

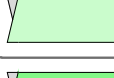
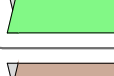
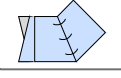
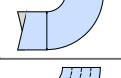
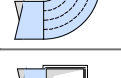
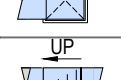
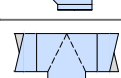
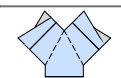
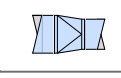
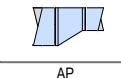
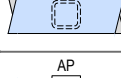
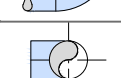
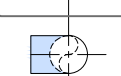
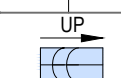
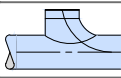
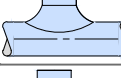
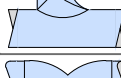
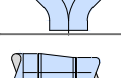
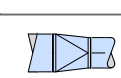
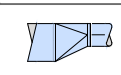
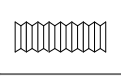
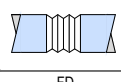
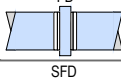
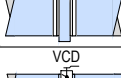
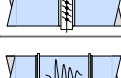
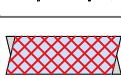
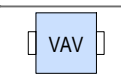
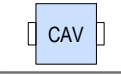
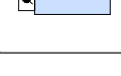
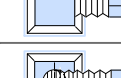
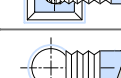
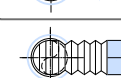
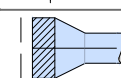
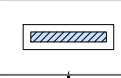
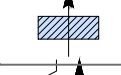
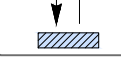
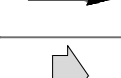
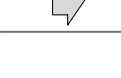
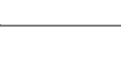
// PIPEWORK & FITTINGS

	PIPEWORK UNDER FLOOR / BELOW FFL
	PIPEWORK AT LOW LEVEL
	PIPEWORK AT HIGH LEVEL
	PIPEWORK WITHIN CEILING VOID
	PIPEWORK INDICATING DIRECTION OF FLOW
	PIPEWORK RISES
	PIPEWORK DROPS
	PIPEWORK RISES (DOUBLE LINE)
	PIPEWORK DROPS (DOUBLE LINE)
	C COLD WATER OUTLET
	H HOT WATER OUTLET
	SH SHOWER MIXER OUTLET
	G NATURAL GAS OUTLET
	G TWIN NATURAL GAS OUTLET
	CAPPED PIPEWORK END
	TUNDISH
	TP TEST POINT
	OV OPEN VENT
	IV MV MANUAL VENT
	AAV AUTOMATIC AIR VENT
	FC FLEXIBLE PIPEWORK CONNECTION
	EXP. EXPANSION BELLOWS
	A PIPEWORK ANCHOR
	PIPEWORK GUIDE
	S PIPEWORK SUPPORT
	EL PIPEWORK EXPANSION LOOP
	PIPEWORK WATER FILTER
	UNION CONNECTION
	PIPEWORK FLANGE CONNECTION
// PUBLIC HEALTH	
	FG FLOOR GULLY
	BIG BACK INLET GULLY
	SEALED TOP GULLY
	GT GREASE TRAP
	IT INTERCEPTING TRAP
	FAI FRESH AIR INLET
	VENT COWL
	RWO RAIN WATER OUTLET
	RWP RAIN WATER PIPE
	RE RODDING EYE / CLEANING POINT
	URE UPTURNED RODDING EYE / CLEANING POINT
	WASTE DRAIN OUTLET
	WC FOUL WASTE OUTLET
FIRE FIGHTING	
	H FIRE HYDRANT
	HR HOSE REEL
	DRY RISER
	LV LANDING VALVE
	SVS SPRINKLER VALVE SET
	SP SPRINKLER HEAD
	FIRE EXTINGUISHER (WATER)
	FIRE EXTINGUISHER (FOAM)
	FIRE EXTINGUISHER (POWDER)
	FIRE EXTINGUISHER (CO ₂)
	FIRE EXTINGUISHER (MET CHEMICALS)

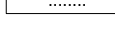
ABOVE GROUND DRAINAGE SYSTEM COLOURS	
	CONDENSATE SYSTEM
	FOUL WASTE SYSTEM
	RAIN WATER SYSTEM
	WASTE OIL SYSTEM
DOMESTIC WATER SYSTEM COLOURS	
	BOOSTED COLD WATER SERVICE SYSTEM
	BOOSTED COLD WATER SERVICE (CAT 5) SYSTEM
	COLD WATER SERVICE SYSTEM
	GREY WATER SERVICE SYSTEM
	HOT WATER SERVICE FLOW SYSTEM
	HOT WATER SERVICE RETURN SYSTEM
	LAB COLD WATER SERVICE SYSTEM
	LABORATORY HOT WATER SERVICE FLOW SYSTEM
	LABORATORY HOT WATER SERVICE RETURN SYSTEM
	MANS COLD WATER SERVICE SYSTEM
	RECYCLED WATER SERVICE SYSTEM
	REVERSE OSMOSIS WATER SERVICE SYSTEM
	SOFTENED WATER SERVICE SYSTEM
	TANKED COLD WATER SERVICE SYSTEM
GAS SERVICES SYSTEM COLOUR	
	MEDICAL AIR - 4 BAR SYSTEM
	MEDICAL AIR - 7 BAR SYSTEM
	MEDICAL AIR - ANAESTHETIC GAS SYSTEM
	MEDICAL AIR - CARBON DIOXIDE GAS SYSTEM
	MEDICAL AIR - ENTONOX GAS SYSTEM
	MEDICAL AIR - HELIOX21 GAS SYSTEM
	MEDICAL AIR - HELIUM GAS SYSTEM
	MEDICAL AIR - iNOnax GAS SYSTEM
	MEDICAL AIR - LIQUID NITROGEN SYSTEM
	MEDICAL AIR - NITROGEN GAS SYSTEM
	MEDICAL AIR - NITROUSOXIDE GAS SYSTEM
	MEDICAL AIR - OXYGEN GAS SYSTEM
	MEDICAL AIR - VACUUM SYSTEM
	ACETYLENE GAS SYSTEM
	AIR GAS SYSTEM
	ARGON GAS SYSTEM
	CARBON DIOXIDE GAS SYSTEM
	COMPRESSED AIR GAS SYSTEM
	HELIUM GAS SYSTEM
	HYDROGEN GAS SYSTEM
	LIQUID NITROGEN SYSTEM
	NATURAL GAS SYSTEM
	NITROGEN GAS SYSTEM
	NITROUS OXIDE GAS SYSTEM
	OXYGEN GAS SYSTEM
	VACUUM SYSTEM
	PROPANE GAS SYSTEM
	PNEUMATIC SYSTEM
COOLING SERVICES SYSTEM COLOURS	
	CHILLED WATER FLOW SYSTEM
	CHILLED WATER RETURN SYSTEM
	REFRIGERANT FLOW SYSTEM
	REFRIGERANT RETURN SYSTEM
HEATING SERVICES SYSTEM COLOURS	
	LOW TEMPERATURE HOT WATER FLOW SYSTEM
	LOW TEMPERATURE HOT WATER RETURN SYSTEM
	MEDIUM TEMPERATURE HOT WATER FLOW SYSTEM
	MEDIUM TEMPERATURE HOT WATER RETURN SYSTEM
	HIGH TEMPERATURE HOT WATER FLOW SYSTEM
	HIGH TEMPERATURE HOT WATER RETURN SYSTEM
OTHER PIPED SERVICES SYSTEM COLOURS	
	SPRINKLER WATER SYSTEM
	FUEL - OIL SYSTEM
// EXTERNAL SERVICES	
	MAINS COLD WATER PIPEWORK
	BOOSTED COLD WATER PIPEWORK
	NATURAL GAS PIPEWORK
	DISTRICT HEATING PIPEWORK
	RAIN WATER PIPEWORK
	GREY WATER PIPEWORK
	SURFACE WATER PIPEWORK
	FUEL (OIL) PIPEWORK
	COMBINED DRAIN WATER PIPEWORK
	FOUL WATER PIPEWORK
	MH MAN HOLE
	VP VALVE PIT
	MC METER CHAMBER
// CONTROL PANELS	
	MECHANICAL EQUIPMENT CONTROL PANEL
PANEL REFERENCES	
AHU-CP	AIR HANDLING UNIT CONTROL PANEL
B-CP	BOILER CONTROL PANEL
BMSC	CENTRALISED BUILDING MANAGEMENT SYSTEM PANEL
BMSL	LOCAL BUILDING MANAGEMENT SYSTEM PANEL
C-CP	CHILLER CONTROL PANEL
CP-CP	CIRCULATING PUMP CONTROL PANEL
HP-CP	HEAT PUMP CONTROL PANEL
HPS-CP	HYDRAULIC & PNEUMATIC SYSTEM CONTROL PANEL
M-CP	MECHANICAL CONTROL PANEL
P-CP	PRESSURE CONTROL PANEL
SD-CP	EMERGENCY SHUTDOWN PANEL
SE-CP	SMOKE EXTRACTION CONTROL PANEL
SP-CP	SPRINKLER SYSTEM CONTROL PANEL
VAV-CP	VARIABLE AIR VOLUME BOX CONTROL PANEL

// VALVES & COCKS	
	2 PORT VALVE (ELECTRIC)
	2 PORT VALVE (PNEUMATIC)
	3 PORT VALVE (ELECTRIC)
	3 PORT VALVE (PNEUMATIC)
	4 PORT VALVE (ELECTRIC)
	AIR ADMITTANCE VALVE
	ANTI VACUUM VALVE
	CHECK VALVE
	DOUBLE CHECK VALVE
	COMMISSIONING SET
	DIFFERENTIAL PRESSURE CONTROL VALVE
	DOUBLE REGULATING VALVE
	DOUBLE REGULATING VALVE (FIXED ORIFICE)
	DRAIN COCK
	DRAIN COCK WITH HOSE UNION
	EMERGENCY SHUT-OFF VALVE
	FLOW MEASURING ORIFICE
	GAS COCK
	GAS GOVERNOR
	ISOLATION VALVE
	ISOLATION VALVE (NORMALLY CLOSED)
	ISOLATION VALVE (ANGLE PATTERN)
	LANDING VALVE
	LOCKSHIELD VALVE
	NON-RETURN VALVE
	PLUG COCK
	PRESSURE REGULATING VALVE
	PRESSURE INDEPENDENT CONTROL VALVE
	PURGE VALVE
	SAFETY VALVE
	SOLENOID VALVE
	STOP COCK
	STRAINER
	THERMAL BALANCING VALVE
	THERMOSTATIC RADIATOR VALVE
	THERMOSTATIC MIXING VALVE
// MECHANICAL EQUIPMENT	
	MECHANICAL EQUIPMENT - RECTANGULAR
	MECHANICAL EQUIPMENT - CYLINDRICAL
EQUIPMENT REFERENCES	
AD	AIR DRYER
AU	AIR COMPRESSOR UNIT
ACU	AIR CONDITIONING UNIT
AHU	AIR HANDLING UNIT
ASHP	AIR SOURCE HEAT PUMP
B	BOILER
BS	BOOSTER SET
CHU	CHILLER UNIT
CU	CONDENSER UNIT
EXP	EXPANSION VESSEL
FCU	FAN COIL UNIT
FC	FAN CONVECTOR
GSHp	GROUND SOURCE HEAT PUMP
HEU	HEAT EXCHANGER UNIT
ODH	OVER DOOR HEATER / AIR CURTAIN
HU	HEATER UNIT
MVHR	MECHANICAL VENTILATION WITH HEAT RECOVERY UNIT
RCU	REFRIGERATION COMPRESSOR UNIT
WH	WATER HEATER
WS	WATER SOFTENER
WT	WATER TANK
	COMPRESSOR
	ELIMINATOR
	EMERGENCY SHOWER

// MECHANICAL EQUIPMENT CONT.	
	EMERGENCY EYE WASH
	FAN - AXIAL
	FAN - PROPELLER
	FAN - WALL MOUNTED
	CENTRIFUGAL FAN (SINGLE)
	CENTRIFUGAL FAN (DOUBLE)
	HEATER BATTERY
	COOLING COIL
	HEAT RECOVERY COIL / COMBINED HEATING & COOLING COIL
	HEADER
	PACKAGED PLATE HEAT EXCHANGER
	PUMP - SINGLE
	PUMP - TWIN
	RADIATOR
	LST RADIATOR
	HEATED TOWEL RAIL
	PERIMETER HEATING
	UNDERFLOOR PIPEWORK HEATING MANIFOLD
	SOLAR THERMAL PANEL
	GAS METER
	WATER METER
	GAS SUB-METER
	WATER SUB-METER
	HEAT METER
// CONTROLS & SENSORS	
	SYSTEM PRESSURE GAUGE
	SYSTEM PRESSURE TRANSMITTER / TRANSDUCER
	SYSTEM PRESSURE SWITCH
	DIFFERENTIAL PRESSURE SWITCH
	SYSTEM TEMPERATURE GAUGE
	SYSTEM TEMPERATURE TRANSMITTER / TRANSDUCER
	TEMPERATURE SWITCH
	THERMOSTAT FOR CONTROLLING HEATING SYSTEM - WALL MOUNTED
	FAN SPEED CONTROLLER - WALL MOUNTED
	FAN COIL UNIT CONTROLLER - WALL MOUNTED
	AIR CONDITIONING UNIT CONTROLLER
	FLOAT SWITCH
	FLOW SWITCH
	LEVEL GAUGE
	LOW LEVEL SENSOR
	HIGH LEVEL SENSOR
	VIBRATION SENSOR
	FLOW CONDITION SENSOR
	GAS SENSOR / DETECTOR
	CORROSION SENSOR
	HUMIDITY SENSOR
	TEMPERATURE SENSOR
	CARBON DIOXIDE SENSOR
	VOLATILE ORGANIC COMPOUND SENSOR
	VACUUM BREAKER
	BURSTING DISC
	STEAM TRAP
	VENT HEAD

// VENTILATION DUCTWORK & ASSOCIATED FITTINGS		
	RECTANGULAR DUCT	SYSTEM COLOURS  SUPPLY / INTAKE AIR DUCTWORK (PRIMARY)  SUPPLY / INTAKE AIR DUCTWORK (SECONDARY)  EXTRACT / RETURN / EXHAUST AIR DUCTWORK (PRIMARY)  EXTRACT / RETURN / EXHAUST AIR DUCTWORK (SECONDARY)  DIRTY AIR EXTRACT / EXHAUST DUCTWORK  KITCHEN EXTRACT / EXHAUST AIR DUCTWORK  FUME EXTRACT / EXHAUST AIR DUCTWORK  BOILER EXTRACT / EXHAUST AIR DUCTWORK  SMOKE EXTRACT DUCTWORK  FIRE RATED DUCTWORK
	RECTANGULAR BEND DUCT	
	RECTANGULAR DUCT RADIUS BEND	
	RECTANGULAR DUCT RADIUS BEND (WITH TURNING VANES)	
	RECTANGULAR DUCT RTA / DFA	
	RECTANGULAR DUCT DTB / RFB	
	RECTANGULAR DUCT SETS DOWN / UP	
	RECTANGULAR DUCT SHOE	
	RECTANGULAR T-JUNCTION	
	RECTANGULAR Y-JUNCTION	
	RECTANGULAR DUCT REDUCES (CONCENTRIC)	
	RECTANGULAR DUCT REDUCES (ECCENTRIC)	
	RECTANGULAR DUCT WITH ACCESS PANEL	
	RECTANGULAR DUCT WITH ACCESS PANEL - SIDE VIEW	
	CIRCULAR DUCTWORK	
	CIRCULAR DUCT RADIUS BEND	
	CIRCULAR DUCT RTA / DFA	
	CIRCULAR DUCT DTB / RFB	
	CIRCULAR DUCT STEPS UP / DOWN	
	CIRCULAR DUCT SHOE	
	CIRCULAR DUCT SHOE (EQUAL)	
	RECTANGULAR TO CIRCULAR TRANSFORMATION SHOE	
	CIRCULAR DUCT T-JUNCTION	
	CIRCULAR DUCT Y-JUNCTION	
	CIRCULAR DUCT REDUCES (CONCENTRIC)	
	CIRCULAR DUCT REDUCES (ECCENTRIC)	
	RECTANGULAR DUCTWORK TRANSFORMS TO CIRCULAR (CONCENTRIC)	
	RECTANGULAR DUCTWORK TRANSFORMS TO CIRCULAR (ECCENTRIC)	
	FLEXIBLE DUCTWORK	
	FLEXIBLE DUCTWORK CONNECTION	
	FIRE DAMPER	
	SMOKE FIRE DAMPER	
	VOLUME CONTROL DAMPER	
	ATTENUATOR / SILENCER	
	CROSS TALK ATTENUATOR	
	FIRE RATED DUCTWORK	
	VARIABLE AIR VOLUME BOX	
	CONSTANT AIR VOLUME BOX	
	MIXING BOX	
	NON-RETURN DAMPER	
	SQUARE GRILLE (CW SIDE ENTRY FLEXIBLE DUCT CONNECTION)	
	SQUARE GRILLE (CW TOP ENTRY FLEXIBLE DUCT CONNECTION)	
	CIRCULAR GRILLE (CW SIDE ENTRY FLEXIBLE DUCT CONNECTION)	
	CIRCULAR GRILLE (CW TOP ENTRY FLEXIBLE DUCT CONNECTION)	
	BELL MOUTH (DOTTED LINE INDICATES BIRD GUARD)	
	SLOT DIFFUSER	
	TRANSFER AIR GRILLE	
	WALL MOUNTED LOUVRE (ARROW INDICATES DIRECTION OF AIR FLOW)	
	INDICATES DIRECTION OF EXTRACTED AIR FLOW	
	INDICATES DIRECTION OF SUPPLY AIR FLOW	
	INDICATES DIRECTION OF AIR FLOW (ALTERNATIVE SYMBOL)	

[illegible]

// ABBREVIATIONS CONT.	
ACRONYMS	DESCRIPTION
GASES	
O ₂	OXYGEN
N ₂ O	NITROUS OXIDE
MA	MEDICAL AIR
CO ₂	CARBON DIOXIDE
N ₂	NITROGEN
He	HELIUM
EN	ENTONOX (NITROUS OXIDE & OXYGEN MIX)
VAC	VACUUM
MVAC	MEDICAL VACUUM
CA	COMPRESSED AIR
H ₂	HYDROGEN
CO	CARBON MONOXIDE
Ar	ARGON
Xe	XENON
BA (100)	100 PSIG COMPRESSED AIR (BREATHING QUALITY)
BA (500)	500 PSIG COMPRESSED AIR (BREATHING QUALITY)
PSIG	POUNDS PER SQUARE INCH GAUGE
VENTILATION SERVICES	
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
ATT	ATTENUATOR
CTA	CROSS-TALK-ATTENUATOR
EA	EXTRACT
EG	EXTRACT GRILLE
EXH	EXHAUST AIR
FAI	FRESH AIR INTAKE
FCU	FAN COIL UNIT
FD	FIRE DAMPER
HVAC	HEATING VENTILATION & AIR CONDITIONING
MVHR	MECHANICAL VENTILATION WITH HEAT RECOVERY
OBD	OPPOSED BLADE DAMPER
RA	RETURN AIR
SA	SUPPLY AIR
SD	SUPPLY DIFFUSER
SFD	SMOKE FIRE DAMPER
VCD	VOLUME CONTROL DAMPER
UNITS OF MEASUREMENT	
ACH	AIR CHANGES PER HOUR
DN	NOMINAL DIAMETER
kg	KILOGRAMS
L	LITRES
L/s	LITRES PER SECOND
mm	MILLIMETRES
m	METRES
m/s	METRES PER SECOND
Pa/m	PASCALS PER METRE (PRESSURE DROP)
W	WATTS
Ø	DIAMETER
R	RADIUS
// POINT SCHEDULE	
	ENERGY MANAGEMENT SYSTEM
	BUILDING MANAGEMENT SYSTEM
AI	ANALOGUE INPUT
AO	ANALOGUE OUTPUT
DR	DATA RICH
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
// REFERENCE TAGS	
HEATING PIPEWORK SCHEMATIC TAG	
	PIPE SIZE (Ømm) FLOW RATE (L/s)
	VELOCITY (m/s) PRESSURE DROP (Pa/m)
DOMESTIC PIPEWORK SCHEMATIC TAG	
	PIPE SIZE (Ømm) FLOW RATE (L/s)
	VELOCITY (m/s) PRESSURE DROP (Pa/m)
DUCTWORK SCHEMATIC TAG	
	DUCT SIZE (mm) FLOW RATE (L/s)
	VELOCITY (m/s) PRESSURE DROP (Pa/m)
	MECHANICAL EQUIPMENT REFERENCE TAG
	TRANSFER AIR GRILLE REFERENCE TAG
	LOUVER REFERENCE TAG
	SUPPLY AIR DIFFUSER REFERENCE TAG
	EXTRACT AIR GRILLE REFERENCE TAG
	REVISION CLOUD & TAG

GENERAL NOTES:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE RELEVANT EST ASSOCIATES SPECIFICATIONS, TECHNICAL SCHEDULE DOCUMENTS, STANDARD SYMBOLS & ABBREVIATIONS DRAWING(S).

ALL APPARENT DRAFTING ERRORS OR DISCREPANCIES WITH OTHER DESIGN DOCUMENTS SHALL BE IDENTIFIED AS SOON AS POSSIBLE AND BROUGHT TO THE ATTENTION OF EST ASSOCIATES.

THIS DRAWING SHOULD ALWAYS BE PRINTED IN COLOUR.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

DO NOT SCALE FROM THIS DRAWING. IF ACCURATE DIMENSIONS ARE REQUIRED, MEASUREMENTS ARE TO BE TAKEN BY THE CONTRACTOR ON SITE.

THIS DRAWING IS INDICATIVE AND ILLUSTRATES PERFORMANCE DESIGN PRINCIPLES ASSOCIATES WITH THE RELEVANT SYSTEMS AND SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR THE DETAILED DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF THE SYSTEMS AND SERVICES AS DEEMED NECESSARY TO FORM A COMPLETE AND FULLY FUNCTIONING SYSTEM. REFER TO RECORD INFORMATION FOR DETAILS OF EXISTING SYSTEMS TO BE RETAINED / ADAPTED.

// DRAWING NOTES