



Systematic Installation of Copper to Save Money

Part 2 - Copper Tube Installation Method

The previous article explained the basic principles that can be used to produce a cost efficient top quality tube installation. This article builds on those principles to produce a systematic copper tube prefabrication method based loosely on production engineering techniques. Useful savings of both time and materials can be made by using the system.

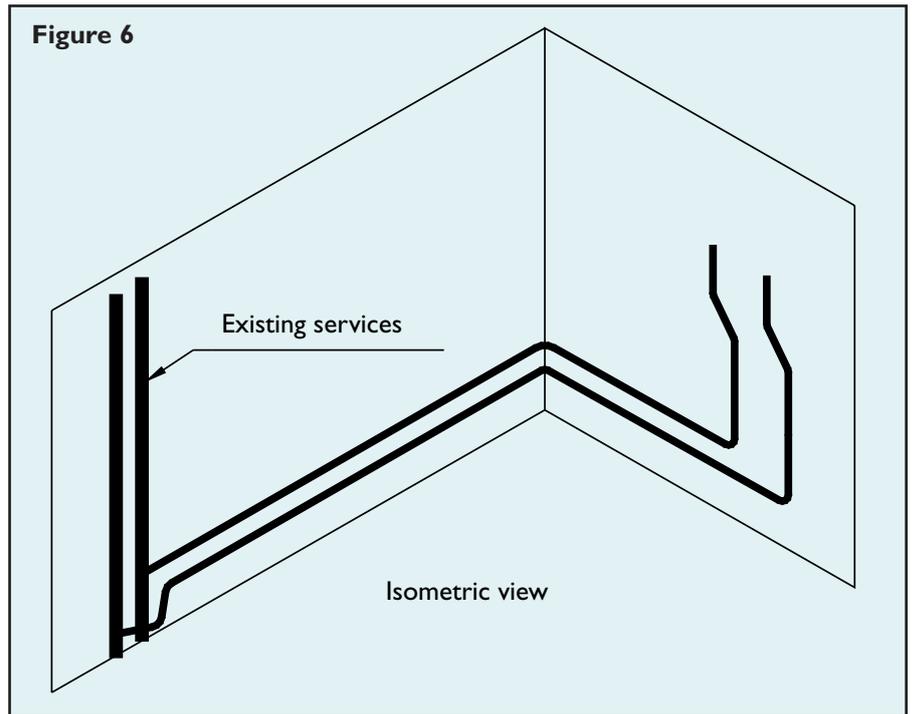
The basic idea behind the system is to take as many measurements as possible in one operation. This is to eliminate the piecemeal preparation of individual pieces of tube and reduce waste from off-cuts. Measurements of the walls or fixing surfaces and positions of fixed points are taken and used to determine accurate tube cutting lengths.

An example

Figure 5 illustrates a plan of hot and cold water pipework to supply a washbasin. Typical clip and fitting allowances are shown. For clarity an isometric view of the pipework is shown, see Figure 6.

Using the system

The square grid at the top of the layout chart is used first to draw a single-line plan, and, if necessary, section of the



work. Tubes are then numbered and diameters written on the cutting list. Next actual measurements of the structure are taken and added to the cutting list. Clip and fitting allowances are measured and noted on the allowances (familiarity with the system will soon enable the measurer to remember

common allowances). The tube cutting list can then be completed by allowing for clips and subtracting the fitting allowances. Figure 7 shows the completed chart with cutting lengths for the work.

Where tube is to be fabricated using multiple bends, the isometric grid is used to show the relative directions of the various bends and sections of tube. The cutting list can be used to allow for clips to determine centre to centre lengths for bending. These can be added to produce the cutting length required for each section of bent tube.

When the cutting list is complete, the tubes can be fabricated. Whether using fittings or a bending machine, good productivity gains can be made when compared to piecemeal production of individual tubes. All tube of a particular diameter can be cut and if necessary bent at one time. This is to minimise the time spent setting up and adjusting machines. Once each piece of tube is

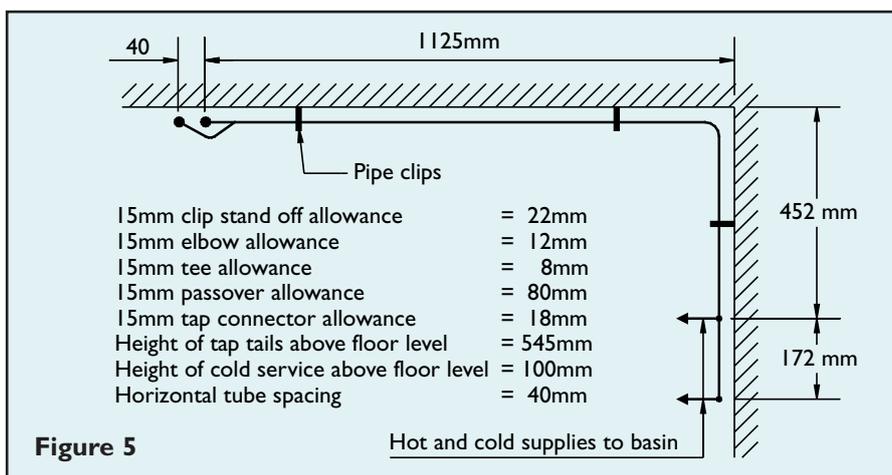


Figure 5

Hot and cold supplies to basin

fabricated it can be marked with its number for easy identification on site by the fitter:

Actual tube installation is quick and efficient. Tubes can be cleaned, fluxed and assembled into the clips and fittings in one operation. The fitter does not have to offer them into position, mark, remove cut, re-check and then assemble.

Variability of site work

To work effectively, any system must be able to cope with the variability encountered in construction work! On large contracts, where detailed drawings are available, measurements for basic runs of tube, such as risers and run-outs in ducts or false ceilings, can often be scaled-off from the drawings with sufficient accuracy. On jobs that do not have detailed drawings, or where dimensions are critical, measurements of the structure should be taken on site.

By using the system, if necessary, hundreds of metres of pipework can be measured in one operation for later fabrication. This can be done either on site or in the workshop by the measurer or another operative. The system also works very well on small individual jobs.

Where there are numbers of identical units, such as on housing sites, it is quite easy to fabricate batches of tubes from a single set of measurements. By making use of the tube that is gained when pipes are to be bent, or by the judicious addition of short extra lengths in strategic places, an allowance can be made for the inevitable variations in size that occur from one unit to the next on site. If compression joints are to be used, one end of each joint can be made on to each piece of tube as it is fabricated.

Cost savings

Experience with the system has shown that considerable savings can be made by the better use of site labour and materials. Piecemeal, time consuming installation is reduced and tube cutting lengths can be optimised to reduce waste. If necessary, the planning of tube runs and calculation of cutting lengths can be done before materials arrive on site. Also, better control and utilisation of stock can be achieved.

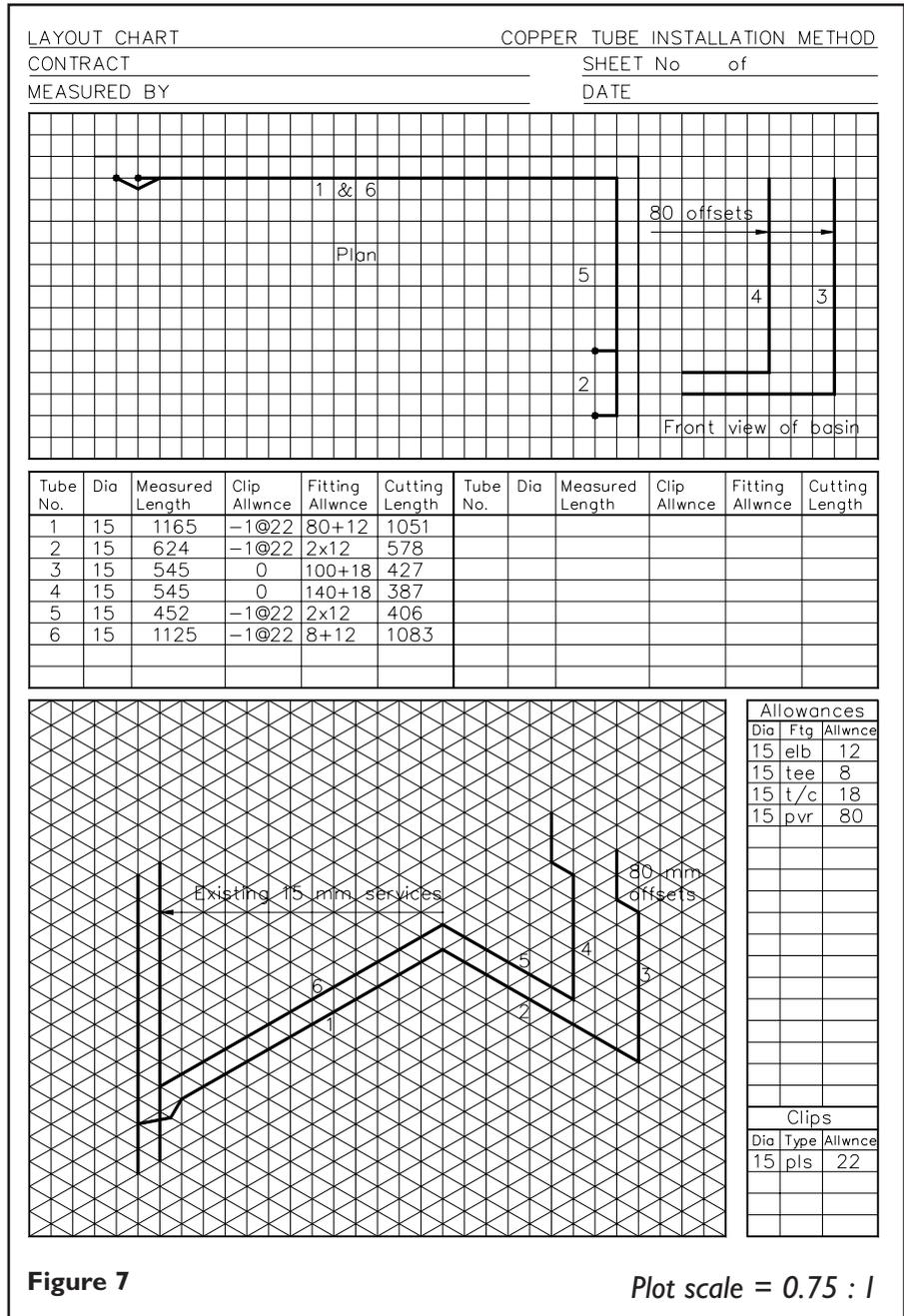


Figure 7

Plot scale = 0.75 : 1