Site Details									
Site Address (where inspection was carried out)		William Hill Bookmakers, 274-276 Laird Street, BIRKENHEAD, CH41 8EW							
City	BIRKENHEAD	Postcode CH41 8EW RRN 0750-0056-1759-0722-9002 Related					RRN	0990-2021-5760-7700-5603	
Report Info	Report Information								
Inspection Date	2016-02-23	Issue Date	2016-03-08	UPRN	505790710000				
Assessor D	otails								
A3363301 D	etans								
Assessor Name		Stephen Edwards Ass						STER001047	
Employer/Trading Name		ACI Reports Ltd							
Employer/Trading Address		Suite A9, Allied Business Centre, Potter Place, Skelmersdale, WN8 9PW							
Accreditation Scheme Name		Sterling Accredit	ation Limited						

Air Conditioning Inspection Report

Executive Summary

This report has been prepared in accordance with the requirements of the Energy Performance of Buildings Regulations 2012 as amended, which implements the EU legislative requirements of the Energy Performance of Buildings Directive 2010/31/EU. The inspection has been carried out by an Accredited Air Conditioning Assessor using the Department for Communities and Local Government approved inspection and reporting methodology.

ACI Reports Ltd has been commissioned to undertake an inspection of the air conditioning systems and associated controls at:

Lansdown 287954 William Hill PLC 274-276 Laird Street Birkenhead CH41 8EW

The subjected building is estimated to be constructed around the early 1900s and is a one storey detached licensed betting office, constructed of solid brick and has a pitched roof to the main property and a flat roof to the rear. The Shop is fitted with aluminium single glazing throughout. The building was originally two storeys but now the second floor is just a void space above the false ceiling. The property is positioned on the busy road of Laird Street in the Birkenhead area. The building area surveyed has three air conditioned areas with occupancy from 08.30am to 21.30pm Monday to Saturday and 09.00am to 20.00pm on a Sunday with a maximum retail occupancy of 23 people.

The inspection and report were undertaken in accordance with CIBSE's methodology, inspection of Air Conditioning Systems TM44: 2012 Edition by an inspector accredited to the National Occupational Standard and accredited by Sterling Certification.

The primary aim of the report is to give the building owner, or operator, information about the performance of the system and plant and to identify opportunities to save energy and cut operating costs. This Report identifies any operating anomalies; no-cost/low-cost savings; capital investment opportunities; the size and appropriateness of refrigeration plant in relation to cooling loads and the effectiveness of current maintenance regimes.

Included within this report will be a description of the air conditioning services, system efficiencies and approximate sizing of the system compared to industry guidelines and suggested improvements, which could be made to increase the system efficiency. The inspection and report will benefit the owner or manager only if its findings are acted upon.

Whilst some items with regard to Health and Safety may have been noted, this should not be taken as a complete Report on Health and Safety. Similarly, whilst some items may refer to replacement of life expired plant, this should not be taken as a complete life cycle replacement report.

The building is cooled by three Mitsubishi split systems with two external condensers serving two customer areas and one external condenser serving one counter area. The cooling plants are located outside on the rear flat roof of the building, ladder access was required. The terminal units consist of three ceiling mounted cassettes. The systems are controlled by three Mitsubishi wall mounted controllers.

The total installed cooling capacity is approximately 17kW.

Equipment inspected:

Two external Mitsubishi PUHZ-RP71VHA4 condensers.

Air Conditioning Inspection Report

Executive Summary

One external Mitsubishi SUZ-KA25VA2 condenser. Three internal Mitsubishi ceiling cassettes. Three Mitsubishi wall mounted controllers.

Essential system documentation including an asset list, schematics, cooling capacities and system method of control were not available, for the purpose of the report documentation was prepared on site.

The equipment inspected was found to be in an acceptable working condition and providing cooling as expected.

Maintenance documentation was not available at the time of the inspection.

SYS 001 & 002 in the subject property are affected by the F-Gas Regulations, records should be available for gas recovery and equipment should be labelled where applicable. The system contains more than 3kg of refrigerant, mandatory leak checks are applicable. At the time of the inspection no documentation was available.

The control of the systems is adequate for current operations.

A number of opportunities are outlined within the report that should be considered to maximise efficiency. While there is no mandatory requirement to carry out any recommendations, acting upon the advice within the report may lead to a reduction in energy consumption and operating costs.

Air Conditioning Inspection Report

About this document and the data in it

This document was produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Sterling Accreditation Limited. You can obtain contact details of the Accreditation Scheme at www.sterlingaccreditation.com.

A copy of this report has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The report (including the building address) and other data about the building collected during the energy assessment may be made publicly available at www.opendatacommunities.org.

This report and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document Air-conditioning inspections for buildings available on the Government website at: www.gov.uk/government/collections/energy-performancecertificates. It explains the content and use of this document, advises on how to identify the authenticity of a report and how to make a complaint.

Air Conditioning Inspection Report

Key Recommendations:

Advice and comments on the efficiencies of the AC sub system(s)

Lighting controls and lamps play an important part in the heat load of a building. Improvements made in this area can significantly reduce heating load and therefore energy consumption used by the HVAC system. Consider a combination of new energy efficient lamps controlled via automatic daylight / PIR sensors; return on investment can be as short as 2 years.

Advice and comments on the maintenance of the AC sub system(s)

Maintenance documentation was not available at the time of the inspection.

Advice and comments on the control of AC sub system(s)

Consider providing guidance notices and educating to staff on the general use of the systems and operating environment.

Consider reviewing system functions where available; (a) Controls are set to the correct time and day; (b) Temperature Set points and Dead Bands are appropriately selected. (c) Weekday and weekend set on and off periods are set. (d) Equipment cannot operate when the building is not occupied. Consider reviewing new control equipment.

Advice and comments on the management of AC sub system(s)

Consider introducing a 'Monitoring and Targeting' regime to help identify where and when excessive energy is being consumed. Actions from this will create energy savings.

Consider a building management system providing computer control of building services such as heating, cooling, ventilation and lighting, which can offer great benefits in energy efficiency.

Sub System Index							
Volume Definitions	VOL001						
Sub System ID	VOL001/SYS001 Customer Standing Area						
Sub System Description	One Mitsubishi split system PUHZ-RP71VHA4 condenser serving one Mitsubishi ceiling cassette.						
Effective Rated Cooling Output of Sub System (kW)	7						
Sub System Area Served	Customer Standing Area						
Inspection Date	2016-02-23						
Cooling Plant Count	1						
AHU Count	0						
Terminal Units Count	1						
Sub System Controls Count	1						

Sub System Index							
Volume Definitions	VOL001						
Sub System ID	VOL001/SYS002 Customer Seating Area						
Sub System Description	One Mitsubishi split system PUHZ-RP71VHA4 condenser serving one Mitsubishi ceiling cassette.						
Effective Rated Cooling Output of Sub System (kW)	7						
Sub System Area Served	Customer Seating Area						
Inspection Date	2016-02-23						
Cooling Plant Count	1						
AHU Count	0						
Terminal Units Count	1						
Sub System Controls Count	1						

Sub	System	Index
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Volume Definitions	VOL001
Sub System ID	VOL001/SYS003 Counter Area
Sub System Description	One Mitsubishi split system SUZ-KA25VA2 condenser serving one Mitsubishi ceiling cassette.
Effective Rated Cooling Output of Sub System (kW)	3
Sub System Area Served	Counter Area
Inspection Date	2016-02-23
Cooling Plant Count	1
AHU Count	0
Terminal Units Count	1
Sub System Controls Count	1

Note: Request the following information from client and complete the following checklist. The assessor should examine the relevant documentation and systems as far as possible to check that the installed equipment is as described. If the documentation is not available, then an additional part of this procedure is to locate the equipment and assemble a portfolio of relevant documentation which should include all 'Essential' items as a minimum.

Record Checklist Pre Inspection Information							
Level	Information Required	Reviewed	Not Available				
Essential	Itemised list of installed air conditioning and refrigeration plant including product makes, models and identification numbers.	[]	[X]				
	Cooling capacities, with locations of the indoor and outdoor components of each plant.	[]	[x]				
	Description of system control zones, with schematic drawings.	[]	[x]				
	Description of method of control of temperature.	[]	[x]				
	Description of method of control of periods of operation.	[]	[x]				
	Floor plans and schematics of air conditioning systems.	[]	[X]				
Desirable	Reports from earlier inspections of air conditioning systems, and for the generation of an energy performance certificate.	[]	[X]				
	Records of maintenance operations carried out on refrigeration systems, including cleaning indoor and outdoor heat exchangers, refrigerant leakage tests, repairs to refrigeration components replenishing with refrigerant.	[]	[X]				
	Records of maintenance operations carried out on air delivery systems, including filter cleaning and changing, and cleaning of heat exchangers.	[]	[X]				
	Records of calibration and maintenance operations carried out on control systems and sensors, or BMS systems and sensors.	[]	[X]				
	Records of sub-metered air conditioning plant use or energy consumption.	[]	[x]				
	For relevant air supply and extract systems, commissioning results of measured absorbed power at normal air delivery and extract rates, and commissioning results for normal delivered delivery and extract air flow rates (or independently calculated specific fan power for the systems).	[]	[X]				
Optional	An estimate of the design cooling load for each system (if available). Otherwise, a brief description of the occupation of the cooled spaces, and of power consuming equipment normally used in those spaces.	[]	[x]				
	Records of any issues or complaints that have been raised concerning the indoor comfort conditions achieved in the treated spaces.	[]	[X]				
	Where a BMS is used the manager should arrange for a short statement to be provided describing its capabilities, the plant it is connected to control, the set points for the control of temperature, the frequency with which it is maintained, and the date of the last inspection and maintenance.	[]	[X]				

Record Checklist Pre Inspection Information							
Information Required	Reviewed	Not Available					
Where a monitoring station, or remote monitoring facility, is used to continually observe the performance of equipment such as chillers, the manager should arrange for a statement to be provided describing the parameters monitored, and a statement reviewing the operating efficiency of the equipment.	[]	[X]					
		~					
	Information Required Where a monitoring station, or remote monitoring facility, is used to continually observe the performance of equipment such as chillers, the manager should arrange for a statement to be provided describing the parameters monitored, and a statement reviewing the operating efficiency of the equipment.	Information Required Reviewed Where a monitoring station, or remote monitoring facility, is used to continually observe the performance of equipment such as chillers, the manager should arrange for a statement to be provided describing the parameters monitored, and a statement reviewing the operating efficiency of the equipment. []					

Air Conditioning Inspection Report

Cooling Plant Equipment Inspected							
Unit Identifier	VOL001/SYS001 Customer Standing Area						
Component Identifier	VOL001/SYS001/CP1 Customer Standing Area						
Manufacturer	Mitsubishi						
Description (type/details)	Split system						
Model/Reference	PUHZ-RP71VHA4						
Serial Number	09U09494						
Year Plant Installed	2010						
Rated Cooling Capacity (kW)	7						
Refrigerant Type	R410A						
Refrigerant Charge (kg)	3						
Location of Cooling Plant	External on rear flat roof						
Areas/Systems Served Customer Standing Area							
Nate below one disconnects between information provided by glight and an eite information collected or one information of additional values on to the provided by glight and							

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system: Not applicable.

This section applies to the following unit: VOL001/SYS001/CP1 Customer Standing Area

Cooling Plant Equipment Visual Inspection								
Item Ref	Inspection Item	Finding	I	Notes and Recommendations				
CS2.1	Is the refrigeration plant operational?	Yes [x]	No []	The refrigeration plant was operational at the time of inspection.				
CS2.2/a	Is the area around the refrigeration plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.				
CS2.2/b	Is the general condition of refrigeration and any associated central plant in good order?	Yes [x]	No []	The refrigeration and associated plant appeared to be in good condition.				
CS2.2/c	Is the condenser placed clear from warm air discharge louvres?	Yes [x]	No []	The condenser is placed clear from warm air discharge louvres.				
CS2.3/a	Are compressors operational or can they be brought into operation?	Yes [x]	No []	The refrigeration plant was operational when conducting the survey.				
CS3.1/a	Is the heat rejection plant operational?	Yes [x]	No []	The heat rejection plant was operational when conducting the survey.				
CS3.1/b	Are condenser heat exchangers undamaged/ un-corroded and clean?	Yes [x]	No []	The condenser appeared undamaged and clean.				
CS3.2/a	Is the area around the heat rejection plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.				
CS3.2/b	Is the condenser free of any possibility of air recirculation?	Yes [x]	No []	The condenser is free and positioned correctly of any warm air recirculation.				
CS4.1	Is the insulation on circulation pipe work well fitted and in good order?	Yes [x]	No []	The refrigerant pipe work viewed appeared well fitted and in satisfactory order.				

Cooling	g Plant Detaile	ed Inspection Notes					
Item Ref	ltem	Inspection Item	Finding			Notes and Recommendations	
CS1.1	Refrigerant		Refrigerant Type	R410A		This system in the subject property is affected by the F-Gas	
	Used		Montreal/ODS/F-Gas controlled?	Yes [x] N	√o []	Regulations, records should be available for gas recovery and equipment should be labelled where applicable. The system contains more than 3kg of refrigerant, mandatory leak checks are applicable.	
CS1.3	Regular Maintenance	Is there evidence of regular maintenance?	Yes []	No [x]		Maintenance documentation was not available at the time of the inspection.	
						Follow best practice guidelines, CIBSE / HVCA SFG 20. Guide M/ Guide F.	
		Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?	Yes []	No [x]		Maintenance documentation was not available at the time of the inspection.	
CS1.4	Appropriately		Following Information Required:			The current version of the Building Regulations Approved	
CL1.1	Sized Cooling Plant	ized Cooling	Total Occupants served by th	is plant 1	10	Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This	
			Total Floor Area served by th plant(m ²)	is 4	42	should be adopted as means of comparison to stay in line with current standards.	
			Occupant Density (m ² /person) 4	4.2		
	Maximum Instantaneous Heat Gain (W/m ²)		40.0	Potoil Ponchmark			
			Installed Cooling Capacity (kW) 7.0		7.0		
			The Installed Size is Deeme	ed:		This calculation refers to the Mitsubishi split system serving	
			More than Expected Less than Expected As Expected	[[[[] [] [x]	the customer standing area. This area has an approximate total treated square area of 42m2. TM44 guidance states the maximum instantaneous heat gain should be around 140W/m2. 140W/m2 x 42 =5880W\1000 = 5.88 kW.	
						The installed capacity is as expected for the area being served.	

Cooling Plant Detailed Inspection Notes							
Item Ref	Item	Inspection Item	Finding			Notes and Recommendations	
CS1.6	Metering Comparison	Is metering installed to enable monitoring of	Yes []	No [x]]	Consider sub metering. See CIBSE TM39 / TM44 section	
	to appropriate energy benchmarks		Recorded meter reading			regular basis it may be possible to deduce whether a system is running excessively. This may indicate basic faults, for example undercharged systems, undersized systems, or control systems that may not be adequate or are incorrectly set.	
		Is the refrigeration plant connected to a BEMS	Yes []	No [x]]	No data available.	
		that can provide out of range alarms?				Consider a BMS system or remote monitoring as part of a wider Energy saving strategy and carbon reduction plan.	
		Are there any records of air conditioning plant	Yes []	No [x]]	No data available.	
		usage or sub-metered energy consumption with expected hours of use per year for the plant?				Consider sub metering of the air conditioning plant, for better monitoring which could lead to greater energy efficiency on site.	
		Is the energy consumption or hours of use excessive?	Yes []	No [x]]	No data available.	
CS2.2/d	Refrigeration	Are there any signs of a refrigerant leak?	Yes []	No [x]]	No visible signs of leaks.	
	Leaks					Regularly check for sign of oil stains.	
CL1.3	Refrigeration		Refrigeration Temperature:				
			Pre Compressor(°C)		0		
			Post Compressor(°C)		0		
			Ambient(°C)		5		
			The Temperature is Deemed	:			
			More than Expected Less than Expected As Expected		[] [] [x]		

Cooling Plant Detailed Inspection Notes								
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations			
		Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.		Utilise system functions, auto mode / auto fan speed for optimised control.			
CS3.5	Water Cooled Chillers (Cooling Towers	Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?	Yes[]	No [x]	Not applicable.			
	& Evaporative Condensers)	Is there a management regime in place to ensure that water is regularly checked and treated to ensure that there is no Legionella risk?	Yes []	No [x]	No data on site.			
	Humidity Control	Is there separate equipment installed for humidity control?	Yes []	No [x]	No separate equipment installed for humidity control. Follow the manufactures recommended maintenance guide to prolong longevity and ensure optimum performance. Follow best practice guides. CIBSE / HVCA SFG 20. Guide M/ Guide F.			

Air Conditioning Inspection Report

Cooling Plant Equipment Inspected					
Unit Identifier	VOL001/SYS002 Customer Seating Area				
Component Identifier	VOL001/SYS002/CP1 Customer Seating Area				
Manufacturer	Mitsubishi				
Description (type/details)	Split system				
Model/Reference	PUHZ-RP71VHA4				
Serial Number	09U09480				
Year Plant Installed	2010				
Rated Cooling Capacity (kW)	7				
Refrigerant Type	R410A				
Refrigerant Charge (kg)	3				
Location of Cooling Plant	External on rear flat roof				
Areas/Systems Served	Customer Seating Area				
Note below on a discrementation of the function information	an exercised by alight and an site information collected, or any information of additional value on a to the application of anti-				

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system: Not applicable.

This section applies to the following unit: VOL001/SYS002/CP1 Customer Seating Area

Cooling	Cooling Plant Equipment Visual Inspection						
Item Ref	Inspection Item	Finding	I	Notes and Recommendations			
CS2.1	Is the refrigeration plant operational?	Yes [x]	No []	The refrigeration plant was operational at the time of inspection.			
CS2.2/a	Is the area around the refrigeration plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.			
CS2.2/b	Is the general condition of refrigeration and any associated central plant in good order?	Yes [x]	No []	The refrigeration and associated plant appeared to be in good condition.			
CS2.2/c	Is the condenser placed clear from warm air discharge louvres?	Yes [x]	No []	The condenser is placed clear from warm air discharge louvres.			
CS2.3/a	Are compressors operational or can they be brought into operation?	Yes [x]	No []	The refrigeration plant was operational when conducting the survey.			
CS3.1/a	Is the heat rejection plant operational?	Yes [x]	No []	The heat rejection plant was operational when conducting the survey.			
CS3.1/b	Are condenser heat exchangers undamaged/ un-corroded and clean?	Yes [x]	No []	The condenser appeared undamaged and clean.			
CS3.2/a	Is the area around the heat rejection plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.			
CS3.2/b	Is the condenser free of any possibility of air recirculation?	Yes [x]	No []	The condenser is free and positioned correctly of any warm air recirculation.			
CS4.1	Is the insulation on circulation pipe work well fitted and in good order?	Yes [x]	No []	The refrigerant pipe work viewed appeared well fitted and in satisfactory order.			

Cooling Plant Detailed Inspection Notes						
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations	
CS1.1	Refrigerant		Refrigerant Type	R410A	This system in the subject property is affected by the F-Gas	
	Used		Montreal/ODS/F-Gas controlled?	Yes [x] No	Regulations, records should be available for gas recovery and equipment should be labelled where applicable. The system contains more than 3kg of refrigerant, mandatory leak checks are applicable.	
CS1.3	Regular Maintenance	Is there evidence of regular maintenance?	Yes []	No [x]	Maintenance documentation was not available at the time of the inspection.	
		Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?	Yes []	No [x]	Maintenance documentation was not available at the time of the inspection.	
CS1.4	Appropriately Following Information Required:		The current version of the Building Regulations Approved			
CL1.1	Sized Cooling Plant		Total Occupants served by this plant		Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This	
			Total Floor Area served by this 42 plant(m ²)		should be adopted as means of comparison to stay in line with current standards.	
			Occupant Density (m ² /person	ı) 4.2		
			Maximum Instantaneous Hea (W/m²)	at Gain 140		
			Installed Cooling Capacity (k)	W) 7.0	Retail Benchmark.	
			The Installed Size is Deeme More than Expected Less than Expected As Expected	ed: [] [] [X]	This calculation refers to the Mitsubishi split system serving the customer seating area. This area has an approximate total treated square area of 42m2. TM44 guidance states the maximum instantaneous heat gain should be around 140W/m2. 140W/m2 x 42 =5880W\1000 = 5.88kW. The installed capacity is as expected for the area being served.	

Cooling	Plant	Detailed	Inspection	n Notes
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Item Ref	Item	Inspection Item	Finding			Notes and Recommendations
CS1.6	Metering	Is metering installed to enable monitoring of	Yes []	No [x]		
	Comparison to appropriate energy	energy consumption of refrigeration plant?	Recorded meter reading		•	
		Is the refrigeration plant connected to a BEMS	Vec []	No ful		No data available
	benchmarks	that can provide out of range alarms?	Yes[]	NO [X]	-	
		Are there any records of air conditioning plant usage or sub-metered energy consumption with expected hours of use per year for the plant?	Yes[]	No [x]		No data available.
		Is the energy consumption or hours of use excessive?	Yes[]	No [x]	l	No data available.
CS2.2/d	Refrigeration Leaks	Are there any signs of a refrigerant leak?	Yes[]	No [x]	l	No visible signs of leaks.
CL1.3	Refrigeration		Refrigeration Temperature:			
			Pre Compressor(°C)		0	
			Post Compressor(°C)		0	
			Ambient(°C)		5	
			The Temperature is Deeme	d:		
			More than Expected		[]	
			As Expected		[] [x]	
		Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.	,		
CS3.5	Water Cooled Chillers (Cooling Towers	Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?	Yes []	No [x]	l	Not applicable.
	& ⊑vaporative Condensers)	Is there a management regime in place to ensure that water is regularly checked and	Yes[]	No [x]		No data on site.

Air Conditioning Inspection Report

Cooling Plant Detailed Inspection Notes

	•	-			
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations
		treated to ensure that there is no Legionella risk?			
	Humidity Control	Is there separate equipment installed for humidity control?	Yes []	No [x]	No separate equipment installed for humidity control.

Air Conditioning Inspection Report

Cooling Plant Equipment Inspected					
Unit Identifier	VOL001/SYS003 Counter Area				
Component Identifier	VOL001/SYS003/CP1 Counter Area				
Manufacturer	Mitsubishi				
Description (type/details)	Split system				
Model/Reference	SUZ-KA25VA2				
Serial Number	05P00185				
Year Plant Installed	2010				
Rated Cooling Capacity (kW)	3				
Refrigerant Type	R410A				
Refrigerant Charge (kg)	1				
Location of Cooling Plant	External on rear flat roof				
Areas/Systems Served	Counter Area				
Model/Reference Serial Number Year Plant Installed Rated Cooling Capacity (kW) Refrigerant Type Refrigerant Charge (kg) Location of Cooling Plant Areas/Systems Served	SUZ-KA25VA2 05P00185 2010 3 R410A 1 External on rear flat roof Counter Area				

Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the cooling plant/system: Not applicable.

Air Conditioning Inspection Report

This section applies to the following unit: VOL001/SYS003/CP1 Counter Area

Cooling	g Plant Equipment Visual Inspection	on		
Item Ref	Inspection Item	Finding		Notes and Recommendations
CS2.1	Is the refrigeration plant operational?	Yes [x]	No []	The refrigeration plant was operational at the time of inspection.
CS2.2/a	Is the area around the refrigeration plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.
CS2.2/b	Is the general condition of refrigeration and any associated central plant in good order?	Yes [x]	No []	The refrigeration and associated plant appeared to be in good condition.
CS2.2/c	Is the condenser placed clear from warm air discharge louvres?	Yes [x]	No []	The condenser is placed clear from warm air discharge louvres.
CS2.3/a	Are compressors operational or can they be brought into operation?	Yes [x]	No []	The refrigeration plant was operational when conducting the survey.
CS3.1/a	Is the heat rejection plant operational?	Yes [x]	No []	The heat rejection plant was operational when conducting the survey.
CS3.1/b	Are condenser heat exchangers undamaged/ un-corroded and clean?	Yes [x]	No []	The condenser appeared undamaged and clean.
CS3.2/a	Is the area around the heat rejection plant clear of obstructions & debris?	Yes [x]	No []	The area around the refrigerant plant is clear from obstruction and debris.
CS3.2/b	Is the condenser free of any possibility of air recirculation?	Yes [x]	No []	The condenser is free and positioned correctly of any warm air recirculation.
CS4.1	Is the insulation on circulation pipe work well fitted and in good order?	Yes [x]	No []	The refrigerant pipe work viewed appeared well fitted and in satisfactory order.

Cooling	Cooling Plant Detailed Inspection Notes					
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations	
CS1.1	Refrigerant		Refrigerant Type	R410A	This system in the subject property contains less than 5 tonnes	
	Used		Montreal/ODS/F-Gas controlled?	Yes[] No	 of CO2 Equivalent, and are therefore unaffected by the F-Gas Regulations leak checks. Records should be available for gas recovery and equipment should be labelled where applicable. Consider checking equipment labelling in compliance with F- Gas Regulations. 	
CS1.3	Regular Maintenance	Is there evidence of regular maintenance?	Yes []	No [x]	Maintenance documentation was not available at the time of the inspection.	
		Is the maintenance undertaken by suitably competent people and in accordance to industry guidelines?	Yes []	No [x]	Maintenance documentation was not available at the time of the inspection.	
CS1.4	Appropriately		Following Information Required:		The current version of the Building Regulations Approved	
CL1.1	Sized Cooling Plant		Total Occupants served by th	nis plant 3	Document Part L documentation provides guidance suggesting that the plant should not be more than 20% oversized. This	
			Total Floor Area served by this 19 plant(m ²)		should be adopted as means of comparison to stay in line with current standards.	
			Occupant Density (m ² /persor	n) 6.3	3	
			Maximum Instantaneous Hea (W/m²)	at Gain 140	.0 Botail Banchmark	
			Installed Cooling Capacity (k	W) 3.		
			The Installed Size is Deeme	ed:	This calculation refers to the Mitsuhishi solit system serving	
			More than Expected Less than Expected As Expected	[] [] [x	the counter area. This area has an approximate total treated square area of 19m2. TM44 guidance states the maximum instantaneous heat gain should be around 140W/m2. 140W/m2 x 19 =2660W\1000 = 2.66 kW.	
					The installed capacity is more than expected for the area being served.	

Cooling	Cooling Plant Detailed Inspection Notes					
Item Ref	ltem	Inspection Item	Finding			Notes and Recommendations
CS1.6	CS1.6 Metering	Is metering installed to enable monitoring of	Yes []	No [x]		
	to appropriate	energy consumption of reingeration plant?	Recorded meter reading			
	energy benchmarks	Is the refrigeration plant connected to a BEMS that can provide out of range alarms?	Yes[]	No [x]		No data available.
		Are there any records of air conditioning plant usage or sub-metered energy consumption with expected hours of use per year for the plant?	Yes[]	No [x]		No data available.
		Is the energy consumption or hours of use excessive?	Yes[]	No [x]		No data available.
CS2.2/d	Refrigeration Leaks	Are there any signs of a refrigerant leak?	Yes[]	No [x]		No visible signs of leaks.
CL1.3	Refrigeration		Refrigeration Temperatur	e:		
			Pre Compressor(°C)		0	
			Post Compressor(°C)		0	
			Ambient(°C)		5	
			The Temperature is Deem	ned:		
			More than Expected Less than Expected As Expected		[] [] [x]	
		Assess the refrigeration compressor(s) and the method of refrigeration capacity control	Inverter controlled.			
CS3.5	Water Cooled Chillers (Cooling Towers	Is the water flow through cooling towers or evaporative coolers even and efficient, and there is no loss of water?	Yes []	No [x]		Not applicable.
	& Evaporative Condensers)	Is there a management regime in place to ensure that water is regularly checked and	Yes []	No [x]		No data on site.

Air Conditioning Inspection Report

Cooling Plant Detailed Inspection Notes

	·				
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations
		treated to ensure that there is no Legionella risk?			
	Humidity Control	Is there separate equipment installed for humidity control?	Yes []	No [x]	No separate equipment installed for humidity control.

Air Conditioning Inspection Report

Air Handling Systems:

Note: For safety reasons, it will be necessary for air handling fans in air distribution systems to be turned off in order to gain access inside air handlers or ductwork to examine components such as fans, drives, filters, heat exchangers and control dampers. The building manager should arrange safe access for the inspector.

Air Conditioning Inspection Report

Terminal Units:

Ferminal Unit Equipment Inspection					
Unit Identifier	VOL001/SYS001 Customer Standing Area				
Component Identifier	VOL001/SYS001/TU1 Customer Standing Area				
Description of Unit	Ceiling Cassette				
Identify Cooling Plant Serving Terminal Unit	VOL001/SYS001/CP1 Customer Standing Area				
Manufacturer	Mitsubishi				
Year Terminal Unit Installed	2010				
Terminal Unit Location	Ceiling Mounted				
Area Served	Customer Standing Area				
Note below any discrepancy between information	on provided by client and on site information collected, or any information of additional relevance to the terminal unit/system:				

This section applies to the following unit:VOL001/SYS001/TU1 Customer Standing Area

Termina	Terminal Unit Detailed Inspection Notes						
Item Ref	ltem	Inspection Item	Finding	Notes and Recommendations			
CS4.1	Insulation	Is the pipework adequately insulated?	Yes [x] No []	Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.			
		Is the ductwork adequately insulated?	Yes [] No [x]	Not applicable.			
CS4.2	Unit Condition	Are the terminal units in good working order?	Yes [x] No []	The equipment inspected was operational at the time of inspection.			
CS5.1	Grilles & Air Flow	Do air delivery openings provide good distribution?	Yes [x] No []	The equipment offers good air distribution to the conditioned area.			
		Is there evidence of tampering with diffusers?	Yes [] No [x]	Not applicable.			
		Are chilled and hot water being supplied to terminals simultaneously?	Yes [] No [x]	Not applicable.			
CS5.2		Are there are any records of occupant	Yes [] No [x]	No records on site.			
				Continue regular maintenance inspections, review maintenance seasonally to ensure that filters, grilles and diffusers are free from debris.			
CS5.3	Diffuser Positions	Is there potential for air to short-circuit from supply to extract?	Yes [] No [x]	The equipment is positioned correctly and there is no potential of air short-circuit.			
CS5.4		Is the position of partitioning or furniture adversely affecting performance?	Yes [] No [x]	Not affecting the system performance.			
CS5.5		Is the control and operation adequate?	Yes [x] No []	The control of the system is adequate for the terminal units to operate correctly.			

Air Conditioning Inspection Report

Terminal Unit Detailed Inspection Notes

Item Ref	ltem	Inspection Item	Finding	Notes and Recommendations

Terminal Unit Equipment Inspection					
Unit Identifier VOL001/SYS002 Customer Seating Area					
Component Identifier	VOL001/SYS002/TU1 Customer Seating Area				
Description of Unit Ceiling Cassette					
Identify Cooling Plant Serving Terminal Unit	VOL001/SYS002/CP1 Customer Seating Area				
Manufacturer	Mitsubishi				
Year Terminal Unit Installed	2010				
Terminal Unit Location Ceiling Mounted					
Area Served Customer Seating Area					
Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the terminal unit/system:					

This section applies to the following unit: VOL001/SYS002/TU1 Customer Seating Area

Termina	Terminal Unit Detailed Inspection Notes						
Item Ref	ltem	Inspection Item	Finding		Notes and Recommendations		
CS4.1	Insulation	Is the pipework adequately insulated?	Yes [x] I	No []	Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.		
		Is the ductwork adequately insulated?	Yes[] N	No [x]	Not applicable.		
CS4.2	Unit Condition	Are the terminal units in good working order?	Yes [x] I	No []	The equipment inspected was operational at the time of inspection.		
CS5.1	Grilles & Air Flow	Do air delivery openings provide good distribution?	Yes [x] I	No []	The equipment offers good air distribution to the conditioned area.		
		Is there evidence of tampering with diffusers?	Yes[] 1	No [x]	Not applicable.		
		Are chilled and hot water being supplied to terminals simultaneously?	Yes[] 1	No [x]	Not applicable.		
CS5.2		Are there are any records of occupant complaints regarding air distribution	Yes[] N	No [x]	No records on site.		
CS5.3	Diffuser Positions	Is there potential for air to short-circuit from supply to extract?	Yes[] N	No [x]	The equipment is positioned correctly and there is no potential of air short-circuit.		
CS5.4		Is the position of partitioning or furniture adversely affecting performance?	Yes[] N	No [x]	Not affecting the system performance.		
CS5.5		Is the control and operation adequate?	Yes [x] I	No []	The control of the system is adequate for the terminal units to operate correctly.		

Terminal Unit Equipment Inspection					
Unit Identifier	VOL001/SYS003 Counter Area				
Component Identifier	VOL001/SYS003/TU1 Counter Area				
Description of Unit	Ceiling Cassette				
Identify Cooling Plant Serving Terminal Unit	VOL001/SYS003/CP1 Counter Area				
Manufacturer	Mitsubishi				
Year Terminal Unit Installed	2010				
Terminal Unit Location	Ceiling Mounted				
Area Served	Counter Area				
Note below any discrepancy between information provided by client and on site information collected, or any information of additional relevance to the terminal unit/system:					

This section applies to the following unit:VOL001/SYS003/TU1 Counter Area

Termina	Terminal Unit Detailed Inspection Notes						
Item Ref	ltem	Inspection Item	Finding	Notes and Recommendations			
CS4.1	Insulation	Is the pipework adequately insulated?	Yes [x] No []	Pipework insulation where visible, is generally adequate and in good condition. Follow the manufacturers recommended maintenance guide to prolong the longevity and ensure optimum performance. Follow best practice guidelines, CIBSE / HVCA SMG 2000.			
		Is the ductwork adequately insulated?	Yes [] No [x]	Not applicable.			
CS4.2	Unit Condition	Are the terminal units in good working order?	Yes [x] No []	The equipment inspected was operational at the time of inspection.			
CS5.1	Grilles & Air Flow	Do air delivery openings provide good distribution?	Yes [x] No []	The equipment offers good air distribution to the conditioned area.			
		Is there evidence of tampering with diffusers?	Yes [] No [x]	Not applicable.			
		Are chilled and hot water being supplied to terminals simultaneously?	Yes [] No [x]	Not applicable.			
CS5.2		Are there are any records of occupant complaints regarding air distribution	Yes [] No [x]	No records on site.			
CS5.3	Diffuser Positions	Is there potential for air to short-circuit from supply to extract?	Yes [] No [x]	The equipment is positioned correctly and there is no potential of air short-circuit.			
CS5.4		Is the position of partitioning or furniture adversely affecting performance?	Yes [] No [x]	Not affecting the system performance.			
CS5.5		Is the control and operation adequate?	Yes [x] No []	The control of the system is adequate for the terminal units to operate correctly.			

Air Conditioning Inspection Report

System Controls:

System	System Controls						
Item Ref	Inspection Item	Finding	Notes and Recommendations				
n/a	Sub System Identifier (if applicable)	VOL001/SYS001 Customer Standing Area					
CS8.1	Is the zoning appropriate in relation to anticipated cooling demand?	Yes [x] No []	Zoning is appropriate in relation to cooling demand.				
CS8.2	Note the current indicated weekday and time of day on controllers or BMS against the actual time. Current indicated weekday was correct but the time of day on controller was not correct. Clock displayed 15.48 at 14.47.		Ensure timer is reset seasonally after the clocks go back or forth.				
CS8.3/a	Note the set on and off periods (for weekday and weekend if this facility is available with the timer).	This system is set to operate in line with occupancy hours.	Ensure timer correctly mirrors occupancy. When changing the opening hours of the LBO, ensure that all time checks reflect occupancy hours.				
CS8.3/b	Is there a shortfall in timer capabilities?	Yes [] No [x]	No shortfall in timer capabilities. Follow best practice guidelines, CIBSE / HVCA SFG 20. Guide M/ Guide F.				
CS8.4	Identify and assess zone heating and cooling temperature control sensors. Are the sensor types and locations appropriate in relation to heating and cooling emitters, heat flows or likely temperature distributions in the zone or space?	Yes [x] No []	There are return temperature sensors installed within the internal unit, which are appropriate for this equipment.				
CS8.5	Note the set temperature in each zone for heating and cooling in relation to the activities and occupancy of zones and spaces in relation to the manager's intent.	Temperature is set to 22.0 degrees Celsius.					

System	System Controls					
Item Ref	Inspection Item	Finding	Notes and Recommendations			
CS8.6	Note whether a 'dead band' is, or can be, set between heating and cooling.	A "dead band" setting was not determined.	Consider using a "dead band" if the facility is available.			
CS8.7	Do the sub system controls integrate effectively with the overall system control strategy?	Yes [] No [x]				
CS8.8	Assess the means of modulating or controlling air flow rate through the air supply and exhaust ducts.	Air flow can be controlled.				
PS3.6	Are guidance notices visible or controls available to inhibit use of cooling equipment whilst windows are open or cooling/heating is on?	Yes [] No [x]	Guidance not in place. Consider providing guidance notices to staff on the general use of the system controllers and the environment.			

System	System Controls					
Item Ref	Inspection Item	Finding	Notes and Recommendations			
n/a	Sub System Identifier (if applicable)	VOL001/SYS002 Customer Seating Area				
CS8.1	Is the zoning appropriate in relation to anticipated cooling demand?	Yes [x] No []	Zoning is appropriate in relation to cooling demand.			
CS8.2	Note the current indicated weekday and time of day on controllers or BMS against the actual time. Current indicated weekday was correct but the time of day on controller was not correct. Clock displayed 15.48 at 14.47		Ensure timer is reset seasonally after the clocks go back or forth.			
CS8.3/a	Note the set on and off periods (for weekday and weekend if this facility is available with the timer). This system is set to operate in line with occupancy hours.		Ensure timer correctly mirrors occupancy. When changing the opening hours of the LBO, ensure that all time checks reflect occupancy hours.			
CS8.3/b	Is there a shortfall in timer capabilities?	Yes [] No [x]	No shortfall in timer capabilities. Follow best practice guidelines, CIBSE / HVCA SFG 20. Guide M/ Guide F.			
CS8.4	Identify and assess zone heating and cooling temperature control sensors. Are the sensor types and locations appropriate in relation to heating and cooling emitters, heat flows or likely temperature distributions in the zone or space?	Yes [x] No []	There are return temperature sensors installed within the internal unit, which are appropriate for this equipment.			
CS8.5	Note the set temperature in each zone for heating and cooling in relation to the activities and occupancy of zones and spaces in relation to the manager's intent.	Temperature is set to 21 degrees Celsius.				

System	System Controls					
Item Ref	Inspection Item	Finding	Notes and Recommendations			
CS8.6	Note whether a 'dead band' is, or can be, set between heating and cooling.	A "dead band" setting was not determined.	Consider using a "dead band" if the facility is available.			
CS8.7	Do the sub system controls integrate effectively with the overall system control strategy?	Yes [] No [x]				
CS8.8	Assess the means of modulating or controlling air flow rate through the air supply and exhaust ducts.	Air flow can be controlled.				
PS3.6	ducts. Are guidance notices visible or controls available to inhibit use of cooling equipment whilst windows are open or cooling/heating is on? Yes [] No [x]		Guidance not in place.			

System	System Controls					
Item Ref	Inspection Item	Finding	Notes and Recommendations			
n/a	Sub System Identifier (if applicable)	VOL001/SYS003 Counter Area				
CS8.1	Is the zoning appropriate in relation to anticipated cooling demand?	Yes [x] No []	Zoning is appropriate in relation to cooling demand.			
CS8.2	Note the current indicated weekday and time of day on controllers or BMS against the actual time.	Current indicated weekday was correct but the time of day on controller was not correct. Clock displayed 15.53 at 14.52.	Ensure timer is reset seasonally after the clocks go back or forth.			
CS8.3/a	Note the set on and off periods (for weekday and weekend if this facility is available with the timer).	This system is set to operate in line with occupancy hours.	Ensure timer correctly mirrors occupancy. When changing the opening hours of the LBO, ensure that all time checks reflect occupancy hours.			
CS8.3/b	Is there a shortfall in timer capabilities?	Yes [] No [x]	No shortfall in timer capabilities. Follow best practice guidelines, CIBSE / HVCA SFG 20. Guide M/ Guide F.			
CS8.4	Identify and assess zone heating and cooling temperature control sensors. Are the sensor types and locations appropriate in relation to heating and cooling emitters, heat flows or likely temperature distributions in the zone or space?	Yes [x] No []	There are return temperature sensors installed within the internal unit, which are appropriate for this equipment.			
CS8.5	Note the set temperature in each zone for heating and cooling in relation to the activities and occupancy of zones and spaces in relation to the manager's intent.	Temperature is set to 17.0 degrees Celsius.				
CS8.6	Note whether a 'dead band' is, or can be, set between heating and cooling.	A "dead band" setting was not determined.	Consider using a "dead band" if the facility is available.			

System	ystem Controls					
Item Ref	Inspection Item	Finding	Notes and Recommendations			
CS8.7	Do the sub system controls integrate effectively with the overall system control strategy?	Yes [] No [x]				
CS8.8	Assess the means of modulating or controlling air flow rate through the air supply and exhaust ducts.	Air flow can be controlled.				
PS3.6	Are guidance notices visible or controls available to inhibit use of cooling equipment whilst windows are open or cooling/heating is on?	Yes [] No [x]	Guidance not in place.			