21 NCAC 23 .0101 is amended as published in 31:01 NCR 14 as follows:

CHAPTER 23 – IRRIGATION CONTRACTORS' LICENSING BOARD

SECTION .0100 – LICENSING

21 NCAC 23 .0101 ~~DIRECT SUPERVISION~~ DEFINITIONS

As used in [~~G.S. 89G and~~] this Chapter:

(1) ~~As used in G.S. 89G-2,~~ "Direct supervision" ~~is defined as~~ means an individual licensed contractor having personal responsibility for and control over all aspects of irrigation work done at each job site.

(2) "Irrigation plan" means a [~~graphic representation of the irrigation system to be installed and other constructed features.~~] drawing of the irrigation system to be installed, the physical features on the land, and the bounding area.

(3) "Irrigation record drawing" means a [~~graphic representation of the irrigation system that was installed and other constructed features.~~] drawing of the irrigation system that was installed, the physical features on the land, and the bounding area.

(4) "Large community water system" [~~means a public water system that regularly serves 1,000 or more service connections or 3,000 or more individuals.~~] is defined in G.S. 143-350.

(5) "Local Government" [~~means a county, city, consolidated city-county, sanitary district, or other local political subdivision or authority or agency.~~] shall have the same meaning as "Unit of local government" as defined in G.S. 143-350.

(6) Microirrigation system means a system that uses either drip emitters or microsprays as application devices.

~~[(6)]~~(7) "Product information" means the [~~manufacturer~~] manufacturer's specifications, model, and size.

History Note: *Authority G.S. 89G-2; 89G-5;[~~140-350;~~]143-350;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0102 is amended as published in 31:01 NCR 14 as follows:

21 NCAC 23 .0102 SURETY BONDS AND LEGAL STATUS

(a) For purposes of this Section a corporate entity is a person as defined in G.S. 89G-1(5) who engages in irrigation contracting, other than natural persons. A natural person licensed by the Board shall post a surety bond or irrevocable letter of credit for his or her individual license listing his or her name and the name of any corporation, partnership, limited liability corporation, limited liability ~~partnership~~ partnership, or assumed or registered business name under which he or she does business.

(b) If any licensed individual employed by a corporate entity does irrigation contracting on his or her own behalf, outside the scope of his or her employment, ~~agency~~ agency, or other relationship with the corporate entity named on the surety bond or irrevocable letter of credit submitted to the Board, that individual licensee must obtain and post a separate surety bond or irrevocable letter of credit with the Board, naming himself or herself as principal.

(c) When a licensed individual terminates his or her relationship (e.g. employment, partnership, or agency) with a corporate entity that lists the individual on a surety bond or irrevocable letter of credit, the licensed individual ~~must~~ shall purchase and post his or her own surety bond or irrevocable letter of credit with the Board. The licensed individual shall report the termination to the Board within five business days of its effective date.

(d) If a licensed individual uses a corporate entity to engage in irrigation contracting and is required to file any corporate documents with the North Carolina Secretary of State pursuant to North Carolina law or rules, the individual licensee who qualifies said corporate entity to engage in irrigation contracting shall notify the Board of having filed corporate documents by providing the Board with copies of the same within five business days of the filing date. In lieu of submitting paper copies of such filings, the individual licensee may submit an e-mail to the Board's administrator including a link to the filed corporate documents on the North Carolina Secretary of State's website within 24 hours of those documents being available on said website.

(e) If a corporate entity's ownership changes or the right to control the corporate entity passes from one person or group to another person, ~~group~~ group, or receiver, the individual licensee who qualifies that corporate entity to engage in irrigation contracting shall notify the Board within five business days of the date when the change in the right of control ~~has become~~ becomes effective. Such changes include the addition of or termination of partnerships, changes in corporate form such as from corporation to limited liability company, sale or transfer of a controlling interest in the corporate entity, merger of the corporate entity with another person, or dissolution of the person's corporate or other legal status.

(f) An individual licensee who qualifies a corporate entity to engage in irrigation contracting shall notify the Board in a timely fashion of the beginning of any of the following legal actions in which the corporate entity, as the petitioner or respondent:

(1) has been named a respondent under an action for legal dissolution by the North Carolina Department of Justice or by a partner, ~~shareholder~~ shareholder, or such other person ~~as~~ that may have the right or authority to bring such action;

(2) has been notified of its administrative dissolution by the North Carolina Secretary of State; or

(3) has been notified of the initiation of any legal proceeding ~~as~~ that may affect its corporate form, ~~ownership or right~~ ownership, right of ~~control~~ control, or otherwise affect its status or ability to comply with G.S. 89G and the Board's rules.

Notice to the Board ~~is~~ shall be timely if the Board receives written notice or e-mail of such action within 10 business days of the receipt of notice or service of legal process by the individual licensee or the registered agent of the corporate entity.

(g) Any individual licensee ~~who~~ whose license has been suspended solely due to cancellation of his or her surety bond or irrevocable letter of credit may apply for reinstatement upon providing the following to the Board:

(1) ~~A~~ a valid surety bond or irrevocable letter of credit naming him or her as principal;

(2) ~~An~~ an affidavit affirming that the suspended licensee has otherwise complied with all obligations of a licensee under G.S. ~~89C,~~ 89G and has refrained from practicing irrigation construction or contracting except as may be subject to a statutory exemption;

(3) ~~Proof~~ proof of compliance with the licensee's continuing education requirements for each calendar year in which the suspension has been in force; and

(4) ~~A~~ a ~~license application fee of one hundred dollars ($100.00).~~ reinstatement fee.

History Note: *Authority G.S. 89G-5; 89G-6; 89G-10;*
Eff. August 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0104 is amended as published in 31:01 NCR 15 as follows:

21 NCAC 23 .0104 CONTINUING EDUCATION

(a) Continuing Education (CEU) credit shall not be obtained for the same course more frequently than once every three years.

(b) Each individual licensee must earn ten hours of approved continuing education each calendar year. The 10 hours shall include ~~at least two but not more than~~ four hours of business education. The remaining six hours of continuing education shall consist of training in landscape and turf irrigation technology.

(c) A licensed contractor shall provide proof of attendance for all continuing education upon request by the Board.

(d) Only continuing education classes or activities that have been approved by the Board as providing adequate education regarding the requirements of this Chapter shall satisfy the licensee's continuing education requirement.

History Note: *Authority G.S. 89G-5; 89G-9;*
Eff. July 1, 2011;
Readopted Eff. January 1, 2016;
Amended Eff. November 1, 2016.

21 NCAC 23 .0208 is adopted as published in 31:01 NCR 15 as follows:

SECTION .0200 – COMPLAINT PROCESS AND HEARING RULES OF THE NORTH CAROLINA IRRIGATION CONTRACTORS LICENSING BOARD

21 NCAC 23 .0208 COMPLAINT PROCESS

(a) Upon receipt of a complaint alleging misconduct or unlicensed practice that might subject a licensee or other person to ~~discipline,~~ discipline or upon notice of such otherwise coming to the Board's attention through investigatory means, the Board's Investigative Committee shall determine whether further investigation is necessary to resolve the complaint. ~~may investigate such matter to determine whether probable cause exists to believe a violation occurred.~~ If the Investigative Committee determines an investigation is necessary, the ~~The~~ Board shall send a notice of complaint to the respondent.

(b) The complainant shall submit the complaint form online through the Board's website (http://www.nciclb.org) or by printing the form from the Board's website and mailing it to the Board ~~office.~~ office at P.O. Box 41421 Raleigh, N.C. 27629. The following information shall be included in the complaint form:

(1) date of complaint;

(2) complainant name;

(3) complainant mailing address;

(4) complainant contact number;

(5) alleged violator name;

(6) location of violation site, including city;

(7) date alleged violation was noted;

(8) how complainant became aware of alleged violation;

(9) detailed description of the work being performed; and

(10) statement that the information provided by the complainant is true and accurate to the best of his or her knowledge.

(c) The Board shall not respond to or investigate anonymous complaints or inquiries.

(d) The Board shall administratively close any complaint that:

(1) is anonymously submitted;

(2) is withdrawn by the complainant at any stage of the investigation; or

(3) is submitted more than 2 years after the irrigation system was completed.

~~(e) The Investigative Committee may:~~

~~(1) be assisted by any attorney retained by the Board;~~

~~(2) hire an investigator or such persons as it deems necessary to determine whether probable cause exists to believe a violation occurred;~~

~~(3) subpoena persons to provide the Committee with sworn testimony or documents, provided that the subpoena is signed by the President or Secretary-Treasurer of the Board;~~

~~(4) make inquiries designed to assist the Committee in its review of matters under investigation; or~~

~~initiate charges against a licensee or other persons if violations are suggested by the evidence considered by the Committee during an investigation of a complaint.~~

~~(f)~~ (e) After ~~a preliminary review of a complaint,~~ reviewing the investigation into the complaint, the Investigative Committee shall:

(1) ~~Find~~ find that there is probable cause to believe a violation ~~occurred,~~ occurred and send the respondent a notice of violation; or

(2) ~~Find~~ find that there is no probable cause to believe a violation ~~occurred,~~ occurred and send the respondent and complainant notification of the same.

~~(g) The Investigative Committee, by and through the Board's legal counsel, may undertake negotiations with the respondent to settle the matter without a hearing when such settlement accomplishes the Board's duty to protect the consuming public. The settlement agreement shall not be final until and unless the Board votes to approve the agreement.~~

~~(h)~~ (f) ~~If a settlement agreement is reached,~~ If a complaint is resolved through a settlement agreement, the Investigative Committee shall present the proposed settlement agreement to the Board, but shall not identify the parties to the ~~complaint~~ settlement to the full Board except by descriptive titles, such as licensee or other persons. The Board shall either vote to approve the settlement agreement or vote to reject the settlement agreement. If the Board approves the settlement agreement, the Board shall notify the respondent and complainant and shall close the case upon satisfaction of all terms in the settlement agreement.

~~(i)~~ (g) If a settlement agreement is not reached or if the Board votes to reject a proposed settlement agreement, the Board shall serve the respondent with a notice of hearing and shall conduct a hearing in accordance with the rules of this Section and as required by G.S. 150B, Article 3A.

History Note: *Authority G.S. 89G-5; 150B;*
Eff. November 1, 2016.

21 NCAC 23 .0301 is amended as published in 31:01 NCR 16 as follows:

SECTION .0300 - IRRIGATION RECORD DRAWING MINIMUM STANDARDS

21 NCAC 23 .0301 IRRIGATION RECORD DRAWING

(a) ~~As required in Rule .0511 of this Chapter a record drawing is a graphic representation of the irrigation system that was installed and other constructed features~~. All irrigation record drawings shall:

(1) ~~accurately portray the site; and~~ be drawn to [~~accurately~~] portray the site;

(2) be legible and ~~reproducible.~~ reproducible;

(3) include the [~~site information of all~~] surrounding development (e.g. building edges, walks, walls, roads), irrigated areas, turf areas, and planted areas; and

(4) show the [~~sprinkler system and/or drip micro irrigation system~~] sprinkler system, microirrigation system, or both as installed and include the location of:

(a) emergency shut-off valve(s);

(b) water source(s);

(c) backflow devices;

(d) all types of valves;

(e) all wire splices;

(f) all wire paths;

(g) controllers;

(h) all sensors;

(i) all grounding location(s) and type(s);

(j) all pumps;

(k) all filters;

(l) all quick couplers or any other water connection points; and

(n) all main line piping.

~~(b) Site information shall include all development (e.g. building edges, walks, walls, roads), irrigated areas, turf areas, and planted areas. The drawings shall show the sprinkler system as it is installed.~~

~~(c) The record drawings shall include locations and product information regarding the location of:~~

~~(1) emergency shut-off valve(s);~~

~~(2) water source(s);~~

~~(3) backflow devices;~~

~~(4) all types of valves;~~

~~(5) all wire splices;~~

~~(6) all wire paths;~~

~~(7) all controllers;~~

~~(8) all sensors;~~

~~(9) all grounding location(s) and type(s);~~

~~(10) all pumps;~~

~~(11) all filters;~~

~~(12) all quick couplers or any other water connection points; and~~

~~(13) all main line piping.~~

~~(d)~~ (b) All manual and automatic valve locations shall be shown with ~~actual measurements~~ distances to permanent reference points so that they may be located in the field. ~~Proper~~ ~~permanent~~ Permanent reference points are buildings, drainage inlets, sidewalks, curbs, light poles, and other permanent, immovable objects.

~~(e)~~ (c) The irrigation record drawings ~~Record drawings~~ shall be labeled "Record Drawings".

History Note: *Authority G.S. 89G-5(15);*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0401 is amended as published in 31:01 NCR 17 as follows:

SECTION .0400 - IRRIGATION DESIGN MINIMUM STANDARDS

21 NCAC 23 .0401 SYSTEM DESIGN OBJECTIVES AND REQUIREMENTS

(a) An irrigation contractor shall design an irrigation system ~~shall be designed to~~ so that it uniformly ~~distribute~~ distributes water.

(b) ~~An irrigation contractor shall prepare a system design considering the following criteria:~~ When designing an irrigation system, an irrigation contractor shall consider the following criteria:

(1) the soil type;

(2) the slope;

(3) the plant root depth;

(4) ~~differing plant material [water] requirements;~~ the water requirements of different plants;

(5) microclimates;

(6) weather conditions;

(7) the quantity, ~~quality~~ quality, and delivery pressure of the water source; and

(8) ~~any issues relating to~~ the long-term management of the system and the landscape it serves.

(c) ~~To conserve and protect water resources,~~ When designing an irrigation system, an irrigation ~~system~~ contractor shall select equipment components and installation techniques that meet state and local code requirements and site requirements.

~~(d) The irrigation system shall be designed to provide uniform distribution of water.~~

~~(e)~~ (d) When designing an irrigation system, an irrigation contractor shall ~~[do the below]~~ to ~~To~~ ensure that the irrigation system is designed to uniformly distribute the water, ~~to~~ conserve and protect water resources, and ~~to~~ function well as a component of the overall [~~landscape:~~] landscape by doing the following: ~~landscape, the irrigation system contractor shall:~~

(1) ~~Obtain~~ obtaining direct knowledge of site conditions by visiting it. Viewing and relying solely on plot plans to generate a design is not adequate preparation for designing an irrigation system.

(2) ~~Produce~~ producing a design that meets all applicable state and local codes, including plumbing and electrical codes.

(3) ~~When~~ when allowable by law, ~~specify~~ specifying in the plan the manufacturer, model, type, and size of all components to eliminate ambiguity during construction and to facilitate management of the system.

(4) ~~Select~~ selecting pipe, electrical ~~wire~~ wire, and other materials based on design parameters, environmental conditions, code requirements, and long-term management requirements of the system.

(5) ~~Design~~ designing the irrigation system to minimize installation and maintenance difficulties.

(6) ~~Select~~ selecting and ~~place~~ placing shrubs, trees, and groundcover sprinkler and ~~drip/micro-irrigation~~ microirrigation components according to the expected size of larger specimen plants through a minimum three-year establishment period for shrubs and ~~10 years~~ 10-year establishment period for trees.

History Note: *Authority G.S. 89G-5;*
Eff. August 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0402 is amended as published in 31:01 NCR 17 as follows:

21 NCAC 23 .0402 PIPING

(a) The following rules of maximum safe flow rate apply to irrigation systems connected to municipal and community water suppliers, with the lowest safe flow rate prevailing as the design minimum standard:

(1) The maximum allowable pressure loss through the meter shall be less than 10 percent of the static pressure at the meter.

(2) The maximum flow rate through the meter shall not exceed 75 percent of the maximum safe flow rate through the meter.

(3) Piping in irrigation systems shall be designed and installed so that the flow of water in the pipe will not exceed a velocity of five feet per second for polyvinyl chloride (PVC), polyethylene ~~(PE)~~ (PE), and high density polyethylene (HDPE) pipe and seven feet per second for metal pipe.

(b) When designing an irrigation system, an ~~An~~ irrigation contractor shall ~~follow~~ use the following criteria for piping:

(1) The manufacturer's recommendations for ~~all pipe usage and fabrication shall be followed.~~ the intended application.

(2) The minimum PVC pipe thickness shall be PR200 — (SDR21) with sch40 fittings.

(3) PVC piping from the above-grade backflow to below grade shall be a minimum of sch80.

(4) All PVC risers shall be a minimum thickness of sch80.

(5) Thrust blocking details and locations shall be included when bell and gasket pipe is used.

(6) Exposed PVC piping shall be protected from UV degradation per the manufacturer's recommendations.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0404 is amended as published in 31:01 NCR 17 as follows:

21 NCAC 23 .0404 WATER PRESSURE

(a) For systems on a municipal or community water supply, an irrigation contractor shall provide allowances in the design for a reduction in static pressure of up to 10 pounds per square inch (psi) to accommodate possible ~~expansion~~ loss of pressure in the supply network.

(b) Where variable or excessive static pressure exists, an irrigation contractor shall specify pressure regulation.

(c) ~~At the maximum design flow rate of the system an irrigation contractor shall specify the recommended operating pressure for the irrigation system.~~ An irrigation contractor shall specify the recommended minimum [~~operation~~] operational pressure for the irrigation system at the maximum design flow rate.

History Note: *Authority G.S. 89G-5;*
Eff. August 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0405 is amended as published in 31:01 NCR 18 as follows:

21 NCAC 23 .0405 ~~DRIP/MICROIRRIGATION~~ MICROIRRIGATION

For zones with ~~drip or~~ microirrigation, when designing an irrigation system, an irrigation contractor shall:

(1) provide [~~Provide~~] a means of filtration at the master ~~control~~ valve to remove particulate matter;

(2) ~~Use~~ use separate ~~drip/microirrigation~~ microirrigation zones where differing plant water requirements and root zone depths make such zones practical;

(3) ~~To improve overall uniformity~~ specify [~~Specify~~] pressure-~~compensated~~ compensating ~~devices;~~ devices to improve overall uniformity;

(4) ~~Specify~~ specify pressure regulation upstream from the drip/microirrigation components to anticipate periodic increases in the pressure of municipal or community water sources when there is flushing or other maintenance on the water supply system. Pressure regulating devices may be omitted only when the maximum possible pressure is known to be lower than the maximum allowable pressure for all drip/microirrigation components; and

~~(5) To improve system uniformity connect (loop) the ends of individual laterals; and~~

~~(6)~~ (5) ~~To minimize ingestion of soil and other contaminants into the emitters,~~ use [~~Use~~] air release valves to minimize ingestion of soil and other contaminants into the emitters.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0406 is amended as published in 31:01 NCR 18 as follows:

21 NCAC 23 .0406 COMPONENTS AND ZONE DESIGN

When designing an irrigation system, an irrigation contractor shall:

(1) ~~(a) An irrigation contractor shall design~~ Design the layout of heads and other emission devices to reduce evaporation loss, reduce surface run-off, and limit overspray across or onto a street, public driveway or sidewalk, parking area, building, fence, or adjoining property.

~~(b) When changes are required an irrigation contractor shall specify in the plan notes that any required equipment shall meet or exceed the design standards of the system.~~

(2) ~~(c) An irrigation contractor shall design~~ Design sprinkler head spacing with an approximate "head-to-head" coverage. ~~coverage, unless the coverage is designed for wind derating. Wind derating shall be based on wind criteria for the time period that the system is normally operated.~~

(3) ~~(d) An irrigation contractor shall use~~ Use separate stations or zones ~~(hydrozones)~~ for areas with dissimilar environmental conditions or dissimilar water or scheduling requirements (hydrozones). These conditions or requirements include sun exposure, plant type, soil type, varying wind conditions, grades, and dimensional issues. When not practicable due to accessibility, dimensional ~~issues~~ issues, or other constraints, practical modifications to this standard may be acceptable.

(4) ~~(e) An irrigation contractor shall, when~~ When selecting system components:

(a) ~~(1)~~ ~~Select~~ select components to avoid surface runoff;

(b) ~~(2)~~ ~~Select~~ select components to keep the sprinkler precipitation rate below the infiltration rate of the soil;

(c) ~~(3)~~ ~~Specify~~ specify the use of repeat cycles to allow the water to soak into the root zone; and

(d) ~~(4)~~ ~~Specify~~ specify stations or zones for sprinklers at the top and toe of sloped areas.

(5) ~~(f) An irrigation contractor shall locate~~ Place sprinkler heads based on an evaluation of physical, environmental, and hydraulic site conditions, including typical wind conditions during the normal irrigation period.

(6) ~~(g) An irrigation contractor shall divide the irrigation systems into zones consistent with the types of sprinkler heads and nozzles being used in order to achieve an approximate matched precipitation rate~~. Select sprinkler heads and nozzles to achieve an approximate matched precipitation rate within each zone.

(7) ~~(h) An irrigation contractor shall utilize water conserving equipment as follows:~~ Plan to use the following water conserving equipment:

(a) ~~(1)~~ ~~Check~~ check valves to minimize low-head drainage when grades exceed five percent;

(b) ~~(2)~~ ~~Pressure~~ pressure regulators or pressure compensating devices when pressures exceed manufacturer's recommendations;

(c) ~~(3)~~ ~~Rain~~ rain sensors to suspend irrigation during rain or other forms of precipitation;

(d) ~~(4)~~ ~~A~~ a controller that has multi-program capability with at least four start times (for multiple repeat soak cycles) and run time adjustments in one-minute increments; ~~and~~

(e) ~~(5)~~ ~~Low-trajectory~~ low-trajectory sprinkler nozzles and modified head spacings to mitigate the effects of ~~wind.~~ wind; and

(f) ~~(6)~~ [~~Components~~] components that do not mist when manufacturer's pressure specifications are met.

~~(i) An irrigation contractor shall select components that do not mist when manufacturer's pressure specifications are met.~~

~~(j) An irrigation contractor shall design~~ ~~irrigation systems with control wire splices made with a waterproof wire splice kit that is UL listed for underground applications~~. ~~The design shall specify the manufacturer's recommended splice kits for two-wire control systems.~~

(8) ~~(k) An irrigation contractor shall offset turf grass sprinklers from pavement edges a minimum of two inches to allow for edging of the turf.~~ Offset turf grass sprinklers a minimum of two inches from pavement edges to allow for edging of the turf.

(9) ~~(l) An irrigation contractor shall offset~~ Offset sprinklers from vertical walls to limit spray on the walls.

(10) ~~(m) An irrigation contractor shall locate~~ Ensure that valves are located [~~in such a way~~] so as ~~valves~~ to allow reasonable access for maintenance or service.

(11) ~~(n) An irrigation contractor shall protect~~ Ensure that the roots of existing trees are protected by:

(a) ~~(1)~~ Planning pipe system layout to limit its effect on existing trees and other planting.

(b) ~~(2)~~ When necessary to trench into the root zone of an established plant in order to provide irrigation within the root zone:

(i) ~~(a)~~ planning to dig ~~digging~~ the trench ~~in such a way as~~ so as to minimize the effect on the roots (for example, by digging the trench in a straight line towards the base of the tree or shrub such that, if the line of the trench were extended, it would intersect with the base of the tree or shrub); or

(ii) ~~(b)~~ planning to use ~~using~~ direct boring or hand-trenching. An irrigation contractor shall use ~~hand-trenching~~ hand-trenching techniques that dig a trench without damaging roots having a diameter of one-half inch or more.

(c) ~~(3)~~ In the event of trenching, maintaining a distance of one foot from the tree trunk for every inch of tree diameter at a height of four feet six inches above the ground. For example, piping shall be kept at least 20 feet away from the trunk of a tree having a 20 inch diameter at four feet six inches above the ground.

(d) ~~(4)~~ In the event of boring, maintaining a distance of at least one-half foot from the tree trunk for each inch of tree diameter at a height of four feet six inches above the ground and, in any event, maintaining a distance of at least five feet from the tree trunk. When direct boring, an irrigation contractor shall bore to a minimum of 36 inches.

(e) ~~(5)~~ Avoiding placing sprinklers in a position to directly spray water on tree trunks of mature trees by placing them no closer to a tree than one-third of the sprinkler spray radius.

~~(o) An irrigation contractor shall use the appropriate size American Wire Gauge ("AWG") wire, as noted by the manufacturer, to operate a valve.~~

(12) ~~(p) An irrigation contractor shall:~~ With respect to wiring:

(a) ~~(1)~~ ~~Install~~ install control wires in the same trench along the side of the main line piping;

(b) ~~(2)~~ ~~Allow~~ allow slack in the wiring; ~~and~~

(c) ~~(3)~~ ~~Bundle~~ bundle an expansion coil for all wires at each valve ~~location.~~ location;

(d) [~~Use~~] use the appropriate size American Wire Gauge ("AWG") wire, as noted by the manufacturer, to operate a valve;

(e) [~~Indicate~~] indicate common wiring (wire that runs through the entire circuit of valves) by using a different colored wire from all other wire connections;

(f) [~~Provide~~] provide additional wire along the irrigation wire path for future expansion or replacement of damaged wires;

(g) [~~Design~~] design irrigation systems with control wire splices made with a waterproof wire splice kit that is UL listed for underground applications. For two-wire control systems, the design shall specify the manufacturer's recommended splice kits; and

(h) [~~Follow~~] follow the manufacturer's recommendation for all wiring and grounding, including two-wire control systems.

~~(q) An irrigation contractor shall indicate common wiring (wire that runs through the entire circuit of valves) by using a different colored wire from all other wire connections.~~

~~(r) An irrigation contractor shall provide additional wire along the irrigation wire path for future expansion or replacement of damaged wires.~~

(13) ~~(s) An irrigation contractor shall use~~ Use valve boxes that are large enough to provide sufficient space for servicing the valve housed inside. For single valve boxes, valve ~~Valve~~ boxes shall be at least 10 inches in diameter for both manual and automatic valves.

~~(t) An irrigation contractor shall follow the manufacturer's recommendation for all wiring and grounding, including two-wire control systems.~~

History Note: *Authority G.S. 89G-5;*
Eff. August 1, 2011;
Readopted Eff. January 1, 2016;
Amended Eff. November 1, 2016.

21 NCAC 23 .0501 is amended as published in 31:01 NCR 20 as follows:

SECTION .0500 - IRRIGATION SYSTEM INSTALLATION MINIMUM STANDARDS

21 NCAC 23 .0501 GENERAL REQUIREMENTS

(a) When an irrigation contractor determines that ~~the~~ a design provided by others does not meet the minimum standards set forth by the rules of this Chapter or local requirements, the irrigation contractor shall notify the designer in writing of such ~~deficiencies.~~ [~~minimum standard~~] violations of minimum standards and shall not complete the job until all such minimum standards are met.

(b) All irrigation system components shall be installed in accordance with manufacturer's specifications, local code ~~requirements~~ requirements, and the requirements of the rules of this Section.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0502 is amended as published in 31:01 NCR 20 as follows:

21 NCAC 23 .0502 SITE CONSIDERATIONS

(a) An irrigation contractor shall confirm all property corners and lines that will determine the borders of landscaped or irrigated ~~areas~~ areas, including any ~~Right of Way~~ right of way (local, state or federal).

(b) The irrigation contractor shall ~~address and note~~ comply with the terms of any encroachment agreements and other easement requirements.

(c) Before the irrigation contractor and those working under his or her supervision do any excavation he or she shall call 1-800-632-4949 or 811 or go to www.ncocc.orq to have major utilities located on the subject property by the appropriate utility companies. Installation shall not be started until all underground utilities are located and marked.

(d) An irrigation contractor shall review the site where the irrigation system is to be installed with the owner to identify private underground lines or structures and locate those that present a potential problem before digging (~~i.e.~~ e.g. ~~Low~~ low voltage lighting wires, propane gas tanks and lines, private power lines to ~~out buildings~~ out-buildings, and drainage lines, septic field ~~lines~~ lines, and tanks).

(e) In the case of new landscape construction where a landscape plan is provided, an irrigation contractor shall verify that the landscape plan is the most current plan available and is not subject to change before starting the installation.

(f) If no landscape plan exists or the landscaping is in place, an irrigation contractor shall review the site with the owner or landscape designer to determine ~~what~~ the irrigation needs of the site ~~are~~. The irrigation contractor shall address specific issues, including:

(1) the plant water needs;

(2) the soil type;

(3) the root depth;

(4) microclimates; and

(5) ~~grades.~~ slopes.

(g) An irrigation contractor shall inform the owner or landscape designer of the importance of designing the irrigation system to meet the needs of the landscape.

(h) An irrigation contractor shall review planting plans prior to installation of the irrigation system to minimize conflicts between larger plants, existing root ~~zones~~ zones, and irrigation heads and review construction plans for conflicts between hardscape and sprinkler head placement.

(i) An irrigation contractor shall inform the property owner and irrigation designer of unusual or abnormal soil conditions which may ~~impact~~ affect the design and management of the irrigation system.

(j) Where deviations from the design are required (e.g., routing pipe around a tree or other structure or adding sprinklers to an area larger than the plan shows), an irrigation contractor shall consult with the designer prior to making the change to ensure that the change is within the design performance specifications.

History Note: Authority G.S. 89G-5;

Eff. July 1, 2011;

Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;

Amended Eff. November 1, 2016.

21 NCAC 23 .0503 is amended as published in 31:01 NCR 20 as follows:

21 NCAC 23 .0503 WATER SUPPLY

(a) Before commencing installation, an irrigation contractor shall verify that the point of connection, water supply, flow ~~rate~~ rate, and static and dynamic pressures meet design criteria.

(b) All new irrigation systems that have a pressurized water supply under continuous pressure must include an isolation valve. The isolation valve's location must be in the main line before the first zone valve or quick coupler.

(c) On all new installations, if ~~If~~ a master valve is used, it shall be installed on the discharge side of the backflow prevention device ~~on all new installations~~.

(d) If the water supply is potable water, an irrigation contractor shall verify that a backflow prevention device is installed upstream of the irrigation system before pressurizing the irrigation mainline.

(e) For local government water systems and large community water systems, an irrigation contractor shall, when required by local code, install a separate meter for new in-ground systems on lots platted and recorded after July 1, 2009, in the office of the register of deeds in the county or counties in which the real property is located [~~after July 1, 2009~~].

History Note: *Authority G.S. 89G-5;G.S. 143-355.4;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0504 is amended as published in 31:01 NCR 20 as follows:

21 NCAC 23 .0504 SYSTEM LAYOUT

(a) An irrigation contractor shall install the irrigation system's components according to the design specifications and manufacturer's performance standards.

(b) ~~The spacing of microirrigation devices shall be selected~~ [~~The microirrigation~~] Microirrigation devices shall be installed at a spacing to meet the maximum irrigation requirements of the plants being irrigated. The flow rate of the microirrigation devices, soil ~~types~~ types, and plant types must all be considered in selecting the spacing of the microirrigation devices.

(c) ~~The maximum spacing between sprinklers must not exceed the radius listed in the manufacturer's specifications.~~ [~~The sprinklers~~] Sprinklers shall be installed such that the spacing between sprinklers results in approximate "head-to-head" coverage, but in no event shall the spacing exceed the radius listed in the manufacturer's specifications. An irrigation contractor shall determine the radius by referring to the manufacturer's specifications for a sprinkler at a specific operating pressure.

~~(d) An irrigation contractor shall determine the radius by referring to the manufacturer's specifications for a sprinklers at a specific operating pressure.~~

~~(e)~~ (d) Irrigation systems shall be installed such that they do not spray water onto or over surfaces made of concrete, asphalt, brick, ~~wood~~ wood, or any other continuous impervious material, such as walls, fences, ~~sidewalks~~ sidewalks, and streets. The irrigation system as installed may spray water onto such surfaces due to irregularly-shaped hardscapes, wind ~~drift~~ drift, or fixed spray patterns of sprinklers.

~~(f) An irrigation contractor shall insure that no water is allowed to run off a site onto impervious surfaces where the water flows for a distance of more than 15 feet during any irrigation day or into a storm water inlet.~~

~~(g)~~ (e) Under sloping conditions, ~~All~~ an irrigation systems shall be installed with ~~use~~ check valves ~~and stronger springs~~ to hold ~~the~~ water in the piping system.

~~(h) When the irrigation contractor determines that water pressure at the head is too low to operate a sprinkler he shall correct this problem with a solution in accordance with Paragraph (a) of this Rule.~~

~~(i) An irrigation contractor shall provide an irrigation schedule to the property owner or his agent that limits the amount of water applied in any one given time period.~~

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0505 is amended as published in 31:01 NCR 21 as follows:

21 NCAC 23 .0505 TRENCHING AND PIPING

(a) All portions of an irrigation system that do not meet the standards in this Rule shall be noted on the record drawing.

(b) An irrigation contractor shall install an irrigation system ~~[such that] he protects [protects] the root systems of the trees on the site by not~~ without trenching across the established root systems of existing trees and shrubs.

(c) Notwithstanding the requirement in Paragraph (b) of this Rule, when the irrigation contractor finds that it is necessary to trench into the root zone of an established plant in order to provide adequate irrigation to the surrounding area ~~within the root zone~~, he shall dig the trench in such a way as to minimize the effect on the roots (for example, by digging the trench in a straight line towards the base of the tree or shrub such that, if the line of the trench were extended, it would intersect with the base of the tree or shrub).

(d) An irrigation contractor shall cut damaged roots cleanly at right angles.

(e) Piping in irrigation systems shall be ~~designed and installed~~ selected so that the flow velocity ~~of water in the pipe~~ will not exceed ~~a velocity of~~ five feet per second for polyvinyl chloride (PVC), polyethylene (PE), and high density polyethylene (HDPE) pipe and seven feet per second for metal pipe.

(f) The main line and lateral line piping shall be installed to provide a minimum of 12 inches between the top of the pipe and the ~~natural~~ finished grade. However, if a utility, man-made structure, or roots create an obstacle that makes the 12 inch depth coverage requirement impractical, the piping shall be installed at a minimum of 6 inches between the top of the pipe and the finished grade.

~~[(g) If a utility, man-made structure, or roots create an unavoidable obstacle that makes the 12 inch depth coverage requirement impractical, the piping shall be installed at a minimum of 6 inches between the top of the pipe and the finish grade.]~~

(g) [~~(h)~~] The bottom of the trench shall be smooth and level and provide a flat bed on which to rest the pipe.

(h) [~~(i)~~] The irrigation contractor shall clean backfill material of any debris that may damage the pipe.

~~(i) If a utility, man-made structure, or roots create an unavoidable obstacle that makes the 12 inch depth coverage requirement impractical, the piping shall be installed inside a larger section of pipe for added protection.~~

~~(j)~~ (i) When swing joints are used, the depth of the pipe shall allow the swing joint to operate as designed.

~~(k)~~ (j) All trenches and holes created during installation of an irrigation system shall be backfilled and compacted to the final grade. The trench shall be compacted in lifts no greater than six inches to insure proper compaction.

~~(l)~~ (k) All PVC connections installed in ~~new~~ irrigation systems ~~that are installed using PVC~~ shall be prepared according to the manufacturer's recommendations (e.g. priming and glue application). ~~prior to connection.~~

~~(m) When the irrigation contractor uses PR 200 pipe, the manufacturer's directions shall be followed.~~

~~(n)~~ [~~(m)~~] (l) The irrigation contractor shall use the manufacturer's approved lubricant when assembling ~~Bell and Gasket Pipe and Fittings.~~ bell and gasket and pipe and fittings.

~~(o)~~ [~~(n)~~] (m) The irrigation contractor shall use Teflon tape on all threaded fittings, wrapping the tape around the pipe three times to insure a proper seal.

~~(p)~~ [~~(o)~~] (n) When the irrigation system uses reclaimed water, the irrigation contractor shall use purple pipe or mark the pipe with purple tape placed above all piping in the system. Tape shall be within six inches of the top of the pipe. The irrigation contractor shall use purple valve box covers and purple quick coupler flaps and place an eight inch by eight inch sign with purple background stating "RECLAIMED WATER-DO NOT DRINK," and "AGUA DE RECUPERION-NO BEBER."

History Note: *Authority G.S. 89G-5(15); 89G-5(16);*
Eff. July 1, 2011;
Amended Eff. April 1, 2015;
Readopted Eff. January 1, 2016;
Amended Eff. November 1, 2016.

21 NCAC 23 .0506 is amended as published in 31:01 NCR 21 as follows:

21 NCAC 23 .0506 ELECTRICAL

(a) This Rule applies to irrigation control wiring ~~of thirty (30) volts or less, or~~ where the installation, construction, ~~maintenance~~ maintenance, or repair of devices is exempt from the requirement of licensure as an electrical contractor ~~under~~ pursuant to G.S. 87-43.1 and 21 NCAC 18B .0805.

(b) Underground electrical wiring used to connect an automatic controller to any electrical component of the irrigation system ~~must~~ shall be listed by Underwriters Laboratories (UL) as acceptable for burial underground.

(c) Electrical wiring that connects any electrical components of an irrigation system ~~must~~ shall be sized according to the manufacturer's recommendation.

(d) Electrical wire splices which are exposed to moisture ~~must~~ shall be waterproofed using a UL ~~Listed~~ listed device.

(e) Underground electrical wiring that connects an automatic controller to any electrical component of the irrigation system ~~must~~ shall be buried with a minimum of twelve inches of backfill.

(f) The wire connections on the ~~two-wire~~ two-wire path of two wire control systems shall be made using devices rated for the higher voltage of the control system.

(g) ~~Multi-strand wire may be used if the material exposed is of rated minimum wire size of 18 AWG for underground application and if the splicing device used water proofs the outer most casing of the wire.~~ An irrigation contractor may splice a multi-wire cable in underground applications when the wire is a minimum [~~size~~] of 18 AWG and when the splicing device [~~water proofs~~] waterproofs the outermost [~~outer most~~] casing of the wire.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0507 is amended as published in 31:01 NCR 21 as follows:

21 NCAC 23 .0507 GROUNDING

(a) This Rule applies to irrigation control wiring and components ~~of thirty (30) volts or less, or~~ where the installation, construction, ~~maintenance~~ maintenance, or repair of devices exempt from the requirement of licensure as an electrical contractor ~~under~~ pursuant to G.S. 87-43.1 and 21 NCAC 18B .0805.

(b) An irrigation contractor shall ground all components of the irrigation system ~~per~~ according to manufacturers' recommendations.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0508 is amended as published in 31:01 NCR 22 as follows:

21 NCAC 23 .0508 SPRINKLERS

(a) ~~Emission devices must be installed to operate at or above the minimum and not above the maximum sprinkler head pressure as published by the manufacturer for the nozzle and emission device spacing that is used.~~ An irrigation contractor shall select sprinklers such that the operating pressure at each sprinkler location is within the range published by the manufacturer of the sprinkler nozzles.

(b) Sprinklers shall be set perpendicular to the grade. In turf areas sprinklers shall be set at a height recommended by the manufacturer. Sprinklers installed on athletic fields shall be equipped with rubber covers on the sprinkler and the sprinklers shall be installed at or below the grade ~~per~~ according to the manufacturer's specifications.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0509 is amended as published in 31:01 NCR 22 as follows:

21 NCAC 23 .0509 CONTROLLER

All automatically controlled irrigation systems ~~must~~ shall include sensor or other technology designed to inhibit or interrupt operation of the irrigation system during periods of either adequate soil moisture or rainfall. Rain or moisture shutoff technology ~~must~~ shall be installed according to the manufacturer's published recommendations.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0510 is amended as published in 31:01 NCR 22 as follows:

21 NCAC 23 .0510 INITIAL SYSTEM START UP

(a) An irrigation contractor shall perform a post installation inspection to verify that the system ~~meets the design criteria including static water pressure at point of connection, working (dynamic) water pressure at sprinklers, head radius, head adjustment, that all sensors are operational and that there are no leaks in the system.~~ operates as designed by:

(1) flushing the system;

(2) checking the static water pressure at the point of connection;

(3) checking the operating pressure at the sprinklers;

(4) checking and adjusting sprinkler head wetted radius as needed;

(5) ensuring that the system does not spray water onto or over surfaces made of concrete, asphalt, brick, [~~wood~~] wood, or any other continuous impervious material, such as walls, fences, [~~sidewalks~~] sidewalks, and streets;

(6) verifying that all sensors are operational; and

(7) checking that there are no leaks in the system.

(b) An irrigation contractor shall educate the end user of the irrigation system, informing him or her that plant material water needs change during the year and that the watering schedule should change accordingly.

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0511 is amended as published in 31:01 NCR 22 as follows:

21 NCAC 23 .0511 OWNER'S MANUAL

(a) A permanent sticker ~~which~~ that contains the irrigation contractor's name, license number, company name and telephone ~~number~~ number, and date of completion of the installation ~~and the dates of the warranty period~~ shall be affixed to each automatic controller installed by an irrigation contractor. The information contained on the sticker ~~must~~ shall be printed with waterproof ink.

(b) The irrigation contractor shall, upon completion of any irrigation system or addition to an existing irrigation ~~system~~ system, provide an ~~owners~~ owner's manual to the owner ~~of~~ or owner's representative containing each the following:

~~(1) A maintenance checklist of items such as the nozzles, heads, microirrigation components, pumps, and filters that require maintenance and the recommended frequency for the service to insure that the irrigation system remains in good working order.~~

~~(2) A report on the system's specifications and a performance by station or zone that includes the plant type, soil type, average root zone depth, precipitation rate, target gallons per minute flow rate, recommended operating pressure range, and maximum recommended cycle run time without runoff. The irrigation contractor shall also maintain a copy of this report at his place of business for a period not less than three years.~~

~~(3) A seasonal watering schedule based on monthly historical reference evapotranspiration (historical ET) data, monthly effective rainfall estimates, plant landscape coefficient factors, and site factors.~~

~~(4)~~ (1) the ~~Manufacturer's~~ manufacturer's manual for the automatic controller and all ~~sensors.~~ sensors;

~~(5)~~ (2) ~~Winterization~~ winterization instructions and precautions on protection of the potable water ~~supply.~~ supply; and

~~(6) A written explanation regarding the operation of the irrigation controller, valves, sensors, pressure regulators, backflow prevention device and sprinklers. An irrigation contractor shall review advanced programming features such as multi cycle irrigation to prevent run off and the use of the percentage water increase or decrease function. An irrigation contractor shall educate the owner on features and capabilities of the system including the maintenance requirements.~~

~~(7)~~ (3) ~~The~~ the irrigation record drawing. ~~that accurately portray the site, and is legible and reproducible. Site information shall include all development (e.g. building edges, walks, walls, roads,), irrigated areas, turf areas, and planted areas. The drawings shall show the sprinkler system as it is installed. An irrigation contractor shall include locations and product information regarding the location of the emergency shut off valve, meters, backflow devices, valves, controllers, pumps, wire paths, wire splice locations and main line piping. All manual and automatic valve locations shall be shown with actual measurements to permanent reference points so they may be easily located in the field. Examples of permanent reference points include buildings, drainage inlets, sidewalks, curbs, light poles. The statement, "This irrigation system has been designed and installed in~~

~~accordance with all applicable state and local laws, ordinances, rules, regulations or orders. I have tested the system and determined that it has been installed according to the Irrigation Plan and is properly adjusted for the most efficient application of water at this time" shall be included in the irrigation drawing record. The irrigation contractor shall provide a plan to scale that includes locations and product information regarding the lateral piping, sprinklers, and rain switches or sensors.~~

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0601 is amended as published in 31:01 NCR 23 as follows:

SECTION .0600 - IRRIGATION SYSTEM MANAGEMENT FOR WATER EFFICIENCY STANDARDS

21 NCAC 23 .0601 PURPOSE

The Rules in this Section shall apply to ~~This Section sets minimum standards [for]~~ irrigation contractors who are hired to maintain an existing irrigation system. ~~water efficiency.~~ ~~The purpose of irrigation system management is to ensure that the irrigation system performs optimally, ensuring efficient and uniform distribution of water.~~

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0602 is amended as published in 31:01 NCR 23 as follows:

21 NCAC 23 .0602 BASIC SYSTEM MAINTENANCE PRACTICES

(a) An irrigation contractor shall establish a systematic maintenance schedule for inspecting, ~~testing~~ testing, and reporting ~~on~~ the performance conditions of the irrigation system to the owner.

(b) An irrigation contractor shall ~~report any deviations from the original design to the owner.~~ inform the owner of any [~~minimum standards violations~~] violations of minimum standards observed in the irrigation system.

~~(c) As part of a systematic maintenance program, an irrigation contractor shall tell the owner to:~~

~~(1) Check, adjust and repair irrigation equipment at least once a year;~~

~~(2) Post irrigation schedules, zone location map and other relevant programming information in each controller or identify for the irrigation contractor and his employees where information is kept;~~

~~(3) Inspect the irrigation system after annual activation in the spring, and bring the system up to intended operating conditions;~~

~~(4) Maintain irrigation systems to keep water off impervious surfaces;~~

~~(5) Repair all leaks immediately or shut off a zone or zones with leaks. If leaks are in main line the owner shall turn water off at the point of connection. Signs of leakage include overgrown or particularly green turf areas, soggy areas around spray heads and above ground hoses, jammed spray heads and torn hoses. In drip systems, leakage problems may be due to damaged tubing from foot traffic or gnawing by animals. The irrigation contractor shall flush pipes, valves, sprinklers, drip components and filters after repairs are completed; and~~

~~(6) As plants mature move sprinklers to preserve system performance. The irrigation contractor shall add additional sprinklers or other hardware as required to compensate for blocked spray patterns or changes in the irrigation needs of the landscape. The owner shall ensure that system modifications are in keeping with design specifications and do not cause landscape water demand to exceed the hydraulic capacity of the system.~~

~~(d)~~ (c) An irrigation contractor ~~who provides monthly inspections~~ shall:

(1) ~~Verify~~ verify that the water supply and pressure are adequate for proper operation;

(2) ~~Adjust~~ adjust valves and flow regulators for proper pressure and flow operation. Valves must shut off tightly to prevent ~~leakage,~~ leakage and operate without abruptly opening or closing to prevent damage to the irrigation system caused by water hammer and pressure surges;

(3) ~~Verify~~ verify that sprinklers are properly adjusted—check the nozzle, arc, radius, ~~level~~ level, and attitude with respect to ~~slope;~~ slope and ensure that water is not spraying on impervious surfaces;

(4) ~~Verify~~ verify that sensors are working properly; ~~properly and are within their calibration specifications~~;

(5) ~~Look~~ look for debris (e.g., rocks, sand, and soil) lodged in sprinklers and drip emitters;

(6) ~~Examine~~ examine filters and clean filtration elements at least once a year or when the irrigation system fails to operate properly due to clogged filters;

(7) ~~Verify~~ verify proper operation of the controller. Confirm correct date and time input and functional back-up battery at least once a year;

(8) ~~Repair~~ repair or replace broken hardware and pipelines with ~~originally specified~~ originally-specified materials or their equivalent, ~~equal,~~ thereby restoring the system to the original design specifications;

(9) ~~Check~~ check for leaks and ~~Complete~~ complete repairs to support the integrity of the irrigation design and to minimize the waste of water;

(10) ~~Move~~ move, adjust, [~~add~~] add, or remove sprinklers or other hardware as required to compensate for blocked spray patterns or changes in the irrigation needs of the landscape; and

~~(10) Notify the end user (or owner) of any deviations from the original design; and~~

(11) ~~Test~~ test all ~~repairs.~~ repairs and flush pipes, valves, sprinklers, drip [~~components~~] components, and filters as needed.

~~(c) An irrigation contractor shall ensure that the replacement hardware used for system repairs matches the existing hardware specifications, and is in accordance with the design.~~

(d) In the event an irrigation contractor makes any changes to the irrigation system, he shall amend the irrigation record drawing to reflect those changes.

~~(f)~~ (e) An irrigation contractor shall establish a "winterization" protocol in areas where low temperatures will damage an irrigation system. Winterization consists of removing enough water from the irrigation system and equipment so that no damage occurs to any part of the irrigation system during temperatures below ~~thirty-two (32)~~ 32 degrees Fahrenheit. This is accomplished by turning off the main water supply, opening all drains, and if necessary using compressed air to remove water from the irrigation system.

~~(g)~~ (f) An irrigation contractor shall establish an "activation/start-up" protocol. Activation consists of ~~re-pressurization of the irrigation system, and inspection.~~ re-pressurization and inspection of the irrigation system.

~~(h)~~ (g) ~~Whenever possible, an~~ An irrigation contractor shall provide the owner with recommendations regarding updating and retrofitting ~~update and retrofit~~ existing irrigation systems with new technology that will reduce overall water ~~consumption.~~ use.

History Note: *Authority G.S. 89G-5;*
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Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
Amended Eff. November 1, 2016.

21 NCAC 23 .0603 is amended as published in 31:01 NCR 24 as follows:

21 NCAC 23 .0603 SCHEDULING

(a) An irrigation contractor shall recommend to the owner or his representative that:

(1) ~~The~~ the owner ~~manage~~ adjust the irrigation schedule and automatic controller to respond to the changing water ~~and seasonal~~ requirements ~~for plant water needs in the landscape;~~ of the landscape;

~~(2) The owner reset automatic controllers according to the seasonal plant needs;~~

~~(3) The owner adjust controllers upon completion of the grow in phase of a landscape or new plant material and should be changed, as soon as possible;~~

~~(4)~~ (2) ~~The~~ the owner inspect irrigation controllers at least monthly to change irrigation frequencies or run ~~times~~ times, as needed; and

~~(5)~~ (3) ~~The~~ the owner should avoid irrigation during rain events.

~~(b) An irrigation contractor shall recommend to the owner or his representative that he understand the capabilities of the irrigation controller and use these features to efficiently irrigate.~~

~~(c)~~ (b) An irrigation contractor shall:

(1) ~~Identify~~ identify soil ~~type~~ type, microclimates, and root depths of plants in each irrigation zone;

(2) ~~Calculate~~ calculate the run-time of each irrigation zone to supply the needed water based upon precipitation rate of the sprinkler zones, the water-holding capacity of the soil, the changing weather conditions and the plant's water requirements; and

(3) ~~Set~~ set initial run times and intervals to minimize runoff.

~~(d) An irrigation contractor shall advise the owner to periodically verify that the plant material is healthy and that soil moisture is adequate. An irrigation contractor shall use a soil probe to visually inspect root depth, soil structure and moisture.~~

~~(e) An irrigation contractor shall educate the end user of the irrigation system, informing him that plant material water needs change during the year and the watering schedule should change accordingly.~~

History Note: *Authority G.S. 89G-5;*
Eff. July 1, 2011;
Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. September 22, 2014;
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