

24701-2-510-M-GA-0027-01	HVAC GENERAL ARRANGEMENT - LEVEL 01
24701-2-510-M-GA-0028-01	HVAC GENERAL ARRANGEMENT - LEVEL 02
24701-2-510-M-SD-0005-01	CHILLED WATER SCHEMATIC
24701-2-510-M-SE-0004-01	HVAC SECTION LAYOUT
DRAWING NO.	REFERENCE
	REFERENCE DRAWINGS

1



CONSTRUCTION.

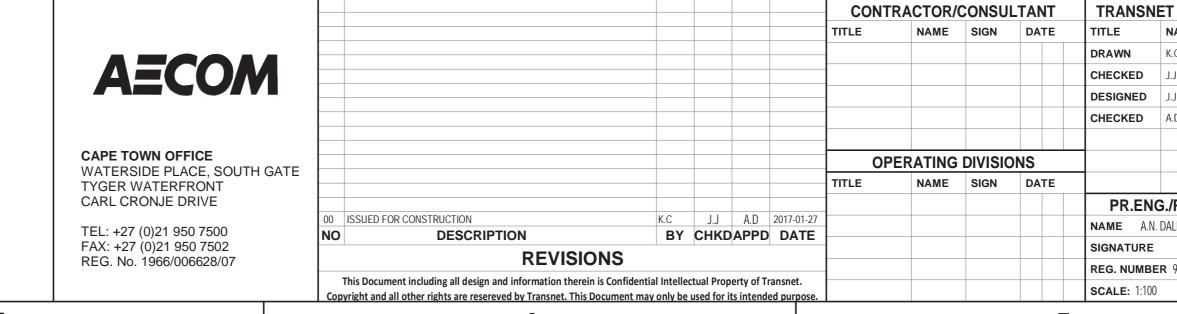
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS,

DIMENSIONS AND LEVELS ON THE SITE AND NOTIFY THE NEC SUPERVISOR OF ANY VARIATIONS BEFORE

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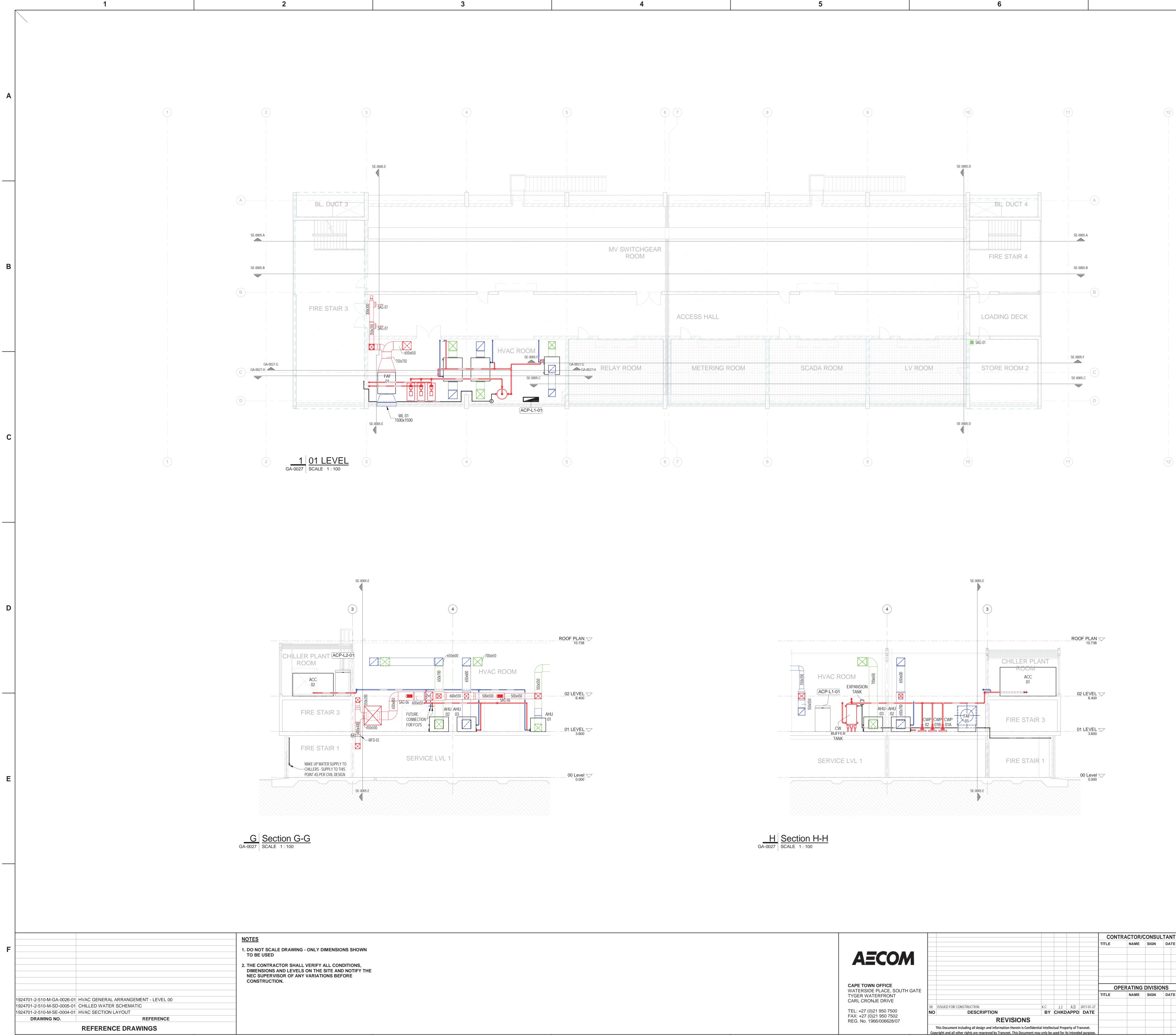
							DESIGN DATA														
REF. NO. DES	REF. NO.	DESCRIPTION	DESCRIPTION	LOCATION / QUANTITY AREA SERVED		PC	OWER FROM	Electric Me	otors each			TP (Pa) Ext. to AHU or			COOLING		1		-		
					1			Mass each (kg)	Total for AHU or Fans (L/s)	Fans	Water Flow	Cooling Coil	Air Oı			Off °C	Return Air OBD (L/s)	Fresh Air OBD (L/s)	Floor Area (m2)		
					Others	Load	Phase				(L/s)	(kW)	DB	WB	DB	WB					
	System 1 - Electrical Equipment Cooling																				
AHU 01	EAST WING SUPPLY	1	RELAY ROOM	ACP-L1-01	SITE ELECTRICIAN	2.00 kW	3	250	1745	T.B.C.	1.0	21.7	30.2	19.3	13.7	13.2	505	1240	38		
	(Initial Installation)		METERING ROOM																38		
			SCADA ROOM																38		
			LV ROOM																38		
41111.00	WEST WING SUPPLY A		MV SWITCHGEAR ROOM - SOUTH	ACP-L1-01	SITE ELECTRICIAN	4.00 kW	0	000	2400	T.B.C.	3.0	68.2	20.0	10.2	40.7	40.0	2000	400	172		
AHU 02	(Initial Installation)	1	MV SWITCHGEAR ROOM - SOUTH	ACP-L1-01	SITE ELECTRICIAN	4.00 KVV	3	600	3180	1.B.C.	3.0	00.2	30.2	19.3	13.7	13.2	2690	490			
AHU 03	WEST WING SUPPLY B	1	MV SWITCHGEAR ROOM - NORTH	ACP-L1-01	SITE ELECTRICIAN	4.00 kW	3	600	3180	T.B.C.	3.0	68.2	30.5	19.7	13.6	13.1	2690	490	172		
	(Initial Installation)																				
FCU 01	WEST WING SUPPLY C	T.B.C	MV SWITCHGEAR ROOM - SOUTH	ACP-L1-01	SITE ELECTRICIAN	1.00 kW	3	T.B.C.	890	N/A	0.8	17.5	30.2	19.3	13.7	13.2	890	0	172		
FCU 02	(Future Capacity Expansion)	T.B.C	MV SWITCHGEAR ROOM - NORTH	ACP-L1-01	SITE ELECTRICIAN	1.00 kW	3	T.B.C.	890	N/A	0.8	17.5	30.2	19.3	13.7	13.2	890	0	172		
	System 2 - Fresh Air Supply																		-		
																			-		
FAF 01	SPIN FILTER FAN	1	AHU 1	ACP-L1-01	SITE ELECTRICIAN	7.00 kW	3	1000	3985	T.B.C.	0	0.0	_	_	_	_	_	1240	N/A		
			AHU 2														_	490	N/A		
			AHU 3														_	490	N/A		
			AC PLANTROOM														_	490	78		
			INTERNAL CORRIDOR														_	440	155		
			SOUTH STAIRWELL														_	130	70		
			NORTH STAIRWELL														_	210	28		
			LEVEL 00 SERVICE FLOOR														_	390	727		
			NORTH EAST CORNER ROOM														_	105	27		
	Chiller Units																				
ACC 01	AIR COOLED CHILLER	1	ALL AHU's	ACP-L2-01	SITE ELECTRICIAN	62.2 kW	3	2000	_	_	8.6	194		_	_						
ACC 02	AIR COOLED CHILLER	1	ALL AHU's	ACP-L2-01	SITE ELECTRICIAN	33.8 kW	3	1050	_	_	4.6	105		—	-	_					

	DIFFUSER SCHEDULE												
SUPPLY FROM	AREA SERVED	REFERENCE NO.	SUPPLY GRILLE QTY.	FLOW PER GRILLE (L/s)	GRILLE DIMENSIONS (L x W)	GRILLE - MAKE	GRILLE - MODEL	REFERENCE NO.	RETURN GRILLE QTY.	FLOW PER GRILLE (L/s)	GRILLE DIMENSIONS (L x W)	GRILLE - MAKE	GRILLE - MODE
AHU 01	RELAY ROOM	SAG 03	2	140	250 x 150	Europair	DD + OBD	N/A	-	0	_	—	—
	METERING ROOM	SAG 03	2	140	250 x 150	Europair	DD + OBD	N/A	_	0	_	_	—
	SCADA ROOM	SAG 04	2	195	300 X 250	Europair	DD + OBD	RAG 01	1	110	250 x 200	Europair	RA
	LV ROOM	SAG 08	3	260	300 x 250	Europair	DD + OBD	RAG 02	2	395	300 x 250	Europair	RA
AHU 02	MV SWITCHGEAR ROOM - SOUTH	SAG 09	6	530	525 x 300	Europair	DD + OBD	RAG 03	5	540	400 x 350	Europair	RA
AHU 03	MV SWITCHGEAR ROOM - NORTH	SAG 09	6	530	525 x 300	Europair	DD + OBD	RAG 03	5	540	400 x 350	Europair	RA
FAF 01	AHU 1	OBD	1	1240		N/A	N/A						
	AHU 2	OBD	1	490	_	N/A	N/A						
	AHU 3	OBD	1	490	_	N/A	N/A						
	INTERNAL CORRIDOR	SAG 07	2	245	375 X 200	Europair	DD + OBD						
	LEVEL 00 - A/C ROOM 1	SAG 06	2	220	375 X 200	Europair	DD + OBD						
	SOUTH STAIRWELL	SAG 02	1	130	250 X 150	Europair	DD + OBD						
	NORTH STAIRWELL	SAG 05	1	210	300 x 250	Europair	DD + OBD						
	LEVEL 00 SERVICE FLOOR	SAG 04	2	195	300 x 250	Europair	DD + OBD						
	NORTH-EAST CORNER ROOM	SAG 01	1	105	300 x 300	Europair	FG 15° + OBD						

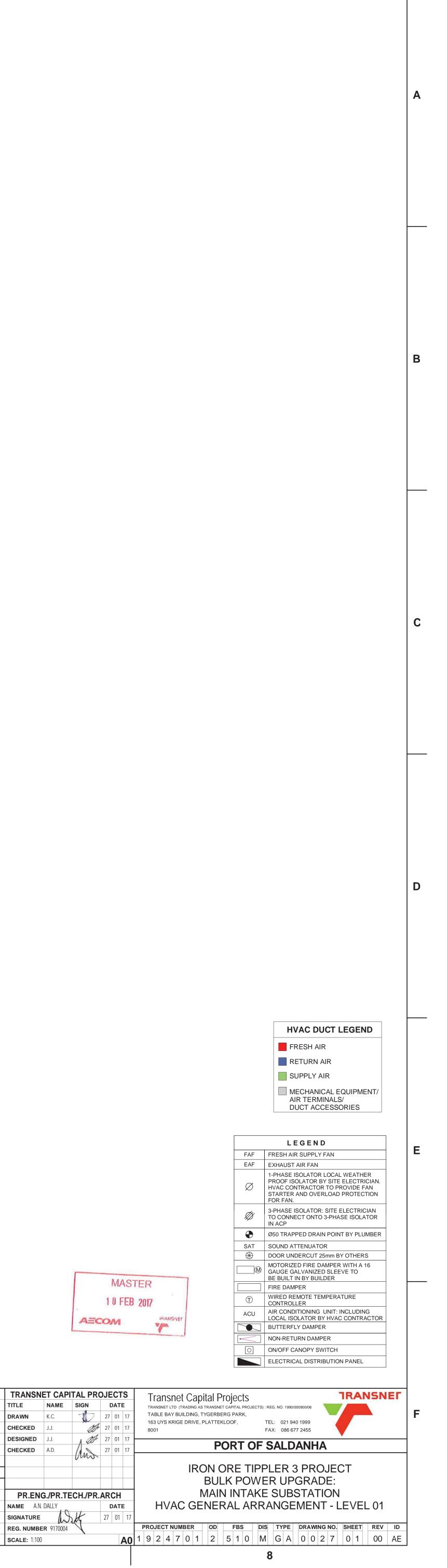


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	WFATHF		ER SCHEDUL	F	
	REF. NO.		SIZE	QTY	
	WL 01		1500x1500	1	
		EVENT	SCHEDULE		
SM	REF. NO. 10KE VENTILA	TOR	SIZE 3600x1000	QTY 2	
	MOTOTRIZ	ED FIR	E DAMPER S	CHEDULE	
	REF. NO.		SIZE	QTY	
	MFD-01 MFD-02		300-300x300 350-350x350	1 3	
	MFD-02 MFD-03		400-400x400	2	D
	MFD-04		50-500x450	1	
	MFD-05 MFD-06		500-500x500 550-550x550	1	
	MFD-07		600-650x600	4	
	MFD-08 MFD-09		650-700x650	4 3	
	MFD-10		250-250x250	1	
	MFD-11		300-400x300	1	
	Grand total: 2	22			
					-
			HVAC DUC	CT LEGEND	
			FRESH AIR		
				X AL EQUIPMENT/	
			AIR TERMIN DUCT ACCE	IALS/	
			LEGEND		
			ESH AIR SUPPLY FAN HAUST AIR FAN	N	E
		D	PHASE ISOLATOR LOG OOF ISOLATOR BY S AC CONTRACTOR TC ARTER AND OVERLO R FAN.	ITE ELECTRICIAN. D PROVIDE FAN	
		3-Р ТО	PHASE ISOLATOR: SI CONNECT ONTO 3-P ACP		
	(0 TRAPPED DRAIN P	OINT BY PLUMBER	
		T.	UND ATTENUATOR	n BY OTHERS	
MASTER		MC GA BE	DTORIZED FIRE DAMP UGE GALVANIZED SI BUILT IN BY BUILDE	PER WITH A 16 LEEVE TO	
1 0 FEB 2017			RE DAMPER RED REMOTE TEMPE	ERATURE	
AECOM		CU AIF	NTROLLER CONDITIONING UN CAL ISOLATOR BY HY		
		BU	TTERFLY DAMPER		
			N-RETURN DAMPER		
			ECTRICAL DISTRIBUT		
	apital Projects		0 1000/000000/55	TRANSNE	F
	IG AS TRANSNET CAPITAL PROJ IG, TYGERBERG PARK, VE. PLATTEKLOOF.		O. 1990/000900/06 021 940 1999		F
CHECKED J.J. # 27 01 17 8001 DESIGNED J.J. ## 27 01 17		FAX:	086 677 2455		
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			UPGRADE:		
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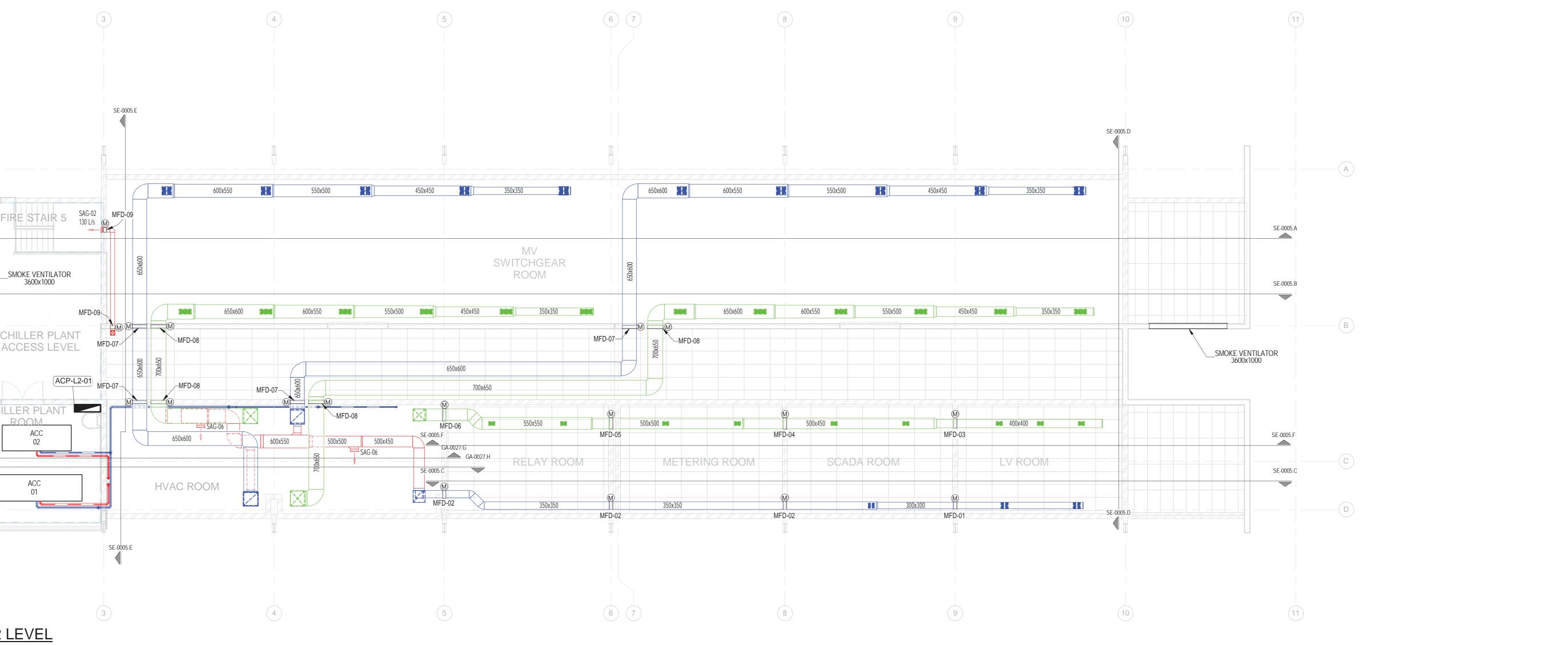


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								TITLE	NAME	SIGN	DATE	E
								OP	ERATING	DIVISIO	NS	
WATERSIDE PLACE, S TYGER WATERFRONT								TITLE	NAME	SIGN	DATE	Ε
CARL CRONJE DRIVE												
		ISSUED FOR CON	ISTRUCTION	K.C	J.J	A.D	2017-01-27					
TEL: +27 (0)21 950 750			DESCRIPTION	BY			DATE					
FAX: +27 (0)21 950 750 REG. No. 1966/006628/			REVISIO	2NC								
REG. NO. 1960/006626/												
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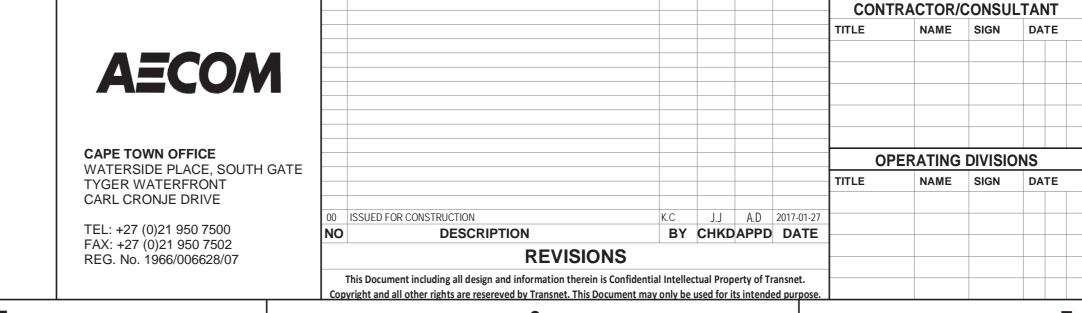


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C	SE-0005.A		SE-0005.A	
	SE-0005.B MV SE-0005.B SMOKE VENTILATOR 3600x1000		SE-0005.B	
	MFD-09 MW M M	New 650x600 New 600x550 New 550x500 New 450x450 M	BOR 350x350 BOR B	
	CHILLER PLANT ACCESS LEVEL	MFD-08	SMOKE VENTILATOR 3600x1000	
	ACP-L2-01 MFD-07 MFD-08 MFD-07 MFD-07 MFD-08 MFD-07			
	GA-0027.G GA-0027.H	500x500 M M 500x450 M M M MFD-04 MFD-03 M<	Did 400x400 Did SE-0005.F	
	ACC 01 HVAC ROOM	METERING ROOM SCADA ROOM	LV ROOM SE-0005.C	
D		350x350 MFD-02 MFD-01 // M	SE-0005.D	
	SE-0005.E			
		7) 8 9	10	
	2 02 LEVEL GA-0028 SCALE 1 : 100			
				HVAC DUCT LEGEND FRESH AIR RETURN AIR
				SUPPLY AIR MECHANICAL EQUIPMENT/ AIR TERMINALS/ DUCT ACCESSORIES
E				LEGEND FAF FRESH AIR SUPPLY FAN EAF EXHAUST AIR FAN 1-PHASE ISOLATOR LOCAL WEATHER
				Image: Solation of the second state
				IN ACP Image: Solution of the second secon
				Image: Second system DOOR UNDERCUT 25mm BY OTHERS Image: Second system MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER Image: Second system FIRE DAMPER
				MASTER Image: Wined remote temperature controller 10 FEB 2017 Air conditioning unit: including local isolator by hvac contractor Image: Butterfly damper
				AECOM VRANSNEF ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL
	<u>NOTES</u>		CONTRACTOR/CONSULT/	ANT TRANSNET CAPITAL PROJECTS Transnet Capital Projects TRANSNET
F	1. DO NOT SCALE DRAWING - ONLY DIMENSIONS SHOWN TO BE USED	AECOM	Image: Sign of the second s	DATE TITLE NAME SIGN DATE DRAWN K.C. Image: Comparison of the comparison
	2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS, DIMENSIONS AND LEVELS ON THE SITE AND NOTIFY THE NEC SUPERVISOR OF ANY VARIATIONS BEFORE CONSTRUCTION.	CAPE TOWN OFFICE	Image: Sector of the sector	DESIGNED J.J. Image: All control of the control of
1924701-2-510-M-GA-0026-01 HVAC GENERAL ARRANGEMENT - LEVEL 00 1924701-2-510-M-SD-0005-01 CHILLED WATER SCHEMATIC 1924701-2-510-M-SE-0004-01 HVAC SECTION LAYOUT		WATERSIDE PLACE, SOUTH GATE TYGER WATERFRONT CARL CRONJE DRIVE TEL: +27 (0)21 950 7500	Image: Non-Struction K.C J.J A.D 2017-01-27 NO DESCRIPTION BY CHKD APPD DATE Image: Non-Struction	DATE BULK POWER UPGRADE: PR.ENG./PR.TECH./PR.ARCH NAME AN DALLY DATE HVAC GENERAL ARRANGEMENT - LEVEL 02
Initial Initia In		FAX: +27 (0)21 950 7502 REG. No. 1966/006628/07	NO DESCRIPTION BY CHKD APPD DATE REVISIONS This Document including all design and information therein is Confidential Intellectual Property of Transnet. Copyright and all other rights are reserved by Transnet. This Document may only be used for its intended purpose.	SIGNATURE 27 01 17 REG. NUMBER 9170004 PROJECT NUMBER OD FBS DIS TYPE DRAWING NO. SHEET REV ID SCALE: 1:100 AO 1 9 2 4 7 0 1 2 5 1 0 M G A 0 0 2 8 0 1 00 AE

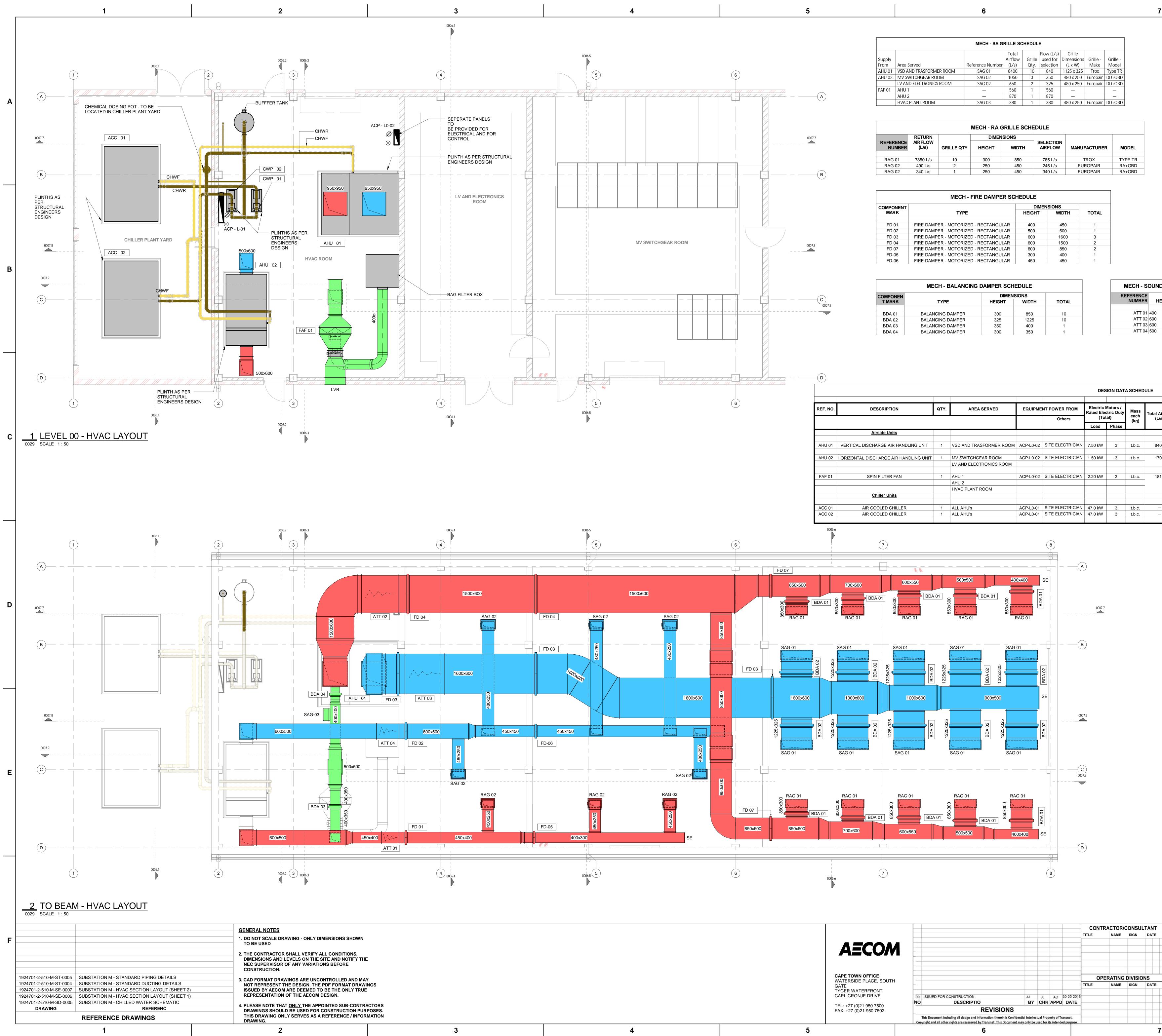
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	T LEGEND
FRESH AIR RETURN AIF	
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LEGEND FAF FRESH AIR SUPPLY FAN EAF EXHAUST AIR FAN 1-PHASE ISOLATOR LOOP	
PROOF ISOLATOR BY SI HVAC CONTRACTOR TO STARTER AND OVERLO/ FOR FAN. 3-PHASE ISOLATOR: SIT TO CONNECT ONTO 3-PI	TE ELECTRICIAN. PROVIDE FAN AD PROTECTION E ELECTRICIAN
IN ACP Ø50 TRAPPED DRAIN PC SAT SOUND ATTENUATOR DOOR UNDERCUT 25mm MOTORIZED FIRE DAMP	BY OTHERS
MASTER GAUGE GALVANIZED SL BE BUILT IN BY BUILDER Image: State of the sta	
10 FEB 2017 ACU AIR CONDITIONING UNITLOCAL ISOLATOR BY HV ▲=COM IRANSNEE ● BUTTERFLY DAMPER ● NON-RETURN DAMPER ● ON/OFF CANOPY SWITCH	AC CONTRACTOR
	ON PANEL
TITLE NAME SIGN DATE TRANSNET LTD (TRADING AS TRANSNET CAPITAL PROJECTS): REG. NO. 1990/000900/06 DRAWN K.C. 27 01 17 CHECKED J.J. UP 27 01 17 001 FAX: 086 677 2455 01 01	F
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PR.ENG./PR.TECH./PR.ARCH NAME A.N. DALLY DATE SIGNATURE 27 01 17	EVEL 02
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	MECH - SA GRILLE SCHEDULE											
			Total		Flow (L/s)	Grille						
Supply			Airflow	Grille	used for	Dimensions	Grille -	Grille -				
From	Area Served	Reference Number	(L/s)	Qty.	selection	(L x W)	Make	Model				
AHU 01	VSD AND TRASFORMER ROOM	SAG 01	8400	10	840	1125 x 325	Trox	Type TR				
AHU 02	MV SWITCHGEAR ROOM	SAG 02	1050	3	350	480 x 250	Europair	DD+OBD				
	LV AND ELECTRONICS ROOM	SAG 02	650	2	325	480 x 250	Europair	DD+OBD				
FAF 01	AHU 1	—	560	1	560	—		—				
	AHU 2	—	870	1	870	_		_				
	HVAC PLANT ROOM	SAG 03	380	1	380	480 x 250	Europair	DD+OBD				

	MECH - RA GRILLE SCHEDULE												
	RETURN		DIMEN	ISIONS									
REFERENCE NUMBER	AIRFLOW (L/s)	GRILLE QTY	HEIGHT	WIDTH	SELECTION AIRFLOW	MANUFACTURER	MODEL						
RAG 01	7850 L/s	10	300	850	785 L/s	TROX	TYPE TR						
RAG 02	490 L/s	2	250	450	245 L/s	EUROPAIR	RA+OBD						
RAG 02	340 L/s	1	250	450	340 L/s	EUROPAIR	RA+OBD						

	MECH - FIRE DAMPER SC	HEDULE		
COMPONENT		DIMEN	ISIONS	
MARK	ТҮРЕ	HEIGHT	WIDTH	TOTAL
FD 01	FIRE DAMPER - MOTORIZED - RECTANGULAR	400	450	1
FD 02	FIRE DAMPER - MOTORIZED - RECTANGULAR	500	600	1
FD 03	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	1600	3
FD 04	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	1500	2
FD 07	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	850	2
FD-05	FIRE DAMPER - MOTORIZED - RECTANGULAR	300	400	1
FD-06	FIRE DAMPER - MOTORIZED - RECTANGULAR	450	450	1

	MECH - BALANCING	DAMPER SCH	IEDULE		MECH - S	OUND ATTE	NUATOR SC	HEDULE	
COMPONEN		DIMEN	SIONS		REFERENCE	REFERENCE			
TMARK	ТҮРЕ	HEIGHT	WIDTH	TOTAL	NUMBER	HEIGHT	WIDTH	ΤΟΤΑ	
BDA 01	BALANCING DAMPER	300	850	10	ATT 0 ²	400	450	1	
BDA 02	BALANCING DAMPER	325	1225	10	ATT 02	2 600	1500	1	
BDA 03	BALANCING DAMPER	350	400	1	ATT 03	8 600	1600	1	
BDA 04	BALANCING DAMPER	300	350	1	ATT 04	500	600	1	

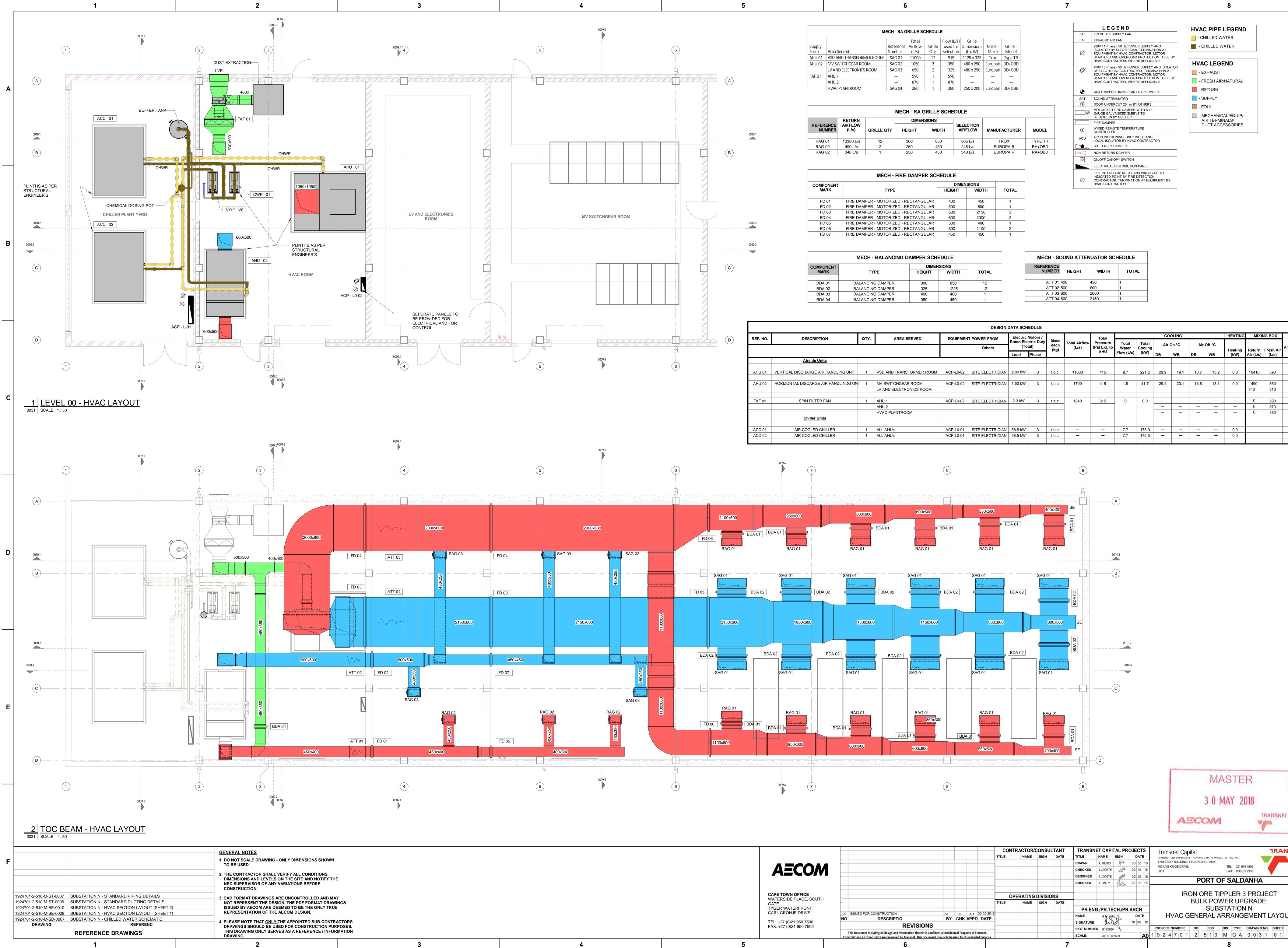
						Electric	Motors /			Tatal			coo				HEATING	МІХІ	NG BO
REF. NO.	DESCRIPTION	QTY.	AREA SERVED	EQUIPME	NT POWER FROM Others	Rated Electric (To	ctric Duty	each	Total Airflow (L/s)	Total Pressure (Pa) Ext. to	Total Water	Total Cooling	Air (On ℃	Air	Off °C			
						Load	Phase	(kg)	, ,	` ÁHU	Flow (L/s)	(1,1,1,1)	DB	WB	DB	WB	Heating (kW)	Return Air (L/s)	
	Airside Units																		
AHU 01	VERTICAL DISCHARGE AIR HANDLING UNIT	1	VSD AND TRASFORMER ROOM	ACP-L0-02	SITE ELECTRICIAN	7.50 kW	3	t.b.c.	8400	425	7.5	170.9	29.9	19.2	13.7	13.2	0.0	7840	56
AHU 02	HORIZONTAL DISCHARGE AIR HANDLING UNIT	1	MV SWITCHGEAR ROOM	ACP-L0-02	SITE ELECTRICIAN	1.50 kW	3	t.b.c.	1700	425	1.8	40.8	29.4	20.1	13.6	13.1	0.0	490 340	56
FAF 01	SPIN FILTER FAN	1	AHU 1	ACP-L0-02	SITE ELECTRICIAN	2.20 kW	3	t.b.c.	1810	190	0	0.0	_		_		_	0	56
			AHU 2 HVAC PLANT ROOM															0 0	870 380
	Chiller Units																		
ACC 01	AIR COOLED CHILLER	1	ALL AHU's	ACP-L0-01	SITE ELECTRICIAN	47.0 kW	3	t.b.c.		_	6.2	142			_		0.0		
ACC 02	AIR COOLED CHILLER	1	ALL AHU's	ACP-L0-01	SITE ELECTRICIAN	47.0 kW	3	t.b.c.			6.2	142	_				0.0		

HVAC CONTRACTOR, WHERE APPLICABLE 400V / 3 Phase / 50 Hz POWER SUPPLY AND ISOLATC BY ELECTRICAL CONTRACTOR, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR. MOTOR		LEGEND
 2007 / 1 Phase / 50 Hz POWER SUPPLY AND ISOLATOR BY ELECTRICIAN, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR, MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY HVAC CONTRACTOR, WHERE APPLICABLE 400V / 3 Phase / 50 Hz POWER SUPPLY AND ISOLATC BY ELECTRICAL CONTRACTOR, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR, MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY HVAC CONTRACTOR, WHERE APPLICABLE Ø50 TRAPPED DRAIN POINT BY PLUMBER SAT SOUND ATTENUATOR DOOR UNDERCUT 25mm BY OTHERS MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER FIRE DAMPER FIRE DAMPER WIRED REMOTE TEMPERATURE CONTROLLER AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY 	FAF	FRESH AIR SUPPLY FAN
 ISOLATOR BY ELECTRICIAN, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY HVAC CONTRACTOR, WHERE APPLICABLE 400V / 3 Phase / 50 Hz POWER SUPPLY AND ISOLATO BY ELECTRICAL CONTRACTOR, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY HVAC CONTRACTOR, WHERE APPLICABLE Ø50 TRAPPED DRAIN POINT BY PLUMBER SAT SOUND ATTENUATOR DOOR UNDERCUT 25mm BY OTHERS MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER FIRE DAMPER FIRE DAMPER FIRE DAMPER GUAR CONTROLLER ALR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY 	EAF	EXHAUST AIR FAN
BY ELECTRICAL CONTRACTOR, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY HVAC CONTRACTOR, WHERE APPLICABLE Image: Solid contractor of the second contractor of t	Ø	ISOLATOR BY ELECTRICIAN, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY
SAT SOUND ATTENUATOR Image: Door Undercut 25mm by others Image: Door Undercut 25mm by builder Image: Door Undercut 25mm by others	Ø	EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY
 DOOR UNDERCUT 25mm BY OTHERS MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER FIRE DAMPER FIRE DAMPER WIRED REMOTE TEMPERATURE CONTROLLER AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER NON-RETURN DAMPER ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY 	•	Ø50 TRAPPED DRAIN POINT BY PLUMBER
MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER FIRE DAMPER T WIRED REMOTE TEMPERATURE CONTROLLER ACU AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY	SAT	SOUND ATTENUATOR
Image: Second Structure Gauge Galvanized Sleeve to Be Built in By Builder Image: Fire Damper Fire Damper Image: Second Structure Controller Acu Air Conditioning Unit: Including Local Isolator By Hvac Contractor Image: Second Structure Second Structure Image: Second Structure Second Structure <tr< th=""><th>\otimes</th><th>DOOR UNDERCUT 25mm BY OTHERS</th></tr<>	\otimes	DOOR UNDERCUT 25mm BY OTHERS
① WIRED REMOTE TEMPERATURE CONTROLLER ACU AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR ● BUTTERFLY DAMPER ● NON-RETURN DAMPER ● ON/OFF CANOPY SWITCH ● ELECTRICAL DISTRIBUTION PANEL ● FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY		GAUGE GALVANIZED SLEEVE TO
CONTROLLER ACU AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER NON-RETURN DAMPER ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY		FIRE DAMPER
ACO LOCAL ISOLATOR BY HVAC CONTRACTOR BUTTERFLY DAMPER Image: Non-Return Damper Image: On/OFF CANOPY SWITCH Image: Electrical Distribution Panel Image: Fire Interlock: Relay and Wiring UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY	Ť	
Image: Non-Return Damper Image: On/OFF CANOPY SWITCH Image: Electrical Distribution Panel Image: Fire Interlock: Relay and Wiring UP to Indicated Point By Fire Detection Contractor, termination at Equipment By	ACU	
O ON/OFF CANOPY SWITCH ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY		BUTTERFLY DAMPER
ELECTRICAL DISTRIBUTION PANEL FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY	~	NON-RETURN DAMPER
FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY	0	ON/OFF CANOPY SWITCH
INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY		ELECTRICAL DISTRIBUTION PANEL
	\otimes	INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY

HVAC PIPE LEGEND
- CHILLED WATER
- CHILLED WATER
HVAC LEGEND
- EXHAUST
- FRESH AIR/NATURAL
- RETURN
- SUPPLY
- FOUL
- MECHANICAL EQUIP/ AIR TERMINALS/ DUCT ACCESSORIES



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TITLE	NAME	SIGN		DATE	Ξ	TRANSNET LTD (TRADING AS TRANSNET CAPITAL PROJE	ECTS) : REG. NO.		
DRAWN	A. JULIUS	Alat	30	05	18	TABLE BAY BUILDING, TYGERBERG PARK,			
CHECKED	J. JOOSTE	M.	30	05	18	163 UYS KRIGE DRIVE, 8001	TEL: 021 940 1999 FAX: 086 677 2455		
DESIGNED	J. JOOSTE	M.	30	05	18				4
CHECKED	A. DALLY	And	30	05	18	PORTO	F SALDANHA		
						BULK POV	PPLER 3 PRO		
PR.EN	G./PR.TE	CH./PR.	AR	СН			STATION M		
NAME	A.N. RA	ALLY	1	DATI		HVAC GENERAL A	RRANGEMEN	T LAYOUT	
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						-						LEGEND	HVAC PIPE LEGEND
		M	ECH - SA G	KILLE SC		E					FAF	FRESH AIR SUPPLY FAN	
				Total		Flow (L/s)	Grille				EAF	EXHAUST AIR FAN	- CHILLED WATER
upply rom Area	Served		Reference Number		Grille Qty.	,	Dimensions (L x W)	Grille - Make	Grille - Model		Ø	230V / 1 Phase / 50 Hz POWER SUPPLY AND ISOLATOR BY ELECTRICIAN, TERMINATION AT EQUIPMENT BY HVAC CONTRACTOR, MOTOR	- CHILLED WATER
	AND TRANSFORM	MER ROOM	SAG 01	11000	12	915	1125 x 325	Trox	Type TR			STARTERS AND OVERLOAD PROTECTION TO BE BY	
	WITCHGEAR RO	OM	SAG 02	1050	3	350	480 x 250	Europair				HVAC CONTRACTOR, WHERE APPLICABLE	HVAC LEGEND
LV AN	ND ELECTRONICS	S ROOM	SAG 03	650	2	325	480 x 250	Europair	DD+OBD		Ø	400V / 3 Phase / 50 Hz POWER SUPPLY AND ISOLATOR BY ELECTRICAL CONTRACTOR, TERMINATION AT	- EXHAUST
AF 01 AHU	1		_	590	1	590	—	_	_			EQUIPMENT BY HVAC CONTRACTOR. MOTOR STARTERS AND OVERLOAD PROTECTION TO BE BY	
AHU	2		—	870	1	870	—	_	—			HVAC CONTRACTOR, WHERE APPLICABLE	- FRESH AIR/NATURAL
HVAC	C PLANTROOM		SAG 04	380	1	380	250 x 200	Europair	DD+OBD			Ø50 TRAPPED DRAIN POINT BY PLUMBER	- RETURN
											SAT	SOUND ATTENUATOR	- SUPPLY
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			MEC	H - RA G	RILLE	SCHEDU	ILE					MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER	- FOUL
	RETURN			DIMEN	SIONS		_					FIRE DAMPER	AIR TERMINALS/
REFERENCE NUMBER		GRILLE		EIGHT	WID ⁻		ELECTION AIRFLOW	MANUF	ACTURER	MODEL	T	WIRED REMOTE TEMPERATURE CONTROLLER	DUCT ACCESSORIES
RAG 01	10380 L/s	12		300	850	<u></u>	865 L/s		ROX	TYPE TR	ACU	AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR	
RAG 01	490 L/s	2		250 250	450		245 L/s		ROPAIR	RA+OBD		BUTTERFLY DAMPER	
RAG 02	340 L/s	1		250 250	450		340 L/s		ROPAIR	RA+OBD		NON-RETURN DAMPER	
	1		I			I				1]		ON/OFF CANOPY SWITCH	
												ELECTRICAL DISTRIBUTION PANEL	
		MEG	CH - FIRE	DAMPE	R SCH	EDULE					\otimes	FIRE INTERLOCK: RELAY AND WIRING UP TO INDICATED POINT BY FIRE DETECTION CONTRACTOR, TERMINATION AT EQUIPMENT BY	
COMPONEN	т 📃 🗌					DIN	IENSIONS					HVAC CONTRACTOR	

COMPONENT		DIMEN	SIONS	
MARK	ТҮРЕ	HEIGHT	WIDTH	TOTAL
FD 01	FIRE DAMPER - MOTORIZED - RECTANGULAR	400	450	1
FD 02	FIRE DAMPER - MOTORIZED - RECTANGULAR	500	600	1
FD 03	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	2150	3
FD 04	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	2000	2
FD 05	FIRE DAMPER - MOTORIZED - RECTANGULAR	300	400	1
FD 06	FIRE DAMPER - MOTORIZED - RECTANGULAR	600	1100	2
FD 07	FIRE DAMPER - MOTORIZED - RECTANGULAR	450	450	1

	MECH - BALANCING	DAMPER SCH	EDULE		
COMPONENT		DIME	NSIONS		
MARK	TYPE	HEIGHT	WIDTH	TOTAL	
BDA 01	BALANCING DAMPER	300	850	12	
BDA 02	BALANCING DAMPER	325	1225	12	
BDA 03	BALANCING DAMPER	400	400	1	
BDA 04	BALANCING DAMPER	350	450	1	

REF. NO.	DE
	<u>Ai</u>
AHU 01	VERTICAL DISCH

REF. NO.	DESCRIPTION	QTY.	AREA SERVED	FOLIIPMEN	T POWER FROM	Electric	Motors /			Total			CO	OLING			HEATING	MIXING BOX		1
		Q (1).			Others	Rated Elec (Tot		each	Total Airflow (L/s)		Total Water	Total	Air	On °C	Air	Off °C				Floor Area (m
					Others	-	, Phase	(kg)	(1/3)	AHU	Flow (L/s)	Cooling (kW)	DB	WB	DB	WB	Heating (kW)	Return Air (L/s)	Fresh Air (L/s)	
	Airside Units																			
AHU 01	VERTICAL DISCHARGE AIR HANDLING UNIT	1	VSD AND TRANSFORMER ROOM	ACP-L0-02	SITE ELECTRICIAN	9.80 kW	3	t.b.c.	11000	415	9.7	221.2	29.9	19.1	13.7	13.2	0.0	10410	590	192
AHU 02	HORIZONTAL DISCARGE AIR HANDLINDG UN	Т 1	MV SWITCHGEAR ROOM	ACP-L0-02	SITE ELECTRICIAN	1.50 kW	3	t.b.c.	1700	415	1.9	41.7	29.4	20.1	13.6	13.1	0.0	490	560	103
AI 10 02			LV AND ELECTRONICS ROOM			1.00 KW	5	1.0.0.		413	1.5	41.7	23.4	20.1	13.0	13.1	0.0	340	310	55
FAF 01	SPIN FILTER FAN	1	AHU 1	ACP-L0-02	SITE ELECTRICIAN	2.3 kW	3	t.b.c.	1840	315	0	0.0			-			0	590	N/A
			AHU 2										_	_		_	_	0	870	N/A
	Chiller Units		HVAC PLANTROOM											_		_	-	0	380	82
ACC 01	AIR COOLED CHILLER	1	ALL AHU's	ACP-L0-01	SITE ELECTRICIAN	58.5 kW	3	t.b.c.	_	_	7.7	175.3	_			_	0.0			
ACC 02	AIR COOLED CHILLER	1	ALL AHU's	ACP-L0-01	SITE ELECTRICIAN	58.5 kW	3	t.b.c.	—	—	7.7	175.3		_	—	_	0.0			

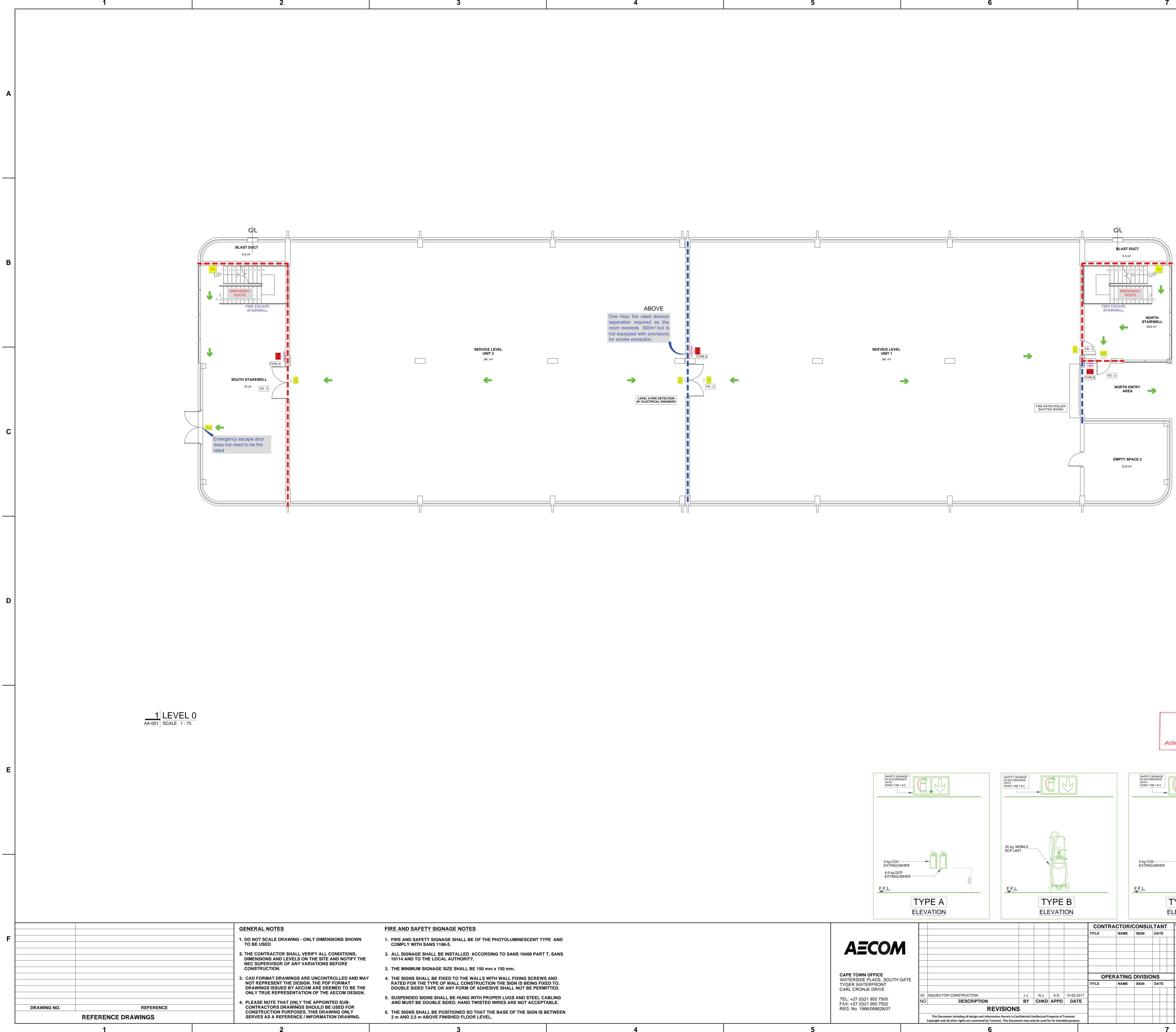
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WATERSIDE PLACE, SOUTH GATE							TITLE	NAME	SIGN	DATE	
TYGER WATERFRONT											_
CARL CRONJE DRIVE	00	ISSUED FOR CONSTRUCTION	AJ	JJ	AD	30-05-2018					
TEL: +27 (0)21 950 7500	NC	DESCRIPTIO	BY	CHK	APPD	DATE					
FAX: +27 (0)21 950 7502		REVISIO	ONS								_
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IGHT	WIDTH	TOTAL
	450	1
	600	1
	2000	1
	2150	1



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TITLE	NAME	SIGN	[DATE		TRANSNET LTD (TRADING AS TRANSNET CAPITAL PROJECTS): REG. NO.							
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CHECKED	J. JOOSTE	Øð+	30	05	18	163 UYS KRIGE DRIVE, TEL: 021 940 1999 8001 FAX: 086 677 2455							
DESIGNED	J. JOOSTE	DF-	30	05	18								
CHECKED	A. DALLY	And	30	05	18	PORT OF SALDANHA							
						IRON ORE TIPPLER 3 PROJECT BULK POWER UPGRADE:							
PR.EN	G./PR.TE	CH./PR	.AR	СН		SUBSTATION N							
NAME	A.N. RA	ALLY	1	DATE		HVAC GENERAL ARRANGEMENT LAYOUT							
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		LIFT SHAFT ENCLOSURES		EXIT ENCLOSURES		
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		$rac{1}{2}$ Hour ceiling fire seperation	_	$1\frac{1}{2}$ Hour fire rated construction		
		1 ¹ / ₂ HOUR INTUMESCENT PAINT	X	DOUBLE SIDED HANGING SIGN	ſ	
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480	FD-2	CLASS B, 2 HOUR FIRE RATED, SELF	CLOSIN	IG FIRE DOOR		
TYPE C	FD-3	CLASS C, 2 HOUR FIRE RATED, SELF	CLOSIN	IG PLANT ROOM DOOR		
LEVATION	FD-4	CLASS E, 1/2 HOUR FIRE RATED, SEI	F CLOS	ING FIRE DOOR		
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	17	8001		FAX: 086 677 2455		
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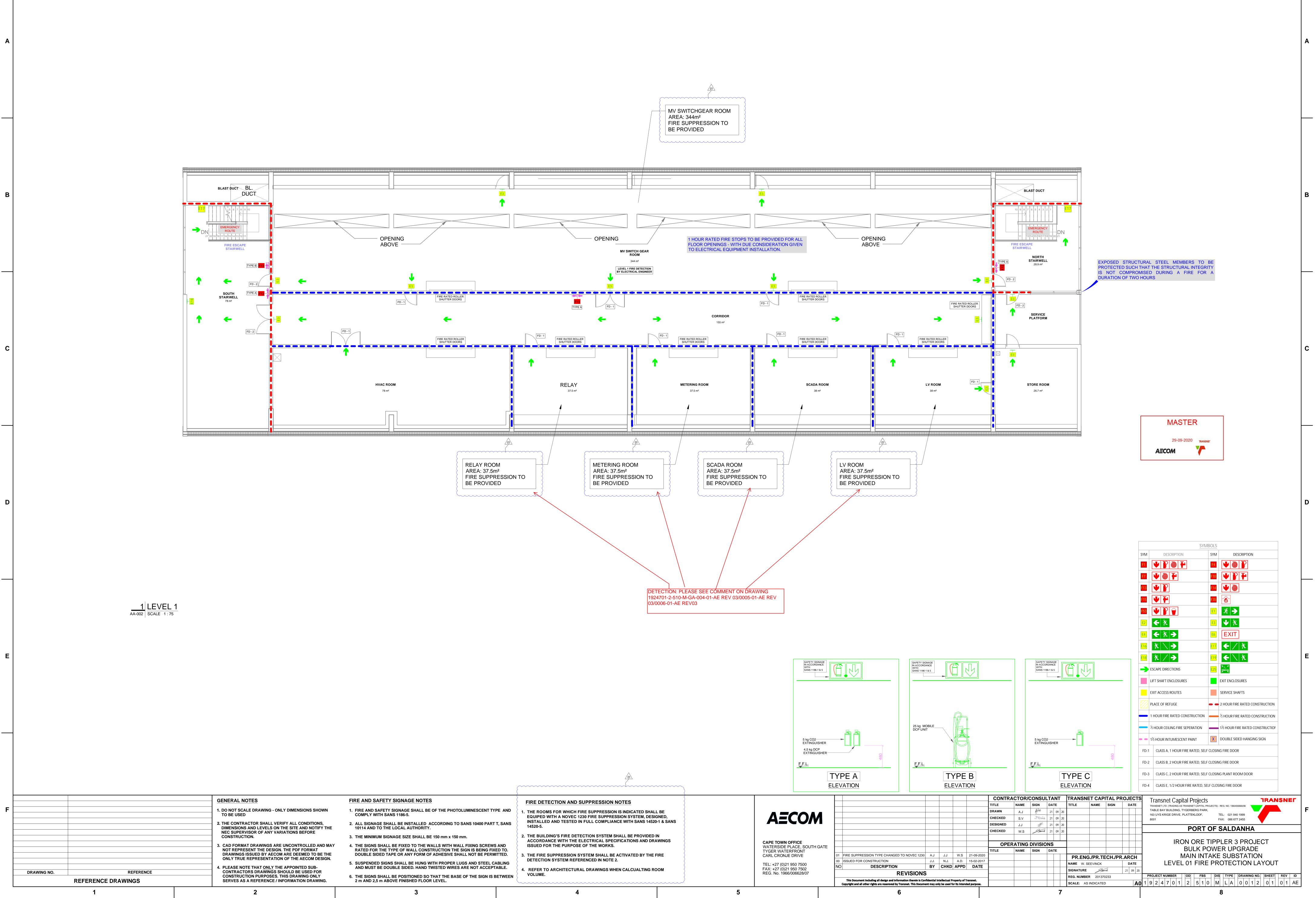
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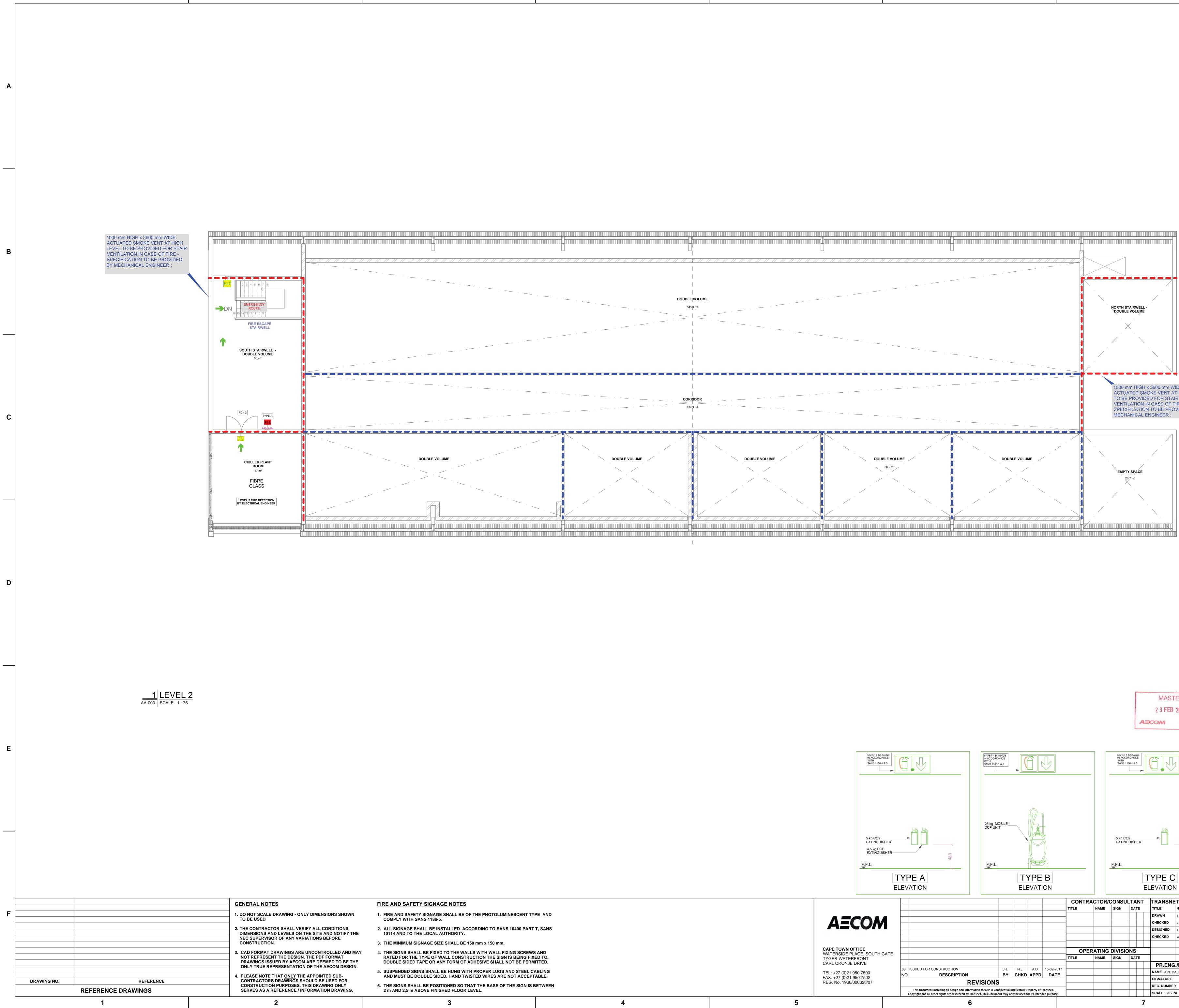
SYM

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SYM DESCRIPTION



FIRE AND SAFETY SIGNAGE NOTES	FIRE DETECTION AND SUPPRESSION NOTES
1. FIRE AND SAFETY SIGNAGE SHALL BE OF THE PHOTOLUMINESCENT TYP COMPLY WITH SANS 1186-5.	PE AND 1. THE ROOMS FOR WHICH FIRE SUPPRESSION IS INDICATED SHALL BE EQUIPED WITH A NOVEC 1230 FIRE SUPPRESSION SYSTEM, DESIGNED,
2. ALL SIGNAGE SHALL BE INSTALLED ACCORDING TO SANS 10400 PART 10114 AND TO THE LOCAL AUTHORITY.	T, SANS INSTALLED AND TESTED IN FULL COMPLIANCE WITH SANS 14520-1 & SANS 14520-5.
3. THE MINIMUM SIGNAGE SIZE SHALL BE 150 mm x 150 mm.	2. THE BUILDING'S FIRE DETECTION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS AND DRAWINGS
4. THE SIGNS SHALL BE FIXED TO THE WALLS WITH WALL FIXING SCREWS RATED FOR THE TYPE OF WALL CONSTRUCTION THE SIGN IS BEING FIXE	AND ISSUED FOR THE PURPOSE OF THE WORKS.
DOUBLE SIDED TAPE OR ANY FORM OF ADHESIVE SHALL NOT BE PERMI	TTED. 3. THE FIRE SUPPRESSION SYSTEM SHALL BE ACTIVATED BY THE FIRE DETECTION SYSTEM REFERENCED IN NOTE 2.
5. SUSPENDED SIGNS SHALL BE HUNG WITH PROPER LUGS AND STEEL CA AND MUST BE DOUBLE SIDED. HAND TWISTED WIRES ARE NOT ACCEPT	BLING
6. THE SIGNS SHALL BE POSITIONED SO THAT THE BASE OF THE SIGN IS B 2 m AND 2,5 m ABOVE FINISHED FLOOR LEVEL.	VOLUME
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	SYM	DESCRIPTION	SYM	DESCRIPTION		
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	E	EXIT ACCESS ROUTES		SERVICE SHAFTS		
	F	PLACE OF REFUGE		2 HOUR FIRE RATED CONSTRUCTION		
		1 HOUR FIRE RATED CONSTRUCTION	_	¹ / ₂ HOUR FIRE RATED CONSTRUCTION		
2	;	HOUR CEILING FIRE SEPERATION		1 ¹ / ₂ HOUR FIRE RATED CONSTRUCTION		
	1	1 ¹ / ₂ HOUR INTUMESCENT PAINT	X	DOUBLE SIDED HANGING SIGN		
480	FD-1	CLASS A, 1 HOUR FIRE RATED, SELF	CLOSIN	G FIRE DOOR		
44	FD-2	CLASS B, 2 HOUR FIRE RATED, SELF	CLOSIN	G FIRE DOOR		
TYPE C	FD-3	CLASS C, 2 HOUR FIRE RATED, SELF	CLOSIN	G PLANT ROOM DOOR		
LEVATION	FD-4	CLASS E, 1/2 HOUR FIRE RATED, SEL	F CLOS	ING FIRE DOOR		
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SYMBOLS

SYM DESCRIPTION

SYM DESCRIPTION

1000 mm HIGH x 3600 mm WIDE ACTUATED SMOKE VENT AT HIGH LEVEL TO BE PROVIDED FOR STAIR VENTILATION IN CASE OF FIRE -SPECIFICATION TO BE PROVIDED BY



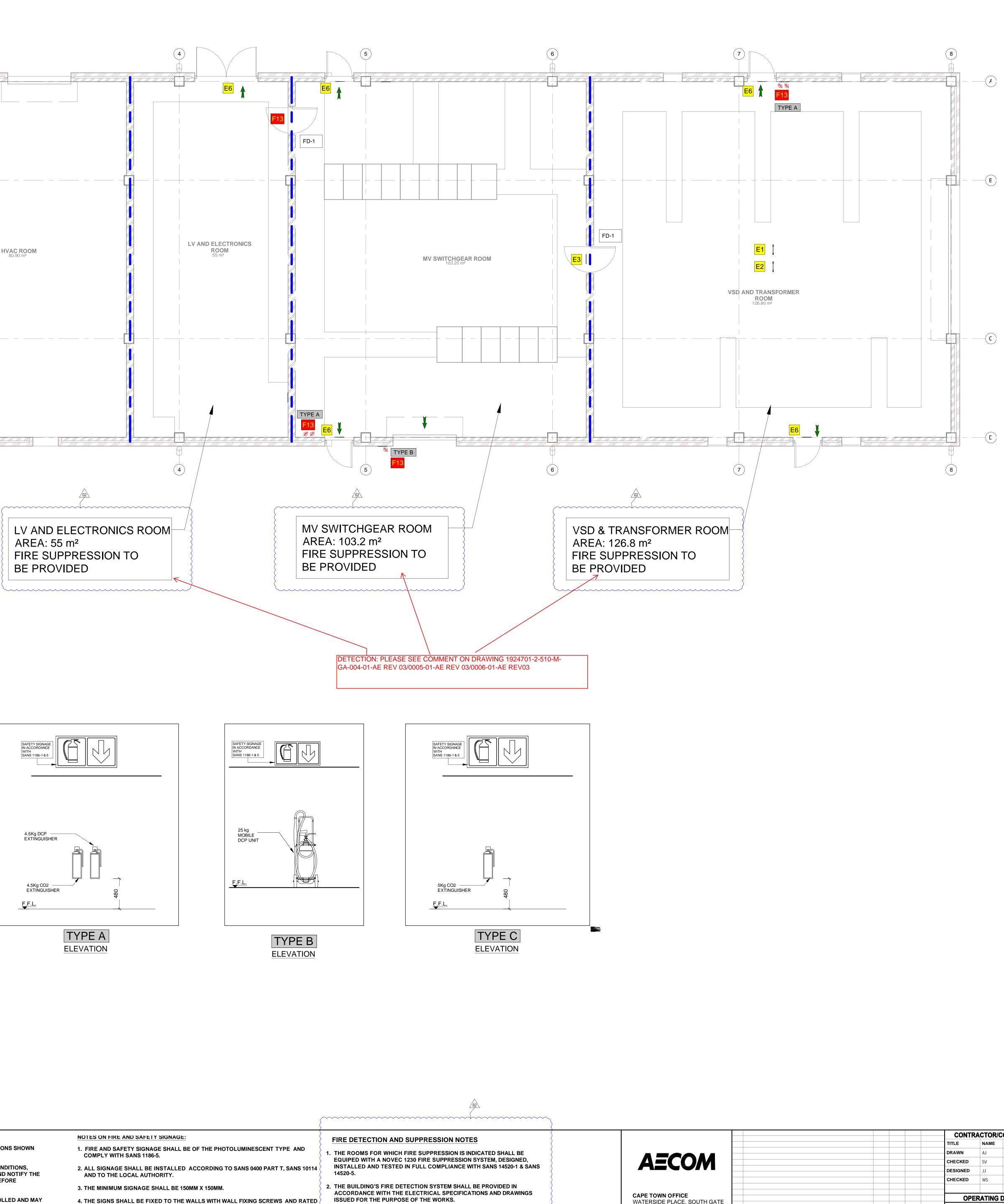




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		GENERAL NOTES
		1. DO NOT SCALE DRAWING - ONLY DIMENSIONS SHOWN TO BE USED
		2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS, DIMENSIONS AND LEVELS ON THE SITE AND NOTIFY THE NEC SUPERVISOR OF ANY VARIATIONS BEFORE CONSTRUCTION.
		3. CAD FORMAT DRAWINGS ARE UNCONTROLLED AND MAY NOT REPRESENT THE DESIGN. THE PDF FORMAT DRAWINGS ISSUED BY AECOM ARE DEEMED TO BE THE ONLY TRUE REPRESENTATION OF THE AECOM DESIGN.
DRAWING NO.	REFERENCE	4. PLEASE NOTE THAT ONLY THE APPOINTED SUB-CONTRACTORS DRAWINGS SHOULD BE USED FOR CONSTRUCTION PURPOSES.
RE	FERENCE DRAWINGS	THIS DRAWING ONLY SERVES AS A REFERENCE / INFORMATION DRAWING.

4. THE SIGNS SHALL BE FIXED TO THE WALLS WITH WALL FIXING SCREWS AND RATED ISSUED FOR THE PURPOSE OF THE WORKS. FOR THE TYPE OF WALL CONSTRUCTION THE SIGN IS BEING FIXED TO. DOUBLE SIDED TAPE OR ANY FORM OF ADHESIVE SHALL NOT BE PERMITTED. 5. SUSPENDED SIGNS SHALL BE HUNG WITH PROPER LUGS AND STEEL CABLING AND MUST BE DOUBLE SIDED. HAND TWISTED WIRES ARE NOT ACCEPTABLE.

6. THE SIGNS SHALL BE POSITIONED SO THAT THE BASE OF THE SIGN IS BETWEEN 2M AND 2,5M ABOVE FINISHED FLOOR LEVEL.

3. THE FIRE SUPPRESSION SYSTEM SHALL BE ACTIVATED BY THE FIRE

4. REFER TO ARCHITECTURAL DRAWINGS WHEN CALCUALTING ROOM VOLUME.

DETECTION SYSTEM REFERENCED IN NOTE 2.

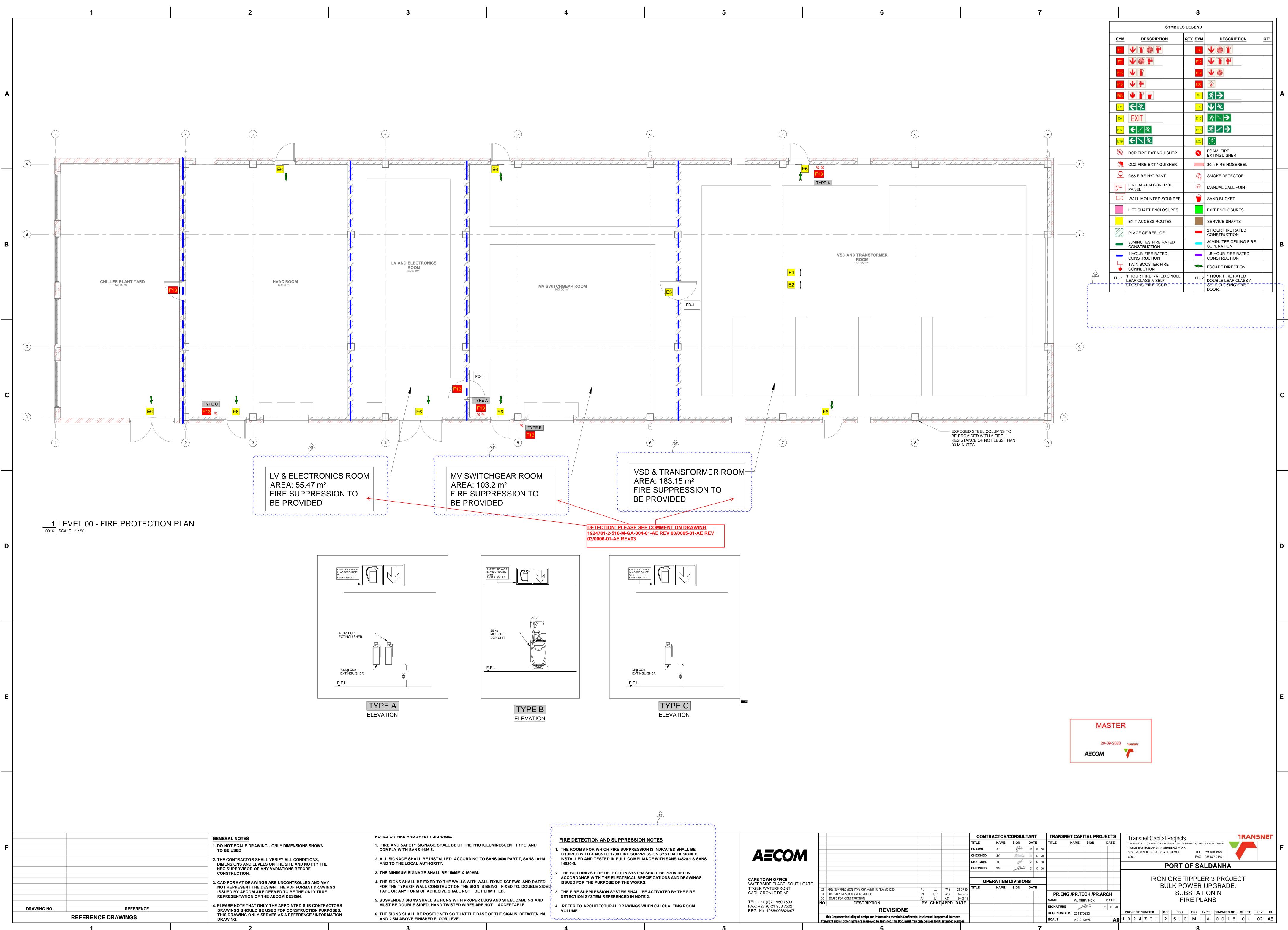
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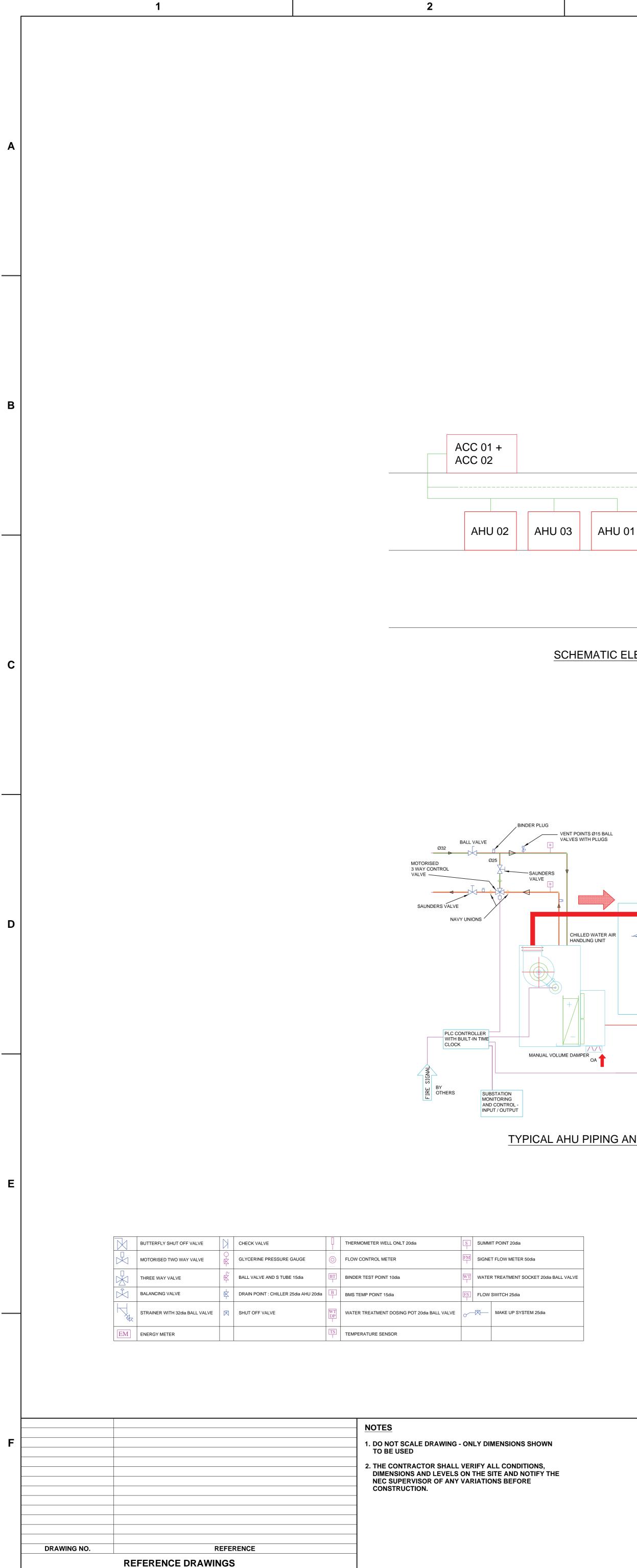


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			CO2 FIRE EXTINGUISHER		•	EXTINGUISHER 30m FIRE HOSEREEL	
		FAC	Ø65 FIRE HYDRANT FIRE ALARM CONTROL		کو ج	SMOKE DETECTOR	
		P	PANEL WALL MOUNTED SOUNDER			SAND BUCKET	
			LIFT SHAFT ENCLOSURES				
			EXIT ACCESS ROUTES			EXIT ENCLOSURES	+
		<u> </u>				2 HOUR FIRE RATED	+
			PLACE OF REFUGE 30MINUTES FIRE RATED			CONSTRUCTION 30MINUTES CEILING FIRE	+
			1 HOUR FIRE RATED			SEPERATION 1.5 HOUR FIRE RATED	+
			THOOR FIRE RATED CONSTRUCTION TWIN BOOSTER FIRE			CONSTRUCTION	+
	02		CONNECTION 1 HOUR FIRE RATED SINGLE			ESCAPE DIRECTION 1 HOUR FIRE RATED	+
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FCU 01 FCU 02 LEVEL 01

SCHEMATIC ELEVATION

CHILLED WATER AIR HANDLING UNIT SUPPLY AIR DIFFUSERS / GRILLES RETURN AIR

TYPICAL AHU PIPING AND CONTROL SCHEMATIC - 3-WAY VALVE

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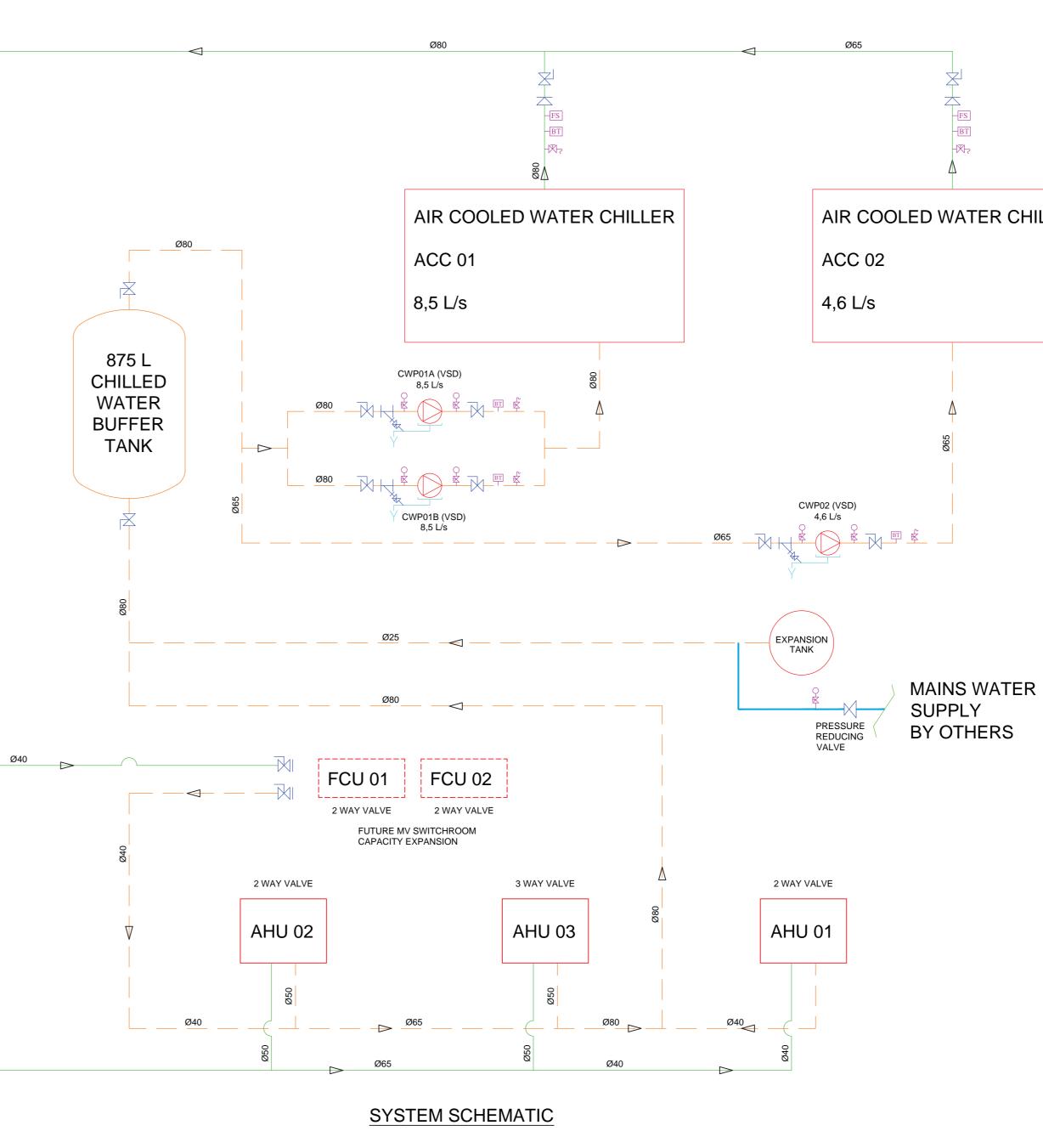
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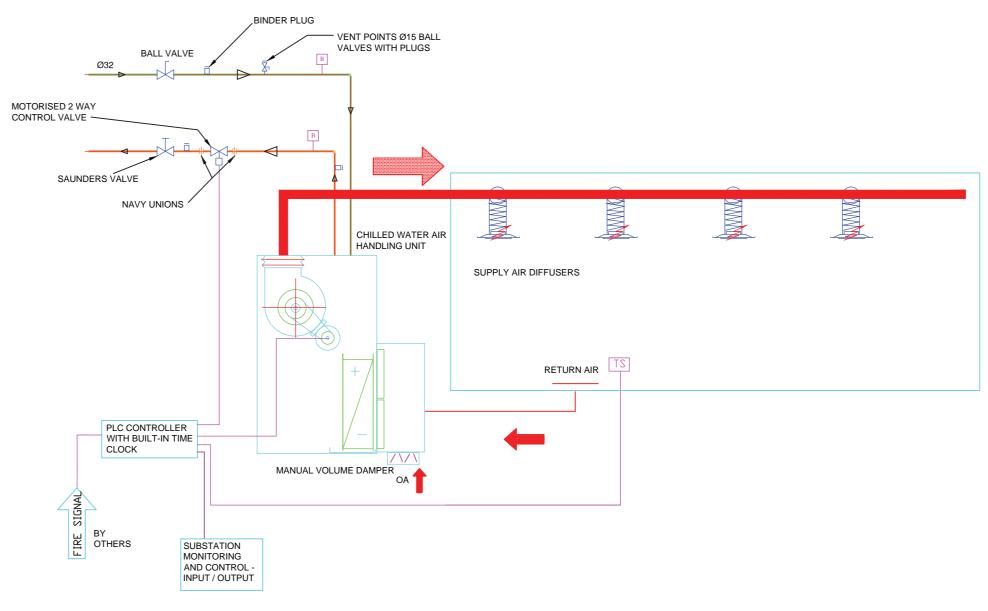
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LEVEL 02 FUTURE MV SWITCHROOM CAPACITY EXPANSION ۲----γ

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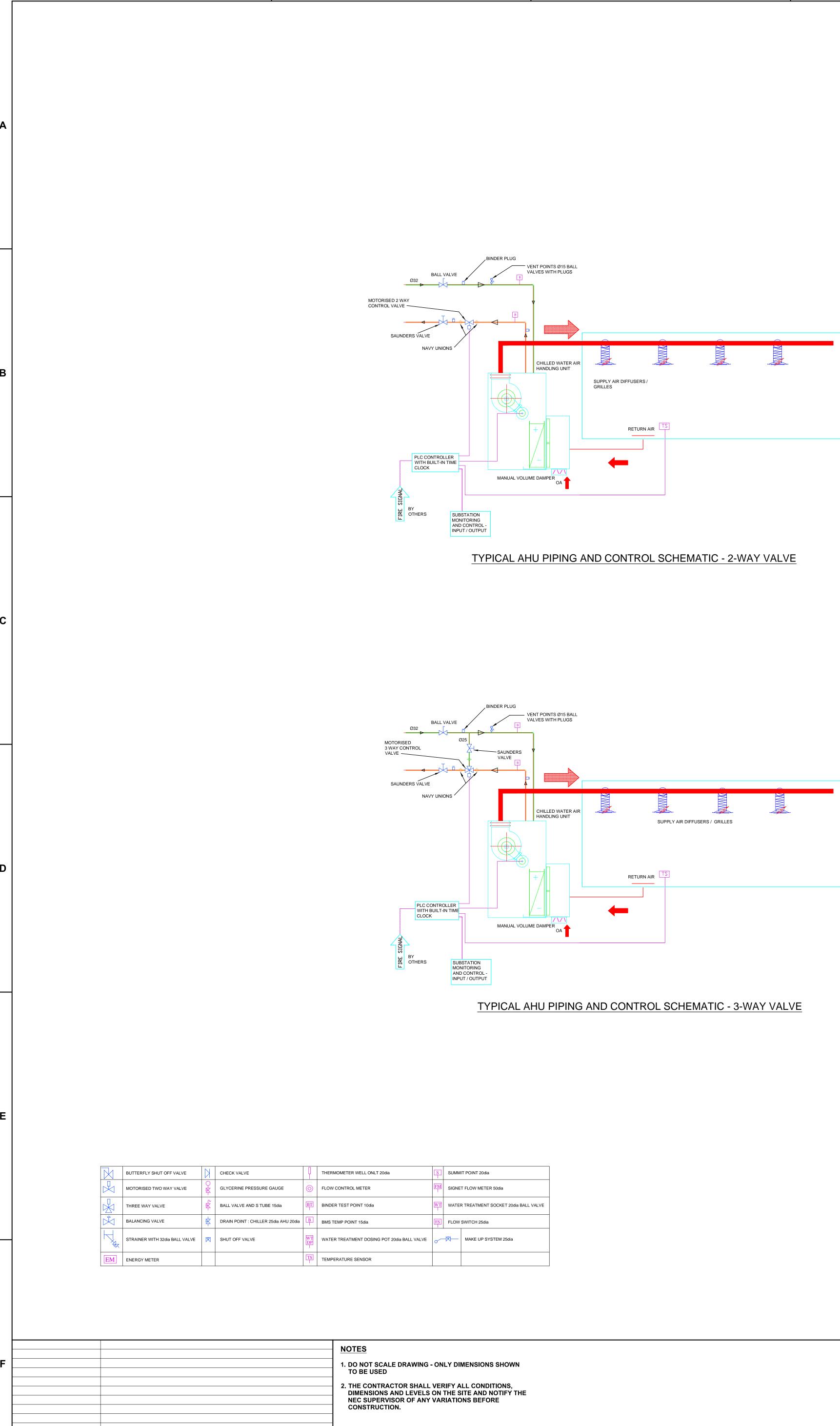


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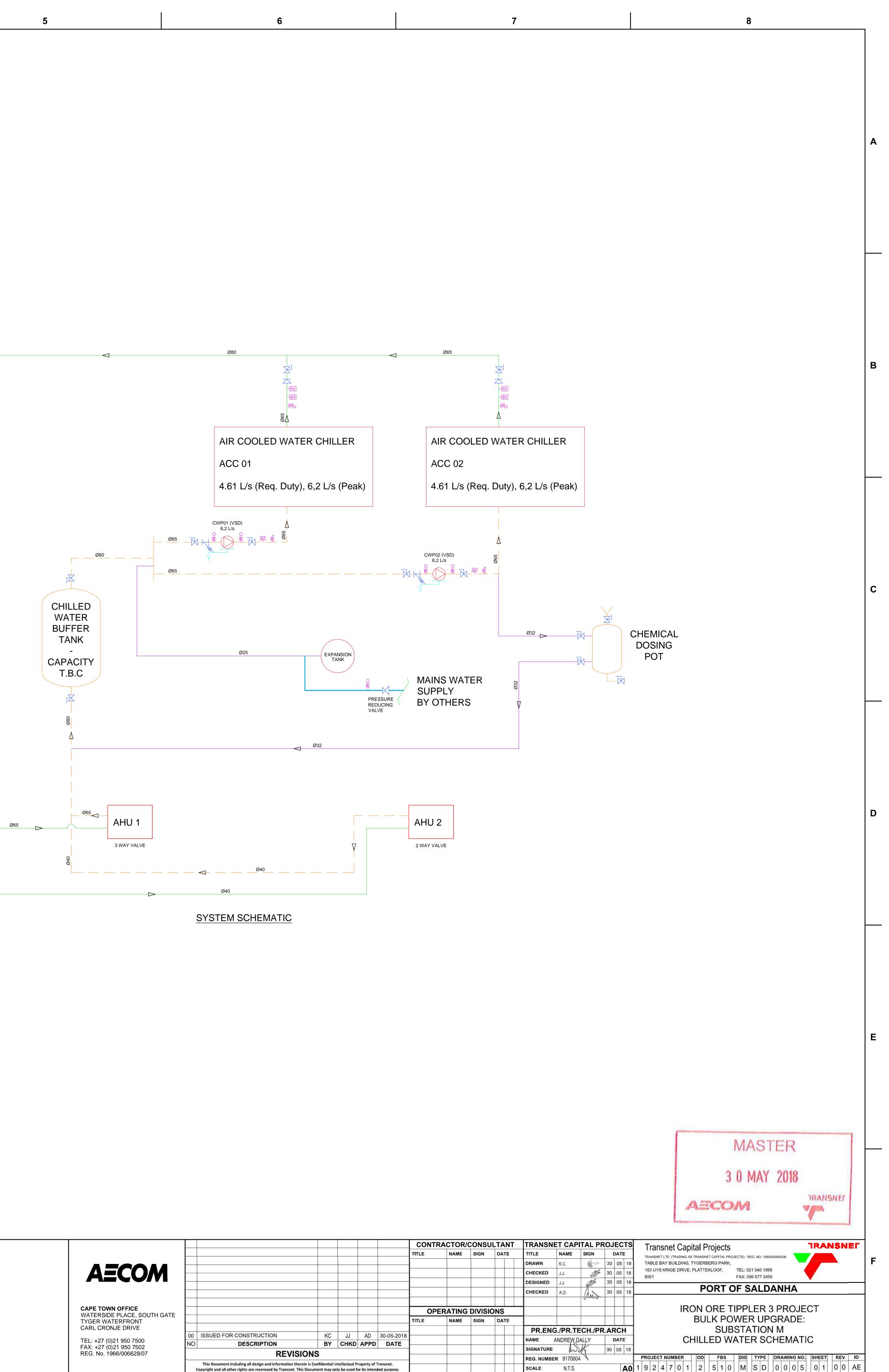
SUBSTATION M - HVAC GENERAL ARRANGEMENT LAYOUT

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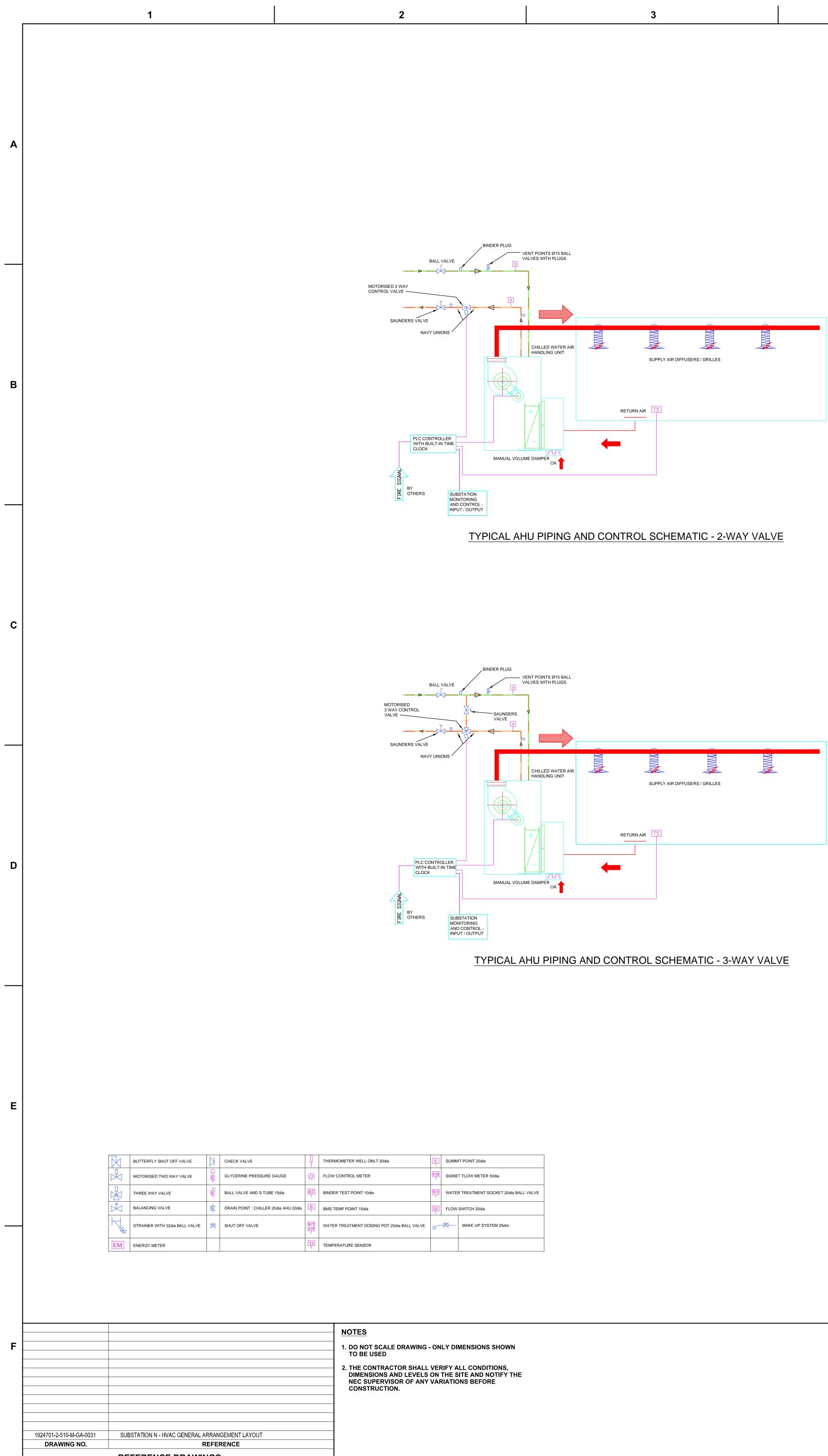
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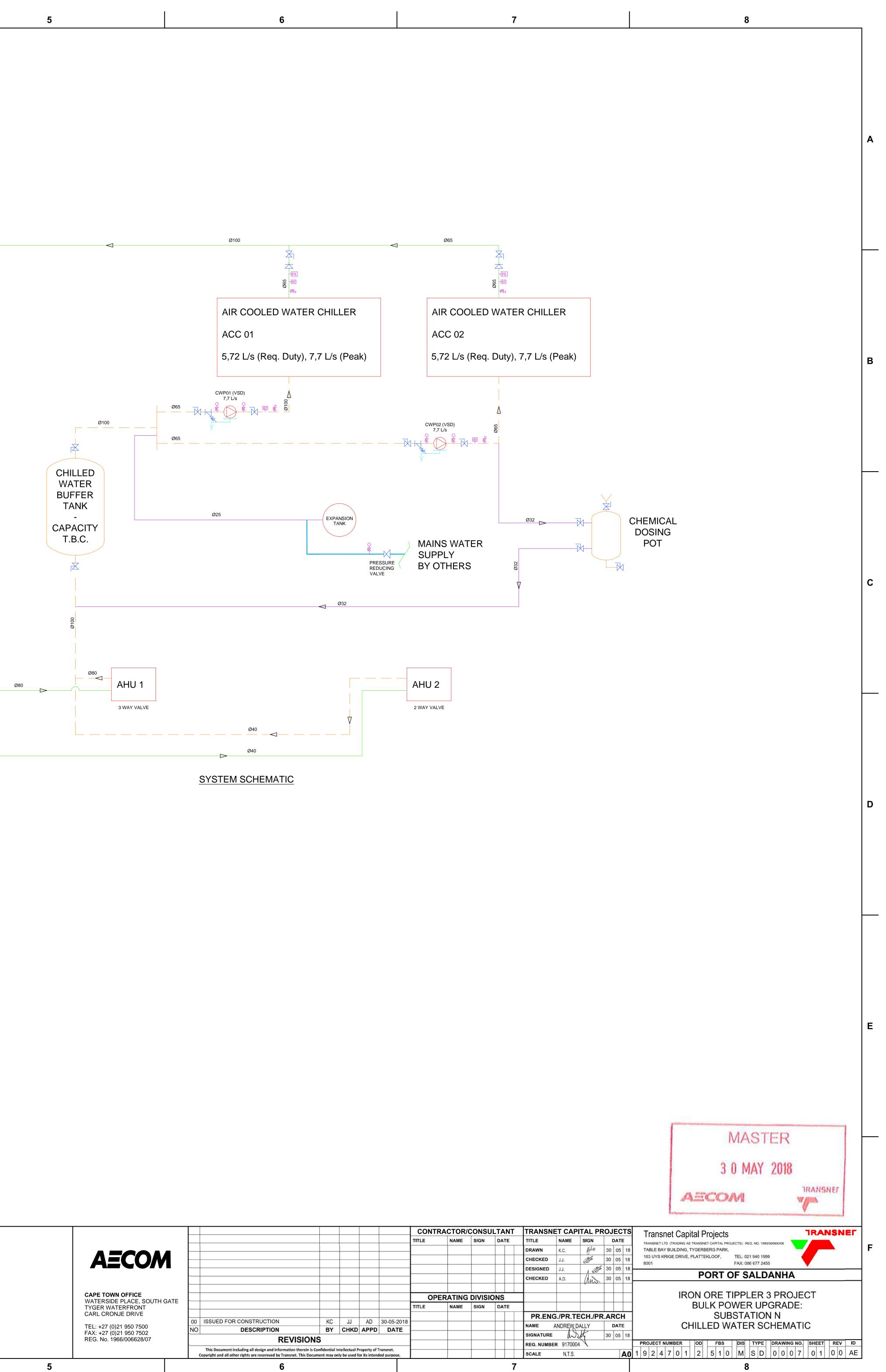


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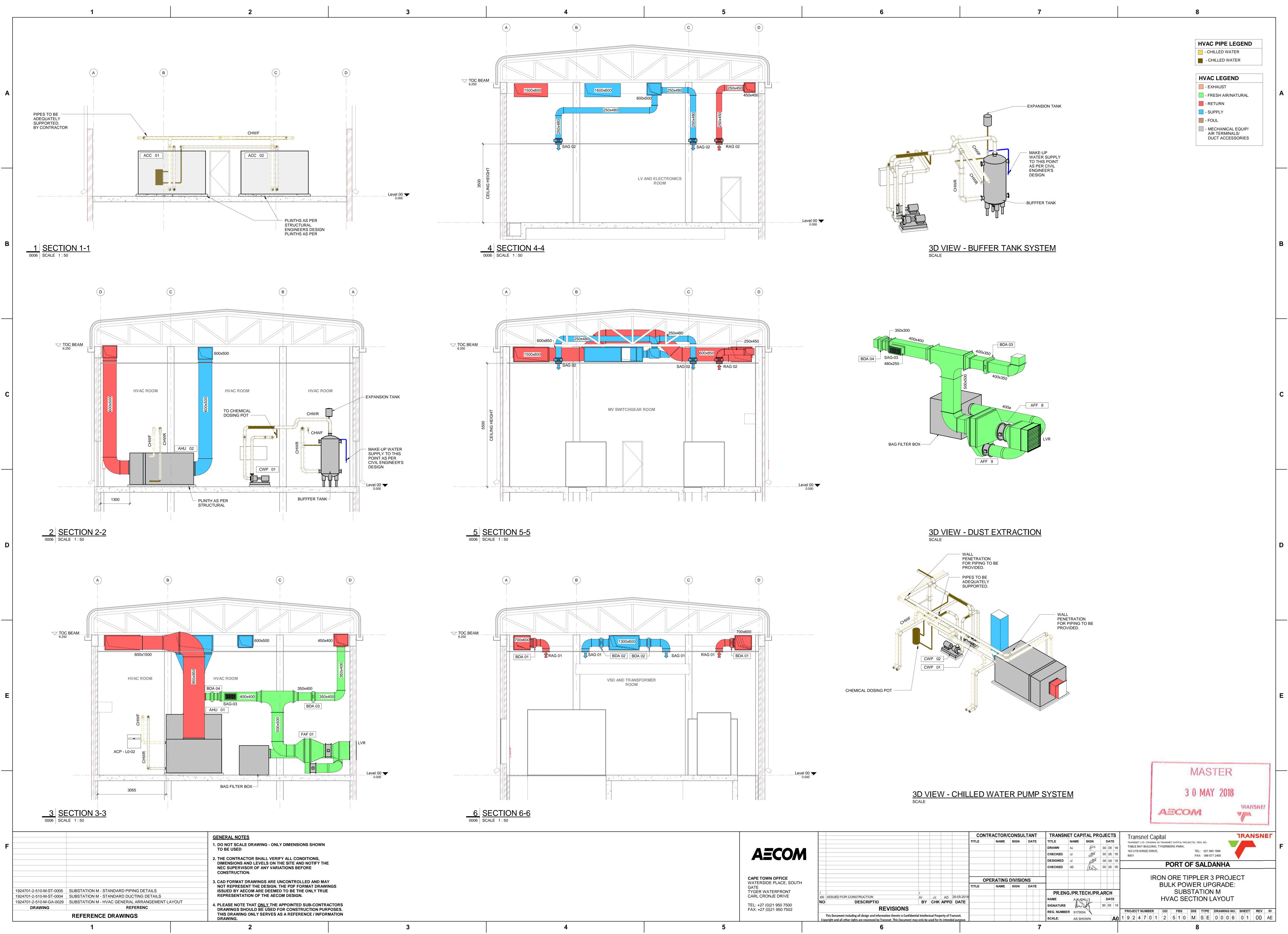
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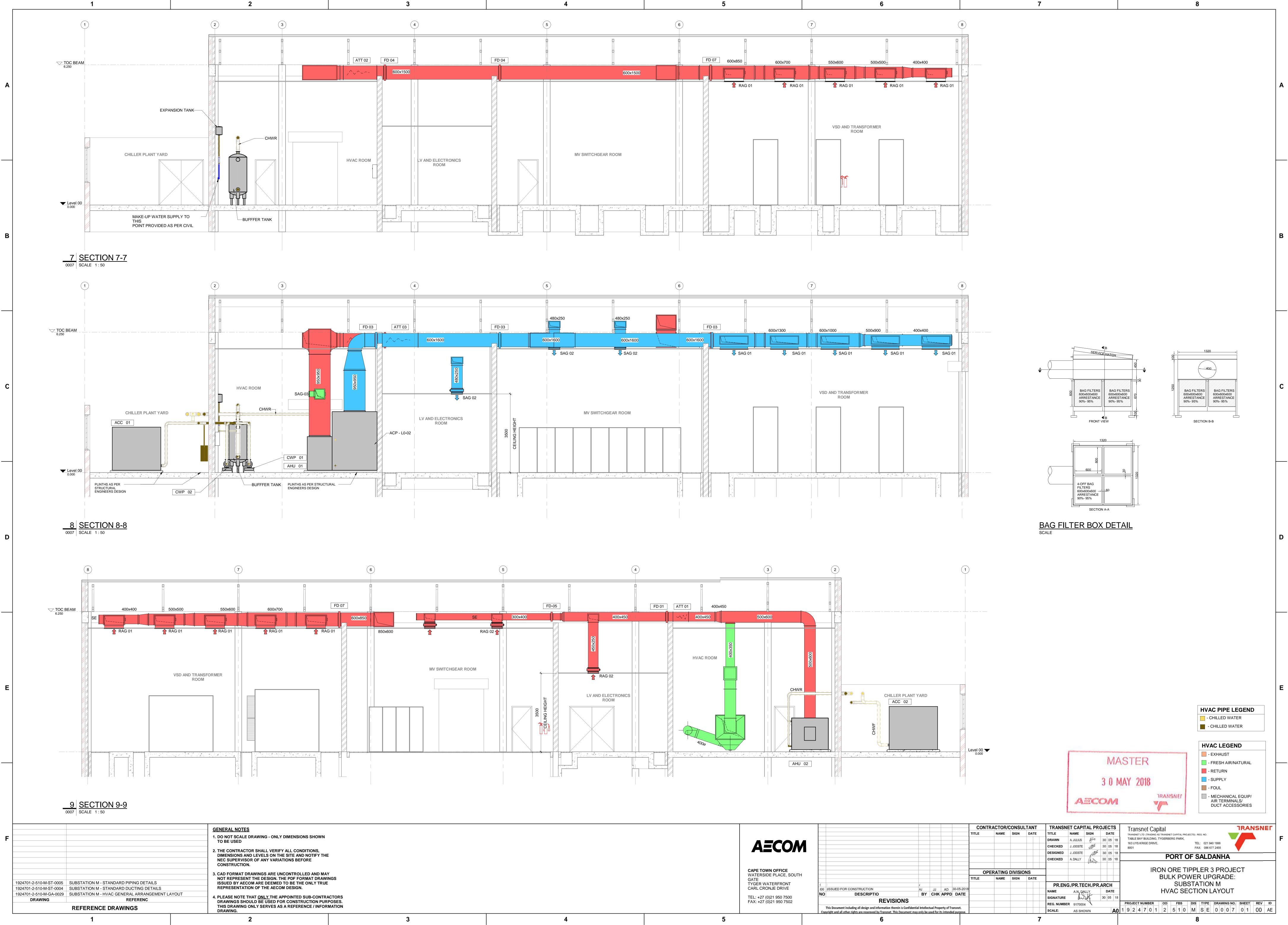


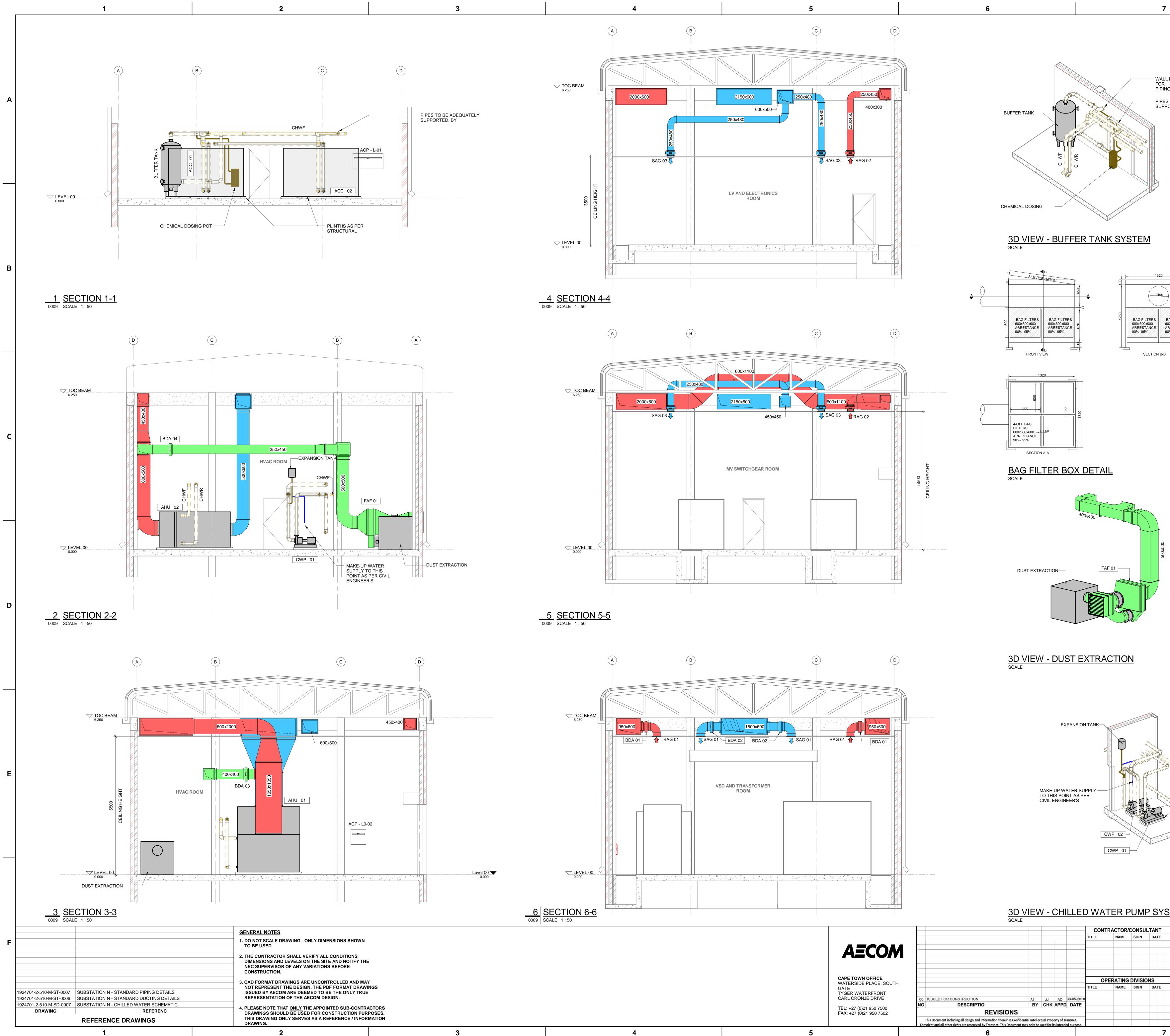
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		HVAC DUCT LEGEND	
		FRESH AIR	
		SUPPLY AIR MECHANICAL EQUIPMENT/ AIR TERMINALS/ DUCT ACCESSORIES	
		LEGEND	E
		FAF FRESH AIR SUPPLY FAN EAF EXHAUST AIR FAN I-PHASE ISOLATOR LOCAL WEATHER PROOF ISOLATOR BY SITE ELECTRICIAN. HVAC CONTRACTOR TO PROVIDE FAN	
		STARTER AND OVERLOAD PROTECTION FOR FAN. 3-PHASE ISOLATOR: SITE ELECTRICIAN TO CONNECT ONTO 3-PHASE ISOLATOR	
		IN ACP Ø50 TRAPPED DRAIN POINT BY PLUMBER SAT SOUND ATTENUATOR DOOR UNDERCUT 25mm BY OTHERS	
	MASTER	MOTORIZED FIRE DAMPER WITH A 16 GAUGE GALVANIZED SLEEVE TO BE BUILT IN BY BUILDER FIRE DAMPER	
	1 0 FEB 2017	① WIRED REMOTE TEMPERATURE CONTROLLER ACU AIR CONDITIONING UNIT: INCLUDING LOCAL ISOLATOR BY HVAC CONTRACTOR ● BUTTERFLY DAMPER	
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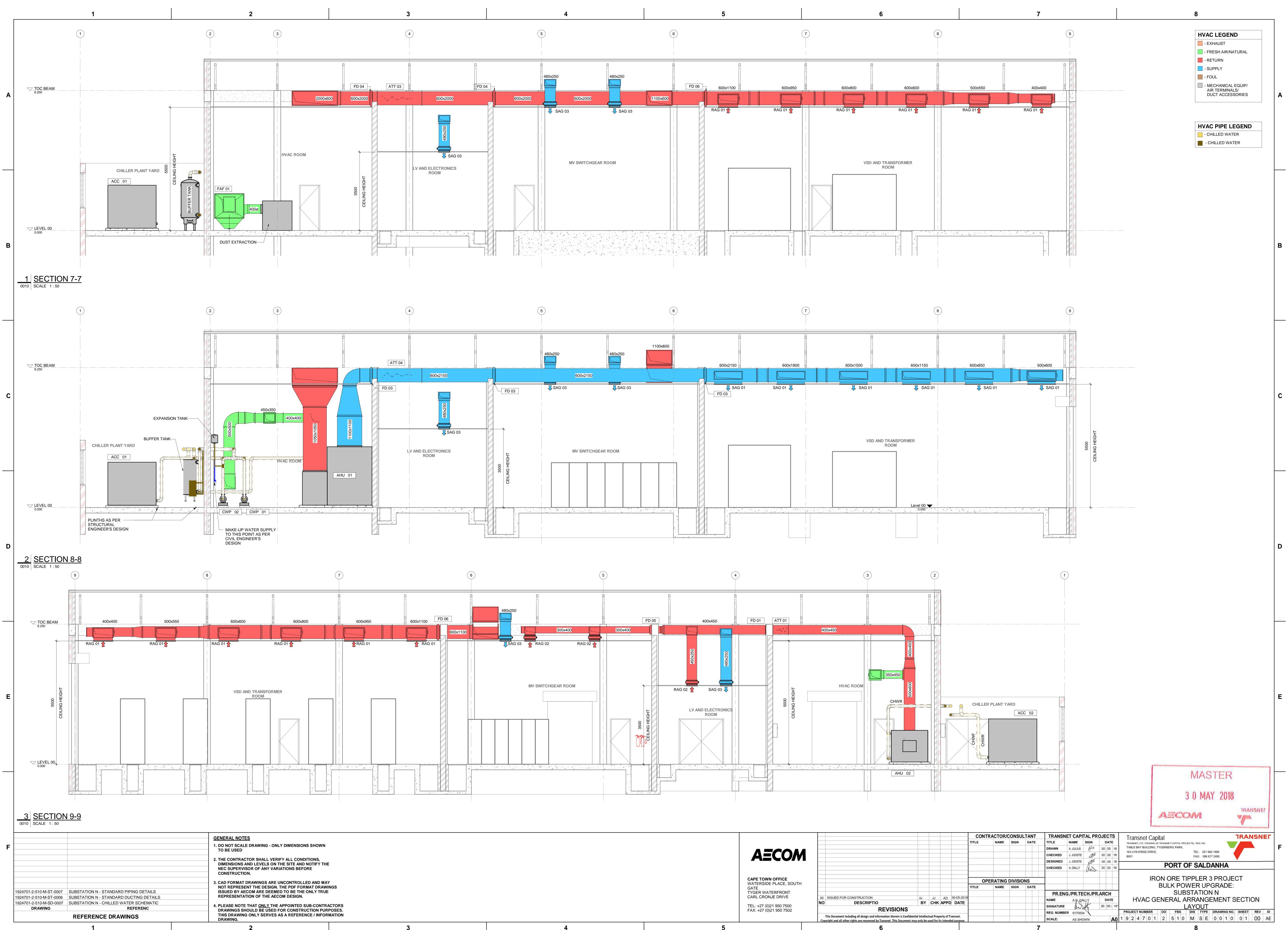






HVAC LEGEND - EXHAUST - FRESH AIR/NATURAL - RETURN - SUPPLY - FOUL - WALL PENETRATION FOR - MECHANICAL EQUIP/ AIR TERMINALS/ DUCT ACCESSORIES PIPING TO BE PIPES TO BE ADEQUATELY SUPPORTED. BY HVAC PIPE LEGEND - CHILLED WATER - CHILLED WATER BAG FILTERS
600x600x600
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90%- 95%BAG FILTERS
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90%- 95% SECTION B-B PLINTHS AS PER STRUCTURAL MASTER 3 0 MAY 2018 TRANSNEL AECOM VA

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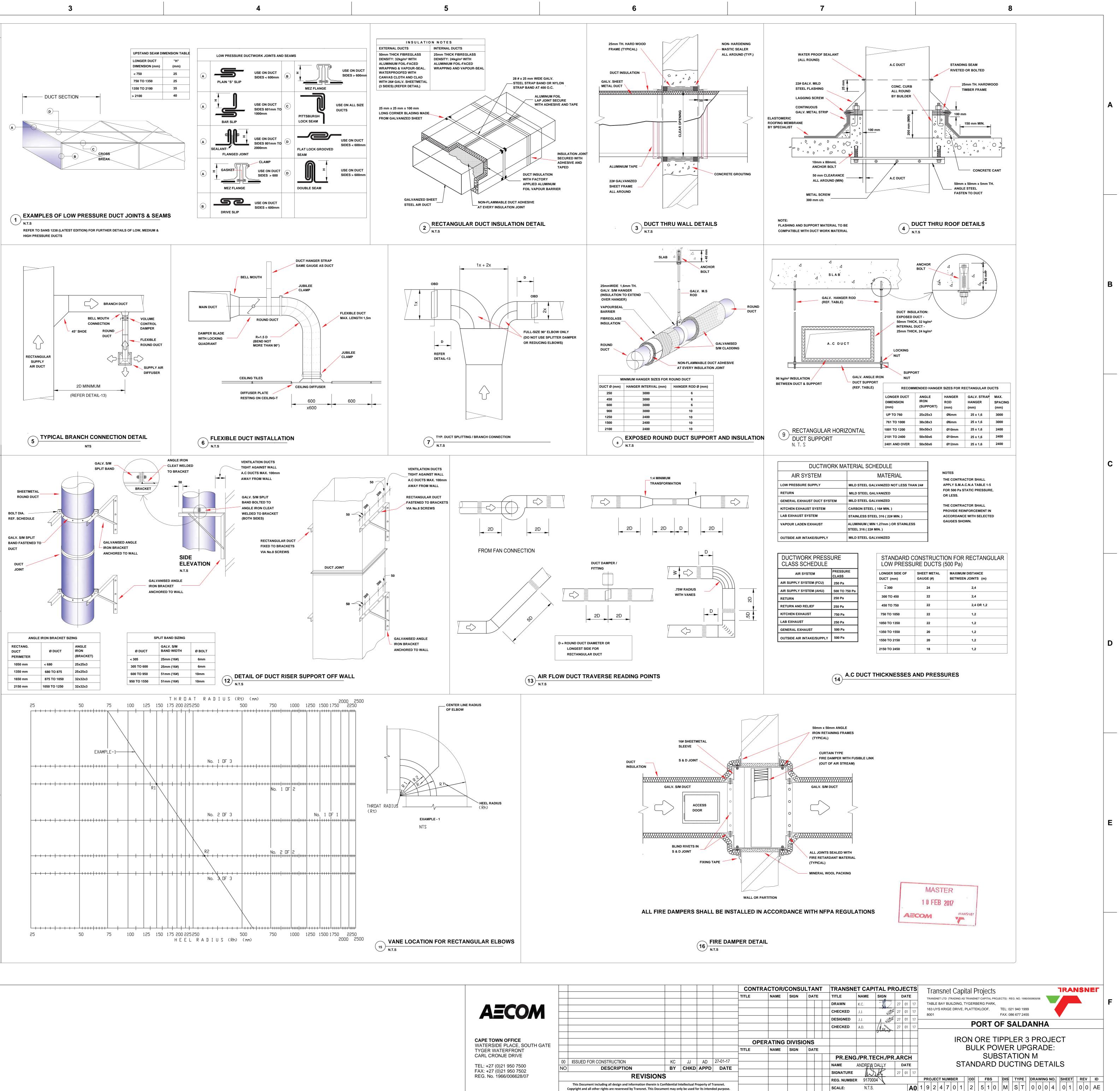


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		STANDARD DUCTING NOTES THIS IS A GENERIC LEGEND AND NOT ALL ITEMS MAY BE APPLICABLE TO THIS SPECIFIC HVAC CONTRACT.	LEGE	
		1. THE ENTIRE HVAC SYSTEM TO COMPLY WITH THE PROJECT TECHNICAL SPECIFICATION, WHICH THIS DRAWING FORMS PART OF.	°C	THERMOSTAT DEGREE CENTIGRADE LITRES PER SECOND
		2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED. SIZES SHOWN FOR THE DUCTS ARE CLEAR INTERNAL DIMENSIONS. 3. CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORKS.	-	- DOOR AIR CURTAIN - DRY BULB
Α		ANY DISCREPANCY TO BE REPORTED TO THE EMPLOYER. 4. ALL HEATING, VENTILATION AND AIR CONDITIONING DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL PROJECT NOTES AND SPECIFICATIONS, AS ISSUED BY AECOM, AND	EAD - E/A	- EXHAUST AIR DUCT - EXHAUST AIR
		RELEVANT ARCHITECTURAL, ELECTRICAL AND STRUCTURAL DRAWINGS 5. CAPACITIES, DIMENSIONS AND LOCATIONS OF HEATING, VENTILATION AND AIR CONDITIONING EQUIPMENT ARE BASED ON EQUIPMENT MODELS INDICATED IN HVAC EQUIPMENT CATALOGUES	EG	ELECTRIC DUCT HEATER EXHAUST AIR GRILLE
		SCHEDULES AND DRAWINGS. 6. ACCESS TO ALL HVAC EQUIPMENT AND ACCESSORIES SHALL BE AS PER DRAWINGS AND MANUFACTURERS' REQUIREMENTS.		 EXTERNAL STATIC PRESSURE EXHAUST FAN FRESH AIR DUCT
		7. ALL WATER PROOFING OF PENETRATIONS AND COUNTER FLASHINGS TO BE DONE BY SPECIALIST SUB-CONTRACTOR, TO BE APPOINTED BY CONTRACTOR.	-	- FAN COIL UNIT - PASCAL
		 8. STATIC PRESSURES FOR ALL THE FANS MUST BE VERIFIED PRIOR TO ORDERING THE FANS. 9. ALL THE TOILET DOORS TO BE UNDERCUT 25mm, OR PROVIDED WITH DOOR GRILLES. 	kw qty.	- KILO WATT - QUANTITY
		10. ALL MATERIALS EXPOSED TO THE AIRFLOW WITHIN THE CEILING CAVITY PLENUM SHALL BE NON COMBUSTIBLE OR LIMITED COMBUSTIBLE, WITH A MAXIMUM SMOKE DEVELOPMENT INDEX OF 50. 11. FINAL LOCATIONS & DIMENSIONS OF CONCRETE UPSTANDS FOR THE HVAC EQUIPMENT AND	R/A	- RETURN AIR - RETURN AIR GRILLE
		HVAC PIPING SHALL BE CHECKED ON SITE TO SUIT HVAC EQUIPMENT SPECIFIED. 12. ALL THE EXTERNAL SUPPORT BRACKETS, SHALL BE HOT DIP GALVANISED BEFORE INSTALLATION	RLG N. RWG	RETURN LINEAR GRILLERETURN WALL GRILLE
		13. WHERE DUCTS AND PIPES PASS THROUGH WALLS, SLEEVES SHALL BE PROVIDED, AND SEALED WITH AN APPROPRIATE FIRE RATED SEALANT TO PROVIDE AN AIR-TIGHT INSTALLATION. 14. ALL EQUIPMENT DUTIES ARE GIVEN AS RATED DESIGN DUTIES WITH AIR VOLUMES CORRECTED	S/A SAF	- SUPPLY AIR - SUPPLY FAN
		FOR SITE ELEVATION ABOVE SEA LEVEL. 15. DIRECTION ARROWS AND IDENTIFICATION BANDS ARE TO BE PLACED EVERY TWO METER INTERVAL 0 OVER THE MENN ATION FOR ALL OFFICIES	SCG SCD	SUPPLY CEILING GRILLE SUPPLY CEILING DIFFUSER
-		INTERVALS OVER THE INSULATION FOR ALL SERVICES. 16. ALL BENDS / ELBOWS WHICH HAVE A THROAT RADIUS LESS THAN 3/4 OF THE HEEL RADIUS MUST BE VANED. REFER TO CHART BELOW.	_ S.S SWG	- STAINLESS STEEL - SUPPLY WALL GRILLE
В		17. ALL AIR DIFFUSION EQUIPMENT SHALL BE SELECTED AND INSTALLED AS PER THE SUPPLIERS' DETAILED SPECIFICATIONS, AND ALL BRANCH DUCTS / CONNECTIONS TO AIR DIFFUSERS TO BE FITTED WITH DUCT BALANCING DAMPERS, AS SHOWN ON DRAWINGS.	T/A TAG	TRANSFER AIRTRANSFER AIR GRILLE
		18. ALL AIR CONDITIONING DUCTWORK TO BE LAGGED WITH RIGID FIBERGLASS SLAB COVERED WIT REINFORCED ALUMINIUM FOIL, AND FINISHED WITH A VAPOUR SEAL BARRIER:	TAD H TEMP	- TRANSFER AIR DUCT - TEMPERATURE
		 - 25mm THICK FIBERGLASS FOR INTERNAL DUCTWORK @ 24 kg/m³ - 50mm THICK FIBERGLASS FOR EXTERNAL DUCTWORK @ 32 kg/m³, AND FINISHED WITH A WATER PROOF BARRIER. 	UC OR	- UNDER CUT (25mm) MIN. - WET BULB
		- HARD INSULATION UNDER SUPPORTS. (REFER DETAIL-10) 19. ALL THE SUPPLY SLOT DIFFUSERS & RETURN SLOT DIFFUSERS SHALL BE SIMILAR TO TROX TYPE - ALS OR APPROVED EQUIVALENT.	– W.O F.D	- WALL OPENING - FIRE DAMPER (? HOUR RATING)
		20. FINAL LOCATION OF ALL AIR DIFFUSION EQUIPMENT SHALL BE CO-ORDINATED WITH THE CEILING TILES, LIGHTING FIXTURES AND OTHER CEILING FIXTURES ON SITE.	-	- FIRE/SMOKE DAMPER (? HOUR RATING)
		21. FLEXIBLE DUCT TO ANY AIR OUTLET SHALL NOT EXCEED A LENGTH OF 1500mm, AND SHOULD BE STRAIGHT TO ACHIEVE MINIMUM AIR RESISTANCE AND NOISE. 22. ALL OUTSIDE AIR INTAKE OPENINGS SHALL BE PROVIDED WITH FILTERS UNLESS OTHERWISE	- ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	W CORE S-WAY BLOW
		NOTED ON THE HVAC DRAWINGS. OPENINGS TO BE MINIMUM 500mm ABOVE ROOF / GROUND LEVEL. 23. ALL DUCTWORK WORK RUNNING THROUGH HIGH HUMIDITY AREAS SHALL BE WRAPPED WITH	- WALL G	
		25mm THICK 32kg / m ³ DENSITY FIBERGLASS INSULATION. 24. ALL THE OUTLETS FOR SUPPLY, RETURN, TRANSFER & EXHAUST AIR SHALL BE PROVIDED WITH		TED FLEXIBLE DUCT
		VOLUME CONTROL DAMPERS. ALL DUCT CONNECTIONS FROM MAIN DUCTS TO BE PROVIDED WITH SPLITTER TYPE DAMPERS, OR AS OTHERWISE NOTED ON THE DRAWINGS. 25. ALL TRANSFER DUCTS SHALL BE PROVIDED WITH BACK DRAFT DAMPERS, IN ORDER TO PREVEN		OLATOR
С		AIR FLOW IN THE OPPOSITE DIRECTION. 26. ALL AIR DIFFUSION EQUIPMENT SHALL BE EPOXY MATT WHITE, UNLESS SPECIFIED OTHERWISE.	26# GALV. S/M CLADDING	
		 27. FINAL SIZE OF ALL THE WEATHER LOUVRES DEPEND ON THE FAN SPECIFIED. 28. BACKDRAFT DAMPERS SHALL BE SIMILAR TO TROX TYPE - ARK OR APPROVED EQUIVALENT. 29. DUCTION OF A NOTED IN MATERIAL COULD IN E CARDINATED CONSTRUCTED AND 	WRAPPED AROUND DUCTING	
		29. DUCTWORK AS NOTED IN MATERIAL SCHEDULE SHALL BE FABRICATED, CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE SMACNA STANDARD. THIS WILL INCLUDE PROVISION FOR ALL TEST POINTS TO ENABLE AIR BALANCING AND COMMISSIONING ACTIVITIES TO BE PERFORMED. (REFER TO DETAIL BELOW)		
		30. HINGED ACCESS DOORS SHALL BE PROVIDED ON THE LINK SIDE OF ALL FIRE DAMPERS AND CONTROL DAMPERS, AND GENERALLY AS RECOMMENDED BY THE SMACNA STANDARD.		A.C DUCT
		31. FILTER SPECIFICATION PRIMARY AIR FILTER MATERIAL SHALL BE CAPABLE OF BEING WASHED AT LEAST 12 TIMES, AND HAVE AVERAGE ARRESTANCE OF 80% ACCORDING TO THE ASHRAE 52 / 76 STANDARD.		A.C DUCT
		SPARE FILTERS SHALL BE PROVIDED. FILTERS TO BE HOUSED IN PURPOSE-MADE FILTER HOUSINGS WITH AIRTIGHT ACCESS DOORS. 32. KITCHEN HOOD AND DUCT DETAILS	DUC	T INSULATION
		a. THE HOOD SHALL BE CONSTRUCTED FROM AND BE SUPPORTED BY STAINLESS STEEL TYPE 430 NOT LESS THAN 1.2mm (OR) OF OTHER APPROVED MATERIAL OF EQUIVALENT STRENGTH, FIRE AND CORROSION RESISTANCE	DEN	SITY
		 b. DUCTS SHALL BE CONSTRUCTED OF AND SUPPORTED BY CARBON STEEL NOT LESS THAN 1.37mm (16#) (OR) STAINLESS STEEL NOT LESS THAN 1.2mm (18#) c. ALL BEAMS AND JOINTS SHALL HAVE LIQUID-TIGHT CONTINUOUS EXTERNAL WELDS 	10 EXPOSE	D DUCT CLADDING DETAIL
		 d. FIRE SUPPRESSION SYSTEM TO BE DONE BY SPECIALIST SUB-CONTRACTOR, TO BE APPOINTED BY CONTRACTOR. e. FIRE WALL SHALL BE 2-HOUR RATED TO ENCLOSE EXHAUST DUCT. 		
		 f. FILTERS MUST BE "UL" CLASSIFIED, STAINLESS STEEL, NON-CLOGGING BAFFLE-TYPE, AND SHOULD BE EASILY REMOVABLE g. A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EACH VERTICAL RISER, WITH PROVISIONS FOR CLEANOUT 		
D		h. AN OPENING, LARGE ENOUGH TO PERMIT CLEANING, SHALL BE PROVIDED AT EACH CHANGE IN DIRECTION OF THE DUCT, FOR THE PURPOSES OF INSPECTION AND CLEANING. SUCH OPENING SHALL BE AT THE SIDES OF THE DUCT AND AT EVERY TWO METER IN		GALVANISED SHEET WETAL DUCTWORK
		HORIZONTAL DUCTWORK.		GALVANSED SHEEL METAL DUCTWORK
		J. KITCHEN EXHAUST DUCTS SHALL BE CONSTRUCTED IN COMPLIANCE WITH NFPA STANDARDS 33. MAIN HVAC ELECTRICAL POWER SUPPLY CABLE TO BE COPPER.	-	0000
		34. ALL HEATER BANKS TO BE HOUSED IN FLANGED STEEL CASINGS FOR EASY REMOVAL AND COMPLY WITH THE FOLLOWING SAFETY REQUIREMENTS:		
		- AIR PRESSURE SWITCH / SAIL SWITCH - OVERHEAT THERMOSTAT WITH MANUAL RESET - BACK OF TERMINAL BOX TO BE INSULATED - ACCESS DOOR INTERLOCKED WITH HEATER BANK	26 GAUGE PERFORATED SH	EET
		- HEATER ELEMENTS TO BE SIZED TO SUIT NUMBER OF STEPS AND BALANCE POWER OVER THE THREE PHASES - PROPORTIONAL OUTPUT CONTROL TO BE PROVIDED	50mm TH. FIBERG	SLASS INSULATION
		 HEATER ELEMENTS TO BE INCOLOY TYPE OR APPROVED EQUIVALENT & CHOSEN FOR "BLACK HEAT" OPERATION. (HEATING INTENSITY NOT MORE THAN 3 WATTS) INSULATION SHALL BE 6mm THICK NON ASBESTOS MILL BOARD, LOCATED 300mm UPSTREAM AND 600mm DOWNSTREAM 		NSITY & MELINEX FILM - OR EQUIVALENT
		35. ALL MACHINES AND MOTORS (ABOVE 0.75 kW) SHALL INCORPORATE THE FOLLOWING:- a. HIGH EFFICIENCY MOTORS (LOW COPPER AND IRON LOSSES)		
		 b. POWER FACTOR CORRECTION TO 0.95 c. SPEED CONTROLLERS WITH VARIABLE / AUTOMATIC CONTROL VIA. BMS WITH 4 - 20 mA CONTROL (IF REQUESTED) 		
Е		d. ALL CONTROL TRANSFORMERS SHALL BE HIGH EFFICIENCY (LOW COPPER AND IRON LOSSES) 36. MOTOR POWER FOR ALL THE HVAC EQUIPMENT SHALL BE VERIFIED ONCE ORDERED	-	
		37. SOUND ATTENUATION a. ALL FACTORY-MADE SOUND ATTENUATORS TO BE SELECTED AND LOCATED AS PER THE "HOWDEN-DONKIN" COMPANY REQUIREMENTS.		
		 b. ALL SOUND ATTENUATORS TO BE LINED WITH MELINEX FILM, OR APPROVED EQUIVALENT. c. TRANSITION DUCTWORK BETWEEN ATTENUATORS AND AIR-CON UNITS TO BE PROVIDED WITH ACOUSTIC INSULATION AS PER DETAIL 11 ON THIS DRAWING. 		
		 d. ALL DUCT LINING MATERIAL SHALL COMPLY WITH SABS STANDARDS. e. OCCUPIED ROOMS SHALL ATTAIN THE SOUND LEVELS AS NOTED IN THE ASHRAE APPLICATIONS HANDBOOK, CHAPTER - "SOUND AND VIBRATION CONTROL". 		
		38. VIBRATION ISOLATION OF EQUIPMENT ALL ROTATIONAL EQUIPMENT WHICH HAS A POWER CONSUMPTION IN EXCESS OF 1kW SHALL BE FITTED WITH VIBRATION ISOLATORS TO ENSURE NO EQUIPMENT VIBRATION IS TRANSMITTED	_	
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		39. FOR ALL THE HVAC EQUIPMENT, A CONDENSATE DRAIN SHOULD BE PROVIDED WITHIN TWO METERS OF THE UNIT, BY OTHERS, UNLESS STATED OTHERWISE.		
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			DIMENSIONS AND LEV	HALL VERIFY ALL CONDITIONS, /ELS ON THE SITE AND NOTIFY THE ANY VARIATIONS BEFORE
			CONSTRUCTION.	
·	DRAWING NO.	REFERENCE DRAWINGS		

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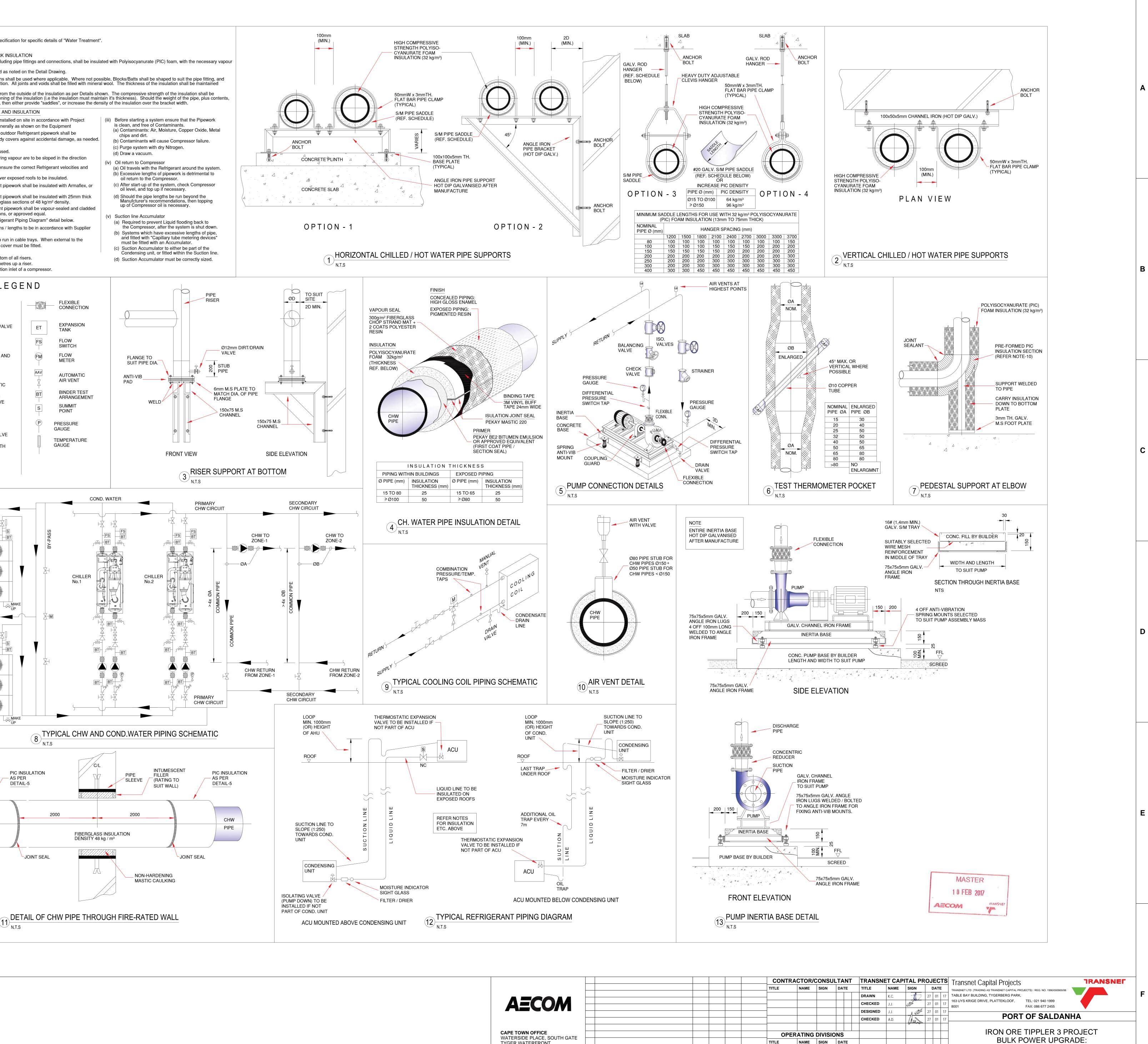


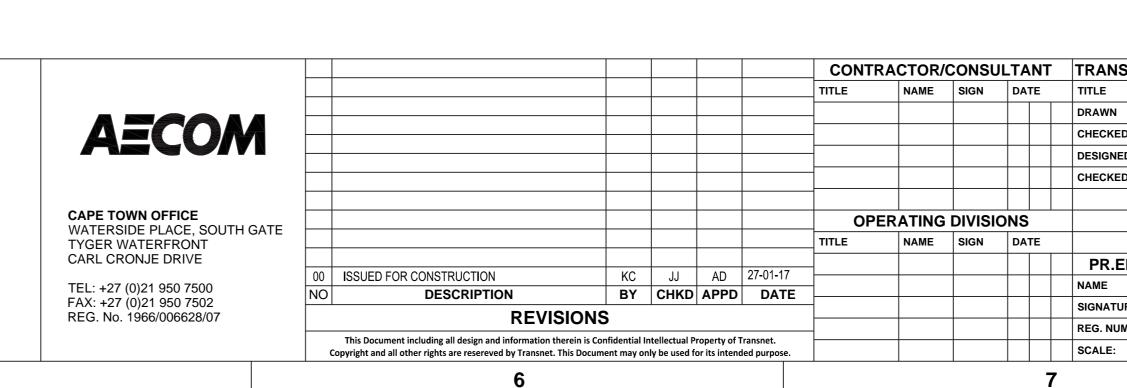
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			07410			• T					
	-				PIPING NO	JT	F2		9. WATER TR Refer to Proj		
	1.	GENERAL Refer to Project Te Pipes, strainers an Valves, strainers a Thread must be in	nd other fittings and other fitting	up to 50 s larger	0mm may be s than 50mm m	crev ust l	wed or flanged.	l.	10. CHILLED W All chilled wa barrier. The insulatic	ater pipewo on shall be	ork, includ applied a
Α		otherwise specified Galvanised piping	d. must be screw	ed whei	-				Rigid preforr securely wire over the pipe All piping sh	ed/banded e fitting. all be supp	in positio
		Clean all piping be Welding to galvani Where welding for	ised piping or fi	ttings is	•		mplete sectior	n must be hot dip	determined t cause the in	o ensure r sulation to	no flattenin flatten, th
		galvanised after m Cold galvanising is	anufacture. s not acceptable	e.					Refrigerant pi Technical Spe	be work sh	all be inst
		Use full radius ben exceptional conditi Where it is necess	ions	Ū					layout drawing insulated and (i) Pipe Ru	protected	
		Provide all pipeline pipe work can be c	es with 15mm c drained of liquic	Irain coo I withou	cks at all low po t dismantling.	oints	s in the systen	n so that the	(a) Type (b) Horiz	e-L copper zontal pipe	es carrying
		Install horizontal pi expansion tank wh formation of air loc	herever possible cks and air pocl	e. Fit al kets. Pr	l pipes in such ovide high poi	a m nts v	nanner as to p with automatic	revent the air vent valves	(c) Pipir pres	e vapour f ig to be siz sure drops id lines rur	zed to ens s.
		or air bottles. Air w pressure of the sys Arrange piping in p	stem.		-			-	(e) All ir appl	nternal Ref roved equa	rigerant p al.
		obstructed. Size pipes which a	are not dimensi	oned on	drawings usin		0		rigid (g) All e	tternal Ref , pre-forme xternal Re	ed fibregla frigerant p
		* The friction Pipe expansion join		xceed 6 uired, sh	0 kPA per 100 all be of the be	ellov	ws type manuf		(h) Refe	Aluminiun r to "Typic efrigerant p	al Refrige
		stainless steel or n expansion movem Chilled water pipin	ents are to be	accomm	odated.	-			Req (i) All Re	uirements. efrigerant p	pipes to ru
		Screwed joints ma whereas all piping flanges where stat	iv be used for p in excess of th	iping of	diameter up to	o an	d including 50	mm diameter	(ii) Oil Trap (a) To b	e fitted at	the bottor
В		Pipes of diameter i accordance with S	in excess of 15 ABS 62-1971 v	with wel	ded joints only		of seamless b	black steel in		e fitted ev raps near t	
		All black pipe fitting Welding of pipewo reserves the right t	ork shall be carr	ried out	only by qualifie		velders and the	e Employer			LI
		Connections to air flanged in the case	handling units, e of piping of di	, pumps ameter	, chillers and o 65mm and ove	er ar	nd shall be joir	ned using cone		- PUMP BUTTE	ERFLY
		face unions in the conditioning system In all piping installa	m to be remove ations due allov	ed and r vance s	eplaced.					VALVE	
		contraction of the p The chilled water s tanks of the asbes	piping material. system and the	hot wat	er system sha	ll ea	ach be supplie	d with expansion			VALVE
		complete with ball Automatic air relea	valve, quick-fill ase valves shal	and dra	ain connections d at the top of	s. the	riser pipe stac	ks, and in any			VALVE AN
		other positions in t necessary to preve Condenser water p	ent airlocks and	to facil	itate commissi	onin	ng of the pump	ing systems.		BALANG	
		SANS 719 specific minimum coating c Fittings shall be of	cations but shal of 300 g/m2.	l be hot	dip galvanised	d aft	ter manufactur	e with a			OSTATIC
		above, and shall be be of cast iron or s	e manufacture steel to BS 4504	d to BS 4 or AS/	1740 or SABS A Standards ar	509	9 specification	s. Flanges shall	s	NON-RE (CHECK	ETURN K) VALVE
		Drain pipes must fa Provide all drain pi Domestic grade co	ipes with cleani	ing eyes	at each chang	-				_ SOLENO VALVE	OID
	2.	the compression o	or solder type.			, pini	g with cibows			_ MOTOF CONTR	RISED OL VALVI
С		Spring hanger mountings for vibration damping shall be used in a Pipe hangers shall be adjustable in height to set the pipe gradier					-	rooms.		_ STRAIN BALL V/	IER WITH ALVE
		The maximum hori for steel chilled wa				od d	liameters shal	l be as follows		- UNION	
		Nomin (mm) 12-32	nal Pipe size	Hang 6	er Rod ø (mm))	Span (m) 2.5				
		40-65 80-10	0	10 12			3.0 3.5				
		125-15 200-30 350-50	00	16 22 25			4.0 5.0 6.0	-		S	
		The maximum hori			for condensa	te (f		」 pipes shall be	C		
			Nominal Pipe (mm)	Size	Span (m)					-	
			12-20 25-40		1.0				COC TOV No.1		
		Hangers shall be	50 and over		2.5 m spacing of 1	me	tre from each	elbow or pipe			
	3.	fitting. VALVES							EXPANSION		
		Valve materials sh For detailed valve Saunders type valve	specification re	efer to P	roject Technic	al S	pecification.				
D		Saunders type valves or approved equivalent will be accepted. Gate valves shall only be used as isolating or shut off valves. Globe valves shall be used for throttling or balancing purposes.									
	Butterfly valves shall be used for isolating and shut off purposes. Diaphragm valves shall only be used as shut-off purpose						oses.		C		
		Check valves shall Plug cocks shall be				al or	r vertical instal	lation.		-	
		Calibrated balancir iron valve bodies, l ends for 65 mm ø	bronze disc, int	ernal se	als, screwed e	ends	s, up to 50 mm	n and flanged	COO TOV No.2		
	4.	STRAINERS Strainers shall be o	of the angle or	Y-type.	Strainers up t	o 50) mm shall hav	ve screwed ends		-	
		and strainers of 65 Bronze or stainless Screens shall be p	s steel screens	will be	-	d en	ds.				
		Screens shall be p	Strainer Size		Perforation Si	ize ((mm)				
			10-50 65-150		1.0 1.5						
		Strainers shall be p	200 and ov		2.0	2 0 °	d cock on the	can nined to the			
		nearest drainpoint. Strainers shall be i	. Flexible pipin	g shall b	be used.						
_	5.	water pumps. GAUGES Pressure gauges fe	Or water chall b)e of the	Bourdon tune	and	d alveering fill-	ed.			/
Е		Pressure gauges for Pressure gauge dia A gauge cock and	als shall have a	a diame	ter of at least 1	100 i	mm.			CHW	
	6.	CONNECTIONS T Flexible connection	ns shall be Mas	son Indu	stries SAFEFL						
	7	type] or approved for chilled, conden TESTING OF PIPE	iser and hot wa	ter pum		ວ the	e suction and o	uscnarge pipes		₩	
		All pipe fittings sha the maximum syste	all be tested hy em pressure, w	drostatio hicheve	er is the higher	valı	ue.	a or 1.5 times			
		Tests shall be carr Water systems sha The test pressure s	all be filled with shall be mainta	water a ined for	and air vented	at le	east 24 hours l				
	8.	testing pump has to FLUSHING/DRAIN Upon the completion	NING		throughout the	e bu	uilding complex	k, and prior to			
		the commencement drained and flushe and sundry constru	nt of commissioned to ensure the	oning of e remov	pumping syste	ems,	, the entire sys	stem shall be			
		Refer to Water Tre reticulation.			hod of cleanin	g an	nd flushing a p	iping			
F										S 61101	
Г							TO BE USED	ALE DRAWING - O ACTOR SHALL VI			•
							DIMENSIONS	S AND LEVELS OI VISOR OF ANY V	N THE SITE AND	NOTIFY T	HE

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DRAWING NO.





SUBSTATION M PR.ENG./PR.TECH./PR.ARCH STANDARD PIPING DETAILS DATE ANDREW DALLY With 27 01 OD FBS DIS TYPE DRAWING NO. SHEET PROJECT NUMBER REG. NUMBER 9170004 A0 1 9 2 4 7 0 1 2 5 1 0 M S T 0 0 5 0 1 0 AE

NAME

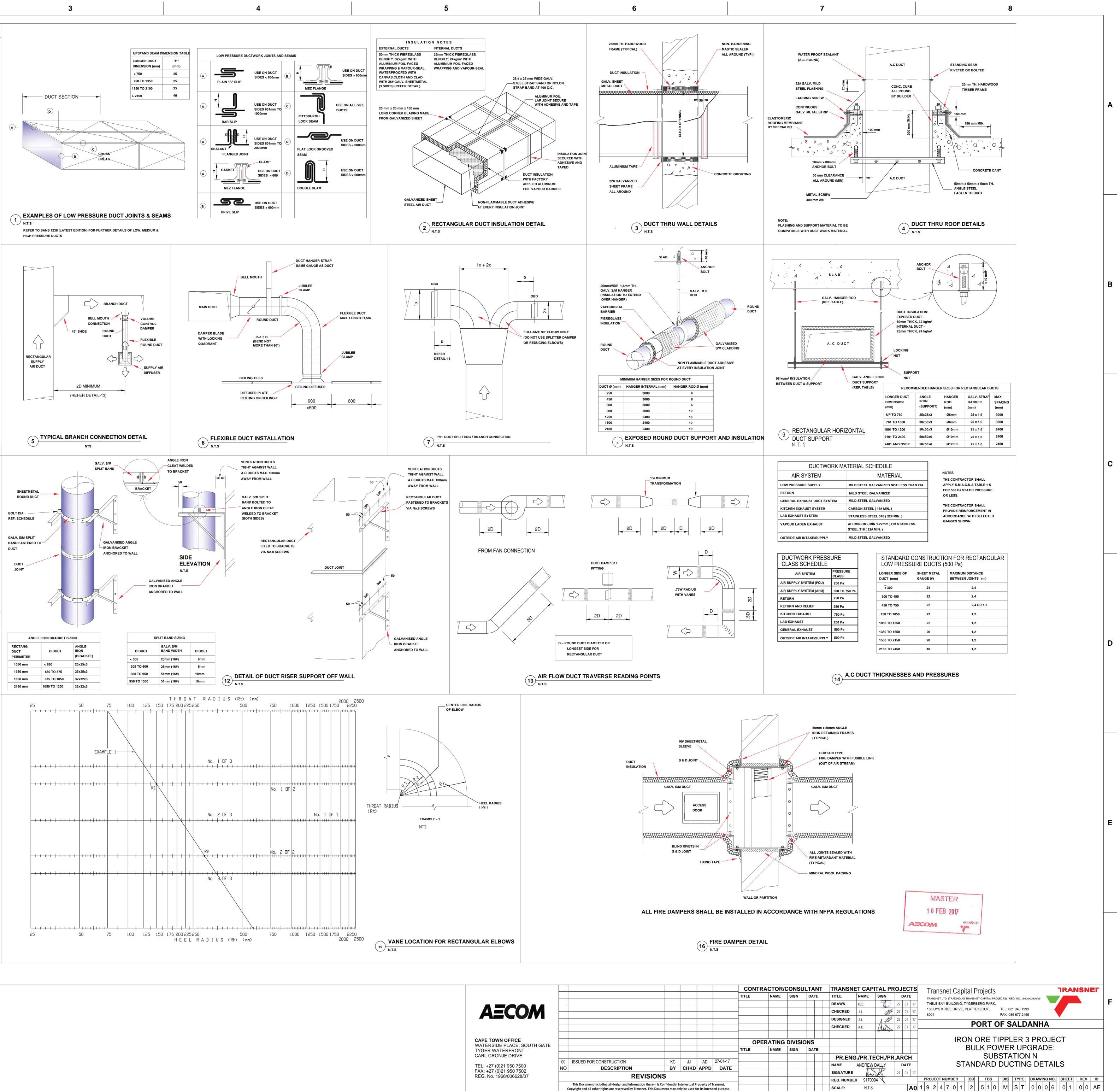
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N.T.S.

		1	2		
		STANDARD DUCTING NOTES	LEGE		
		SPECIFIC HVAC CONTRACT.		- THERMOSTAT	
		1. THE ENTIRE HVAC SYSTEM TO COMPLY WITH THE PROJECT TECHNICAL SPECIFICATION WHICH THIS DRAWING FORMS PART OF.	°C	DEGREE CENTIGRADE LITRES PER SECOND	
		2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED. SIZES SHOWN FOR THE DUCTS ARE CLEAR INTERNAL DIMENSIONS.	DAC	- DOOR AIR CURTAIN	
		3. CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK ANY DISCREPANCY TO BE REPORTED TO THE EMPLOYER.	S. db EAD	- DRY BULB	
Α		4. ALL HEATING, VENTILATION AND AIR CONDITIONING DRAWINGS SHALL BE READ IN	E/A	- EXHAUST AIR	
		CONJUNCTION WITH ALL PROJECT NOTES AND SPECIFICATIONS, AS ISUED BY AECOM, AN RELEVANT ARCHITECTURAL, ELECTRICAL AND STRUCTURAL DRAWINGS	EDH	- ELECTRIC DUCT HEATER	
		5. CAPACITIES, DIMENSIONS AND LOCATIONS OF HEATING, VENTILATION AND AIR CONDITIO EQUIPMENT ARE BASED ON EQUIPMENT MODELS INDICATED IN HVAC EQUIPMENT CATAL		EXHAUST AIR GRILLE EXTERNAL STATIC PRESSURE	
		SCHEDULES AND DRAWINGS. 6. ACCESS TO ALL HVAC EQUIPMENT AND ACCESSORIES SHALL BE AS PER DRAWINGS AND	EF	- EXHAUST FAN	
		MANUFACTURERS' REQUIREMENTS. 7. ALL WATER PROOFING OF PENETRATIONS AND COUNTER FLASHINGS TO BE DONE BY	FAD	- FRESH AIR DUCT	
		SPECIALIST SUB-CONTRACTOR, TO BE APPOINTED BY CONTRACTOR.	FCU Pa	- FAN COIL UNIT - PASCAL	
		8. STATIC PRESSURES FOR ALL THE FANS MUST BE VERIFIED PRIOR TO ORDERING THE FAN 9. ALL THE TOILET DOORS TO BE UNDERCUT 25mm, OR PROVIDED WITH DOOR GRILLES.	S kW	- KILO WATT	
		10. ALL MATERIALS EXPOSED TO THE AIRFLOW WITHIN THE CEILING CAVITY PLENUM SHALL I	QTY. BE NON-	- QUANTITY - RETURN AIR	
		COMBUSTIBLE OR LIMITED COMBUSTIBLE, WITH A MAXIMUM SMOKE DEVELOPMENT INDEX 11. FINAL LOCATIONS & DIMENSIONS OF CONCRETE UPSTANDS FOR THE HVAC EQUIPMENT A	RAG	- RETURN AIR GRILLE	
		HVAC PIPING SHALL BE CHECKED ON SITE TO SUIT HVAC EQUIPMENT SPECIFIED. 12. ALL THE EXTERNAL SUPPORT BRACKETS, SHALL BE HOT DIP GALVANISED BEFORE INSTA	RLG	RETURN LINEAR GRILLE RETURN WALL GRILLE	
		13. WHERE DUCTS AND PIPES PASS THROUGH WALLS, SLEEVES SHALL BE PROVIDED, AND S	EALED S/A	- SUPPLY AIR	
		WITH AN APPROPRIATE FIRE RATED SEALANT TO PROVIDE AN AIR-TIGHT INSTALLATION. 14. ALL EQUIPMENT DUTIES ARE GIVEN AS RATED DESIGN DUTIES WITH AIR VOLUMES CORRECT	SAF	- SUPPLY FAN	
		FOR SITE ELEVATION ABOVE SEA LEVEL. 15. DIRECTION ARROWS AND IDENTIFICATION BANDS ARE TO BE PLACED EVERY TWO METER	SCG SCD	SUPPLY CEILING GRILLE SUPPLY CEILING DIFFUSER	
		INTERVALS OVER THE INSULATION FOR ALL SERVICES.	S.S	- STAINLESS STEEL	
в		16. ALL BENDS / ELBOWS WHICH HAVE A THROAT RADIUS LESS THAN 3/4 OF THE HEEL RADIU MUST BE VANED. REFER TO CHART BELOW.	SWG	- SUPPLY WALL GRILLE	
Ы		17. ALL AIR DIFFUSION EQUIPMENT SHALL BE SELECTED AND INSTALLED AS PER THE SUPPL DETAILED SPECIFICATIONS, AND ALL BRANCH DUCTS / CONNECTIONS TO AIR DIFFUSERS		- TRANSFER AIR	
		TO BE FITTED WITH DUCT BALANCING DAMPERS, AS SHOWN ON DRAWINGS.	TAD	- TRANSFER AIR DUCT	
		18. ALL AIR CONDITIONING DUCTWORK TO BE LAGGED WITH RIGID FIBERGLASS SLAB COVER REINFORCED ALUMINIUM FOIL, AND FINISHED WITH A VAPOUR SEAL BARRIER:	ED WITH TEMP	- TEMPERATURE	
		- 25mm THICK FIBERGLASS FOR INTERNAL DUCTWORK @ 24 kg/m ³ - 50mm THICK FIBERGLASS FOR EXTERNAL DUCTWORK @ 32 kg/m ³ , AND FINISHED		- UNDER CUT (25mm) MIN.	
		A WATER PROOF BARRIER. - HARD INSULATION UNDER SUPPORTS. (REFER DETAIL-10)	wb W.O	- WET BULB	
		19. ALL THE SUPPLY SLOT DIFFUSERS & RETURN SLOT DIFFUSERS SHALL BE SIMILAR TO TRO TYPE - ALS OR APPROVED EQUIVALENT.		- FIRE DAMPER (? HOUR RATING)	
		20. FINAL LOCATION OF ALL AIR DIFFUSION EQUIPMENT SHALL BE CO-ORDINATED WITH THE TILES, LIGHTING FIXTURES AND OTHER CEILING FIXTURES ON SITE.	F.S.D	- FIRE/SMOKE DAMPER (? HOUR RATING)	
		21. FLEXIBLE DUCT TO ANY AIR OUTLET SHALL NOT EXCEED A LENGTH OF 1500mm, AND SHO STRAIGHT TO ACHIEVE MINIMUM AIR RESISTANCE AND NOISE.			
		22. ALL OUTSIDE AIR INTAKE OPENINGS SHALL BE PROVIDED WITH FILTERS UNLESS OTHERW		W C C S-WAY BLOW DIFFUSER	
		NOTED ON THE HVAC DRAWINGS. OPENINGS TO BE MINIMUM 500mm ABOVE ROOF / GROUL			
		23. ALL DUCTWORK WORK RUNNING THROUGH HIGH HUMIDITY AREAS SHALL BE WRAPPED V 25mm THICK 32kg / m ³ DENSITY FIBERGLASS INSULATION.		TED FLEXIBLE DUCT	
		24. ALL THE OUTLETS FOR SUPPLY, RETURN, TRANSFER & EXHAUST AIR SHALL BE PROVIDED VOLUME CONTROL DAMPERS. ALL DUCT CONNECTIONS FROM MAIN DUCTS TO BE PROVID	- COMMIS	SIONING POINT	
		WITH SPLITTER TYPE DAMPERS, OR AS OTHERWISE NOTED ON THE DRAWINGS.	LI - LOCAL IS	OLATOR	
		25. ALL TRANSFER DUCTS SHALL BE PROVIDED WITH BACK DRAFT DAMPERS, IN ORDER TO P AIR FLOW IN THE OPPOSITE DIRECTION.			
С		26. ALL AIR DIFFUSION EQUIPMENT SHALL BE EPOXY MATT WHITE, UNLESS SPECIFIED OTHER	WRAPPED AROUND DUCTING	3	
		27. FINAL SIZE OF ALL THE WEATHER LOUVRES DEPEND ON THE FAN SPECIFIED. 28. BACKDRAFT DAMPERS SHALL BE SIMILAR TO TROX TYPE - ARK OR APPROVED EQUIVALED.	ON 3 SIDES		
		29. DUCTWORK AS NOTED IN MATERIAL SCHEDULE SHALL BE FABRICATED, CONSTRUCTED A INSTALLED IN ACCORDANCE WITH THE SMACNA STANDARD.			
		THIS WILL INCLUDE PROVISION FOR ALL TEST POINTS TO ENABLE AIR BALANCING AND COMMISSIONING ACTIVITIES TO BE PERFORMED. (REFER TO DETAIL BELOW)			
		30. HINGED ACCESS DOORS SHALL BE PROVIDED ON THE LINK SIDE OF ALL FIRE DAMPERS AN CONTROL DAMPERS, AND GENERALLY AS RECOMMENDED BY THE SMACNA STANDARD.		A.C DUCT	
		31. FILTER SPECIFICATION PRIMARY AIR FILTER MATERIAL SHALL BE CAPABLE OF BEING WASHED AT LEAST 12 TIME	S, AND		
		HAVE AVERAGE ARRESTANCE OF 80% ACCORDING TO THE ASHRAE 52 / 76 STANDARD. SPARE FILTERS SHALL BE PROVIDED.			
		FILTERS TO BE HOUSED IN PURPOSE-MADE FILTER HOUSINGS WITH AIRTIGHT ACCESS DO	DRS. DUC	T INSULATION m TH. 32 kg/m ³	
		32. KITCHEN HOOD AND DUCT DETAILS a. THE HOOD SHALL BE CONSTRUCTED FROM AND BE SUPPORTED BY STAINLESS STEEL TYPE 430 NOT LESS THAN 1.2mm (OR) OF OTHER APPROVED MATERIAL OF EQUIVALENT	DEN	SITY	
		b. DUCTS SHALL BE CONSTRUCTED OF AND SUPPORTED BY CARBON STEEL NOT LESS TH		D DUCT CLADDING DETAIL	
		1.37mm (16#) (OR) STAINLESS STEEL NOT LESS THAN 1.2mm (18#) c. ALL BEAMS AND JOINTS SHALL HAVE LIQUID-TIGHT CONTINUOUS EXTERNAL WELDS	(10) N.T.S		
		d. FIRE SUPPRESSION SYSTEM TO BE DONE BY SPECIALIST SUB-CONTRACTOR, TO BE APP BY CONTRACTOR.	OINTED		
		e. FIRE WALL SHALL BE 2-HOUR RATED TO ENCLOSE EXHAUST DUCT. f. FILTERS MUST BE "UL" CLASSIFIED, STAINLESS STEEL, NON-CLOGGING BAFFLE-TYPE, A SHOULD BE EASILY REMOVABLE	ND	\sim	
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		SUCH OPENING SHALL BE AT THE SIDES OF THE DUCT AND AT EVERY TWO METER IN HORIZONTAL DUCTWORK.		GALVANISED SHEET NETAL DUCTWORK	
		i. AFTER INSTALLATION OF FILTERS, THE REMAINING AREA OF THE HOOD TO BE CLOSED		MIT	
		33. MAIN HVAC ELECTRICAL POWER SUPPLY CABLE TO BE COPPER.			0
					0
		34. ALL HEATER BANKS TO BE HOUSED IN FLANGED STEEL CASINGS FOR EASY REMOVAL AN COMPLY WITH THE FOLLOWING SAFETY REQUIREMENTS: - AIR PRESSURE SWITCH / SAIL SWITCH			
		- OVERHEAT THERMOSTAT WITH MANUAL RESET - BACK OF TERMINAL BOX TO BE INSULATED - ACCESS DOOP INTERLOCKED WITH HEATER BANK	26 GAUGE PERFORATED SH	EET	
		- ACCESS DOOR INTERLOCKED WITH HEATER BANK - HEATER ELEMENTS TO BE SIZED TO SUIT NUMBER OF STEPS AND BALANCE POWER OVE THE THREE PHASES			
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		a. HIGH EFFICIENCY MOTORS (LOW COPPER AND IRON LOSSES) b. POWER FACTOR CORRECTION TO 0.95			
		C. SPEED CONTROLLERS WITH VARIABLE / AUTOMATIC CONTROL VIA. BMS WITH 4 - 20 mA CONTROL (IF REQUESTED)			
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		e. OCCUPIED ROOMS SHALL ATTAIN THE SOUND LEVELS AS NOTED IN THE ASHRAE APPLICATIONS HANDBOOK, CHAPTER - "SOUND AND VIBRATION CONTROL".			
		38. VIBRATION ISOLATION OF EQUIPMENT			
		ALL ROTATIONAL EQUIPMENT WHICH HAS A POWER CONSUMPTION IN EXCESS OF 1kW SH BE FITTED WITH VIBRATION ISOLATORS TO ENSURE NO EQUIPMENT VIBRATION IS TRANSM INTO THE STRUCTURE. VIBRATION ISOLATORS SHALL BE SELECTED IN ACCORDANCE WIT	IITTED		
		MASON INDUSTRIES SELECTION DATA CONSIDERING A MINIMUM 0F 5% TRANSMISSION OF VIBRATION.			
		39. FOR ALL THE HVAC EQUIPMENT, A CONDENSATE DRAIN SHOULD BE PROVIDED WITHIN TW METERS OF THE UNIT, BY OTHERS, UNIT ESS STATED OTHERWISE	vo		
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			I		
_			NOTES		
F			1. DO NOT SCALE DRAW TO BE USED	VING - ONLY DIMENSIONS SHOWN	
			DIMENSIONS AND LEV	HALL VERIFY ALL CONDITIONS, /ELS ON THE SITE AND NOTIFY THE	
				ANY VARIATIONS BEFORE	
	DRAWING NO.	REFERENCE			
		REFERENCE DRAWINGS			
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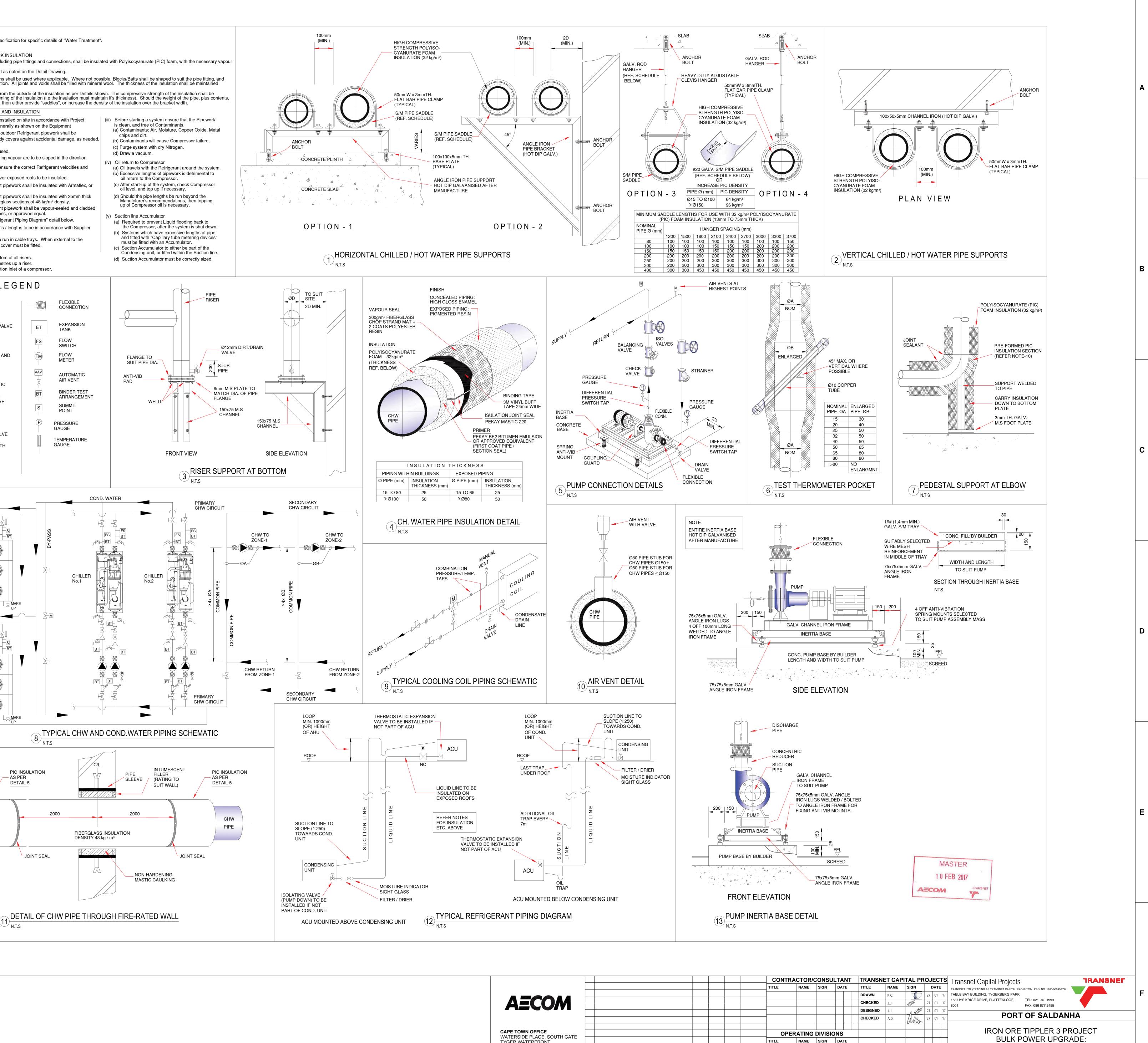


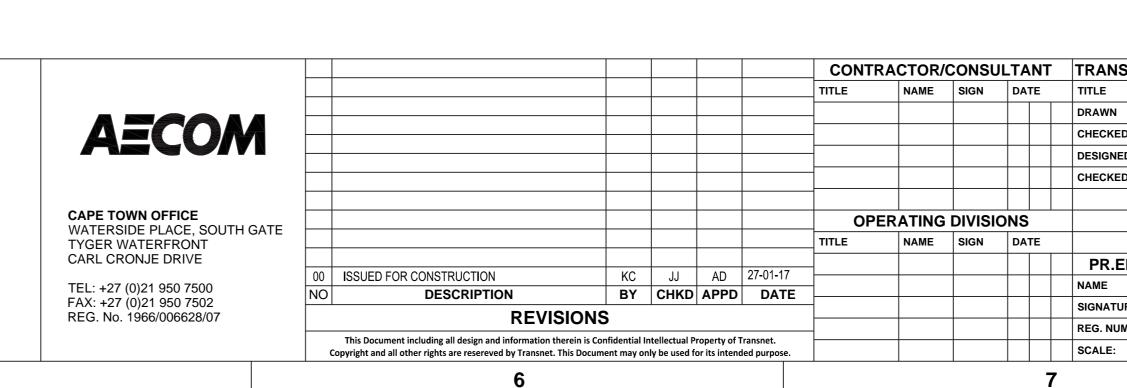
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							~~				
		-				PIPING NO	υT	F2		9. WATER TREATMENT Refer to Project Technic	al Speci
		1.	GENERAL Refer to Project To Pipes, strainers ar Valves, strainers a Thread must be in	nd other fittings and other fitting	up to 5 s larger	0mm may be s than 50mm m	screv iust l	wed or flanged be flanged.	l.	10. CHILLED WATER PIPE All chilled water pipewor barrier. The insulation shall be a	k, includ
Α			otherwise specifie Galvanised piping	d. must be screw	ed whe	-				Rigid preformed piping s securely wired/banded ir over the pipe fitting. All piping shall be suppo	n positio orted fror
			Clean all piping be Welding to galvan Where welding for	ised piping or fi	ittings is	•		mplete sectior	n must be hot dip	determined to ensure no cause the insulation to fl REFRIGERATION PIPEW	attenir atten, th
			galvanised after m Cold galvanising is	nanufacture. s not acceptabl	e.					Refrigerant pipe work sha Technical Specification, a	ll be inst
			Use full radius ber exceptional condit Where it is necess	tions	Ū				-	layout drawings. All indoor insulated and protected by (i) Pipe Runs	
			Provide all pipeline pipe work can be o	es with 15mm c drained of liquid	drain coo d withou	cks at all low p t dismantling.	oint	s in the system	n so that the	(a) Type-L copper to (b) Horizontal pipes	carrying
			Install horizontal p expansion tank wh formation of air loc	herever possible cks and air pocl	e. Fit al kets. Pi	l pipes in such ovide high poi	n a m ints v	nanner as to p with automatic	revent the air vent valves	of the vapour flo (c) Piping to be size pressure drops. (d) Liquid lines runn	ed to ens
			or air bottles. Air pressure of the sys	stem.		-			-	(e) All internal Refri approved equal	gerant p
			obstructed. Size pipes which a	are not dimensi	oned on	drawings usir		C		(f) All external Refrig rigid, pre-formed (g) All external Refri	d fibregla igerant p
			* The friction Pipe expansion joi		exceed 6 uired, sh	60 kPA per 100 nall be of the b	ellov	ws type manuf		with Aluminium (h) Refer to "Typica (i) All Refrigerant pi	l Refrige
			stainless steel or r expansion movem Chilled water pipin	nents are to be	accomm	nodated.	-			Requirements. (i) All Refrigerant pi	pes to ru
			Screwed joints ma whereas all piping flanges where stat	ay be used for p in excess of th	piping of	diameter up to	o an	d including 50	mm diameter	Building, a prote (ii) Oil Traps (a) To be fitted at th	e bottor
В			Pipes of diameter accordance with S	in excess of 15 SABS 62-1971 v	with wel	ded joints only	<i>'</i> .	l of seamless l	black steel in	(b) To be fitted ever (c) No traps near th	
			All black pipe fittin Welding of pipewo reserves the right	ork shall be carı	ried out	only by qualifie		velders and the	e Employer		LI
			Connections to air flanged in the case	r handling units e of piping of di	, pumps ameter	, chillers and c 65mm and ove	er ar	nd shall be joir	ned using cone		RFLY
			face unions in the conditioning syste In all piping installa	m to be remove ations due allow	ed and r vance s	eplaced.					
			contraction of the The chilled water s tanks of the asbes	system and the	hot wat						
			complete with ball Automatic air relea	valve, quick-fil	and dra	ain connection	IS.			BALL V	ALVE AN
			other positions in t necessary to preve Condenser water	ent airlocks and	d to facil	itate commissi	ionir	ng of the pump	ing systems.		
			SANS 719 specific minimum coating of Fittings shall be of	cations but shal of 300 g/m2.	ll be hot	-dip galvanise	d aft	ter manufactur	e with a	VALVE	STATIC
			above, and shall b be of cast iron or s	be manufacture steel to BS 450	d to BS 4 or AS	1740 or SABS A Standards a	509	9 specification	s. Flanges shall	NON-RET (CHECK)	
			Drain pipes must f Provide all drain p	ipes with clean	ing eyes	at each chan	-			SOLENO VALVE	ID
			Domestic grade co the compression of HANGERS AND S	or solder type.	uid de u	ised for drain p	oipin	ig with eldows	and fittings of		
С			Spring hanger mountings for vibration damping shall be used in al Pipe hangers shall be adjustable in height to set the pipe gradient.					-	ooms.	STRAINE BALL VAI	
			The maximum hor for steel chilled wa				od d	liameters shal	be as follows		
			(mm)			jer Rod ø (mm	I)	Span (m)			
			12-32 40-65 80-10	5	6 10 12			2.5 3.0 3.5	-		
			125-1 200-3 350-5	800	16 22 25			4.0 5.0 6.0		S-	Ļ
			The maximum hor as follows:			g for condensa	ite (f		pipes shall be		
			as lonows.	Nominal Pipe	Size	Span (m)					
				(mm) 12-20 25-40		1.0				COOLING TOWER	
				50 and over		2.0 2.5		tur fur ar a b	- 11	No.1	
		3.	Hangers shall be fitting.	e provided at a f	naximu	In spacing of 1	me	are nom each	endow of pipe		
			Valve materials sh For detailed valve	specification re	efer to F	roject Technic	al S	pecification.		EXPANSION TANK	
D			Saunders type val Gate valves shall Globe valves shall	only be used as	s isolatir	ng or shut off v	valve	es.			
		Butterfly valves shall be used for isolating and shut off purposes. Diaphragm valves shall only be used as shut-off purpose									
			Check valves shal Plug cocks shall b				al o	r vertical insta	lation.		
			Calibrated balanci iron valve bodies, ends for 65 mm ø	bronze disc, int	ternal se	eals, screwed	ends	s, up to 50 mm	and flanged	COOLING TOWER No.2	
		4.	STRAINERS Strainers shall be						·		
			and strainers of 65 Bronze or stainles	5 mm ø and abo s steel screens	ove, sha will be	all have flanged					
			Screens shall be p	Strainer Size		Perforation S	ize '	(mm)			
				10-50 65-150		1.0 1.5	(
				200 and ov		2.0					
			Strainers shall be nearest drainpoint Strainers shall be	. Flexible pipin	g shall l	be used.					
		5.	water pumps. GAUGES								/
Е			Pressure gauges f Pressure gauge di A gauge cock and	ials shall have a	a diame	ter of at least 1	100	mm.	ed.	CHW	
		6.	CONNECTIONS T Flexible connectio		EQUIP	MENT			le sphere	PIPE	
			type] or approved for chilled, conden	equivalent, whi nser and hot wa	ich shall iter pum	be provided to					
		7.	TESTING OF PIPE All pipe fittings sha the maximum syst	all be tested hy	drostatio				a or 1.5 times		
			Tests shall be carr Water systems sh The test pressure	ried out before all be filled with	the app water a	lication of insu and air vented	latio at le	on. east 24 hours			
		8.	testing pump has FLUSHING/DRAII	been disconneo NING	cted.	·			·		
			Upon the completi the commenceme drained and flushe	ent of commission and to ensure the	oning of e remov	pumping syste	ems	, the entire sys	stem shall be		(1
			and sundry constr Refer to Water Tre reticulation.	uction materials	s.	-	-	-			
		L								1	
							N	OTES			
F								TO BE USED)	NLY DIMENSIONS SHOWN	
								DIMENSIONS	S AND LEVELS OI	ERIFY ALL CONDITIONS, N THE SITE AND NOTIFY TH ARIATIONS BEFORE	E
								CONSTRUC	ION.		

1

DRAWING NO.





A0 1 9 2 4 7 0 1 2 5 1 0 M S T 0 0 7 0 1 0 AE

SUBSTATION N

STANDARD PIPING DETAILS

PROJECT NUMBER OD FBS DIS TYPE DRAWING NO. SHEET

PR.ENG./PR.TECH./PR.ARCH

With

DATE

1 1

ANDREW DALLY

N.T.S.

NAME

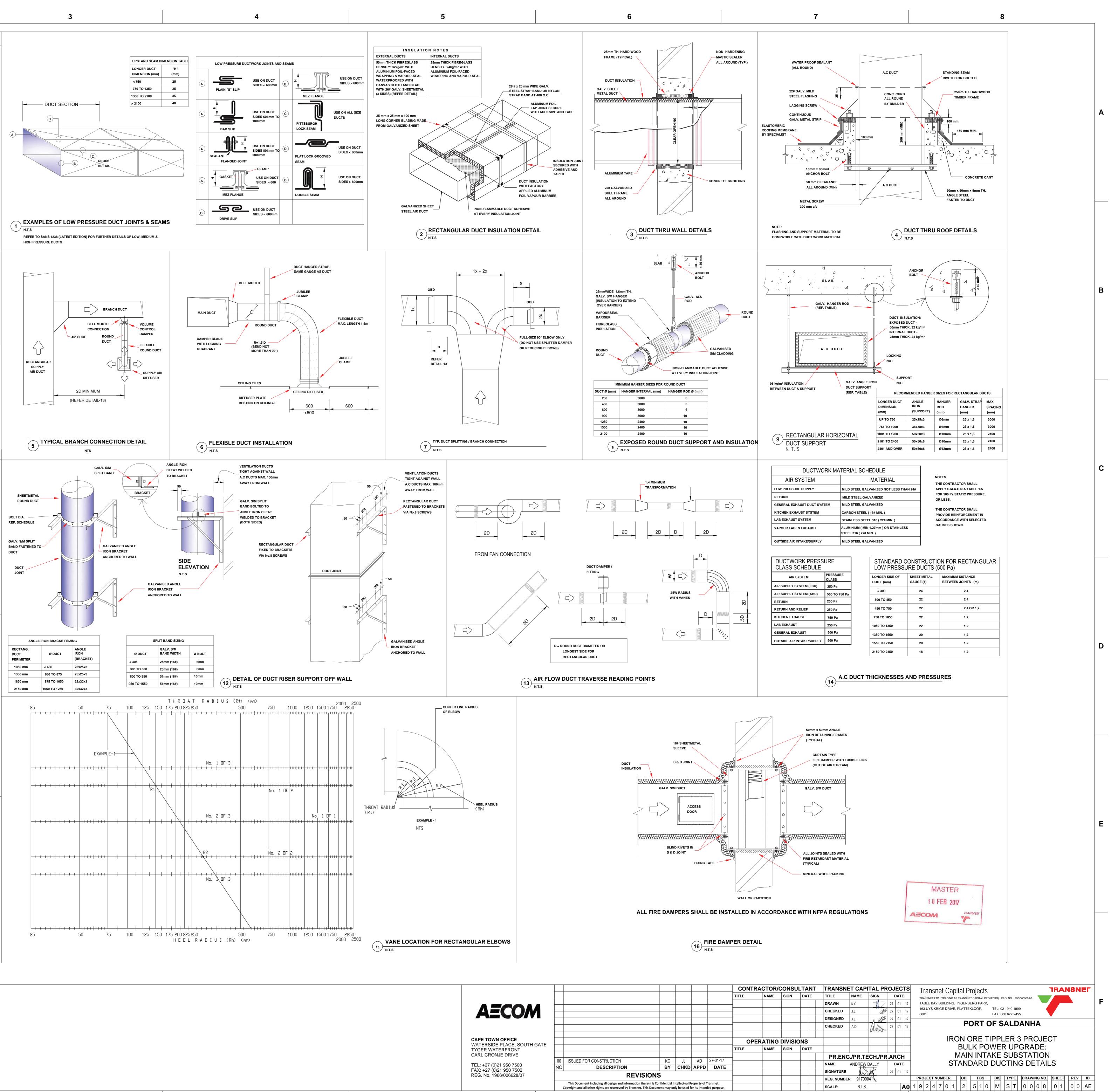
SIGNATURE

REG. NUMBER 9170004

		1		2
		STANDAF	RD DUCTING NOTES	
		THIS IS A GENERIC LEGEND AND NOT ALL ITEMS MAY BE APPLIC SPECIFIC HVAC CONTRACT.		LEGEND - THERMOSTAT
		1. THE ENTIRE HVAC SYSTEM TO COMPLY WITH THE PROJECT T	ECHNICAL °C	
		SPECIFICATION, WHICH THIS DRAWING FORMS PART OF.	I/s	
		SIZES SHOWN FOR THE DUCTS ARE CLEAR INTERNAL DIMENS 3. CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO COM	SIONS.	AC - DOOR AIR CURTAIN
		ANY DISCREPANCY TO BE REPORTED TO THE EMPLOYER.		AD - EXHAUST AIR DUCT
Α		4. ALL HEATING, VENTILATION AND AIR CONDITIONING DRAWING CONJUNCTION WITH ALL NOTES AND SPECIFICATION, AS ISSU	ED BY AECOM. AND	
		RELEVANT ARCHITECTURAL, ELECTRICAL AND STRUCTURAL	DRAWINGS.	CH - ELECTRIC DUCT HEATER
		5. CAPACITIES, DIMENSIONS AND LOCATIONS OF HEATING, VENT EQUIPMENT ARE BASED ON EQUIPMENT MODELS INDICATED I SCHEDULES AND DRAWINGS.	N HVAC EQUIPMENT CATALOGUES,	SP EXTERNAL STATIC PRESSURE
		6. ACCESS TO ALL HVAC EQUIPMENT AND ACCESSORIES SHALL	BE AS PER DRAWINGS AND	F - EXHAUST FAN
		MANUFACTURERS' REQUIREMENTS. 7. ALL WATER PROOFING OF PENETRATIONS AND COUNTER FLA	SHINGS TO BE DONE BY	AD - FRESH AIR DUCT
		SPECIALIST SUB-CONTRACTOR, TO BE APPOINTED BY CONTRA	FC	CU - FAN COIL UNIT
		8. STATIC PRESSURES FOR ALL THE FANS MUST BE VERIFIED PR	k\	N - KILO WATT
		9. ALL THE TOILET DOORS TO BE UNDERCUT 25mm, OR PROVIDE 10. ALL MATERIALS EXPOSED TO THE AIRFLOW WITHIN THE CEILIN	۵ NG CAVITY PLENUM SHALL BE NON-	TY QUANTITY
		COMBUSTIBLE OR LIMITED COMBUSTIBLE, WITH A MAXIMUM S 11. FINAL LOCATIONS & DIMENSIONS OF CONCRETE UPSTANDS FO		AG - RETURN AIR
		HVAC PIPING SHALL BE CHECKED ON SITE TO SUIT HVAC EQU	PMENT SPECIFIED.	LG - RETURN LINEAR GRILLE
		12. ALL THE EXTERNAL SUPPORT BRACKETS, SHALL BE HOT DIP O		WG - RETURN WALL GRILLE
		WITH AN APPROPRIATE FIRE RATED SEALANT TO PROVIDE AN	AIR-TIGHT INSTALLATION.	/A - SUPPLY AIR AF - SUPPLY FAN
		14. ALL EQUIPMENT DUTIES ARE GIVEN AS RATED DESIGN DUTIES FOR SITE ELEVATION ABOVE SEA LEVEL.		CG - SUPPLY CEILING GRILLE
		15. DIRECTION ARROWS AND IDENTIFICATION BANDS ARE TO BE F INTERVALS OVER THE INSULATION FOR ALL SERVICES.		CD - SUPPLY CEILING DIFFUSER
		16. ALL BENDS / ELBOWS WHICH HAVE A THROAT RADIUS LESS TH	AAN 3/4 OF THE HEEL RADIUS	S - STAINLESS STEEL NG - SUPPLY WALL GRILLE
В		MUST BE VANED. REFER TO CHART BELOW. 17. ALL AIR DIFFUSION EQUIPMENT SHALL BE SELECTED AND INS [®]		A - TRANSFER AIR
		TO BE FITTED WITH DUCT BALANCING DAMPERS, AS SHOWN O	ECTIONS TO AIR DIFFUSERS TA	AG - TRANSFER AIR GRILLE
		18. ALL AIR CONDITIONING DUCTWORK TO BE LAGGED WITH RIGID	т,	AD - TRANSFER AIR DUCT
		REINFORCED ALUMINIUM FOIL, AND FINISHED WITH A VAPOUR - 25mm THICK FIBERGLASS FOR INTERNAL DUCTWORK	C @ 24 kg/m ³	EMP - TEMPERATURE
		- 50mm THICK FIBERGLASS FOR EXTERNAL DUCTWORI A WATER PROOF BARRIER.	K @ 32 kg/m ³ , AND FINISHED WITH	C OR • UNDER CUT (25mm) MIN.
		- HARD INSULATION UNDER SUPPORTS. (REFER DETAI	L-10) W	I.O - WALL OPENING
		19. ALL THE SUPPLY SLOT DIFFUSERS & RETURN SLOT DIFFUSERS TYPE - ALS OR APPROVED EQUIVALENT.	F	.D - FIRE DAMPER (? HOUR RATING)
-		20. FINAL LOCATION OF ALL AIR DIFFUSION EQUIPMENT SHALL BE TILES, LIGHTING FIXTURES AND OTHER CEILING FIXTURES ON S	E F	.S.D - FIRE/SMOKE DAMPER (? HOUR RATING)
]	21. FLEXIBLE DUCT TO ANY AIR OUTLET SHALL NOT EXCEED A LE STRAIGHT TO ACHIEVE MINIMUM AIR RESISTANCE AND NOISE.	NGTH OF 1500mm, AND SHOULD BE	
		22. ALL OUTSIDE AIR INTAKE OPENINGS SHALL BE PROVIDED WITH		A-WAY BLOW DIFFUSER
		NOTED ON THE HVAC DRAWINGS. OPENINGS TO BE MINIMUM 5 LEVEL.	DUUMM ABOVE ROOF / GROUND	- WALL GRILLE DOUBLE DEFLECTION
		23. ALL DUCTWORK WORK RUNNING THROUGH HIGH HUMIDITY AR 25mm THICK 32kg / m ³ DENSITY FIBERGLASS INSULATION.		- INSULATED FLEXIBLE DUCT
С		24. ALL THE OUTLETS FOR SUPPLY, RETURN, TRANSFER & EXHAU	ST AIR SHALL BE PROVIDED WITH	- COMMISSIONING POINT
		VOLUME CONTROL DAMPERS. ALL DUCT CONNECTIONS FROM WITH SPLITTER TYPE DAMPERS, OR AS OTHERWISE NOTED ON		LI - LOCAL ISOLATOR
		25. ALL TRANSFER DUCTS SHALL BE PROVIDED WITH BACK DRAF AIR FLOW IN THE OPPOSITE DIRECTION.	T DAMPERS, IN ORDER TO PREVENT	
		26. ALL AIR DIFFUSION EQUIPMENT SHALL BE EPOXY MATT WHITE	,	ALV. S/M CLADDING
		27. FINAL SIZE OF ALL THE WEATHER LOUVRES DEPEND ON THE F		PPED AROUND DUCTING SIDES
		28. BACKDRAFT DAMPERS SHALL BE SIMILAR TO TROX TYPE - ARI 29. DUCTWORK AS NOTED IN MATERIAL SCHEDULE SHALL BE FAB		
		INSTALLED IN ACCORDANCE WITH THE SMACNA STANDARD. THIS WILL INCLUDE PROVISION FOR ALL TEST POINTS TO ENAI COMMISSIONING ACTIVITIES TO BE PERFORMED. (REFER TO		
		30. HINGED ACCESS DOORS SHALL BE PROVIDED ON THE LINK SID		A.C DUCT
		CONTROL DAMPERS, AND GENERALLY AS RECOMMENDED BY T	THE SMACNA STANDARD.	A.C DUCT
		31. FILTER SPECIFICATION PRIMARY AIR FILTER MATERIAL SHALL BE CAPABLE OF BEING		
		HAVE AVERAGE ARRESTANCE OF 80% ACCORDING TO THE ASH SPARE FILTERS SHALL BE PROVIDED.	_	
		FILTERS TO BE HOUSED IN PURPOSE-MADE FILTER HOUSINGS	WITH AIRTIGHT ACCESS DOORS.	50mm DUCT INSULATION 2 50mm TH. 32 kg/m³ 50mm TH. 32 kg/m³
		a. THE HOOD SHALL BE CONSTRUCTED FROM AND BE SUPPOR TYPE 430 NOT LESS THAN 1.2mm (OR) OF OTHER APPROVED		DENSITY
		STRENGTH, FIRE AND CORROSION RESISTANCE b. DUCTS SHALL BE CONSTRUCTED OF AND SUPPORTED BY CA		EXPOSED DUCT CLADDING DETAIL
		1.37mm (16#) (OR) STAINLESS STEEL NOT LESS THAN 1.2mm (c. ALL BEAMS AND JOINTS SHALL HAVE LIQUID-TIGHT CONTINU	(18#)	(10) N.T.S
		d. FIRE SUPPRESSION SYSTEM TO BE DONE BY SPECIALIST SUB BY CONTRACTOR.		
		e. FIRE WALL SHALL BE 2-HOUR RATED TO ENCLOSE EXHAUST f. FILTERS MUST BE "UL" CLASSIFIED, STAINLESS STEEL, NON-		_
		SHOULD BE EASILY REMOVABLE g. A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EAC	H VERTICAL RISER, WITH	
D		PROVISIONS FOR CLEANOUT h. AN OPENING, LARGE ENOUGH TO PERMIT CLEANING, SHALL	BE PROVIDED AT EACH CHANGE	
		IN DIRECTION OF THE DUCT, FOR THE PURPOSES OF INSPEC SUCH OPENING SHALL BE AT THE SIDES OF THE DUCT AND		GALVANISED SHEET NIETAL DUCTNORK
		HORIZONTAL DUCTWORK. i. AFTER INSTALLATION OF FILTERS, THE REMAINING AREA OF	THE HOOD TO BE CLOSED OFF	GALALL
		J. KITCHEN EXHAUST DUCTS SHALL BE CONSTRUCTED IN COM	PLIANCE WITH NFPA STANDARDS	
		33. MAIN HVAC ELECTRICAL POWER SUPPLY CABLE TO BE COPPE	R.	
		34. ALL HEATER BANKS TO BE HOUSED IN FLANGED STEEL CASIN	GS FOR EASY REMOVAL AND	
		COMPLY WITH THE FOLLOWING SAFETY REQUIREMENTS: - AIR PRESSURE SWITCH / SAIL SWITCH - OVERHEAT THERMOSTAT WITH MANUAL RESET		
_		- BACK OF TERMINAL BOX TO BE INSULATED - ACCESS DOOR INTERLOCKED WITH HEATER BANK	26 G	AUGE PERFORATED SHEET
		- HEATER ELEMENTS TO BE SIZED TO SUIT NUMBER OF STEPS THE THREE PHASES	AND BALANCE POWER OVER	*
		PROPORTIONAL OUTPUT CONTROL TO BE PROVIDED HEATER ELEMENTS TO BE INCOLOY TYPE OR APPROVED EQU "BLACK HEAT" OPERATION. (HEATING INTENSITY NOT MORE		50mm TH. FIBERGLASS INSULATION WITH 32 kg/m³ DENSITY & WRAPPED WITH MELINEX FILM - OR EQUIVALENT
		- INSULATION SHALL BE 6mm THICK NON ASBESTOS MILL BOA AND 600mm DOWNSTREAM		WRAPPED WITH MELINEX FILM - OR EQUIVALENT
		35. ALL MACHINES AND MOTORS (ABOVE 0.75 kW) SHALL INCORPO		(11) N.T.S
		a. HIGH EFFICIENCY MOTORS (LOW COPPER AND IRON LOSSES b. POWER FACTOR CORRECTION TO 0.95		
		C. SPEED CONTROLLERS WITH VARIABLE / AUTOMATIC CONTR CONTROL (IF REQUESTED)		
		d. ALL CONTROL TRANSFORMERS SHALL BE HIGH EFFICIENCY 36. MOTOR POWER FOR ALL THE HVAC EQUIPMENT SHALL BE VEF		
Ε		37. SOUND ATTENUATION		
		a. ALL FACTORY-MADE SOUND ATTENUATORS TO BE SELEC "HOWDEN-DONKIN" COMPANY REQUIREMENTS.	TED AND LOCATED AS PER THE	
		b. ALL SOUND ATTENUATORS TO BE LINED WITH MELINEX FI c. TRANSITION DUCTWORK BETWEEN ATTENUATORS AND A		
		WITH ACOUSTIC INSULATION AS PER DETAIL 11 ON THIS D d. ALL DUCT LINING MATERIAL SHALL COMPLY WITH SABS S		
		e. OCCUPIED ROOMS SHALL ATTAIN THE SOUND LEVELS AS APPLICATIONS HANDBOOK, CHAPTER - "SOUND AND VIBR		
		38. VIBRATION ISOLATION OF EQUIPMENT		
		ALL ROTATIONAL EQUIPMENT WHICH HAS A POWER CONSUMP BE FITTED WITH VIBRATION ISOLATORS TO ENSURE NO EQUIPM INTO THE STRUCTURE, VIBRATION ISOLATORS SHALL BE SELE	MENT VIBRATION IS TRANSMITTED	
	-	INTO THE STRUCTURE. VIBRATION ISOLATORS SHALL BE SELE MASON INDUSTRIES SELECTION DATA CONSIDERING A MINIMU VIBRATION.		
		39. FOR ALL THE HVAC EQUIPMENT, A CONDENSATE DRAIN SHOU	ILD BE PROVIDED WITHIN TWO	
		METERS OF THE UNIT, BY OTHERS, UNLESS STATED OTHERWIS		
	ļ,			
			<u>NOTE</u>	<u>S</u>
F				IOT SCALE DRAWING - ONLY DIMENSIONS SHOWN E USED
				CONTRACTOR SHALL VERIFY ALL CONDITIONS, INSIONS AND LEVELS ON THE SITE AND NOTIFY THE
			NEC	SUPERVISOR OF ANY VARIATIONS BEFORE SUPERVISOR OF ANY VARIATIONS BEFORE STRUCTION.
	1			
	DRAWING NO.	REFERENCE DRAWINGS		

3

50mm

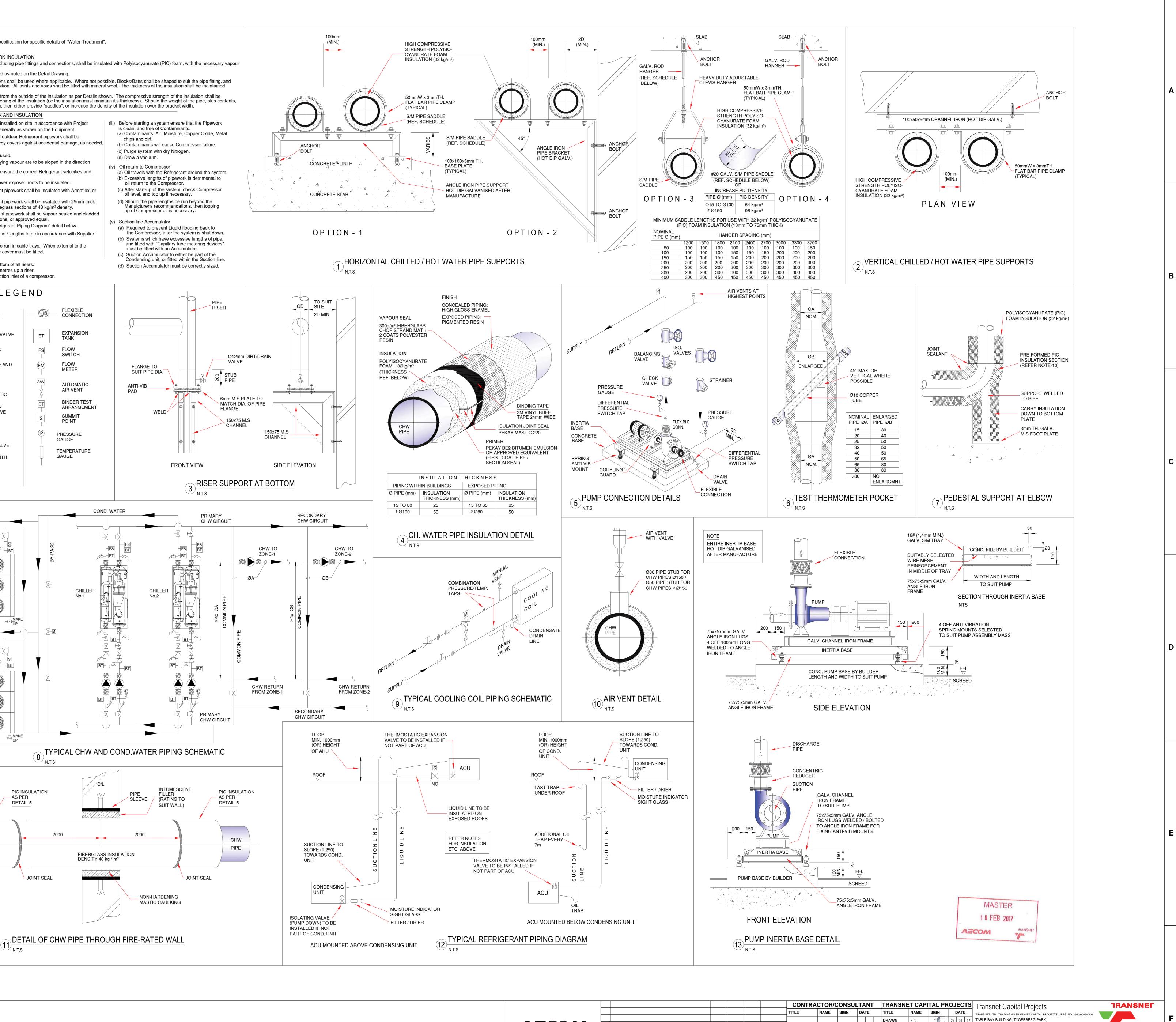


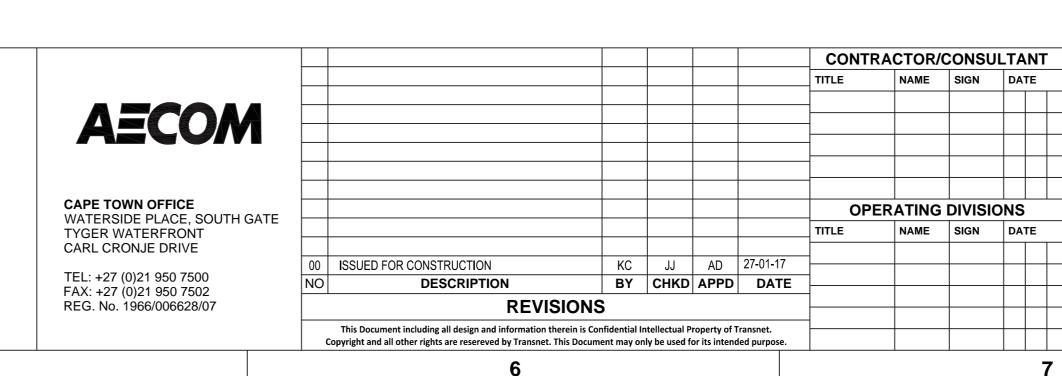
		STAN	JDA	RD P	IPING NO	TE	S		9. WATER TRE	
	-	HILLED WATER PIPE INSTA GENERAL Refer to Project Technical S	ALLAT	FIONS				ation	Refer to Proje	ect Technical Speci
		Pipes, strainers and other fith Valves, strainers and other f	tings (fittings	up to 50 s larger t	mm may be scr han 50mm mus	rewe st be	ed or flanged. e flanged.		All chilled wa barrier.	ATER PIPEWORK ter pipework, incluc n shall be applied a
Α		Thread must be in accordance otherwise specified. Galvanised piping must be s	screwe	ed when	-				securely wire over the pipe	ned piping sections d/banded in positio fitting. all be supported fror
		Clean all piping before conne Welding to galvanised piping Where welding for whatever	g or fit purpo	ttings is	•	comp	plete section	must be hot dip	determined to cause the ins	o ensure no flatteni sulation to flatten, th ION PIPEWORK A
		galvanised after manufacture Cold galvanising is not accep Use full radius bends and sw	ptable		herever possib	ole. l	Use elbows o	nly under	Technical Spec	e work shall be inst cification, and gene s. All indoor and ou
		exceptional conditions Where it is necessary to redu Provide all pipelines with 15r pipe work can be drained of	mm di	rain cocl	ks at all low poi		-		(i) Pipe Rur (a) Type	-L copper to be use
		Install horizontal pipes with a expansion tank wherever po formation of air locks and air	a slop Issible	e of at le e. Fit all	east 1 in 500 to pipes in such a	a mar	nner as to pre	event the	of the (c) Pipin press	contal pipes carrying e vapour flow. g to be sized to ens sure drops.
		or air bottles. Air vents or bo pressure of the system. Arrange piping in plant room	ottles	must be	designed for a	t lea	st 1,5 times t	he working	(e) All in appre	d lines running over ternal Refrigerant p oved equal. ternal Refrigerant p
		obstructed. Size pipes which are not dim * The velocity must not	nensio excee	oned on ed 2,5 m	drawings using n/s.	the	following crite		rigid, (g) All ex	pre-formed fibregla ternal Refrigerant p Aluminium sections
		* The friction rate must Pipe expansion joints, where stainless steel or may be of t expansion movements are to	e requ the Vi	iired, sha iking Joł	all be of the bell	lows	s type manufa		(i) All Re Requ	r to "Typical Refrige frigerant pipe runs uirements.
		Chilled water piping shall be Screwed joints may be used whereas all piping in excess	black I for pi	c mediur	n tubing, confor diameter up to a	and i	including 50n	nm diameter	Build (ii) Oil Trap	frigerant pipes to ru ling, a protective co s e fitted at the bottor
В		flanges where stated below. Pipes of diameter in excess accordance with SABS 62-19	of 150 971 w	vith weld	led joints only.		f seamless bl	ack steel in	(b) To be	e fitted every 7 met aps near the suctio
		All black pipe fittings shall co Welding of pipework shall be reserves the right to have cu	e carri It for e	ied out c examina	only by qualified tion.	l wel				– PUMP
		Connections to air handling u flanged in the case of piping face unions in the case of pip conditioning system to be real	of dia ping c	ameter 6 of diame	5mm and over ter less than 65	and	shall be joine	ed using cone		BUTTERFLY
		In all piping installations due contraction of the piping mat The chilled water system and	allow terial.	/ance sh	all be made for		-			ISOLATING VAI
		tanks of the asbestos or cop complete with ball valve, qui Automatic air release valves	per ty ick-fill s shall	/pe each and dra be fitteo	n with a minimu in connections. d at the top of th	m wa ne ris	ater volume c ser pipe stack	of 150 litres, s, and in any		BALL VALVE
		other positions in the hot was necessary to prevent airlocks Condenser water pipes shall	s and I be o	l to facilit f mediur	tate commissior n or heavy blac	ning :k ste	of the pumpi eel piping to E	ng systems. 3S 1387 or		S-TUBE BALANCING VALVE
		SANS 719 specifications but minimum coating of 300 g/m Fittings shall be of heavy gal above, and shall be manufac	12. Ivanis	ed malle	eable steel or m	nallea	able iron with	galvanising as		THERMOSTATIC VALVE NON-RETURN
		be of cast iron or steel to BS Drain pipes must fall with a g Provide all drain pipes with o	gradie	ent of 1:5	50.		-			(CHECK) VALVE SOLENOID VALVE
	2	Domestic grade copper pipin the compression or solder ty HANGERS AND SUPPORT	ng cou /pe.		-	-	-			MOTORISED CONTROL VALV
С	2.	Spring hanger mountings for Pipe hangers shall be adjust	r vibra				-	ooms.		STRAINER WITH BALL VALVE
		The maximum horizontal sup for steel chilled water, conde	enser	water, h			meters shall Span (m)	be as follows		UNION
		(mm) 12-32 40-65	20	6 10			2.5 3.0			
		80-100 125-150 200-300		12 16 22			3.5 4.0 5.0			s i
		350-500 The maximum horizontal sup as follows:	pport	25 spacing	for condensate		6.0 om AC units) (pipes shall be	DI	
		Nominal (mm)	Pipe	Size	Span (m)					
		12-20 25-40 50 and	lover		1.0 2.0 2.5	-			COO TOW No.1	(NAAXX80X33AX)
		Hangers shall be provided a fitting.	at a n	naximun	n spacing of 1 n	_ netre	e from each e	lbow or pipe		
	3.	VALVES Valve materials shall be sele For detailed valve specification	ion re	efer to Pr	oject Technical	l Spe	ecification.		EXPANSION TANK	
D		Saunders type valves or app Gate valves shall only be use Globe valves shall be used f	ed as for thr	isolating ottling o	g or shut off val r balancing purp	lves. pose	es.			
		Butterfly valves shall be used Diaphragm valves shall only Check valves shall be of the	be us	sed as s	hut-off purpose			ation.	DI	
		Plug cocks shall be used for Calibrated balancing valves iron valve bodies, bronze dis	shall sc, inte	be of the ernal se	e plug cock or g als, screwed en	nds, ι	up to 50 mm	and flanged	TOW	
	4.	ends for 65 mm ø and over. STRAINERS Strainers shall be of the ang						·	No.2	
		and strainers of 65 mm ø an Bronze or stainless steel scr Screens shall be perforated	id abo reens	ove, shal will be a	I have flanged e					
		Strainer 10-50			Perforation Size	e (mi	m)			
		65-150 200 ar		er	1.5 2.0					
		Strainers shall be provided w nearest drainpoint. Flexible Strainers shall be installed o	piping	g shall b	e used.					_
-	5.	water pumps. GAUGES Pressure gauges for water s								
E		Pressure gauge dials shall h A gauge cock and siphon tul	ave a be sha	a diamete all be pr	er of at least 10 ovided with eac	0 mr	m.			CHW PIPE
	0.	CONNECTIONS TO VIBRAT Flexible connections shall be type] or approved equivalent for chilled, condenser and he	e Mas t, whic	on Indus ch shall	stries SAFEFLE be provided to t					
	7.	TESTING OF PIPE INSTALL All pipe fittings shall be teste the maximum system pressu	_ATIO ed hyc	NS drostatic	ally up to a pres			a or 1.5 times		
		Tests shall be carried out be Water systems shall be filled The test pressure shall be m	efore t d with naintai	the appli water a ined for	cation of insulat nd air vented at	tion. t leas	st 24 hours b			
	8.	testing pump has been disco FLUSHING/DRAINING Upon the completion of all pr the commencement of comm	ressu	re tests						
		drained and flushed to ensur and sundry construction mat Refer to Water Treatment se	re the terials	e remova s.	I of waste jointi	ng m	naterial, accu	mulated dirt,		(1
		reticulation.								
F							TES 0 NOT SCA			SHOWN
·						т(2. Ті	O BE USED	CTOR SHALL V	ERIFY ALL CONDI	TIONS,
						N		ISOR OF ANY V	ARIATIONS BEFO	

1

DRAWING NO.

2





	TITLE	NAME	SIGN	DATE			TRANSNET LTD (TRADING AS TRANSNET CAPITAL PROJECTS): REG. NO. 1990/000900/06							
	DRAWN	K.C.	17	27	01	17	TABLE BAY BUILDING, TYGERBERG PARK,							
	CHECKED	J.J.	St.	27	01	17	163 UYS KRIGE DRIVE, PLATTEKLOOF, TEL: 021 940 1999 8001 FAX: 086 677 2455							
	DESIGNED	J.J.	1 the	27	01	17								
	CHECKED	A.D.	An	27	01	17	PORT OF SALDANHA							
			0000											
							IRON ORE TIPPLER 3 PROJECT							
							BULK POWER UPGRADE:							
	PR.ENG					4	MAIN INTAKE SUBSTATION							
_				<u> </u>										
	NAME	ANDREW	DALLY		DATE		STANDARD PIPING DETAILS							
	SIGNATURE	ant	the	27	01	17								
	REG. NUMBER	ع 9 <mark>17000</mark>	04 V				PROJECT NUMBER OD FBS DIS TYPE DRAWING NO. SHEET REV ID							
	SCALE:	N.T.S.				40	1 9 2 4 7 0 1 2 5 1 0 M S T 0 0 0 9 0 1 0 AE							
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