Moore-Love, Karla

From: Stephanie Stewart <stewartstclair@gmail.com>
Sent: Thursday, June 11, 2015 12:19 PM
To: Moore-Love, Karla
Subject: LU 14-218444 HREN, materials for the record
Attachments: ResponseVFINAL June11_2015.pdf

Please confirm receipt of this email
Comments for the record and distribution
Case file: LU 14-218444 HREN

Dear Karla Moore-Love,

Attached is the Mount Tabor Neighborhood Association's June 10, 2015, response to the May 28th hearing of this matter. Please include this submission in the record and for distribution before the Council hearing scheduled for June 25, 2015, at 2:00pm. I am also providing 12 hand-delivered copies to Hillary Adam at BDS.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Stephanie Stewart
Mt. Tabor Neighborhood Association (MTNA) land use
1121 SE 50th Ave; Portland, OR 97215

MOUNT·TABOR
NEIGHBORHOOD ASSOCIATION

June 10, 2015

Dear Mayor Hales and City Commissioners Fish, Fritz, Novick, and Saltzman:

During the last 14 days, we've focused our efforts on two activities: meeting with the Applicant in an effort to bring our positions closer together, and addressing the questions Council asked during the May 28 hearing. In the following pages, we cover topics that specifically address your questions.

We remain hopeful that a settlement might yet be possible, and in this cover letter we offer an assessment of the way forward to a Decision both parties can embrace. There have been some process problems, as discussed in the following pages, and the record is not without confusion, especially with regard to the timeline required for the Applicant to refresh water and the impact its chosen method will have on the presence of the site's iconic views. In our recent discussions with the Applicant, we have come closer to crafting new solutions for Condition B, and we have come closer to consensus on the other Appeal points. But despite our good faith efforts, there just wasn't enough time for the conversation to run the course to a solution. Because of this, **we respectfully recommend that you take the following actions:**

1) Do not make any decisions regarding Condition B until you have more facts. SHPO stated this week that it will likely reverse the "No Adverse Effect" determination if the Applicant doesn't meet the 60-day time limit (documentation is attached). To reach a considered Decision, you need to see all technical options for managing healthy water at this site. The Applicant acknowledged in our meetings that **they did not explore any alternative methods** for keeping reservoir water healthy (other than the drain/clean/fill approach). They also acknowledged they are not experts in the management of non-potable water, and do not possess the knowledge base to design a solution that keeps the water healthy without extensive dumping and refilling.

2) Direct the Water Bureau to consult, in conjunction with the MTNA, with experts in managing bodies of non-potable water. Experts can recommend options that will keep the water both healthy and consistently present at this site.

3) Hold the record open longer. This will allow Council to reach a fuller understanding of the technical possibilities and limits at play here. This will also provide more time for Appellants to finish conversations.

4) Host a work session with all parties, including Council, Appellants, BES, and water management consultants.

5) Approve Condition E with the edits recommended on pages 5 and 6 of this document.

The Historic Landmarks Commission conducted a thorough review of this case, with four hearings and 71 days of deliberation. Indeed, they have conducted the **most** thorough review of the facts that will happen in this case. They determined that Conditions B and E were essential to meet the Approval Criteria for Historic Resource Review. Moreover, they determined that these two Conditions need **measurable benchmarks** to clearly establish compliance. We ask you to uphold the Historic Landmarks Commission's considered Decision.

Sincerely,

Stephanie Stewart and John Laursen
On behalf of the Mt. Tabor Neighborhood Association

Process Update

We met with the Applicant three times, for six hours total, between May 28 and June 8. We hoped to have efficient discussions, during which we would reach a consensus plan to offer Council. While we do believe that we made some progress, we found that the Applicant was slow to warm to new ideas. Progress has been too slow for us to be able to offer you a joint plan by the writing of this document (June 10), but we are hopeful that continued talks could be fruitful.

We also note at the outset our concerns about two aspects of this process. First, as noted in our summary letter, the Applicant has provided two different sets of data to the first two decision makers (HLC and Council) regarding the time required to drain and clean the reservoirs. The significant change in response has left Appellant MTNA (and indeed the Council) in an untenable position. Neither the MTNA nor the HLC Commissioners had reason to question the information provided to the HLC. The new assertion that it is physically impossible for the Applicant to comply with the HLC's directive must be scrutinized before any reasonable decisions can be made. This is particularly necessary because the Applicant has acknowledged that 1) it has no expertise in maintaining non-potable water supplies, and 2) it did not consider any alternative water management methods beyond the thrice yearly drain and fill approach. These defects in the process would render any decision other than rejection of the Applicant's appeal on Condition B unsupportable.

Our second concern is about the disadvantage we experience in a process that has citizens going head to head with one City Bureau (PWB) as that Bureau resists the directives of a second City agency (HLC), relying upon a claim of permit limitations imposed by a third City Bureau (BES), in a case that is managed by a fourth City Bureau (BDS), and adjudicated by a fifth City body (Council).

Condition B – The drain/clean/fill math

The 1000 gallons per minute limit on the reservoir drainage capacity is **not** a pipe limitation. The pipes can technically drain much more (and thus much faster) than this.[1] It appears to be a BES permit limit, and it is the lower end of the range that we understand BES actually permits, which is 1000 to 1500 gpm.

The math quoted by the Applicant on May 28 – 98 days to drain/clean/fill per cycle, creating a total of 294 days per year below historic levels – is as ugly as it is in part because the Applicant chose the lowest end of the drain permit range as the factor to quote (1000 gpm, instead of 1500 gpm), and they've chosen the highest end of the fill level range as the factor to quote (they've started the clock as soon as the reservoirs fall below 85% full, instead of the lower limit of 65% full). If we adjust the math to use the upper end of the permit range, or 1500 gpm (this 50% larger gpm produces a 33% reduction in days consumed), and we adjust the math to use the lower end of the historic fill range (because the reservoirs are not outside the historic fill range until they fall below 65%) then the process clocks in at 61 days to drain/clean/fill the reservoirs per cycle. If this cycle happens three times per year, then the reservoirs are below their historic fill levels for at least 183 days per year (or longer, as rainy spells will demand a halt to drain cycles mid-stream). **This is more than 6 months each year. This prospect is alarming to the community.**

During its deliberations, the Historic Landmarks Commission specifically requested the Applicant to supply the record with documentation of the drain/clean/fill cycle so that Commissioners could craft Condition B with precision. It is unfortunate that the information presented to Council was not presented to the HLC. If it had been, it is likely that Council would be seeing fully developed alternative plans that are acceptable to both the MTNA and the Bureau.

[1] For pipe sizes and technically achievable flow rates, see Appendix A to this document.

To date, the Applicant has explored and proposed only one solution to keep healthy water in the reservoirs, and that is to execute the drain/clean/fill process three times per year. In our conversations, the Applicant acknowledged that they are not experts in the management of non-potable water, and do not possess the knowledge base in-house to design a solution that keeps the water healthy without extensive dumping and refilling.

We assert that the drain/clean/fill scenario proposed by the Applicant may not be the right solution for keeping water both healthy *and present* at iconic fill levels. **To achieve compliance with the mandate for historic fill levels for the majority of the year, the Applicant will need to explore other solutions.** In recent talks, we have offered the following new ideas as solutions that would keep the water healthy, with fewer days below target levels:

1) The applicant can explore a partial-drain-and-dilute strategy that would drain the water, say, from 85% full to 40%, and then refill, thus moving out a majority of the stale water and diluting what's left with clean water. Something like this could happen once or twice per year, and a full drain/clean could take place just once per year (during a dry month when the drain permits from BES are likely to allow higher GPM), thus achieving healthy water *and* constancy of historic water levels.

2) The applicant can investigate circulating pumps that turn just enough of the surface water volume to keep the water healthy with fewer cleanings.

3) The applicant can investigate a trickle-through strategy that keeps water healthy by keeping it moving, as it slowly cascades down the hill from one reservoir to another, and then out to the sewer system. A strategy like this could be calculated so as to consume less water than three drain/fills, and, again, one full drain/clean could happen each year.

4) The applicant can negotiate a higher gallons-per-minute (GPM) range in their BES permits.

5) The applicant could creatively combine multiple solutions such as those above, or devise yet another solution altogether.

SHPO, the HLC, and the MTNA have all concurred that the goal is to keep the iconic views regularly available at this site for park visitors. We believe that these views should be reliably available, with healthy water, for considerably more than 6 months of the year. We believe that there is an engineering solution to meet this goal. We volunteers do not have the resources to engineer new solutions, and our requests to the Applicant to do so have not progressed.

It is time for the Applicant to pivot its efforts towards designing a solution that **will meet** Condition B's mandate for water in the reservoirs at historic levels for 10 months of the year.

Condition B – The scrivener's error

Given the complexities involved in draining these reservoirs to the sewer system (timelines must adjust based on the weather each day), and given how difficult it will be for the Applicant to predict the start date for the next reservoir's draining cycle opportunity, we predict that, in preparation for the next draining opportunity, these reservoirs will be staged at the lowest level in the mandated range for most of the year.

Given these complexities, and the likelihood that the lowest mandated fill level will be the operational level for most of the "full" part of the year, we request you correct the scrivener's error in accordance with our April 29 request, which is "65% to 85%."

Condition E - The removal of non-historic elements

Contrary to the Applicant's assertion at the hearing on May 28, the *2009 Historic Structures Report* (HSR) does not request that the Applicant remove pumps or liners. In fact, it explicitly supports the non-historic liner in Reservoir 5 as creating a more appropriate aesthetic effect for the Historic District, when compared with the poorly matched and very obvious patch job that has been done to control leaking in Reservoir 1. The *Historic Structures Report* actually directs the Applicant to plan for liners in Reservoirs 1 and 6, similar to the non-historic liner in Reservoir 5.

The community is chiefly interested in removing and replacing non-historic elements that impact the aesthetic of the historic district. Of the three items we consider most important to remove and replace, all but one is **already recommended** and accounted for in the *2009 Historic Structures Report* (HSR). These removal and replacement projects make up more than half of the report's total original cost estimate, so it was disingenuous for the Applicant to suggest that these remove and replace costs would be *in addition* to the cost of implementing this report.

The one remove and replace project not already accounted for inside the HSR is the chain link fence on Dam 5. When this out-of-character fence was installed, years ago, the community was under the impression that it was only temporary. The Applicant informed us this week that this fence was actually required by FERC to prevent erosion on Dam 5, and that it was always intended to be permanent. It is disappointing to learn that the Applicant knowingly invested in an obviously out-of-character fence for installation in the middle of this historic district. We are also concerned that projects such as the installation of this fence do not trigger either Design Advice or Historic Resource Reviews.

For clarity, MTNA's list of non-historic elements to be prioritized for removal and replacement includes three items:

1) Removal of the modern shopping-mall-style pole lights, and replacement with similarly effective yet aesthetically appropriate lights (around the perimeter of all three reservoirs, total cost estimated and included in the *Historic Structures Report* at $775,000);

2) Removal of the multiple modern electrical conduit pipes – some of them clearly neglected and not being used – that have been run along the visible surfaces of the reservoir walls (these expenses are included in the *Historic Structures Report* inside the cost estimate to remove and replace the pole lights, above);

3) Removal of the chain link fence on Dam 5, and replacement with similarly effective yet aesthetically appropriate fencing.

In conclusion, the list is manageable and most of the costs are already built into the *Historic Structures Report*.

Condition E - Priorities and costs

MTNA made a careful, line-by-line review of the *2009 Historic Structures Report* again this week.

The report estimated it would cost $1.5 million to perform the preservation/deferred maintenance projects that had to have attention before 2019. The immediate, crisis-level items were costed out as roughly $450,000. Normal maintenance was considered an ongoing expense and not specifically calculated in this report, but instructions and protocols were discussed to aid planning for said maintenance.

It's obvious that we can lower the cost of implementing this report in several ways. First, the Applicant asserts that they have completed $149,100 worth of the costs listed in this report. So, those can be removed from our discussion today. Another $22,000 in items are for expenses that can logically be moved to Approval Condition C's budget, as they are all documentation expenses for the creation of a interpretive program. Another $14,500 in items are for projects at covered Reservoir 7, which we are willing to deprioritize at this time. The adjusted total for this report is now $1.285 million ($1.5 million - $149,100 - $22,000 - $14,500 = $1.285 million). As stated above, the bulk of this $1.285 million – or $775,000 – is allocated towards the removal and replacement of non-historic elements.

If we apply a very generous 250% markup to the grand total of $1.285 million -- to account for inflation, engineering, design, and under-estimates -- the expenses being proposed here are $3.212 million.

There are four items listed in this report that do not have cost projections. They are new liners for Reservoirs 1 and 6, and the reinstallation of the original, wrought iron lights to the fences at Reservoirs 5 and 6. We recall the new liner at Reservoir 5 (and all associated work) cost $600K in 1998. We now use this to ballpark a $2,000,000 placeholder estimate for liners for Reservoirs 1 and 6. The community notes that these liners make empty and less-than-full periods at these Reservoirs less of an eyesore, and that their installation may be part of a compromise solution regarding the fill-levels and full periods for this park. We've used a $1,000,000 placeholder for the re-installation of the wrought iron lights. Even with these two generous placeholders, and the 2.5 multiplier on the 2009 estimates, this report totals $6.212 million ($3.212 million + $2 million + $1 million = $6.212 million). This figure is in line with the site's need; it is less than the $8 million asserted by the Applicant on May 28; it is less than half of what was allocated "to protect historic aesthetic" in 2002–2004; and it is less than what is being spent to protect the historic aesthetic at Washington Park.

Condition E – Our proposal

We find the majority of the expenses in this report to be reasonable and many of them urgent, and really just accounting for **decades of deferred maintenance**. We'd like to have a serious discussion with an Applicant that accepts the idea of spending money for historic preservation. Maybe with more time, we could have that conversation. But for two of our three meetings, the Applicant was committed to rejecting this Condition. It wasn't until our last meeting that they were willing to offer a compromise that allowed some funding for the *Historic Structures Report*. Having lost what we hoped would be an opportunity for efficient discussions that rapidly produce compromise, we independently propose the following:

1) Keep Condition E.

2) Retain Condition E's stated timeline of completion in 2019 (as opposed to our previously requested timeline of 2017), but add language that directs the Applicant to group projects in such a way so as to limit disruptions to the park.

3) Clarify the language of Condition E so that the Applicant is assured as to the intent regarding non-historic element removal. The Historic Landmarks Commission did not intend, nor do we, that pumps or liners be removed. We have clarified our priorities with regard to the removal of non-historic elements in the list above, for your reference.

4) Direct the Applicant to prioritize all items originally listed as "short term" priorities in the *Historic Structures Report*, as these were deemed to be at crisis level six years ago. Please also prioritize sidewalk repair, and the removal and replacement of non-historic elements as per the list we provided above. When searching for items that can be deprioritized, we suggest the work for Reservoir 7.

With those four points in mind, we offer the following edits to Condition E's language for Council to consider (BLACK represents existing text; RED represents additions):

> *E. The City of Portland shall formally adopt the May 2009 Mount Tabor Reservoirs Historic Structures Report and fully implement the short- and long-term restorative recommendations and maintenance therein, including removal of non-historic elements that affect the districts' historic aesthetic, such as light fixtures and conduit, and restoration of the contributing resources of the Mt. Tabor Park Reservoirs Historic District by December 31, 2019. Regarding non-historic elements, the Applicant is directed to prioritize the removal and replacement, with aesthetically more appropriate counterparts and under a DAR, of the following non-historic elements: the chain link fence on Dam 5; the modern pole lights on Reservoirs 1, 5 and 6; and the surface-mounted electrical conduit pipes on Reservoirs 1, 5, and 6 (starting with the unused conduit, and moving the remaining conduit underground when sidewalk replacement provides that opportunity). Regarding items listed in the Historic Structures Report, the Applicant is directed to prioritize any action originally flagged in the "short term" priorities column. Regarding implementation timeline, the Applicant is directed to institutionalize protocols for ongoing maintenance by 2019, and to group all other discrete projects to be completed in full by December 31, 2019, such that park disruptions are kept to a minimum.*

Conditional Use Review request

The Applicant asserts that this project produces less than 1,500 square feet of "exterior alterations." Their logic is that no work eventually covered by ground is included in the "exterior alterations" calculation. By this logic, I could open a nightclub in a bunker in my backyard and not violate my residential zoning classification, because, after all, the development is all below ground. The Code does not support the reading of "exterior alterations" as meaning all exterior alterations *except* those below ground level.

We assert that when underground work has permanent above-ground implications, as does this project with its prohibition of trees for 10 feet in every direction, the underground development contributes to the calculus of the square feet of "exterior alterations." The Applicant will lay 850 linear feet of new pipe in the park; that pipe is 4 feet in diameter, which means the Applicant plans to expand development in this park by 3,400 square feet of new pipe (850 ft long x 4 ft wide = 3,400 square feet). This new pipe brings with it a 24-foot corridor above it, at park-user level, where trees are prohibited. This places 20,400 square feet of park land under a tree prohibition (850 ft long x 24 ft wide = 20,400 square feet). This park is well known for its trees, and as Conditional Use Reviews are designed to evaluate impacts on character, we assert that this project's total of exterior alterations triggers the Conditional Use Review. Moreover, this site and project seem to especially need this review.

The Applicant asserted in testimony before you on May 28, that "most" of the new pipe falls under "roads and gravel paths." Of the 850 linear feet of pipe, 350 feet fall under a road. This road is wide and paved, and, as park users are accustomed to roads being treeless swaths, this portion of the pipe is well hidden and the permanent impact to the park landscape is minimal. This accounts for only 1,400 square feet of the new pipe development, and 8,400 square feet of the restricted, treeless pipe corridor. This is **not** "most" of the pipe. Accounting for this, we still have 2,000 square feet of new pipe development and 12,000 square feet of park land under a tree prohibition that would be clearly noticeable in Mt. Tabor Park.

Let's examine the Water Bureau's no-trees-near pipes policy.[2] It was beyond our resources to identify whether this is a *guideline* from the Water Bureau, or whether it is a *binding* policy applicable across all bureaus. In any case, it is not without flexibility or contradiction.

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[2] See Appendix B to this document.

First, there is precedent for other city guidelines to contradict the standard no-trees-near-pipes policy. Street tree guidelines, bioswale tree plantings, and interior landscape requirements for parking lots all appear to direct the planting of trees with minimal regard for pipes.

Second, the actual Water Bureau policy appears to allow trees within the restricted corridor **if a root barrier is used.** Despite more than a year of dialog with the Applicant, we did not learn of this flexible option for mitigation until the May 28 hearing. Had the Applicant been more forthcoming about this mitigation option in the tree policy, we likely could have reached a satisfying agreement before now regarding our concerns with the trees-and-pipes management policy on Tabor, and avoided bringing this to Council in this appeal. As volunteers who have contributed a considerable amount of time and effort to this case, at great cost to our families, we find the persistent omission of this data disturbing, and an indication that the Applicant may only conduct a careful, site-specific review of its policies if required to do so by a full-fledged, public review process. The Conditional Use Review would provide that process.

An alternative to a Conditional Use Review

If Council chooses to take the risk of skipping the Conditional Use Review for this project, we hope you will consider an additional Approval Condition that addresses, at a minimum, the Applicant's stated no-trees-near-pipes policy for Mt. Tabor. That Approval Condition should require the Applicant to 1) craft a Tabor specific trees-and-pipes policy that establishes mitigation measures to allow trees near pipes, and 2) implement that site-specific policy as the standard for all of this Applicant's projects at Tabor.

SHPO's "No Adverse Effect" finding

The State Historic Preservation Office (SHPO) supports the HLC Decision, and as such they have followed these appeals. SHPO advised this week that they will likely reverse the "No Adverse Effect" determination if the Applicant does not meet a 60-day time limit on periods when water is below historic levels. SHPO, like the HLC, expects water to be present at historic levels for 305 days a year. (See Appendix C.) This statement alone should cause the Council to grant Appellant MTNA's request to either 1) deny the Water Bureau's appeal, or 2) delay decision and direct further study.

SHPO has clarified that its original finding of "No Adverse Effect" is dependent on normal water levels for the majority of the year. In their own words:

> *Regarding the SHPO's position about water levels in the Reservoirs, our concurrence with a finding of No Adverse Effect was clearly contingent upon the project proponent following through with the scope of work provided to our office for review. Among those were the proposal (from PWB) that the reservoirs be maintained with water in them at normal operating depth, draining them only for routine maintenance and cleaning. This is reflected in my email to Eileen Brady, who also contacted our office with the same question. Here is a brief excerpt of my response:*
>
> > *"Our office found no adverse effect based on the latest proposal from Water Bureau, which includes the retention of water in the reservoirs as a condition of approval. If the project does not result in the retention of water in the reservoirs, we would be able to re-open the case and find an adverse effect at that point. This has been made clear to Water Bureau, and is implicit in our finding."*

It is important to understand that SHPO's review did not include the Approval Criteria before HLC and City Council, nor did it hold the Applicant to the rigorous documentation and evidence standard set by local land use laws, which dictate the need for better plans, as in Conditions B and E. In their own words:

> *To address the question of the parallel reviews, ours under state law, and HLC's under local ordinance. These two regulations and the regulatory bodies that are empowered by them (SHPO by the state law, and HLC by the local ordinance) are entirely different. It is almost universally the case that local regulation is more restrictive than state law, with more powers to intervene, regardless of the city or state we are discussing. In reality, the reviews should be different, otherwise they would be duplicative and a waste of time. If one accepts the theory that democracy is best served when the most specific laws are decided at the most local level possible, with state and federal laws being more general in their application, it follows that local preservation regulation would be more specific (and even more restrictive) than state law.*
>
> ...
>
> *We expect the HLC to reach decisions based on application of local ordinance, and not to be influenced by SHPO review of the same project under entirely different laws. It is expected that in some cases, SHPO review of a project may result in a finding of no adverse effect, while local review of the same project under local ordinance reaches a different conclusion. To suggest that State review should in any way impact, or trumps local review outcomes, is simply incorrect, and not supported by law or historic preservation best practice. They are two separate processes that should be allowed to play out independently.*
>
> ...
>
> *With a fuller understanding of local issues, we trust the local review authority to make informed and appropriate decisions based on the authority granted them by local ordinance. The same is true with regard to PWB official acceptance of the 2009 report. If HLC feels it is important that this happen, our office trusts that decision.*

In its challenge to Conditions B and E, the Applicant asserts the mandates are unnecessary because SHPO issued a "No Adverse Effect" finding for the Tabor Disconnect. SHPO rejects that assertion. For relevant correspondence from SHPO, see Appendix C to this letter.

Conclusion

The Applicant continues to object to Approval Conditions B and E on principle. They continue to assert that they alone determine the scope of their project, and that a plan review like this Historic Resources Review does not have standing to direct additional work. This is simply not true. Plan reviews regularly identify items to be addressed by Applicants. In fact the Code, not the Applicant, has the final say about the scope of a project. We believe that acceptance of the Applicant's argument on the point of project scope runs the risk of setting a dangerous precedent for development in our city.

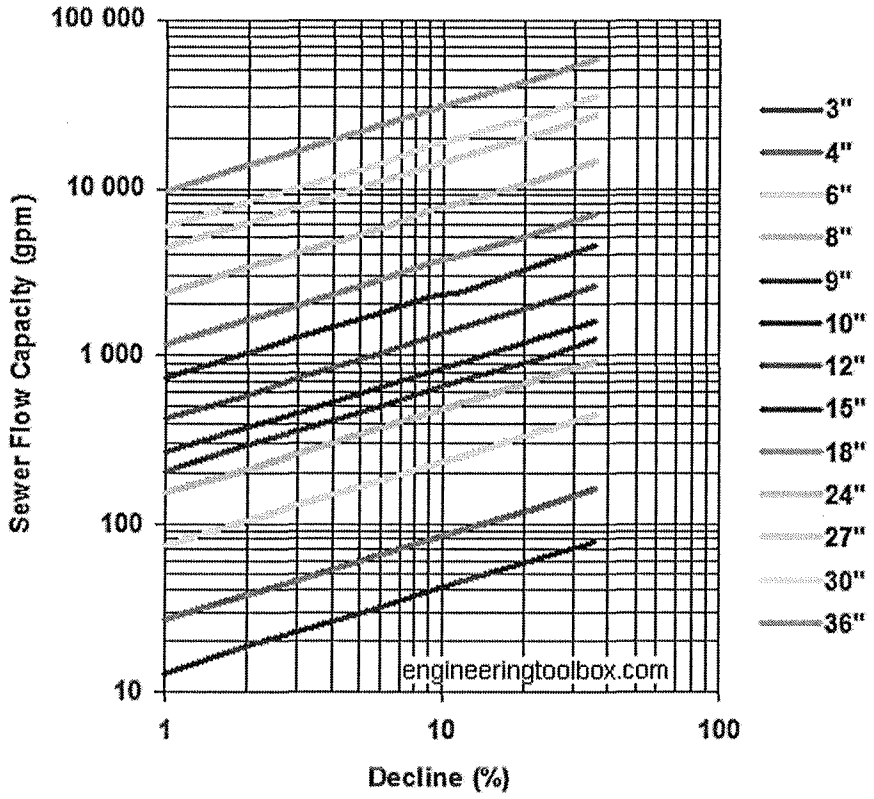
The City Council has delegated responsibilities with regard to the Approval Criteria for historic landmarks to a city entity—the Historic Landmarks Commission. Now, a City agency, the Portland Water Bureau, seeks to overturn the unanimous Decision of the City's HLC. We believe that the Council, which chartered the Historic Landmarks Commission, should not accept an argument from a City agency that fundamentally undermines the HLC's jurisdiction.

Appendix A – pipe sizes, flow capacity

Flow capacities of sewer pipes are affected by the diameter and the downhill grade of that pipe (among other things). We provide an engineering table for pipe flow capacity below[3] – this table shows how the gallons-per-minute (gpm) capacity increases with pipe size and downhill grade.

You can see that a 24" pipe (as is available at Res 5) technically can produce a flow capacity of over 7,000 gpm, depending on the decline. A 30" pipe (as is available at Res 6) technically can produce a flow capacity over 20,000 gpm, depending on the decline.

Sewage Pipe Capacity – *gpm*



MTNA requested pipe sizes for each sewer drain line at each reservoir (request made June 1). The Applicant provided the following response on June 5; there was no follow up:

> *"Pipe sizes – here's some preliminary information – though I have asked for them to give me the sizes all the way to the river and to tell me maximum allowable discharges and constraints and limitations that effect the discharge rates. I will send that information as soon as I can.*
>
> *a. Res. 1, the drain pipe is 20", then increases to 30" near 60th & Division.*
> *b. Res. 5, the drain pipe is 24", then it joins a 30" pipe in 60th.*
> *c. Res. 6, each half of the reservoir has a 30" drain, they join inside the Gate House, and the pipe diameter remains 30" all the way to Cesar Chavez & Division."*

[3] Accessed at engineeringtoolbox.com on June 9.

Appendix B – PWB tree policy

The Applicant provided MTNA three documents in response to our June 3rd request for the language of their tree policy. We are entering these documents into the record by way of their reference here:

- Standard Drawing No. P-845 "Tree Location and Root Barrier," effective 04April2011 (1 page)
- Portland Water Bureau Public Works Permit Process Manual 2010 (47 pages)
- Conduit Protection Requirements (3 pages)

We especially note:

- P-845 seems to allow trees with root barriers to be planted less than 10 feet from pipes
- Public Works Permit Manual 2010, pages 3-4, outlines a root barrier option than allows trees less than 10 feet from water mains

Appendix C – SHPO's response to the Applicant's appeal

Here are two significant responses from the State Historic Preservation Office (SHPO), to the Applicant's appeal of the HLC Decision. In the June mail, SHPO advises they may reverse the "No Adverse Effect" determination if the Applicant doesn't meet the 60-day limit called out in Condition B. In the March mail, SHPO rejects the Applicant's assertion that SHPO's finding negates the HLC's need to place Conditions on their Approval; they clarify authority; they clarify the requirements of their finding of "No Adverse Effect." YELLOW emphasis added by MTNA.

.....

From: ALLEN Jason * OPRD <Jason.Allen@oregon.gov>
Date: Monday, June 8, 2015 at 4:39 PM
To: "Carter, Tom" <Tom.Carter@portlandoregon.gov>
Cc: JOHNSON Ian * OPRD <Ian.Johnson@oregon.gov>
Subject: FW: Regarding SPHO letter to HLC

Hi Tom,

Below is the email I sent in January, regarding the SHPO's position on retention of water in the Mt. Tabor Reservoirs. To further clarify, our decision was based on the submission of the Water Bureau, which included agreement to keep water in them except for periods of cleaning and maintenance, these periods not to exceed 60 days per calendar year. That element was a key decision factor in our review, and if that cannot be met, we should re-consider our review result based on updated information on the periods of "downtime" that the reservoirs would be at less than historic operating level.

I'm hopeful that a solution can be found that would keep these reservoirs at operating level for the vast majority of the calendar year, so that at any given time, a visitor to the historic district stands an excellent chance of seeing these resources as they historically have been seen- with water in them at an appropriate level.

As the question of down-time is explored, please keep me advised, so that we can determine if we are maybe looking at an adverse effect, requiring a readdress of our earlier findings.

Cheers,
-Jason

Jason M. Allen, M.A.
Historic Preservation Specialist
Oregon State Historic Preservation Office
725 Summer St. NE Ste C; Salem, OR 97301
503.986.0579; Jason.allen@oregon.gov

.....

From: ALLEN Jason * OPRD <Jason.Allen@oregon.gov>
Date: Friday, March 20, 2015 at 12:46 PM
To: Stephanie Stewart
Cc: "Starin, Nicholas" <Nicholas.Starin@portlandoregon.gov>, "Carter, Tom" <Tom.Carter@portlandoregon.gov>
Subject: RE: response to appeal? SHPO# 14-0107

Hello Stephanie,

Thank you for attaching the appeal language. I appreciate your questions. The questions you pose below are relevant to all parties involved, and I have received similar questions from others. In order to provide the same information to all those involved, I have copied this email to Nicholas Starin from the Portland City Preservation Planner and Tom Carter from the City of Portland Water Bureau. Any one receiving this email should feel free to forward it to whomever may be interested.

First, to address the question of the parallel reviews, ours under state law, and HLC's under local ordinance. These two regulations and the regulatory bodies that are empowered by them (SHPO by the state law, and HLC by the local ordinance) are entirely different. It is almost universally the case that local regulation is more restrictive than state law, with more powers to intervene, regardless of the city or state we are discussing. In reality, the reviews should be different, otherwise they would be duplicative and a waste of time. If one accepts the theory that democracy is best served when the most specific laws are decided at the most local level possible, with state and federal laws being more general in their application, it follows that local preservation regulation would be more specific (and even more restrictive) than state law.

We would also point out that the City of Portland is a Certified Local Government, which is a federal program designed to encourage local oversight of historic preservation issues. To be a CLG, a city must have local preservation ordinances that are enforceable, have a historic landmarks committee that meets certain qualifications. The State's role in the CLG program is limited to providing funding pass-through funding and providing technical assistance and general support. We do not get involved in questions of application of, or results of local review. We also do not get involved in questions that are outside of our professional qualifications, such as local land use law. Because Portland is a CLG, we expect the HLC to reach decisions based on application of local ordinance, and not to be influenced by SHPO review of the same project under entirely different laws. It is expected that in some cases, SHPO review of a project may result in a finding of no adverse effect, while local review of the same project under local ordinance reaches a different conclusion. To suggest that State review should in any way impact, or trumps local review outcomes, is simply incorrect, and not supported by law or historic preservation best practice. They are two separate processes that should be allowed to play out independently.

Regarding the SHPO's position about water levels in the Reservoirs, our concurrence with a finding of No Adverse Effect was clearly contingent upon the project proponent following through with the scope of work provided to our office for review. Among those were the proposal (from PWB) that the reservoirs be maintained with water in them at normal operating depth, draining them only for routine maintenance and cleaning. This is reflected in my email to Eileen Brady, who also contacted our office with the same question. Here is a brief excerpt of my response:

> "Our office found no adverse effect based on the latest proposal from Water Bureau, which includes the retention of water in the reservoirs as a condition of approval. If the project does not result in the retention of water in the reservoirs, we would be able to re-open the case and find an adverse effect at that point. This has been made clear to Water Bureau, and is implicit in our finding."

With that having been said, if the HLC wishes to place further conditions on this to ensure that it is done, such as a limit on the number of calendar days in a year that the reservoirs can be empty, as has been proposed, that is their prerogative. With a fuller understanding of local issues, we trust the local review authority to make informed and appropriate decisions based on the authority granted them by local ordinance. The same is true with regard to PWB official acceptance of the 2009 report. If HLC feels it is important that this happen, our office trusts that decision.

Finally, I would like to be very clear that our office supports all processes, regulations, or projects that result in positive outcomes for the preservation of historic resources. While our role in influencing outcomes is limited by the regulations that empower our office, we would support any plan to restore, maintain, and preserve in perpetuity historic resources, regardless of our regulatory authority.

Cheers,
-Jason

Jason M. Allen, M.A.
Historic Preservation Specialist
Oregon State Historic Preservation Office
725 Summer St. NE Ste C; Salem, OR 97301
503.986.0579; Jason.allen@oregon.gov

Moore-Love, Karla

NOTE: ALSO SENT TO CLERK. SEE 6/11/2015 12:19PM email.

From: Adam, Hillary
Sent: Thursday, June 11, 2015 10:14 AM
To: Council Clerk – Testimony
Cc: Carter, Tom
Subject: FW: LU 14-218444 HREN - response from Appellant #2
Attachments: ResponseVFINAL June11_2015.pdf

Final comments from MTNA.

Hillary Adam
Bureau of Development Services
p: 503.823.3581

From: Stephanie Stewart [mailto:stewartstclair@gmail.com]
Sent: Thursday, June 11, 2015 10:01 AM
To: Adam, Hillary
Subject: LU 14-218444 HREN - response from Appellant #2

Please confirm receipt of this email, hand-delivery will be later today.

Via Email: hillary.adam@portlandoregon.gov

and Hand-Delivery

Hillary Adam, City Planner

City of Portland Bureau of Development Services

1900 SW Fourth Avenue, Suite #5000

Portland, OR 97201

Re: Mt. Tabor Reservoirs Disconnection

Site Address: 6325 SE Division Street (Mt. Tabor Park)

Case File: LU 14-218444 HREN

Dear Ms. Adam:

Enclosed please find 12 copies of the Mount Tabor Neighborhood Association's June 10, 2015, response to the May 28th hearing on this matter. Please include this in the record and for distribution before the Council hearing scheduled for June 25, 2015, at 2:00pm.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Stephanie Stewart

Mt. Tabor Neighborhood Association (MTNA) land use

stewartstclair@gmail.com

503-230-9364

Moore-Love, Karla

From: Stephanie Stewart <stewartstclair@gmail.com>
Sent: Wednesday, June 10, 2015 9:57 AM
To: Adam, Hillary; Moore-Love, Karla; Parsons, Susan
Cc: Ty K. Wyman
Subject: SHPO responds to PWB's challenge of Condition B's timeline

RE: Case # LU 14-218444 HREN

Dear Hillary Adam, Karla Moore-Love, and Sue Parsons -

Please enter this email thread into the record and distribute to the Mayor and Commissioners. The State Historic Preservation Office (SHPO) has responded this week to Water Bureau's challenge to Condition B's 60-day limitation on periods of below-level water for the reservoirs. SHPO informs Water Bureau that they, like HLC, expect water to be present at historic levels for 305 days a year.

Stephanie Stewart
MTNA land use

From: ALLEN Jason * OPRD <Jason.Allen@oregon.gov>
Date: Monday, June 8, 2015 at 4:39 PM
To: "Carter, Tom" <Tom.Carter@portlandoregon.gov>
Cc: JOHNSON Ian * OPRD <Ian.Johnson@oregon.gov>
Subject: FW: Regarding SPHO letter to HLC

Hi Tom,

Below is the email I sent in January, regarding the SHPO's position on retention of water in the Mt. Tabor Reservoirs. To further clarify, our decision was based on the submission of the Water Bureau, which included agreement to keep water in them except for periods of cleaning and maintenance, these periods not to exceed 60 days per calendar year. That element was a key decision factor in our review, and if that cannot be met, we should re-consider our review result based on updated information on the periods of "downtime" that the reservoirs would be at less than historic operating level.

I'm hopeful that a solution can be found that would keep these reservoirs at operating level for the vast majority of the calendar year, so that at any given time, a visitor to the historic district stands an excellent chance of seeing these resources as they historically have been seen- with water in them at an appropriate level.

As the question of down-time is explored, please keep me advised, so that we can determine if we are maybe looking at an adverse effect, requiring a readdress of our earlier findings.

Cheers,
-Jason

Jason M. Allen, M.A.
Historic Preservation Specialist
Oregon State Historic Preservation Office
725 Summer St. NE Ste C
Salem, OR 97301
503.986.0579
Jason.allen@oregon.gov

****My email address has changed! Please note the new email address in your email contacts list****

-----Original Message-----
From: ALLEN Jason * OPRD
Sent: Wednesday, January 07, 2015 12:55 PM
To: 'Eileen Brady'
Subject: RE: Regarding SPHO letter to HLC

Hello Eileen,

Our office found no adverse effect based on the latest proposal from Water Bureau, which includes the retention of water in the reservoirs as a condition of approval. If the project does not result in the retention of water in the reservoirs, we would be able to re-open the case and find an adverse effect at that point. This has been made clear to Water Bureau, and is implicit in our finding.

Jason M. Allen, M.A.
Historic Preservation Specialist
Oregon State Historic Preservation Office
725 Summer St. NE Ste C
Salem, OR 97301
503.986.0579
Jason.allen@oregon.gov

****My email address has changed! Please note the new email address in your email contacts list****

-----Original Message-----
From: Eileen Brady [mailto:eileen@journey21.com]
Sent: Wednesday, January 07, 2015 12:34 PM
To: ALLEN Jason * OPRD
Subject: Regarding SPHO letter to HLC

Dear Jason,

I am a Mt Tabor Park neighbor in Portland and have been closely following the Historic Landmark Commission process. I understand that you have just sent a letter indicating that the current project proposed by the Portland Water Bureau has little or no historic impact to the Park for the above ground resources.

While I respect your decision, I have one request.

Would it be possible for you and your team to clarify to the HLC your opinion on maintaining water in the reservoirs as part of maintaining the historic character in the park. I understand you are supportive of this, but it was not in the letter. This would help the Commission clearly support a condition for maintaining water in the reservoir.

So, I was hoping you could send an addendum or update to you letter clarifying this point. Some think this is an obvious point but others do not. While the water itself is not historic, the vistas created by water in the reservoirs are. This has not been clarified by case law and may be challenged going forward.

Thanks for you concern and attention,

Eileen Brady
1242 SE 60th
Portland, OR 97215
eileen@journey21.com

Parsons, Susan

From: Adam, Hillary
Sent: Tuesday, June 09, 2015 12:32 PM
To: Council Clerk – Testimony
Subject: FW: for record, LU 14-218444
Attachments: P-845, effective 04April2011.pdf; PWB Drevelopers manual.pdf; CONDUIT PROTECTION REQUIREMENTS.pdf

Please forward to City Council.

Hillary Adam
Bureau of Development Services
p: 503.823.3581

From: Stephanie Stewart [mailto:stewartstclair@gmail.com]
Sent: Tuesday, June 09, 2015 12:06 PM
To: Adam, Hillary
Subject: for record, LU 14-218444

Hillary Adam-

Please enter into the record for case # LU 14-218444 this email thread and the three attached documents.

Thank you,
Stephanie Stewart
MTNA land use

From: "Elliott, Teresa" <Teresa.Elliott@portlandoregon.gov>
Date: Sunday, June 7, 2015 at 10:25 PM
To: Stephanie Stewart, John Laursen, Steven Wax
Cc: "Shaff, David" <David.Shaff@portlandoregon.gov>
Subject: RE: info requested

Here's some information on the clearances from trees. I think there is more. If I can find it I will send it.

From: Elliott, Teresa
Sent: Friday, June 05, 2015 10:06 PM
To: 'Stephanie Stewart'; John Laursen; Steven Wax
Cc: Shaff, David
Subject: info requested

Hi Stephanie, John and Steven,
Here are some of the documents requested.

Discharge permits - Discharges to BES sewers are regulated by three permits – discharge permit for draining, discharge permit for cleaning, and their DEQ NPDES permit. The city regulates the first two and DEQ regulates

the last. I have included the permit policies from BES and some of the actual permits they issued previously to PWB for draining and cleaning.

Pipe sizes – here's some preliminary information – though I have asked for them to give me the sizes all the way to the river and to tell me maximum allowable discharges and constraints and limitations that effect the discharge rates. I will send that information as soon as I can.

a. Res. 1, the drain pipe is 20", then increases to 30" near 60th & Division.
b. Res. 5, the drain pipe is 24", then it joins a 30" pipe in 60th.
c. Res. 6, each half of the reservoir has a 30" drain, they join inside the Gate House, and the pipe diameter remains 30" all the way to Cesar Chavez & Division.

I'll send the docs about the tree clearances as soon as I find them.

I gave you Wednesday copies of the other docs submitted since we filed our appeal. These are also posted on the auditor's website under the council hearing agenda item for May 28th.

Teresa

From: Stephanie Stewart
Date: June 1, 2015 at 6:57:39 PM PDT
To: "Shaff, David" <David.Shaff@portlandoregon.gov>
Cc: John Laursen, StevenWax
Subject: meeting prep

Hello David -

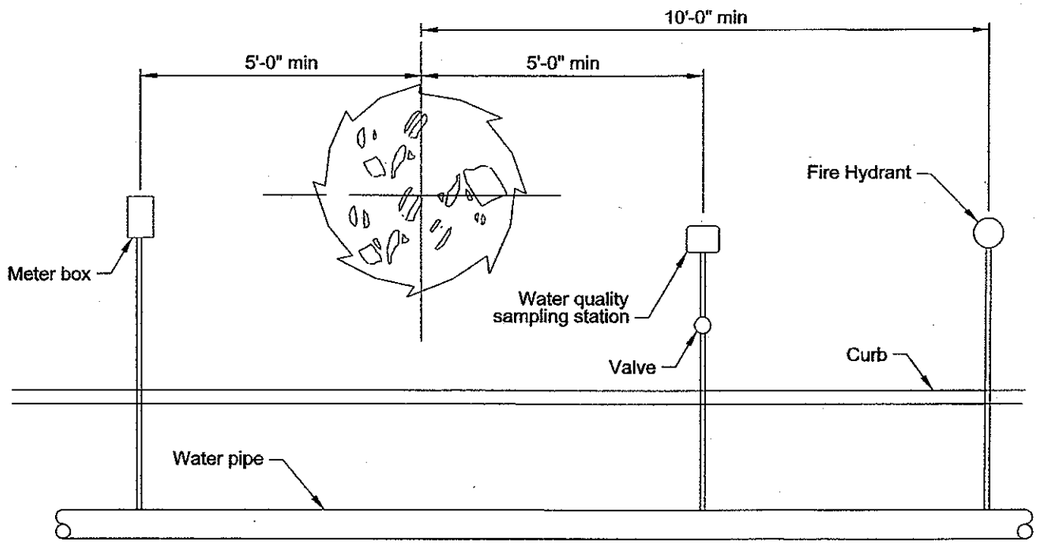
We are looking forward to our meeting Wednesday. If you decide that Gatehouse 5 isn't quite ready for guests, just let us know and I'll make my dinning room table the fall back location. To make our meeting productive, we are asking that you come prepared with a few items. Here they are:

1) Permit language for the BES and DEQ permits that determine the flow rates of water leaving Tabor's reservoirs, for the sewer or storm system.

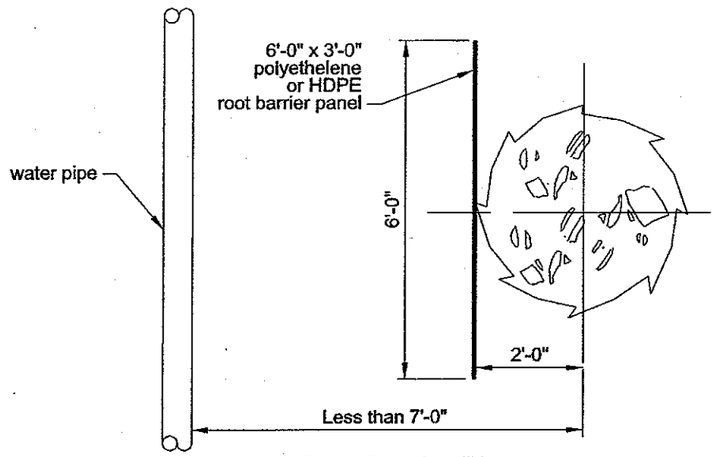
2) Pipe sizes for the following pipes:
Pipes allowing water to flow from one reservoir to another
Drain pipes to sewer system, at each reservoir
Drain pipes to storm water system, at each reservoir
Outlet pipes to distribution system/drinking taps, at each reservoir
Any other outlet pipes, at each reservoir

3) All of the items PWB entered into the record since Feb 26, 2015.

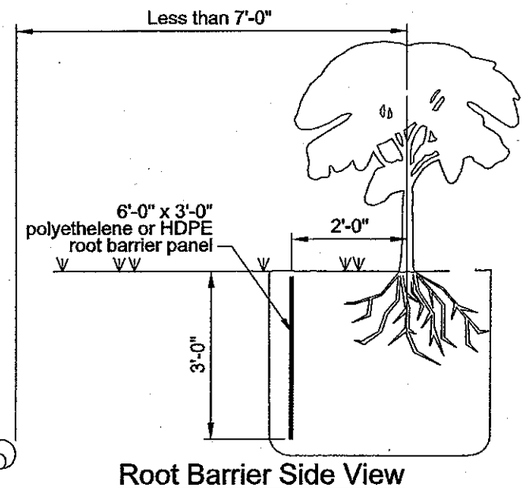
Thank you!
Stephanie Stewart
MTNA land use



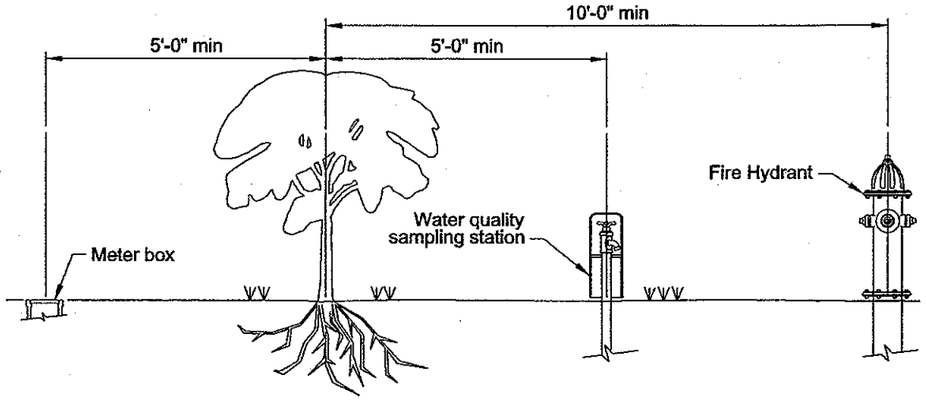
Tree Location: Plan



Root Barrier Plan



Root Barrier Side View



Tree Location: Side View

Note:

1. Root barrier installation required when new trees will be planted less than seven feet from the outside diameter of a water pipe.
2. Trees shall not be planted within the limits without approval by PWB:
   a) Five feet minimum from water pipe, water service pipe and meter, and water quality sampling station.
   b) Ten feet minimum from a fire hydrant assembly and run.
3. Where installed trees are an exception to the City Forester's approved tree list, a root barrier will be required for trees planted 5' to 10' from the outside diameter of the existing water main.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

PORTLAND WATER BUREAU
CITY OF PORTLAND, OREGON

Chief Engineer

Standard Drawing Title

Tree Location and Root Barrier

Note:
All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.

Effective Date	April 4, 2011
Calc. Book No.	PWB 1
Baseline Report Date	April 4, 2011

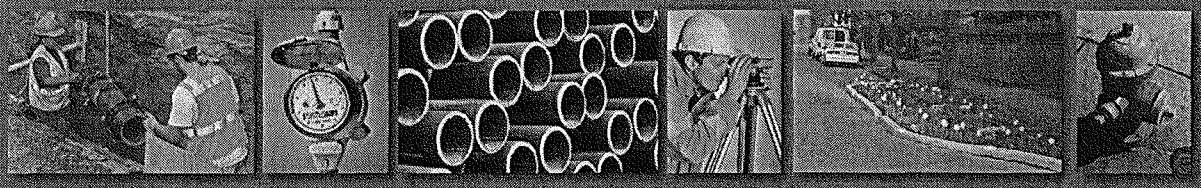
Standard Drawing No.

P-845

PORTLAND WATER BUREAU

Public Works Permit Process Manual 2010

Design and Construction of Water Systems for New Residential and Commercial Subdivisions



PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Portland Water Bureau Development Services

1120 SW 5th Avenue, Room 600 • Portland, OR 97204-1926
Website: portlandoregon.gov/water
Phone: 503-823-7368 • FAX: 503-823-7743

Randy Leonard, Commissioner • David G. Shaff, Administrator

TABLE OF CONTENTS

List of References and Forms

All URLs were current as of publication, and are subject to change.

Portland Water Bureau

Backflow Assembly Installation Requirements
http://www.portlandonline.com/shared/cfm/image.cfm?id=41917
Columbia South Shore Wellhead Protection Program
http://www.portlandonline.com/water/index.cfm?c=29890
Green Streets Review Flowchart
http://www.portlandonline.com/shared/cfm/image.cfm?id=169103
Standard Drawings and PDF sample of developer plans

P-700 P-720 P-730
P-740 P-750 P-755
P-760 P-765 P-770
P-780 P-805 P-810
P-815 P-910 P-915
P-930 P-935

For questions on sample plans, contact Gary Egan, CAD Services, 503-823-5584.

Materials Manual and Material List
http://www.portlandonline.com/water/index.cfm?c=29862&
Statement of Conditions for Use of Water Facility Easement (Water Facilities Easement)
http://www.portlandonline.com/shared/cfm/image.cfm?id=169124
Water Meter Sizing Tool
http://www.portlandonline.com/water/index.cfm?c=30501

City of Portland

City Code Title 21 Section 21.080.020 (City Auditor)
http://www.portlandonline.com/auditor/index.cfm?c=28185
2008 Erosion and Sediment Control Manual (Bureau of Environmental Services)
http://www.portlandonline.com/bes/index.cfm?c=43428
Green Street Detail Drawings (Bureau of Environmental Services)
http://www.portlandonline.com/bes/index.cfm?c=48417
2007 Edition of the Standard Construction Specifications
Select link; use PDF search feature to find individual specifications
http://www.portlandonline.com/transportation/index.cfm?c=40032
List of Franchises (Cable/Franchise Management)
http://www.portlandonline.com/cable/index.cfm?c=33150

State of Oregon

Oregon Administrative Rules 333 (Department of Human Services, Public Health Division)
http://arcweb.sos.state.or.us/rules/OARs_300/OAR_333/333_tofc.html
OAR 333-061-0050 Construction Standards
http://arcweb.sos.state.or.us/rules/OARs_300/OAR_333/333_061.html
OAR 340 (Department of Environmental Quality)
http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_tofc.html
OAR 952-001 (Oregon Utility Notification Center)
http://arcweb.sos.state.or.us/rules/OARS_900/OAR_952/952_tofc.html
Oregon Secretary of State Business Office

http://egov.sos.state.or.us/br/pkg_web_name_srch_inq.login

Document Navigation Tips

Organization of document cover
The cover has bookmarks for the Table of Contents and each chapter, allowing the reader direct access to content.

The Table of Contents includes a List of References and Forms. This list is organized by governmental agencies. It includes descriptions and links to Portland Water Bureau website, City of Portland website, and State of Oregon websites.

Document Display
The default for page layout is to display the Bookmarks Panel and page. Readers can hide the bookmarks. Display size has been set at 90 percent.

Bookmarks are located on the left side panel of the document. They are tabbed like a table of contents, and when clicked will take you directly to the chapter or heading you wish to view. Internal bookmarks have been limited to Level 2 Subheadings, e.g., Section 1.1 Introduction to the Developer's Manual. You may expand or collapse the list of bookmarks by clicking on the positive or negative symbol at the beginning of each entry.

Links take the reader to an internet site. In addition to links within the Developer's Manual, there is a List of References and Forms on Page ii of the Table of Contents.

Navigation controls are located on the bottom panel of your page. The basic blue arrows < > can help you quickly move from page to page, the <I I> arrows will move you to the very first or very last page of the entire document. The arrows in **green circles** will move you to the page you most recently visited, in either direction. This feature can help you a great deal when navigating between different areas of the document. Between the arrows, where the page information is available, you may click your cursor and enter the page number you wish to view to go directly to a specific page number.

Search the entire document quickly for a word or a phrase by clicking on the "binoculars" icon on the upper toolbar.

CHAPTER 1 - GENERAL INTRODUCTION

1.1 INTRODUCTION TO THE PUBLIC WORKS PERMIT PROCESS MANUAL

1.1.1 Purpose:

The Portland Water Bureau has produced the Public Works Permit Process Manual to aid in the design and construction of water systems for new residential and commercial subdivisions. The manual is intended to:

- Acquaint developers with the process to construct a water system within a new subdivision.
- Provide developer's consulting engineer with pertinent information necessary to aid in the design of the water system to Portland Water Bureau Standards.
- Inform developer's contractor of the minimum requirements to construct the water system.

City of Portland City Code Title 21 Section 21.08.020 allows for the developer of a new residential or commercial subdivision to design and construct the water mains and appurtenances within the limits of the subdivision. In order to design and construct the water system, the developer must petition the Portland Water Bureau Administrator. The Administrator may approve the petition if the Chief Engineer accepts the plans and if the developer pays for the cost of installation, connection to the live system, and inspection. Connection to the city water system is made by the Portland Water Bureau upon satisfactory

completion and acceptance of all required work.

All water main extensions within existing public rights-of-way necessary to provide water to a new subdivision shall be constructed by the Portland Water Bureau at the expense of the developer. However, if the cost of the installation within the existing public right of way is less than $125,000, costs shall be shared under standards developed in Title 21 Section 21.08.02B. Typically, the Portland Water Bureau will also complete the design for the water main construction proposed in existing rights-of-way at the expense of the developer. However, on a case by case basis, the Portland Water Bureau may allow the Developer to employ a Design Engineer to design construction plans.

1.2 Definitions and Project Participant Responsibilities

This section identifies and defines the various participants involved in the design and construction of water systems for new subdivisions.

1.2.1 Administrator:

The Administrator refers to the person in charge of the Portland Water Bureau, or the Administrator's designee.

1.2.2 Developer:

The Developer is the initiator of the proposal to construct a public water system within a new subdivision. The Developer must employ a Design Engineer to prepare the water system plans, employ a licensed Contractor to construct the water system, pay any fees for review of plans and for construction-related activities, grant any easements required, and transfer ownership of the water system to the Portland Water Bureau after completion and acceptance of the work. The Developer may also be required to pay for the extension or upsizing of the public water system to deliver water to the subdivision site.

1.2.3 Design Engineer:

The Design Engineer is employed by the Developer to prepare plans for construction of the water system within the subdivision and must be a professional engineer currently registered in the State of Oregon with water system design experience. The Design Engineer must design and prepare the water system construction plans in accordance with Portland Water Bureau design and drafting standards and Oregon Administrative Rules 333. During the review process, the plans are to be modified to reflect changes in design, and correct errors and omissions per the review comments of the Portland Water Bureau Project Engineer. The plans, prior to acceptance by the Portland Water Bureau, must bear the stamp or seal of the Design Engineer.

The Developer may designate the Design Engineer or a designee as his representative during the preconstruction, construction and post construction phases of the project.

1.2.4 Contractor:

The Contractor is employed by the Developer to install the water system. The Contractor must be licensed in the State of Oregon. The Contractor must install the water system in accordance with the accepted construction plans and specifications and must comply with all Portland Water Bureau, City of Portland, State of Oregon and Federal standards and regulations when doing the work. The Contractor must perform and satisfactorily pass all testing required as outlined in Chapter 5 of this manual. The Contractor must coordinate project work with the Portland Water Bureau Inspector, who will inspect and observe the work and be present at all tests, as required.

1.2.5 Portland Water Bureau Personnel:

Project Engineer:

The Project Engineer reviews the plans submitted by the Design Engineer to assure that the subdivision water system is designed in accordance with all applicable codes and standards, reviews and accepts all the material submittals proposed for use on the project, oversees the construction, reviews and approves any changes to the accepted plans and accepts the water system as completed when all requirements have been met.

Principal Engineer:

The Principal Engineer, a Licensed Professional Engineer, oversees the Portland Water Bureau's Development Services or Design Services Operations, signs the plans, accepting them as complying with the standards of design and drafting. The Principal Engineer may delegate this responsibility to a Supervising Engineer. This signature is made prior to signature of the Chief Engineer.

Chief Engineer:

The Chief Engineer, a Licensed Professional Engineer, is in charge of the Portland Water Bureau engineering staff. The Chief Engineer is responsible for establishing, maintaining, and enforcing engineering and technical standards for design and construction of the water system. In terms of Developer Main construction plans, the Chief Engineer reviews and signs the plans, thereby accepting them as complying with the standards of the Portland Water Bureau. The Chief Engineer may delegate this responsibility to a Principal Engineer. This signature is made after the plans have been signed by the Principal Engineer and the Inspect/Connect Fee Statement payment is submitted. The plan set that is signed by the Chief Engineer is termed the "Accepted Plans" and is the set to be used for construction purposes.

Inspector:

The Portland Water Bureau Inspector coordinates with the Project Engineer for subdivision water system installations. The Inspector works directly with the Contractor to assure that the new water system is installed in accordance with the accepted plans and with applicable

standards and regulations. The Inspector will examine all materials to be used in the construction of the new water system, observe the construction, is present when tests are conducted, administer other tests as necessary, and verify that the "as-constructed" plans kept by the Contractor are accurate. Inspectors have the authority to reject work or faulty materials. The time that the Inspector spends on the project is directly related to the level of competency of the Contractor, the complexity of work, and the amount of time it takes the Contractor to complete the work. Inspection time affects the final cost to the Developer.

Maintenance and Construction Services Group:

The Maintenance and Construction Services Group connects the new subdivision water system to the existing public water system upon written notification by the Portland Water Bureau Project Engineer. The Maintenance and Construction Services Group shall perform all installation work within the existing public right-of-way and any connections to the existing live water system per City Code 21.08.020.

1.3 LOCAL WATER PROVIDERS AND UTILITY COMPANIES

1.3.1 Local Water Providers

The following is a list of local water providers that may be impacted by the Developer's project. The Developer shall work with the Portland Water Bureau to determine if these districts should be contacted by the Developer.

Burlington Water District	503-621-9788	
Clackamas River Water District	503-722-9220	
City of Gresham	503-618-2525	
City of Lake Oswego	503-635-0393	
City of Milwaukie	503-659-5171	Ext. 35
City of Tigard	503-639-3516	
City of Tualatin	503-642-1511	
GNR Water Company	503-668-8613	
Green Valley Water Company	503-936-7876	
Hideaway Hills Water Company	503-826-1404	
Lake Grove Water District	503-636-1617	
Lusted Water District	503-663-3059	
Sunrise Water Authority	503-761-0220	
Palatine Hill Water District	503-636-8420	
Pleasant Home Water District	503-663-1091	
Raleigh Water District	503-292-4894	
Rockwood Water PUD	503-665-4179	
Skyview Acres Water Company	503-761-0220	
Tualatin Valley Water District	503-642-1511	
Two Rivers Water Association	503-668-6926	
Lorna Water Company	503-846-8977	

West Slope Water District	503-292-2777
Valley View Water District	503-642-1511

1.3.2 Local Utility Companies

The Developer shall contact and notify all local utility companies that might be impacted by their project and shall be responsible for all utility locates on the project site. For the most current list of utility franchises available and to find contacts for them, you may visit the following link: List of Franchises

The Developer is required by law to contact the One Call Utility Locate Service at 1-800-332-2344 or "811".

CHAPTER 2 –PLAN REVIEW PROCESS

2.1 REVIEW PROCESS "AT A GLANCE"

PROCESS SUMMARY FOR DEVELOPER DESIGNED AND INSTALLED WATER SYSTEMS

The Developer and the Contractor must consider time requirements when scheduling the design and construction of the subdivision water system.

Review Process	Maximum turnaround timelines (business days)
Public Works Inquiry & 30% Review:Following the Public Works inquiry meeting, the Design Engineer shall submit six sets of plans with $1000 (check or VISA/MC accepted) plan review fee (check made out to the Portland Water Bureau) to the Public Works Project Group at the Bureau of Development Services office, 1900 SW 4th Ave, Portland, OR 97201 for initial plan review. Plans and payment may be mailed or delivered in person. The Water Bureau Project Engineer will review the plans and return one set of plans with redline comments to the Design Engineer.	7 days for minimum engineering acceptability of plans for each review; plans returned to applicant at or before interbureau review meeting scheduled in accordance with public works process timelines
Plan Reviews (60%, 90%): The Design Engineer is responsible for making corrections noted in the redline comments and resubmits one set of plans along with the redline plans for subsequent plan review to the Portland Water Bureau. The Portland Water Bureau Project Engineer will provide subsequent comments within the time frame indicated. When notified by the Project Engineer that the plans meet the Portland Water Bureau's design and drafting standards, the Design Engineer submits one set of Mylar plans trimmed to 22" X 34".	7 days for minimum engineering acceptability of plans for each review, plans returned to applicant at or before interbureau review meeting scheduled in accordance with public works process timelines
Mylars: Upon receipt of the Mylar plans, the PWB Principal Engineer signs the Mylars, accepting them as complying with the standards of design and drafting. The Water Bureau Project Engineer will then prepare the "Inspect/Connect Fee Statement" and will mail, email, or FAX a copy of the estimate to the Developer within 7 days.	7 days
Payment: Upon receipt of payment of the Inspect/Connect Fee, The Portland Water Bureau Chief Engineer signs the Mylars, which are then sent out for reproduction.	7 days
Street Opening Permit: The Portland Water Bureau then obtains a Street Opening Permit from the Portland Bureau of Transportation. A duplicate set of the approved Mylar plans will be provided to the Developer and/or the Design Engineer once the Street Opening Permit is obtained. .	7 days
Submittals: Material submittals are submitted to the Portland Water Bureau Project Engineer for review. Submittals not meeting the minimum standards will be returned for correction and resubmittal.	3 days per submittal
Preconstruction Meeting: The Contractor shall contact the Portland Water Bureau Inspector at least 5 days prior to beginning construction to schedule an on-site preconstruction meeting. The meeting shall take place at least 3 days prior to beginning work.	Schedule 5 days in advance

2.2 REVIEW PROCESS IN DETAIL

The Portland Water Bureau plan review process will progress in conjunction with the Bureau of Development Services Public Works Permitting Process.

The plan review process serves to identify the source of water to the subdivision, the flow demands within the subdivision, the design and drafting criteria, and associated Portland Water Bureau fees.

The Portland Water Bureau allows the Developer of a proposed subdivision to have a consulting engineer (the Design Engineer) design the water system for the subdivision and then to have the water system installed by a Contractor. The following describes the process for the review and acceptance of the water system subdivision plans.

2.2.1 Public Works Inquiry Meeting:

Typically for a proposed subdivision project, applicants will need to request a "Detailed Consultation" inquiry meeting in order to consult with each public works bureau regarding project specific requirements. At that meeting, the Water Bureau Project Engineer discusses the availability of water supply to the subdivision and a general description of the minimum water system requirements within the subdivision. Specific discussion is directed to any special requirements that are known at that time. The general review process is communicated to the Developer and the Design Engineer. The Design Engineer will be provided a checklist for minimum engineering acceptability of plans.

Following the public works inquiry meeting, the Design Engineer is encouraged to contact the Portland Water Bureau Project Engineer for more detailed discussion on the design criteria for the water system. Please refer to Chapter 8 for standard water system details, general notes and drafting symbols.

2.2.2 30% Concept Development, 60% Design Development, 90% Plan Review:

When the Design Engineer has prepared the subdivision water plans to minimum engineering acceptability, they may be submitted for review in accordance with the submittal & drafting standards as outlined in the City of Portland 30%, 60%, & 90% permitting documents. The Design Engineer shall submit six (6) sets of plans to the Public Works Project Group at the Bureau of Development Services Building 1900 SW 4th Ave., Portland, OR 97201. The plans must be accompanied by a check (or VISA/MC payment) made out to the Portland Water Bureau for $1000 or an amount specified by the Project Engineer. The $1000 deposit will be applied toward the fixed review fee; the amount of which will be provided to the Developer following the 30% Concept Development review phase.

At this stage, the plans will be distributed to the assigned Project Engineer, the Design Section, Inspection, Planning, Maintenance, and Construction Services groups within the

Portland Water Bureau for review and comment. The plans are also sent to the Portland Fire Bureau for review and comment.

If the Project Engineer determines that the plans are not in general conformance with Portland Water Bureau standards for drafting and/or design (minimum engineering acceptability) and they are not ready to be distributed for initial review, the plans will not be reviewed. A meeting between the Design Engineer and the Project Engineer will be scheduled to discuss pertinent issues and the plans will be returned to the Design Engineer.

At each stage of the review process (30%. 60%, 90%), please allow one week for city staff to review for minimum engineering acceptability of the plans. Review meetings will then be coordinated and scheduled in conjunction with other City bureaus in accordance with public works process timelines. One set of plans with redline comments will be returned to the Design Engineer with each review.

The review will focus on the following bulleted elements:

- Drafting must conform to Portland Water Bureau Drafting standards (Chapter 8)
- Design must conform to the City of Portland Standard Construction Specifications and its most current revisions.
- Design must conform to the Water Bureau's design standards with respect to the following issues:

    1. Size of mains
    2. Horizontal and vertical alignment
    3. Number and location of valves and fire hydrants
    4. Location of services
    5. Horizontal and vertical clearances between water mains/services and other utilities, structures, and trees
    6. System water pressure in acceptable range
    7. Location and size of pressure regulators
    8. Location and size of pumps
    9. Joint restraint; all joints must be restrained
    10. Proper call-outs/notation
    11. Specialty design requirements if development is located near existing or proposed light rail or streetcars.
    12. Cathodic protection requirements.
    13. Possible contaminated soil or groundwater conditions.
    14. Any additional project specific design requirements as applicable.

- Water facility easement related issues and facilitation of easement dedication process

2.2.3 Mylar Submission :

When the water system plans for the subdivision meet the design and drafting standards of the Portland Water Bureau as determined by the Project Engineer, the Design Engineer shall submit one (1) set of Mylar plans (with Design Engineer's PE Stamp) to the Portland Water Bureau. These plans will be signed by a Portland Water Bureau Principal Engineer or his/her designee. The Mylar plans must be trimmed to 22 inches x 34 inches.

2.2.4 The Inspect/Connect Fee Statement:

After the initial Mylar plans are signed by a Principal Engineer, the Project Engineer will prepare a fee statement to *inspect* the construction and to *connect* the subdivision water system to the existing public water system (this cost is called the "Inspect/Connect Fee Statement"). The "inspect" portion of the fee statement will be based on a time and materials billing and includes fees for Water Bureau inspection and project management services. For the "connect" portion of the fee statement, the Portland Water Bureau will cover 40% of the estimated fee (the fee for this portion of work must not exceed $125,000 for cost sharing provision to apply) and the applicant will pay the balance of the fee (60%). The "connect" fee is firm for which there will be no further billing/refund and is based on anticipated Water Bureau crew labor, equipment, and materials. Final accounting between estimated and actual costs of the "inspect" fees will be billed/refunded after the work has been completed and accepted by the Portland Water Bureau.

Preparation of the Inspect/Connect Fee Statement requires a maximum of seven (7) business days to prepare and will be sent to the Developer or his designated representative. On request to the Portland Water Bureau Development Services Office, (503) 823-7368, the fee statement can also be transmitted by FAX or e-mail.

Please note that Portland Water Bureau staff will not sign off on the final subdivision plat until the Inspect/Connect Fee Statement and all plan review fees have been paid.

2.2.5 Payment and Street Opening Permit:

When payment has been received for the Inspect/Connect Fee Statement, the Chief Engineer signs the Mylar plans as "Accepted For Construction." The plans are then sent out for printing and reproduction. The time for signature and reproduction is seven (7) business days.

Upon receipt of prints, the various copies are distributed with three (3) sets going to the Portland Bureau of Transportation along with a request for a Street Opening Permit. The Street Opening Permit will be returned within seven (7) business days.

A duplicate Mylar set of the approved plans will be provided to the Developer or his/her designee that may be used to generate copies for the Contractor. A letter outlining the preconstruction and final project acceptance requirements will be provided to the Developer with the Mylar drawings.

Considering the combined elements of the approval process, it could require up to a maximum of ten (10) business days from the time payment for the Inspect/Connect Fee Statement is submitted

until the Street Opening Permit is issued. **The Developer and the Contractor must consider this time requirement when scheduling construction of the water system.**

Before construction can begin, the Contractor must meet pre-construction requirements. The Project Engineer will inform the Developer and the Contractor of those requirements following acceptance of the plans. Please refer to Chapter 5 for pre-construction requirements and final project acceptance guidelines.

2.3 Public Works Appeals Process

The Public Works Permitting Process now offers a coordinated appeals process. The rules and procedures for this process are managed by the Public Works Permit Engineering Manager in the Bureau of Transportation. The appeal process is a two step process: Level 1 Public Works Administrative Appeal Panel and Level 2 Public Works Appeal Board.

Level 1 consists of the Development Division Managers of the Bureaus of Transportation, Environmental Services, and Water and one representative from the DRAC and one from the Citywide Land Use Group. Level 2 consists of the City/Chief Engineers from the Bureaus of Transportation, Environmental Services and Water. There is a $200 fee associated with each appeal.

For additional information regarding this process and necessary forms, please contact Christopher Wier 503-823-7227.

CHAPTER 3 –DESIGN GUIDELINES

3.1 UTILITY INVESTIGATION AND COORDINATION

3.1.1 General

To properly design the water system, it is essential that the location of the water main be coordinated with the other existing and proposed utilities, as well as proposed street alignment and profiles. If there are no existing utilities in the proposed street, the water system must be designed in conjunction with any other utilities that are to be installed with the water system as a result of the proposed development. Reference City of Portland Standard Drawing 3-60 (Standard Utility Locations) and 3-61 (Underground Utility Locations) for standard utility locations.

3.1.2 Investigation and Coordination

It is the responsibility of the Design Engineer to investigate the location of existing and proposed underground utilities during the design process per Oregon State Law, Oregon Administrative Rules 952-001. Contractors are required to "call before you dig" Oregon Utility Notification Center 1-800-332-2344 or "811". The investigation should also include at a minimum, the following tasks:

1. Request utility location marking prior to survey. Location of utilities for field marking should be accomplished by evidence obtained in the field rather than by measurements taken from records.
2. A field exploration of the proposed waterline route to look for surface indications of existing utilities that may need to be marked or potholed for establishment of the location by the surveyor.
3. Instruct the surveyors to document the locations and/or elevations of all utilities which are found, marked or potholed. Surveyors should document all poles, wires, manholes, meters, CIV's, hydrants, and any other surface indication of other utilities which are in the potential work area.
4. Potholing may be required in critical locations. Prior to potholing, proof of insurance, a performance bond, and a street opening permit must be obtained and approved by the Portland Water Bureau and the Portland Bureau of Transportation.

Incorporate information obtained on existing utilities into the water system plans. For projects with no existing utilities, design the water system in conjunction with the other utilities according to the standards set forth in this chapter.

3.2 DESIGN GUIDELINES

3.2.1 General

A. Scope:

This chapter provides design requirements for 4-inch, 6-inch, 8-inch, 12-inch , and 16-inch distribution mains. It is a compilation of key points from numerous City documents pertinent to the design of water mains intended for development projects.

B. Published References:

- City of Portland Construction Standards
- Oregon Administrative Rules (OAR Chapter 333)
- Portland Water Bureau Material Manual and Material List
- Erosion Control Manual by the Bureau of Development Services in conjunction with the Bureau of Environmental Services, the Portland Bureau of Transportation and the Portland Water Bureau.

3.2.2 Hydraulic Analysis

A. Fire Flows:

For residential and commercial/industrial developments, the water system shall be designed to provide the minimum required flow to the fire hydrants as required by the Fire Bureau. Residential areas zoned R5, R7, R10, R20 require a minimum flow of 1250 gallons per minute (gpm). For project locations in urban wildfire interface areas, the minimum fire flow requirement is 1750 gpm. For site specific fire flow information please contact 503-823-1408 or submit the following fireflow information request form. FIRE FLOW REQUEST FORM Please submit the form as an email attachment to fireflow@ci.portland.or.us or fax form to 503-823-4117.

B. Service Pressures:

Service pressure for all customers should be within the range of 40 to 110 psi. The minimum acceptable service pressure is 20 psi (under all conditions including fireflows). If the pressure to a service is within the range of 20 psi to 40 psi, the customer may want to install a booster pump system to improve operation of the private plumbing system. The Uniform Plumbing Code requires a pressure reducing valve (PRV) if service pressure exceeds 80 psi. PRVs are to be installed on the property side of service meters and are owned, installed, and maintained by the property owner. In accordance with the Oregon Plumbing Specialty Code, each regulator and strainer shall be located aboveground or in a vault with a properly sized and sloped bore sighted drain to daylight. A PRV assembly and vault that limits pressure in the main is generally required when the system pressure exceeds 110 psi.

C. Network Analysis:

A system impact hydraulic analysis will be done by the Portland Water Bureau prior to the acceptance of plans. The analysis will be done at the time of the Initial Plan Review. The sizes and lengths of mains and requirements for PRVs may be revised as a result of the analysis.

3.2.3 Site Layout and Water Main Design

A. Pipeline Layout:

1. All water mains shall be located within the public right-of-way or on exception, in an easement as approved by the Chief Engineer. For additional information regarding easements, please refer to Chapter 7.
2. Water mains are typically located on the south or east side of a street and 6 feet from the existing or proposed curb in 28-foot and wider streets (4-foot minimum in 20-foot to 26-foot wide streets). The dimension is measured from centerline of the pipe to face of curb. Do not locate water mains in median strips or planter areas. For water mains installed less than 10 feet from street trees, a root barrier per Standard Drawing RD-286 is required.
3. If the new main is being installed in a street that will be extended in the future, the main shall end 5 feet short of the end of the street.
4. Mains shall be planned to be compatible with anticipated future improvements.
5. When specifying the location of other utilities within a development, the Design Engineer shall provide adequate clearance in both the horizontal and vertical plane to allow for the installation of water services by the Portland Water Bureau. This is especially important in commercial or industrial developments where large vaults for water services could be required. See Section H of this Chapter, Separation Distances to Other Utilities.
6. The minimum distance between a bend and face of curb shall be 3 feet when a horizontal bend is to be installed at a curve in the street.
7. When designing a main in a cul-de-sac, extend the main to 12 feet from the curb at the bulb of the cul-de-sac. The design shall include the installation of a 2-inch blow off at the end of the main.
8. Piping shall be networked where possible to avoid dead-ends.

B. Connections to Existing Mains:

1. The Portland Water Bureau will connect newly accepted subdivision water mains to the public water system.
2. The Contractor shall install water mains up to a point 10 feet from the planned Portland Water Bureau connection location (but not past private property into the right of way). Where this is not possible or practical the Contractor shall end installation of the water main as directed by Portland Water Bureau Project Engineer.
3. Typical connection types to existing mains will consist of the following:

Existing Main	Typical Connection
≥ 4 inch Steel	Cut in tee or welded tapping saddle and install isolation joint
≥ 4 inch ductile iron	Cut in tee or tapping sleeve and valve
≥ 4 inch cast iron	Cut in tee

4. Provide minimum horizontal 5 feet clearance between existing fittings and the connection point.

5. Install restrained MJ caps which are tapped for 2 inch pipe at the ends of mains where the Portland Water Bureau is to make a connection. Caps are to be used on pipe ends and plugs are to be used on valves and other MJ fittings. All joints, pipe, fittings, valves, hydrants, bends etc. are to be fully restrained along the entire length.
6. When a proposed main is to connect to an existing main at an angle other than 90 degrees, at a point 5 feet from the existing main the proposed main shall deflect at an angle such that it will create an alignment perpendicular to the existing main.

C. Pipe Cover: (distance from top of pipe to finished grade of street)

The depth of a water main shall be designed at the minimum required pipe cover as indicated below. Pipe cover may be increased at specific locations if necessary in order to avoid other utilities or obstructions.

1. Provide minimum pipe cover of 36" (3') for mains 8" diameter and smaller.
2. Provide minimum pipe cover of 42" (3.5') for mains 12" in diameter.
3. Provide minimum pipe cover of 48" (4') for mains 16" in diameter and larger.
4. Provide minimum pipe cover of 42" (3.5') for mains 12" and smaller in arterial streets and streets with anticipated heavy truck/bus traffic.
5. For unimproved streets, the Portland Bureau of Transportation will review future street grades designed by the Design Engineer and all proposed water mains shall be profiled as follows: 42" (3.5') minimum cover for 10" diameter and smaller, 48" (4') minimum cover for 12" diameter mains, and 60" minimum cover for 16" diameter mains. All the above are measured below proposed finish grade at the pipeline.

D. Pipeline Deflection:

1. General:
   Joint deflections shall be no more than 80% of maximum allowable deflection per manufacturer's specifications.

   When using a manufactured bend fitting, provide a note on the construction plans that indicates the standard fitting to be used (11¼°, 22½°, 45° or 90°) with the actual deflection (RT or LT) in degrees

2. Horizontal:

   Minimize bends by utilizing deflections in joints whenever possible. When utilizing joint deflections for proposed water mains on a horizontal radius, the minimum radius shall be 257 feet for 18' pipe lengths and 286 feet for 20' pipe lengths. This will result in a maximum deflection of 80 %. Manufacturer's maximum deflection will vary according to pipe diameter.

3. Vertical:

Minimize bends by utilizing deflections in joints whenever possible. Design to avoid high points whenever possible. This may require short sections of the water main to be installed lower than the minimum design depth (reference Section 3.2.3-C). Attempt to locate grade breaks at proposed fittings.

E. Valve Locations:

1. Within the Right-of-Way:

Gate valves are typically located at the extension of a right-of-way line or property line and will further be referred to as a "line valve". Deviations from this standard may be appropriate given site specific conditions and is per the approval of the Project Engineer.

2. At Intersections:

a) 3-way Intersections:
   1) Install a minimum of 2 line valves.
   2) Where there are two or more services located in adjacent streets in each direction from the intersection, install 3 line valves.

b) 4-way Intersections:
   1)Install a minimum of 3 line valves.
   2)Where there are two or more services located in adjacent streets in each direction from the intersection, install 4 line valves.
   3) Intersections with no cross-street main: Place a single line valve.

3. Maximum Spacing along Straight Runs: Along straight runs, locate line valves at intervals not to exceed 500'. Place the valves along the extension of a property line where possible.

4. On Sloping Main: A valve may not be installed on a main that is laid at a grade which is more than 3 degrees different from the grade of the ground surface.
5. Isolation valves located on both sides of railroad, light rail, streetcar, or stream crossings.
6. Additional locations as directed by the Water Bureau.

F. Hydrants:

1. Hydrant Spacing: Proposed hydrants shall be spaced in accordance with the standard for the type of development served.

   a) Hydrants in residential areas shall have a maximum spacing of 500' and each parcel shall have at least one hydrant within 250' of its frontage.
   b) Streets that support commercial development shall have two hydrants per intersection, placed at opposite corners, with 300' maximum spacing between hydrants.
   c) Hydrants along arterial streets in residential areas shall be typically spaced at 1,000' on each side of street, and staggered 500' from hydrants on opposite side of street.

Hydrants along arterial streets that support commercial development shall be typically spaced at 600' on each side of street, and staggered 300' from hydrants on opposite side of street.

d) Hydrants along light rail, street care and railroad tracks, shall have reduced hydrant spacing. For instance, a typical area would have maximum 250' spacing on each side of the tracks. Hydrants shall be located on each side of the tracks essentially functioning independently of each other.

2. Hydrant Locations along the Main

Hydrants must be located in the public right-of-way or in easements. Locate hydrants at intersections, or at a property line if in the middle of a block. Hydrants shall be located 5' from the point of curb returns (not in the curb return itself), power poles, street lights, and driveways. Consideration shall also be given to catch basins and catch basin lead locations. Please refer to section 4.2.3 for hydrant locations in proximity to a stormwater swale.

3. Hydrant Locations Relative to the Curb

a) The standard location (and minimum distance) for a hydrant location is 30-inches (measured to the center of the hydrant) behind the face of curb. The maximum distance behind face of curb for a hydrant is 15 feet.
b) There must be 5 feet horizontal clearance between the outside of a hydrant and any other above ground obstruction (including trees) to allow access to the hydrant.
c) For sidewalk corridors less than 8 feet width (includes curb, furnishing zone or planter strip and sidewalk), set hydrants 1' behind back of walk (if there is room in the right-of-way or easement).
d) For curb bulb-outs into the normal travel way, hydrants shall be installed at a maximum distance of 15 feet from the face of curb.
e) For sidewalk corridors 8 feet or greater in width (includes curb, furnishing zone or planter strip and sidewalk), set hydrants 30" behind face of curb.
f) Refer to the Portland Pedestrian Design Guide by the City of Portland, Bureau of Transportation for guidelines regarding sidewalk corridors.
g) Fire hydrants must be at least 5' from the top of a slope that falls away from the shoulder of the road. If the hydrant must be located less than 5' from a slope, the Fire Bureau requires a platform around the hydrant, with a guardrail at the edge of the platform. The guardrail itself is to be 5 feet from the fire hydrant. The design of the platform shall be included in the plans for the water system. Fire hydrants shall be located a minimum 5' from any physical obstruction.
h) Easements are required when hydrants are not placed in the public right-of-way. Hydrant easements should extend eight feet past the center of the hydrant and shall have a minimum width of eight feet. See Chapter 7 for procedures on securing easements.

G. Waterline/ Sewer line Separation:

Reference OAR 333-061-0050, (9) Crossings – Sanitary Sewers and Water Lines. This can be found on-line at http://arcweb.sos.state.or.us/rules/OARs_300/OAR_333/333_061.html

All references to sewers in this section shall mean sanitary sewers, combined sewers (sanitary and storm flow combined in one pipe), and piping that drains to combined sewers (ie. Inlet leads)..

1. In situations involving a water line parallel to a gravity sewer main or sewer lateral, the separation between the two shall be as indicated in Figure 1 of this chapter.

2. In situations where a water line and a gravity sanitary sewer main or sanitary sewer lateral cross, the vertical skin-to-skin clearance between the two shall be as follows:

   a) The bottom of the water line shall be 1.5' or more above the top of the sewer line and one full length of water pipe shall be centered at the crossing.
   b) Where the water line crosses over the sewer line but with a clearance of less than 1.5', the sewer line shall be exposed to the sewer line joints on both sides of the crossing to permit examination of the sewer pipe. If the sewer pipe is in good condition and there is no evidence of leakage from the sewer line, the 1.5-foot separation may be reduced if authorized by the Project Engineer. However, in this situation, the Contractor must center one length of the water line at the crossing and must submit a written proposal stating the conditions, findings and indicating the reasons for reducing the separation. Such a reduction in separation shall result in no less than 0.5 feet of separation between the sewer and water lines. The report shall be submitted to the Project Engineer no less than 24 hours following the installation of the water facility. If the Project Engineer determines that the conditions are not favorable or finds evidence of leakage from the sewer line, the sewer line shall be replaced with a full length of pipe centered at the crossing point, of PVC pressure pipe (ASTM D-2241, SDR 32.5), high-density PE pipe (Drisco pipe 1000), ductile-iron Class 52 (AWWA C-51), or other acceptable water-tight pressure pipe; or the sewer shall be encased in a reinforced concrete jacket for a distance of 10 feet on both sides of the crossing.
   c) Where the water line crosses under the sewer line, the sewer line shall be exposed and examined as indicated above. If conditions are favorable and there is no evidence of leakage from the sewer line, the sewer line may be left in place but must be supported with a steel or reinforced concrete beam or other means of preventing settlement when it spans the water line trench, and special precautions must be taken to assure that the backfill material over the water line in the vicinity of the crossing is thoroughly compacted in order to prevent settlement which could result in the leakage of sewage. Prior to installation, the contractor must submit a written proposal stating the conditions, findings, and indicate the reasons for not meeting the OAR separation requirements and what is proposed to mitigate the risks of cross contamination and how the sewer pipe will be supported to prevent settlement of the sewer pipe. If the Project Engineer agrees that a variance is necessary and conditions are favorable, a variance may be granted. In this situation, the Contractor

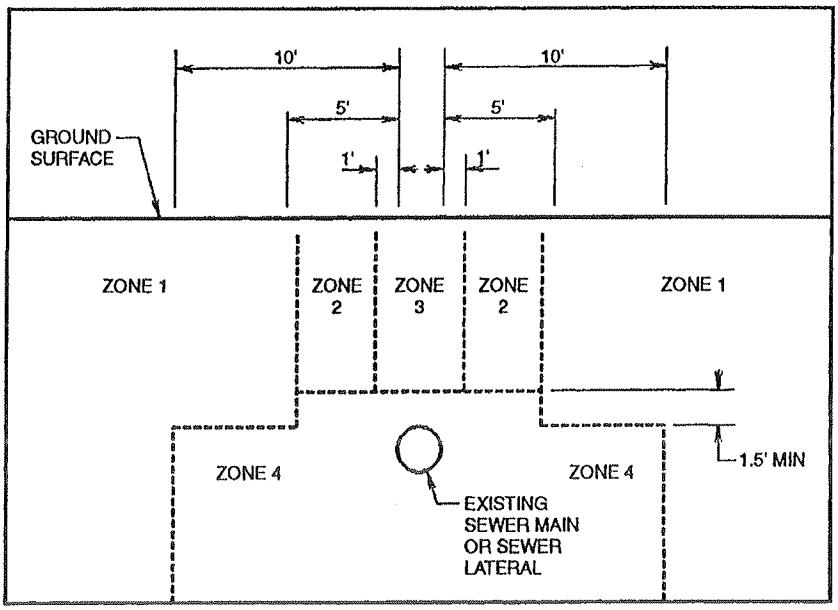
must center one length of the water line at the crossing, support both sides of the sewer pipe at the crossing, and the material and methods used in backfilling and compacting to prevent settlement of the sewer. The report shall be submitted to the Project Engineer no less than 24 hours following the installation of the water facility. If the Project Engineer determines that conditions are not favorable or finds evidence of leakage from the sewer line, the provisions of paragraph 2b, above, apply.

d) Zone 3 conditions where the water pipe and the sewer pipe are proposed in the same trench is prohibited. No variance will be considered.

e) For situations in which the water line is existing and a new sewer line is being proposed, the Contractor will need to comply with OAR 340.

3. When a water line is installed under a stream or other watercourse, a minimum cover of 30" shall be provided over the pipe. Where the watercourse is more than 15' wide, the pipe shall be of special construction with flexible watertight joints, valves shall be provided on both sides of the crossing so that the section can be isolated for testing or repair, and test cocks shall be provided at the valves.

Figure 1: Water Line-Sewer Line Separation



Zone 1: Only crossing restrictions apply
Zone 2: Case-by-case determination
Zone 3: Parallel waterline prohibited
Zone 4: Parallel waterline prohibited

H. Separation Distances to Other Utilities

1. Minimum vertical separation of 6 inches where water line crosses over or under other

utilities (except sanitary sewer or cathodically protected utilities).
2. Minimum 3-feet horizontal skin-to-skin clearance between the water line and other utilities (except sanitary sewer).
3. Minimum 1-foot horizontal skin-to-skin clearance between water line and manholes, catch basins, and other underground concrete structures.
4. Minimum 5-feet horizontal separation between a water line fitting and a sanitary or storm sewer crossing.
5. Minimum 5 foot clearance from any structural footing.

Note: Refer to Standard Plan 3-60 for Standard Utility Locations.

I. Cathodically Protected Main Crossings

Where water line crosses a water line or another utility that is cathodically protected:

1. Center a 20-foot length of Ductile Iron (DI) pipe over the crossing and sleeve the barrel of the DI pipe in Schedule 40 Polyvinyl Chloride (PVC) pipe or corrugated polyethylene pipe, and seal the casing ends with polyethylene tape or other bureau approved materials.
2. Where the piping configuration does not permit the above installation, wrap or encase the DI piping in 40 mil. reinforced PVC geomembrane for 20-foot length, 10-foot each side of the crossing. The fill around the geomembrane shall be sand or 1/4" -0" crushed rock.
3. The Design Engineer shall contact the Water Bureau Corrosion Engineer for additional requirements.
4. Please refer to Standard Drawings for Corrosion Control P-750, P-755, P-760, P-765, P-770.

J. Blow-offs

2-inch Blow-offs shall be located at dead-ends. See Standard Drawing P-720 (2" Blowoff Assembly). For 12-inch mains, 6-inch blow-offs shall be located at low points in the main; (Updated Standard Drawing currently pending). Hydrants can be used as blow-offs, if approved as such during the design review process. See Standard Drawing P-700 (Fire Hydrant).

K. Air-Release Assemblies

Air-releases shall be located at high points in the main.

L. Regulators

1. Pipe Coating: Ductile iron pipe within regulator vaults shall be power tool cleaned and coated with aluminum mastic epoxy with leaf aluminum, Carbomastic 15 or approved equal.

2. Provide two layers of coating. Each later shall be of 6 mil dry film thickness with 12 mil dry film thickness total.

3. A Site Specific Safety Plan submittal will be required.

M. Restrained Joints

The pipe shall be fully restrained along the entire length.

Set screw restraint and joint harness systems are not allowed. Acceptable materials for restraint can be found in the Portland Water Bureau Materials Manual or approved materials list.

N. Slope and Pipe Stabilization

1. A written slope stability analysis (written by a licensed geotechnical engineer) must be submitted by the Design Engineer for areas with documented slope stability issues, areas susceptible to soil liquefaction, and areas at or below the 100-year flood plain. Use a predicted earthquake scenario for Portland to determine the risk of soil liquefaction.
2. Concrete cut-off walls shall be constructed along a waterline laid on a slope of 20% or greater. The walls serve to anchor the pipe to the slope and to prevent the displacement of backfill around the pipe. Wall design and placement frequency will be subject to review by Portland Water Bureau engineering staff.
3. For waterline installed on a slope in excess of 20%, backfill material shall be ¾" -1" crushed rock backfill. Sand is not suitable backfill material in this scenario.
4. Provide an Erosion Control Plan (see the Erosion Control Manual as Developed by the Bureau of Development Services in conjunction with Bureau of Environmental Services, Portland Bureau of Transportation and Portland Water Bureau).

O. Casings

Casings shall be used when water mains are to be laid under railroad tracks, light-rail tracks, street car tracks, retaining walls, sound walls, freeways, or when open trench installation is not an option due to traffic volumes, ODOT requirements, etc. The pipe must be supported in the casing by means of insulators, must be restrained, and the ends of the casings must be sealed. Approved insulators and seals must be specified. Insulator and casing must be large enough to accommodate the mechanical restraint. Casings must be either tape wrapped or coated with coal tar enamel depending on how the casing is installed.

3.2.4 Materials

A. Pipe

Standard sizes of distribution main piping is 4", 6", 8", or 12" Class 52 Ductile Iron (DI) Pipe. Comply with Standard Construction Specifications Section 02470 for ductile iron pipe, cement mortar lining and gauging. Pipe shall have double cement mortar lining and shall be fully gauged and fully restrained along the entire length.

B. Fittings

Fittings shall be ductile iron. Comply with Standard Construction Specifications Section 02475 for ductile iron pipe fittings, lining and coatings. Fittings shall be NSF 61 approved as a complete product, including barrier linings from the manufacturer. Portland Water Bureau will accept single cement mortar lined fittings, however double-lined is preferred.

C. Accessories

- Where the following appurtenances are required, use only materials approved in the corresponding sections of the Portland Water Bureau Material Manual. For a quick reference list, please refer to the Materials List Portland Water Bureau – Material Manual

Ductile Iron Pipe & Fillings	Section 501
Steel Pipe & Fittings	Section 503
Gate Valves	Section 505.2
Butterfly Valves	Section 505. 4
Regulators (Pressure Reducing Valves)	Section 505.12
Pressure Relief Valves	Section 505.14
Blowoffs	Section 505.15
Meter Boxes, Covers, Lids	Section 505.18
Fire Hydrants	Section 506
Concrete Vaults	Section 509.2

CHAPTER 4 – GREEN STREETS

4.1 INTRODUCTION

In support of the Citywide Green Street Initiative, the Portland Water Bureau offers the following general design guidelines, which were developed to assist the engineer, developer, or any City Bureau when designing a subdivision, new street, or street retrofit that incorporates a green street storm water management facility. These guidelines are intended to assure that these facilities are designed and constructed in a manner that protects the City's valuable drinking water distribution system and ensures low-cost maintenance of the water facility infrastructure.

4.2 SWALES/STORMWATER PLANTERS IN NEW SUBDIVISIONS

4.2.1 Main

-The water main shall be installed in a location consistent with City Standard Utility Locations (Standard Drawing 3-60).
-If a water main is under or behind a proposed curb or sidewalk, the water main must be relocated, unless otherwise approved by the Portland Water Bureau
-The water main (existing or proposed) must be a minimum of 3' from face of curb.

4.2.2 Metered Services

- Every effort must be made to locate water meters and services in locations outside the proposed swale. Please refer to the Meter and Hydrant Location Details SW-304, SW-316, SW-324 (Green Street Detail Drawings- for a hierarchy of preferred meter locations in relation to proposed swales, planters, and curb extensions.
- Driveways and driveway wings are acceptable alternate locations.

- When installing a meter in a driveway location, a cast iron frame and cover are required.
- Construction plans shall include a cross section of a typical water service as it crosses beneath the proposed stormwater facility. A 4" Schedule 40 PVC casing will be required surrounding the proposed water service. For casings on existing services, the casing must be installed by Portland Water Bureau service crews at the expense of the Developer. For casings on new services within a new subdivision, the contractor may install the casing. The Developer is to contact the Portland Water Bureau to request a cost estimate.

4.2.3 Hydrants

- Hydrants must be located a minimum of 3 feet from the edge of any proposed stormwater facility.
- Hydrants must be a minimum of 10 feet from any proposed or existing tree
- Please refer to Standard Drawing P-700.

4.3 SWALES/STORMWATER PLANTERS PROPOSED IN EXISTING STREETS (DEVELOPER OR CITY BUREAU INITIATED)

The following decision-making tool is available when designing a green street in a retrofit situation:

1. Green Streets Review Flowchart

The Design Engineer should consult this resource prior to commencing with street design.

Infrastructure (mains, hydrants) that does not meet the guidelines set forth in the above-mentioned resource may need to be relocated at the expense of the Developer or City Bureau per the discretion of the Portland Water Bureau Project Engineer.

4.4 SWALES/STORMWATER PLANTERS PROPOSED IN COLUMBIA SOUTH SHORE WELL FIELD WELLHEAD PROTECTION AREA

Projects located in the Columbia South Shore Well Field Wellhead Protection Area may be subject to additional requirements to protect groundwater. The Columbia South Shore Well Field Wellhead Protection Area Reference Manual outlines requirements for businesses that use, store or transport hazardous materials. The Reference Manual contains requirements for both public and private transportation routes. In addition, specifications have been developed for green street designs in the Wellhead Protection Area. To find out more information on the program visit the following web site at The Columbia South Shore Well Field Wellhead Protection Program or by telephone at 503-823-7493.

CHAPTER 5 –CONSTRUCTION GUIDELINES AND SUBMITTAL REQUIREMENTS

5.1 INTRODUCTION

The developer of a newly created subdivision may desire to have the water system constructed by a contractor along with construction of the other improvements of the subdivision. The contractor must construct the water system according to the approved plans, the most recent version of the City of Portland Standard Construction Specifications and the Oregon Administrative Rules (OAR) Chapter 333. The work will be inspected and approved by the Portland Water Bureau. After the water system construction has been completed and has passed the required testing it will be connected to the existing water system by Portland Water Bureau personnel.

5.1.1 References

American Water Works Association
City of Portland Standard Construction Standards
Code of Federal Regulations (CFR)
Oregon Administrative Rules (OAR)
Occupational Safety and Health Administration (OSHA)

5.2 PRE-CONSTRUCTION REQUIREMENTS

Before construction can begin the following items must be completed:

A. Payment of the "Inspect/Connect Fee Statement" received by Portland Water Bureau
B. Water system plans signed and accepted by the Chief Engineer.
C. Street Opening Permit issued by the Portland Bureau of Transportation.
D. Material submittals approved and returned (See Section 5.3).
E. Materials inspected and accepted by the Portland Water Bureau Project Inspector or Project Engineer.
F. Notification of the construction start date, which must be provided to the Portland Water Bureau Inspector a minimum of 5 days prior to beginning work.
G. An onsite preconstruction meeting between the Contractor and the Portland Water Bureau Inspector, which must be held at least 3 days prior to construction.

5.3 SUBMITTAL REQUIREMENTS

Submit to the Water Bureau Project Engineer in writing the following items for approval. For approved materials, please refer to the most current Materials List at Portland Water Bureau Material Manual and Material List

Item	Submittal
1. Ductile Iron Pipe All pipe to be Class 52 double cement lined and fully gauged	Manufacturer, Model and Certificate of Compliance
2. Fittings All fittings to be at a minimum single cement lined	Manufacturer, Model and Certificate of Compliance
3. Restrained Joints	Manufacturer, Model and Certificate of Compliance
4. Gate Valves MJ except FLG x MJ for hydrants, 2" blowoff valve to have a handwheel smaller than 8" diameter, 4" through 12" valves must have a 2" operating nut	Manufacturer, Model and Certificate of Compliance
5. Fire Hydrants	Manufacturer, Model and Certificate of Compliance
6. Backfill Material	Location of Pit , Material Size and Gradation
7. Spoils Site	Location and Permit(s)
8. Hydrant Permit	Verification
9. Erosion Control Plan	
10. Copper Pipe/Brass Fittings	Manufacturer, Model
11. Meter Boxes	Manufacturer, Model
12. Survey Notes	Offset grade stakes (to invert) every 25 feet on any curved sections and every 50 feet on straight sections. Include all bends, fittings, valves, grade changes, hydrants (include top of curb elevations), etc. Service tap locations are not necessary if property line is evident.
13. PR Vault and all Materials	Manufacturer, Model
14. Chlorination & Dechlorination Plan	

The Project Engineer reserves the right to ask for additional submittals that are not included on the above list. Acceptance of said materials by the Project Engineer shall not relieve the Contractor from responsibility for any error or omission. The Contractor shall obtain the Project Engineer's acceptance prior to beginning any fabrication or other work. No deviations from the approved drawings shall be allowed without the prior approval of the Project Engineer and the

Design Engineer. No work may begin until all submittals have been reviewed and approved and pipe and materials have been inspected and accepted.

5.4 CONSTRUCTION

Construction must be coordinated and scheduled so that the Portland Water Bureau Inspector may observe any elements of the work as required by the Bureau. The Contractor must contact Water Bureau Inspection Services a minimum of 48 hours prior to commencing work.

There are a number of common requirements for each project that must be met during construction of the water system. They involve tests that must be performed or actions required by the Contractor. The following is a list of those common requirements:

5.4.1 Compaction Testing

A. Compaction testing is required at all backfilled trenches. Please refer to Standard Construction Specification Section 00405.
B. The City will conduct the trench backfill compaction (density) tests.
C. The Contractor must provide the Inspector 48 hours advance notice to schedule trench backfill compaction tests.
D. The Inspector will be responsible for determining compaction testing locations. Typically, 1 test is required for every 200 feet of installed water mainline.
E. Compact to 95% of the maximum density at optimum moisture content per ASTM D-698.

5.4.2 Hydrostatic Testing

A. Refer to Standard Construction Specification 01140.51.
B. A hydrant permit will be required.
C. The entire project will be tested at one time at 150 psi or 1.5 times the working pressure (which ever is greater) unless otherwise approved by the Portland Water Bureau Project Engineer.
D. All internal valves must be open, including valves to fire hydrants.
E. Contractor activities cause adjustments to installed water systems. Angle meter stops, hydrants, and curbs shall be installed before the hydrostatic test is performed.
F. The trench compaction testing must be completed with acceptable results before the hydrostatic test is performed.
G. The Contractor performs the hydrostatic test. It must be witnessed by the Portland Water Bureau Inspector who will provide the official gauge for the test.

5.4.3 Disinfection

A. Refer to Standard Construction Specification 01140.52 for chlorination procedures.

5.4.4 Bacteriological Testing & Substantial Completion

A. The hydrostatic test must be successfully completed prior to commencing with the bacteriological test.
B. The Portland Water Bureau will obtain samples and perform the bacteriological test. The Inspector will schedule the sample collections and will need at least 48 hours advance notice from the Contractor that the facility is ready for testing.
C. Samples must be taken before 12:00 noon (Pacific Time Zone).
D. The Portland Water Bureau Inspector will determine sample locations. Samples must be taken from a temporary 2" test/sample riser per Std Plan 5-152 or from another fitting approved by the Portland Water Bureau Inspector.
E. Bacteriological test samples are collected and processed by the Portland Water Bureau laboratory once daily. Preliminary bacteriological test results are available the next business day and final test results are available after 48 hours; but not until the testing for that day has been completed. Samples will not be taken on weekends.
F. A discharge permit is required. Please contact the Bureau of Environmental Services.
G. Two consecutive, successful ("negative") bacteriological tests will be required. ***The date of the second successful bacteriological test will be considered the date of Substantial Completion. The date of Substantial Completion is the beginning of the two year warranty period per 5.5.3.***

5.4.5 Punch List

A. The Contractor will notify the Inspector and Project Manager when all work has been completed.
B. The Inspector will check all work and make a Punch List of any remaining work to be completed.
C. The Punch List will be sent to the Contractor and Developer.
D. The Contractor needs to notify the Inspector when all Punch List items are complete and ready for final inspection.

5.5 FINAL PROJECT ACCEPTANCE

Pending completion of all items of work called for in the plan and the specifications, the Portland Water Bureau will accept ownership of the water system. **Services fed from the new water system WILL NOT be sold or activated until the water system has been accepted by the Portland Water Bureau. Acceptance of the water system is contingent upon satisfying all of the following requirements:**

5.5.1 As-Constructed Plans

A. As-constructed plans shall consist of a set of construction plans marked with red ink. The Contractor shall mark through those items that have changed and add any new information.
B. As-constructed plans shall show any deviations from line and grade, all utility lines encountered (including size and depth), manufacturer's name of pipe, fittings, hydrants and valves. The Contractor shall record the centerline elevation of the largest valve of a pressure reducing valve assembly.
C. As-constructed plans shall be neat and legible.
D. For each valve installed, Contractor to make a notation on the as-constructed plans calling out the manufacturer and type of valve (eg. Clow, 6" gate) and note that the valve is "turned 18 ¼ turns open left".
E. As-constructed plans shall be signed and dated by the Contractor and submitted to the Portland Water Bureau site Inspector. The Portland Water Bureau Inspector shall review the as-constructed plans. No connections to the public water system will be made prior to their approval.

5.5.2 Project Cost Data

The Developer shall provide a cost break down of the total water system cost and include the unit price of the branch services and fire hydrants. This is necessary so that a maintenance bond amount can be determined.

5.5.3 2-year Maintenance Warranty

The Developer shall provide the Portland Water Bureau with a two-year maintenance warranty on workmanship and materials from the date of substantial completion, as specified in Section 4.4.4 E. The method of warranty is typically a bond and is subject to approval by the City. The dollar amount of the warranty shall be 20% of the submitted Project Cost Data per section 5.5.2.

5.5.4 Easement dedication

All easement documentation and/or the final subdivision plat has been prepared and recorded. See Chapter 7 for additional information.

5.6 CONNECTION

The Portland Water Bureau shall connect the new water mains to the existing public water system. Connections will be made only after all required testing (see sections 5.4.1 Compaction Testing, 5.4.2 Hydrostatic Testing, 5.4.3 Disinfection, & 5.4.4 Bacteriological Testing) has passed and acceptable as-constructed plans have been received.

CHAPTER 6– METER BOX & SERVICE INSTALLATION

6.1 GENERAL

6.1.1 References

American Water Works Association Standards
City of Portland, Standard Construction Specifications
City of Portland, Portland Water Bureau Material Manual
Uniform Plumbing Code (as amended by State of Oregon 2008 Plumbing Specialty Code)
City of Portland, City Code, Title 21

6.1.2 Service Requirement & Site Layout

Provide a separate service to each house, building, or tax lot under separate ownership. Unless otherwise approved, a separate service is required for each house or building on the same lot or parcel even if under one ownership. The Portland Water Bureau Chief Engineer (or his/her approved designee) may approve of a single service for two or more houses or buildings on a single lot or parcel under one ownership (in this case, a Separate Service Agreement is required). The service must be located along the frontage of a public street or Portland Water Bureau easement in which there is a public water main. The service must directly enter the lot or parcel it is to serve with no offset in alignment.

Separate Service Agreements must have the original owner and notary signature. Faxes or copies will not be acceptable. All recorded owners of the property must sign the agreement. If the property is owned by a business, the applicant shall verify with the Oregon Secretary of State Business Office who has the authority to sign. If the business is out of state or if the applicant is unable to locate the business, the applicant must provide documentation that they have the authority to sign.

The Portland Water Bureau shall install services unless they are being installed by the Contractor in conjunction with water system construction in a privately developed subdivision. If the work is to be done by a contractor within a new subdivision, the contractor may tap the newly installed main (an inactive main, prior to project acceptance), lay the service branch, and set the meter box (to be supplied by the Portland Water Bureau). The Portland Water Bureau will furnish and install the meter and the service branch segment between the meter and the property line.

6.1.3 Type of Service:

A. **Domestic Service**
Water from the service is to be used by the residents of the house or building served for domestic needs. Examples are for consumption, personal hygiene, food preparation, clothes washing and lawn irrigation. A domestic water service may also be used for a residential or commercial fire sprinkler system. The service provides water for both fire and domestic needs.

B. **Irrigation**
The service is used exclusively for the irrigation of lawn and shrubbery.

C. Fire Service
An unmetered fire service may be used exclusively for a fire sprinkler system.

D. Temporary Service:
A service may be installed for a period not to exceed one year where there is a limited duration need for water service. A temporary service is intended to provide water for construction or other similar needs where there will be no ongoing demand for water service. No system development charge (SDC) is assessed for a temporary service.

E. Basement Service:
Where the basement of a building extends into the public right-of-way, the meter on the service may have to be installed within the basement of the building. To protect the owner from water damage and the liability of the Portland Water Bureau, the meter must be enclosed in a waterproof vault.

6.2 MATERIALS

6.2.1 Pipe

Use 1-inch copper tubing service lines for proposed 5/8-inch, 3/4-inch, and 1-inch diameter water meters. All copper tubing shall be of soft drawn design, Type K, seamless, and annealed. All copper tubing shall conform to the specifications detailed in the Portland Water Bureau Material Manual, 504.2 COPPER PIPE. For 1 inch and smaller services, refer to Standard Drawing P-780. Updated Standard Drawings are currently pending for 1.5-inch and 2-inch services.

6.2.2 Service Saddle

Service Saddles are required on water mains 4 inches in diameter
and for all services taps larger than 1 inch. Double strap service saddles are required on all service taps larger than 1 inch.Service saddles shall be as specified in the Water Bureau Material Manual, 501.10.6 SERVICE SADDLES.

6.2.3 Fittings:

All fittings shall be brass and shall conform to the specifications as detailed in the Water Bureau Material Manual, 504.6 BRASS SERVICE FITTINGS.

6.2.4 Meter Box, Cover and Lid:

Note: All meter boxes are to be supplied by the Portland Water Bureau. These materials shall be obtained from the Water Bureau Storeroom at 1900 N. Interstate Avenue, Portland, Oregon. The Contractor shall coordinate with the Water Bureau's Project Engineer or Inspector to schedule the Contractor's interactions with the storeroom.

A. Non-Traffic Area (includes planter areas, sidewalks, and easements)

A non-traffic area is defined as a location of the meter box where it would be unlikely that it would be subject to vehicular traffic. Examples would be behind a standard street curb or on the property side of a ditch along an unimproved street. For this situation, specify the installation of a meter box and cover, as illustrated in Standard Drawing P-780 (1" and Smaller Service) and detailed in the Material Manual. The updated Standard Drawing for Meter Box and Cover is currently pending.

B. Traffic Area (includes driveways and mountable curbs)

A traffic area is defined as a location of the meter box that is subject to vehicular traffic. Examples would be a meter box installed in a driveway or behind a mountable curb. Installation shall be made as illustrated in Standard Drawing P-780 (1" and Smaller Service) . The Water Bureau, at the expense of the Developer, shall furnish a No. 5 Wood Box and a 12" x 14" Cast Iron Frame and Cover for each service to be installed within an area subject to vehicular traffic. Please refer to Standard Drawing P-930 for the 12" x 14" Cast Iron Frame and Cover.

C. Basement Service

Where the water meter must be located within a basement, the owner shall provide a waterproof vault for the meter. When installation of the vault has been completed, the Portland Water Bureau will install the meter in the vault. Design standards for waterproof vaults are currently being developed. Waterproof vaults will be reviewed on a case by case basis.

6.2.5 Bedding and Backfill

Provide bedding and backfill for the copper tubing as specified in the City of Portland Standard Construction Specifications, Section 00405.

6.3 SERVICE DESIGN

6.3.1 Backflow Prevention Assemblies

A minimum of a Double Check Valve Assembly (DCVA) is required if one or more of the following applies:

- The proposed water meter is 2 inches or larger
- The service is for commercial or industrial use
- Discretionary review of Portland Water Bureau staff determines that backflow potential exists

All fire and irrigation water services are to be equipped with approved backflow protection that is acceptable to the Portland Water Bureau. For additional information, please consult the Backflow Assembly Installation Requirements.

6.3.2 Size of Meters:
Meter size will be calculated upon submission of building permits for each structure. A water meter size calculating tool can be accessed electronically at Water Meter Sizing Tool.

6.3.3 Service tap locations:

A. Tap
Service taps shall be made no closer than 1.5 feet apart along the newly installed inactive water main. Service taps must be located a minimum of 2 feet from pipe joints or fittings. *Please note that service taps into a live, active water main can only be installed by the Portland Water Bureau.*

B. Conventional Street
Locate the tap on the main along the frontage of the lot to be served. For new subdivisions or where the customer has not specified the service location, locate the angle meter stop no closer than 1.5 feet from the property line (extended). If adjacent lots are to be served, locate an individual tap for each service near a common property line where possible. The service shall be no more than 5 feet from the property line. See the "typical service installation" detail in the sample plan set in Chapter 8.

C. Cul - De - Sac
For services in a cul-de-sac, locate the tap as near as possible to the lot to be served. Service lines are to be perpendicular to the water main.

6.3.4 Service Branch

A. Conventional Street

Locate the service branch tubing in a straight line from the tap towards the lot to be served. The service branch should be perpendicular to the water main. The service branch shall have a minimum of 3' cover within the street area, as per Standard Drawing P-780. Extend the service branch from the corporation stop at the main to the angle meter stop at the meter.

B. Cul - De – Sac

Locate the service branches within a cul-de-sac in the shortest practical distance from the tap to the lot to be served. Follow the location requirements given under the title Conventional Street concerning cover and extent of the service branch.

C. Meter Box

The meter box shall be located within the public right-of-way. If there is a curb along the street in front of the property to be served, the meter box shall be located behind the curb. The standard location for the meter box is to place it so that the angle meter stop shall be 18" behind the face of the curb. This is illustrated in Standard Drawing P-780.

If there is no curb present, the meter shall be located where it can easily be read and maintained. Acceptance by the Portland Water Bureau Project Engineer shall be required of the location of all meters. For siting meters proposed in or adjacent to water quality swales, refer to guidelines set forth in Chapter 4.

The Portland Bureau of Transportation may allow the basement of a building to extend beneath the ground surface into the public right-of-way out to the curb line. The water meter for a service with a basement extended to the curb line requires that the meter be located within the basement area.

6.3.5 Service Pressure:

Service pressure for all customers is typically within the range of 40 to 110 psi. The minimum acceptable service pressure is 20 psi (under all conditions including fireflows). If the pressure to a service is within the range of 20 psi to 40 psi, the customer may want to install a booster pump system to improve operation of the private plumbing system. The Uniform Plumbing Code requires a pressure reducing valve (PRV) if service pressure exceeds 80 psi. PRV's are to be installed on the property side of service meters and are owned, installed, and maintained by the property owner. A PRV assembly and vault that limits pressure in the main is generally required when the system pressure exceeds 110 psi. Please consult with the Portland Water Bureau Project Engineer for additional information.

6.4 SERVICE INSTALLATION

6.4.1 Taps:

A. Direct Taps

Corporation stops may be tapped directly into a ductile iron water main for 1" diameter taps on all mains 6" in diameter and larger. Service saddles are to be used for 1" taps (and larger) into a 4" diameter main. Service saddles are also to be used for taps larger than 1" regardless of size of main. All taps shall be made in accordance with the standards of the AWWA.

All work shall be done with a drilling and tapping machine intended for use on ductile iron pipe as manufactured by Mueller or equal, as accepted by the Portland Water Bureau. The drilling and tapping machine shall have alignment tool guides and a placement strap. Hand held equipment shall not be allowed.

Portland Water Bureau approved ball- valve corporation stops are to be used for all buried and above ground (not direct buried) installations including vaults. Direct taps require the use of 2 layers of 3-mil TFE tape on the threads of the corporation stop and the corporation stop and copper tube shall be wrapped with corrosion protection tape for a minimum clear distance of 3 feet.

6.4.2 Service Branch

A. Water Main to Meter Box

Service branches shall be installed from the corporation stop to the angle meter stop. The service branch may be installed by means of excavation, hydraulic pushing, washing or drilling. If the excavation method is to be used, and service is to be provided to adjacent lots, the service branches to the two lots may be laid in a common trench. The service branches must have a minimum separation of 1', but must conform to the specific separation standards at the tap and at the meter. 1" copper services shall be one piece without connectors.

B. Meter Box to Property Line

Please refer to Standard Drawing P-780. Typically, the Portland Water Bureau will install the service branch from the meter to the property line at the time that the meter is installed. However, the contractor may also install the service branch from the meter to the property line in order to coordinate pouring of sidewalk and/or driveway.

6.4.3 Meter Installation

Following acceptance and activation of the water system by the Portland Water Bureau, the owners of individual lots may purchase a water service through the Portland Water Bureau's Development Services Office, 1900 SW 4th Ave, Portland, OR 97201. The meter shall be furnished and installed by the Portland Water Bureau whether the service branch is installed by the Portland Water Bureau or by a contractor.

CHAPTER 7 – WATER FACILITY EASEMENTS

7.1 WATER SYSTEM EASEMENTS

The Portland Water Bureau requires that an easement be granted for all water facilities that are located on private property or on property owned by another governmental agency. The entire water system may be within a private site, or just a portion of it, such as a fire hydrant, may be on private property. The easement allows the Portland Water Bureau to gain access to its facilities for operation and maintenance of the system. The easement document also specifies the responsibilities of the signatories of the easement.

7.2 EXTENT OF EASEMENT

The water facility easement must be sufficiently wide to encompass Portland Water Bureau facilities on both sides of the street. The minimum width of an easement for a water main up to and including 12 inches in diameter is 20', with the minimum distance from the nearest outer edge of the easement to the water main centerline being 6'. To allow access to Portland Water Bureau facilities for maintenance and repair, and to provide clearance for hydrant use during fire fighting operations, the easement must extend a minimum of 8' beyond fire hydrants, 5' beyond the end of water mains, and 2' beyond small services. For larger diameter mains and other appurtenances of the water system, and/or for Portland Water Bureau facilities in sites with special limitations on construction and access, check with the Portland Water Bureau staff to determine the additional width of easement required.

7.3 ILLUSTRATING THE EASEMENT

The location and limits of the easement must be clearly delineated on the Plan view of the water plans. If at least one easement boundary does not coincide with an existing property line, create a specific line with dimensions to show the easement location in relation to nearby property line(s). Label the easement boundary lines as the "Limit of Easement." Dimension the width and depth of the easement. Also, show the easement width and limits on the cross-section of the

street(s).

7.4 RECORDING THE EASEMENT

Once the easements have been identified, they must be formalized. There are two means of accomplishing this. The preferred method is to record the easement(s) along with the recording of the plat. This should always be done when a new subdivision is being created or there is a change to the parcel that requires a re-recording of a plat or another form of recorded legal boundary survey affecting the easement area. The other method of formalizing the easement is for the Portland Water Bureau to process the easement documents separately, using the Portland Water Bureau's authority delegated by City Council for acceptance of easements and similar documents. In existing land partitions and subdivisions, this process should be reserved for only those cases in which there are no modifications to the plat that would require it to be re-recorded. This process may also be used in cases where no new parcels are being created, such as within existing, unplatted properties.

7.4.1 Recording with Plat:

If the easement is to be recorded along with the plat, it needs to be shown on the final recorded plat. The property owner(s) named in the plat also must sign a "Statement of Conditions for Use of Water Facility Easement" document, record it and reference it on the final recorded plat or map at the time of recording.

The following statement shall appear on the final plat or map:

> ## STATEMENT OF CONDITIONS
>
> **"Statement of Conditions for Use of Water Facility/Public Utility Easement" recorded as Document Number _____, dated ____, Multnomah County Deed Records.**

(For a document recorded in a different county, such as Washington County or Clackamas County, substitute the appropriate county name).

This document details conditions of use that are imposed on the easement area. The statement of conditions must be signed by the owner(s) of the property and notarized.

There are two methods of recording this document with the plat. The preferred method is to record it along with the recording of the plat and to cross-reference the two documents. Another method is to record the Statement of Conditions first and then refer to the Document Number, date and County of its recording in the text of the plat. When the plat and Statement of Conditions have been recorded, provide the Water Bureau with two copies of the plat and Statement of Conditions bearing the County's approvals and recording information, and, if it can be generated, a digital copy of the plat on computer disk.

7.4.2 Recording by City:

If there are to be no changes to an existing plat or partition, or if the easement involves only existing parcels in an unplatted area (or a similar situation), the Water Bureau must formalize and record the easement by means of the bureau's existing authority delegated from City Council to accept and record certain forms of easement agreements; or in some cases, by processing a City Ordinance to accept and record the easement.

The Statement of Conditions document must also be submitted to the Portland Water Bureau. Besides signing and notarizing that document, the owner must also prepare and submit a legal description of the easement(s), including an exhibit map or plan, and a current report from a title insurance company indicating the name(s) of the property owner(s) and indicating any existing easements or other encumbrances of record in the property that would affect the proposed easement area. These documents are to be submitted to the Property Management section of the Water Bureau. Water Bureau staff will then have the easement document routed for approval, signature and recording. In some cases, bureau staff will also need to prepare an ordinance to adopt the easement(s) and to submit the Ordinance to the City Council for approval.

7.4.3 Timing:

It is suggested that the Developer or Project Engineer initiate the easement dedication process as soon as possible during the design phase. Please note that Final Project Acceptance will not be granted (no services will be sold or activated) until all easement documentation has been prepared and recorded.

CHAPTER 8 – DRAFTING GUIDELINES

8.1 Introduction

This chapter is a quick reference to specific drafting standards that pertain to development projects. Water system plans submitted to the Portland Water Bureau for review are expected to meet basic standards for appearance, content, line type, line weight, symbols, annotation, etc.

Please contact the Portland Water Bureau Development Services Office at 503-823-7368 for updated Portland Water Bureau Drafting Standards.

8.2 Seed and Template Files

Drawings submitted to the Portland Water Bureau must be created using the Microstation Seed File or the AutoCAD Template File which contain levels, line styles, text styles and a Detail Sheet pertinent to Developer Projects.

8.3 Cell and Block Libraries

The Portland Water Bureau requires the use of custom Microstation Cell Libraries and AutoCAD Block Libraries.

8.4 Sample Project

A sample project is available for download in AutoCAD, Microstation, & PDF formats.

8.5 Files Available for Download

The Microstation seed file, cell library, and sample drawings are grouped together into one file available for download at left.

The Auto CAD template file, block library, and sample drawings are grouped together into one file available for download at left.

There is a PDF available for download which contains a sample cover sheet, design sheet, and

detail sheet.

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Nick Fish, Commissioner
David G. Shaff, Administrator

1120 SW 5th Avenue, Room 600
Portland, Oregon 97204-1926
Information: 503-823-7404
www.portlandoregon.gov/water

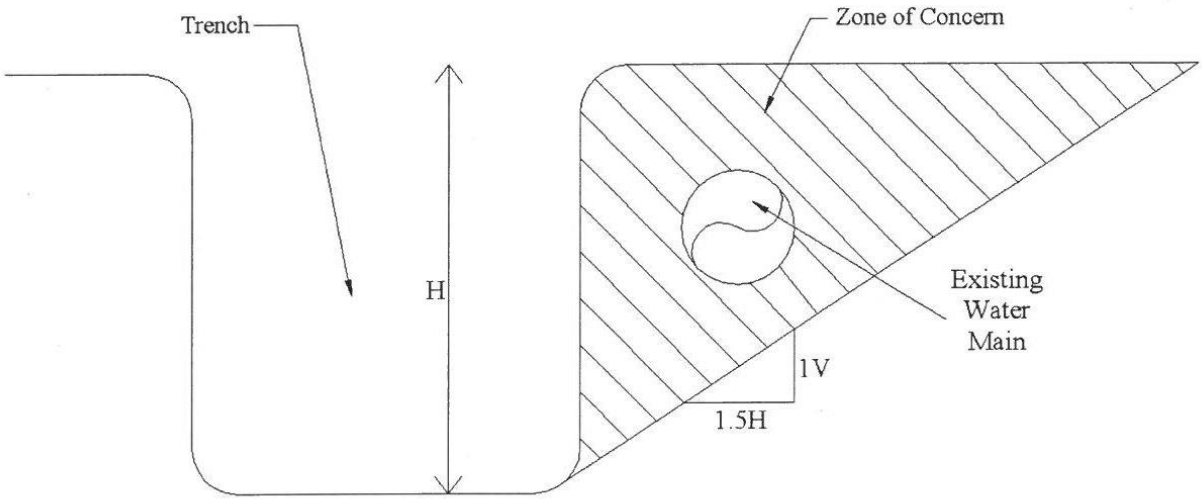
CONDUIT PROTECTION REQUIREMENTS

1. Determine the depth of cover for the conduit/transmission main to be crossed.

   a. Request depth of cover information from Portland Water Bureau (PWB) Records at 503-823-1524. If the conduit/transmission main will be potholed during project design, notify City of Portland (COP) 48 working hours in advance of potholing, contact Sandy River Station at 503-663-4030, as well as Roy Martinez at 503-823-8311, to obtain PWB Inspection Assistance.

2. Maintain 5' skin-to-skin horizontal clearance between the outside diameter of the conduit pipe and the outside edge of excavation for all construction activities.

3. A site specific, Oregon registration Engineer stamped/sealed utility protection plan (EUPP) for supporting and maintaining the conduit in service will be required for excavations that: 1) Cross underneath the conduit; or 2) That will be parallel to the conduit and will place any part of the conduit pipe within the zone of concern (1.5H: 1V of the outside diameter of the conduit pipe) of the required excavation adjacent to the conduit. Submit a scaled drawing showing the conduit pipe and the limits of the excavation along with the EUPP to PWB for review. PWB acknowledgement of "No Exception" to the EUPP is required prior to starting excavation.



For excavations parallel to the conduit, supported sections of trench shall have positive shoring. Positive shoring shall support the trench wall such that no lateral movement is possible. Positive shoring can be achieved with hydraulic jacks or by having zero clearance between shoring and trench wall. Plans should minimize the length of open trench at any one time, regardless of the shoring system used.

For excavations perpendicular to the conduit, include the location of proposed supports on the submitted scaled drawing, and any blocking, length of beam on each side of trench and columns shall also be shown. In addition: 1) The support beam shall have a steel plate foundation support; 2) Pipe supports shall be adjustable, tensioned and rated to the calculated loads; 3) Provide calculations of maximum anticipated deflection and resulting stress in pipe, maximum anticipated deflection and resulting stress in support beam, and assumed soil bearing pressure; and 4) Provide the methods and means of excavation, backfill and compaction. If required by PWB, survey and monitor conduit elevations prior to and during excavation.

4. For all tunneling or pipe jacking projects that will cross under and/or occur within the zone of influence (as defined in the paragraph # 3 above) of the conduit: 1) Provide plans showing proposed equipment, equipment guidance system, type and kind of cutter head, anticipated soil conditions, jacking pit and pipe clearances, tolerances and clearances; 2) Provide calculated pipe deflections and stresses under estimated settlements; and 3) Show proposed grout plan around jacked pipe/casing. Vacuum excavation to install settlement monitoring station(s) directly over the pipe crossing may be required, as well as providing before and after elevation measurements of the conduit pipe.

5. Provide COP two working days advance notice to the Sandy River Station prior to starting any work crossing over or under a conduit pipe, by calling 503-663-4030.

6. If operating construction equipment overtop of the conduit, maintain 3' of cover at all times. If there is < 3’ of cover overtop of the conduit, at a minimum, protect the conduit by installing traffic plates (10' or wider) centered overtop of the conduit.

7. The outside edge of any new UIC or stormwater planter/swale installation requires 12-feet separation between the outside edge of the UIC or stormwater planter/swale and the outside diameter of either side of the conduit.

   In addition, there is a trench drain beneath some sections of Conduit 2 and Conduit 3. In order to reduce impact to this trench drain and lessen the possibility that the groundwater level would be raised around the conduit, any stormwater facility or UIC shall be completely lined to ensure water does not infiltrate into the conduit pipe trench.

8. Ensure 1.5' clearance for any pipe installed over top of, or underneath the conduit, to allow for future maintenance. If the conduit will be crossed underneath with < 1.5’ of clearance, a compaction plan for the material to be placed between the bottom of the conduit and the top of the other utility must be submitted to PWB for review.

   Sanitary sewer lines are required by OAR 333/340 to cross over or under potable water lines with $\geq$ 1.5’ of clearance. If the clearance will be < 1.5’, a waiver must be obtained through PWB.

9. Use of vibratory compaction equipment is allowed where there is >3-feet of cover over top of the conduit/transmission main pipe, or >3-feet of undisturbed soil horizontally from the outside diameter of the conduit/transmission main pipe. Where there is < 3-feet of horizontal or vertical clearance, non-vibratory compaction methods must be used that will not impact the conduit, such as using a sheep-foot roller.

10. Request locates for, field locate and identify on the plans the cathodic protection system for the conduit, including the location of the rectifier, anode bed and test stations, and the wiring connection between all three and the conduit. If a section of the cathodic protection system is damaged, the Engineer of Record for the construction project must submit plans and procedures to re-establish the conduit protection system. It is the Excavator's responsibility to ensure any damaged sections of the cathodic protection system are repaired and inspected prior to backfilling that area of the trench.

11. Any new trees proposed to be planted in the Public Right-of-Way shall be planted a minimum of 10' from the outside diameter of the adjacent conduit.