CLAIM OF BENEFICIAL USE
for Permits claiming more than 0.1 cfs and All Transfers

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

A fee of $175 must accompany this form for permits with priority dates after July 8, 1987.

A fee of $175 must accompany this form for any Transfer final orders including a water right with a priority date of July 9, 1987, or later.
Example – A transfer involves 5 rights and one of the rights has a priority date of July 9, 1987, or later, the fee is required.

A separate form shall be completed for each permit.

In cases where a permit has been amended through the permit amendment process, a separate claim for the permit amendment is not required. Incorporate the permit amendment into the claim for the permit.

This form is subject to revision. **Begin each new claim** by checking for a new version of this form at:
http://www.oregon.gov/owrd/pages/wr/cwre_info.aspx

The completion of this form is required by OAR 690-014-0100(1) and 690-014-0110(4).

Please type or print in dark ink. If this form is found to contain errors or omissions, it may be returned to you. **Every item must have a response.** If any requested information does not apply to the claim, insert "NA." **Do not delete or alter any section of this form unless directed by the form.** The Department may require the submittal of additional information from any water user or authorized agent.

"Section 8" of this form is intended to aid in the completion of this form and should not be submitted.

If you have questions regarding the completion of this form, please call 503-986-0900 and ask for the Certificate Section.

The Department has a program that allows it to enter into a voluntary agreement with an applicant for expedited services. Under such an agreement, the applicant pays the cost to hire additional staff that would not otherwise be available. This program means a certificate may be issued in about a month. For more information on this program see
http://www.oregon.gov/owrd/pages/mgmt_reimbursement_authority.aspx

SECTION 1
GENERAL INFORMATION

1. File Information

APPLICATION # (G, R, S OR T)	PERMIT # (IF APPLICABLE)	PERMIT AMENDMENT # (IF APPLICABLE)
G-15074	G-16625	N/A

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2. Property Owner (current owner information)

Applicant/Business Name	Phone No.	Additional Contact No.
Bend Park and Recreation District	541-389-7275	

Address			
799 SW Columbia Street			
City	State	Zip	E-Mail
Bend	OR	97702	brian@bendparksandrec.org

If the current property owner is not the permit or transfer holder of record, it is recommended that an assignment be filed with the Department. ***Each*** *permit or transfer holder of record must sign this form.*

3. Permit or transfer holder of record (this may, or may not, be the current property owner)

Permit or Transfer Holder of Record		
Bend Park and Recreation District		
Address		
799 SW Columbia Street		
City	State	Zip
Bend	OR	97702

Additional Permit or Transfer Holder of Record		
N/A		
Address		
N/A		
City	State	Zip
N/A	N/A	N/A

4. Date of Site Inspection: May 1st and 4th, 2015. Multiple other site visits during construction, June 2014 through May 2015

5. Person(s) interviewed and description of their association with the project:

Name	Date	Association with the Project
Jesse Rudelitch	Multiple, June 2014 through May 2015	Irrigation and Landscape Supervisor for Botanical Developments
Jen Bass	Multiple, June 2014 through May 2015	Irrigation and Landscape designers for Botanical Developments
Brian Caldwell	Multiple, June 2014 through May 2015	Irrigation and Landscape designers for Botanical Developments

6. County: Deschutes

7. If any property described in the place of use of the permit or transfer final order is excluded from this report, identify the owner of record for that property (ORS 537.230(4)):

NOTE: Below I have listed all taxlots that were included in the original permitted place of use. Most of these taxlots are now private residential lots that will not be using the water right. Ownership is current information on Deschutes County Assessor's website as of June 15, 2015. Many of these lots will be changing ownership in the future as they are bought and sold. Please note that there is water use in small portions of City of Bend Right of Way adjoining the park.

OWNER OF RECORD		
West Bend Property Company LLC *(Taxlot 1711360000320, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Company LLC *(Taxlot 1711360000321, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Company LLC *(Taxlot 1711360000322, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Company LLC *(Taxlot 1711360000323, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
City of Bend *(this water right does irrigate small portions of landscape which are located within City rights-of-way. Shields Dr., Discovery Park Dr., and Northwest Crossing Dr.)*		
ADDRESS		
710 NW Wall Street		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
Buettner Land Group LLC *(Taxlot 171136BB00200, water right is not used on this parcel)*		
ADDRESS		
PO Box 489		
CITY	STATE	ZIP
Redmon	**OR**	**97756**

OWNER OF RECORD		
Rivers Northwest Enterprises Inc *(Taxlot 171136BB00300, water right is not used on this parcel)*		
ADDRESS		
PO Box 7714		
CITY	STATE	ZIP
Bend	**OR**	**97708**

OWNER OF RECORD		
Hackbarth Builders, Inc *(Taxlot 171136BB00400, water right is not used on this parcel)*		
ADDRESS		
PO Box 7707		
CITY	STATE	ZIP
Bend	**OR**	**97707**

OWNER OF RECORD		
West Bend Property Co. *(Taxlot 171136BB00500, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
Frazier, Jon & Shaylin *(Taxlot 171136BB00600, water right is not used on this parcel)*		
ADDRESS		
60958 Snowbrush Dr.		
CITY	STATE	ZIP
Bend	**OR**	**97702**

OWNER OF RECORD		
Skinner, Kevin & Ellen *(Taxlot 171136BB00700, water right is not used on this parcel)*		
ADDRESS		
4232 Ridgemont Ct.		
CITY	STATE	ZIP
Oakland	**CA**	**94619**

OWNER OF RECORD		
Bellaire, Paul J Jr & Mary M L *(Taxlot 171136BB00800, water right is not used on this parcel)*		
ADDRESS		
1352 NW Elgin Ave.		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Co. *(Taxlot 171136BB00900, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Co. *(Taxlot 171136BB01000, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Co. *(Taxlot 171136BB01100, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
West Bend Property Co. *(Taxlot 171136BB01200, water right is not used on this parcel)*		
ADDRESS		
2754 NW Crossing Dr. #201		
CITY	STATE	ZIP
Bend	**OR**	**97701**

OWNER OF RECORD		
Brewer, Jonathan D & Ann S *(Taxlot 171136BB01300, water right is not used on this parcel)*		
ADDRESS		
19356 Soda Springs Dr		
CITY	STATE	ZIP
Bend	**OR**	**97702**

OWNER OF RECORD		
Jim St. John Construction, LLC *(Taxlot 171136BB02900, water right is not used on this parcel)*		
ADDRESS		
61864 SE Pettigrew Rd		
CITY	STATE	ZIP
Bend	**OR**	**97702**

OWNER OF RECORD		
Souther, Courtney P & John B *(Taxlot 171136BB03000, water right is not used on this parcel)*		
ADDRESS		
19412 Greenlakes Loop		
CITY	STATE	ZIP
Bend	**OR**	**97702**

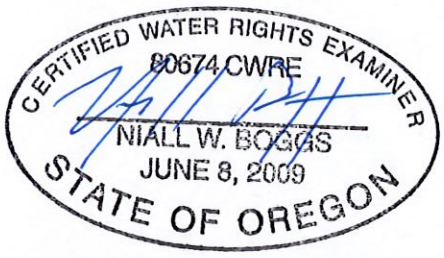
OWNER OF RECORD		
Heritage Homes NW LLC *(Taxlot 171136BB03100, water right is not used on this parcel)*		
ADDRESS		
3218 NW Fairway Heights		
CITY	STATE	ZIP
Bend	**OR**	**97701**

SECTION 2
SIGNATURES

CWRE Statement, Seal and Signature

The facts contained in this Claim of Beneficial Use are true and correct to the best of my knowledge.

Seal and Signature



EXPIRES: 12-31-2015

CWRE NAME		PHONE NO.	ADDITIONAL CONTACT NO.
Niall Boggs, PE, CWRE		**541-550-7694**	**541-508-7710**
ADDRESS **595 SW Bluff Dr., Suite B**			
CITY **Bend**	STATE **OR**	ZIP **97702**	E-MAIL **nboggs@parametrix.com**

Permit or Transfer Holder's of Record Signature or Acknowledgement

Each *permit or transfer holder of record must sign this form in the space provided below.*

The facts contained in this Claim of Beneficial Use are true and correct to the best of my knowledge. I request that the Department issue a water right certificate.

SIGNATURE	PRINT OR TYPE NAME	TITLE	DATE
D. P. Horton	Dan P. Horton	Executive Dir	9/24.

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SECTION 3

CLAIM DESCRIPTION

1. Point of diversion/appropriation name or number:

POINT OF DIVERSION/APPROPRIATION (POD/POA) NAME OR NUMBER (CORRESPOND TO MAP)	WELL LOG ID # FOR ALL WORK PERFORMED ON THE WELL (IF APPLICABLE)	WELL TAG # (IF APPLICABLE)
Well	**DESC 59793**	**#L110018**

Attach each well log available for the well (include the log for the original well and any subsequent alterations, reconstructions, or deepenings)

2. Point of diversion/appropriation source and, if from surface water, the tributary:

POD/POA NAME OR NUMBER	SOURCE	TRIBUTARY
Well	**Deschutes Basin Groundwater**	**N/A**

3. Developed use(s), period of use, and rate for each use:

POD/POA NAME OR NUMBER	USES	IF IRRIGATION, LIST CROP TYPE	SEASON OR MONTHS WHEN WATER WAS USED	ACTUAL RATE OR VOLUME USED (CFS, GPM, OR AF)
Well	**Irrigation**	**Park Landscaping, Turf, Wetlands, Decorative**	**March 1 - October 31**	**0.134 cfs**
Well	**Agriculture**	**N/A**	**March, April, October, November**	**0.125 cfs**
Well	**Pond Maintenance**	**N/A**	**Year Round**	**0.10 cfs**
Well	**Storage**	**N/A**	**Year Round**	**0.234 cfs**
Total Quantity of Water Used				**0.234 cfs Maximum Rate**

4. Provide a general narrative description of the distribution works. This description must trace the water system from **each** point of diversion or appropriation to the place of use:

Water is pumped from aquifer by submersible well pump into the lake (well log DESC 59793). Water is then pumped out of the lake into the irrigation system by a skid-mounted package irrigation pump station. Lake is excavated out during mass grading of the site. Lake is lined with polyethylene liner with welded seams.

The well has a submersible 15HP well pump that operates based on lake level. The well pump discharges through 3" diameter galvanized steel drop pipe, up through the well house where the flow is metered. Water is then discharged into the far ends of the lake through 3" HDPE discharge lines.

The package irrigation skid mounted pump station consists of a submersible pump sitting in a wet well. Wet well is connected to lake by a 10" ductile iron pipe with a self-cleaning screen. Pump station consists of a PLC, 15HP pump, variable frequency drive, filter, and control panel.

Irrigation system generally consists of 4" Sch. 40 and 3" CL200 PVC mainline and smaller 1", 1-1/2", 2" and 3" CL200 PVC lateral piping that distributes water to pop-up spray sprinklers, pop-up rotor sprinklers, and tree bubblers. There are 54 different zones that are operated in different combinations by the PLC based on irrigation needs.

Reminder: The map associated with this claim must identify the location of the point(s) of diversion, Donation Land Claims (DLC), Government Lots (GLot), and Quarter-Quarters (QQ).

5. Variations:

Was the use developed differently from what was authorized by the permit, permit amendment final order, or extension final order? If yes, describe below. **YES**

(e.g. *"The permit allowed three points of diversion. The water user only developed one of the points."* or *"The permit allowed 40.0 acres of irrigation. The water user only developed 10.0 acres."*)

The permit allowed 10.0 acres of irrigation, and surface area of reservoirs of 8.0 acres. The water user developed 10.0 acres of irrigation and the lake/reservoir has a surface area of 2.68 acres.

6. Claim Summary:

POD / POA NAME OR #	MAXIMUM RATE AUTHORIZED	CALCULATED THEORETICAL RATE BASED ON SYSTEM	AMOUNT OF WATER MEASURED	USE	# OF ACRES ALLOWED	# OF ACRES DEVELOPED
Well	**0.234 cfs**	**124gpm (well pump)**	**107 gpm – 140 gpm**	**Irrigation and reservoir fill**	**10.0**	**10.0**

SECTION 4

SYSTEM DESCRIPTION

Are there multiple PODs or POAs? **NO**

If *"YES"* you will need to copy and complete Sections 4B through 4G for each POD/POA.

POD/POA Name or Number this section describes (only needed if there is more than one):

N/A

A. Place of Use

1. Is the right for municipal use? **NO**

If "YES" the table below may be deleted.

TWP	RNG	MER	SEC	QQ	GLOT	DLC	USE	IF IRRIGATION, # PRIMARY ACRES	IF IRRIGATION, # SUPPLEMENTAL ACRES
17S	11E	W.M.	36	NW NW			Agriculture, Irrigation, Pond Maintenance, & Storage	3.55 Acres	0 Acres
17S	11E	W.M.	36	SW NW			Agriculture, Irrigation, Pond Maintenance, & Storage	6.45 Acres	0 Acres
Total Acres Irrigated								10.0 Acres	0 Acres

Reminder: The map associated with this claim must identify Donation Land Claims (DLC), Government Lots (GLot), Quarter Quarters (QQ), and if for irrigation, the number of acres irrigated within each projected DLC, GLot, and QQ.

B. Diversion and Delivery System Information

Provide the following information concerning the diversion and delivery system. Information provided must describe the equipment used to transport and apply the water from the point of diversion/appropriation to the place of use.

1. Is a pump used? **YES**

If "NO" items 2 through item 6 may be deleted.

2. Pump Information

MANUFACTURER	MODEL	SERIAL NUMBER	TYPE (CENTRIFUGAL, TURBINE OR SUBMERSIBLE)	INTAKE SIZE	DISCHARGE SIZE
Franklin Electric	100STS15D 6B 9-Stage	N/A	Submersible (well pump from aquifer to lake)	N/A, Submersible Pump.	3"
Goulds	VIS-T 6CHC 3-Stage	N/A	Submersible (Irrigation pump from lake to irrigation system)	N/A, Submersible Pump.	3"

3. Motor Information

MANUFACTURER	HORSEPOWER
Well Pump – Franklin Electric	**15 HP**
Irrigation pump - CentriPro	**15 HP**

4. Theoretical Pump Capacity

HORSEPOWER	OPERATING PSI	LIFT FROM SOURCE TO PUMP *IF A WELL, THE WATER LEVEL DURING PUMPING	LIFT FROM PUMP TO PLACE OF USE	TOTAL PUMP OUTPUT (IN CFS)
Irrigation pump – 15HP	**N/A - No pressure gauge**	**302.21' from pump station finish floor to pumping water level.**	**-2.5' from finish floor of pump station down to lake water surface**	**0.27cfs = 124gpm**
Irrigation pump – 15HP	**60psi**	**2.5' from water level to finish floor of pump station**	**33.50' from finish floor of pump station to highest sprinkler**	**0.56cfs= 252gpm**

5. Provide pump calculations:

Well Pump:

Lake Elevation=3730.00'
Finish Floor of Pump House Elevation = 3732.50'
Top of casing elevation=3732.50+3.04'=3735.54'
Pumping water level from top of casing=305.2'
Pumping water elevation=3430.34'

Total Lift=Lake Elevation-Pumping Water Elevation = 3730.00-3430.34'=299.66'

Friction Loss:
357LF of 3" galvanized pipe at 105gpm
85LF of 3" PVC pipe at 105gpm
300LF of 3" PVC pipe at 52.5gpm (flow is split between two discharge pipes)

$$\frac{10.44x357x105^{1.85}}{100^{1.85}x3^{4.87}} + \frac{10.44x85x105^{1.85}}{120^{1.85}x3^{4.87}} + \frac{10.44x300x52.5^{1.85}}{120^{1.85}x3^{4.87}} = 25.6 \text{ feet}$$

Total Head = 299.7' + 25.6' = 325.3'
Installed Franklin pump has approximate efficiency of 68% at 105gpm
Theoretical $Q_{pump} = \frac{HP \times eff \times 550}{62.4 lb/ft^3 \times head} = \frac{15HP \times 0.68 \times 550}{62.4 \times 325.3}$ = **0.27cfs = 124gpm**

Irrigation Pump:

Lake Elevation=3730.00'
Finish Floor of Pump House Elevation = 3732.50'
Highest Sprinkler Elevation=3766.00'

Total Lift=3766.00-3730.00=36'

Utilize OWRD methodology assuming 10% of pressure at discharge for headloss, and 80% efficiency for submersible pumps:
60psi = 138.6ft X 1.10 = 152.4 feet
Total Head=36'+152.4' = 188.4 feet

Theoretical $Q_{pump} = \frac{(horsepower)(pump\ efficiency\ factor)}{(total\ head\ in\ feet)} = Q$ in cfs

$= \frac{15HP \times 7.04 ft^4/s/HP}{188.4 ft}$ = **0.56 cfs = 252gpm**

6. Measured Pump Capacity (using meter if meter was present and system was operating)

	Initial Meter Reading	Ending Meter Reading	Duration of Time Observed	Total Pump Output (in cfs)
Well Pump	**4082.0X1000gal**	**4105.5X1000gal**	**3 hrs, 0 min., 45s**	**0.290cfs (130gpm)**
Irrigation Pump	**N/A – PLC touch screen displayed hertz and amps for irrigation pump. Pump has rated capacity of 240gpm at 185ft.**			

Reminder: For pump calculations use the reference information at the end of this document.

7. Is the distribution system piped? **YES**

If "NO" items 8 through item 11 may be deleted.

8. Mainline Information

Mainline Size	Length	Type of Pipe	Buried or Above Ground
4"	40 LF	Ductile Iron	Buried
4"	4,189 LF	PVC	Buried

9. Lateral or Handline Information

Lateral or Handline Size	Length	Type of Pipe	Buried or Above Ground
3" Lateral	Not Available	PVC	Buried
2" Lateral	Not Available	PVC	Buried
1-1/2" Lateral	Not Available	PVC	Buried
1" Lateral	Not Available	PVC	Buried
Hand watering occurs on trees located west of path north and west of pump house	Not Available	N/A	Above Ground, hose and buckets

10. Sprinkler Information

Size	Operating PSI	Sprinkler Output (GPM)	Total Number of Sprinklers	Maximum Number Used	Total Sprinkler Output (CFS)
½" RWS-B-C-1402 (bubbler – root watering system)	30 psi	0.5 gpm	512	Max. number in a single zone is 90. Max single zone output 45.00 gpm per landscape designer.	Max irrigation pump station output is 125gpm per Botanical Development. Pump station combines zones automatically to optimize irrigation operations, and it is unknown which combination of zones is running simultaneously. As park is new, it is expected that the operations of the pump station will be adjusted over time by Bend Park 7 Rec. Dist. Staff to maximize irrigation efficiency and adjust watering amounts to specific areas.
4" 5004-PL-PC/FC (pop-up rotor)	45 psi	4.0 gpm (max per RainBird) 1.6 gpm (per landscape designer)	77	Max. number in a single zone is 40. Max. single zone output 63.72 gpm per landscape designer.	
4" 5004-PL-PC/FC (pop-up rotor)	60 psi	4.6 gpm (max per RainBird) 1.7 gpm (per landscape designer)	45	Max. number in a single zone is 45. Output 78.31 gpm per landscape designer.	
6" 5006-PL-PC/FC (pop-up rotor)	45 psi	6.01 gpm (max per RainBird) 2.1gpm (per landscape designer)	36	Max. number in a single zone is 18. Max single zone output 37.26 gpm per landscape designer.	
4" 6504-F4-PC/FC (pop-up rotor)	60 psi	4.0-17.1 gpm (depends on nozzle size per RainBird) 5.7 gpm (max per landscape designer)	184	Max. number in a single zone is 22. Max. single zone output 102.00 gpm (18 head zone) per landscape designer	
6" 1806 W/MP ROT (pop-up spray head)	40 PSI	1.5 gpm (max per landscape designer)	164	Max. number is a single zone is 54. Max single zone output 51.46 gpm (34 head zone) per landscape design	

Reminder: For sprinkler output determination use the reference information at the end of this document.

11. Pivot Information

Manufacturer	Maximum Wetted Radius	Operating PSI	Total Pivot Output (GPM)	Total Pivot Output (CFS)
N/A – no pivot	--	--	--	--

12. Additional notes or comments related to the system:

Number of sprinklers listed is approximate and is best estimate based on design files and observed operations. Pressure in psi listed is pressure at control valve for the zone.

C. Groundwater Source Information (Well and Sump)

1. Is the appropriation from ground water (well or sump)? **YES**

If "NO", items 2 through 8 relating to this section may be deleted.

2. Describe the access port (type and location) or other means to measure the water level in the well:

1/2" access hole with removable threaded metal cap in top of well cap. ½" PVC conduit down to top of pump.

3. If well logs are not available, provide as much of the following information as possible:

Casing Diameter	Casing Depth	Total Depth	Completion Date of Original Well	Completion Dates of Alterations	Who the well was drilled for	Well drilled by
8"	475'	475'	09/03/2013	N/A	West Bend Property Co.	ABBAS Well Drilling

4. In addition to the information requested in item "3" above, provide any other information which may help the Department locate any well logs associated with this appropriation.

Start card 1020894

5. Is the appropriation from a dug well (sump)? **NO**

If "NO", items 6 through 8 relating to this section may be deleted.

Reminder: Construction standards for sumps can be found in OAR 690-210-0400.

D. Storage

1. Does the distribution system include in-system storage (e.g. storage tank, bulge in system / reservoir) **YES**

If "NO", item 2 and 3 relating to this section may be deleted.

If "YES" is it a: Storage Tank **NO**

Bulge in System / Reservoir **YES**

Complete appropriate table(s), unused table may be deleted.

2. Storage Tank:

Material (concrete, fiberglass, metal, etc.)	Capacity (in gallons)	Above Ground or Buried
N/A, no storage tank		

3. Bulge in System / Reservoir:

Reservoir Name or Number (correspond to map)	Approximate Dam Height	Approximate Capacity (in acre feet)
Discovery Park Lake	N/A, No Dam. Excavated Lake with liner.	12.6 Ac-Ft to Normal Operating Level

E. Gravity Flow Pipe

(THE DEPARTMENT TYPICALLY USES THE HAZEN-WILLIAM'S FORMULA FOR A GRAVITY FLOW PIPE SYSTEM)

1. Does the system involve a gravity flow pipe? **NO**

If "NO", items 2 through 4 relating to this section may be deleted.

F. Gravity Flow Canal or Ditch

(THE DEPARTMENT TYPICALLY USES MANNING'S FORMULA FOR CANALS AND DITCHES)

1. Is a gravity flow canal or ditch used to convey the water as part of the distribution system? **NO**

If "NO", items 2 through 4 relating to this section may be deleted.

G. Reservoir

1. Does the claim involve a reservoir modified through a transfer? **NO**

Reminder: Complete this section if the reservoir right has been modified through the transfer process. If the claim is for a permitted reservoir use the Claim of Beneficial Use form for reservoirs.

If "NO", items 2 through 9 relating to this section may be deleted.

SECTION 5

CONDITIONS

All conditions contained in the permit, permit amendment, transfer final order, or any extension final order shall be addressed. Reports that do not address all performance related conditions will be returned.

1. Time Limits:

Permits, transfer final orders, and any extension final orders contain any or all of the following dates: the date when the actual construction work was to begin, the date when the construction was to be completed, and the date when the complete application of water to the proposed use was to be completed. These dates may be referred to as ABC dates. Describe how the water user has complied with each of the development timelines established in the permit, extension or transfer final order:

	DATE FROM PERMIT OR TRANSFER	DATE ACCOMPLISHED*	DESCRIPTION OF ACTIONS TAKEN BY WATER USER TO COMPLY WITH THE TIME LIMITS
ISSUANCE DATE	**January 21, 2010**		
BEGIN CONSTRUCTION (A)	**N/A**	**Well Construction started August 2013 and Park Construction=2014**	**Began construction of well and park.**
COMPLETE CONSTRUCTION (B)	**January 21, 2015**	**January 1, 2015**	**Completed construction of irrigation system and park facilities**
COMPLETE APPLICATION OF WATER (C)	**January 21, 2015**	**January 1, 2015**	**Irrigated land for beneficial use**

* MUST BE WITHIN PERIOD BETWEEN PERMIT, TRANSFER FINAL ORDER, OR ANY EXTENSION FINAL ORDER ISSUANCE AND THE DATE TO COMPLETELY APPLY WATER

2. Is there an extension final order(s)? **NO**

If "NO", you may delete item 3 in this section.

4. Initial Water Level Measurements:

a. Was the water user required to submit an initial static water level measurement? **NO**

If "NO", items 4b through 4d relating to this section may be deleted.

5. Annual Static Water Level Measurements:

a. Was the water user required to submit annual static water level measurements? **NO**

If "NO", items 5b through 5e relating to this section may be deleted.

6. Pump Test (Required for most ground water permits prior to issuance of a certificate)

a. Did the permit require the submittal of a pump test? **YES**

If "NO", items 6b through 6e relating to this section may be deleted.

b. Has the pump test been previously submitted to the Department? **NO**

c. Is the pump test attached to this claim? **YES**

d. Has the pump test been approved by the Department? **NO**

e. Has a pump test exemption been approved by the Department? **NO**

**** Claims will not be reviewed until a pump test or exemption has been approved by the Department**

7. Measurement Conditions:

a. Does the permit, permit amendment, transfer final order, or any extension final order require the installation of a meter or approved measuring device? **YES**

If "NO", items 7b through 7f relating to this section may be deleted.

Reminder: If a meter or approved measuring device was required, the COBU map must indicate the location of the device in relation to the point of diversion or appropriation.

b. Has a meter been installed? **YES**

c. Meter Information

POD/POA NAME OR #	MANUFACTURER	SERIAL #	CONDITION (WORKING OR NOT)	CURRENT METER READING	DATE INSTALLED
Well	**Seametrics**	**0920140 02876**	**Working**	**4080500 gallons**	**2014**

If a meter has been installed, items 7d through 7f relating to this section may be deleted.

8. Recording and reporting conditions

a. Is the water user required to report the water use to the Department? **YES**

If "NO", item 8b relating to this section may be deleted.

b. Have the reports been submitted? **YES**

METHOD OF SUBMITTING REPORT (PAPER OR ELECTRONIC)	WATER USER REPORTING ID
Electronic	**65925 & 64116 – note that this was done for 2014 when property was owned by West Bend Property Company, prior to sale to Bend Park & Recreation District.**

If the reports have not been submitted, attach a copy of the reports if available.

9. Fish Screening

a. Are any points of diversion required to be screened to prevent fish from entering the point of diversion? **NO**

If "NO", items 9b through 9e relating to this section may be deleted.

10. By-pass Devices

a. Are any points of diversion required to have a by-pass device to prevent fish from entering the point of diversion? **NO**

If "NO", items 10b and 10c relating to this section may be deleted.

11. Other conditions required by permit, permit amendment final order, extension final order, or transfer final order:

a. Were there special well construction standards? **NO**

b. Was submittal of a ground water monitoring plan required? **NO**

c. Was the water user required to restore the riparian area if it was disturbed? **NO**

d. Was a fishway required? **NO**

e. Was submittal of a letter from an engineer required prior to storage of water? **NO**

f. Was submittal of a water management and conservation plan required? **NO**

g. Other conditions? **YES**

If "YES" to any of the above, identify the condition and describe the water user's actions to comply with the condition(s):

Water user was required to mitigate per Deschutes Basin Mitigation rules. User mitigated 31.6 acre-feet by way of Mitigation Projects.

SECTION 6
ATTACHMENTS

Provide a list of any additional documents you are attaching to this report:

ATTACHMENT NAME	DESCRIPTION
Appendix A	**Pump Test**
Appendix B	**OWRD Water Right Documentation**
Appendix C	**Well Log**
Appendix D	**Site Photographs**
Appendix E	**Irrigation System Information**
Appendix F	**2014 Water Use Reporting**
Appendix G	**Waiver from mapping standards (OWRD staff email)**

SECTION 7
CLAIM OF BENEFICIAL USE MAP

The Claim of Beneficial Use Map must be submitted with this claim. Claims submitted without the Claim of Beneficial Use map will be returned. The map shall be submitted on poly film at a scale of 1" = 1320 feet, 1" = 400 feet, or the original full-size scale of the county assessor map for the location.

Provide a general description of the survey method used to prepare the map. Examples of possible methods include, but are not limited to, a traverse survey, GPS, or the use of aerial photos. If the basis of the survey is an aerial photo, provide the source, date, series and the aerial photo identification number.

The basis of survey was to utilize the design and as-built AutoCAD files from the Landscape Architect and Civil Engineer. The park constructed features were staked out based on this design. During site visits for this Claim, field verifications of the improvements was made. Irrigation coverage shown on map for trees within dog park at south end of project is best estimate, as is hand watered area north and west of pump house.

Map Checklist

Please be sure that the map you submit includes ALL the items listed below.
(Reminder: Incomplete maps and/or claims may be returned.)

☒ Map on polyester film

☒ Appropriate scale (1" = 400 feet, 1" = 1320 feet, or the original full-size scale of the county assessor map) **NOTE: Received waiver to use 1"=100' scale from Gerry Clark, see attached email.**

☒ Township, Range, Section, Donation Land Claims, and Government Lots

- ☒ If irrigation, number of acres irrigated within each projected Donation Land Claims, Government Lots, Quarter-Quarters
- ☒ Locations of fish screens and/or fish by-pass devices in relationship to point of diversion
- ☒ Locations of meters and/or measuring devices in relationship to point of diversion or appropriation
- ☒ Conveyance structures illustrated (pumps, reservoirs, pipelines, ditches, etc.)
- ☒ Point(s) of diversion or appropriation (illustrated and coordinates)
- ☒ Tax lot boundaries and numbers
- ☒ Source illustrated if surface water **NOTE: Groundwater, not surface water**
- ☒ Disclaimer ("This map is not intended to provide legal dimensions or locations of property ownership lines")
- ☒ Application and permit number or transfer number
- ☒ North arrow
- ☒ Legend
- ☒ CWRE stamp and signature

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Appendix A

Pump Test

Oregon Water Resources Department

PUMP TEST FORM COVER SHEET

Well Owner:
Name: BEND Park & Recreation District
Address: 799 SW Columbia St
County: Deschutes
City: BEND State: OR Zip: 97702
Original owner (from well log): WEST BEND PROPERTY CO.

Well Location:
Township: 17 S (N/S) Range: 11 E (E/W)
Section: 36 ¼: NW 1/16: NW 1/64: ____.
Well depth: 475 Date drilled: 9/3/2015
Owners well no. (if any): ____
POD ID: DISCOVERY PARK WELL

Water Right Information:
Application: G-15074 Permit: G-16625 Certificate: N/A
Is this well listed on more than one water right? ☐ Yes If yes, list additional water rights below:
Application: ____ Permit: ____ Certificate: ____
Application: ____ Permit: ____ Certificate: ____

Pump Test:
Test Conducted by: NIALL BOGGS, PE, CWRE Well Owner? ☐ Yes
Company: Parametrix
Address: 595 SW BLUFF DRIVE, SUITE B Date of Test: 05/04/2015
City: BEND State: OR Zip: 97702.
Daytime phone: 541-550-7694

Method of discharge measurement (see our brochure for acceptable methods): Flow Meter
Method of water-level measurement (pick one or enter other method used): Electronic tape w/ 0.01' markings
Length of air line (if used): NA.

Pump type (pick one or enter other method used): SUBMERSIBLE
Was the pump test conducted during normal use of the well? ☒ Yes Note: Approx. 64 hours of idle time prior to test

Are you aware of any wells, other than domestic or stock wells, pumping within 1000 feet of the tested well during the test or within 24 hours prior to the test? ☐ Yes Note: NONE KNOWN
If yes, give approximate distances to each and approximate pumping rate of each. If possible, indicate if they were turned on or off during the test: ____

Is there a lake, stream or other surface water body within ¼ mile of the tested well? ☒ Yes If yes, give approximate distance from the well and approximate elevation difference between the surface water and the well head. Approx. distance: 40 ft Approx. elevation difference: 5.54 ft

Well elevation is ABOVE surface water body.

Description of measuring point (e.g. top port of 1 inch port pipe, west side) ½" access hole w/ removable threaded cap in top of well head. ½" PVC conduct down to top of well pump
Measuring point distance above land surface 3.04 feet.

Static water level measurements: (A minimum of three measurements are required in the hour before pumping begins at no less than 20 minutes apart):

Time	Depth to water below meas. point	Depth to water below land surface
9:15	305.03	301.99
9:20	305.02	301.98
3:00 pm on 5-1-2015	305.02	301.98

Discharge measurements: (A discharge measurement is required at the start of pumping and at least once an hour during the test; additional measurements should be noted on the Pump Test Data Sheet):

Time	Discharge Rate	Discharge Units (e.g. gpm, cfs, etc)
9:23	125.2	gpm
10:23	139	gpm
11:30	141.8	gpm
12:23	110.7	gpm
1:23	108	gpm

Time pump turned on: Date 5-4-2015 Time 9:23 AM
Time pump turned off: Date 5-4-2015 Time 1:24 pm
Total pumping time: 4 hours 1 minutes

Note: Well must be idle for at least 16 hours prior to the test.
Additional forms can be obtained from our web site at: http://www.wrd.state.or.us OWRD 2/9/2000

Required Signature: [signature]

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MEASURING POINT = TOP OF CASING 36½" = 3.04 ft

Oregon Water Resources Department

pump station clock 10:02:30 AM = 36:26 on stop watch = 9:59 am iphone clock

PUMP TEST DATA SHEET

WELL PUMP SHUT DOWN SINCE FRIDAY AFTERNOON

Application: G-15074 Permit: G-16625 Certificate: ______ Pod_Id: DESC 59793

All water-level measurements must either be in feet and inches, or feet and decimal fractions.

1-10 Every 2; 10-30 Every 5

Drawdown Data / Recovery Data

Date	Time	Time Since Pump Started (minutes)	Depth to Water Below Measuring Pt	Depth to Water Below Land Surface	Comments	Date	Time	Time Since Pump Stopped (minutes)	Depth to Water Below Measuring Pt	Depth to Water Below Land Surface	Comments
5-4-2015	9:15 AM	—	305^{03}	301^{99}	Static Level	5-4-2015	1:21	0:00:00	305^{18}	302^{14}	
5-1-2015	3:00 pm		305		Static Leve		1:24:45	0:00:45	305^{16}	302^{12}	
5-4-2015	9:20 am		305^{02}	301^{98}	Static		1:25:09	0:01:09	305^{10}	302^{06}	
5-4-2015	9:23:19	0:00:00	305^{02}				1:25:45	0:01:45	305^{10}	302^{06}	
					water pumping		1:26:08	0:02:08	305^{08}	302^{04}	
					@ 25 seconds		1:27:08	0:03:08	305^{06}	302^{02}	
	9:24:56	0:01:37	305^{20}	302^{16}	125.2 gpm		1:27:49	0:03:49	305^{05}	302^{01}	
		0:02:02	305^{20}	302^{16}	129.4 gpm		1:28:17	0:04:17	305^{04}	302^{00}	
		0:03:45	305^{20}	302^{16}	131.0 gpm		1:29	0:05:00	305^{05}	302^{01}	
		0:04:45	305^{20}	302^{16}	126 gpm		1:30:05	0:06:05	305^{03}	301^{99}	
		0:06:15	305^{25}	302^{21}	120 gpm		1:31	0:07:00	305^{04}	302^{00}	
		0:07:00	305^{25}	302^{21}	123.7 gpm		1:32	0:08:00	305^{03}	301.99	
		0:08:00	305^{20}	302^{16}			1:33	0:09:00	305^{03}	301.99	
		0:09:00	305^{02}	301^{98}	128.6 gpm		1:34	0:10:00	305^{03}	301.99	
		0:10:00	305^{04}	302^{07}			1:35	0:11:00	305^{03}	301.99	
		0:16:00	305^{15}	302^{11}	133 gpm		1:37	0:13:00	305^{03}	301.99	
		0:16:44	305^{15}	302^{11}	134.4 gpm		1:38	0:14:00	305^{03}	301.99	
		0:18:37	305^{18}	302^{14}	117.6 gpm		1:39	0:15:00	305^{03}	301.99	
		19:42	305^{19}	302^{15}	118 gpm						
		21:37	305^{20}	302^{16}	119 gpm						
		24:45	305^{17}	302^{13}	120.9 gpm						
		30:25	305^{18}	302^{14}	130.6 gpm						
		42:51	305^{18}	302^{14}	118.7 gpm						
		45:00	305^{19}	302^{15}	113 gpm						
		57:47	305^{19}	302^{15}	138 gpm						
	10:23:35	59:10	305^{18}	302^{14}	139 gpm						
		1:25:00	305^{19}	302^{15}	Not good reading ... oil no difference						
		1:34:45	305^{19}	302^{18}	140 gpm						
		1:43:50	305^{19}	302^{15}	141 gpm						
		1:55:00	305^{20}	302^{16}							
	11:30:25	2:06:00	305^{20}	302^{16}	141.8 gpm						
		2:18:30	305^{19}	302^{15}	139.7 gpm						
		2:38:00	305^{20}	302^{16}	141.6 gpm						
		2:52:00	305^{20}	302^{16}	141.4 gpm						
	12:23:41	3:00:22	305^{20}	302^{16}	110.7 gpm						
		3:05:00	305^{19}	302^{15}	107 gpm						
	12:43:49	3:20:30	305^{19}	302^{15}	107.9 gpm						
		3:31:00	305^{18}	302^{14}	107.8 gpm						
		3:41:30	305^{18}	302^{14}	106.4						
	1:23:19	4:00:00	305^{18}	302^{14}	108 gpm						

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Appendix B

OWRD Water Right Documentation

STATE OF OREGON

COUNTY OF DESCHUTES

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

WEST BEND PROPERTY CO., LLC.
2754 NW CROSSING DRIVE, SUITE 201
BEND, OR 97701

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: G-15074

SOURCE OF WATER: A WELL IN DESCHUTES RIVER BASIN

PURPOSE OR USE: AGRICULTURE AND IRRIGATION USE ON 10.0 ACRES, POND MAINTENANCE, AND STORAGE FOR RECREATION USE

SURFACE AREA OF RESERVOIRS: NOT TO EXCEED 8.0 ACRES

MAXIMUM RATE: NOT TO EXCEED 0.234 CUBIC FOOT PER SECOND (CFS), FURTHER LIMITED BY USE AND VOLUME (ACRE-FEET (AF)) AS SHOWN IN TABLE BELOW

MAXIMUM RATE, MAXIMUM ANNUAL VOLUME, AND PERIOD OF USE:

USE	RATE CFS	VOLUME AF	SEASON
AGRICULTURE	0.134	6.67	MARCH, APRIL, OCTOBER, AND NOVEMBER
IRRIGATION	0.125	18.0	MARCH 1 THROUGH OCTOBER 31
POND MAINTENANCE	0.10	6.93	YEAR-ROUND
STORAGE	0.234	6.93	YEAR-ROUND

DATE OF PRIORITY: DECEMBER 23, 1999

WELL LOCATION: NE ¼ NW ¼, SECTION 36, T17S, R11E, W.M.; 1300 FEET SOUTH & 1400 FEET EAST FROM NW CORNER, SECTION 36

The amount of water used for irrigation under this right, together with the amount secured under any other right existing for the same lands, is limited to a diversion of ONE-EIGHTIETH of one cubic foot

per second and 3.0 acre-feet for each acre irrigated during the irrigation season of each year.

THE PLACE OF USE IS LOCATED AS FOLLOWS:

Agriculture and Irrigation:

Twp	Rng	Mer	Sec	Q-Q	Acres
17 S	11 E	WM	36	NE NW	1.8
17 S	11 E	WM	36	NW NW	5.0
17 S	11 E	WM	36	SW NW	2.4
17 S	11 E	WM	36	SE NW	0.8

Pond Maintenance and Storage:

Twp	Rng	Mer	Sec	Q-Q
17 S	11 E	WM	36	NW NW
17 S	11 E	WM	36	SW NW

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a totalizing flow meter or other suitable measuring device, as approved by the Director, at each point of appropriation and diversion. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

Use of water under authority of this permit may be regulated if analysis of data available after the permit is issued discloses that the appropriation will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway in quantities necessary for recreation, fish and wildlife in effect as of the priority date of the right or as those quantities may be subsequently reduced.

The use of groundwater allowed under the terms of this permit will not be subject to regulation for Scenic Waterway flows so long as mitigation is maintained.

GROUND WATER MITIGATION CONDITIONS

Mitigation Obligation:	31.6 acre-feet in the General Zone of Impact located anywhere on the Deschutes River above the Madras gage, below Lake Billy Chinook.
Mitigation Source:	11.2 acre-feet of mitigation water generated by Mitigation Project MP-92, established by Instream Certificate 84909, within the General Zone of Impact.
	20.4 mitigation credits generated by Mitigation Project MP-1, established by Instream Certificate 80400, within the General Zone of Impact.

Mitigation water must be legally protected instream for instream use within the General Zone of Impact and committed for the life of the permit and subsequent certificate(s). Regulation of the use and/or cancellation of the permit, or subsequent certificate(s), will occur if the required mitigation is not maintained.

If mitigation is from a secondary right for stored water from a storage project not owned or operated by the permittee the use of water under this right is subject to the terms and conditions of a valid contract, a copy of which must be on file in the records of the Water Resources Department prior to use of water.

The permittee shall provide additional mitigation if the Department determines that average annual consumptive use of the subject appropriation has increased beyond the originally mitigated amount.

Failure to comply with these mitigation conditions shall result in the Department regulating the ground water permit, or subsequent certificate(s), proposing to deny any permit extension application for the ground water permit, and proposing to cancel the ground water permit, or subsequent certificate(s).

STANDARD CONDITIONS

If substantial interference with a senior water right occurs due to withdrawal of water from any well listed on this permit, then use of water from the well(s) shall be discontinued or reduced and/or the schedule of withdrawal shall be regulated until or unless the Department approves or implements an alternative administrative action to mitigate the interference. The Department encourages junior and senior appropriators to jointly develop plans to mitigate interferences.

The wells shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

Completion of construction and application of the water shall be made within five years of the date of permit issuance. If beneficial use of permitted water has not been made before this date, the

permittee may submit an application for extension of time, which may be approved based upon the merit of the application.

Within one year after making beneficial use of water, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner.

Issued JANUARY 21, 2010

E. Timothy Wall for

Phillip C. Ward, Director
Water Resources Department

GROUNDWATER APPROPRIATION APPLICATION MAP
FOR WEST BEND PROPERTY COMPANY, LLC
LOCATED WITHIN THE NW 1/4 SECTION 36, T 17S, R 11E, W.M.
DECEMBER, 1999

Application No. G-15074
Permit No.

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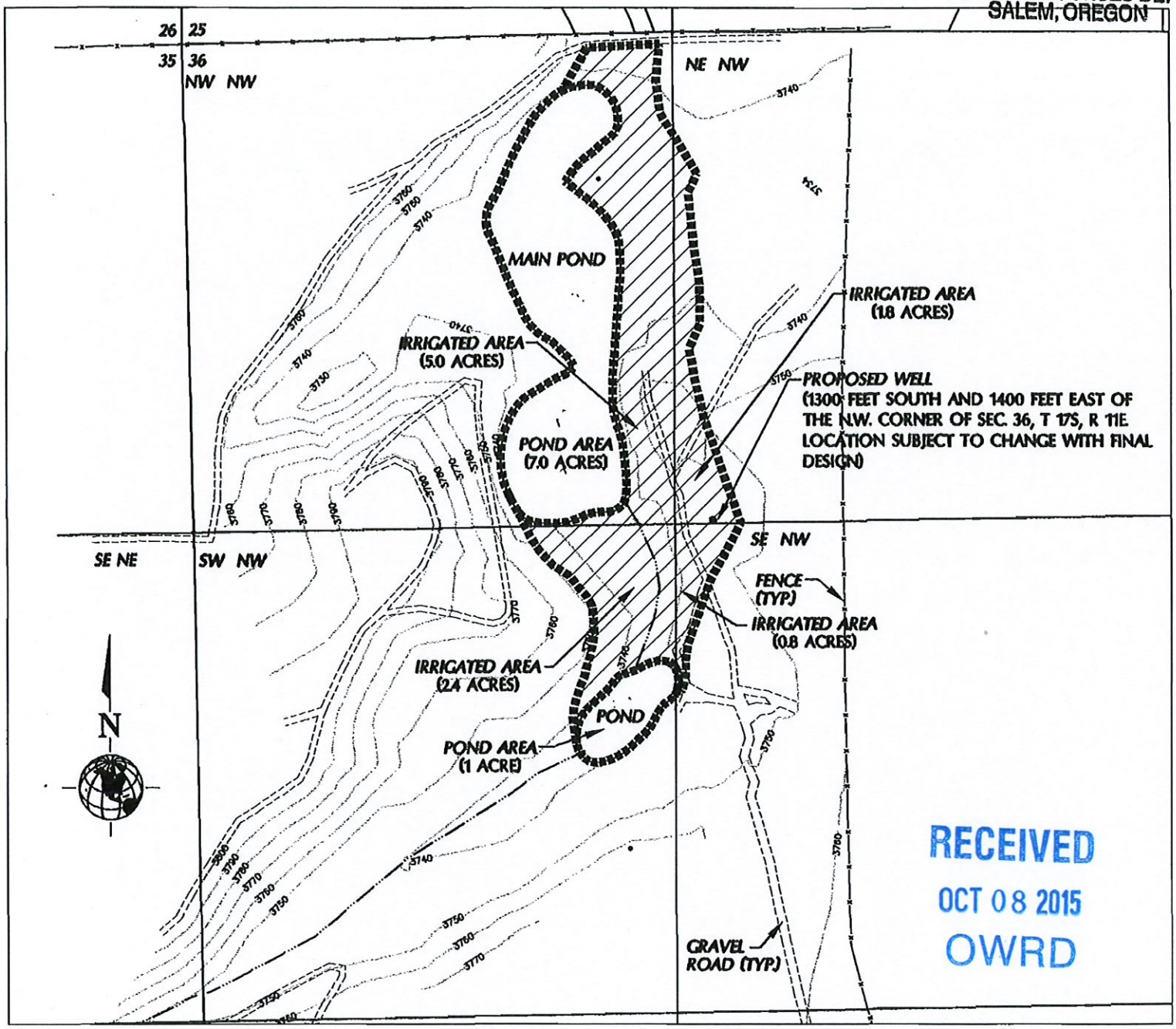
WATER RESOURCES DEPT
SALEM, OREGON



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Note: This map is for the purpose of locating a water right and is not intended to provide the location of property lines or dimensions.

SCALE

400 0 200 400 800

(FEET)

1 INCH = 400 FT.

Registered Professional Engineer
#137
Thomas A. Walker
Nov 19, 1999
STATE OF OREGON
EXPIRES 6-30-00

1326-1001 / Lwbpwr01.dwg

Appendix C

Well Log

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 59793
9/6/2013

WELL I.D. LABEL# L 110018
START CARD # 1020894
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name Last Name
Company WEST BEND PROPERTY COMPANY
Address 2754 NW CROSSING DR SUITE 201
City BEND State OR Zip 97701

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment(complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD

[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE

[ ] Domestic [X] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [ ] (Attach copy)
Depth of Completed Well 475.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
12	0	238	Cement	0	238	286	S
10	238	475					

How was seal placed: Method [ ] A [ ] B [X] C [ ] D [ ] E
[ ] Other
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: [ ] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	8	X	2	475	.250	●	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)
Temp casing [X] Yes Dia 12 From 1 To 36

(7) PERFORATIONS/SCREENS

Perforations Method MACHINE
Screens Type Material

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Casing	8	435	475	.125	3	560	

(8) WELL TESTS: Minimum testing time is 1 hour

○ Pump ○ Bailer ◉ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
200		470	2

Temperature 53 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 17.00 S N/S Range 11.00 E E/W WM
Sec 36 NW 1/4 of the NW 1/4 Tax Lot 300
Tax Map Number Lot
Lat ° ' " or 44.06333333 DMS or DD
Long ° ' " or -121.35972222 DMS or DD
○ Street address of well ◉ Nearest address
MT WASHINGTON DR AND LEMHI PASS DR
BEND,OR

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	9/3/2013			306

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 395.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
8/28/2013	395	475	200			306

(11) WELL LOG

Ground Elevation 3728.00

Material	From	To
COMPACTED BACKFILL PUMICE	0	26
TUFF PUMICE RED	26	50
BASALT SAND BROKEN	50	80
PUMICE CLAY SEAMS	80	125
PUMICE TUFF LIGHT BROWN CLAY	125	175
CLAYSTONE BROWN	175	185
SANDSTONE	185	200
BASALT SOFT	200	295
SANDSTONE CONGLOMEERATE LAYERS	295	360
SANDSTONE CINDERS BLACK	360	395
BASALT VESICULAR CINDERS BLACK	395	455
BASALT GRAY FRACTURED	455	465
CINDERS BLACK	465	475

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Date Started 8/28/2013 Complete 9/3/2013

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 758 Date 9/6/2013
Signed THOMAS R PECK (E-filed)

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1720 Date 9/6/2013
Signed JACK ABBAS (E-filed)
Contact Info (optional)

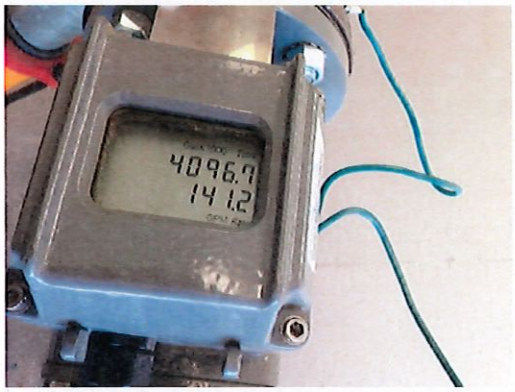
ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version:

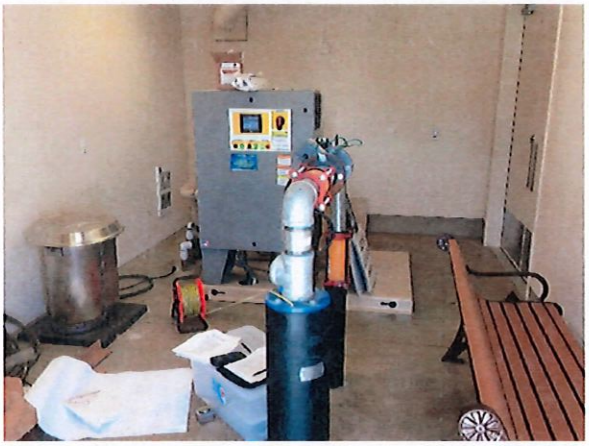
Appendix D

Site Photos

Control Panel for well and irrigation pumps



Well meter



Pump house interior

Irrigation pump station

Appendix E

Irrigation System Information

Abbas Pump Service
P.O. Box 2130
Terrebonne Or. 97760

PAID 10/14/201

TAYLOR NW
C/O TODD TAYLOR
18500 BULL SPRINGS ROAD
BEND OR 97701

Quantity	Description
1	INSTALL AND REMOVE TEST PUMP 357' SET
1	RUN FLOW TEST 3 HRS @ $125.00 PER HOUR-PUMPED 170GPM NO DRAW DOWN
1	F6STS 100 15HP 9STG POE
1	15HP 460V 3 PHASE MOTOR
1	357' OF 3" GALVANIZED PIPE
1	2-3" CHECK VALVES
1	3" FLOW METER
1	WELD ON PITILESS AND CAP
1	HOYA SUB PANEL 460V 3 PHASE
1	387' OF 10/3 SUBMERSIBLE CABLE
1	4X3 BUSHING
1	360' OF 3/4" CLASS 200 PVC
1	INSTALLATION IN WELL
	BROOKS RESOURCE DISCOVERY PARK WELL

INVOICE DUE 30 DAYS FROM DATE OF SERVICE. INTEREST @ RATE OF 18% ON UNPAID BALANCE

WELL DRILLING 548-2787
PUMP SERVICE 548-6887
FAX 923-7509
LICENSED AND BONDED
CCB#158451
WWC# 1720 PI#39CPI

RECEIVED
OCT 08 2015
OWRD

PRECISION PUMPING SYSTEMS

Proposal No: RP14-07-25 01
Item No: ITEM 001

Section 4.1
Pump Data

MANUFACTURER: Goulds
MODEL:VIS-T Size:6CHC 3 Stage(s) QTY:1

Operating conditions

SERVICE	
LIQUID	(70.0 deg F) SP.GR 1.000
LIQUID TYPE	Non Toxic
CAPACITY	240.0 gpm
HEAD	185.0 ft

Performance at 3450 RPM

BOWL EFFY	0.0% @design
RUN OUT CAPACITY	325.9 (gpm) (Min Req.Submerg. 13.15 (in) @ Run out) (1), (2)
POWER	14.62 @design, 6.9 @ Shut off, 15.7 NOL (hp)
TOTAL THRUST	585.2 @ Shut off, 467.0 @design (Lb)
DISCH. PRESSURE	101.4 psi g @ Shut off, 80.5 @design (at bowl)
MIN. FLOW	Continuous Stable: 73.6 gpm Hydraulic: 73.6 gpm Thermal: N/A

(1) for vortex suppression, based on H.I. 1994 Edition
(2) Min Req.Submerg. 12.16 (in) @ Rated

Materials

BOWL	Cast iron with glass enamel standard
IMPELLER	316SS (Enclosed) taper locked
IMPELLER DIA	4.0000 (in)
BOWL SHAFT	416SS 1.0000 (in) diameter
SUCT.ADAPTER BRG	Bronze
BOWL BEARINGS	Bronze
SUCT.ADAPTER	Ductile iron
DOCUMENTATION	Std pump inst. and operation manual and order data

Driver : Motor

FURNISHED BY	Pump mfg
RATING	15.0 hp
PHASE/FREQ/VOLTS	3/60 Hz/460
ACTUAL SPEED	3,483
STATOR HOUSING/SHELL MAT.	304SS
SPLINED COUPLING MAT.	416SS

Manufacturer : CentriPro

MOUNTED BY	Customer
SPEED	3600 RPM
TYPE	Hermetically sealed

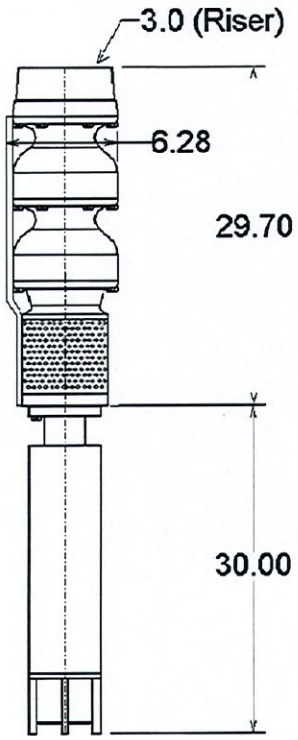
Weights

Total Bowl Weight	95.0 (lb)
Driver Weight	161.0 (lb)
Total Unit Weight	256.0 (lb)

GOULDS WATER TECHNOLOGY

xylem
Let's Solve Water

OUTLINE DRAWING



CUSTOMER PRECISION PUMPING SYSTEMS

P.O. NO.

ITEM NO. ITEM 001

NO. OF UNITS 1

PUMP SIZE 6CHC NO. OF STGS. 3

GPM 240.0 GPM T.D.H. 185.0 FT

LIQUID

SP.GR. 1.000 TEMP. 70.0 DEG F VISC.

COL SIZE 4.0 IN SHAFT 0.0000 IN DIA.

COUPLING GUARD YES ☐ NO ■

DRIVER MFG. CENTRIPRO

HP 15.0 HP RPM 3600 VSS ☐ VHS ☐

PH. 3 CYCLES 60 HZ VOLTS 460

ENCL. MOTOR SIZE 6.0 IN

WEIGHT:

PUMP	95	LB
DRIVER	161	LB
TOTAL	256	LB

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OCT 08 2015
OWRD

NO.	NOTES
1	T.P.L. (TOTAL PUMP LENGTH) IS THE DISTANCE TO LOWEST PROJECTION ON PUMP ± 1.0
2	TOLERANCE ON ALL DIMENSIONS IS ± .12 OR ± .12 PER 5 FT WHICHEVER IS GREATER. TOLERANCE ON ALL PIPING DIMENSIONS IS AS FOLLOWS: DISCH. NOZZLE FLANGE IS ± .25 AUXILIARY CONNECTIONS ARE ± 1.0
3	HT - DISTANCE OF DRIVER FACE TO TOP OF HEADSHAFT.
4	ALL DIMENSIONS SHOWN ARE IN INCHES UNLESS OTHERWISE STATED.
5	DRAWING IS NOT TO SCALE.
6	RECOMMENDED DIAMETER RANGE TO CLEAR PUMP. DRAIN AND COLUMN ASSEMBLY IS 6.28 in
7	1/2" NPT - GAUGE CONN. (PLUGGED)
8	DRIVER MAY BE ROTATED AT 90° INTERVALS ABOUT VERTICAL CENTERLINE. FOR DETAILS REFER TO DRIVER DIMENSION DRAWING.
9	BEFORE STARTING PUMP, IMPELLER MUST BE LIFTED 0.12 in
10	M.A.W.P DISCH.HEAD,DISCH.SIDE =
11	THIS PUMP ASSEMBLY HAS BEEN DESIGNED SO THAT ITS NATURAL FREQUENCY RESPONSES AVOID THE SPECIFIC OPERATING SPEED (OR SPEEDS) BY AN ADEQUATE SAFETY MARGIN. THE DESIGN HAS ASSUMED THE FOUNDATION TO BE RIGID.

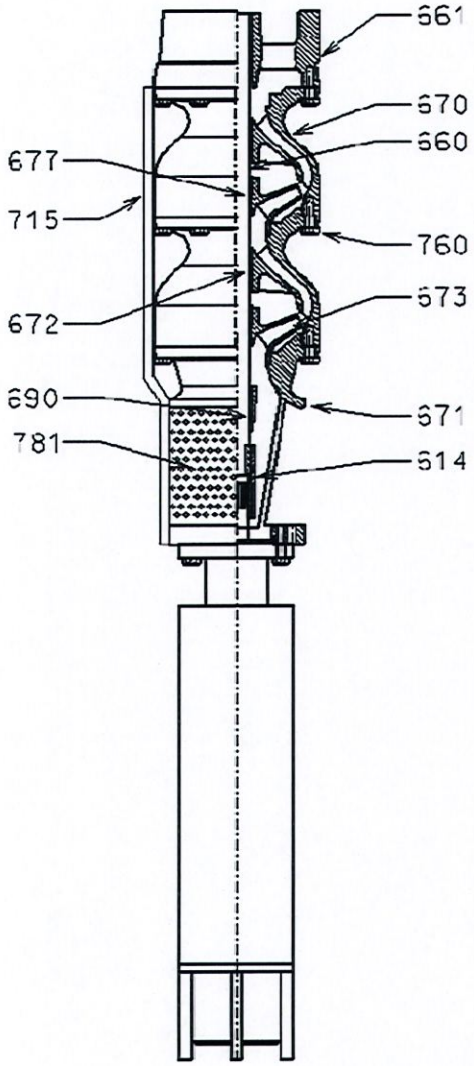
DO NOT USE FOR CONSTRUCTION
UNLESS CERTIFIED

CERTIFIED BY	DATE 07/25/2014
TITLE OUTLINE MODEL VIS-T 6CHC 3 STAGES	
xylem Let's Solve Water / GOULDS WATER TECHNOLOGY a xylem brand	S.O. NUMBER

CROSS SECTIONAL DRAWING

Model VIS-T
Size 6CHC

xylem
Let's Solve Water



BILL OF MATERIAL

Bowl Assembly

ITEM	PART NAME	CODE	MATERIAL	ASTM#
614	COUPLING -- SUB MOTOR	2218	SST 416	A582M-95b
660	BOWL SHAFT	2227	SST 416	A582M-95b
670	BOWL- INTERMEDIATE	6911	CAST IRON CL30 ENAMEL	A48-94e1
671	SUBADAPTER	1018	DUCTILE IRON 65-45-12	A536-84(1999)e1
672	BEARING- INT BOWL	1109	FEDERALLOY BISMUTH BRZ	B584-00
673	IMPELLER	1203	SST 316	A744M-00
677	COLLET- IMPELLER	2242	CARBON STEEL 1018	A108-99
690	BEARING- SUCTION	1109	FEDERALLOY BISMUTH BRZ	B584-00
715	GUARD- CABLE	3215	SST 304	A240M-00
760	CAPSCREW- HEX	2298	STEEL BOLTING GR 8	J429-99
781	SCREEN- SUCTION	3211	SST 316	A240M-00

* Recommended spare parts
\# Items not illustrated

Service:
End User:
Project No:
Item No: ITEM 001
Customer P.O. No:
Serial No:
Customer: PRECISION PUMPING SYSTEMS

DRAWING NO RP14-07-25 01/ITEM 001

CROSS SECTIONAL DRAWING

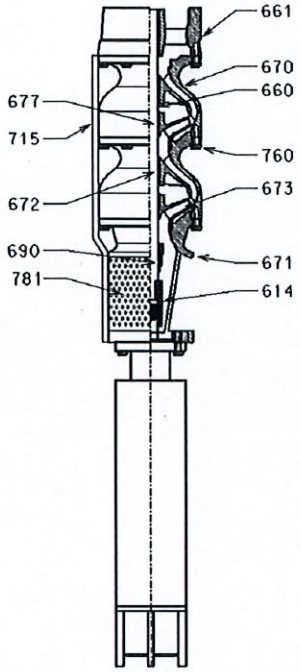
Model VIS-1
Size 6CHC

xylem
Let's Solve Water

BILL OF MATERIAL

Bowl Assembly

ITEM	PART NAME	CODE	MATERIAL	ASTM#
614	COUPLING -- SUB MOTOR	2218	SST 416	A582M-95b
660	BOWL SHAFT	2227	SST 416	A582M-95b
670	BOWL- INTERMEDIATE	6911	CAST IRON CL30 ENAMEL	A48-94e1
671	SUBADAPTER	1018	DUCTILE IRON 65-45-12	A536-84(1999)e1
672	BEARING- INT BOWL	1109	FEDERALLOY BISMUTH BRZ	B584-00
673	IMPELLER	1203	SST 316	A744M-00
677	COLLET- IMPELLER	2242	CARBON STEEL 1018	A108-99
690	BEARING- SUCTION	1109	FEDERALLOY BISMUTH BRZ	B584-00
715	GUARD- CABLE	3215	SST 304	A240M-00
760	CAPSCREW- HEX	2298	STEEL BOLTING GR 8	J429-99
781	SCREEN- SUCTION	3211	SST 316	A240M-00



* Recommended spare parts
\# Items not illustrated

Service:
End User:
Project No:
Item No: ITEM 001
Customer P.O. No:
Serial No:
Customer: PRECISION PUMPING SYSTEMS

DRAWING NO RP14-07-25 01/ITEM 001

Model: VIS-T	Size: 6CHC	60Hz	RPM: 3450	Stages: 3

Job/Inq.No. :
End User :
Item/Equip.No. : ITEM 001
Order No. :

Purchaser : PRECISION PUMPING SYSTEMS
Issued by : Rory Penfold
Quotation No. : RP14-07-25 01
Certified By :

Service :
Date : 07/25/2014
Rev. : 0

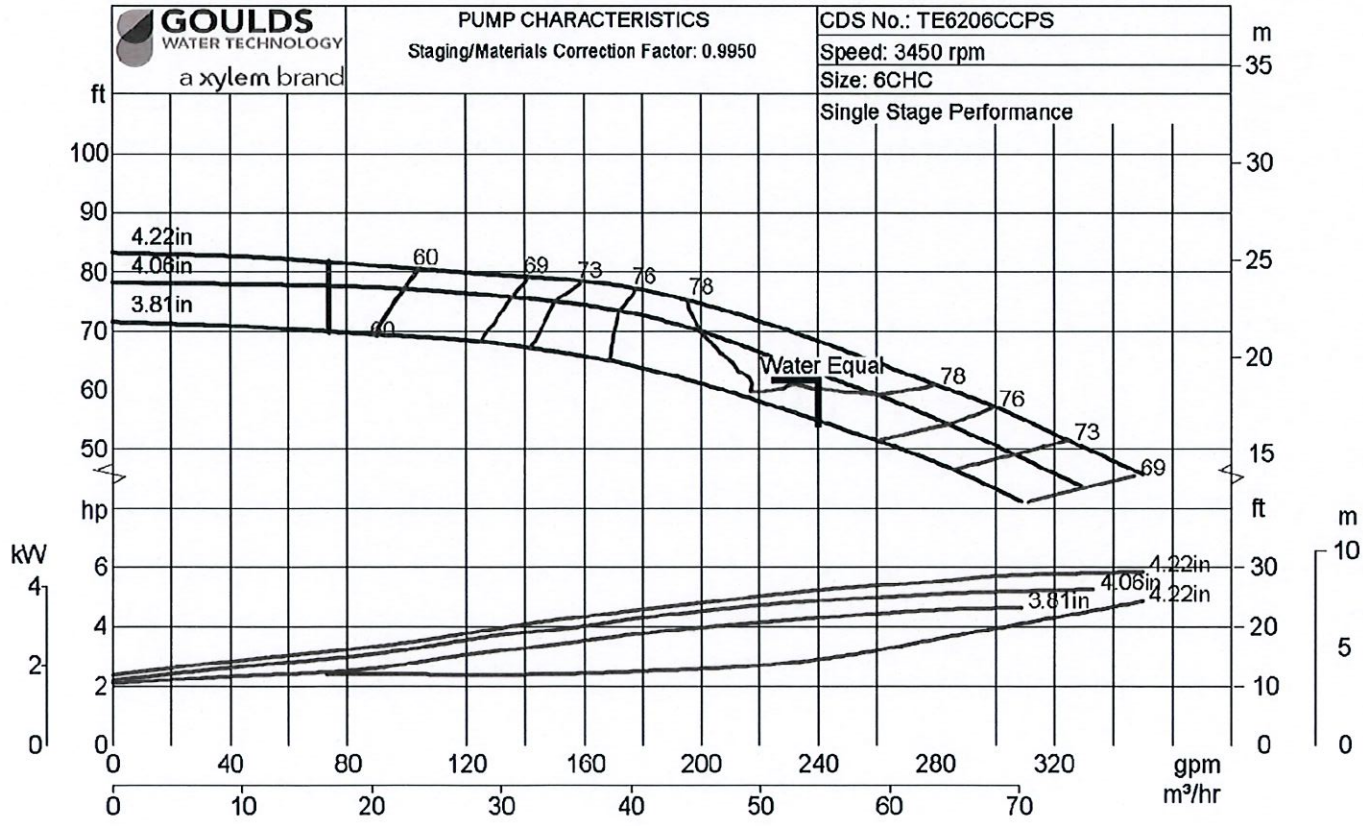
Operating Conditions

Temp.:	70.0 deg F
Design Flow:	240.0 gpm
Design TDH:	185.0 ft
Actual Flow:	240.0 gpm
Actual Bowl Head:	185.9 ft
NPSHa:	
Solid size:	
Bowl Size:	5.8800 in
Liquid:	
S.G./Visc.:	1.000/1.000 cp

Pump Performance

Bowl Efficiency:		Suction Specific Speed:	7,142 gpm(US) ft
Rated Pump Efficiency:	77.1 %	Min. Hydraulic Flow:	73.6 gpm
Rated Total Power:	14.62 hp	Min. Thermal Flow:	N/A
Non-Overloading Power:	15.7 hp		
Imp. Dia. First 1 Stg(s):	4.0000 in	Imp. Dia. Addt'l Stg(s):	4.0000 in
NPSHr:	14.6 ft	Vapor Press:	
Shut off Head:	234.3 ft	Max. Solids Size:	0.2200 in
Max. Lateral:	0.3800 in	Thrust K factor:	2.10
Bowl Material:	Cast iron with glass enamel		
Impeller Material:	316SS		

Notes:
1. Bowl Performance Curve based on Pumping Clear, non-Aerated Water. Rated Point only is guaranteed.
2. Power and efficiency Losses are not reflected on the curve below.
3. For units requiring performance test, all performance tests will be conducted per ANSI/HI 14.6 standards unless otherwise noted in the selection software submittal documents. Test results meeting with grade 2B tolerances for pumps with a rated shaft power of 134HP or less and grade 1B for greater than 134HP will be considered passing.



Model: VIS-T	Size: 6CHC	60Hz	RPM: 3450	Stages: 3

Job/Inq.No. :
End User :
Item/Equip.No. : ITEM 001
Order No. :

Purchaser : PRECISION PUMPING SYSTEMS
Issued by : Rory Penfold
Quotation No. : RP14-07-25 01
Certified By :

Service :
Date : 07/25/2014
Rev. : 0

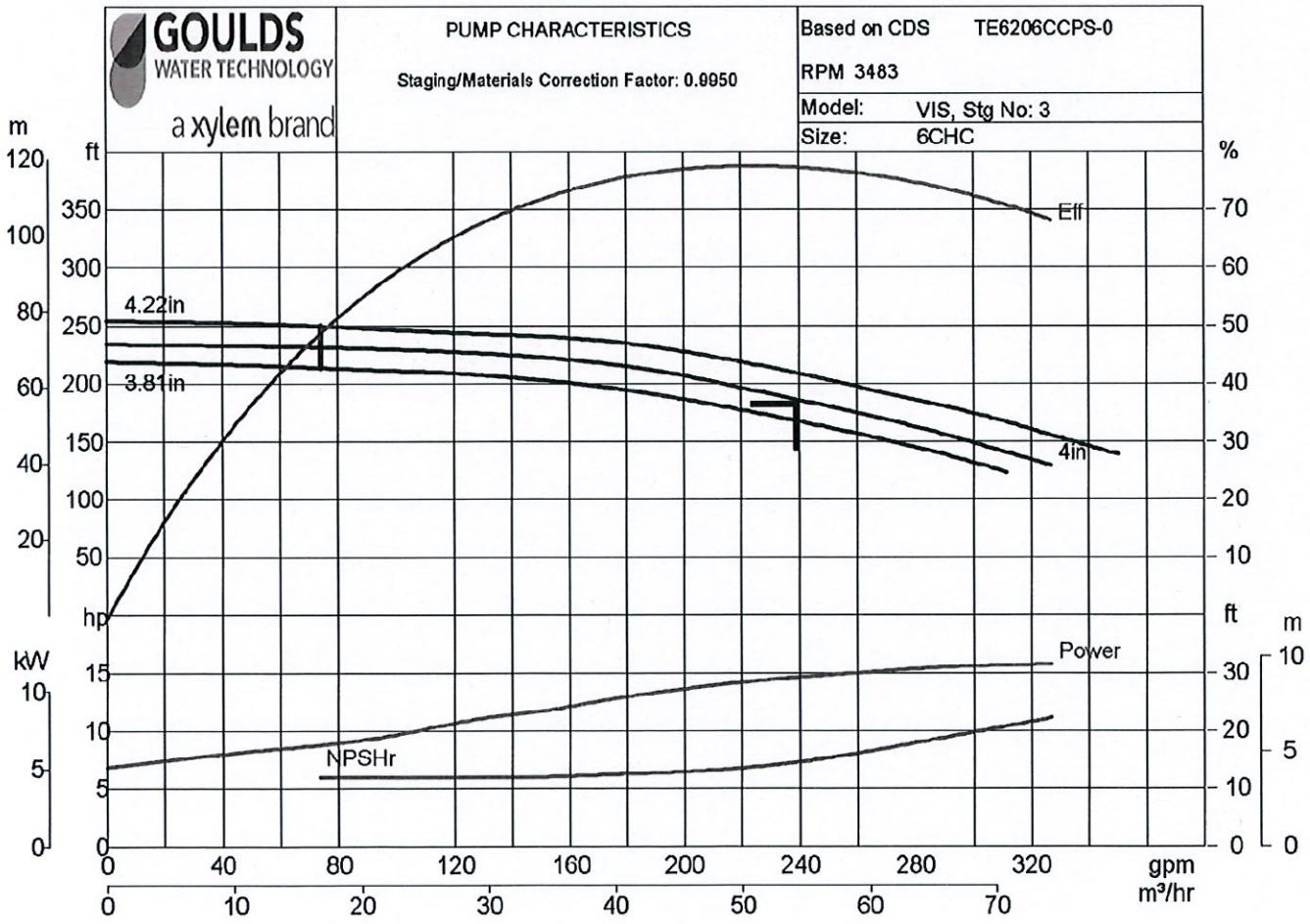
Operating Conditions

Temp.:	70.0 deg F	Bowl Efficiency:		Suction Specific Speed:	7,142 gpm(US) ft
Design Flow:	240.0 gpm	Rated Pump Efficiency:	77.1 %	Min. Hydraulic Flow:	73.6 gpm
Design TDH:	185.0 ft	Rated Total Power:	14.62 hp	Min. Thermal Flow:	N/A
Actual Flow:	240.0 gpm	Non-Overloading Power:	15.7 hp		
Actual Bowl Head:	185.9 ft	Imp. Dia. First 1 Stg(s):	4.0000 in	Imp. Dia. Addt'l Stg(s):	4.0000 in
NPSHa:		NPSHr:	14.6 ft	Vapor Press:	
Solid size:		Shut off Head:	234.3 ft	Max. Solids Size:	0.2200 in
Bowl Size:	5.8800 in	Max. Lateral:	0.3800 in	Thrust K factor:	2.10
Liquid:		Bowl Material:	Cast iron with glass enamel		
S.G./Visc.:	1.000/1.000 cp	Impeller Material:	316SS		

Pump Performance

Notes: 1. Bowl Performance Curve based on Pumping Clear, non-Aerated Water. Rated Point only is guaranteed.

2. For units requiring performance test, all performance tests will be conducted per ANSI/HI 14.6 standards unless otherwise noted in the selection software submittal documents. Test results meeting with grade 2B tolerances for pumps with a rated shaft power of 134HP or less and grade 1B for greater than 134HP will be considered passing.



GOULDS WATER TECHNOLOGY
a xylem brand

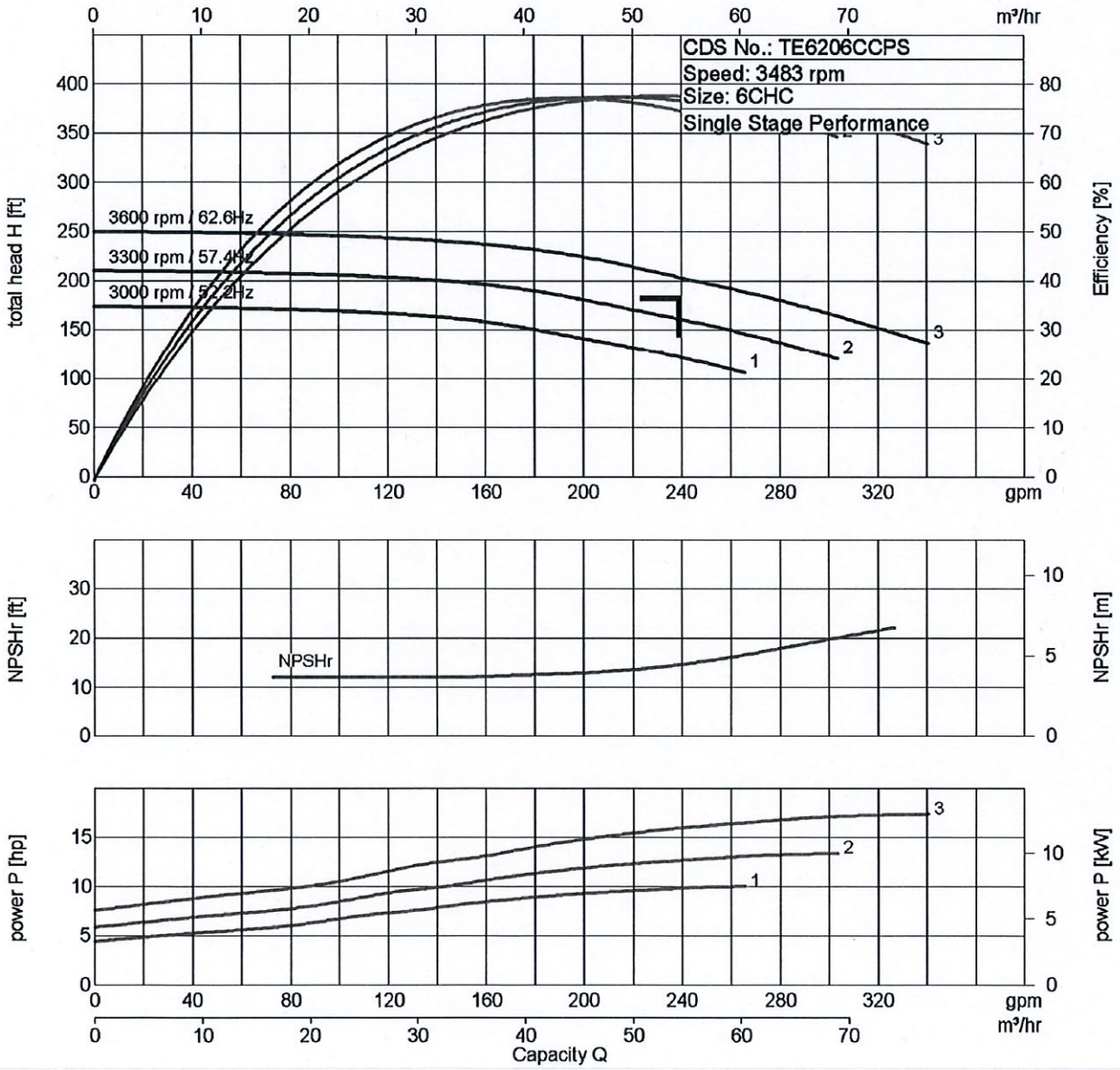
Model VIS-T Speed Variable		Size 6CHC Frequency 60Hz
Purchaser PRECISION PUMPING SYSTEMS End User Item No. ITEM 001 Service Certified By	Liquid Nom. Temperature 70.0 deg F Spec. Gravity 1.000 Viscocity 1.000 cp Vapor Press Solids% / Size	Date 07/25/2014 Issued by: Rory Penfold Quotation No. RP14-07-25 01 Job/Inq.No. Order No.

Rated Operating Point

Capacity	240.0 gpm	Power - Pump	14.62 hp	No. of Stages	3
Head	185.0 ft	Power - Loss	0.12 hp	Imp. Dia. 1st Stg:	4.0000 in
NPSHa		Power - Others		Imp. Dia. Adl Stg:	
NPSHr	14.6 ft	Power - Totals	14.62 hp	Min. Hydraulic Flow	73.6 gpm
Rated Efficiency	77.1 %	Power - max.	15.7 hp	Min. Thermal Flow	N/A
Specific Speed	2,340 gpm(US) ft				

Notes: 1. Bowl Performance Curve based on Pumping Clear, non-Aerated Water. Rated Point only is guaranteed.

2. For units requiring performance test, all performance tests will be conducted per ANSI/HI 14.6 standards unless otherwise noted in the selection software submittal documents. Test results meeting with grade 2B tolerances for pumps with a rated shaft power of 134HP or less and grade 1B for greater than 134HP will be considered passing.



RAIN BIRD®

Tech Spec

1800™ Series Spray Heads

Industry's Leading Spray Heads

Trusted for over 30 years, 1800 Series Spray Heads have provided unmatched durability, reliability, and performance.

Superior components and features make the 1800 Series Spray Head the spray head of choice for a wide variety of applications.

Features

Co-molded, pressure-activated, multi-functional wiper seal assures positive seal without excess "flow-by" which enables more heads to be installed on the same valve.

- Designed for use with all Rain Bird plastic spray head nozzles – Rotary Nozzles, U-Series, MPR, VAN and XPCN Series.
- Precision controlled flush at pop-down clears debris from unit, assuring positive stem retraction in all soil types.
- Strong stainless steel spring provides reliable stem retraction.
- Ratchet mechanism on all models allows easy nozzle pattern alignment without tools.
- Pre-installed 1800 Pop-Top™ flush plug blocks debris from entering after flushing. Allows for easy nozzle installation.
- Constructed of time-proven UV-resistant plastic and corrosion resistant stainless steel parts, assuring long product life.
- All sprinkler components are removable from the top without special tools, providing for quick and easy flushing and maintenance of the sprinkler.
- Side inlets featured on 1806, 1806PRS, 1812, and 1812PRS models only.
- Five-year trade warranty.

Operating Range

- Spacing: 2.5 to 24 feet (0.8 to 7.3 m)
- Pressure: 15 to 70 psi (1.0 to 4.8 bar)

Specifications

- Flow-by: 0 at 8 psi (0.6 bar) or greater; 0.1 gpm (0.02 m^3/h; 0.006 l/s) otherwise

Dimensions/Models

- ½" (15/21) NPT female threaded inlet
- Models and height:
  1802: 4" (10 cm) body height; 2" pop-up height (5 cm)
  1803: 4⅞" (12 cm) body height; 3" pop-up height (7.6 cm)
  1804: 6" (15 cm) body height; 4" pop-up height (10 cm)
  1806: 9⅜" (24 cm) body height; 6" pop-up height (15 cm)
  1812: 16" (40 cm) body height; 12" pop-up height (30 cm)
- Exposed surface diameter: 2¼" (5.7 cm)

How To Specify

1804 - SAM - PRS - P45

- **Model** — 1804: 4" (10.2 cm) pop-up height
- **Optional Feature** SAM: Seal-A-Matic™ check valve
- **Optional Feature** PRS: 30psi (2.1 bar) in-stem pressure regulation
- **Optional Feature** P45: 45psi (3.1 bar) in-stem pressure regulation

Note: SAM feature included with P45 models

How To Specify

1804 - SAM-P45 - R13-18Q

- **Model** — 1804: 4" (10.2 cm) pop-up height
- **Optional Feature** SAM: Seal-A-Matic™ check valve
- **Optional Feature** P45: 45psi (3.1 bar) in-stem pressure regulation
- **Nozzle** — Rotary Nozzle
- **Radius Range** — 13-18' (4.0 – 5.5,m) 17-24' (5.2 – 7.3m)
- **Pattern** — F: Full (360°) TQ: Three Quarter (270°) TT: Two Third (240°) H: Half (180°) T: Third (120°) Q: Quarter (90°)

Note: Specify sprinkler bodies and nozzles separately.

PRS

SAM

SAM-PRS

SAM-PRS-P45

1800® SAM Series

Ideal for use in areas with changing elevations, the 1800 SAM Series offers all 1800 Series features plus:

- Built-in Seal-A-Matic™ (SAM) check valve. Eliminates the need for under-the-head check valves. No parts to be installed at the site.
- Stronger retract spring to accommodate elevation changes up to 14' (4.2 m). One of the strongest springs in the industry.
- Prevents drainage from spray heads at lower elevations. Stops water waste. Ends landscape damage due to flooding and/or erosion.
- Helps retain water in lateral pipes which reduces wear on system components by minimizing water hammer during start-up.
- Designed for use with all Rain Bird plastic spray head nozzles.
- "SAM" stamped on cap for easy identification and maintenance.
- Five-year trade warranty.

Operating Range

- Spacing: 2.5 to 24 feet (0.8 to 7.3 m)
- Pressure: 25 to 70 psi (1.7 to 4.8 bar)

Specifications

- SAM capability: holds up to 14 feet (4.2 m) of head; 6 psi (0.3 bar)
- Flow-by: 0 at 8 psi (0.6 bar) or greater; 0.1 gpm (0.02 m^3/h; 0.006 l/s) otherwise
- Installation: bottom inlet only

Dimensions

- ½" (15/21) NPT female threaded inlets
- Body height: 1804 SAM - 6" (15 cm), 1806 SAM - 9⅜" (24 cm), 1812 SAM- 16" (40 cm)
- Exposed surface diameter: 2¼" (5.7 cm)

Models

- 1804 SAM: 4" pop-up height (10 cm)
- 1806 SAM: 6" pop-up height (15 cm)
- 1812 SAM: 12" pop-up height (30 cm)

1800 PRS Series

Designed for areas with high and/or widely fluctuating water pressures, the 1800 PRS Series has all 1800 Series features plus:

- **PATENTED** PRS pressure regulator built into the stem. No parts to be installed at the site. Saves time and money.
- Maintains constant outlet pressure at 30psi (2.1 bar). Spray nozzles perform best at 30psi. Ensures maximum nozzle performance, even with varying inlet pressures. Maintains constant pressure regardless of nozzles used.
- Restricts water loss by up to 70% if nozzle is removed or damaged. Saves water and money. Reduces possibility of accidents and property damage. Recommended for vandal-prone areas.
- Ensures consistent performance throughout zone if nozzle is removed or damaged. Keeps plant life covered by other spray heads properly irrigated.
- Ends misting and fogging caused by high pressure. Stops water waste. Ensures necessary watering occurs in high pressure or wind conditions.
- Designed for use with all Rain Bird plastic spray head nozzles.
- "PRS" stamped on cap for easy identification and maintenance.
- Five-year trade warranty.

Operating Range

- Spacing: 2.5 to 24 feet (0.8 to 7.3 m)
- Pressure: 15 to 70 psi (1 to 5 bar)

Specifications

- Regulates nozzle pressure to an average 30 psi (2.1 bar) with inlet pressures of up to 70 psi (4.8 bar)
- Flow-by: 0 at 8 psi (0.6 bar) or greater; 0.1 gpm (0.02 m^3/h; 0.006 l/s) otherwise
- Installation: side or bottom inlet
- Side inlet installation not recommended in freezing climates

Dimensions

- ½" (15/21) NPT female threaded inlets
- Body height: 1804 PRS - 6" (15 cm), 1806 PRS - 9⅜" (24 cm), 1812 PRS - 16" (40 cm)
- Exposed surface diameter: 2¼" (5.7 cm)

Models

- 1804 PRS: 4" pop-up height (10 cm)
- 1806 PRS: 6" pop-up height (15 cm)
- 1812 PRS: 12" pop-up height (30 cm)

1800 SAM-PRS Series

Meets the needs of all spray areas, regardless of changing elevation or water pressures. Incorporates all 1800 Series SAM and PRS features. "SAM-PRS" stamped on the cap for easy identification and maintenance.

Operating Range

- Spacing: 2.5 to 24 feet (0.8 to 7.3 m)
- Pressure: 25 to 70 psi (1.7 to 4.8 bar)

Specifications

- SAM capability: holds up to 14 feet (4.2 m) of head; 6 psi (0.3 bar)
- Flow-by: 0 at 8 psi (0.6 bar) or greater; 0.1 gpm (0.02 m^3/h; 0.006 l/s) otherwise
- Installation: bottom inlet only
- Regulates nozzle pressure to an average 30 psi (2.1 bar) with inlet pressures of up to 70 psi (4.8 bar)

Dimensions

- ½" (15/21) NPT female threaded inlets
- Body height: 1804 SAM-PRS - 6" (15 cm), 1806 SAM-PRS - 9⅜" (24 cm), 1812 SAM-PRS - 16" (40 cm)
- Exposed diameter: 2¼" (5.7 cm)

Models

- 1804 SAM-PRS: 4" pop-up height (10 cm)
- 1806 SAM-PRS: 6" pop-up height (15 cm)
- 1812 SAM-PRS: 12" pop-up height (30 cm)

1800 SAM-P45 Series

Meets the needs of spray body applications using Rotary Nozzles regardless of changing elevation or water pressures. Incorporates 1800 Series SAM feature and regulates operating pressure at 45psi (3.1 bar).

- Designed to maximize application efficiency when using Rotary Nozzles.
- Maintains constant outlet pressure at 45psi (3.1 bar) at varying inlet pressures. Maintains constant pressure regardless of nozzle used.
- "SAM-PRS-45" stamped on cap for easy identification and maintenance.
- Five-year trade warranty.

Operating Range

- Spacing: 13 to 24 feet (4.0 to 7.3 m)
- Pressure: 25 to 70 psi (1.7 to 4.8 bar)

Specifications

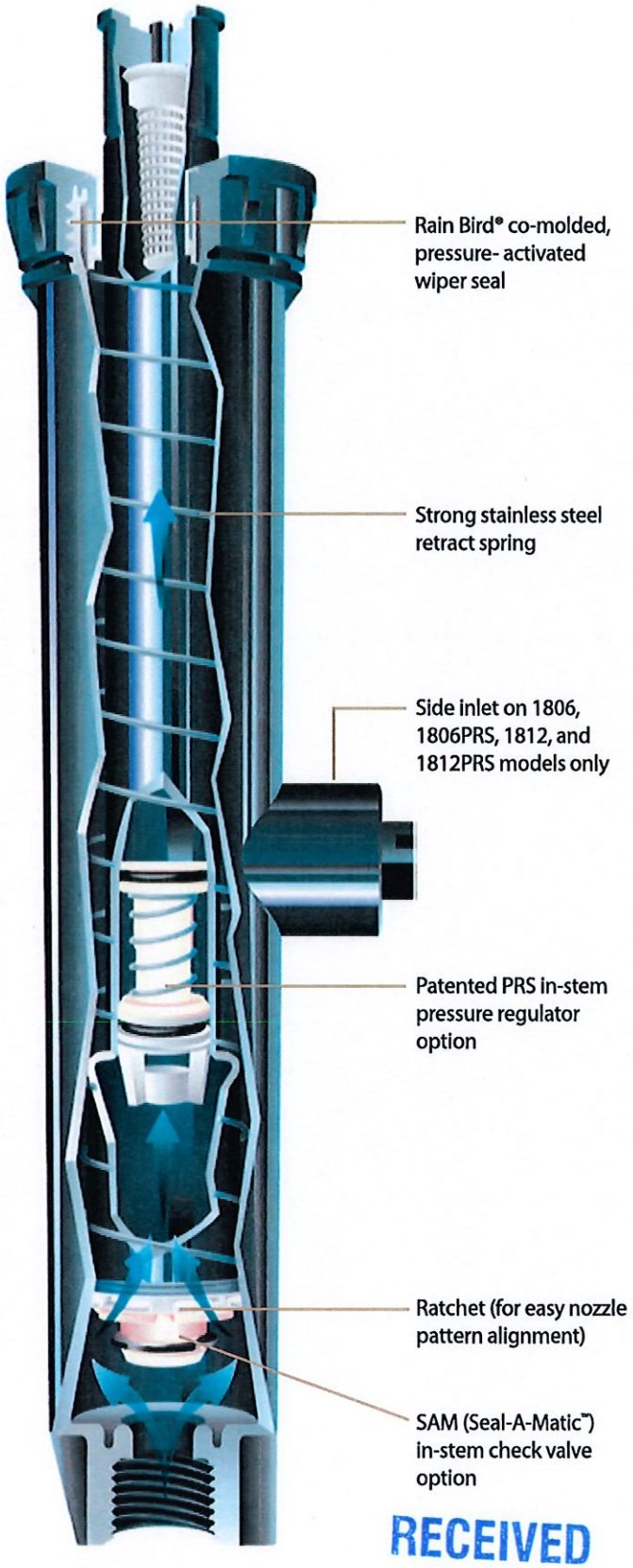
- Regulates nozzle pressure to an average 45 psi (3.1 bar) with inlet pressures of up to 70 psi (4.8 bar)
- SAM capability: holds up to 14 feet (4.2 m) of head; 6 psi (0.3 bar)
- Flow-by: 0 at 8 psi (0.6 bar) or greater; 0.1 gpm (0.02 m³/h; 0.006 l/s) otherwise
- Installation: bottom inlet only

Dimensions

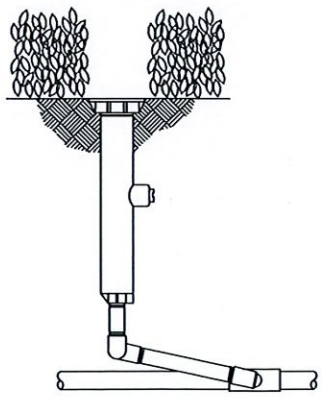
- ½" (15/21) NPT female threaded inlets
- Body height: 1804 SAM-P45 - 6" (15 cm), 1806 SAM-P45 - 9⅜" (24 cm), 1812 SAM-P45 - 16" (40 cm)
- Exposed diameter: 2¼" (5.7 cm)

Models

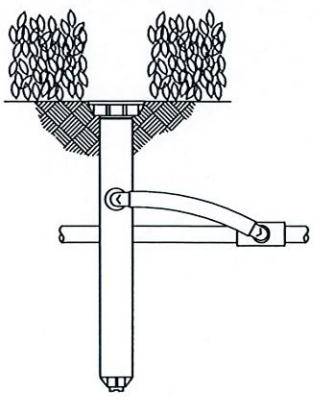
- 1804 SAM-P45: 4" pop-up height (10 cm)
- 1806 SAM-P45: 6" pop-up height (15 cm)
- 1812 SAM-P45: 12" pop-up height (30 cm)



1806 with Swing Joint on Bottom Inlet



1812 with Swing Pipe on Side Inlet



Specifications

1802, 1803, 1804, 1806 and 1812 Pop-up Full or Part Circle Spray Sprinkler

The sprinkler body, stem, nozzle and screen shall be constructed of heavy-duty, ultra-violet resistant plastic. It shall have a heavy-duty stainless steel retract spring for positive pop-down and a ratcheting system for easy alignment of the pattern. The sprinkler shall have a soft elastomer pressure-activated co-molded wiper seal for cleaning debris from the pop-up stem as it retracts into the case to prevent the sprinkler from sticking up to minimize "flow-by."

The sprinkler shall have a matched precipitation rate (MPR) plastic or brass nozzle with an adjusting screw capable of regulating the radius and flow. The sprinkler shall be capable of housing protective, non-clogging filter screens or pressure compensating screens (PCS) under the nozzle. The screen shall be used in conjunction with the adjusting screw for regulating. The 6" (15 cm) and 12" (30 cm) models shall have both a side and a bottom 1/2" (15/21) (FNPT) inlet for ease of installation.

The sprinkler shall have a Pop-Top™ Flush Plug pre-installed. The plug shall prevent debris from clogging the sprinkler during installation and allow for the system to be flushed before nozzling. The plug shall be bright orange in color and constructed of polypropylene material.

1804 SAM, 1806 SAM and 1812 SAM Full or Part Circle Seal-A-Matic™ Pop-up Spray Sprinkler

Optional Feature Specifications:

When so indicated on the design, the 4", 6" or 12" high pop-up spray sprinklers shall also include a Seal-A-Matic (SAM) check valve to prevent low-head drainage of up to 14 feet of head. This feature shall require the use of the bottom inlet only. These units shall be identifiable from the top with "SAM" marking on the cap. The sealing device shall be an integral part of the pop-up stem, removable through the top of the sprinkler, and shall seal against the bottom case inlet. It shall create no more than 1 psi pressure drop at the maximum rated flow.

1804 PRS, 1806 PRS and 1812 PRS Full or Part Circle Pressure Regulating Pop-up Spray Sprinkler

Optional Feature Specifications:

When so indicated on the design, the 4", 6" or 12" high pop-up spray sprinkler shall also include a pressure regulating (PRS) device to prevent high pressure fogging to the nozzle stream. This regulating device shall be an integral part of the pop-up stem, removable through the top of the case. These units shall be identifiable from the top with "PRS" markings on the cap.

The device shall regulate the nozzle pressure to 30 psi for inlet pressures from 35 to 70 psi. Below 35 psi the pressure loss shall not exceed 6 psi.

1804 SAM-PRS, 1806 SAM-PRS and 1812 SAM-PRS Full or Part Circle Seal-A-Matic Pressure Regulating Pop-up Spray Sprinkler

Optional Feature Specifications:

When so indicated on the design, the 4", 6" or 12" high pop-up spray sprinkler shall also include a Seal-A-Matic (SAM) check valve and a pressure regulating (PRS) device. These units shall be identifiable from the top with "SAM-PRS" markings on the cap.

The check valve shall prevent low-head drainage of up to 14 feet of head. The pressure regulating device shall prevent high pressure fogging of the nozzle stream by regulating the nozzle pressure to 30 psi for inlet pressures from 35 to 70 psi. Below 35 psi the pressure loss shall not exceed 6 psi. These models shall utilize the bottom inlet only.

1804 SAM-P45, 1806 SAM-P45, and 1812 SAM-P45 Full or Part Circle Seal-A-Matic Pressure Regulating Pop-up Spray Sprinkler

Optional Feature Specifications:

When so indicated on the design, the 4", 6", or 12" high pop-up spray sprinkler shall also include a Seal-A-Matic (SAM) check valve and a 45 psi pressure regulating (P45) device. These units shall be identifiable from the top with "SAM-PRS-45" markings on the cap.

The check valve shall prevent low-head drainage of up to 14 feet of head. The pressure regulating device shall prevent high pressure misting and undesirable performance of the nozzle stream by regulating the nozzle pressure to 45 psi for inlet pressures from 50 to 70 psi. Below 50 psi the pressure loss shall not exceed 6 psi. These models shall utilize the bottom inlet only.

The sprinkler shall be as manufactured by Rain Bird Corporation, Azusa, California.

Rain Bird Corporation
6991 E. Southpoint Road
Tucson, AZ 85756
Phone: (520) 741-6100
Fax: (520) 741-6522

Rain Bird Technical Services
(800) RAINBIRD (1-800-724-6247)
(U.S. and Canada)

Rain Bird Corporation
970 West Sierra Madre Avenue
Azusa, CA 91702
Phone: (626) 812-3400
Fax: (626) 812-3411

Specification Hotline
800-458-3005 (U.S. and Canada)

Rain Bird International, Inc.
1000 West Sierra Madre Ave.
Azusa, CA 91702
Phone: (626) 963-9311
Fax: (626) 852-7343

The Intelligent Use of Water™
www.rainbird.com

D39025K

RAIN BIRD®

Tech Spec

5000 Series Rotors

5000, Plus, PRS, SAM

Built from top to bottom with the contractor in mind, the Rain Bird 5000 Series product line is the durable, reliable rotor for residential and commercial applications. Its Rain Curtain™ Nozzle set includes 12 nozzles: 8 standard angle nozzles and 4 low angle nozzles that ensure you always have the right nozzle in hand for the project.

Standard Features

- Thicker rubber cover
- Self Flushing Arc Adjustment Port: as the riser stem pops-up and retracts a jet of water cleans out the arc adjustment slot
- Slip Clutch: quickly set the left edge of the 5004 rotor (dry set only)
- Self-Flushing tapered stem design and integrated pressure-activated multi-function wiper seal protect internals from debris and assures day in, day out performance
- Positive riser stem retraction
- Heavy duty case
- 40- 360° arc rotation and reversing full circle rotation in one. (A non-reversing full circle only unit is also available)
- Top-adjust arc adjustment requiring only a flat-blade screwdriver
- Tree of nozzles including 8 Rain Curtain (25° trajectory) and 4 low angle (10° trajectory) provides 25' to 50' (7.6 to 15.2m) distance of throw
- Rain Curtain™ nozzles feature:
  - Large droplets for consistent performance
  - Effective close-in watering
  - Even distribution over the entire radius
- Optional pre-installed Rain Curtain™ nozzles
- Optional Matched Precipitation Rate (MPR) nozzles
- Radius adjustment screw allows up to 25% radius reduction without changing nozzles
- True 4" (10 cm) pop-up (measured from the case cover to the nozzle)
- Five-year trade warranty

Operating Range

- Precipitation rate: 0.20 to 1.01 inches per hour (5 to 26 mm/h)
- Radius: 25' to 50' (7.6 to 15.2 m)
- Radius may be reduced up to 25% with radius reduction screw
- Pressure: 25 to 65 psi (1.7 to 4.5 bar)
- Flow Rate: 0.76 to 9.63 gpm (3.0 to 36.6 l/m)

Specifications

- 3/4" (20/27) NPT female bottom threaded inlet
- Reversing full and part-circle adjustment 40° – 360°
- Full-circle only adjustment 360°

Dimensions

- Pop-up height: Shrub; 4" (10.2 cm); 6" (15.2 cm); 12" (30.5 cm)
- Overall body height: Shrub: 7 3/4" (19.7cm) 4": 7 3/8" (18.5 cm); 6": 9 5/8" (24.5 cm); 12": 16 7/8" (42.9 cm)
- Exposed surface diameter: 1 5/8" (4.1 cm)

***Note:** Pop-up height measured from the cover to the nozzle. Overall body height is measured popped down*

How To Specify

5004-S-PL-PC-SAM-R-NP-SS

Options
SAM
R: PRS
NP: Non-potable cover

Rotation
"PC" for 40-360 degrees
"FC" for 360 degree only

Model
Plus

Model
Stainless steel

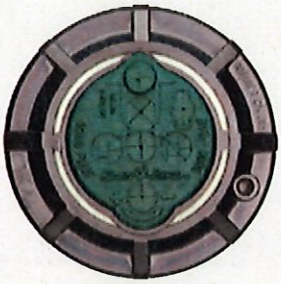
Model
Shrub

Model
5004: 4" pop-up
5006: 6" pop-up
5012: 12" pop-up

Note: Certain specifications not available for some rotor series.

Optional Features

Plus (PL)
The Green Top



FLOW SHUT OFF

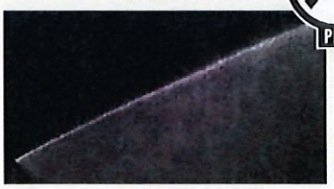
On

Off

PRS (R)

PRESSURE REGULATION

Without PRS



With PRS

SAM

CHECK VALVE

Without SAM

With SAM

Benefits

- Turn the rotor on/off at the head for easier maintenance.
- Flush zone and nozzle the rotor without going back and forth to a valve or controller.
- Troubleshoot for leaks by turning off all the heads in that zone.

PRS with Flow Optimizer™ technology

- Conserve water and manage flow at each head by regulating pressure to precisely 45 psi.
- Eliminate wasteful misting and fogging.
- Ensure even distribution uniformity across the entire zone.

- Prevent low head drainage.
- Eliminate puddling or water stains on hardscape areas.
- Contain water in lateral lines for smoother start ups.

Additional Features

- Stainless Steel (SS)
- Non-potable (NP)

Models

	Plus	SAM	PRS
5004-PC			
5004-PL-PC	✓		
5004-PC-SAM		✓	
5004-PC-R			✓
5004-PL-PC-SAM	✓	✓	
5004-PL-PC-R	✓		✓
5004-PL-PC-SAM-R	✓	✓	✓

5000 Series Std. Angle Rain Curtain™ Nozzle Performance

Pressure psi	Nozzle	Radius ft.	Flow gpm	■ Precip In/h	▲ Precip In/h
25	1.5	33	1.12	0.20	0.23
	2.0	35	1.50	0.24	0.27
	2.5	35	1.81	0.28	0.33
	3.0	36	2.26	0.34	0.39
	4.0	37	2.91	0.41	0.47
	5.0	39	3.72	0.47	0.54
	6.0	39	4.25	0.54	0.62
	8.0	36	5.90	0.88	1.01
35	1.5	34	1.35	0.22	0.26
	2.0	36	1.81	0.27	0.31
	2.5	37	2.17	0.31	0.35
	3.0	38	2.71	0.36	0.42
	4.0	40	3.50	0.42	0.49
	5.0	41	4.47	0.51	0.59
	6.0	43	5.23	0.54	0.63
	8.0	43	7.06	0.74	0.85
45	1.5	35	1.54	0.24	0.28
	2.0	37	2.07	0.29	0.34
	2.5	37	2.51	0.35	0.41
	3.0	40	3.09	0.37	0.43
	4.0	42	4.01	0.44	0.51
	5.0	45	5.09	0.48	0.56
	6.0	46	6.01	0.55	0.63
	8.0	47	8.03	0.70	0.81
55	1.5	35	1.71	0.27	0.31
	2.0	37	2.30	0.32	0.37
	2.5	37	2.76	0.39	0.45
	3.0	40	3.47	0.42	0.48
	4.0	42	4.44	0.48	0.56
	5.0	45	5.66	0.54	0.62
	6.0	47	6.63	0.58	0.67
	8.0	50	8.86	0.68	0.79
65	1.5	34	1.86	0.31	0.36
	2.0	35	2.52	0.40	0.46
	2.5	37	3.01	0.42	0.49
	3.0	40	3.78	0.45	0.53
	4.0	42	4.83	0.53	0.61
	5.0	45	6.16	0.59	0.68
	6.0	48	7.22	0.60	0.70
	8.0	50	9.63	0.74	0.86

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

5000 Series Std. Angle Nozzle Performance METRIC

Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
1.7	1.5	10.10	0.25	4.2	5	6
	2.0	10.70	0.34	5.4	6	7
	2.5	10.70	0.41	6.6	7	8
	3.0	11.00	0.51	8.4	8	10
	4.0	11.3	0.66	10.8	10	12
	5.0	11.90	0.84	13.8	12	14
	6.0	11.90	0.97	16.2	14	16
	8.0	11.00	1.34	22.2	22	26
2.0	1.5	10.20	0.28	4.8	5	6
	2.0	10.80	0.36	6.0	6	7
	2.5	10.90	0.44	7.2	7	9
	3.0	11.20	0.55	9.0	9	10
	4.0	11.6	0.71	12.0	11	12
	5.0	12.10	0.91	15.0	12	14
	6.0	12.40	1.05	17.4	14	16
	8.0	11.80	1.45	24.0	21	24
2.5	1.5	10.40	0.31	5.4	6	7
	2.0	11.00	0.41	6.6	7	8
	2.5	11.30	0.50	8.4	8	9
	3.0	11.20	0.62	10.2	9	11
	4.0	12.3	0.81	13.2	11	13
	5.0	12.70	1.03	17.4	13	15
	6.0	13.20	1.21	20.4	14	16
	8.0	13.30	1.63	27.0	19	21
3.0	1.5	10.60	0.34	6.0	6	7
	2.0	11.20	0.45	7.8	7	8
	2.5	11.30	0.56	9.6	9	10
	3.0	12.10	0.69	11.4	9	11
	4.0	12.7	0.89	15.0	11	13
	5.0	13.50	1.13	18.6	12	14
	6.0	13.90	1.34	22.2	14	16
	8.0	14.10	1.79	30.0	18	21
3.5	1.5	10.70	0.37	6.0	7	8
	2.0	11.30	0.49	8.4	8	9
	2.5	11.30	0.60	10.2	9	11
	3.0	12.20	0.74	12.6	10	12
	4.0	12.8	0.97	16.2	12	14
	5.0	13.70	1.23	20.4	13	15
	6.0	14.20	1.45	24.0	14	17
	8.0	14.90	1.93	32.4	18	20
4.0	1.5	10.60	0.40	6.6	7	8
	2.0	11.10	0.52	9.0	8	10
	2.5	11.30	0.64	10.8	10	12
	3.0	12.20	0.80	13.2	11	12
	4.0	12.8	1.04	17.4	13	15
	5.0	13.70	1.32	22.2	14	16
	6.0	14.90	1.55	25.8	15	17
	8.0	15.20	2.06	34.2	18	21
4.5	1.5	10.40	0.42	7.2	8	9
	2.0	10.70	0.55	9.0	10	11
	2.5	11.30	0.68	11.4	11	12
	3.0	12.20	0.84	13.8	11	13
	4.0	12.8	1.10	18.0	13	15
	5.0	13.70	1.40	23.4	15	17
	6.0	14.60	1.64	28.2	15	18
	8.0	15.20	2.19	36.6	19	22

5000 Series Low Angle Nozzle Performance					
Pressure psi	Nozzle	Radius ft.	Flow gpm	■ Precip In/h	▲ Precip In/h
25	1.0 LA	25	0.76	0.23	0.27
	1.5 LA	27	1.15	0.30	0.35
	2.0 LA	29	1.47	0.34	0.39
	3.0 LA	29	2.23	0.51	0.59
35	1.0 LA	28	0.92	0.23	0.26
	1.5 LA	30	1.38	0.30	0.34
	2.0 LA	31	1.77	0.35	0.41
	3.0 LA	33	2.68	0.47	0.55
45	1.0 LA	29	1.05	0.24	0.28
	1.5 LA	31	1.58	0.32	0.37
	2.0 LA	32	2.02	0.38	0.44
	3.0 LA	35	3.07	0.48	0.56
55	1.0 LA	29	1.17	0.27	0.31
	1.5 LA	31	1.76	0.35	0.41
	2.0 LA	33	2.24	0.40	0.46
	3.0 LA	36	3.41	0.51	0.58
65	1.0 LA	29	1.27	0.29	0.34
	1.5 LA	31	1.92	0.38	0.44
	2.0 LA	33	2.45	0.43	0.50
	3.0 LA	36	3.72	0.55	0.64

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

5000 Series Low Angle Nozzle Performance METRIC						
Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
1.7	1.0 LA	7.60	0.17	3.0	6	7
	1.5 LA	8.20	0.26	4.2	8	9
	2.0 LA	8.80	0.33	5.4	9	10
	3.0 LA	8.80	0.51	8.4	13	15
2.0	1.0 LA	8.00	0.18	3.0	6	6
	1.5 LA	8.60	0.28	4.8	8	9
	2.0 LA	9.10	0.36	6.0	9	10
	3.0 LA	9.30	0.55	9.0	13	15
2.5	1.0 LA	8.60	0.20	3.6	5	6
	1.5 LA	9.20	0.32	5.4	8	9
	2.0 LA	9.50	0.41	6.6	9	10
	3.0 LA	10.10	0.62	10.2	12	14
3.0	1.0 LA	8.80	0.22	3.6	6	7
	1.5 LA	9.40	0.35	6.0	8	9
	2.0 LA	9.70	0.45	7.8	10	11
	3.0 LA	10.60	0.68	11.4	12	14
3.5	1.0 LA	8.80	0.24	4.2	6	7
	1.5 LA	9.40	0.38	6.6	9	10
	2.0 LA	9.90	0.49	8.4	10	11
	3.0 LA	10.80	0.74	12.6	13	15
4.0	1.0 LA	8.80	0.26	4.2	7	8
	1.5 LA	9.40	0.41	6.6	9	11
	2.0 LA	10.10	0.52	9.0	10	12
	3.0 LA	11.00	0.80	13.2	13	15
4.5	1.0 LA	8.80	0.27	4.8	7	8
	1.5 LA	9.40	0.44	7.2	10	11
	2.0 LA	10.10	0.56	9.0	11	13
	3.0 LA	11.00	0.84	13.8	14	16

5000 Series with PRS Std. Angle Rain Curtain™ Nozzle Performance					
Pressure psi	Nozzle	Radius ft.	Flow gpm	■ Precip In/h	▲ Precip In/h
25	1.5	33	1.12	0.2	0.23
	2.0	35	1.5	0.24	0.27
	2.5	35	1.81	0.28	0.33
	3.0	36	2.26	0.34	0.39
	4.0	37	2.91	0.41	0.47
	5.0	39	3.72	0.47	0.54
	6.0	39	4.25	0.54	0.62
	8.0	36	5.9	0.88	1.01
35	1.5	34	1.35	0.22	0.26
	2.0	36	1.81	0.27	0.31
	2.5	37	2.17	0.31	0.35
	3.0	38	2.71	0.36	0.41
	4.0	40	3.5	0.42	0.49
	5.0	41	4.47	0.51	0.59
	6.0	43	5.23	0.54	0.63
	8.0	43	7.06	0.74	0.85
45	1.5	35	1.54	0.24	0.28
	2.0	37	2.07	0.29	0.34
	2.5	37	2.51	0.35	0.41
	3.0	40	3.09	0.37	0.43
	4.0	42	4.01	0.44	0.51
	5.0	45	5.09	0.48	0.56
	6.0	46	6.01	0.55	0.63
	8.0	47	8.03	0.7	0.81
55 – 75	1.5	35	1.59	0.25	0.29
	2.0	37	2.14	0.3	0.35
	2.5	37	2.6	0.37	0.42
	3.0	40	3.2	0.39	0.44
	4.0	42	4.15	0.45	0.52
	5.0	45	5.27	0.5	0.58
	6.0	46	6.22	0.57	0.65
	8.0	47	8.31	0.72	0.84

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

5000 Series with PRS Std. Angle Rain Curtain™ Nozzle Performance METRIC						
Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
1.7	1.5	10.1	0.25	4.20	5	6
	2.0	10.7	0.34	5.40	6	7
	2.5	10.7	0.41	6.60	7	8
	3.0	11.0	0.51	8.40	8	10
	4.0	11.3	0.66	10.80	10	12
	5.0	11.9	0.84	13.80	12	14
	6.0	11.9	0.97	16.20	14	16
	8.0	11.0	1.34	22.20	22	26
2.0	1.5	10.2	0.28	4.80	5	6
	2.0	10.8	0.36	6.00	6	7
	2.5	10.9	0.44	7.20	7	9
	3.0	11.2	0.55	9.00	9	10
	4.0	11.6	0.71	12.00	11	12
	5.0	12.1	0.91	15.00	12	14
	6.0	12.4	1.05	17.40	14	16
	8.0	11.8	1.45	24.00	21	24
2.5	1.5	10.4	0.31	5.40	6	7
	2.0	11.0	0.41	6.60	7	8
	2.5	11.3	0.50	8.40	8	9
	3.0	11.2	0.62	10.20	9	11
	4.0	12.3	0.81	13.20	11	13
	5.0	12.7	1.03	17.40	13	15
	6.0	13.2	1.21	20.40	14	16
	8.0	13.3	1.63	27.00	19	21
3.0	1.5	10.6	0.34	6.00	6	7
	2.0	11.2	0.45	7.80	7	8
	2.5	11.3	0.56	9.60	9	10
	3.0	12.1	0.69	11.40	9	11
	4.0	12.7	0.89	16.80	11	13
	5.0	13.5	1.13	18.60	12	14
	6.0	13.9	1.34	22.20	14	16
	8.0	14.1	1.79	30.00	18	21
3.5 – 5.2	1.5	10.6	0.35	6.00	6	7
	2.0	11.2	0.47	7.80	8	9
	2.5	11.3	0.58	10.20	9	11
	3.0	12.1	0.71	12.00	10	11
	4.0	12.7	0.92	15.60	12	13
	5.0	13.5	1.17	19.20	13	15
	6.0	13.9	1.39	22.80	14	17
	8.0	14.1	1.85	31.20	18	21

5000 Series with PRS PRS Low Angle Nozzle Performance

Pressure psi	Nozzle	Radius ft.	Flow gpm	■ Precip In/h	▲ Precip In/h
25	1.0 LA	25	0.76	0.22	0.26
	1.5 LA	27	1.15	0.3	0.35
	2.0 LA	29	1.47	0.34	0.39
	3.0 LA	29	2.23	0.51	0.59
35	1.0 LA	28	0.92	0.21	0.25
	1.5 LA	30	1.38	0.3	0.34
	2.0 LA	31	1.77	0.35	0.41
	3.0 LA	33	2.68	0.47	0.55
45	1.0 LA	29	1.05	0.23	0.26
	1.5 LA	31	1.58	0.32	0.37
	2.0 LA	32	2.02	0.38	0.44
	3.0 LA	35	3.07	0.48	0.56
55 – 75	1.0 LA	29	1.09	0.25	0.29
	1.5 LA	31	1.64	0.33	0.38
	2.0 LA	32	2.09	0.39	0.45
	3.0 LA	35	3.18	0.5	0.58

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

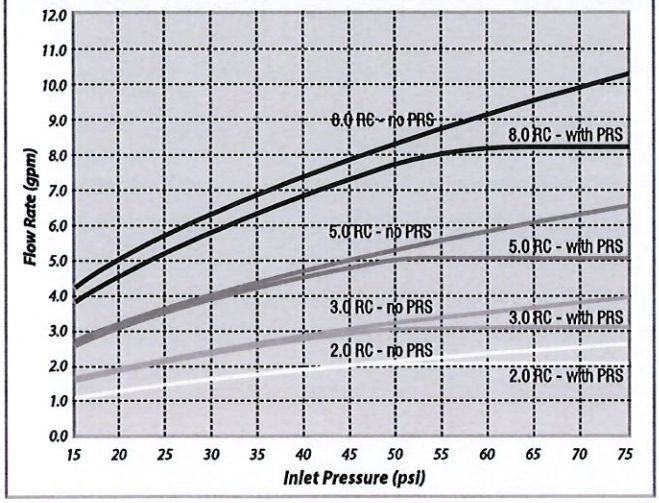
Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

5000 Series with PRS PRS Low Angle Nozzle Performance METRIC

Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
1.7	1.0 LA	7.6	0.17	3.00	6	7
	1.5 LA	8.2	0.26	4.20	8	9
	2.0 LA	8.8	0.33	5.40	9	10
	3.0 LA	8.8	0.51	8.40	13	15
2.0	1.0 LA	8.0	0.18	3.00	6	6
	1.5 LA	8.6	0.28	4.80	8	9
	2.0 LA	9.1	0.36	6.00	9	10
	3.0 LA	9.3	0.55	9.00	13	15
2.5	1.0 LA	8.6	0.20	3.60	5	6
	1.5 LA	9.2	0.32	5.40	8	9
	2.0 LA	9.5	0.41	6.60	9	10
	3.0 LA	10.1	0.62	10.20	12	14
3.0	1.0 LA	8.8	0.22	3.60	6	7
	1.5 LA	9.4	0.35	6.00	8	9
	2.0 LA	9.7	0.45	7.80	10	11
	3.0 LA	10.6	0.68	11.40	12	14
3.5 – 5.2	1.0 LA	8.8	0.23	3.60	6	7
	1.5 LA	9.4	0.36	6.00	8	10
	2.0 LA	9.7	0.47	7.80	10	12
	3.0 LA	10.6	0.70	12.00	13	15

Flow Rate v Inlet Pressure – Rain Curtain™ Nozzles



5000 Plus Series Rotor Technical Specification

5000 Plus Series Full and Reversing Full/Part Circle Sprinkler

The full and/or part circle sprinkler shall be a single-stream, water-lubricated, gear-drive type capable of covering a ___ foot (xx meter) at ___ pounds per square inch (psi) or (bar) with a discharge rate of ___gallons per minute (___ gpm) (___ m^3/h). The sprinkler shall have a flow shut-off device that is integrated into the flow path of the rotor as well as adjustable arc coverage of 40 to 360 degrees. Arc adjustment can be performed with or without the sprinkler in operation and shall require only a flat-blade screwdriver.

The sprinkler shall have a smoothed flow path entrance to enhance the flow characteristics of the rotor. In addition, the sprinkler shall feature a flow path to nozzle bore transition radius to minimize pressure loss and assure peak nozzle radius is achieved.

The sprinkler shall have a pressure activated, multi-function wiper seal that positively seals against the pop-up stem to keep debris out of the rotor and to clean debris from the pop-up stem as it retracts.

This wiper seal shall prevent sprinkler from sticking up, and be capable of sealing the sprinkler cap to sprinkler body under normal operating pressures.

The sprinkler shall have a screen installed in the pop-up stem to filter inlet water, protect the drive from clogging and simplify its removal for cleaning and flushing of the system. It shall have a 3/4" (FNPT) bottom inlet.

The sprinkler shall have a standard green rubber cover and a strong stainless steel retract spring for positive pop down. Pop-up height as measured from the top of the cap, at normal installation, to the middle of the nozzle orifice shall be __ inches or __ cm.

The rotor's overall height shall be ___ inches (_____cm), with an exposed surface diameter of 15/8" (4.1 cm).

The sprinkler shall have 12 interchangeable nozzles: 8 Rain Curtain nozzles for superior coverage and, 4 Low Angle nozzles for reduced radius of throw and superior wind resistance with all nozzles containing Micro-Ramp™ for superior close-in watering. The angle of trajectory shall be 25 degrees for the Rain Curtain nozzles and 10 degrees for the low angle nozzles. The sprinkler shall come with a stainless steel adjusting screw capable of reducing the radius up to 25%.

The sprinkler shall be as manufactured by Rain Bird Corporation, Glendora, California.

Optional Feature Specification

5000 Plus Series SAM, Full and Reversing Full/Part Circle Sprinkler SAM unit

When so indicated on the design, the sprinkler shall have a spring-loaded Seal-A-Matic™ (SAM) device in the base of the case. The device shall hold back at least 7' (2, 13m) of elevation change to prevent puddling, run-off and erosion caused by low-head drainage.

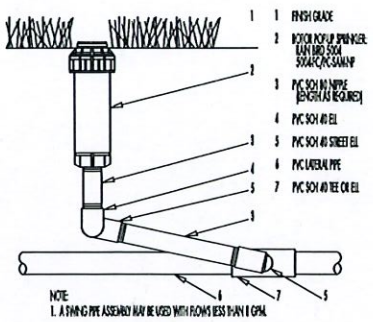
5000 Plus Series Full and Reversing Full/Part Circle Non-Potable

When so indicated on the design, the sprinkler shall have a purple rubber cover to indicate to the user that non-potable water is being used. There shall be no difference between the black and the purple covers, except for the color.

The sprinkler shall be as manufactured by Rain Bird Corporation, Glendora, California.

5000 Series Shrub Model Full and Reversing Full/Part Circle Sprinkler (SAM)

When so indicated on the design, the shrub model shall contain all of the specifications of the standard 5000 series rotor plus a locking screw to fasten the shrub unit to the riser. Additionally, the shrub base unit will feature Secure Ribs™ that are designed to assist in the staking of the shrub model if so specified on the design. When the Seal-A-Matic™ (SAM) model is indicated on the design, the device shall hold back at least 7' (2.13m) of elevation change to prevent puddling, run-off and erosion caused by low head drainage. As well the SAM unit shall experience no pressure loss during normal operation.



5000 Plus Series Stainless Steel

When so indicated on the design, the rotor shall have a stainless steel covered nozzle turret and riser stem. This riser stem shall be tapered and conform to the standard plastic riser in all other ways.

5000 MPR Nozzle Specification

The MPR Nozzle shall be capable of covering a _____foot radius (FT.RAD.)/(meter) at ____pounds per square inch (psi)/(Bars) with a discharge rate of _____gallons per minute (GPM)/(m^3/h, l/s).

The MPR Nozzle shall have a matched precipitation rate of 0.6 in/hr (15 mm/h) at 45 psi (3.1 bar).

The MPR Nozzle shall be color-coded by radius. The MPR Nozzle shall contain Micro Ramp™ technology for superior close-in watering.

The MPR Nozzle shall be manufactured by Rain Bird Corporation, Azusa, California.

How To Specify

5000 - MPR - 25 - Q

Model	Nozzle	Radius Range	Pattern
5000 Series	Matched Precipitation Rate	25'	Q=Quarter
		30'	T=Third
		35'	H=Half
			F=Full

Rain Bird Corporation
6991 E. Southpoint Road
Tucson, AZ 85756
Phone: (520) 741-6100
Fax: (520) 741-6522

Rain Bird Technical Services
(800) RAINBIRD (1-800-724-6247)
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Rain Bird Corporation
970 West Sierra Madre Avenue
Azusa, CA 91702
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Fax: (626) 812-3411

Specification Hotline
800-458-3005 (U.S. and Canada)

Rain Bird International, Inc.
1000 West Sierra Madre Ave.
Azusa, CA 91702
Phone: (626) 963-9311
Fax: (626) 852-7343

The Intelligent Use of Water™
www.rainbird.com

RAIN BIRD®

Tech Spec

Falcon® 6504 Rotors

Uncompromising performance.

With the Falcon 6504 rotor you can have it all — superior distribution, reliability and durability! Rain Curtain™ nozzles maximize performance and coverage. A multi-function wiper seal and tapered riser keep the stem clear of debris, providing long-term protection. Plus, heavy-duty construction makes the Falcon 6504 one of the toughest rotors in the field. Available in full- and part-circle models with optional stainless steel riser, the Falcon 6504 rotor is ideal for large turf sites such as parks, athletic fields, cemeteries, schools and commercial applications.

Features

- Stainless steel riser option helps deter vandalism on public turf areas.
- Five-year trade warranty.
- Easy arc adjustment (part-circle model) through top of rotor from 40 to 360 .
- Water-lubricated gear drive for reliable, durable rotation.
- Heavy-duty stainless steel retract spring ensures positive pop-down.
- Standard black rubber cover or optional purple rubber cover for non-potable water.
- Removable Seal-A-Matic™ (SAM) check device prevents puddling and erosion caused by low-head drainage.
- Eight color-coded Rain Curtain™ nozzles offer greater design flexibility.
- Rain Curtain™ nozzles have three ports for optimal long-range, mid-range and close-in watering, for green grass even in the heat of summer.
- Nozzles are interchangeable from the front with no special tools.
- Self-adjusting stator does not require replacement when changing nozzles.
- Radius adjustment screw allows radius reduction up to 25% without changing nozzles.
- Small 2" (5,1 cm) exposed diameter reduces possibility of injury in play areas.
- Patented, pressure-activated wiper seal and tapered riser stem on both plastic and stainless steel models protect internals from debris to ensure positive pop-up and retraction.
- 4" (10,2 cm) pop-up height to center line of nozzle clears taller turfgrass.
- Stainless steel trip gears ensure long-term durability.
- High-speed model completes full rotation in approximately one minute for quick wet-down of clay tennis courts and sports turf infield areas.
- Falcon 6504 rotors can now be ordered from the factory with nozzles pre-installed in case quantities as a special order.
- Optional rubber collar for added safety on playing fields New

Operating Range

- Precipitation Rate: 0.37 to 1.14 inches per hour (9 to 29 mm/h)
- Radius: 39 to 65 feet (11,9 to 19,8 m)
- Pressure - 30 to 90 psi (2,1 to 6,2 bar)
- Flow: 2.9 to 21.7 GPM (0,66 to 4,93 m³/h; 0,18 to 1,37 l/s)

Specifications

- 1" (26/34) female NPT or BSP threaded inlet
- SAM check device holds up to 10 feet (3,1 m) of head
- Rain Curtain nozzles: 04-black; 06-light blue; 08-dark green; 10-gray; 12-beige; 14-light green; 16-dark brown; 18-dark blue
- Nozzle outlet trajectory is 25°

Dimensions

- Overall height: 8 1/2" (21,6 cm)
- Pop-up height: 4" (10,2 cm)
- Exposed surface diameter: 2" (5,1 cm)

Note: Pop-up height is measured from cover to center of nozzle. Overall body height is measured popped down.

Models

- F4-FC: Full-circle
- F4-PC: Part-circle
- F4-FC-NP: Full-circle, non-potable cover
- F4-PC-NP: Part-circle, non-potable cover
- F4-FC-SS: Full-circle, stainless steel
- F4-PC-SS: Part-circle, stainless steel
- F4-FC-SS-HS: Full-circle, stainless steel, high speed rotation
- F4-PC-SS-HS: Part-circle, stainless steel, high speed rotation
- F4-FC-SS-NP: Full-circle, stainless steel, non-potable cover
- F4-PC-SS-NP: Part-circle, stainless steel, non-potable cover

How To Specify

NP or

F4- PC- SS- HS- 16- P

- **Model** F4: Falcon
- **Rotation** Part-circle
- **Optional Feature** Stainless steel riser
- **Optional Features** Non-potable cover or, High-speed rotor
- **Nozzle Size** 16
- **Optional Feature** Pre-installed Nozzle

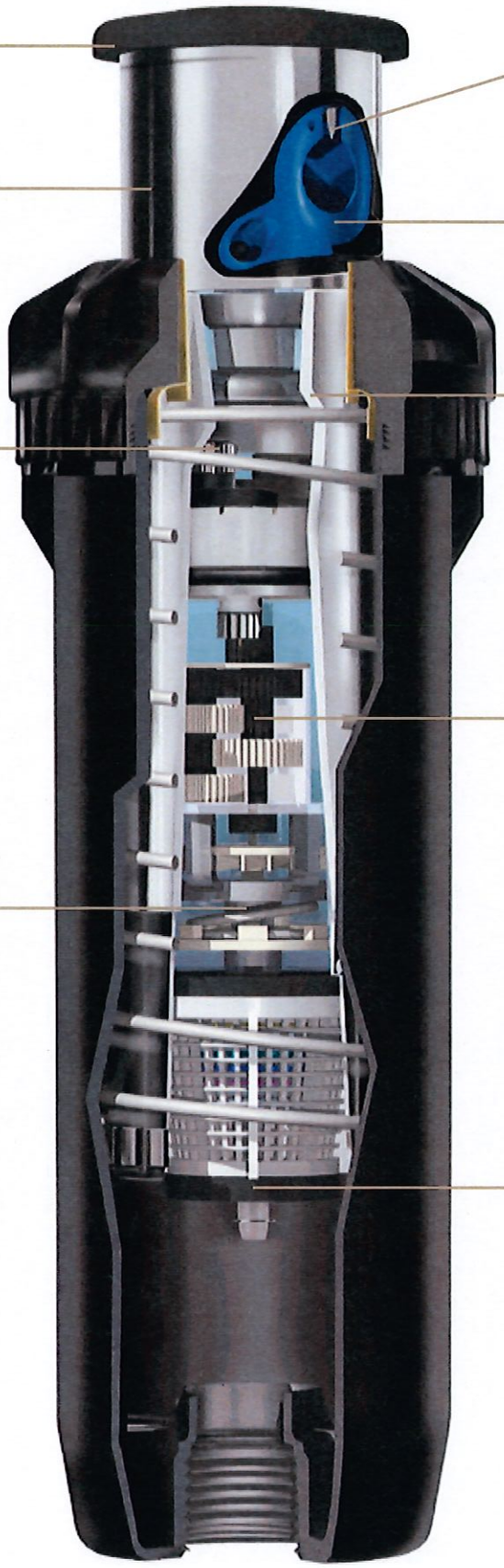
Note: For non-U.S. applications, it is necessary to specify NPT or BSP thread type.

Standard Rubber Cover with 2" Exposed Diameter
for enhanced safety on playing areas

Tapered Riser Stem (all models)
ensures positive pop-up and retraction

Stainless Steel Trip Gears
for long-term strength and durability

Self-adjusting Stator
automatically adjusts when nozzle is changed



Radius Adjustment Screw
allows up to 25% radius reduction without changing nozzles

Interchangeable Color-coded Nozzles
for superior water distribution

Patented, Pressure-activated Wiper Seal
protects the internals from debris

Water Lubricated Gear Drive
for reliable rotation

Seal-A-Matic™ (SAM) Check Device
prevents puddling/erosion

Falcon 6504 Nozzle Performance					
Pressure bar	Nozzle	Radius ft.	Flow gpm	■ Precip in/h	▲ Precip in/h
30	● 4	39	2.9	0.37	0.42
	● 6	43	4.2	0.44	0.50
40	● 4	41	3.3	0.38	0.44
	● 6	45	4.9	0.47	0.54
	● 8	49	6.6	0.53	0.61
	● 10	51	8.1	0.60	0.69
	● 12	53	9.7	0.66	0.77
	● 14	55	11.3	0.72	0.83
	● 16	55	12.6	0.80	0.93
	● 18	59	13.7	0.76	0.87
50	● 4	41	3.7	0.42	0.49
	● 6	49	5.5	0.44	0.51
	● 8	51	7.4	0.55	0.63
	● 10	53	9.1	0.62	0.72
	● 12	55	11.0	0.70	0.81
	● 14	59	12.7	0.70	0.81
	● 16	61	14.3	0.74	0.85
	● 18	59	15.4	0.85	0.98
60	● 4	41	4.0	0.46	0.53
	● 6	47	6.0	0.52	0.60
	● 8	51	8.2	0.61	0.70
	● 10	55	10.0	0.64	0.73
	● 12	57	12.2	0.72	0.83
	● 14	61	14.0	0.72	0.84
	● 16	63	15.7	0.76	0.88
	● 18	63	17.1	0.83	0.96
70	● 4	41	4.4	0.50	0.58
	● 6	49	6.3	0.51	0.58
	● 8	51	8.9	0.66	0.76
	● 10	57	10.8	0.64	0.74
	● 12	59	13.2	0.73	0.84
	● 14	61	15.2	0.79	0.91
	● 16	63	16.9	0.82	0.95
	● 18	65	18.3	0.83	0.96
80	● 4	43	4.6	0.48	0.55
	● 6	49	6.9	0.55	0.64
	● 8	53	9.4	0.64	0.74
	● 10	55	11.6	0.74	0.85
	● 12	61	14.0	0.72	0.84
	● 14	61	16.2	0.84	0.97
	● 16	63	18.1	0.88	1.01
	● 18	65	19.6	0.89	1.03
90	● 18	65	21.7	0.99	1.14

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

Falcon 6504 Nozzle Performance METRIC						
Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
2.1	● 4	11.9	0.66	10.98	9	11
	● 6	13.1	0.95	15.90	11	13
2.5	● 4	12.3	0.72	11.92	10	11
	● 6	13.5	1.05	17.56	12	13
	● 8	14.9	1.50	25.20	13	16
	● 10	15.5	1.84	30.60	15	18
	● 12	16.2	2.20	36.60	17	19
	● 14	16.8	2.57	42.60	18	21
	● 16	16.8	2.86	47.40	20	24
	● 18	18.0	3.11	51.60	19	22
3.0	● 4	12.5	0.78	13.02	10	12
	● 6	14.1	1.16	19.34	12	13
	● 8	15.1	1.56	26.04	14	16
	● 10	15.8	1.92	31.99	15	18
	● 12	16.4	2.31	38.44	17	20
	● 14	17.2	2.68	44.63	18	21
	● 16	17.4	3.00	49.95	20	23
	● 18	18.0	3.25	54.11	20	23
3.5	● 4	12.5	0.85	14.09	11	13
	● 6	14.9	1.26	20.96	11	13
	● 8	15.5	1.69	28.24	14	16
	● 10	16.2	2.08	34.70	16	18
	● 12	16.8	2.52	41.98	18	21
	● 14	18.0	2.91	48.45	18	21
	● 16	18.6	3.27	54.53	19	22
	● 18	18.1	3.53	58.78	22	25
4.0	● 4	12.5	0.89	14.91	11	13
	● 6	14.4	1.34	22.33	13	15
	● 8	15.5	1.83	30.44	15	17
	● 10	16.6	2.23	37.17	16	19
	● 12	17.3	2.72	45.28	18	21
	● 14	18.5	3.12	52.01	18	21
	● 16	19.1	3.50	58.37	19	22
	● 18	19.0	3.81	63.45	21	24
4.5	● 4	12.5	0.96	15.94	12	14
	● 6	14.6	1.40	16.72	13	15
	● 8	15.5	1.95	32.43	16	19
	● 10	17.1	2.37	39.44	16	19
	● 12	17.7	2.89	48.17	18	21
	● 14	18.6	3.32	55.38	19	22
	● 16	19.2	3.71	61.82	20	23
	● 18	19.5	4.03	67.12	21	24
5.0	● 4	12.7	1.01	16.84	13	15
	● 6	14.9	1.47	15.08	13	15
	● 8	15.7	2.05	34.16	17	19
	● 10	17.2	2.50	41.64	17	19
	● 12	18.1	3.04	50.72	19	21
	● 14	18.6	3.51	58.49	20	23
	● 16	19.2	3.91	65.11	21	24
	● 18	19.8	4.23	70.51	22	25
5.5	● 4	13.1	1.04	17.39	12	14
	● 6	14.9	1.56	25.79	14	16
	● 8	16.1	2.13	35.54	16	19
	● 10	16.8	2.63	43.84	19	22
	● 12	18.6	3.18	52.92	18	21
	● 14	18.6	3.67	61.23	21	25
	● 16	19.2	4.10	68.40	22	26
	● 18	19.8	4.44	74.07	23	26
6.0	● 18	19.8	4.79	79.77	24	28
6.2	● 18	19.8	4.93	82.13	25	29

High-Speed Falcon® 6504 Nozzle Performance

Pressure bar	Nozzle	Radius ft.	Flow gpm	■ Precip in/h	▲ Precip in/h
30	4	37	3.0	0.42	0.49
	6	39	4.3	0.54	0.63
40	4	41	3.5	0.40	0.46
	6	43	6.0	0.62	0.72
	8	47	6.6	0.58	0.66
	10	47	8.1	0.71	0.82
	12	49	9.9	0.79	0.92
	14	53	11.4	0.78	0.90
	16	51	12.6	0.93	1.08
	18	53	13.9	0.95	1.10
50	4	41	3.7	0.42	0.49
	6	45	5.6	0.53	0.62
	8	49	7.5	0.60	0.69
	10	49	9.2	0.74	0.85
	12	53	11.2	0.77	0.89
	14	53	12.9	0.88	1.02
	16	53	14.3	0.98	1.13
	18	55	15.6	0.99	1.15
60	4	41	4.2	0.48	0.56
	6	45	6.2	0.59	0.68
	8	47	8.3	0.72	0.84
	10	49	10.2	0.82	0.94
	12	53	12.4	0.85	0.98
	14	53	14.2	0.97	1.12
	16	55	15.7	1.00	1.15
	18	59	17.2	0.95	1.10
70	4	41	4.6	0.53	0.61
	6	43	6.7	0.70	0.81
	8	49	9.0	0.72	0.83
	10	51	11.1	0.82	0.95
	12	55	13.5	0.86	0.99
	14	53	15.3	1.05	1.21
	16	57	17.1	1.01	1.17
	18	59	18.6	1.03	1.19
80	4	39	4.9	0.62	0.72
	6	43	7.1	0.74	0.85
	8	51	9.7	0.72	0.83
	10	49	11.9	0.95	1.10
	12	55	14.4	0.92	1.06
	14	53	16.5	1.13	1.31
	16	59	18.4	1.02	1.18
	18	59	20.0	1.11	1.28
90	18	61	21.3	1.10	1.27

Precipitation rates based on half-circle operation

■ *Square spacing based on 50% diameter of throw*

▲ *Triangular spacing based on 50% diameter of throw*

Performance data collected in zero wind conditions

Performance data derived from tests that conform with ASAE Standards; ASAE S398.1.

Falcon 6504 Nozzle Performance — METRIC

Pressure bar	Nozzle	Radius m	Flow m^3/h	Flow l/m	■ Precip mm/h	▲ Precip mm/h
2.1	4	11.3	0.68	11.35	11	12
	6	11.9	0.98	15.90	14	16
2.5	4	12.0	0.75	12.54	10	12
	6	12.7	1.22	20.16	15	18
	8	14.2	1.49	25.20	15	17
	10	14.2	1.83	30.60	18	21
	12	14.8	2.24	37.20	20	24
	14	16.0	2.58	43.20	20	23
	16	15.4	2.85	47.40	24	28
	18	16.0	3.15	52.80	24	28
3.0	4	12.5	0.81	13.51	10	12
	6	13.3	1.33	22.18	15	17
	8	14.5	1.57	26.18	15	17
	10	14.5	1.93	32.12	18	21
	12	15.4	2.35	39.20	20	23
	14	16.2	2.71	48.09	21	24
	16	15.8	3.00	49.95	24	28
	18	16.4	3.29	54.87	25	28
3.5	4	12.5	0.85	14.15	11	13
	6	13.7	1.28	21.37	14	16
	8	14.9	1.72	28.62	16	18
	10	14.9	2.11	35.11	19	22
	12	16.2	2.56	42.74	20	23
	14	16.2	2.95	49.20	23	26
	16	16.2	3.27	54.53	25	29
	18	16.9	3.57	59.51	25	29
4.0	4	12.5	0.93	15.52	12	14
	6	13.7	1.38	23.02	15	17
	8	14.4	1.85	30.81	18	21
	10	14.9	2.27	37.86	20	24
	12	16.2	2.76	46.03	21	24
	14	16.2	3.17	52.77	24	28
	16	16.6	3.50	58.37	25	29
	18	17.7	3.83	63.90	24	28
4.5	4	12.5	1.00	16.69	13	15
	6	13.4	1.48	24.46	16	19
	8	14.6	1.97	32.81	18	21
	10	15.3	2.42	40.40	21	24
	12	16.5	2.95	49.13	22	25
	14	16.2	3.36	55.94	26	30
	16	17.1	3.73	62.22	26	30
	18	18.0	4.07	67.89	25	29
5.0	4	12.3	1.06	17.70	14	16
	6	13.1	1.56	25.74	18	21
	8	15.1	2.08	34.73	18	21
	10	15.4	2.57	42.78	22	25
	12	16.8	3.12	51.96	22	26
	14	16.2	3.54	59.06	27	31
	16	17.5	3.96	65.96	26	30
	18	18.0	4.30	71.74	27	31
5.5	4	11.9	1.11	18.52	16	18
	6	13.1	1.61	26.84	19	22
	8	15.5	2.20	36.65	18	21
	10	14.9	2.70	44.97	24	28
	12	16.8	3.27	54.43	23	27
	14	16.2	3.74	62.35	29	33
	16	18.0	4.17	69.53	26	30
	18	18.0	4.53	75.58	28	32
6.0	18	18.4	4.75	79.16	28	32
6.2	18	18.6	4.84	80.62	28	32

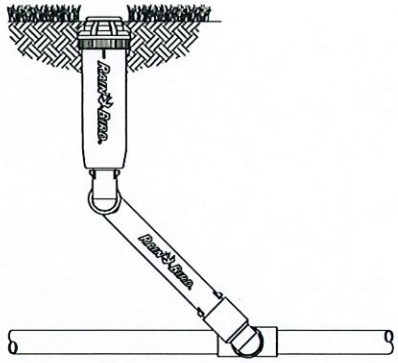
Specifications

The full- or part-circle sprinkler shall be a single stream, water lubricated, gear drive type capable of covering a_____foot (meter) radius at a base pressure of _____ pounds per square inch (Bars) with a discharge rate of _____ gallons per minute (l/s, m^3/h). The part-circle sprinkler shall have adjustable arc coverage of 40 to 360 degrees. Arc adjustment can be performed with or without the rotor in operation and shall require only a flat blade screwdriver. The sprinkler shall be capable of full-circle (360 degree) operation in either the single direction mode (FC) or the bi-directional mode (PC). The sprinkler shall have a rotating nozzle turret independent of the riser stem. The portion of the riser stem that is in contact with the wiper seal shall be non-rotating.

The sprinkler shall have a pressure activated, multi-function, soft elastomeric wiper seal that will clean debris from the pop-up stem as it retracts. This wiper seal shall prevent the sprinkler from sticking in the up position, and be capable of sealing the sprinkler riser stem to the sprinkler cap under normal operating pressures. The sprinkler shall have a tapered riser stem that will assist in the flushing mode of the sprinkler as it pops-up, as well as when it pops-down. The tapered stem shall seal positively against the multi-function wiper seal to assure no flow-by when fully activated.

The sprinkler shall have a screen attached to the drive housing to filter inlet water, protect the drive from clogging and simplify its removal for cleaning and flushing of the system.
The sprinkler body shall have a double-wall construction 1" (26/34) female (NPT or BSP) bottom inlet. The sprinkler shall have a standard rubber cover which designates the full-circle sprinkler from the top, as well as designates each adjustment opening from the top.
The sprinkler shall have a front-load nozzle assembly which will allow the nozzle to be installed without a stator bushing change. The sprinkler shall have eight color-coded nozzles. All but the #4 and #6 nozzle shall have three ports for optimal close-in, mid-range and long-range water distribution. The sprinkler shall have a stainless steel adjusting screw capable of reducing the radius up to 25%. The angle of trajectory shall be 25 degrees from horizontal.

The sprinkler shall have a strong stainless steel retract spring for positive pop-down. The sprinkler shall have a standard Seal-A-Matic™ (SAM) device capable of holding up to 10 feet (3,1 m) of head. Pop-up height as measured from the top of the cover to the centerline of the nozzle orifice shall be 4 inches (10,2 cm). The sprinkler's overall height shall be 8½ inches (21,6 cm) and the diameter shall be 2 inches (5,1 cm).



Optional Feature Specifications

Non-Potable Rubber Cover: F4-FC-NP, F4-PC-NP

When so indicated on the design, the rotor shall have a purple rubber cover to indicate to the user that non-potable water is being used. There shall be no difference between the black and purple covers except for the color.

Stainless Steel Riser Stem: F4-FC-SS, F4-PC-SS

When so indicated on the design, the rotor shall have a stainless steel covered nozzle turret and riser stem. The riser stem shall be tapered and conform to the standard plastic riser stem in all other ways.

High Speed Rotation: F4-FC-SS-HS, F4-PC-SS-HS

When so indicated on the design, the rotor shall have a stainless steel covered nozzle turret and riser stem and shall complete a full-circle rotation in approximately one minute. The rotor shall have a brown rubber cover to indicate to the user that the rotor is a high speed version. There shall be no difference between the black and brown covers except for the color.

The sprinkler shall be as manufactured by Rain Bird Corporation, Glendora, California.

Rain Bird Corporation
6991 E. Southpoint Road
Tucson, AZ 85756
Phone: (520) 741-6100
Fax: (520) 741-6522

Rain Bird Technical Services
(800) RAINBIRD (1-800-724-6247)
(U.S. and Canada)

Rain Bird Corporation
970 West Sierra Madre Avenue
Azusa, CA 91702
Phone: (626) 812-3400
Fax: (626) 812-3411

Specification Hotline
800-458-3005 (U.S. and Canada)

Rain Bird International, Inc.
1000 West Sierra Madre Ave.
Azusa, CA 91702
Phone: (626) 963-9311
Fax: (626) 852-7343

The Intelligent Use of Water™
www.rainbird.com

RAIN BIRD®

Tech Spec

Root Watering System

Primary Application

The Rain Bird® Root Watering System (RWS) enables vital water, air and nutrients to bypass compacted soil and directly reach tree and shrub root systems. Its factory assembled irrigation hardware and patented basket weave canister allow ground installation to a depth of 36" (91,4 cm) for the RWS, 18" (45,7 cm) for the RWS-Mini, and 10" (25,4 cm) for the RWS-Supplemental. This system is intended for use with water dispensing devices, such as a bubbler head or an emitter. This system can be customized by the end user to meet their specific required irrigation needs or can be purchased with pre-installed bubbler and check valve options.

Features and Benefits

Investment protection

- Deep and broad roots yield transplantation survivability, stability in high winds, fast and healthy growth

Watering efficiency

- Subsurface irrigation minimizes run-off and evaporation

Landscape aesthetics

- Installs at grade and helps minimize damage to hardscapes

Models

RWS

RWS — Root Watering System Basic, 4" (10,2 cm) grate, ready for customer-provided irrigation hardware

RWS-B-1401 — Root Watering System with 0.25 GPM (0,95 l/m) bubbler, 4" (10,2 cm) grate, versatile swing assembly with ½" (15/21) M NPT inlet

RWS-B-1402 — Root Watering System with 0.50 GPM (1,9 l/m) bubbler, 4" (10 cm) grate, 12" (30,5 cm) versatile swing assembly with ½" (15/21) M NPT inlet

RWS-B-C-1401 — Root Watering System with 0.25 GPM (0,95 l/m) bubbler & check valve, 4" (10,2 cm) grate, versatile swing assembly with ½" (15/21) M NPT inlet

RWS-B-C-1402 — Root Watering System with 0.50 GPM (1,9 l/m) bubbler & check valve, 4" (10,2 cm) grate, versatile swing assembly with ½" (15/21) M NPT inlet

RWS-B-C-1404 — Root Watering System with 1.00 GPM (3,8 l/m) bubbler & check valve, 4" (10,2 cm) grate, versatile swing assembly with ½" (15/21) M NPT inlet

RWS-B-X-1401 — Root Watering System with 0.25 GPM (0,95 l/m) bubbler, 4" (10,2 cm) grate, 18" (45,7 cm) open swing assembly with ½" (15/21) M NPT inlet

RWS-Mini

RWS-M — Mini Root Watering System Basic with 4" (10,2 cm) grate, ready for customer provided irrigation hardware

RWS-M-B-1401 — Mini Root Watering System with 0.25 GPM (0,95 l/m) bubbler, 4" (10,2 cm) grate, ½" (15/21) M NPT inlet spiral barb elbow

RWS-M-B-1402 — Mini Root Watering System with 0.50 GPM (1,9 l/m) bubbler & check valve, 4" (10,2 cm) grate, ½" (15/21) M NPT inlet spiral barb elbow

RWS-M-B-C-1401 — Mini Root Watering System with 0.25 GPM (0,95 l/m) bubbler & check valve, 4" (10,2 cm) grate, ½" (15/21) M NPT inlet spiral barb elbow

RWS-M-B-C-1402 — Mini Root Watering System with 0.50 GPM (1,9 l/m) bubbler & check valve, 4" (10,2 cm) grate, ½" (15/21) M NPT inlet spiral barb elbow

How to Specify

RWS – X – X – X – XXXX

- **Model** RWS 36" (91,4 cm)
- **Other Size** M: Mini (18" - 45,7cm) S: Supplemental (10" - 25,4cm) GRATE-P: Purple Grate RWS-Sock: Sock
- **Bubbler** B: Bubbler Pre-installed
- **Optional** C: Check Valve
- **Bubbler Model** 1401 1402 1404

RWS/RWS-Mini Accessories

RWS-SOCK — Root Watering System Sock (6 per bag)

RWS-GRATE-P — Root Watering System 4" (10 cm) Purple Grate

RWS-Supplemental

RWS-S-B-1401 — Supplemental Root Watering System with 0.25 GPM (0,95 l/m) bubbler, 2" (5,1 cm) snap-on cap and base, ½" (15/21) M NPT inlet spiral barb elbow

RWS-S-B-C-1401 — Supplemental Root Watering System with 0.25 GPM (0,95 l/m) bubbler & check valve, 2" (5,1 cm) snap-on cap and base, ½" (15/21) M NPT inlet spiral barb elbow

Specifications

The RWS is the smart watering product line designed to maximize tree and shrub transplanting survivability. It consists of a perforated polyethylene cylinder in three different lengths – 36" (91,4 cm) for large trees, 18" (45,7 cm) for small trees, and 10" (25,4 cm) for shrubs and row plantings – and two different widths – 4" (10.2 cm) for trees and 2" (5,1 cm) for shrubs and row plantings. The rigid mesh material helps support the horizontal movement of water and air into the root zone and adjacent soil. The cylinder supports pea gravel fill to provide better top-to-bottom water dispersion and firmness against root compression.

The RWS is designed with an integrated bubbler and optional check valve. The water being emitted from the bubbler helps train roots away from surfaces and hardscapes, minimize surface erosion and reduce waste due to run-off. The factory-assembled RWS comes pre-configured with swing assemblies and/or spiral barbed fittings in order to promote irrigation design flexibility, accommodate all tree and shrub sizes, and help save installation time by being ready to install out of the box. The assemblies and fittings enable the RWS to be directly connected to PVC or polyethylene lateral lines.

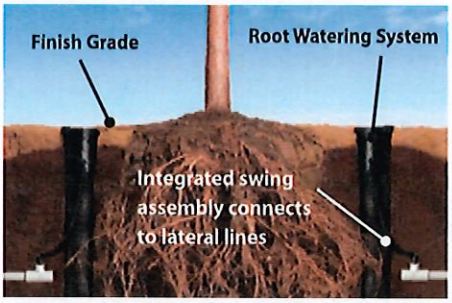
The bubblers on the 18" (45,7cm) and 36" (91,4cm) RWS models can be replaced with Rain Bird's 6-outlet drip manifold (EMT-6XERI) allowing use of the RWS as a drip distribution hub. RWS includes two ports allowing distribution of XQ ¼" drip tubing to surrounding RWS units or other drip irrigation emitters. Rain Bird's Drip System Operation Indicator (OPERIND) can be optionally used to indicate active RWS irrigation.

The RWS, including the RWS-M and RWS-S models, protect the investment property owners make in trees and shrubs. It helps trees and shrubs establish deeper and broader roots for better stability against high winds and quicker, healthier growth. The subsurface irrigation design improves watering efficiency by minimizing the total volume of water used to irrigate trees and shrubs and minimize water lost due to evaporation and run-off. The RWS improves the aesthetics of the landscape by installing at finish-grade level and minimizing root damage to hardscapes.

The RWS supports an extra-wide molded collar to provide convenient access to the bubbler and drip line fastener. It supports a locking grate cover to help deter vandalism. It offers a purple, reclaimed water grate cover option. The RWS offers also a sock option in order to prevent small particles from penetrating the RWS cylinder. THe RWS is designed with a peripheral watering feature which allows water to flow along the perforated cylinder resulting in the wetting of soil along the vertical distance of the cylinder.

RWS units should be installed on their own watering zone in order to improve irrigation efficiency and management.

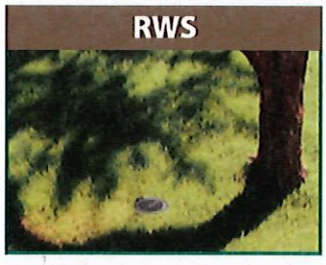
Installation Diagram

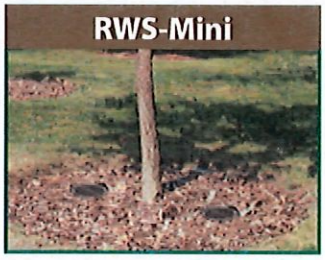


- *Position units evenly spaced, adjacent to the root zone and within the canopy of the tree.*
- *Consider filling canisters with pea gravel fill to provide better top-to-bottom water dispersion and firmness against root compression.*
- *Optional soil sock should be used to prevent particle intrusion into cylinder.*
- *Optional purple grate cover should be used for non-potable water sources.*
- *For long-term deep and broad roots, consider installing two RWS perimeters on separate zones—running the inner zone for the first couple of years and the outer zone in subsequent years.*

RWS Usage Guide

- 2–3 **RWS** units for large trees
- 1–2 **RWS-Mini** units for small trees
- 1–2 **RWS-Supplemental** units for shrubs





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6991 East Southpoint Road
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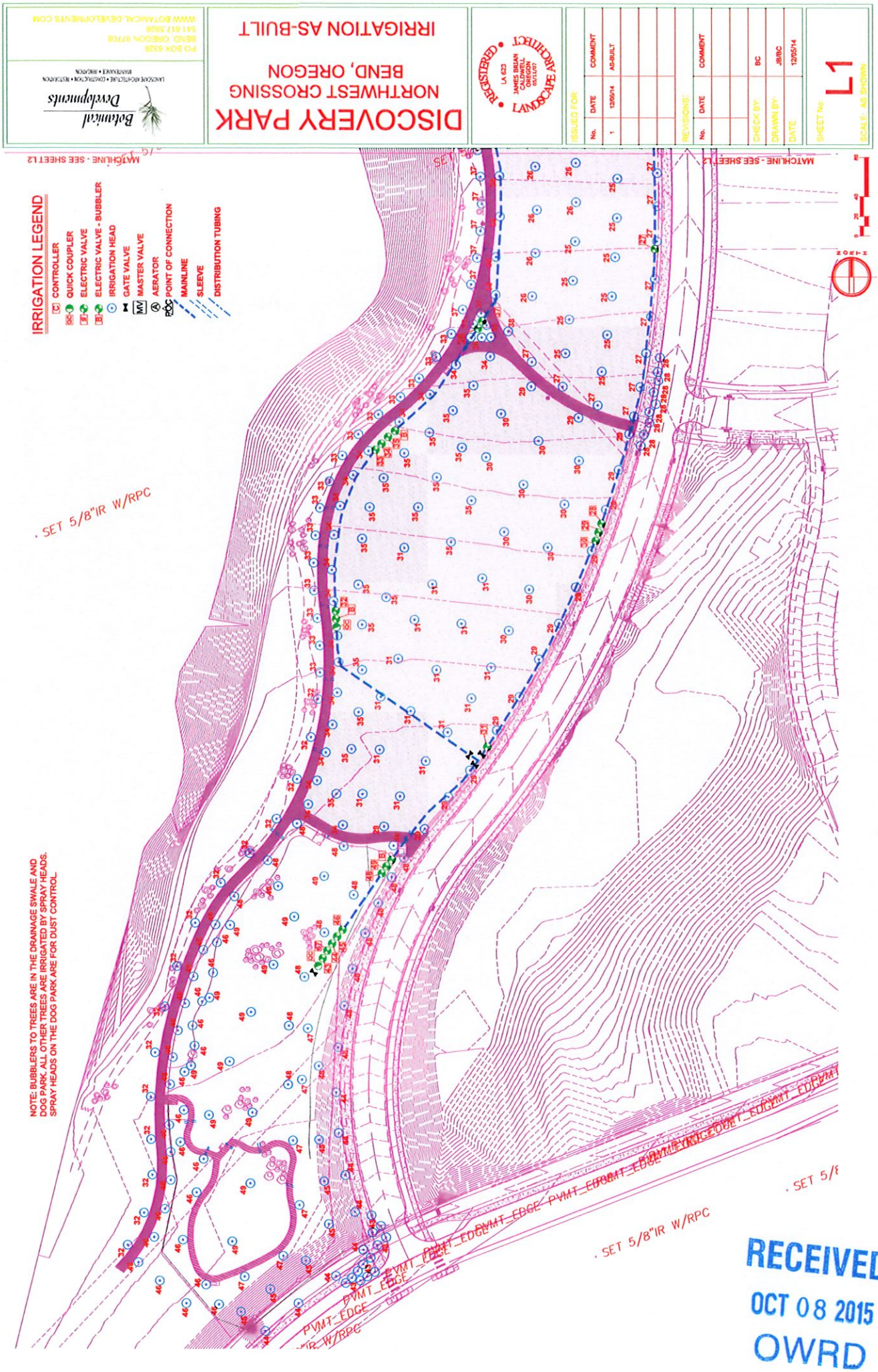

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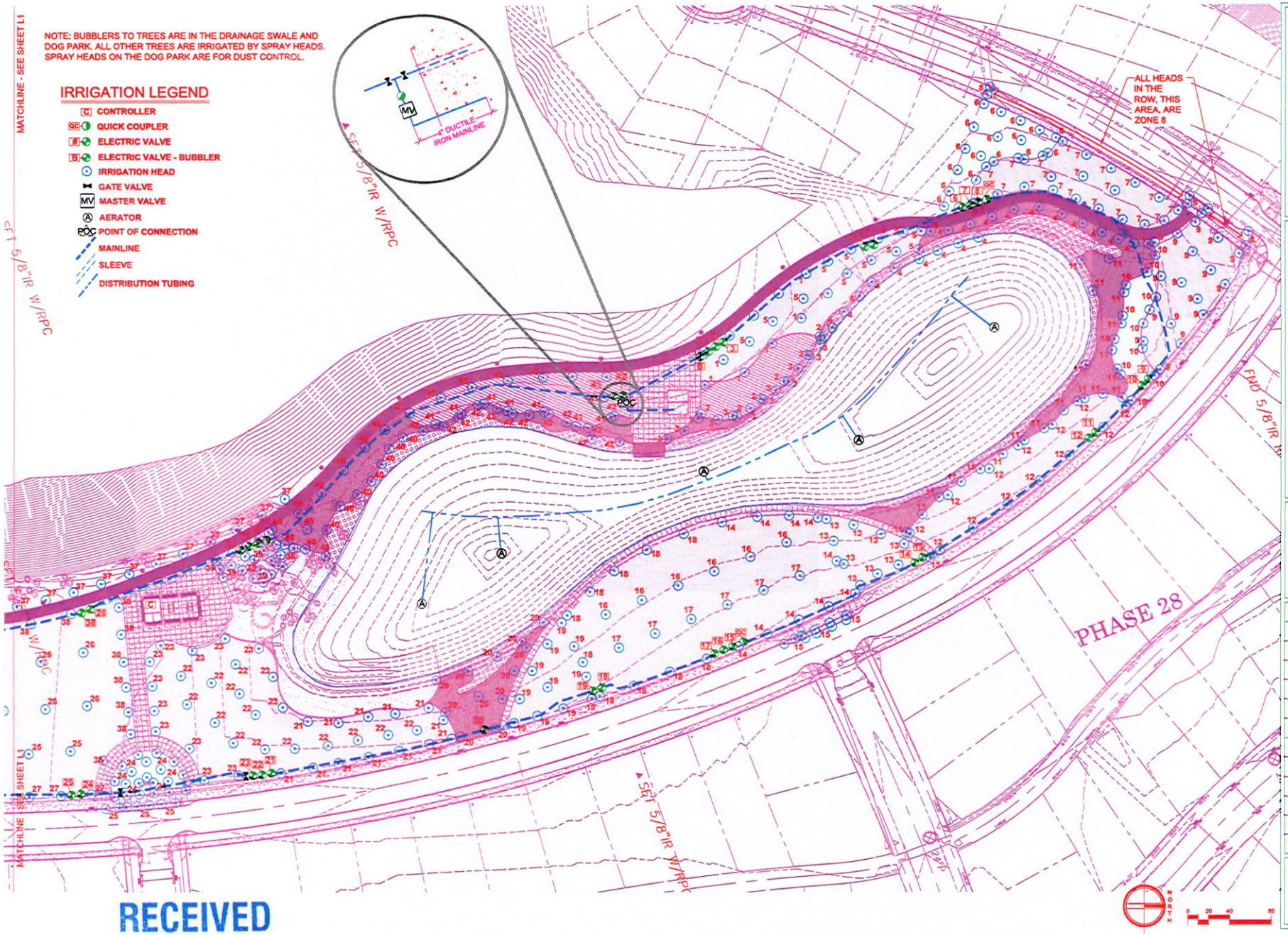

PO BOX 6326
BEND, OREGON 97708
541 617 5566
WWW.BOTANICALDEVELOPMENTS.COM

DISCOVERY PARK
NORTHWEST CROSSING
BEND, OREGON
IRRIGATION AS-BUILT

REGISTERED LANDSCAPE ARCHITECT
LA 623
JAMES BRIAN CALDWELL
OREGON
05/11/07

ISSUED FOR:

No.	DATE	COMMENT
1	12/05/14	AS-BUILT

REVISIONS:

No.	DATE	COMMENT

CHECK BY:	BC
DRAWN BY:	JB
DATE:	12/05/14

SHEET No: L2

SCALE: AS SHOWN

Appendix F

2014 Water Use Reporting

Water Use Reporting Entry

Logout

WEST BEND PROPERTY CO. LLC

Enter amount of water used or stored each month:

- **Do not report actual meter readings - subtract the previous month's meter reading from the next month's reading to find the amount of water used in the month.**
- **For ponds or reservoirs, enter amount of water in storage, as measured on a particular day each month.**
- **Leave zeroes for any months when there was no water use or a reservoir was empty.**
- **Enter data for all months of the year before submitting the report.**

Rpt ID	Unit	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	S
64116 Water Year: 2014	Gallons	0	0	0	0	0	0	0	0	0	0	0	0

Method of measurement used: No use under this permit

Additional Comments (optional): See LL 491 report

Name of the person submitting the report: Niall Boggs PE, CWRE

Company, if applicable: WHPacific

Phone number, if different from that of water right holder: 541-312-2540

If used for irrigation, total number of acres irrigated:

Once the report has been submitted, you will need to contact the Department if changes are needed.

Submit Cancel

Water Use Reporting Entry

Logout

WEST BEND PROPERTY CO. LLC

Enter amount of water used or stored each month:

- **Do not report actual meter readings - subtract the previous month's meter reading from the next month's reading to find the amount of water used in the month.**
- **For ponds or reservoirs, enter amount of water in storage, as measured on a particular day each month.**
- **Leave zeroes for any months when there was no water use or a reservoir was empty.**
- **Enter data for all months of the year before submitting the report.**

Rpt ID	Unit	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	S
65925 Water Year: 2014	Gallons	692000	240000	60000									

Method of measurement used: Filled 4000gallon water trucks, kept log of loads filled.

Additional Comments (optional):

Name of the person submitting the report: Niall Boggs, PE, CWRE

Company, if applicable: WHPacific

Phone number, if different from that of water right holder: 541-312-2540

If used for irrigation, total number of acres irrigated:

Once the report has been submitted, you will need to contact the Department if changes are needed.

Submit Cancel

Appendix G

Waiver from Mapping Standards

Niall Boggs

From: CLARK Gerry E <gerald.e.clark@state.or.us>
Sent: Wednesday, June 17, 2015 5:07 PM
To: Niall Boggs
Subject: RE: Permit G-16625 - waiver from mapping stds.

Niall,

Your request for a waiver is approved as requested. Please be sure that the map clearly describes the quarter quarters and any applicable government lots.

Please let me know if you have any additional questions.

Gerry

Gerry Clark
Water Right Services Division
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301

Phone: 503-986-0811

From: Niall Boggs [mailto:NBoggs@parametrix.com]
Sent: Tuesday, June 16, 2015 9:30 AM
To: gerald.e.clark@state.or.us
Subject: Permit G-16625 - waiver from mapping stds.

Gerry-
I am working on a Claim of Beneficial Use for Permit G-16625. This is an irrigation right for a new public park within the City of Bend. On the map for this permit, using 1"=400' scale, it is difficult to fit in all the detail needed on the map (tax lot numbers, irrigation system components, etc.) I am requesting a waiver from standards to utilize a different scale, such as 1"=100'. Please let me know if this is acceptable.

Thank you,

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Niall Boggs, PE, CWRE
Project Engineer
595 SW Bluff Dr., Suite B
Bend, OR 97702
541.508.7710 | main
541.550.7694 | desk
541.948.5362 | cell