Appendix B

Project: **Purley Leisure Centre**

Client: **Croydon Council**

Condition Survey of M&E Services

Rev	Date	Note
1.0	24.07.15	Draft Issue
1.1	20.08.15	Executive Summary Amended
1.2	02.05.2019	Following Site Survey 14.03.2019, report has been updated.

Version:	**1.0**	**1.1**	**1.3**	
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Contents

1.0 Executive Summary

Darnton B3 originally undertook a survey of the Leisure Centre back in 2015. Since then there have been updates and replacement undertaken within the Leisure Centre. DarntonB3 have been commissioned in 2019 to undertake and update of their original report.

This report forms the basis of the original investigation and has been updated to reflect changes where identified.

The Leisure Centre and Swimming Pool where constructed in the early 1980's, the majority of the Main Plant and equipment are original as of 2014 and therefore at the end of their practical life. There has been various updates undertaken and plant replaced, however some plant does remain operational however we deem the operation to be inefficient and prone to failure without notice.

There would be substantial work and capital expenditure to bring all the current plant and equipment to current standards in terms of energy efficiency. In terms of Regulations the building services do require minor modifications as detailed within this report. This report is not intended to address a complete overhaul of the services but to review maintenance and servicing over the next 5 years.

The centre is generally beyond its economical life in terms of plant and system life expectancy. A complete overhaul and replacement would see significant energy saving and efficiency improvements. Replacement of the systems together with building upgrades would give improved building environments to benefit users.

1.1 Budget Cost Summary

Within section 6.1 of this report we have included a schedule that identifies the anticipated maintenance and budget costs requirements for the next 5 year period. A summary of this Capital Expenditure is detailed in the table below.

Year 1 we have included what we deem to be immediate works required to allow the centre to continue to function as it currently does with no energy or plant improvements just simply maintenance and serving to prolong the building operation. Year 2 to 3 follows on with anticipated maintenance and service requirements ongoing, followed by Yr 4 to 5 etc. Whilst the kit is at the end of its economical life it is still operational, we would highlight that the kit could fail catastrophically in Year 1 or even year 5. We have therefore included a full replacement costs for the M&E Services which is provided in detail in section 6.0:

Service	Immediate Year 1 to 3	Yr 4 to 5	Full Replacement	Pool Filtration
M&E and Pool Filtration	£141,100.00	£142,250.00	£1,597,000.00	£215,000.00

We would highlight that the above are high level budget figures. Should complete overhaul be undertaken there could be opportunity to reduce expected replacement costs through careful planning with Architect, building user groups etc.

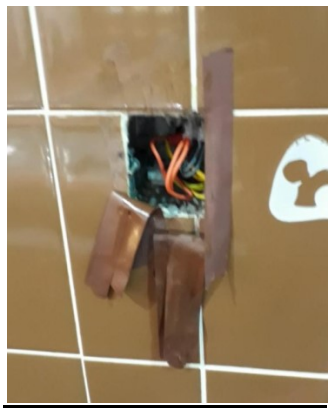
The Leisure Centre building services in our opinion are generally in a poor condition. We would expect the running costs alone to be an ongoing issue with increases in expenditure

on a yearly basis. The Plant installed in its current state we would summarise as being 50-60% efficient compared with new systems that would in the region of 90-95% efficient. The plant is running currently beyond what was expected as their economical life - in excess of 25 years in most cases.

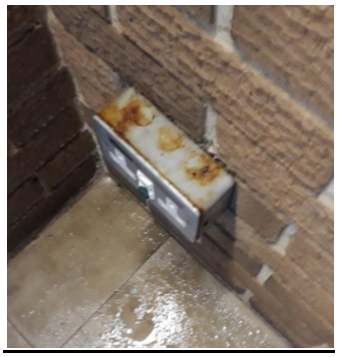
1.2 Immediate Work required

From our visual survey we would suggest the following works are undertaken within the next few months to prevent further deterioration and to improve the overall comfort levels and environment within the Leisure Centre. The anticipated costs associated have been included in the budgets provided for Year 1.

1. Full Electrical Inspection and rectification works – there are various sockets and outlets in the building that are in need of attention.



< Covers missing from socket sin Pool/Wet change side



< Condense dropping on outlets not IP rated.

< Use of multiple extension leads

2. Ductwork and Grilles - it is evident from staining on ceilings and dirt build up on grilles that the internal surfaces of the ductwork are in need of full clean. This will reduce resistance in the system and improve overall ventilation throughout which is currently deemed ineffective.
3. Air Handling Units - we would suggest that all AHUs and fans are fully serviced and cleaned internally. In particular the Roof mounted Pool AHUs. We note that some AHU have had fans replaced, however the complete overhaul of the AHU would be effective in terms of efficiency.

4. General Plant Servicing - the majority of the plant is operational but in need of general service to prolong its life and improve efficiency. Replacement of the plant in many areas would see significant energy improvement and running cost reduction.
5. Emergency Lighting Levels taken under test conditions - Further testing on site needs to be undertaken to establish how effective the emergency lighting is, with regard to lighting levels under emergency conditions, especially within "High Risk areas" (Plant & Electrical Switchroom). This was raised at last visit in 2015 and we have not been update dif this was actually undertaken.
6. Fitness Suite Lighting – the lighting circuits are currently switched via the distribution board for the area. We would suggest this is addressed and local lighting circuit switches/controls installed.

2.0 Introduction

The London Borough of Croydon (LBC or 'the Council') has commissioned DarntonB3 Building Services to reassess the suitability and condition of the existing building services, equipment and plant at:

Purley Leisure Centre
50 High Street
Purley
Surrey
CR8 5AA

DarntonB3 originally undertook a survey and report in July 2015. The assessment submitted within this report is from a non intrusive visual inspection only of the Mechanical and Electrical services. The survey was undertaken on the 13th March 2019. No testing, operating, servicing or maintenance of plant was carried out during our inspection. The inspection was carried out whilst the centre was in use.

The purpose of this report is to provide the Council with the following:

a) Immediate works required to keep centre fully operational and complaint with all statutory legislation, including budget costs;

b) Programmed maintenance works to facilitate safe occupation and compliance for a period of 1-3 years (short term), including budget costs;

c) Programmed maintenance works to facilitate safe occupation and compliance for a further period 2 years, in 4-5 years (medium term), including budget costs

2.1 Exclusions / Clarifications

The Clients attention is drawn to the fact that repair, maintenance and inspection of the following items are expressly excluded from this contract:-

- Shower thermostatic controls
- Chlorine alarms
- Heating and lighting control systems
- PA Systems
- CCTV System
- Intruder Alarm System
- Fire Alarm System - Pel Services Limited carried out Annual Service and Maintenance on 25th April 2014.
- The testing of water systems in terms of the Control / Prevention of Legionellae.

2.2 Background

The following information is taken from the Councils brief.

The following section is unchanged from the original report back in 2015 as it is just background of the building itself.

Purley Leisure Centre located at 50 High Street in south Croydon is Croydon's most southern public leisure centre which offers main and learning pools with some gym facilities containing free weights, fixed weight and cardiovascular machine areas. The Centre was completed in 1982 and comprised part of a complex that provided leisure, shopping and parking facilities located on land that was formerly an outdoor public car parking facility.

The centre is operated by Fusion Lifestyle and maintained by Interserve*fm* as partners on behalf of the Council's Leisure and Facilities Management Service teams.

Purley Leisure Centre's general layout is as follows:

Ground Floor

a) Office and administration area at facility entrance (75m²)
b) Cardiovascular gym area(125m²)
c) Fixed and free weight gym area (100m²)
d) Main pool plant and Low voltage switch area (260m²)
e) Storage (160m²)

First Floor

f) Separate Male, Female and Family changing areas (90m²)
g) Shared locker area (70m²)
h) Separate Male and Female pre-swimming pool WC & Shower facilities
i) Main pool 25 x 13 metre (650m²),
j) Learning pool 13 x 7 metre (230m²),
k) Storage and administration area (60m²),

Second Floor

a) Low voltage switch area (40m²),
b) Learning pool Air Handling (AHU) area (30m²),

Third Floor

a) Duct work and lift motor room area (40m²),

Fourth Floor

a) Main boiler & CHP room (50m²),
b) 3x externally mounted main pool Air Handling Units (AHU)

It was built as part of a multi-storey car park and former supermarket complex. The structure is principally constructed of cast in-situ reinforced concrete columns and slabs making ground, intermediate and roof levels. External façades are of internal blockwork with external brick cavity wall and aluminium framed fenestration.

The pool is serviced by traditional sand filtration, low level pool water chlorination and ultraviolet disinfection system. Extract and Ventilation of air via 5x Air Handling Unit (AHU), 3x main pool, 1x small pool and 1x changing areas. The gym area is serviced by split heat pump cassette units providing heating and cooling.

Main heating, pool heating and hot water is provided by 2 x cast iron boilers, and the CHP has been decommissioned.

2.3 Report Format

The following section is unchanged from the original report back in 2015. This report is split into sections that cover the following:

Section 3.0 Summary Condition Survey Findings - this sections provides an overview of the findings during our visual inspection fo the M&E Services.

Section 4.0 Major Plant Asset Registers - this section provides summary of major plant that is installed in the Building such as boilers, AHU, Distribution board etc. Each Asset is Condition Graded and Priority Graded within this section.

Section 5.0 Minor Plant Asset Register - this section provides summary of minor plant that is installed in the Building such as switches, luminaries, sanitaryware etc. Each Asset is Condition Graded and Priority Graded within this section.

Section 6.0 This section of the report identifies all defects, remedial work together with budget costs. These have been split as requested into:

a) Immediate rectification works,
b) Programmed maintenance works for 1-3 years, and
c) Programme maintenance works for 4-5 years.

2.4 Asset Management Plan and Condition Assessment

The following section is unchanged from the original report back in 2015 as grading principles set are still current.

The following section identifies the grading ratings that are used in section 2.0 & 3.0 of this report.

1.4.1 Existing condition Grading

The condition of each element should be assessed, using the following recommended grades:

Grade A. Good. Performing as intended and operating efficiently.
Grade B. Satisfactory. Performing as intended but exhibiting minor deterioration.
Grade C. Poor. Exhibiting major defects and/or not operating as intended.
Grade D. Bad. Life expired and/or serious risk of imminent failure.

Examples of the application of these grades to specific elements are given in Annex A.

1.4.2 Priority Grading

Once the condition of premises has been assessed, priorities should be allocated according to the seriousness of the condition revealed and the urgency associated with any breaches of legislation. This should have particular regard to the possible consequences of deferment.

The following priority grades are recommended in the context of a five year planning period:

Priority 1. Urgent work that will prevent immediate closure of premises and/or address an immediate high risk to the health and safety of occupants and/or remedy a serious breach of legislation.
Priority 2. Essential work required within two years that will prevent serious deterioration of the fabric or services and/or address a medium risk to the health and safety of occupants and/or remedy a less serious breach of legislation.
Priority 3. Desirable work required within three to five years that will prevent deterioration of the fabric or services and/or address a low risk to the health and safety of occupants and/or remedy a minor breach of legislation.
Priority 4. Long term work required outside the five year planning period that will prevent deterioration of the fabric or services.

Examples of the application of this priority classification are given in Annex D. Annex E lists some of the legislation and guidance that may need to be taken into account in determining priorities.

An element graded Condition D will not always warrant Priority 1. There may be instances where an element is in poor condition, but for which maintenance work is not a high priority. The reverse may also be the case. The following table shows some such examples.

1.4.3 Economic Life

The age of existing main plant, mechanical and electrical elements have been compared with indicative economic life cycle in accordance with “CIBSE – Guide M, Maintenance Engineering and Management (2014), Appendix 12.A1: Indicative economic life expectancy” and an assessment made to determine if it has reached the end of it economic life when considering the Programmed Maintenance Works.

3.0 Summary of Condition Findings

The following section provides an outline of the findings observed during our visual inspection of the Building Services at Purley Leisure Centre.

The building services installed in most cases are in excess of 30 years old and are past the end of their practical operating life. Failure of the main plant items would result in the building being unsuitable for operation as the outcome would mean a habitable building without heating service, lighting, hot water and/or ventilation/air conditioning.

As and when the plant will fail cannot be predicted due to the age. ***We would highlight that most plant is beyond its expected economical life, 'on borrowed time'.*** Ongoing maintenance and repair works can prolong life but this has to be weighed against costs and potential for astronomical failure resulting in closure of the building.

The major concern with the plant is that replacement parts required will become obsolete meaning major plant overall to keep the building operational.

3.1 Plant Replaced from 2015

The following plant we understand to have been replaced since our last visit in 2015.

1. Teaching Pool Plant room (Room 53)
    a. AHU 4 Teaching Pool Void anti-condensation supply air unit. Replaced within the past 2 years, in good working order.
    b. AHU 5 Teaching Pool Supply and Extract. Replaced within the past 2 years, in good working order.

    Note: the above change only applies to the AHU itself - no pipework, control, ductwork or other ancillaries appears to have been changed.
2. Changing Room AHU (Room 52)
    a. AHU 7 Supply Fan only replaced within the unit. The AHU case and other components remains existing.
3. Acc WC Changing Room AHU (Room 54)
    a. AHU 6 Supply Fan only replaced within the unit. The AHU case and other components remains existing.
4. Boiler Room (Room B56)
    a. 2No burners replaced on the boilers in past 2 years.

From the above it is evident that limited works have been carried out to the Mechanical Services systems since 2015.

3.2 Mechanical Services

<u>Heating Plant</u>

The primary source of heat to the building is provided via 2No gas fired boilers (non condensing) which are installed in the Fourth Floor plant room accessed from the car park. Originally these boiler were coupled with CHP unit, we understand the CHP has been redundant for more than 15 years. We have asked about peak loadings on the building and have been informed the building operates sufficiently with the two boilers only.

If one boiler fails the building would not be able to support peak demand during and would be deemed to be unsuitable for occupancy. Replacing the boilers would see improved efficiency and in turn reduce running costs. Replacement of the boilers would also offer back-up facility in event of failure (i.e. duty and standby arrangement).

The general circulation systems and pipe work are in fair condition for their age but we would suspect are in need of minor repair and/or flushing to remove residual and corrosion within

the circulation system. The operation of valves should be addressed to ensure that systems can be isolated in the event of failure. We are unsure if this has been undertaken since our last visit 2015.

There are various circulation pumps within the building and a mix of direct drive and belt drives. The condition of the pumps vary some appear is good condition with others in poor condition with heavy corrosion. Replacement of these pumps with inverter drives would see reduced running costs.

Insulation to pipework would benefit from being upgraded and replaced to reduce standing losses. Reduction in standing losses could in turn reduce firing time of boiler and running of the circulation pumps.

Hot Water Plant

The generation of hot water is via two calorifiers located in the ground/basement plant room. From the legionella reports produced by others we understand the hot water generation plant meet current Regulations in terms of output.

During our survey we did not note the temperature gauges on the calorifiers. Unless these have been replaced since 2015 we would still suspect that the gauges are faulty and in need of replacement. The primary pipe work serving the vessels is in fair condition along with the motorised valves and ancillaries.

Insulation to pipework would benefit from being upgraded and replaced to reduce standing losses. Reduction in standing losses could in turn reduce firing time of boiler and running of the circulation pumps.

General Ventilation Plant

The air handling units for the building are located in various plant rooms. All units, with exception of those replaced as per section 3.1, are deemed to be at the end of the economical life and all show signs of corrosion and deterioration. The Pool Hall units should be addressed at earliest opportunity as currently one have failed completely.

We note that some fans have been replaced, as section 3.1, but the general condition of the outer casing and we suspect the heaters batteries and fitler frames within are in need of upgrade or replacement. Refer to the Major Plant asset register for further details of their condition.

The changing room air handling units we note have had supply fan changes within the existing unit casings. We would deem them to be operating effectively providing air movement within the changing rooms. However the ductwork has not be replaced and it is unknown if it has been cleaned out. We would suggest that the AHU is serviced and the ductwork system cleaned. We understand that works have been undertaken within the ceiling voids over the past few years which has resulted in grilles being disconnected from the ductwork system and not reconnected – a complete overhaul would provide more effective conditioning of the space.

The Pool Hall AHU No1 was not operational during our visit, understand that this has been switched off since July/August 2018. Understand the disabling of the unit is down to the bearings in the extract fan failing. As unit if off the damper actuator has been removed and installed on AHU 2. The Pool Hall condition must be drastically affected by the drop in mechanical ventilation in the space. This could be leading to further building fabric deterioration. There were signs of condensation and minor surface corrosion on the ductwork at high level.

The ductwork systems are evidently becoming less effective and local staining to grilles and ceiling suggest that the internal ductwork and AHU generally are in need of major cleaning and filter replacement. Upgrade of controls components would see decrease in running costs.

Insulation to ductwork would benefit from being upgraded and replaced to reduce standing losses.

The ventilation systems generally for the Pool hall appear in an unhygienic state and would recommend replacement and upgrade. High levels of corrosions apparent both internally and externally.

Air Conditioning

The general split air conditioners control the environment in the gym. At the time of survey they were effectively controlling to 19°c. The plant appears in good condition at the time of survey.

There are 3No external condenser units installed between 2013 and 2017.

Building Control Systems

The overall building control systems consist of control panels located within each plant room. All control panels appear to have been modified/adapted and we would deem them to be original. The economical life of a new control system would be 20-25 years, therefore we would deem the control to be at the end of the economical life.

Currently we understand the control panels provide the on and off functions appropriate for the plant in its current state, full testing required for isolation. If the plant is replaced then we would suggest the full Building Management system is replaced/updated.

During recent plant upgrades we understand that no control upgrades or enhancements have been undertaken.

3.2 Electrical Services
We note that most Electrical systems remain as they were back in 2-015 with minimal major changes.

The principle items of electrical equipment surveyed comprised the following:

- Distribution and Switchgear
- Data
- Small Power
- General Lighting
- Emergency Lighting
- Fire Alarm System
- Security Systems
- Facilities for the disabled
- TV System

Switchgear and Distribution
The existing incoming electrical supply and associated switchgear is located in a switch room of the leisure centre.

Electrical Supply
The main incoming supply is situated in the ground floor plant area.

The service cut-out is owned and maintained by the distribution network operator.

The incoming main cable terminates into a Supply Authority panel board and then a programmable polyphase meter.

The distribution network operator's equipment is in good order.

Main Switchgear
The main switchgear and ancillary devices are approximately 30 years old.

The main switchgear panel is situated in the ground floor plant area, next to the main incoming supply.

The main switchgear panel comprises of a main busbar and individual fuse switches using BS 88 type ceramic fuse protection feeding MCCB boards, integral to the main panel.

These MCCB's are obsolete and unavailable to replace.

The panel is suitably sized for the incoming electrical supply, but has no spare capacity.

An number of tap off isolator units have been added to the top of the main switchgear panel to accommodate

The switchgear panel is in good condition and shows no sign of significant deterioration.

In summary the equipment is in an acceptable condition for its age, however most of the components are now obsolete.

The switchgear is serviceable for the foreseeable future, however if any future extensions are planned there is no spare space on the panel.

There is no Mains Distribution Schematic diagram on site, we would recommend that a full survey is carried out and a schematic completed

Distribution Boards
Recent inspection and testing is evident from updated circuit charts and certification labels.

There is little to no spare capacity on some distribution boards.

We would recommend replacement of the worst distribution boards, retaining spares and refurbishment of better condition / newer boards.

There have been isolators replacements around the centre but majority of the existing still remain.

Data

Structured cabling has been installed to administration areas in mini-trunking and surface boxes, suggesting a more recent retrofit installation.

Generally sockets, cabling and containment are acceptable.

Some trunking lids are missing and in places the installation has been undertaken to a good standard.

In summary the data installation, while not particularly well installed in places is satisfactory.

Various trunkings need to be replaced to present an acceptable visual appearance.

Power

The Small Power installation exists throughout the buildings and comprises of single and three phase isolators, conventional 1 and 2 gang switched and un-switched socket outlets and fused spur units feeding specific items of equipment.

In the office areas the sockets are mounted on Dado trunking, provided for IT.

In general there are no sockets in changing areas.

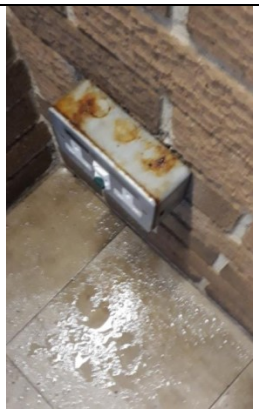
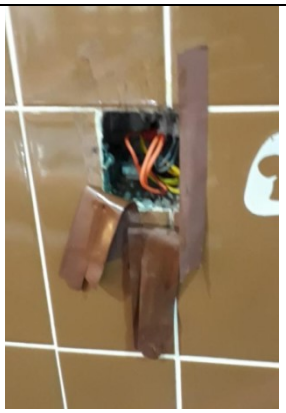
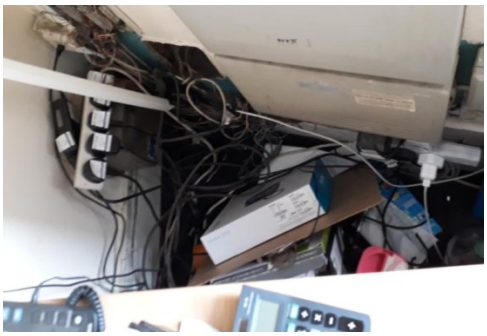
Where possible the wiring is concealed in the plasterwork or alternatively surface run in conduit/trunking.

Small power provisions generally satisfactory. Some accessories are showing sign of corrosion and require replacement, especially within the plant area where heavy corrosion is evident.

We would recommend a full replacement of the all isolators, sockets outlets, fused spurs and switches within the plant area.

This is due to the chemicals in the atmosphere, which have also severely corroded the electrical containment, which should also be replaced.

The whole building should be electrically tested and immediate works undertaken to ensure cover plates are secured and/or replaced as appropriate. There are instances throughout the building where covers plates are either not securely, fixed, not IP rate as required and not installed at all.

		
Condense water dripping on to a non IP rated outlet	No cover plate to live circuits in wet area	Over loading circuits through use of extension cables.

General Lighting

The majority of the general lighting is achieved with the use of ceiling mounted recessed down lights and surface mounted fluorescent fittings.

IP rated fluorescent luminaires are used in the Plant room, WC's and changing rooms. Recessed twin or four tube fluorescent fittings are used in the Activity rooms, reception/ office, and fitness suite.

There are additional recessed down lighter fittings in the corridors, lobbies and entrance area.

Lighting levels were taken from around the building

Room	Lighting Level	Recommended Lighting Level
Pool Viewing Area	150 Lux	100-200 Lux
Main Pool Area	135-208 Lux	200-300 Lux
Learner Pool	390-480 Lux	200-300 Lux
Pool Changing Area	105 Lux	100-150 Lux
Corridors	120-170 Lux	100-200 Lux
Plant Area	110-180 Lux	200 Lux
Switch Room	80 Lux	200 Lux
Fitness Suite	350 Lux	200-300 Lux
Weights/Gym Area	110-130 Lux	200-300 Lux

The refurbished lighting within the main pool consists of 8x Thorn floodlights mounted facing down around the pool perimeter.

This has led to glare from the light fittings on the pool surface that could make it difficult for life guards to see if swimmers are in difficulty in the pool.

We would recommend a full replacement of the older light fittings with energy efficient long life fluorescent lamps or LED alternatives (especially for the fittings mounted at high level due to 50,000+ lamp life's) and a full relamping schedule and thorough cleaning of the remaining light fittings.

We would also recommend additional light fittings be added within the weights/ gym area to achieve lighting levels

A further recommendation would be that within the main pool the 8x floodlights are retained but lowered and rotated 180° to use as an indirect light source, bouncing the light of the pool ceiling to help reduce to glare on the water surface.

Emergency Lighting

The emergency lighting is provided by non maintained battery pack bulkheads luminaires via a central battery unit located within the plant/switch rooms.

Overall the emergency lighting was of the non maintained type and was working.

On site records suggest the installation is being tested and maintained.

Further testing on site needs to be undertaken to establish how effective the emergency lighting is, with regard to lighting levels under emergency conditions

External emergency lighting to exits and escape routes is provided by surface mounted bulkheads.

Bulkheads showing signs of UV age related damage.

A number of areas had little to no emergency lighting with only one emergency bulkhead in the plant switchgear area.

A number of areas including WC's and store areas had no emergency lighting installed.

Satisfactory, but approaching end of serviceable life.

We would recommend in line with the lighting replacement that integral non-maintained emergency light fittings be installed throughout the leisure centre In order to comply with BS5266.

BS 5266: Part 7: 1999 requires that higher levels of emergency lighting shall be provided in areas of particular risk, although no values are defined.

The British standard states that the average horizontal illuminance on the reference plane shall be as high as the task demands in areas of high risk. It shall not be less than 10% of the normal lighting level, or 15 lux, whichever is the greater. In practice this minimum is unlikely ever to be a problem as it would only be valid if the risk area had a normal illumination level less than 150 lux.

For sports applications, standby lighting can be further subdivided into ‘safety lighting’ and ‘continuation of an event’. The degree of standby lighting provided will be influenced by the nature of the activities being undertaken, the duration of the activities and the level of associated risks involved.

BS EN 12193:2007 provides guidance on ‘safety lighting’, the purpose of which is to ensure that in the event of a power failure a sporting activity can be safely stopped without causing injury to participants.

Provision of standby lighting with the purpose of allowing events to continue to their conclusion in the event of failure of the main lighting system is not usually economical. Exceptions will be provision of alternative cover for major events, where loss of lighting would cause unacceptable cancellation.

The lighting level for the safe stopping of an event is a percentage of the level for that class. This applies to the following sports and percentages listed below:

Sport	**% for minimum period (seconds)**
Swimming	5% for 30s

Fitness suite lighting requires review as to how it is operated. Currently the staff use the distribution board in the area to switch the lighting circuits on and off. This is not how the system should have been installed nor operated.

Fire Alarm System

The fire alarm is a conventional 6 zone fire alarm system (5 Zones used) with automatic detection, manual call points and electronic sounders.

Sounders with flashing indicators were installed for hard of hearing users within the building.

Evidence of routine testing and maintenance was evident on site from records.

In summary, the system is satisfactory.

Security Systems

The intruder alarm has been installed, the intruder alarm consists of PIRs, door sensors, together with sounders and a telephone link to a central monitoring station.

The system is on a maintenance contract and appears to be satisfactory. Satisfactory

CCTV System

CCTV cameras were installed throughout the leisure centre, a mixture of fixed and dome cameras are installed and linked back to reception area DVR and two monitors. Satisfactory

Facilities for the disabled

Disabled call alarms are installed within the changing area but are not installed within the disabled WC's

The auto opening door at the leisure centre entrance was working correctly.

we would recommend the installation of disabled alarms to all disabled WC's, linked back to the reception/ office area.

TV / Aerial Installation

TV services to fitness centre and gym area all working, assume digital connection over cabled service provider. Satisfactory

3.3 Pool Filtration

No changes to this section since the 2015 report.

The main Pool Filtration plant is not original, it is understand that originally the Pool was treated with an ozone system and carbon filter. This has since been made redundant and replaced with deep bed sand filters and UV. There is only one central plant to serves both pools. Ideally the Pool should have separate filtration plants.

We would surmise that the pipe work and ancillaries into the Pool are original.

The Pool water circulation pumps are direct drive with no facility to our knowledge to enable the pumps to be ramped down over night or during non occupied periods. The pumps are showing signs of deterioration and corrosions. Replacement with new inverter drive pumps would provide running costs savings.

The general pool filtration pipe work is plastic with parts in stainless steel (i.e. headers and junctions). The s/s pipe work is starting to show signs of corrosion. The valves and strainers installed local to the pump sets are corroded in parts and the operation of the isolation valves to enable to strainers to be removed weekly is unknown. We would suggest replacement of isolation valves to ensure that weekly cleaning can be carried out satisfactory.

The control system to the Pool Filtration plant is more than likely beyond its economical life and should main plant be replaced then the central control should be updated also.

3.4 Energy Efficiency

When looking at the Energy Conservation of the Swimming Pools and Leisure Centre, the following areas should be investigated which could offer significant energy savings to the operator:-

Incorporate a Heat Recovery system into the Pool Hall Ventilation system.

Currently there is no efficient heat recovery on the Pool Hall Ventilation.

- A standard ventilation system supplies fresh air which has been heated via a primary heat medium and discharges the room tempered air directly to outside. By incorporating a heat recovery system the exhaust airs heat energy can be reclaimed and used to indirectly heat the incoming fresh air. This will enable primary heating loads to be reduced.

Reduce Energy Losses

The current pipe work and duct work insulation is in a very poor state. Improving/replacing/continuing the insulation to pipework and ductwork would see savings in fuel and running costs. Reducing energy loss would also assist in plant life as central pant and ancillaries would not need of work as hard, i.e. firing of boilers could be reduced, pumping costs etc.

Limit Electrical Energy consumptions by incorporating inverter drives to pump and fan motors.

- Standard pump and fan motors are operated by an 'on/off strategy and therefore use 0 or 100% energy. A sustainable design would modulate the pump/fan loadings to suit the building performance requirements.
- Introduce a Night Set Back control of all systems – during the day the systems will normally operate at 100% design condition, but during the night they may need only operate at half speed.
- The above can be achieved by incorporating inverter drives to pump and fan motors – should the existing pump and fans be compliant.

Reinstate the Combined Heat and power Plant

More than likely the current CHP will need to be replaced entirely. A new CHP engine suitably sized and coupled with a thermal store would see significant energy savings with potential payback period circa 5 to 8 years.

Heat energy generated would be offset to the gas fired boiler output and electrical energy generated would be offset against grid electricity supplied.

A Review the existing building controls system to provide technical feedback as to how the system could be improved including:-

- Energy monitoring of pumps, fans and heat generation. This enables operator to review energy consumptions each month for various systems and will in turn high lights areas where system may be in need of maintenance or repair. This also provides compliance with the current Building Regulations Part L.

Introduce Renewable Energy to assist primary fuel driven plant.

- Roof mounted Solar Collectors may be viable to aid the primary low temperature hot water generation plant. The solar collector can be incorporated to pre-heat pool water prior to final treatment via the primary heat source.
- By aiding a primary heat generation plant with renewable means could potentially provide cost savings on Gas consumptions (based on as primary heat source being Gas fired boiler plant).

- Other renewable means are available but would be subject to the location and plant area provisions in an existing building. These include: Biomass Boilers, Heat Pumps and CHP plant.

Replace Standard Lighting with LED Lighting.

- Lighting can account for up to 40% of electricity use in buildings and technological advances in recent years make lighting refurbishment more viable than ever.
- It is estimated that up to 75% of buildings have outdated lighting which is not only inefficient in its energy consumption but is also not delivering the optimum visual environment for its occupants
- LED lighting supports sustainable design in several ways. It uses less energy than most other types of lamp, lasts longer (which means less frequent replacement and therefore reduced waste), is mercury-free, and can be housed in special luminaires designed for easier disassembly and recycling.

Replace Light Switches with Presence Detector Lighting control.

- Currently a distribution board is used to switch lighting circuit on and off in the Gym. This is bad practice and goes against standards as to what the DB is installed for. Ligting circuits should be installed to wall mounted rocker switches or similar.
- Presence Detectors

  Detectors will switch on lighting automatically when a person enters the room, and switches off lighting automatically when no movement is detected.
- Absence Detectors

  Upon entering the room the person switches on the light as normal, but on leaving the detector switches off the lighting automatically. Lights can also be switched off manually.
- PIR Detectors PIR (Passive Infrared) presence detectors detect body heat and movement and are ideally suited where a defined detection pattern is required.

  PIR detectors work on detecting the movement of body heat. Better suited to smaller spaces or where a defined detection pattern is required.
- Microwave Detectors Microwave presence detectors are sensitive to movement and are ideal for large spaces and areas that have an awkward shape or where fine motion detection is required.

  Microwave Detectors are sensitive to objects that move, with much greater coverage and sensitivity. They can detect through glass, therefore careful consideration on location is needed in certain applications.
- Adjusting the artificial lighting according to the amount of natural light in a room using daylight sensors or photocells can reduce electricity use by up to 40%.
- Switching Detectors with Lux Level Sensing, These presence detectors have built-in adjustable lux sensors which will keep the lighting switched off if there is sufficient natural light.
- Direct Dimming Detectors with Lux Level Sensing In addition to lux level sensing, dimming detectors are able to provide automatic control of lighting output. A dimming detector can be used to control the light output of luminaires that are fitted with dimming ballasts. The detector measures the overall light level in the detection area and regulates the output of the luminaires, ensuring the correct lux level (maintained illuminence) for the area and saving energy when natural daylight can be used to replace/supplement luminaires (daylight harvesting).

Maintenance Plan

- By regularly cleaning windows and skylights you can reduce the need for artificial light. Cleaning the fixtures that contain lamps, known as luminaires, will improve their performance.
- Annual cleaning and servicing of the HVAC components including internal ductwork, grilles, filters etc would see increase in the life span of plant and also inpriove the overall wellbeing and conditions within the building.

4.0 Major Plant Asset Registers

The following section provides data sheet for each major plant items such as:

- Boiler plant,
- Air Handling units,
- Distribution Board

4.1 Major Plant - Mechanical Services

4.2 Major Plant - Electrical Services

4.3 Major Plant - Pool Filtration

5.0 Minor Plant Asset Registers

The following section provides schedule for minor plant/equipment, such as:

- Lamps, luminaries
- Switches,
- Ventilation Grilles
- Radiators

5.1 Minor Plant Asset Register

6.0 Programmed Maintenance and Budget Costs

The following schedule we trust is self explanatory. The intent of the schedule is to provide a condition and remedy for all significant M&E Services. The schedule is detailed as follows:

- **Item** - this is the particular M&E Service, i.e. boiler plant, Emergency Lighting etc.
- **Element** - M, E or PF
- **Location**
- **Condition** - this is a general summary of the condition of the service as visually inspected.
- **Remedy** - what works we suggest are undertaken
- **Full Plant Replacement** - this is the budget cost to replace the item of plant/equipment. We have provided this as guidance in the event of catastrophic plant failure or in the event replacement parts become obsolete.
- **Year 1** - this is for works required immediately to satisfactorily condition the building as intended. For instance servicing of plant and cleaning of ductwork. The cost does not allow for catastrophic failure, for instance if during the servicing of a piece of kit its is found to be faulty, the cost of rectification and replacement in not included.
- **Year 2 to 5** - ongoing servicing to plant with minor replacement of parts such as lamps, belt drives etc.

6.1 Budget Cost Schedule

The following budget costs have been determined following the site visit. Full Plant replacement of plant/systems is taken on the Gross floor as provided on the building drawings.

The Total Gross internal floor area is 2,800m2.

	Item	Element	Location	Condition	Remedy	FULL PLANT REPLACE	YEAR 1 (2019)	YEAR 2	YEAR 3	YEAR 4	YEAR 5
1	Electrical safety test certificate to all areas.	E	all areas	reasonable	A full periodic test to be carried out at 5 yearly intervals	N/A	£5,000	£0	£0	£0	£5,000
2	Portable Appliance Testing (PAT Test)	E	all areas	New inspection imminent.	Allow for annual testing	N/A	£1,350	£1,350	£1,350	£1,350	£1,350
3	Switchgear, LV Distribution including Distribution boards and sub-main cables.	E	all areas	Fair - in working order	Allowance for repairs	£98,000	£3,500	£1,500	£500	£500	£1,500
4	General small power circuits and accessories (& earthing)	E	all areas	Fair - in working order. Some items required immediate attention – replace covers plates etc.	Allowance for repairs	£56,000	£10,000	£1,500	£500	£500	£1,500
5	Internal & External Lighting	E	all areas	Fair - in working order	Allowance for repairs/cleaning & relamping	£182,000	£2,500	£2,500	£1,500	£1,500	£1,500
6	Emergency Lighting	E	all areas	Non compliant in areas	Replace whole system	£48,500	£20,000	£5,000	£1,500	£1,000	£1,000
7	Lightning Protection	E	all areas	Good working order inspected Oct 14	N/A	£0	£0	£0	£0	£0	£0
8	Fire Detection	E	all areas	Fair - in working order	Allowance for call out and bi-annual testing	£33,600	£0	£1,800	£0	£1,800	£0
9	CCTV	E	all areas	Good working order	Allowance for call out and annual testing	£1,800	£700	£700	£700	£700	£700
10	Intruder Alarm	E	all areas	Good working order	Allowance for call out and annual testing	£15,000	£700	£700	£700	£700	£700
11	Call/Panic alarm System	E	all areas	Equipment difficult to repair due to part being obsolete	Replace now then allow for annual maintenance and repairs.	£25,000	£700	£700	£700	£700	£700
12	Door Access systems	E	all areas	Suffering intermittent faults	Allow to replace over the next 5 years as units fail	tbc	£1,000	£1,000	£1,000	£1,000	£1,000
13	Lift - passenger / goods	E	all areas	Good working order	Allowance for call out and annual testing	tbc	£6,500	£6,500	£6,500	£6,500	£6,500
14	Radiators	M	all areas	Fair - in working order.	Allow for call outs due to leaks/faulty stats	See item 15	£350	£350	£350	£350	£350
15	General LTHW Heating & Domestic services pipe work and valves	M	all areas	For age it is in fair condition, however in parts it is prone to failure	Allow for call outs due to leaks/ Replace in 5 years. Pipe work and ancillaries to be repaired/replaced (in parts) to prevent failure	£243,600	£2,500	£1,000	£2,500	£1,000	£2,500
16	General Pipe work Insulation	M	all areas	Some insulation is missing	Insulation to be repaired periodically to improve efficiency	£25,000	£1,500	£1,500	£1,500	£1,500	£1,500
17	General Ductwork and ancillaries	M	all areas	For age it is in fair condition, however in parts it is prone to failure and required internal clean	Ductwork / grilles and ancillaries to be replaced where appropriate	£350,000	£2,500	£1,250	£2,500	£1,250	£2,500
18	General Ductwork Insulation	M	all areas	Some insulation is missing	Insulation to be repaired to improve efficiency	£30,000	£2,000	£1,500	£2,000	£1,500	£2,000
19	Cleaning of all internal ductwork system and grilles	M	all areas	Build up of dirt around ceiling grilles	Filters, ductwork and grilles to be deep cleaned to improve efficiency	N/A	£5,000	£2,500	£2,500	£2,500	£2,500
20	Gas Fired Heating Boilers (2No Hartley & Sugden)	M	Boiler Room 56	Fair - in working order.	Allow for annual testing/servicing	£50,000	£900	£900	£900	£900	£900
21	Boiler Flues	M	Boiler Room 56	Fair - in working order.	Allow for possible repair/replacement in 10 years	£18,500	£500	£500	£500	£500	£500
22	Pressurisation unit & Expansion Vessel	M	Boiler room 56	In fault/error during inspection.	Assume fault can be rectified. Allow for annual service. Replace after 5 years	£8,000	£500	£200	£200	£200	£200
23	Lowara MTHW close coupled pump	M	Boiler room 56	Fair - in reasonable condition.	Allow for annual service. Replace after 5 years	£7,500	£300	£300	£300	£300	£300
24	Brook Hansen MTHW close coupled pump	M	Boiler room 56	Fair - in reasonable condition.	Allow for annual service. Replace after 5 years	£4,500	£300	£300	£300	£300	£300
25	CHP Unit	M	Boiler room 56	NOT WORKING	Unit has been decommissioned	£125,000	N/A	N/A	N/A	N/A	N/A
26	System Dosing Pot	M	Boiler Room 56	Fair - in working order	Annual services and inspection	£1,000	N/A	N/A	N/A	N/A	N/A
27	Mechanical Gas shut off	M	Boiler Room 56	Fair - in working order	To be tested along with gas safe. Replace in future with solenoid valve linked to emergency shut off	£5,500	£250	£250	£250	£250	£250
28	General Boiler Control Panel and BMS	M	Boiler Room	Poor - in working order but showing signs of	Annual servicing. Full replacement of the BMS	£61,600	£450	£450	£450	£450	£450

	Item	Element	Location	Condition	Remedy	FULL PLANT REPLACE	YEAR 1 (2019)	YEAR 2	YEAR 3	YEAR 4	YEAR 5
	associated		56	deterioration	recommended when main plant replaced.						
29	Cold water storage tanks	M	Cold Water tank room	Fair - in reasonable condition.	Allow for annual clean/service. Replace after 5 years.	£17,500	£500	£500	£500	£500	£500
30	Frost Protection Heaters	M	Cold Water Tank Room	Fair - not in operation during inspection	Annual Service and testing	£800	£100	£100	£100	£100	£100
31	Ventilation Plant - Main Pool Supply & Extract	M	External flat roof	Poor - in working order but showing signs of corrosion	Allow for annual service. Units are very inefficient compared to modern pool units.	£75,000	£5,000	£5,000	£5,000	£5,000	5,000
32	Heat Pump - Condenser Units (2No)	M	Fourth Floor Roof Level	Fair and in operation	Annual Service	£1,000	£600	£600	£600	£600	£600
33	2No Domestic Hot Water calorifiers	M	Plant room - Room 12	Fair - in working order.	Allow for annual test / service. Replace after 5 years	£1,800	£800	£500	£500	£500	£800
34	Domestic hot water secondary pump	M	Plant room - Room 12	Fair - in working order. Showing signs of corrosion	Allow for annual testing/service & replace after 5 years	£1,800	£250	£150	£250	£150	£250
35	Secondary Heating pumps - belt driven	M	Plant room - Room 12	Poor - in working order. Showing major corrosion from pump casing	Allow for annual test / service. Replace after 5 years	£6,500	£500	£250	£500	£250	£500
36	Ventilation Plant - AHU7 Changing Supply & Extract	M	Room 52	In working order – fans changed	Annual Service	£12,500	£1,250	£500	£500	£500	£500
37	Ventilation Plant - Teaching Pool Supply & Extract	M	Room 53	Replaced circa 2017	Annual Service	£12,500	£500	£500	£500	£500	£500
38	Ventilation Plant - Teaching Pool Supply (void supply)	M	Room 53	Replaced circa 2017	Annual Service	£12,500	£500	£500	£500	£500	£500
39	Ventilation Plant - AHU6 Changing Supply	M	Room 54	In working order – fans changed	Annual Service	£7,500	£1,250	£500	£500	£500	£500
40	Ventilation Plant - AHU6 Changing Extract	M	Room 54	In working order – fans changed	Annual Service	£7,500	£1,250	£500	£500	£500	£500
41	Ventilation Plant - general controls (various panels around building)	M	Various	In working order - modifications taken place	Annual service	£50,000	£500	£500	£500	£500	£500
42	Sand Filters (2No)	PF	Plant room - Room 12	Fair for age and in working order - require service	Full service including replacement of Sand within the vessels	£40,000	£6,000	£500	£500	£6,000	£500
	Circulation pipework and valves within plantroom	PF	Plant room - Room 12	Fair - in working order. Signs of corrosion/deterioration	Annual testing and replacement	£40,000	£1,000	£1,000	£1,000	£1,000	£1,000
43	Pool circulation pump (Teaching and Main)	PF	Plant room - Room 12	Fair - in working order. Signs of corrosion to casing	Annual Service.	£35,000	£1,000	£500	£500	£1,000	£500
44	Chemical Dosing Systems and Meter	PF	Plant room - Room 12	Fair - in working order. Signs of deterioration due to aggressive nature	Annual service	£30,000	£1,250	£600	£600	£1,250	£600
45	Drench Shower & safety kit	PF	Plant room - Room 12	Fair - in working order	Annual testing	£3,500	£300	£300	£300	£300	£300
46	Air blower unit	PF	Plant room - Room 12	Fair - in working order	Annual Testing	£3,500	£250	£250	£250	£250	£250
47	Hanova UV Unit	PF	Plant room - Room 12	Fair - in working order	Annual Testing and lamp replacement	£15,000	£500	£500	£500	£500	£500
48	Pool Water Plate Heat Exchangers	PF	Plant room - Room 12	Fair - in working order	Annual Service	£18,000	£100	£100	£100	£100	£100
49	Pool Filtration Plant room Control Systems	PF	Plant room - Room 12	Fair - in working order	Annual Testing and service and parameter review	£30,000	£300	£300	£300	£300	£300
							£92,700	£48,400	£43,700	£48,050	£50,500

Summary of Budget Costings		
Maintenance Year 1 to 2	**£141,100.00**	Inclusive of immediate works but not inclusive of plant failures
Maintenance Year 3 to 5	**£142,250.00**	
Full replacement of the M&E	**£1,597,000.00**	
Pool Filtration	**£215,000.00**	

The above cost for Year 1 and 2 are what are deemed necessary to bring the centre into a fair state of repair in terms of operation and functionality.
Full replacement of the M&E Systems would be preferable but understand budget constraints to do so.