

THE ICEHOUSE

R.W.C.



A RAINWATER COLLECTION AND STORAGE SYSTEM

The Project Wide Collection, Storage, Distribution and Re-Use of Rainwater



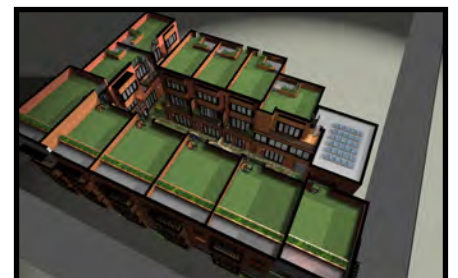
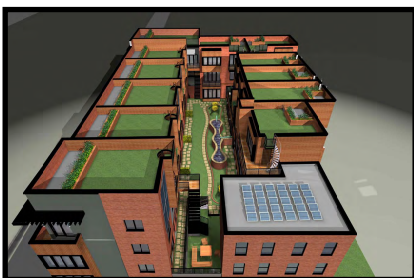
The IceHouse

SUSTAINABLE CONDOMINIUM LIVING



Rain Water Collection System (RWC):

The rain water collection and recycling system at The Icehouse is designed to collect, store and/or delay all rain/storm water that falls onto the complex. The rain water is then recycled and used for irrigation, watering of plants, recharging of the Koi Pond, general cleaning and maintenance.



RAINWATER COLLECTION

All of the rain water that hits the private green roofs (1) on top of the dwelling units at The Icehouse is absorbed by the semi-intensive green roofs and is slowly released and leaves the rooftops through the roof scuppers (2). The rain water then travels through the downspouts (3) to the common green roof level (4) below. The rain water is then diverted through a 4" perforated PVC pipe (5) that redirects the water away from the green roof drains. The perforated pipe was installed to reduce wash out during a large storm at the base of downspouts. This piping also creates a secondary passive watering effect dispersing the water from the upper rooftops into the common green roof in an area that would be somewhat shielded from the rain due to the height of the structure. The common green roof is nearly twice as deep as the upper green roofs and therefore has greater absorption abilities. Once the green roof growing media (soil) is saturated, it will drain through the filter fabric, reach the drainage mat and slowly find its way to one of the 4 common green roof drains (6). Once the rain water flows into the green roof drain, it is then funneled and piped (7) into the basement of the existing building where it is collected and stored in 3-750 gallon interconnected cisterns.



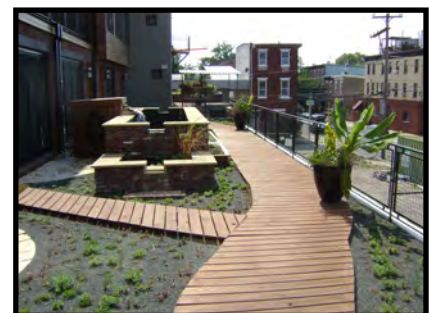
(1) Private Rooftops



(2) Scuppers



(3) Downspouts



(4) Common Green Roof



(5) Perforated PVC Pipe



(6) Common Green Roof Drains



(7) RW Collection

RAINWATER COLLECTION

Prior to entering the storage tanks (cisterns) (8) the collected rain water flows through a wye strainer (9) that filters the debris that is inherently collected along with the rain water. The collected rain water then flows into tank 1 – the sediment tank (10). This tank fills to approximately a 50% level prior to the water flowing into tank 2. The system is designed in such a way to allow heavier sediment to stay on the bottom of the 1st tank while the cleaner water is overflowing into the second and third tanks (the supply tanks) (11). The sediment tank is then periodically cleaned out as part of the permanent maintenance program. The 2nd and 3rd cisterns work as the supply tanks and fill simultaneously as the water flows out of tank 1. The rain water that is stored in the supply tanks will be used for the drip irrigation system as well as supply the array of non-potable hose bibs located throughout the complex. Prior to being pumped to the various usage locations, the rain water is once again filtered to provide the cleanest end product possible. This filtering is completed by a large ball strainer being installed at the end of the outlet pipe in each of the supply tanks. A pair of standard toilet floats is attached to the supply hoses inside of the supply tanks to keep the end of the supply hose elevated in the tank and siphoning the cleanest water possible. A ball strainer is attached to the end of the supply hose to prevent any large green roof sediment from being pulled through the suction pump that powers the system. Both of the supply tanks are piped directly to the system's suction pump (12) which can deliver up to 22 gallons per minute to the various end user locations. To protect the pump (RWC system's engine), a flow switch (13) has been installed which will not allow the pump to operate unless there is an adequate amount of water pressure in the supply lines. Another preventative measure and to make the system drought resistant, a fresh water supply (14) has also been integrated into the system. In times of long drought or heavy demand when the tanks would normally run dry, the fresh water valve will open and fill the supply tanks to the minimum level required for system operation.



(8) Storage Tanks



(9) Wye Strainer



(10) Sediment Tank



(11) Supply tanks



(12) Suction pump



(13) Flow Switch



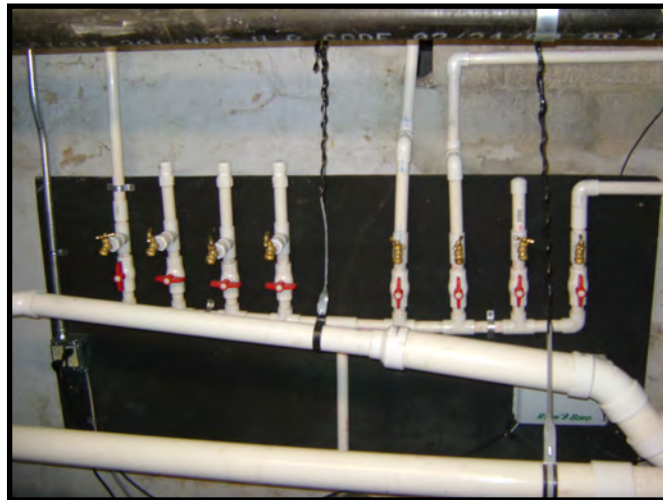
(14) Fresh Water Supply

RAINWATER SUPPLY AND USAGE

The stored rainwater is recycled and used for many purpose throughout The Icehouse complex. The suction pump is connected to an 8 head manifold system (15) that feeds various locations throughout the complex. Each of the system legs has its own shut off valve for maintenance purposes. 5 out of the 8 legs are currently in use. These legs feed the following:

1. Common Green Roof Drip Irrigation system (16) –

A 1" PVC main line runs from the suction pump located in the basement of the parking garage 20' up to the common green roof. The main line runs approx 80' down the main green roof and then turns and runs between A and B buildings. From this main line, individual auxiliary lines are run with KSS drip irrigation hose to various extended locations throughout the green roof. The intent is to provide irrigation to 100% of the common area green roof. The drip irrigation lines are buried under the green roof growing media. This type of drip irrigation provides a very efficient form of irrigation that allows for the consistent watering of the common green roof. The irrigation system is connected to a Rain Bird timer (17) which controls not only the time of irrigation but also the amount of water the green roof receives.



(15) Manifold System



(16) Drip Irrigation System



(17) Rain Bird Timer

RAINWATER SUPPLY AND USAGE CONTINUED

2. Main Green Roof / Koi Pond non-potable hose bibs –

The main green roof hose bib (18) is utilized for many purposes including manual watering of the common area green roof, the watering of secluded planters and the recharging of the Koi Pond (19). Unit owners can easily access this location for their own purposes such as watering house plants or general cleaning. This supply line also T's off and goes up to the private green roofs (20) on top of the dwelling units. Unit owners can use this recycled rain water to irrigate their own private green roofs, wash down their roof top decks or clean up after the rooftop BBQ they just had with their interconnected gas grills (21).



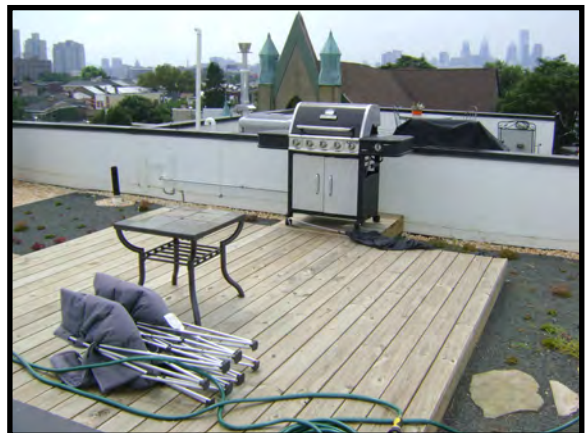
(18) Main Green Roof Hose Bib



(19) Koi Pond



(20) Private Green Roof



(21) Interconnected Gas Grill

RAINWATER SUPPLY AND USAGE CONTINUED

3. Street / sidewalk non-potable hose bib –

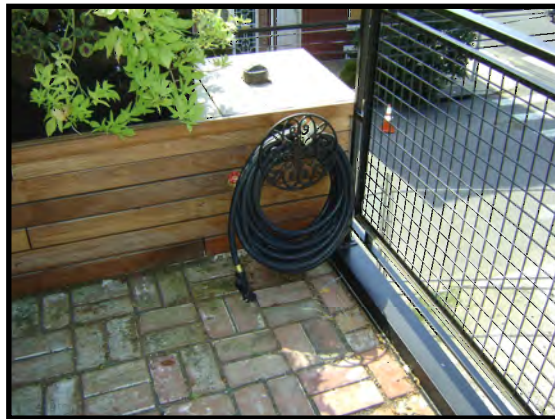
This location is used for general maintenance such as washing down sidewalks, cleaning the facade of the building and washing the main garage door to insure continued quiet operation. This bib is also used to water the window planters (22) located on the front of the building. When the second phase of the complex is complete, there will be a commercial space directly next to this bib location which will certainly have multiple uses for the recycled rain water. Also, we do not discourage neighbors from using the sidewalk hose bib for watering and the overall greening/beautification of the block.



(22) Sidewalk Location

4. Common seating area / large planter hose bib –

This location is used to irrigate the common seating area (23) that is made with recycled brick in a permeable paver configuration. Located at the edge of this seating area is large planter with various types of foliage planted with the intent of the plants growing down over the side of the building.



(23) Seating Area Location

RAINWATER SUPPLY AND USAGE CONTINUED

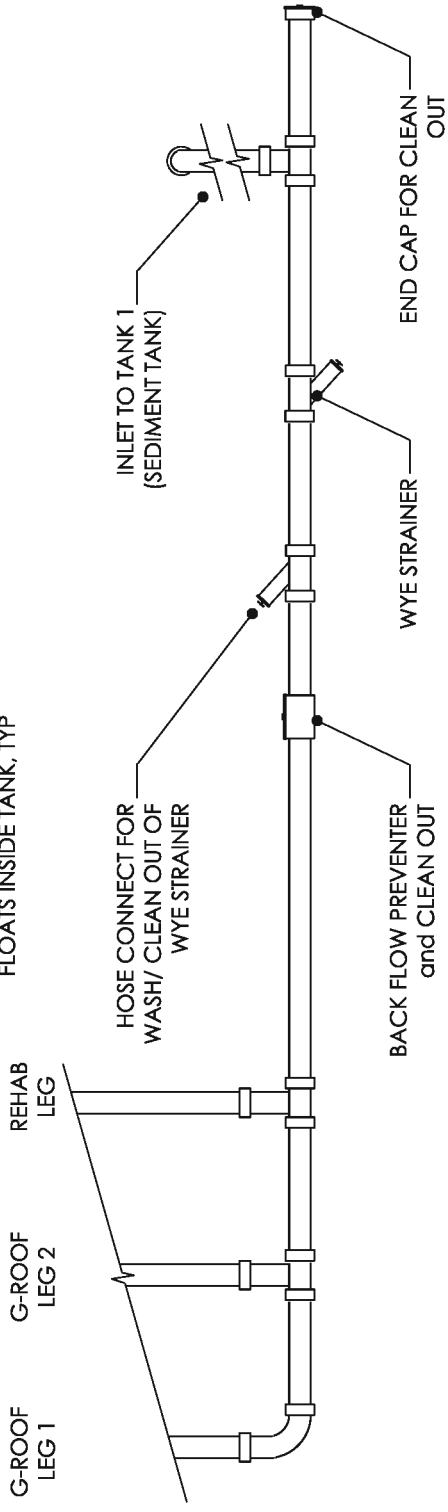
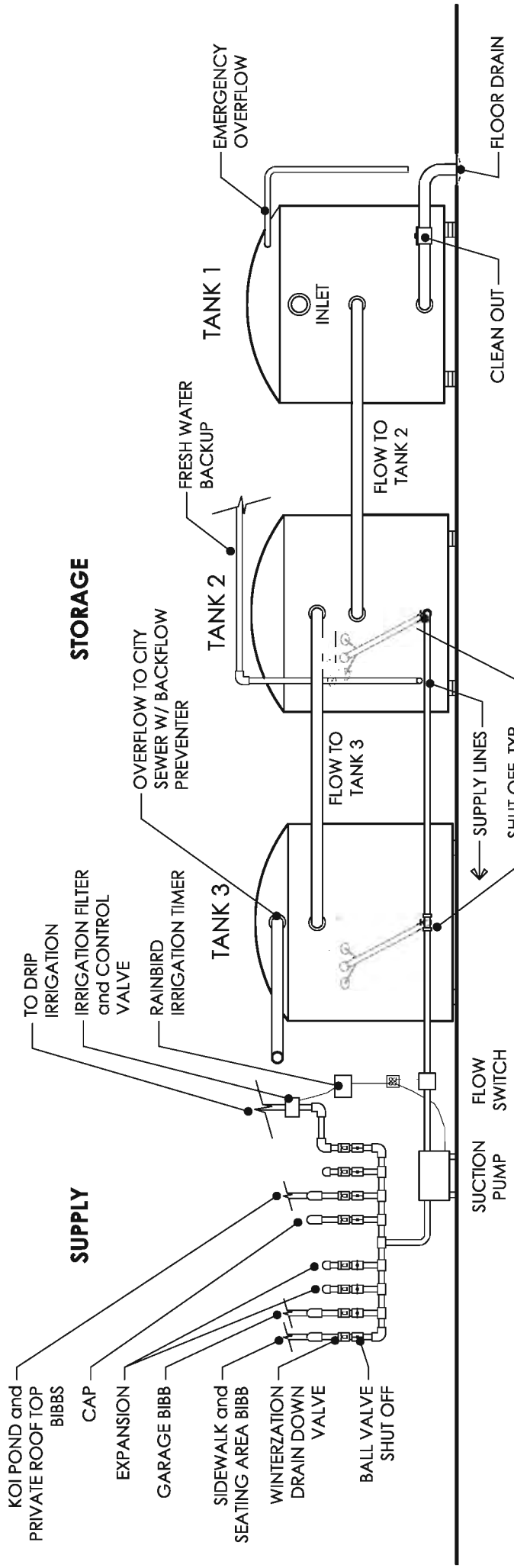
5. Garage hose bib –

The garage hose bib (24) is used for the general maintenance of the complex. It will be utilized for the washing down of the garage floor, garage doors, and access/egress stairways. This hose bib can also be used by residents for the washing of bikes and vehicles. Residents can also use for general cleaning of outdoor equipment.



(24) Garage Bib Location

***For details on the design of the rainwater collection system please refer to the diagram on the following page**



RAINWATER COLLECTION

The Icehouse Residences

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