1.1 INTRODUCTION

1.1.1 OBJECT

This report, annexes and accompanying drawings, are intended to describes installations of a sports center. This sports center has two floors, one of them, the ground floor with access from the street Avenida 11 and the basement with access from an interior street.

This technical installations project includes memory, annexed calculation, measurements, plans and specifications.

1.1.2 TITULAR

El titular del immoble és:

UPC amb NIF 56858521M Barcelona, Avinguda 11 de setembre nº 1

1.1.3 DOMICILI SOCIAL I EMLAÇAMENT

El domicili del poliesportiu és Avinguda 11 de setembre nº 1 de Pallejà, provincia de Barcelona. Per la part nord es troba el carrer c/Vallès i Ribot.

1.1.4 DESCRIPCIÓ I CARACTERÍSTIQUES CONSTRUCTIVES DEL LOCAL

The plot of the sport center has a rectangular shape, the main entrance is on an interior street and there is a second entrance on Avenida 11.

The main front has 54.8 meters, the front of the Avenue September 11 has a length of 37.5 meters and the back front is approximately 55 meters.

The sports center has two floors, the ground floor, where is the main entrance, and the basement floor.

The structure of the building is made by columns and beams supported by the respective foundation. The roof is supported by a steel pieces also.

The total floor area is 2,789.93 m²,

The ground floor is about 945.78 m² and the basement floor is about 1844.93 m².

There are some activities in the sport center: Basketball, football, handball, gymnastics and figure skating.

These is the surfaces of the different rooms:

GROUND FLOOR:
### Projecte de instal·lacions Poliesportiu de Pallejà

#### Office
- Office 1: 12,29 m²
- Office 2: 17,30 m²
- Office 3: 17,82 m²
- Office 4: 17,69 m²
- Office 5: 29,93 m²
- Office 6: 38,11 m²
- Fitness: 110,64 m²
- Toilet Men: 12,15 m²
- Toilet Women: 10,71 m²
- Toilet disabled: 5,4 m²
- Entrance: 23,98 m²
- Step area: 112 seients
- Public area: 603 m²
- Area accés bar: 37,57 m²

#### BASEMENT FLOOR:

<table>
<thead>
<tr>
<th>ROOM</th>
<th>SURFACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archive</td>
<td>11,95 m²</td>
</tr>
<tr>
<td>Store 1</td>
<td>15,30 m²</td>
</tr>
<tr>
<td>Store 2</td>
<td>8,91 m²</td>
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<tr>
<td>Store 3</td>
<td>8,91 m²</td>
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<tr>
<td>Serveis</td>
<td>22,51 m²</td>
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<tr>
<td>Dressing room Monitors</td>
<td>38,11 m²</td>
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<tr>
<td>Store Basquet</td>
<td>33,15 m²</td>
</tr>
<tr>
<td>Store. Futbol Sala</td>
<td>17,81 m²</td>
</tr>
<tr>
<td>Dressing room. Pers 1</td>
<td>9,00 m²</td>
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<table>
<thead>
<tr>
<th>ROOM</th>
<th>SURFACE</th>
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<tbody>
<tr>
<td>Dressing room Pers 2</td>
<td>9,00 m²</td>
</tr>
<tr>
<td>Dressing room 1</td>
<td>25,10 m²</td>
</tr>
<tr>
<td>Dressing room 2</td>
<td>24,05 m²</td>
</tr>
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<td>Dressing room 3</td>
<td>24,05 m²</td>
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<tr>
<td>Dressing room 4</td>
<td>21,29 m²</td>
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<tr>
<td>Infermeria</td>
<td>11,84 m²</td>
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<tr>
<td>Dressing room Arb 1</td>
<td>15,73 m²</td>
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<tr>
<td>Dressing room Arb 2</td>
<td>11,67 m²</td>
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<tr>
<td>Corridor</td>
<td>419,41 m²</td>
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<tr>
<td>A.A</td>
<td>12,68 m²</td>
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<tr>
<td>Quadre llum</td>
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</tr>
<tr>
<td>Caldera</td>
<td>7,83 m²</td>
</tr>
<tr>
<td>Pista</td>
<td>1052,49 m²</td>
</tr>
</tbody>
</table>
1.2 PLUMBING MEMORY

1.2.1 INTRODUCTION

The water supply is provided by the company Aigües Barcelona.

The documents used are:
- “CTE-DB HS 4 Suministro de agua”
- RITE. REGLAMENTO DE INSTALACIONES TÉRMICAS EN LOS EDIFICIOS (Real Decreto 1751/1998, de 31 de julio de 1998)

The project of plumbing of the sport center will consist calculation and dimensioning of the entire pipe network from the feeding tube to each of the wares. In this case we only need one accountant, a box will be built in front of the basement.

Les canonades de la instal·lació seran de coure.

The pipes of the installation will be copper.

The method of calculation has been calculated manually, without computer aids. The calculation was done as directed "CTE HS DB-4 supplied by water." The final values of diameter, loss of load and speed of the abacus calculation obtained by relating these factors with the flow.

1.2.2 DESCRIPTION OF THE INSTALLATION

Since the distribution network starts with a rush, where there is a key making a record and another key where it starts the main pipe, which connects with the interior installation of the sport center.

Since the password, start by feeding tube into the utility meter located in a cabinet in the front of the building.

The water arrives continuously and in sufficient quantity to supply all the points. So its not necessary to install any regulatory mechanism.

 Depends on the situation, the pipes will be hung on the ceiling or built in the wall. For the basement ground corridor it will be hung from the ceiling with a false ceiling. However, in wet rooms it will be embedded in the wall. The reason it runs for the false ceiling is that the path of the installation is very simple and it will carry other installations.

The separation between the hot pipe, which will be always on the cold water pipe, and the cold pipe it will always be 4 cm as the normative marks.

It placed a network return since there are more than 15 meters from the exit of ACS and the farthest point of consumption and will run parallel to the impulsion. Since 10% of the circulating water outlet pipes will be placed with a diameter of 16 mm, which is the minimum because circulate few quantity of water.

The plans are numbered different visual details that are explained better to understand critical parts.

1.2.3 WATER SUPPLY

Before describing the components of the installation we have to mention that the company that supplies water in Pallejà is Aigües de Barcelona and gives us a regular and sufficient flow and pressure of 4.5 kg/cm²

The minimum instantaneous flow devices are:

Cool water
- Sink: 0,05 l / s.
- Urinary: 0,04 l / s.
- Toilet with tank: 0,10 l / s.
- Shower: 0,20 l / s

Hot water
- Sink: 0,03 l / s.
- Shower: 0,10 l / s

At consumption points the minimum pressure must be:
- 10 m.c.a for a common tap

The pressure at any point of consumption should not exceed 50 mca.

The temperature of hot water at consumption points should be between 50 ° C and 65 ° C.

The water installation must comply with the current legislation on water for human consumption.

The materials to be used in the installation, in relation to its effects on the water supply, must adapted
by the following requirements:

- For pipes and accessories should be used materials that do not produce harmful substances in concentrations that exceed the values permitted by Royal Decree 140/2003 of 7 February.
- They should not modify the organoleptic or safety of the water supplied.
- They must be corrosion-resistant interior.
- Must be able to operate efficiently in terms of service provided.
- There must submit electrochemical incompatibility between them.
- They must be resistant to temperatures up to 40 °C, and temperatures outside of their immediate environment.
- They must be compatible with the water supplied and should encourage the migration of substances in quantities of materials that are a risk to the health and cleanliness of water for human consumption.
- The aging, fatigue, durability and other mechanical, physical or chemical, should not reduce the useful life of the installation.

To satisfy the previous conditions can be used coatings, protective systems and water treatment systems.

The installation of water supply must have appropriate characteristics to prevent the development of pathogens and promote the development of the biofilm.

1.2.4 ELEMENTS OF INSTALLATION

Here we have the elements that form part of the installation with the help of the Código Técnico HS4: supplies of water.

The installation has been divided into:

- Supply and distribution (rush)
- Inside installation

1.2.4.1 Rush

Is the branch and additional elements that link the distribution network and the installation general.

Cross the wall close by a hole performed by the owner or subscriber, so that the pipe remains loose and allows the free expansion, although it must be sealing while the hole remains waterproof. The installation must make by the supply company.

The connection must have, at least the following elements:

2.4.1.1 Decision valve

Opens the way for the rush, is located above the pipe distribution network. The installation is convenient because it allows you to the rush prey and maneuvering without stop the service of the pipe. Only the company can manipulate, the supplier or authorized person, without subscribers, owners or other people can manipulate it.

1.2.4.1.2 Pipe rush

Pipe coming from the public network and connects to the private installation inside the building.

Is the pipe that connects inside general the installation of the property with pipe distribution network through a collar. Cross the closing wall of the building for a performed hole made by the owner or paid, so that the pipe remains loose and allows the free expansion, although it must be sealing to remains the hole impermeable. This hole in the wall or closing walls should to be a pipe with cement mortar made of lime and has a displacement greater than 10 mm.

The rush is made by PVC.
1.2.4.1.3 Chest/casket for water supply

This is where the pipe comes from the public and where the key of cut is located outside, is made by bricks and is registrable.

1.2.4.1.4 External valve (or registrable)

It is located over the rush next to the building. As the previous, only the supplier or authorized person could handled, without subscribers, owners or other people can manipulate it.

1.2.4.1.5 Hole wall

In the case of the branch crosses the exterior wall of the building, the performed hole will allow the expansion of the materials and be completely waterproofed. In our case it is

1.2.4.2 Inside installation

The indoor installations will be made by a private authorized installer of the Provincial Delegation of the Ministry of Industry, having passed the necessary inspections by the supply company and if it is necessary by an industry personal.

1.2.4.2.1 Water main pipe

Is the pipe that connects the passing valve of the property with the utility meter. If is possible, it stay visible all the way, and if it exist any disadvantages for building, it stay buried in a hosted channeling brickwork filled with sand, which will have a record at the ends to allow the inspection and control of leaks.

1.2.4.2.2 Meter casket

The meter casket is the space where the counter is with different element:

- **General valve**: Is used to interrupt the water supply of the building from the inside of it. Is the differentiating factor between the area that is owned by the supply company and the area owned by the user. If necessary, under the responsibility of the owner it can be closed to leave without water the entire building. It will be housed in a chest located immediately after the wall of the building and cover with a registrable lid and a natural drain, will also plastered with Portland and waterproofed. This chest will be built by the owner or subscriber.

- **Filter General installation**: protects the possible entry of the hardscape installation

- **General meter and unique**: a device that measures the total consumption of the building.
- Tap test
- Retention valve: Protect the distribution network against the return of water suspicious.
It will be placed on the feeding tube next to its connection to the battery, or in the case of utility meter
after it. It will be advisable to put a check valve downstream of each meter divisionari.
- Valve counter: idem check valve, but located after the meter

2.4.2.4 Domestic connection
This chest comes from the counter and is distributed all wet stays of the building.

2.4.2.5 Derivation to the device
It will connect the particular derivation or one of its branches with each of device. It will be advisable
to install a valve before each device, so that they can become independent from the rest of installation
in case of failures.

1.2.4.2.7 Vertical pipes
Pipes that are vertically, in this particular case comes from the basement to the ground floor. At the
base of the vertical pipe will be a purge tap, a retention valve and a key valve. As the temperature
doesn't drop in the winter to the point of freezing is not necessary to place him any isolation.

Characteristics of vertical pipe:
- It will be housed in specific technical conducts for this purpose. The pipes should be registrable
  and must have appropriate dimensions
- At the top is placed a purge device that reduces the water hammer.

1.2.4.2.8 Clau de tall de cada estància humida
Lets cut the water supply for every room.

1.2.4.2.9 Clau de tall de cada aparell
Lets cut the water supply for every advice
1.2.4.10 Unions, gaskets and accessories

The joints of the pipes to each other and other accessories will be in accordance with the contact materials mode that the execution of the operations are done without cause losses of sealing joints.

In cases where it is not possible to guarantee the welding sealing we use threaded joints always being threaded and tapered boards go sealed with teflon properly approved by the Ministry of Industry. Making sure, in this way, a total sealing of installation.

All the way of the pipe will be subject to walls or ceilings, so that make sure alignment and stability to allow the same strain of this, due to water hammer and temperature changes, so these subjections have a clearance to allow expansion and contraction of the pipe.

In those places where pipes may be exposed to shocks will be protected by a key sheath resistant material.

1.2.5 HOT SANITARY WATER

1.2.5.1 Producers and heat accumulators

There are two ways to produce hot water, or by using instantaneous production or by accumulation production:

The instantaneous production will produce exactly the same amount of hot water you need in every moment. Require high power and therefore do not generally used in centralized installations. The boiler usually use fuel gas, city gas or GLP. We have boilers used exclusively to ACS. In this case, when the circuit detects depression in ACS as a result of opening a tap, all production of the boiler is used to heat the cold water from installation In individual installations the minimum pressure to cause ignition of the boiler is about 3 mca for low pressure and 10 for high pressure.

When there is accumulation, the ACS will be prepared before consumption and accumulate in pressurized tanks ready to be consumed. The centralized installations must have this type of systems.

The same boiler can be used to produce hot water and serve the heating circuit. The resistance water heaters in a pressure vessel (tank) will act as a heating element of the water accumulated in the boiler. A thermostat will regulate the operation of the system to maintain the temperature between certain limits. Generally water is accumulated between 60 and 70 ° C. Nominal pressure of water heaters usually is 6 bar, so that safety valve is usually slightly above hum. The gas water heaters take advantage of the heat emitted by the combustion gases to heat the walls of the tank, and that the water contained inside. The regulation will be igniting or shutting the boiler located under the heater.

All accumulators will have safety devices against excessive increases in temperature or pressure (safety valve).

The hot water according RITE must meet the following four points:

- The points of consumption in the home will be in wet rooms
- The temperature production A.C.S. is 58 ° C
- The temperature distribution at the outlet of the heater should be 50 ° C
- The temperature of use in toilets and showers will be from 37 to 40 ° C

The A.C.S. of the sports center is made using a natural gas boiler. This heated water that we should consider on the installation of cold water to remove from it the volume of water required to heat.

More than 70% of the ACS will be obtained to installation of solar energy (see Solar memory) but the rule indicates that we calculate the power and size of the boiler to supply the whole consumption. This procedure we have done by calculation program of Saunier Duval.

The distance between the pipes for cold water and hot water will be at least 4 mm. The hot water pipe must be placed above the cold water to prevent this last one to appear condensation problems.

1.2.5.2 Distribution (impulsion and return)

- The design of ACS installations shall apply analogous conditions to networks of cold water.
- In buildings where is applicable the minimum contribution of solar energy to produce hot water, under section DB -4 HE - HE, must have, in addition to shots of cold water, provided for connecting the washing machine and dishwasher, hot water dams to allow the installation of bithermal equipment.
- Both individual installations and in centralized production installations, the distribution network must be equipped with return a network when the length of the pipe to the farthest point of consumption is equal to or higher than 15 m.
- The return network will consist of:
  a ) a return collector on the distributions to multiple groups of columns. The collector must have a pipe downward from the top of the columns to the return column; Each collector can collect all or several of the departure columns, which have equal pressure;
  b ) columns return: from the top of stating the columns, or from the return collector, until the tank heater or centralized.
- The return networks run parallel to the impulsion.

- In vertical pipes, you should be the return from the top and below the last particular derivation. On the basis of these vertical pipes will have valve seat to regulate and balance hydraulically the return.

- Except for single-family homes or small installations, will have a double recirculation pump. Mounting parallel or "twin" operate similarly as specified for a pressure group of cold water. In the case of individual installations may be incorporated into production equipment.

- To fully support the movement of thermal expansion effects should take the following precautions:

  a) On the principal distributions have been pipes and their anchors so that dilate freely in accordance with the provisions of Regulation Thermal Installations in Buildings and their complementary technical instructions for ITE heating networks;

  b) in the straight sections will consider the linear expansion of the material, preventing dilators if necessary, complying for each type of pipe the distances specified in the Regulation.

- The isolation of pipe networks, both in impulsion and in return, it will conform to the Regulation of Thermal Installations in Buildings and their complementary technical instructions ITE.

1.2.6 BOILER AND ACCUMULATORS

The boiler we have chosen from the results given to us Calsolar calculation program to calculate the solar panels. This information is detailed in the memory of the solar energy. Due to that the program is by Saunier Duval, the boiler is of this mark as well.

Also will be installed two accumulators as a result of CalSolar study program to satisfy the needs the sports center (see Solar memory).

1.2.7 SOLAR ENERGY

For the use of hot it is important to mention that combine gas boiler with water heated by solar collectors thus making use of renewable energy, which significantly reduces the environmental impact of the installation.

On the cover has been installed solar panels, which will be explained and dimensioned later. These plates were connected to an accumulator and only when missing hot start operating the boiler.

The installation of solar energy is explained in the memory of solar energy. For this installation we have used calculation program Calsolar, which also gave us the type of boiler we need.

1.2.8 RETURN WATER PROTECTION

- We have anti-return systems to prevent reversal of the direction of the flow at the points listed below, as well as any other that is necessary:

  a) after the meters;
b) on the base to the ascending;
c) before the water treatment equipment;
d) in the feeding tubes that are not for domestic use;
e) before refrigeration or air conditioning.

- The installations of water supply can not be connected directly to evacuation installations or installations of water supply from another origin than the public network.
- In the devices and equipment of the installation, the arrival of water take place with no returns.
- The anti-return are combined with emptied taps so that it is always possible to drain any section of the network.

Is forbidden the installation of any type of equipment or devices, by their constitution or form installation made possible the introduction of any fluid in the interior installations or return , volunteer or accidental, the water exit from these installations.

It is forbidden direct splicing of the water installation to a evacuation pipeline of used water (sump)

Is forbidden to establish connections between the interior piping spliced to the distribution networks and other public installations.

To a pipe attached directly to the network of public distribution, is prohibited the circulation of this alternative water distribution and water from another source.

The public distribution of water and other sources will have different circulate around pipes that have no nexus.

The subjection elements are seen in facilities separate by clamps or flanges according to the rule ITIC, so it flechten not more than 2 mm.

When we go through the construction elements will passing with plastic walls or plastic floors , allowing the pipe to move without damaging it.

In the individual derivations the demands in general are for underrun :

- The pipes never go for the air chamber of a wall
- Do not pass water pipes on the floor
- If the vertical pipes can not go for the front or front closets, will be registrable in a registrable closet.
- The distribution pipes will be passed above doors and windows.
- All connections for water supply for domestic use are equated with the valve.

All water supply connections that are not intended exclusively for domestic needs should be provided with an anti-return deviceAnd a purge control. In all cases, the valves or devices must be of a type approved by the Ministry of Industry, and immediately installed after the meter.

1.2.8.1 Arrangements of the devices
- In the showers, toilets, sinks, tanks, and in general, all containers and equipment that directly fed the usual way of the distribution of water, the lower level of the arrival of water have to pour freely to 20 millimeters.
- is forbidden feeding called "bottom", so the water entering from the bottom of the container.
- Is forbidden to throw or drop any limb in a bowl of free extensions, flexible or rigid, spliced to the public distribution.
- The hand showers, the tip of which can accidentally fell in the shower, should have anti-return device accepted by the Provincial Delegation of the Ministry of Industry.
- The flush valves, which must be located a 200 millimeters, at least, above the top edge of the basins, are equipped with air suction device designed to prevent any return of water. The section of air passage through the suction valve can not at any point be less than one square centimeter and will always be free.

1.2.9 ELECTION OF EQUIPMENT AND MATERIALS FOR THE INSTALLATION

1.2.9.1 General terms of the materials
- In general, the materials to be use in installations of water for human consumption meet the following requirements:

a) all products used must comply with the current legislation specifies for water human consumption.
b) should not modify the organoleptic characteristics or safety of the water supplied

c) it will be resistant to inside corrosion

d) it will be able to function effectively under the conditions provided of the service

e) it will not present electrochemical incompatibility between them

f) It should be strong, without showing damage or deterioration at temperatures up to 40 °C, without affecting either the external temperature of its immediate surroundings

g) it will be compatible with the water transport and to contain and should encourage the migration of substances in quantities of the materials when there are a risk to the health and cleanliness of the water for human consumption

h) their aging, fatigue, durability and all kinds of mechanical factors, physical or chemical, it will not decrease the useful life of the installation.

- For the previous conditions are met, can be used coatings, protective systems or systems already mentioned as water treatment.

1.2.9.2 Pipes and accessory elements

Generally, the dams must be made of galvanized steel, polyethylene or ductile iron. The general interior installation, from the valve step, usually galvanized steel, as well as the battery meter and the vertical pipe.

As regards to interior installations usually use copper, plastics (cross-linked polyethylene, polypropylene, chlorinated PVC, etc.) and galvanized steel.

All accessories used in the installation it will be homologated: tees, elbows, couplings, reducers, extensions, etc..

The water system will have a distance of not less than 30 cm in any driving or electrical panel.

In a mixed network steel - copper, steel it will always placed before the copper in relation to the direction of water flow. The union steel pipe and copper have a brass sleeve.

The hot water system will have a distance greater than 4 cm from the cold water and never below that.

The copper pipes it will made using phosphorus deoxidized copper, with a purity of 99.9% finding in two states supply: the "hard" and "annealing". Pipe Joints and trims it will made with soft solder type capillary.

When pipes pass through walls, partitions or floors, will be received with a lime mortar a cuff with comfortably minimum of 10 mm and filled the space with plastic paste.

For the choice of materials we will choose the most adapt to the nature of our construction. I chose copper for its large presence in such installations.

1.2.9.3 Canonades

Cold water pipes and hot water it will be basically copper for ease of assembly and to fit properly in our facility. All calculation was made from dimensioned diameters for copper pipes.

The joints between the different sections of pipe and direction changes are made by soldering.

Soldier It as follows:

a- Cut the pipe and removed carefully all the dirt that it has
b- tube area is cleaned it with steel wool for solder with deoxidized copper. It is important for the properly clean than the weld become perfectly.
c- Placing a protective on the wall to avoid damaging it.
d- Put pickling to the parts to be welded (tube and joint) and enter it in the other one. The pickling improving the connection between parts and does more liquid solder tin.
e- To solder the joint it will be hot. When the pickling begins to boil, it's time to put the whole lake union, moving away a little flame.
f- The tin melts and puts himself within the pieces. Wait for it to cool and never reheat the solder
g- Once you have cold soldering, clean it with a wet cloth to remove traces of stripper
h- Before connecting to a tap it should stop running water to remove the dirt that it could damage the tap.

The materials used in pipes and taps interior installations must be able, in general and at least for a working pressure of 15 kg/cm², in anticipation of the necessary resistance to support the service and water hammer caused by closing the taps. It Must be corrosion resistant and completely stable with
time on their physical properties (strength, roughness, etc.). It should not alter any of the characteristics of the water (taste, odor, drinking, etc.).

The valves used in interior installations must be of good quality and do not produce excessive pressure losses when they are fully open.

1.2.9.4 Valves
The main function of the valves is “isolation.”

The valves must be closed and sealed when they closed and they are easy to maneuver (keeping in time) and easy assembly.

When they are fully open it will have low pressure loss. The working pressure is 15 bar or higher.

It have a small size for a given caliber and high mechanical resistance to pressure. For its construction, it will be allowing the dismantling of damaged parts, without removing the entire valve.

Advised a locking mechanism to prevent a “golpe de ariete”

It will be used gate valves (connections), butterfly-ball (usually), or valve seat all alone (inclined or parallel), square or angled valves, diaphragm, etc.. Some valves include emptying taps.

The ignition device can be different from each other (wheel, lever, square, etc.).

Valves “retention” are devices that prevent, automatically, the traffic flow in one direction, allowing free passage in the other. Its fundamental mission is to prevent returns to the network for public use or communication between different installations (hot and cold, etc.).

To choose an accountant is necessary to consider a number of issues:

- Maximum flow (usually twice the nominal). It is the highest volume with which the counter can operate without deterioration for limited periods of time, respecting the maximum permissible errors, and without exceeding the maximum value of pressure loss.
- Nominal flow (half of maximum flow). Expressed in m³ / h serves to designate the counter. At the nominal flow meter must be able to operate under normal use, ie, continuously or intermittently, without exceeding the maximum permissible errors.
- Minimum flow. Is the volume from which the entire device should have function respecting the maximum permissible errors. From this flow the error will be less than ± 5%.
- Flow transition. It separates the two upper and lower parts of the measuring equipment. From this flow the error will be less than ± 2%.
- Flow start (estimated by the manufacturer). This is the minimum volume that makes the boot counter. Is a function of nominal flow.
- Curve pressure loss caused by different flows.
- Hot or cold water
- Range of flow measuring
- Precision Meter
- Position Counter

When we have the general counter, be housed in a cabinet or chamber drain and waterproofed, located inside the property in common area easily accessible and close to the entrance of the building. Inside the closet or camera we have the general valve.

1.2.9.6 Taps
We can install different types:
- Mixer (two entrances, one cold and one hot, and one or two outputs).
It will consist of a device responsible for controlling the mix: conventional mixer (two independent commands), mixer taps (one command).

The single lever mixers. It consists of a device that prevents the passage of hot water into the cold water circuit and vice versa.

The taps have a filter in the filter output, which must be cleaned regularly to avoid excessive pressure drops that make the flow can decrease to.

In the toilets will be installed the following or equivalent:

ROCA Instant Ref. 5A7877C00 (catáleg comercial a annexes)

This collection represents an optimal solution for public spaces, it is also the most economical.

In the the showers installed the following or equivalent:

ROCA Instant Ref. 5A2677C00 (catáleg comercial a annexes)

1.2.9.7 Sink
The sink selected is the following or equivalent:

ROCA Khroma Ref. 327650..0 (catáleg comercial a annexes)

1.2.9.8 Urinary
The urinal selected is the following or equivalent:

ROCA Mural Ref. 353330.1 (catáleg comercial a annexes)

1.2.9.9 W.C
The W.C selected is the following or equivalent:

ROCA America Ref. 342497..0 (catáleg comercial a annexes)

1.2.9.10 Protection of underground network
The sections of pipe will be buried to a depth sufficient to avoid any danger and the trench where they are housed will have a stable background, solid and completely free from stones or any other material that could damage the pipe.

The filling will be made with materials that do not harm or attack the pipe.

1.2.9.11 Incompatible materials
- It will avoided the assembly of pipes and metal elements with different values of electrochemical potential.
- In particular, copper pipes are not placed before the pipes of galvanized steel, according to the direction of water flow, to prevent the onset of corrosion by the formation of pairs will galvanic ion drag that accelerates the procés of perforation
- Also we not installed equipment production of hot water of copper pipes placed before steel pipes.
- Exceptionally insurmountable requirements for the installation admitted using antielectrolítics sleeves, plastic, in the union of copper and galvanized steel.
- It will be authorized but, the coupling copper galvanized steel, putting a valve between the two pipes.
- It will be able attached to galvanized steel, stainless steel elements.
- In the “beines” walls, it will stand a plastic material to avoid inconvenience contacts between different materials.

1.2.10 TESTING AND CHECKS
All items and accessories that integrate the facilities will be subject to testing regulations.

Before proceeding to the socket of the pipes, the installation companies are obliged to perform the following test:

- Testing of mechanical strength and tightness. This test will be made with hydraulic pressure.
  
a) It will be subject to this test all pipes, fixtures and fittings that make up the installation.

b ) The test will be made to 20 Kg./cm2. To start the test water filled the entire installation while keeping the terminal taps open until you have the assurance that the purge was complete and nothing remains of air. Then it will close all the taps that have helped us to purge and the power supply. Then turn on the pump, which is connected and it will continue its operation until reaching the test pressure. Once obtained, it will close the valve of the pump. It will proceed to recognized throughout the installation to ensure that there is no lost.

c ) Then decrease the pressure to reach the service pressure, with a minimum of 6 Kg./cm2 and maintain this pressure for fifteen minutes. Will be given for good the installation if it during this time the the manometer was reading constantly.

d) The pressures alluded previously refer to the level of the road
All materials, accessories and elements of the facilities must be officially homologated. The doubts and discrepancies that may arise will be resolved by the Provincial Delegation of the Ministry of Industry.

1.2.10.1 Testing of internal installations
- The installation company is required to perform a test of mechanical resistance and tightness of all pipes, elements and accessories that make up the installation, all components being viewed and accessible to control.

- To start the test it will filled the entire installation of water, keeping the terminal taps open until it has assured that the purge was complete and there are nothing of air.

Then we close the terminal taps that have helped to purge and the power supply. Then we will use the pump, which will be connected and will remain its operation until it reaches the test pressure. Once determined, will be based on the type of material as follows:

a) for metal pipes are considered valid tests as described in the UNE 100 151:1988;

b) for thermoplastic pipes and multilayer are considered valid tests in accordance with the method of the UNE ENV 12 108:2002.

c) Once you have the last test, the installation will be connected taps and consumer devices, putting it back to the previous test.

d) The manometer used in this test should appreciate at least 0.1 bar pressure ranges.

e) The pressures alluded previously refer to the level of the road.

1.2.10.3 Testing particular of the ACS installations
- Installations preparation for ACS undertake the following performance tests:

a) Temperature and flow measurement in water points

b) Obtaining the required flow temperature set when the number of taps estimated at concurrency are opened

c) Checking the time it takes the water to come to operating temperature Once the hydraulic balance of the different branches of the return net and opened one by one from the furthest tap of each branch lines, without open any tap in the last 24 hours

d) Temperature measurement of the network

e) with the accumulator in action, check with contact thermometer the temperature of it at his departure and in the terminal taps. The temperature of the return should not be less than 3 °C in the output of the accumulator.

1.2.11 MAINTENANCE AND CONSERVATION
We will do the maintenance with the following instructions of the CTE:

1.2.11.1 Interruption of Service
- Installations of human consumption that are not placed in service after 4 weeks from completion, or who remain out of service for more than 6 months, it will close the connection and proceed to drain.

- The connections that are not used immediately after its completion or are temporarily stops, it have to close in leading supply. The connections that are not used during the first year must be plugged.

1.2.11.2 Maintenance of installations
- Maintenance operations relating to plumbing installations collected contained detailed prescriptions for these facilities in Royal Decree 865/2003 on hygienic sanitary standards for the prevention and control of Legionella, particularly everything related in Annex 3.

- The teams that need periodic maintenance operations, elements such as measurement, control, protection and maneuver as well as valves, dampers, terminal units, that it should be hidden, it will be located in areas that allow access.

- Is advisable to place the pipes in areas that allow access along its route to facilitate the inspection of them and their accessories.

1.2.12 NORMATIV AND RULES
Regulations and documents used in this section are:

- DB HS Salubridad

Código Técnico de la Edificación (CTE). Parte II. Documento Básico HS.
B.O.E.: 28 de marzo de 2006
Modificado por el Real Decreto 1371/2007, de 19 de octubre, del Ministerio de Vivienda.
B.O.E.: 23 de octubre de 2007
Corrección de errores.
B.O.E.: 25 de enero de 2008
- Modificación de determinados documentos básicos del Código Técnico de la Edificación aprobados por el
Real Decreto 314/2006, de 17 de marzo, y el Real Decreto 1371/2007, de 19 de octubre
B.O.E.: 23 de abril de 2009

- **Criterios higiénico-sanitarios para la prevención y control de la legionelosis**
  Real Decreto 865/2003, de 4 de julio, del Ministerio de Sanidad y Consumo.
  B.O.E.: 18 de julio de 2003

- **RITE. REGLAMENTO DE INSTALACIONES TÉRMICAS EN LOS EDIFICIOS**
  Real Decreto 1751/1998, de 31 de julio de 1998