Appendix 4.6 Operation Phase Fixed Noise Calculation (Unmitigated)

Fixed Plant Inventory and Noise Level (Unmitigated)

Location (Group)	Group	Type	Reference Name	Reference	SWL, dB(A) (Item)	No.	SWL, dB(A) (Type)	Design / Env. Features	Corrections, dB(A)	Corrected SWL, dB(A) (Type)	Corrected SWL, dB(A) (Group)
Inlet Works Building	IW	Dry Well Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	3	95	Enclosed by concrete structure	-20	75	82
		Motor (Coarse Screen)	15kW Motor	AESV2W 180L [5]	88	3	93	Enclosed by concrete structure	-20	73	
		Motor (Fine Screen)	15kW Motor	AESV2W 180L [5]	88	3	93	Enclosed by concrete structure	-20	73	
		Motor (Grit Trap)	15kW Motor	AESV2W 180L [5]	88	2	91	Enclosed by concrete structure	-20	71	
		Ventilation Fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	10	89	Acoustic louver	-10	79	
		Equalisation Tank Transfer Pump	Submersible pump	EIA-245/2016-1 [2]	85	3	90	Enclosed by concrete structure	-20	70	
Primary Sedimentation Tanks	PST	Primary Sludge pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	73
Bioreactors	BR	Motor (Drum Screen)	15kW Motor	AESV2W 180L [5]	88	3	93	Enclosed by concrete structure	-20	73	76
		MLR Pump	Submersible pump	EIA-245/2016-1 [2]	85	8	94	Enclosed by concrete structure	-20	74	
Tertiary Treatment Building	TT	Permeate Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	9	100	Enclosed by concrete structure	-20	80	85
		Plant Service Water Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	3	95	Enclosed by concrete structure	-20	75	
		RAS Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	
		SAS Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	
		Aeration Blower	Air Blower	EIA-148/2008-1 [3]	85	3	90	Enclosed by concrete structure	-20	70	
		Air Scouring Blower	Air Blower	EIA-148/2008-1 [3]	85	2	88	Enclosed by concrete structure	-20	68	
		Ventilation Fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	18	92	Acoustic louver	-10	82	
		Effluent Lift-up Pump	Submersible pump	EIA-245/2016-1 [2]	85	3	90	Enclosed by concrete structure	-20	70	
Sludge Treatment Building	ST	Centrifuge feed pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	7	98	Enclosed by concrete structure	-20	78	94
		Thickened sludge transfer pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	
		Centrate pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	
		Motor (Centrifuge)	Main Motor	EIA-086/2002-2 [4]	105	7	113	Enclosed by concrete structure	-20	93	
		Motor (Dryer)	Main Motor	EIA-086/2002-2 [4]	105	1	105	Enclosed by concrete structure	-20	85	
		Ventilation Fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	10	89	Acoustic louver	-10	79	
CHP Building	CHP	CHP	CHP (Gas Engine)	EIA-259/2018-1 [6]	93	2	96	Enclosed by concrete structure	-20	76	81
		Steam Boiler	Firetube Boiler [9]	Cleaver Brooks CBLE-4D 100HP HFG Boiler [8]	97	1	97	Enclosed by concrete structure	-20	77	
		Ventilation Fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	6	87	Acoustic louver	-10	77	
Organic Waste Reception Facility	OWR	Digester feed pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	77
		Food Waste Conveyance Pump	LV Electric Motor	Clause 3.3.1.(e) [7]	90	2	93	Enclosed by concrete structure	-20	73	
		Ventilation Fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	2	82	Acoustic louver	-10	72	
Inlet Works Building	DO1	DO Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Acoustic louver	-10	69	69
Inlet Works Building	DO2	DO Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Acoustic louver	-10	69	69
Bioreactors	DO3	DO Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Acoustic louver	-10	69	69
Tertiary Treatment Building	DO4	DO Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Acoustic louver	-10	69	69
Next to Organic Waste Reception Facility	DO5	DO Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Acoustic louver	-10	69	69

Any acoustic louvers to be provided for the exhaust fans

Yes

Remarks:

[1] The SWL of ventilation fan is referenced with Good Practices on Ventilation System Noise Control published by EPD.

[2] The SWL of submersible pump is referenced with EIA Report of Expansion of Sha Tau Kok Sewage Treatment Works, code: EIA-245/2016.

[3] The SWL of air blower is referenced with EIA report of Harbour Area Treatment Scheme (HATS) Stage 2A, code: EIA-148/2008.

[4] The SWL of main motor is referenced with EIA report of Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station, code: EIA-086/2002.

[5] The SWL of motor is referenced with catalogue of TECO Motors AWSV2W, 15kW, frame no. 180L

[6] The SWL of CHP gas engine is referenced with EIA report of Yuen Long Effluent Polishing Plant, code: EIA-259/2018, and will be specified in contract to be followed by future contractor.

[7] The SWL of dry well pump is referenced from British Standard, code 60034-9: Rotating electrical machines. Noise limits as required under DSD general specifications 3.3.1.(e)

[8] The SWL of Steam Boiler is referenced with catalogue of Cleaver Brooks CBLE-4D, 100HP, type HFG

[9] The SWL of the Firetube boiler is calculated with reference to ISO 3746

Appendix 4.6 Operation Phase Fixed Noise Calculation (Unmitigated)

Fixed Noise Calculation (Unmitigated)

NSR	Description	Noise Criteria (Day / Evening / Night), dB(A)	Noise Source (Group)	Distance (m)	SWL, dB(A)	Corrections, dB(A)			Overall Predicted Noise Level, dB(A)
						Distance	Tonal	Façade	
YE03	121 Wong Nai Tun Tsuen	49 / 49 / 45	IW	270	82	-57	3	3	43
			PST	290	73	-57	3	3	
			BR	320	76	-58	3	3	
			TT	390	85	-60	3	3	
			ST	320	94	-58	3	3	
			CHP	380	81	-60	3	3	
			OWR	420	77	-60	3	3	
			DO1	310	69	-58	3	3	
			DO2	340	69	-59	3	3	
			DO3	360	69	-59	3	3	
			DO4	450	69	-61	3	3	
			DO5	460	69	-61	3	3	
YE04	125 Wong Nai Tun Tsuen	49 / 49 / 45	IW	270	82	-57	3	3	43
			PST	290	73	-57	3	3	
			BR	330	76	-58	3	3	
			TT	390	85	-60	3	3	
			ST	320	94	-58	3	3	
			CHP	380	81	-60	3	3	
			OWR	400	77	-60	3	3	
			DO1	320	69	-58	3	3	
			DO2	340	69	-59	3	3	
			DO3	360	69	-59	3	3	
			DO4	440	69	-61	3	3	
			DO5	440	69	-61	3	3	
YP01	Planned Residential Development (R3.1e)	49 / 49 / 47	IW	330	82	-58	3	3	41
			PST	340	73	-59	3	3	
			BR	280	76	-57	3	3	
			TT	350	85	-59	3	3	
			ST	390	94	-60	3	3	
			CHP	430	81	-61	3	3	
			OWR	560	77	-63	3	3	
			DO1	330	69	-58	3	3	
			DO2	390	69	-60	3	3	
			DO3	380	69	-60	3	3	
			DO4	420	69	-60	3	3	
			DO5	600	69	-64	3	3	
YP02	Planned Residential Development (R3.4b)	49 / 49 / 47	IW	290	82	-57	3	3	42
			PST	310	73	-58	3	3	
			BR	280	76	-57	3	3	
			TT	360	85	-59	3	3	
			ST	370	94	-59	3	3	
			CHP	410	81	-60	3	3	
			OWR	530	77	-62	3	3	
			DO1	290	69	-57	3	3	
			DO2	360	69	-59	3	3	
			DO3	360	69	-59	3	3	
			DO4	430	69	-61	3	3	
			DO5	570	69	-63	3	3	
YP03	Planned Education Development (E3.3)	49 / 49 / 47	IW	280	82	-57	3	3	42
			PST	310	73	-58	3	3	
			BR	280	76	-57	3	3	
			TT	370	85	-59	3	3	
			ST	360	94	-59	3	3	
			CHP	410	81	-60	3	3	
			OWR	520	77	-62	3	3	
			DO1	280	69	-57	3	3	
			DO2	350	69	-59	3	3	
			DO3	350	69	-59	3	3	
			DO4	430	69	-61	3	3	
			DO5	560	69	-63	3	3	
YP04	Planned Education Development (E3.1)	49 / 49 / 47	IW	280	82	-57	3	3	42
			PST	300	73	-58	3	3	
			BR	310	76	-58	3	3	
			TT	390	85	-60	3	3	
			ST	360	94	-59	3	3	
			CHP	410	81	-60	3	3	
			OWR	480	77	-62	3	3	
			DO1	300	69	-58	3	3	
			DO2	360	69	-59	3	3	
			DO3	370	69	-59	3	3	
			DO4	460	69	-61	3	3	
			DO5	520	69	-62	3	3	
YP05	Planned Low-rise Residential Development (VR3.1)	49 / 49 / 47	IW	200	82	-54	3	3	44
			PST	230	73	-55	3	3	
			BR	250	76	-56	3	3	
			TT	320	85	-58	3	3	
			ST	280	94	-57	3	3	
			CHP	340	81	-59	3	3	
			OWR	400	77	-60	3	3	
			DO1	240	69	-56	3	3	
			DO2	290	69	-57	3	3	
			DO3	300	69	-58	3	3	
			DO4	390	69	-60	3	3	
			DO5	440	69	-61	3	3	

Remarks:

1. Noise from fixed plants within the same building is only counted once.

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

LEGEND:

- PROPOSED YUEN LONG SOUTH (YLS) EFFLUENT POLISHING PLANT
- BURIED UTILITIES
- PROPOSED RISING MAIN (BY OTHERS)
- PROPOSED RECLAIMED WATER PIPE (BY OTHERS)
- PROPOSED WATER RECLAMATION FACILITIES (BY OTHERS)
- ROADWORKS AND PIPWORKS
- A — WORKFRONT
- 300m ASSESSMENT AREA
- YE01 — REPRESENTATIVE NOISE SENSITIVE RECEIVER (OPERATION PHASE)
- DO1 — DEODOURIZER
- PROPOSED ROAD UNDER YLS DA
- 110 — MAXIMUM BUILDING HEIGHT (mPD)
- YLS DEVELOPMENT AREA (DA) BOUNDARY
- R2 — RESIDENTIAL - ZONE 2 (R2)
- R3 — RESIDENTIAL - ZONE 3 (R3)
- R6 — RESIDENTIAL - ZONE 6 (R6)
- OU(STW) — OTHER SPECIFIED USES (SEWAGE TREATMENT WORKS)
- OU — OTHER SPECIFIED USES
- G — GOVERNMENT (G)
- E — EDUCATION (E)
- DO — DISTRICT OPEN SPACE (DO)
- LO — LOCAL OPEN SPACE (LO)
- A — AMENITY (A)
- AGR — AGRICULTURE (AGR)
- GB(1) — GREEN BELT (1) (GB(1))
- TAI LAM COUNTRY PARK
- YE03 — CONSTRUCTION AND OPERATION PHASE ASSESSMENT POINT

819200 E
819600 E
820000 E
830800 N
830400 N
N

70 YLSDA
90 YLSDA
90 YLSDA
90 YLSDA
60 YLSDA
55
55
55
40
35

R3 YP01
R2
R2 YP02
E YP03
E YP04
R6 YP05
YE03
YE04
DO1
DO2
DO3
DO4
DO5
GB(1)
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DO
LO
A
G
AGR

Plot File by: YaoFB
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26/1/2022

AECOM

PROJECT
項目

HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

CLIENT
客戶

渠務署
Drainage Services Department

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ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核核

STATUS
階段

SCALE 比例
A1 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60631936

CONTRACT NO. 合約編號
CE 6/2019 (DS)

SHEET TITLE
圖紙名稱

LOCATIONS OF FIXED PLANT NOISE SOURCES

SHEET NUMBER
圖紙編號

60631936/EIA/YLSEPP/795

Appendix III

TYPICAL SOUND POWER LEVELS OF VENTILATION EQUIPMENT

The following sound power levels for various rating of ventilation equipment are given in Tables 7a, 7b and 7c for reference purpose only. Where practicable, the sound power level of the concerned equipment should be referred to the respective manufacturers .

Table 7a : Typical Sound Power Levels of Air-cooled Chillers

Cooling Capacity (Ton)	Sound Power Level (dB(A))
50	100
100	102
150	103
200	105
250	106
300	106
350	107
400	109

Table 7b : Typical Sound Power Levels of Water Cooling Towers

Horsepower of Fan (hp)	Sound Power Level (dB(A))
10	96
20	99
30	101
40	102
50	103
60	104
70	105
80	105

Table 7c : Typical Sound Power Levels of Fans

Volume Flowrate (m^3/hr)	Sound Power Level (dB(A)) at Static Pressure	
	125 Pa	750 Pa
1700	79	95
8600	83	99
17000	85	101
34000	89	105
43000	90	107
86000	93	110
170000	97	113

Appendix IV

COMPLETE ENCLOSURES

When a noise reduction of 20dB(A) or more is required, it is generally necessary to use a complete enclosure if the noise problem is a result of air-borne noise transmission. The enclosure should be internally lined with 50mm thick sound absorbing material (e.g. fibre glass). A variety of materials can be utilized for fabricating an enclosure. The sound transmission loss for enclosures using different materials are given in Table 8. Ventilation of enclosures should not be overlooked as most equipment, such as motors, requires an adequate air supply either to prevent overheating or to enable them to function efficiently. A silenced ventilation system incorporating silencers at the air intakes and discharge openings should be employed (see Figures 4 and 9).

Table 8 : Sound Insulation Materials for Enclosures

Material	Thickness (mm)	Surface Density (kg/m^2)	Sound Transmission Loss (dB)		
			125Hz	500Hz	2,000Hz
Plastered Brick Wall	125	240	36	40	54
Compressed Strawboard	56	25	22	27	35
Acoustic Panel (Sandwich type steel sheet with fibre glass)	50	27	19	31	44
Chipboard	19	11	17	25	26
Plaster board	9	7	15	24	32
Plywood	6	3.5	9	16	27

ANNEX 4D

Operational Noise Assessment of Expanded STKSTW

NSR 1

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	162	52	3	26	31	38	45	No
	Mechanical pump	2	92	95	20	162	52	3	26				
	Submersible pump	3	85	90	20	162	52	3	21				
	Exhaust fan	4	79	85	10	162	52	3	26				
	Deodourization fan	1	85	85	20	162	52	3	16				
B	Mechanical pump	3	92	97	20	148	51	3	28	31			
	Submersible pump	2	85	88	20	148	51	3	20				
	Exhaust fan	4	79	85	10	148	51	3	27				
	Deodourization fan	1	85	85	20	148	51	3	17				
C	Air blower	5	85	92	20	142	51	3	24	27			
	Exhaust fan	2	79	82	10	142	51	3	24				
	Deodourization fan	1	85	85	20	142	51	3	17				
D	Mechanical pump	3	92	97	20	133	50	3	29	32			
	Submersible pump	4	85	91	20	133	50	3	24				
	Exhaust fan	4	79	85	10	133	50	3	28				
E	Mechanical pump	2	92	95	20	124	50	3	28	31			
	Submersible pump	1	85	85	20	124	50	3	18				
	Exhaust fan	4	79	85	10	124	50	3	28				

NSR 2

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	148	51	3	27	32	38	45	No
	Mechanical pump	2	92	95	20	148	51	3	27				
	Submersible pump	3	85	90	20	148	51	3	21				
	Exhaust fan	4	79	85	10	148	51	3	27				
	Deodourization fan	1	85	85	20	148	51	3	17				
B	Mechanical pump	3	92	97	20	143	51	3	29	31			
	Submersible pump	2	85	88	20	143	51	3	20				
	Exhaust fan	4	79	85	10	143	51	3	27				
	Deodourization fan	1	85	85	20	143	51	3	17				
C	Air blower	5	85	92	20	142	51	3	24	27			
	Exhaust fan	2	79	82	10	142	51	3	24				
	Deodourization fan	1	85	85	20	142	51	3	17				
D	Mechanical pump	3	92	97	20	141	51	3	29	32			
	Submersible pump	4	85	91	20	141	51	3	23				
	Exhaust fan	4	79	85	10	141	51	3	27				
E	Mechanical pump	2	92	95	20	140	51	3	27	30			
	Submersible pump	1	85	85	20	140	51	3	17				
	Exhaust fan	4	79	85	10	140	51	3	27				

Notes:
Area A : Preliminary treatment area
Area B : Sludge dewatering and thickening area
Area C : Air blower area
Area D : MBR area
Area E : Outfall pump area
* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).
** 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.
*** 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

Appendix 4.7 Calculations of Operational Noise Levels at Representative Noise Sensitive Receivers (Unmitigated Scenario)

Stonecutters Island STW

Treatment Units	No of item	SWL dB(A)	Total SWL dB(A)	Enclosure Reduction dB(A)	NSR N27 Distance (m)	NSR N27 Screening Reduction, dB(A)	NSR N27 SPL dB(A)	Remark *
New Equipment to be Installed for the Proposed Upgrading Works								
Influent Sewage Pumping Station								
Centrifugal Pump	6	80	88	20	210	10	6	6 duty + 2 standby
Influent Channel								
Blower	1	85	85	20	320	10	–	1 duty + 1 standby
Flocculation Tank								
Blower	2	85	88	20	320	10	3	2 duty + 2 standby
Sludge Pump (Stroke Piston-Membrane Type)	2	80	83	20	320	10	–	2 duty
Sedimentation Tank								
Sludge Pump (Stroke Piston-Membrane Type)	2	80	83	20	320	10	–	2 duty
Scum Pump (Torque-Flow Type)	2	80	83	20	320	10	–	2 duty
Main Distribution Channel								
Blower	1	85	85	20	320	10	–	1 duty + 1 standby
Scum Pump (Torque-Flow Type)	1	80	80	20	320	10	–	1 duty + 1 standby
Sludge Treatment System								
Recirculation Pump	1	80	80	20	365	10	–	1 duty
Sludge Centrifuge	4	100	106	20	365	10	20	4 duty + 2 standby
Sludge Feed Pump (Progressive Cavity Type)	4	80	86	20	365	10	–	4 duty + 2 standby
Northwest Kowloon PTW Building								
Exhaust Fan for odour control facility	4	80	86		260	10	23	4 duty + 1 standby
Odour Control Facilities (Option 2 - Decentralized System)								
Exhaust Fan at Existing MPS	2	80	83		490	10	14	2 duty + 1 Standby
Exhaust Fan at Stage 2A MPS	2	80	83		205	10	22	2 duty + 1 Standby
Exhaust Fan at Sludge Handling Area	6	80	88		365	10	22	6 duty + 1 Standby
Exhaust Fan at New Primary Sedimentation Tank Area	12	80	91		320	10	26	12 duty + 2 Standby
Exhaust Fan at Flow Distribution Chamber Area	2	80	83		535	10	13	2 duty + 1 Standby
Sub-Total SPL at NSR for New Equipment							30	
Existing Equipment to be Retained after Upgrading Works All existing equipment will be retained, including chlorination plant	With reference to an *EIA Study for the Provision of Disinfection Facilities at Stonecutters Island STW*, the predicted noise level at FSD Diving Rescue and Diving Centre would be adopted to calculate the cumulative noise level in this assessment						48	
Total SPL at NSR (Existing and New Equipment)					**Total SPL, dB(A) at P1**		48	

Notes:
Enclosure Reduction: Reduction of SWL due to the enclosure for the equipment
Screening Reduction: Reduction of SPL due to the screening of line of sight by the structure of FSD diving training centre itself.
– 0 dB(A) or negative noise level is not presented.

* Standby item was not inlcuded in the noise assessment

See the attached Figure A4.7 for locations of treatment units

Reference No.4
EIA report of Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station, code: EIA-086/2002.

CE 62/2000 San Wai STW and Ha Tsuen PS - EIA
Operational Noise Assessment

San Wai STW - Unmitigated Scenario

Distance to NSR

	N37	N38	N39	N40	N42
Distance from site boundary (m)	212	192	260	270	213
*Distance from NNS (m)	335	325	397	334	400

* Notional Noise Source (NNS) for operational phase is assumed to be located at the San Wai STW transfer pumping station for the purpose of operational noise only.

Equipment

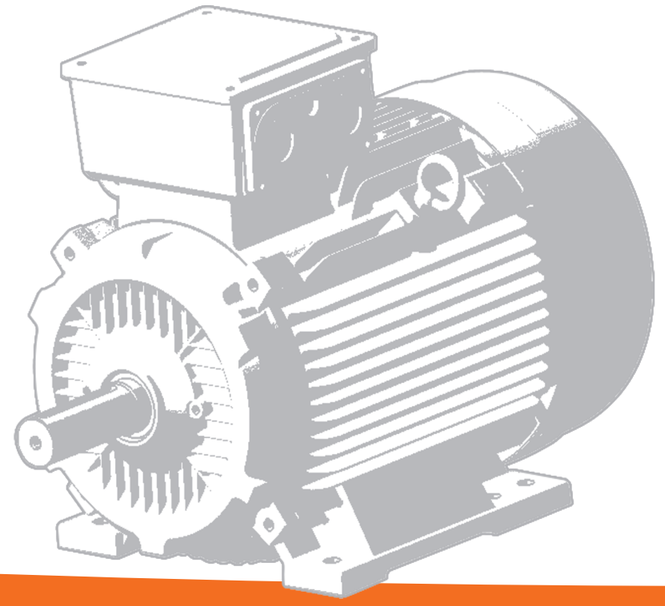
Equipment Name	SWL dB(A)	No.	Total SWL dB(A)
Main Pump	109	6	116.8
Main Motor	105	6	112.8
Deodourisation Unit	96	2	99.0
Ventilation Fan	96	8	105.0
Transformer	91	1	91.0
Total:			118.5

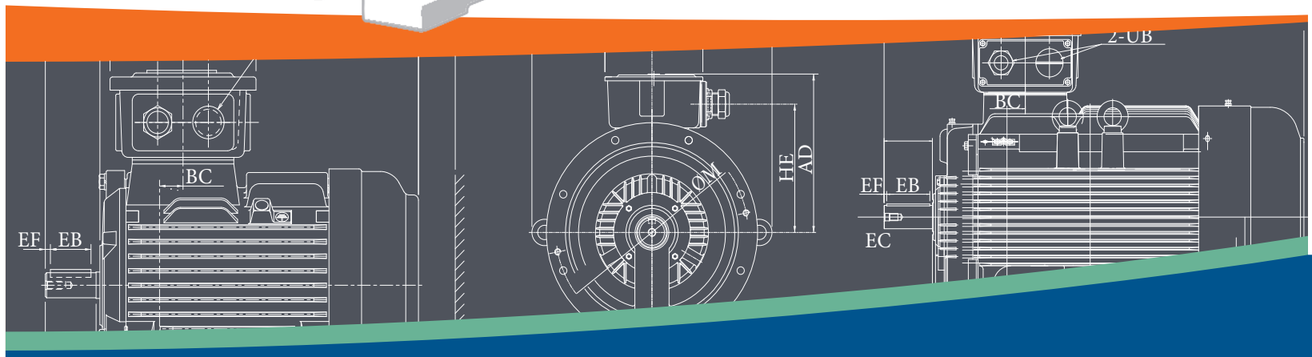
SPL at NSRs

	SPL-N37 dB(A)	SPL-N38 dB(A)	SPL-N39 dB(A)	SPL-N40 dB(A)	SPL-N42 dB(A)	
Total SPL at NSR (dB(A))	**63.0**	**63.3**	**61.5**	**63.0**	**61.5**	
Criteria for NSR (dB(A))	50	50	50	50	50	Day Time
Criteria for NSR (dB(A))	45	45	45	45	45	Night Time
Comply with Noise Criteria?	No	No	No	No	No	

Reference No.5
TECO Motors AESV2W, 15kW, frame no. 180L

TECO
e-motion





Standard IE2 Motor Catalogue

AESV2W, AESU2W

ELECTRICAL CHARACTERISTICS - AESV2W, AESU2W

TEFC, Class F, 40°C Ambient Temperature, IEC; Design N Continuous Duty, S. F. 1.0 380V/50Hz

OUTPUT				EFFICIENCY			POWER FACTOR			CURRENT		TORQUE				ROTOR GD^2 kg-m^2	NOISE SOUND POWER NO-LOAD dB(A)	APP. WEIGHT kg
kW	hp	FULL LOAD rpm	FRAME NO.	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (A)	LOCKED ROTOR %FLT	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL UP %FLT	BREAK DOWN %FLT			
0.55	0.75	1430	80M	78.1	78.0	75.3	74.0	64.0	49.5	1.45	640	0.381	260	230	290	0.010	78	17
		930	80M	74.0	72.8	68.4	65.5	56.0	43.0	1.72	470	0.585	255	245	255	0.013	73	19.5
0.75	1	2865	80M	77.4	75.8	72.6	84.5	77.5	66.0	1.74	630	0.253	225	200	280	0.005	84	16.5
		1430	80M	79.6	79.5	76.3	74.5	65.0	51.0	1.92	705	0.508	330	290	340	0.011	78	18.5
		935	90S	75.9	75.8	73.5	73.0	63.5	50.5	2.06	480	0.776	170	170	220	0.018	73	24.5
1.1	1.5	2880	80M	79.6	80.3	79.1	85.5	78.5	66.5	2.46	775	0.378	255	200	305	0.007	84	19.5
		1440	90S	81.4	81.6	79.3	77.5	69.0	55.0	2.65	740	0.756	275	220	310	0.017	78	24.5
		935	90L	78.1	77.6	74.9	72.0	62.5	49.0	2.97	550	1.164	205	195	245	0.025	73	28.5
1.5	2	2845	90S	81.3	81.5	80.5	90.0	86.0	75.5	3.11	650	0.510	220	170	250	0.010	88	23
		1430	90L	82.8	83.8	82.7	82.5	75.5	62.5	3.34	740	1.015	265	190	280	0.022	82	27.5
		955	100L	79.8	79.1	77.3	71.5	63.5	50.0	3.99	550	1.520	165	130	230	0.044	74	36.4
2.2	3	2840	90L	83.2	84.0	83.0	89.5	85.0	75.5	4.49	750	0.767	265	230	300	0.013	88	27
		1455	100L	84.3	84.6	82.9	79.0	71.0	58.0	5.02	790	1.497	215	175	290	0.041	82	36.5
		945	112M	81.8	80.8	79.6	75.5	67.5	54.0	5.41	570	2.304	205	175	245	0.071	74	47
3	4	2890	100L	84.6	84.4	83.6	89.0	85.0	76.0	6.05	820	1.005	215	195	280	0.022	93	37.6
		1445	100L	85.5	85.4	84.3	80.5	73.0	60.0	6.62	795	2.009	210	155	275	0.050	86	40
		965	132S	83.3	81.8	79.2	72.5	63.5	50.0	7.55	585	3.009	195	185	270	0.097	82	57.5
4	5.5	2880	112M	85.8	86.5	85.5	91.0	88.0	81.0	7.78	890	1.384	235	230	335	0.042	93	47.5
		1455	112M	86.6	87.0	86.1	81.0	74.5	62.5	8.66	830	2.744	260	220	290	0.083	86	52
		960	132M	84.6	84.8	84.3	77.5	69.5	56.5	9.27	645	4.159	190	175	275	0.131	82	69
5.5	7.5	2925	132S	87.0	87.0	85.7	85.5	81.5	73.0	11.2	690	1.861	190	145	250	0.057	93	61.5
		1460	132S	87.7	87.8	86.3	81.5	75.0	63.0	11.7	775	3.729	255	190	320	0.113	86	67.5
		965	132M	86.0	85.3	82.9	72.0	63.5	50.0	13.5	690	5.641	210	160	280	0.171	82	77.5
7.5	10	2905	132S	88.1	88.6	87.6	84.5	80.5	71.5	15.3	660	2.499	190	165	250	0.066	97	67
		1465	132M	88.7	89.0	88.8	85.5	80.5	70.0	15.0	760	4.955	230	165	280	0.133	90	78
		960	160M	87.2	88.0	87.0	81.5	76.5	66.0	16.0	600	7.561	210	185	225	0.363	82	110
11	15	2940	160M	89.4	89.4	88.6	91.5	89.0	83.0	20.4	830	3.703	220	155	270	0.154	97	105
		1465	160M	89.8	90.1	89.5	88.5	85.0	77.5	21.0	730	7.432	205	155	255	0.297	90	110
		965	160L	88.7	89.2	88.6	81.5	76.0	65.0	23.1	685	11.280	245	230	270	0.558	85	140
15	20	2925	160M	90.3	90.3	90.2	93.0	91.5	88.0	27.1	765	4.963	230	155	240	0.192	100	120
		1470	160L	90.6	91.3	90.5	86.5	82.5	73.5	29.1	785	9.876	235	185	280	0.396	94	130
		975	180L	89.7	89.7	88.4	80.0	74.0	62.5	31.8	760	14.890	265	185	315	1.342	88	200
18.5	25	2945	160L	90.9	91.7	90.5	92.5	90.5	86.0	33.4	880	6.162	265	175	280	0.237	100	135
		1470	180M	91.2	92.0	91.0	85.0	82.5	75.5	36.3	630	12.340	180	175	275	0.654	94	180
		975	200L	90.4	91.1	90.2	82.5	79.0	70.5	37.7	610	18.610	200	185	220	1.604	88	250
22	30	2945	180M	91.3	91.5	91.0	90.0	88.0	82.5	40.7	800	7.394	220	175	280	0.283	100	175
		1475	180L	91.6	91.8	91.5	84.0	80.5	72.5	43.4	710	14.760	195	150	230	0.712	94	190
		975	200L	90.9	91.1	90.9	82.0	78.5	69.5	44.8	680	22.330	225	180	220	1.912	88	270
30	40	2955	200L	92.0	92.0	90.8	90.0	89.0	85.0	55.0	775	9.825	185	140	275	0.521	102	240
		1475	200L	92.3	92.3	91.7	87.5	84.5	77.5	56.4	790	19.680	205	185	245	1.220	98	255
		975	225M	91.7	92.0	91.5	86.0	83.5	76.0	57.8	615	29.780	175	155	210	2.442	91	325

ELECTRICAL CHARACTERISTICS - AESV2W, AESU2W

TEFC, Class F, 40°C Ambient Temperature, IEC; Design N Continuous Duty, S. F. 1.0 380V/50Hz

OUTPUT				EFFICIENCY			POWER FACTOR			CURRENT		TORQUE				ROTOR GD^2 kg-m^2	NOISE SOUND POWER NO-LOAD dB(A)	APP. WEIGHT kg
kW	hp	FULL LOAD rpm	FRAME NO.	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (A)	LOCKED ROTOR %FLT	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL UP %FLT	BREAK DOWN %FLT			
37	50	2950	200L	92.5	92.0	91.3	90.5	89.5	85.5	67.2	845	12.30	205	140	240	0.663	102	270
		1480	225S	92.7	92.8	92.1	87.0	84.0	77.0	69.7	710	24.52	190	160	245	1.649	98	320
		980	250M	92.2	92.4	91.9	85.0	81.0	72.5	71.7	640	37.03	180	180	220	3.373	91	410
45	60	2965	225M	92.9	92.3	90.9	90.5	87.5	81.0	81.3	875	14.69	160	155	320	1.074	104	320
		1475	225M	93.1	93.3	92.9	86.5	83.5	76.5	84.9	690	29.53	190	160	270	1.731	100	330
		985	280S	92.7	92.6	92.0	84.0	81.0	73.5	87.8	650	44.52	140	115	230	6.400	94	580
55	75	2970	250M	93.2	93.4	93.1	91.0	90.0	85.5	98.5	735	18.33	135	115	295	1.211	104	405
		1485	250M	93.5	93.6	93.1	87.0	85.0	79.0	103.0	780	36.66	265	230	250	3.621	100	450
		985	280M	93.1	93.0	92.5	83.5	81.5	74.0	107.0	650	55.27	145	120	230	7.600	94	660
75	100	2965	280S	93.8	93.8	93.2	90.5	89.5	85.5	134.0	700	24.65	160	135	260	2.000	106	565
		1480	280S	94.0	94.0	93.5	87.5	86.0	78.5	139.0	690	49.25	170	145	260	5.200	103	620
		985	315S	93.7	93.6	93.1	83.5	81.0	73.0	146.0	650	74.20	150	125	220	12.400	98	870
90	125	2965	280M	94.1	94.0	93.5	90.5	89.5	86.0	161.0	700	30.60	165	140	260	2.400	106	615
		1480	280M	94.2	94.2	93.6	87.5	86.0	78.0	166.0	690	59.26	180	155	260	6.000	103	690
		985	315M	94.0	94.0	93.4	84.0	81.5	74.0	173.0	650	89.04	155	130	220	14.000	98	932
110	150	2965	315S	94.3	94.3	93.7	89.5	88.5	85.0	198.0	700	36.72	150	125	250	4.400	106	850
		1480	315S	94.5	94.5	93.8	88.5	87.0	82.0	200.0	690	72.43	160	135	240	8.800	103	960
		985	315L	94.3	94.2	93.6	85.0	82.0	74.5	209.0	650	108.80	150	125	220	18.800	98	1120
132	175	2965	315M	94.6	94.6	93.8	90.0	89.0	86.0	236.0	690	42.84	145	120	240	4.800	109	922
		1480	315M	94.7	94.7	94.0	88.5	87.5	82.5	239.0	675	86.80	160	135	240	10.000	106	1000
		985	315L	94.6	94.5	93.8	85.0	83.0	75.5	249.0	650	130.60	150	125	220	20.400	102	1250
160	215	2970	315L	94.8	94.8	94.0	89.0	88.0	84.5	288.0	690	52.55	150	125	240	5.200	109	980
		1485	315L	94.9	94.9	94.1	88.5	87.0	82.5	289.0	670	105.20	140	115	230	11.600	106	1090
		985	315L	94.8	94.8	94.0	84.5	82.0	74.0	304.0	650	158.30	145	120	230	23.200	102	1280
		985	355M	94.8	94.8	94.0	84.5	82.0	74.0	303.0	650	158.30	145	120	230	31.600	102	1700
200	270	2970	315L	95.0	95.0	94.1	90.5	90.0	88.0	353.0	690	65.99	150	125	240	6.400	109	1150
		1485	315L	95.1	95.0	94.2	88.5	87.0	83.0	361.0	670	131.50	150	125	230	14.400	106	1280
		985	315D	95.0	94.9	94.1	85.0	83.0	76.0	376.0	650	197.90	155	130	230	38.800	102	1665
		985	355M	95.0	94.9	94.1	85.0	83.0	76.0	376.0	650	197.90	155	130	230	40.800	102	1900
250	335	2975	315D	95.0	95.0	94.2	91.0	90.5	88.5	439.0	690	81.74	140	115	240	10.000	111	1600
		2975	355M	95.0	95.0	94.2	91.0	90.5	88.5	439.0	690	81.74	140	115	240	10.800	111	1700
		1485	315D	95.1	95.1	94.3	89.0	88.0	84.0	449.0	680	164.00	140	115	230	25.200	108	1650
		1485	355M	95.1	95.1	94.3	89.0	88.0	84.0	449.0	680	164.00	140	115	230	27.200	108	1750
		985	315D	95.0	95.0	94.2	85.0	83.5	77.0	470.0	650	247.30	150	125	230	46.400	105	1840
		985	355L	95.0	95.0	94.2	85.0	83.5	77.0	470.0	650	247.30	150	125	230	46.000	105	2080
315	420	2975	315D	95.0	95.0	94.2	91.5	91.0	89.0	551.0	700	103.20	140	115	240	12.000	111	1760
		2975	355L	95.0	95.0	94.2	91.5	91.0	89.0	551.0	700	103.20	140	115	240	14.000	111	1870
		1485	315D	95.1	95.1	94.3	89.0	88.0	84.5	566.0	675	206.70	140	115	230	31.200	108	1860
		1485	355L	95.1	95.1	94.3	89.0	88.0	84.5	565.0	675	206.70	140	115	230	34.400	108	1960

NOTE: * The above are typical values based on test according to IEC60034-2-1:2007
* Tolerance according to IEC60034-1
* Breakdonw & Locked rotor torques are show as average expected voltages
* Efficiency, power factor, speed and torque are the same for other voltages. Current values vary inversely with voltage.
* F#315D only suitable for IM B3
* Noise: sound power level at no-load, dB(A)/1M, tolerance +3 dB(A)
* Data subject to change without notice

Location (Group)	Group	Type	Reference Name	Reference	dB(A) (Item)	No.	dB(A) (Type)	Features [7]	Corrections	SWL, dB(A) (Type)	cted SWL, dB(A) (Group)
Inlet Works Building	L1, L2, L3	Immersible pump	Submersible pump	EIA-245/2016-1 [2]	85	4	91	Plant room	-30	61	77
		Motor (Grip Trap)	45kW Motor	M3BP 225SMB 4 [5]	88	3	93	Plant room	-30	63	
		Motor (Coarse Screen)	45kW Motor	M3BP 225SMB 4 [5]	88	4	94	Plant room	-30	64	
		Motor (Fine Screen)	45kW Motor	M3BP 225SMB 4 [5]	88	5	95	Plant room	-30	65	
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	5	86	Silencers at ventilation	-10	76	
Primary Treatment	PT	Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	6	93	Plant room	-30	63	63
Biological Treatment	L4	Internal recycle pump	Submersible pump	EIA-245/2016-1 [2]	85	12	96	Plant room	-30	66	66
Ancillary Building	L5	Air blower (276 m3/min)	Air Blower	EIA-148/2008-1 [3]	85	2	88	Plant room	-30	58	78
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	7	87	Silencers at ventilation	-10	77	
	L6	Air blower (276 m3/min)	Air Blower	EIA-148/2008-1 [3]	85	4	91	Plant room	-30	61	78
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	7	87	Silencers at ventilation	-10	77	
Tertiary Treatment Complex	L7	Compressor	Air Compressor, air flow > 30m3/min	CNP 003	104	4	110	Plant room	-30	80	81
		Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	2	88	Plant room	-30	58	
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	2	82	Silencers at ventilation	-10	72	
		Motor (Disc filter)	30kW Motor	M3BP 200MLA 4 [5]	85	3	90	Plant room	-30	60	
		Effluent pump	Submersible pump	EIA-245/2016-1 [2]	85	2	88	Plant room	-30	58	
Sludge Thickening Building	L8, L9, L10, L11	Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	2	88	Plant room	-30	58	81
		Motor (Centrifuge)	Main Motor	EIA-086/2002-2 [3]	105	4	111	Plant room	-30	81	
		Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	1	85	Plant room	-30	55	
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	1	79	Silencers at ventilation	-10	69	
Sludge Treatment	L12, L13	Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	1	85	Plant room	-30	55	78
		Motor (Centrifuge)	Main Motor	EIA-086/2002-2 [3]	105	1	105	Plant room	-30	75	
		CHP (gas engine)	Gas Engine	YLEPP 1 [6]	93	4	99	Plant room	-30	69	
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	3	84	Silencers at ventilation	-10	74	
Organic Waste Reception Facility	L14, L15	Sludge pump	Submersible pump	EIA-245/2016-1 [2]	85	4	91	Plant room	-30	61	77
		CHP (gas engine)	Gas Engine	YLEPP 1 [6]	93	6	101	Plant room	-30	71	
		Ventilation fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	5	86	Silencers at ventilation	-10	76	
Inlet Works Building	DO1	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	6	87	Barrier adjustment	-10	77	77
Ancillary Building	DO2	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	18	92	Barrier adjustment	-10	82	82
Sludge Thickening Building	DO3	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	2	82	Barrier adjustment	-10	72	72
Sludge Treatment	DO4	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	7	87	Barrier adjustment	-10	77	77
Organic Waste Reception Facility	DO5	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	4	85	Barrier adjustment	-10	75	75
Ancillary Building	DO6	Extraction fan	Ventilation Fan (1700 m3/hr)	Vent_sys-17 [1]	79	7	87	Barrier adjustment	-10	77	77

Remarks:

1. The SWL of ventilation fan is referenced with Good Practices on Ventilation System Noise Control published by EPD.
2. The SWL of submersible pump is referenced with EIA Report of Expansion of Sha Tau Kok Sewage Treatment Works, code: EIA-245/2016.
3. The SWL of air blower and centrifuge pump is referenced with EIA report of Harbour Area Treatment Scheme (HATS) Stage 2A, code: EIA-148/2008.
4. The SWL of Main Motor is referenced with EIA report of Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station, code: EIA-086/2002.
5. The SWL of motor is referenced with catalogue of ABB Motors and Generators IE2 cast iron motors, code: 9AKK105944 EN 06-2018.
6. The SWL of Gas Engine to be specified in construction contract.
7. Reduction of SWL with "Plant room" is referenced with Good Practices on Pumping System Noise Control published by EPD.

3.3 LV Electric Motor

3.3.1 General Design and Requirements

(a) Motors shall comply with BS EN 60034 / IEC 60034 or equivalent.

(b) Unless otherwise specified in the Particular Specification, motors shall be of squirrel cage, single or three phase induction motors, with rated voltage as specified in the Particular Specification. For indoor applications, the motors shall be protected to IP 44 and relevant requirements to BS EN 60034-5 / ICE 60034-5. For outdoor use/ indoor chemical handling areas, the motors shall be protected to IP 55 and relevant requirements to BS EN 60034-5 / IEC 60034-5. The method of cooling of motors shall be to Class IC 01, BS EN 60034-6 / IEC 60034-6.

(c) Motors shall be rated for maximum continuous duty running Class S1 to BS EN 60034 / IEC 60034, with output of at least 10% in excess of the maximum duty power requirement of the equipment, or as otherwise specified.

(d) Motor windings and accessories shall have Class F insulation with Class B maximum temperature rise limit.

(e) Motors shall be designed for minimum noise during normal operation, the noise emitted shall be limited to less than 90 dB(A) sound power level to BS EN 60034-9 / IEC 60034-9.

(f) Vibration limits shall not exceed those specified in BS EN 60034-14 / IEC 60034-14. The maximum allowable vibration levels shall apply to all operating temperatures of the motor between ambient and maximum operating temperature and to all operating conditions between no-load and full-load and at all possible operating speeds.

(g) The Electrical Code 5.4 stated that, except for motors which are components of package equipment, any polyphase induction motor exceeding 5kW and operating >1,000 hours per year should use "high-efficient" motors tested to relevant international standards such as IEEE 112-1991, IEC 34-2, or JEC-37. Unless otherwise specified in the Particular Specification, the minimum rated efficiencies for various size of polyphase induction motor (extracted from Table 5.1 of Electrical Code) is shown below:-

Motor Rated Output (P)	Minimum Rated Efficiency (%)
5kW <= P < 7.5kW	84.0%
7.5kW <= P < 15kW	85.5%
15kW <= P < 37kW	88.5%
37kW <= P < 75kW	90.0%

Reference No.8
- Boiler Noise Level

CBLE-4D

50-800 HP

Boiler Book

DIMENSIONS AND RATINGS

The Model CBLE-4D dimensions and ratings are provided in the tables and figures below.

Dimensions are for reference only; certified drawings from CB are required if clearances are critical.

Table 1: Model CBLE-4D Steam Boiler Ratings

BOILER HP	50	60	70	80	100	125	150	200	250	300	350	400	500	600	700	800
	RATINGS SEA LEVEL TO 700 FT															
Rated Steam Cap. (lbs/hr from and @ 212 °F)	1725	2070	2415	2760	3450	4313	5175	6900	8625	10350	12075	13800	17250	20700	24150	27600
Btu Output (1000 Btu/hr)	1674	2009	2343	2678	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
	APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY															
Light Oil (gph)[A]	14.9	17.9	20.9	23.9	29.9	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	233.3
Natural Gas (cfh)[B]	2092	2511	2929	3348	4184	5103	6123	8165	10206	12247	14288	16329	20412	24494	28576	32659
Gas (Therm/hr)	20.9	25.1	29.3	33.5	41.8	51.0	61.2	81.6	102.1	122.5	142.9	163.3	204.1	244.9	285.8	326.6
Propane (cfh)[C]	820	985	1150	1315	1640	2000	2402	3202	4002	4802	5600	6404	8006	9605	11206	12807
	POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ															
Blower Motor hp	Refer to Table 15					Refer to Tables 11 and 12										
Oil Pump Motor hp No. 2 Oil	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (Oil firing Only)	2	2	2	2	2	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

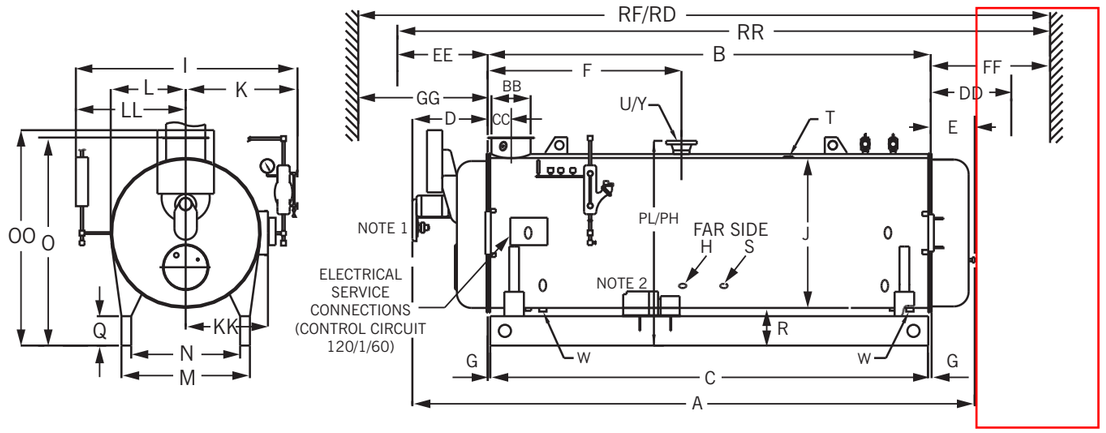
NOTES:
A. Based on 140,000 Btu/gal
B. Based on 1000 Btu/cu-ft
C. Based on 2550 Btu/cu-ft

Table 2: Model CBLE-4D Hot Water Boiler Ratings

BOILER HP	50	60	70	80	100	125	150	200	250	300	350	400	500	600	700	800
	RATINGS SEA LEVEL TO 700 FT, 60 HZ															
Rated Cap. Btu Output (1000 Btu/hr)	1674	2009	2343	2678	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
	APPROXIMATE FUEL CONSUMPTON AT RATED CAPACITY															
Light Oil (gph)[A]	14.9	17.9	20.9	23.9	29.9	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	233.3
Natural Gas (cfh)[B]	2092	2511	2929	3348	4184	5103	6123	8165	10206	12247	14288	16329	20412	24494	28576	32659
Gas (Therm/hr)	20.9	25.1	29.3	33.5	41.8	51.0	61.2	81.6	102.1	122.5	142.9	163.3	204.1	244.9	285.8	326.6
Propane (cfh)[C]	820	985	1150	1315	1640	2000	2402	3202	4002	4802	5600	6404	8006	9605	11206	12807
	POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ															
Blower Motor hp	Refer to Table 15					Refer to Tables 11 and 12										
Oil Pump Motor, hp No. 2 Oil	1/3	1/3	1/3	1/3	1/3	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (Oil firing Only)	2	2	2	2	2	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:
A. Based on 140,000 Btu/gal
B. Based on 1000 Btu/cu-ft
C. Based on 2550 Btu/cu-ft

Figure 1. Dimensions CBLE-4D Steam - 50-100 HP



Dimensions in inches unless indicated

Table 3: Dimensions Steam 50-100 HP

Description	DIM	Boiler HP				
		50	60	70	80	100
LENGTHS						
Overall	A	129	129	168	168	187
Shell	B	92	92	131	131	150
Base Frame	C	91	91	130	130	148
Front Head Extension	D	18-1/2	18-1/2	18-1/2	18-1/2	18-1/2
Rear Head Extension	E	18-1/2	18-1/2	18-1/2	18-1/2	18-1/2
Front Ring Flange to Nozzle - 15 psig	F	54	54	65-1/2	65-1/2	75
Front Ring Flange to Nozzle - 150 psig	F	54	54	72-1/2	72-1/2	82
Ring Flange to Base	G	5/8	1/2	1/2	1/2	1/2
WIDTHS						
Overall	I	73	73	73	73	73
ID, Boiler	J	48	48	48	48	48
Center to Water Column	K	39	39	39	39	39
Center to Outside Hinge	KK	29	29	29	29	29
Center to Lagging	L	27	27	27	27	27
Center to Auxiliary LWCO	LL	34	34	34	34	34
Base, Outside	M	37-5/8	37-5/8	37-5/8	37-5/8	37-5/8
Base, Inside	N	29-5/8	29-5/8	29-5/8	29-5/8	29-5/8
Base to Steam Outlet (15 psig only)	PL	70-1/2	70-1/2	70-1/2	70-1/2	70-1/2
Overall	OO	78-3/4	78-3/4	78-3/4	78-3/4	78-3/4
Base to Vent Outlet	O	70	70	70	70	70
Base to Steam Outlet (150 psig only)	PH	66-1/2	66-1/2	66-1/2	66-1/2	70-5/16
Height of Base	Q	12	12	12	12	12
Base to Bottom of Boiler	R	16	16	16	16	16
BOILER CONNECTIONS						
Chemical Feed	H	1	1	1	1	1
Feedwater	S	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4
Low Pressure (15 psig only) Steam Nozzle Drain, Front and Rear	 U W	 6[A] 1-1/4	 6[A] 1-1/4	 6[A] 1-1/2	 6[A] 1-1/2	 8[A] 1-1/2
High Pressure (150 psig only) Surface Blowoff, Top CL Steam Nozzle Blowdown, Front and Rear	 T Y W	 1 3 1-1/4	 1 3 1-1/4	 1 3 1-1/4	 1 3 1-1/4	 1 4[B] 1-1/4

Table 3: Dimensions Steam 50-100 HP (Continued)

Description	DIM	Boiler HP				
		50	60	70	80	100
VENT STACK						
Diameter (flgd connection)	BB	10	10	12	12	12
Front Ring Flange to Vent C_L	CC	6	6	7	7	7
MINIMUM CLEARANCES						
Rear Door Swing[C]	DD	55	55	55	55	55
Front Door Swing[C]	EE	55	55	55	55	55
Tube Removal, Rear	FF	84	84	123	123	142
Tube Removal, Front	GG	74	74	113	113	132
MINIMUM BOILER ROOM LENGTH ALLOWING FOR DOOR SWING AND TUBE REMOVAL FROM:						
Rear of Boiler	RR	231	231	309	309	347
Front of Boiler	RF	221	221	299	299	337
Thru Window or Doorway	RD	202	202	241	241	260
WEIGHT IN LBS						
Normal Water Capacity		3130	2920	4620	4460	5088
Approx. Ship Wgt - 15 psig		6900	7000	8100	8200	9000
Approx. Ship Wgt - 150 psig		7000	7200	8800	9000	9500
Approx. Ship Wgt - 200 psig		7400	7600	9300	9500	10000

NOTES:
1. Air compressor module on sizes 50 thru 100 hp.

A. ANSI 150 psig flange.
B. ANSI 300 psig flange.
C. 50 - 100 hp standard hinged door.

ENGINEERING DATA

Sound Level

Table 25 gives a summary of predicted sound pressure levels for Model CB boilers with 30 ppm LE Options. Contact your local Cleaver-Brooks authorized representative for sound levels or other LE Options.

Units - The units for the sound level tables are dbA (decibels, measured on the A-weighted scale) in reference to 0.0002 microbars (20 micro-Newtons per square meter). Their reference are standardly used in specifying and reporting sound pressure levels on industrial equipment.

Test Method - The sound pressure levels in the above tables were obtained from tests in accordance with the "ABMA Test Code for the Measurement of Sound from Packaged Boilers". In accordance with this code the sound pressure levels reported were measured on the boiler centerline 4-1/2 feet vertically above the bottom of the base rails and 3 feet horizontally in front of the end of the blower motor or front surface of the electrical cabinet.

Sound Level Meter - The sound level meter used complies with ANSI S1.4, Type 1 (Precision). The readings are taken with the meter set for slow response and corrected for background levels.

Sound Pressure - The large size boilers, the need for auxiliary equipment, and the necessary interconnecting piping make it impractical (and sometimes impossible) to provide a boiler testing environment which is suitable for taking the data needed to develop Sound Pressure Power levels.

Typical Values - Sound pressure levels (dbA) for the same boiler will vary between boiler rooms. Sound levels will vary with motor type, NOx levels, and altitudes. In addition, variations will occur between different people using different sound meters on the same boiler. And finally, no two boilers can be expected to give precisely the same sound levels. For these reasons, we can only predict, but not guarantee, sound levels (dbA).

Table 25: CBLE-4D Predicted Sound Levels

BOILER HP	50	60	70	80	100	125	150	200	250	300	350	400	500	600	700	800
HFO, dbA	79	79	79	79	81	84	84	84	83	84	85	84	85	85	88	90
LFO, dbA	78	78	78	78	79	82	82	83	81	82	83	82	83	83	84	89
HFG, dbA	77	77	78	78	78	82	82	83	82	83	84	83	83	85	87	90
LFG, dbA	72	73	74	75	75	81	81	82	81	82	83	81	81	82	84	88

NOTES
1. Sound pressure levels in dbA
2. Based on standard altitude fans and fan motors, 60 Hz.
3. 50-100 HP based on uncontrolled NOx. 125-800 HP based on 30ppm.
4. Contact your local Cleaver-Brooks authorized representative for sound levels of 60 or 20 ppm LE options.

ABBREVIATIONS:
HF = High Fire
LF = Low Fire
O = Oil
G = Gas

Table 26: Gas Pressure Requirements 50-100 HP

Boiler Hp	Train Size	Gas Supply Pressure Less Then 27" W.C.		Gas Supply Pressure Up To 10 Psi	
		Regulator Model*	Pressure range	Regulator Model*	Pressure range
50	2	RV-91	0.3 - 1.0 psi	210-E	0.3 - 10 psi
60	2	RV-91	0.4 - 1.0 psi	210-E	0.4 - 10 psi
70	2	RV-91	0.5 - 1.0 psi	210-E	0.5 - 10 psi
80	2	RV-91	CONTACT CB	210-E	CONTACT CB
100	2	RV-91		210-E	
*Maxitrol RV series is standard; 210 series is optional					

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Our Ref.: DNCM:ZYN:ATKX:kchy:60631936/8.0-2021008369W

24 November 2021

Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme
5/F, Western Magistracy,
2A Pok Fu Lam Road
Hong Kong

Attn.: Mr. Lee Chiu Chun, Lawrence (Ch Engr/Harbour Area Treatment Scheme)

Dear Sir,

Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant – Investigation

Confirmation of Noise Inventory and Operation Mode used for the Environmental Impact Assessment for Hung Shui Kiu Effluent Polishing Plant

In response to the comments of the Environmental Protection Department, we would like to seek your confirmation on the validity of the information in the noise inventory for the fixed noise sources as shown in Appendix 4.6 of the EIA report for Hung Shui Kiu Effluent Polishing Plant (HSKEPP) in accordance with Clauses 3.2.2(c) and 3.3.1(b) of Appendix C in the EIA Study Brief (ref: No. ESB-312/2019). The noise inventory is attached herewith for your reference.

Please also confirm that the following statement on the operation mode of the fixed plant equipment at HSKEPP is valid:-

"Potential fixed noise sources impact during operation of the proposed HSKEPP would be generated from the operation of the fixed plants, such as pumps, air blowers, motors ventilation fans and extraction fans of deodorisation units, etc., at the proposed treatment facilities. The plant equipment at HSKEPP will be operated 24 hours per day, 7 days per week throughout the year."

We would be grateful to have your confirmation on or before 30 November 2021 to ensure the timely submission of the EIA report.

Should you have any queries, please feel free to contact our Ms. Yanning Zhang at 3922 9583 or email: yanning.zhang@aecom.com.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Desmond Ng
Executive Director
Water, Hong Kong

Encl.

Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme Division
5/F., Western Magistracy,
2A Pok Fu Lam Road, Hong Kong

渠務署
污水處理服務科
淨化海港計劃部
香港薄扶林道 2A 號
西區裁判法院 5 樓

來函檔號 Your Ref: DNCM:ZYN:ATKX:kchy:60631936/8.0-2021008370W
本署檔號 Our Ref: (00RW1E) in DSD HATSR 8/CE201906 Pt.4
電 話 Tel: (852) 2594 7299
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Urgent By Fax (3922 9797)

26 November 2021

AECOM
12/F, Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong

(Attn: Mr. Desmond NG)

Dear Sirs

Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and
Yuen Long South Effluent Polishing Plant – Investigation

Confirmation of Noise Inventory and Operation Mode used for the Environmental Impact Assessment for Yuen Long South Effluent Polishing Plant

I refer to your above referenced letter dated 24 November 2021 enclosing with the noise inventory details and related information.

2. Please be confirmed that both the noise inventory and operation mode of the fixed noise sources to be used in the noise impact assessment in the environmental impact assessment for YLSEPP are valid.

Yours faithfully,

(AU-YEUNG Wai-keung)
for Chief Engineer / Harbour Area Treatment Scheme
Drainage Services Department