City of Brookings

WORKSHOP Agenda

CITY COUNCIL

Monday February 4, 2013, 4:00pm
City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

A. Call to Order

B. Roll Call

C. Topics

1. Americans with Disabilities Act (ADA) Transition Plan: Sidewalks and Pedestrian Ways [Building, pg. 2]
    a. Transition Plan [pg. 3]
2. Tribble / Mahar Sewer System Proposal [Public Works, pg. 5]
    a. Letter from Mahar-Tribble [pg. 8]
    b. Memo from PWDS Director [pg. 18]
    c. March 12, 2012 Council Agenda Report [pg. 23]
    d. February 13, 2013 Council Workshop Report [pg. 25]
    e. November 17, 2011 Memo from City Manager [pg. 30]
    f. STEP System evaluation Report, August 2011 [pg. 32]
    g. North Bank Chetco River Road Wastewater Feasibility Analysis, November 2010 (viewable from the website agenda; hard copy available upon request)
3. Cross Connection Control / Backflow Program - Part 2 of 2 [Public Works, pg. 42]
    a. Proposed ordinance revisions [pg. 43]
    b. Cross Connection Control Program [pg. 55]
4. Parks Maintenance Staffing [Parks, pg. 170]
    a. Matrix [pg. 172]
    b. Salary spreadsheet [pg. 173]

D. Council Member Requests for Workshop Topics

E. Adjournment

All public City meetings are held in accessible locations. Auxiliary aids will be provided upon request with advance notification. Please contact 469-1102 if you have any questions regarding this notice.

CITY OF BROOKINGS

Council WORKSHOP Report

Workshop Date: February 4, 2013

Originating Dept: PWDS

Laura Lee Snook
Signature (submitted by)

City Manager Approval

Subject: ADA (Americans with Disabilities Act) Transition Plan regarding sidewalks and pedestrian ways

Recommendation: Discussion regarding scope of Transition Plan and budgeting necessary to accomplish goals

Financial Impact: significant

Background/Discussion: Title II of the ADA requires that all public entities have a transition plan, working toward the goal of full compliance with ADA at all facilities. Curry Disability Services Advisory Council (DSAC) and PWDS Staff participated in a walking tour to evaluate Chetco and Railroad Avenue from 5th Street to Oak Street for pedestrian barriers. In this area 21 deficiencies were identified, many other elements do not meet ***current*** ADA standards, as required, but were not identified as problematic by the group at this time. This leaves many other streets to be evaluated and budgeting needs could be substantial.

Policy Considerations: This is consistent with our policy of being in compliance with State and Federal law.

Attachment(s): Transition plan

Transition Plan
ADA Title II

Accessibility issues are extremely important to the City of Brookings and every attempt is made to resolve any situations or complaints that come up relating to accessibility.

Grievance procedure: Any person who feels that their access to any program, activity, service or facility, which is administered by the City of Brookings, may file a written complaint to the City Manager. Upon receiving such complaint the City Manager will forward the complaint to the appropriate department head for resolution.

If the complaint is regarding a program, activity or service the complaint will be followed up by the department head that oversees the program, activity or service to determine how the program, activity or service can be altered to allow all individuals with disabilities to participate.

If the complaint is related to access to facilities the complaint is forwarded to the Building Official, who also acts as the ADA Coordinator and is responsible for the ADA Transition Plan, to determine whether an alteration to the building is possible in order to resolve the complaint. Depending on the cost of the alteration and the availability of budgeting, the alteration will be scheduled for repair or put on a transition list for future budgeting.

The following elements of the Transition Plan have been completed:

Physical barriers:

09/1992:	Addition of ADA restroom to main City Hall
06/1994:	Conversion of 2 jail cells to ADA unisex restroom in Police Department
06/2007:	Renovate restrooms at Azalea Park and replace fixtures with accessible units
10/2007:	Install accessible walkways through Azalea Park
06/2008:	Addition of thresholds at all exterior doors at City Hall to bring into compliance.
06/2009	Change thresholds in restrooms at concession stand at Azalea Park
07/2009	Renovate interior and replace all fixtures in restroom at Easy Manor Park, provide ADA parking space, loading zone and accessible route to restrooms. Replace playground equipment with play structure that incorporates accessible play elements and accessible picnic area.
08/2009	Change thresholds on all doors at City Hall and adjust tension so exterior doors meet "pull" maximums.
05/2010	Construct accessible trail and wheelchair viewing stations at Azalea Park band shell.
06/2010	Replace ladder and diving board platform with accessible stairs to new platform at swimming pool.

08/10/10	Contract to build accessible ramp to Council Chamber Dias, additional renovations to concrete block wall to accommodate wider opening at ramp end and add door adjacent to dais.
Fall 2011	Add accessible parking at south entrance of City Hall
Fall 2011	Added accessible parking spaces and curb cuts in downtown street parking areas on Fern and Willow Streets.

Programs, activities and services

2008 TTI # added to all letterheads and mailings
2010 Grievance process and complaint forms created and put on City web site
2012: Evaluate all park facilities for compliance

- Installation of compliant swimming pool lift
- Accessible route to Bud Cross fields
- Started a field evaluation of all public infrastructure for compliance with the assistance of the DSCA group.

GOALS

2013: Develop priorities list and budget for addressing deficiencies in the pedestrian public infrastructure system.

2014: Evaluate all additional facilities not accessed by the Public

CITY OF BROOKINGS

COUNCIL WORKSHOP REPORT

Meeting Date: February 4, 2013

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Tribble/Mahar Sewer System Proposal

Background/Discussion:
In 2010, Ron Tribble contacted the City with a preliminary proposal to construct 60 single family housing units on two tax lots totaling 14 acres located on North Bank Chetco River Road. The subject property is within the Urban Growth Boundary, but is not within the City Limits or the Urban Renewal Area. The property was not included in the Wastewater Master Plan.

The City retained The Dyer Partnership to undertake a study and report concerning extension of sewer service to the area within the UGB served by North Bank Chetco River Road. This study was completed in November, 2010, and estimated the new connection potential in this region of the UGB at 1,531 units. The study reviewed various alternatives and recommended the installation of a conventional sewer collection system that could be constructed in segments. The first segment of the sewer line would serve the Tribble property, two existing RV parks and vacant property owned by Tidewater. The estimated cost of construction for this initial segment of the project was $1,200,000.

To provide an incentive to the developer (Ron Tribble and Mike Mahar), and because the Tidewater property is located within the Urban Renewal Area, the Urban Renewal Agency tentatively agreed to contribute up to $200,000 toward the cost of the project. The developer concluded that it was not economically feasible to proceed.

State/federal grant funding from various sources was also explored; no such funding is available.

Some months later, the developer returned to the City with a proposal to install an alternative form of collection system known as "STEP." Essentially, the Orenco STEP system is a modified septic system whereby each residence would have a holding tank that would be pumped periodically and residual liquid would be discharged to the City's sewer collection system. Again, The Dyer Partnership was retained to analyze this proposal and produced a report dated August 2011. The City Council rejected this proposal in September, 2011. The primary reasons for rejecting the proposal were:

1. The City would be required to own, maintain and service 60 separate holding tanks.
2. The STEP system is not expandable; all other properties in the UGB would be required to install STEP systems or construct a parallel conventional sewer main and an even higher per unit cost.
3. The STEP system, essentially, converts a developer capital cost to a homeowner/City ongoing maintenance/operation cost.

Subsequently, the City met with the developer and other landowners to explore the possible formation of a local improvement district as a funding mechanism for the traditional sewer collection system. Several meetings were held and the staff prepared several cost-sharing scenarios. A draft agreement was prepared by the City Attorney and included a $200,000 contribution from URA and the rebate of 66 per cent of SDCs paid. This concept was approved in concept by the City Council in March, 2012. Petitions requesting the formation of an improvement district were prepared. Ultimately, the property owners were unable to reach an agreement on cost sharing.

The developer then approached County with a proposal to downsize the scope of the development and install on-site treatment systems. According to a letter to the developer from Curry County Sanitarian Sara Hunter, the County would only approve the construction of one dwelling unit on the site "with a very expensive onsite system, namely a sand filter, or advanced treatment with ultra violet light due to the permanent and temporary ground water table that was apparent in all of the test pit soil horizons."

In January, 2013, the City received a letter from the developer proposing a "pretreatment with private sewer main alternative" (see attached). The scope of the project has been changed to 50 housing units. The difference between the Orenco pretreatment system and the Orenco STEP system is, essentially, that the developer would construct a pre-treatment facility onsite, there would be no individual holding tanks, and all facilities would be privately owned and maintained up to the point of connection with the City sewer main. The developer estimates the cost of constructing this system at $645,000.

The developer is also now proposing that the Urban Renewal Agency contribute some unspecified amount to the project, and that the entire amount of Wastewater System Development Charges generated by the 50 housing units ($482,300) be rebated to the developer. The project is not located within the URA boundaries and the sewer system improvements would not benefit any properties within the URA boundaries; thus URA funds could not used to support this project. Whereas the infrastructure proposed for installation would be privately owned, and would not be available to serve any future City sewer service customers, management sees no rationale for rebating SDCs. Management would recommend that the SDC amounts applicable to this project be reviewed and possibly lowered as the pre-treatment process may lessen the impact on the collection/treatment system.

Management has a continuing concern that, while the proposal may be technically feasible, it would have the same policy affect as the Orenco STEP system in that the system is not expandable. This issue could be partially addressed by the installation of a larger transmission line and dedication of that line to the City.

Another possible attribute to the proposal, which would require further study, is that the pre-treated wastewater could possibly be used for irrigation purposes at nearby Azalea Park. The feasibility of such an alternative use, costs associated with Park infrastructure modification and operations, and possible grant funding for such a project would need further evaluation; initial investigation indicates that the discharge water from a pretreatment facility as proposed would not meet state/federal standards for this type of use.

The Public Works/Development Services Director is preparing a separate preliminary technical report concerning the latest proposal.

Attachment(s):

a. Mahar/Tribble letter dated January 1, 2013
b. Public Works/Development Services Director memorandum dated January 11, 2013.
c. Council Agenda Report March 12, 2012
d. Council Workshop Report February 13, 2012
e. City Manager memorandum dated November 17, 2011
f. STEP System evaluation report August 2011
g. North Bank Chetco River Road Wastewater Feasibility Analysis November 2010 (viewable from website agenda; hard copy available upon request).

Mahar/Tribble, LLC
736 Hemlock Lane, Roseburg, Oregon 541-430-3455 rontribble@charter.net

1 January 2013

Mr. Gary Milliman,
City Manager
City of Brookings
898 Elk Drive
Brookings, OR 97415

Subject: North Bank Chetco River Road Sewer Connection- Pretreatment with private sewer main alternative

Dear Mr. Milliman,

This letter follows up recent discussions between us, the Dyer Partnership and your staff for connecting a private sewer main from our property on the North Bank Road of the Chetco River to either the pump station or the existing sewer main near the intersection of the North Bank Road and Hwy 101.

Our proposal is to install a private low pressure sewer main from our property to the city sewer main. The private low pressure sewer main would be located on city and county right of way in or along the North Bank Road of the Chetco River. Our proposal is to pre-treat the effluent prior to pumping. The pretreatment unit proposed is an Advantex Treatment plant constructed by Orenco Systems Inc of Sutherlin Oregon. The treatment system, pump stations and all appurtenances will be located and maintained on our property under a Department of Environmental Quality WPCF permit. A Schematic Diagram of our proposal is attached to this letter.

We discussed this proposal with the County Sanitarian and Mr. Steve Majors, President of the Dyer Partnership. They both indicated this would be a good alternative for the city and resolves their previous concerns with the step system option we had previously proposed. Some of the benefits of this proposal are summarized below.

1. Max flows would be 30 gallons per minute which would have minimum impact on the existing city pump station. The maximum daily flows at approximated full development would be 15000 gallons per day using the DEQ sizing tables. This is based on 50 homes x 300 gallons per home per day. Final development planning could adjust number of housing units. The actual flows are expected to be much less. A flow meter will be installed on the line to allow the city to monitor its use and as a requirement of the WPCF permit.

2. Effluent would be treated and would have no effects to the existing storm sewer mains or pumping station from erosion, corrosion, odor, etc. The quality of treatment from this plant is excellent such that the treated effluent effects to the existing sewer mains and treatment plant would be consistent with storm water infiltration.

3. Maintenance of the effluent line and the treatment plant would be paid for and managed by the residents of the home owners association as part of their lease or ownership. Maintenance would

be per a contract with a licensed maintenance provider which is typical with WPCF. The DEQ is responsible as the permitting agency to monitor that permit for compliance. Due to the quality of treatment an adjustment to fees charged by the City on a per home per month basis should be evaluated.

4. Under this proposal, we intend to construct approximately 50 housing units more or less on this property. The development would be constructed in phases. The initial phase would be to install the first half of the treatment plant and the low pressure line under a WPCF permit. Once installed, housing units would be constructed over time. The second half of treatment plant would be constructed when designed capacities of system dictated the need.

5. The 4000 foot low pressure effluent line from our treatment plant to the City will remain a private line. It would be sized for our developments flows. As you're aware, if more than one user is on a sewer main extension it must than become a public sewer main. This is not our intention.

6. The benefits to the city are obvious and have been discussed in our previous proposals. Briefly the quality residential development that Mahar/Tribble LLC envision will provide construction jobs for an extended period. Our project in its highly visible location will be an added draw for the Brookings area. The usage we intend would be far more attractive then industrial development without sewer connection. The increase in tax base surely will be welcome and will easily offset the assistance we ask in making this project viable.

7. The cost of this proposal is between $12,000 and $15,000 per unit using the 50 housing units number. The total estimated development cost of the sewer system ending at the city connection with 50 new housing units is $645,000. A cost estimate is available for your review. Again is this an estimate and based on our example of 50 units.

We are asking the City to approve this proposal so that we can continue our planning process, which includes annexation to the City of Brookings and a zone change. Additionally, we ask that the City assist us in receiving funding through the Urban Renewal Agency, and to allow Systems Development Charges (SDCs) typically paid by the Parties to be applied in full to the construction of the project.

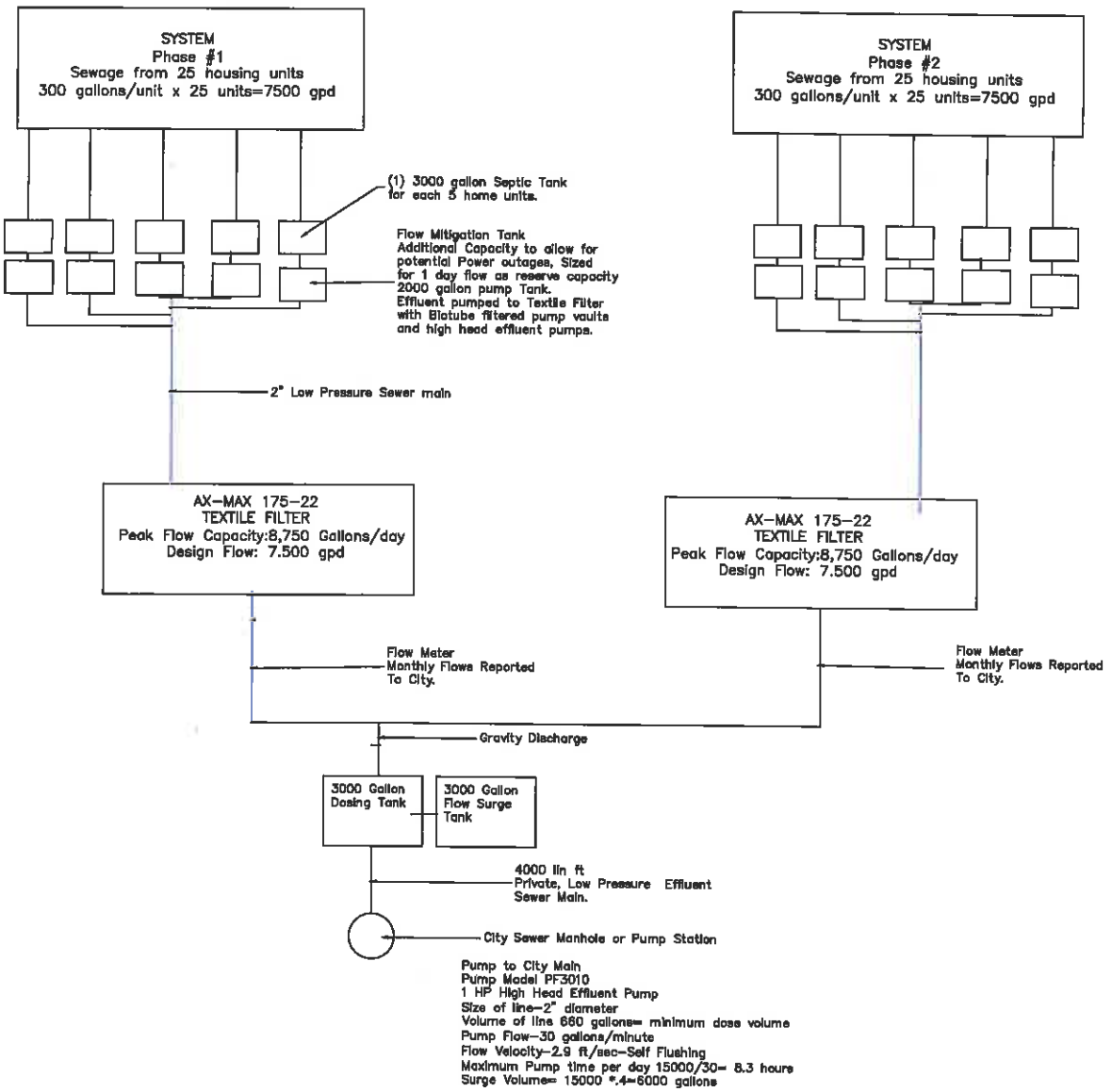
We are looking forward to personally reviewing this proposal with your office and your staff. Thank you again for your assistance with our development and considering this proposal.

Respectfully Yours,

Ron Tribble

Enclosure:
Schematic Diagram of proposed development
Submittals from Orenco on proposed treatment system
Cost Estimate of proposed sewage treatment portion of development.

Schematic Diagram of On Site Sewage Disposal
Tribble/Mather Development
North Bank of Chetco River



Prepared By:
PORIOR ENGINEERING
69262 WILDWOOD ROAD
NORTH BEND,OREGON,
97459
541-756-6747

NO.	DATE	DESCRIPTION	BY

Prepared For:

North Bank Chetco River Development
Tribble and Meyer
Sewage Treatment Plan
SCHEMATIC DIAGRAM

28 OCTOBER 2012

North Bank Chetco River					FIVE HOME UNITS		phase 1- 25 home units			phase 2- 50 home units		
						$ 35,656.00			$400,773.00			644,053.00
Contract Item Number	Item- Description	Unit	Number	notes	Installed unit costs	subtotal	units phase 1	Installed unit costs	subtotal	units phase 1 and 2	unit costs	subtotal
Sewer Main to Septic Tanks for 5 unit module					$ -							
1	4 inch Gravity Sewer Main	LIN FT	500	100 lin ft per home	$ 20.00	$ 10,000.00	2500	$20.00	$50,000.00	5000	$20.00	$100,000.00
2	Cleanouts	each	10	two cleanouts per home	$ 100.00	$ 1,000.00	50	$100.00	$5,000.00	100	$100.00	$10,000.00
Septic and mitigation Tanks for 5 units					$ -	$ -	0	$0.00	$0.00	0	$0.00	$0.00
3	3000 Gallon Concrete Tank	Each	2	1 Septic tank and 1 flow mitigation/septic tank	$ 5,400.00	$ 10,800.00	10	$5,400.00	$54,000.00	20	$5,400.00	$108,000.00
4	30" dia fiberglass riser at inlet	Each	2	INSTALLER WILL VERIFY Height BEFORE ordering	$ 163.00	$ 326.00	10	$163.00	$1,630.00	20	$163.00	$3,260.00
5	Riser Lid	Each	2		$ 68.00	$ 136.00	10	$68.00	$680.00	20	$68.00	$1,360.00
6	30" dia fiberglass riser with lids @riser at outlet for pump,hole for external splice box	Each	2	INSTALLER WILL VERIFY Height BEFORE ordering	$ 163.00	$ 326.00	10	$163.00	$1,630.00	20	$163.00	$3,260.00
7	Riser Lid	Each	2		$ 68.00	$ 136.00	10	$68.00	$680.00	20	$68.00	$1,360.00
8	Apoxy	Each	2	ONE FOR EACH RISER	$ 30.00	$ 60.00	10	$30.00	$300.00	20	$30.00	$600.00
9	Apoxy for risers	Each	2	ONE FOR EACH RISER	$ 16.00	$ 32.00	10	$16.00	$160.00	20	$16.00	$320.00
10	DISCHARGE ASSEMBLY	Each	4	hv 1	$ 120.00	$ 480.00	20	$120.00	$2,400.00	40	$120.00	$4,800.00
11	biotube pump vault	Each	1	Universal pump vault for two pumps in same vault	$ 560.00	$ 560.00	5	$560.00	$2,800.00	10	$560.00	$5,600.00
12	Gromet for discharge line	Each	2	2"1-1/2" diameter transport line to disposal field	$ 5.00	$ 10.00	10	$5.00	$50.00	20	$5.00	$100.00
13	pumps	Each	2	Duplex Pumps two septic tank per WPCF	$ 690.00	$ 1,380.00	10	$690.00	$6,900.00	20	$690.00	$13,800.00
14	panels -type demand	Each	1	HT- HEATER	$ 2,500.00	$ 2,500.00	5	$2,500.00	$12,500.00	10	$2,500.00	$25,000.00
15	SPLICE BOX	Each	2	two external boxes ,	$ 150.00	$ 300.00	10	$150.00	$1,500.00	20	$150.00	$3,000.00
16	Floats	Each	1	high level lag pump entable, lag, override, timer on/off, reduntant off	$ 110.00	$ 110.00	5	$110.00	$550.00	10	$110.00	$1,100.00
Sewers Mains Lower Side To Recirculation Tank for each of five home modules								$0.00	$0.00		$0.00	$0.00
17	Low Pressure Sewer main to AXMax	LIN FT	500	Pipe Depth 3' when crossing storm drain laterals	$ 15.00	$ 7,500.00	500	$15.00	$7,500.00	1000	$15.00	$15,000.00

North Bank Chetco River					FIVE HOME UNITS		phase 1- 25 home units			phase 2- 50 home units		
						$ 35,656.00			$400,773.00			644,053.00
Contract Item Number	Item- Description	Unit	Number	notes	Installed unit costs	subtotal	units phase 1	Installed unit costs	subtotal	units phase 1 and 2	unit costs	subtotal
Secondary treatment Unit Phase 1												
18	AdvanTex- Max, 28'Peak Hydraulic Capacity 8700 gpd/unit Proprietary Unit includes:tanks,filters, control panel,maintenance manual,manufacturer startup,ventalation fans, pumping equipment,	each	1	See submital from Orenco			1	$95,000.00	$95,000.00	2	$95,000.00	$190,000.00
19	Kiosk for electrical panel	each	1		$ 1,500.00		1	$1,500.00	$1,500.00	1	$1,500.00	$1,500.00
20	Telephone Service to panel	each	1		$ 500.00		1	$500.00	$500.00	1	$500.00	$500.00
21	3000 Gallon pump and surge tanks	Each	2	Phase 1 tanks will be used in phase 2	$ 5,400.00		2	$5,400.00	$10,800.00	2	$5,400.00	$10,800.00
22	30" dia fiberglass riser at inlet	Each	2		$ 163.00		2	$163.00	$326.00	2	$163.00	$326.00
23	Riser Lid	Each	2		$ 68.00		2	$68.00	$136.00	2	$68.00	$136.00
24	30" dia fiberglass riser with lids @riser at outlet for pump,hole for external splice box	Each	1		$ 163.00		1	$163.00	$163.00	1	$163.00	$163.00
25	Riser Lid	Each	2		$ 68.00		2	$68.00	$136.00	2	$68.00	$136.00
26	Apoxy	Each	2	ONE FOR EACH RISER	$ 30.00		2	$30.00	$60.00	2	$30.00	$60.00
27	Apoxy for risers	Each	2	ONE FOR EACH RISER	$ 16.00		2	$16.00	$32.00	2	$16.00	$32.00
28	DISCHARGE ASSEMBLY	Each	4	hv 1	$ 120.00		4	$120.00	$480.00	4	$120.00	$480.00
29	biotube pump vault	Each	1	Universal pump vault for two pumps in same vault	$ 560.00		1	$560.00	$560.00	1	$560.00	$560.00
30	Gromet for discharge line	Each	2	2" diameter line to City Pump Station	$ 5.00		2	$5.00	$10.00	2	$5.00	$10.00
31	pumps	Each	2	Alternating Duplex Pumps on Demand	$ 690.00		2	$690.00	$1,380.00	2	$690.00	$1,380.00
32	SPLICE BOX	Each	2	two external boxes ,	$ 150.00		2	$150.00	$300.00	2	$150.00	$300.00
33	Floats	Each	1	high level lag pump entable, lag, override, timer on/off, reduntent off	$ 110.00		1	$110.00	$110.00	1	$110.00	$110.00
Electrical Service												
34	Electrical Service to AXMax	LSQ	1		3500		1	$3,500.00	$3,500.00	1	$3,500.00	$3,500.00
35	Electrical Service to Control Panel Septic tank	LSQ	1	Includes necessary permits and inspections from County Electrical Inspector	$ 3,500.00		5	$3,500.00	$17,500.00	5	$3,500.00	$17,500.00
Low Pressure Sewer Main to City Pump Station												
36	2 inch Low Pressure Sewer Main	LIN FT	4000	Bid from local Contractor -To City of Brookings and County Code	$ 30.00		4000	$30.00	$120,000.00	4000	$30.00	$120,000.00

Don Porior

From: Garry-Lee Espinosa [gespinosa@orenco.com]
Sent: Friday, December 28, 2012 2:03 PM
To: mrdon@porior.com
Cc: David Nelson; David Lepre; Scott Hammerschmith; Eric Lanning
Subject: (OR) Trimble Property - AX-MAX175-28

Attachments: 28-AX-MAX175-28 Model (1).pdf; Trimble AX-MAX CE R1.pdf

28-AX-MAX175-28 Model (1).pdf ... Trimble AX-MAX CE R1.pdf (123 ...

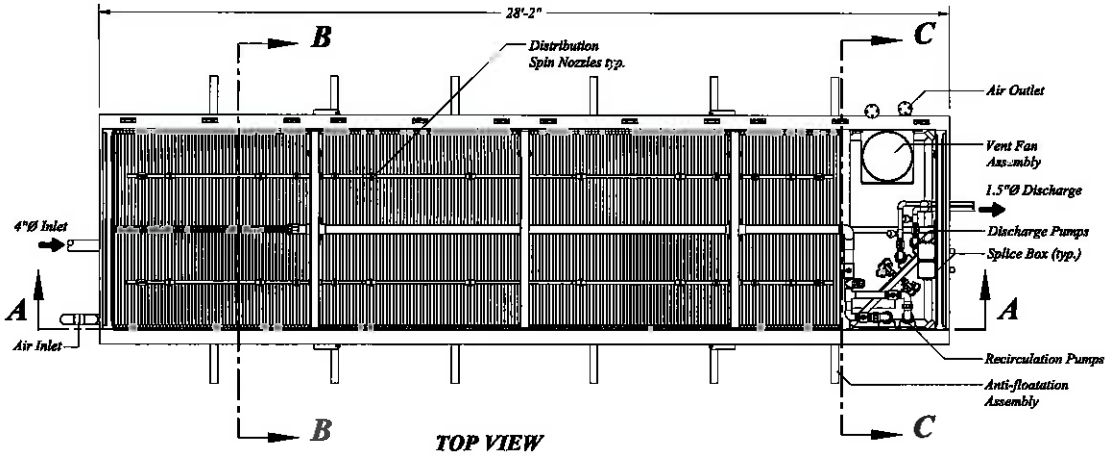
Don,

Here is the cost estimate for your project. This is phase 1. Phase 2 would be the same price. This is for an AX-MAX175-28. The drawing has discharge pumps (the cost estimate does not). It was the only AX-MAX175-28 drawing we have right now. This would be for the following:

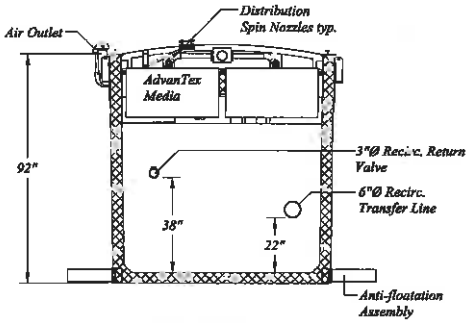
50 homes @ 300gpd = 15,000gpd (Design)

Respectfully,

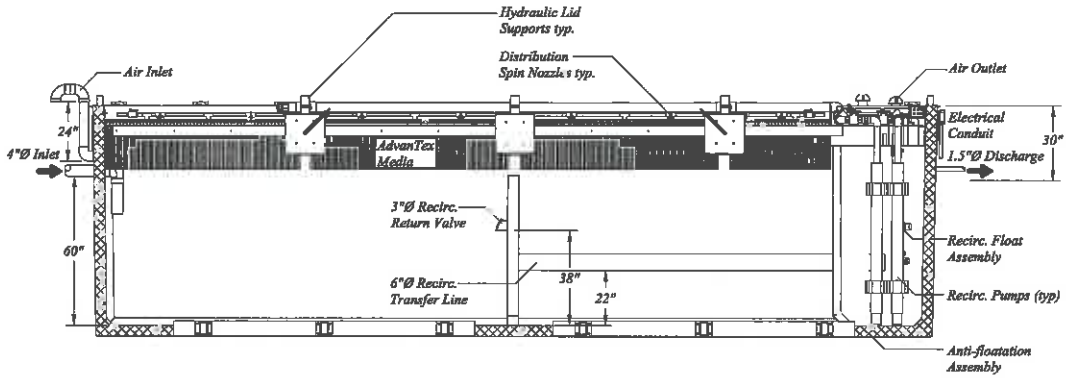
Garry-Lee G. Espinosa
Applications Engineering Leader
Orenco Systems, Inc.
814 Airway Avenue
Sutherlin, OR 97479
Phone: (800) 348-9843 ext. 322
Fax: (541) 459-2884
gespinosa@orenco.com
www.orenco.com



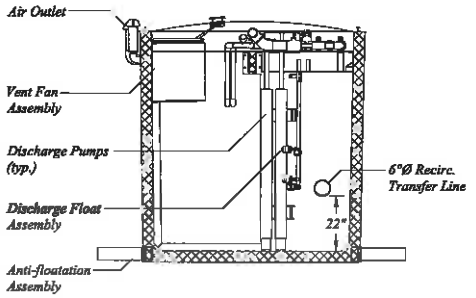
TOP VIEW



SECTION C-C



SECTION A-A



SECTION B-B

Design Notes:

Expected Influent Quality	***Typical Effluent Quality***
Grease & Oil: 20 mg/L	***BOD: < 20 mg/L***
BOD: 150 mg/L	***TSS: < 20 mg/L***
TSS: 40 mg/L	***TKN: < 25 mg/L ****
TKN: 65 mg/L	

** Non Nitrogen Sensitive Applications*

General Notes:

Consult with Orenco Systems, Inc. for applications where expected influent quality and/or targeted treatment goals vary from those stated.

For engineer drawing and information contact Orenco Systems, Inc.

For instructions on maximizing nitrogen reduction, contact Orenco Systems Engineering.

APPROVED:

DATE APPROVED:

PRODUCT CONFIGURATION DRAWINGS

Orenco Systems® Incorporated
Changing the Way the World Does Wastewater®

Drawn By: CHRIS JORDAN

Drawn For: Engineer

Project: AX-MAX175-28

Title: System Details

Scale: 1" = 4'-0"

Sheet: 1 OF 1

Rev: 1.0

Date: 8/1/12

AdvanTex-MAX Cost Estimating Worksheet

Orenco Systems® Incorporated
1-800-348-9843

Application

This cost estimating worksheet should be used for preliminary cost estimating only. Due to variances in products specified, manufacturing costs, as well as labor and engineering costs, a low and high range estimate is provided. Shipping and handling charges are not included.

System Data

System Design Flow (gpd)	8,750
Design Loading Rate (gal/sq.ft./day)	50
Required AdvanTex Media (sqft.)	175
AX-Max Size (length in feet)	28
Number of AX-Max	1
Number of Recirc Pump Packages AX-Max	1
Number of Discharge Pump Packages	0
Alk & Carbon	0
Building square footage	0
Title 22 Equipment or Denite Filter	0
Manufacturer Start Up Costs	$1,000

Project: Trimble Property - Phase 1

Date Prepared: 28-Dec-12
Prepared by: Garry-Lee Espinosa

	Unit Cost Range		Total Cost Range	
	Low	*High*	*Low*	*High*
Materials				
AdvanTex-MAX				
Per 14' - 42' and 3,000 - 10,000 gallons units	$60,000	$65,000	$60,000	$65,000
Recirculating Pumps				
Pumps & floats for recirculation	$2,352	$2,554	$2,352	$2,554
Discharge Pumps				
Pumps & floats for discharge	$2,072	$2,272	$0	$0
Miscellaneous Equipment				
Piping, fittings, glue	$75	$150	$75	$150
Control Panel				
Control panel with Remote Telemetry (Recirc/Dosing)	$3,000	$7,500	$3,000	$7,500
Alkalinty and Carbon Equipment				
Pumps and feeder	$6,500	$12,000	$0	$0
Title 22 filter and Denite Filter (Installation Included)				
Upflow or Other filter for polishing	$0.5	$2	$0	$0
Materials Subtotal			**$65,427**	**$75,204**
Additional Construction Costs				
Control Building (Installation included)				
Low: Block Structure, High: Orenco Meridian Building	$45	$197	$0	$0
Building Utilities (Installation Included)				
Power, Water, Ventilation	$5,000	$12,000	$5,000	$12,000
Building Site Work (Installation Included)				
Driveway, parking, lighting	$2,000	$10,000	$2,000	$10,000
Subtotal			**$7,000**	**$22,000**
Labor and Engineering				
Labor and Misc. Equipment				
Percent of Materials	20%	30%	$13,085	$22,561
Engineering, Permits, Inspection				
Percent of Labor and Materials	8%	30%	$6,281	$29,330
Manufacturer Startup				
Varies significantly depending upon system location	$1,000	$1,000	$1,000	$1,000
Labor and Engineering Subtotal			**$20,366**	**$52,891**
***Total Installed Costs of Complete Treatment System**			**$92,793**	**$150,095**
Cost per Treated Gallon			**$10.60**	**$17.15**

NOTE:

1. Cost estimate does not include materials and labor costs for collection, primary treatment, or dispersal.
2. All AX-MAX units are quoted with active ventilation, pump flow inducers, discharge assemblies, splice boxes
3. Prices are based on manufacture's recommended retail pricing

Mahar/Tribble, LLC
736 Hemlock Lane, Roseburg, Oregon 541-430-3455 rontribble@charter.net

7 January 2013

Mr. Gary Milliman,
City Manager
City of Brookings
898 Elk Drive
Brookings, OR 97415

Subject: North Bank Chetco River Road Sewer Connection- Pretreatment with private sewer main alternative

Dear Mr. Milliman,

This letter follows up your request of 3 January for additional information regarding our proposal.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1. Applicability of Urban Renewal Funding:

The availability of Urban Renewal Funding at this time appears not be possible as this area is outside the URD boundary. The Urban Renewal boundary could be adjusted to include our property when the property is annexed and rezoned. We would like to see $175,000.00 in funding either from Urban Renewal funds or from some other source. Perhaps other sources of funding are available to the city.

2. Potential for future EDUs not included in this project

Our proposal includes the construction of a private low pressure sewer main and treatment plant, the only way additional EDU's can be available to the city outside of our development is if the city were to modify this proposal and make the pressure line a public line available to others. The city would require other parties who wish to use the line to pretreat the effluent similar to our proposal. With the proposed pressure a public line, properties within the City limits and in the path of that line could access the line. They would of course need to pre-treat the effluent to the same standard as effluent generated from our property.

An additional future benefit of this proposal is in water savings and reuse. In the future, the highly treated effluent could be diverted and used for irrigation.

The SDC rates are less than the construction costs. Our estimate of construction cost is approximately $13,000 per unit.

Using the SDC rates from our previous correspondence of $9400 each, the following summary is provided.

Example: Estimated Construction Cost for 50 units= $644,000.00

Estimated Reimbursement credits of SDC costs for 50 units = 50 X $9400= $470,000.00

Difference = $174,000.00

Unit Cost for Construction $12,880.00.

The unit cost for construction using a pretreatment system exceeds the SDC credits at this time. The city has other direct pay backs from this project. Some of those pay backs include monthly charges for sewer use, an increase in tax base, and building permit fees.

We are looking forward to personally reviewing this proposal with your office and staff. Thank you again for your assistance with our development and considering this proposal.

Respectfully Yours,

Ron Tribble

City of Brookings

PUBLIC WORKS/DEVELOPMENT SERVICES DEPARTMENT

898 Elk Drive, Brookings, OR 97415

(541) 469-1138, Fax (541) 469-3650, TTY (800) 735-1232

lpryce@brookings.or.us

Interoffice Memo

To: City Manager

From: Public Works/Development Services Director LP

Date: January 11, 2013

Re: Orenco Advantex Proposal for the Tribble Development at North Bank Road

---

The current proposal from Mr. Tribble and his civil engineer, Don Poire, is a private sewer system comprised of one pretreatment system called the Orenco Advantex system (specification included), a lift station, and force main piping to the City's closest public sewer collection system at Constitution Way. The proposed Orenco Advantex system reduces biological oxygen demand (BOD) and reduces hydrogen sulfide which Mr. Poire assures will require less treatment at the City's wastewater treatment plant. A sewer lift station would pump the treated effluent via a force main of roughly a mile of pipe along County and City right of way. All of these appurtenances Mr. Poire assures would be privately maintained by the homeowners association formed in the development.

It has been an ongoing concern of staff that we would inherit the maintenance of a non conventional sewer system and add additional burden to City staffing workload. Department of Environmental Quality (DEQ) was contacted as to whether they would allow this proposal to be "privately maintained." DEQ stated only one tax lot would be allowed to have a private system, or each lot would have a separate private system. In the one tax lot scenario, the Orenco Advantex system, lift station and force main would fall under State Plumbing Code jurisdiction as private. Mr. Tribble currently has two tax lots and he would have to vacate the lot line between the properties to create one tax lot. In order to be maintained as private, the development would be restricted to condominiums or a planned community of rental units under one ownership. The City would need to condition this property as a part of an annexation process to include; 1) Creation of one parcel; 2) Recordation of a homeowners maintenance agreement for all infrastructure; 3) Recordation of a condominium subdivision map or; 4) Property use restricted to a planned community; and 5) Written approval of the County to install a private sewer main in County right of way.

Disadvantages of this proposal are; 1) Approval of this system does not allow for future use of the infrastructure; 2) I have a concern that DEQ may change their policy at a later date and require the City to take ownership of the facility; 3) Any consideration of reduction of SDC or monthly sewer bills will require City staff to monitor the effluent data and time to recalculate any changes in BOD levels.

AdvanTex® Treatment Systems

Orenco's years of research and development have helped to refine the benefits of packed bed filters into a treatment system that is premanufactured, modular, and reliable for a variety of flows and waste strengths.

Science-based Technology

Orenco's AdvanTex Treatment System uses an engineered textile media to treat wastewater to meet stringent regulatory requirements. The filter is configured like a a recirculating sand filter -- a **packed bed filter technology** that Orenco engineers have helped to perfect since the 1970's.

AdvanTex Treatment Systems can provide treatment quality equivalent to that of sand filters at loading rates as high as 25-50 gpd/ft² (1000-2000 L/d/m²). That means AdvanTex can serve even those projects with severe space constraints.

AdvanTex provides consistent, reliable treatment, even under peak flow conditions. What's more, the clear, odorless effluent is ideal for reuse applications. The process **reduces nitrogen** significantly, and special configurations can reduce nitrogen even further to meet stringent limits.

Designed for the Real World

Our premanufactured AX100 filter ensures quality control and allows for fast installation. The modular layout of an AdvanTex Treatment System lets a designer add more pods for later phases of an expanding project -- no need to oversize the treatment system and the cost!

Orenco also manufactures a **mobile AdvanTex** unit for remote locations or temporary/emergency situations, such as disaster relief or military operations. Same AdvanTex performance, packaged for the real world.

In addition, we offer **AX-MAX**, a custom designed treatment plant for flows up to 1 MGD, an ideal size for small communities or new development on the urban fringe.

Thousands of Installations

Our textile-based treatment technology has undergone third-party testing and evaluation to ANSI Standards. More importantly, about 17,000 residential-sized AdvanTex filters have been installed since the year 2000, and over 2,300 of our commercial-sized AX100 units are now in operation. Orenco has AdvanTex systems installed in 16 countries around the globe.

Commitment to Long Term Performance

It takes more than a product to solve wastewater problems. That's why our AdvanTex Treatment System comes with a program to ensure every project has support for the life of the system.

- Trained and authorized dealers, installers, and service providers
- Training and plan reviews for designers
- Comprehensive project checklist for successful system design, installation, start-up, and follow-up
- Round-the-clock system supervision via Orenco's remote telemetry controls
- Commitment to ongoing O&M, signed by system owners

Orenco's engineers and asset management team are available to answer questions and provide ongoing manufacturer support throughout the life of your system.

Covered by one or more Orenco patents.

Specialized Configurations

AX-Mobile™ for mobile applications

AX-Max™ for flows up to 1MGD

Nitrogen Reduction

Resources

AX100 Brochure

Installation Manual

Technical Data Sheet

Design Criteria

Environmental Impact

CAD files

- AX100 details
- 1 pod layout
- 2 pod layout
- 3 pod layout
- 4 pod layout
- 5 pod layout
- 6 pod layout

Request Design Assistance

Porior Engineering LLC
Donald Porior
Engineering and Land Surveying

69262 Wildwood Road
North Bend, Oregon, 97459
mrdon@porior.com
Phone/fax: 541-756-6747

Loree Pryce, PE
Public Works/ Development Services Director
City of Brookings
898 Elk Drive
Brookings, Oregon, 97415

Facility: Tribble Property

Loree

This letter is in response to your request for additional information on Mr. Tribble's proposal for a private sewer line from the Tribble Property to the City of Brookings Sewer main. This is a completely new proposal from the earlier proposals to use a STEP system. This proposal is to pre-treat the effluent using an Advantex AXMAX or similar treatment plant from Orenco Systems Inc. of Sutherlin Oregon prior to discharging to the city system.

The city will have no maintenance obligations under this proposal. The sewage effluent will enter the city's sanitary main per established guideline via a private low pressure line from a home owners associations pump station.

Options considered for connecting to the city with a private line included the following:

1. Private Grinder Pump Station maintained by Home Owners Association pumping thru a private 3 inch pressure main to the city's sewer main
2. Private effluent pump station with flows directly from septic tanks pumping to the city's sewer main via a private 2" diameter low pressure sewer main. Aeration and controls needed for odor. Coating of existing manholes required to prevent corrosion and additional maintenance to city.
3. Pretreatment of effluent from septic tanks and pumping to city main with a low pressure sewer main.

The advantages of the pretreatment option to the owners included the following:

1. The pretreated sewage reduces any impacts to the city's sewer infrastructure from untreated effluent such as additional treatment loads to the city treatment plant and the potential for odor or corrosion of the city mains.
2. High Head effluent pumps will pump from a home owners pump station to the city main thru a minimum size (2" diameter) low pressure sewer main to the city's sewer main. Similar to option 2 above.
3. The flow rate of the high head pumps used to transport effluent to the city main will be between 10-30 gpm. This flow rate will have no impact on the city's sewer main.
4. Pretreated effluent will negate any risk of hydrogen sulfide occurrence that might impact the city's treatment system and the transport line.
5. The pretreatment of the effluent reduces any load on the city's sewer plant which further supports a reduction in SDC fees for the connection to the city.
6. Future possibilities under separate WPCF or NPDES permit to use effluent for irrigation. Pumped effluent from septic tanks within the proposed development eliminates the need for deep sewer mains in an area of high groundwater.

As part of this response, Scott Hammerschmith of Orenco Systems reviewed this proposal with the Department of Environmental Quality namely Mr. Gasik and initially with Mr. Kucinsky. A summary of

his review is included as attachment A to this letter. In his letter he discusses how the city will establish guidelines for implementation and the DEQ determination that a permit to connect to the city and establish standards for construction is not required by their agency. He noted that reuse of the effluent for beneficial reuse requires a separate permit under either a WPCF permit or a NPDES permit. See his attached memo for details

Item 1. Clarify how this system is benefiting the rate payers of Brookings. Discuss the use of the discharge to irrigate a park downstream of the project.

The proposal allows the developers to develop this property for its best purposes. This increases the tax base of the city of Brookings. The cities sewer treatment system is minimally affected as solids and high strength sewage is not added to the system. The cities infrastructure is enlarged without an increase in maintenance costs.

See Item 3 for beneficial reuse

Item 2. Provide a written statement from DEQ that this is a permissible as well as outlining the responsibilities of the HOA via an O&M and operations procedure for the unit

Per Hammersmith's letter the DEQ is not involved in the permitting or review process. The city will issue guidelines for acceptable discharge to the developer. Those guidelines would most likely mirror the DEQ WPCF permit guidelines for similar projects not connected to a city sewer system.

The Homeowners Association is responsible for all maintenance for the low pressure sewer main to the individual units of the association. Septic tanks, pump tanks, treatment tanks all will be on common property to the association. The homeowners association(HOA)will have a certified maintenance provider do all work. Orenco System provides that certification and requires that their equipment be maintained by such a provider as part of their sales agreement. The city would undoubtedly use similar language to a WPCF permit in their guidelines for acceptable discharge to the HOA.

Item 3. Will the Orenco system or HOA conduct effluent testing and will this be readily available to the city. Discuss how this would be used if the effluent was used by the city for irrigation.

In our proposal a state certified and factory trained maintenance provider will monitor the system daily, conduct quarterly testing of effluent and provide all necessary maintenance to the system. The provider will report annually to the city similar to a WPCF permit site. In addition the provider will report any deviations to the city immediately and how they were repaired. If requested in the city's guidelines to the homeowners association, daily and monthly flows can be reported to the city by the maintenance provider. The proposed system has a telephone line connection to an internet reporting system that allows the maintenance provider to check on operations of the plant on line.

If the city wished to use the effluent from the development for irrigation, the city will need to apply under a WPCF permit or NPDES permit. The contact person is Mr. Kennedy with the DEQ . A beneficial use chart for effluent discharge is included with this letter as Attachment B. Similarly if the home owners association wished to use the effluent for irrigation of their common area they will need to request a separate permit for this purpose. From a practical side, the amount of effluent available for irrigation versus the cost of compliance with permit makes beneficial use impractical at this time.

Item 4. Discuss the use of urban renewal funds to supplement the cost of construction of the system.

Per our discussion since this is a privately owned connection, urban renewal funds do not appear applicable for the project.

Item 5. Will this system be above ground or below ground.

The treatment plant will be partially above ground. Pump tanks and septic tanks will be below ground similar to city manholes. The use of septic tanks that pump to a common sewer pump station reduces the depth within the development of collection and transport lines.

Item 6. Discuss the desired reduction of SDC fees based on ongoing monthly sewer bills.

We propose that the SDC or System development charges be reduced by the cost of pretreatment and the private low pressure sewer main pipe line to the city sewer main. In a typical development the city would use those funds for extending the sewer main or payment for an expansion of the treatment system. This proposal eliminates the publicly owned and maintained sewer main extension for these properties, and significantly reduces or eliminates any impact on the cities treatment system

Item 7. Discuss the city's monitoring and maintenance obligations with this proposal.

The proposed development includes private lots with a common area that will be a separate lot similar to a condominium development. Owners of homes in the development will pay monthly fees under a home owners association for road maintenance, common area maintenance, repairs to common areas, up keep of common areas and the monthly fees for maintaining and monitoring of the sewage treatment facility which will be located within the common areas. In that the system is servicing the common area it would not fall in the "common sewer" guidelines and is considered a single private connection. See Attachment C.

The sewage treatment system will have a maintenance agreement with a maintenance provider. That provider will maintain the system, monitor daily the flows via an internet connection to a control panel, and report to the city any repairs as required or if required in the guidelines for discharge. Tests will be taken quarterly by the maintenance provider and an annual report given to the city of monthly flow rates, test results, and maintenance provided as required or if required in the guidelines. Any deviations from the guidelines will be reported to the city by the maintenance provider subject to the penalties in the guidelines.

Respectfully Yours,

Donald B Porior

Donald Porior, PE

Cc: Ron Tribble, Owner
Scott Hammerschmith, Orenco Systems

Attachments A. Memo of Friday January 25th from Scott Hammersrschmith
Attachment B – Beneficial Use Chart for reuse of effluent
Attachment C-Guidelines for design of septic tank effluent pumps or gravity sewer projects for common sewers.

CITY OF BROOKINGS
COUNCIL AGENDA REPORT

Meeting Date: March 12, 1012

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: North Bank Chetco River Road Sewer Project Proposal

Recommended Action:
Authorize the City Manager and City Attorney to develop a draft agreement with the North North Bank Land Owners Group concerning sewer service extension to North Bank Chetco River Road.

Background/Discussion:
The City has received a proposal from the North Bank Land Owners Group (Mike Mahar, Ron Tribble, Chetco RV Resort, Riverside RV and Tidewater Contractors) regarding the extension of sewer service along North Bank Chetco River Road. The City staff has held several meetings with the members of this group. This matter was discussed at the City Council workshop of February 13, 2012.

The basics of the proposal can be summarized as follows:

1. The North Bank Land Owners Group (NBLOG) would install all conventional sewer main improvements, including sewer mains and lift stations, to serve the potential build-out of their properties, with additional capacity to serve the sewage-shed as identified in the October 2010 report from the Dyer Partnership (a potential build-out of 525 residential units within the Urban Growth Boundary). The preliminary cost estimate for this project is $1,261,600.
2. The property owners would provide all necessary easements.
3. Once the improvements are completed to the satisfaction of the City, the sewer main and lift stations would be dedicated to the City and become a part of the City-maintained sewer collection system.
4. The NBLOG would recover 66 percent, or approximately $840,000 of their cost of installing the improvements in the form of SDC credits. This is similar to the infrastructure financing agreement with Lone Ranch LLC.
5. The NBLOG is seeking City participation in the project through the Urban Renewal Agency in the amount of $200,000. This is the estimated cost of extending the sewer main from the existing lift station at the intersection of Highway 101 and North Bank Chetco River Road to the Urban Renewal Area boundary. Approximately three-quarters of the Tidewater property is located within the URA. Agency participation would facilitate the overall project, including the development of the Tidewater property which has a development potential of up to 150 residential units. If 100 of these units within the URA sold for $300,000 each, the URA would receive tax increment revenue in excess of $200,000 annually.
6. All of the properties would annex into the City.

Using the preliminary construction cost estimate of $1,261.600, the cost chares for this project would be:

Amount	%	Paid by
$839,956	66	Property owners - recoverable though SDC's
$221,644	18	Property owners - **not** recoverable through SDC's
$200,000	16	Urban Renewal Agency

The Urban Renewal Agency currently receives approximately $150,000 annually in excess of its debt service needs. The $200,000 contribution toward this project could come as a part of a debt financing for infrastructure improvements that would include this project and others, such as Railroad Street.

The details of the above would be worked out in a development agreement - including time lines for the completion of the private improvements. The agreement would clearly identify who would be responsible for which elements of the project, time lines for the completion of the sewer improvements and provide for annexation.

There is also some potential that federal or state grant funding may be available for that portion of this project that would result in the abandonment of on-site disposal systems at the two RV parks.

Attachment(s):

a. North Bank Land Owners Group MOU
b. Chart describing preliminary allocation of project cost.

CITY OF BROOKINGS

COUNCIL WORKSHOP REPORT

Meeting Date: February 13, 2012

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: North Bank Chetco River Road Sewer Project Proposal

Recommended Action:
Conceptual discussion of proposal from North Bank Land Owners Group concerning sewer service extension to North Bank Chetco River Road.

Background/Discussion:
The City has received a proposal from the North Bank Land Owners Group (Mike Mahar, Ron Tribble, Chetco RV Resort, Riverside RV and Tidewater Contractors) regarding the extension of sewer service along North Bank Chetco River Road. The City staff has held several meetings with the members of this group.

The basics of the proposal can be summarized as follows:

1. The NBLOG would install all conventional sewer main improvements, including sewer mains and lift stations, to serve the potential build-out of their properties, with additional capacity to serve the sewage-shed as identified in the October 2010 report from the Dyer Partnership (a potential build-out of 525 residential units within the Urban Growth Boundary). The preliminary cost estimate for this project is $1.2 million.
2. The property owners would provide all necessary easements.
3. Once the improvements are completed to the satisfaction of the City, the sewer main and lift stations would be dedicated to the City and become a part of the City-maintained sewer collection system.
4. The NBLOG would recover approximately $1.0 million of their cost of installing the improvements in the form of SDC credits. $1.0 million equals the SDC value of approximately 106 units. This is similar to the infrastructure financing agreement with Lone Ranch LLC.
5. The NBLOG is seeking City participation in the project through the Urban Renewal Agency in the amount of $200,000. This is the estimated cost of extending the sewer main from the existing lift station at the intersection of Highway 101 and North Bank Chetco River Road to the Urban Renewal Area boundary. Approximately three-quarters of the Tidewater property is located within the URA. Agency participation would facilitate the overall project, including the development of the Tidewater property which has a development potential of up to 150 residential units. If 100 of these units within the URA sold for $300,000 each, the URA would receive tax increment revenue in excess of $200,000 annually.
6. All of the properties would annex into the City.

Memorandum of Understanding
North Bank Chetco River Road Sewer Connection
1-30-2012

PARTIES:
The North Bank Land Owners Group (NBLOG) is made up of Mahar /Tribble LLC, Chetco RV Resort, Riverside RV, and Tidewater Contractors.

OBJECTIVE:
The North Bank Landowners Group intends to get public sewer to their properties in a timely manner at an affordable cost.

PROJECT:
The project includes construction of gravity sewer mains, force mains, sewer lift stations and related facilities sufficient to serve the properties owned by members of the NBLOG and connecting to the City of Brookings (City) sewer lift station located near the intersection of the North Bank Chetco River Road and U.S. Highway 101, including any upgrades necessary to said lift station. Included in this project would also be two pumping stations to deal with the elevation of the Constitution Way pump station. Gravity feed would be used where possible. The preliminary cost estimate for the project is approximately $1.2 million.

CITY PARTICIPATION:
The NBLOG proposes to construct the project, with City participation, as follows:

The City would provide approximately $200,000 of the funding through its Urban Renewal Agency. The City would allow Systems Development Charges (SDCs) paid by the Parties to be applied in full to the construction of the project. Landowners normally pay SDCs to the City at the time of construction and connection of a housing unit. The current SDC rate per Equivalent Dwelling Unit (EDU) is approximately $9400. The City would apply prepaid SDCs to the project. The City further agrees to explore any and all low-interest loan programs and grants that could be applied directly to construction costs. The NBLOG intends to proceed with a private project that at completion would be turned over to the City. The City's engineering firm, The Dyer Partnership, would be involved in the design phase and would inspect the construction to assure it meets City requirements.

APPORTIONMENT:
The NBLOG would decide how to apportion the costs of the construction among the Parties. NBLOG will seek bids for the project. Tidewater Contractors, as one of the land owners, does have a vested interest in this project, but will be one of the companies bidding on the project. Tidewater will be given the option to modify its bid in response to other bids. It is understood preliminary cost estimates might require modification. The NBLOG will decide on a fixed percentage of the total cost that each owner will be responsible to pay. The RV parks will be allowed to add additional spaces up to their allowable limits as specified by the zoning. The RV parks will not be assessed any

additional costs in the form of SDCs, as this is considered to have been covered in the apportionment of costs. Mahar/Tribble LLC. and Tidewater Contractors agree that the cost apportionment each agrees to will be divided by the current SDC value. This number will be assigned as the number of prepaid EDUs for each. Example: $300,000/$9400 = approximately 32 EDUs. If either owner exceeds the number of EDUs they have paid for in advance they agree to pay for any additional units over that amount at the current rate at the time a building permit is issued. The option of an Escrow Account to collect and distribute funds for the NBLOG should be considered.

EASEMENTS AND ANNEXATION

The route that the sewer line takes will require that all owners provide easements to the City to form a route that is found to be the least cost and is deemed reasonable based on existing structures. The NBLOG understands that the owner of the Constitution Way Property on which the connection point pump station is located has requested that State of Oregon vacate an easement along HWY 101. This easement would be utilized as part of the route for the North Bank Sewer Line. This easement must be kept intact. The City will work with the State of Oregon to serve this easement for the project. It is understood that any fees from additional future connections to the line will be retained by the City in consideration of applying the SDCs to the original cost of construction of the line.

The annexation of all of the lots to the City of Brookings is considered an integral part of this project. The City and NBLOG will work together to accomplish a timely annexation process. In addition a zone change for the property owned by Mahar/ Tribble must be completed. The zone change is from the current zoning of Commercial and Industrial to Residential. All owners understand that whatever agreements are reached with the City will be recorded on the properties and will apply in a transfer of ownership.

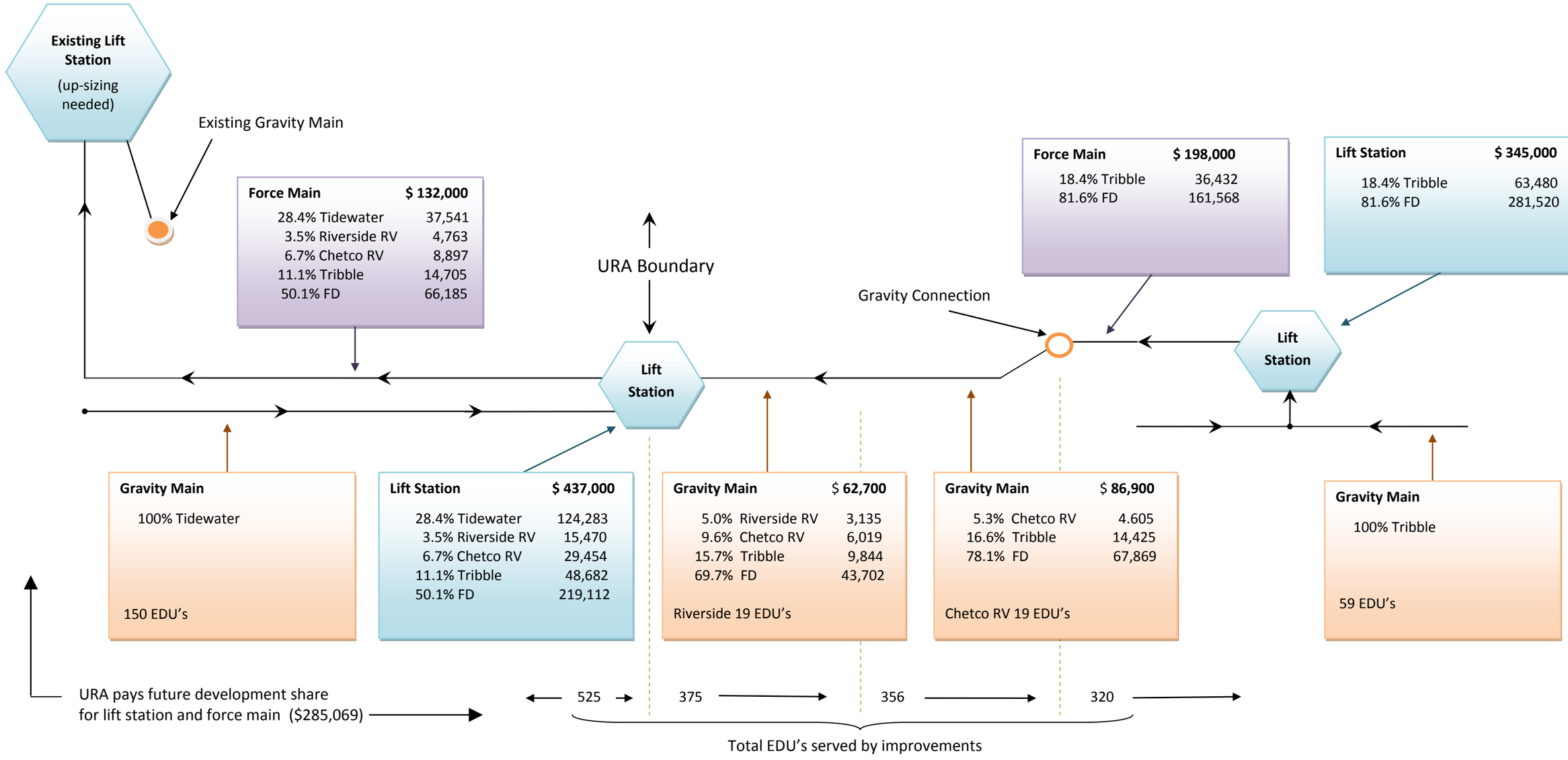
The NBLOG would like the City of Brookings to consider our proposal and take the necessary steps to jointly develop a comprehensive plan. This Plan would allow costs to be better determined and allow bidding for the project to take place. NBLOG supports the concept of this memorandum. Our concerns are with final costs, grant availability, and financing options. We look forward to further discussion with the City to work out these items as the planning proceeds.

The details of the above would be worked out in a development agreement, which would also include time lines for the completion of the sewer improvements, would clearly identify who would be responsible for which elements of the project, provide for annexation, and time lines for the completion of the private improvements.

There is also some potential that federal or state grant funding may be available for that portion of this project that would result in the abandonment of on-site disposal systems at the two RV parks. The City is not eligible to apply for grant funding until the property is located within the City.

Attachment(s):

a. Memorandum of Understanding among members of the North Bank Land Owners Group.
b. Chart describing preliminary allocation of project cost.



	EDU's	Cost Shares (for base system)	SDC's	
Tidewater	150	$ 162,824	$ 1,407,150	
Riverside RV	19	23,278	178,239	1,069,434
Chetco RV	36	48,975	337,716	
Tribble	59	187,568	553,479	
FD	261	839,956	2,814,430	
Total	**525**	**$1,261,600**		

Base System Funding Formula

SDC's from Tribble, Riverside and Chetco	$ 1,069,434
URA	192,166
Total	**$1,261,600**

MEMORANDUM

Office of the City Manager

GARY MILLIMAN
City Manager
Credentialed City Manager
International City Management Association

TO: Mayor and Council **DATE**: November 17, 2011

SUBJECT: North Bank Chetco River Road Sewer

Following the City Council action to reject the STEP system proposal by Ron Tribble for providing sewer service to the North Bank Chetco River Road region, staff conferred with the City Engineer to explore a possible scenario for merging some aspects of the STEP system into the traditional collection system. The hydraulics and geography of the area simply do not work.

The City Manager then began to work on an alternative concept for funding the construction of a traditional system for this region. The goal was to get a basic trunk line system extended initially to the Tribble/Mahar property. This concept is graphically depicted on the attachment. Key elements of this concept are:

1. This would be a traditional system expandable to serve the entire North Bank Chetco River Road region within the Urban Growth Area, serving an ultimate build-out of 525 equivalent dwelling units (EDUs).

2. Costs for the initial basic system are apportioned to benefitting properties based upon EDU's, including properties that would immediately be served and future development (FD).

3. Most of the Tidewater property is located within the boundaries of the Urban Renewal Area. While no specific development project has been identified on this property, Urban Renewal Agency participation in the project could provide an incentive for development in the near-term. One way the URA could contribute to the overall project is to fund a portion of the cost of the sewer main and lift station located within the URA.

4. The overall base project cost is reduced because the cost of the collection system on the Tidewater property and the Tribble/Mahar property would be borne entirely by them, to be installed by their contractors on their development schedule.

5. The total project cost for the base system is estimated at $1,261,600. This is our best estimate at this time and does not include paying for easements.

6. SDC's that would be payable from Tribble/Mahar, Riverside RV and Chetco RV total $1,069,434. I am proposing that the URA contribute $192,166 to the project.

This is all preliminary. I have shared this concept and the graphic with Ron Tribble and his reaction has been positive, although they are now considering reducing the scope of their project to 35 units instead of 59. Tribble expressed concern that Chetco RV would not be able to pay or finance the SDCs and could therefore not connect now. I told him that someone else (Tribble/Mahar and or Tidewater) would need to contribute additional money to fill any gaps and we could do a payback agreement.

We are also exploring financing through USDA.

We are planning a meeting with the property owners to discuss this concept.

City of Brookings
Curry County, Oregon

EVALUATION OF

STEP Collection System for the North Bank Chetco River Road

Developments 2011
Report Provided by Orenco Systems, Inc.
to
City of Brookings, Oregon
August 2011

The Dyer Partnership
Engineers & Planners, Inc.

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Project No. 145.33

City of Brookings
Curry County, Oregon

Evaluation of

STEP Collection System for the North Bank Chetco River Road Developments 2011

August 2011

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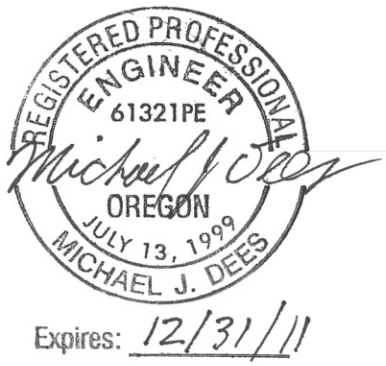

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SECTION 1 - INTRODUCTION

Scope

This report reviews and evaluates the report titled STEP Collection System for the North Bank Chetco River Road Developments 2011 produced by Orenco, hereafter referred to as the "Orenco Report", which has been offered to the City of Brookings as an alternative to the conventional gravity sewer, pump station and force main system recommendations provided by the Dyer Partnership to the City in the a previous report titled, "North Bank Chetco River Road Wastewater Feasibility Analysis", November 2010, hereafter referred to as the "Dyer Report".

Description of Orenco Recommended Alternative

The Orenco Report recommends, for the "Short Term", alternative Alt. #2A. This Orenco STEP (septic tank effluent pump) system provides for service to 342 EDUs. Each home served has an on-site septic tank system. The treated effluent, rather than being discharged into an on-site drain field, is pumped from each home site to a common pressure sewer system. This type of system requires that the accumulated treated sludge be periodically pumped from the on-site septic tank at an average 10 year interval. The least expensive alternative developed in the Orenco Report consists of three mainline pressure sewer collection sections identified as Lines A,B and C and described as follows.

Line A is 6" in diameter and runs southward and westward from near the entrance of the Chetco RV Resort on North Bank Chetco River Road to a discharge manhole on Lundeen Road. It receives flow from lines B and C.

Line B is 6" in diameter and runs from the south end of the Tidewater Development near the Hwy 101 Chetco River bridge, northward through Tidewater Development, the Riverside RV Resort and the Chetco RV Resort to an intersection with Line A and C.

Line C is 4" in diameter and runs southward from the north end of the Tribble Development along the North Bank Chetco River Road to an intersection with lines A and B.

A single Sulfide Control station is proved in the Orenco Report near the discharge location on Lundeen Avenue.

Cost Assumptions of the Orenco STEP System

The cost basis between the Orenco Report and the Dyer Report was significantly different. Discussion of the differences follows:

Force Main Construction Costs - The Orenco Report estimates the installation cost of 4" diameter mainline at $20 per foot and of 6" diameter mainline at $25 per foot. The Orenco Report does not differentiate between pressure line installed in roadway (which requires asphalt surface cut and replacement and controlled density fill in some cases), line installed in non-roadway areas, and line installed via horizontal directional drilling.

Our measurement of the distances for Orenco Alternative #2A totals about 8,300 rather than 7,300 feet. Forcemain unit costs for estimating the Orenco #2A alternative should be the same as used to develop project costs for the Dyer Report.

Power Costs - Orenco states that power costs have not been included in their O&M costs because they are minimal. This assumes that power will be provided from the residence's existing service and a new meter set is not required. Note that DEQ requires two breaker circuits be provided from the homeowner's power panel; one for the pump and control power and one for the alarm circuit.

In addition, power costs for the odor control air systems stations should be addressed. No size or specific run time was provided in the Orenco Report.

We recommend that these power costs be included for evaluation of operation and maintenance (O&M) and life cycle cost comparison.

Labor Costs - The maintenance labor costs in the Dyer Report were assumed to be $28/hr for City maintenance forces (the average wage for a maintenance worker within the City is $27.75/hr. which includes benefits). Orenco used $40/hr. The higher Orenco unit rate is believed to be based on contracted labor. Ordinarily, in order for comparisons to be made, it would be assumed that the STEP system labor if performed by City forces would be at the $28/hr rate and cost estimates for the STEP system O&M should be reduced accordingly. However, the efficiencies of using the contracted labor in comparison to the use of City labor would tend to negate this cost differential, especially with respect to monitoring and pump service.

O&M Costs for Force Mains & Odor Control - For purposes of cost comparison, O&M costs will be added to the Orenco mainline for which no costs had been allocated. The rate used will be the same as for the Dyer Report. Nominal O&M costs for odor control system labor and parts will also be added.

Misc. Costs - The unit costs for the pigging port, isolations valves, clean outs and Odor Control Station as shown in the Orenco Report appear low. These costs may reflect material costs only but they do not correspond to "as provided and installed" costs for estimation of public works construction for such items. More appropriate construction costs should be used.

Differences Between Orenco Report and Dyer Report Plans

In order to compare and evaluate the recommended Orenco Plan and the Dyer Plan correctly, certain differences should be noted. The key differences are as noted below.

Discharge Location – The recommended Orenco plan discharges to Lundeen Avenue with a remaining receiving capacity of 276 gpm at a predicted maximum flow rate of 186 gpm. The Dyer Plan discharges to Constitution Way pump station with a remaining capacity of 229 gpm at a flow rate of 210 gpm. The Lundeen Avenue discharge location is possible for the Orenco plan because the pumps utilized for the STEP system are able

to produce the necessary pressure to pump the effluent to this 210 foot elevation location. The Dyer Plan proposed conventional submersible pump stations are not able to achieve the required head condition to reach the Lundeen Avenue discharge location efficiently.

Service Area – The Dyer Report's recommended alternative service area includes the 342 EDUs covered by the Orenco plan and in addition the Thompson Road area, Ferry Creek Heights area, and the Apple Alley area for a total of 525 EDUs served.

Unit Construction Costs – As noted in preceding sections, the unit costs assumed for the STEP force main costs are significantly less than the unit costs for the same type, size and construction conditions estimated for the Dyer Report force mains.

O&M Costs – As noted in preceding sections, the O&M costs relating to power consumption and equipment replacement for the STEP systems should be included to produce accurate life cycle costs.

SECTION 2 – DYER REDUCED SERVICE AREA PROJECT COSTS

Cost Impact of Reduced Service Area to Dyer Recommendation

The Dyer Report recommended short term future plan may be reduced in scope to serve only the same 342 EDUs addressed in the Orenco plan by removal of the three Thompson Road gravity sewers, the two Ferry Creek Heights gravity sewers and the Apple Alley gravity sewer.

Note that the pump station capital costs are not changed but that power costs are slightly reduced. The power costs constitute approximately 23% of the pump station O&M costs. With the reduction to 343 EDUs from 525 EDUs (a factor of 0.65), the expected power cost reduction would be (0.23 x 0.65 =) 15%. The reduction in line length and corresponding line O&M is approximately 34%.

The cost effect is that the capital cost is reduced by $1,358,290 and the annual O&M is reduced by $3,384 as shown in Table 1 below.

Table 1 - Dyer Original & Reduced Service Cost Comparison

Dyer Alt #1A	Original	Reduced Service Area
Pump Stations	$782,280	$782,280
Gravity Sewers & Force Mains	$3,107,475	$1,749,185
Total	$3,889,755	$2,531,465
Average Annual O&M Pump Stations	$15,891	$13,516
Average Annual O&M Lines	$2,939	$1,930
Average Annual O&M	$18,830	$15,446
EDUs served	525	342

SECTION 3 – ON-SITE COSTS

Onsite Costs for Service Connections

Neither the Orenco Report nor the Dyer Report included the plumbing costs required to connect the customers to the collection lines. For purposes of this report, the plumbing costs will be considered the same for the distance from the home to as far as the septic tank system and therefore not included in the analysis. From the septic tank location to the street, the STEP system has a significant cost advantage in that the remaining distance from the septic tank to the pressure sewer in the street need only be a small diameter pressure line buried at 3 feet, while the conventional gravity service line must be continued to the street at a greater depth for connection to the gravity sewer line. The distance for this portion of the line is estimated to be 35 feet with 1 ½" forcemain cost at $15/ft. and a 4" gravity service line assumed to cost $40/ft. This results in a cost per lot of $525 connection cost for the STEP system alternative and $1,400 per lot for the gravity sewer system. The additional costs to be added to both alternatives are shown below in Table 2.

Table 2 – Service Line Connection Costs

System	EDUs	Unit Cost	Total Cost
STEP System	342	$535	$182,970
Gravity Sewer	342	$1,400	$478,800

On-Site Tank and Equipment Costs

The $5,000 to $6,000 cost range stated by Orenco for installation of the tank, pump unit, control unit and power connection to each home appears low to us, if the work is preformed under a public works contract with required BOLI wages. For purposes of this report and analysis, we will consider the upper range cost of $6,000 to be correct, considering the economies of scale which may be achieved and that the work could be contracted by the individual homeowners.

A gravity sewer system does not incur this on-site cost. The cost of $6,000 for 342 EDUs totaling $2,052,000 must be added to the STEP system capital costs for accurate comparison with the gravity system alternative.

SECTION 4 – O&M COSTS FOR STEP SYSTEM

On-Site O&M

Based on the information provided by Orenco, annual average on-site O&M costs appear to be (342 x $10 x 12 =) $41,040, based upon the operational costs for the on-lot components price of $10/month per residence. This includes tank pumping and equipment repair and replacement.

Control of Hydrogen Sulfide

Orenco indicates use of a Venturi type of aerator which would be installed near the end of the main pressure sewer at the discharge end. This has apparently been approved by DEQ in other locations. However, according to DEQ guidelines for Design of STEP systems,

"pressure sewer shall be oxygenated by means of air injection into the head (low point) of each common sewer collector line." DEQ states in their guidelines that "end of pipe aeration alone or air stripping alone is generally unable to reduce the sulfide content of STEP sewer to 0.1 mg/l, and shall not be relied on for sulfide control". They further state that "air injection shall be 2 scfm per inch diameter" and "static head shall be computed as the sum of all ascending segments in the line being aerated". For Orenco Alternative #2A, the ascending line segments appear to total about 220 feet for each of lines B and C. Full of water, this is an equivalent static pressure of about 95 psi. For the sake of calculation simplicity, we round this value to 100 psi. An air delivery system for odor control able to introduce this volume of air under this pressure to the low ends of both collector pressure sewers is required. The line size is 4 inches for one line and 6" for the other. Therefore 20 scfm will be required. A rule of thumb used for sizing at 100 psig is that 3 scfm is provided for each unit of HP. Therefore, it is estimated that the compressor will draw a total of 6.67 HP during operation. Should a single Venturi aerator system be approved, the power and labor costs are assumed to be similar but the initial capital cost providing two rather than a single station could be reduced.

Power costs for the air compressors at the odor control stations will be assumed to draw a total of 6.67 HP running 75% of the time. This would generate power costs of (6.67 Hp x 0.745 Kw/HP x 18 hrs/day x 365 days/yr =) 32,647 Kw-hr x $0.08 / Kw-hr = $2,612/yr.

For labor, we believe that an annual cost based on at least 4 hrs attention to each station should be assigned. Using the $40/hr value for labor this totals $320 per year.

For parts and materials we believe that at least $200 per year per station totaling $400 should be used for estimation purposes.

Power Costs

Orenco states that power costs have not been included in their O&M costs because they are minimal (little more than $1.50/month per household). This would be an annual cost of $6,156 per year for 342 services.

O&M Costs for Force Mains

For purposes of cost comparison, O&M costs of $0.13 per foot will be added to the Orenco mainline which had no costs allocated. This is the same rate as used for the Dyer Report. For 8,300 feet of force main this cost will total $1,079 per year.

Total STEP System O&M Costs

Shown below in Table 3 is the summation of the O&M costs we believe to be correct for the Orenco STEP system alternative 2A.

Table 3 STEP System O&M Costs

Item	Quantity	Units	Unit Cost	Total Cost
On-Site O&M (except power)	342	EDUs	$120	$41,040
On-Site Power	342	EDUs	$18	$6,156
Control of Hydrogen Sulfide - Power	32,647	KwHr	$0.08	$2,612
Control of Hydrogen Sulfide – Labor & Parts	1	LS	$720	$720
Main Line O&M	8,300	LF	$0.13	$1,079

Total				$51,607

SECTION 5 – LIFE CYCLE COST COMPARISON

Mainline Capital Costs - As noted in Section 1, the Orenco Report estimates the installation cost of 4" diameter mainline at $20 per foot and for 6" diameter mainline at $25 per foot and does not differentiate between pressure line installed in roadway, line installed in non-roadway areas, and line installed via horizontal directional drilling. Also, our check of the distances for Orenco Alternative #2A totals about 8,300 rather than 7,300 feet of mainline indicated in the Orenco Report. Forcemain unit costs recommended for estimating the Orenco #2A alternative and based on the same unit costs as used to develop project costs for the Dyer Report are used for the life cycle cost calculations. Listed below in Table 4 are the values we believe correct to compute the estimated capital costs of the STEP mainline pressure sewer system.

Table 4 - STEP Mainline Capital Costs

Item	Dia. inch	Length feet	HDD feet	HDD $/ft.	Paved feet	Paved $/ft.	Std Trnc feet	Std Trnc $/ft.	Total Cost
Tribble Dev along Road To Chetco RV	4	2704	436	$124	120	$118	2148	$60	$197,104
Chetco RV through	6	792	0	$131	200	$127	592	$77	$70,984
Riverside RV Through	6	856	0	$131	200	$127	656	$77	$75,912
Tidewater Through	6	1607	0	$131	0	$127	1607	$77	$123,739
Chetco RV Resort to Lundeen Discharge	6	2335	169	$131	1625	$127	541	$77	$270,171
		8294	605		2145		5544		$737,910

HDD = installation by Horizontal Directional Drilling
Paved = installation in or across paved surfaces which requires asphalt surface cut and replacement & higher backfill compaction than standard trench
Std Trnc = Standard trench with native backfill permitted above the pipe zone.

Other STEP System Capital Cost Items

The unit costs for the pigging port, isolations valves, clean outs and Odor Control Station as shown in the Orenco Report appears low to us since our interpretation of the DEQ guidelines indicates the need for two stations of the pressurized line air injection type. The costs provided by Orenco may reflect material costs only but they do not correspond to "as provided and installed" costs for estimation of public works construction for such items. The more appropriate construction capital costs are shown below in Table 5.

Table 5 – Other Step System Capital Cost Items

Item	Quantity	Unit Cost	Total Cost
Pig Port	1	$600	$600
Isolation Valves	5	$800	$4,000
Clean Out Assembly	2	$600	$1,200
Odor Control Station	2	$55,000	$110,000
Total			$115,800

Life Cycle Cost for STEP System

The calculation of the life cycle cost for the Orenco STEP system alternative is shown below in Table 6. It consists of summation of the capital costs and the 20 year, 3.5% present worth cost of the O&M.

Table 6 - Life Cycle Cost for Orenco Recommended Alternative

Main Line – From Tab. 4	$743,505
On-Lot Tanks & Equipment (342EDUs x $6,000)	$2,052,000
Other Capital Cost Items - From Tab. 4	$115,800
On-Site Service Line Tab. 2	$182,970
Total Construction Costs	**$3,094,275**
O&M Annual Costs - From Tab. 3	$51,607
O&M Present Worth Cost 20 yrs - I =3.5 %	$733,459
Total Present Worth Cost of STEP Alternative	**$3,827,734**

Life Cycle Cost for Conventional Gravity/Pump Station System

The calculation of the life cycle cost for the Dyer recommended conventional gravity/pump station system alternative (reduced in scope to serve the same 342 EDUs) is shown below in Table 7. It consists of summation of the capital costs and the 20 year, 3.5% present worth cost of the O&M.

Table 7 – Life Cycle Cost for Dyer Modified Recommended Alternative*

Pump Stations – From Tab. 1	$782,280
Gravity Sewers & Force Mains – From Tab. 1	$1,749,185
On-Site Service Line Tab. 2	$478,800
Total Construction Costs	**$3,010,265**
O&M Annual Costs – From Tab. 1	$15,446
O&M Present Worth Cost 20 yrs – I =3.5 %	$219,525
Total Present Worth Cost of Grav./PS Alternative	**$3,229,790**

* Service Area reduced to 342 EDUs

SECTION 6 – CONCLUSION

We find that the Orenco Report provides a viable STEP system alternative to a gravity sewer/pump station system for the area under consideration. However the STEP system does not have the cost advantages as stated in their report. This can be seen by comparing Tables 6 and 7 above when the unit construction cost basis for each alternative are the same. If all components, including on-site equipment are included, the conventional gravity sewer / pump station system has a capital cost advantage of approximately $84,000 over the STEP system. If a single Venturi type aeration station near the STEP discharge point is permitted by DEQ (in contradiction to DEQ STEP system guidelines) and accepted by the City, this capital cost difference would be reduced by approximately $55,000. This cost difference in that case would only be $29,000 in favor of the conventional system. In addition, the O&M costs differ by $36,160 per year in favor of the conventional gravity/PS system. This results

in a conventional gravity / pump station system O&M present worth advantage of approximately $513,900 over a 20 year period using a 3.5% interest rate.

The disadvantages of the STEP system compared to the conventional system are increased labor (either force account or by contact) and the larger number of mechanical components to monitor and care for. This results in higher O&M costs than a conventional gravity sewer / pump station system. Our analysis concluded that the ratio of STEP O&M costs were 3.34 times higher than conventional gravity/pump station O&M costs. The City would be responsible in 342 locations for the servicing and replacement of pumps, the periodic removal and disposal of sludge from each septic tank and the cleaning of the filter screen at each septic tank whether this was done using City forces or contract labor. We question the stated 20 year average life of the pumps for the system but have not modified this assumption for this analysis. Were the average life of the pumps to be only 10 to 12 years, as has been our experience, this would significantly increase the annual O&M costs and provide a more pronounced advantage in life cycle costs to the conventional gravity/pump station system.

The advantages of the STEP system compared to the conventional system are that a large portion of the capital expenditures (i.e. the on-site tank and equipment) are not incurred until the lot is developed and then is paid directly by the property lot owner rather than handled (however funded) by the City. Another advantage is that a STEP system is likely to have significantly less infiltration and inflow (I/I) over time with respect to a conventional gravity system.

From the City's and the STEP system served public's standpoint, the conventional gravity system would be less troublesome with regard to maintenance attention and uncertainty regarding maintenance costs. The future risk of having to accept the trucked pumped sludge at the City's wastewater treatment plant, should the sludge disposal arrangements Orenco proposes change, would be eliminated with a conventional system. The City does not currently have the facilities to receive and pre-treat septic tank sludge, so facilities would have to be constructed to receive, aerate and control odors for septic tank sludge if the City had to do so.

The STEP system funding methodology may prove to be easier to achieve by the developer, because the largest costs are incurred as lots are developed with respect to the LID arrangements which would have to be made for complete upfront funding of a conventional gravity/pump station system. With regard to funding, the Dyer proposed reduced size conventional gravity/pump station system would be eligible for SDC funding in the amount of 34.9% (approximately $1,050,600) because this is the amount of additional capacity which remains over and above the immediate requirement of the 342 EDU LID development.

CITY OF BROOKINGS

Council WORKSHOP Report

Workshop Date: February 4, 2013

Originating Dept: Public Works

Signature (submitted by)

City Manager Approval

Subject: Cross Connection Control/Backflow Program – Part 2 of 2

Recommendation: Adopt the attached Brookings Municipal Code (BMC) revisions and Cross Connection Control Program

Financial Impact: The financial impact is twofold. There is an impact to City staffing needed to administer the program. There is also a subsequent financial impact to customers who will now be required to annually check their backflow devices and/or the customers who were identified as needing a backflow who currently do not have a backflow device.

Background/Discussion: The City provides a public water system and Oregon state law, all public water systems are required to maintain a cross connection program under Oregon Administrative Rule 333-061-0070. This same administrative rule specifies under Table 48 a list of high risk activities that require backflow prevention. At a minimum the program must include an annual inspection of backflows, and the agency must employ a State certified cross connection control specialist to evaluate all water customers' degree of hazard for cross contamination to the public water system.

Attachment A provides BMC revisions which will allow staff to implement and enforce the proposed Cross Connection Control Program. The entire program, Attachment B herein, was developed by the company BMI who has considerable experience on the west coast with public water system compliance with State law.

Policy Considerations: By adopting the ordinance revisions, the City will be enabled to implement and enforce a Cross Connection Control Program. March 31, 2013 is the deadline to report to Oregon Health Authority any and all efforts to comply with OAR 333-061-0070. Adopting this program will allow the City to move forward administering the program immediately. This program is an ongoing program that will require staffing resources to continue to evaluate and administer the prevention of water quality hazards.

Attachment(s):

A. Proposed ordinance revisions
B. Cross Connection Control Program

Title 8
HEALTH AND SAFETY

Chapters:

Chapter 8.20
Water Quality, Cross Connection Control Program

8.20.010 Definitions.

1) “AUXILIARY SUPPLY” means any water source or system other than the City of Brookings Water System.

2) "APPROVED BACKFLOW PREVENTION ASSEMBLY" or "BACKFLOW ASSEMBLY" or "ASSEMBLY" means an assembly to counteract backpressure and/or prevent back-siphonage. This assembly must appear on the list of approved assemblies issued by the Oregon Health Authority.

3) "BACKFLOW" means the flow in the direction opposite to the normal flow or the introduction of any foreign liquids, gases, or substances into the water system of the City of Brookings.

4) “CERTIFIED BACKFLOW ASSEMBLY TESTER” shall mean a person who has successfully completed and maintains all requirements as established by the Oregon Health Authority to be a tester in the state of Oregon.

5) “CERTIFIED CROSS CONNECTION CONTROL SPECIALIST” shall mean a person who has successfully completed and maintains all requirements as established by the Oregon Health Authority to be a Specialist in the state of Oregon.

6) “CITY WATER SYSTEM” shall refer to and mean the City of Brookings Water System, maintained by the City of Brookings, which shall include, wells, treatment mechanisms or processes, pumping stations, reservoirs, supply trunk or feeder lines, service lines, meters and all other appurtenances, device lines and items necessary to the operation of the system and to supply water service to individual property or premises and shall include the City of Brookings potable water with which the system is supplied.

7) "CONTAMINATION" means the entry into or presence in a public water supply system of any substance which may be deleterious to health and/or quality of the water.

8) "CROSS CONNECTION" means any physical arrangement where a potable water supply is connected, directly or indirectly, with any other non-drinkable water system or auxiliary system, sewer, drain conduit, swimming pool, storage reservoir, plumbing fixture, swamp coolers or any other device which contains, or may contain, contaminated water, sewage or other liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water system as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices or other temporary or permanent devices through which or because of which backflow may occur, are considered to be cross connections.

9) “DEGREE OF HAZARD” means the NON-HEALTH HAZARD or HEALTH HAZARD classification that shall be assigned to all actual or potential cross connections.

10) “DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY”, “DOUBLE CHECK ASSEMBLY”, “DOUBLE CHECK” or “DCVA” means an assembly which consists of two (2) independently-operating check valves which are spring-loaded or weighted. The assembly comes complete with a resilient seated shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness.

11) “DOUBLE CHECK DETECTOR ASSEMBLY” or “DCDA” means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness. It shall also be provided with a factory bypass arrangement with a meter and a minimum of an approved double check assembly.

12) “HEALTH HAZARD” means an actual or potential threat of contamination of a physical, chemical or biological nature to the public potable water system or the consumer’s potable water system that would be a danger to health.

13) “IN-PREMISES PROTECTION” means the appropriate backflow prevention within the consumer’s water system at or near the point at which the actual or potential cross connection exists.

14) “MOBILE UNITS” shall mean units that are temporary in nature, connecting to the water system through a legally-permitted hydrant, hose bibb, or other appurtenance of a permanent nature that is part of the City of Brookings water system or a permanent water service to a premises. Examples can include but are not limited to the following: water trucks, pesticide applicator vehicles, chemical mixing units or tanks, waste hauler’s trucks or units, sewer cleaning equipment, carpet or steam cleaning equipment other than homeowner use, rock quarry or asphalt/concrete batch plants or any other mobile equipment or vessel that poses a threat of backflow in the City of Brookings Water System. Uses that are excluded from this definition are recreational vehicles at assigned sites or parked in accordance with other City of Brookings policies pertaining to recreational vehicles and homeowner devices that are used by the property owner in accordance with other provisions of this, or other, City of Brookings policies pertaining to provision of water service to a premises.

15) "NON-HEALTH HAZARD" shall mean the classification assigned to an actual or potential cross connection that could allow a substance that may be objectionable, but not hazardous to one’s health, to backflow into the potable water supply.

16) “OHA” shall mean Oregon Health Authority.

17) “OAR” shall mean Oregon Administrative Rule.

18) “PERSON(S)” shall mean a natural person (individual), corporation, company, city, partnership, firm, Limited Liability Company, Joint Venture Company or city, and other such entity.

19) "POLLUTION HAZARD" means an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer’s potable water system, but which would not constitute a health or system hazard, as defined. The maximum intensity of pollution

to which the potable water system could be degraded under this definition would cause minor damage to the system or its appurtenances.

20) "PREMISES" means any piece of property to which water service is provided, including, but not limited to, all improvements, mobile structures and other structures located upon it.

21) "PREMISES ISOLATION" means the appropriate backflow prevention at the service connection between the public water system and the premises. This location will be at or near the property line and downstream from the service connection meter.

22) "REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY" or "REDUCED PRESSURE PRINCIPLE ASSEMBLY" or "RP ASSEMBLY" shall mean an assembly containing two independently-acting approved check valves together with a hydraulically-operated, mechanically-independent pressure differential relief valve located between the check valves, and at the same time, below the first check valve. The assembly shall include properly located test cocks and two tightly closing shut-off valves.

23) "REDUCED PRESSURE DETECTOR ASSEMBLY" or "RPDA" shall mean an approved assembly consisting of two approved reduced pressure backflow assemblies, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use. The assembly should include properly-located test cocks and two tightly closing shut off valves.

24) "RESIDENT" means a person or persons living within the area(s) served by the City of Brookings Water System.

25) "RETROFITTING" means to furnish a service connection with parts or equipment made available after the time of construction or assembly installation.

26) "SPECIALIST" means an Oregon Health Authority-certified Cross Connection Specialist, either employed with the City of Brookings or contracted by the City of Brookings.

27) "SOP Manual" shall mean the City's Standard Cross Connection Control Program Operating Procedures and Guidance Manual.

28) "SUBMERGED HEADS" means irrigation sprinkling or delivery devices that are located below the surface of the landscaped area in which they are installed.

29) "SUPERVISOR" shall mean the Public Works Supervisor or his/her designee.

30) "THERMAL EXPANSION" means the pressure created by the expansion of heated water.

31) "UNAPPROVED SUBSTANCE" means any substance, gas, or liquid other than the city's drinking water or the city's used drinking water.

32) "USED WATER" means any water supplied by the city to a customer's property after it has passed through the service connection and is no longer under the control of the city.

8.20.020 Purpose

The purpose of this Ordinance is to protect the water supply and distribution system of the City of Brookings from contamination or pollution due to any existing or potential cross connections and to comply with the Oregon Administrative Rule Chapter 333-061-0070, 0071, 0072, 0073 and 0074 or as amended.

8.20.030 Application and Responsibilities

This Ordinance applies throughout the City of Brookings Water System and to every premises and property served by the City of Brookings Water System. It applies to all premises, regardless of date of connection to the City of Brookings Water System. Every owner, occupant or person in control of any concerned premises is responsible for the terms and provisions contained in this Ordinance.

8.20.040 Cross Connections Regulated

A. No cross connections shall be created, installed, used or maintained within the area(s) served by the City of Brookings Water System, except in accordance with this Ordinance.

B. The Specialist shall carry out or cause surveys to be carried out to determine if any actual or potential cross connection exists. If found necessary, an assembly commensurate with the degree of hazard will be required at the service connection.

C. The owner, occupant or person in control of any given premises is responsible for all cross connection control within the premises.

D. All premises found on Table 48 of the OAR shall install a Reduced Pressure Backflow Assembly at the service connection in accordance with this Ordinance.

E. It is the responsibility of the property owner/occupant to purchase, install, test, repair and maintain all backflow assemblies.

F. If there is a change in ownership of any and all property within the City's service area, it shall be the responsibility of the new owner to determine that all assemblies are in compliance with this Ordinance.

8.20.050 Backflow Prevention Assembly Requirements

A Specialist employed by or under contract with the City of Brookings, shall determine the type of backflow assemblies to be installed within the City of Brookings Water System. All assemblies shall be installed at the service connection unless it is determined by the Specialist and approved by the Supervisor that in-premises protection would be adequate.

An approved assembly shall be required in each of the following circumstances, but the Specialist is in no way limited to the following circumstances:

1) In the case of any premises where there is any material dangerous to health which is handled in such a fashion as to permit entry into potable water system, the potable water system shall be protected by an approved air gap separation or an approved reduced pressure principle backflow prevention assembly.

2) When the nature and extent of any activity at a premises, or the materials used in connection with any activity at premises, or materials stored at a premises, could contaminate or pollute the potable water supply.

3) When a premises has one (1) or more cross connections, as that term is defined in **8.20.010**.

4) When internal cross connections are present that are not correctable.

5) When intricate plumbing arrangements are present making it impractical to ascertain whether cross connections exist.

6) When the premises has a repeated history of cross connections being established or re-established.

7) When entry to the premises is restricted so that surveys for cross connections cannot be made with sufficient frequency to assure cross connections do not exist.

8) When materials are being used such that, if backflow should occur, a health hazard could result.

9) When an appropriate cross connection survey report form has not been filed with the City of Brookings Supervisor.

10) Any and all used water return systems.

11) If an in-premises assembly has not been tested or repaired as required by this Ordinance, the installation of a reduced pressure principle assembly will be required at the service connection.

12) There is piping or equipment for conveying liquids other than potable City of Brookings water and that piping or other equipment is under pressure and installed and operated in a manner that could cause a cross connection.

13) When installation of an approved backflow prevention assembly is deemed by a Specialist to be necessary to accomplish the purpose of this Ordinance.

14) The use of any type of chemical spray attachment connected to the premises plumbing, including garden hose fertilizers and pesticide applicators, is not allowed within the City of Brookings Water System without proper protection from the potential of backflow occurring.

15) The use of any type of radiator flush kits attached to the premises plumbing is not allowed within the City of Brookings Water System without proper protection from backflow occurring.

16) Wherever reclaimed water or separate irrigation water is used on premises.

17) When there is a premises with an auxiliary water supply which is interconnected to the City of Brookings Water Service or supply system.

8.20.060 New Construction

1) On all new non-residential construction, an approved backflow assembly shall be installed at the service connection. The type of the assembly will be commensurate with the degree of hazard as determined by a Specialist.

2) When a building is constructed on commercial premises, and the end use of the building is not determined or could change, a reduced pressure principle backflow prevention assembly shall be installed at the service connection to provide protection of the public water supply in the event of the most hazardous use of the building.

8.20.070 Retrofitting

Retrofitting shall be required at all service connections where an actual or potential cross connection exists, and wherever else the City of Brookings deems retrofitting necessary to comply with the OAR, this Ordinance and the City's SOP Manual.

8.20.080 Irrigation Systems

All irrigation systems shall be protected according to the Uniform Plumbing Code. In the event any system is equipped with an injector system, a reduced pressure principle assembly will be required at the service connection.

8.20.090 Thermal Expansion

If a closed system has been created by the installation of a backflow prevention assembly, or other appurtenances, it is the responsibility of the property owner, the occupant, or person in control of the property to eliminate the possibility of damage from thermal expansion in accordance with the Plumbing Code.

8.20.100 Mobile Units- Portable Water Trucks

Any mobile unit or apparatus, as defined in Section **8.20.010** Subsection (14) of this Ordinance, which uses the water from any premises within the City of Brookings Water System, shall first obtain a permit from the City of Brookings and be inspected to assure an approved air gap or reduced pressure principle assembly is installed on the unit.

8.20.110 Installation Requirements

All backflow prevention assembly installations shall follow the requirements as stipulated by the City of Brookings and current OAR Chapter 333, Division 061 and the City's SOP Manual.

If the premises isolation assembly is allowed to be installed at an alternate location, the City of Brookings must have access to the assembly. No connections can be made between the meter and the backflow assembly.

The type of backflow prevention assembly required shall be commensurate with the degree of hazard that exists and must, at all times, meet the standards of the Oregon Health Authority. All backflow prevention assemblies required under this section shall be of a type and model approved by the OHA.

8.20.120 Pressure Loss

Any decrease in water pressure caused by the installation of a backflow assembly shall not be the responsibility of the City of Brookings.

8.20.130 Fire Systems

An approved double check detector assembly shall be the minimum protection on all new fire sprinkler systems using piping material that is not approved for potable water use, and/or that does not provide for periodic flow-through. A reduced pressure principle detector assembly must be installed, if any solution other than potable water can be introduced into the sprinkler system.

Retrofitting on fire sprinkler systems will be required in each of the following circumstances:

A) Where improper maintenance has occurred

B) On all health hazard systems

C) Wherever a Specialist deems necessary

D) Wherever required by the OAR

In the event an assembly is installed on a designated lateral, a detector assembly commensurate with the degree of hazard will be required.

8.20.130 Temporary Meters and Hydrant Valves

Backflow protection will be required on all temporary meters and hydrant valves before any use. The type of assembly will be commensurate with the degree of hazard and will be determined on a case-by-case basis by a City of Brookings Specialist.

Plumbing Code

As a condition of water service, customers shall install, maintain, and operate their piping and plumbing systems in accordance with the current Uniform Plumbing Code, or as amended. If there is a conflict between this Ordinance and the Plumbing Code, the more stringent supersedes.

8.20.150 Right-of-Way Encroachment

All backflow assemblies must be installed in accordance with the Right-of-Way Encroachment stipulated by the City's "Right to Use" Encroachment Document.

8.20.160 Access to Premises

Authorized personnel of the City of Brookings, with proper identification and sufficient notice, shall have access during reasonable hours to all parts of a premises and within the structure to which water is supplied. However, if any owner, occupant or person in control refuses authorized personnel access to a premise, or to the interior of a structure, during these hours for inspection, a reduced pressure principle assembly must be installed at the service connection to that premise.

8.20.170 Annual Testing and Repairs

All backflow prevention assemblies installed within the area(s) served by the City of Brookings shall be tested immediately upon installation, and at least annually thereafter by an OHA certified backflow assembly tester. All such assemblies found not functioning properly shall be promptly repaired or replaced at the expense of the owner, occupant or person in control of the premises. In the event an assembly is moved, repaired or replaced it must be retested immediately. All repairs on backflow assemblies within the City of Brookings service area must be performed according to all State and County regulations.

8.20.180 Maintenance of Assemblies

Backflow prevention assemblies shall be maintained, tested and repaired in accordance with the requirements set out in this Ordinance, the City's SOP Manual, the OAR and all applicable State agency's regulations. The assembly owner is responsible for protecting their assembly from freezing and vandalism.

In the event an assembly is not properly tested and repaired, the City of Brookings will have the assembly tested and repaired and apply all costs associated with this to the assembly owner's utility bill.

8.20.190 Responsibilities of Backflow Prevention Assembly Testers

1) All backflow assembly testers operating within the City of Brookings Water System service area shall be certified in accordance with all applicable regulations of the OHA and must abide by the requirements of this Ordinance and the City's SOP Manual.

2) Persons certified as backflow assembly testers shall agree to abide by all requirements of the United States Occupational Safety and Health Administration ("OSHA") and Oregon Occupational Safety and Health Administration ("OR-OSHA").

3) It is the responsibility of backflow assembly testers to submit records of all backflow assembly test reports to the City of Brookings within 10 days of completing the test.

8.20.200 Costs of Compliance

All costs associated with purchase, installation, surveys, testing, replacement, maintenance, parts and repairs of the backflow prevention assembly, and all costs associated with enforcement of this

document, are the financial responsibility of the property owner, occupant, or other person in control of the premises.

8.20.210 Recovery of Costs

Any water customer violating any of the provisions of this Ordinance and who causes damage to or impairs the City of Brookings Water System, including, but not limited to, allowing contamination, pollution, any other solution or used water to enter the City of Brookings Water System, shall be liable to the City of Brookings for any expense, loss or damage caused by such violation. The City of Brookings shall collect from the violator the cost incurred by the City of Brookings for any cleaning, purifying, repair or replacement work or any other expenses caused by the violation. Refusal to pay the assessed costs shall constitute a violation of this Ordinance and shall result in the termination of service. All cost associated with any disconnect or reconnect fees resulting from the enforcement of this Ordinance are the sole responsibility of the property owner.

8.20.220 Termination of Service

Failure on the part of any owner, occupant or person in control of the premises to install a required assembly, have it tested a minimum of annually and repaired if necessary, and/or to discontinue the use of all cross connections and to physically separate cross connections in accordance with this Ordinance is sufficient cause for the discontinuance of public water service to the premises pursuant to Oregon Administrative Rule chapter 333-061-0070, or as amended. In the case of an extreme emergency or where an immediate threat to life or public health is found to exist, discontinuance or termination of public water service to the premises shall be immediate.

In lieu of termination of service, the City of Brookings may, at the property owner's expense, install a reduced pressure assembly at the meter. Testing, maintenance and repair of the assembly will be the responsibility of the property owner.

8.20.230 Falsifying Information

Any person who knowingly makes any false statement, representation, record, report or other document filed or required to be maintained pursuant to this Ordinance, or who falsifies, tampers with, or knowingly renders inaccurate any backflow assembly, device or method required under this Ordinance shall be subject to civil and/or criminal penalties provided by state law.

8.20.240 Constitutionality and Saving Clause

Should any provision, section, sentence, clause or phrase of this Ordinance, or the application of same to any person or set of circumstances, are for any reason held to be unconstitutional, void, invalid, or for any reason unenforceable, the validity of the remaining portions of this Ordinance, or its application to other persons or circumstances, shall not be affected; thereby, it being the intent of the City of Brookings Water System in adopting and approving this Ordinance that no portion hereof or provision or regulation contained herein shall become inoperative or fail by reason of any unconstitutionality or invalidity of any other portion, provision, or regulation.

Existing BMC Chapter 13.05 Water

13.05.190 Discontinuance of service.

A. On Customer Request. Each customer about to vacate any premises supplied with water service by the city shall give the city written notice of his intentions at least two days prior thereto, specifying the date service is to be discontinued; otherwise, he will be responsible for all water supplied to such premises until the city shall receive notice of such removal. At the time specified by the customer that he expects to vacate the premises where service is supplied or that he desires service to be discontinued, the meter will be read and a bill rendered which is payable immediately. In no case will the bill be less than the monthly base rate.

B. Nonpayment of Sewer and Water Service Charges. If the sewer service charges provided for in Chapter 13.15 BMC are not paid when due by any such person, firm, or corporation whose premises are served or who are subject to the charges herein provided, water service provided to that customer by the city may be discontinued because of the default in the payment of the sewer service charges. As an additional alternative method of collection, if such rates and charges are not paid when due by any such person, firm, or corporation, the amounts so unpaid may be certified by the city recorder to the county assessor of Curry County, Oregon, and shall be by him assessed against the premises served as provided by law and shall be collected and paid over to the city in the same manner as other taxes are assessed, collected, and paid over, with interest. Interest on unpaid bills shall run from the due date thereof at the rate adopted by resolution of the city council. Such unpaid charges may also be recovered in an action at law in the name of the city, with interest as aforesaid.

C. Improper Customer Facilities.

~~1. Unsafe Facilities. The city may refuse to furnish water and may discontinue services to any premises without prior notice where plumbing facilities, appliances, or equipment using water are dangerous, unsafe, or not in conformity with the plumbing code of the state of Oregon.~~

~~2. Cross Connections. A cross connection is defined as any physical connection between the city system and another source.~~

~~3. The Oregon State Board of Health and the U.S. Public Health Service prohibit cross connections. The requirements of OAR 333-61-070 are hereby adopted by this reference and included as if set out herein.~~

~~4. The city will not permit any cross connection and will discontinue service to any premises where a cross connection or a potential cross connection exists. Service will not be restored until the cross connection or potential cross connection is eliminated. Customers using water from one or more sources in addition to receiving water from the city on the same premises shall maintain separate systems for each; and the city's water supply facilities shall be separated from~~

~~any and all other systems by an air gap or approved backflow prevention device as provided by OAR 333-61-070.~~

Reference Title 8 “Health and Safety” Section 8.20 “Water Quality – Cross Connection Control Program.”

D. Water Waste. Where water is wastefully or negligently used on a customer’s premises, seriously affecting the general service, the city may discontinue service if such conditions are not corrected after due notice by the city.

CROSS CONNECTION CONTROL PROGRAM

STANDARD OPERATING PROCEDURES AND GUIDELINES

D R A F T

For the City of Brookings, OR

November 2012

Prepared by
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This manual is meant to be used in conjunction with the City's Cross Connection Control Enforcement Document

STANDARD OPERATING PROCEDURES AND GUIDELINES

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SECTION 1

DEFINITIONS

Except where specifically designated in this section, all words used in this section shall carry their customary meanings. Any word, term, or phrase not found in this section shall be determined as set forth in the Oregon Health Authority's (OHA) Drinking Water Regulations or in the AWWA-PNWS Cross Connection Control Manual, if not found in such regulations.

A) "Approved Air Gap (AG)" means a physical separation between the free-flowing discharge end of a potable water supply pipeline and an open or non-pressurized receiving vessel. An "Approved Air Gap" shall be at least twice the diameter of the supply pipe measured vertically above the overflow rim of the vessel and in no case less than 1 inch (2.54 cm), and in accord with Oregon Plumbing Specialty Code.

B) "Approved Backflow Prevention Assembly" means an assembly, of a make, model, orientation, and size approved by the OHA Assemblies listed in the currently approved backflow prevention assemblies list developed by the University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research, or other testing laboratories using equivalent testing methods, are considered approved by the OHA.

C) "Auxiliary Water Supply" means any supply of water used to augment the supply obtained from the public water system, which serves the premises in question.

D) "AWWA-PNWS Cross Connection Control Manual" means the latest version of the manual published by the American Water Works Association – Pacific Northwest Section and is endorsed by the State addressing cross connection control practices, which shall be used as a guidance document for the water supplier in implementing a Cross Connection Control Program.

E) "Backflow" means the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any sources other than its intended source, and is caused by backsiphonage or backpressure.

F) "Backflow Assembly Tester" or "BAT" means a person holding a valid Backflow Assembly Tester certification issued in accordance with the Oregon Health Authority.

G) "Closed system" means any water system or portion of a water system in which water is closed to atmosphere.

H) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water that creates a health hazard.

I) "Cross connection" means any physical arrangement where the public water system is connected, directly or indirectly, actual or potential, with any other non-potable water system or auxiliary system, well, sewer, drain conduit, swimming pool, storage reservoir, plumbing

fixture, swamp cooler, or any other device which contains, or may contain, contaminated or polluted water, sewage, used water, or other liquid of unknown or unsafe quality which may be capable of imparting contamination or pollution to the public water system as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, or other temporary or permanent devices through which, or because of which, backflow may occur are considered to be cross connections.

J) "Cross Connection Specialist" or "CCS" or "Specialist" means a person holding a valid Cross Connection Specialist certification issued in accordance with the OHA, who is an employee or contractor of the city and meets the requirements of this Chapter 13.06 and the City's Standard Operating Procedures Manual to carry out surveys for cross connections on behalf of the City.

K) "Degree of Hazard" means either pollution (non-health hazard) or contamination (health hazard) and is determined by an evaluation of hazardous conditions within a system.

L) "Double Check Detector Backflow Prevention Assembly (DCDA)" means a specially designed assembly composed of a line size approved double check valve assembly assembled with a bypass containing a specific water meter and an approved double check valve assembly. The meter shall register accurately for only very low rates of flow up to three gallons per minute and shall show a registration for all rates of flow. This assembly is designed to protect against a non-health hazard.

M) "Double Check Valve Backflow Prevention Assembly (DC)" means an assembly of two independently acting approved check valves, including tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly is designed to protect against a non-health hazard.

N) "Drinking Water Regulations" means the most recent edition of the regulations adopted by the Oregon Health Authority.

O) "Health Hazard (Contamination)" means an impairment of the quality of the water that could create an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, waste, or other substances.

P) "In-premises protection" means a method of protecting the health of consumers served by the customer's plumbing system (*i.e.* located within the property lines of the customer's premises) by the installation of an approved air gap, backflow prevention assembly, or device at the point of hazard.

Q) "Mobile unit" means a unit connecting to the public water system through a hydrant, hose bibb, or other appurtenance of a permanent nature that is part of the public water system. Examples include, but are not limited to, the following: water trucks, pesticide applicator vehicles, chemical mixing units or tanks, waste or septage hauler trucks or units, sewer cleaning equipment, carpet or steam cleaning equipment, rock quarry or asphalt/concrete batch plants, or any other mobile equipment or vessel. Uses that are excluded from this definition are recreational vehicles at assigned sites or parked in accordance with city ordinances pertaining to recreational vehicles, and homeowner devices that are used by the

property owner in accordance with city ordinances pertaining to the provision of water service to a premises.

R) "Non-Health Hazard (Pollution)" means an impairment of the quality of the water to a degree that does not create a hazard to the public health, but does adversely affect the aesthetic qualities of such water for potable use.

S) "Plumbing code" means the most current plumbing code adopted by the City.

T) "Plumbing hazard" means an internal or plumbing-type cross connection in a consumer's potable water system that may be either a pollutional or a contamination-type hazard. This includes, but is not limited to, cross connections to toilets, sinks, lavatories, wash trays, domestic washing machines, and lawn sprinkling systems. Plumbing-type cross connections can be located in all types of structures including, but not limited to, homes, manufactured homes, apartment houses, hotels, and commercial or industrial establishments.

U) "Pollutant" means a substance that creates an impairment of the quality of the water to a degree which does not create a hazard to the public health, but which does adversely affect the aesthetic qualities of the water.

V) "Potable water supply" means water which has sufficiently low concentrations of microbiological, inorganic chemical, organic chemical, radiological or physical substances so that individuals drinking such water at normal levels of consumption will not be exposed to disease organisms or other substances which may produce harmful physiological effects.

W) "Premises" means any piece of property to which water is provided including, but not limited to, all improvements, mobile structures, and structures located on it.

X) "Premises isolation" means a method of protecting the public water system by the installation of an approved air gap or approved backflow prevention assembly at the point of service (end of the city's service pipe) to separate the customer's plumbing system from the city's distribution system.

Y) "Public Water System" means a system for the provision to the public of piped water for human consumption, if such system has more than three service connections, or supplies water to a public or commercial establishment that operates a total of at least 60 days per year, and that is used by 10 or more individuals per day. Public water system also means a system for the provision to the public of water through constructed conveyances other than pipes to at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days of the year. A public water system is a "Community Water System", a "Transient Non-Community Water System", a "Non-Transient Non-Community Water System" or a "State Regulated Water System"

Z) "Reduced Pressure Principle Detector Backflow Prevention Assembly (RPDA)" means a specifically designed assembly composed of a line size approved reduced pressure principle backflow prevention assembly with a bypass containing a specific water meter and an approved reduced pressure principle backflow prevention assembly. The meter shall register accurately for only very low rates of flow up to three gallons per minute and

shall show a registration for all rates of flow. This assembly is designed to protect against a non-health hazard or a health hazard.

AA) "Reduced Pressure Principle Backflow Prevention Assembly (RP)" means an assembly containing two independently acting approved check valves, together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located resilient seated test cocks and tightly closing resilient seated shutoff valves at each end of the assembly. This assembly is designed to protect against a non-health hazard or a health hazard.

AB) "Standard Operating Procedures Manual" or "SOP Manual" means the most recent edition of the city's Standard Operating Procedures Manual related to cross connection control.

AC) "Supervisor" means the supervisor of Public Works or his/her designee.

AD) "Thermal Expansion" means the pressure increase due to a rise in water temperature that occurs in water piping systems when such systems become "closed" by the installation of a backflow prevention assembly or other means, and will not allow for expansion beyond that point of installation.

AE) "Unapproved substance" means any substance, gas, or liquid other than the city's drinking water or the city's used drinking water.

AF) "Used water" means any water supplied by the city to a customer's property after it has passed through the service connection and is no longer under the control of the city.

SECTION 2

ENFORCEMENT DOCUMENT

CITY OF BROOKINGS
CROSS CONNECTION CONTROL ORDINANCE

Pursuant to Chapter 333, Division 61, of the Oregon Administrative Rules, it is the responsibility of the City of Brookings to protect the public water system from pollution and contamination by instituting and enforcing a cross connection control program.

1:01 PURPOSE

The purpose of this Ordinance is to protect the water supply and distribution system of the City of Brookings from contamination or pollution due to any existing or potential cross connections and to comply with the Oregon Administrative Rule Chapter 333-061-0070, 0071, 0072, 0073 and 0074 or as amended.

1:02 DEFINITIONS

For the purposes of this Ordinance, the following definitions shall apply unless the context clearly indicates or requires a different meaning. If a word or term used in this Ordinance is not contained in the following list, its definition, or other technical terms used, shall have the meanings or definitions listed in the Oregon Administrative Rules, Chapter 333, or the most recent edition of the *Manual of Cross Connection Control* published by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California ("USC").

1) "APPROVED BACKFLOW PREVENTION ASSEMBLY" or "BACKFLOW ASSEMBLY" or "ASSEMBLY" means an assembly to counteract backpressure and/or prevent back-siphonage. This assembly must appear on the list of approved assemblies issued by the Oregon Health Authority.

2) "AUXILIARY SUPPLY" means any water source or system other than the City of Brookings Water System.

3) "BACKFLOW" means the flow in the direction opposite to the normal flow or the introduction of any foreign liquids, gases, or substances into the water system of the City of Brookings.

4) "CERTIFIED BACKFLOW ASSEMBLY TESTER" shall mean a person who has successfully completed and maintains all requirements as established by the Oregon Health Authority to be a tester in the state of Oregon.

5) "CERTIFIED CROSS CONNECTION CONTROL SPECIALIST" shall mean a person who has successfully completed and maintains all requirements as established by the Oregon Health Authority to be a Specialist in the state of Oregon.

6) "CITY" shall mean the City of Brookings.

7) "CITY WATER SYSTEM" shall refer to and mean the City of Brookings Water System, which shall include, wells, treatment mechanisms or processes, pumping stations, reservoirs, supply trunk or feeder lines, service lines, meters and all other appurtenances, device lines and items necessary to the operation of the system and to supply water service to individual property or premises and shall include the City of Brookings potable water with which the system is supplied.

8) "CONTAMINATION" means the entry into or presence in a public water supply system of any substance which may be deleterious to health and/or quality of the water.

9) "CROSS CONNECTION" means any physical arrangement where a potable water supply is connected, directly or indirectly, with any other non-drinkable water system or auxiliary system, sewer, drain conduit, swimming pool, storage reservoir, plumbing fixture, swamp coolers or any other device which contains, or may contain, contaminated water, sewage or other liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water system as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices or other temporary or permanent devices through which or because of which backflow may occur, are considered to be cross connections.

10) "DEGREE OF HAZARD" means the NON-HEALTH HAZARD or HEALTH HAZARD classification that shall be assigned to all actual or potential cross connections.

11) "DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY", "DOUBLE CHECK ASSEMBLY", "DOUBLE CHECK" or "DCVA" means an assembly which consists of two (2) independently-operating check valves which are spring-loaded or weighted. The assembly comes complete with a resilient seated shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness.

12) "DOUBLE CHECK DETECTOR ASSEMBLY" or "DCDA" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness. It shall also be provided with a factory bypass arrangement with a meter and a minimum of an approved double check assembly.

13) "HEALTH HAZARD" means an actual or potential threat of contamination of a physical, chemical or biological nature to the public potable water system or the consumer's potable water system that would be a danger to health.

14) “IN-PREMISES PROTECTION” means the appropriate backflow prevention within the consumer’s water system at or near the point at which the actual or potential cross connection exists.

15) “MOBILE UNITS” shall mean units that are temporary in nature, connecting to the water system through a legally-permitted hydrant, hose bibb, or other appurtenance of a permanent nature that is part of the City of Brookings water system or a permanent water service to a premises. Examples can include but are not limited to the following: water trucks, pesticide applicator vehicles, chemical mixing units or tanks, waste hauler’s trucks or units, sewer cleaning equipment, carpet or steam cleaning equipment other than homeowner use, rock quarry or asphalt/concrete batch plants or any other mobile equipment or vessel that poses a threat of backflow in the City of Brookings Water System. Uses that are excluded from this definition are recreational vehicles at assigned sites or parked in accordance with other City of Brookings policies pertaining to recreational vehicles and homeowner devices that are used by the property owner in accordance with other provisions of this, or other, City of Brookings policies pertaining to provision of water service to a premises.

16) "NON-HEALTH HAZARD" shall mean the classification assigned to an actual or potential cross connection that could allow a substance that may be objectionable, but not hazardous to one’s health, to backflow into the potable water supply.

17) “OHA” shall mean Oregon Health Authority.

18) “OAR” shall mean Oregon Administrative Rule.

19) “PERSON(S)” shall mean a natural person (individual), corporation, company, city, partnership, firm, Limited Liability Company, Joint Venture Company or city, and other such entity.

20) "POLLUTION HAZARD" means an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer’s potable water system, but which would not constitute a health or system hazard, as defined. The maximum intensity of pollution to which the potable water system could be degraded under this definition would cause minor damage to the system or its appurtenances.

21) "PREMISES" means any piece of property to which water service is provided, including, but not limited to, all improvements, mobile structures and other structures located upon it.

22) "PREMISES ISOLATION" means the appropriate backflow prevention at the service connection between the public water system and the premises. This location will be at or near the property line and downstream from the service connection meter.

23) "REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY" or "REDUCED PRESSURE PRINCIPLE ASSEMBLY" or "RP ASSEMBLY" shall mean an assembly containing two independently-acting approved check valves together with a hydraulically-operated, mechanically-independent pressure differential relief valve located between the check valves, and at the same time, below the first check valve. The assembly shall include properly located test cocks and two tightly closing shut-off valves.

24) "REDUCED PRESSURE DETECTOR ASSEMBLY" or "RPDA" shall mean an approved assembly consisting of two approved reduced pressure backflow assemblies, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use. The assembly should include properly-located test cocks and two tightly closing shut off valves.

25) "RESIDENT" means a person or persons living within the area(s) served by the City of Brookings Water System.

26) "RETROFITTING" means to furnish a service connection with parts or equipment made available after the time of construction or assembly installation.

27) "SPECIALIST" means an Oregon Health Authority-certified Cross Connection Specialist, either employed with the City of Brookings or contracted by the City of Brookings.

28) "SOP Manual" shall mean the City's Standard Operating Procedures and Guidance Manual.

29) "SUBMERGED HEADS" means irrigation sprinkling or delivery devices that are located below the surface of the landscaped area in which they are installed.

30) "SUPERVISOR" shall mean the Public Works Supervisor or his/her designee.

31) "THERMAL EXPANSION" means the pressure created by the expansion of heated water.

1:03 APPLICATION AND RESPONSIBILITIES

This Ordinance applies throughout the City of Brookings Water System and to every premises and property served by the City of Brookings Water System. It applies to all premises, regardless of date of connection to the City of Brookings Water System. Every owner, occupant or person in control of any concerned premises is responsible for the terms and provisions contained in this Ordinance.

1:04 CROSS CONNECTIONS REGULATED

1) No cross connections shall be created, installed, used or maintained within the area(s) served by the City of Brookings Water System, except in accordance with this Ordinance.

2) The Specialist shall carry out or cause surveys to be carried out to determine if any actual or potential cross connection exists. If found necessary, an assembly commensurate with the degree of hazard will be required at the service connection.

3) The owner, occupant or person in control of any given premises is responsible for all cross connection control within the premises.

4) All premises found on Table 48 of the OAR shall install a Reduced Pressure Backflow Assembly at the service connection in accordance with this Ordinance.

5) It is the responsibility of the property owner/occupant to purchase, install, test, repair and maintain all backflow assemblies.

6) If there is a change in ownership of any and all property within the City's service area, it shall be the responsibility of the new owner to determine that all assemblies are in compliance with this Ordinance.

1:05 BACKFLOW PREVENTION ASSEMBLY REQUIREMENTS

A Specialist employed by or under contract with the City of Brookings, shall determine the type of backflow assemblies to be installed within the City of Brookings Water System. All assemblies shall be installed at the service connection unless it is determined by the Specialist and approved by the Supervisor that in-premises protection would be adequate. An approved assembly shall be required in each of the following circumstances, but the Specialist is in no way limited to the following circumstances:

1) In the case of any premises where there is any material dangerous to health which is handled in such a fashion as to permit entry into potable water system, the potable water system shall be protected by an approved air gap separation or an approved reduced pressure principle backflow prevention assembly.

2) When the nature and extent of any activity at a premises, or the materials used in connection with any activity at premises, or materials stored at a premises, could contaminate or pollute the potable water supply.

3) When a premises has one (1) or more cross connections, as that term is defined in Section 1.

4) When internal cross connections are present that are not correctable.

5) When intricate plumbing arrangements are present making it impractical to ascertain whether cross connections exist.

6) When the premises has a repeated history of cross connections being established or re-established.

7) When entry to the premises is restricted so that surveys for cross connections cannot be made with sufficient frequency to assure cross connections do not exist.

8) When materials are being used such that, if backflow should occur, a health hazard could result.

9) When an appropriate cross connection survey report form has not been filed with the City of Brookings Supervisor.

10) Any and all used water return systems.

11) If an in-premises assembly has not been tested or repaired as required by this Ordinance, the

installation of a reduced pressure principle assembly will be required at the service connection.

12) There is piping or equipment for conveying liquids other than potable City of Brookings water and that piping or other equipment is under pressure and installed and operated in a manner that could cause a cross connection.

13) When installation of an approved backflow prevention assembly is deemed by a Specialist to be necessary to accomplish the purpose of this Ordinance.

14) The use of any type of chemical spray attachment connected to the premises plumbing, including garden hose fertilizers and pesticide applicators, is not allowed within the City of Brookings Water System without proper protection from the potential of backflow occurring.

15) The use of any type of radiator flush kits attached to the premises plumbing is not allowed within the City of Brookings Water System without proper protection from backflow occurring.

16) Wherever reclaimed water or separate irrigation water is used on premises.

17) When there is a premises with an auxiliary water supply which is interconnected to the City of Brookings Water Service or supply system.

1:06 NEW CONSTRUCTION

1) On all new non-residential construction, an approved backflow assembly shall be installed at the service connection. The type of the assembly will be commensurate with the degree of hazard as determined by a Specialist.

2) When a building is constructed on commercial premises, and the end use of the building is not determined or could change, a reduced pressure principle backflow prevention assembly shall be installed at the service connection to provide protection of the public water supply in the event of the most hazardous use of the building.

1:07 RETROFITTING

Retrofitting shall be required at all service connections where an actual or potential cross connection exists, and wherever else the City of Brookings deems retrofitting necessary to comply with the OAR, this Ordinance and the City's SOP Manual.

1:08 IRRIGATION SYSTEMS

All irrigation systems shall be protected according to the Uniform Plumbing Code. In the event any system is equipped with an injector system, a reduced pressure principle assembly will be required at

the service connection.

1:09 THERMAL EXPANSION

If a closed system has been created by the installation of a backflow prevention assembly, or other appurtenances, it is the responsibility of the property owner, the occupant, or person in control of the property to eliminate the possibility of damage from thermal expansion in accordance with the Plumbing Code.

1:10 MOBILE UNITS

Any mobile unit or apparatus, as defined in Section 1:02 Subsection (15) of this Ordinance, which uses the water from any premises within the City of Brookings Water System, shall first obtain a permit from the City of Brookings and be inspected to assure an approved air gap or reduced pressure principle assembly is installed on the unit.

1:11 INSTALLATION REQUIREMENTS

All backflow prevention assembly installations shall follow the requirements as stipulated by the City of Brookings and current OAR Chapter 333, Division 061 and the City's SOP Manual.

If the premises isolation assembly is allowed to be installed at an alternate location, the City of Brookings must have access to the assembly. No connections can be made between the meter and the backflow assembly.

The type of backflow prevention assembly required shall be commensurate with the degree of hazard that exists and must, at all times, meet the standards of the Oregon Health Authority. All backflow prevention assemblies required under this section shall be of a type and model approved by the OHA.

1:12 PRESSURE LOSS

Any decrease in water pressure caused by the installation of a backflow assembly shall not be the responsibility of the City of Brookings.

1:13 FIRE SYSTEMS

An approved double check detector assembly shall be the minimum protection on all new fire sprinkler systems using piping material that is not approved for potable water use, and/or that does not provide for periodic flow-through. A reduced pressure principle detector assembly must be installed, if any solution other than potable water can be introduced into the sprinkler system. Retrofitting on fire sprinkler systems will be required in each of the following circumstances:

A) Where improper maintenance has occurred
B) On all health hazard systems
C) Wherever a Specialist deems necessary
D) Wherever required by the OAR

In the event an assembly is installed on a designated lateral, a detector assembly commensurate with the degree of hazard will be required.

1:14 TEMPORARY METERS AND HYDRANT VALVES

Backflow protection will be required on all temporary meters and hydrant valves before any use. The type of assembly will be commensurate with the degree of hazard and will be determined on a case-by-case basis by a City of Brookings Specialist.

1:15 PLUMBING CODE

As a condition of water service, customers shall install, maintain, and operate their piping and plumbing systems in accordance with the current Uniform Plumbing Code, or as amended. If there is a conflict between this Ordinance and the Plumbing Code, the more stringent supersedes.

1:16 RIGHT-OF-WAY ENCROACHMENT

All backflow assemblies must be installed in accordance with the Right-of-Way Encroachment stipulated by the City's "Right of Way" Encroachment Document.

1:17 ACCESS TO PREMISES

Authorized personnel of the City of Brookings, with proper identification and sufficient notice, shall have access during reasonable hours to all parts of a premises and within the structure to which water is supplied. However, if any owner, occupant or person in control refuses authorized personnel access to a premise, or to the interior of a structure, during these hours for inspection, a reduced pressure principle assembly must be installed at the service connection to that premise.

1:18 ANNUAL TESTING AND REPAIRS

All backflow prevention assemblies installed within the area(s) served by the City of Brookings shall be tested immediately upon installation, and at least annually thereafter by an OHA certified backflow assembly tester. All such assemblies found not functioning properly shall be promptly repaired or replaced at the expense of the owner, occupant or person in control of the premises. In the event an assembly is moved, repaired or replaced it must be retested immediately. All repairs on backflow assemblies within the City of Brookings service area must be performed according to all State and County regulations.

1:19 MAINTENANCE OF ASSEMBLIES

Backflow prevention assemblies shall be maintained, tested and repaired in accordance with the requirements set out in this Ordinance, the City's SOP Manual, the OAR and all applicable State agency's regulations. The assembly owner is responsible for protecting their assembly from freezing and vandalism.

In the event an assembly is not properly tested and repaired, the City of Brookings will have the assembly tested and repaired and apply all costs associated with this to the assembly owner's utility bill.

1:20 RESPONSIBILITIES OF BACKFLOW PREVENTION ASSEMBLY TESTERS

1) All backflow assembly testers operating within the City of Brookings Water System service area shall be certified in accordance with all applicable regulations of the OHA and must abide by the requirements of this Ordinance and the City's SOP Manual.

2) Persons certified as backflow assembly testers shall agree to abide by all requirements of the United States Occupational Safety and Health Administration ("OSHA") and Oregon Occupational Safety and Health Administration ("OR-OSHA").

3) It is the responsibility of backflow assembly testers to submit records of all backflow assembly test reports to the City of Brookings within 10 days of completing the test.

1:21 COSTS OF COMPLIANCE

All costs associated with purchase, installation, surveys, testing, replacement, maintenance, parts and repairs of the backflow prevention assembly, and all costs associated with enforcement of this document, are the financial responsibility of the property owner, occupant, or other person in control of the premises.

1:22 RECOVERY OF COSTS

Any water customer violating any of the provisions of this Ordinance and who causes damage to or impairs the City of Brookings Water System, including, but not limited to, allowing contamination, pollution, any other solution or used water to enter the City of Brookings Water System, shall be liable to the City of Brookings for any expense, loss or damage caused by such violation. The City of Brookings shall collect from the violator the cost incurred by the City of Brookings for any cleaning, purifying, repair or replacement work or any other expenses caused by the violation. Refusal to pay the assessed costs shall constitute a violation of this Ordinance and shall result in the termination of service. All cost associated with any disconnect or reconnect fees resulting from the enforcement of this Ordinance are the sole responsibility of the property owner.

1:23 TERMINATION OF SERVICE

Failure on the part of any owner, occupant or person in control of the premises to install a required assembly, have it tested a minimum of annually and repaired if necessary, and/or to discontinue the use of all cross connections and to physically separate cross connections in accordance with this Ordinance is sufficient cause for the discontinuance of public water service to the premises pursuant to Oregon Administrative Rule chapter 333-061-0070, or as amended. In the case of an extreme emergency or where an immediate threat to life or public health is found to exist, discontinuance or termination of public water service to the premises shall be immediate.

In lieu of termination of service, the City of Brookings may, at the property owner's expense, install a reduced pressure assembly at the meter. Testing, maintenance and repair of the assembly will be the responsibility of the property owner.

1:24 FALSIFYING INFORMATION

Any person who knowingly makes any false statement, representation, record, report or other document filed or required to be maintained pursuant to this Ordinance, or who falsifies, tampers with, or knowingly renders inaccurate any backflow assembly, device or method required under this Ordinance shall be subject to civil and/or criminal penalties provided by state law.

1:25 CONSTITUTIONALITY AND SAVING CLAUSE

Should any provision, section, sentence, clause or phrase of this Ordinance, or the application of same to any person or set of circumstances, are for any reason held to be unconstitutional, void, invalid, or for any reason unenforceable, the validity of the remaining portions of this Ordinance, or its application to other persons or circumstances, shall not be affected; thereby, it being the intent of the City of Brookings Water System in adopting and approving this Ordinance that no portion hereof or provision or regulation contained herein shall become inoperative or fail by reason of any unconstitutionality or invalidity of any other portion, provision, or regulation.

SECTION 3

PUBLIC EDUCATION AND OUTREACH
(See accompanying Public Education packet)

1. Newspapers and Periodicals

    A) An educational cross connection control article should be provided to water users annually. This article can be provided as a bill stuffer, in local newspapers or in utility newsletters, etc. All articles must be approved by the City's Cross Connection Specialist.

    B) Some public education topics that are helpful to cross connection control programs are:

    - The cross connection control enforcement document
    - Hazards of backflow
    - Types of protection from backflow
    - Federal Safe Drinking Water Act and State Regulations
    - Hazards of backflow contamination from fire systems
    - Hazards of backflow contamination from underground irrigation systems
    - Requirements of mobile water-using vehicles and equipment
    - Aspects of a cross connection control survey
    - The relationship between the most current plumbing code adopted by the City and cross connection control enforcement document
    - Violation and penalty procedures
    - Backflow and water conservation
    - Updates relative to the industry

    C) All articles and related publications should be kept on file in the cross connection control program records. Document when and how they were distributed.

2. Electronic Media

    A) If applicable, the articles and publications written for the print media should be the basis for local broadcasts.

    B) Place articles and publications on the water city's website.

3. Establish a cross connection library

    A) A library of all public community education cross connection information distributed by the city should be kept on file.

    B) A library of examples of public community education cross connection information

distributed by other systems, consultants and program Supervisors should be kept for reference.

C) A library of reference materials constituting of industry-related manuals, publications, and web links to helpful information should be maintained for staff and the public.

SECTION 4

SURVEYS

General Operating Procedures

1) Always have a City-issued photo ID visible.

2) When entry to premises is unduly restricted by customer, report to Supervisor immediately to consult on a course of action.

3) In the event of encountering threats or abusive language, leave the site. Report to Supervisor immediately to consult on the next course of action.

4) Consult the Supervisor on any issues of uncertainty, i.e., variance requests, regulation interpretation, plumbing code questions and legal questions.

5) Be a professional representative of the City at all times.

Performing Surveys

1) Performing surveys is the core of the cross connection control program. Two aspects of the survey process are very important to keep in mind at all times:

   A) The survey is only as valuable as the documentation which records and supports the physical walk-through survey. Survey report forms, notes, drawings, photos, phone conversations, and copies of correspondence are absolutely necessary to the survey program.

   B) The specialist is not required to make on-site decisions as to assembly application or requirements of protection. Quite often the protection required is obvious and unquestionable. However, some conditions may require the specialist to consult industry manuals, regulations, plumbing codes, other specialists or Supervisors before making a decision on what may be required.

2) Below is a step-by-step procedure to be used by all City specialists when performing surveys. Following these procedures will establish consistency within the program.

   A) Make contact

      i. Prioritize a group of customers based on degree of hazard, hydraulic conditions, elevations and location.

      ii. Contact the group as a whole by using mail-out literature or have a group meeting to introduce them to the program.

iii. Make an appointment with individual customers for surveys. Surveys are time-consuming, so allow adequate time.

iv. When making a survey appointment, ask:

- that someone knowledgeable with the facility's plumbing accompany the specialist
- to speak with the facility safety officer about conducting the survey
- about the size of the facility---number of buildings, number of floors
- to meet with an administrator after the survey to discuss the next course of action - i.e., assembly installation, testing of existing assemblies

B) Meet with the customer at the appointed time

i. Be prepared with the following:

- A copy of the City's enforcement document;
- A copy of the current and relevant Plumbing Code chapter on cross connections;
- Case histories of backflow incidents;
- Educational literature, brochures, newsletters;
- Survey report forms, notebook for drawings, flashlight, hard hat, coveralls, tape measure, pipe OD tape and all necessary safety equipment.
- Customer's account information: Water meter number, water meter size, and monthly base rate.

ii. Explain the background and purpose of the program and listen to the customer's concerns.

C) Preparation for a walk-through

i. Review all available maps, blueprints, as-builts or drawings of water lines, and plumbing.

ii. Prepare survey report by completing one of the survey forms in Appendix A: "Survey Report Short Form" or "Survey Report Long Form Industrial/Commercial Facility".

iii. Ask for records on existing assemblies. Use the form "Existing Backflow Assemblies" found on pages 73-74 of Appendix A. If no records are

available, complete pages 75-78 of Appendix A as assemblies are found during the walk-through.

D) Begin a walk-through outside

Start survey at the service connection. Verify water meter information. Look for fire lines, irrigation connections and branch lines prior to entering a building.

i. For residential surveys, refer to page 86 of Appendix B, "Occupant Water Use - Residential Chart".

ii. For more complex surveys, refer to the charts in Appendix B as checklists for water-using equipment and type of protection required. Ask the facility representative about auxiliary water supplies, fire protection, irrigation systems, ponds and fountains, and water-using equipment (boilers, film developers, aspirators, etc).

E) Continue the walk-through inside

i. Complete page 78 of Appendix A, "Point of Use Hazards Within this Building" for each building.

ii. Make drawings of the piping and equipment locations for the purpose of selecting assembly installation location, if required. Attach drawings to the report form.

iii. Complete page 88-89 of Appendix C, "Compliance Report Form". Use the assembly application charts in Appendix C for guidelines in determining the type of protection needed.

iv. Complete page 90 of Appendix C, "Survey Report Form Follow-Up Required". Make comments on any aspect of cross connection control and water-use practices that will help the owner maintain safe drinking water (e.g., altered air gaps, hoses).

v. Signature, date and employee number must be completed.

F) Summarize the findings with the facility owner or administrator

i. Meet with the facility representative before leaving the site or schedule a follow-up appointment.

ii. Discuss findings and potential assembly installations.

iii. Explain that a copy of the survey report, with the required assembly installation due dates and assembly test dates, including all supplemental information such as approved assembly list and installation standards, will be mailed to the facility within ten working days.

iv. Make sure the facility representative understands the next course of action.

Answer questions, leave a business card and thank them for their time. Re-emphasize the focus on protecting public health, limiting liability.

G) Follow-up

i. Prepare draft of official copies of the survey report (two copies minimum).

ii. This report must be reviewed by the Supervisor.

iii. Prepare a cover letter detailing the City's cross connection requirements for this facility (two copies). This letter (Appendix D) must have the specialist's signature and the signature of the Supervisor.

iv. Prepare copies of supplemental information as needed, i.e., thermal expansion letter (Appendix E), pressure loss section of the enforcement document, testing and maintenance requirements, local suppliers of assemblies, list of certified testers, approved assembly list and installation standards from the City Enforcement Document (two copies of each). Do not specify manufacturers or quote prices.

v. Track requirement due dates on desktop calendar, computer database, or by whatever means the Specialist has available for tracking.

vi. Mail facility owner's copies within ten working days of walk-through survey.

vii. Create a hard copy file by labeling a file folder with the block number, customer name, and date. Place a copy of all documents (including any inter-departmental memos related to the customer) in the file folder. Place folder in cross connection program file cabinet.

H) Past due date for complying with requirements

i. Periodically review the tracking system and computer calendar for test or installation due dates that have not been met.

ii. Review the customer's file. Check for the following:

- original due dates
- compliance requirements
- name of the Specialist

iii. The original Specialist should then consult with the Supervisor regarding the next course of action. The action options are the following:

- extend the due date (amount of time extension is to be determined by the specialist and the Supervisor)

- terminate water service and/or enforce penalties and fines as per the City's enforcement document

iv. Once a course of action is agreed upon, the specialist should generate a letter detailing compliance requirements.

v. Make copies (two minimum) of this letter. Mail one copy to customer, file one copy in the customer's hard copy file folder, and update this information into the customer's file in the tracking program.

vi. Enter any new compliance due dates in tracking system.

vii. Monitor the new due dates.

I) Compliance survey–when customer has notified the City that compliance requirements have been met.

i. When notification of compliance is received by anyone in the cross connection control department, that employee should check file for original specialist and then notify that specialist.

ii. Original specialist should make an appointment with customer for compliance survey.

iii. Specialist should review all customer files prior to compliance survey.

iv. Specialist should make a copy of original survey report form to take on compliance inspection and/or survey walk-through (leave a copy of the original report form in hard copy file).

J) On-site compliance survey walk-through

i. Be prepared at pre-arranged appointment with the following:

- copy of original survey report form
- compliance survey forms
- tools and safety equipment (hard hat, flashlight, mirror for assembly serial numbers, tape measure)
- assembly test equipment, if applicable
- test report form

i. Conduct the walk-through survey using the cross connection control report form (Appendix C) to verify all compliance issues have been met.

ii. Complete the compliance survey form.

iii. Meet with owner or representative to explain results of compliance survey.

iv. Explain next course of action to owner or representative. Action should be one of the following:

- All compliance issues have been met. Owner should receive copy of compliance survey report within five working days.

- Compliance issues have not been met. Explain what needs to be done, establish new due dates for compliance and mail copy of compliance survey report.

v. Make sure owner understands what must be done and when. Explain liability and compliance.

K) Compliance survey follow-up

i. Update customer's hard copy and tracking file with results of compliance survey.

ii. If second compliance survey is required, note due date in the tracking system. When due date arrives, repeat the survey walk-through procedure.

iii. If all compliance issues have been met, enter this information into a hard copy file and the tracking system.

iv. Mail or hand-deliver the owner's copy of completed compliance report within five working days of the compliance survey, sending a copy to the Plumbing Department.

v. Establish the next survey dates in files. Re-surveys will need to be scheduled at established intervals or events that could change usage.

Retrofitting

1) All facilities, even those built prior to the cross connection program being established, must be surveyed for cross connections or assemblies which are not commensurate with the degree of hazard. Follow the survey procedures listed in Section 4 of this Standard Operating Procedures Manual and all requirements in the City's enforcement document.

2) Health hazard cross connection protection retrofit

A) In the event that a Cross Connection Specialist determines that a health hazard cross connection exists, the specialist should take immediate action to provide protection.

i. The specialist should notify the facility owner or responsible person in charge that a health hazard exists and immediate action is required (see: City Cross Connection Control Enforcement Document for similar definitions of these terms: health hazard, non-health hazard).

ii. The specialist should determine the required action to eliminate the health

hazard, which may include any or all of the following:

- Physically removing or permanently disconnecting the actual or potential cross connection;
- Physically removing portions of the piping system;

- Turning water service off at the service connection. Note: Prior to discontinuing water service, the specialist should ascertain that there are no critical water needs.

i. The specialist should oversee the elimination of the health hazard cross connection.

ii. The specialist should notify the Supervisor regarding the action taken.

B) Retrofitting with Adequate Protection

i. Once the cross connection has been eliminated, the specialist should inform the owner of the acceptable permanent protection, i.e., air gap or approved RP assembly.

ii. The specialist should inform the owner that the water service will be re-instated when retrofit of protection is completed, tested and inspected (if applicable).

C) Report Form

i. The specialist should complete a cross connection control survey report form following the standard operating procedures for surveys.

ii. The specialist should complete all record keeping and follow-up as detailed in the Standard Operating Procedures.

Surveying Facilities that are Owned, Operated or Leased by the City

The City needs to establish consistent procedures for their cross connection control program. This includes identifying and prioritizing areas of responsibility, educating staff, conducting water-use surveys, identifying cross connections at each facility and eliminating or controlling cross connections.

1. Establish a Facilities List

A) Compile a complete list of all buildings and facilities which are owned by the City or where the City is responsible for operation and maintenance.

B) Create a survey priority list by placing each facility in one of three groups: high,non-health or no hazard. Use facility application charts as a guideline.

Example: Wastewater treatment plant = health hazard group
Office building with a sprinkler system = non-health hazard group
Office buildings less than 2 – 3 stories tall = no hazard group

C) Further refine list within each group by placing oldest buildings at top of priority list. If exact age of facility is unknown, the approximate dates will suffice.

D) Establish a cross connection file (computer and hard copy) for each facility.

2. Prioritize according to degree of hazard.

3. Set a survey schedule that is manageable and affordable to the City. This schedule must address health hazard facilities as quickly as possible, and immediately if the cross connection is an eminent threat such as a waste water treatment plant or a facility which deals with nuclear waste.

4. Follow the procedures set out in this section.

5. Follow procedures for new construction in this section, pages 28-29.

6. Make the schedule available to the general public, if requested.

New Water Customer Accounts

1. New Accounts--Non-Residential

A) At time of application for water service, the New Accounts Department should forward a copy of the application to the Supervisor.

B) The Supervisor should check cross connection files to determine current status of the non-residential service connection, checking for survey information, existing assemblies, and test records.

C) In the event that no cross connection records exist, the Supervisor should make provisions for conducting an on-site survey of premises (see Standard Operating Procedures for Survey.)

D) If cross connection records exist and are current, new customers should receive a copy of assembly records including location, type, size, testing history and next required annual test date; a copy of the cross connection newsletter; and if applicable, a thermal expansion notice (Appendix E) and no internal protection notice.

2. New Accounts--Residential (Existing Service Connection, New Owner)

A) At the time of an application for water service, new customers should receive cross connection control program information as part of the application packet. This

should include an educational article, cover letter, and residential cross connection survey report form (see Appendix F for examples).

B) If cross connection records exist and are current, new customers should receive a copy of assembly records including location, type, size, testing history and next required annual test date; a copy of the cross connection newsletter; and if applicable, a thermal expansion notice (Appendix E) and no internal protection notice.

Residential Customers

1. A cross connection mailer should be sent to residential customers at the time of program implementation. The mailer should include a letter explaining the City's cross connection control program and its purpose, an educational article on backflow and its causes and a survey form (see Appendix F for examples). The survey form will be filled out by the residential customer and returned to the City within a time frame determined by the cross connection control Supervisor. The survey will aid the cross connection control Supervisor in determining the hazard levels within the residential community and prioritizing inspections and/or surveys. The mailer should be returned within 30 days. If it is not returned a follow up should be sent with a stronger cover letter. If the City's enforcement document allows for enforcement for non-compliance in the event the survey is not returned the second letter should indicate this. A self-stamped return envelope or information about returning it with the bill payment should be included for compliance.

New Construction - Non-Residential - Plans Review

1. Initiating New Records

   A) The Supervisor should review construction drawings/blue prints for the required backflow protection.

   B) A cross connection record for a new construction service connection should be established.

   C) A cross connection survey should be performed by a certified specialist prior to establishing permanent water service to new construction sites.

2. Plans Review

   A) The Supervisor should make arrangements with the Building Department to review plans and permit applications once per week.

   B) When adequate backflow protection is not indicated on plans, the reviewer should indicate, in red, the required protection and do the following:

      i. Notify the Building Department of deficiencies.

      ii. Notify owner, contractor, architect, or responsible person of the backflow

protection required prior to release of permit.

C) It is extremely important to establish and maintain communication with the cross connection control department and the Building Department As each department grows and changes, the plans review process must be flexible enough to facilitate all departments.

3. Compliance

All cross connection control enforcement document requirements must be addressed, and scheduled to be met, prior to establishing permanent water service, including new backflow prevention assembly initial tests.

Surveying Wholesale Customers' Cross Connection Program

1. Every wholesale customer who has a contract for water services with the City shall have an active, ongoing cross connection control program.

2. The program must be in compliance with OHA cross connection control requirements.

3. The City reserves the right at all times to require a reduced pressure backflow assembly at the interconnect.

Inspecting Mobile Units

1. In order to operate within the City, the owner of the mobile units must abide by all other City requirements.

2. Inspection and/or Survey Requirement

A) All vehicles that use water from the city's water system must be inspected by the Supervisor prior to each use. An RP assembly must be required if the vehicle is not equipped with a permanent air gap.

3. The Supervisor should coordinate and communicate with the licensing department to establish the following:

A) Any mobile unit (water-using) owner/operator who applies for a business license use permit will be advised to contact the Utility Department to schedule a mobile unit cross connection inspection and/or survey.

4. Inspection and/or Survey Report

The mobile unit must have a copy of the mobile unit inspection and/or survey report in or on the vehicle at all times while operating within the boundaries of the city's water system. (See Mobile Unit Inspection Report, Appendix I.)

5. Testing

A) Test the assembly before each use if it is moved.

B) Test the assembly at least annually if it is part of a permanent installation**.**

Violation Report

1. Any city employee who observes, or is made aware of, a violation of the mobile unit section of the City's Enforcement Document, will submit a written report to the Supervisor.

   A) The written report should include the following:

      i. The name of the mobile unit, owner, operator or company name.

      ii. The location of the violation.

      iii. The date of the violation.

      iv. The business license number (if possible).

      v. A description or details of the violation.

      vi. The names of other witnesses to the violation.

2. Violation Review and Enforcement

   A) The Supervisor should review the written violation report and investigate further, if necessary.

   B) The Supervisor should take any and/or all of the actions listed in the City's enforcement document.

SECTION 5

ASSEMBLIES: INSTALLATION, TESTING and MAINTENANCE

Installation Requirements

1. Backflow prevention assemblies should be installed in accordance with the most recent plumbing code adopted by the City and the City's enforcement document. The assembly installer should obtain the required plumbing permits prior to installation, and should have the assembly inspected as required by the most current plumbing code adopted by the City. In the event there is a conflict between the Plumbing Code installation and the installation requirements set forth in the City's enforcement document and the issue is regarding internal plumbing, the Plumbing Code will supersede. If it is at the meter or service connection, the City's enforcement document will supersede.

2. No part of a reduced pressure principle backflow prevention assembly should be submerged in water, or installed in a location subject to flooding. If a double check valve assembly is installed in a vault, plugs should be maintained in the test ports at all times and adequate drainage should be provided.

3. In the event a premises isolation assembly is required, the assembly should be installed as close as possible to the point-of-delivery and before any branch in the line. On private property, the backflow prevention assembly should be located just inside the boundary of the City's right-of-way.

4. The assembly should be protected from traffic, vandalism, freezing and other severe weather conditions.

5. All backflow prevention assemblies should be of a type and model approved by the Supervisor.

6. All vertical installations shall be approved for that orientation.

7. The assembly should be readily accessible with adequate room for maintenance and testing.

8. If the backflow assembly is installed inside of a building, the assembly should be readily accessible for inspection and/or survey and testing.

9. If the backflow assembly for premises isolation is installed inside of a building, there should be no other cross connection or "tee" off the service line between the meter and the backflow assembly.

10. If an assembly is installed pursuant to the City's enforcement document and the location is five (5) feet or higher above the floor, it should be equipped with a rigidly and permanently installed scaffolding acceptable to the Supervisor. This installation should also meet all applicable requirements set out by the U.S. Occupational Safety and Health Administration and the State occupational safety and health laws.

11. The property owner should register all backflow assemblies with the Supervisor. Registration should consist of the type, make, model, size, serial number, and date of installation of the backflow prevention assembly as well as the initial test report and the name and plumbing license (or other approved licenses for installation) number of the installer.

12. Lines should be thoroughly flushed prior to installation. A strainer with blowout tapping may be required ahead of the assembly.

13. The property owner, lessee, or agent assumes all responsibility for leaks and damage caused by the backflow assembly. The owner should also see that any vault is kept reasonably free of silt and debris.

14. Any variation from the above requirements must be obtained in writing.

Backflow Assembly Installation Guidelines

1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (RP) AND REDUCED PRESSURE PRINCIPLE DETECTOR CHECK ASSEMBLY (RPDA)

   A) RP's should be utilized at premises where a substance being handled would be hazardous to the public health if it was introduced into the potable water system. An RP is normally used in locations where an air gap is impractical. An RP is effective against both backsiphonage and back pressure.

      i. All RP assemblies should be tested immediately upon installation, after repair, if moved, and periodically (industry standards require annual testing).

      ii. RPs should be sized to provide an adequate supply of water and pressure for the premises being served.

      iii. Premises where the water supply is critical and cannot be interrupted should be provided with two assemblies of the same type, installed in parallel. They should be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide for the maximum flow required.

      iv. Bypass lines are prohibited. Pipe fittings which could be used for connecting a bypass line should not be installed.

      v. Assemblies should be readily accessible for testing and maintenance and should be located in an area where water damage to buildings or furnishings will not occur from relief valve discharge. An engineered and approved air gap funnel assembly may be used to direct minor discharges away from the assembly; this air gap funnel assembly will not control flow under a continuous relief discharge situation. Drain lines will need to accommodate full relief valve discharge flow.

      vi. Enclosures should be designed for ready access and sized to allow for the minimum clearances established below. Daylight drain ports should be sized to accommodate full pressure discharge from the assembly.

vii. All assemblies larger than two (2) inches should have a minimum of twelve (12) inches on the back side, twenty-four (24) inches on the test cock side, and the relief valve opening should be at least twelve (12) inches plus nominal size of assembly above the floor or highest possible water level. Headroom of six (6) feet is required in vaults without a fully removable top. A minimum access opening of twenty-four (24) inches square is required on all vault lids. All assemblies two (2) inches and smaller should have at least a six (6) inch clearance on all sides.

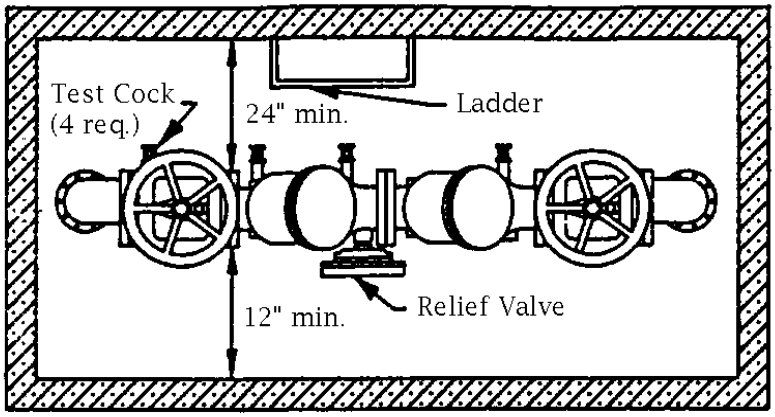
viii. All RP assemblies should be tested in accordance with the method acceptable to the City's Cross Connection Control enforcement document.

ix. An approved air gap should be located at the relief valve opening of the RP assembly. This air gap should be at least twice the inside diameter of the incoming supply line as measured vertically above the top rim of the drain and in no case less than one (1) inch.

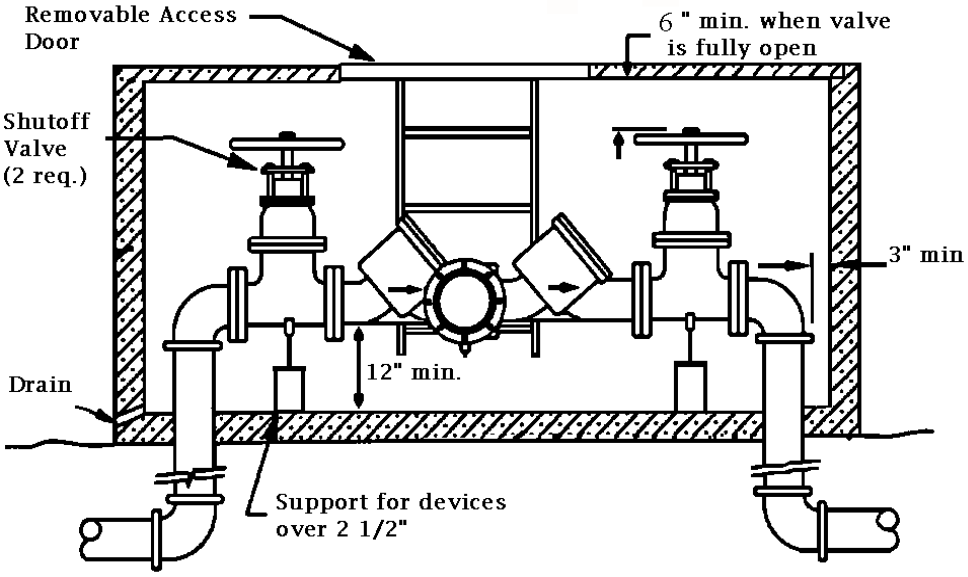
x. RP assemblies may be installed in a vault only if relief valve discharge can be drained to daylight through a boresighted type drain. The drain should be of adequate size to carry the full-rated flow of the assembly and should be screened on both ends.

xi. Variances from these specifications should be evaluated on a case-by-case basis. Any deviations should be prohibited without prior written approval of the Supervisor.

xii. Reduced pressure principle detector assemblies (RPDA) may be utilized in all installations requiring a double check valve assembly and detector metering. RPDA's should comply with the installation requirements applicable for reduced pressure principle detector assemblies (RPDAs). Both assemblies must be tested in accordance with the schedule set out in this manual.



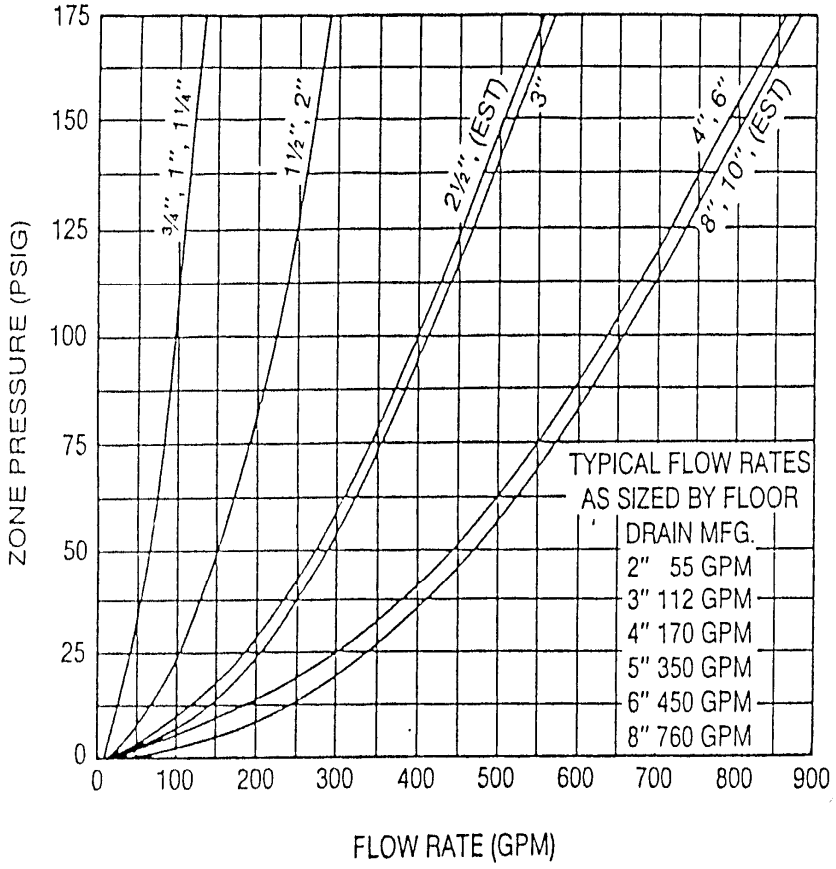
TOP **VIEW**



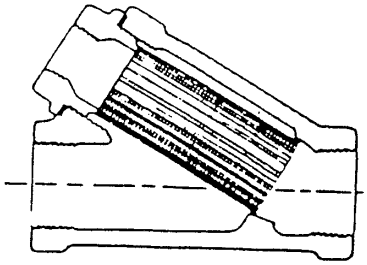
SIDE VIEW
Vault must have a drain boresighted to daylight

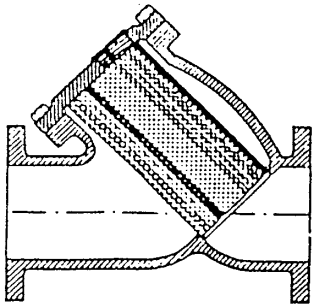
REDUCED PRESSURE PRINCIPLE LARGE ASSEMBLY

NOTES:
1) LARGE ASSEMBLIES ARE THOSE THAT ARE 2" AND LARGER.
2) ASSEMBLY SHALL NOT BE SUBJECT TO FLOODING.
3) DRAIN LINES SHALL BE SIZED TO ACCOMMODATE FULL RELIEF VALVE DISCHARGE FLOW.
4) REDUCED PRESSURE BACKFLOW ASSEMBLIES ARE TYPICALLY INSTALLED ABOVE GRADE IN WELL DRAINING AREAS, BUT MAY BE INSTALLED BELOW GRADE IF AN ADEQUATE DRAIN TO DAYLIGHT IS PROVIDED.
5) A STRAINER MAY BE REQUIRED TO BE INSTALLED ON THE SUPPLY LINE UPSTREAM OF THE ASSEMBLY.



RELIEF VALVE DISCHARGE RATES
FOR REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLIES

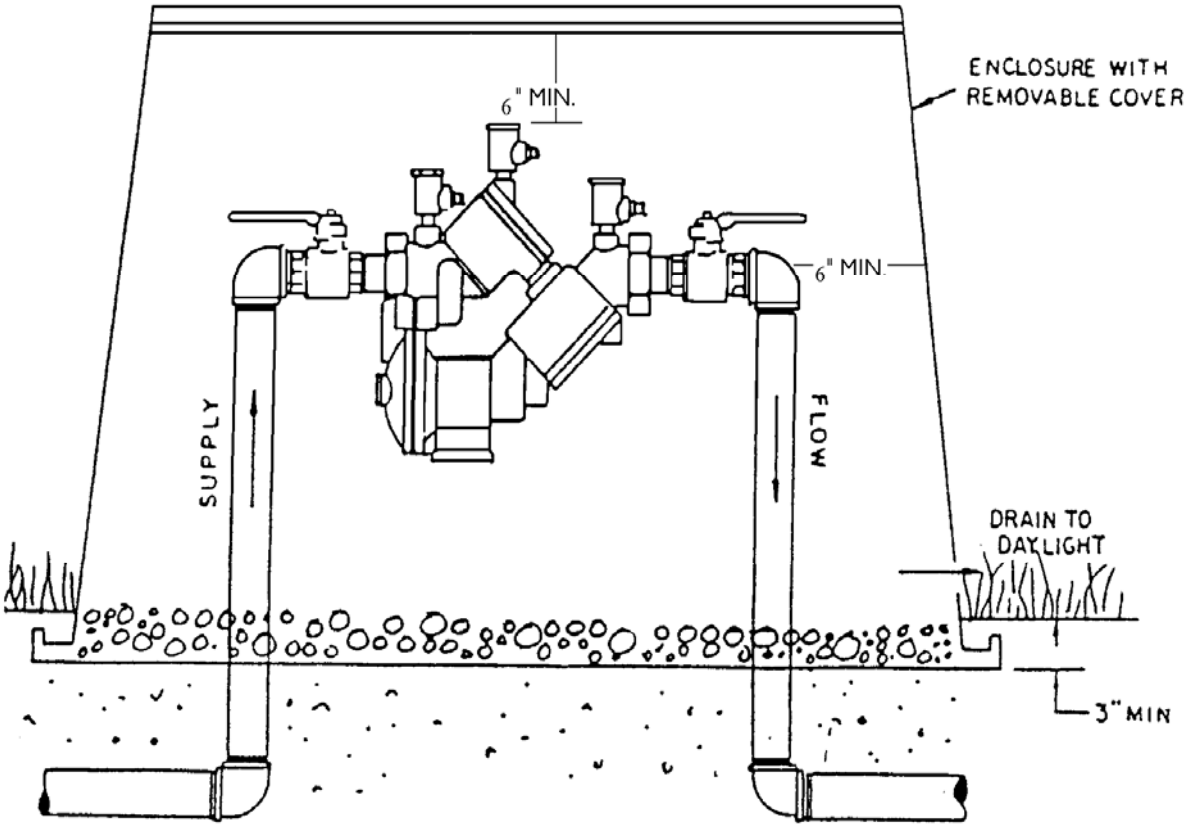




STRAINERS

One of the most common causes of backflow prevention assembly failure is the accumulation of sand, scale, or debris trapped in the assembly. This debris can cause the assembly to fail its required testing and can contribute to a shorter working life span of the assembly.

To minimize maintenance and repairs, it is recommended that a strainer, with removable screen, is installed immediately upstream on the supply line of the assembly. Remove and clean strainer screens periodically.



REDUCED PRESSURE PRINCIPLE SMALL ASSEMBLY

NOTES:

1) ASSEMBLY MUST BE PROTECTED FROM TRAFFIC, VANDALISM, AND FREEZING.
2) REMOVABLE INSULATED COVERS CAN BE USED.
3) ENCLOSURES MUST BE IN AREA NOT SUBJECT TO FLOODING.
4) THE COVER MUST BE FITTED WITH AN ADEQUATE SIZED DRAIN TO DAYLIGHT
5) IT IS RECOMMENDED TO INSTALL A STRAINER ON THE SUPPLY LINE, UPSTREAM OF THE ASSEMBLY

2. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY (DC)

A) Double check valve assemblies should be utilized at premises where a substance being handled would be objectionable, but not hazardous to health, if introduced into the potable water system.

i. DCs should be sized to provide an adequate supply of water and pressure for the premises being served.

ii. Premises where water supply is critical and cannot be interrupted should be provided with two assemblies of the same type, installed in parallel. They should be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide the maximum flow required.

iii. Bypass lines are prohibited. Pipe fittings which could be used for connecting a bypass line should not be installed.

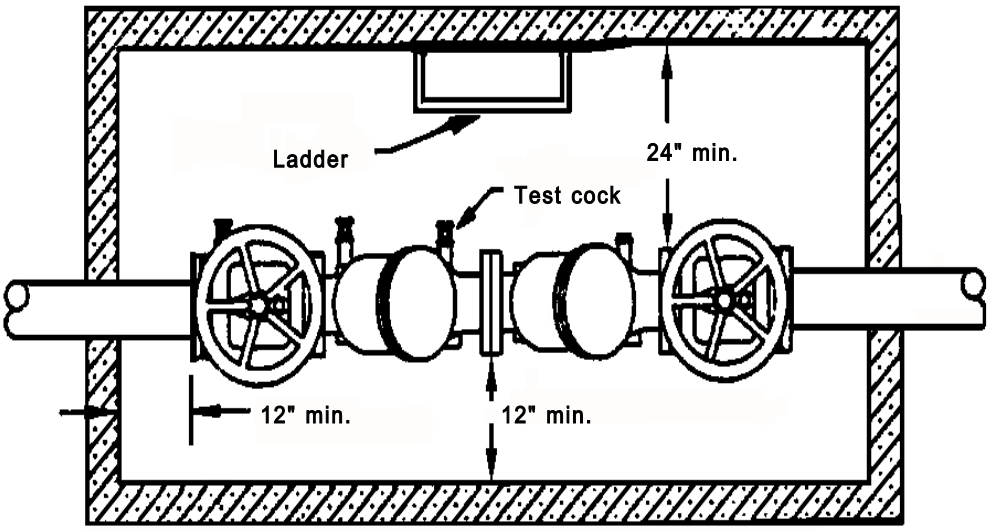
iv. Assemblies should be readily accessible with adequate room for testing and maintenance. DCs may be installed below grade, providing all test cocks are fitted with plugs. All vaults should be well drained, constructed of suitable materials and sized to allow for the minimum clearances established below.

v. Assemblies two (2) inches and smaller should have at least a three (3) inch clearance below and on both sides of the assembly, and, if located in a vault, the bottom of the assembly should be not more than twenty-four (24) inches below grade. All assemblies larger than two (2) inches should have a minimum clearance of twelve (12) inches on the back side, twenty-four (24) inches on the test cock side and twelve (12) inches below the assembly. Headroom of six (6) feet is required in vaults without a fully removable top. A minimum access opening of twenty-four (24) inches square is required on all vault lids.

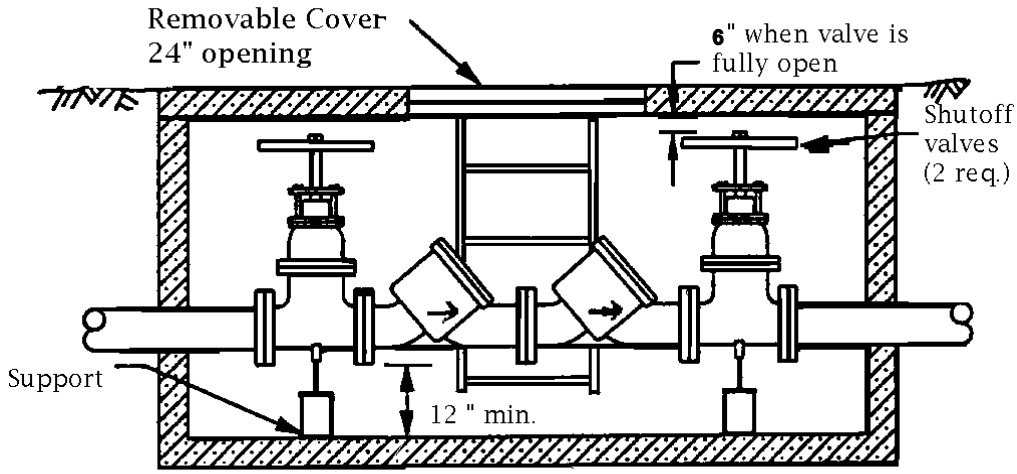
vi. Vertical installations are allowed if the assembly is approved for that orientation by an approving agency such as ASSE or USC.

vii. All DCs should be tested in accordance with the approved method in the City's Cross Connection Control Enforcement Document.

viii. Variances from these specifications should be evaluated on a case-by-case basis. No deviations should be permitted without prior written approval of the Supervisor.



TOP VIEW

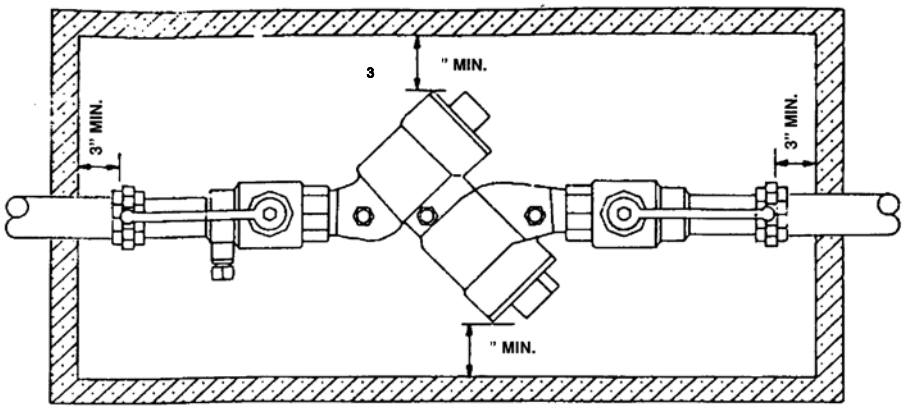


SIDE VIEW

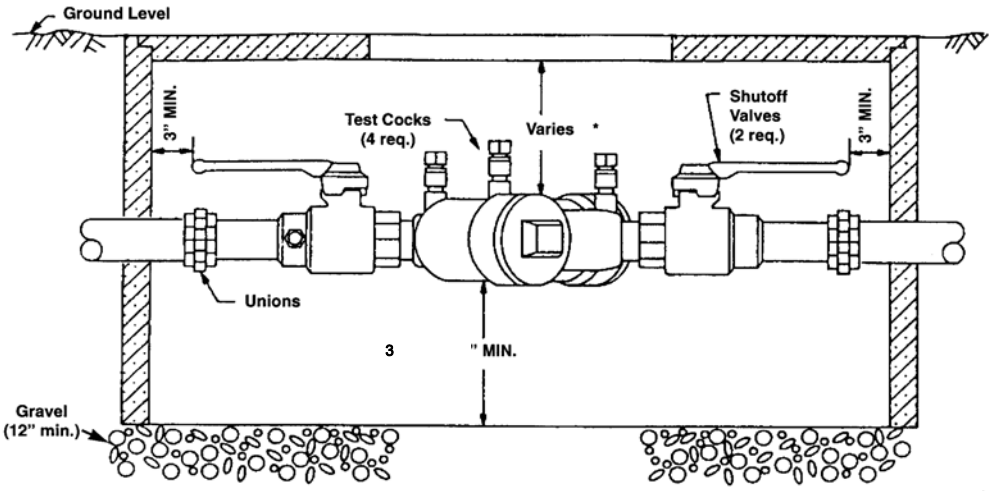
DOUBLE CHECK VALVE LARGE ASSEMBLY

NOTES:

1) LARGE ASSEMBLIES ARE THOSE THAT ARE 2" AND LARGER.
2) VAULT INSTALLATIONS REQUIRE THE USE OF PLUGS IN ALL TEST COCKS.
3) A STRAINER INSTALLED ON THE SUPPLY LINE UPSTREAM FROM THE ASSEMBLY IS RECOMMENDED.



TOP VIEW



SIDE VIEW

SMALL DOUBLE CHECK VALVE ASSEMBLY

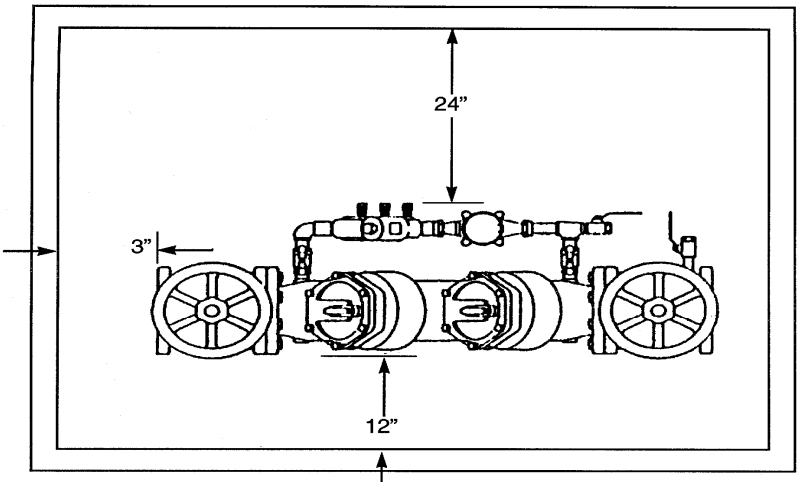
NOTES:

1) ADEQUATE SPACE MUST BE PROVIDED FOR TESTING AND MAINTENANCE.
2) AREA AROUND ASSEMBLY MUST DRAIN WELL.
3) VAULT INSTALLATIONS REQUIRE THE USE OF PLUGS IN ALL TEST COCKS.
4) 'Y' PATTERN ASSEMBLIES MUST BE INSTALLED SO THAT THE TEST COCKS ARE POINTED UP.
5) THOROUGHLY FLUSH THE LINES PRIOR TO INSTALLATION OF THE ASSEMBLY.
6) STRAINERS INSTALLED ON THE SUPPLY LINE AND UPSTREAM OF THE ASSEMBLY ARE RECOMMENDED.

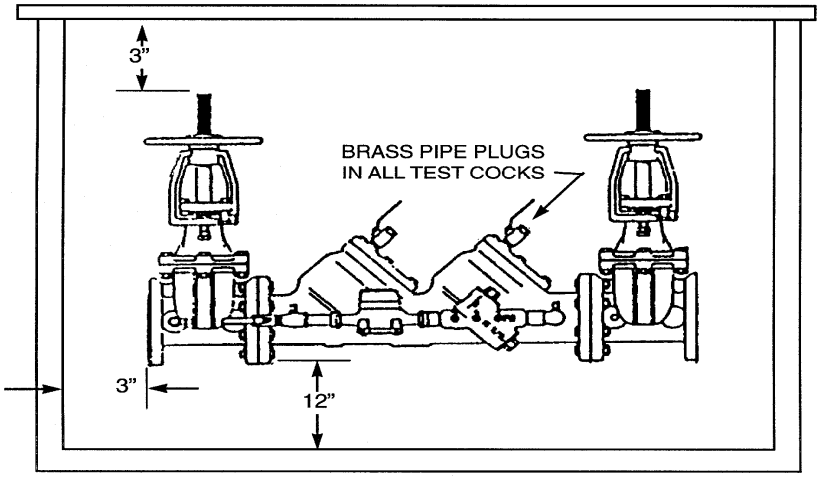
3. DOUBLE CHECK DETECTOR ASSEMBLY (DCDA)

A) "Double check detector assembly" or "DCDA" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness. It should also be provided with a factory-installed bypass feature of an approved double check assembly.

B) Double check detector assemblies may be utilized in all installations requiring a double check valve assembly and detector metering. DCDAs should comply with the installation requirements applicable for double check valve assemblies (DCs). Both assemblies must be tested.



TOP VIEW



SIDE VIEW

DOUBLE CHECK DETECTOR ASSEMBLY

NOTES:

1) ASSEMBLIES 2" AND SMALLER SHALL HAVE 3" CLEARANCE ABOVE AND ON SIDES.
2) VAULT INSTALLATIONS REQUIRE THE USE OF PLUGS IN ALL TEST COCKS.
3) A STRAINER INSTALLED ON THE SUPPLY LINE UPSTREAM OF THE ASSEMBLY IS RECOMMENDED.

4. PRESSURE VACUUM BREAKER ASSEMBLY (PVB) AND SPILL RESISTANT VACUUM BREAKER (SVB)

A) PVBs and SVBs may be utilized as in-premises protection fornon-health or health hazard. PVB's and SVB's protect against *backsiphonage only* and should not be installed where there is a potential for backpressure.

i. Assemblies should be installed a minimum of twelve (12) inches above the highest use outlet or overflow level downstream from the assembly.

ii. PVB's and SVB's should not be installed in an area subject to flooding or where damage would occur from water discharge.

iii. Assemblies should be readily accessible for testing and maintenance, with a minimum clearance of twelve (12) inches all around the assembly.

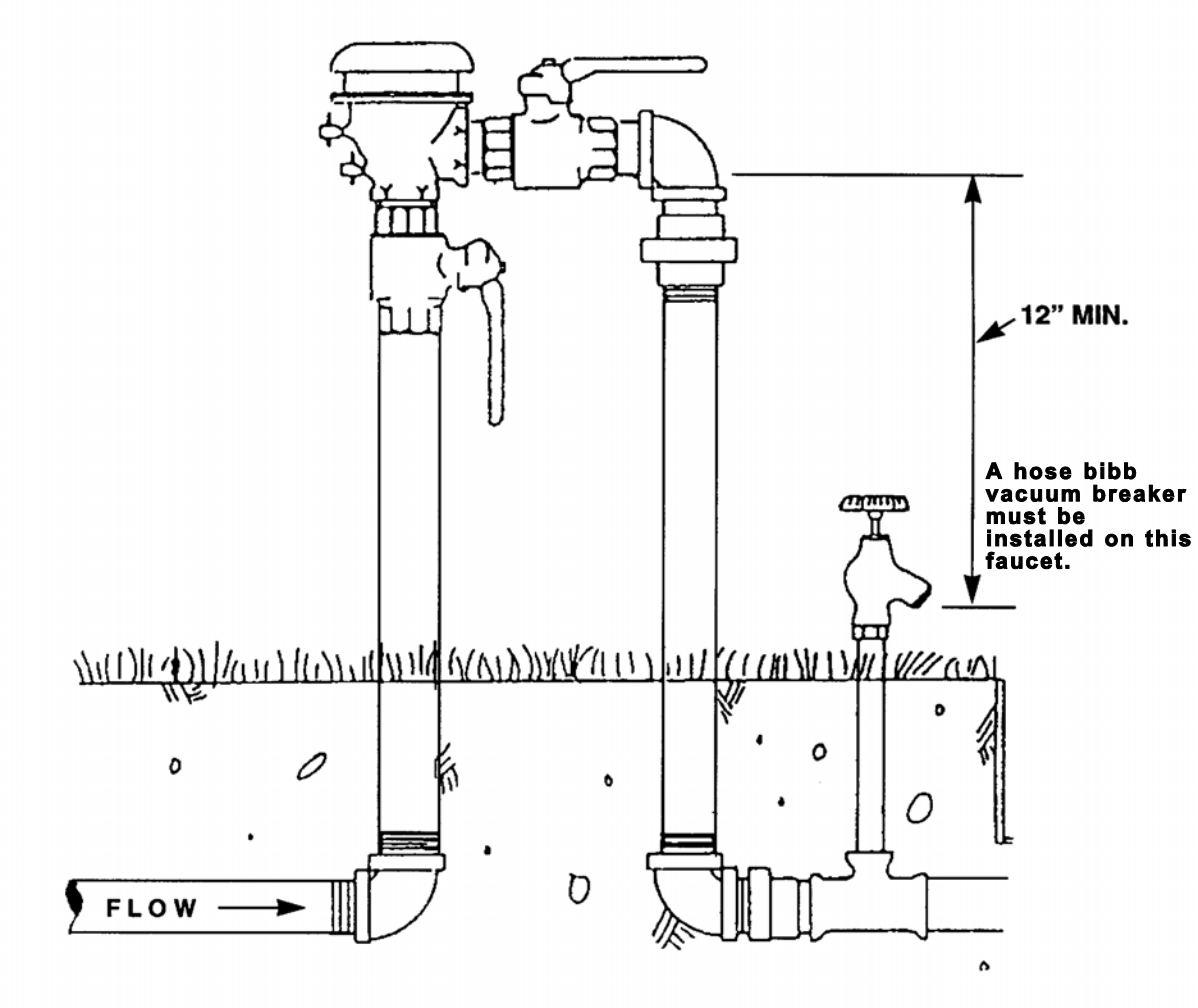
iv. PVB's and SVB's should be located between twelve (12) inches and sixty (60) inches above ground level.

v. A strainer with blowout tapping may be required to be installed upstream of the assembly.

vi. All PVB's and SVB's must be tested in compliance with the City's Cross Connection Control Enforcement Document.

vii. Variances from these specifications should be evaluated on a case-by-case basis. No deviations should be permitted without prior written approval of the Supervisor.

viii. Installation standards for SVB's are the same as PVB's.



PRESSURE VACUUM BREAKER OR SPILL-RESISTANT VACUUM BREAKER

NOTES:

1) DOWNSTREAM CONTROL VALVES OR SHUT-OFFS ARE ALLOWED.
2) INSTALL ASSEMBLY AT LEAST 12" ABOVE HIGHEST DOWNSTREAM PIPING.
3) NO PUMPS OR BACKPRESSURE SOURCES DOWNSTREAM ARE ALLOWED.
4) NO CHEMICAL ADDITION INTO A SYSTEM ALLOWED.

5. ATMOSPHERIC VACUUM BREAKER (AVB)

A) AVB's provide protection against non-health or health hazard applications. AVB's protect against *backsiphonage* only and are prohibited where there is potential for backpressure.

1. The device should be installed a minimum of six (6) inches above the highest use outlet or overflow level downstream from the device.

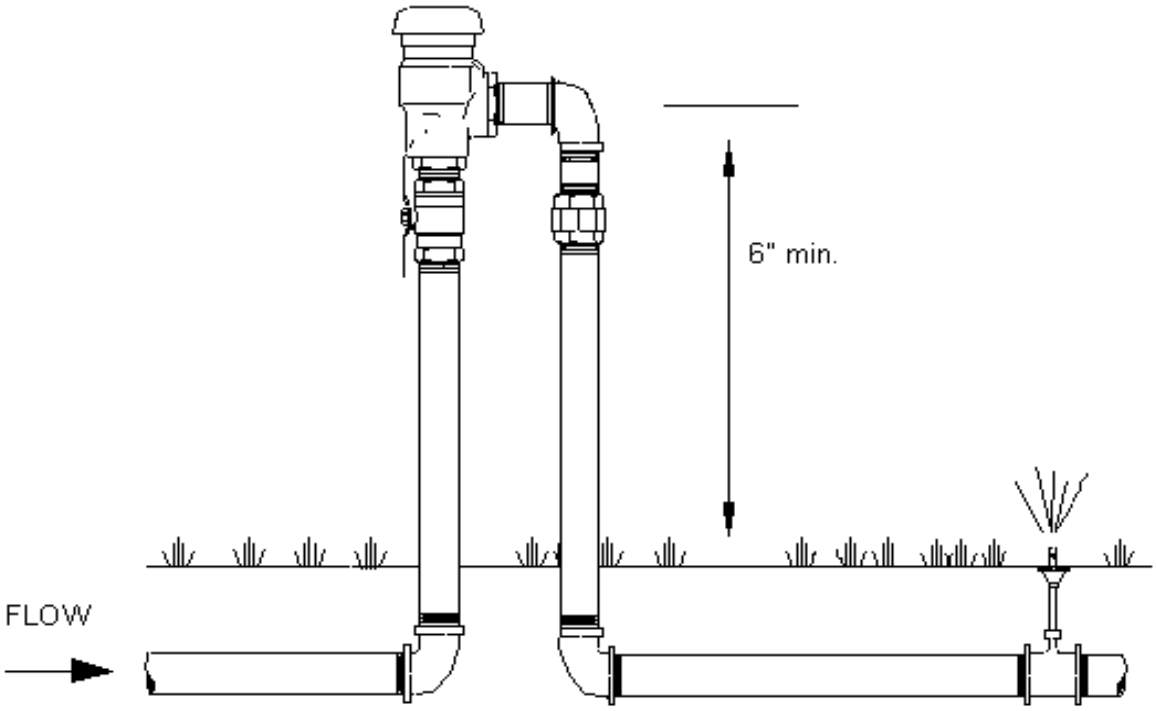
2. Shut-off valves downstream from the device are prohibited.

3. AVB's should be allowed only for those applications where there is less than twelve (12) hours per day continuous use.

4. AVB's should not be installed in an area subject to flooding or where damage may occur from water discharge.

5. AVB's should be allowed for point-of-use protection only in accordance with the most current Plumbing Code adopted by the City. AVB's, in some installations, may not be recognized as adequate protection by the Supervisor, so additional protection may be required.

6. If an AVB is used on an irrigation system, there should be one (1) AVB installed per zone.



ATMOSPHERIC VACUUM BREAKER

NOTES:

1) NO CONTROL VALVES OR SHUT-OFFS ALLOWED DOWNSTREAM.
2) INSTALL ASSEMBLY AT NO MORE THAN 60" ABOVE GROUND LEVEL.
3) INSTALL ASSEMBLY AT LEAST 6" ABOVE HIGHEST DOWNSTREAM USE PIPING.
4) NO PUMPS OR BACKPRESSURE SOURCE ALLOWED.
5) NO CHEMICAL ADDITION INTO SYSTEM ALLOWED.

6. AIR GAP SEPARATION

A) Air gap separations provide maximum protection from backflow hazards and may be utilized at premises where a substance being handled would be hazardous to health, if introduced into the potable water system.

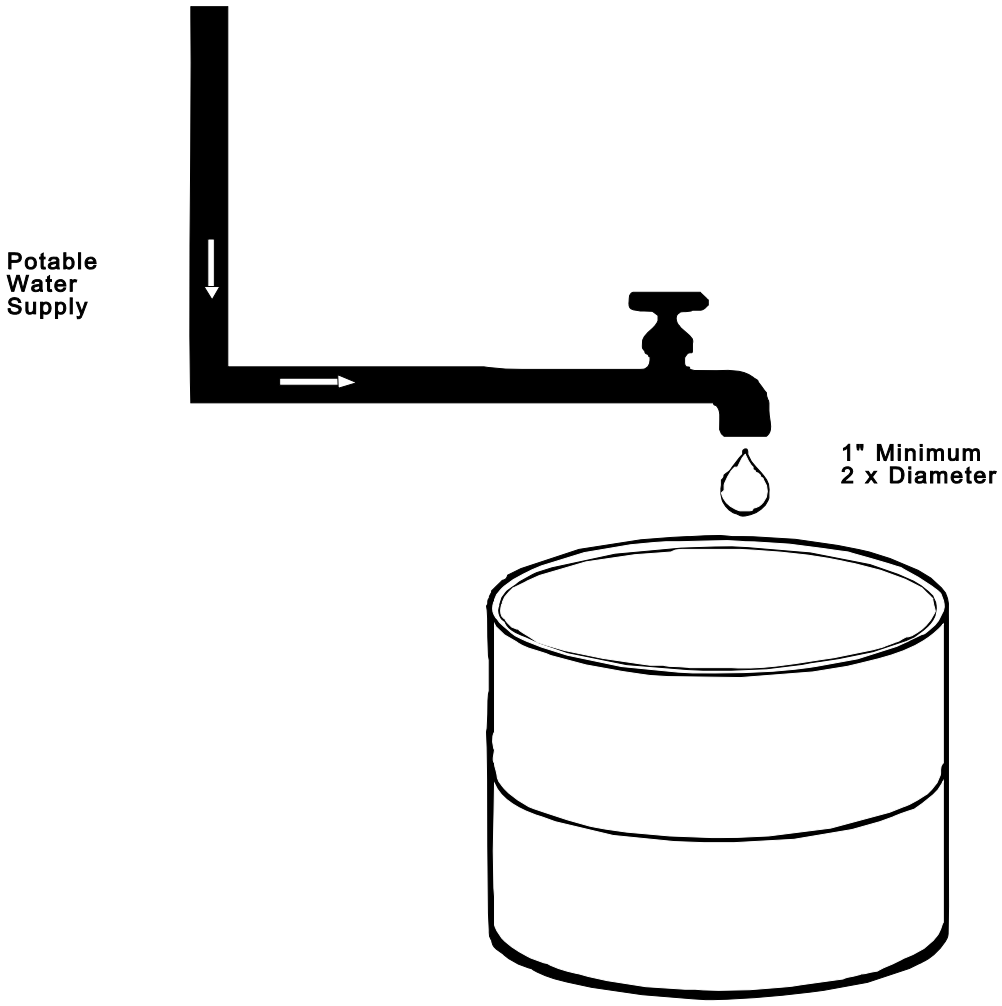
i. An air gap separation should be at least twice the diameter (three times the diameter against a wall and four times the diameter in a corner) of the supply pipeline measured vertically above the top rim of the receiving vessel — in no case less than one (1) inch. If splashing is a problem, tubular screens may be attached or the supply line may be cut at a 45° angle. The air gap distance is measured from the bottom of the angle. Hoses or pipe threading should not be allowed.

ii. Air gap separations should not be altered in any way and should be available for inspection and/or survey at all reasonable times.

iii. Side walls, ribs or similar obstructions do not affect air gaps when spaced from the inside edge of the spout opening a distance greater than three times the diameter of the effective opening for a single, or a distance greater than four times the effective opening for two intersecting walls.

iv. In cases where there are three or more side walls, ribs or similar obstructions extending from the water surface to or above the horizontal plane of the spout opening other than as specified in paragraph (3) above, the air gap should be measured from the top of the wall.

v. The effective opening should be the minimum cross-sectional area at the seat of the control valve or the supply pipe or tubing which feeds the assembly or outlet. If two or more lines supply one outlet, the effective opening should be the sum of the cross-sectional areas of the individual supply lines or the area of the single outlet, whichever is smaller.



AIR GAP SEPARATION

NOTES:

1) PROVIDES MAXIMUM PROTECTION.
2) THE VERTICAL, PHYSICAL SEPARATIONS MUST BE AT LEAST TWICE THE DIAMETER OF THE INLET PIPE BUT NEVER LESS THAN ONE INCH.

Backflow Prevention Assembly Testing

All backflow prevention assemblies shall be tested in accordance with the test procedures recognized by the Oregon Health Authority.

SECTION 6

BACKFLOW ASSEMBLY TESTER AND CROSS CONNECTION SPECIALIST RESPONSIBILITIES: CITY AND PRIVATE

Cross Connection Specialist Certification Requirements

1. In accordance with the City's cross connection control enforcement document, Specialist means an employee or contractor of the city who meets the requirements of the City's Standard Operating Procedures manual to carry out inspections and/or surveys for cross connections on behalf of the city. Any person certified and registered by the City as a Cross Connection Specialist/surveyor must meet the following criteria:

   A) Be approved by the Supervisor

   B) Be employed by or under contract with the City

   C) Hold a current Cross Connection Specialist Certificate issued by the Oregon Health Authority

   D) Agree to abide by all regulations of the United States Occupational Safety and Health Administration (OSHA)

2. In the event the property owner is required to contract with a specialist/surveyor to perform surveys on the downstream side of the service connection, all State, County and City requirements must be met.

Backflow Assembly Tester Certification Requirements

1. In accordance with the City's Cross Connection Control Enforcement Document, all Backflow Assembly Testers operating within the City's limits shall be certified in accordance with all applicable State regulations. Any person seeking to become a certified tester and/or to register with the City must meet the following criteria and any criteria in the addendum:

   A) Hold a current Backflow Assembly Tester certification from the Oregon Health Authority.

   B) Abide by all requirements of the United States Occupational Safety and Health Administration (OSHA).

   C) Obtain, or have access to, approved calibrated test gauge equipment.

   D) Submit a completed application form (pages 102-103 of Appendix G) to the person designated by the Supervisor.

E) Be licensed, insured and bonded, as required by the City's enforcement document and/or the State administrative authority.

Backflow Assembly Tester Registration Procedures

All certified backflow testers, planning to work within the City should be registered with the City and must appear on the OHA website's list of testers available for contract testing.

1. At the time of registration, testers must provide their certification number issued to them by the Oregon Health Authority and any other applicable information required by the State, the City's enforcement document and the Supervisor.

2. Pay appropriate fees; the City can establish an annual registration fee to assist in offsetting the administrative cost of the program.

3. All testers should be required to carry liability insurance. The minimum amount recommended is $500,000. The City can ask to be named on the policy as "additional insurers" or proof of insurance can be shown at the time of registration and annually thereafter.

4. All registrations and fees must be renewed on an annual basis.

5. Any tester who has been issued a number and leaves the program or fails to renew his/her certification will have his/her number classified as invalid and it will be removed from the database.

6. The Supervisor must review and verify for accuracy all information on the Certification Application for Backflow Assembly Testers (pages 102-103 of Appendix G) submitted by the tester.

Test Gauge Accuracy Verification

1. Gauges used in the testing of backflow prevention assemblies should be tested for accuracy verification at least annually in accordance with procedures recognized by the State's cross connection control administrative authority or agency having jurisdiction.

2. A copy of the gauge accuracy report form given to the tester by the person or company that performed the accuracy test should be provided to the City at the time of registration and the annual registration.

Backflow Prevention Assembly Test Report Forms

1. All certified Backflow Assembly Testers are required to submit completed backflow assembly test report forms (Appendix H) to the Supervisor within ten (10) days after the test is completed.

2. A test report form is to be generated for each initial testing, for periodic testing (industry standards require testing at least once a year), and for all tests performed after a repair is completed, an assembly is moved, or after a backflow incident.

3. The City should require testers to include their name, contact phone number, mailing address, company name (if applicable), test gauge serial numbers, state certification and system generated numbers (if applicable) on all backflow assembly test report forms.

Recertification for Backflow Assembly Testers and Specialists

The State requires testers to maintain certifications in accordance with OAR 333-061-0072.

Requirements for Annual Re-registration for Testers and Specialists, If Applicable

1. Submit documentation of current certification.

2. Provide statement of insurance coverage, bond, and appropriate licensing (See Addendum).

3. Have test gauge equipment checked for verification of accuracy and approved for use.

4. Review the City's enforcement document and current State regulations.

Certified Commercial Tester List

1. The City should maintain a list of certified testers who are available for hire to test assemblies (see page 106 of Appendix G).

   A) The list should include only those testers who have completed the Tester Certification Application, including proof of liability insurance, contractor's registration, bond, and annual gauge calibration.

   B) The list should be formatted in alphabetical order by a company or an individual's name.

   C) The City should not endorse any individual tester or company.

   D) The City should not quote or establish the cost of tester services.

   E) The list should not include in-house testers, i.e., testers testing only for their employer's facility, hospital or industrial complex.

The City should periodically update the list by mailing the "Cross Connection Control Annual Reregistration Application For Certified Backflow Assembly Tester" (found in Appendix G) to certified testers and making forms available at training courses.

2. Distribution of Commercial Tester List

   A) The list should be made available for customers to obtain at various departments including, but not limited to, Development and Planning, Water Service Customer Applications, Billing and Water Operations.

   B) The list should also be mailed or provided electronically (email or fax) to customers upon request.

3. Removal of Names from List

   The Supervisor may remove an individual tester or company name from the list, if a certified test performed by a tester is not in compliance with or violates any part of the City's enforcement document.

SECTION 7

BACKFLOW INCIDENT RESPONSE PROCEDURES

1. Notification

   A) When investigation reveals that a backflow incident has occurred, staff should immediately notify the Supervisor.

2. Containment

   A) The Utility Department should take immediate action, as deemed necessary, to contain contamination and protect public health.

   B) These actions may include discontinuing water service, physically removing sections of supply lines and/or water-using equipment, and flushing of mains and service lines.

3. Recording Incident

   A) The incident must be recorded by a Cross Connection Specialist of the Utility Department, or the Supervisor, by filling out a Backflow Incident Report Form (found on pages 110-11 of Appendix I).

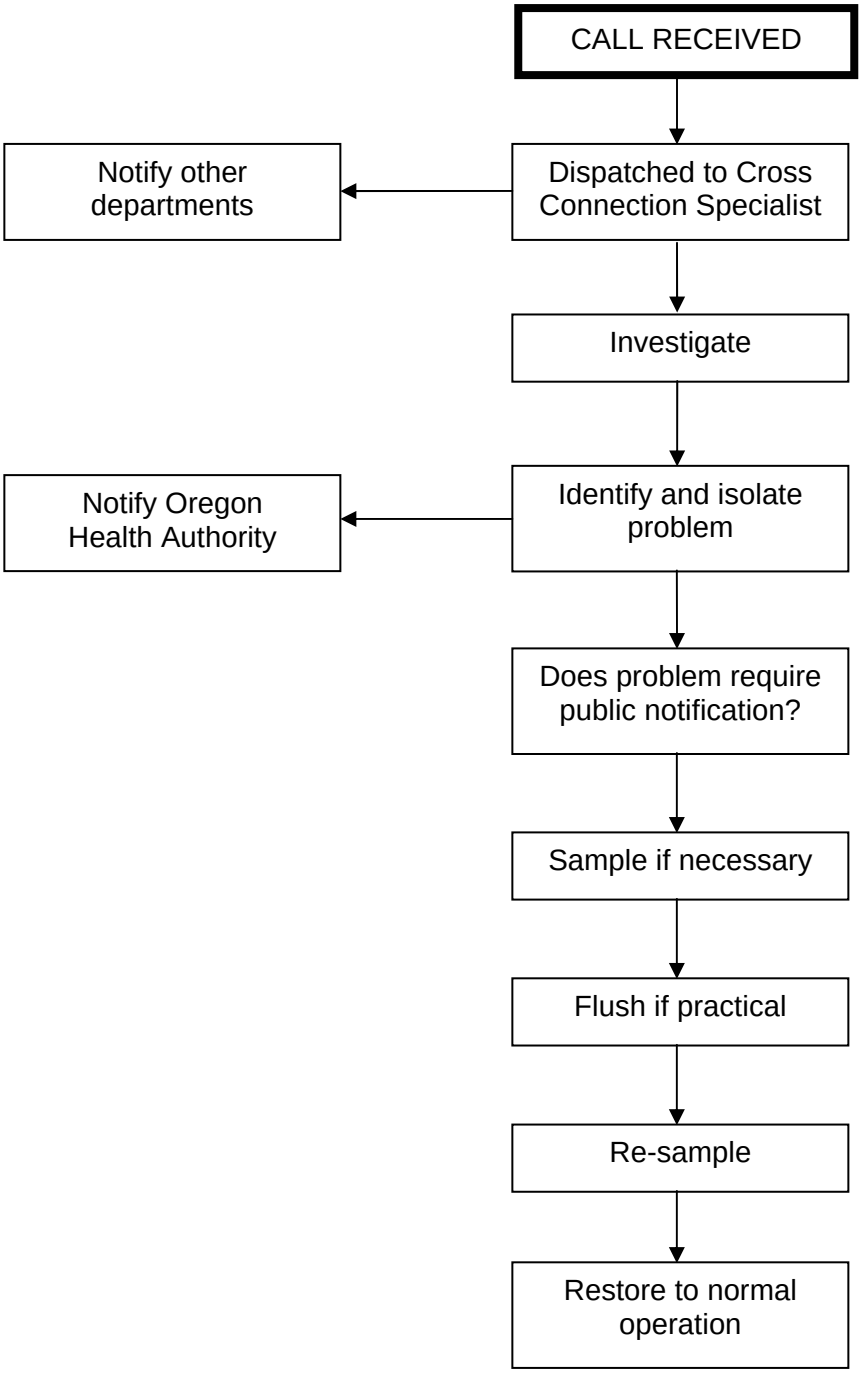
   B) A copy of the report form must be distributed to the Supervisor, the Plumbing Inspection Department, and any other department that may be impacted by the incident, such as the fire department, legal department, narcotics enforcement, and wastewater plant.

4. Media

   A) All media inquiries regarding backflow incidents should be directed to the Supervisor.

   B) If approached by the media, all specialists and other Utility Department personnel will simply state: “I cannot comment on the situation. The Supervisor will address your questions.”

Backflow Incident Response Flow Chart


CALL RECEIVED
Dispatched to Cross Connection Specialist
Notify other departments
Investigate
Identify and isolate problem
Notify Oregon Health Authority
Does problem require public notification?
Sample if necessary
Flush if practical
Re-sample
Restore to normal operation

SECTION 8

RECORD KEEPING

1. A good ongoing record keeping system for a cross connection control program is absolutely essential to sustain an active program. As the program evolves from start-up to implementation to ongoing maintenance, the specialists and testers will rely more and more on the established records. The initial record system must be flexible enough to accommodate change and growth, yet basic enough to remain "user friendly" to all personnel involved in the program. Record keeping can be divided into four general areas:

   A) The survey program

      Survey records must provide the necessary documents for specialists to record the results of physical site surveys and related documents that could include photographs, drawings, equipment specifications, and material safety data sheets (MSDS). The need to file these non-computer compatible items will require hard copy files in addition to computer tracking of survey results.

   B) The testing program

      Assembly test and maintenance records lend themselves to computer program record keeping and tracking. The computerized system with backup files will allow quick access for testers, customers and specialists. Using one standard assembly test report form will enable data entry to be consistent. The hard copy of all test report forms should be kept in the program archives files for at least five years or to comply with record retention rules.

   C) The customer notification and education program

      This area of record keeping must be maintained in order to track which public notices have been sent to which customers and when. Standard form letters to design professionals, must-assembly test due notices, notices to testers, phone records, and special correspondence can be generated and tracked.

   D) The reporting program

      Reporting may be required internally, with other departments, and with state officials to keep everyone informed about the program. Reports should be concise and easy to read. They can provide a clear overview of entire cross connection control programs.

   E) A good ongoing record keeping system is not only essential to sustaining the program, but can make all the difference in legal matters. Defensible records that are dated, signed, and recorded establish a paper trail that will accurately describe the order of events. Liability issues can usually be resolved through complete and accurate record keeping.

2. Record Keeping Requirements

   A) The City will maintain the following records for each commercial and industrial

customer:

i. Meter or account number.
ii. Owner name.
iii. Facility address.
iv. Date of initial cross connection survey.
v. Survey results (cross connections found - yes/no).

B) For each cross connection found at any location, the following should be recorded:

i. Location of cross connection
ii. Degree of hazard
iii. Exact location of backflow prevention assembly
iv. Type of assembly required
v. Make, model, size and serial number of assembly installed
vi. Date of installation
vii. Date of initial certification
viii. Tester certification number
ix. Date of most recent test
x. 1Repair date
xi. 1Repair personnel certification number
xii. 1Date of latest retest
xiii. 1Retest status (pass/fail)

C) Monthly reports should be generated showing the status of all facilities surveyed the previous month (including those needing assemblies installed, tested or repaired) and a listing of all facilities and assemblies due for survey and/or inspection the following month.

Computer Data Entry

1. Information should be put into the computer program, Cross-Track 5.2, as it is available. Accurate data input and efficient use of the program assists the City in having a well-documented, detailed cross connection program.

   A) Data Entry Staff

   Cross-Track 5.2 is designed to assist the staff in having the complete cross connection control program at their fingertips. It is not necessary for the person entering data to have a complete understanding of cross connections, but some basic knowledge will help. Data entry staff will be instructed by the Supervisor.

   B) Backing Up Data

   The entire computer program (all files) should be backed up after EVERY use. Either a DOS backup utility or a tape backup can be used, whichever the computer has. If using disk backup, a three-set disk rotation is best.

   i. Day one . . . . .set one

   ii. Day two . . . . .set two

   iii. Day three . . . .set three

   iv. Day four . . . . set one

SECTION 9

INTER-CITY RELATIONSHIPS

1. Communication

   A) The Building Department should communicate with Public Works regarding enforcement document status, testing program, inspection and/or survey procedures, and violations of the enforcement document and/or most current plumbing code adopted by the City.

   B) The Building Department should attend and participate in all cross connection control program training courses and seminars.

   C) The Building Department should coordinate with Public Works when scheduling meetings involving the cross connection control program.

2. Consistency

   A) The Building Department should provide Public Works with procedures to facilitate consistency between the two departments.

3. Co-Inspection and/or Surveys

   A) Whenever possible, new construction plumbing inspections and cross connection control surveys should be performed at the same time.

4. Backflow Incident Report

   A) In the event of a backflow incident, the Building Department and Public Works should work together.

   B) All information on a backflow incident should be made available to the Supervisor of Public Works and the Building Department.

5. Plumbing Permits

   A) All plumbing permits issued by the Building Department should be forwarded to the Supervisor for review.

6. Discontinuing Service

   A) Public Works should describe to the Building Department in advance the events that could lead to discontinuation of water service.

   B) In the event that service will be discontinued, Public Works must notify the plumbing inspector prior to discontinuing service, except in the case of an eminent threat to the public water supply.

   C) In the event that water service to a food establishment will be discontinued, the

Supervisor will notify the appropriate local health authority.

7. Some of the entities that will be affected by the City's Cross Connection Control Program are:

   A) Property owners or persons having responsibility:
      i. Commercial
      ii. Industrial
      iii. Residential

   B) Contractors, to include:
      i. Landscape companies
      ii. Engineering firms
      iii. Plumbing companies
      iv. Backflow assembly testing companies

   C) State and county regulatory agencies

   D) Fire officials

   E) Media

SECTION 10

JOB DESCRIPTIONS AND STAFF TRAINING

JOB TITLE: Cross Connection Control Program Supervisor

DEPARTMENT:

SUPERVISES: All cross connection control program staff

JOB SUMMARY: Supervises and has responsibility for all areas of the cross connection control program, ensuring the System's compliance with all federal and state regulations and system enabling authority (internal requirements).

QUALIFICATIONS:

1. High School education or equivalent and at least one year post high school education in the field of water distribution operation.
2. Valid State driver's license.
3. Acceptable writing and verbal communication skills in the English language.
4. Currently certified backflow assembly tester with certificate issued by the State's cross connection control administrative authority.
5. Current certificate of training for confined-space entry.
6. Current Cross Connection Control Specialist/Surveyor Certification, if applicable.

JOB DUTIES AND RESPONSIBILITIES:

1. Administer all aspects of the cross connection control program.
2. Perform all aspects of direct supervision and employee evaluations of cross connection staff.
3. Work with consultants and other departments to formulate and distribute public relations and community education information regarding the cross connection control program.
4. Communicate with all related departments regarding the status and activities of the cross connection control program.
5. Directly supervise all aspects for quality control of the backflow assembly tester program.
6. Coordinate, schedule, and participate in all continuing education training for cross connection control staff and certified testers.
7. Perform cross connection control inspections/surveys.
8. Perform all aspects of direct supervision of the cross connection control program computer record keeping system.
9. Evaluate and address in writing all cross connection control enforcement document variance requests.
10. Prepare periodic reports of program status and activity for in-house use.
11. Draft required records and reports for state and federal monitoring agencies.
12. Attend conferences, seminars, and/or training sessions pertaining to cross connection control and backflow assembly testing as required to maintain licenses and certifications.
13. Ensure, by direct supervision, that cross connection control program staff complies with all safety regulations and policies.
14. Participate in securing materials, equipment, tools, and products needed to operate the cross

connection control program.
15. Appoint or assume all responsibilities as media contact.

WORKING CONDITIONS: The working environment will vary from possible extreme outdoor weather conditions to a controlled indoor environment. Safe conditions must be met at all times as job duties may expose employees to hazardous conditions, confined-space entry and construction sites.

SKILLS: This position requires leadership and decision-making abilities. This employee must be able to react calmly, confidently and professionally in emergency situations. Verbal communications with customers must be conducted with an attitude toward customer service and courteous professionalism. If the Supervisor is designated as the media contact person, he/she must use a considerable amount of judgment when dealing with the media.

JOB TITLE: Cross Connection Specialist

DEPARTMENT:

REPORTS TO:

SUPERVISES:

JOB SUMMARY: Performs cross connection control surveys. Assists the Supervisor in all areas of program implementation and record keeping. Performs backflow prevention assembly testing, as required. Manages the day to day activities for that ensure cross connection hazards are eliminated or protected by backflow preventers and the required testing is performed according to regulations.

QUALIFICATIONS:
1. High School education or equivalent.
2. Valid State driver's license.
3. Acceptable writing and verbal communication skills in the English language.
4. Currently certified cross connection control specialist, with certificate issued by the State (if applicable) and/or all system requirements.
5. Currently certified backflow assembly tester, with certificate issued by the State (if applicable) and/or all system requirements.
6. Current certificate of training for confined-space entry.
7. Licensed plumber, if required by the State's regulations, system's enforcement document or by the Supervisor.

JOB DUTIES AND RESPONSIBILITIES:
1. Perform cross connection control surveys of all types of facilities.
2. Compile survey results information and determine hazards.
3. Perform record keeping duties in all areas of the cross connection control program, including written

and computer data entry.
4. Administer public education program.
5. Assist the Supervisor in preparing reports for internal, state and federal monitoring where applicable.
6. Perform backflow prevention assembly tests as stipulated by the Supervisor.
7. Attend continuing education seminars as required by the Supervisor.
8. Comply with all safety regulations and policies.
9. Perform any other duties or responsibilities as directed by the Supervisor.

WORKING CONDITIONS: The working environment will vary from possible extreme outdoor weather conditions to a controlled indoor environment. Safe conditions must be met at all times as job duties may expose an employee to hazardous conditions, confined-space entry and construction sites.

SKILLS: This position requires the ability to apply technical skills in the field, away from direct supervision. Verbal and written communication must be performed in a professional manner at all times. This position requires working directly with customers on issues of compliance.

Cross Connection Specialist Requirements

I. In accordance with the System's cross connection control enforcement document, Specialist means a person who is a certified cross connection control specialist recognized by the System and certified by the State, where applicable. Any person certified and registered by the System as a cross connection control specialist/surveyor must meet the following criteria:

A) Be approved by the Supervisor.

B) Be employed by or under contract with the System.

C) Attend and successfully complete a System recognized Cross Connection Control Specialist certification training course consisting of a minimum of 24 hours of instruction, or equivalent on-the-job work experience approved by the Supervisor.

D) The System reserves the right to require all specialists to be licensed plumbers.

E) Hold a current Cross Connection Control Specialist Certificate issued by the State, where applicable**.**

F) Agree to abide by all regulations of the United States Occupational Safety and Health Administration (OSHA).

G) In the event the property owner is required to contract with a specialist/surveyor to perform surveys on the downstream side of the service connection, all State, County and System requirements must be met.

Staff Training

1. Departments and personnel which should be notified a cross connection control program exists are the following.

   A) Administration

   B) Building inspectors

   C) City Council/Board

   D) City-owned facilities maintenance staff

   E) Development

   F) Fire

   G) Law enforcement divisions

   J) Billing

   K) Meter readers

   L) Operations service crews

   M) Hazardous Materials Division

2. Education Information Distribution

   A) Each department should receive basic cross connection training and/or information. Please refer to the public education packet.

   B) Each department should also receive information on its specific role in the cross connection control program (i.e. excerpts from enforcement document pertaining to the department.)

SECTION 11
PROGRAM MAINTENANCE

Seven Components of Maintaining an Effective Cross Connection Control Program

1. An ongoing program which identifies cross connections and requires the appropriate assembly to be properly installed, tested and maintained is essential to fulfill state requirements, protect the water purveyor from potential liability and to protect the quality of drinking water as it travels from the source, through the distribution system and to the consumer. Maintaining a cross connection control program can seem like an overwhelming task. However, there are some basic things which can make this task easier.

   A) Training and Recertification
   - What ongoing training is required or available?

   B) Maintaining an Enforcement Document.
   - Schedule an overview of the City's enforcement document annually to ensure it is in line with current State regulations.

   C) Ongoing Education for Staff and Customers.
   - What ongoing education is required or available?

   D) Record Keeping (See Section 8)
   - A good record keeping system for a cross connection control program is absolutely essential to establish and sustain an active program.

   E) Maintaining the City's survey program. (See Section 4)

   F) Maintaining the City's installation, testing and repair programs. (See Section 5)

   G) Ongoing enforcement. (See remainder of Section 11)

Reviewing and Amending Existing Cross Connection Control Enforcement Document

1. Annual Review
   A) The City's existing enforcement document should be reviewed at least annually by the Supervisor.

   B) The purpose of the review is to do the following:
      i. Determine if the federal, state, or local code changes have an effect on the Enforcement Document.

ii. Determine if the Standard Operating Procedures require Enforcement Document changes.

iii. Determine if changes in the industry standards require changes in the Enforcement Document.

iv. Determine if the City's governmental structure changes require changes in the Enforcement Document.

2. Recommended Changes

A) The Enforcement Document reviewers should make recommended changes, additions or omissions by submitting a draft Enforcement Document amendment to the Supervisor.

B) The Supervisor should obtain approval for Enforcement Document amendments through the proper chain of command, including the legal department.

3. Adoption of Changes

A) Upon review by all associates departments, the Enforcement Document amendment should go to the City Council for a vote on adoption.

B) Upon adoption by the City Council, the Supervisor should initiate a public education program to inform the public of Enforcement Document changes. (See Standard Operating Procedure on Public Education.)

Ongoing Education

1. The most desired recipient of educational efforts is the public or the water customers of the system. Keep the public informed of council or board meetings where the program will be discussed. Remember, a well informed public is more likely to be a supportive public.

2. Newspapers and Periodicals (See Appendix F for an example, or City's public education brochures)

A) An in-depth cross connection control article should be provided for publication annually. The article must be approved by the Supervisor.

B) The article should be published in as many local newspapers and periodicals as possible.

C) Some public education topics that would be helpful to the City's cross connection control program are:

i. The cross connection control enforcement document

ii. Hazards of backflow

iii. Types of protection from backflow

iv. Safe Drinking Water Act

v. Hazards of backflow contamination from fire systems

vi. Requirements of mobile water-using vehicles and equipment

vii. Aspects of a cross connection control survey

viii. Who the specialists are

ix. Relationship between the most current plumbing code adopted by the City and cross connection control ordinance

x. Violation and penalty procedures

xi. Backflow and water conservation

xii. Updates relative to the industry

xiii. Thermal expansion

xiv. Premises isolation does not provide internal protection to the premises

D) The City will create an annual Consumer Confidence Report (CCR) to be sent to all water customers covering the topics listed above.

E) All articles and related publications should be kept on file in the cross connection control program records with dates, how they were used, and who received them.

3. Electronic Media

A) If applicable, the articles and publications written for the print media should be the basis for local broadcasts, including websites.

4. Residential Customers

A) A cross connection mailer should be sent to residential customers at the time of program implementation and yearly thereafter.

5. All utility personnel should keep well educated on cross connections and related topics. If the department personnel clearly understand the program, then they are able to explain possibilities and probabilities and can provide examples of backflow incidents which have happened because of situations very similar to ones in their locale.

Maintaining the City's Survey Program

1. Residential Customers

A) The City should send an annual reminder to customers, reminding them that they signed a residential survey and what their responsibilities are to that survey.

2. Industrial Customers

B) If the City's responsibility stops at the meter, and if there is an RP, the City should send an annual letter to customers reminding them that although the City has protected its water supply, it remains the customer's responsibility to protect

themselves internally.

C) After the initial survey, if a double check assembly has been installed at the meter, if there is no protection at the meter, or if the City's responsibility is to the last free flowing tap, then annual surveys will need to be completed. This may be accomplished by reminding the customer by mail of their responsibilities to notify the City of any plumbing changes.

If changes have been made, the City should schedule a time to survey the customer's premises. If the survey program is the responsibility of the customer, they will be required to contact a certified specialist to schedule a survey.

Maintaining the City's Installation, Testing and Repair Programs

1. The City should continue with all installation, testing and repair procedures set forth in this manual (Sections 5 and 6).

2. If the City uses a computer program to track the installation, testing and repairs of backflow assemblies, the program must be kept current and all letters sent out in a timely manner.

3. The City should send an annual thermal expansion letter to all of the water customers.

Ongoing Enforcement

1. The following are some tips on how to keep the program going:
   A) Plan review
   B) New move-in packets
   C) Shift some responsibility to the property owner through public education
   D) Keep assembly testing program active
   E) Organize ongoing surveys by quadrants
   F) Ongoing training

Violations

1. What Constitutes a Violation?
   A) Failure to comply with the City's enforcement document shall be deemed a violation.

2. When Does a Violation Occur Regarding Surveys?
   A) A violation does not occur until the responsible party has exceeded the due date to comply as specified by the Cross Connection Specialist.

B) The normal cross connection survey process for non-residential and residential premises should be as follows:

i. The survey is conducted.

ii. The hazards are identified.

iii. Cross connection control protection is required in a written survey report.

iv. The responsible party is given a period of time in which to comply (due date). A violation occurs when the "must comply due date" is not met.

C) In the event of an extreme, health hazard condition that poses immediate life and/or health risk as determined by the specialist, an "immediate must comply due date" must be established and noted in the records that a violation has occurred.

3. Action Taken When Violation Occurs

A) A notice of a violation should be issued by the Supervisor.

B) A compliance order should also be issued.

C) When a violation has occurred on a construction site, the Supervisor may issue a "Stop Work Order".

D) When a violation has occurred, the Supervisor may invoke a "Right of Entry" to enter the premises

E) The Supervisor may enforce judicial remedies and penalties.

4. Communicating with the Plumbing Department

Any time a violation occurs, a copy of the violation notice, with all actions taken, should be forwarded to the Plumbing Inspection Department.

5. Record Keeping

A) All violation notices and relative correspondence should be copied into the customer's hard-copy file folder.

6. Inter-Department Notification

A) All affected departments within the City should be notified immediately.

SECTION 12

APPENDICES

Survey Report Short Form

CROSS CONNECTION CONTROL SURVEY REPORT FORM

☐ Business ☐ Residence

Owner/ business name		Site Contact	
Street address		Telephone	
Mailing address		Email	
City/State/Zip		Fax	

	Yes	No	Comments
If a business, does it require non-interrupted water service?			
Is backflow protection incorporated at the service connection?			
Is fire protection incorporated in this building?			
Is fire protection separate from the domestic service line?			
Are there any backflow prevention assemblies on any piping?			
Is there another source of water to the property other than the service connection to System water?			
Is there an underground sprinkler system?			

Type of business:

List the mechanical apparatus of the facility or property which determined the type of protection at the meter:

Type of backflow prevention required? ☐ RP ☐ DCVA ☐ None	
Comments:	
Survey by:	Date:

Survey Report Long Form

CROSS CONNECTION CONTROL SURVEY REPORT FORM

Industrial/Commercial Facility

Date: **Specialist:**

NAME OF FACILITY:	
ADDRESS:	
CONTACT:	TITLE:
EMAIL:	
TELEPHONE:	FAX:

Number of buildings on premises:		
Number of main service lines domestic/metered:		
Number of fire line connections to main:		
Is there existing backflow protection on main service lines?	☐ Yes	☐ No
Comments:		
Does this facility require uninterrupted service?	☐ Yes	☐ No
Comments:		

CROSS CONNECTION CONTROL SURVEY REPORT FORM

Existing Backflow Assemblies

Facility Name: **Date:**

1	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

2	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

3	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

4	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

5	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

CROSS CONNECTION CONTROL INSPECTION REPORT FORM

Existing Backflow Assemblies

Facility Name: **Date:**

6	Type/Make::	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

7	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

8	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

9	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

10	Type/Make:	Size:	Model:	Serial #:
Last Test Date:		Passed:	Failed:	Repaired:
Location of Assembly:				
Type of Protection (premises or point-of-use):				
Comments:				

CROSS CONNECTION CONTROL SURVEY REPORT FORM

Facility Name: **Date:**

Building #, Name or Area Description:

Does this building or area have:

AUXILIARY WATER SUPPLY
Protected:
Tested:
Comments:

FIRE PROTECTION SYSTEM
Type of System: ☐ Wet ☐ Dry ☐ Chemical Add.
Protected:
Tested:
Comments:

IRRIGATION SYSTEM ☐ Chemical/Fertilizer Add.
Protected:
Tested:
Comments:

ORNAMENTAL FOUNTAINS/DECORATIVE PONDS
Protected:
Tested:
Comments:

Facility Name: **Date:**

STEAM GENERATING SYSTEMS
Protected:
Tested:
Comments:

USED WATER SYSTEMS
Protected:
Tested:
Comments:

HEAT EXCHANGERS/SOLAR HEATING SYSTEMS
Protected:
Tested:
Comments:

BOILERS
Protected:
Tested:
Comments:

COOLING TOWERS
Protected:
Tested:
Comments:

Facility Name: **Date:**

AIR CONDITIONING SYSTEMS
Protected:
Tested:
Comments:

CHILLED WATER SYSTEMS
Protected:
Tested:
Comments:

CHEMICAL OR HAZARD WASTE STORAGE
Protected:
Tested:
Comments:

PROCESS MAKE-UP TANKS
Protected:
Tested:
Comments:

OTHER SYSTEMS/EQUIPMENT/HAZARDS

CROSS CONNECTION CONTROL SURVEY REPORT FORM

Point-of-Use Hazards (Actual or Potential) Within this Building

Building #, Name or Area Description:

	Comments:
Beverage dispenser CO2	
Coffee urns	
Computer cooling	
Detergent dispenser	
Dishwasher	
Drinking fountains	
Emergency shower	
Eye wash	
Garbage disposal	
Hose bibb/threaded faucet/ wall hydrant	
Hot tub/Jacuzzi	
Ice makers	
Janitor sinks	
Laundry equipment	
Photo processing	
Pressure washers	
Soap mixing equipment	
Swimming pool	
Wash basins	
Other	

ASSEMBLY APPLICATION CHARTS & GUIDELINES

As a starting point for assembly application, each Cross Connection Specialist must use knowledge, experience, and a complete overview of the individual cross connection hazard. The goal of using the following charts is to establish consistency of assembly application.

Chart 1: Premises Isolation. This chart lists specific facilities, buildings, or businesses that require backflow protection at or near the water service connection (meter). Health hazard and non-health hazard categories are established with minimum premises isolation protection for each.

Chart 2: Physical Plant Water Use. This chart lists the water-using equipment and plumbing systems required for most non-residential buildings, regardless of how the building is being used.

Chart 3: Occupant Water Use - General. This chart lists many of the plumbing systems and water-using equipment used by the occupants of non-residential buildings, regardless of how the building is being used

Chart 4: Occupant Water Use - Industrial. This chart is specific to industrial manufacturing and process facilities, and the occupant's water use and plumbing systems.

Chart 5: Occupant Water Use - Medical. This chart lists commonly-used equipment by occupants of facilities that provide human or animal health care and medical procedures.

Chart 6: Occupant Water Use - Residential. A list of water-using equipment, systems or attachments used within the home that may create a cross connection hazard.

Chart 7: Portable/Mobile Equipment. This chart shows non-stationary water equipment that can create a hazard. Usually with mobile equipment, the cross connection protection must be administered by the public water supplier or business license department.

These charts are not meant to be all-inclusive. The cross connection specialist can expect to encounter facilities and equipment not listed in these charts that will require protection.

Assembly Application Guidelines

ABBREVIATIONS

Legend of Abbreviations	
AG	Air Gap
RPBA	Reduced Pressure Backflow Assembly
RPDA	Reduced Pressure Detector Assembly
DCVA	Double Check Valve Assembly
DCDA	Double Check Detector Assembly
PVB	Pressure Vacuum Breaker Assembly
AVB	Atmospheric Vacuum Breaker

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

Chart 1: Premises Isolation

HEALTH HAZARD FACILITIES THAT REQUIRE PREMISES ISOLATION PROTECTION

Approved Air Gap or RPBA (RPDA) at Service Connection	
☐ Battery manufacturing/repair	☐ Meat rendering
☐ Beverage bottling	☐ Metal plating
☐ Boat marinas/dry docks	☐ Mortuaries
☐ Car washes	☐ Nursing homes
☐ Chemical manufacturing/storage	☐ Paper products
☐ Cold storage	☐ Petroleum process
☐ Commercial laundries	☐ Piers/docks
☐ Dialysis centers	☐ Plasma centers
☐ Dry cleaners	☐ Radioactive storage
☐ Film processing	☐ Sewage pump stations
☐ Hospitals/clinics	☐ Sewage treatment
☐ Ice manufacturing	☐ Veterinary clinics
☐ Laboratories	

NON-HEALTH HAZARD FACILITIES THAT REQUIRE PREMISES ISOLATION PROTECTION

Minimum DCVA (DCDA) at Service Connection*	
☐ Canneries	☐ Food processing
☐ Concrete/gravel processing	☐ Mobile home parks
☐ Dairies	☐ Parks/playgrounds
☐ Farms	☐ Shopping malls

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

Chart 2: Physical Plant Water Use — Commercial/Industrial/Multistory Buildings

EQUIPMENT AND PLUMBING FIXTURES, MINIMUM IN-PREMISES PROTECTION

Approved Air Gap	
☐ Floor drains ☐ Humidifier tanks ☐ Sumps/pumps	☐ Trap primers ☐ Wastewater lines

Approved Air Gap or RPBA (RPDA)	
☐ Air-conditioning systems ☐ Boiler feed lines ☐ Chemical feeder tanks ☐ Chilled-water systems ☐ Condensation tanks ☐ Cooling towers ☐ Emergency generators ☐ Fertilizer injection equipment ☐ Fire sprinkler systems (antifreeze)	☐ Heat exchangers ☐ Heat pumps ☐ Irrigation (chemical) ☐ Make-up tanks ☐ Solar heating ☐ Steam boilers ☐ Water heating (non-domestic) ☐ Water treatment

DCVA (DCDA)*	
☐ Air compressors ☐ Fire department connections ☐ Fire sprinkler systems	☐ Irrigation (non-chemical) ☐ Private hydrants ☐ Water-recirculating systems

AVB	
☐ Hose bibbs	

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

Chart 3: Occupant Water Use — Non-Residential/General

EQUIPMENT AND PLUMBING FIXTURES, MINIMUM IN-PREMISES PROTECTION

Approved Air Gap	
☐ Drinking fountains ☐ Ice makers	☐ Sewer-connected equipment ☐ Sewer-flushing equipment

Approved Air Gap or RPBA (RPDA)	
☐ Aquarium make-up water ☐ Beverage dispenser (CO_2) ☐ Computer cooling ☐ Decorative ponds	☐ Fountains, ornamental ☐ Laundry machines ☐ Steam-generating equipment ☐ Wet-vacuum systems

DCVA (DCDA)*	
☐ High-pressure wash ☐ Water-cooled equipment	☐ Water-settling equipment

AVB	
☐ Coffee urns ☐ Detergent dispensers ☐ Dishwashers ☐ Garbage can washers ☐ Garbage disposals ☐ Hoses: kitchen, garden ☐ Janitor sinks ☐ Kitchen equipment	☐ Lavatories ☐ Threaded faucets ☐ Toilets ☐ Urinals ☐ Wall hydrants ☐ Wash basins ☐ Water closets

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

Chart 4: Occupant Water Use — Industrial

EQUIPMENT AND PLUMBING FIXTURES, MINIMUM IN-PREMISES PROTECTION

Approved Air Gap or RPBA (RPDA)	
☐ Air washers	☐ Pump-seal water lines
☐ Degreasing equipment	☐ Radiator-flushing equipment
☐ Dye vats and tanks	☐ Solution tanks
☐ Etching tanks	☐ Steam/air spray
☐ Industrial-fluid systems	☐ Steam cleaners
☐ Perchlorethylene reclaim (dry cleaners)	☐ Stills
☐ Processing tanks	☐ Used-water systems

DCVA*	
☐ Dynamometers	☐ Pump prime lines
☐ Hydraulically-operated equipment	☐ Water/air sprays
☐ Intertied (looped) systems	

PVB or AVB	
☐ Soap mixing tanks	☐ Vats

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

Chart 5: Occupant Water Use — Medical/Dental/Veterinary/Healthcare/Mortuary

EQUIPMENT AND PLUMBING FIXTURES, MINIMUM IN-PREMISES PROTECTION

Approved Air Gap or RPBA	
☐ Autoclaves	☐ Laboratory equipment
☐ Autopsy tables	☐ Photostat equipment
☐ Bottle-washing equipment	☐ Pipette washers
☐ Demineralized-water systems	☐ Specimen tanks
☐ Dental cuspidors	☐ Sterilizers
☐ Dialysis equipment	☐ Ultrasonic baths
☐ Film processing equipment	☐ X-ray equipment

PVB or AVB	
☐ Aspirators (medical)	☐ Hydrotherapy baths
☐ Bedpan washers	☐ Shampoo basins
☐ Bidets	☐ Shower (hand-held nozzle)
☐ Fume hoods	

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

Chart 6: Occupant Water Use — Residential

EQUIPMENT AND PLUMBING FIXTURES, MINIMUM IN-PREMISES PROTECTION

Approved Air Gap or RPBA (RPDA)	
☐ Garden hose spray attachments ☐ Greenhouse ☐ Hot tubs ☐ Lawn sprinklers (chemical) ☐ Photo darkrooms	☐ Radiator flush kits ☐ Solar system (chemical) ☐ Swamp coolers ☐ Swimming pools ☐ Wading pools

DCVA*	
☐ Solar systems (no chemical)	

PVB or AVB	
☐ Drip irrigation ☐ Hose bibbs ☐ Lawn sprinklers	☐ Threaded faucets ☐ Water beds

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

Chart 7: Portable/Mobile Water-Using Equipment

MINIMUM PROTECTION

Approved Air Gap or RPBA	
☐ Fertilizer/pesticide applicator trucks ☐ Livestock water or feeder tanks ☐ Mobile carpet-cleaning trucks	☐ Portable toilet service trucks ☐ Recreational vehicle dump sites ☐ Water-hauling trucks

DCVA*	
☐ Fire hydrant use for construction sites	

Note: Overhead bulk-water dispensing stations must have an air gap between filling outlet and receiving tank.

Remember, when performing surveys, the most stringent regulations supersede.

Check with the Building Code Council for the current plumbing code and the regulations set by the State's cross connection control administrative authority.

*The DCVA may be required only if the Cross Connection Specialist has determined that the degree of hazard is low.

CROSS CONNECTION CONTROL COMPLIANCE REPORT FORM

Date: **Specialist:**

Name of Facility:
Building #, Name or Area Description:

REQUIRED BACKFLOW PROTECTION AS SPECIFIED BY SURVEY: [Date / /]		
	Approved	Comments

REQUIRED BACKFLOW ASSEMBLY TESTING - EXISTING ASSEMBLIES		
	Approved	Comments

REQUIRED BACKFLOW ASSEMBLY TESTING - NEW ASSEMBLIES		
	Approved	Comments

CROSS CONNECTION CONTROL COMPLIANCE REPORT FORM

NAME OF FACILITY:

COMMENTS:

All cross connection requirements have been complied with: ☐ Yes ☐ No

_____ _____

Specialist's Signature Specialist's Employee No.

☐ Compliance report was: ☐ mailed ☐ hand delivered Date:_____

cc: Plumbing Inspector

CROSS-CONNECTION CONTROL SURVEY REPORT FORM

Follow-Up Required

Date: **Specialist:**

NAME OF FACILITY:
CONTACT:

COMMENTS:

_____ _____

Specialist's signature Specialist's Employee No.

Information was: ☐ mailed ☐ hand-delivered

Date:_____

cc: Plumbing Inspector

Cover Letter

(This is a layout example of the letter to be sent to user after the survey)

City Water Department

11 Main Street
Timber, OR 97144

October 3, 1994

Mr. Jeff Stewart
Maintenance Foreman
City Hospital
300 N. First
Timber, OR 97144

Dear Jeff:

Thank you for assisting me with the recent survey which our water department conducted at your facility. Following are the city's requirements:

1. The most immediate concern is the main service connection. There is a reduced pressure principle assembly (RP) at the connection. However, this assembly is installed in a vault and the vault was filled with water. The vault needs to be pumped immediately and must be continuously pumped. There must not be any water in this vault. RP assemblies cannot be installed in a vault and, as we discussed in our meeting, this assembly must be installed correctly within 10 days of the date of this letter. (Installation requirements enclosed.)

2. In Building 1, basement mechanical room, there is a 4" RP assembly installed in the ceiling with no drain. You must install a fixed platform under the assembly for safety and accessibility. Also, you need to provide adequate drainage for the relief valve (instructions enclosed). These corrections must be made within 60 days of the date of this letter.

3. In Building 3, Laboratory F, the air gap between the relief valve and the drain on the RP to the autoclave has been altered. Please return this to an approved air gap within 10 days of the date of this letter.

4. In Building 3, hazardous waste processing area, the RP assembly must be tested, and repaired if necessary, by a state-certified tester. This must be done within 10 days of the date of this letter and every 6 months thereafter.

   In the same area, the eye wash is tapped downstream of the RP assembly. It must be tapped upstream. This must be done within 10 days of the date of this letter.

This line also serves bathrooms. All faucets must be labeled "NON-POTABLE WATER. DO NOT DRINK."

5. In the Dental Clinic, chair #5 needs to be isolated with an RP assembly within 10 days of the date of this letter.

6. In Building 2, cafeteria, the hard-plumbed pressure cooker needs to have a double check valve on the water inlet side. On the outlet side the approved air gap must be maintained. This must be done within 60 days of the date of this letter.

7. In Building 2, mechanical room, the RP assembly installed over the electrical box needs to be moved 6 feet downstream and adequate drainage needs to be provided. This must be done within 10 days of the date of this letter.

8. The double check valve on the irrigation system needs to be replaced with an RP assembly. This needs to be done before the irrigation system is turned on next spring.

In conclusion, I would like to remind you and your staff of the importance of not altering approved air gaps. I have enclosed the state definition of an approved air gap. It is also extremely important to educate your staff about the significance of keeping the ends of hoses out of any type of vessel or floor drain, etc.

Thank you for your willingness to work with us in protecting our drinking water. I look forward to our next meeting. If you have any questions, please do not hesitate to call.

Sincerely,

M. Howell
enc.

cc: Plumbing Inspector
Hospital Chief Engineer
Chief City Cross Connection Inspector

February 11, 2008

«CustomerName»
«MAddress1»
«MAddress2»
«MCity», «MState» «MZip»

«AttnLine»
RE: Assembly(s) at «SAddress1»

SUBJECT: No Internal Protection Reminder

Dear Water Customer:

Our records indicate that your facility or premise has a backflow prevention assembly installed on the main service line to the facility. This assembly protects the public drinking water supply from the potential of a reversal in the normal direction of water flow, referred to as "backflow". Backflow can result in the contamination of your drinking water if unprotected plumbing hazards exist.

This letter is a reminder that an assembly installed at the water meter (called "premise isolation") is for the protection of the public drinking water supply. It does not provide protection against any internal plumbing hazards that may exist within your facility or premise.

Protection against internal hazards is afforded through proper application of the plumbing code. We encourage you, as your water supplier, to notify us in the event that you plan on making changes to your plumbing system, so we can assist you in determining if plumbing permits will be required and how to obtain permits.

Thank you for taking part in protecting your community's drinking water supply. Please contact us if you have any questions or concerns.

Sincerely,

«DistrictContact»
«ContactTitle»
«ContactPhone»

February 11, 2008

«CustomerName»
«MAddress1»
«MAddress2»
«MCity», «MState» «MZip»

«AttnLine»

SUBJECT: Thermal Expansion Information

Our records indicate you have, or will be installing, a backflow prevention assembly on your water service supply line. This backflow prevention assembly prevents used water or other solutions within your property from entering the distribution system of your drinking water supply and was required for compliance with state and local rules.

It is necessary to inform you of a potential hazard that exists in relation to this backflow prevention assembly and your water heater. Water heaters must be installed with a temperature and pressure (T/P) relief valve, which is designed to vent water to the atmosphere in the event of over-pressurization of the contained water, when created by an excessive rise in temperature. This condition called "thermal expansion" is simply explained as an increase in volume due to a rise in temperature. This increase in volume, if not adequately released by the T/P valve, can force hot water backwards (a condition known as "backflow") through the cold water inlet pipe of the water heater, and back into the water distribution system.

Once a backflow prevention assembly is installed on your water supply line, hot water will no longer be able to backflow (which is our goal) past the backflow prevention assembly and into the distribution system. As the property owner, there are some things to consider for your protection from thermal expansion problems:

1. Do you have a properly installed and functioning T/P valve and thermal expansion tank or other device designed for intermittent operation for thermal expansion control, as required by current plumbing code?
2. If you do not, contact a licensed plumber.
3. If you are not sure, contact a licensed plumber.

Remember, the backflow prevention assembly provides a very important function and so does the T/P valve and thermal expansion tank or device. Please make sure you and your property are properly protected against thermal expansion.

Sincerely,

«DistrictContact»
«ContactTitle»
«ContactPhone»

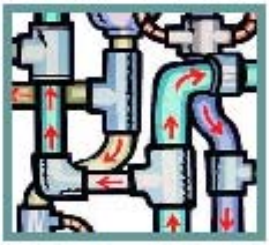
DOES WATER EVER FLOW BACKWARDS?

A public education article for water customers of the City of Brookings

By
Backflow Management Inc.

It is a logical assumption that because water is always under pressure, it can only flow in one direction. However, the reality is that water will always flow toward the point of *lowest pressure*. So, yes, water can flow opposite its intended direction, often with disastrous results.

For example, if a fire occurred and the fire department opened several hydrants, the pressure in the water mains could drop dramatically, causing a reversal of flow. This reversal, called backflow, increases the chance that contaminants could be introduced into the water system. Backflow is a serious concern for the City's Public Works Department, whose job it is to keep your drinking water safe.



More examples of potentially hazardous conditions that can cause backflow:

- A garden hose submerged in a hot tub or swimming pool, or attached to an insecticide sprayer, could siphon the material from that vessel back into water mains.
- If plumbing that carries potable water is connected to piping that is carrying another fluid or gas (like an air conditioner's algae-killing chemicals), the fluid or gas could be drawn back into water mains. A high school in Redmond, Oregon had ethylene glycol antifreeze from an air conditioner backflow into the water piping, sending eight teachers to the hospital.
- Several incidents have occurred where a car wash cross-connected their plumbing and pumped dirty, soapy water through several city blocks.
- In a town in Arkansas, a worker hooked up a hose to a nearly empty propane tank to flush out the tank. The residual pressure of the propane was greater than the water pressure, causing several homes to explode.

DID YOU KNOW?
The average Brookings citizen uses about 125 gallons of water per day; public schools and parks use about 60,000 gallons per day. To meet the City's demand for safe, potable water, the City treats over 450 million gallons of water each year, transmitting it through over 26.5 miles of pipe.

Backflow incidents like these are regularly documented throughout the United States, but even more incidents go unreported. That is why state regulations require water systems to implement Cross Connection Control Programs (CCCPs). These programs utilize inspections to identify actual or potential cross connections, eliminate those cross connections where possible, and in the cases where cross connections cannot be avoided, require the installation of backflow prevention devices or assemblies to protect the potable water system.

Some cross connections cannot be eliminated. The water line connected to a fire sprinkler system falls into this category. The black iron pipe used is not approved for potable water. This pipe sometimes contains built-in corrosion inhibitors and can leach out metals when the water inside them sits stagnant for long periods. In tests performed on the water drawn from the fire lines of several locations in Oregon, Washington and Utah, concentrations of iron, lead, cadmium and other heavy metals were found. Bacterial re-growth will also occur in this stagnant water.

Another unavoidable cross connection is a solar heating system. These systems usually use some type of liquid as a transfer medium in the solar collectors. Once this liquid is heated by the sun, it flows through pipes surrounded by potable water and transfers the heat. There are a variety of liquids that may be used for the transfer medium, some of which are toxic. If a leak in the piping should occur, the potable water would become contaminated.

Although fire sprinkler systems, solar heating systems and other types of equipment can cause cross connections, they don't have to jeopardize the safety of your drinking water. Thanks to CCCPs, potential problems can be identified, controlled and/or eliminated. Your water supplier's goal is to consistently provide access to clean, safe water, but this goal cannot be achieved without the cooperation of customers like you. Please do your part by following the recommendations of your water supplier and complying with any notices you may receive. The life you save may be your own.

City of Brookings
www.brookings.or.us

898 Elk Dr.
Brookings, OR 97415

(541) 469-2163

DO YOU KNOW ...

1. Under certain hydraulic conditions, substances can reverse their normal direction of flow and *"backflow"* into the drinking water?

2. Water always flows to the point of greatest demand. You see this every day when you open a faucet and the water flows out.

3. The state requires all public water suppliers to institute a "cross connection" control program to protect against backflow occurring?

4. If there is an actual or potential cross connection, there are mechanical devices called "assemblies" which must be installed to protect the water user from substances that could backflow into the drinking water supply?

5. These backflow prevention assemblies come in different types and models to be installed in accordance with the degree of hazard?

6. These assemblies must be tested at least annually by a certified tester and should be protected against freezing, flooding and vandalism?

7. Some substances which can backflow can cause illness, disease and, in some cases, death?

8. Actual backflow incidents have been recorded throughout the United States?

9. There are cross connections which can easily be created within a home?

10. The most effective cross connection program begins with informed consumers?

February 11, 2008

«CustomerName»
«MAddress1»
«MAddress2»
«MCity», «MState» «MZip»

«AttnLine»

SUBJECT: Residential Questionnaire Request

The «ServiceDistrict» takes pride in providing safe drinking water to our customers. Although the water that reaches your home or business meets all State and Federal drinking water standards and is safe to drink, contamination can occur within your own piping system. This potential hazard is known as an unprotected "cross connection", which can cause backflow to occur.

The «Regulation» has established rules and requirements to enable the «ServiceDistrict» to protect our water system. Our goal is to identify potential cross connection hazards and take appropriate actions to protect against the possibility of backflow to occur. We need your help, because as a water user, you are the most familiar with how our water is being used within your property.

Water suppliers, homeowners, business owners and health officials must all share in the responsibility to ensure the safety of our drinking water. Please read the enclosed informational brochure. We feel it will help give a better understanding of cross connections and backflow and the means of protection available. Please take time to complete and return the attached cross connection questionnaire within 30 days of the date on this letter. Your participation is essential to the success of this program.

If you have questions or would like more information, please contact this office at the number listed below. Thank you for your cooperation.

Sincerely,

«DistrictContact»
«ContactTitle»
«ContactPhone»

Enclosure(s)

February 11, 2008

«CustomerName»
«MAddress1»
«MAddress2»
«MCity», «MState» «MZip»

«AttnLine»

SUBJECT: Residential Questionnaire Return Request

Recently you received a questionnaire related to the «ServiceDistrict» Cross Connection Control Program and the «Regulation». Your questionnaire was not received within the 30 days, as requested.

It is important that you take the time to fill out the enclosed form and return it immediately. If the questionnaire is not returned within 15 days of this letter, we may need to schedule an on-site survey or require your premise to be isolated by the installation of a backflow prevention assembly at the water meter. The cost of either of these actions will be added to your water bill. There are many reasons why we ask for this questionnaire but the two most important are: it could save you money and it will protect your health.

Sincerely,

«DistrictContact»
«ContactTitle»
«ContactPhone»

Enclosure

CROSS CONNECTION SURVEY REPORT FORM

1. Is this residential or commercial property? Residential ☐ Commercial ☐

   If commercial, please specify business name: _____

2. Are you renting or do you own this property? Rent ☐ Own ☐

   If renting, please provide name and address of owner:

   _____

   _____

   _____

3. Your water meter serves how many homes? _____ How many buildings? _____

4. Do you use darkroom or photo developing equipment? Yes ☐ No ☐

5. Do you use any equipment that combines chemicals with your drinking water? (e.g., antifreeze flush kits, insecticide sprayers) Yes ☐ No ☐

6. Does anyone on the premises use a portable dialysis machine or any other type of medical equipment? Yes ☐ No ☐

7. Do you have a bathtub/Jacuzzi that fills from the bottom? Yes ☐ No ☐

8. Do you have a water softener or any other water treatment system connected to your drinking water supply? Yes ☐ No ☐

9. Do you have auxiliary water supply (i.e. well, pond) on your premises? Yes ☐ No ☐

10. Do you have livestock (i.e., horses, cows, etc.) that use a water trough? Yes ☐ No ☐

12. Does a creek, river, or spring run near your property? Yes ☐ No ☐
    a. Do you pump or draw water from this source? Yes ☐ No ☐

13. Do you have a booster pump, well pump, or any other type of water pump? Yes ☐ No ☐

14. Do you receive irrigation water from a different source? Yes ☐ No ☐

15. Do you have a backflow prevention assembly on your property now? Yes ☐ No ☐
    If yes, where? _____

16. Do you have any situation that you are aware of that could create a connection between your drinking water and any other substance? Yes ☐ No ☐

17. Do you have any other water using equipment on your property not mentioned above? Yes ☐ No ☐

Comments: _____

_____

_____

Please notify the City of Brookings if any of the above conditions change on your property due to remodeling, changes or additions to your water piping system.

_____ _____

Signature of Water Customer | Phone Number

_____ _____

Print Your Name | Best time to call or alternate contact

Today's Date _____

Your mailing address: | Physical address of property (if different):

_____ _____

_____ _____

_____ _____

Please answer all questions and return this questionnaire within 30 days. This form will be kept on file at Public Works. If you have any questions please call Public Works at (541) 469-1173.

RETURN SURVEY REPORT FORM TO:
City of Brookings
898 Elk Dr.
Brookings, OR 97415

Thank you for your cooperation!

February 11, 2008

«CustomerName»
«MAddress1»
«MAddress2»
«MCity», «MState» «MZip»

«AttnLine»

SUBJECT: Survey Follow-up

Thank you for your cooperation during our recent survey of your property. The following cross connections were noted:

«ReportNotes»

For the person qualified to perform the installation, please follow these guidelines:

1. *Use only backflow prevention assemblies that are on the approved list.*
2. *Follow all installation guidelines.*
3. *Thoroughly flush lines prior to installation to minimize fouling of the assembly.*
4. *Access to assembly test cocks, shutoff valves, and check valve covers is critical. Maintain all minimum clearances.*
5. *Protection from freezing and vandalism is your responsibility.*
6. *Pressure vacuum breakers, spill-resistant vacuum breakers, atmospheric vacuum breakers, and reduced pressure assemblies can all vent water on occasion. Consideration of water spillage is important.*
7. *All backflow prevention assemblies must be tested immediately following installation and the completed test report(s) forwarded to the «ServiceDistrict».*

Please call if you have any additional questions regarding the correct installation, appropriate assemblies, testing or maintenance.

Sincerely,

«DistrictContact»
«ContactTitle»
«ContactPhone»

Enclosure(s)

CROSS CONNECTION CONTROL ANNUAL REREGISTRATION APPLICATION FOR CERTIFIED BACKFLOW ASSEMBLY TESTER

Fill Out All Applicable Sections

Name:	
Address:	
City, State, Zip:	
Phone:	Certification #:
Company or Employer:	
Business Address:	
Business Phone:	Fax:
Cell Phone:	Email:
Contractor's Registration #:	
Are you a licensed plumber? yes ❒ no ❒	License #:
Are you a licensed Landscape Contractor? yes ❒ no ❒	License #:
Are you a licensed fire system contractor? yes ❒ no ❒	License #:
Have you completed Confined Space Entry Competent Person training? yes ❒ no ❒	If yes, Location: Instructor: Date:
Insurance company's name:	Agent's Name:
Policy number:	Date issued:
Amount of liability coverage:	Agent's Phone:
Bond Information:	Amount of Bond:

TEST GAUGE ACCURACY VERIFICATION

Do you own or have access to test gauge equipment? yes ❒ no ❒

Gauge I.D. #:		Diff. Pressure □	Electronic □
Date of Verification:		By:	
Or Date of Calibration:		By:	

This completed application must be signed, dated and submitted with copies of requested information:

- ❒ Certification, Validation Certificate or card
- ❒ Copy of Contractor Registration
- ❒ Completion certificate from Confined Space Entry training
- ❒ Copies of any other licenses checked above
- ❒ Insurance and bond certificates/statements of coverage
- ❒ Current gauge accuracy verification report form

DEMONSTRATION OF TEST PROCEDURES					
PVB:	yes ❒	no ❒	**DCVA:**	yes ❒	no ❒
SVB:	yes ❒	no ❒	**RPBA:**	yes ❒	no ❒
Location:			Instructor/Proctor:		
Date:					

Applicant's Signature:_____ Date:_____

Print Applicant's Name: _____

Note: If the System did not conduct an applicant's test gauge verification and test procedure demonstration, the tester must provide current documentation (within the last three months).

OFFICE USE ONLY			
Applicant approved:	yes ❒	no ❒	Date:
Approved by:			Date:
Next recertification date:			

CROSS CONNECTION CONTROL ANNUAL REREGISTRATION APPLICATION FOR CROSS CONNECTION CONTROL SPECIALIST

Fill Out All Applicable Sections

Name:	
Address:	
City, State, Zip	
Phone:	Certified Specialist #:
Company or Employer:	
Business Address:	
Business Phone:	Fax:
Cell Phone:	Email:
Contractor's Registration #:	
Insurance company's name:	
Policy number:	Date issued:
Amount of liability coverage:	
Bond Information:	Amount of Bond:

Applicant's Signature:_____ Date:_____

OFFICE USE ONLY	
Applicant approved: yes ❒ no ❒	Date:
Approved by:	Date:
Next recertification date:	

Certified Backflow Assembly Testers (BATs)
Pre-Approved for Submitting Test Reports to the City of Brookings

The following table lists Certified Backflow Assembly Testers that are pre-approved to test backflow assemblies in the City of Brookings's service area. The list is complied by identifying individual testers who requested to work in this area or who previously submitted properly completed test reports to our system with all the required information. ***Note: listing does not constitute an endorsement of these testers by our system or a certification of the quality of services they provide, as noted on the footer of the Tester List Report form from Cross-Track.***

To appear on our pre-approved BAT list, the tester must:

- Show proof of current tester certification from the Oregon Health Authority
- Submit documentation that his/her assembly test equipment has been verified for accuracy within the last 12 months and calibrated if needed
- Submit proof of adequate insurance, bond, contractor licensing and any local business licenses required.

As an alternative to the above, pre-approved testers must document that they appear on the approved BAT list of another nearby water system that has a testing QA/QC program acceptable to our system.

OAR 333-061-0070 requires a BAT to test all assemblies (RPBA, RPDA, DCVA, etc.) that protect the distribution system. Assemblies that protect the public water system must be tested in accordance with OAR 333-061-0070.

- Upon installation, and annually thereafter;
- After repair, reinstallation, or relocation; and
- After a backflow incident.

Note: The BAT certification is a special certification separate from other waterworks operator certification categories, plumbing licenses, contractor registration, etc. Other licenses, certifications and/or registrations may be required to install backflow prevention assemblies and/or perform maintenance work on assemblies within buildings.

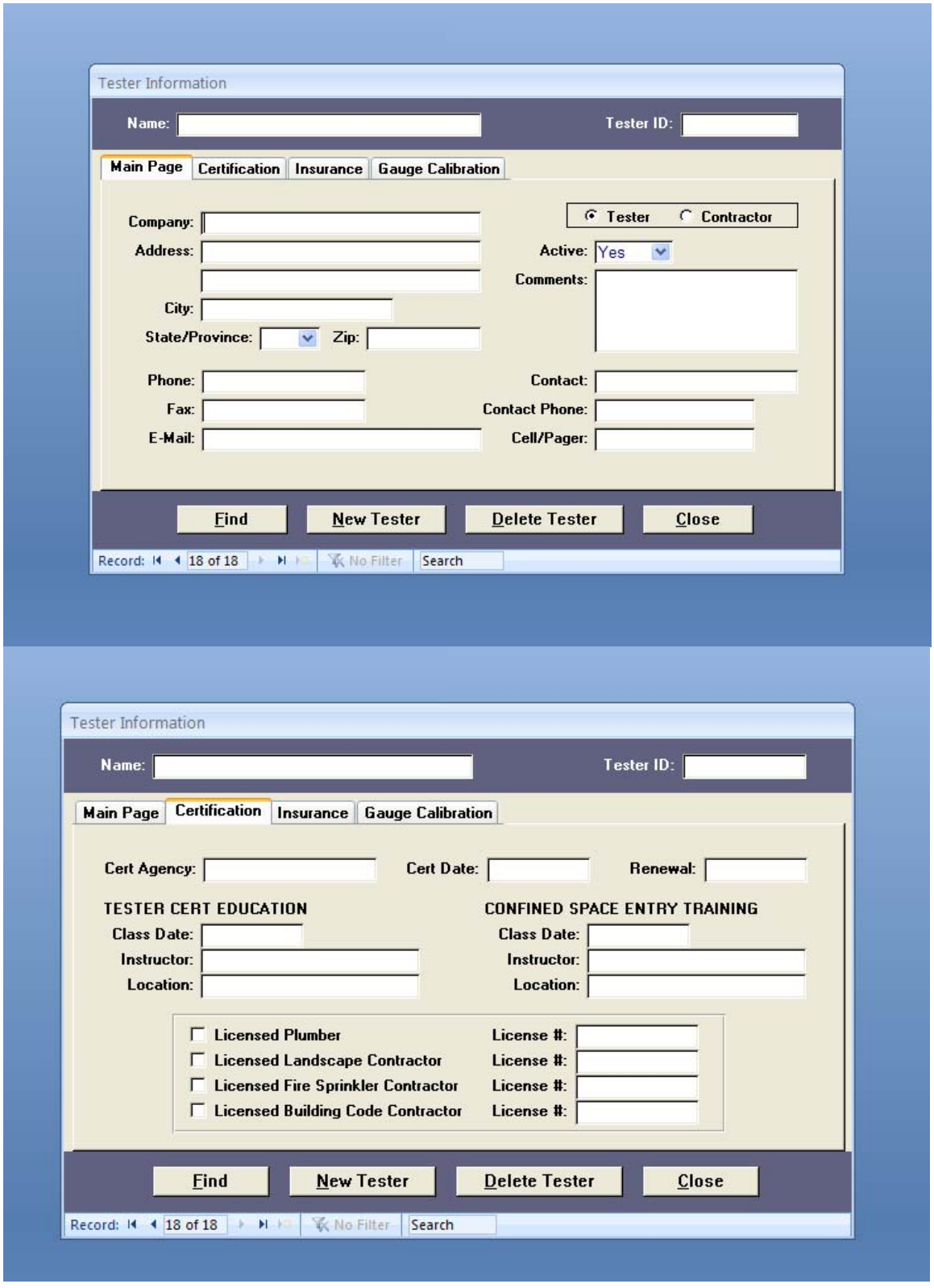
Enter the tester's required information into the Cross-Track Testers section. The Cross-Track program will keep track of testers (public - test for a fee) and their certification expiration dates. See the following screen prints for required information and tracking.

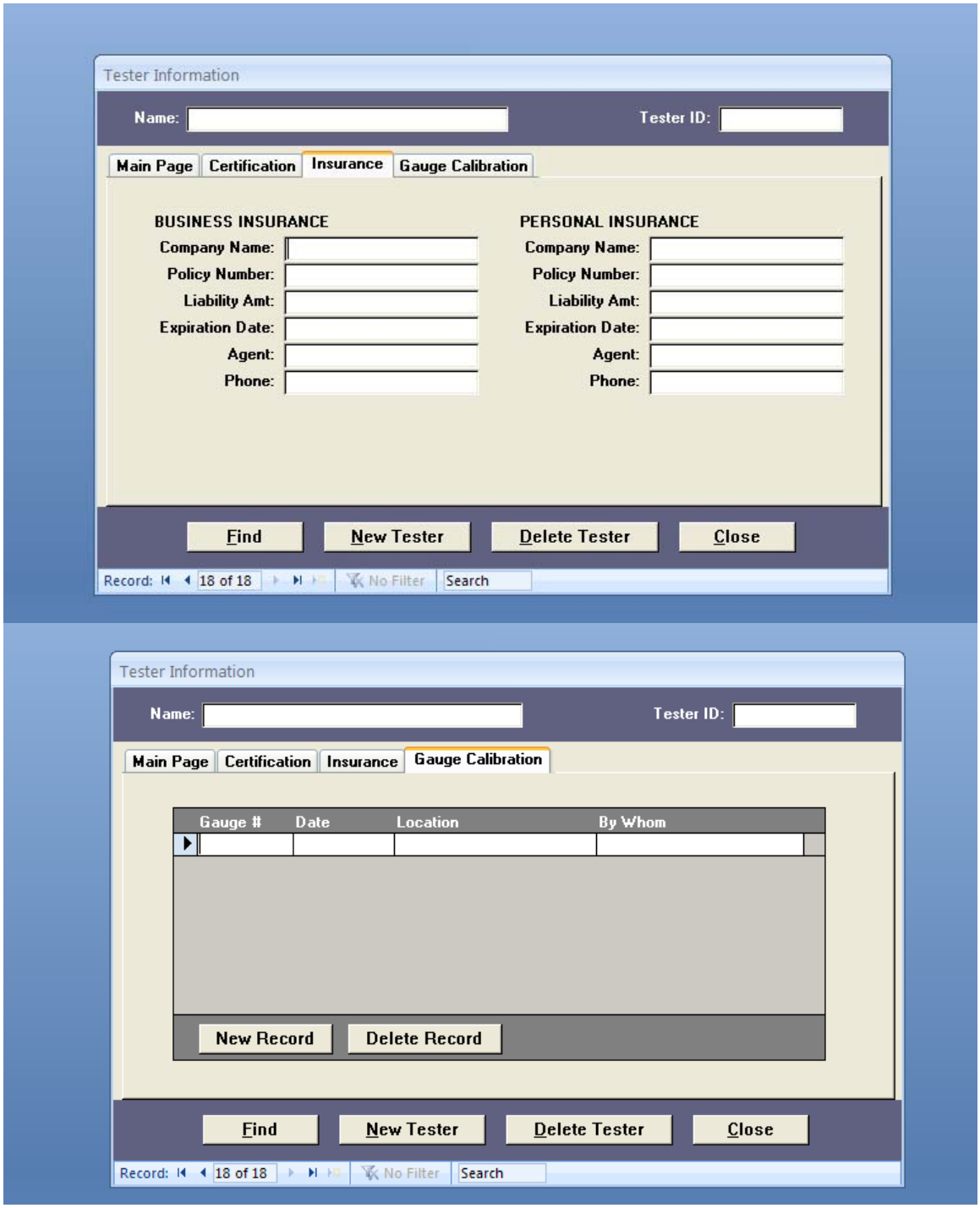
Certified Backflow Assembly Testers for Oregon

Backflow Assembly Testers are required to obtain licensing through the Construction Contractors Board (CCB) or the Landscape Contractors Board (LCB) if they provide their services for a fee. CCB and LCB licenses have not been verified for individuals on this list. Call the CCB at 503-378-4621 or the LCB at 503-986-6561 to verify licensing.

Curry County

Certification Number	Name of Tester	Phone Number	Employer	Address
2779	JOHN F ADAMS	800-571-2550		25325 CAPE VIEW LOOP; GOLD BEACH, OR 97444


Tester Information
Name:
Tester ID:
Main Page
Certification
Insurance
Gauge Calibration
Company:
Address:
City:
State/Province:
Zip:
Tester
Contractor
Active:
Yes
Comments:
Phone:
Fax:
E-Mail:
Contact:
Contact Phone:
Cell/Pager:
Find
New Tester
Delete Tester
Close
Record:
18 of 18
No Filter
Search
Tester Information
Name:
Tester ID:
Main Page
Certification
Insurance
Gauge Calibration
Cert Agency:
Cert Date:
Renewal:
TESTER CERT EDUCATION
Class Date:
Instructor:
Location:
CONFINED SPACE ENTRY TRAINING
Class Date:
Instructor:
Location:
Licensed Plumber
Licensed Landscape Contractor
Licensed Fire Sprinkler Contractor
Licensed Building Code Contractor
License #:
License #:
License #:
License #:
Find
New Tester
Delete Tester
Close
Record:
18 of 18
No Filter
Search


Tester Information
Name:
Tester ID:
Main Page
Certification
Insurance
Gauge Calibration
BUSINESS INSURANCE
Company Name:
Policy Number:
Liability Amt:
Expiration Date:
Agent:
Phone:
PERSONAL INSURANCE
Company Name:
Policy Number:
Liability Amt:
Expiration Date:
Agent:
Phone:
Find
New Tester
Delete Tester
Close
Record: 18 of 18
No Filter
Search
Tester Information
Name:
Tester ID:
Main Page
Certification
Insurance
Gauge Calibration
Gauge #
Date
Location
By Whom
New Record
Delete Record
Find
New Tester
Delete Tester
Close
Record: 18 of 18
No Filter
Search

BACKFLOW ASSEMBLY TEST REPORT

☐ NEW
☐ EXISTING
☐ REPLACEMENT

PREMISE OWNER: «CustomerName» PHONE: «Phone»
MAILING ADDRESS: «MAddress1» «MAddress2»
CITY: «MCity» STATE «MState» ZIP «MZip»
ASSEMBLY ADDRESS:
ASSEMBLY TYPE: «AsmType» ASSEMBLY LOCATION: «Location»
MAKE: «AsmMake» MODEL: «AsmModel» SIZE: «AsmSize»
WATER PURVEYOR: «ServiceDistrict» SERIAL NUMBER: «SerialNumber»

	REDUCED PRESSURE ASSEMBLY		PRESSURE VACUUM BRKR/ SPILL-RES VACUUM BRKR		INITIAL TEST
		DOUBLE CHECK	AIR INLET	CHECK	
TEST RESULTS	#1 CHECK PRESS DROP ____ (A) RELIEF VALVE OPENS AT ____ (B) (MIN 2 PSID) BUFFER (A) – (B) = ____ (MIN 3 PSI RECOMMENDED) RELIEF VALVE PASSED ☐ FAILED ☐	CHECK #1 TIGHT ☐ ____ PSID LEAKED ☐ CHECK #2 TIGHT ☐ ____ PSID LEAKED ☐	OPENED AT: ____ PSID DID NOT OPEN ☐	PRESSURE DROP ____ PSID FAILED ☐	PASSED ☐ FAILED ☐ DATE: / / SYSTEM PSI ____

COMMENTS & NOTES

	REDUCED PRESSURE ASSEMBLY		PVBA./SVBA		RE-TEST AFTER REPAIR DATE:
		DCVA	AIR INLET	CHECK	
RE-TEST AFTER REPAIRS	#1 CHECK PRESS DROP ____ (A) RELIEF OPENED ____ (B) MIN 2 PSID BUFFER (A)-(B) = ____ MIN 3 PSI	CHECK #1 TIGHT ☐ ____ PSID CHECK #2 TIGHT ☐ ____ PSID	OPENED AT ____ PSID	PRESS DROP ____ PSID	/ / PASSED ☐

GAUGE CALIBRATION DATE: ____ DETECTOR METER READING ____

TESTER SIGNATURE ____ TESTER CERT #
TESTERS NAME PRINTED ____ GAUGE #
TESTERS ADDRESS ____ PHONE #
COMPANY NAME ____ ☐ WATER RESTORED ?
REPORT RECEIVED BY: (REPRESENTATIVE OF OWNER)

BACKFLOW INCIDENT REPORT FORM

Reporting department:	Report date:
Reported by:	Title:
Phone:	

INCIDENT	
Date:	Time:
General location (street, etc.):	
Backflow originated from (name of premises):	
Street address:	
Contact:	Phone:
Type of business:	

CONTAMINANTS
Description of contaminants (attach chemical analysis or MSDS if available):
Distribution of contaminants: Contained within customer's premises? yes ☐ no ☐
Number of persons affected:
Effect of contamination: illness reported:
Physical irritation reported:

SOURCE/CAUSE
Cross connection source of contaminant (boiler, chemical pump, irrigation system, etc.):
Cause of backflow (main break, fire flow, etc.):

Continued…

CORRECTIVE ACTION
Corrective action taken to restore water quality (main flushing, disinfection, etc.):
Corrective action ordered to eliminate or protect from cross-connection (type of backflow preventer, location, etc.):

PREVIOUS CROSS CONNECTION SURVEY OF PREMISES					
Specialist:				Date:	
Type of backflow preventer: RPBA ☐		RPDA ☐		DCVA ☐	DCDC ☐
PVBA ☐	SRVB ☐	AVB ☐	Air gap ☐	None ☐	Other:
Date of last assembly test:					

NOTIFICATION OF STATE HEALTH DEPARTMENT		
Date:	Time:	Person:

Attach sheets with additional information, sketches, photos.

OFFICE USE			
Inventory of resources used to investigate, contain, take corrective action:			
Investigation/inspection:	Dates:		Hours:
Isolation/containment/flushing:	Dates:		Hours:
Materials/equipment:			
Copies of this report sent to:			
Customer ☐	Health Dept. ☐	Plumbing Dept. ☐	Legal Dept. ☐
Billing Dept. ☐	Fire Dept. ☐	Other:	
Report prepared by (print name):			Date:
Signature:			Employee #:

Backflow Incident Response Plan

A. General

This Backflow Incident Response Plan should be considered a supplement to the City of Brookings's Emergency Plan.

The City of Brookings should immediately begin a backflow incident investigation whenever the initial evaluation of a water quality complaint indicates that:

1. A backflow incident has occurred (i.e., drinking water supply has been contaminated) or may have occurred; or

2. The complaint can't be explained as a "normal" aesthetic problem.

Also, whenever a water main break (or power outage for pumped systems) causes a widespread loss of water pressure in the system (creating backsiphonage conditions), the City of Brookings should initiate a check of distribution system water quality as a precursor to the need for a backflow incident investigation.

A backflow incident investigation is often a team effort. The investigation should be made by or initially led by the City of Brookings's certified cross connection control specialist. The investigation team may include state health (regional) staff, local health personnel and/or local plumbing inspectors.

The City of Brookings can get more detailed guidance on how to respond to a backflow incident from the manual, *Backflow Incident Investigation Procedures*, published by the Pacific Northwest Section, American Water Works Association (PNWS-AWWA).

B. Condensed List of Tasks

The City of Brookings can use the following short list of tasks as initial guidance for dealing with backflow incidents. The City of Brookings should consult the most recently published edition of the PNWS-AWWA *Backflow Incident Investigation Procedures Manual* referenced above for greater detail as soon as possible after learning of a possible or confirmed backflow incident.

1. Customer Notification

a. As soon as possible, the City of Brookings will notify customers not to consume or use water.

b. The City of Brookings will start the notification with the customers nearest in location to the assumed source of contamination (usually the customer(s) making the water quality complaint).

c. The City of Brookings will inform the customer about the reason for the backflow incident investigation and their efforts to restore water quality as soon as possible. The City will let the customer know that customers will be informed when they may use water, the need to boil water used for consumption until a satisfactory bacteriological test result is obtained from the lab, etc.

d. Where a customer cannot be contacted immediately, the City of Brookings will place a written notice on the front door handle, and a follow-up visit will be made to confirm that the customer received notice about the possible contamination of the water supply.

e. When dealing with a backflow incident, the City of Brookings will let customers know that it could take several days to identify the source and type of contaminant(s) and to clean and disinfect the distribution system.

2. Identification of Source of Contamination

a. The City of Brookings will give consideration to the distribution system as a potential source of the contaminant (e.g., air valve inlet below ground).

b. The City of Brookings will not start flushing the distribution system until the source of contamination is identified (flushing may aggravate the backflow situation, and will likely remove the contaminant before a water sample can be collected to fully identify the contaminant).

c. The City of Brookings will conduct a house-to-house survey to search for the source of contamination and the extent that the contaminant has spread through the distribution system. Note: a check of water meters may show a return of water (meter running backward) to the distribution system.

d. When the cross connection responsible for the system contamination is located, the City should discontinue water service to that customer, until the customer completes the corrective action ordered by the City.

3. Isolation of Contaminated Portion of System

a. The City of Brookings will isolate the portions of the system that are suspected of being contaminated by closing isolating valves; leave one valve open to ensure that positive water pressure is maintained throughout the isolated system.

b. The City of Brookings will be sure to notify all affected customers in the isolated area first and then notify other customers served by the system.

4. Public Health Impacts

a. The City of Brookings will seek immediate input from and work with state and local health agencies to accurately communicate and properly mitigate potential health effects resulting from the backflow incident.

b. If appropriate, the City will refer customers that may have consumed the contaminant or had their household (or commercial) plumbing systems contaminated to public health personnel and Local Administrative Authorities (plumbing inspectors).

5. Cleaning/Disinfecting the Distribution System

a. The City of Brookings will develop and implement a program for cleaning the contaminated distribution system consistent with the contaminant(s) identified.

b. Where both chemical and bacteriological contamination has occurred, the City will disinfect the system after the removal of the chemical contaminant.

c. Where any bacteriological contamination is suspected, the City will provide field disinfection.

C. Additional Information on Cleaning/Disinfecting the Distribution System

Most chemical or physical contaminants can be flushed from the water distribution system or customer's plumbing system with adequate flushing velocity. However, this may not be the case in systems where scale and corrosion deposits (e.g., tuberculation on old cast iron mains) provide a restriction to obtaining adequate flushing velocity, or where chemical deposits or bacteriological slimes (biofilm) are present (on which the chemical contaminant may adhere).

To remove a chemical or physical contaminant from the distribution system, the City may need to:

1. Physically clean the affected area using foam swabs (pigs); and/or

2. Alter the form of the chemical contaminant (e.g., through oxidation using chlorination or addition of detergents).

When adding any chemical (including chlorine) to remove a contaminant from the distribution system, it is essential that the City fully understand the chemistry of the contaminant. **Adding the wrong chemical could make the contaminant more toxic to customers and/or more difficult to remove from the distribution system.**

To disinfect water mains using the "slug" or "continuous flow" method, a field unit should be used for chlorine injection, such as a chemical feed - metering or proportioning pump for sodium hypochlorite. The City of Brookings should contact the Oregon Health Authority to discuss proposed approaches to contaminant removal and disinfection prior to taking corrective action.

MOBILE UNIT - VEHICLE

CROSS CONNECTION CONTROL SURVEY REPORT FORM

Date of Survey:

NAME OF BUSINESS:	
TYPE OF BUSINESS:	
ADDRESS:	
CITY, STATE, ZIP:	PHONE:
CONTACT:	TITLE:

Description of mobile unit:	
Vehicle State License #:	Vehicle Registration #:
Mobile unit's function (haul water, carpet cleaning, street sweep, standpipe):	
How unit obtains system water (garden hose, fire hydrant, etc.):	

EXISTING BACKFLOW PROTECTION ON MOBILE UNIT			
None ☐ Air gap ☐ Backflow assembly ☐ (fill in below)			
Type:	Size:	Model:	Serial #:
Last test date:	Passed:	Failed:	Repaired:
Location of assembly:			

REQUIRED BACKFLOW PROTECTION	
Assembly required:	
Date of next required backflow assembly test/inspection:	
Comments:	
Signature of Specialist:	Employee #:

NOTE: This report must be on or in mobile unit whenever unit operates within the water system boundaries.

CITY OF BROOKINGS

Council WORKSHOP Report

Workshop Date: 2-4-13

Originating Dept: Parks

Signature (submitted by)

City Manager Approval

Subject:
Parks Maintenance Staffing

Recommendation: To approve one permanent full time, in addition to one seasonal (four months) full time hourly and one half time hourly staff position for park maintenance.

Financial Impact: Cost in wages & benefits for recommended staffing would be approximately $87,633.

Background/Discussion: Following the retirement of the Parks Foreman Dave Lentz in June of 2012, the City pursued a contract services agreement for park maintenance rather than refilling the position with a full time City employee. A budget of $60,000 for contract services was established for 2012-13 based on the higher end of wage of a City employee minus retirement benefits. Bid specifications were prepared and bids were obtained in June 2012 from several local contractors ranging from $66,480 to $150,000. The low bid was submitted by Superior Landscape Maintenance, a company owned by Dave Lentz. Based upon post bidding interviews, the high bids submitted were likely a result of the following;

- Cost of workers' compensation, liability insurance and implementing payroll and routine drug screening;
- Bidders lack of experience bidding public contract work
- Bidders lack of equipment for large commercial mowing services
- The mandatory pre bid was supposed to be at a model Park to demonstrate the scope of services. Due to weather, the pre bid was held in doors.

In July 2012, a temporary (6-8 months) full time hourly position was filled for park maintenance in addition to the seasonal staff position already in place. Retired Public Works Supervisor Bob Schafer was also added to the parks maintenance staff in July 2012 to work on special projects for both Parks & Public Works and provide support with equipment operation and metal fabrication. In order to reduce staff workload, we have also executed a Memorandum of Understanding (MOU) with the Brookings-Harbor Garden Club in the amount of $3000 to maintain Frontage Road and Bankus fountain area landscaping as well as City Hall courtyard landscaping. In October of 2012 we executed an MOU with the Azalea Park Foundation at no compensation, to provide consulting services to City staff regarding care of the native azaleas at Azalea Park in addition to the Foundations regular maintenance of the formal gardens. The remaining park maintenance duties and required hours to accomplish those duties are identified on the Parks Maintenance Matrix attached.

For the past six months under the direction of Parks & Technical Services Supervisor Tony Baron, park maintenance has been conducted under close watch with the intent of identifying inefficiencies and developing an approach to correcting those inefficiencies. The matrix identifies the number of total hours required to maintain the parks at the current basic level. There are several duties identified on the matrix that fall outside the scope of what would be required in a contract services agreement. Additionally, Parks staff has provided much needed assistance to Public Works during the recent storm event by cleaning and clearing roadways storm drains and ditches and have regularly executed projects in areas outside of regular park maintenance duties. These projects include:

- Gun Range Pole Building – concrete slab & building erection.
- Emergency Operations Center – miscellaneous carpentry
- Waste Water Treatment Lab Building – dry-rot roof repair.
- Bud Cross Park – block wall construction
- Azalea Park – gazebo column base dry-rot repair and new concrete bases
- City Hall – miscellaneous interior & exterior carpentry repairs
- City Pool –pool surface cleaning and equipment repair.
- Upper Yard storage area shelving.

Additional skilled areas that will prove valuable in the maintenance of our City buildings and grounds include:

- Rough and Finish Carpentry
- Concrete Forming, Placing & Finishing
- Building Remodel & Maintenance
- Heavy Equipment Operation
- Equipment and Vehicle Maintenance.

If the City of Brookings pursues future projects as owner builder similar to the Emergency Operations Center, full time staff with experience in the above skilled areas provided an advantage to the City resulting in potential cost savings to these future projects.

Attachment(s):

a. Parks Maintenance Matrix (Rev1)
b. Salary Spreadsheet

City of Brookings
Annual Parks Maintenance

Park or Public Open Space	clean & restock restrooms	empty trash receptacles	trash & debris cleanup	irrigation repairs & inspections	mowing	blowing & sweeping	weed-eating & edging	prunning, weed pulling & mulch	inspections	hand watering	general maint. & painting	vandalism	equipment repair & maint.	fertilizing	spraying	total man hours annually per park	percentage per park	cost to city in wages with current staffing at 1 full time, 1 half time & 1 seasonal (4 months full time).	Notes
Regular Duties	260	500	104	106	509	169	303	129	111	76	118	48	260	54	198	**2945**	100%	$87,633.00	
Azalea**	104	104	52	21	256	26	16	16	24	6	10	15	40	20	10	**720**	24.4%	$21,424.71	Overtime and on call duties for concert in the park duties not included in this matrix
Chetco Point	0	52	4	21	48	16	48	32	12	0	2	2	40	6	6	**289**	9.8%	$8,599.64	
Bud Cross	104	104	3	21	48	16	48	8	24	0	10	20	40	10	48	**504**	17.1%	$14,997.29	
Easy Manor	52	26	3	0	16	52	16	2	6	0	2	2	40	3	2	**222**	7.5%	$6,605.95	
Stout	0	6	16	11	48	16	48	48	12	0	0	1	40	8	6	**260**	8.8%	$7,736.70	
City Hall*	0	0	1	0	16	16	16	1	0	2	12	0	0	2	3	**69**	2.3%	$2,053.20	
Mill Beach	0	52	4	0	0	0	12	0	1	0	0	1	40	0	4	**114**	3.9%	$3,392.25	
Hillside Pedestrian Oasis	0	0	0	0	8	1	8	0	0	2	0	0	0	1	1	**21**	0.7%	$624.89	
Richard Street POS	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	**8**	0.3%	$238.05	
Boulder Park - (Car Wash)	0	0	1	0	12	0	12	0	0	0	0	0	0	0	3	**28**	1.0%	$833.18	
Tanbark/Memory POS	0	0	0	0	8	0	4	0	0	0	0	0	0	0	0	**12**	0.4%	$357.08	
Frontage Road*	0	0	10	0	16	4	16	0	0	0	0	0	0	2	0	**48**	1.6%	$1,428.31	
Bankus Fountain*	0	0	0	11	8	6	0	0	0	16	0	0	0	2	0	**43**	1.5%	$1,279.53	
Waste Water Treatment Plant	0	0	0	21	2	0	0	2	0	0	8	0	0	0	48	**81**	2.8%	$2,410.28	
Joe Hall Creek - Water Treatment Plant	0	0	0	0	4	0	8	0	0	0	0	0	0	0	4	**16**	0.5%	$476.10	
Gun Range	0	0	0	0	0	0	8	2	0	0	0	0	0	0	4	**14**	0.5%	$416.59	
Kidown Repairs	0	0	0	0	0	12	0	0	24	0	12	6	0	0	52	**106**	3.6%	$3,154.19	
City Pool	0	0	0	0	12	3	6	10	6	0	60	0	20	0	4	**121**	4.1%	$3,600.54	
Downtown Trash Receptacles	0	156	0	0	0	0	0	0	0	0	2	1	0	0	0	**159**	5.4%	$4,731.29	
Downtown Tree's & Shrubs	0	0	0	0	0	0	0	6	0	48	0	0	0	0	0	**54**	1.8%	$1,606.85	
Ferry Creek Reservoir	0	0	0	0	0	0	16	0	2	0	0	0	0	0	0	**18**	0.6%	$535.62	
Jodie Lane POS	0	0	0	0	3	1	3	0	0	0	0	0	0	0	1	**8**	0.3%	$238.05	
Spruce Street POS	0	0	10	0	0	0	12	0	0	0	0	0	0	0	0	**22**	0.7%	$654.64	
North Welcome Sign	0	0	0	0	0	0	2	2	0	2	0	0	0	0	2	**8**	0.3%	$238.05	
total hours annually in each duty	**260**	**500**	**104**	**106**	**509**	**169**	**303**	**129**	**111**	**76**	**118**	**48**	**260**	**54**	**198**	**2945**	**100%**	**$87,633.00**	

* Garden Club MOU for all other duties

** Azalea Park Foundation MOU for all other duties

City of Brookings
2012-13 Salary Spreadsheets

Employee Name				Parks Total
Employee Classification	UTWI Parks	Seasonal Parks	Seasonal Parks	
PERS code	2	0	0	
Insurance Code	1	0	0	
WC code	5506	5506	5506	
FT/PT (1,.5, etc)	1	1	0.5	
Grade	5	5	5	
Step 7/1/12	1	1	1	
Pay 7/1/12	2328	2080	2574	
# of months	12	4	12	
Date of Increase				
Step				
Pay				
# of months				
Base Salary	27936	8320	15444	51700
Certifications				
Percent				
Amount	0	0	0	0
Standby/Dbl Back				0
OOC				0
OT				0
Total Salary	27936	8320	15444	51700
PERS	4526			4526
Social Security/Med	2137	636	1181	3954
Insurance	12961		9636	22597
Unemployment	39	12	22	73
Workers Comp	2584	770	1429	4783
Subtotal - benefits	22247	1418	12268	35933
Total Personal Services	50,183	9,738	27,712	87,633