Tides Leisure Centre

MEP Plant
Replacement Report
Rev 02

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Tides Leisure Centre
Deal, Kent

MEP Plant Replacement Report

Issue and Revision Record

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1 INTRODUCTION

M-E Engineers were asked by Dover District Council (DDC), to attend a workshop at the existing Tides Leisure Centre, Deal, Kent with representatives from Dover District Council, the Operator and the maintenance company that look after the heating plant and controls.

The workshop reviewed the future proposals for the existing leisure centre and the operation of the existing plant systems, with the intention to assess whether replacement would be beneficial or required under health and safety grounds.

Other factors were also considered including reuse of any plant in a future redevelopment at the site, reuse of plant from the existing Dover Leisure Centre and any benefits from energy consumption/ carbon reduction.

The replacement of the existing plant will, in the majority of cases indicate a saving whether that be gas, water or electricity consumption. It is very difficult to predict the savings for each item of plant that is being replaced, as there are so many factors that need to be taken into account, but on a holistic basis, when compared to existing operational hours and use, we estimate the following :-

Gas – Predicted saving based on number of operating hours	25%
Water – Predicted saving based on wasted water using current valve arrangement	10%
Electricity - Predicted saving based on number of operating hours	5%

It is intended that new items of plant, where possible, will be reused in any future scheme at Tides and we estimate that the saving on capital expenditure against a future project will be circa £75,000.00.

It should be noted that M-E Engineers are experienced in water treatment however we are not specialists in this field and it is recommended that a water treatment specialist such as FT Leisure are engaged directly by Dover District Council to assist with the final design of the chemical and acid store as well as assisting with the testing of pool water leakage and best method of ongoing treatment.

2 EXISTING PLANT AND PROPOSALS

2.1 Boilers

There are 2No. existing boilers on site both gas fired and rated at 640kW and installed in 1987. Since the original construction, a number of additional extensions have been added, without the increase in heating plant capacity to cater for the additional floor area that requires heating and hot water.

DSL the current maintainers on behalf of DDC identified a catalogue of issues that have occurred over the last few years that were clarified further by a site survey. Apart from various component failures, the most concerning issue is a hairline crack in one of the sections of the boilers, that is believed to have not resulted in complete failure, due to the need to keep the boilers operational 24/7, in order to maintain the temperature in the building, particularly through the winter months.

The replacement of these boilers is recommended due to the number of faults occurring and a potential complete failure looming. In addition the new boilers will be selected such that they are modular in the way they work, so they will be sized for the future development but able to operate at a lower capacity for the existing leisure centre whilst running more efficiently than the existing system. It is expected that there will be a significant saving in gas consumption and a lowering of carbon emissions as a direct result of the replacement.

2.2 Pumps

The existing pumps have been replaced over the last few years with good quality units that are sized to suit the pipework and heating plant.

It is not intended to replace the pumps as they have been replaced recently and replacements are readily available.

The pumps will not be reused in any future development as they will be sized to suit the existing installation and unlikely to be a match for a future development.

2.3 Control Panels

The existing electrical controls and contactors are showing signs of major failure and a number of localised burn outs have occurred, with one causing a closure of the centre.

From site survey it can be seen that the localised burn outs have caused damage to containment and likely other cables within the control panel. It is also likely that the other contactors have worn contacts in the same way that has led to burn outs.

Replacement of the electrical panels is recommended as there is a risk that a more onerous event could occur such as a full electrical fire.

The new control panel will be bespoke for the existing leisure centre and unlikely to be able to adapt for the future development, however components may be transferrable for spare parts.

It is known that the actual control system is not functioning and manual operation is utilised, with staff having to rely on judgement in deciding whether to set the temperature controls higher or lower each evening, ready for the next day's use.

The saving in gas and electricity by having suitable controls will be significant as well as reducing the buildings carbon footprint.

2.4 Domestic Hot Water

The domestic hot water system is supplied from 2No. storage calorifiers with a capacity of 520 litres each.

They are made of stainless steel and were manufactured in 1988 by Hoval a reputable manufacturer.

There have not been any major problems with the calorifiers, so they are not being considered for replacement.

There may be some work on the controls but these are relatively minor for the gain that will be made in efficiency that will in turn reduce energy consumption and carbon footprint.

2.5 Pool Heating

The existing pool heating is achieved using a low loss header and control valves. This system does not give effective hydraulic separation between the primary and secondary circulation, with the risk that any leak or problem will lead to a total shut down.

The existing controls have failed meaning that all setting is done manually, leading to inefficiencies in operation and thus energy efficiency and carbon footprint.

It is recommended to replace the low loss header with a plate heat exchanger that will be reuseable in the future development, the pumping arrangements will also be reviewed and any new pumps will be inverter driven to allow them to be reuseable in a future development.

The installation of the plate heat exchanger will give better control and efficiency for the pool water heating whilst giving hydraulic separation to the primary and secondary water circulation, minimising the risk of total shutdown in the event of a fault on either the primary or secondary sides of the plat heat exchanger.

The efficiency improvement will also have the effect of reduced energy consumption and reduction on carbon footprint.

2.6 Pool Water Treatment

The pool water treatment is in very poor condition having failed in the recent past with catastrophic damage to control panels and valves.

The disinfection system was originally design using an ozone system but this failed in the past and has not been operational for some time. The result is that more sodium hypochlorite is being used than necessary to ensure the correct levels are achieved in the pool. There is always risk with a manual operation for such things as pool water treatment, not only from the quality of water but also the amount of manual handling to keep topping up the system.

The bunds are in poor condition albeit a repair has been carried out after the past spillage into the basement plant area and the drench showers are in poor condition in a very crowded area making them not easy to access should an emergency occur.

It is recommended to install a new Ultra Violet filter system to ensure effective disinfection, and although this does have ongoing maintenance commitments it will be more effective and reduce risks advised previously. The UV filter will be able to be reused in the future development.

To overcome the many issues with the storage and use of sodium hypochlorite and hydrochloric acid, including risk of damage to plant and equipment and health and safety risk to personnel, it is recommended to provide a new storage facility external to the plant area that will contain a chemical store and acid store incorporating the necessary drench showers. Planning consent will be required for such an addition to the building, and this action should be built into the development of a more detailed delivery programme.

The equipment purchased for the chemical and acid store will be reuseable in a future development, however, the housing itself will most likely be unusable.

2.7 Ventilation Plant

The existing ventilation plant to the main pool area is fully operational and some replacements have occurred to the fan motors over the recent months.

It has been observed that the humidity in the café area adjacent the pool is extreme at times and although bathers do not tend to complain, if members of the public are sitting waiting or just resting the environment is unpleasant.

In an attempt to improve the situation it is intended to review the belts and pulleys within the air handling units, with a view to increase the output volume to push more air into the pool area that will reduce the effect of humidity.

One further observation on site was that the fresh air intake and heated air exhaust are within the same overall louvre that is leading to short cycling where the warmer exhaust air is being pulled into the fresh air intake side of the air handling ductwork, this will exasperate the humidity issue within the pool area.

It is recommended to replace the louvre with a separate fresh air intake and exhaust louvre located at 90 degrees to one another. This will involve the installation of a new louvre.

The additional louvre installed around the corner of the building will give a significant improvement to the air distribution efficiency and quality of air being delivered in to the pool area.

Anything more extensive in attempting to correct the issues will be very disruptive to operations and high capital outlay, particularly when weighted against the level of complaints received about the issue.

2.8 Water Storage Tank for Pool Water Make Up

The existing water storage tank for pool water make up is currently located above the pump pit making it inaccessible for future maintenance.

The existing valve arrangement is such that water is constantly running via the overflow externally.

It was also observed during survey that the connections to the incoming mains water are deteriorated to the point when failure could occur at any time.

To avoid such water wastage, provide more resilience to the water connections and improve on the health and safety aspects, it is recommended to relocate the tank on a new frame located where the existing sodium hypochlorite is located with new pipework installed locally from incoming water supply connections.

2.9 Water Loss from Main Pool

It has been observed by the Pool Manager that there is a significant loss of water from the main pool that requires regular topping up consistent with a leak. It was observed that some investigation into this issue has taken place, with various areas dug out to inspect the effect on structures and whether it was possible to determine the source of the leak.

As part of the works it is recommended to establish the level of leakage by installation of additional water meters on the pipework feeding the main pool, in addition some additional testing of the pool water loss will be carried out to determine the level of water loss due to evaporation.

It is expected that this information will better inform where any future intrusive investigations should be focused.

3 PROGRAMME

Report Issued by M-E Engineers	28th March 2018	
Appointment of engineers to create design	Early April 2018	
Design Period, including drawings, specifications and tender documents	April /May/June 2018	8 weeks design period
Cabinet Report	Early June 2018	Allow up to three weeks for internal preparation
Tender & Procure	Early July 2018	
Appoint contractors	Mid-August 2018	Allow six weeks lead in for ordering equipment
Commence works	Early October 2018	
Complete works	Mid December 2018	