

# THE BROAD DIMENSION

## the newsletter of tbd consultants - 2nd quarter 2015



**tbd consultants**

Construction Management Specialists

111 Pine Street, Suite 1315  
 San Francisco, CA 94111  
 (415) 981-9430 (San Francisco office)

1663 Eureka Road, Roseville, CA 95661  
 (916) 742-1770 (Sacramento office)

9449 Balboa Avenue, Suite 270  
 San Diego, CA 92123  
 (619) 518-5648 (San Diego office)

8538 173rd Avenue NE, Redmond, WA 98052  
 (206) 571-0128 (Seattle office)

2063 Grant Road, Los Altos, CA 94024  
 (650) 386-1728 (South Bay office)

9705 Cymbal Drive, Vienna, VA 22182  
 (703) 268-0852 (Washington, DC, office)

[www.TBDconsultants.com](http://www.TBDconsultants.com)

## Net Zero Water

Astronomers are discovering hundreds of planets circling distant stars, and the often asked question is, 'Is there life on any of them?' To help answer that question, the first thing astronomers look for is any indication that water exists on the planet, because life as we know it requires water. Our planet is blessed with an abundance of water, so why are so many areas of the world suffering with water shortages?



The first answer is that most of the water on the planet is found in the seas and contain salt, and it is fairly expensive to turn salt water into potable salt-free water using distillation or reverse osmosis technology. Secondly, we have a tendency to waste water (which can be read two ways, and both apply.) Consequently, just as there is a growing demand for Net Zero Energy buildings, there is also a growing movement towards Net Zero Water buildings.

There are two main objectives when pursuing this goal. The first is to capture as much rainwater for future use as

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possible, rather than just letting it run ultimately out to sea, where it will become costly to make usable. The second objective is to capture the water used in a building, treat it, and make it reusable, and that can be further subdivided into the capture and treatment of grey water and black water. Finding ways to reduce water usage is also very important, but water conservation and the use of low-flow fixtures has always been a part of green building, and we need to add to that.

Rainwater is not quite pure, because it can collect pollutants from the atmosphere, but treatments required to make it potable are effective and fairly cheap. Sometimes, regulatory requirements impose other restrictions, such as on a project in Seattle where chlorine was required to be added to comply with legislation, so proprietary water filters were then supplied at points of use to remove that same chlorine.

Grey water is water from laundry facilities, showers, sinks, and the like, and contains few impurities, and is therefore easy to treat. In regions where rainfall is plentiful, there may not be a need to recycle the water, and here it may be simply treated in artificial wetlands and allowed to percolate through landscape areas or swales and recharge the aquifer. Otherwise, it can be treated by processes, such as UV filtration and bio-filtration, and recycled for use in laundries or flushing toilets. While grey water can be treated to a condition suitable for potable use, regulation and people's current perception would normally prohibit such practices at present.

Black water (from WCs, urinals, kitchen sinks and dishwashers) provides more of a problem for processing,

requiring first separation of the solid waste, and then additional processing to clean up and remove organic compounds. Not to mention the additional psychological resistance to the reuse of such water. But since all the water on this planet has probably passed through some creature more than once in Earth's history, there should be no real barrier to considering black water's treatment and reuse. After treatment it can be brought to a state where it can be added to the grey water and follow that treatment path. That is opposite to the current situation, where grey water gets added to the black water and everything gets dumped into the sewer, requiring treatment plants to treat it all as black water. The use of composting toilets can significantly reduce the volume of black water in the first place.

Every building will require some input of relatively clean water in the form of rainwater, so in some regions achieving the goal of net zero water, without some reciprocal arrangement with areas of high rainfall may not be possible. But cooperation can make goals more achievable, including, for instance, having a central facility for treating grey and/or black water from a number of buildings in the same area, making the process more economical, while also saving the energy resources currently expended in the transporting of water to buildings and removing waste.

Among the projects working towards achieving Net Zero Water is a project at Eaton Residential College in Miami that, along with fitting out a portion of the building to implement net zero water usage, is also attempting to develop software that will automatically monitor the water quality, helping control the processing and report any problems. It will also study the socio-cultural acceptance of the technology, which is probably the aspect that is the biggest hurdle to cross, along with current legislative restrictions that have arisen largely because of those same biases.

Another hurdle in the adoption of Net Zero Water is financial. The burden of providing the infrastructure for water supply and waste treatment now becomes the responsibility of the building owner, rather than the utility. Even when looked at from a life-cycle perspective, it is often hard to justify, especially when utility rates may not reflect the true cost of the infrastructure. But if you take into account the cost to the planet, the scales can tip in the right direction and some municipalities offer financial incentive programs to help offset costs.



## Greece is Back

It was back in 2010 that we first wrote about the effects Greece was having on the world economy, and now it is back in the headlines again. At the time this article is being written (latter half of February), Greece is trying to renegotiate the terms of its bailout, but the rest of Europe has various reasons for not wanting to give them much slack, and pessimism abounds about the outcome. The idea of Greece leaving the Euro remains a possibility, but while Alan Greenspan made some valid points about the long-term viability of the Euro without closer political union in Europe, the Euro seems safe enough at present. And European politicians proved to be just as good as ours at coming up with a compromise that everyone could claim victory from, while kicking the can down the road a bit, so Greece shouldn't be too much of an issue until our third-quarter newsletter is due out.

Other serious international problems, such as ISIS and Ukraine, remain, but don't have much influence on our domestic market, except for occasionally worrying stock market investors when the headlines get too large. Even the probability of Greece leaving the Euro is no longer such a worrying issue, as those holding the debt are in a stronger financial position than they were.

in the world we see growth in China is slowing, and Russia is mired in sanctions and suffering lack of income due to oil's price drop. Japan moved out of recession at the end of 2014, and also has rising employment but little wage increase while corporate coffers have been bulging (which might sound like a familiar situation that occurred closer to home).

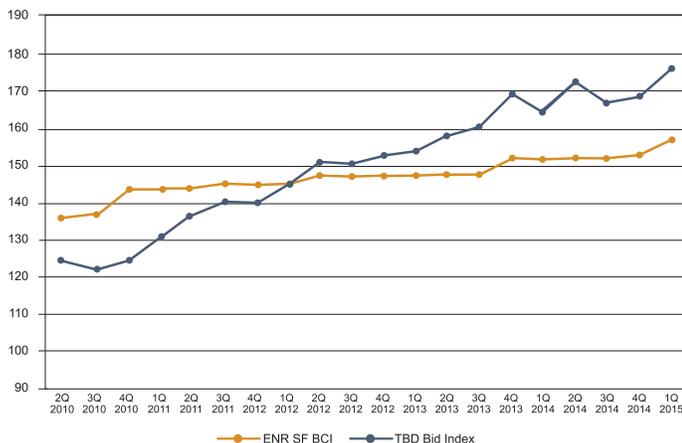
Here in the US, the economy continues to improve. While low oil prices are a serious concern for some, it has been suggested that the low energy costs could result in more manufacturing jobs returning to the US. With consumers spending less on gas, it is also hoped that they will end up spending more elsewhere. That could boost the job situation even more, and the latest indications even show that wage growth has been picking up.

The soaring US dollar has been creating problems for exporters, but if Europe continues to improve, that should ease the situation. While other central banks are reducing interest rates and buying bonds to encourage growth and fight the risk of deflation, the Fed is doing the opposite.

January saw severe weather across much of the nation, an icy blast blowing through the stock market, and also showed the Architectural Billings Index recording a drop. But the indications are that all three will continue to improve as the year progresses.

*Geoff Canham, Editor*

Bid Index

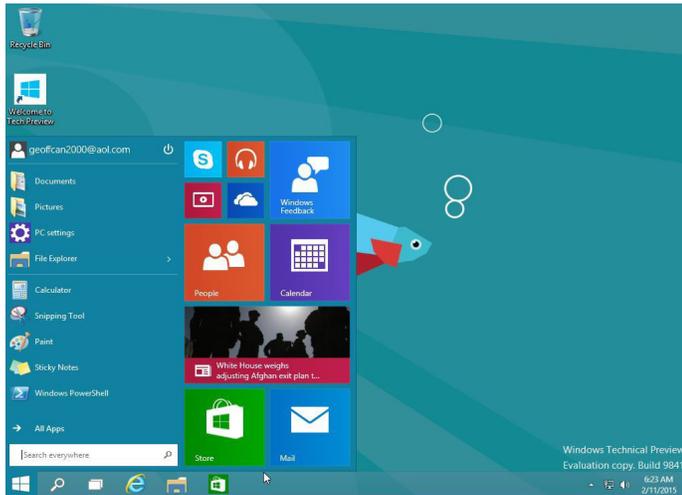


While the European economy is still in a bit of a mess, the Eurozone did grow stronger than expected in the fourth quarter of 2014, thanks to strong domestic demand in Germany. Spain also grew, while France and Italy still have problems but performed better than expected. Elsewhere

## Windows 10 Is Coming

Microsoft made a bold move with Windows 8, but perhaps not the wisest one. The fact that it seemed like two operating systems, stitched together in a far from seamless way, left a lot of people confused. The way the apps that ran in the new interface differed from those that worked in the more traditional desktop environment was probably the most confusing part. The big question that arose was how to close one of the 'new' apps. No wonder the adoption rate for Windows 8 was pathetic at best. The Windows 8.1 upgrade improved things a lot, but not enough to encourage people to upgrade from Windows 7 or XP.

Something had to be done to create a computing environment that people were comfortable with, and Microsoft is hoping Windows 10 will provide that. The fact that they have by-passed the name 'Windows 9' is meant to show the separation from Windows 8, and the feel of this new operating system is definitely more like that of Windows 7. Which is not to say that it is a step backwards.

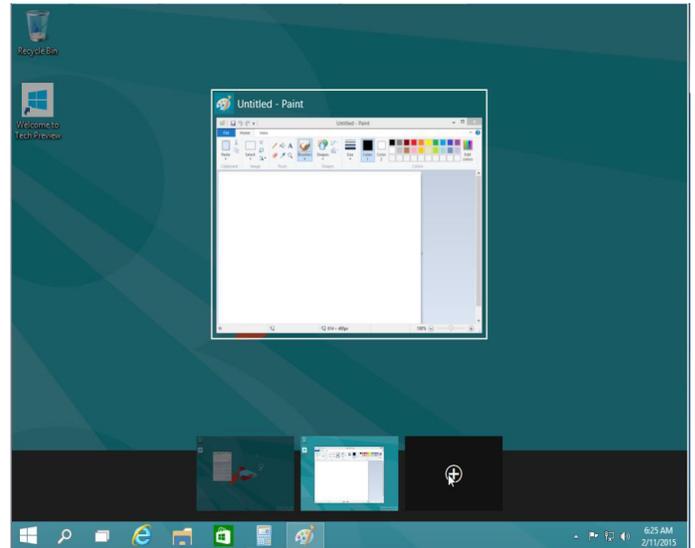


The Start menu has been restored, but you will see dynamic tiles in that menu that are very reminiscent of Windows 8, and you can run both the traditional desktop applications and the new Microsoft Store apps. However, now both types of software run in resizable windows within the desktop environment, and the 'new' apps have a button to let you close them easily. The look and feel is definitely more integrated.

Another rather annoying feature of Windows 8 happened if you inadvertently brought the mouse-pointer close to a corner of the screen, when something unexpected might happen, like the Charms Bar popping out. The Charms Bar is still there, if needed, but the 'hot corners' features has disappeared.

The really new feature of Windows 10 is the option for creating different desktops. You might like to have multiple screens attached to your PC, with different apps running on each screen, but now you can do something similar with only one screen. If you have been using a recent version of Mac OSX, then this isn't really a new feature, but it is new to Windows. A button on the taskbar, looking like two overlapping sheets of paper, takes you into Task View which lets you create and delete desktops and allows you to switch between them. So you might have Excel and Word open in one desktop, Outlook in another, a game

or two in a third desktop, and then you can switch back to the desktop with Excel and Word on it when the boss approaches ;-)



But perhaps the best feature is one called Continuum. Windows 10 is meant to run on everything from smartphones through PCs, including tablets and laptops along the way. So how will it adapt to the particular machine? This is where Continuum comes in, and it appears that basically if a keyboard and mouse is attached it will expect those to be the primary modes of input and it will supply the mouse pointer. If no keyboard and mouse is there, it will expect you to be using a touchscreen, and will supply an on-screen keyboard if needed. And it should adapt on the fly, so if you have one of the portable units that can work as a laptop, or detach the keyboard and it's a tablet, Windows should always provide the appropriate means of input. The phone version of Windows 10 will only run the 'new' apps (those obtainable from the Microsoft store).

Other features expected to be incorporated include a new Web browser (although Internet Explorer will also be included for compatibility reasons), and Cortana (Microsoft's personal assistant). Cortana is supposed to predict what you are planning to do, and help you be more efficient. Hopefully it won't become as annoying as the assistant known as Clippy that used to ship with some earlier versions of Microsoft Office.

The consumer version of Windows 10 could be available around June this year, and it has been announced that it will be a free upgrade for Windows 8/8.1 users. This article was based on the Technical Preview version.