BOARD OF WATER SUPPLY of the COUNTY OF KAUA‘I

RULES COMMITTEE MEETING

Second Floor, Microbiology Lab Bldg
Kaua‘i County Department of Water
4398 Pua Loke Street, Līhu‘e, Kaua‘i, Hawai‘i 96766

FRIDAY, OCTOBER 4, 2013

3:00 p.m.
or soon thereafter

Recessed to Reconvene on Thursday, October 10, 2013

AGENDA

1. ROLL CALL

2. ACCEPTANCE OF AGENDA

3. MEETING MINUTES:
   Review and approval of:
   Rules Committee Meeting Minutes – January 23, 2013

4. OLD BUSINESS:
   1. Manager’s Report No. 13 – 7 - Board Discussion and Possible Action on Part 2 Section IX of the Rules: Adjustment of Bills for Undetected Leaks and Unforeseen Damages
      i. DOW Revised Proposed Changes on Part 2 Section IX of the Rules

5. NEW BUSINESS:
   1. Manager’s Report No. 14 – 13 – Discussion and Possible Action on correspondence received from the Kaua‘i Board of Water Finance Committee to the Rules Committee (5-16-13)

6. ADJOURNMENT
AGENDA

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   1. Manager’s Report No. 14 – 13 – Discussion and Possible Action on correspondence received from the Kaua‘i Board of Water Finance Committee to the Rules Committee (5-16-13)

6. ADJOURNMENT
Draft Minutes
Committee Members Present: Michael Dahilig, Chair, Randall Nishimura

Board Members Present: Sherman Shiraishi

Board Members Excused/Absent: Ray McCormick

Staff Present: David Craddick, Deputy County Attorney Andrea Suzuki, Gregg Fujikawa. Dustin Moises

Guests: Shawn Shimabukuro, Grove Farm, Royce Kawabata, Grove Farm

Chair Dahilig called the Rules Committee Meeting to order at 2:07 p.m., quorum was achieved.

AGENDA
Mr. Dahilig moved to accept the agenda as amended to rearrange and take Item 4b before Item 4a; seconded by Chair Dahilig; with no objections, motioned was carried with 2 ayes.

MINUTES
Mr. Dahilig moved to approve the Rules Committee meeting minutes of November 29, 2012; seconded by Chair Dahilig; motion was carried with 2 ayes.

OLD BUSINESS
Re: b. Manager’s Report No. 13-7 – Board Discussion and Possible Action on Part 2 Section IX of the Rules: Adjustment of Bills for Undetected Leaks and Unforeseen Damages
i. DOW Revised Proposed Changes on Part 2 Section IX of the Rules

BACKGROUND:
Manager Craddick referenced Page 3 of 3 of the Manager’s Report Section IX, Item No. 8 which states “Reduction in water bills for underground leaks is allowed “once in 10 years” for the premise the leak is found.” The recommendation is to leave in the language “once in ten years” because there are a group of customers that come in annually for rebates. However, the Manager felt it does not make a difference if it is 5 or 10 years.

DISCUSSION:
Mr. Nishimura inquired after the meter, what is the Department’s position on having the responsibility on the rate holder.
Manager Craddick commented that in some cases there may be leaks right at the meter. Anything that is inside the meter box, the Department of Water (DOW) takes the responsibility even though the rules say that the customer’s shut off valve is their responsibility. The shut off valve is located inside the DOW’s box.

Mr. Nishimura questioned why it isn’t reasonable to give a customer a leak rebate on an annual basis. Manager Craddick explained that it can be done but the same customers, usually farmers, come in year after year. Farmers saturate to soften the ground up before they plow to plant and break the ground and call it a line leak.

Mr. Nishimura feels 10 years is very restrictive. The Department should eliminate this issue with repeat customers who do this deliberately. Manager Craddick has not done a study of those customers who come back for leak rebates.

Mr. Nishimura referred to the last sentence in Item No. 3 regarding, “For storms, explosions or fires the leak must be stopped within 24 hours unless the service holder is unavailable, then one week will be allowed.” Manager Craddick indicated the rules states “a period of one week after or a customer should of or known of the leak in cases of storms, explosions or fire.” This sentence could be revised to state “a customer has one week to do this regardless of the case notified or not.” In these cases, the DOW normally does not notify the customer.

Chair Dahilig suspended the rules to ask questions for justification on Item No. 7 “Should the customer decide they want to contest the Manager’s decision, they must pay 50% of the reduced bill before the matter is put on the Board’s agenda.”

Manager Craddick commented that under this rule, customers have to pay half of the disputed amount before they come before the Board because it would take up the Board’s time to dispute $30 or $100 bills.

Chair Dahilig commented that it should not be necessary for the Board to take up disputed bills.

Mr. Nishimura inquired if the Department can charge interest on outstanding balances.

Manager Craddick indicated the Board approved to charge interest which started with the new billing system.

Mr. Nishimura asked if the Department is charging customers a service fee. If the service fee is waived, customers end up paying a high interest.

Manager Craddick indicated this could eliminate customers coming to the Board. After the Department provides what the rules allow, customers still come to the Board for a leniency on their bill. If the Board is going to have the customer pay half of their bill before they come before the Board, the Board could still waive the whole fee or not give the customer any of the half. The customer could end up getting money back.
Deputy County Attorney Andrea Suzuki is concerned about the legality of this part. There are leak bills that are higher than others who pay a higher fee to appeal that they have a right to it in Part I of the rules.

Mr. Shiraishi agreed that there would be legitimate complaints more than once every 10 years. Item No. 1 could state “underground leaks caused by the acts of the homeowner or land owner.”

Mr. Dahilig commented that the repeated nature of potential deception could be brought before the Board to be determined. To have something fixed which is a right of the customer is problematic in Item No. 7 and Item No. 8. If there is something wrong, the customer should be able to contest it. But if a customer comes in 12 times in the past 12 months for leak rebates, the customer should be denied to come before the Board. This provides more room in interpretation from a departmental standpoint versus purpose over material.

Mr. Shiraishi questioned rebates of high water bills that are customarily brought before the Board.

Mr. Nishimura clarified the purpose of the rule reduces the amount of customers who come before the Board. The rules provide the Department to address the issue and provides relieve for the rate holder. Mr. Shiraishi prefers to have the issues referred to staff and not the Board.

Manager Craddick explained that if a customer does not agree with what the Department does when the rule is applied, it is the option of the customer to go before the Board.

In the last four years, Manager Craddick noted there have been about (2) two unusual requests.

At 2:17 p.m., Chair Dahilig called for a recess.

At 2:21 p.m., Chair Dahilig called the meeting back to order.

Mr. Nishimura moved to incorporate “acts of the landowner” after the phrase “leaks is not caused by acts of the landowner, tenants, invitees” and to strike Item No. 7 and Item No. 8 and to approve the amended version to the full Board for action.

At 2:23 p.m., Chair Dahilig suspended the rule.

DISCUSSION:
Manager Craddick questioned why Chair Dahilig would delete Item No. 8. There would be no incentive to fix the water system if a customer comes in once a month.

Mr. Shiraishi inquired if this is covered in Item No. 3 “Adjustments will be allowed only if the consumer exercises diligence in stopping the leak.”

Manager Craddick expressed that the customer can stop the leak and the next month they have another leak. This does not make them fix their water line which is the cause of the leak. New language for Item No. 8 could be changed to “Reduction in water bills for underground leaks is allowed only once in 10 years to “5 years.”
Mr. Nishimura suggested to modify the language in Item No. 3 for the customer to fix their water line.

Manager Craddick explained you cannot force the customer to fix their water line if they don’t want to.

Chair Dahilig’s issue in Item No. 8 states that you cannot come back 10 years without a cause to show why.

Deputy County Attorney Andrea Suzuki does not think setting a time limit is arbitrary. The leak rebates are in relation to the Board’s financial concerns in reducing the amount of water consumed. Some of the underground leaks are under slabs. If a customer has a leak, would the rules require the Department to look under the slab to check a customer’s water system? How would the Department check the entire problem on the homeowner’s private property? Would the Board be willing to do this?

Chair Dahilig acknowledged that each case is different. The Department could build a case for denial and if the landowner feels they have been wronged. There may be a legitimate reason why there may be another leak again. Chair Dahilig would rather have the customer go through due process with a call by Manager Craddick instead of a carte blanche formula.

Mr. Nishimura recommended adding language and to leave the sentence in to state “reduce it to two (2) years” and to add language to say “the rate holder may appeal to the Board for relief if a leak rec-occurs within the two (2) year period.” This would allow the Department and the rate holder the opportunity to make a case. Mr. Nishimura prefers to incorporate this sentence in the rule.

Why is there this big gap and no need to repeat.

At 2:28 p.m., Chair Dahilig called the meeting back to order.

After the discussion, Mr. Nishimura restated his previous motion which was not voted on.

Mr. Nishimura moved to leave Item No. 8 in the rules and to amend the language to read “only once in two (2) years on the premise the leak was found on” and to add the language “may appeal denial of rebate if a leak is found within the two (2) year period;” seconded by Chair Dahilig; with no objections, motion carried with 2 ayes.

OLD BUSINESS
   i. Part V Water System Development Fee (revised 12-19-12, 11:05 p.m.)
       Part V Water System Development Fee (original 11-23-12, 2:30 p.m.)

Chair Dahilig acknowledged there was nobody from the public who wished to testify on the above agenda items.

At 2:31 p.m., Chair Dahilig suspended the rules.

DISCUSSION:
Manager Craddick commented from the January 22nd Finance Committee Meeting, testimony was given regarding not seeing the schedule being approved ahead of the rules.

Chair Dahilig previously spoke to Finance Chair Mr. Larry Dill who expressed to have this issue resolved with the Rules Committee before the Finance Committee formally resolves their issue. Chair Dahilig clarified that the November draft was reconciled with the December draft. The November draft would be available for future purposes only.

Manager Craddick added that the December draft goes with the January 23rd Report to the Rules Committee. The Rules Committee went through section by section which were discussed. Unresolved issues were also brought up in the report. The report includes an update of the committee meetings that were held. If a developer provides 100% of source on a system and provided it at half of the DOW’s fee, the current rules allows DOW to give credit for a certain amount but they still have to pay for the balance of the fee, even though they paid 100%. Manager Craddick explained that the rules state the DOW still charge the customer up to the development fee even if it cost the developer less and was unsure why this part of the rule got passed.

Manager Craddick acknowledged that the December 19th draft is the most current version since the Rules Committee accepted it. Subject to system adequacy, the credits for state money should be given outside the DOW system. The DOW put the provision in based on the input from Affordable Housing without any changes. Manager Craddick expressed there are concerns that need to be addressed.

Manager Craddick commented that state funding could be for a specific water system for source, storage and transmission or a portion of it. The water system may be a $1M project and state funded. The state may want a 5/8” meter for a state facility in another water system that has an adequate system. If the DOW is going to give the state credits off of the state funding, restriction to where a system improvement is should not be done. This provision is not in the rules which Manager Craddick has a concern.

Mr. Nishimura does not believe that this is actionable. More work is needed before this rule change comes before the Rules Committee for action.

Mr. Nishimura questioned if the Task Force is going to continue working with the Department or will the Task Force give this back to the Department to complete? Chair Dahilig indicated the Task Force is still ongoing to give the Department the opportunity to stimulate input.

At 2:42 p.m., Chair Dahilig called the meeting back to order.

Mr. Nishimura moved that the Water System Development and FRC Proposed Rules be moved back to the Task Force until an actionable draft is submitted before the Rules Committee for action; seconded by Chair Dahilig; with no objections, motion was carried with 2 ayes.

Mr. Nishimura will not be a member of the Task Force but will continue to attend the Rules Committee meetings. He mentioned there were some questions submitted and entered into the record which may be considered for the Task Force and the Rules Committee.

With no further business, Chair Dahilig adjourned the Rules Committee Meeting at 2:45 p.m.
MANAGER’S REPORT NO. 13-7 revised from 9/20/12 & 11/29/12:

January 23, 2013

Re: Rules Committee Discussion on Part 2 Section IX of the Rules

RECOMMENDATION: It is recommended that the Rules Committee take a look at a revised proposal on Part 2 Section IX ADJUSTMENT OF BILLS FOR UNDETECTED LEAKS AND UNFORESEEN DAMAGES.

BACKGROUND: The leak elimination proposal was expected to be implemented with the rate changes as the changes eliminate lost revenue. It was expected that $0.4 to $0.5 million in annual leak rebate revenue would not be lost. It was also expected that this proposal be implemented the same time as the monthly billing, which has been delayed.

Testimony was provided on the rule change proposal. Primarily it was directed toward reducing costs in other areas within the Department where funds were thought to be lost. These include overtime and unaccounted for water.

The concern over unaccounted for water is something the staff is working diligently on. Overtime is now primarily a result of construction connections that are done after hours to limit inconvenience from service disruption, SCADA system call outs, and accounting process changes being implemented. Construction related overtime is capitalized with the construction project and would not reduce operating costs by eliminating that activity. Elimination of night overtime may however disrupt customer water use during the day if connections were done during the day. I do not want to infer that connection overtime cannot be looked at as there is other activity related to the connections that are not capitalized, that is not providing any benefit to the system, and is also a drain on revenues.

Another testimony is from a repairman who benefits from our leak rebate. In the event a customer has a water line break in their property, the Department does not find nor fix leaks after the meter. Customers with leaks typically get plumbers of their choice to find and fix their underground leaks. In order for a leak adjustment request to be submitted to the Department, their underground leak must be substantiated with an invoice from their plumber indicating when the leak was fixed and the cost paid by the customer.

Our guess is that this activity would still go on whether the leak rebate was cancelled or not. There may be some concern customers may try to fix the leaks themselves if an invoice were not required by the department.

The issues raised do not address the issue that customers with non-leaking service lines are subsidizing leaks that are no cause of their own.
Attached is a revised proposal that was brought up with the full board on its September 20, 2012 board meeting and passed to the Rules Committee for review on November 29, 2012 and again deferred.

Our implementation in the upcoming CC&B project is set for January 22, 2013. HBWS is not accepting any process changes until the new billing system is in place and working accordingly. After department changes are approved by the Board, it will still take some time to adjust the billing system to accept the changes.

Thank you for your attention to this matter.

Respectfully submitted,

David R. Craddick, P.E., C.E.M.
Manager and Chief Engineer

Attached: DOW Revised Proposed Changes on Part 2 Section IX of the Rules

DC: ein
SECTION IX - ADJUSTMENT OF BILLS FOR UNDETECTED LEAKS AND UNFORESEEN DAMAGES

1. The Department will reduce high water bills caused by undetected leaks in the consumer’s supply pipe, by one half of the excess over the consumer’s normal bill based on the previous six months’ average. Adjustments will also be allowed where the high water bill was caused by some unforeseen circumstance such as underground leaks is not caused by the acts of the or land owner, tenants, invitees, storm damage, flood, explosion, fire and or others.

2. Before adjustment is made under this section, the owner shall first request an adjustment and submit substantiating data to warrant such an adjustment if required by the Department. The Department shall make their determination based on the data presented and any other evidence as collected by the Department, if necessary.

3. Adjustment will be allowed only if the consumer exercises diligence in repairing stopping the leak within the period of one week after knowledge they knew or should have known of an underground leak age. Knowledge of the leak can come from a water bill, personal notification from the Department by attaching a notice to the door of the residence, phone or email message from the Department, neighbor notification or other means. For storms, explosions or fires the leak must be stopped within 24 hours unless the service holder is unavailable. A customer has one week to do this regardless of the case notified or not.

4. No adjustments will be made for leakage due to faulty plumbing fixtures and exposed waterlines within his property the premise. Adjustments will be allowed only if the consumer exercises diligence in stopping the leak.

5. Before adjustment is made under this section, the owner shall first request an adjustment and submit substantiating data to warrant such an adjustment if required by the Department. The Department shall make the determination based on the data presented and any other evidence as collected by the Department, if necessary. The reduction in high water bill from leaks as noted above will be by charging the first block rate for the Department’s best estimate of the excess over the consumer’s normal bill based on the years monthly average.

6. In cases where the consumer has had the service for less than one year the Managers shall decide on the amount of the reduction.

7. Should the consumer decide they want to contest the Managers decision they must pay fifty percent of the reduced bill before the matter is put on the Board’s agenda.

8. Reduction in water bills for underground leaks is allowed only once in two (2) years ten years for the on the premise the leak is found on. The rate holder may appeal denial of rebate if a leak is found within the two (2) year period.

9. Payment of the leak amount may be made by monthly payment spread over one year but in no case shall it be less than twenty five percent of the average monthly bill per month of payment.
SECTION IX - ADJUSTMENT OF BILLS FOR UNDETECTED LEAKS AND UNFORESEEN DAMAGES

1. The Department will reduce high water bills caused by leaks in consumer’s supply pipe. Reduction in water bill shall be allowed where the high water bill in underground leaks is not caused by the acts of the land owner, tenants, invitees, storm damage, explosion, fire or others.

2. Before adjustment is made under this section, the owner shall first request an adjustment and submit substantiating data to warrant such an adjustment if required by the Department. The Department shall make their determination based on the data presented and any other evidence as collected by the Department, if necessary.

3. Adjustment will be allowed only if the consumer exercises diligence in stopping the leak within the period of one week after they knew or should have known of an underground leak. Knowledge of the leak can come from a water bill, personal notification from the Department by attaching a notice to the door of the residence, phone or email message from the Department, neighbor notification or other means. For storms, explosions or fires the leak must be stopped within 24 hours unless the service holder is unavailable. A customer has one week to do this regardless of the case notified or not.

4. No adjustments will be made for leakage due to faulty plumbing fixtures and exposed waterlines within property the premise. Adjustments will be allowed only if the consumer exercises diligence in stopping the leak.

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7. Reduction in water bills for underground leaks is allowed only once in two (2) years on the premise the leak is found on. The rate holder may appeal denial of rebate if a leak is found within the two (2) year period.

8. Payment of the leak amount may be made by monthly payment spread over one year but in no case shall it be less than twenty five percent of the average monthly bill per month of payment.
New Business
MANAGER’S REPORT No. 14-13

October 4, 2013


RECOMMENDATION:

Page 1, paragraph 1:
It is recommended that the Rules Committee review and comment on the proposed language for Part 5 Section III. This paragraph references Schedule 2 in Part 4 of the DOW Rules and Regulations. Schedule 2 is being revised to show meter size and meter cost, all other information will be deleted.

Page 2, last 2 paragraphs:
It is recommended that the Rules Committee approve the Finance Committee’s recommendation not to phase the Water Service Development Fee (WSDF) until a reasonable method of limiting the amount of water any one developer can request.

Other recommendations in the Finance Committee’s report will be addressed in the revisions to Parts 2, 3, 4 and 5 of the Rules and Regulations.

BACKGROUND:
The Department is currently developing a draft of Part 5 WSDF of the DOW Rules and Regulations for review and comment by the Rules Committee. Parts 2, 3, and 4 will be revised to reflect the provisions set forth in Part 5.

Respectfully submitted,

Kirk Saiki, P.E.
Deputy Manager-Engineer

Concurred:

David R. Craddick, P.E., C.E.M.
Manager and Chief Engineer
FINANCE COMMITTEE REPORT

May 16, 2013

Re: Finance Committee Report to the Rules Committee

The Finance Committee has reviewed your proposed language for Part 5 Section III and returns it with approved changes to eliminate the fire charge. Although there is nothing in the fee for fire protection costs and it makes sense to charge for this, there is no independent study at this time, which would protect the Board, backing any proposed charge. The Finance Committee will be recommending to the full Board to include fire charges in the next study along with staff costs to implement the expansion projects both of which were not a part of the present study.

The Finance Committee is forwarding the current draft of its proposed recommendation for the Rules Committee to comment. The schedule allows indexing according to the Engineering News Record construction cost index not to exceed 4% per year on average from the date of approval. This should prevent future large jumps in the WSDF.

The Finance Committee does cover administrative costs with a charge at two dollars per fixture unit for review of water requests. This is a very low cost and will not cover DOW’s administrative costs in this endeavor. There is some question if this is the appropriate place for this administrative charge or whether staff should implement it with other administrative charges.

We have approved the schedule as proposed by our consultant attached to this submittal. The schedule allows determination of the fee by fixture units, per gallon charge, or increasing up from 5/8” size according to AWWA standard C-700-95 for Cold Water Meters-Displacement type meter size ratio which DOW meters are currently comprised of. There is an allowance to use similar methodology for future meter types if different from the Badger meters currently used.

For meter sizes larger than 2” we have left the fee determination to staff based on the consultants recommendations and have inserted a schedule for AWWA standard C-702 for Cold Water Compound Type Class II meters based on the consultant’s schedule for fixture units and per gallon cost. There are too many other types of meters which could be used and would make the schedule unnecessarily confusing to list them all. The class I and class II compound meters are the meter types most commonly used. The difference in this schedule is it is a fee not to exceed as the range of fixture units is too large and depending on the expected use may require different meter sizes with the same number of fixture units.

The finance committee expects the rules will provide any further clarification needed for the methodology allowed. These larger size are primarily commercial meters and have
very large ranges of use and find it not appropriate to list a cost per meter as staff currently uses other methodology such as fixture units or equivalent 5/8" units. DOW has less than 150 meters total in this range of sizes and do not feel it is appropriate to limit the Manager and staff application of engineering standards and practices to determine a proper WSDF that is commensurate with demand required.

The schedule also has a provision for services charged for a certain amount of water that goes over the allotted per day gallon usage in 100 gallon increments for more than a year to be charged the difference in development fee spread over five years as long as the meter size is still appropriate for the application. For example if a meter used 100 gpd over the allotment for one year, they would see a $57 per month surcharge on their water bill for five years or until the use went below their allotment.

The Finance Committee has had testimony from the County Housing Department requesting waiver of fees. There is nothing in the schedule to waive fees. The Finance Committee believes proper application of the fixture units will not overcharge affordable projects and as long as there is a provision to direct grants funds toward affordable projects the concern raised will be addressed. Provided the Rules Committee allows for offsets based on grants from outside of the DOW.

The schedule has the allotted amount of water on an average day basis for the meter sizes up to 2" using the maximum fixture units. Should fixture units be allowed for meter sizes 2" and smaller language would need to be added to show how water use would be adjusted in the event of over use. Please inform the Finance Committee of the Rules Committees allowance or not of using fixture units for sizing of meters 2" and smaller so it may make that change if required.

While the Finance Committee understands DOW will not be able to charge a second fee for the same meter size for water used over the allotment it believes the difference may be charged to specific accounts in usage charges that are transferred to the expansion fund. Should the Rules Committee move in this direction the Finance Committee will make necessary changes to the schedule to address use over the allotted amount for 2" and smaller meters in the rate schedule.

The last major issue discussed was phasing. In light of the current financial condition of the FRC fund balance the Boards fiduciary responsibility and proposed projects which would utilize bond debt the Finance Committee cannot recommend phasing at this time. The fact is water that is currently available and provided by developers which DOW would have to develop and provide back can be used to some extent. That DOW "appropriated" water given now could all be taken at the lowest rate. The Finance Committee cannot recommend a lower cost while there is no limit on the amount of water any one developer can request.

Should the Rules Committee see fit to limit the amount of water any one developer can request to a time after the full fee is applicable the schedule may be able to be phased in over time. It would take further deliberations on the part of the Finance Committee to make a phasing determination once rules were determined which regulate the amount of water anyone developer can request. There may also be a legal issue to treat some areas
differently since the Board has accepted the concept of one benefit zone and is planning to go to public hearing on this.

Attached is a current copy of the Rules Part 4 Section VII – Water System Development Fee (WSDF) schedule to be proposed to the Full Board subject to any further recommendation from the Rules Committee.

Sincerely,

Larry Hill, P.E.
Finance Committee Chair

Recommended by,

David Craddick, P.E., C.E.M.
Manager and Chief Engineer

LD: mjg

Attachment:  Rules Part 5 Section III WSDF Fee Schedule
Rules Part 4 Section VII – Water System Development Fee (WSDF)
ENRs Indexes (3-25-13)
AWWA Standard for Cold-Water Meters-Compound Type
AWWA Standard for Propeller-Type Meter for Waterworks Applications
AWWA Standard Cold-Water Meters – Turbine Type, for Customer Service
April 4, 2013 (rev from February 5, 2013)

Re: Request for the Rules Committee to make the proposed changes to Part 5 Section III of the Rules and refer back to the Rules Committee

BACKGROUND:
The Department has been working with the Rules Committee on a Part 5 Water System Development Fee Section III. The WSDF Fee schedule was referred to the Finance Committee on the November 29, 2012 Rules Committee meeting for the committee’s review and comment.

In the February 5th Finance Committee meeting, the recommended changes were to add the double underlined sentence.

Part V Section III is stated as follows:

Section III: WSDF Fee Schedule

A. The WSDF imposed shall be as set forth in the WSDF Schedule, in Part IV of the Department Rules. The WSDF Schedule was created in accordance with a report prepared by an independent consultant as adopted by the Board for the purposes of WSDF assessment. The report calculated the costs associated with water development needs as laid out in the Department of Water facilities needs assessment study entitled “Water Plan 2020” as amended. A fire charge and administrative charge is are also required.

Thank you for your attention to this matter.

Respectfully Submitted,

David. R. Craddick, P.E., C.E.M.
Manager and Chief Engineer

DC: ein

Mgrnpt/Finance/April2013/Proposed Changes to Part 5 Section III/ein
PART 4 SECTION VII – FACILITIES RESERVE CHARGE WATER SYSTEM DEVELOPMENT FEE

1. The water system facilities reserve charge shall be assessed against all new developments and subdivisions requiring supply of water from the County of Kauai, Department of Water, and existing developments requiring additional supply of water from the Department’s system. The facilities reserve charge must be paid before water services are made available to the new or existing development.

1. The Water System Development Fee will be raised or lowered each year according to the percentage increase or decrease in the Engineering News Record Construction Cost Index change over previous year index held as the base. This shall not increase more than four percent average per year determined from the effective date of this rule.

2. The water system facilities reserve charge shall be paid by all applicants for water service, including but not limited to the following:
   
a. All irrigation services and/or meters.

b. Additional buildings to be connected to existing services where additional demands or supplies are indicated. The charges shall be based on the meter sizes required if the buildings were metered separately.

c. Additional units connected to existing services and meters under the categories of single family and multi family residential units. The charges will be based on the established schedule of charges for the respective categories.

2. The Water System Development Fee shall be determined from the following Schedule 1:

<table>
<thead>
<tr>
<th>Source</th>
<th>$ per Fixture Unit</th>
<th>$ per gallon</th>
<th>$ per 5/8&quot; meter</th>
<th>MAXIMUM PERCENTAGE*</th>
</tr>
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<tr>
<td>SOURCE</td>
<td>$104.00</td>
<td>$4.15</td>
<td>$3,120</td>
<td>18%</td>
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<tr>
<td>STORAGE</td>
<td>$196.00</td>
<td>$7.86</td>
<td>$5,880</td>
<td>34%</td>
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<tr>
<td>TRANSMISSION</td>
<td>$272.00</td>
<td>$10.87</td>
<td>$8,160</td>
<td>48%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$572.00</strong></td>
<td><strong>$22.88</strong></td>
<td><strong>$17,160</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

* Maximum Offset Percentage allowed when developer provides all of source, storage or transmission capacity according to DOW standards. For developments providing less than 100% of source, storage
or transmission capacity according to Hawaii Water Standards 2002 as amended the maximum percentage listed in the schedule for offset will be reduced according to Part 5 rules.

3. The water system facilities reserve charges shall apply to all applicants for water service as follows:
   a. For each parcel created by subdivision, including the first lot created; and for every new single family residential dwelling unit not yet metered and a facilities reserve charge has not yet been paid, the charge shall be $4,600.00.
   b. For each unit or hotel room in a multi-family residential development and/or resort development, which applies to each unit or hotel room, the charge shall be $4,600.00.
   c. For all other uses, the facilities reserve charge shall be determined by the size of the meter as follows:

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot;</td>
<td>$4,600.00</td>
</tr>
<tr>
<td>¾&quot;</td>
<td>$14,300.00</td>
</tr>
<tr>
<td>1&quot;</td>
<td>$26,400.00</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>$53,200.00</td>
</tr>
<tr>
<td>2&quot;</td>
<td>$90,700.00</td>
</tr>
<tr>
<td>2&quot;</td>
<td>$170,000.00</td>
</tr>
<tr>
<td>4&quot;</td>
<td>$283,400.00</td>
</tr>
<tr>
<td>6&quot;</td>
<td>$566,800.00</td>
</tr>
<tr>
<td>8&quot;</td>
<td>$907,000.00</td>
</tr>
</tbody>
</table>

   Meter sizes shall be determined by the Department and not by the Developer or Applicant. The facilities reserve charge for multi-family and/or resort development will be determined by the approved meter size or the number of units, whichever number is larger. Facilities reserve charges are periodically adjusted by the Department. These adjustments may increase or decrease existing facilities reserve charge amounts. Where adjustments to facilities reserve charges result in decreases of such charges, no refund will be made of the difference between the higher, pre-existing charges and the lower, adjusted charges.

3. a. For meter sizes up to two inch the water system development fee will increase according to the AWWA Standard C-700-latest edition for Cold Water Meters-Displacement type, Bronze Main Case Recommended Maximum Rate for Continuous operations gpm flow rate ratio of larger sizes to the 5/8” meter which is as follows in Schedule 2:

   **Schedule 2**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>GPM</th>
<th>Ratio to 5/8&quot;</th>
<th>Maximum meter cost</th>
<th>FixU Range of use</th>
<th>Yearly use/365 not to exceed Gallons**</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot;</td>
<td>10</td>
<td>1</td>
<td>$17,160</td>
<td>15-30</td>
<td>500 gallons</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>15</td>
<td>1.5</td>
<td>$25,740</td>
<td>31-45</td>
<td>750 gallons</td>
</tr>
<tr>
<td>1&quot;</td>
<td>25</td>
<td>2.5</td>
<td>$42,900</td>
<td>46-120</td>
<td>1,250 gallons</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>50</td>
<td>5</td>
<td>$85,800</td>
<td>121-250</td>
<td>2,750 gallons</td>
</tr>
</tbody>
</table>
2”  80  8  $137,280  251-700            4,000 gallons

**When the maximum number of fixture units are installed this column shows the average day
gallons allowed for the maximum number of fixture units. When lower numbers of fixture units
are approved by DOW the average use will be reduced in accordance with the reduction in
fixture units.

b. For meter sizes beyond two inch the water system development fee will be determined by
the application of engineering principles and standards. For AWWA Standard C-702-latest
edition for Cold-Water Meters-Compound Type Class II given as a reference type of meter the
fee shall not to exceed schedule 3:

Schedule 3  

<table>
<thead>
<tr>
<th>SIZE</th>
<th>Max cont.</th>
<th>Meter cost</th>
<th>FixU</th>
<th>Yearly use/365 not to exceed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3”</td>
<td>175</td>
<td>$5,720,100</td>
<td>701-10,000</td>
<td>166,670 gallons</td>
</tr>
<tr>
<td>4”</td>
<td>300</td>
<td>$9,884,160</td>
<td>5,000-17,280</td>
<td>288,000 gallons</td>
</tr>
<tr>
<td>6”</td>
<td>675</td>
<td>$22,239,360</td>
<td>8,500-38,880</td>
<td>648,000 gallons</td>
</tr>
<tr>
<td>8”</td>
<td>900</td>
<td>$29,652,480</td>
<td>15,500-51,840</td>
<td>864,000 gallons</td>
</tr>
</tbody>
</table>

**When the maximum number of fixture units are installed this column shows the average day
gallons allowed for the maximum number of fixture units. When lower numbers of fixture units
are approved by DOW the average use will be reduced in accordance with the reduction in
fixture units.

4. FRC Offsets:

a. Definitions and construction of words. As used in this paragraph 4, the following
definitions shall apply:

“Applicant” means any person, individual, corporation, partnership, business,
organization, association, or other entity whatsoever that applies for water service
from the Department.

“Consumer” has the meaning ascribed to it under Section I of Part 2 of the
Department’s Rules and Regulations.

“FRC” means the facilities reserve charges described in section VII of Part 4
and Section III of Part 3 of the Department’s rules.

“Offset” means reduced or reduction.

“Subdivider” has the meaning ascribed to it under section I of Part 3 of the
Department’s Rules and Regulations.

“Subdivision” has the meaning ascribed to it under section I of Part 3 of the
Department’s Rules and Regulations.
“Water transmission main” or “main” means a main extension under Paragraph 2.d [2.a.(4)] of Section II of Part 2 of the Department’s Rules and Regulations.

As used in this Paragraph 4, the following rules of construction shall apply:

Number. Words in the singular or plural number signify both the singular and plural number.

"Or", "and". Each of the terms "or" and "and", has the meaning of the other or of both.

b. When an applicant, consumer, or subdivider is required to construct and dedicate water source or water storage facilities, or water transmission mains, to the Department, the following rules shall apply.

Subject to the provisions of this paragraph 4, the applicable FRC liability of such applicants, consumers, or subdividers shall be offset by up to 33% each where water source or water storage improvements are constructed, and up to 50% where water transmission mains are constructed; provided that the total amount of all offsets that an applicant, consumer, or subdivider receives shall not exceed 100% of the applicant’s, consumer’s, or subdivider’s FRC liability, and provided further that the offset for any source or storage improvement or transmission main shall not exceed the actual cost of the source or storage improvement or transmission main.

The Department, and not the applicant, consumer, or subdivider, shall calculate and determine the total amount of an applicant’s, consumers, or subdivider’s FRC offset in any given case. The Department may require the applicant, consumer, or subdivider to submit documentation verifying the actual cost of a source or storage improvement or transmission main.

c. The offsets described in this Paragraph 4 “FRC Offsets” shall not apply to water transmission mains constructed by a subdivider, applicant or consumer which are within or adjacent to a subdivision or lands either 1) owned by the applicant or consumer, or 2) developed by the applicant or consumer for uses such as, but not limited to, residential, agricultural, commercial, resort, industrial, governmental, religious, or educational uses. Where water transmission mains are constructed within, adjacent to, or outside of such subdivisions or lands, the offsets shall apply only to mains constructed outside of and off-site from such subdivisions or lands.”

4. When average day use exceeds the allowable use listed in the water service request a system expansion surcharge will be added to the monthly water bill until the average use drops below the allowed average day use or a larger meter is allowed and a water service request to upsize the meter is approved. The system expansion surcharge will be the difference in WSDF of the new demand and the demand paid for in average 100 gallon per day increments with the water service request divided by 60.
5. Should the Department use meters different than the meters currently used by the Department, the same methodology for WSDF determination shall be used for other meters approved by the Department.

6. The administrative charge for review of Water Requests is $2 per fixture unit as defined by the Uniform Plumbing Code latest edition. This same definition for fixture unit will be used for the schedule above as adjusted by Department staff for low flow devices which are built as part of the structure and are not easily changed to high flow devices.

7. Fix U’s are the fixture units determined by application of the Uniform Plumbing code as adjusted for low flow devices that are built into the structure.
By Tim Grogan

How To Use ENR’s Indexes

Explaining the difference between the construction and building cost indexes

Readers of ENR generate a steady stream of questions about the magazine’s indexes and how to accurately apply them to construction projects. To help clarify the nature and use of the cost indexes, here are answers to the most frequently asked questions as well as suggestions on how to avoid costly mistakes when using the indexes.

What is the difference between ENR’s Construction Cost Index and its Building Cost Index?

The difference is in their respective labor components. The CCI uses 200 hours of common labor, multiplied by the 20-city average rate for wages and fringe benefits. The BCI derives its calculation from a baseline of 68.38 hours of skilled labor, multiplied by the 20-city wage-fringe average for three trades: bricklayers, carpenters and structural ironworkers. For their materials components, both indexes use 25 cents of standard fabricated structural steel at the 20-city average price, 1.128 tons of bulk portland cement priced locally and 1,088 board-ft of 2x4 lumber, which is also priced locally. The ENR indexes measure how much it costs to purchase this hypothetical package of goods compared to the price in the base year.

What kinds of construction are represented by the ENR indexes?

The two indexes apply to general construction costs. The CCI can be used when labor costs are a high proportion of total costs. The BCI is more applicable, for structures.

Where does ENR get its data?

ENR has price reporters who check prices locally in 20 U.S. cities. The prices are quoted from the same suppliers each month. ENR computes its latest indexes from these figures as well as local union wage rates.

Does ENR have cost indexes for cities outside of the U.S.?

ENR publishes indexes for two Canadian cities, Montreal and Toronto, each month. ENR’s Fourth Quarterly Cost Report includes the most comprehensive listing of international costs.

Are materials prices averaged?

No. ENR reporters collect spot prices from a single source for all the materials tracked, including those in the index. The reporters survey the same suppliers each month for materials that affect the index. Actual prices within a city may vary depending on the competitiveness of the market and local discounting practices. This method allows for a quick indicator of price movement, which is the primary objective of both indexes.

Do the indexes measure cost differentials between cities?

No. This is one of the more common errors in the application of ENR’s indexes, which measure a trend only in an individual city and in the U.S. as a whole. Differentials between cities may reflect differences in labor productivity and building codes. Moreover, price quotations for lumber and cement vary from one city to another.

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### Building Cost Index History (1926-2013)

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Annual Average</th>
<th>1926-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCI</td>
<td>1926: 1.65</td>
<td>1926: 1.65</td>
</tr>
<tr>
<td>BCI</td>
<td>1926: 1.65</td>
<td>1926: 1.65</td>
</tr>
</tbody>
</table>

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One city may report list prices, while another city may include discounts in its reported price for the same material.

Are the cost indexes seasonally adjusted?

No. This is an important point for users of the indexes to keep in mind. Wages, the most important component, usually affect the indexes once or twice a year. Cement prices tend to be more active in the spring, while pricing for fabricated structural steel tends to have monthly adjustments. Lumber prices, which are more dependent on local pricing and production conditions, are the most volatile and can change appreciably from month to month. Declines in the indexes are most often the result of falling lumber and steel prices.

The study of an index movement for a period of less than 12 months can sometimes miss these important developments. Users of an index for individual cities should also watch the timing of wage settlements. Stalled labor negotiations may keep the old wage rate in effect longer than a 12-month period, giving the appearance of a low inflation rate.

Is it more accurate to use an index that is closest to my home city?

No. The 20-city average index is generally more appropriate. Because that index has more elements, it has a smoother trend. Indexes for individual cities are more susceptible to price spikes.

Are annual averages weighted?

No. They are straight mathematical averages.

Are the indexes verifiable?

Yes. In the Construction Economics section, ENR's national indexes are updated in the first week of each month, while the indexes for individual cities appear in the second issue of each month.

Prices for the indexes' materials components can be found in the preceding month's Construction Economics pages: Cement prices appear in the first issue, lumber prices in the third issue and steel in the fourth issue. Wage rates for all 20 cities are published in the Third Quarterly Cost Report. Readers can compute ENR's indexes by multiplying the published prices and wages by the appropriate weights (shown in the tables below) and summing the results.

Does ENR forecast its indexes?

Yes. Once a year, ENR projects its BCI and CCI for the next 12 months in the Fourth Quarterly Cost Report. To reach its forecast, ENR incorporates the new wage rates called for in a multiyear, collective-bargaining agreements and estimates for the cities in which new contract terms will be negotiated.

Further, ENR estimates the materials component by studying consumption forecasts as well as price trends.

Does ENR change the weighting of the index components?

No. The components are always multiplied by the same factors. However, a component's share of an index's total will shift with its relative escalation rate.

Has ENR ever changed the makeup of the index components?

Only once, in 1996, ENR was forced to switch from the mill price for structural steel to the 20-city average fabricated price for channel beams, I-beams and wide flanges when ENR's two sources for mill prices left the structural market.

Does ENR revise the indexes?

Yes. On some occasions, ENR must revise the indexes. For example, ENR revised its March 2004 indexes shortly after their initial publication to reflect the huge surcharges being placed on structural steel. Any revisions to national indexes are published below. Any revisions to indexes for individual cities are published in the cost report at ENR.com.

Is ENR's cost data on the web?

Yes. All ENR's cost indexes, wage rates, material prices and cost-issue articles can be found at ENR.com.

### CONSTRUCTION COST INDEX HISTORY (1926-2013)

<table>
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<tr>
<th></th>
<th></th>
<th></th>
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<tr>
<td>JAN</td>
<td>1.000</td>
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<td>1.000</td>
</tr>
<tr>
<td>FEB</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
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</tr>
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<tr>
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<td>1.000</td>
</tr>
<tr>
<td>NOV</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
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<tr>
<td>ANNUAL AVERAGE</td>
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</tr>
</tbody>
</table>

enr.com March 25, 2013 • ENR • 47
AWWA STANDARD
FOR
COLD-WATER METERS—COMPOUND TYPE

Effective date: June 1, 2001.
First edition approved by AWWA Board of Directors May 24, 1923.
This edition approved January 21, 2001.

AMERICAN WATER WORKS ASSOCIATION
6666 West Quincy Avenue, Denver, Colorado 80235
4.2.2 Capacity. The nominal capacity ratings and the related pressure-loss limits shall be as shown in Table 1 for the safe maximum operating capacities.

4.2.3 Length. Maximum overall length of the meters, face-to-face of spuds or flanges, shall not be greater than those shown in Table 2. A flanged spool may be used to increase the length of a shorter meter to meet this requirement.

4.2.4 Pressure requirement. Meters supplied according to this standard shall operate without leakage or damage to any part at a working pressure of 150 psi (1,050 kPa).

4.2.5 Interior parts. Meters shall be designed for easy removal of all interior parts without disturbing connections to the pipeline.

4.2.6 Registration accuracy. Meters shall meet the following requirements for accuracy with water at a temperature less than 80°F (27°C).

4.2.6.1 Normal flow rate. The class I compound meter shall register not less than 97 percent and not more than 103 percent of the water actually passed through it at any flow rate within the normal test flow-rate limits specified in Table 1, except

![Table 1. Operating characteristics class I](image)

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Safe Operating Capacity</th>
<th>Maximum Flow Rate for Continuous Duty</th>
<th>Maximum Allowable Loss of Head at Safe Maximum Operating Capacity</th>
<th>Normal Test Flow-Rate Limits</th>
<th>Minimum Test Flow Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. (mm)</td>
<td>gpm (m³/h)</td>
<td>gpm (m³/h)</td>
<td>psi (kPa)</td>
<td>gpm (m³/h)</td>
<td>gpm (m³/h)</td>
</tr>
<tr>
<td>2 (50)</td>
<td>160 (36)</td>
<td>80 (18)</td>
<td>20 (140)</td>
<td>2-160 (0.45-36)</td>
<td>1/4 (0.06)</td>
</tr>
<tr>
<td>3 (80)</td>
<td>320 (72)</td>
<td>160 (36)</td>
<td>20 (140)</td>
<td>4-320 (0.90-72)</td>
<td>1/2 (0.11)</td>
</tr>
<tr>
<td>4 (100)</td>
<td>600 (110)</td>
<td>250 (55)</td>
<td>20 (140)</td>
<td>6-600 (1.4-110)</td>
<td>3/4 (0.17)</td>
</tr>
<tr>
<td>6 (150)</td>
<td>1,000 (220)</td>
<td>600 (110)</td>
<td>20 (140)</td>
<td>10-1,000 (2.3-220)</td>
<td>1 1/2 (0.34)</td>
</tr>
<tr>
<td>8 (200)</td>
<td>1,600 (360)</td>
<td>800 (180)</td>
<td>20 (140)</td>
<td>16-1,600 (3.6-360)</td>
<td>2 (0.45)</td>
</tr>
</tbody>
</table>

![Table 1.1 Operating characteristics class II](image)

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Safe Operating Capacity</th>
<th>Maximum Flow Rate for Continuous Duty</th>
<th>Maximum Allowable Loss of Head at Safe Maximum Operating Capacity</th>
<th>Normal Test Flow-Rate Limits</th>
<th>Minimum Test Flow Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. (mm)</td>
<td>gpm (m³/h)</td>
<td>gpm (m³/h)</td>
<td>psi (kPa)</td>
<td>gpm (m³/h)</td>
<td>gpm (m³/h)</td>
</tr>
<tr>
<td>2 (50)</td>
<td>160 (36)</td>
<td>80 (18)</td>
<td>15 (103)</td>
<td>1-160 (0.23-36)</td>
<td>1/4 (0.06)</td>
</tr>
<tr>
<td>3 (80)</td>
<td>360 (79)</td>
<td>175 (40)</td>
<td>15 (103)</td>
<td>2-360 (0.45-79)</td>
<td>1/2 (0.12)</td>
</tr>
<tr>
<td>4 (100)</td>
<td>600 (136)</td>
<td>300 (68)</td>
<td>15 (103)</td>
<td>3-600 (0.68-136)</td>
<td>3/4 (0.17)</td>
</tr>
<tr>
<td>6 (150)</td>
<td>1,350 (307)</td>
<td>675 (153)</td>
<td>15 (103)</td>
<td>5-1,350 (1.1-307)</td>
<td>1 1/2 (0.34)</td>
</tr>
<tr>
<td>8 (200)</td>
<td>1,600 (360)</td>
<td>900 (204)</td>
<td>15 (103)</td>
<td>16-1,600 (3.6-360)</td>
<td>2 (0.45)</td>
</tr>
</tbody>
</table>
Propeller-Type Meters for Waterworks Applications

Effective date: Nov. 1, 2008.
This edition approved Jan. 27, 2008.
## Table 1  Operating characteristics

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Safe Maximum Operating Capacity*</th>
<th>Maximum Loss of Head at Safe Maximum Operating Capacity</th>
<th>Maximum Rate for Continuous Operation</th>
<th>Normal Test Flow Limits†</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. (mm)</td>
<td>gpm (m³/hr)</td>
<td>psi (kPa)</td>
<td>gpm (m³/hr)</td>
<td>gpm (m³/hr)</td>
</tr>
<tr>
<td>2 (50)</td>
<td>120 (27)</td>
<td>5.00 (34.0)</td>
<td>100 (23)</td>
<td>45–100 (10–23)</td>
</tr>
<tr>
<td>3 (80)</td>
<td>300 (68)</td>
<td>5.00 (34.0)</td>
<td>250 (57)</td>
<td>80–250 (18–57)</td>
</tr>
<tr>
<td>4 (100)</td>
<td>600 (135)</td>
<td>2.00 (14.0)</td>
<td>500 (110)</td>
<td>85–500 (19–110)</td>
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<td>6 (150)</td>
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<td>160–1,200 (36–270)</td>
</tr>
<tr>
<td>8 (200)</td>
<td>1,800 (405)</td>
<td>0.50 (3.5)</td>
<td>1,500 (340)</td>
<td>190–1,500 (43–340)</td>
</tr>
<tr>
<td>10 (250)</td>
<td>2,400 (543)</td>
<td>0.50 (3.5)</td>
<td>2,000 (450)</td>
<td>260–2,000 (59–450)</td>
</tr>
<tr>
<td>12 (300)</td>
<td>3,375 (765)</td>
<td>0.50 (3.5)</td>
<td>2,800 (640)</td>
<td>275–2,800 (62–640)</td>
</tr>
<tr>
<td>14 (350)</td>
<td>4,500 (1,020)</td>
<td>0.50 (3.5)</td>
<td>3,750 (850)</td>
<td>350–3,750 (79–850)</td>
</tr>
<tr>
<td>16 (400)</td>
<td>5,700 (1,295)</td>
<td>0.50 (3.5)</td>
<td>4,750 (1,080)</td>
<td>450–4,750 (102–1,080)</td>
</tr>
<tr>
<td>18 (450)</td>
<td>6,750 (1,590)</td>
<td>0.25 (1.7)</td>
<td>5,625 (1,280)</td>
<td>550–5,625 (125–1,280)</td>
</tr>
<tr>
<td>20 (500)</td>
<td>8,250 (1,875)</td>
<td>0.25 (1.7)</td>
<td>6,875 (1,560)</td>
<td>650–6,875 (148–1,560)</td>
</tr>
<tr>
<td>24 (600)</td>
<td>12,000 (2,725)</td>
<td>0.25 (1.7)</td>
<td>10,000 (2,270)</td>
<td>1,000–10,000 (227–2,270)</td>
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<tr>
<td>30 (750)</td>
<td>18,000 (4,090)</td>
<td>0.25 (1.7)</td>
<td>15,000 (3,400)</td>
<td>1,600–15,000 (363–3,400)</td>
</tr>
<tr>
<td>36 (900)</td>
<td>24,000 (5,450)</td>
<td>0.25 (1.7)</td>
<td>20,000 (4,540)</td>
<td>2,400–20,000 (545–4,540)</td>
</tr>
<tr>
<td>42 (1,050)</td>
<td>40,000 (9,090)</td>
<td>0.10 (0.7)</td>
<td>28,000 (6,360)</td>
<td>2,800–28,000 (696–6,360)</td>
</tr>
<tr>
<td>48 (1,200)</td>
<td>50,000 (11,350)</td>
<td>0.10 (0.7)</td>
<td>35,000 (7,950)</td>
<td>3,500–35,000 (795–7,950)</td>
</tr>
<tr>
<td>54 (1,350)</td>
<td>55,000 (12,500)</td>
<td>0.10 (0.7)</td>
<td>45,000 (10,200)</td>
<td>5,000–45,000 (1,140–10,200)</td>
</tr>
<tr>
<td>60 (1,500)</td>
<td>80,000 (18,180)</td>
<td>0.10 (0.7)</td>
<td>60,000 (13,600)</td>
<td>6,000–60,000 (1,360–13,600)</td>
</tr>
<tr>
<td>66 (1,650)</td>
<td>95,000 (21,590)</td>
<td>0.10 (0.7)</td>
<td>75,000 (17,000)</td>
<td>7,500–75,000 (1,700–17,000)</td>
</tr>
<tr>
<td>72 (1,800)</td>
<td>115,000 (26,100)</td>
<td>0.10 (0.7)</td>
<td>90,000 (20,400)</td>
<td>9,000–90,000 (2,040–20,400)</td>
</tr>
</tbody>
</table>

*As shown for use 10 percent to 15 percent of total time meter is operating (also referred to as "intermittent maximum flow").

†Also referred to as "normal flow limits."
Cold-Water Meters—Turbine Type, for Customer Service

Effective date: June 1, 2007.
First edition approved by AWWA Board of Directors May 24, 1923.
This edition approved Jan. 21, 2007.
Table 1 Operating characteristics

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>Safe Maximum Operating Capacity</th>
<th>Maximum Rate for Continuous Duty</th>
<th>Maximum Loss of Head at Safe Maximum Operating Capacity</th>
<th>Normal Test-Flow Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>gpm (m³/h)</td>
<td>gpm (m³/h)</td>
<td>psi (kPa)</td>
<td>gpm (m³/h)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>--------------------------------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Class I</strong></td>
<td>Low-Velocity Horizontal Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(50) 160 (36)</td>
<td>80 (18)</td>
<td>15 (103)</td>
<td>16-120 (3.6-27.0)</td>
</tr>
<tr>
<td>3</td>
<td>(80) 350 (80)</td>
<td>175 (40)</td>
<td>15 (103)</td>
<td>24-250 (5.4-57.0)</td>
</tr>
<tr>
<td>4</td>
<td>(100) 600 (140)</td>
<td>300 (70)</td>
<td>15 (103)</td>
<td>40-400 (9.0-90.0)</td>
</tr>
<tr>
<td>6</td>
<td>(150) 1,250 (280)</td>
<td>625 (140)</td>
<td>15 (103)</td>
<td>80-1,000 (18.0-230.0)</td>
</tr>
<tr>
<td>8</td>
<td>(200) 1,800 (410)</td>
<td>900 (210)</td>
<td>15 (103)</td>
<td>140-1,600 (32.0-360.0)</td>
</tr>
<tr>
<td>10</td>
<td>(250) 2,900 (660)</td>
<td>1,450 (330)</td>
<td>15 (103)</td>
<td>225-2,500 (51.0-570.0)</td>
</tr>
<tr>
<td>12</td>
<td>(300) 4,300 (980)</td>
<td>2,150 (490)</td>
<td>15 (103)</td>
<td>400-4,000 (91.0-910.0)</td>
</tr>
<tr>
<td><strong>3/4</strong></td>
<td>(20) 30 (7)</td>
<td>20 (5)</td>
<td>15 (103)</td>
<td>1.5-30 (0.3-7.0)</td>
</tr>
<tr>
<td>1</td>
<td>(25) 50 (11)</td>
<td>35 (8)</td>
<td>15 (103)</td>
<td>2-50 (0.5-11.0)</td>
</tr>
<tr>
<td>1 1/2</td>
<td>(40) 100 (23)</td>
<td>65 (15)</td>
<td>15 (103)</td>
<td>3-100 (0.7-23.0)</td>
</tr>
<tr>
<td>2</td>
<td>(50) 160 (36)</td>
<td>100 (23)</td>
<td>15 (103)</td>
<td>4-160 (0.9-36.0)</td>
</tr>
<tr>
<td>3</td>
<td>(80) 350 (80)</td>
<td>220 (50)</td>
<td>15 (103)</td>
<td>6-350 (1.4-79.0)</td>
</tr>
<tr>
<td>4</td>
<td>(100) 630 (140)</td>
<td>420 (96)</td>
<td>15 (103)</td>
<td>8-630 (1.8-140.0)</td>
</tr>
<tr>
<td>6</td>
<td>(150) 1,300 (290)</td>
<td>865 (200)</td>
<td>15 (103)</td>
<td>15-1,300 (3.4-290.0)</td>
</tr>
<tr>
<td><strong>Class II</strong></td>
<td>In-Line (High-Velocity) Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>(40) 120 (27)</td>
<td>90 (20)</td>
<td>7 (48)</td>
<td>4-120 (0.9-27.0)</td>
</tr>
<tr>
<td>2</td>
<td>(50) 190 (43)</td>
<td>160 (36)</td>
<td>7 (48)</td>
<td>4-190 (0.9-43.0)</td>
</tr>
<tr>
<td>3</td>
<td>(80) 435 (99)</td>
<td>350 (80)</td>
<td>7 (48)</td>
<td>8-435 (1.8-99.0)</td>
</tr>
<tr>
<td>4</td>
<td>(100) 750 (170)</td>
<td>650 (150)</td>
<td>7 (48)</td>
<td>15-750 (3.4-170.0)</td>
</tr>
<tr>
<td>6</td>
<td>(150) 1,600 (360)</td>
<td>1,400 (320)</td>
<td>7 (48)</td>
<td>30-1,600 (6.8-360.0)</td>
</tr>
<tr>
<td>8</td>
<td>(200) 2,800 (640)</td>
<td>2,400 (550)</td>
<td>7 (48)</td>
<td>50-2,800 (11.0-640.0)</td>
</tr>
<tr>
<td>10</td>
<td>(250) 4,200 (950)</td>
<td>3,500 (790)</td>
<td>7 (48)</td>
<td>75-4,200 (17.0-950.0)</td>
</tr>
<tr>
<td>12</td>
<td>(300) 5,300 (1,200)</td>
<td>4,400 (1,000)</td>
<td>7 (48)</td>
<td>120-5,300 (27.0-1,200.0)</td>
</tr>
<tr>
<td>16</td>
<td>(400) 7,800 (1,770)</td>
<td>6,500 (1,470)</td>
<td>7 (48)</td>
<td>200-7,800 (45.0-1,770.0)</td>
</tr>
<tr>
<td>20</td>
<td>(400) 12,000 (2,730)</td>
<td>10,000 (2,270)</td>
<td>7 (48)</td>
<td>300-12,000 (68.0-2,730.0)</td>
</tr>
</tbody>
</table>

*Safe Maximum Operating Capacity is the maximum flow rate for intermittent service and should not exceed 33 percent usage (8 hr/day).

†Does not include strainer, which may be required in some applications. Maximum head loss listed for class II meters is at Maximum Rate for Continuous Duty.