

ภาคผนวก ค6

เอกสารการทำความสะอาดห้องเย็น

COOLING TOWER CLEANING REPORT

Site: **Carlton Hotel Sukhumvit**

Cleaning date: **22,23,24 January 2024**

Cleaning Cooling Tower No: **1,2,3**

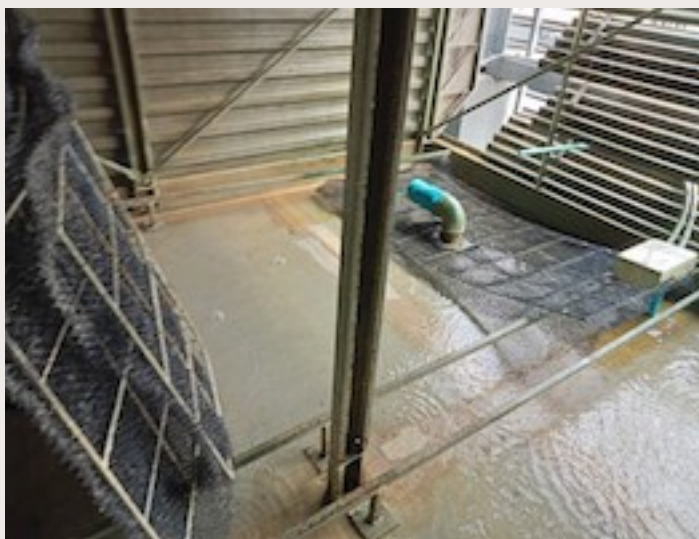
Cooling Tower NO.1

AFTER CLEAN



Cooling Tower NO.2

AFTER CLEAN

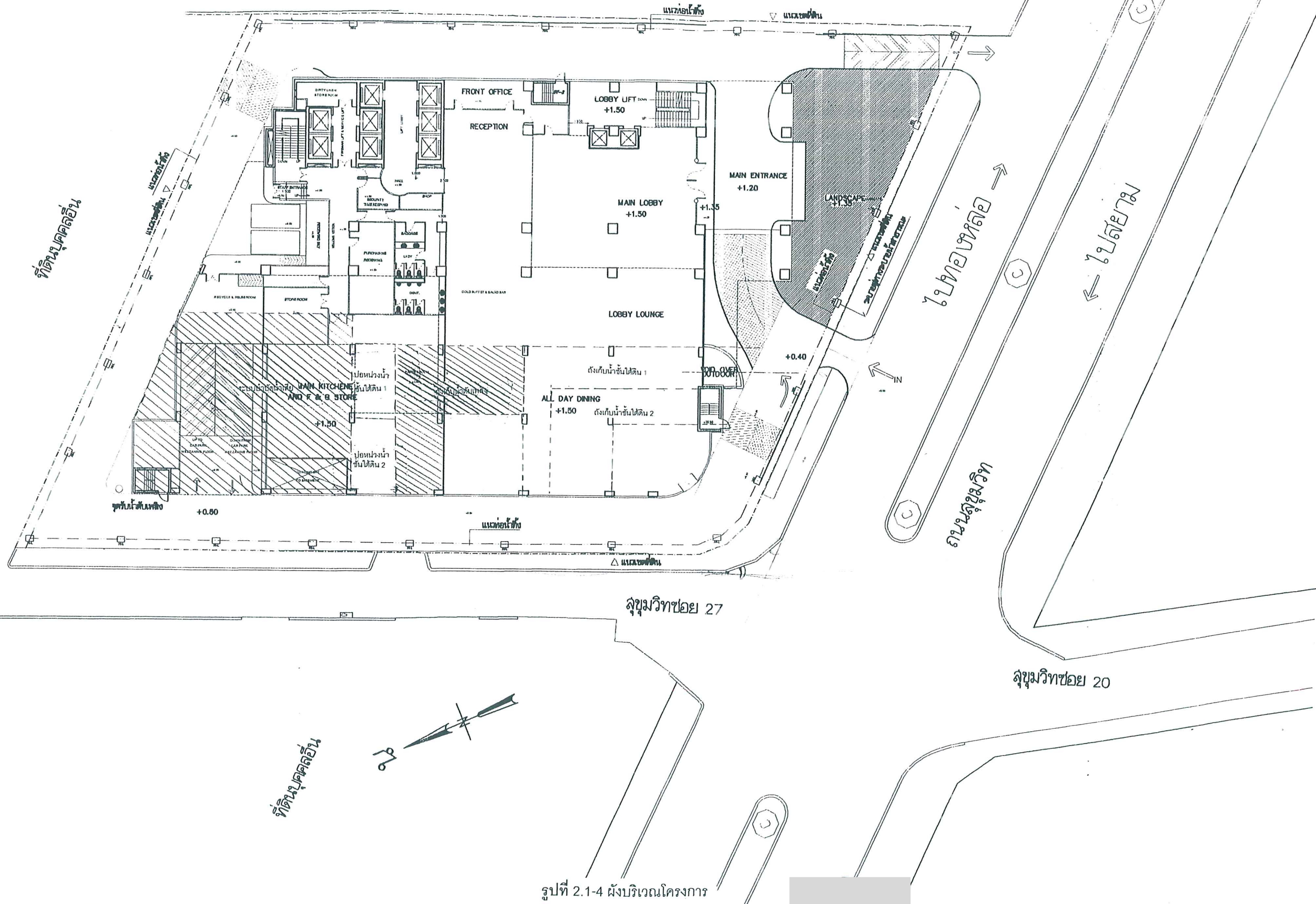


Cooling Tower NO.3

AFTER CLEAN



ภาคผนวก ค7
แบบแปลนป่อหนองน้ำ



โครงการ

โรงแรมสูง 34 ชั้น 338 ห้อง และอาคารจอดรถ

เจ้าของโครงการ

บริษัทแกรนด์ แอสเสท ดีเวลลอปเม้นท์ จำกัด (มหาชน)

259 ถนนสุขุมวิท 19 แขวงคลองเตยเหนือ เขตวัฒนา กรุงเทพมหานคร 10110
โทร (662) 6505115

สถาปนิก
1. นาย
2. นาย

วิศวกรโครงสร้าง
วิศวกรไฟฟ้า
วิศวกรเครื่องกล
วิศวกรสุขาภิบาล

แสดงแบบ		
LAYOUT		
มาตราส่วน	1:400	
วันที่	เลขที่แบบ	รวม
	1	1

ภาคผนวก ค8

เอกสารการใช้บริการรถเก็บขนมูลฝอยของสำนักงานเขตวัฒนา

ภาคผนวก ง

ผลการวิเคราะห์ทางห้องปฏิบัติการ

ภาคผนวก ง1

ผลการวิเคราะห์คุณภาพน้ำทิ้ง

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : Piya.nalamphun@carltonhotel.co.th
SAMPLING SOURCE : WASTEWATER TREATMENT PLANT
SAMPLE TYPE : WASTEWATER
SAMPLING DATE : MARCH 25, 2024
SAMPLING TIME : 1/
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY :
ANALYZED BY :
RECEIVED DATE : MARCH 25, 2024
ANALYTICAL DATE : MARCH 25 - APRIL 1, 2024
ISSUE DATE : APRIL 2, 2024
REPORT NO. : 2024-U027770
WORK NO. : 2023-008118
ANALYSIS NO. : T24AG319-0001 - T24AG319-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 15:35 HOUR 1/ T24AG319-0001	2 15:30 HOUR 1/ T24AG319-0002		
pH ^a	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	6.9 (31°C)	7.0 (30°C)	5-9	-
BIOCHEMICAL OXYGEN DEMAND ^c	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	422	4.5	≤ 20	2.0
SUSPENDED SOLIDS ^a	mg/L	SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	266	6.5	≤ 30	5.0
TOTAL DISSOLVED SOLIDS ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAO.007 (TOTAL DISSOLVED SOLIDS DRIED AT 103-105 °C); SM: PART 2540 C	630	367	500*	25
SULPHIDE ^b	mg/L	IODOMETRIC METHOD (SM: PART 4500-S ²⁻ F)	1.9	< 0.50	≤ 1.0	0.50
TOTAL KJELDAHL NITROGEN ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	38.2	6.6	≤ 35	1.5
FAT, OIL AND GREASE ^c	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	28	ND	≤ 20	3



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 15:35 HOUR 1/ T24AG319-0001	2 15:30 HOUR 1/ T24AG319-0002		
MICROBIOLOGY						
COLIFORM BACTERIA ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B)	>160,000	24,000	-	1.8
SAMPLE CONDITION						
WATER'S COLOUR/TURBID			YELLOW/TURBID	YELLOW/TURBID		
SEDIMENT			BROWN	BROWN		

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23rd EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23rd EDITION, 2017.

RESULT 1 : บ่อปรับสภาพน้ำ

RESULT 2 : บ่อน้ำใส

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS A, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 122, PART 125 D, DATED DECEMBER 29, 2005 AND VOL 139 SPECIAL PART 171 D, DATED JULY 21, 2022.

500* : PERMITTED EXCESS VALUE TO TOTAL DISSOLVED SOLIDS OF ACTUAL TAP WATER USED.

BIOCHEMICAL OXYGEN DEMAND (T24AG319-0002) : ADDITION OF NITRIFICATION INHIBITION (TCMP) FOLLOW TO THE SM: 5210B,5(e).

ND : NON-DETECTABLE.

LABORATORY SUPERVISOR

APRIL 8, 2024

ภาคผนวก ง2

ผลการวิเคราะห์คุณภาพน้ำหอฝิ่งเย็น

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKHUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : phanuphan.lekwilai@carltonhotel.co.th
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : JUNE 25, 2024
SAMPLING TIME : 15:15 HOUR
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY : 
ANALYZED BY : 
RECEIVED DATE : JUNE 25, 2024
ANALYTICAL DATE : JUNE 25 - JULY 3, 2024
ISSUE DATE : JULY 11, 2024
REPORT NO. : 2024-U063204
WORK NO. : 2023-008118
ANALYSIS NO. : T24AO197-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			น้ำเข้ามาเดิม ในอ่างรองรับ T24AO197-0001	
pH	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500 -H ⁺ B AND 1060 B	7.8 (30°C)	-
RESIDUAL CHLORINE	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	1.0	0.1
MICROBIOLOGY				
COLIFORM BACTERIA	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	< 1.8	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR -	

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.



LABORATORY SUPERVISOR



ANALYSIS REPORT

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CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : phanuphan.lekwilai@carltonhotel.co.th
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : JUNE 25, 2024
SAMPLING TIME : 15:15 HOUR
SAMPLING METHOD * : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY * :
ANALYZED BY :
RECEIVED DATE : JUNE 25, 2024
ANALYTICAL DATE : JUNE 25 - JULY 8, 2024
ISSUE DATE : JULY 11, 2024
REPORT NO. : 2024-U063212
WORK NO. : 2023-008118
ANALYSIS NO. : T24AO197-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			น้ำเข้ามาเติม ในอ่างรองรับ T24AO197-0001		
MICROBIOLOGY					
Legionella spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION					
WATER'S COLOUR/TURBID			COLOURLESS/CLEAR		
SEDIMENT					

THE LABORATORY HAS BEEN ACCEPTED AS AN ACCREDITED LABORATORY COMPLYING WITH THE ISO/IEC 17025.



* : TEST METHOD ARE NOT COVERED COMPLYING WITH THE ISO/IEC 17025, VERIFIED BY OWN LABORATORY QUALITY SYSTEM.

REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA BACTERIA IN COOLING TOWERS, JANUARY 2001.

LABORATORY SUPERVISOR



ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : phanuphan.lekwilai@carltonhotel.co.th
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : JUNE 25, 2024
SAMPLING TIME : 15:20 HOUR
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY : 
ANALYZED BY : 

RECEIVED DATE : JUNE 25, 2024
ANALYTICAL DATE : JUNE 25 - JULY 3, 2024
ISSUE DATE : JULY 11, 2024
REPORT NO. : 2024-U063205
WORK NO. : 2023-008118
ANALYSIS NO. : T24AO197-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			ท่อน้ำทิ้งจาก หอผึ่งเย็น T24AO197-0002	
pH	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500 -H ⁺ B AND 1060 B	9.0 (30°C)	-
RESIDUAL CHLORINE	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	0.1	0.1
MICROBIOLOGY				
COLIFORM BACTERIA	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	4.5	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR -	

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

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LABORATORY SUPERVISOR



ANALYSIS REPORT

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ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
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SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : JUNE 25, 2024
SAMPLING TIME : 15:20 HOUR
SAMPLING METHOD * : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY * :
ANALYZED BY :
RECEIVED DATE : JUNE 25, 2024
ANALYTICAL DATE : JUNE 25 - JULY 8, 2024
ISSUE DATE : JULY 11, 2024
REPORT NO. : 2024-U063213
WORK NO. : 2023-008118
ANALYSIS NO. : T24AO197-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			หอน้ำทิ้งจากหอสังเียน T24AO197-0002		
MICROBIOLOGY					
Legionella spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION			YELLOW/CLEAR		
WATER'S COLOUR/TURBID					
SEDIMENT					

THE LABORATORY HAS BEEN ACCEPTED AS AN ACCREDITED LABORATORY COMPLYING WITH THE ISO/IEC 17025.

* : TEST METHOD ARE NOT COVERED COMPLYING WITH THE ISO/IEC 17025, VERIFIED BY OWN LABORATORY QUALITY SYSTEM.

REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA BACTERIA IN COOLING TOWERS, JANUARY 2001.

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LABORATORY SUPERVISOR

