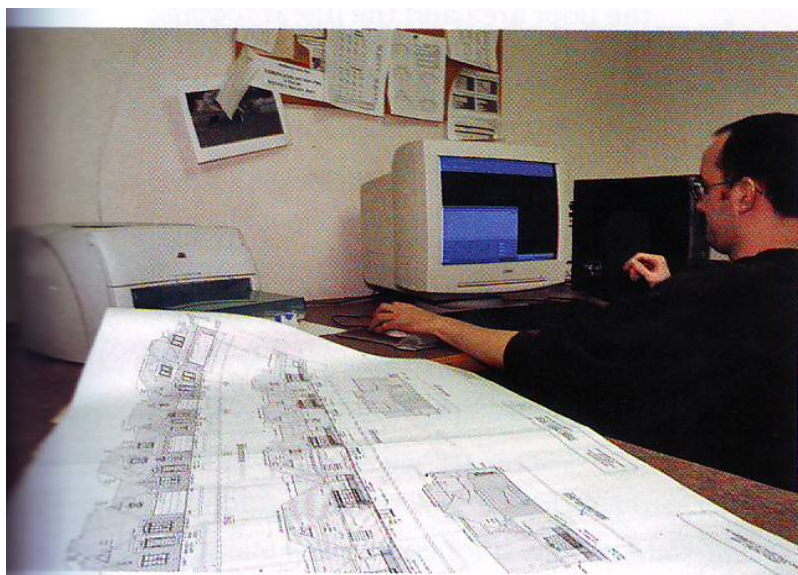




UNESCO-NIGERIA TECHNICAL &
VOCATIONAL EDUCATION
REVITALISATION PROJECT-PHASE II



NATIONAL DIPLOMA IN QUANTITY SURVEYING



MEASUREMENT OF BUILDING WORKS II

COURSE CODE: QUS 102

YEAR I - SEMESTER II

THEORY/PRACTICAL

Version 1: December 2008

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WEEK 1

Foundations

Introduction

Foundations or sub-structure is the term used to indicate all supporting building work in the ground below a specific demarcation line, usually the damp proof course and/or damp proof type membrane.

In this first example all descriptions are written out in full, but it is usual for these to be abbreviated in practice.

Information required

SMM D20.P1 lists information which should accompany the bills of quantities. The following information is required before measurement can commence:

1. Full specification
2. Site survey report including the results of trial pits and/or bore hole investigations
3. Plan of foundations complete with sections and levels

With regard to levels, the following information is required:

1. Existing ground levels
2. Floor level of proposed building
3. Level showing depth of foundations
4. Finished ground levels

Existing ground levels will be found on the 'site survey' drawings which should also show the position of trial pits and/or bore holes including date when inspected. In addition, the positions and types of trees, existing buildings, services, paved areas and other features which may affect the measurement should be included.

Finished floor levels and levels showing depths of foundation will be found or can be calculated from the architect's or engineer's drawings. Finished ground levels will be found on the external works drawings.

Measurement

Excavation

Excavation oversite to remove topsoil is one of the first operations carried out. Topsoil may be kept on site in temporary spoil heaps for use later in the execution of the external works. The depth of topsoil is obtained from the site survey investigations and if it is to be preserved it is measured in square metres, see SMM D20.2.1.

The oversite excavation is measured to the extreme dimensions of the building's foundation, even though in practice the whole site may be stripped of topsoil in one operation. If there is no topsoil or if the topsoil is not to be retained then the resultant excavation to reduced level is measured in cubic metres and described as such.

The oversite excavation must be completed before the measurement of excavation of trenches or pits of which the depth is calculated from this reduced level (also known as the commencing level of excavation), and if this is more than 250 mm below existing ground level, this must be stated.

The description and measurement rules in SMM7 are based on mechanical forms of excavation. Therefore the classifications and maximum depths must be given to provide sufficient information to enable the estimator to price the excavation using the most economic type of plant for the particular project. The maximum depth given can be for each unit or group of units (see Code of Procedure).

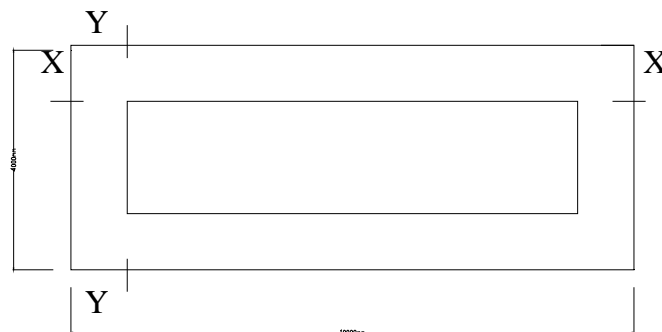
Excavation is measured to the shape shown on the drawings and the estimator must allow in his pricing for bulking of the soil and additional space to accommodate earthwork support, see SMM D20.M3.

Earthwork support

Earthwork support is to be measured to the full depth of all faces of excavation whether or not required to all vertical faces exceeding 0.25 metres high, see SMM D20.7.*.*.M9. It is up to the contractor to decide whether or not earthwork support is required to any particular excavation.

Earthwork support is classified by the maximum depth of the excavation and the distance between the opposing face, i.e. the distance the supporting struts have to span. However, it should be noted that the word ‘opposing’ does not necessarily mean opposite. For example, in the plan shown in Figure 3.1 all the earthwork support is classified as ‘Distance between opposing faces 2.00 m’ even though some opposing faces exceed 2.00 m. There would be no earthwork support measured in the categories 2.00—4.00 m (faces Y—Y) or >4.00 m (faces X—X) between opposing faces.

Where earthwork support to oversite excavation or reduced level excavation coincides with the external face of a trench and does not exceed 0.25 m high it is in practice measured and given the same ‘distance between opposing faces’ classification as the trenches. Where it exceeds 0.25m high it should be measured and given the appropriate classification, e.g. distance between opposing faces >4.00



Plan of foundation trenches

Concrete in foundations

Concrete in foundations is measured to the exact dimensions shown on the drawings but must be distinguished as between being ‘poured on or against earth or unblinded hardcore’ so that the contractor can make due allowance for any concrete loss due to irregularities.

Brickwork

Generally brickwork is measured in square metres and the thickness is stated, as shown in Figures 3.2—3.4. This is usually given in numbers of bricks and is measured on the bed of the brick at right angles to the face of the wall.

The actual size of standard bricks is 215 x 102.5 x 65 mm, but the nominal size is 225 x 112.5 x 75 mm, which includes a 10mm allowance for a mortar joint. This information will be used to calculate wall, pier and chimney stack widths and thicknesses in the following worked examples.

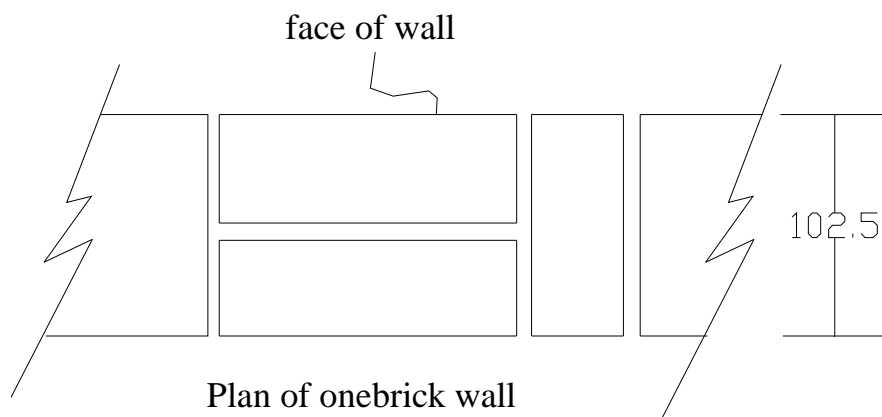
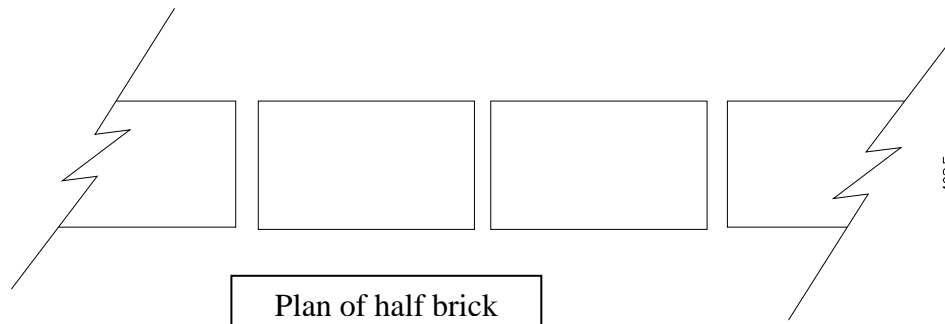


Figure 3.3 Plan of one brick wall

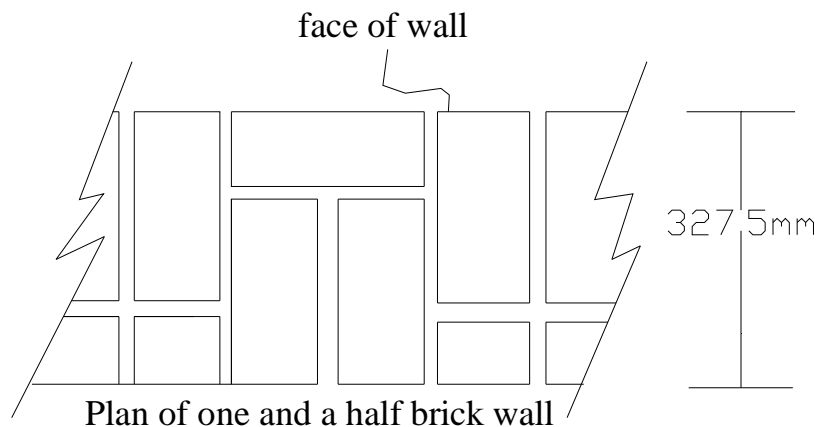
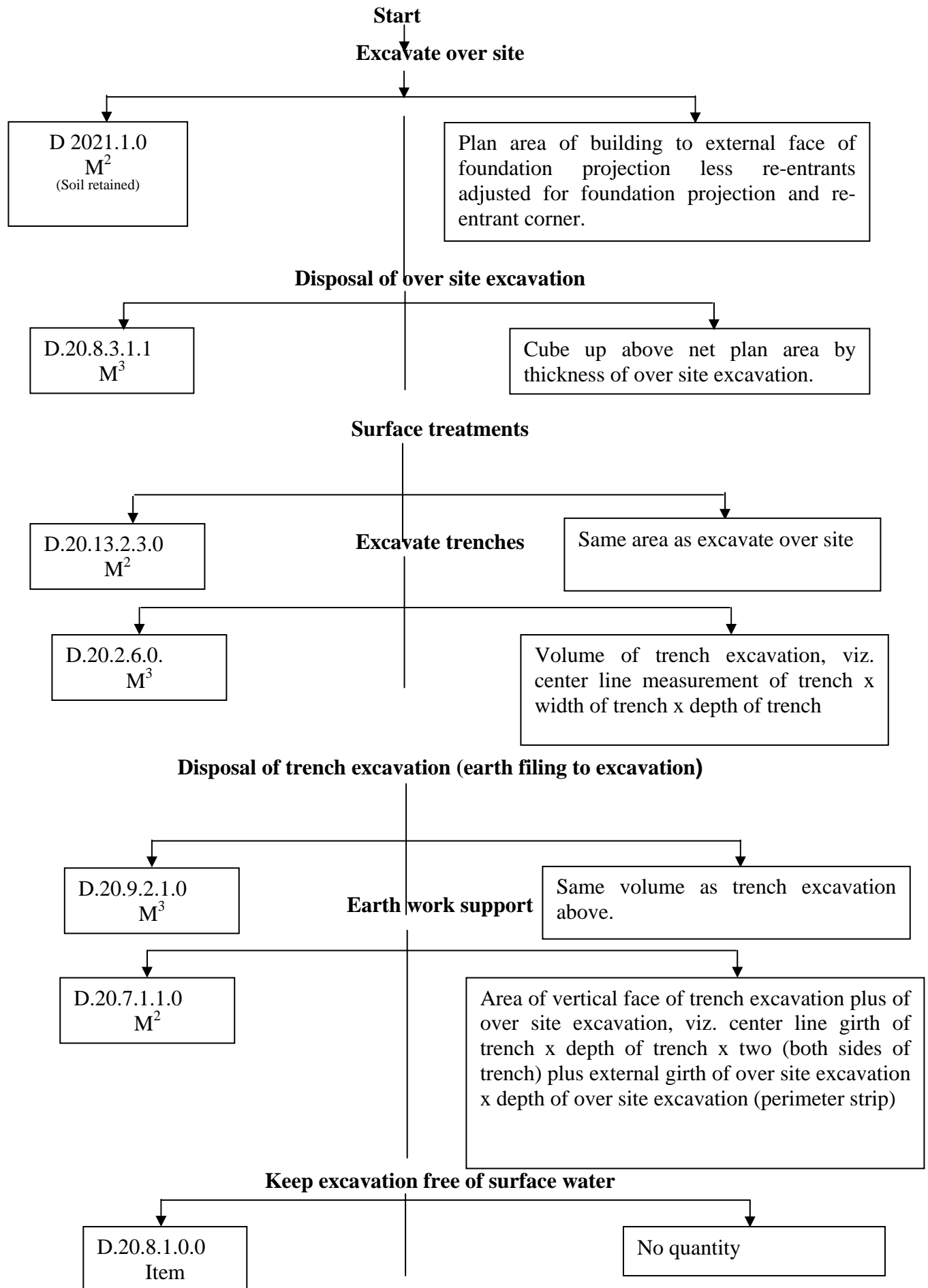


Figure 3.4 Plan of one and a half brick wall

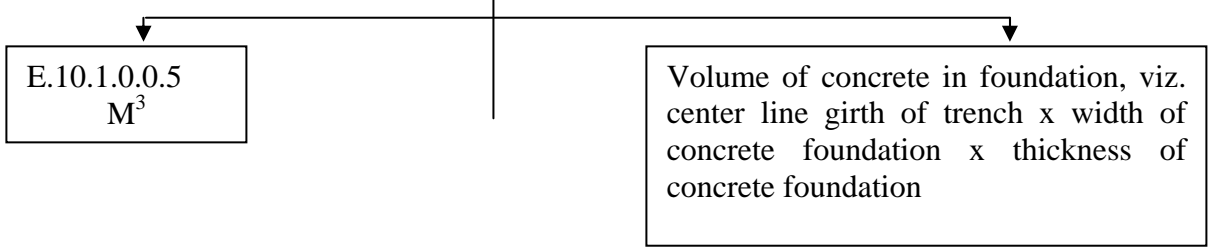
Faced brickwork

Exposed faces of brick walls will usually be built using facing bricks and the joints pointed. To allow for the soil backfilling of trenches to settle, one or preferably two courses of facing brickwork are taken below the finished ground level. In the following worked examples two courses are taken below the finished ground level.

Flow chart for foundation measurement

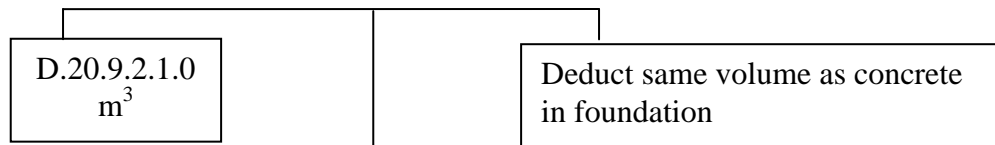


Concrete foundation

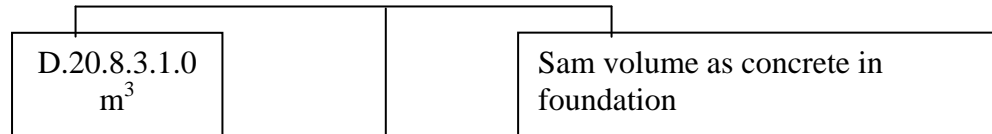


SMM ref & unit measurement

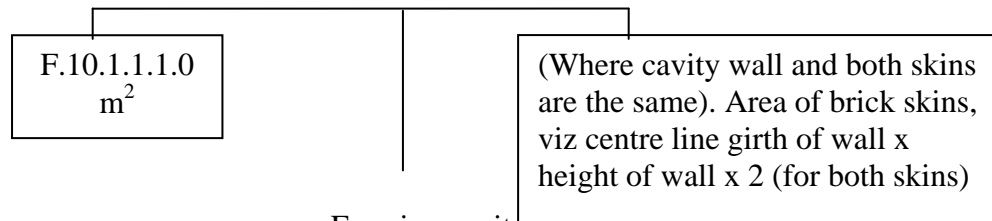
Earth filling to excavation (displacement by concrete)



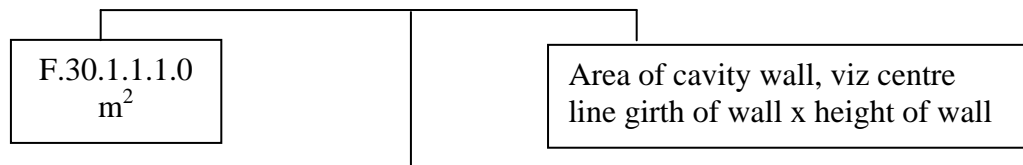
Disposal of excavated material



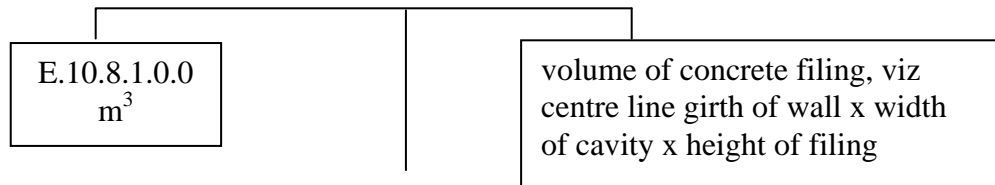
Brickwalls in common bricks



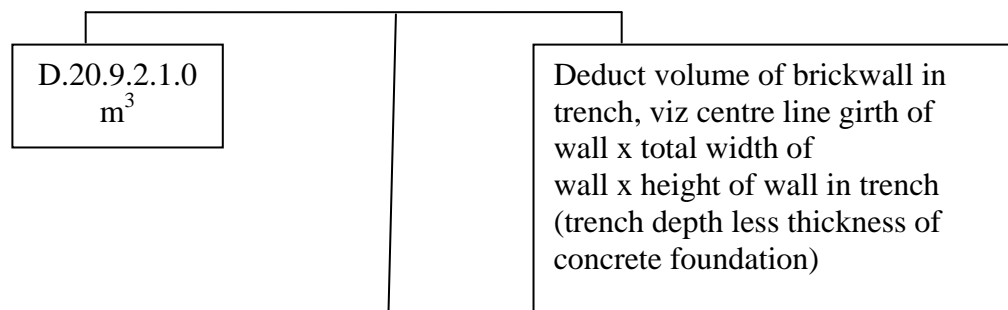
Forming cavity



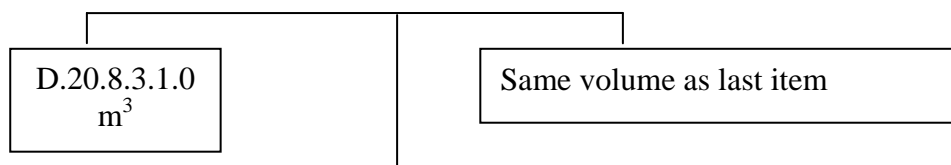
Filling to cavity



Earth filing to excavation (displacement by brickwork)



Disposal of excavated material



Damp proof course

F.30.2.1.3.0
m²

Plan area of brickwalls (where
cavity walls), viz centre line girth
of wall x width of skin of wall x 2
(for both skins)

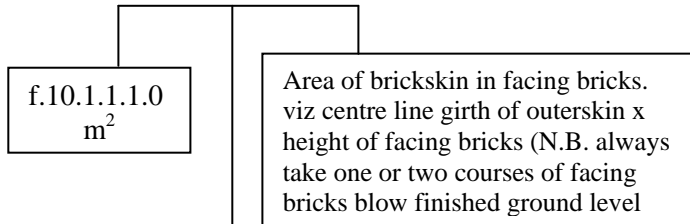
Flow chart for foundation measurement – continued

SMM Ref & Unit

Measurement

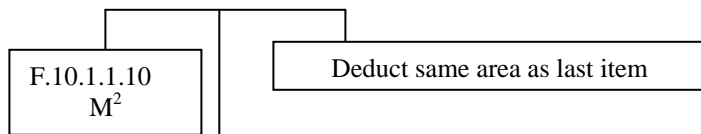
Continued

Brickwalls in facing bricks

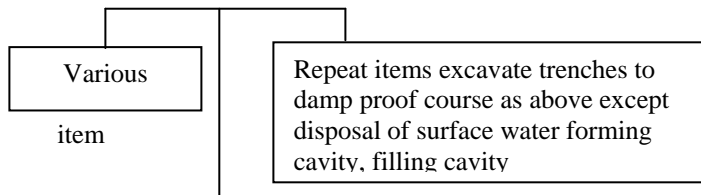


Adjust of brickwalls built in common

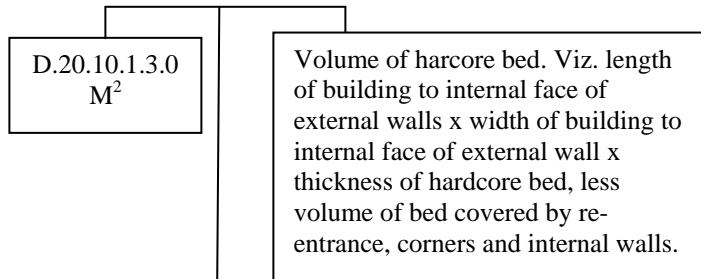
Bricks



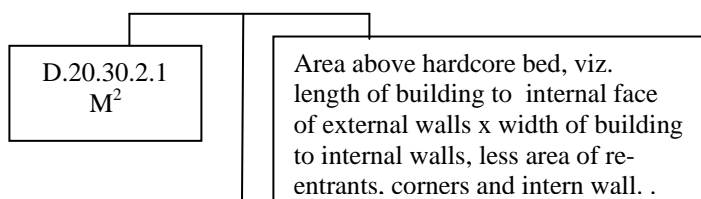
Internal walls



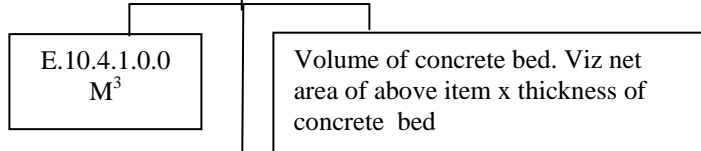
Hardcore bed



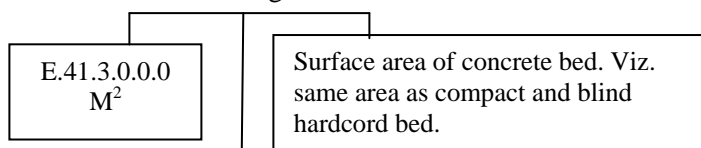
Compact And Blind Hardcore Bed



Over Concrete



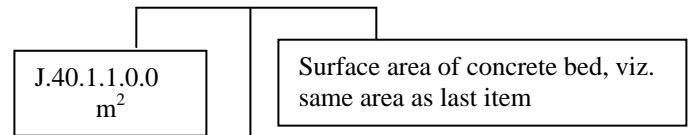
Trowelling surface concrete



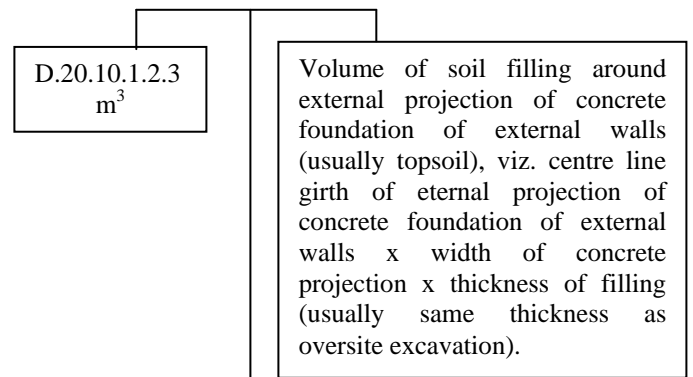
SMM Ref Unit

Measurement

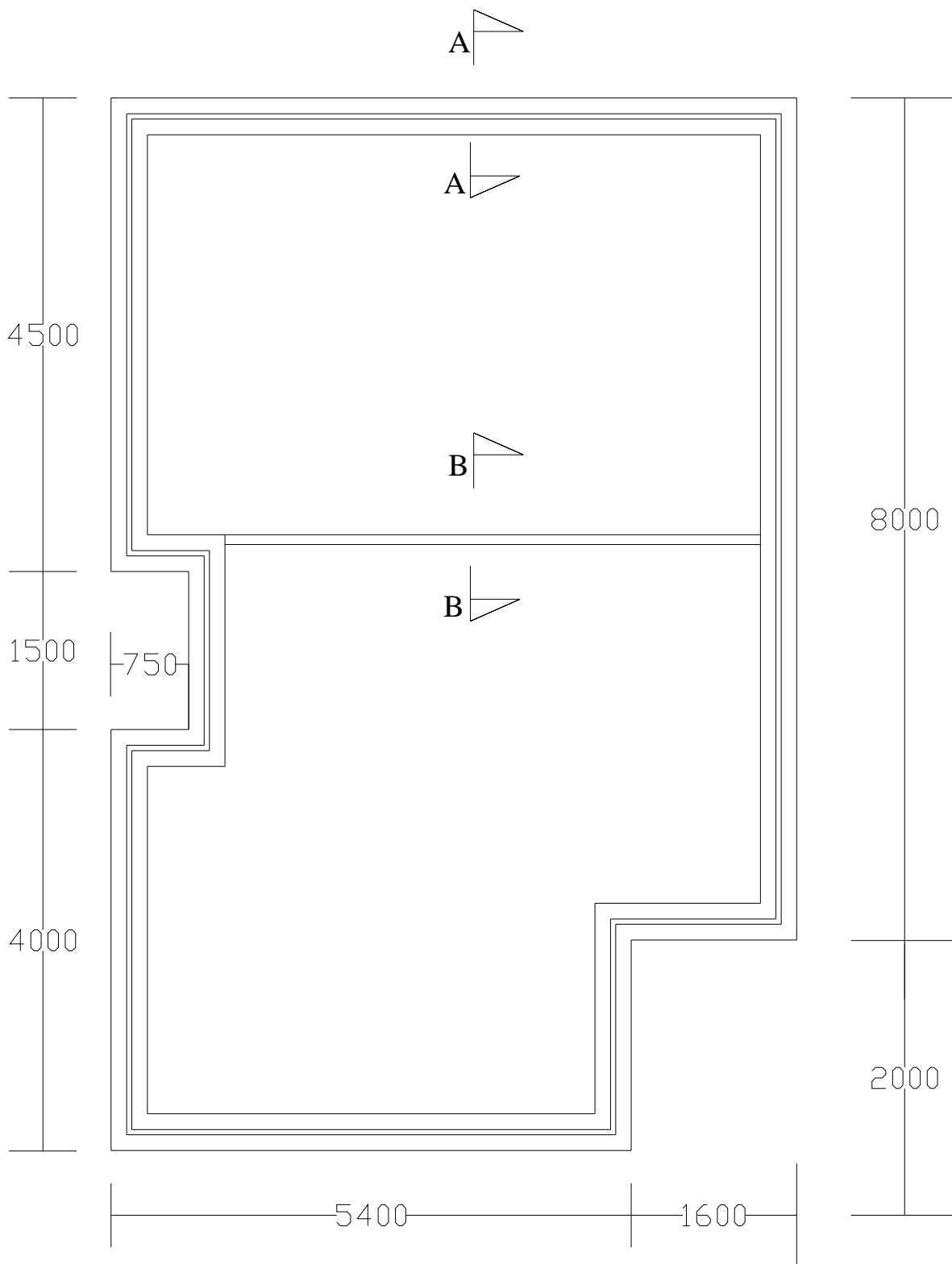
Damp Proof Membrane



Adjustment of soil to perimeter of building



Check drawing and taking-off list for outstanding

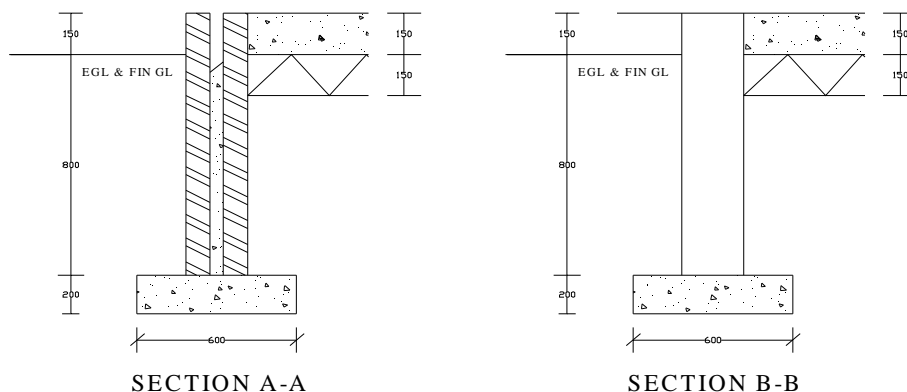


PLAN Scale: NTS

FOUNDATIONS

SPECIFICATION

1. Topsoil: 150 mm deep — to be excavated & deposited in spoil heaps 50 m from excavation.
2. All surplus soil taken to a tip provided by the contractor.
3. No ground water.
4. Concrete: a) Foundations — 15N/20 mm
b) Oversite & cavity fill — 20N/20 mm
5. Brickwork: a) Generally to be Class B engineering bricks in cement mortar — (1:3)
b) Facing bricks to be Redland multi coloured in cement mortar — (1:3) pointed with a flush joint as work proceeds.
c) Built in stretcher or English bond.
6. Wall tiles: Mild steel vertical twisted type —
to BS.1243 Type 3 — 2 per sq. metre.
7. DPC: Hyload pitch polymer bedded in cement mortar (1:3) lapped 150 mm.
8. DPM: 1000 gauge polythene lapped 150 mm at all joints.
9. Hardcore: Broken brick or stone — blinded with sand.



FOUNDATION

Foundations 1

Taking off list.

1. Excavate vegetable soil and disposal of soil.
2. Surface treatments
3. External walls
 - a. Excavate trenches and disposal of soil.
 - b. Earth work support.
 - c. Keep excavations free of surface water
 - d. Concrete in foundations and adjust disposal of soil.
 - e. Brickwork up to damp proof course and ditto.
 - i. Outer and inner skins
 - ii. Formation of cavity
 - iii. Concrete filling to cavity
 - f. Damp proof course
 - g. Facing brick work to external skin and adjustment of common brick work.
4. Internal walls repeat a.f above
5. Hardcore bed.
6. Blind hardcore bed
7. Oversite concrete.
8. Trowelling surface of concrete
9. Damp proof membrane.
10. Adjustment of top soil to perimeter

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Foundation 2

Excavate oversite.

$$5.400 \times 8.000$$
$$\underline{1.600} \times \underline{2.000}$$

External dimensions	7.000	10.000
---------------------	-------	--------

+concrete projection

Trench	0.600
--------	-------

-brick wall 0.255
$$2/1/2/0.345 = \underline{0.345}$$

0.345

7.345

10.345

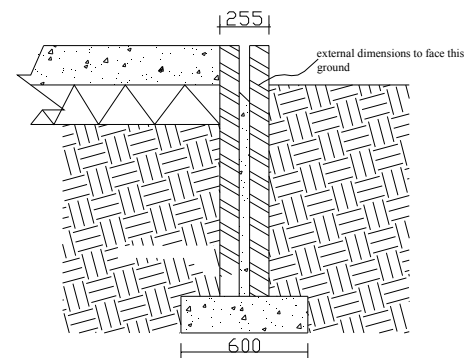
Side notes indicate section
measured. (See taking-off list.)

Waste calculations to three decimal places. (See SMM General Rules 3.2.)

The convention of noting horizontal dimensions followed by vertical dimensions is used here.

The oversight excavation must be taken to the extreme dimensions necessary to enable the foundations to be dug.

Therefore the projection of the concrete foundation is added to the external brickwork dimensions.



It is necessary to add this same
dimensions for the concrete projection

	<u>Foundations 3</u>	
	<u>Excavate oversite (Ctd)</u>	
7.35	Excavating topsoil for preservation	SMM D20.2.1.1.O
<u>10.35</u>	average 150mm deep.	
	&	The ampersand is used to save writing the dimensions again.
	Disposal excavated material on site in Soil heaps average 50m from excavations	SMM D20.8.3.1.1
	Cube x 0.15 = _____m ³	The instruction given after a description converts the superficial measurement into a cubic measurement.
	&	
	Surface treatments compacting bottoms of excavations.	SMM D20.13.2.3.0
	<u>Re-entrant</u>	Side notes to identify particular points or areas.
	1.500	
	-concrete projection	Waste calculation set out to enable complete checking of dimensions.

				$20\frac{1}{2}/0.345 = 0.345$	
				<u>1.155</u>	
	1.60		<u>Ddt</u> Excavating topsoil (corner		SMM D20.2.1.1.O
	<u>2.00</u>		as before	(re-entrant	The Golden Rule' of measurement is
	0.75				'measure overall and then adjust'. It is
	<u>1.16</u>				necessary to adjust the topsoil
					excavation, etc., for the wants.

		<u>Foundations 4</u>	
		<u>Excavate oversite (ctd)</u>	
1.60	<u>Ddt</u>	disposal excavated (corner	SMM D20.8.3.1.1
<u>2.00</u>		material on site in spoil heaps as before	The instruction Deduct (Ddt)
		Cube x 0.15_____ m ³ (re-entrant	is written in front of the
		&	description of the item which
		<u>Ddt</u> surface treatments as compacting as before	has to be reduced.
			SMM D20.13.2.3.0
			The term as before (usually
			written a.b.) is used to save
			written full descriptions for
			items fully described
			previously.
		<u>External walls</u>	
		<u>Trench Ç</u>	Ç= center line calculation.
		7.000	External dimensions from
		10.000	foundations 2.
		<u>2√17.000</u>	
		34.000	

Re-entrant $2/0.750= 1.500$

External girth of brick work = 35.500

	Passings $4/2/1/2 /0.255$	<u>1.020</u>
	Ç=	<u>34.480</u>
	<u>Trench depth</u>	
	Existing ground level to top of concrete foundation	
	+ concrete foundation	0.800
		<u>0.200</u>
		1.000
	Over site excavation	<u>0.150</u>
	Trench depth	0.850

The total depth of foundation trench is calculated from the drawing, i.e existing ground level to underside of foundation concrete less the thickness of the top soil which has already been measured.

		<u>Foundations 5</u>	
		<u>External wall (ctd)</u>	SMM D20.2.6.2.0
34.48		excavating trenches width	See Foundations 13 for waste
0.60		0.30m maximum depth	calculations for internal wall.
<u>0.85</u>		$\leq 1.00\text{m}$ (internal wall	
		&	
		Filling to excavation average thickness	SMM D20.9.2.1.O
		> 0.25m arising from excavations.	
			Part of the excavated soil is
			c required to be returned to the
			trench and part disposed of
			elsewhere. The conventional way
			of measuring this item is by
			filling the excavated material
			back into the trench and then
			adjusting for the volume of
			concrete and brickwork in the
			trench later.
			Sometimes it may be more
			convenient to dispose of the

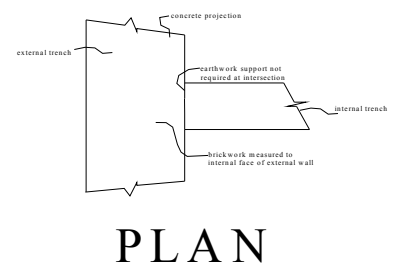
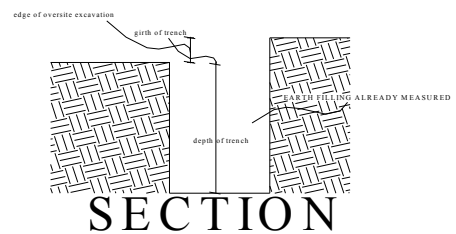
		<u>Earthwork support.</u>
		<u>External girth of trench</u>
		Ç girth 34.480
		+passings $4/2/ \frac{1}{2}/ 0.600$ <u>2.400</u>
		girth of oversite strip <u>36.880</u>

[illegible]

SMM D20.7.1.1.0

Earthwork support must be measured to any vertical face of excavation which exceeds 250 mm high whether or not the contractor requires it. The exposed face of excavation is measured in square metres as required by SMM7. The centre line girth of the trench is multiplied by the depth of the trench and then multiplied by 2 for both faces. This calculation gives an area equal to the area of the exposed faces of the trench. To this is added the area of

The exposed edge of the oversight excavation.



WEEK 3: Foundation cont'd

Foundations 7Surface water (ctd)Item

Disposal, surface water

SMM D20.8.1.O.O

Surface water is water which runs over the surface of the ground and collects in the excavations (see SMM D20.8.1 —D9), the disposal of which is given as an item whenever any excavation is measured. The estimator assesses the cost based on the amount of excavation, e.g. open trenches, and when the foundations are likely to be built, e.g. winter or summer.

Concrete foundations

34.48

In situ concrete (15N/20mm)

0.60

Foundations poured on or against earth

0.20

or unblended hard core (internal wall

5.40

0.60

0.20

The phrase 'poured, on or against earth etc' is necessary because work is measured net as fixed in position (see SMM General Rules 3.1) and in practice the trench may not be excavated as a perfect rectangle; therefore the estimator has to make an allowance in the price to cover such eventualities.

SMM E10.1.O.O.5

WEEK 3: Foundation cont'd

The phrase 'poured, on or against earth etc' is necessary because work etc is measured net as fixed in position (see SMM General Rules 3.1) and in practice the trench may not be excavated as a perfect rectangle; therefore the estimator has to make an allowance in the price to cover such eventualities.

WEEK 3: Foundation cont'd

		<u>Foundations 8</u>	
		<u>Concrete foundations (ctd)</u>	
34.48		<u>Ddt</u> filling to excavations as before	SMM D20.9.2.1.O
0.60			Instructions Add and Ddt are
0.20			emphasized by underlining.
5.40			
0.60		& (internal wall	
0.20			
		<u>Add</u> disposal excavated material off site	SMM D20.8.3.1.O
		<u>Brickwork height</u>	
		Brickwork in trench .800	The required height of brickwork is
		Brickwork above ground level	from the top of the foundation concrete
		to damp proof course 0.150	to the damp proof course.
		0.950	
2/34.48		walls half brick thick, vertical in	SMM F10.1.1.1.O
0.95		engineering bricks in cement mortar	The component parts of cavity walls
		(1:3) in stretcher bond.	are each measured separately, e.g.
			brickwalls, cavity and cavity filling.
			The word 'vertical' can be omitted 'as
			work is deemed to be vertical unless
			otherwise described'.(See SMM F.10-
			D3.)

Foundations 9

Brickwork (ctd)

Where the inner and outer skins of hollow walls are built of the same material, are the same width and are central on the concrete foundation, the walls can be measured on the centre line girth. If the skins are built of different materials or are of different thicknesses then the centre line of each skin must be calculated.

The walls are measured overall ignoring the fact that part of the outer skin is built in facing bricks. The adjustment will be made later.

The area of the brick skins of the hollow walls is calculated by multiplying the centre line girth by the height by 2 for both skins.

Cavity

Wall thickness	0.255
-brick walls 2/.1025	0.205
Cavity width	<u>0.050</u>

Forming cavities in hollow walls 50mm wide, stainless steel wall ties as specified 2 per square meter.

SMM F30.1.1.1.O

WEEK 3: Foundation cont'd

	34.48		forming cavities in hollow walls 50mm	SMM F30-S2 requires the spacing of
	0.95		wide, stainless steel wall ties as specified	wall ties to be given. In this case the
			2 per square meter	description could be written as 'wall
				ties ... 100mm apart horizontally and
				0.50m vertically, staggered'.

WEEK 3: Foundation cont'd

Foundations 10

Brickwork (ctd)

Cavity filling

Height of cavity 0.950

-distance below damp

Proof course 0.150

0.800

34.48 In situ concrete (20N/20mm)

0.05 Filling to hollow walls

0.08 Thickness \leq 150mm

Adjustment of filling to trench

Trench depth 0.850

-concrete foundation 0.200

0.750

0.650

34.48 Ddt filling to excavations as before.

0.26

0.75

nil

&

34.48

0.26

(internal wall

SMM E10.8.1.0.0

The thickness given in the description enables the estimator to calculate the site labour required to place 1m³ of concrete.

If an error is made in a side cast calculation, this should be crossed through and the correct figures written underneath.

SMM D20.9.2.1.O

If an error is made when writing dimensions, the incorrect dimension should be

WEFK 3- Foundation cont'd

0.65

5.74

0.22

0.65

nilled as shown and the
correct dimension written
underneath.

Add disposal excavated material off site.

SMM D20.8.3.1.O

The dimension 0.26 is the
width of the cavity wall 0.255.

Foundations 11Damp proof course

2/34.48

damp proof course width $\leq 225\text{mm}$ 0.10

horizontal single layer of 'Hylood' pitch

5.74

polymer lapped 150mm at all passings,

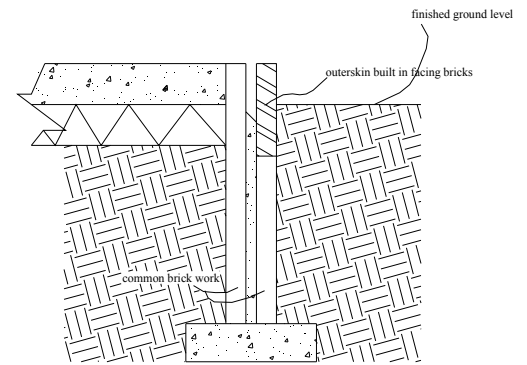
0.22

bedded in cement mortar (1:3)

(Meas. nett)

Facing brick adjustment

SMM F30.2.1.3.0

SECTION

All brickwork has been measured in common bricks. The outerskin shown hatched on above section can be seen and this part of the wall is built in facing bricks and the joints pointed. The facing bricks are usually extended one or two courses below ground level to take account of irregular ground lines and/or settlement of filling.

		<p><u>Foundations 12</u></p> <p><u>Facing brick adjustment</u> (ctd)</p> <p><u>¢ of outerskin</u></p> <p>External girth of walls 35.500</p> <p style="text-align: right;">4/2/½</p> <p style="text-align: right;">-passings <u>0.1025</u> <u>0.410</u></p> <p style="text-align: right;"><u>35.090</u></p> <p style="text-align: center;"><u>Height</u></p> <p>Ground level to damp proof course</p> <p>Below ground level 0.150</p> <p style="text-align: right;"><u>0.150</u></p> <p style="text-align: right;"><u>0.300</u></p>	It is necessary to calculate the centre line girth of the outerskin in order to find the area of faced brickwork.
0.35		Walls facework one side half brick	SMM F1O.1.1.1.O
<u>0.30</u>		thick, vertical in Redland multi coloured facing bricks in cement mortar (1:3) in stretcher bond and pointing with a flush joint as work proceeds.	
		&	
		<u>Ddt</u> walls half brick thick in Engineering bricks as before.	SMM F1O.1.1.1.O

WEEK 3: Foundation cont'd

The description for a repeat item or deduction need only be full enough to enable the worker-up to recognize the item to which it relates.

Foundation 13

Internal wall

Depending on the form of construction, the internal wall foundation may be measured with the external wall foundation, but here it is measured separately to enable the student to concentrate on one section of the foundation at one time.

One system is to add these dimensions back in a coloured ink as this saves making notes against each set of dimensions (as done in this example) and enables the worker-up to check that all items are measured. The term added back means that the taker-off will add on to previously booked dimensions, thus saving working-up time, taking-off time and paper in repeating descriptions.

Length of brick wall

Overall dimension 7.000

-re-entrant 0.750

-external brickwalls

2/0.255: 0.510

5.740

Length of trench etc

Length of 1B wall 5.740

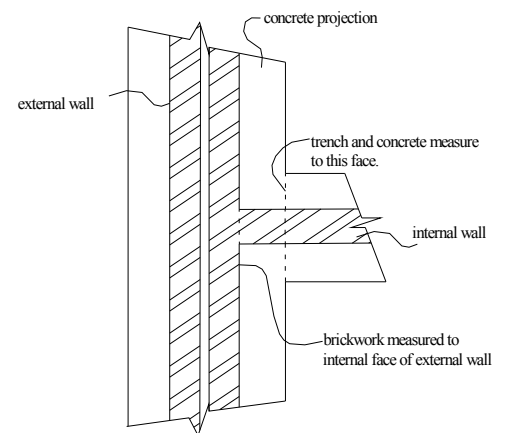
-concrete projection of

external wall

foundation

2/1/2/0.345: 0.345

length of trench 5.395



PLAN AT JUNCTION OF

EXTERNAL AND INTERNAL

WALLS

		<p><u>Foundations 14</u></p> <p><u>Internal wall (ctd)</u></p> <p>Same depth as external wall.</p> <p>The dimensions for the internal wall are</p> <p>Added back to foundations 5 et seq.</p> <p>except:</p>	<p>When measuring internal wall foundations it should be noted that the length/girth of the brickwork is longer than the length/girth of the trench and concrete. This is due to the projection of the concrete foundation beyond the brick face at the junction of walls.</p>
5.74	<u>0.95</u>	<p>walls one brick thick, vertical in engineering bricks in cement mortar (1:3) in english bond</p>	SMM F10.1.1.1.O
		<p><u>Hardcore bed</u></p> <p>External dimensions 7.000 x 10.000</p> <p>-external walls 2/0.255:<u>0.510</u> <u>0.500</u> <u>6.490</u> <u>9.490</u></p>	
6.49		Filling to make up levels average	SMM D20.10.1.3.O
9.49		thickness obtained $\leq 0.25\text{m}$	
<u>0.15</u>		hardcore obtained off site.	<p>The average thickness of the filling must be calculated to place the filling in categories according to SMM D20.10.1 or 2. In this case the filling is the same thickness throughout.</p>

Foundations 15

Hardcore bed (ctd)

1.60

Ddt hardcore filling as before (corner

2.00

0.15

(re-entrant 1.500

+external walls

2/0.255:0.510

2.010

(Internal wall

Concrete beds etc

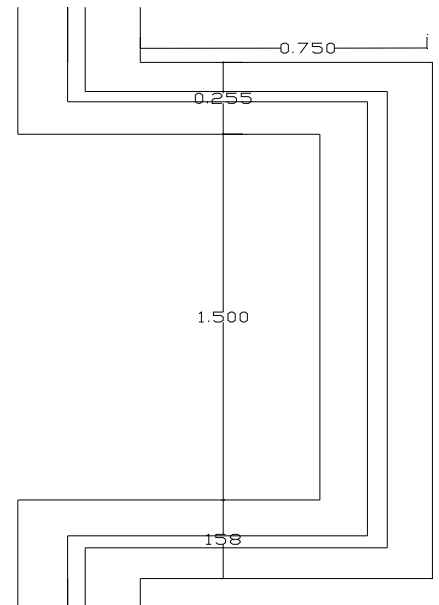
surface treatments compacting hard core
filling blinding with sand.

&

In situ concrete (20N/20mm) beds

Thickness \leq 150mm

SMM D20.10.1.3.0



PLAN OF RE-ENTRANT

SMM D20.13.2.2.1

Where the blinding material
has no thickness and is
intended to fill the
interstices in the filling
material only, it can be
included with the surface
treatment.

SMM E10.4.1.0.0

WEEK 3: Foundation cont'd

Cube x 0.15_____m³

&

Trowelling surface of concrete

SMM E41.3.O.O.O

	<u>Foundations 16</u>	SMM D20.13.2.2.1
	<u>Concrete beds etc (ctd)</u>	
1.60	<u>Ddt</u> surface treatments.	
<u>2.00</u>	Compacting hardcore (corner	
0.75	as before (re-entrant	
<u>2.01</u>		SMM E10.4.1.O.O
	&	
5.74	Ddt in situ concrete	
<u>0.22</u>	(20N/20mm) as before	
	Cube x 0.15 = _____ m ³	
		SMM E41.3.O.O.O
	&	
	<u>Ddt</u> trowelling surface of concrete	
	as before	
	<u>Damp proof membrane</u>	SMM J40.1.1.O.O
6.49	Damp proof membrane. Horizontal of	The extent of laps, the measurement of
<u>9.49</u>	1000 gauge polythene sheet as	which is deemed included, should be
	specified laid on concrete.	specified in the Preambles section.
		SMM J40.1.1.O.O
1.60	<u>Ddt</u> ditto (corner	
<u>2.00</u>	(re-entrant	

0.75

(internal wall

2.01

5.74

0.22

Foundations 17Adjustment of topsoil to perimeter¢ of projection

External grith of external walls

Concrete projection

2) 0.345

0.173

+ passings $4/2/1/2/0.173 = 0692$ 36.192

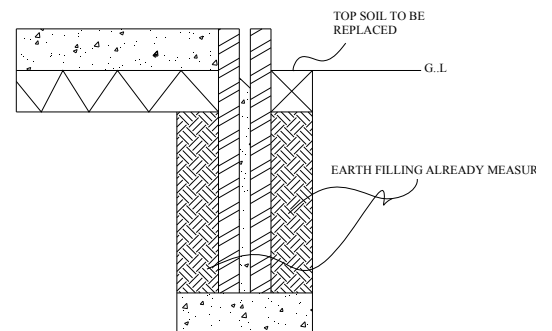
36.19

Filling to make up levels average

0.17

thickness $\leq 025\text{m}$ obtained from on site

0.15

top soil spoil heaps average 50m from
excavation.SECTION

SMM D20.10.1.2.3

WEEK 4:

Walls

Introduction

The measurement of structural walls may be carried out by a variety of methods, depending on the format of the bills of quantities to be adopted, e.g. elemental, trade, etc., although the approach for each is similar. However, before measurement can commence, plans of all floors, roof level, elevations, sections and all necessary details will be required.

Approach

Measurement should be divided into manageable portions for each individual building or parts of a building and then further divided into:

- | | | | |
|----|----------------|----|-----------------|
| 1. | external walls | 3. | chimney breasts |
| 2. | internal walls | 4. | chimney stack |

The measurement of fire surrounds, flue liners, chimney pots and cappings would normally be measured as a separate section and thus could be measured by a different taker-off.

Working from the whole to the part, measure walls over all openings and projections and then adjust for blank openings (not window or door openings which will be adjusted in that particular section), recesses, different types of facing bricks, projections and similar features.

All types of facing applied to the external walls, e.g. rendering, tile hanging, etc., are measured in this section.

Generally

Brickwork and blockwork are generally measured as complete items on the centre line of the wall with the nominal thickness stated, see SMM F10-M1 and D1. every description must include the supplementary information requirements (see SMM F10-S1-S5) as necessary, in addition to the usual classification terms. Depending on the complexities of the project, these requirements may be more conveniently covered by a heading or preamble clause in the bills of quantities.

- | | | |
|----|---|---|
| S1 | - | Kind, quality and size of bricks, etc., usually covered by stating a manufacturer's name and size of bricks. |
| S2 | - | Type of bond, e.g. stretcher, English or Flemish bond; this may affect the number of facing bricks used. |
| S3 | - | Composition of bricks and mortar, e.g. cement mortar 1:3 (one part cement and three parts fine aggregate) or gauged mortar 1:1:6 (one part cement, one part lime and six parts fine aggregate). |

- S4 - Type of pointing; this is the treatment of the face of the mortar joints. There are different finishes, e.g. weather struck joint, flush joint, bucket handle joint, etc., but irrespective of the type of finish, they are executed by one of the two following methods:
1. 'As work proceeds'. The bricklayer will complete the face of the mortar joints to the required finish at some convenient time before the mortar has set. This is a relatively cheap process. The code of practice relating to brickwork describes this process as 'jointing', but as SMM7 F10-S4 refers to 'pointing' only, it is described in the following examples as 'pointing with a . . . joint as work proceeds'.
 2. 'As a separate operation'. The bricklayer will rake out the mortar joints to a depth of approximately 12mm while the mortar is still green and then, after the brickwork is finished, but before the scaffolding is dismantled, the joints will be filled with mortar and the face treated. This gives the brickwork a uniform appearance but is a very much more expensive method of pointing.

SMM F10.1-4 Classified brickwork and blockwork in to four separate heading, i.e. walls, isolated piers, isolated casings, and chimney stacks. Also, different thicknesses of brickwork or blockwork are kept separate and are each measured in m2. Furthermore, work built against or bonded to other work, used as formwork or built overhand shall be kept separate because of the extra cost involved (BESMM F10.1.1.1-4). There is also separate provision for battering walls and those tapering on one of both sides (SMM F10.1.1.2-4.0) and forming and closing cavities in hollow walls (SMM F30.1.1.1.0 and F10.12.1.1.0). All blockwork and brickwork are deemed vertical unless otherwise described (SMM F10.D3).

Projection

It will be noted that projections are measured in metres stating the width and depth of projection (SMM F10.5.1.1-3.0). Projections consist of attached piers (whose length on plan is less than or equal four time their thickness), plinths, oversailing courses and the like (SMM F10.D9).

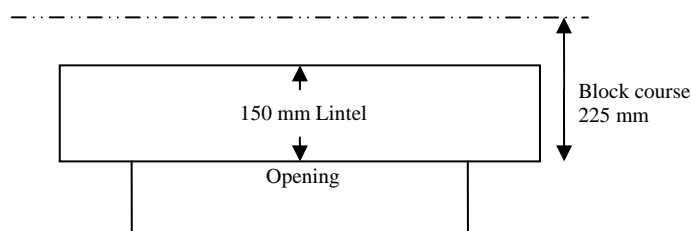
The term 'facework' all includes any work in bricks and block finished fair see SMM F10-D2. and is included in the walling item, stating whether it is on one or both sides and giving the thickness of the wall (SMM F10.1.2-3.1.0). Full particulars of the blocks or bricks, bond, mortar and pointing must be given (SMM F10.S1-4)

Thus, facework not only includes work built in facing bricks and pointed but also walls built in common bricks, fair faced and pointed. The term 'fair faced' means providing a good finished appearance to the face of common brickwork. The bricklayer will select the common bricks, choose the best face of the brick, and take extra care in laying and pointing.

Measurement

Measurement the walls up to a general level, e.g. roof plate level, overall opening, recesses, etc., and add for gable walls, all adjustments being made later. The taker-off must decide whether or not to measure the walls over openings. Generally the decision depends on whether the wall is to be supported on a lintel over the opening (with adjustments being made with the doors or windows sections), or if the doors have storey height frames, i.e. floor to ceiling, in which case there is no need to measure the wall over only to be deducted in full at a later stage. These openings are termed nett openings and they should be noted on the drawing and the taking-off. Deductions for lintels, etc., are made as regards height to the extent only of full brick or block courses displaced and as regards depth to the extent only of full half brick beds displaced, see SMM F10-M3.

For example, with regard to Figure W.1, blockwork is not deducted as the lintel does not displace a full course. If the lintel was 225 mm high a full block would be displaced and an appropriate deduction would be made.



When measuring chimney breasts and chimney stack, the brickwork is measured as if it is solid unless the flue exceeds 0.25m^2 , see SMM F10-M2, and Figure W.1.

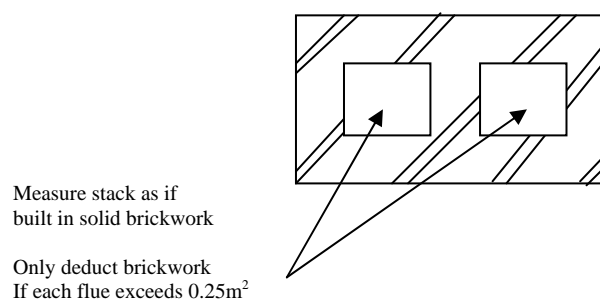


Figure W.2 *Plan of chimney stack*

Isolated piers are measured as such only if dimensions are as shown in Figure W.3, see SMM F10.2 D8, otherwise are measured as a wall if it exceed 4x 225

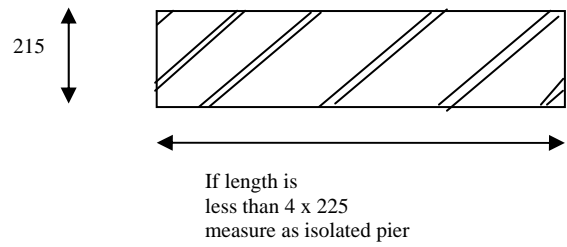


Figure W.3 *Plan*

Flow chart for structural walls

SMM ref & unit

Measurement

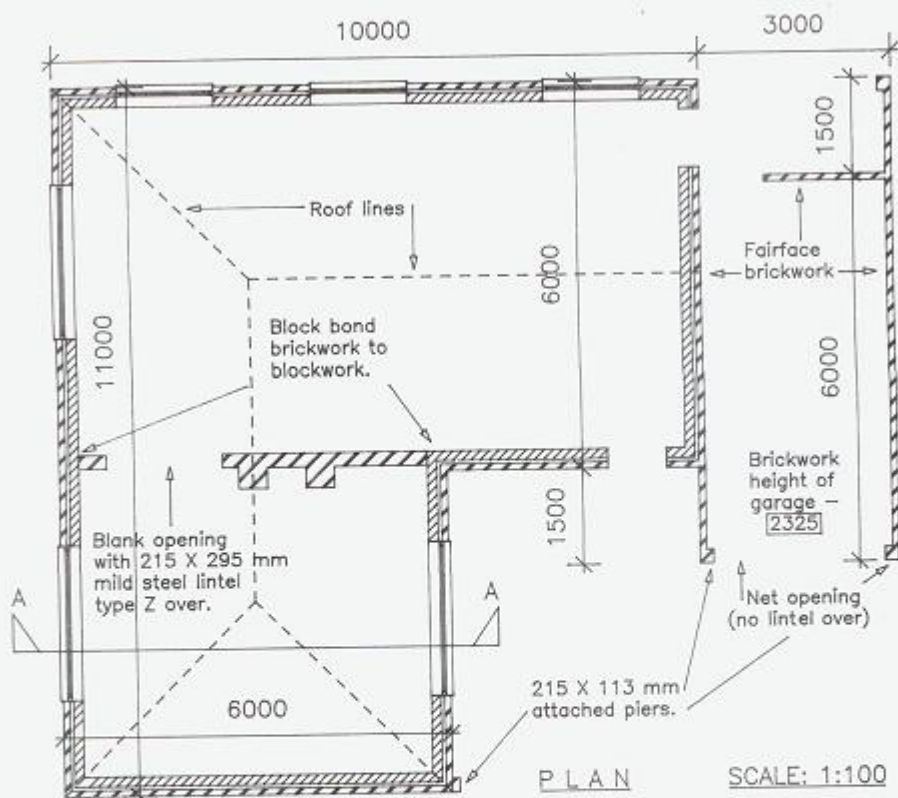
Start

External wall to bungalow – brick out	
Skin in facing bricks	
F.10.1.2.1.0 m ²	Area of brick outerskin of hollow wall to bungalow including gable (measured as if garage were not attached – adjustment made later) viz. centre line of outerskin x height of wall plus width of gable x height of gable x ½ (area of triangle base x height divided by 2), plus width of gable x height to raise brickwork above roof plate level.
Ditto – forming cavity including insulation	
F.30.1.1.1.1 m ²	Area of cavity of hollow wall including gable, viz. centre line of cavity x height of wall plus area of gable and raising as above.
Ditto – block inner skin	
F.10.1.1.1.0 M ²	Area of block inner skin of hollow wall including gable, viz. centre line of inner skin x height of wall plus area of gable and raising as above.
Adjustment for gable wall built fair face in roof space	
F.10.1.1.1.0 m ²	Deduct area of block inner skin to gable in roof space, viz. triangular area of gable as above.
Ditto	
F.10.1.2.1.0 m ²	Add area of block inner skin facework one side to gable in roof space, viz. same area as last item.
Adjustment for outerskin built in common bricks behind enclosed eaves	
F.10.1.2.1.0 m ²	Deduct area of brick outerskin in facing bricks behind enclosed eaves, viz. centre line girth of outerskin less gable end x height of outerskin from soffit board to plate level.
Ditto	
F.10.1.1.1.0 m ²	Add area of brick outerskin in common bricks behind enclosed eaves, viz. same as last item

Attached pier to bungalow	
F.10.5.1.1.0 m ²	Length of attached pier, viz. height from dpc to soffit board level.
Adjustment of brick outerskin built in facing bricks but not pointed behind attached pier	
F.10.1.2.1.0 m ²	Deduct area of outerskin built in facing bricks and pointed behind attached pier, viz. width of pier x height of pier as last item.
Ditto	
F.10.1.1.1.0 m ²	Add area of outerskin built in facing bricks but not pointed behind attached pier, viz. same area as last item.
Internal structural brick walls	
F.10.1.1.1.0 m ²	Area of 1B wall measured over blank opening, viz. length of wall x height of wall, plus width of gable x height to raise brickwork above roof plate level as before.
Ditto in roof space faced both sides	
F.10.1.3.1.0 m ²	Area of 1B wall in roof space, viz. width of gable x height of gable x ½.
Adjustment for blank opening in one brick wall	
F.10.1.1.1.0 m ²	Deduct area of 1B wall for blank opening, viz. length of opening x height of opening.
Lintel over blank opening	
F.30.16.1.1.0 nr	Number lintel
Adjustment of one brick wall for lintel	
F.10.1.1.1.0 m ²	Deduct at area of one brick wall displaced by lintel, viz. length of lintel
Chimney breast ground floor	
F.10.1.1.1.0 m ²	Area of chimney breast – described as brick wall 2½ B thick, viz. length of breast x height of breast (ground floor).
Adjustment of one brick wall for chimney breast	
F.10.1.1.1.0 m ²	Deduct area of one brick wall displaced by chimney breast, viz. same area as last item.
Chimney breast roof space	
F.10.1.1.1.0 m ²	Length of chimney breast in roof space. Viz. average height of chimney breast attached to one brick wall in roof space.

Adjustment of one brick wall pointed both sides in roof space behind chimney breast	
F.10.1.3.1.0 m ²	Deduct area of one brick wall facework both sides, viz. width of chimney breast in roof space x average height of chimney breast.
Ditto	
F.10.1.2.1.0 m ²	Add area of one brick wall facework one side, viz. same area as above item.
Chimney stack	
F.10.4.3.1.0 m ²	Area of chimney stack above roof level, viz. width of stack x average height of chimney stack.
Damp proof course in chimney stack	
F.30.2.2.3.0 m ²	Plan area of stack, viz. width of stack x depth of stack
Chimney capping flue linings etc	
To take note measure with fires and vents section	Not measured in this example
External brick wall in facing bricks to garage	
F.10.1.3.1.0 m ²	Area of half brick wall to garage, viz. girth of garage wall x height of garage wall
Attached piers to garage	
F.10.5.1.1.0 m ²	Length of attached piers, viz. same height as garage x 2
Adjustment of garage wall not pointed both sides behind attached pier	
F.10.1.3.1.0 m ²	Deduct area of garage wall facework both sides behind attached piers, viz. width of pier x height of pier as last item x 2
Ditto	
F.10.1.2.1.0 m ²	Add area of garage wall facework one side behind attached piers, viz. same as area last item.
Brick screen wall	
F.10.1.3.1.0 m ²	Area of half brick screen wall, viz. length of screen wall x height of screen wall.
Attached pier to screen wall	
F.10.5.1.1.0 m ²	Length of attached pier, viz. same height as screen wall.
Adjustment of screen wall not pointed both sides behind attached pier	
F.10.1.3.1.0 m ²	Deduct area of screen wall facework both sides behind attached pier, viz. width of pier x height of pier as last item

Ditto	
F.10.1.2.1.0 m ²	Add area of screen wall facework one sides behind attached pier, viz. same as area as last item.
Adjustment for outerskin of bungalow built in common bricks next attached	
F.10.1.2.1.0 m ²	Add area of outerskin built in common bricks next attached garage, viz. same area as last item.



STRUCTURAL WALLS

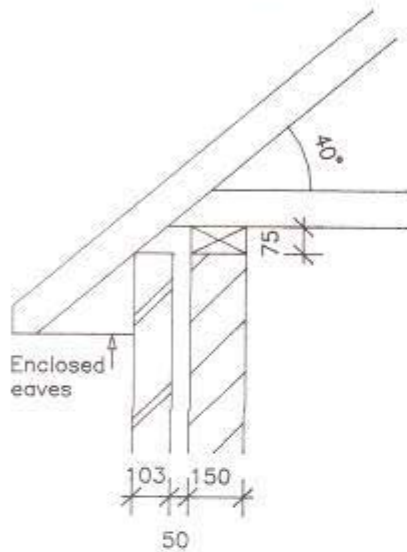
SPECIFICATION

1. External walls: 303 mm hollow wall comprising half brick outer skin in Messrs X Multi-colour facing bricks in stretcher bond in gauged mortar (1:1:6) pointing with a weathered joint as work proceeds. 50 mm cavity with 'Hemax' 50 stainless steel wall ties 225 mm long at 900 mm centres horizontally & 450 mm centres vertically, staggered. (Contd.)

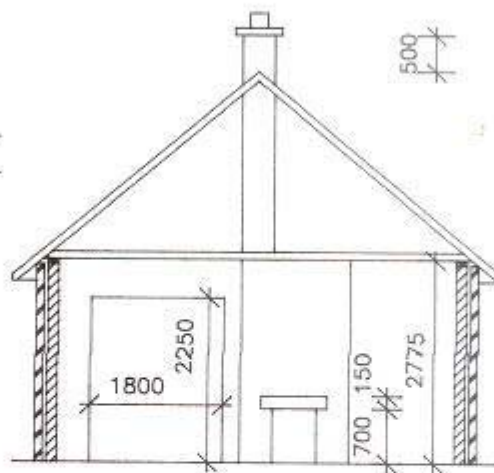
SPECIFICATION (Cont.)

25 mm 'Dri Therm' rigid insulation, and 150 mm Thermalite Turbo Blocks in gauged mortar (1:1:6).

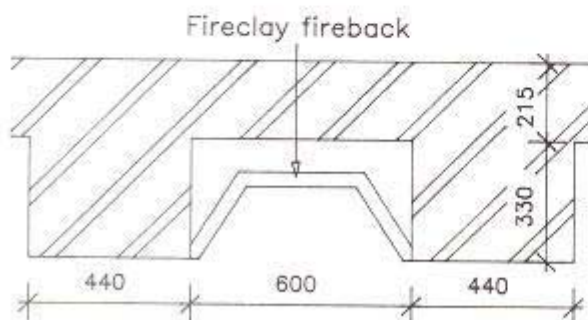
2. Roof space: All exposed brickwork and blockwork to be built fairfaced and pointing with a flush joint as work proceeds.



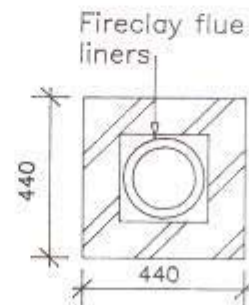
DETAIL AT EAVES
Scale: 1:20



SECTION A - A
Scale: 1:100



SECTIONAL PLAN OF CHIMNEY BREAST
Scale: 1:20



SECTIONAL PLAN OF CHIMNEY STACK
ABOVE ROOF LEVEL
Scale: 1:20

WEEK 5
WALLS MEASUREMENT

			WALLS <u>Sequence of Measurement</u>	
		1	External walls	
	-	2	Adjustment of fair faced work in roof space	
		3	Adjustment of faced work at eaves	
		4	Attached piers	
		5	Internal walls including walls in roof space	
		6	Blank opening adjustment	
		7	Chimney breast	
		8	Chimney stack	
		9	Garage	
		10	Screen wall	
		11	Adjustment of external wall next garage	
			<u>External walls</u>	
			<u>Mean girth outer skin</u>	
			10,000	
			<u>11,000</u>	
			<u>2/21,000</u>	
			Ext. girth = 42000	
			ext. Corners = 5	
			- int. Corners = <u>1</u>	
			passing timesing <u>4</u>	
			mean girth outer skin = <u>41, 588</u>	
			<u>Height</u>	
			dpc to soffit 2.775	
			less- wall plate <u>0.075</u>	
			<u>2.7'00</u>	
				<p>The approach for this example is to measure the bungalow ignoring the attached garage and screen wall completely. The garage etc is then measure later and adjustments made to the dividing wall.</p> <p>To calculate the external girth of brickwork of an " L " shaped building, add together the two longest overall dimensions (in this case ignoring the garage) which are at right angles to each other and times by two</p> <p>The superstructure is measured from the d.p.c. level</p>

			<u>Gable Wall</u>	The height of the external wall generally has been measured to the underside of the wall plate. Therefore the measurement of the gable wall will comprise the raising of the general wall height by 150mm, and then a triangle following the shape of the top line of the rafters.
			<u>Height of gable</u> Tan 400 x half span Tan 400 x 3.000 = <u>2.517</u>	The height of the triangle is calculated by trigonometry. Pitch of roof is 40° The outerskin, cavity and innerskin will all be the same size.
				SMM F10.1.2.1.0
				The term walls includes skins of hollow wall. (see SMM F10- D4.)
½/	41.59	Walls facework one side h. b. thick, vert.		
	<u>2.7'0</u>	Messrs "X" multi. Col. Facg bks		
	6'.00	in stretcher bond in gyp. Mort (<i>gable end</i>)		
	<u>0.15</u>	(1:1:6) & ptg wi. A (<i>raising</i>)		
	6'.00	weathered struck jt. A.w.p. (<i>gable end</i>)		
	<u>2.52</u>	(<i>triangle</i>)		
	-			
	-			
	-		<u>Mean girth cavity</u>	
	-			
	-	mean girth outer skin, a. b. 41.588		
	-	less- passings ab. 0.412		
	-	cavity 4/2'/½/ <u>0.050</u> = <u>0.200</u> <u>0.612</u>		
	-		40.976	
	-			
	40.98	Forming cavity in h.w. 50mm wide		SMM F30.1.1.1.1
	<u>2.7'0</u>	inc. "Hemax 50" stainless steel		
	6'.00	wall tiles 225mm long (<i>gable end</i>)		
	<u>0.15</u>	spaced at 900mm (<i>raising</i>)		
½/	6'.00	centres horiz. & 450mm (<i>gable end</i>)		
	<u>2.52</u>	centres vert. staggered, (triangle)		
	-	rigid "Dri Therm insul. 25mm thick		
	-	fixed with plastic clips to wall ties		
	-			
	-		<u>Mean girth inner skin</u>	
	-			
	-	mean girth outer skin, a. b. 40.976		
	-	less- cav passings ab. 0.200		
	-	skin 4/2'/½/ <u>0.150</u> = <u>0.600</u> <u>0.800</u>		
	-		40.176	
	-			

	-		<u>Innerskin cont'd</u>	
	40.18		Walls 150mm thick, vert.	
	<u>2.70</u>		in Thermalite Turbo	SMM F10.1.1.1.0
	6.00		blks. In stretcher	(gable end
	<u>0.15</u>		bond in g.m raising	(raising
1/2/	6.00		(1:1:6) (gable end triangle	(gable end
	<u>2.52</u>			(triangle
			<u>Adj for facework in roof space</u>	The exposed face of walls in the roof
			<u>Gable wall.</u>	space is to be finished fair.
1/2/	6.00		<u>Ddt</u> walls 150mm thick	SMM F10.1.1.1.0
	<u>2.52</u>		in Thermalite blks a.b.	
			&	
			<u>Add</u> walls facework one	SMM F10.1.2.1.0
			side 150mm thick in	
			Thermalite Turbo' blks.	
			in stretcher bond in	
			g.m. (1:1:6) & ptg. With	
			a flush j ^t . A.w.p.	
			<u>Adj._ of outerskin behind</u>	
			<u>enclosed eaves.</u>	
			Ext. girth ab. 42.000	
			-gable wall <u>6.000</u>	
			36.000	
			-passings 2/2'/1/2/0.103 0.206	
			<u>mean girth. 35.794</u>	
			<u>Adj._ of outer skin behind</u>	
			<u>eaves cont'd</u>	
	35.79		<u>Ddt</u> walls facewk. One	SMM F10.1.2.1.0
	<u>0.23</u>		side h.b. thick in Messrs	
			x' Fcg. Bks. A.b.	
			<u>Add</u> walls h.b. thick, vert.	SMM F10.1.1.1.0
			in c.b. in stretcher	
			bond in g.m. (1:1:6)	

			<p><u>Attached pier</u> NB. Pier built to soffit board level.</p> <p><u>Hgt.</u> Outerskin 2.700 - soft. Depth <u>0.225</u> 2.475</p>	
	<u>2.48</u>		<p>Projections 215mm. Wide & 113mm. Proj. vert. in Messrs 'x' multi - col. Fcg. bks. In English bond in g.m. (1:1:6) & ptg. With a weathered struck jt. a.w.p.</p>	<p>SMM F10.5.1.1.0</p> <p>Labours to returns are deemed to be included. (see SMM F10-C1 (f))</p>
	0.22 2.48		<p><u>Attached pier</u></p> <p>Ddt walls facework one side in Messrs 'X' fcg bks a.b.</p> <p>&</p> <p><u>Add</u> walls h.b. thick. Vert. in Messrs 'X' fcg. Bks. in stretcher bond in in g.m. (1:1:6)</p> <p><u>Internal structural wall.</u></p> <p>ext dims. 6.000 - ext walls <u>2/0.303</u> <u>0.606</u> 5.394</p>	<p>SMM F10.1.2.1.0</p> <p>The wall behind the attached pier is built in facing bricks but not pointed on face. Probably would not be measured in practice</p> <p>SMM F10.1.1.1.0</p>
	5.39 <u>2.7'0</u>		<p>Walls one bk. thick vert. in c.b. in English bond in g.m. (1:1:6)</p> <p>Underside plate raising Above</p>	<p>SMM F10.1.1.1.0</p>

			<p><u>Int. struct. Wall (Ctd).</u> <u>wall in rf. Space.</u></p>	
1/2/	6.00 <u>2.52</u>		<p>Walls facework both sides one bk. Thick in c.b. in English bon in g.m. (1:1:6) & ptg both sides with a flush jt. a.w.p.</p> <p><u>Adj. of blank opg</u></p> <p><u>Adj. of blank opg (ctd)</u></p> <p><u>Adj. of blank opg (Ctd)</u></p>	<p>SMM F10.1.3.1.0</p> <p>There does not appear to be a classification in SMM for the measurement of block bonding at the junction of the brick internal wall and block external wall. The classification requirements in SMM. F10.1.0.0.2 refer to superficial items and F10.25 refers to existing work</p> <p>Sometimes an opening is required through a wall which will not have a door or window set in it. This is called a blank opening. The adjustment of the structure will not be carried out in the usual way, i.e structure etc. deducted for the opening when the window or door is measured. Therefore in the case of a blank opening each taker-off is responsible for adjusting his own dimensions. These openings are usually indicated by having "blank" or "net" opening written over the opening on the drawings.</p>
	1.80 <u>2.25</u> 2.25 <u>0.25</u> -	- - -	<p><u>Ddt</u> 1B wall in c.b. a.b.</p> <p>(lintol</p> <p>Lintol opg. 1.800 ends <u>2/0.225.0.450</u> 2.250</p>	<p>SMM F10.1.1.1.0</p>

WEEK 6
WALLS MEASUREMENT CONT'D

	1	<p>Proprietary gal. m.s Lintol 215mm wide x 215mm hi. & 2250mm lg. Type 'Z' manufactured by Messrs 'Y' & b.i. to bwk.</p> <p style="text-align: right;"><u>bwk. adj. added back</u></p> <p style="text-align: center;"><u>Chimney breast</u></p> <p style="text-align: right;"><u>Height</u></p> <p>Grd. Flr. 2.775</p> <p>into roof space. 0.075</p> <p style="text-align: right;">2.850</p> <p style="text-align: right;"><u>Length</u></p> <p style="text-align: right;">0.440</p> <p style="text-align: right;">0.600</p> <p style="text-align: right;">0.440</p> <p style="text-align: right;">1.480</p> <p><u>PLAN OF CHIMNEY BREAST</u></p> <p>4 X 0.330 (PROJ.) = 1.320 As length 1.480 > four times proj. 1.320 then measure chimney breast as a wall.</p> <p style="text-align: right;"><u>Thickness</u></p> <p style="text-align: right;">wall 1B</p> <p style="text-align: right;">Proj. 1½B</p> <p style="text-align: right;">2½B</p> <p>Walls 2½B thick vert. in c.b. in Eng. Bond in g.m. (1:1:6)</p> <p style="text-align: center;">&</p> <p><u>Ddt</u> Walls 1B thick in c.b.a.b.</p>	<p>SMM F30.16.1.1.0</p> <p>The chimney breast is measured gross, i.e over the fireplace opening. The adjustments for the fireplace opening and measurement of flue linings etc. will be made in the fires and vents section of the taking-off</p> <p>The brickwork in chimney breasts and chimney stacks is measured solid as if there are no flues in them. Brickwork will only be deducted if the flue area exceed 0.25m². (see SMM F10-M2 (b)) . The usual cross-sectional area of a domestic flue is 0.215 x 0.215 = 0.05m²</p> <p>SMM F10.5-D9 defines a projection. If the length of the project (attached pier) < four times their thickness then the work is measured in linear metres as a projection. If the length exceeds four times the thickness then it is measured in square metres as a wall of that thickness plus the thickness of the backing wall.</p> <p>SMM F10.1.1.1.0</p> <p>SMM F10.1.1.1.0</p>
	1.48 <u>2.85</u>		

			<p><u>Chimney</u> <u>breast (Ctd)</u></p> <p><u>Roof _space</u></p> <p><u>Hgt.</u></p> <p>ext. walls 2.700</p> <p>rf. Plate etc. 0.150</p> <p>△</p> <p>to apex of in rf. <u>2.517</u></p> <p> '5.367</p> <p>- breast grd. Flr. <u>2.850</u></p> <p> '2.517</p> <p>Adj. of a △ at top of chimney breast</p> <p>x = $\tan 40^0 \times \frac{0.440}{2} = \frac{0.185}{2}$</p> <p>- av = $\frac{1}{2} / 0.185 = 0.093$</p> <p> '2.424</p> <p><u>Width</u></p> <p>'0.440</p> <p>As width 0.440 < four times proj. 1.320</p> <p>Then measure</p> <p>Chimney breast as a projection</p> <p><u>2.42</u></p> <p>Proj. 440mm wide & 330mm deep vert. in c.b. in Eng. bond in g.m (1:1:6) built fair face & ptg. With a flush joint a.w.p.</p> <p><u>Chimney Breast</u></p> <p><u>Adj. of wall behind chimney breast</u></p> <p><u>Ddt</u> walls facework both sides 1B thick in C.B. a.b.</p> <p>&</p> <p>Add walls facework one side 1B thick. Vert. in c.b. in Eng. Bond in g/m. (1:1:6) & ptg. With a flush jt.a.w.p.</p>	<p>△ △ △</p> <p>SMM F10.5.1.1.0</p> <p>SMM F10.1.3.1.0</p> <p>SMM F10.1.2.1.0</p>
	0.44 <u>2.42</u>			

			<p style="text-align: right;"><u>Chimney Stack</u> <u>Hgt</u></p> <p>Above roof 0.500 + Adj. of B at top of rf. <u>0.093</u> <u>'0.593</u></p>	
	0.44 <u>0.59</u>		<p>Chimney stacks facework both sides 2B thick vert. in Messers 'X' fcg. Bks. .b. in Eng. Bond in c.m. (1:3) with joints raked out 10mm dp & ptd. In g.m (1:1:6) & finished with a weather struck jt. As a separate operation.</p>	<p>SMM F10.4.1.0 The chimney stack is usually built in cement mortar due to its exposed position but the mortar will appear to give the faced brickwork a different colour from that built in gauged mortar. Therefore the joints of brickwork are raked out and pointed in gauged mortar to give the chimney stack a similar appearance. There is no clause in SMM to measure pointing ends of the chimney stack as the labour is deemed to be included. (See SMM F10.C1 (f).)</p>
	0.44 <u>0.44</u>		<p>D.p.c. width > 225mm. Horig bit. Felt as spec. single layer bedded in c.m. (1:3)</p> <p style="text-align: center;"><u>To Take</u> Fire surround, flue linings, capping etc in Fires & Vents.</p>	<p>SMM F30.2.2.3.0 No deduction is made for the flue. (See SMM F30-M3.)</p>
			<p style="text-align: right;"><u>Garage</u> <u>Mean girth of wall</u></p> <p>back wall 3.000 side " 6.000 '9.000 - passing $1\frac{1}{2}/1\frac{1}{2}/0.103 = 0.103$ '8.8977 Front flank wall <u>1.500</u> Mean grith <u>10.397</u></p>	
	10.4'0 <u>2.33</u>		<p>Walls facework both sides h.b. thick vert. in Messrs 'X' fcg. Bks. A.b. in stretcher bond in g.m. (1:1:6) & ptg. One side with a weather struck joint & other side with a flush jt. A.w.p.</p>	<p>SMM F10.1.3.1.0</p>

			<p><u>Garage (Ctd)</u> <u>Attached piers</u></p>	
	<p>²/2.33 <u>2.33</u></p>		<p>Proj. 215mm wide & 113mm deep. Vert. in (Screen wall Messrs 'X' fcg bks a.b. in Eng. Bond in g.m. (1:1:6) & ptg. With a weather struck jt. A.w.p.</p>	SMM F10.5.1.1.0
			<p><u>Adj. of walls behind piers</u></p>	
	<p>²/0.22 <u>2.33</u></p>		<p><u>Ddt</u> walls facework both sides in Messrs 'X' fcg bks. a.b. ptg. One side wit a weather struck jt. & other side with a flush jt. A.w.p.</p>	SMM F10.1.3.1.0
			<p>&</p>	
			<p><u>Add</u> walls facework one side in Messrs 'X' fcg bks a.b. ptg. One side with a weather struck jt.a.w.p.</p>	SMM F10.1.2.1.0
			<p><u>Screen walls</u></p>	
	<p>1.50 <u>2.33</u></p>		<p>Walls facework both sides h.b. thick, vert. in Messrs 'X' fcg. Bks a.b. in stretcher bond in g.m. (1:1:6) & ptg. Both sides with a weather struck jt.a.w.p.</p>	SMM F10.1.3.1.0
			<p><u>N.B.</u> no coping to top of wall. pier added back to struck. Walls 14.</p>	

			<u>Adj. of wall behind pier</u>	
	0.22		<u>Ddt. Ditto</u>	SMM F10.1.3.1.0
	<u>2.33</u>		&	
			Add walls facework one side h.b. thick, vert. in Messrs 'X' fcg. Bks. A.b. in stretcher bond in g.m. (1:1;^) & ptg with a weather struct jt a.w.p.	SMM F10.1.2.1.0
			<u>Adj. of ext. Wall of</u> <u>Bungalow next garage.</u>	
			<u>Length</u> '6.000 - '1.500 <u>'4.500</u>	
			<u>Hgt.</u> garage bwk.2.325 + roof <u>0.225</u> <u>'2.550</u>	
	4.50		Ddt walls facework (outerskin one side h.b. thick, vert. in Messrs 'X' fcg. Bks.a.b & ptg.with a weather struct jt.a.w.p	SMM F10.1.2.1.0
	<u>2.55</u>		&	
			Add ditto in c.b. in strtcher bond in g.m. (1:1;^) & ptg. with a flush jt.a.w.p.	SMM F10.1.2.1.0

WEEK 7

Introduction

Roofs

A roof, whether flat or pitched, is divided into the following sections for measurement purposes:

1. roof construction
2. roof coverings
3. treatment at eaves
4. rainwater goods
5. roof lights and adjustments
6. adjustments for chimney stacks

Only the first four sections have been considered in the following example, as in practice the last two may be measured by another member of the taking-off team, as has been assumed here.

As mentioned in exercise, it may be necessary to measure with this section any brick gable and party walls above roof plate level if the format of the bills is elemental. This brickwork would be measured with the first section, roof construction; however, the more traditional format has been adopted in the measurement of the following examples.

Obviously, it is preferable to have a plan of the roof, section through the roof and building, together with full specification but in the absence of such, the roof layout may be superimposed on the upper floor plans and the overall dimensions calculated.

Approach

Divide the project into individual buildings and consider each building according to the style of roof, e.g. flat or pitched roofs, and then according to the form of construction, e.g. timber flat roof or concrete flat roof. Each roof is then further divided into the sections previously listed in the introduction and the constituent parts measured as shown in the taking-off lists.

Generally

Measure each individual roof including projections over all openings, chimney breasts, roof lights, etc., which are measured separately together with any adjustments. For measurement purposes, there are two classes of pitched roof:

1. Roofs which have a constant or same pitch on all roof slopes.
2. Roofs which do not have a constant pitch on all roof slopes.

In the following examples, constant pitched roofs have been used. For non-constant pitched roofs the same rules of measurement apply but each roof slope must be measured separately.

The plan of a rectangular constant pitched roof will show the shape of the roof and have the following geometric properties, as shown in Figures R.1 and R.2. below

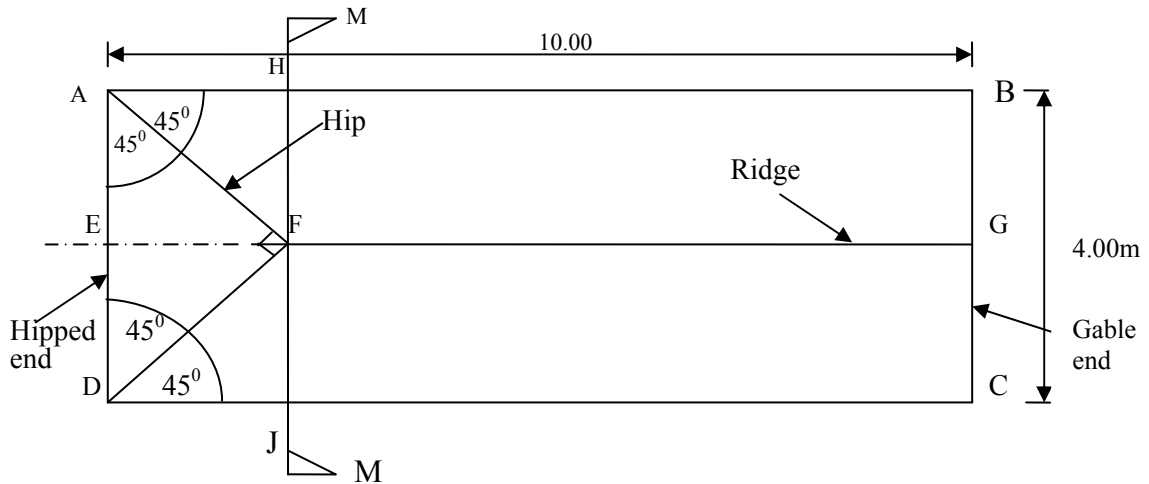


Figure R.1 Plan

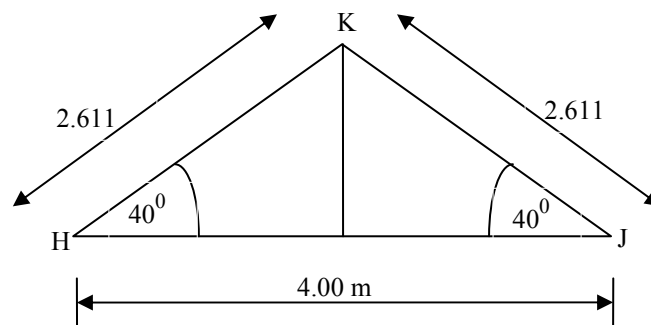


Figure R.2 Section M-M

1. Shape of roof – pitched with one end hipped and other end gabled.
2. $\angle AFD = 90^\circ$
3. $\angle EAF = \angle EDF = 45^\circ$
4. $HF = EF = JF = \text{Half span.}$

Using the above information, the total area of coverings can be calculated by dividing the roof into three individual areas – two trapeziums, which have the same area, plus the triangles at the hip, e.g.

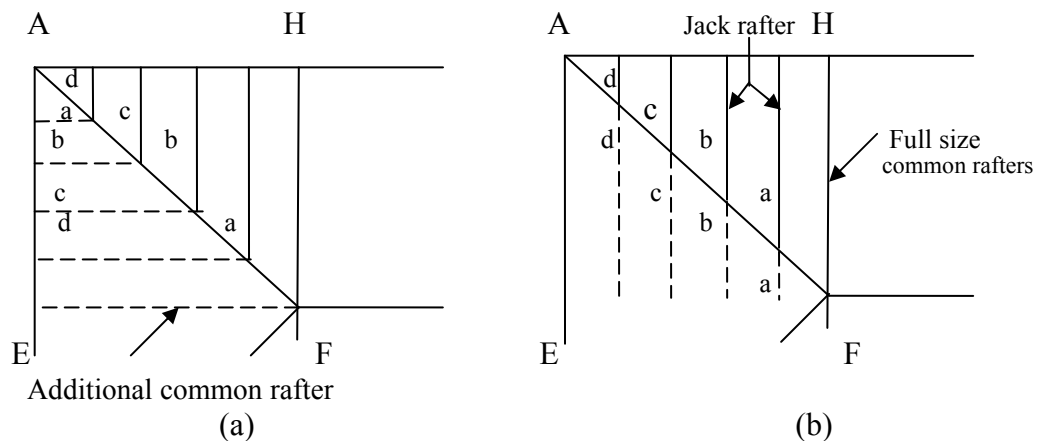
$$\text{Trapeziums} = 2 \left\{ \frac{(10 + 10 - 2) \times 2.611}{2} \right\} = 46.998$$

plus

$$\text{Triangles} = \frac{4 \times 2.611}{2} = 5.222$$

$$\underline{\underline{52.220\text{m}^2}}$$

However, because the roof is of constant pitch, the total area of covering can be calculated by measuring overall, ignoring the hipped end e.g. $2. (10 \times 2.611) = \mathbf{52.220}$ **square metres**. As the roof is of constant pitch, half of the area of the hip end covering is equal to the additional area measured if one roof slope is measured as a rectangle. Similarly, when measuring the length of timber required for the common and jack rafters of the main roof slopes and hipped end, the common rafter. From Figures R.3 (a) and (b) below, it can be seen that : $a + a = \text{common rafter}$.



Figures R.3 (a) *Part plan hipped end of roof (1)*
(b) *Part plan at hipped end of roof (2)*

However, one additional common rafter must be measured to the apex of each hip to ensure that the required span between the last two jack rafters is not exceeded, see Figure R.3 above

Consider the division of the building outline into main roof and projections and in all cases in Figures R.4 -R.6 below and the area of roof covering will be the same, viz $2.(1 \times rs) + 2.(pl \times rs)$. As a result it can be seen that the shape of constant pitched roofs, with the inclusion of hips or valleys, has little effect on the measurement of roof coverings or common rafters.

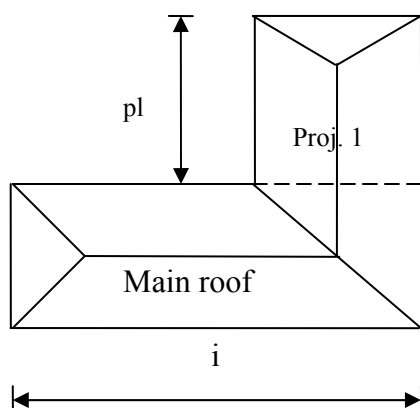


Figure R.4 *Roof plan*

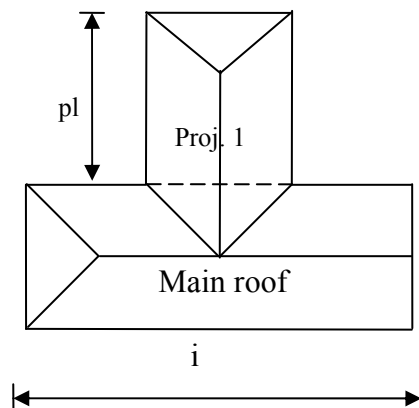


Figure R.5 *Roof plan*

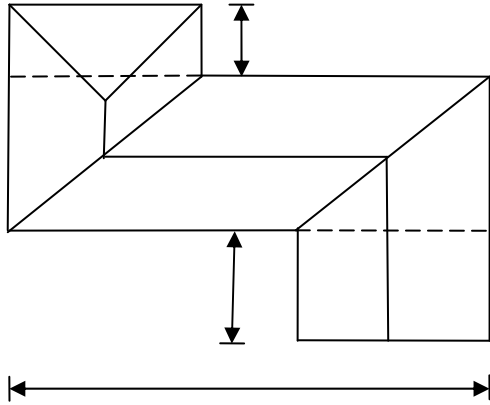


Figure R.6 *Roof plan*

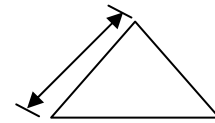


Figure R.7 *Section*

Let length of roof slope in all cases be 'rs', see Figure 9.7.

Structural timbers – generally

Structural timber is measured in linear metres and cross-sectional dimensions are given in the description. Allowance must be made in the measurement for any joints required, e.g. halved joints or housed joints, etc. structural timber is converted by sawing timbers into standard sizes known as nominal sizes. If a planed finish or wrot finish is required, then a finishing process is carried out which reduces the nominal size of the timber by approximately 3 mm on each finished face. As a result, a piece of timber planed all round having a nominal size of 50 x 100 mm will in fact be 44 x 94 mm which is known as the actual or finished size. Usually, sizes given on drawings and in bills of quantities are nominal but should finished sizes be required then the finished or actual size is given and indicated as such, see SMM G20-D1.

If a section of timber is required to be in one length and exceeds 6 m long, then this is a requirement which must be stated in the description, see SMM G20.6.0.0.1. If a piece of timber is to be fixed in a specified way then this also needs to be stated in the description, otherwise the fixing will be left to the discretion of the contractor, see SMM G20-S2.

Rafters

In order to measure the amount of timber required for common and jack rafters it is necessary to:

1. Calculate length of common rafter, see Figure R.8.
 - (a) By Pythagora's theorem. $L = \sqrt{S^2 + R^2}$
 - (b) By Trigonometry. $L = S \div \cos 40^\circ$
Calculation will give a dimension along the centreline of the rafter to which should be added an allowance for the raking and cutting at the ridge.
 - (c) By scaling. This method should only be used as a last resort.

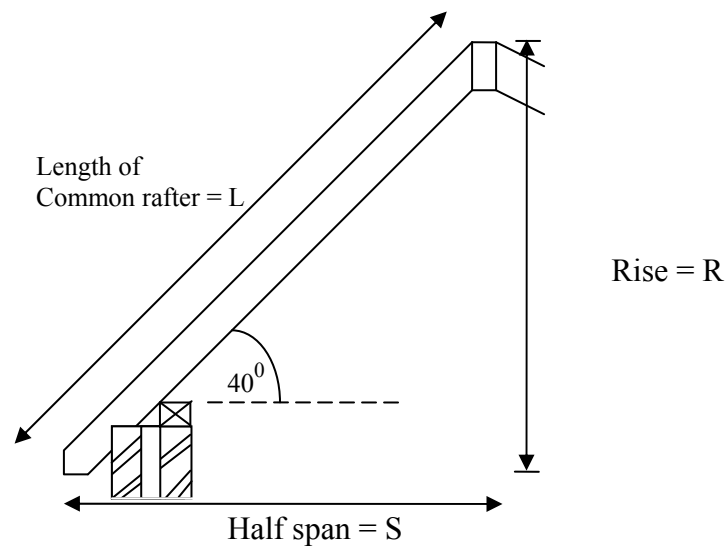


Figure 9.8 *Half section through roof*

2. Calculate number of common rafters.
 - (a) For any style of roof (not hipped)
 - (i) Calculate the distance between the centre line of the first and last common rafters to one roof slope.
 - (ii) Divide the distance by the centres between the rafters (this gives the number of gaps between the rafters).
 - (iii) Add one rafter if there is a remainder (this ensures that the centres between rafters are not exceeded).
 - (iv) Add one to the end rafter which closes the last gap.

For example, let the centres of rafter be 450 mm.

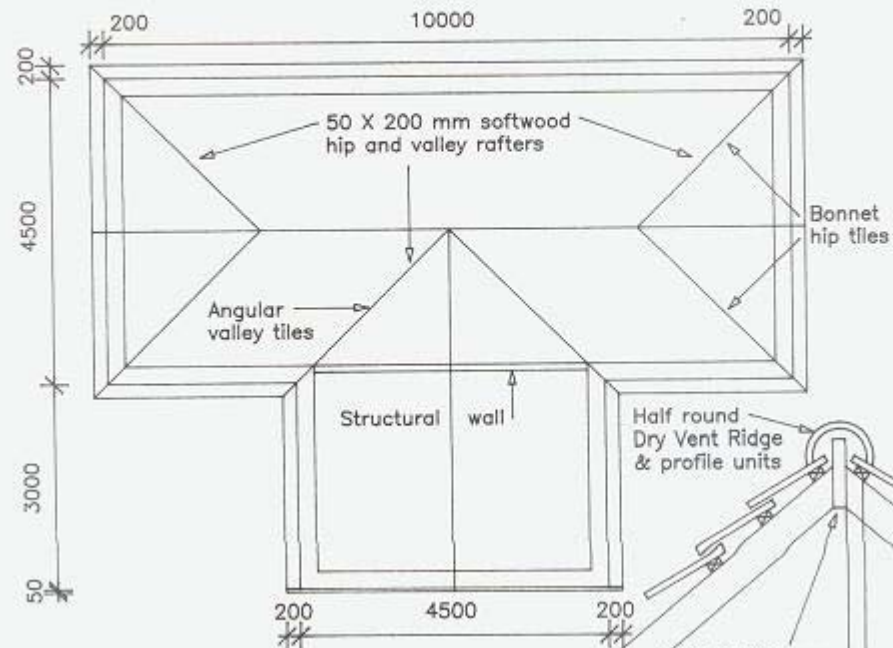
(i) Calculate distance between centres as follows:

Overall dimension	2.810
Less	
Gable end	
Wall	0.255
Gap	0.025
Centre of last rafter $\frac{1}{2} / 0.050$	<u>0.025</u>
	$2 / \underline{0.305} =$
Distance between centres of first and	<u>0.610</u>
Last rafters	2.200

- (ii) Divide by centres $0.450 \overline{) 2.200} = 4$
 (iii) Plus one for any remainder $0.400 = 1$
 (iv) Plus one for end rafter $= \underline{1}$
 6 Nr

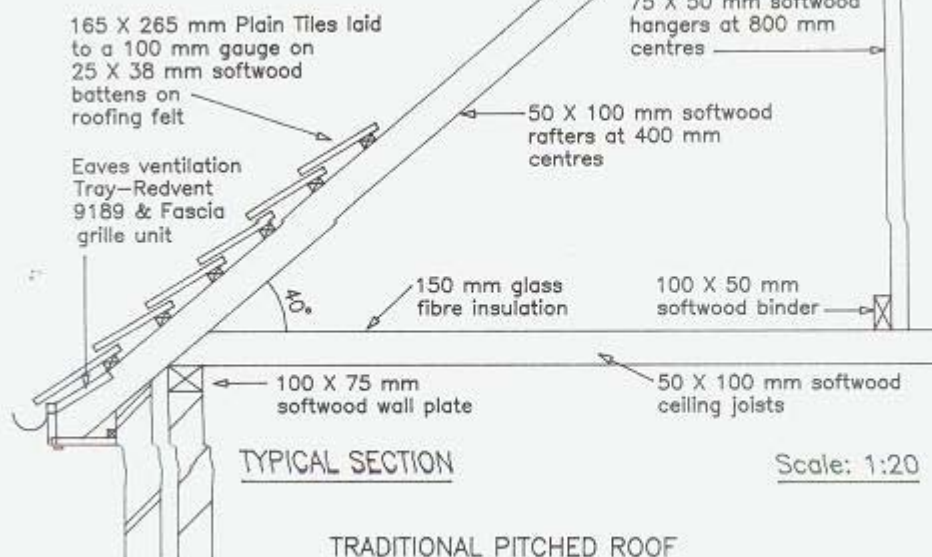
(b) For hipped roofs:

- (i) Calculate the extreme distance between hip rafters.
 (ii) Divide the extreme distance by the centres between rafters.
 (iii) Add one rafter if there is a remainder.
 (iv) Deduct one to give the number of rafters between hip rafters.



PLAN

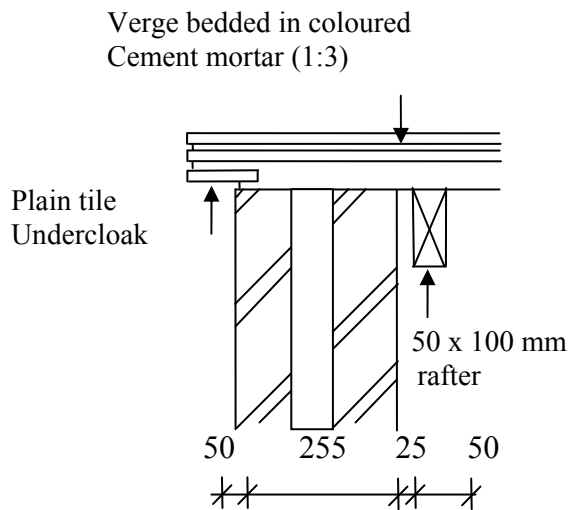
Scale: 1:100



TYPICAL SECTION

Scale: 1:20

TRADITIONAL PITCHED ROOF



SECTION THROUGH VERGE

Scale 1:10

SPECIFICATION

1. All sawn softwood to be stress graded timber to Cp 112 grade SSS S1 and pressure impregnated with Tanalith C. dry salt net retention 5.3 kg / m³.
2. Roof tiling to be Redland Rosemary plain tiles – colour Medium Mixed Brindle laid to a 65 mm lap, each tile in every fifth course twice nailed with 38 mm x 12g aluminium alloy nails.
3. Ventilation:
 - a) Eaves - Redland Red Vent eaves ventilator with fascia grille.
 - b) Ridge - Redland Dry Vent ridge system with plastic air vents both sides.
4. All wrot softwood to be primed all round and painted – 2 undercoats and 1 top coat of paint on exposed faces.

WEEK 8**PITCHED ROOF MEASUREMENT****TRADITIONAL PITCHED ROOF**

			<p style="text-align: center;"><u>Pitched Roof 1</u></p> <p style="text-align: center;"><u>Take – off List</u></p> <p><u>Construction</u></p> <ol style="list-style-type: none">1. Wall plates2. Rafters3. Ceiling Joints4. Ridge5. Hip & Valley rafters6. Binders7. Hangers8. Insulation <p><u>Coverings</u></p> <ol style="list-style-type: none">1. Tiling including battens & felt2. Eaves including ventilators3. Verges4. Ridges including ventilators5. Hips6. Valleys <p><u>Eaves</u></p> <ol style="list-style-type: none">1. Fascia including priming bocks2. Soffit3. Boxed ends4. Decoration <p><u>Rainwater Goods</u></p> <ol style="list-style-type: none">1. Gutters including fittings2. Rainwater pipers including fittings	
--	--	--	--	--

			<p><u>Pitched Roof 3</u></p> <p><u>Construction (Ctd)</u></p> <p><u>Wall plate (Ctd)</u></p>	<p>A wall plate is required to support the main roof ceiling joists across the junction of the main roof and projection. The wall plate will run on the top of the structural partition which is shown on the drawing. If there were no partition shown then a beam would have to be measured.</p> <p>The wall plate to the two long sides exceed 6.00m long. It is not necessary to have it in one continuous length as it is supported on a wall, therefore an allowance is made for a halved joint. (See SMM G20.8.0.0.1.)</p> <p>SMM G20.8.0.1.0</p>
2/	<u>28.06</u> <u>3.00</u>		<p>100 x 75mm SWN. Ton . swd</p> <p>Plate bedded in (proj. g.m (1:1:6)</p>	<p>The wall plate to the projection is measured over the main roof plate and to the inside face of the gable wall, thus allowing for a halved joint at the junction.</p>

			<p style="text-align: center;"><u>Pitched Roof 4</u></p> <p><u>Constr. (CTd)</u> <u>Wall plate (Ctd)</u></p> <p><u>NB.</u> There is no wall plate at the gable End.</p>	
			<div style="text-align: right;"> <u>Rafters</u> <u>Numbers</u> </div>	
			<div style="display: flex; justify-content: space-between;"> <div> <u>Main roof</u> o/a bk dims. + overhang 0.200 - fascia bd <u>0.025</u> 2 / <u>0.175</u> 0.400 </div> <div style="text-align: center;"> = </div> <div> <u>0.350</u> <u>10.350</u> 25 + 1 rem - 1 end = <u>25 Nr.</u> </div> </div>	<p>The main roof is essentially the same as a roof hipped at both ends. Therefore the rafters will be set out from the ends of the hip rafters. The overall dimension is calculated from the back of the fascia at the hips.</p> <p>An allowance of one is made for any remainder to ensure that</p>

			<p align="center"><u>Pitched Roof 5</u></p>	
			<p align="right"><u>Constr. Ctd)</u> <u>Rafters (Ctd)</u></p>	<p>the centres are always less than the design centres of the rafters.</p>
			<p align="right"><u>Numbers (Ctd)</u></p>	<p>The amount of timber measured for rafters will be sufficient to produce the structure to cover the main roof irrespective of its shape.</p>
			<p><u>Projection</u></p>	
			<p>o/a. bk. dims. 3.000</p>	
			<p>-junction with main of</p>	
			<p>overhang 0.200</p>	
			<p>- fascia <u>0.025</u></p>	<p><u>0.175</u></p>
				<p>2.825</p>
			<p>-gable wall 0.255</p>	
			<p>Gap 0.025</p>	
			<p>& rafter ½ /0.050 <u>0.025</u></p>	<p><u>0.305</u></p>
			<p>0.400 <u>2.520</u></p>	
			<p>: 6 + 1 rem + 1 end</p>	
			<p>: <u>8 Nr.</u></p>	<p>The projection is treated as a roof structure on its own. See first rafter next main roof.</p>
			<p><u>Length of common rafters</u></p>	
			<p>Half span bk. dims. ½ / <u>4.500</u></p>	<p>2.250</p>
			<p>+ eaves overhang 0.200</p>	
			<p>- fascia bd. <u>.0.025</u></p>	<p><u>0.175</u></p>
				<p>2.425</p>
			<p>-ridge ½ /<u>0.038</u></p>	<p><u>0.019</u></p>
				<p><u>2.406</u></p>
			<p>By trigonometry length = <u>half span</u></p>	
			<p>Cas pitch</p>	
			<p>= <u>2.406</u></p>	
			<p>Cas 40°</p>	
			<p>c/f = <u>3.141</u></p>	

			<p><u>Pitched Roof 6</u></p> <p><u>Contr. (Ctd)</u></p> <p><u>Length of common rafters (Ctd)</u></p> <p>extra length x = <u>0.050</u> Ton 50⁰</p> <p>b/f = 3.141 = <u>0.042</u> <u>3.183</u></p>	<p>The shape of common rafters is complex for calculation purposes. Because there are so many rafters in a roof it is necessary to calculate the length of timber required for each rafter accurately.</p> <p>The calculation for this additional length of timber shows that there could be an undermeasure. In practice an allowance of half the depth of the rafter is added to the calculated length to cover the undermeasure.</p>
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WEEK 9

PITCHED ROOF MEASUREMENT

			<u>Pitched Roof 8</u>	
			<u>Constr. (Ctd)</u> <u>C/g jsts. (Ctd)</u>	
8.25/	<u>4.50</u>		50 x 100mm.swn 'Ton' Swd rf. Members Pitched	SMM G20.9.2.1.0
			<u>Adj of C/g jsts</u> <u>at junction with proj.</u>	
			wall 0.255	
			-partition <u>0.100</u>	
			<u>0.155</u>	The ceiling joists at the junction with the projection are shorter than the general joists as they finish on the partition.
			<u>Nr.</u> 4.500	
			Proj width	
			+ eaves overhang 0.200	
			- fascia 0.025	
			- jst ½ / <u>0.050</u> <u>0.025</u> <u>0.050</u>	
			+ 2/ <u>0.150.</u> <u>0.300</u>	
			0.400 / <u>4.800</u>	
			12 – 1 end	
			= <u>11 Nr</u>	The number is calculated using the design centres of the joists, but this time one is deducted from the number to give the number of shorter joists, leaving the two extreme joists the full length.
11/	0.16		<u>Ddt</u> 50 x 100mm ditto	SMM G20.9.2.1.0

			<p><u>Pitched Roof 12</u></p> <p><u>Contr. (Ctd)</u> <u>Insulation</u></p> <p>Projection 3.000 - gable wall <u>0.255</u> <u>2.745</u></p>	
	<p>10.00 <u>4.50</u> 4.50 <u>2.75</u></p>	<p>150 mm Glass fibre (main rf Insulation quilts Laid bet. Members (proj. at 400 mm. centres. bult joints horiz.</p>		SMM P10.2.3.1.0
			<p><u>Coverings</u></p> <p><u>Main roof</u> 10.000 + overhang 0.200 + over gutter <u>0.050</u> hips 2/<u>0.250</u> 0.500 <u>10.500</u></p> <p><u>Projection</u> 3.000 - overhang etc. main rf ab. <u>0.250</u> 2.750 + verge <u>0.050</u> <u>2.800</u></p> <p>Slpg length half sapn. ½ /<u>4.500</u> = 2.250 <u>0.250</u> <u>2.500</u> Slpg length = cos 40° <u>= 3.264</u></p>	

			<p style="text-align: center;"><u>Pitched Roof 13</u></p> <p style="text-align: right;"><u>Cvgs. (Ctd)</u></p>	
2/	10.50 <u>3.26</u>		<p>165 x 265 mm 'Redland (main rf Rosemary plain tiles as spec. rf (proj. cvgs. 40° pitch laid to a 65 mm end lap & half tile side lap, each tile in every 5th cars. twice nailed with 38 mm x 12g aluminium alloy nails to & inc. 32 x 19 mm swn Tan. swd. battens at 100 mm gauge fvg with 40 mm x 12g. nailsinc. Rfd. bit rfg. felt underlay to BS. 747 type 1F fxd. with galvanised clout headed nails with 150 mm laps at all passings.</p>	<p>SMM H60.1.0.0</p> <p>For constant pitch roofs this measurement will give the correct area of tiling etc. irrespective of the shape.</p>
2/	2.80 <u>3.26</u>			
			<p style="text-align: right;"><u>Eaves</u> 10.500 <u>5.000</u> 2/15.500 = 31.000 <u>5.000</u> <u>26.000</u></p>	
			<p><u>Main rf</u> - 2/2.500</p> <p>- junction</p>	

WEEK 10**PITCHED ROOF MEASUREMENT**

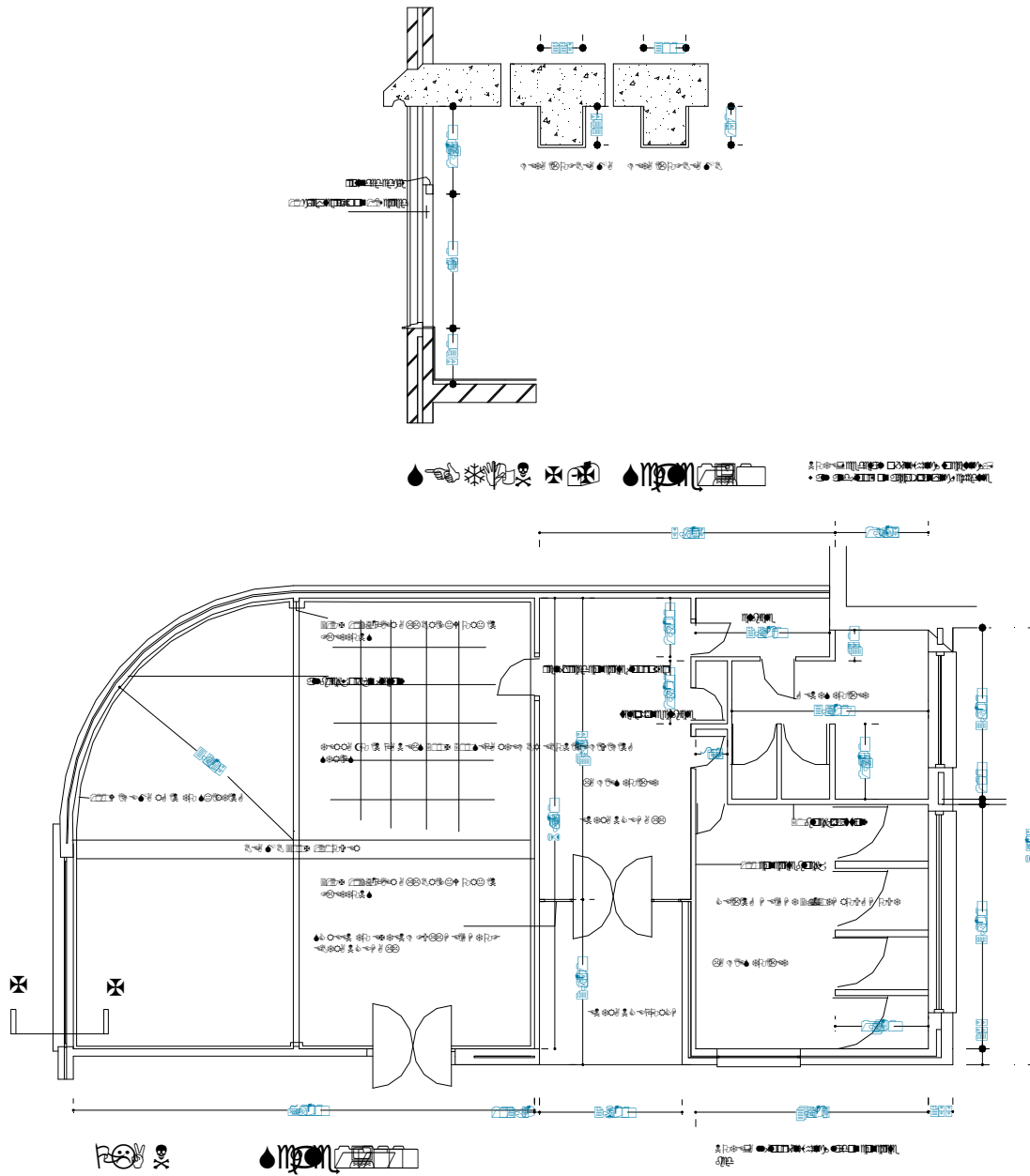
			<u>Pitched Roof 14</u> <u>Cvgs (Ctd)</u> <u>Eaves (Ctd)</u>	
	<u>26.00</u>		Eaves double (main rf course each tile (proj. twice nailed.	SMM H60.4.0.0.0
2/	<u>2.80</u>			
			'Redland Redvent' eaves ventilator Type 9189 with fascia grill & integral apron fxg. to swd. rafters at 400 mm centres. <u>PRELIMINARY NOTE</u> State change of unit for measurement of roof ventilator.	SMM H60.10.1.1.0 (unit altered to m) The eaves ventilation system specified here is a continuous system and therefore has been measured in linear metres rather than numbered as required by SMM. This change must be recorded in the Preliminary Bill.
			<u>Verges</u> <u>Proj.</u>	
2/	<u>3.26</u>		Verges inc. tile & half & plain tile undercloak, bedded & ptd. In cal. c.m. (1:3) each bite twice nailed.	SMM H60.5.0.0.0 SMM H60-C2 states that boundary work is deemed to include undercloaks, bedding, pointing etc. but SMM H60-S5 requires the method of forming verges etc. to be stated.

		<u>Pitched Roof 17</u>	
			<u>Eaves (Ctd)</u> <u>Soffit (Ctd)</u>
<u>32.00</u>	19 x 175 mm wrot swd. Eaves soffit bds width ≤ 300 mm.		SMM G20.16.3.2.0
	Prime only gen. surf. Of wood isol. Surf. girth ≤ 300 mm a.b.		SMM M60.1.0.2.4
	bwk girth a.b. 30.500 + passings 2/2/2/1/2/0.025 <u>0.100</u> <u>30.600</u>		
<u>30.60</u>	25 x 50 mm swn. Swd. individual supports plugged & fxd. to bwk. at 450 mm centres.		SMM G20.13.0.1.0

			<div>Pitched Rood 18</div> <div>Eaves (Ctd)</div> <div>Boxed ends</div>	
2/	<div>1</div>		<div>19mm Wrot swd. spandrel ends to eaves 200 x 300 mm overall Scaled</div> <div>&</div> <div>Prime only gen. surf. of wood, isol. area ≤ 0.50 m² irrespective of girth applied on site prior to fxd</div> <div>Decoration</div> <div>girth of eaves</div> <div>overhang0.200</div> <div>fascia0.125</div> <div>recess0.025</div> <div>0.350</div>	<div>SMM G20.18.0.1.0</div> <div>Boxing in he gap between the fascia and soffit boards and brickwork at the gable ends.</div> <div>SMM M60.1.0.3.4</div>
2/	<div>31.50</div> <div>0.35</div> <div>2/0.20</div> <div>0.30</div>		<div>K.P.S & (3) on gen. surf. of swd. girth > 300 mm</div> <div>(boxed end</div> <div>external</div>	<div>SMM M60.1.0.1.0</div> <div>The term KPS & (3) refers to knotting, priming and stopping the timber and then painting three coats of paints. The specification and number of undercoats etc. will be specified in the Preambles.</div>

			<p style="text-align: center;"><u>Pitched Roof 19</u></p> <p style="text-align: center;"><u>Rainwater goods</u> <u>Gutters</u></p> <p style="text-align: center;">same dims. as for eaves cars.</p>	
	<u>26.00</u>		100mm Dia. U.P.V.C. rainwater gutters to B.S. 4576 str. half round with dipped neoprene jts & fascia bkts. at 1m centres screwed to swd.	SMM R10.10.1.1.1
2/	<u>2.80</u>			Gutters are measured on the centre line and all fittings are measured as extra over.
	<u>2</u>		Extra over ditto for stop ends	SMM R10.11.2.1.0
	<u>4</u>		E. O. ditto for ext. L's	SMM R10.11.2.1.0
	<u>2</u>		E.O. ditto for int. L's	SMM R10.11.2.1.0
	<u>3</u>		E.O. ditto for outlet with nozzle for 75 mm dia. Pipe	SMM R10.11.2.1.0

			<p><u>Pitched Rood 20</u></p> <p><u>Rainwater Gds (Ctd)</u> <u>Gutters (Ctd)</u></p>	
	<u>3</u>		Pipework ancillaries gal. wire balloon grating to fit 75 mm dia pipe.	SMM R10.6.4.1.1
3/	<u>5.00</u>		<p><u>Pipes</u> <u>NB length assumed</u></p> <p>75 mm Dia. U.P.V.C. rainwater pipes to B.S. 4576 str. with push fit socketted jts. & brackets at 2m centres p & s to bwk.</p>	SMM R10.1.1.1.1
3/	<u>1</u>		E. O. ditto for swanneck 200 mm proj.	SMM R10.2.4.5.0
			&	
			E. O. ditto for caulking bush & cmt. Jt. to stoneware drain.	SMM R10.2.2.1.0



SHEDULE OF FINISHING

Location	Ceiling Finishing	Decorations to ceiling	Wall Finishing	Decorations to Walls	Skirting	Floor Finishing	Any Other Features
Treatment Room	10 thick, 2 coat lightweight gypsum plaster	Prepare and apply 3 coats of white emulsion	10 thck grey in situ terrazzo dado, 1.27 m	Prime and apply 3 coats of oil paint, matt	10 thick black in Situ terrazzo 150 high flush with	16 thick black and white in Situ terrazzo laid	Rounded edge to wall terrazzo at top edge and rounded
Entrance Porch	to 85 1911 Part 2 on concrete with bonding plaster backing and final coat of finish plaster steel trowelled		high above skirting on t2 thick cement and sand (1:4) screeded backing plaster above as for ceilings	finish, above dado	dado above and with terrazzo margin 16 thick and 100 wide at junction with floor	alternately in panels about 500 x 500 between 6 — 16 ebonite dividing strips on building paper underlay on 34 thick cement and sand 11:3) screeded	external and coved internal angles. 10 radius coved internal vertical angles and rounded arrises toplasterwork in all compartments
	25 thick British Columbian Pine tongued, grooved and v jointed boarding nailed to 50 x 19 impregnated softwood battens plugged to concrete	K.p.s. and 3 coats of oil paint gloss finish	Cement and sand (1:4) backing 10 thick and Tyrolean finish of 'Cijllamix' mixture applied by machine			152 X 152 X 22 brown quarry tiles to BS 12t36TypeA, bedded, lointed and pointed in cement mortar)1 :3lon 28 thick cement and sand (1 :3) screeded bed	
Entrance Hall	10 thick, 2 coat lightweight gypsum plaster as Treatment Room	Prime and apply 3 coats of oil paint, matt finish	4 thick pre-finished Iroko veneered plywood decorative panelling in sheets 2.445< random V groove on face to dado	Prime and apply 3 coats of oil paint, matt finish above dado	38 x 225 Iroko chamfered skirting, on grounds and apply 2 coats of polyurethane clear varnish	25 thick Iroko tongued and grooved wood block flooring laid herringbone pattern bedded in mastic with 2 block wide border and machine sanding on 25	32 X 32 moulded Iroko rail to top of plywood dado. Cornice of gypsum plaster (class B) to BS 1191 Part 1, with curved contour of 125 girth

Cloaks	10 thick, 2 coat lightweight gypsum plaster as treatment room	Prepare and apply 2 coats of emulsion paint	<p>1.22 m high above skirting, fixed with adhesive to 50X 19impregnated softwood battens fixed to walls at 406 centres at top and bottom. 13 thick 2 coat plaster above dado with base coat of Thistle browning and sand (1 :2) 11 thick and finishing coat of Thistle finish plaster 2 thick steel trowelled</p> <p>13 thick, 2 coat gypsum plaster to BS 1191 Part 1 of browning plaster and sand backing and final coat of Class 8 finish plaster, steel trowelled</p>	Prepare and apply 2 coats of emulsion paint	25 X 150 chamfered softwood skirting on grounds, and k.p.s. and 3 coats of oil gloss finish	<p>thick cement and sand (1:3) bed. Seal, body in and twice wax polish</p> <p>300 x 300 X 2 PVC tiles to BS 3261 Type A fixed with adhesive on 43 thick cement and sand (1:3) trowelled bed</p>	
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Telephone Cubicle	Fibreboard accoustic tiles 305 x 305 X 19 butt jointed both ways, fixed with adhesive to cement and sand 11:4) backing 10 thick		13 thick, 2 coat gypsum plaster as Cloaks	Prepare and apply 2 coats of emulsion paint	25 x 15Ochamfered softwood skirting on grounds, and k.p.s and 3 coats of oil gloss finish	300 X 3005< 3.2 cork tiles, Cork-o-Plast, checker tiles Nr 13 standard, semi bright finish, butt jointed, fixed with copad adhesive on 47 thick cement and sand(1 :3) trowelled bed	
Ladies and Gents Toilets and Lobby	10 thick, 2 coatplaster with 8 thick coat of Carlite bonding plaster finished with 2 thick coat of Carlite finish plaster	Prime and apply 3 coats of oil paint, gloss finish	152 x 152 x 6 cushion edged glazed ceramic tiles to BS 1281, fixed with adhesive jointed and pointed with white cement on 10 thick, cement and sand 11:4) floated backing for full height above skirting			152 x 152 x 9.5 full vitrified ceramic tiles to BS 1286, with 3 wide joints, bedded, jointed and pointed with cement mortar 1 :3) on 40 thick cement and sand)l :4) screeded bed	External angles wall tiling to be finished with rounded edge tiles

Week 12

FINISHINGS

		<u>Ceiling</u>	A logical sequence is adopted		
		<u>Treatment Rm</u>	for the measurement of the	3/	6.75
		6.750	finishings, taking the order of		6.78
		Less beam 300	ceilings, walls, skirting and	2/	6.78
		2) 6.450	floor		
		3.225	The work is deemed to be		
			internal unless described as		
		Less 3.225 7.000	external (SMM M20 DI), and so		
		225 3.450	internal work requires no		
		3.550	specific mention		
			The areas of ceiling to		
2/	3.55	Pla dg, width >	treatment room between the	3/	6.75
	3.23	300,	beams are calculated in waste		0.23
	3.23	Light wt gypsum	the plasterwork to the teams		6.78
	3.23	pla to BS 11911 Pt	has to be kept separate as the		0.30
1/4 /22	3.23	2. in 2 ds, 10 th o/a.	widths of the sides and soffits	2/	6.78
7 /	3.23	On conc w. bondg	are < 300mm and are measured		0.15
				2/	0.10

Examples 12

Pla clg, width 300, light ut gyp Pla 10 th o/a on Conc a.b.d	Beam A Soft & sides	The plasterwork to the beams is classified as to ceilings, but as the width is < 300 mm, it is measured in meter (SMM M 20.2.1.0 and M20.D5)
	Beam B Soft	
	Beam B Soft	
Paintg gen surfs Gth>300, seal & 3cts white Emulsn Pt., pla clg	Beam A Soft & sides	The decorations to the sides and soffits of the beams are added to similar work on the ceiling, where it is of the same colour, and are measured in m2 as they do not form isolated surfaces
	Beam B Soft	
	Beam B Soft	
Ddt pla clg width	(piers	Both plasterwork and

[illegible]

Beam B

3.550

3.225

6.775

Decorations to ceiling are measured in mw and classified as to general surfaces (SMM M60.10.1.0), with particulars given in accordance with SMM M60.51-8. painting and decorations to ceilings >3.50m above floor level are so described in 1.50, stages, except in staircase area which are kept separate and so described (SMM M60.M1-M2) rubbing down is deemed to be included and does not require specific mention (SMM M6.C1)

discretion of the contractor and nature of background as 5mm k11.311.0 and k11.51-13. The painting particulars are given in accordance with 5mm N601.01.0 and M60.51-8

FINISHINGS

9/	2.05	400) 2.600	Battens are measured in metres as individual supports with a dimensioned overall cross-section description (smmm G20.13.0.1.0), which include \s the method of fixed where not at the discretion of the contactor (smm G20 52).	
		7 + 1	Continue to work round the building in a logical sequence marking off each section on the schedule of finishings, as it is completed make full use pf waste for the build up of dimensions.	
		Indivdl suppts, 50 x		3.31
		19 impregnted. Sawn		2.55
		sed. [;ugd to conc.		1.91
				0.45
				4.29
				3.00
		Ent. Jall	The description of the ceiling plaster is reduced by the use if the letters 'a.b.d.' (as before described) as it consists of the same materials s use for the treatment room	1.3
		2.600	For painting give particulars of the kind and quantity of materials, painting requirement and nature of base (smm M60.6\51-8)	0.88
	4.86 2.76	Add cavity wall 255	It appears from M20.2 1.1.0. and the SMM 7 library of standard description. This does, however, seen superflous as it could be assumed to be > 300 mm wide, if not described as ≤ 300mm and measured in	
		2.955		
		Less block ptn. 100		
		2.755		
		Pla dg, width > 300,		
	2.28 1.00			

Examples cont

		Ladies & Gents	In building up area
		Toilets and lobby	figured dimensions are use whenever possible
			in preferences to scaling
		Lobby	
		1.450	
		Less blk ptn 100	
		q.350	
		gents toilet	
		3.000	
		Less recess 450	
	2.550		
		Pla. Dg, width > 200, in 2ct, 10 th	Another attenerative type of celing plaseter is used to give the student examples of different approaches in firming descriptive the locations of the area are shown in waste to help in identifying dimensions in the future
		a/o w, 8 th it of carlite bondg	
		finish & 2th it.	
		Of corlite	
		Fin pla. Ot con.	
	0.88	&	
		Ladies toilet	
		lobby	
		Painting. g.s, girth 300, (1) pring. ct, (1)glass fin, pla clg	
	2/3.550	Walls	The sectional area of each dividing partition in the toilet cubicles is < the void limit of 0.50 m2 presecrbed in 5MM M20.M2 amd <60. M3, and hence they do not have to be deduced from the area of ceiling
		Treatment Rm	
		6.750	
		2/3.225	
		6.450	
		Beam	
		300	
			Note use of different

FINISHINGS

1/4 /22 7/	3.23	Terrazzo in situ ling to wall, width ≥ 300 , 10 th a.b.d curved to rad of 3.23m	Curved word is taken separately, stating the (SMM M10 M5)	2/	0.30 0.15
1/4 /22 7/	3.23 1.42	It & sd (1.4) backg to walls, width ≥ 300 , fitd., 12 th , on bwk, curved to rod of 3.23 m		1/4 /22 7/	3.23 1.45
2/	1.27	Terrazzo in situ pier ling To walls, faces	In situ finishings to areas ≤ 300 mm wide are measured in metres as 5MM m10.1.2.10	2/	1.23
2/2/	1.27	width < 10 th , a.b.d. pier retns		2/2/	1.23
2/	1.42	It. & sf (1.4) pier backing to faces walls, width ≤ 300 12 th pier on bwk retns		2/	0.22 1.23
1/4 /22 7/	20.60 1.27	rdd. L to Tap edge terrazzo piers rad 10-100	Rounded angles are measured in metres when in 10-100mm radius range as 5mm M10.16.0.0.0 and m10.m7 Curved work is given separately stating the radius	2/2/	0.10 1.23

Examples cont

Ddt both last	Deductions are necessary as the voids are on the boundary of the measured area (5MM General Rules 3.4)
Pla to walls, width ≥ 300 , lightet gyp pla a.b.d to curved suit to rad of 3.23 m	
&	The paintwork is not separately classified
Painting g.s gth ≥ 300 , (1) primg it, (2) u/cs oil paint & (1) matt, tim to pla walls.	
1.450	
Less beam	225
1.225	
Pla to walls, width < 300 lightwt gyp pla faces a.b.d pier retns	In situ finishings to suface < 300 mm wide are kept separate and measured in metre (5MM M20.12.10).But this distinction does not apply to the paintwork, as the painting is not to isolated surfaces (SMM M60. 1.0.1.0) the height is adjusted for the beam intersection.
panitg g.a girth > 300, (1) primg ct, (2) u/cs oil paoint & (1) matt. Fin to pla wall	

FINISHINGS

		<u>Ceiling</u>	A logical sequence is adopted		
		<u>Treatment Rm</u>	for the measurement of the	3/	6.75
		6.750	finishings, taking the order of		6.78
		Less beam 300	ceilings, walls, skirting and	2/	6.78
		2) 6.450	floor		
		3.225	The work is deemed to be		
			internal unless described as		
		Less 3.225 7.000	external (SMM M20 DI), and so		
		225 3.450	internal work requires no		
		3.550	specific mention		
			The areas of ceiling to		
2/	3.55	Pla dg, width >	treatment room between the	3/	6.75
	3.23	300,	beams are calculated in waste		0.23
	3.23	Light wt gypsum	the plasterwork to the teams		6.78
	3.23	pla to BS 11911 Pt	has to be kept separate as the		0.30
1/4 /22	3.23	2. in 2 ds, 10 th o/a.	widths of the sides and soffits	2/	6.78
7 /	3.23	On conc w. bondg	are < 300mm and are measured		0.15
				2/	0.10

Examples 12

Pla clg, width 300, light ut gyp Pla 10 th o/a on Conc a.b.d	Beam A Soft & sides	The plasterwork to the beams is classified as to ceilings, but as the width is < 300 mm, it is measured in meter (SMM M 20.2.1.0 and M20.D5)
	Beam B Soft	
	Beam B Soft	
Paintg gen surfs Gth>300, seal & 3cts white Emulsn Pt., pla clg	Beam A Soft & sides	The decorations to the sides and soffits of the beams are added to similar work on the ceiling, where it is of the same colour, and are measured in m2 as they do not form isolated surfaces
	Beam B Soft	
	Beam B Soft	
Ddt pla clg width	(piers	Both plasterwork and

[illegible]

Beam B

3.550

3.225

6.775

Decorations to ceiling are measured in mw and classified as to general surfaces (SMM M60.10.1.0), with particulars given in accordance with SMM M60.51-8. painting and decorations to ceilings >3.50m above floor level are so described in 1.50, stages, except in staircase area which are kept separate and so described (SMM M60.M1-M2) rubbing down is deemed to be included and does not require specific mention (SMM M6.C1)

discretion of the contractor and nature of background as 5mm k11.311.0 and k11.51-13. The painting particulars are given in accordance with 5mm N601.01.0 and M60.51-8

FINISHINGS

9/	2.05	400) 2.600	Battens are measured in metres as individual supports with a dimensioned overall cross-section description (smmm G20.13.0.1.0), which include \s the method of fixed where not at the discretion of the contactor (smm G20 52).	
		7 + 1	Continue to work round the building in a logical sequence marking off each section on the schedule of finishings, as it is completed make full use pf waste for the build up of dimensions.	
		Indivdl suppts, 50 x		3.31
		19 impregnted. Sawn		2.55
		sed. [;ugd to conc.		1.91
				0.45
				4.29
				3.00
		Ent. Jall	The description of the ceiling plaster is reduced by the use if the letters 'a.b.d.' (as before described) as it consists of the same materials s use for the treatment room	1.3
		2.600	For painting give particulars of the kind and quantity of materials, painting requirement and nature of base (smm M60.6\51-8)	0.88
	4.86 2.76	Add cavity wall 255	It appears from M20.2 1.1.0. and the SMM 7 library of standard description. This does, however, seen superflous as it could be assumed to be > 300 mm wide, if not described as ≤ 300mm and measured in	
		2.955		
		Less block ptn. 100		
		2.755		
		Pla dg, width > 300,		
	2.28 1.00			

Examples cont

		Ladies & Gents	In building up area
		Toilets and lobby	figured dimensions are use whenever possible
			in preferences to scaling
		Lobby	
		1.450	
		Less blk ptn 100	
		q.350	
		gents toilet	
		3.000	
		Less recess 450	
	2.550		
		Pla. Dg, width > 200, in 2ct, 10 th	Another attenerative type of celing plaseter is used to give the student examples of different approaches in firming descriptive the locations of the area are shown in waste to help in identifying dimensions in the future
		a/o w, 8 th it of carlite bondg	
		finish & 2th it.	
		Of corlite	
		Fin pla. Ot con.	
	3.00	&	
		Ladies	
		toilet	
		Painting. g.s, girth	
		300, (1) pring. ct,	
		(1)glass fin, pla clg	
	2/3.550		
		Walls	
		Treatment Rm	
		6.750	
		2/3.225	
		6.450	
		Beam	
		300	
	2/3.225		

FINISHINGS

1/4 /22 7/	3.23	Terrazzo in situ ling to wall, width ≥ 300 , 10 th a.b.d curved to rad of 3.23m	Curved word is taken separately, stating the (SMM M10 M5)	2/ 0.30 0.15
1/4 /22 7/	3.23 1.42	It & sd (1.4) backg to walls, width ≥ 300 , fitd., 12 th , on bwk, curved to rod of 3.23 m		1/4 /22 7/
2/ 2/2/	1.27 1.27	Terrazzo in situ pier ling To walls, faces width < 10 th , a.b.d. pier retns	In situ finishings to areas ≤ 300 mm wide are measured in metres as 5MM m10.1.2.10	2/ 1.23
2/	1.42	It. & sf (1.4) pier backing to faces walls, width ≤ 300 12 th pier retns on bwk		2/2/
1/4 /22 7/	20.60 1.27	rdd. L to Tap edge terrazzo piers rad 10-100	Rounded angles are measured in metres when in 10-100mm radius range as 5mm M10.16.0.0.0 and m10.m7 Curved work is given separately stating the radius	2/ 0.22 1.23 2/2/ 0.10 1.23

Examples cont

Ddt both last	Deductions are necessary as the voids are on the boundary of the measured area (5MM General Rules 3.4)
Pla to walls, width ≥ 300 , lightet gyp pla a.b.d to curved suit to rad of 3.23 m	
&	The paintwork is not separately classified
Painting g.s gth ≥ 300 , (1) primg it, (2) u/cs oil paint & (1) matt, tim to pla walls.	
1.450	
Less beam	225
1.225	
Pla to walls, width < 300 lightwt gyp pla faces a.b.d pier retns	In situ finishings to suface < 300 mm wide are kept separate and measured in metre (5MM M20.12.10).But this distinction does not apply to the paintwork, as the painting is not to isolated surfaces (SMM M60. 1.0.1.0) the height is adjusted for the beam intersection.
panitg g.a girth > 300, (1) primg ct, (2) u/cs oil paoint & (1) matt. Fin to pla wall	

Week 13

FINISHINGS

1/4 /22 7/	3.28	ditto curved top edge to rad of 3.23 m	If the rounded angles were < 10mm radius, they would not be measured, where > 100mm radius they are classified as curved work (5MM M10.D3)
3/	1.27	rdd. L to corners terrazzo, to rm rad 10-10 piers	
2/2/	1.27		
20.60 1.45		Pla to walls, width ≥ 300, lightwt gyp pla to B5 1911 pt 2 in 2 cts, 10 th o/a to bwk w. bong pla backing & final it of fin. Pla trowld fin.	The plaster above the terraxxo dado is described given the appropriate particulars from 5MM M20 1.1.1.0 and m20 51-8. the height is take from section X-X measurements are taken on the actual wall surface 9area in contact with base) not on the centre line of the plaster 5MM M20. M2)
		& Paintgn g.s girth ≥ 300, (1) priming it, (2)u/cs oil paint & (1) matt fin to pla walls	the paintwork description induces the preparation kind of paint number of coats and nature of base 5MM m60 51-8.

Examples cont

2/2/	1.23 1.45 1.45 1.45	rdd l pla rad 10 – 100	piers corners to rm	voids are on the boundary of the measured area. Rounded angles are measured in metres, when in the radius range 10-100 mm (5MM M20 16.0.0.0 and M20.m7) Note the variation in height resulting from the 225 x 225 mm beam
2/	2.05 2.77	Ent. Porch Ct & sd (1:4) backg. To wall, width > 300, trowelled 10 th on bwk, ect.		The adjustment of finishing for the window and doors will be taken when measuring the joinery Butings to nails are measured in a similar manners to screeds (SMM M10.1.1.1.0), and the tyrolean finish is measured using the same rules (5mm M20.1.1.1.0)
		& Renderg. To walls, width > 300, tyrolean fin of cullamin applied by meachine to it & sd backg (m/s), ext.		External work must be so described (5MM M10.0.D1)

FINISHINGS

			Ent. Hall 6 th of panellg 2/4.855 9.710 2.755 Rdtn to scrn. 155 12.620	The dimensions are extracted from those previously calculated for ceiling of the entrance hall	
12.62 1.22		Rigid sheet ling to walls, width ≥ 300 , 4 th pre-finished Iroko veneered plywd. Decorative panellg in sheets 2.44 x 1.22mw random vjt. On force to dado , fxd w adhesive to swd. Battens (m/s)	405)4.855 4.855 12+1 2.755 406)2.755 7.610 7 + 1	The wall lining to the dado is measured in m2 in accordance with SMM KII.1.1.10 with a dimensioned description and giving details of the types of sheet, thickness, method of jointing, nature of background and method of fixing, where not at the discretion of the contractor (SMM k11.51-13) vertical battens are fixed at 406 mm centre and at the type and bottom of the paneling. Te battans are measured in metres, with a dimensioned overall cross-section description as SMM G20 51-9. The term supports includes battens (SMM G20.D7). Two additional vertical battens are dotted n to support the return length of paneling to the screen. The battens fixed to the brick walls will require plugging, while those fixed to the concrete	3/
		Indivdl suppts vert. 50 x 19 battens Impregnted			
		Sawn sud plugged top& To ok walls bott			
		4.855 Add retn to scrn 155			

Examples cont

	5.01 <u>1.29</u>	Pla to walls width > 300, in 2 cts 13 th a.b.d to con blkwk	The adjustments of wall finishing for the areas occupied by doors will be made when measuring the internal doors, probably working from a schedule containing all the necessary particulars.
		& Paintg g.s gth ≥ 300 , (1) pring ct (2) u.cs oil paint & (1) math fin to pa wall	
	5.01	Rdd l to pla rad 10-100 (int. ls) Dado rail	Where rounded angles are in the 10-100mm radius range, they are taken as linear items and so classified (5MM M20 16.0.0.0 and M20 M7).
	7.61	Dado rl, 32 x 32 wrot Iroko mo, fixd w. 13 x 32 impregnated sn. Swd spld gads.	Dado rails are measured in a similar manner to skirtings an picture rails in metres, with a dimensioned overall cross section description, including the method of fixing where not at the description, include the method of fixing where no at the discretion of the contractor (SMM P20.1.1.0.0 and P20.SI-9) as the rail is
	5.01	Dado rl. & grds a.b. plugd to bwk	
		Clear finishing gen isolted surfs, wd, gith ≥ 300 , 2 cts	

			5.010	block partition can be nailed direct, and so they need to be kept separate. The height of the wall plaster above the paneled dado is calculated in waste.				polyurethane varnish.	< 0.003mp ² in sectional area ends, angles mitres and intersections and deemed to be included (SMM P20. Cl).
	Ditto fixed to cono	vert battens			7.61				
		To & Both		Plasterwork to brick and concrete block walls is kept separate, in accordance with SMM M20 SS and General rules 8.2 the plaster particulars contain the appropriate details listed in SMM M20. 51-8. this item is followed by the decorations, which include the relevant particulars listed in SMM M60. 51-8	7.61			Conice	The varnishing follows classified as SMM M60.1.0 2.0
	Less	ht, of pla	2.770		4.86			Pla crnice, gth L125 gype pla class B to Bs 1191 pt. 1., to bk bilk & cnc. Surfs filt fin.	Conices are measured in metres. For the length in contact with the base stating the girth as SMM M20.19.0.1.0, with ends internal angles, external angles and intersectings enumerated as extra over the work in which they occur (SMM M31 10 & 12.0.1.0 Fibrous plaster is however seldom used nowadays and so no worked example is provided the mean girth of the cornice is calculated in waste as it is required from painting purposes.
	Dado		1.220						
	Sktg.		255						
	Rail to dado	32	1.477		2/	1		E.O fir int. L to ola crnic	
			1.293					&	
	Pla to walls, width > 300 in 2ds 18 th w. base ct of thistle bowing & sd (1.2)11 th & finishing it of fin pla 2th, stl, trowelled tp bwk							E.O for end to do	
								7.610	
								4.855	
								12.465	
								Less corners 2/85	
								170	
								12.295	
				</					

FINISHINGS

12.30	Painting gen isolated surfs girth < 300, (1) priming it, 2 u/cs oil point (1) matt fin to pla cornice,	It is assumed that the cornice will not be continued around the return wall to be screen. The cornice is separately classified for painting purposes as it is to a base different from that of the wall and ceiling and it assumed to be of a different colour, hence it become isolated surface with a girth \leq 300mm.	0.65 2.77
12.30 0.09	Ddt pla dg itwt gyp pla in 2cts to conc a.b.d & Dtt pointg g.s gth > 300, (1) priming it (2) uks oil pt & matt fin to pla dg.	It is necessary to adjust the plaster and paint work to the ceiling for the area occupied by the cornice.	4/ 2.62
7.61 0.09	Dtt pla to walls in 2cts 13 th to bwt a.b.d	The adjustment of the wall plaster and pointwork for the area of the cornice follows	
4.86 0.09	Dtt pla to walls in 2 cts 13 th to conc bwk a.b.d	Regardless of the area involved the wall and ceiling finishes the wall and ceiling finishings will always be deductable as the cornice is on the boundary of arch area and does not constitute a void (SMM General rules 3.4)	6.56 2.62
12.47 0.09	Dtt painting g.s gth > 300 (1) priming ct. (2) u/cs oil pt & (1) matt fin to pla walls	As the specification of the wall plaster and the paintwork to the claks and telephone cubicle are the same, the two compartments are combine for	3.95 2.62
2.28 2.77	Claks & telephone cubicle Telephone cubicle Pla to walls width > 300, gyp pla 13 th in 2 cts		

Examples cont

Ditto to xtg bk walls	Work on existing surfaces is so described (SMM general rules 13. 1-2).
&	Surface treatments to masonry are measured in me stating the type and purpose and type of wall (SMM F10. 26.11.0) with new work this is deemed to be included (SMM F10. Cid).
R.o j. of xtg bwk to form key for Pla	
	Rt <u>2.770</u>
Less skty.	<u>150</u> <u>2.620</u>
Rdd. L to pla rad (clks) 10-100	
Tel. cub.	
	Clks (gth) 2.280 <u>1.00</u> <u>2)3.280</u> <u>6.560</u>
Painting g.s girth > 500, seal & 2 its of emulsion pt, pla walls	
	(clks. (tel cub.
Toilets & lobby Gents toilet	
	3.310 <u>3.00</u> <u>2)6.310</u>
	The height is adjusted for the skirting.

[illegible]

Week 14

Finishing (contd.)							
		<div><div>Lobby</div><div>1.400</div><div>875</div><div>2 2.275</div><div>/ 4.550</div></div>	There is no skirting to deduct when calculating the height of the wall tiling, as the tiling extends to the floor (see schedule of finishings). The description of the ceramic tiles contains the appropriate particulars listed in SMM M40. 51-8, including the kind and quality of materials, size, shape and thickness of units, nature of base, method of fixing, and treatment and layout of joints. The cement and sand backing is measured for the full height, as a separate item, in accordance with SMM M10.1.1.1.0 and particulars as SMM M10. 51-7				The length of the skirting is calculated in waste, starting with the overall length of straight runs, excluding piers, extracted from the wall finishing dimensions. The pier faces are added as these are not taken separately and the widths of doors and architraves deducted. Alternatively the latter adjustments could be taken with the doors but it is probably simpler to take-them here.
	12.62 2.77	Ceramic tiling, to walls, plain, width> 300) (gents toilet) 152 c 152 x 6th.				<div><div>Sktgs</div><div>Treatment Rm.</div><div>Straight runs 20.600</div><div>odd pier faces 1/215</div><div>430</div><div>Pier retns4/102.5 410</div><div>21.440</div><div>Less drs.&archves.</div><div>1.900</div><div>900 2.800</div><div>18.640</div></div>	The pier faces are added as these are not taken separately and the widths of doors and architraves deducted. Alternatively the latter adjustments could be taken with the doors but it is probably simpler to take-them here.
2/	4.10 2.77	& (ladies cubs)			18.64		Skirting as are measured in metres stating the height or width and thickness or a dimensioned description (SMM M10. 13.0.1 – 2.1-6).
4/	4.33 2.77						
	4.55 2.77	Ct & sd. (1.4) back. (lobby to walls fltd. 10th. to conc.blk.	Adjustment are made for the backing on different bases, as	1/4/22 7	3.2.3	<div><div>Sktg., black in situ</div><div>terrazzo, 10th & 150hi.,</div><div>fin. flush w. wall</div><div>terrazzo above & w. 20</div><div>rod. Cove to terrazzo</div><div>marin 16th. & 110 wide</div><div>at junction. w. flr., on ct.</div><div>& ad bed & backg. (m/s)</div></div> <div><div>Ditto curved to rad of</div><div>3.23m</div></div> <div><div>Entrance Hall</div><div>Sktgs.w.grds.pludg.tbwk,</div><div>7.610</div><div>Less dr. & archve. 900</div></div>	Curved work IS taken separately stating the radius measured on face (SMM M10. MS). Ends and deemed to be included without the need for separate enumeration (SMM M10.C10)
							The length of skirting to the entrance hall is taken from

3/	<u>2.51</u>	Clear finishing., gen isold.	skirting is measured in accordance with SMM. M60.1.8.2.8	$\frac{1}{4}/\frac{22}{7}$	6.75 <u>3.78</u>	<u>Treatment 12m</u>	rectangular areas of floor
	<u>6.71</u>	Surfs., wd., gth. ≤ 300, 2 cts of polyurethane clear	Angles, ends, mrtres and intersections to skirting are enumerated if the skirting has a sectional areas exceeding 0.003.m2 (SMM Ps0.cl)			3.550 odd beam <u>225</u> <u>3.775</u> <u>3.225</u> odd beam <u>300</u> <u>6.525</u>	finishings to treatment room in waste, using as a starting point the dimensions already calculated for the ceiling
10/	<u>1</u>	E. O sktg. for L.	The length of skirting in the cloaks and Telephone Cubicle are taken together as they are to the same specification, and this will avoid duplication of items.	$\frac{1}{4}/\frac{22}{7}$	3.53 <u>3.23</u>	Screed to fir., fir., lev., 34 ct & sd (1:3) trowld., on conc base.	Screeds are measured in m ² as SMM M10.5.1.1.0, giving the appropriate particulars usted in SMM M10.51-7 (no with range required). The actual type of finish to be received is included in the description. Door openings are normally included at this state. The work to the curved perimeter does not require special mention. To determine the area of terrazzo paving it is necessary to deduct the projection of the base of the skirting from the overall dimension as used for the measurement of the screed.
	<u>1</u>	E. O sktg. for end.				Swing drs opg). Ddt lost (piers)	
		<u>Clk & Telephone Cubicle Clks</u> 2/2.280 4.560 <u>1000</u> <u>Less</u> 5.560 dr. & archves. <u>850</u> <u>4.710</u> Sktg.on grds plugd to bwk. & fxd to blkwk. 4.710 new bk. wall 2.280 xtg.bk.wall <u>650</u> <u>2.930</u> fxd to blkwk <u>1.780</u>	All timber must be adequately described, including stating whether sawn or wrot (SMM P20.S1)	2/	1.80 <u>0.10</u> <u>0.22</u> <u>0.10</u> 6.55 <u>3.68</u> 3.43	less sktgs 2/100 200 <u>6.550</u> <u>3.775</u> Less sktg <u>100</u> <u>3.675</u> <u>3.525</u> less sktg <u>100</u> 3.125 In situ terrazzo flr., lev., 16th black & white., ct & marble chippgs. (1:2), ld. alternatively in panels	

		<p style="text-align: right;"><u>Tel cubicle</u> 3.650</p> <p>Less dr. & archives. <u>800</u> 3.150</p> <p>Sktg., 25 x 150, (clks) wrot swd., fxd. w. 13 x 22 impregnated (tel cub.) sn.swd.grds. to blkwk.</p>	<p>separate the skirting items according to whether the grounds require plugging (brickwork base) or not (blockwork base) SMM P20.58). The description of paint work is to state the number of undercoats and finishing coats, and the surfaces finish (SMM M60.55-6)</p>	<p>$\frac{1}{4}/\underline{22}$ 7</p> <p>2/</p>	<p><u>3.13</u> 3.13 <u>3.13</u> 1.80 <u>0.10</u></p> <p>0.22 <u>0.10</u></p>	<p>abt. 500 x500 between ebonite dividg. Strips (m/s), trowelling to msth.fin& pol., on & inc., bldg., paper underlay, ld., on trowelled screed (m/s) swg.drs opa & sktg.) Ddt. last (piers)</p>	<p>M10.5.1.1.1-2 The building paper underlay in included in the item but not the ebonite dividing strips</p> <p>A deduction has to be made for the area occupied by the piers as they are on the boundary of the paved area (SMM General (rules 3.4)</p>
	<p><u>1.78</u> <u>3.15</u></p>						
	<u>2.93</u>	<p>sktg. & grds. a.b. (clks) plugd. tp bwk</p>					
	<p><u>4.71</u> <u>3.15</u></p>	<p>Paintg. gen isold. (clks) surfs., wd., gth. ≤ 300, k.p.s., (2) ulcs & (1) tel cub) hd. gloss pt.</p>					

Week 15

		Dividg. strips 7.000 less sktgs. 2/100 200 6.800 3.550 6.740 less sktgs. 100 5.350 3.450 2)12.090 odd pier 215 6.045 3.665 6.750 less sktgs. 2/100 200 6.550 pier 6.660 3.125 5.350 odd beam 300 2)12.010 3.425 6.005 Diving strip, 6 x 16 Ebonite bedded in c.m. (1:3) between terrazzo flr. Panels. piers retns. swg.drs.opg dividg strip a.b. curved to rad. Of 3.13m ent.porch	The lengths of the dividing strip are calculated in waste, counting the numbers of full lengths in each direction from the drawing and adjusting for the 100mm wide margin. The lengths intercept by the cured wall are averaged in length and the shorter lengths on two side of the room linking up with the curved section are then taken. Dividing strips are measured in meters with a dimensioned description as 5MM M10.24.7.1.0 In practice the separate measurement of the dividing strips in this situation might be regarded as superfluous and the surveyor might be tempted to include them in the description of the terrazzo paving,		4..86 <u>2.76</u> 1.55 <u>0.10</u> 0.75 <u>0.10</u>	<u>Ent. Hall</u> Screed to flr., lev., 25 ct. & sd., (1:3) fltd. On conc. base & Wd.blk flr. Lve. (ent.drs. opg 300 x 75 x 25 th . Troko wrot t &g. (dr.opgs to treatmt. Rm..clks & lobby) Pattn.w.2b.l Plain margins alrd Bedded & jtd. In (dr.opg to tel cub) Scrd. (m/s), w. machine Sanded fin., & deal, body in & cts. Of wax pol. divdg. strip. 6 x 25, ebonite, bedded in c.n. (1:3) (dr.opgs) Clks. Screed to flr., lev., 48 ct.	All work is deemed internal unless described as external (SMM M40. D.1), hence the addition of external to the description. Screeds include the appropriate particulars listed in SMM. M10.S1-7.The description shall also include the method of surface treatment, such as floated or trowelled and the nature of the base. The description of wood blocks incorporates appropriate particulars listed in SMM.M40.51-8, including the layout of joints. All cutting is deemed to be included (SMM.M40- cld). The description is to include include all preparatory work and the nature of the finished surface, including any dealing/polishing. !i!duding ang sroling!fclishing.
9/	<u>6.80</u>						
5/	<u>6.05</u>						
9/	<u>6.55</u>						
5/	<u>6.01</u>						
	<u>3.67</u>						
	<u>3.43</u>						

2/	<u>0.10</u>	scree to flr., lev., 28 ct. & sd. (1:3) trowld., on conc. Base, ext.	but this would pose problems for the estimator as he needs to know the length of dividing strip required. Addition information has been included in the description as permitted by SMM General Rules 1.1			&sd. (1:3) stl. Trowelled, on conc. base	Liner item as SMM M40.16.4.I.0, with a dimensioned description and giving the method of fixing (SMM.M40.59). The minimum depth is taken as the thickest adjoining floor finish
4/	<u>0.10</u>					&	
1/4/22 7	<u>3.13</u>	&			<u>1.55</u>	(dr.opg.to gents toilet)	
	<u>2.60</u>	Quarry tile flr., plain, 152 x 152 x 22th .brown tiles to BS 1286, Type A, bedded, jtd & ptd in c.m (1:3) on trowld screed (m/s), ext.	Further additions are inserted for a pair of pier returns and the cross joints at the opening for the swing doors and line of skirting, and to the single door. Curved work is kept separate, stating the radius (SMM M10.M5). The measurements of the screed to received quarry tiles are identical to those of the ceiling determined previously.	3/	<u>0.75</u>	Plastic flr. Width > 300, lev., 300 x 300 x 25 th .	The thickness of the bed is varied according to the thickness of the finishing to provide a level surface throughout
	<u>2.05</u>				<u>0.70</u>	PVC tiles to BS 3261 Type A fxd. w. adhesive on trowelled screed (m/s)	
					2.28		
					<u>1.00</u>		
					0.75	Dividg, strip 6 x 16 ebonite, bedded in c.m. (1:3) dr. opg.	The overall thickness is 50m. The PVC floor tiling is measured in accordance with SMM. M50.1.1.0, including the prescribed width range. The flooring to the cloaks is followed by the dividing strip in the door opening to the gents toilet. Alternatively all strips in door openings could be taken together at the end of the floor finishings
					<u>0.10</u>		

			appropriate particulars listed in SMM M40. 51 – 8. There must be adequate information for the estimator to price the work		<u>0.75</u>		
	1.00 <u>0.88</u>	Tel cubicle Screed to flr., lev., 47 ct & sd (1:3) stk trowelled on conc. base & Corkl flrg., width > 300, lev., 300 x 300 x 3.2th. cork tiles, cork-0- plast checker tiles nr. 13, semio-bright fin, butt jtd. & n fxd. w. copod. Adhesive on trowelled scrd. (m/s) <u>Ladies & gents</u> <u>Toilets & lobby</u>	The trowel screed and the cork tile finishing to the telephone cubicle form two separate items, with the cork tiles fully described in accordance with SMM. M50.5 1.1.0 including the prescribed width range classification.				
	3.31 <u>2.55</u>	Screed to flr., lev., 40 ct. & sd. (1:3) gents toilet) Trowld., on conx. base	The flooring to the gents and ladies toilets and the lobby can be taken together as they all have the same finishing the boundary of a floor finish is taken				
	1.91 <u>0.45</u>	& Ditto recess					

	4.29 <u>3.00</u> 1.45 <u>088</u>	Ceramic tiled flr. Lev. Plain, 152 (ladies toilet) X9.5th fully vitrified ceramic tiles to BS 1286, w. (lobby 3 wide jts bedded, jtd,. & ptd.w.c.m (1:3) on trowld. Scrd. (m/s)	to conincide with a door so that the joint is not visible when the door is closed. The length of the lobby has been increased to include the finish to the door opening into the ladies toilet. No further dividing strips are required				
--	---	--	---	--	--	--	--