9. MECHANICAL INSTALLATIONS

9.1 General

9.1.1 All mechanical systems including plumbing, cold and hot water, drainage, rainwater, fire protection, refrigeration, kitchen planning, refuse disposal, ventilating and air conditioning, controls, compressed air, fuel and LPG systems, and materials shall be in accordance with the Authority Standards and in full compliance with, but not limited to, the following standards specifications or any equivalent standard approved by the Authority.

ASHRAE	American Society for Heating Ventilation and Air Conditioning Engineer
NFPA	National Fire Protection Association
ANSI	American National Standards Institute
BS	British Standard
UBC	Uniform Building Code
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
ARI	Air Conditioning and Refrigeration Institute
AMCA	Air Moving and Conditioning Association
UL	Underwriters' Laboratories Inc.
FM	Factory Mutual
AGA	American Gas Association
API	American Petroleum Institute
LEED	Green Building related code of practice

9.1.2 All mechanical systems are to have identification and colour coding system in compliance with ANSI or any equivalent standard approved by the Authority.

9.2 Plumbing

9.2.1 Water supply, plumbing and sanitary drainage installations shall be in accordance with the requirements of the Authority Standards and the relevant Service Authority (Water) Regulations in compliance with the Uniform Plumbing Code (UPC) and/or the British standards.

9.3 Ventilation and Air Conditioning

9.3.1 The design and installation of all air conditioning and ventilation systems shall be in accordance with latest guidelines of ASHRAE standards, ANSI, the UBC and applicable NFPA standards.

9.3.2 The design of walls and roof shall take into account Ventilation and Air conditioning requirements. The purpose is to limit the accumulation of moisture and pollutants which originate in the building and which would otherwise become a health hazard. An adequate supply of fresh air is necessary to ensure the health and comfort of the occupants of buildings and to limit condensation.

9.3.3 The objective is to provide means of:

a. Proper ventilation, either natural or mechanical, to ensure acceptable Indoor Air Quality (IAQ) and dilution of pollutants.
b. Proper air conditioning to ensure comfortable indoor temperature.
c. Proper extraction of moisture and control of contaminants (e.g., from kitchens, laundries, toilets, industrial spaces, etc).

9.3.4 Habitable rooms will comply if there are provisions for:

a. One or more operable Ventilation Openings to the exterior with a total area of at least 1/20 of the floor area of room with some part of the opening at least 1.75 m above floor level
b. such opening(s) shall have a total ventilation area not less than 0.46 m² with opening secure and draughts avoided.
c. mechanical ventilation capable of providing 2 air changes/hour with a minimum of 7 L/s of fresh unpolluted outside air for each occupant during the time the space is occupied.

9.3.5 Ventilation of kitchens will comply if there are provisions for:

a. mechanical kitchen hood extract system designed and installed in compliance with ASHRAE guidelines.

b. Background ventilation - either natural by means of operable opening(s) to the exterior of not less than 0.46 m² or mechanical ventilation operating