

Episode 296

How to connect a new water supply to your home – with John Heron from Thames Water

The show notes: www.houseplanninghelp.com/296

John: Thames Water is the biggest water company in the UK. We've got nine-million clean water customers, and around fifty-million wastewater customers. Effectively, our job is to provide clean water to households and to take their waste away as well.

So, we're the biggest in the UK and we also cover London which is probably one of the most challenging areas that you can work in.

Ben: What do you use to do that? Water obviously comes from the sky and all the rest of it. Do you just collect it and ship it to the house? I imagine there's a bit more to it than that.

John: Oh yes. We've got a vast amount of water treatment works. We obviously extract water from the ground, we've got reservoirs for the collection of water, we've got a whole massive network – I think over thirty-thousand kilometres – of water mains and network that we need to service and maintain.

We've got a huge number of sewage treatment works. Obviously, once we've collected that sewage through our network, we've then got to treat that sewage to a stage where we can actually put the final effluent back into the water course.

So, there's a huge amount of work that we need to do. We're also generating a lot of our own power now. So, it's a humungous business.

Ben: Let's talk about cleaning up that water to begin with. Is it always the same process?

John: It's generally the same process in our treatment works. So, different treatment works when they were built have different technologies, but generally the process is still the same in terms of getting us through the initial process, getting to the stage where we need to release the final effluent.

Ben: What does that entail?

John: There are three or four different processes through that. I'm not an expert on the waste side of our business to be quite honest with you, but basically, we try to separate out the solids from the liquids – trying to put it as politely as possible – and then obviously a lot of the heavy solids will go away and be dried; some of the by-products will be sold to farmers and so on.

Then the liquids go through a treatment process, it's screened, we clear out everything we possibly can, put it through the final treatment process, and then we've got that final effluent which we can then get back out into the environment.

Ben: Is this done quite locally to where we live; in other words, we've got lots of these plants? Or is there one big one? How does it work?

John: We've got three-hundred-and-fifty sewage treatment works, but say in London, we've got five or six main treatment works. So, if you ever go and visit Twickenham, there's Mogden Sewage Treatment Works next door to Twickenham.

So, there are five or six main ones, but across our entire region we've got three-hundred-and-fifty sewage treatment works.

Ben: When the water is leaving from that point and coming to the home, what is the infrastructure looking like then? Again, does it vary because of history?

John: Yes. If you're talking about the water network, there are almost two types to our water mains network. We've got the strategic network which is effectively massive pipes that transport water across our region, and then you've got the local distribution network.

With the strategic network, you can have up-to sixty inch water mains, down to a small four inch or below pipe which would be classed as a distribution main. So, the size and scale of that is huge, and the age of that network is also very varied.

The new stuff that we're adding nowadays for new developments versus what was installed – quite a large proportion of our water network is well over a hundred years old.

Ben: Maybe you can describe the difference between something that's old and what would go in on a new site or new part of the network?

John: Basically, the old pipes that we used to have are generally old cast iron pipes. Cast iron pipes like to sit there, don't like to be disturbed,

they like to be nice and settled. Whereas nowadays with new equipment and technology being used, the pipes that are normally installed now by new developers are plastic pipes.

Ben: Is there any information on how those are going to age over time? Did the metal pipes not rust? How was that seen at the time?

John: Metal pipes were the preferred option a hundred years ago and so on. Nowadays, the plastic pipes give you greater flexibility.

A lot of our network across London especially does need to be upgraded and changed. The challenge we face is the disruption that will cause because obviously, with the nature of our asset, we can't just pull these through a duct and so. We have to effectively dig up a road to actually replace.

So, we've got a massive programme to replace our aging network but it's going to take a long time because we need to balance that between causing chaos effectively.

Ben: Is it just the chaos? I imagine the cost must be huge for upgrading a network like that.

John: Yes, it's a massive cost for us to replace those assets. Due to the nature of our works, we have to go and dig these holes, we have to go and replace these assets.

If possible, we'll try to line the assets. So, where we've got an old asset in place, there are technologies nowadays where we can actually replace or line the asset itself rather than doing a full replacement. But it's a very timely and costly exercise that we need to do.

Ben: How can you afford to do that? Is that just part of the phasing as well, that you just need to play it bit by bit, gradually upgrade it, maybe have a better monitor of which bits have been upgraded?

John: We're introducing more technologies now to get a better understanding of where we have weak points in our network.

Obviously, what we tend to do is prioritise where we've had asset failures. We'll be prioritising those areas to replace the assets. So, we have almost like a risk register to understand where we think we need to replace assets first.

Ideally, we'd replace them all straight away but that just isn't practical.

- Ben: I imagine you're talking about leaks here?
- John: Yes.
- Ben: What does that mean? If you get a leak underground, is it immediately obvious to you sitting in the office?
- John: No. Unfortunately, a lot of our assets that will fail will be leaking into the ground. So, we don't get that big American-style fire hydrant gets hit and water sprays twenty metres in the air. It's a lot of detection work that we need to do to find and fix those leaks.
- Ben: When we're talking about the water flowing, how do you make sure that the water is moving where you want it to move to?
- John: We do have booster stations; we do have to boost that water. So, if people are living on top of a hill, we'll often have booster stations where we'll need to boost the water up. It's not all gravity.
- Effectively, the whole network that we work with in terms of the water side is a pressurised system because we need to guarantee a certain amount of pressure for every customer that we have. So, we need to work out where we need to boost our supply.
- Ben: When you're bringing it to the edge of a boundary, how do you know what that pressure is there? Is that part of the technology that's starting to go in?
- John: We need to provide one bar of pressure. So, if you were to put a nail through that water main, water would spray ten metres in the air. That is our guaranteed minimum at the boundary of a property. A lot of our network operates at a higher pressure than that, but that's our absolute minimum.
- Ben: Let's talk about new properties. This is what we're dealing with, we're building a house, and we want to get a supply. Where does this journey begin for us as a customer?
- John: The journey from our perspective needs to begin almost before the planning stage. We want developers, even small developers, to contact us as early as possible in the process so we can support them on that journey through.
- Ben: Can you get water to anywhere?
- John: We have to assess that. So, again by getting early visibility and someone saying, 'we want to build a new house' and it's

somewhere where we haven't got a water network, we might have to do significant reinforcement to our mains network to supply that.

So, we would want to speak to that person as soon as possible to understand the constraints that we need to face and whether we'd need to cross a third party's land and so on.

Ben: How much of this is new connections versus other business? Is it just all increasing or are there terminations as well?

John: In terms of new connections, we do a huge amount of work in that space. In the last few years I think we've added sixteen-thousand new water connections across our geographical area which actually equates to forty-thousand new properties being installed – as you can imagine in London, there are a lot of high-rise buildings that get one bulk supply and that can feed a thousand apartments.

So, we're adding a lot of new connections to our network on a yearly basis.

Ben: When we're looking at the cost of this, is there any rule of thumb of how it might work for a new connection?

John: No. We provide an individual quotation for all the new connections that come into us. We've tried to get it streamlined and simplified as much as we possibly can.

So, somebody who makes that application to us, we'll look to get the quotation out to them within fourteen days and then once that quote has been paid, it will be valid for one-hundred-and-eighty days. So, we'll be able to turn around and give the developer an idea fairly quickly about what that cost will be.

There are things that we need to factor into that. We need to look at the distance away from our nearest assets, any traffic management that we might need to deal with, are there any lane rental charges and so on – all of these things impact on the cost of the quotation.

Ben: And the time, I'm assuming as well. What will cause the most significant delays?

John: The most significant is the local authority's requirements in regard to notifications. Sometimes that can delay things up to around twelve weeks. If a local authority says we cannot dig on that road for that period, we'll then need to speak to that developer to make sure they're fully aware of that.

Again, that all ties back into the earlier you speak to us the better because you don't want to come to us, pay for your quotation expecting it to be connected within a month, if the local authority then turns around to us as Thames Water and say, 'sorry, you cannot dig up that road'.

Ben: Presumably, you have quite a good relationship with the local authorities, but that has no sway?

John: We work very closely with them but obviously, we need to balance that relationship up because they look at it from a disruption perspective. So, us digging up on a road can cause traffic management issues for themselves. We need to balance up between what our customers require and also what that local authority requires.

Ben: So, your responsibility, is it just to the boundary? What do we do once we've got our water supply?

John: It is our responsibility to the boundary, but obviously once we've installed the supply, our responsibility is to that customer who we're now serving. So, we need to ensure that we get that new account setup and the meter installed and logged on our network to ensure that we can then fairly charge that customer for their services going forward.

We also have a duty of care to ensure that what has been built there and what is connected to the water network is fully compliant. We will carry out those inspections to ensure that the fittings that have gone into that new building are actually compliant with the water regulations.

Ben: Maybe you can explain a little bit about, I know this may not be your territory, but how, from the boundary, how do we know about the pressure, how deep will the pipe go – what considerations do we need en route to the house?

John: The key thing for that developer who is installing the new supply is, they'll generally lay out a twenty-five mill. or thirty-two mill. new supply. They need to run that pipework out to the boundary, effectively out to where the footpath is, and leave a little bit of extra pipe there.

What we need them to do is to lay that pipework at a depth of around a metre because most of our asset in the street is at around that one metre depth. So, we'll need them to lay that pipework out to that point because that will help in terms of frost protection and heat gain in the summer. So, we require them to do that.

We will come and inspect that. We'll make sure that they have laid that to the point where they have to lay that out to, and they've used the right material. On some occasions we may have to see that the area is deemed as contaminated so they might have to put a protective pipe in there, a barrier pipe supply. So, we'll want to carry out those inspections to ensure that the pipework has been laid out to the boundary at the correct depth and is the right material.

- Ben: Does anything go around the pipe, or is it just onto the soil?
- John: On to the soil. So wherever possible, we don't want them sleeved or anything because if a pipe is sleeved then say there was a leak on the customer's pipework, and the pipe was through a sleeve, we wouldn't be able to clearly identify where that issue was.
- Ben: As we get closer to the house then, is this where the meter is going to be, on the house?
- John: No. We generally install the meter on the boundary, in the footpath. That clearly demarks the point at which our responsibility ends, and the customer's responsibility begins.
- Ben: What does this meter tell you? Is it all automatic back to base?
- John: Our network at the moment generally isn't smart but we're now looking to install a smart metre network across our region to give us a better understanding of what the customers are using and where we are having issues with customer supply. I.e., if we can identify a supply that's running constantly twenty-four seven, we know that there's an issue and there's probably a leak somewhere between the meter and the house itself.
- Ben: This might sound obvious, but what are we likely to be using this water for on a typical new house?
- John: In a new house, it's generally for toilet flushing, washing through your dishwasher, bathing, cleaning, sink use, outside taps – they're the general standard uses that we have these new supplies connected for.
- Ben: Is most of that water coming back to you?
- John: Yes. The vast majority. What we would love and what we're looking at, and what everyone in the UK is looking at is all the water we're providing is wholesome water and you're using wholesome water to effectively flush a toilet. We're now looking at all other options around where there are opportunities to introduce grey water systems. We don't always need to provide potable water to flush a

toilet. So, that's something that we are looking at actively at the moment.

Ben: This may be a bit of a tangent, but I've wondered it, having built my own house. Is a water supply connected to the toilet the best way? Are there technologies that have advanced to make it a dry system?

John: There are systems, yes. A bit like when you go on an aeroplane, that vacuum kind of toilet. There are more of those appearing on the market now. But I think the general problem is, they are very, very expensive. So, for someone building their new home, they would probably see that as quite a substantial cost.

Ben: When we've got all this sewage, I know that it's all being mixed up. So, when it comes back the other way, can you deal with it all at all times? You've got things like rainwater to consider, or is that separate?

John: Most of our network in London is combined, so we do have where the rainwater and the sewage are combined. It's called a combined network that we generally have. What we're very actively looking at now is where we can separate this out because when we have heavy rain, our sewers get inundated. So, we're looking at all the opportunities we have to actually separate out surface and foul networks to ensure that surface we can send to a water course and the foul we can take back to our treatment works and treat.

That will hopefully then start to create some capacity in our network because again, in London, the network that was installed a hundred-and-fifty years ago by Bazalgette in a lot of areas is at its capacity.

Ben: I guess that's another side of it. You're saying about all these new connections. If you're not losing any connections as well, you're constantly having to grow.

John: Yes. And that's the challenge now, especially where we're working in very tightly constrained areas. Us introducing large new assets is a massive challenge.

Ben: Back to the house then for a moment, who is doing this work? Is it our contractor who's going to take it from the boundary and deal with all the pipes and that side of things?

John: Yes. On the water side, we like developers to appoint an approved plumber, someone who understands our business and understands what is required. They'll know what depth they need to lay the

pipework out to. It'll be their responsibility to run that pipe from the inside stop valve out to the property boundary.

Generally, at that point, that is where Thames Water and our contractors would take over and liaise with the highway authority, doing that final connection which is to connect that new bit of pipe on to the main that exists in the street.

Ben: What other things do we need to think about? Is there anything that you'd love to tell someone who wants a new connection?

John: The key thing for us, and what we really want to do is, to make sure that people are fully aware. So, don't always buy the cheap products. Obviously, cheap products are cheap, and it saves a bit of money upfront, but we want people to use the most water efficient products as possible.

There's been a lot in the press recently around leaky loos where you've got dual flush toilets, and a lot of the cheaper ones fail. So, you're then constantly wasting lots and lots of water because that cistern is constantly being filled up.

It's things like that where we really want to encourage people to look at the best products and make sure that they choose the most efficient products to help drive down and save water.

Ben: And that's at the level of the house or the infrastructure as well, of putting all the pipes in?

John: It's generally at the house, but again, that's why we want an approved plumber because we know that plumber will lay the right material at the right depth and therefore there is less chance of that failing.

Ben: Are these quite simple plans when we're getting it all drawn out? It's not rocket science too much? What things do we need to bear in mind?

John: It's pretty simple, to be fair. It's one pipe generally from that property out to the boundary in a trench at the right depth. That's generally all we're asking for. Then we'll come and inspect that.

So, once you've paid your quotation, you can say, 'I'm now ready', and we will send one of our own inspectors to make sure that it's all been done correctly. Therefore, you don't have that risk of our contractors turning up and saying, 'I'm not going to connect that on to the network because it's not the right material or right depth, or

it's been put in the wrong place'. So, we do that check to make sure that things are all covered.

Ben: Are there any other parts of your process, if we're one of your clients, that we should know about or how it all works?

John: We're fully aware that with the network we operate in, we have some huge, substantial customers. We've got these massive, big, multi-million pound developers. But what we've now put a big focus on is the smaller customer, the single build customers.

If you go on to our website, we've put a section in there that makes it really simple. We've put some really simple guidelines on there just to help those single developers because we were getting a lot of feedback saying, 'we are not these big companies that develop huge housing estates who know the ins and outs of everything. We find this quite confusing'.

So, we've actually spent quite a lot of time and upgraded our website to make it as simple as possible for these people that are just looking to get their supplies connected to a single house.

Ben: Are there ever any cases where a water supply getting connected to the mains becomes too expensive? Do you have to turn some people away or is there always a solution?

John: There's generally a solution, but sometimes it can get costly. Obviously, if you're building a new home in a field, a barn conversion or something like that, and there is a long run to try to get to that nearest connection, there could be a lot of cost to get to that point. So, sometimes people will look at that, but as I say, speaking to us as early as possible will give you that indication as early as we can about those costs involved.

We also provide a pre-development service. So, even before you've gone through that planning process, you can contact us, and we can give you an estimate about what we'll need to do to get our network ready to support that new home.

Ben: Perfect. Well, I feel like I've asked all the questions I want to ask. Is there anything else you think I've missed?

John: No. One of the things that we always say to smaller developers as well, especially on the waste side of things, is to make sure they avoid misconnections. Things happen where people accidentally connect to a drain, and therefore if then we've got sewage running through a drain, that could potentially get to a watercourse and cause pollution.

So, again, we just want to make sure that the smaller developers are aware of that and connect right to the system.

Again, where you're connecting to or intending to connect to our waste system, you need to get consent from us. With that consent, we can then come and do those checks to make sure that there is no misconnections and people have actually connected on to our sewers and so on correctly.

Ben: That is again, I suppose something you need to be wary of as a company, something that should never happen really?

John: Yes, and that's it. Someone sees what they just assume is a sewer and not aware that it might just be purely for surface water. They then connect on to that. If they haven't told Thames Water about this, we've not had a chance to look at that, and suddenly all the sewage then from that home could be going straight into a watercourse and polluting that watercourse.

We'll then potentially get contacted by the Environment Agency and we have to start doing that investigation to try and find the source of that. So, if we know as soon as possible up front that we've got the confidence that these things are connected properly, it can just help those wider investigations.

Ben: Finally, what does the next five or ten years look like for Thames Water and where would you like to get yourself, if you're on this mission of constant improvement?

John: The big thing we need to do, and it's obviously highlighted a lot in the press, is the huge work that we need to do in terms of improving leakage. Our leakage levels are high, like a lot of water companies, so we do have a massive target in the next five years to deliver that.

We're also putting a real big focus in the next five years on improving our customer service. Again, we've done a lot of work for smaller developers, we're also doing a lot of work in the background in terms of improving the customer experience so that when the customer has to contact Thames we make it as seamless and easy as possible.

We're also upgrading our website so that when customers have issues around their bill, they can actually go online and get some information online rather than always having to wait in a call centre. So, lots and lots of work is happening in that place.

So, really, it's all about improving the customer experience and really trying to drive down our leakage.



Ben: Lovely. John, thank you very much for all the information today.

John: No worries. Nice to speak to you.