Settlement systems

Jump to: navigation, search

Settlement facilities are linked and supported by systems that provide functions. Systems can be both physical and operational. This page concentrates on physical systems.

Contents

Life support systems

The life support systems main function is to support human life in the settlement. Another important function is to provide support to living organisms such as food production and habitat vegetation.

Plumbing and Water distribution

Water distribution is the system providing potable water to users from the Potable water treatment facility, while waste water systems take used water to the waste water treatment facility. Plumbing is the generic term for these systems. Water distribution is composed of pipes, pumps, control elements such as valves and storage elements such as tanks.

Water based fire protection is usually grouped with these systems, although the piping is generally different.

Heating and cooling distribution

Some of the temperature management in the settlement may be done using air circulation. However, energy transmission to and from the air handling units will probably be done using circulating water loops. An energy balance is required in the settlement, where energy input is equal to energy output. Some parts of the settlement may have excess energy, while others are in energy deficit.

Air circulation

The air circulation system uses the structure of buildings or dedicated ductwork to distribute treated air through the settlement. The air treatment function is not in a facility but is generally distributed to local air handling units that can cool, heat, filter, humidify and dehumidify the air. The humidity management systems are part of the larger

water treatment and distribution system. Fresh air might be handled in a central location, where CO2 would be removed and Oxygen added. Nitrogen would be added as well to compensate for losses (leaks) and absorption by plants and bacteria.

Electrical energy distribution systems

Electrical energy distribution systems include wiring, protection elements, insulation and grounding. These systems connect energy sources to energy storage and energy using equipment.

Electricity provides power for Processes, lighting and life support.

Communication systems

Communication systems are used for information networks, process control networks and building control networks. These systems link data sources to data storage and data users. These systems can use electrical wiring, radio links or optical links for transmit communications.

A simple planet wide communication system might use areostationary satellites in an equatorial orbit. This would reduce land infrastructure to a minimum. Canada was an early user of satellites for reasons that will also apply to Mars: A large land area with sparse population.

Transportation systems

Internal

External

Structural systems

Foundations

Walls and airlocks

Interior structures