CERTIFICATION PROGRAM
Golf Irrigation Auditor

FIELD AUDIT SUBMISSION PACKAGE

August 2013

❶ Read and follow the **Candidate Procedures to Submit Field Audits**. Audit field work and calculations must be conducted and completed independently by the candidate with no outside assistance.

❷ Contact an IA-certified professional in good standing to observe and verify your audit. Make sure they read and follow the **Field Audit Verification Procedures and Policies** before you conduct your audit. These procedures must be followed during the audit field work and calculations.

❸ Conduct field audit. Record all audit data on IA forms – 5 worksheets for the fairway (must be minimum of 60 yards of audited fairway and a minimum of 4 sprinkler heads) and 5 worksheets for the green.

Only data submitted on IA forms will be used to grade the audit. Do not submit additional materials or photographs.

Fill out the candidate and site info at the top of every audit worksheet. Do not write your name on the worksheets.

❹ Complete the **Audit Verification Form**.

❺ **FIRST TIME SUBMISSIONS:** Mail original **Verification Form** and **10 Audit Worksheets** to the Irrigation Association. Make a copy for your records.

RESUBMISSIONS: Mail original **Resubmission Form** with payment information and corrected **Audit Worksheets** to the Irrigation Association. Make a copy for your records.

Certification
Irrigation Association
6540 Arlington Blvd
Falls Church, VA 22042-6638
Tel: 703.536.7080
Fax: 703.536.7019

CERTIFIED GOLF IRRIGATION AUDITOR

August 2013

AUDIT VERIFICATION FORM

CANDIDATE INFORMATION

☐ Dr. ☐ Mr. ☐ Mrs. ☐ Miss ☐ Ms.

Last Name First M.I.

Business name (if applicable):

Address

Address

City State/Province Zip/postal code

Phone

E-mail

Candidates are required to conduct field audits and complete all calculations independently with no assistance. This must be verified and attested to in writing by an IA-certified professional in good standing. Audits conducted as part of a class do not meet this requirement.

The Irrigation Association reserves the right to revoke any certification if it was obtained under conditions that did not meet the posted requirements, if any portion of the Code of Ethics is not upheld or if renewal/CEU procedures are not adhered to.

Fairway Audit Site Date

Green Audit Site Date

I conducted the field work on the site(s) and date(s) identified here and completed all calculations independently without outside assistance.

Auditor Signature

Date

VERIFICATION INFORMATION

☐ Dr. ☐ Mr. ☐ Mrs. ☐ Miss ☐ Ms.

Last Name First M.I.

Address

Phone

E-mail

To verify this audit, you must be IA certified and in good standing. Verification does not attest to the accuracy of the work, just that the field work and calculations were completed independently by the candidate with no assistance.

I have witnessed that the decisions and actions involved in the submitted field work on this site were made solely by the candidate with no assistance from myself or anyone else. I am also confident that all calculations were completed by the candidate.

Signature ☐ CID ☐ CIC ☐ CLIA ☐ CGIA ☐ CLWM ☐ CAIS

Date

To submit a field audit:

1) Complete audit on IA worksheets
2) Sign and make sure all pages are included
3) Make a copy for your records
4) Mail the original audit and verification form to:
   Certification
   Irrigation Association
   6540 Arlington Blvd.
   Falls Church, VA 22042
5) You will be notified via e-mail when the audit is received at the IA.

Please note that it may take up to six weeks to process your audit.

CERTIFIED IRRIGATION AUDITOR

August 2013

CANDIDATE PROCEDURES TO CONDUCT AND SUBMIT FIELD AUDITS

The process to become an Irrigation Association certified auditor involves three steps.

1) Application and acceptance into the program.
2) Successful completion of the auditor exam.
3) Successful completion of independent field audits:
   - Landscape - one rotor and one spray area.
   - Golf - one fairway (minimum of 60 yards of audited fairway and a minimum of four sprinkler heads) and one green.

Candidates are required to conduct audits and complete calculations independently with no assistance. This must be verified and attested to in writing by an IA-certified professional. Audits conducted as part of a class do not meet this requirement.

WHEN YOU ARE READY TO CONDUCT THE FIELD AUDIT

1) Check the IA web site for the correct version of the Audit Work Sheets and the Audit Verification Form. Print or request a hard copy of these forms. Audits must be submitted on these worksheets.
2) Contact an IA-certified irrigation professional in good standing who will be present to verify your field work. Make sure that the person verifying your audit has access to and agrees to follow the "Field Audit Verification Procedures and Policies" document. Your audit must meet these conditions or it may be rejected.
3) Conduct field audit (one spray and one rotor area for landscape; one fairway (minimum of 60 yards of audited fairway and four sprinkler heads) and one green for golf). Fill out all information completely including date(s), time(s), pressure and flow data, etc.
4) Complete the remaining forms making sure to show all values and calculations. Pay careful attention to the DU_{LQ}, precipitation rate and total run time calculations. These must be calculated to within the rounding margin of error in order for the audit to be approved. A software program may be used to generate the scheduling worksheet (base schedule worksheet).
5) Provide completed original audit and verification form to the verifier to sign off on. This signature only indicates that work was performed independently by the candidate; the verifier is not responsible for the accuracy of the audit. Any outside assistance could cause the audit to be rejected.

FINDING SOMEONE TO VERIFY YOUR AUDIT

Any IA-certified professional in good standing (regardless of the certification they hold) can verify and sign off on your audit. They do not have to be certified in auditing. Check the certification directory at the IA web site to find someone near you. Send them a copy of the verification procedures so they will know what they are being asked to do. If you can not find anyone in your area to verify your audit, contact Sherrie Schulte at sherrie@irrigation.org before you do your field work to come up with a procedure that is agreeable to all parties.

WHEN YOU ARE READY TO SUBMIT YOUR FIELD AUDIT

1) Sign and make sure all pages are included
2) Make a copy for your records
3) Mail the original audit and verification form to:

   Certification
   Irrigation Association
   6540 Arlington Blvd
   Falls Church, VA 22042
4) You will be notified when the audit is received at the IA
5) Results will be mailed to the address shown on the verification form.

RESULTS MAY TAKE UP TO EIGHT WEEKS TO COMPLETE.

The Irrigation Association reserves the right to revoke any certification if it was obtained under conditions that did not meet the posted requirements, if any portion of the Code of Ethics is not upheld or if renewal/CEU procedures are not adhered to.

REJECTING AUDITS

Audits may be rejected if you work together or if you observe someone while they conduct their audit on the same site where you will be conducting your field work.

If there is reason to believe that the audit was not conducted independently or if any information was copied or falsified, the candidate will be notified in writing and given an opportunity to respond. After investigating, the Certification Board will make a decision about the consequences which may include a partial or full ban on the candidate's involvement in the IA Certification Program. The candidate will be notified in writing of the decision.

CERTIFIED IRRIGATION AUDITOR

August 2013

FIELD AUDIT VERIFICATION PRODEDURES AND POLICIES

If a candidate in the IA auditor program contacts you to verify their field audit, you must witness that the decisions and actions involved in the submitted field work were taken solely by the candidate with no assistance from yourself or anyone else. You must also be confident that all calculations were completed by the candidate.

To verify a field audit for a candidate, you must be IA-certified and in good standing.

The goal for someone verifying an audit is to help provide a good "testing environment" for the candidate. The most critical part of the field audit is to verify that the candidate has the knowledge and skills to make the judgments required to conduct a field audit. The candidate must also be able to work through the calculations required to complete the scheduling worksheet.

THE AUDITOR PROCESS

The process to become an Irrigation Association certified auditor involves three steps.

1) Application and acceptance into the program.
2) Successful completion of the auditor exam.
3) Successful completion of independent field audits:
    - Landscape - one rotor and one spray area.
    - Golf - one fairway (minimum of 60 yards of audited fairway and a minimum of four sprinkler heads) and one green.

CANDIDATES HAVE BEEN INFORMED THAT:

1) Audits (field work and calculations) must be conducted independently with no outside assistance.
2) Audits conducted as part of a class are not acceptable.
3) Audits must be submitted using IA-approved procedures and forms.
4) The original paperwork must be submitted – copies or faxes will not be accepted.

FREQUENTLY ASKED QUESTIONS

What would cause an audit to be rejected?

The following will be grounds to reject an audit:

1) More than one candidate on the audit site
2) A candidate observing another candidate while they do their audit (whether they will be performing their audit on that site or not)
3) A candidate accepting advice or assistance from anyone.

Can two candidates work together or in a group?

No. There is no such thing as a group audit even if one person is only helping to read the catch devices. The only people allowed at the audit site are the candidate and the verifier.

What if I see someone doing something wrong?

Either in the field work or calculations, if a verifier offers advice or assistance, the audit will be invalid and should not be signed off on by the verifier and submitted for grading.

Can our organization conduct field audit classes/sessions?

Providing the following field audit assistance is acceptable:

1) Auditing equipment
2) Audit site *

* A wide variety of audit sites should be made available. Using the same audit site for large numbers of candidates is roughly equivalent to giving everyone the same exam. A different site should be used for the spray and rotor zones. The intent of the field audit is for the candidate to make judgments in two different audit conditions.

The Irrigation Association reserves the right to revoke any certification if it was obtained under conditions that did not meet the posted requirements, if any portion of the Code of Ethics is not upheld or if renewal/CEU procedures are not adhered to.

For questions or clarification on verifying an audit contact Sherrie Schulte at sherrie@irrigation.org or 703.536.7080.

FAIRWAY WORKSHEET #1 – SITE INSPECTION
Station Data

Site Name _____ Audit Date _____

Candidate ID # _____ Sheet # _____ of _____ (use additional sheets if needed)

Site inspection is only necessary on the zones being audited. Record the number of defects for each sprinkler problem or check mark for zone problems; leave blank if no problem exists.

Controller Identification										
Station Number:										
Turfgrass Type										
Sprinkler Type										
Observed Problems:										
Valve Malfunctions										
Low Pressure										
High Pressure										
Tilted Sprinklers										
Spray Deflection										
Sunken Sprinklers										
Plugged Equipment										
Arc Misalignment										
Low Sprinkler Drainage										
Leaky Seals or Fittings										
Lateral or Drip Line Leaks										
Missing or Broken Heads										
Slow Drainage or Ponding										
Compaction/Thatch/Runoff										
Notes and Comments:										

FAIRWAY WORKSHEET #2 – SITE INSPECTION
Controller and Point of Connection (POC) Information

Site Name _____ Audit Date _____

Candidate ID # _____ Sheet # _____ of _____ (use additional sheets if needed)

Central Control ____yes____no

Controller Make & Model:

Features:

Number of Stations		**Minimum Run Time**	**min.**	**Maximum Run Time**	**min.**
Number of Programs		**Cycles per Program**		**Stations per Program**	
Days per week		**Maximum hours per day**		**Calendar period**	
Skip Day		**Cycle Soak**		**Percent Adjust**	
Other controller features					
List sensors installed/capabilities					

Current Schedule Information (for zones being audited only; use additional sheets if needed)

Program	Start Time(s)	Start Days	Cycle/Rest Time	Station	Run Time

POC Pressure Data

Dynamic pressure at source: _____ psi Dynamic pressure at test area _____ psi Time of day _____

Static pressure at source: _____ psi Static pressure at test area _____ psi Time of day _____

Notes: Backflow Device, Pump Station, Regulator

_____

_____

_____

POC Flow Data (use catalog data if non-metered sources exist)

Meter Number	Station Number	gallons (cf)	Beginning Readings	Ending Readings	Total	Beginning Time	Ending Time	Elapsed Time

FAIRWAY WORKSHEET #3 – TEST AREA DATA AND MAP

Site Name: _____ Sub Area: _____ Audit Date: _____ Cand ID #: _____

STATION # _____

CONTROLLER _____

RUN TIME _____ **min.**

PRESSURE _____ **psi**

PLANT MATERIAL

- ☐ cool season turf
- ☐ warm season turf
- ☐ ground cover
- ☐ shrubs

DENSITY FACTOR (K_d)

- ☐ high
- ☐ average
- ☐ low

MICROCLIMATE FACTOR (K_{mc})

- ☐ high
- ☐ average
- ☐ low

ROOTZONE DEPTH

_____ inches

SOIL TYPE

- ☐ clay
- ☐ loam
- ☐ sand
- ☐ _____

ZONE

- ☐ overlap
- ☐ stand-alone

- ☐ Valve-in-head
- ☐ Block

← Indicate north and ALL audit area dimensions →

O = SPRINKLER Record the location of each sprinkler and sprinkler spacing.

X = CATCH DEVICE Record the location of each catch device and catch amount.

FAIRWAY WORKSHEET #4 – DU AND PR CALCULATIONS

Site Name/Location _____

Audit Date _____ Candidate ID # _____

All values and calculations must be completed on this page; auditing software is not acceptable for use in determining these values.

Run time (t_R): _____ min. **Catchment Type: _____** **Catchment Device Area (A_{CD}): _____ sq. in.**

1) Record ALL catch device values 2) circle ALL values used to calculate lower quarter

Can #1 _____	#11 _____	#21 _____	#31 _____	#41 _____	#51 _____	#61 _____
Can #2 _____	#12 _____	#22 _____	#32 _____	#42 _____	#52 _____	#62 _____
Can #3 _____	#13 _____	#23 _____	#33 _____	#43 _____	#53 _____	#63 _____
Can #4 _____	#14 _____	#24 _____	#34 _____	#44 _____	#54 _____	#64 _____
Can #5 _____	#15 _____	#25 _____	#35 _____	#45 _____	#55 _____	#65 _____
Can #6 _____	#16 _____	#26 _____	#36 _____	#46 _____	#56 _____	#66 _____
Can #7 _____	#17 _____	#27 _____	#37 _____	#47 _____	#57 _____	#67 _____
Can #8 _____	#18 _____	#28 _____	#38 _____	#48 _____	#58 _____	#68 _____
Can #9 _____	#19 _____	#29 _____	#39 _____	#49 _____	#59 _____	#69 _____
Can #10 _____	#20 _____	#30 _____	#40 _____	#50 _____	#60 _____	#70 _____
Column Subtotals _____	_____	_____	_____	_____	_____	_____

TOTAL CATCH: _____ mL

AVERAGE CATCH: _____ mL

TOTAL CATCH IN LOWER QUARTER: _____ mL

AVERAGE CATCH IN LOWER QUARTER: _____ mL

Calculate Distribution Uniformity (DU)

$$DU_{LQ} = \left(\frac{\text{Average Catch in Lower Quarter}}{\text{Average Catch Overall}} \right)$$

$$= \left(\frac{\_\_\_ \text{mL}}{\_\_\_\_ \text{mL}} \right)$$

$$= \_\_\_\_\_$$

DISTRIBUTION UNIFORMITY (DU) = _____

Calculate Precipitation Rate (PR)

$$PR_{net} = \frac{3.66 \times V_{avg}}{t_R \times A_{CD}}$$

$$= \frac{3.66 \times (\_\_\_\_ \text{mL})}{(\_\_\_ \text{min}) \times (\_\_\_ \text{in.}^2)}$$

$$= \_\_\_\_\_ \text{ in./h}$$

PRECIPITATION RATE (PR_{net}) = _____ in. / h

FAIRWAY WORKSHEET #5 – SCHEDULE

Site Name/Location _____

Audit Date _____ Candidate ID # _____

Controller No. _____ Station No. _____ Reference Period _____

ITEM	SOURCE		VALUE	UNIT or FUNCTION
I. Plant Water Requirement				
A. Plant Material	Audit			grass species
B. Reference Period	Judgment			days
C. Reference ET_o	Various sources			inches of water
D. Crop Coefficient (K_C)	Various sources			species factor
E. Microclimate Factor (K_{mc})	Judgment			factor
F. Plant Water Requirement (PWR)	K_C x K_{mc} x ET_o	C x D x E		inches of water
II. Sprinkler Performance				
G. Precipitation Rate (PR)	Audit			inches per hour
H. Distribution Uniformity (DU_{lq})	Audit			percent
III. Soil Reservoir				
I. Soil Type	Audit			classification
J. Infiltration Rate	Table			inches per hour
K. Available Water (AW)	Table			inches per inch
L. Root Zone (RZ)	Audit			inches
M. Plant Available Water (PAW)	AW x RZ	K x L		inches
N. Managed Allowable Depletion (MAD)	Judgment			percent in decimal
O. Allowable Depletion (AD)	PAW x (MAD/100)	M x N		inches
IV. Scheduling – Run Time				
P. Run Time Multiplier (RTM)	Table			factor
Q. Base Run Time (RT_b)	60 x (PWR/PR)	F/G x 60		minutes
R. Adjusted Run Time (RT)	RT_b x RTM	Q x P		minutes
S. Maximum Run Time per Cycle (CRT)	(I / PR) x 60	J/G x 60		minutes
V. Scheduling – Programming				
T. Irrigation Days per Period *	PWR/AD	F / O		days (round up)
U. Minutes per Irrigation Day *	RT/Irr. Days	R / T		minutes (round off)
V. Days Between Irrigation Events *	Ref Period/Irr. Days	B / T		days (round down)
W. Number of Cycle Starts *	Min per Day/Cycle RT	U / S		cycles (round up)
X. Minutes per Cycle *	Min per Day/Cycle Starts	U / W		minutes (round down)

*** Must be expressed as an integer.**

GREEN WORKSHEET #1 – SITE INSPECTION
Station Data

Site Name _____ Audit Date _____

Candidate ID # _____ Sheet # _____ of _____ (use additional sheets if needed)

Site inspection is only necessary on the zones being audited. Record the number of defects for each sprinkler problem or check mark for zone problems; leave blank if no problem exists.

Controller Identification										
Station Number:										
Turfgrass Type										
Sprinkler Type										
Observed Problems:										
Valve Malfunctions										
Low Pressure										
High Pressure										
Tilted Sprinklers										
Spray Deflection										
Sunken Sprinklers										
Plugged Equipment										
Arc Misalignment										
Low Sprinkler Drainage										
Leaky Seals or Fittings										
Lateral or Drip Line Leaks										
Missing or Broken Heads										
Slow Drainage or Ponding										
Compaction/Thatch/Runoff										
Notes and Comments:										

GREEN WORKSHEET #2 – SITE INSPECTION
Controller and Point of Connection (POC) Information

Site Name _____ Audit Date _____

Candidate ID # _____ Sheet # _____ of _____ (use additional sheets if needed)

Central Control ____**yes**____**no**	**Controller Make & Model:**

Features:

Number of Stations		**Minimum Run Time**	**min.**	**Maximum Run Time**	**min.**
Number of Programs		**Cycles per Program**		**Stations per Program**	
Days per week		**Maximum hours per day**		**Calendar period**	
Skip Day		**Cycle Soak**		**Percent Adjust**	
Other controller features					
List sensors installed/capabilities					

Current Schedule Information (for zones being audited only; use additional sheets if needed)

Program	Start Time(s)	Start Days	Cycle/Rest Time	Station	Run Time

POC Pressure Data

Dynamic pressure at source: _____ psi Dynamic pressure at test area _____ psi Time of day _____

Static pressure at source: _____ psi Static pressure at test area _____ psi Time of day _____

Notes: Backflow Device, Pump Station, Regulator

_____

_____

_____

POC Flow Data (use catalog data if non-metered sources exist)

Meter Number	Station Number	gallons (cf)	Beginning Readings	Ending Readings	Total	Beginning Time	Ending Time	Elapsed Time

GREEN WORKSHEET #3 – TEST AREA DATA AND MAP

Site Name: _____ Sub Area: _____ Audit Date: _____ Cand ID #: _____

STATION # _____

CONTROLLER _____

RUN TIME _____ **min.**

PRESSURE _____ **psi**

PLANT MATERIAL

- ☐ cool season turf
- ☐ warm season turf
- ☐ ground cover
- ☐ shrubs

DENSITY FACTOR (K_d)

- ☐ high
- ☐ average
- ☐ low

MICROCLIMATE FACTOR (K_{mc})

- ☐ high
- ☐ average
- ☐ low

ROOTZONE DEPTH

_____ inches

SOIL TYPE

- ☐ clay
- ☐ loam
- ☐ sand
- ☐ _____

ZONE

- ☐ overlap
- ☐ stand-alone

- ☐ Valve-in-head
- ☐ Block

← Indicate north and ALL audit area dimensions →

O = SPRINKLER Record the location of each sprinkler and sprinkler spacing.

X = CATCH DEVICE Record the location of each catch device and catch amount.

GREEN WORKSHEET #4 – DU AND PR CALCULATIONS

Site Name/Location _____

Audit Date _____ Candidate ID # _____

All values and calculations must be completed on this page; auditing software is not acceptable for use in determining these values.

Run time (t_R): _____ min. **Catchment Type: _____** **Catchment Device Area (A_{CD}): _____ sq. in.**

1) Record ALL catch device values 2) circle ALL values used to calculate lower quarter

Can #1 _____	#11 _____	#21 _____	#31 _____	#41 _____	#51 _____	#61 _____
Can #2 _____	#12 _____	#22 _____	#32 _____	#42 _____	#52 _____	#62 _____
Can #3 _____	#13 _____	#23 _____	#33 _____	#43 _____	#53 _____	#63 _____
Can #4 _____	#14 _____	#24 _____	#34 _____	#44 _____	#54 _____	#64 _____
Can #5 _____	#15 _____	#25 _____	#35 _____	#45 _____	#55 _____	#65 _____
Can #6 _____	#16 _____	#26 _____	#36 _____	#46 _____	#56 _____	#66 _____
Can #7 _____	#17 _____	#27 _____	#37 _____	#47 _____	#57 _____	#67 _____
Can #8 _____	#18 _____	#28 _____	#38 _____	#48 _____	#58 _____	#68 _____
Can #9 _____	#19 _____	#29 _____	#39 _____	#49 _____	#59 _____	#69 _____
Can #10 _____	#20 _____	#30 _____	#40 _____	#50 _____	#60 _____	#70 _____
Column Subtotals _____	_____	_____	_____	_____	_____	_____

TOTAL CATCH: _____ mL

AVERAGE CATCH: _____ mL

TOTAL CATCH IN LOWER QUARTER: _____ mL

AVERAGE CATCH IN LOWER QUARTER: _____ mL

Calculate Distribution Uniformity (DU)

$$DU_{LQ} = \left(\frac{\text{Average Catch in Lower Quarter}}{\text{Average Catch Overall}} \right)$$

$$= \left(\frac{\_\_\_ \text{mL}}{\_\_\_\_ \text{mL}} \right)$$

$$= \_\_\_\_\_$$

DISTRIBUTION UNIFORMITY (DU) = _____

Calculate Precipitation Rate (PR)

$$PR_{net} = \frac{3.66 \times V_{avg}}{t_R \times A_{CD}}$$

$$= \frac{3.66 \times (\_\_\_\_ \text{mL})}{(\_\_\_ \text{min}) \times (\_\_\_ \text{in.}^2)}$$

$$= \_\_\_\_\_ \text{ in./h}$$

PRECIPITATION RATE (PR_{net}) = _____ in. / h

GREEN WORKSHEET #5 – SCHEDULE

Site Name/Location _____

Audit Date _____ Candidate ID # _____

Controller No. _____ Station No. _____ Reference Period _____

ITEM	SOURCE		VALUE	UNIT or FUNCTION
I. Plant Water Requirement				
A. Plant Material	Audit			grass species
B. Reference Period	Judgment			days
C. Reference ET_o	Various sources			inches of water
D. Crop Coefficient (K_C)	Various sources			species factor
E. Microclimate Factor (K_{mc})	Judgment			factor
F. Plant Water Requirement (PWR)	K_C x K_{mc} x ET_o	C x D x E		inches of water
II. Sprinkler Performance				
G. Precipitation Rate (PR)	Audit			inches per hour
H. Distribution Uniformity (DU_{lq})	Audit			percent
III. Soil Reservoir				
I. Soil Type	Audit			classification
J. Infiltration Rate	Table			inches per hour
K. Available Water (AW)	Table			inches per inch
L. Root Zone (RZ)	Audit			inches
M. Plant Available Water (PAW)	AW x RZ	K x L		inches
N. Managed Allowable Depletion (MAD)	Judgment			percent in decimal
O. Allowable Depletion (AD)	PAW x (MAD/100)	M x N		inches
IV. Scheduling – Run Time				
P. Run Time Multiplier (RTM)	Table			factor
Q. Base Run Time (RT_b)	60 x (PWR/PR)	F/G x 60		minutes
R. Adjusted Run Time (RT)	RT_b x RTM	Q x P		minutes
S. Maximum Run Time per Cycle (CRT)	(I / PR) x 60	J/G x 60		minutes
V. Scheduling – Programming				
T. Irrigation Days per Period *	PWR/AD	F / O		days (round up)
U. Minutes per Irrigation Day *	RT/Irr. Days	R / T		minutes (round off)
V. Days Between Irrigation Events *	Ref Period/Irr. Days	B / T		days (round down)
W. Number of Cycle Starts *	Min per Day/Cycle RT	U / S		cycles (round up)
X. Minutes per Cycle *	Min per Day/Cycle Starts	U / W		minutes (round down)

*** Must be expressed as an integer.**

Run Time Multiplier (RTM)

The Run Time Multiplier is used to increase the number of minutes that would be required to apply a given amount of water depending upon the precipitation rate of the sprinkler and to compensate for the lack of perfect uniformity in the distribution of water. The RTM also accounts for the lateral movement of water in the soil. The RTM is based upon the following equation:

$$RTM = \frac{1}{0.4 + (0.60 \times DU_{LQ})}$$ **Equation 3-11**

Where:

RTM = Run Time Multiplier

DU_{LQ} = Lower Quarter Distribution Uniformity

The RTM can also be determined from the following table:

Table 3-8: Conversion Table from DU_{LQ} to RTM

DU_{LQ}	RTM	DU_{LQ}	RTM	DU_{LQ}	RTM
1.00	1.00	0.70	1.22	0.40	1.56
0.98	1.01	0.68	1.24	0.39	1.58
0.96	1.02	0.66	1.26	0.36	1.62
0.94	1.04	0.64	1.28	0.33	1.67
0.92	1.05	0.62	1.30	0.30	1.72
0.90	1.06	0.60	1.32	0.27	1.78
0.88	1.08	0.58	1.34	0.24	1.84
0.86	1.09	0.56	1.36	0.21	1.90
0.84	1.11	0.54	1.38	0.18	1.97
0.82	1.12	0.52	1.40	0.15	2.04
0.80	1.14	0.50	1.43	0.12	2.12
0.78	1.15	0.48	1.45	0.09	2.20
0.76	1.17	0.46	1.48	0.06	2.29
0.74	1.18	0.44	1.51	0.03	2.39
0.72	1.20	0.42	1.53	0.00	2.50

stressed areas and achieve an acceptable appearance. When additional minutes of run time become excessive, runoff potential increases, and it becomes more difficult to do proper maintenance if the sprinkler system is operating beyond its desired or designated water window.

Table 4-2 is a quick reference for the SM that corresponds to the measured DU_{lq} for a particular sprinkler zone or area. The SM is a quick way to determine how much extra water could be applied. For example, a DU_{lq} of 0.60 has an SM of 1.32, which indicates that about one-third more water would be applied.

Table 4-2
Conversion table from DU_{lq} to scheduling multiplier

DU_{lq}	SM	DU_{lq}	SM	DU_{lq}	SM
1.00	1.00	0.78	1.15	0.58	1.34
0.98	1.01	0.76	1.17	0.56	1.36
0.96	1.02	0.74	1.18	0.54	1.38
0.94	1.04	0.72	1.20	0.52	1.40
0.92	1.05	0.70	1.22	0.50	1.43
0.90	1.06	0.68	1.24	0.48	1.45
0.88	1.08	0.66	1.26	0.46	1.48
0.86	1.09	0.64	1.28	0.44	1.51
0.84	1.11	0.62	1.30	0.42	1.53
0.82	1.12	0.60	1.32	0.40	1.56
0.80	1.14	Fix the sprinkler problems if below 0.40			

Precipitation Rate

Precipitation rate [PR] is the rate at which irrigation water is applied per unit of time. PR is usually measured in inches of water per hour {in./h}. It is calculated as an average within a given area. Precipitation rate (also referred to as the application rate) is a critical factor in design, because sprinkler systems can easily apply water at rates greater than the soil's intake rate. Depending on the pressure, spacing, and type of sprinkler selected, each individual station may have a different precipitation rate. At many sites, it is possible to use a water meter to measure the flow into an irrigation area or zone. If the flow rate of a station and the area covered by the sprinklers are known, it is possible to estimate the average gross precipitation rate. Variations depending on sprinkler spacing and configuration are given, but all are based on the same general equation used for the gross or theoretical precipitation rate in equation 4-3a. In each example, the area is calculated based upon the data available for the site.