

## Appendix 1 - Cascade Irrigation Efficiency Program Hardware Specifications and Rebate Amounts – 04.4.16

<b>I. High Distribution Uniformity Nozzles</b>			
Replacing standard nozzles with High Distribution Uniformity nozzles can produce healthier landscapes that use 15% - 20% less water and reduce dry spots, runoff and erosion.			
Hardware	Specifications	Applications and Requirements	Rebate Amount
Rotating spray nozzles	<ul style="list-style-type: none"> <li>● Multi-stream, multi-trajectory, rotating spray nozzles.</li> <li>● Constructed of UV-resistant plastic with stainless steel radius-adjustment screw capable of 25% reduction based on manufacturer's rating.</li> <li>● Nozzles must have adjustable spray arc and radius and matched precipitation rates across patterns and radii.</li> </ul>	<ul style="list-style-type: none"> <li>● All spray heads in a zone must be upgraded to matching High Distribution Uniformity nozzles (including all sprays in zones with mix of spray heads and rotors).</li> <li>● Pressure in zone must be within manufacture's specified range for new nozzles.</li> </ul>	\$5 per nozzle
High-frequency oscillating stream nozzles	<ul style="list-style-type: none"> <li>● Nozzles that distribute water through internal oscillating chambers, mounted around turret.</li> <li>● Constructed of UV-resistant plastic, with stainless steel radius-adjustment screw capable of 25% reduction from rating.</li> <li>● Must have integrated HDPE screen sized to prevent nozzle plugging.</li> <li>● Model number with arc and radius must be stamped on top of nozzle.</li> </ul>		

**II. Sprinkler Bodies with Check / Pressure Regulating Valves**

Check and pressure regulating valves integrated into sprinklers or installed in pipes prevent water in distribution pipes from leaking out of sprinklers at low spots after the zone has shut off. In large zones, hundreds of gallons may be wasted each time the system runs. In some situations, pressure regulators built into sprinkler bodies may also reduce wasteful misting more effectively than pressure regulation at control valves.

Hardware	Specifications	Applications and Requirements	Rebate Amount
Spray bodies with check valves and other sealing components	<ul style="list-style-type: none"> <li>● Check valve, or model number indentifying as such, must be stamped on top of each sprinkler body.</li> <li>● Check valves shall be rated to seal while under a minimum of 4 pounds of static pressure (10 feet of elevation change).</li> </ul>	<ul style="list-style-type: none"> <li>● Check valve heads may be limited to low portions of zone only where they will stop low head drainage.</li> <li>● Check valve must be rated by manufacturer to match elevation / pressure change at head.</li> </ul>	\$3 for 4" spray heads  \$6 for 6" or larger spray heads
Rotor bodies with check valves and other sealing components			\$20 per rotor
Check valve retrofit for rotor head	<ul style="list-style-type: none"> <li>● Retrofit check valves should be used when sprinkler manufacturer offers compatible model for existing rotors.</li> </ul>	<ul style="list-style-type: none"> <li>● Check valve must be specified by sprinkler manufacturer as compatible with intended application.</li> <li>● Check valve must be rated by manufacturer to match elevation / pressure change at head.</li> </ul>	\$5 per check valve
In-line check valves	<ul style="list-style-type: none"> <li>● Spring-loaded check valves may be used where elevation / pressure changes are too large to be corrected by in-head or below head PRVs.</li> <li>● Check valve bodies must be constructed of PCV or impact-resistant ABS.</li> </ul>	<ul style="list-style-type: none"> <li>● Check valve must be rated by manufacturer to match elevation related pressure change in zone.</li> <li>● Installation of check valve will only be approved when needed to reduce pressure to sprinkler manufacturer's suggested operating range.</li> </ul>	\$10 per check valve

**III. Master Valves**

A master valve installed where the sprinkler system is connected to the water main will shut off water to the entire irrigation system when no zones are running. Using a master valve prevents leaks in main lines or at zone valves from running continuously and can save thousands of gallons of water if a main line breaks.

Hardware	Specifications	Applications and Requirements	Rebate Amount
Master Valves	<ul style="list-style-type: none"> <li>Rebates may be authorized for installation of Master Valves <b>or</b> Pressure Reducing Valves, not for <b>both</b>.</li> </ul>	<ul style="list-style-type: none"> <li>Controller must be equipped to shut off master valve when system is not running.</li> </ul>	3" - \$250 2" - \$150 1.5" - \$100 1" - \$75 ¾" - \$50

**IV. Pressure Regulating Valves**

High pressure in zones creates mist that can waste up to 20% of the water being applied and puts unnecessary wear and tear on the system. Depending on the system, pressure regulation may be required for the whole system, some zones or some heads.

Hardware	Specifications	Applications and Requirements	Rebate Amount
Valves		<ul style="list-style-type: none"> <li>All pressure reducing valves rebates must be approved based on application description of existing static pressure and operating range of sprinklers.</li> </ul>	3" - \$250 2" - \$150 1.5" - \$100 1" - \$75 ¾" - \$50
Retrofit Valves	<ul style="list-style-type: none"> <li>Retrofit zone valves instead of installing new zone valve, unless otherwise justified.</li> </ul>	<ul style="list-style-type: none"> <li>Pressure reducing master valves must be adjustable.</li> </ul>	\$50 per valve
In Line Pressure Reducing Valves		<ul style="list-style-type: none"> <li>Installation of pressure regulating valve will only be approved when needed to reduce pressure to sprinkler manufacturer's suggested operating range. <u>Rebates will not be approved for pressure reducing valves at zone valves where the pressure can be or is already adequately regulated by a master valve.</u></li> </ul>	\$25 per valve

**V. Smart Controllers**

Irrigation controllers that automatically adjust watering based on weather conditions and plant needs determined by on-site sensors or data from local weather stations can reduce watering by 15% - 20% compared to a system that is not regularly adjusted. The Irrigation Association (IA) has developed protocols for testing the efficiency of these "Smart Controllers" called Smart Water Application Technology (SWAT). The IA publishes this list at [www.irrigation.org/SWAT/swat.aspx?id=298](http://www.irrigation.org/SWAT/swat.aspx?id=298).

Hardware	Specifications	Applications and Requirements	Rebate Amount (per number of zones)
Smart Controllers	<ul style="list-style-type: none"> <li>● IA-SWAT tested and approved Smart Controllers.</li> </ul>	<ul style="list-style-type: none"> <li>● At final inspection, Smart Controllers must be correctly programmed to match each zone's soil and plant conditions, watering needs, and sprinkler precipitation rates.</li> <li>● <u>All controller proposals must be accompanied by a site plan map that shows the location of the zones run by that controller.</u> A written schedule listing the location, plant type, and irrigation head type for each zone must be posted at the controller.</li> </ul>	\$ 150 / <4 \$ 200 / 5-12 \$ 250 / 13-18 \$ 300 / 18-24 \$ 350 / >24 Larger systems will be considered on case-by- case basis.

**VI. Sensors**

Sensors that detect rainfall or moist soil and stop irrigation can be added to most controllers and help reduce unnecessary watering. Some controllers are capable of adjusting irrigation based on more sophisticated weather sensors, or shutting down the system if excessive flows indicate large leaks.

Hardware	Specifications	Applications and Requirements	Rebate Amount
Rain Sensors		<ul style="list-style-type: none"> <li>● Hardwired or wireless</li> <li>● Must be installed to manufacturer's specifications.</li> <li>● Must be set to interrupt irrigation program at ¼" setting.</li> <li>● Automatically break the circuit to the solenoid valves of the sprinkler system after a rain.</li> <li>● Have replaceable absorptive disks or an anti-splash catchment system.</li> <li>● Be adjustable to shut off at different amounts of rainfall.</li> </ul>	\$50 per controller
Retrofit to change controller to ET-based model	<ul style="list-style-type: none"> <li>● IA-SWAT tested and approved Smart Controller retrofits.</li> </ul>	<ul style="list-style-type: none"> <li>● Must have compatible controller.</li> </ul>	\$125 per controller

Flow Sensors for existing controller equipped to read flow meter	<ul style="list-style-type: none"> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● Flow-sensors must be equipped with automatic shutoff of zones and remote alarm via cell-phone or pager.</li> <li>● The flow sensor must be installed on the mainline with compatible firmware/software and controller to record flows by zone. In addition, a high flow condition must result in the controller closing the master valve or zone valves.</li> <li>● A master valve and controller with flow monitoring capabilities must be installed with the flow sensor.</li> </ul>	\$200 per sensor
Soil Sensor		<ul style="list-style-type: none"> <li>● Soil sensor rebates must be approved based on application details.</li> <li>● Automatically break the circuit to the solenoid valves of the sprinkler system.</li> <li>● Have an interface module between the sensor and the controller.</li> <li>● Have the ability to finish an irrigation cycle after activation.</li> <li>● Be adjustable to shut off at different soil moisture levels.</li> <li>● Be installed by a professional trained in soil moisture technology.</li> </ul>	\$75 per controller

<b>VII. Removed Sprinkler Heads</b>			
<p>Sprinkler heads installed with new landscapes often become unnecessary as plants become established. Trees and shrubs often do not need to be watered once established; landscape changes may replace plants with paths or utility areas. Removing sprinkler heads that are no longer needed saves water and reduces the potential for damage to heads that are shut off at the nozzle but still pop-up each time the zone runs.</p>			
Hardware	Specifications	Applications and Requirements	Rebate Amount
Removed Sprinkler Heads	<ul style="list-style-type: none"> <li>● Removed sprinkler heads and associated parts (swing joints, flex-pipe, etc.) must be removed at the point of connection to zone laterals, and replaced with a pipe threaded PVC cap or plug.</li> </ul>	<ul style="list-style-type: none"> <li>● Sprinkler heads must be in actively scheduled zones.</li> <li>● Mark each sprinkler head to be removed with paint for initial site inspection.</li> <li>● Present removed sprinkler heads and associated parts at post-inspection.</li> </ul>	\$5 per sprinkler head

**VIII. Drip Irrigation**

Drip irrigation delivers water directly to the root zone and can improve plant health and reduce water use by up to 50%. Layout of drip emitters must be based on the soil, plant type, and plant spacing to economically provide adequate coverage. Typically in sandy soils each emitter creates a 12" diameter wet zone, and in clay soils a 24" diameter wet zone. Drip lines and emitters should be spaced about 1.5 to 2 times these distances in perennial and densely planted shrub beds or one line per row of annuals or drought tolerant plants. Emitters may be spaced farther apart where irrigation is needed solely for establishment of native and drought tolerant plantings.

Hardware	Specifications	Applications and Requirements	Rebate Amount
Drip Lines, Emitters and associated hardware.	<ul style="list-style-type: none"> <li>● Drip designs are subject to review and must be pre-approved.</li> <li>● Drip irrigation may only be used in dedicated zones, not mixed with sprinklers, sprays, bubblers or other devices.</li> <li>● All drip lines should be laid on the soil surface, staked down, and covered with at least 2 inches of mulch.</li> <li>● Use only pressure regulating, self-flushing emitters, and wherever practical, use in-line or low-profile emitters to minimize potential damage.</li> <li>● Use compression fittings or barbed fittings with screw-tightened stainless steel hose clamps.</li> <li>● Install pressure regulators at each zone valve or valve cluster as needed to provide optimum pressure as defined by the equipment manufacturer.</li> </ul>	<ul style="list-style-type: none"> <li>● Pressure regulating style emitters</li> <li>● Each converted zone or valve group must have a Wye-type filter with 150 or finer filter media.</li> <li>● Compression or clamped barb fittings on all lines ½" diameter or larger.</li> <li>● ½" in-line emitter tubing, or low-profile inserted emitters recommended for most applications.</li> </ul>	Wholesale cost, up to \$400 per 1,000 square feet.