4.0 Landscape and Water Conservation

4.1 Applicability

A. These criteria shall apply to all of the following landscape projects:
   1. New construction and renovated landscapes for public agency projects and private development projects requiring a building or landscape permit, plan check or design review;
   2. New construction and renovated landscapes which are developer-installed in single-family and multi-family projects requiring a building or landscape permit, plan check or design review;
   3. New construction and renovated landscapes which are homeowner-provided and/or homeowner-hired in single family and multi-family residential projects with a total project landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review; and
   4. Existing landscapes limited to section 4.1B.

B. These criteria do 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.

4.2 Definitions

The words used in this section have the meanings set forth below:

ANTIDRAIN VALVE or CHECK VALVE - A valve located under/in a sprinkler head to hold water in the system to eliminate drainage from the lower elevation sprinkler heads.

APPLICATION RATE – The depth of water applied to a given area, usually measured in inches per hour. Also known as precipitation rate (sprinklers) or emission rate (drippers/micro-sprayers) in gallons per hour.

APPLIED WATER – The portion of water supplied by the irrigation system to the landscape.

AUTOMATIC CONTROLLER – An electronic or solid-state timer capable of operating valve stations to set the days, time and length of time of a water application.

BACKFLOW PREVENTION DEVICE – A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

BENEFICIAL USE – Water used for landscape evapotranspiration.

BILLING UNITS – Units of water (1 billing unit = 1 CCF = 100 cubic feet = 748 gallons) for billing purposes. To convert gallons per year to 100 cubic feet per year, divide gallons per year by 748. (748 gallons = 100 cubic feet).

CITY – The City of Indio.

CONVERSION FACTOR (0.62) – A number that converts the Maximum Applied Water Allowance from acre-inches per acre to gallons per square foot. The conversion factor is calculated as follows:

(32,851 gallons/43,560 square feet)/12 inches	= (0.62)
325,851 gallons	= one-acre-foot
43,560 square feet	= one acre
12 inches	= one foot

DESERT LANDSCAPE – A desert landscape using native plants spaced to look like a native habitat.

DISTRIBUTION UNIFORMITY - A measure of how evenly sprinklers apply water. The low-quarter measurement method (DULQ) utilized in the irrigation audit procedure is utilized for the purposes of these criteria. These criteria assume an attainable performance level of 75% DULQ for spray heads, 80% DULQ for rotor heads and 85% DULQ for recreational turf grass rotor heads.

DRIP IRRIGATION - A method of irrigation where the water is applied slowly at the base of plants without watering the open space between plants.

ECOLOGICAL RESTORATION PROJECT - A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

EFFECTIVE PRECIPITATION or USABLE RAINFALL - The portion of total natural precipitation that is used by the plants, usually assumed to be three inches annually. Precipitation or rainfall is not considered a reliable source of water in the desert.
ELECTRONIC CONTROLLERS - Time clocks that have the capabilities of multiprogramming, water budgeting and multiple start times.

EMISSION UNIFORMITY - A measure of how evenly drip and micro-spray emitters apply water. The low-quarter measurement method (EULQ) utilized in the landscape irrigation evaluation procedure is utilized for the purposes of these criteria. These criteria assume 90% EULQ for drippers, micro-sprays and pressure compensating bubblers.

EMITTER - Drip irrigation fittings that deliver water slowly from the watering system to the soil.

ESTABLISHED LANDSCAPE - The point at which new plants in the landscape have developed roots into the soil adjacent to the root ball.

ESTABLISHMENT PERIOD - The first year after installing the plant in the landscape.

ESTIMATED TOTAL WATER USE (By hydrozone) - The portion of the estimated annual total applied water use that is derived from applied water to a specified hydrozone.

ESTIMATED ANNUAL TOTAL APPLIED WATER USE (Total of all hydrozones) - The annual total amount of water estimated to be needed by all hydrozones to keep the plants and water features in the landscaped area healthy and visually pleasing. It is based upon such factors as the local evapotranspiration rate, the size of the landscaped area, the size and type of water feature, the types of plants, and the efficiency of the irrigation system. The estimated annual total applied water use shall not exceed the Maximum Applied Water Allowance (MAWA).

EVAPOTRANSPIRATION or ET - The quantity of water evaporated from adjacent soil surfaces and transpired by plants expressed in inches during a specific time.

ET ADJUSTMENT FACTOR - A factor of 0.455 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.

FINISHED GRADE – Grade height after surface mulch covering has been installed.

FLOW RATE - The rate at which water flows through pipes, valves and meters (gallons per minute or cubic feet per second).

HARDSCAPE - Concrete or asphalt areas including streets, parking lots, sidewalks, driveways, patios and decks.

HEAD-TO-HEAD COVERAGE - One hundred percent sprinkler coverage of the area to be irrigated, with maximum practical uniformity.

HIGH FLOW CHECK VALVE - A valve located under/in a sprinkler head to stop the flow of water if the spray head is broken or missing.

HYDROZONE - A portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation (once established) is a non-irrigated hydrozone.

INFILTRATION RATE - The rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

IRRIGATION EFFICIENCY - 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 irrigation efficiency for purposes of these regulations is 0.75 or 75 percent and .90 or 90 percent for drip systems. Greater irrigation efficiency can be expected from well-designed and maintained systems.

IWA – Indio Water Authority.

IWA ENGINEERING –Indio Water Authority Engineering Department.

LANDSCAPE IRRIGATION AUDIT - A process to perform site inspections, evaluate irrigation systems and develop efficient irrigation schedules.

LANDSCAPED AREA - The entire parcel less the building footprint, driveways, non-irrigated portions of the parking lots, hardscapes (such as decks and patios), and other nonporous areas. Water features are included in the calculation of a site's landscaped area.

LATERAL LINE - The water delivery pipeline that supplies water to the emitters sprinklers from a valve.

MAIN LINE - The pressurized pipeline that delivers water from the water source to a valve or outlet.

MAXIMUM APPLIED WATER ALLOWANCE (MAWA) - For design purposes, the upper limit of annual applied water for the established landscape area as specified in Division 2, Title 23, California Code of Regulations, Chapter 7, Section 492. It is based upon the area's reference evapotranspiration, ET adjustment factor, and the size of the landscaped area. The estimated applied water use shall not exceed the Maximum Applied Water Allowance (MAWA).

MICROIRRIGATION - See drip irrigation.

MULCH - Any organic material such as leaves, bark, straw or inorganic material such as pebbles, stones, gravel, decorative sand or decomposed granite left loose and applied to the soil surface to reduce evaporation.

NATIVE PLANTS - Native plants are low water using plants that are: 1) indigenous to the Coachella Valley and lower Colorado Desert region of California and Arizona, 2) native to the southwestern United States and northern Mexico or 3) native to other desert regions of the world, but adapted to the Coachella Valley.

NATURAL GRADE – Grade height of native soil before application of surface mulch.

OPERATING PRESSURE - The pressure at which an irrigation system's sprinklers, bubblers, drippers or microsprays are designed to operate, usually indicated at the base of an irrigation head.

OVERHEAD SPRINKLER IRRIGATION STATIONS - Sprinklers with high flow rates (spray heads, impulse sprinklers, gear rotors, etc.) that are utilized to apply water through the air to large irrigated areas.

OVERSPRAY – The water which is delivered beyond the landscaped area onto pavements, walks, structures or other non-landscape areas. Also known as hardscape applications.

PLANT FACTOR - A factor that, when multiplied by reference evapotranspiration, estimates the amount of water used by plants. For purposes of these criteria, the average plant factor of very low water using plants ranges from 0.01 to 0.10, for low water using plants the range is 0.10 to 0.30, for moderate water using plants the range is 0.40 to 0.60, and for high water using plants, the range is 0.70 to 0.90. Reference: Water Use Classifications of Landscape Species IV (WUCOLS IV).

PRESSURE COMPENSATING (PC) BUBBLER – An emission device that allows the output of water to remain constant regardless of input pressure. Typical flow rates for this type of bubbler range between 0.25 gpm to 2.0 gpm.

PRESSURE COMPENSATING SCREENS/DEVICES - Small screens/devices inserted in place of standard screens/devices that are used in sprinkler heads for radius and high pressure control.
QUALIFIED PROFESSIONAL - A person who has been certified by their professional organization or a person who has demonstrated knowledge and is locally recognized as qualified among landscape architects due to longtime experience.

RAIN-SENSING DEVICE - A system that automatically shuts off the irrigation system when it rains.

RECYCLED WATER/RECLAIMED WATER - Treated or recycled wastewater of a quality suitable for non-potable uses such as landscape irrigation. Recycled water is not for human consumption.

RECORD DRAWING or AS-BUILTS - 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.

RECREATIONAL AREA - Areas of active play or recreation such as golf courses, sports fields, schoolyards, picnic grounds, or other areas with intense foot or vehicular traffic.

RECREATIONAL TURF GRASS - High traffic turf grass that serves as a playing surface for sports and recreational activities. Athletic fields, golf courses, parks and school playgrounds are all examples of areas having recreational turf grass.

RECREATIONAL TURF GRASS ET ADJUSTMENT FACTOR - A factor of 0.82 that, when applied to reference evapotranspiration, adjusts for the additional stress of high traffic on recreational turf grass and the higher irrigation efficiencies of long-range rotary sprinklers. These are the two major influences upon the amount of water that needs to be applied to a recreational landscape. A mixed cool/warm season turf grass with a seasonal average of 0.7 is the basis of the plant factor portion of this calculation. The irrigation efficiency of long-range sprinklers for purposes of the ET adjustment factor is 0.85. Therefore, the ET adjustment factor is 0.82 = 0.7/0.85.

REFERENCE EVAPOTRANSPIRATION or ETo - A standard measurement of the environmental parameters which affect the water use of plants, using cool season grass as a reference. ETo is expressed in inches per day, month or year and is an estimate of the evapotranspiration of a large field of cool-season grass that is well watered. Reference evapotranspiration is used as a basis of determining the Maximum Applied Water Allowances so that regional differences in climate can be accommodated.

RENOVATED LANDSCAPE - Any re-landscaping project in which the choice of new plant material and/or new irrigation system components is such that the calculation of the sites estimated water use will be significantly changed. The new estimated water use calculation must not exceed the Maximum Applied Water Allowance (MAWA) calculated for the site using a 0.455 ET adjustment factor.

RIPARIAN PLANTS - Riparian plants are high water using and water-loving plants that are found growing naturally along flowing rivers and lake shores. They may also be native to wet swampy areas with high water tables or poor drainage.

RUNOFF - Irrigation water which is not absorbed by the soil or landscape to which it is applied and which flows from the planted area.

SERVICE LINE - The pressurized pipeline that delivers water from the water source to the water meter.

SMART CONTROLLER – Weather-based or soil moisture-based irrigation controls that monitor and use information about environmental conditions for a specific location and landscape (such as soil moisture, rain, wind, the plants' evaporation and transpiration rates and, in some cases, plant type and more) to automatically control when to water and when not to, providing exactly the right amount of water to maintain lush, healthy growing conditions.

SOIL MOISTURE-SENSING DEVICE - A device that measures the amount of water in the soil.

SOIL TEXTURE - The classification of soil based on the percentage of sand, silt and clay in the soil.

SPRINKLER HEAD - A device that sprays water through a nozzle.

STATIC WATER PRESSURE - The pipeline or municipal water supply pressure when water is not flowing.

STATION - An area served by one valve or by a set of valves that operate simultaneously.

TURF - A surface of earth containing mowed grass with roots.

VALVE - A device used to control the flow of water in the irrigation system.

WATER FEATURE - Any water applied to the landscape for non-irrigation, decorative purposes. Fountains, streams, ponds and lakes are considered water features. Water features use more water than efficiently irrigated turf grass and are assigned a plant factor of 1.1 for a stationary body of water and 1.2 for a moving body of water.

WATER SYSTEM - The network of piping, valves and irrigation heads.

WUCOLS III - Water Use Classifications of Landscape Species III

4.3 Provisions for New or Renovated Landscapes

A. Landscape Documentation Package

1. Prior to construction, the project applicant shall:
   a. Submit two copies of Worksheet A – Landscape Documentation Package Checklist (Worksheet A), to IWA that conform to these design criteria. No water meter will be issued until the IWA reviews and approves the Landscape Documentation Package Checklist. Refer to Appendix F for Worksheet A.
   b. Submit one copy of Worksheet A to the IWA Engineering Department.

2. Upon receipt of Worksheet A Checklist, the IWA shall:
   a. Review Worksheet A.
   b. Approve or deny Worksheet A.

3. Upon approval of Worksheet A , the IWA will:
   a. Sign and date the approved plans and return them to the project applicant.
   b. Submit a copy of Worksheet B – Water Efficient Landscape Worksheet (Worksheet B) to IWA Engineering. Refer to Appendix F for Worksheet B.

4. Upon approval of Worksheet A by IWA Engineering, the project applicant shall:
   a. Receive an approval of the landscape design review or plan check.
   b. Finalize Worksheet E – Certification of Completion (Worksheet E), including recording the date of the approval. Refer to Appendix F for Worksheet E.
   c. File Worksheet E with IWA Engineering, and provide a copy to the property owner or designee.
   d. Submit a copy of the approved Worksheet A, along with the record drawings and any other information, to the property owner or designee.

5. Each Worksheet A shall include the following elements:
   a. A completed Worksheet A, which includes the date, project applicant, and project address information. This checklist serves to verify that the elements of the Landscape Documentation Package have been completed.
   b. Total landscaped area (square feet)
   c. Project type (e.g., new, renovated, public, private, cemetery, homeowner-installed, etc.)
   d. Worksheet B, which may be imbedded in the plan sheets of the Landscape Documentation Package Checklist, and include the following:
      i. Hydrozone Information Table (reference Worksheet B in Appendix F)
   e. Water Budget Calculations that adhere to the following requirements:
      i. The plant factor used shall be from WUCOLS. The plant factors ranges from 0 to 0.3 for the low use plants, from 0.4 to 0.6 for the moderate use plants, from 0.7 to 1.0 for the high use plants and 1.1 to 1.2 for water features.
      ii. All water features shall be included in the 1.1 to 1.2 hydrozone and temporary irrigated areas shall be included in the low water use hydrozone. For the calculation of the Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use, a project applicant shall use ETo values from the Reference Evapotranspiration Table. See Worksheet C – ET Profile (Worksheet C) in Appendix F. For geographic areas not covered in Worksheet C, use data from other cities located nearby in the same reference evapotranspiration zone.
   f. Landscape Design Plan
   g. Irrigation Design Plan
   h. Grading Design Plan (as required)
   i. Soil Management Report (as required)
   j. All plans must contain a signature block for both IWA Engineering and IWA.

6. Worksheet A shall be submitted by the following procedure:

   a. The applicant or applicant's representative may bring, send or ship copies of Worksheet A to the IWA Engineering Department, as applicable. Appropriate fees must accompany Worksheet A.

b. The plans will normally be returned to the applicant with comments by IWA Engineering staff within ten working days of receipt.
c. After noted corrections have been made, the applicant shall resubmit Worksheet A to the IWA for approval.
d. Signed plans will be held at the IWA's office for applicant pick up or sent by certified shipping at the applicant's request and expense.
e. For direct communication:

Telephone No.:	(442) 400-5250
Mailing Address:	Indio Water Authority Engineering Department 83101 Ave 45 Indio, CA 92201
Hand Delivery or Shipping Address:	Indio Water Authority Engineering Department 83101 Ave 45 Indio, CA 92201

f. The IWA Engineering Department will inspect the landscaped area(s) for conformance with the approved Worksheet A. Landscaping that does not conform to the approved Worksheet A is subject to penalties in accordance with Section 54.063(H) of the Indio Municipal Code.

7. Upon review and approval of Worksheet A by the IWA, the project applicant shall:
    a. Submit a copy of the IWA-approved Worksheet A and Worksheet B to the IWA Engineering Department.
    b. Record the date of the permit on Worksheet E.
    c. Provide the property owner or designee a copy of the local-agency approved Worksheet A in addition to the record drawings, and any other information normally forwarded to the property owner or designee.

B. Landscape Design Plan

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

1. Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance (MAWA). To encourage the efficient use of water the following is highly recommended:

a. Protection and preservation of native species and natural vegetation;
b. Selection of water-conserving plant and turf species;
c. Selection of trees based on applicable local tree ordinances or tree shading guidelines; and
d. Selection of plants from local and regional landscape program plant lists.

2. Specifications for Landscape Design Plan
The landscape design plan shall be drawn on 36-inch by 24-inch project base sheets at a scale that accurately and clearly identifies the following:
a. Tract name, tract number or parcel map number on cover sheet.
b. Proposed planting areas.
c. Plant material location and size.
d. Plant botanical and common names.
e. Plant spacing, where applicable.
f. Natural features including, but not limited to, rock outcroppings, and existing trees and shrubs that will remain incorporated into the new landscape.
g. Vicinity map showing site location on top sheet or on cover sheet.
h. Title block on each sheet with the name and address of the project, and the name and address of the professional design company with its signed professional stamp, if applicable.
i. Reserve two (2) 6-inch by 3-inch spaces for a) the IWA Engineering Department signature block and b) an IWA signature block in lower right corner of the cover sheet and on all of the landscape, irrigation design/detail/specification sheets.
j. Show plan scale and north arrow on design sheets.
k. Show graphic scale on all design sheets.
l. Show all property lines and street names.
m. Show all paved areas, such as driveways, walkways and streets.
n. Show all pools, ponds, lakes, fountains, water features, fences and retaining walls.
o. Show locations of all overhead and underground utilities within project area.
p. Provide an index map, as necessary, showing the overall project, including all 1/4 and 1/16 section lines and section numbers.
q. Show Maximum Applied Water Allowance (MAWA) for the proposed project. (See formula and Sample MAWA in Worksheet D.
r. Show total landscaped area in square feet. Separate area square footages by hydrozone. Show the total percentage area of each hydrozone. Include total area of all water features as separate hydrozones of still or moving water. Show Estimated Total Water Use, for each major plant group hydrozone and water feature hydrozone expressed in either seasonal (turf grass) or annual (trees, shrubs, groundcovers and water features) billing units.
s. Show Total Estimated Total Water Use for each major plant group hydrozone and water feature hydrozone expressed in either seasonal (turf grass) or annual (trees, shrubs, groundcovers and water features) billing units.

t. Show Total Estimated Water Use for the entire project. (Formula and Sample Calculation Estimated Water Use can be found in Worksheet D. The Total Estimated Use shall not exceed the Maximum Applied Water Allowance (MAWA).
u. Designate recreational areas and recreational turf areas.
v. When model homes are included, show the Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use (by hydrozone with totals) for each model unit.

3. Landscape Design Criteria
   a. The landscape design must be carefully planned and take into account the intended function of the project.
   b. Plants' appropriateness shall be selected based upon their adaptability to the climatic, geologic and topographical conditions of the site.
   c. Selection of water-efficient and low-maintenance plant material is required.
   d. All planted areas must be a minimum of one inch below adjacent hardscapes to eliminate runoff and overflow.
   e. Long, narrow or irregularly shaped turf areas shall not be designed because of the difficulty in irrigating uniformly without overspray onto hardscaped areas, streets and sidewalks. Areas less than 108 feet in width shall not be designed with turf. Turf will be allowed in these areas only if irrigation design reflects the use of subsurface irrigation or a surface flow/wick irrigation system.
   f. Turf areas irrigated with spray/rotor systems must be set back at least 24 inches from curbs, driveways, sidewalks or any other area that may result in runoff of water onto streets. An undulating landscape buffer area created by the setback shall be designed with rocks, cobble or decomposed granite and/or can be landscaped with drip irrigated shrubs/accents or covered with a suitable ground cover.
   g. Plants having similar water use shall be grouped together in distinct hydrozones.
   h. The use of a soil covering mulch or a mineral groundcover of a minimum three-inch depth to reduce soil surface evaporation is required around trees, shrubs and on non-irrigated areas. The use of boulders and cobble shall be considered to reduce the total vegetation area.
   i. Annual color plantings shall be used only in areas of high visual impact and must be irrigated with drip, micro-irrigation or other systems with efficiencies of 90 percent or greater. Otherwise, drip irrigated, perennial plantings should be the primary source of color.
   j. Native desert plants shall be specified to be planted in a shallow, wide, rough hole two times the root ball width. The root ball will be set on either undisturbed native soil or a firmed native soil. The root ball top will be set even with the finished surface grade or above grade if the soil is poorly drained. The hole must be backfilled with native soil. Extra soil may be used to mound up around plants where the soil is poorly drained.

k. Landscaping must not obstruct or interfere with street signs, lights or road/walkway visibility. Screening may be provided by walls, berms or plantings.
l. High water use plans, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.
m. Use locally approved plant materials lists in the selection of appropriate plants.
n. Planter islands in parking lots with canopy trees shall be sized to meet local land use agency requirements.
o. A landscape plan 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 material and highly flammable mulches.
p. The use of invasive and/or noxious plant species is prohibited.
q. The architectural guidelines of a common interest development, which includes community apartment projects, condominiums, planned developments and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group (California Civil Code, Section 1353.8).

C. Grading Design Plan

1. For 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 Worksheet A. A comprehensive grading plan prepared by a civil engineer for other permits required by the City satisfies this requirement.

2. 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.

3. To prevent excessive erosion and runoff, it is highly recommended, or mandatory if per City requirements, 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.

4. The grading design plan shall contain the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading plan."

5. 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).

6. Slopes greater than 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 must be confirmed during an irrigation audit.

7. All grading must retain normal stormwater runoff and provide for an area of containment. All irrigation water must be retained within property lines and not allowed to flow into public streets or public rights-of-way. Where appropriate, a simulated dry creek bed may be used to convey storm drainage into retention areas. A drywell shall be installed if the retention basin is to be used as a recreational area.

8. Mounded or sloped planting areas that contribute to runoff onto hardscape are prohibited. Sloped planting areas above a hardscaped area shall be avoided unless there is a drainage swale at toe of slope to direct runoff away from hardscape.

9. Median islands must be graded to prevent stormwater and excess irrigation runoff.

D. Irrigation Design Plan

For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturer's 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 criteria shall be submitted as part of Worksheet A.

Separate landscape water meters shall be installed for all projects except single-family homes with a landscape area less than 5,000 square feet. Landscape meters for single family homes with a landscape area over 5,000 square feet may be served by a permanent service connection provided by the IWA or be a privately owned submeter installed at the irrigation point of connection on the customer service line. When irrigation water is from a well, the well shall be metered. The irrigation design plan shall be drawn on project base sheets. It should be separate from, but use the same format as, the landscape design plan. The irrigation system specifications shall accurately and clearly identify the following:

1. Specifications for Irrigation Design.
   a. Control valves, manufacturer's model number, size and location.
   b. Irrigation head manufacturer's model number, radius, operating pressure, gallons per minute/gallons per hour (gpm/gph) and location.
   c. Piping type, size and location.
   d. Point of connection or source of water and static water pressure.
   e. Meter location and size (where applicable).
   f. Pump station location and pumping capacity (where applicable).
   g. Power supply/electrical access and location.
   h. Plan scale and north arrow on all sheets.
   i. Graphic scaling on all irrigation design sheets.
   j. Irrigation installation details and notes/specifications.
   k. The irrigation system shall be automatic, constructed to discourage vandalism and simple to maintain.
   l. All equipment shall be of proven design with local service available.
   m. Show location, station number, size, and design gpm of each valve on plan. Control valves shall be rated at 200 psi.
   n. Visible sprinklers near hardscape shall be of pop-up design.
   o. All heads should have a minimum number of wearing pieces with an extended life cycle.
   p. Sprinklers, drippers, valves, etc., must be operated within manufacturer's specifications.
   q. Manual shut-off valves shall be fully ported ball valves or butterfly valves. Manual shut-off valves are required upstream of automatic valve manifolds.
   r. Master valves shall be metal, located as close to the point of connection as possible, and be metal piped between the master valve and the water meter.
   s. High flow sensors that detect and report high flow conditions created by system damage or malfunction shall be specified for all projects where a dedicated landscape irrigation meter is required.
   t. The following statement "I have complied with the criteria of the ordinance and have applied them accordingly for the efficient use of water in the irrigation design plan;" and
   u. The signature of a licensed landscape architect, certified irrigation designer, irrigation consultant, landscape contractor or any other person authorized to design an irrigation system.

2. Specifications for Irrigation Efficiency
   The minimum irrigation efficiency shall be 0.75 (75%). Greater irrigation efficiencies are expected from well-designed and maintained systems. The following are required:

a. Design spray head and rotor head stations with consideration for worst wind conditions. Close spacing and low-angle nozzles are required in high and frequent wind areas (ETo Zone No. 5).
b. Spacing of sprinkler heads shall not exceed manufacturer's maximum recommendations for proper coverage. The plan design shall show a minimum of 0.75 (75%) distribution uniformity.
c. Only irrigation heads with matched precipitation rates shall be circuited on the same valve.
d. Valve circuiting shall be designed to be consistent with hydrozones.
e. Individual hydrozones that mix plants that are moderate and low water use may be allowed if:
    i. plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
    ii. the plant factor of the higher water using plant is used for the calculations.
f. Individual hydrozones that mix high and low water use plants shall not be permitted.
g. 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 assist with pre-inspection and final inspection of the irrigation system, and programming the controller.

3. Irrigation System Criteria
    a. Reduced pressure backflow prevention devices shall be installed behind meter at curb by the IWA.
    b. Show location, station number, size and design gpm of each valve on plan.
    c. Smart Controllers shall be specified for all projects. This includes climate based or sensor based controllers, which can automatically adjust for local weather and/or site conditions.
    d. High flow check valves shall be installed in or under all heads adjacent to street curbing, parking lots and where damage could occur to property due to flooding, unless controllers with flow sensor capabilities are specified that can automatically shut off individual control valves when excess flow is detected.
    e. Pressure compensating screens/devices shall be specified on all spray heads to reduce radius as needed to prevent overthrow onto hardscape and/or to control high pressure misting.
    f. All irrigation systems shall be designed to avoid runoff onto hardscape from low head drainage, overspray and other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures.
    g. Rotor type heads shall be set back a minimum of 4 feet from hardscape.
    h. The use of drip, micro-irrigation or pressure compensating bubblers or other systems with efficiencies of 90 percent or greater is required for all shrubs and trees. Small,

narrow (less than 8 feet), irregularly shaped or sloping areas shall be irrigated with drip, micro-spray or PC (pressure-compensating) bubbler heads.

i. Trees in turf areas shall be on a separate station to provide proper deep watering.
j. Street median irrigation
    i. No overhead sprinkler irrigation system shall be installed in median strips or in islands.
    ii. Median islands or strips shall be designed with either a drip emitter to each plant or subsurface irrigation. Bubblers used for trees must be fixed-flow pressure compensating type. Adjustable bubblers are prohibited
k. Meter sizing for landscape purposes shall be 33 gpm per planted acre. Maximum design meter flow rates are: 3/4" = 23 gpm, 1" = 37 gpm, 1-1/2" = 80 gpm, 2" = 120 gpm

4. Drip Irrigation System Criteria
    a. The drip system must be sized for mature-size plants.
    b. The irrigation system should complete all irrigation cycles during peak use in about 12 hours. Normally, each irrigation controller should not have more than four drip stations that operate simultaneously.
    c. Field installed below ground pipe connections shall be threaded PVC or glued PVC. Surface laid hose and tubing is prohibited. Polyethylene tubing is allowed only in subsurface installations. Drip emitter installation shall be directly into polyethylene tubing on a 1/4 inch thick-walled riser. Multi-port outlet devices and multi-port distribution is prohibited.
    d. Proportion gallons per day per plant according to plant size. The following sizing chart is for peak water use. The low to high end of the range is according to the relative water requirements of the plants. The low end is for desert natives and the high end is for medium water use type plants.

Size of Plant	Gallons Per Day
Large trees (over 30-foot diameter)	58+ to 97+
Medium trees (about 18-foot diameter)	21 to 35
Small trees/large shrubs (9-foot diameter)	6 to 10
Medium shrubs (3.5-foot diameter)	.8 to 1.3
Small shrubs/groundcover	.5 or less

    e. Plants with widely differing water requirements shall be valved separately. As an example, separate trees from small shrubs and cactus from other shrubs. Multiple emitter point sources of water for large shrubs and trees must provide continuous bands of moisture from the root ball out to the mature drip line plus 20 percent of the plant diameter. See Worksheet C for more information on emitter spacing and wetted area.

f. Most plants require 50 percent or more of the soil volume within the drip line to be wetted by the irrigation system. See Worksheet C for more information. For additional information on plant watering and plant relative water needs, see the plant list section of the "Lush and Efficient, Landscape Gardening in the Coachella Valley" or a list provided by the IWA Engineering Department.

5. Recycled Water Specifications
   a. When a site has recycled water available or is in an area that will have recycled water available as irrigation water, the irrigation system shall be installed using the industry standard purple colored or marked "Recycled Water Do Not Drink" on pipes, valves and sprinkler heads.
   b. The backup groundwater supply (well water or domestic water) shall be metered. Backup supply water is only for emergencies when recycled water is not available.
   c. Recycled water users must comply with all county, state and federal health regulations. Cross connection control shall require a 6-inch air gap system or a reduced pressure backflow device. All retrofitted systems shall be dye tested before being put into service.
   d. Where available, recycled water shall be used as a source for decorative water features.
   e. Sites using recycled water are not exempted from the Maximum Applied Water Allowance (MAWA), prescribed water audits or the provisions of these criteria.
   f. Worksheet F – Recycled Water Checklist (Refer to Appendix F) shall be submitted to the IWA upon submittal of the first plan check of the landscape design plan and the irrigation design plan.

6. Irrigation Water (Non-potable) Specifications
   a. When a site is using non-potable irrigation water that is not recycled water (from an on-site well or canal water) all hose bibs shall be loose key type and quick coupler valves shall be of locking type with non-potable markings to prevent possible accidental drinking of this water.
   b. Sites using non-potable irrigation water are not exempted from the Maximum Applied Water Allowance (MAWA), prescribed water audits or the provisions of these criteria.

7. Groundwater Water Specifications
   a. Sites using groundwater irrigation water from wells are not exempted from the Maximum Applied Water Allowance (MAWA), prescribed water audits, or the provisions of these criteria.

8. Golf Course Criteria
   a. For all new golf courses and additions or renovations to existing golf courses, the area of irrigated turf used for tees, fairways, greens and practice areas shall be limited. The total turf area of the golf course shall be limited to a maximum of four (4) irrigated

acres average per golf hole. Practice areas such as driving ranges and short game areas shall not exceed ten (10) acres of turf. The golf course design shall reflect the natural topography and drainage ways of the site, minimize the clearing of vegetation and be flexible and water efficient in design.

b. All non-turf areas such as ponds, lakes, artificial water courses, bunkers and irrigated landscapes within the golf course project area must not exceed the Maximum Applied Water Allowance (MAWA) calculations set forth within these criteria.

4.4 Other Provisions

A. Required Certifications

1. Effective November 1, 2016, as a prerequisite to the issuance or renewal of a business license for any entity providing landscape installation, maintenance, design professionals, and their suppliers within the City of Indio, the applicant shall present proof that at least one employee has, within the twelve months immediately preceding the application, completed a minimum four-hour course developed by the Coachella Valley Association of Governments, the South Coast Air Quality Management District, the Coachella Valley Water District, and local stakeholders, on grass over-seeding alternatives to traditional scalping and landscaping water efficiency.

2. **Landscape Audit, Irrigation Survey, and Irrigation Water Use Analysis for New Construction and Renovated Landscapes**

1. This section shall apply to new construction and renovated landscape projects installed after January 20, 2016.
2. All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.
3. The project applicant shall submit an irrigation audit report with the Certificate of Completion to the IWA Engineering Department that may include, but not be 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, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming;
4. The IWA will 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 (MAWA).
5. The owner of the landscaped area shall bear the cost of the audit.

3. **Irrigation Audit, Irrigation Survey and Irrigation Water Use Analysis for Existing Landscapes**

1. This section shall apply to all existing landscapes that were installed before January 1, 2010 and are over one (1) acre in size.
2. The IWA will administer programs that may include, but not be limited to, irrigation water analysis, irrigation surveys and irrigation audits that verify landscape water use does not exceed the Maximum Applied Water Allowance (MAWA) for existing landscapes. The Maximum Applied Water Allowance (MAWA) for existing landscapes shall be calculated as: MAWA = (.70) (ETo) (LA) (.62/748) unless landscape plans were submitted and approved under a more water conserving ordinance.

4. **Water Waste Prevention**

1. Water Waste Prevention. Water waste resulting from inefficient landscape irrigation including run-off, low-head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures is prohibited. All broken heads and pipes must be repaired within 72 hours of notification. Penalties for violation of these prohibitions are established in Section 54.063(H) of the Indio Municipal Code.
2. Water service to customers who cause water waste may have their service discontinued.
3. Customers who appear to be exceeding the Maximum Applied Water Allowance (MAWA) may be interviewed by the IWA Water Management Department to verify customer water usage to ensure compliance.

5. **Soil Management Report**

1. In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant or designee as follows;
   a. Submit soil samples to a laboratory for analysis and recommendation.
   b. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plans.
   c. The soil analysis may include:
      i. Determination of soil texture, indicating the available water holding capacity.
      ii. An approximate soil infiltration rate (either) measured or derived from soil texture/infiltration rate tables. A range of infiltration rates shall be noted where appropriate.
      iii. Measure of pH, total soluble salts and percent organize matter.
   d. The project applicant or designee shall comply with one of the following:
      i. If significant mass grading is not planned, the soil analysis report shall be submitted to the IWA Engineering Department as part of Worksheet A ; or
      ii. If significant mass grading is planned, the soil analysis report shall be submitted to the IWA Engineering Department as part of Worksheet E.

e. The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and the irrigation plans to make any necessary adjustments to the design plans.
f. The project applicant or designee shall submit documentation verifying implementation of soil analysis report recommendations to the IWA Engineering Department with Worksheet E.

6. **Developer-Provided Documentation**

1. The developer/applicant/designee shall provide an approved copy of Worksheet A and the following information for the homeowner or irrigation system operator. The package/information shall include a set of drawings, a recommended monthly irrigation schedule, and a recommended irrigation system maintenance schedule as described in Section 6.4F.
2. Irrigation Schedules. For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water to maintain plant health. Irrigation schedules shall meet the following criteria:
   a. An annual irrigation program with monthly irrigation schedules shall be required for the plant establishment period, for the established landscape, and for any temporarily irrigated areas. The irrigation schedule shall:
      i. Include run time (in minutes per cycle), suggested number of cycles per day, and frequency of irrigation for each station.
      ii. Provide the amount of applied water (in hundred cubic feet) recommended on a monthly and annual basis.
      iii. Whenever possible, incorporate the use of evapotranspiration data, such as those from the California Irrigation Management Information System (CIMIS) weather stations, to apply the appropriate levels of water for different climates.
      iv. Whenever possible, be scheduled between 8:00 p.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature. Compliance with provisions of the City's and IWA's water conservation programs regulating irrigation schedules shall be required.

7. **Maintenance Schedules**

A regular maintenance schedule satisfying the following conditions shall be submitted as part of Worksheet A:

1. Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule shall include but not be limited to checking, adjusting, cleaning and repairing equipment; resetting the automatic controller, aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; and weeding in all landscaped areas.

2. Repair of irrigation equipment shall be done with the originally specified materials or their approved equal.
3. A project applicant is encouraged to implement sustainable or environmentally-friendly practices for the overall landscape maintenance.

8. **Certificate of Completion**

1. Worksheet E – Certificate of Completion shall include the following:
   a. Submittal and Approval Dates of Worksheet A and Submittal Date of Worksheet B
   b. Project Name
   c. Project Address and Location
   d. Applicant Name, Telephone and Mailing Address
   e. Property Owners 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 Worksheet A.
3. Irrigation scheduling parameters used to set the controller. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes.
4. Landscape and irrigation maintenance schedule.
5. Irrigation audit report.
6. Soil analysis report and documentation verifying implementation of soil report recommendations.
7. The project applicant shall:
   a. Submit the signed Worksheet E to the IWA Engineering Department for review and approval.
   b. Ensure that copies of Worksheet E with all approvals are submitted to the IWA Engineering Department, and property owner or his or her designee.
8. The IWA Engineering Department shall:
   a. Receive the signed Worksheet E from the project applicant.
   b. Approve or deny Worksheet E. If Worksheet E is denied, IWA Engineering shall provide information to the project applicant regarding reapplication, appeal or other assistance.

9. **Stormwater Management**

1. 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.

2. Project applicants shall refer to the IWA Engineering Department and/or Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.
3. Rain gardens and other landscape features that increase rain water capture and infiltration are recommended.

10. **Public Education**

1. Public 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.
2. The IWA shall provide information to residents regarding the design, installation, management and maintenance of water efficient landscapes.