

PROFESSIONAL COLUMN: *Waller and Dyker, Winter 2009/10*

Ends part 2

Last time I promised to deal with “broken ties”, so here we go.

As usual broken ties are dealt with in BTCV’s “*Dry Stone Walling*”, see p.91 or online at <http://handbooks.btcv.org.uk/handbooks/content/section/1633>. Hopefully the following will illustrate the basic pitfalls you are likely to encounter.



With a ‘broken tie’ end you have runners but no ties. Instead you place a runner and then at the same level butt a broken tie stone to it. This broken tie should be more than half the width of the wall so it at least ties something, but less than $\frac{3}{4}$, simply because if it is more than $\frac{3}{4}$ the runner is too narrow. You can place the broken tie first but usually it is easier and structurally sounder to place the runner first and then fully utilise the available space with a broken tie. On the next layer you reverse the process with a runner sat on the broken tie and a broken tie on the runner.

This example from Llanfihangel-Glyn-Myfyr (I shall not even attempt to pronounce it), near Cerrig-y-Drudion (OMG) North Wales, shows very good overlapping within the head. The photo on the right shows the right hand side of the end as it ties into the main body of



the wall.

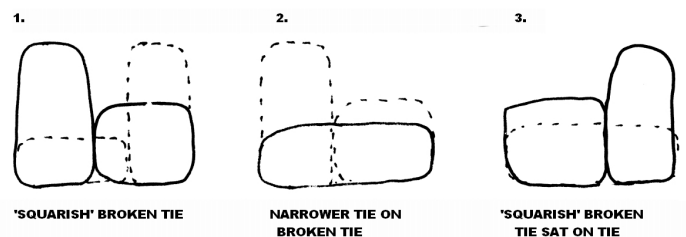
With less regular stone, as in this example, it is acceptable to double up runners/ties to match the depth of a thicker runner/broken tie, but this can create problems with tying the end into the main body of the wall. Where you double up runners/broken ties you have to ensure they have different lengths into the main body of the wall otherwise joints will develop. Here this has been quite well done, to be hypercritical $\frac{3}{4}$ of the way up it hiccups a little but given the type of stone this is not unreasonable.



The sandstone end left (seen in part 1), demonstrates the problem that can easily occur – in this instance the lower of the 2 sets of joints has been created by placing short runners on wide broken ties, whilst the upper joint is two runners of the same length. This is in effect “stacking”, within a wall that is the placing stones of similar face length on top of each other, creating joints on both sides, and hence a serious weakness.

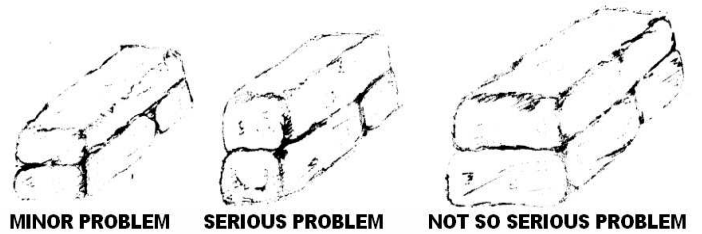
When building a broken tie end you should still use full ties if they are available as their role as a through will improve the end’s stability. However the full tie will inevitably be sat on a broken tie and runner, and have a broken tie and runner sat on it. This can lead to joints/stacking similar to the sandstone end. Consequently you need to plan the use of the tie well in advance. Work out at what height it’s going to be placed (obviously determined by its length) and then ensure that the broken tie it is going to sit on is either significantly wider or narrower than it, thus avoiding the joint

problem. Only use ‘narrower’ broken ties where you have a slab for the full tie. Make sure you place a wider/narrower broken tie on top of it – and don’t forget to alternate it from the one below the tie.

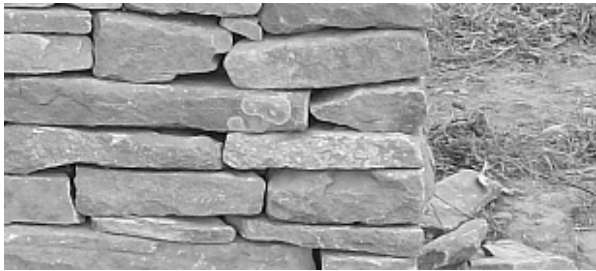


Hopefully this makes it clearer. It should be obvious that squarer broken ties tend to be useful here. I have no real answer as to whether it is better to have a full tie with a joint rather than no tie at all. It will depend on individual

circumstances and the joint might be outweighed by the tie whatever the case, opinion varies. As an example of this conundrum, if you have relatively thin stone a joint created by say a two inch thick tie sitting on a two inch thick broken tie, will not be anywhere near as serious as a joint created by a four inch thick tie sitting on a 4 inch thick broken tie. The seriousness will then be partly dependant on how far into the wall the ties run.



What is certain is that a full tie without a joint will be stronger and whilst it might be easier said than done, it can nearly always be done with a bit of forethought and planning.



So far we have only touched on how the end is tied into the main body of the wall, and it isn't all down to the actual tie stones. In part 1 we saw an end where potential runners had been used in the wall, (this is in fact the same sandstone end as above) part of which is shown left.

Essentially you have a longish runner, narrower tie and longish runner, to avoid a joint there is a tendency to trace (i.e. run the long axis along the line of the wall) a stone up to the tie, sandwiched by the two runners. The end result is a stack of three traced stones on top of each other, which can be a serious weakness, arguably weaker than having a joint. Again there is no definitive answer to this one. In this example the sandwich filling (so to speak) is definitely excessively traced, a couple of shorter stones would be more stable. There should also be enough space within the body of the wall (i.e. the back at this level is a runner, given we are butting to a broken tie) to use a stone with some length. Whatever the case always utilise this space even if you really have to trace a stone the weakness will be partly mitigated if you use most of the available space within the wall.

If the wall head is constructed from long runners, then not having long stones 'filling the sandwich' can look a little strange. However if the smaller stones cross joints, are tight, run well into the wall there shouldn't be a problem. It might to some eyes look better if there are longer stones it doesn't necessarily affect strength. You have to remember that if the smaller stone is representative of the wall as a whole then the fact that you have long ties should be sufficient to stop the head from moving (all other things being equal) and as the rest of the stone size is the same as any other part of the wall this should be no more likely to fail than any other section, and arguably more likely to be able to absorb movement during settlement than if you create a stack of traced stones.

This has implications when constructing the more 'advanced' features such as passageways/lunkies and corners which essentially develop the basic principles of wall end construction... as we shall see next time, but first we have one more issue to deal with, the problem of sitting long runners.

Where a runner has to sit on a number of stones you are likely to encounter problems. With more regular stone careful levelling of the building stone should suffice. With very regular stone you have to avoid small steps which will result in the runner rocking or not gripping a building stone sufficiently. It can be tempting to sit it on long traced stones thus removing some of the potential problems. You should be able to tell from the preceding paragraphs that this is little more than a poor excuse for compromised craftsmanship. With less regular stone you can spend ages building a nice level bed only to find the runner will not sit, or grip, or both – as would have been the case with the long runner two thirds of the way up the end shown above left, and the next runner up. Another conundrum. I tend to sit the runner on the tie and prop the other end with a couple of stones, then find stones to fit the 'letterbox' underneath. Once a couple of these are in place the props are removed and replaced with something more suitable. It can be a painstaking approach trying to find good fits but worth it if you want to avoid having to pin the runner. Occasionally you can try hammering stones into the gap, but you have to take great care not to lift the runner off other building stones.



More Next time!
Craig Arbennigol

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