

## Introduction

This document describes the physical requirements needed to install a submetering system in multi-family apartments. H2O Degree's system is a wireless, fixed network submetering system that collects and stores meter readings. Although this specification is provided for water submetering, the H2O Degree submetering system can collect wireless readings simultaneously from water meters, gas meters, electric meters, BTU meters and thermostats.

H2O Degree systems can easily be installed during construction of a multi-family complex or at any point after construction if a few items are included in the design of the multi-family property.

## Individual Living Units or Apartments

The plumbing in each multi-family building should include one or two water supply lines for each apartment. One cold only water supply line should be installed if the hot water heater is located in each apartment. Two water supply lines should be installed if the hot water is produced centrally (large domestic hot water heater) and if there is a cold water supply line and a separate hot water supply line entering each apartment.

A ball valve should be installed on the water supply lines (either just cold only or both cold and hot) entering into each apartment. The ball valve(s) should be accessible to the resident of the apartment so that the valve can be turned off for maintenance or in case of emergency. The manufacturer of the ball valve can be specified by the architect or engineer.

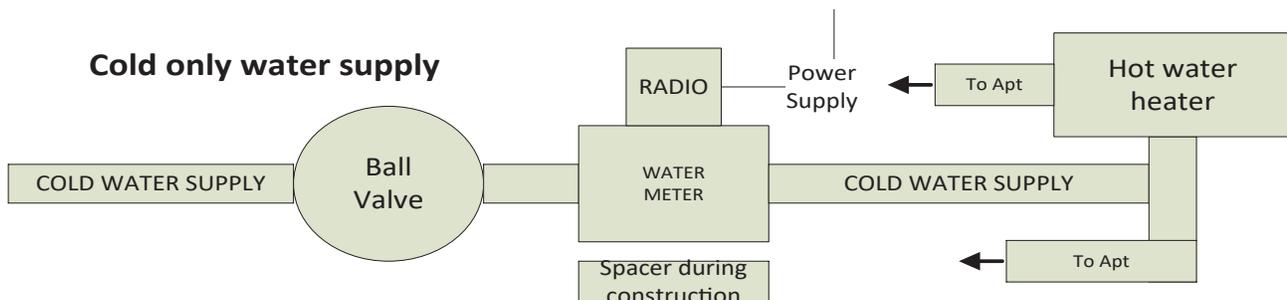
A straight section of pipe should be placed after the ball valve but before any plumbing TEEs in the supply line. This straight section of pipe allows for the installation of the water meter.

The water meter should include both a radio and a flow sensor which can measure gallons, time of flow (how many seconds water has flowed), the number of water flow events (number of times water started and stopped) and water temperature.

If the water submetering system is being installed on a new construction building then a meter spacer may be required. The spacer should be the same length and thread type as the water meter so that the water meter can easily be installed. During construction, a spacer can be installed after the ball valve in place of the water meter. The spacer allows the plumbing trades to flush the potable water system to clear the pipes of debris and contaminants. Once the system is cleaned and filled with potable water then the spacer can be removed and the water meter installed.

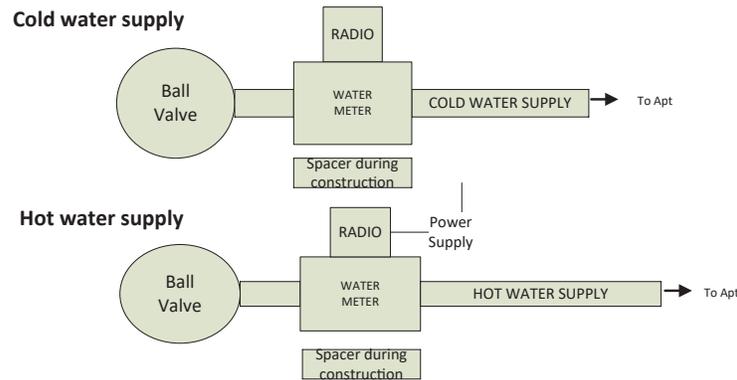
## Cold Only Water Supply

This is the least cost method of installing water submeters for apartments since it requires only one water meter and radio. One meter is used to measure the total water consumption for each apartment.



## Cold and Hot Water Supply

This method of installing water submeters for apartments requires two water meters per apartment. One water meter is used to measure the total cold water consumption and the second water meter is used to measure the total hot water consumption for each apartment.



## Water Ball Valve Installation

Installing a ball valve on the water supply line before each water meter is standard practice. This allows the water for the entire apartment to be turned off by the resident, plumber or maintenance person. The valve should be installed in an easily accessible location to facilitate a quick and easy water shut-down.

## Location of the Water Meter(s)

The water meter should be installed after the ball valve and before any TEEs supplying water to the hot water heater or to any plumbing fixtures in an apartment. The meter manufacturer can provide details regarding the length, location and orientation of a straight section of pipe required to install the water meter. The water meter needs to be accessible to a plumber for the initial installation and for water meter replacement in the future.

## Types of Water Meters

The H2O Degree submetering system can accommodate a wide range of water meters. Since various water meters have different interfaces (pulse, encoded registers and dedicated Hall cells) the water meter must be selected from a list of water meters that have been tested and proven with the H2O Degree submetering system. Contact H2O Degree for more information and the list of compatible water meters.

Note: In certain parts of the United States, specific legal requirements exist regarding water meters and other parts that come in contact with potable water. The American Water Works Association (AWWA), National Apartment Association (NAA), submetering billing companies and/or local plumbers may be of assistance regarding these regulations.

## Property Manager Office

An Internet connection and continuous electrical power (120 VAC) must be provided at the location designated by the property owner.

The H2O Degree gateway and coordinator are typically installed in the property manager's office. The gateway requires 120 VAC and an Ethernet cable going to the local Internet connection (switch or router). The Internet connection is required to allow H2O Degree to retrieve the water meter data stored in the gateway. The gateway should be located where a maintenance person can access the equipment. The gateway should require no local configuration and should be "Plug and Play."