable equipment and support infrastructure remained in use, avoiding unnecessary replacement and material demand.
Operational efficiency	Heat recovery, heat-pump systems, LED lighting, controls, BMS scheduling and recommissioning reduced avoidable demand.
Indoor environmental quality	Validated ventilation, temperature control and lighting design supported clinical, technical and office functions.
Resilience	Power-demand rationalisation limited the UPS increase and preserved critical technical capability.
Flexibility	Wireless controls, adaptable zoning and retained underfloor systems support future workplace change.
Supply-chain delivery	MCS delivery tracking indicates 240 effectively returned pallets, an estimated 1.92 tCO_2e saving and a calculated 39.5 kg single-use-plastic reduction.
Waste performance	MCS contributed to the multidisciplinary project outcome of 100% recorded waste diversion from landfill, with 99.54% recycled.
Maintainability	Updated controls, O&M information, equipment labelling, testing and commissioning supported long-term operation.

MCS PROJECT WAVE AT A GLANCE

54	13.35 tCO_2e	16.86 tCO_2e	1.92 tCO_2e	39.5 kg
MEP assets retained	Quantified upfront reuse benefit	Quantified lifecycle reuse benefit	Estimated pallet-return saving	Calculated SUP reduction



Project-wide landfill diversion

A PRACTICAL MODEL FOR LOW-CARBON REFURBISHMENT

Project Wave demonstrates how MCS supports client sustainability goals through retention, measured design validation and selective upgrading. MCS demonstrated that meaningful carbon and resource benefits come not only from new technology, but also from extending the life of existing equipment, reducing overdesign and commissioning systems so that they can operate as intended.

The legacy for clients is MCS' repeatable delivery approach: validate first, reuse where safe and practical, upgrade only where value is clear, and retain the evidence needed for credible reporting.

GOOD EVIDENCE, CAREFULLY STATED

The client-facing claims in this case study retain all material sustainability gains from the full technical report while distinguishing verified outcomes, modelled results and benefits that remain unquantified.

Important qualifications

- Operational energy, water, ventilation and lighting figures are modelled or design-stage values unless stated otherwise.
- The FCU saving uses a conservative project-specific replacement proxy because the exact retained FCU models were not recorded.
- No carbon value is assigned to reused grilles or refurbished AHUs, avoiding overstatement.
- Whole-project waste outcomes are attributed as multidisciplinary project performance, with MCS contributing through MEP asset reuse, minimisation, segregation, packaging reduction and coordinated delivery.
- The pallet-return figure is an estimated project calculation based on approximately 300 consolidated deliveries, an 80% return rate, 10 $kgCO_2e$ gross avoidance per pallet and a 20% logistics deduction; it is not a product-specific LCA.
- Carbon assessments use different areas, scopes, study periods etc. As such have not been presented as a direct before-and-after comparison.

END OF DOCUMENT