TTE Training Ltd.

Phase 1

Electrical Course Notes

E-CN-005

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Bending Steel Conduit

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The most common method of bending steel conduit is to use a bending machine. However, for bending 32mm diameter or larger conduits it is recommended to use a portable ratchet bender. The following are the main steps to be taken when using a bending machine.

- Insert the conduit under the stop and into the groove in the former.
- Pull down the handle, allowing the roller to bend the conduit around the former.
- Use a template to compare the angle of the bend formed with the desired angle.

Bends should be formed to an internal radius **of** not **less than** 2.5 times **the conduit diameter**

Making a 90o Bend in Steel Conduit
Figure 1 illustrates a right angle bend in steel conduit, which must be formed to a dimension of 200mm.

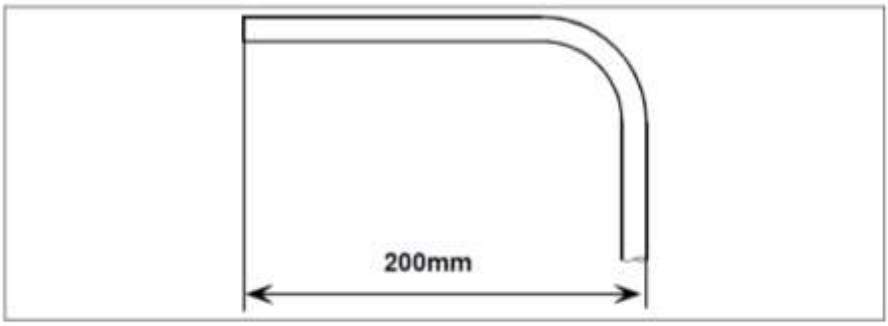

Figure 1

The first step is to mark off 200mm from the end of the conduit as illustrated in Figure 2.

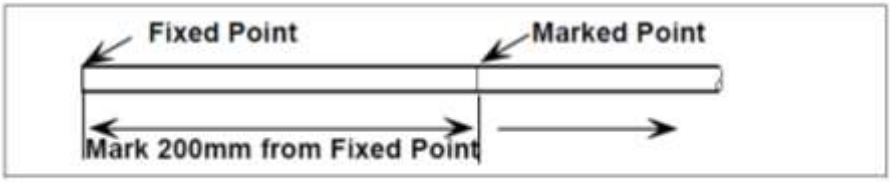

Figure 2.

The next step is to place the conduit in the former with the mark to the rear. Position the conduit so that an engineer's square, held against the mark touches and forms a tangent to the edge of the former as illustrated in Figure 3.

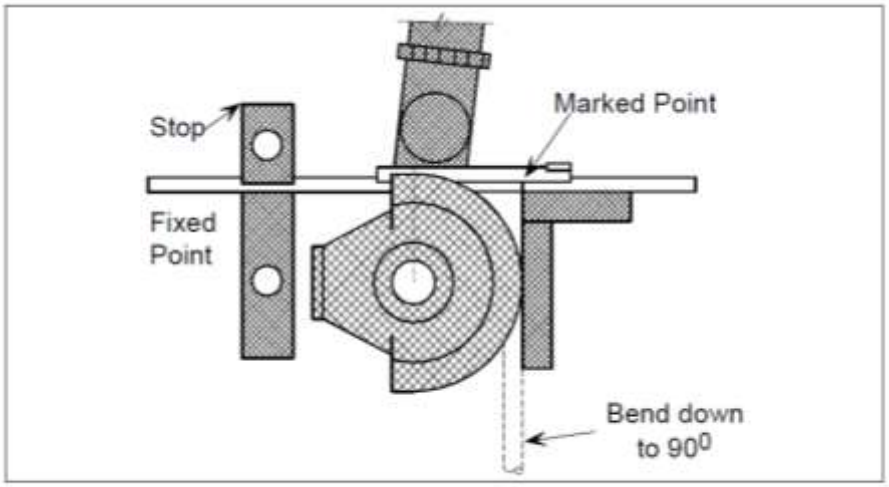

Figure 3.

Next pull the lever down until the 90° angle, is achieved.

Making a Double Set or Offset in Steel Conduit

Normally offsets should be formed at either 30° or 45°.

A 30° offset is preferred for two reasons:

- Ease of measurement.
- Ease of drawing-in cables.

Forming of a 30° Offset

Figure 4 illustrates a 30° offset to be formed in steel conduit. From the illustration it can be seen that the 30° angle is one of three angles forming a right angled triangle.

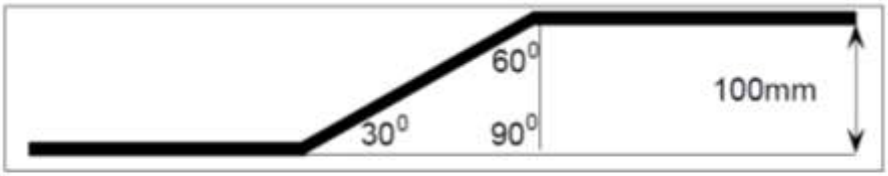

Figure 4.

A rule of thumb for a right angle triangle (30°, 60°, 90°) states that the relationship between the three sides is in the ratio of 1:2:√3, see Figure 5.

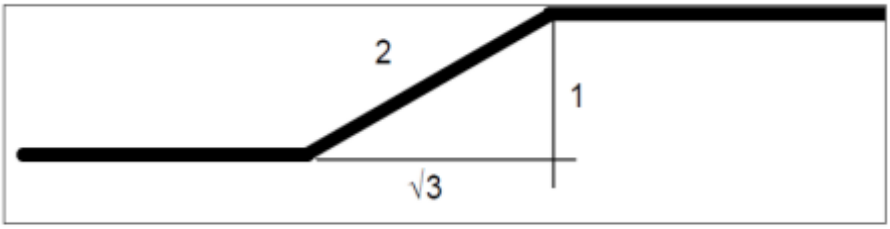

Figure 5.

With this information, once we know the dimension of the offset (100mm in this case) we can now calculate and mark off the distance between the two bends. At this point take the straight piece of conduit and mark on it where you want the first bend to start from, then measure 200mm from that point to where the second bend starts, see Figure 6.

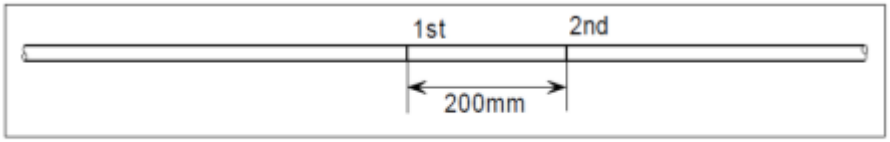

Figure 6.

Now go to the bending machine. Mark a point on the former as shown in Figure 7. Place the conduit in the former matching the first mark on the conduit with the mark on the former and bend to 30° as shown in Figure 8. Now remove the conduit and check the offset angle against a 30° template.

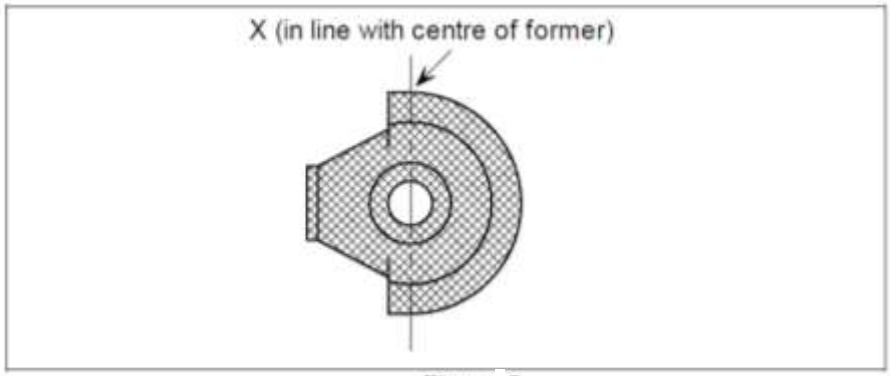

Figure 7.

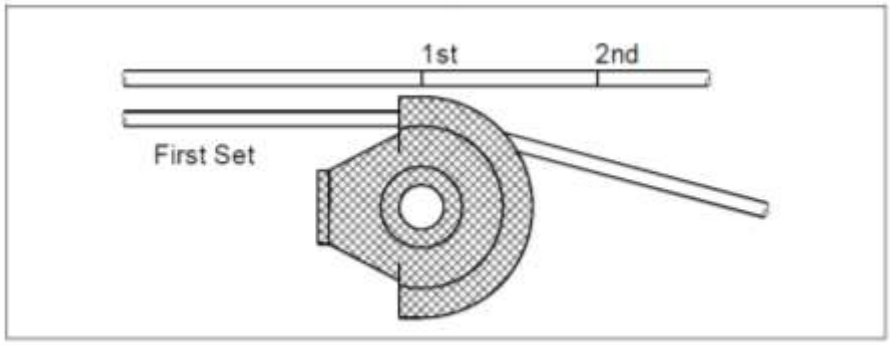

Figure 8.

Place the conduit back in the machine pointing in the same direction as before but inverted and match the second mark on the conduit with the mark on the former, see Figure 9. The second offset is now formed until it is in parallel with the first offset.

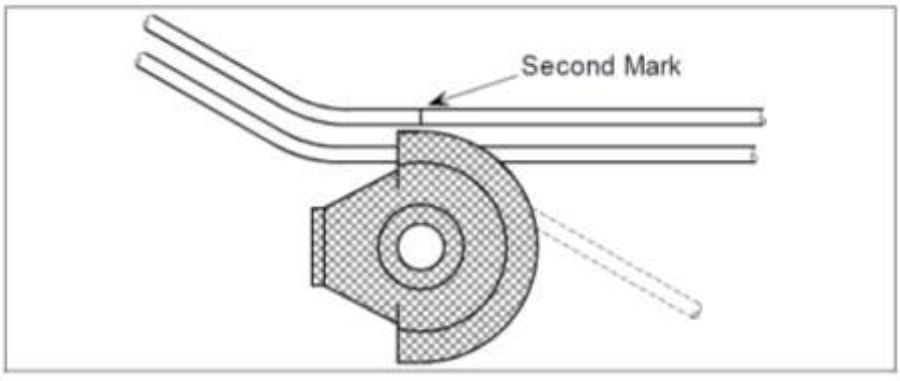

Figure 9.

Forming a 45° Offset

A 45° degree offset is formed in exactly the same manner as the 30° version except that the measurements between the first and second bends are calculated using the following formula 1:1:√2. Figure 20 illustrates the use of this formula, in this case √2 =141mm or 100 x √2 = 141mm.

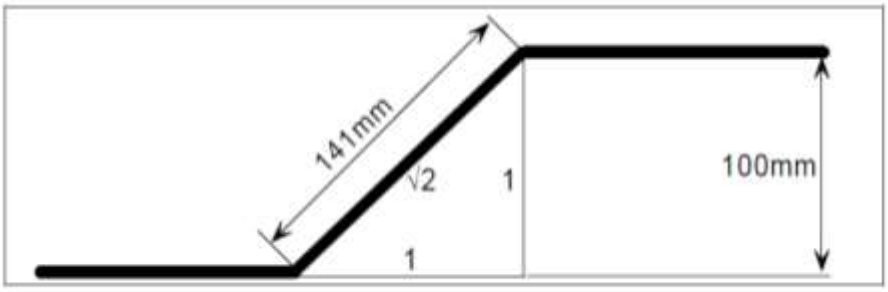

Figure 10.