# Unit 112: Construction operations and civil engineering operations

# Worksheet 15: Drainage systems – calculations 1 (tutor)

The drawing details a section of plastic drain to be laid around a new office block.

**Task:**

You are responsible for:

(a) calculating the total volume of earth to be excavated and

(b) ordering the total number of drainage fittings and materials required to carry out the work and cost the project.

Complete the table on the next page to show your work.

**Note:**

All pipe runs are 100mm in diameter

All straight pipes are 6000mm in length

Pipes to be laid on a 100mm bed of pea gravel

The trench width is to be 750mm wide

Average depth of trench is 1m

The average trench depth is 850mm

|  |  |  |  |
| --- | --- | --- | --- |
| Items | Amount | Cost per item  (£) | Total cost |
| Earth to be excavated | 104.25m³ | n/a | n/a |
| Pipes | 24 | £6.50 | £156 |
| Manholes | 2 | £65 | £130 |
| Inspection Chambers | 3 | £48 | £144 |
| Rodding Eyes | 2 | £25 | £50 |
| Back Inlet Gullies | 2 | £30 | £60 |
| Pea gravel | 22 tonnes | £35 | £770 |
|  |  | **Total cost** | £1,250 |

**Builders’ merchants price list**

Pipes £6.50 each

Manholes £65 each

Inspection Chambers £48 each

Rodding Eye £25 each

Back Inlet Gully £30 each

Pea gravel £35 per tonne

All prices are inclusive of 20% VAT