McWANE DUCTILE | IRON STRONG

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McWane Ductile Double Bump Test Protocol

This serves to inform any or all interested parties with regards to a specific and reliable diagnostic hydrostatic testing procedure not outlined in AWWA standards but long proven in the field.

It is based in the knowledge and fact that air is compressible and water is not. While not arguing nor ignoring the AWWA acceptance criteria where +/- 5 psi of the asserted final test pressure should be maintained while performing an AWWA proof test; it should be noted and clarified that pressure loss alone on the gauge is not a judge of pass or fail, merely an indicator. Being able to hold within +/- 5 psi simply indicates that all reasonable or measurable air pockets have been previously exhausted from the closed pipeline. It is often the case that a pressure drop is confused for water loss, leading the contractor on a frustrating and costly hunt for what may not be there.

The difference can be reliably attained via three short-term and increasing pressure tests aimed to record the recovery volumes needed in each instance. Starting at initial test pressure (typically and presumed to be 150 psi); after a 30-minute sit re-pump the pipeline to 150 psi and note exactly how much water was needed to get back to 150 psi. This can be done with a meter involved at the pump or simply drawing recovery water out of a bucket or larger holding basin of your choice. Repeat the same 30-minute sit & recovery at 200 psi and 250 psi. Understanding that each pipe has already experienced a 500 psi hydro-test before leaving the foundry so we are not dealing with concerning pressures at all, the pressure drop is not important, the recovery volumes are the absolute and sole key.

If the recovery volume at these increasing pressures, whether its ounces or gallons, stays the same or decreases, you have a tight pipeline that is not leaking water but simply compressing a contained air bubble, which expands when the pumps cease, indicating a (somewhat misleading) pressure loss on the gauge. As the bubble moves within and finds a spot (pipe or fitting joint / ARV / corporation connection) to exhaust in whole or in part, the recovery volume decreases and would eventually reach zero (during natural movements of the transported water when in service). Remembering there is 7.48 gallons of non-compressible water contained in each cubic foot of space, we are generally not speaking of a large bubble. I have seen many cases where an air bubble the size of softball has “cost” 40 or 50 psi on a gauge. AWWA standards (design, manufacturing, installation and testing) recognize and mandate a watertight joint, not necessarily airtight, which is why air can and does escape in points where water does not.

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On the contrary, if the recovery volumes at these increasing pressures go from ounces in the initial, to a gallon or more in the first 50 psi bump-test, to multiple or more gallons of recovery water needed with the next 50-psi bump & 30-minute sit; this increasing recovery volume trend is a clear statement that its not trapped air but a passing valve, a leaking joint, a defective item, or some other issue that must be further diagnosed or repaired / replaced to achieve the AWWA C600 post-installation testing requirement.

Experience with rates of loss / recovery volumes being compared can indicate generally what aspect or item you're chasing. Yet, until you know HOW MUCH WATER YOU'RE LOSING, you're only guessing and potentially being falsely led by a pressure loss alone.

We at McWane Ductile are available, free of cost, to consult with or actively assist onsite in such testing or diagnosis. Please feel free to contact us through our Pocket Engineer, http://pe.mcwane.com/ or website, www.mcwaneductile.com.