

## MUNICIPAL CODE AMENDMENT AT-06-09

### EXHIBIT A

**Ordinance 405-93 is hereby repealed and replaced by Chapter 18.112 of the Union City Municipal Code, which is as follows:**

#### **Chapter 18.112 Water Efficient Landscape Ordinance**

##### **18.112.010 Purpose.**

The purpose and intent of this Chapter is to:

- A. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;
- B. Establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects;
- C. Establish provisions for water management practices and water waste prevention for existing landscapes;
- D. Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount;
- E. Promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;
- F. Encourage local agencies and water purveyors to use economic incentives that promote the efficient use of water, such as implementing a tiered-rate structure;
- G. Utilize Bay Friendly Landscaping, which is a whole systems approach to the design, construction and maintenance of the landscape, to conserve water; and
- H. Satisfy the requirement to adopt a landscape water conservation ordinance as required by the Water Conservation in Landscaping Act of 2006 (AB 1881).

##### **18.112.020 Applicability.**

- A. After January 1, 2010, this Chapter shall apply to all of the following landscape projects:
  - 1. New construction and rehabilitated landscapes for both public and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, Site Development Review approval or Administrative Site Development Review approval;
  - 2. All existing landscapes limited to Section 18.112.180 and 18.112.190; and
  - 3. Cemeteries. Recognizing the special landscape management needs of cemeteries, new rehabilitated cemeteries are limited to Sections 18.112.050, 18.112.120 and 18.112.130; and existing cemeteries are limited to Sections 18.112.180 and 18.112.190.
- B. This ordinance does not apply to:

1. Registered local, state or federal historical sites;
2. Ecological restoration projects that do not require a permanent irrigation system;
3. Mined-land reclamation projects that do not require a permanent irrigation system; or
4. Plant collections, as part of botanical gardens and arboretums open to the public.

**18.112.030 Definitions.**

For the purposes of this chapter, the following definitions shall apply:

- A. "Applied water" means the portion of water supplied by the irrigation system to the landscape.
- B. "Automatic irrigation controller" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.
- C. "Backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
- D. "Bay-Friendly Basics Landscape Checklist" means the most recent version of the checklist developed by StopWaste.Org whose staff shall maintain the most recent version of the "Bay-Friendly Landscape Guidelines" at all times.
- E. "Bay-Friendly Landscape Guidelines" means the most recent version of the guidelines developed by StopWaste.Org for use in the professional design, construction and maintenance of landscapes, whose staff shall maintain the most recent version of the "Bay-Friendly Landscape Guidelines" at all times.
- F. "Bay-Friendly Landscaping Scorecard" means the most recent version of the Bay-Friendly Landscaping points system developed by StopWaste.Org, whose staff shall maintain the most recent version of the Bay-Friendly Landscaping Scorecard at all times.
- G. "Certificate of Completion" means the document required under Section 18.112.100.
- H. "Certified irrigation designer" means a person certified to design irrigation systems by an accredited academic institution a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Irrigation Designer program.
- I. "Certified landscape irrigation auditor" means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.
- J. "Check valve" or "anti-drain valve" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.
- K. "Conversion factor (0.62)" means the number that converts acre-inches per acre per year to gallons per square foot per year
- L. "Compost" is the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. Excerpted from US Compost Council, Field Guide to Compost Use

M. "Drip irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

N. "Drought resistant soil" means soil that has been managed, by amending with compost and covering with mulch, for example, to maximize rainfall infiltration, increase the soil's capacity to hold water, and allow for plant roots to penetrate and proliferate such that the landscape can survive with less than optimal water (i.e. less than MAWA)

O. "Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

P. "Effective precipitation" or "usable rainfall" (Eppt) means the portion of total precipitation which becomes available for plant growth.

Q. "Emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.

R. "Established landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

S. "Establishment period of the plants" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.

T. "Estimated Total Water Use" (ETWU) means the total water used for the landscape as described in Section 18.112.050.

U. "ET adjustment factor" (ETAF) means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is  $(0.7) = (0.5/0.71)$ . ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

V. "Evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

W. "Flow rate" means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

X. "Hardscapes" means any durable material (pervious and non-pervious).

Y. "High-flow sensors" or "flow meters" detect and report high flow conditions created by system damage or malfunction

Z. "Homeowner-provided landscaping" means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

AA. "Hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

BB. "Infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

CC. "Invasive plant species" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

DD. "Irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

EE. "Irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

FF. "Irrigation survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

GG. "Irrigation water use analysis" means an analysis of water use data based on meter readings and billing data.

HH. "Landscape architect" means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

II. "Landscape area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

JJ. "Landscape contractor" means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

KK. "Landscape Documentation Package" means the documents required under Section 18.112.040.

LL. "Landscape project" means total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance, meeting requirements under Section 18.112.020.

MM. "Landscape Permit" means a permit issued for landscape projects meeting the criteria listed under Section 18.112.020 that are not associated with a Site Development Review or Administrative Site Development Review.

NN. "Lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

OO. "Local water purveyor" means any entity, including a public agency, city, county, or private water company that provides retail water service. The local water purveyor for Union City is Alameda County Water District.

PP. "Low volume irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers.

Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

QQ. "Main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

RR. "Maximum Applied Water Allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 18.112.050. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.

SS. "Microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

TT. "Mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

UU. "Mulch" means any organic material such as leaves, arbor or wood chips, recycled wood waste, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

VV. "New construction" means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

WW. "Operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

XX. "Overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., spray heads and rotors).

YY. "Overspray" means the irrigation water which is delivered beyond the target area.

ZZ. "Permit" means an authorizing document issued by the City for new construction or rehabilitated landscapes.

AAA. "Pervious" or "permeable" means any surface or material that allows the passage of water through the material and into the underlying soil.

BBB. "Plant factor" or "Plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

CCC. "Precipitation rate" means the rate of application of water measured in inches per hour.

DDD. "Project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section 18.112.040, to request a permit, plan check, or Site Development Review approval from the City of Union City. A project applicant may be the property owner or his or her designee.

EEE. "Rain sensor" or "Rain sensing shutoff device" means a component which automatically suspends an irrigation event when it rains.

FFF. "Record drawing" or "As-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

GGG. "Recreational area" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

HHH. "Recycled water", "Reclaimed water", or "Treated sewage effluent water" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

III. "Reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.

JJJ. "Rehabilitated landscape" means any re-landscaping project that requires a permit, plan check, Site Development Review or Administrative Site Development Review, meets the requirements of Section 18.112.020, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

KKK. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

LLL. "Soil moisture sensing device" or "Soil moisture sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

MMM. "Soil texture" means the classification of soil based on its percentage of sand, silt, and clay.

NNN. "Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water or water captured from cisterns, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

OOO. "Sprinkler head" means a device which delivers water through a nozzle.

PPP. "Static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.

QQQ. "Station" means an area served by one valve or by a set of valves that operate simultaneously.

RRR. "Swing joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

SSS. "Turf" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

TTT. "Valve" means a device used to control the flow of water in the irrigation system.

UUU. "Water conserving plant species" means a plant species identified as having a low plant factor.

VVV. "Water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

WWW. "Watering window" means the time of day irrigation is allowed.

XXX. "WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

**18.112.040 Landscape Documentation Package.**

A. Prior to issuance of building or landscape permits, the project applicant shall submit two copies of the Landscape Documentation Package to the City for review and approval, which shall include the following information.

1. Project information:

- a. Date;
- b. Project address and if available Assessor Parcel Number and /or Tract and Lot Number;
- c. Total landscape area (square feet);
- d. Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed);
- e. Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor (typically Alameda County Water District); if the applicant is not served by a private well;
- f. Checklist of all documents in Landscape Documentation Package;
- g. Project contacts to include name and contact information for the project applicant and property owner; and
- h. Applicant signature and date with statement, "I agree to comply with the requirements of Chapter 18.112 and submit a complete Landscape Documentation Package".

2. Water Efficient Landscape Worksheet in accordance with the provisions listed in Section 18.112.050 that includes the following information:

- a. Hydrozone information table;
  - b. Water budget calculations including the Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use (ETWU).
3. Soil management report in accordance with the provisions listed in Section 18.112.060.
  4. Landscape design plan in accordance with the provisions listed in Section 18.112.070.
  5. Irrigation design plan in accordance with the provisions listed in Section 18.112.080.
  6. Grading design plan (if applicable) in accordance with the provisions listed in Section 18.112.090.

B. Upon approval of the Landscape Documentation Package by the City, the project applicant shall:

1. Include approved Landscape Documentation Package in Building Permit or Landscape Permit planset submitted for building permit or landscape permit issuance.

2. Submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee.
3. Submit a copy of the Water Efficient Landscape Worksheet to the Alameda County Water District.

**18.112.050 Water Efficient Landscape Worksheet.**

A. Project applicant shall complete the Water Efficient Landscape Worksheet which contains two sections:

1. A hydrozone information table for the landscape project; and
2. A water budget calculation for the landscape project.

a. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, the following ETo values from the Reference Evapotranspiration Table, listed in the State Model Water Efficient Landscape Ordinance, shall be used:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
1.4	1.8	3.1	4.2	5.4	5.9	6.4	5.7	4.4	3.1	1.5	1.2	44.2

B. Water budget calculations shall adhere to the following requirements:

1. The plant factor used shall be from WUCOLS. The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.
2. All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.
3. All Special Landscape Areas shall be identified and their water use calculated as described below.
4. ETAF for Special Landscape Areas shall not exceed 1.0.

C. Maximum Applied Water Allowance

1. The Maximum Applied Water Allowance shall be calculated using the equation:  
 $MAWA = (ETo) (0.62) [(0.7 \times LA) + (0.3 \times SLA)]$

2. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

D. Estimated Total Water Use.

1. The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$ETWU = (ETo)(0.62) \left( \frac{PF \times HA}{IE} + SLA \right) \quad \text{Where:}$$

ETWU = Estimated Total Water Use per year (gallons)

ETo = Reference Evapotranspiration (inches)

PF = Plant Factor from WUCOLS (see Section 491)

HA = Hydrozone Area [high, medium, and low water use areas] (square feet)

SLA = Special Landscape Area (square feet)

0.62 = Conversion Factor

IE = Irrigation Efficiency (minimum 0.71)

**18.112.060 Soil Management Report.**

A. In order to create drought resistant soil, reduce runoff and encourage healthy plant growth, a soil management report addressing soil attributes of the project site shall be completed by the project applicant, or his/her designee;

B. The soil management report shall address the soil attributes of the project site and shall include:

1. Identification of areas of quality topsoil to be protected during construction and/or critical soil limitations such as compaction; water logged soils or wetlands; thin, eroded or erosion prone soils.

2. A laboratory soil analysis of the soil(s) into which plantings are to be made:

a. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

b. At a minimum the soil analysis shall include:

i. Soil texture;

ii. Infiltration rate determined by laboratory test or soil texture infiltration rate table;

iii. pH;

iv. Total soluble salts;

v. Sodium;

vi. Essential nutrients;

vii. Percent organic matter; and

viii. Recommendations for soil amendments or nutrient applications to ameliorate the soil limitations identified by the analysis and the amount of compost required to bring the soil organic matter content to a minimum of 3.5% by dry weight or a minimum application of at least 1 inch . The required practice of adding compost is waived if the plant palette primarily includes California native species that are adapted to soils with little or no amendments.

c. It is highly recommended that:

i. The lab report recommendations are based on an 'organic' approach to soil and landscape management that specifies natural and non-synthetic fertilizers to rectify any soil deficiencies.

ii. If the soils are to be irrigated with recycled water the lab report recommendations are tailored to recycled water.

iii. The types of plantings intended such as turf, perennial bed, annual bed, swale etc are provided to the soil laboratory.

iv. Management actions are identified to remediate limiting soil characteristics such as ripping the soil to alleviate soil compaction.

3. Specifications for protecting topsoil, ameliorating soil limitations, such as ripping the soil to alleviate soil compaction, and incorporating compost and/or amendments as per recommendations in the soil analysis report.

C. The project applicant, or his/her designee, shall comply with one of the following:

1. If significant mass grading is not planned, the soil management report shall be submitted to the City of Union City as part of the Landscape Documentation Package; or

2. If significant mass grading is planned, the soil management report shall be submitted to the City of Union City as part of the Certificate of Completion.

D. The soil management report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

E. The project applicant, or his/her designee, shall submit documentation verifying implementation of the soil management report recommendations to the City with the Certificate of Completion.

**18.112.070 Landscape Design Plan.**

A. For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

1. Plant Material

a. The estimated total water use of the plant material selected must not exceed the Maximum Applied Water Allowance.

b. Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 18.112.080(a)(2)(D).

c. At least seventy-five percent (75%) of the total number of plants in non-turf areas shall require occasional, little or no summer water. All species should be adapted to the climate in which they will be planted, as documented by a published plant reference. If plants are given a range of water needs from “occasional to moderate” for example, the landscape designer must determine if the plant will require either occasional or moderate watering based on site, soil, and climate conditions and categorize the plant appropriately. Sources used to determine climate adaptation and watering requirements may include:

i. Bornstein, Carol, David Fross and Bart O’Brien, California Native Plants for the Garden. Qualifying irrigation designation: “occasional”, “infrequent”, or “drought tolerant”

ii. East Bay Municipal Utility District’s publication Plants and Landscapes for Summer Dry Climates. Qualifying irrigation designation: “occasional”, “infrequent” or “no summer water”

iii. Sunset Publishing Corporation Sunset Western Garden Book. Qualifying irrigation designation: “little or no water”

iv. University of California Cooperative Extension’s Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA. Qualifying irrigation designation: “Low” or “Very Low”

d. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

e. Total irrigated areas specified as turf shall be limited to a maximum of 25% with recreational areas exempted.

f. A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

g. Those species identified by CAL-IPC as invasive in the San Francisco Bay Area shall not be included in the landscape design plan.

h. Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water and other resources, the following is highly recommended:

- i. Protection and preservation of native species and natural vegetation;
- ii. Selection of plants based on disease and pest resistance;
- iii. Selection of trees based on applicable local tree ordinances or tree shading

guidelines;

iv. Selection of California native plants from local and regional landscape program plant lists using local natural plant communities as models;

v. Use of the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;

vi. Recognition of the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); to allow them to grow to their mature size within the space allotted them to avoid shearing and topping;

vii. Consideration of the solar orientation for plant placement to maximize summer shade and winter solar gain;

viii. Avoid specifying turf in street medians, traffic islands or bulbouts of any size unless irrigated with subsurface or low volume irrigation; and

ix. Avoid installing turf on slopes exceeding 10:1 (horizontal to vertical) or ten percent (10%).

## 2. Water Features

a. Recirculating water systems shall be used for water features.

b. Where available, recycled water shall be used as a source for decorative water features.

c. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

d. Pool and spa covers are highly recommended.

## 3. Mulch and Amendments

a. A minimum three inch layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, or direct seeding applications where mulch is contraindicated.

b. Stabilizing mulching products shall be used on slopes. It is highly recommended that bio based products are used and petroleum based products are avoided.

c. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

d. Compost and soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 18.112.060).

e. It is highly recommended that:

i. Compost and mulch is recycled from local organic materials such as plant or wood waste;

ii. Compost is purchased from processors who participate in the US Composting Council's Standard Testing Assurance Program; and

iii. Ongoing maintenance includes regular reapplication of mulch to a minimum of three (3) inches.

B. The landscape design plan, at a minimum, shall:

1. Delineate and label each hydrozone by number, letter, or other method;
2. Identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
3. Identify recreational areas;
4. Identify areas permanently and solely dedicated to edible plants;
5. Identify areas irrigated with recycled water;
6. Identify type of mulch and application depth;
7. Identify soil amendments, type, and quantity;
8. Identify type and surface area of water features;
9. Identify hardscapes (pervious and non-pervious);
10. Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
  - a. Rain gardens, infiltration beds, swales, and basins that allow water to collect and soak into the ground;
  - b. Constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
  - c. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.
11. Identify any applicable rain harvesting or catchment technologies (e.g. cisterns, etc.);
12. Comply with the Bay-Friendly Basics Landscape Checklist;
13. Contain the following statement: “I have complied with the criteria listed in Chapter 18.112 of the Union City Municipal Code and applied them for the efficient use of water in the landscape design plan”; and
14. Bear the signature of a licensed landscape architect. Landscape design plans associated with the development of new, individual, single-family residences shall bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

**18.112.080 Irrigation Design Plan.**

A. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers’ recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

**1. System**

- a. Dedicated landscape water meters are highly recommended on landscape areas to facilitate water management.
- b. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.

c. The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

i. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

ii. Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

d. Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

e. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

f. Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the Alameda County Water District regulations for additional backflow prevention requirements.

g. High flow sensors (flow meters) that detect and report high flow conditions created by system damage or malfunction are recommended.

h. The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

i. Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

j. The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

k. The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 18.112.050 regarding the Maximum Applied Water Allowance.

l. It is highly recommended that the project applicant inquire with the Alameda County Water District about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

m. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

n. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

o. Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

p. Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

q. Check valves or anti-drain valves are required for all irrigation systems.

r. Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.

s. Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

i. The landscape area is adjacent to permeable surfacing and no runoff occurs; or  
ii. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

iii. The irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in Section 18.112.080 (a)(1)(H). Prevention of overspray and runoff must be confirmed during the irrigation audit.

t. Slopes greater than twenty-five percent (25%) shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

## 2. Hydrozone

a. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

b. Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

c. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.

d. Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if the plant factor of the higher water using plant is used for calculations.

e. Individual hydrozones that mix high and low water use plants shall not be permitted.

f. On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table. This table can also assist with the irrigation audit and programming the controller.

B. The irrigation design plan, at a minimum, shall contain:

1. Location and size of separate water meters for landscape, if applicable;
2. Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
3. Static water pressure at the point of connection to the public water supply;
4. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
5. Recycled water irrigation systems as specified in Section 18.112.150;

6. The following statement: "I have complied with the criteria listed in Chapter 18.112 of the Union City Municipal Code and applied them accordingly for the efficient use of water in the irrigation design plan"; and

7. The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

**18.112.090 Grading Design Plan.**

A. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for other City-issued permits satisfies this requirement.

1. The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
  - a. Height of graded slopes;
  - b. Drainage patterns;
  - c. Pad elevations;
  - d. Finish grade; and
  - e. Stormwater retention improvements, if applicable.
2. To prevent excessive erosion and runoff, it is highly recommended that project applicants:
  - a. Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
  - b. Avoid disruption of natural drainage patterns and undisturbed soil; and
  - c. Avoid soil compaction in landscape areas.
3. The grading design plan shall contain the following statement: "I have complied with the criteria listed in Chapter 18.112 of the Union City Municipal Code and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

**18.112.100 Certificate of Completion.**

A. The Certificate of Completion shall include the following six (6) elements:

1. Project information sheet that contains:
  - a. Date;
  - b. Project name;
  - c. Project applicant name, telephone, and mailing address;
  - d. Project address and location; and
  - e. Property owner name, telephone, and mailing address;
2. Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;
  - a. Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
3. Irrigation scheduling parameters used to set the controller (see Section 18.112.110);

4. Landscape and irrigation maintenance schedule (see Section 18.112.120);
  5. Irrigation audit report (see Section 18.112.130); and
  6. Soil management report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations (see Section 18.112.060).
- B. Prior to issuance of a Certificate of Occupancy in the case of a building permit or a final sign-off in the case of a landscape permit, the following shall occur:
1. The project applicant shall submit the signed Certificate of Completion to the City for review;
  2. The City shall approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the City Department shall provide information to the project applicant regarding reasons for denial.
- C. The project applicant shall ensure that copies of the approved Certificate of Completion are submitted to the Alameda County Water District and property owner or his or her designee.

**18.112.110 Irrigation Scheduling.**

- A. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:
1. Irrigation scheduling shall be regulated by automatic irrigation controllers.
  2. Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from those stipulated by the Alameda County Water District, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
  3. For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.
  4. Parameters used to set the automatic controller shall be developed and submitted for each of the following:
    - a. The plant establishment period;
    - b. The established landscape; and
    - c. Temporarily irrigated areas.
  5. Each irrigation schedule shall consider for each station all of the following that apply:
    - a. Irrigation interval (days between irrigation);
    - b. Irrigation run times (hours or minutes per irrigation event to avoid runoff);
    - c. Number of cycle starts required for each irrigation event to avoid runoff;
    - d. Amount of applied water scheduled to be applied on a monthly basis;
    - e. Application rate setting;
    - f. Root depth setting;
    - g. Plant type setting;
    - h. Soil type and mulch depth;
    - i. Slope factor setting;

- j. Shade factor setting; and
- k. Irrigation uniformity or efficiency setting.

**18.112.120 Landscape and Irrigation Maintenance Schedule.**

A. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.

B. A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

C. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.

D. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance. The following is highly recommended:

1. Use the “Bay-Friendly Landscape Model Maintenance Specifications” and the “Bay-Friendly Landscape Guidelines” as an official reference documents in the landscape maintenance contract and/or with on-site landscape staff

2. At least one landscaping staff member or contractor to be trained in the use of IPM or is a “Bay-Friendly Qualified Landscape Professional.”

**18.112.130 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.**

A. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

B. For new construction and rehabilitated landscape projects installed after January 1, 2010, as described in Section 18.112.020:

1. The project applicant shall submit an irrigation audit report with the Certificate of Completion to the City that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule;

2. The City shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

**18.112.140 Irrigation Efficiency.**

A. For the purpose of determining Maximum Applied Water Allowance, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

**18.112.150 Recycled Water.**

A. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in Section 18.112.150 (B).

B. Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the Alameda County Water District stating that recycled water

meeting all public health codes and standards is not available and will not be available for the foreseeable future.

C. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.

D. Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0.

**18.112.160 Stormwater Management.**

A. Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged. Examples include:

1. Rain gardens, infiltration beds, swales and basins that allow water to collect and soak into the ground;
2. Constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants; and
3. Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

B. Rain harvesting or catchment technologies such as cisterns are recommended for storage and use of rainwater to satisfy a percentage of the landscape irrigation requirements.

C. Project applicants shall refer to the City of Union City or Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.

**18.112.170 Public Education.**

A. Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.

1. The City shall make available information to owners of new, single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes.

2. The City shall make available a Water Efficient Landscape Worksheet, Certification of Completion Form and Bay-Friendly Basics Landscape Checklist to project applicants.

B. Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.

1. Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme.

2. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

**Section 18.112.180 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.**

A. This section shall apply to all existing landscapes that were installed before January 1, 2010 and are over one acre in size.

1. For all landscapes that have a water meter, the City shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as:  $MAWA = (0.8) (ET_o)(LA)(0.62)$ .

2. For all landscapes that do not have a meter, the City shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

B. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

**18.112.190 Water Waste Prevention.**

A. Runoff shall be prohibited runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures.

B. Restrictions regarding overspray and runoff may be modified if:

1. The landscape area is adjacent to permeable surfacing and no runoff occurs; or

2. The adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

**18.112.200 Effective Precipitation.**

A. The City may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:

$MAWA = (ET_o - Eppt) (0.62) [(0.7 \times LA) + (0.3 \times SLA)]$ .