

BUILDING CONSTRUCTION DRAWING

BUILDING CONSTRUCTION METHOD

THE FACTORS THAT INFLUENCE THE HOUSE CONSTRUCTION

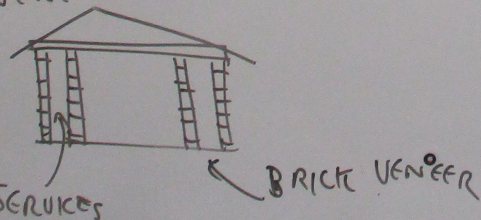
- CLIMATE
- SOIL CONDITION
- LOCAL, STATE, OTHER BUILDING REGULATIONS.
- ENVIRONMENTAL & HERITAGE AWARENESS
- COST
- GOVERNMENT SERVICES (SEWERAGE PIPES)

BUILDING TYPES

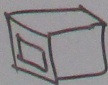
TIMBER FRAMED CONSTRUCTION



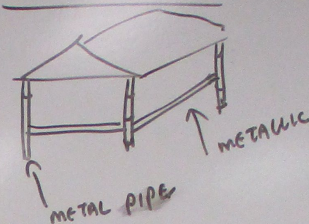
VENEER CONSTRUCTION



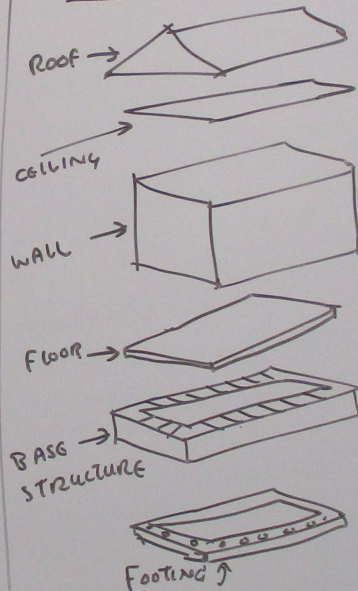
CAVITY BRICK CONSTRUCTION (CONCRETE BLOCK)



METAL FRAME



BASIC CONSTRUCTION OF HOUSE



FOUNDATIONS

THE FOUNDATIONS ARE THE

THE BUILDING IS CONSTRUCTED

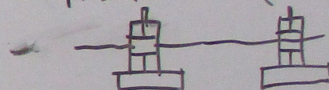
GROUND PREPARATION

- LEVELLING
- TRENCHING
- BACK FILLING.

FOOTINGS

THE PART OF THE CONSTRUCTION
THE LOAD OF THE HOUSE

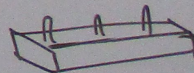
PAD FOOTING (UNDER)

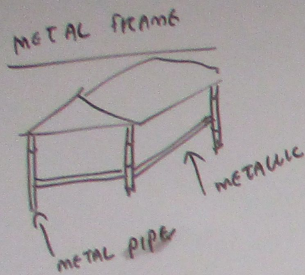


STRIP FOOTING - CONTINUOUS CONCRETE POUR AREA AS A BASE FOR EXT

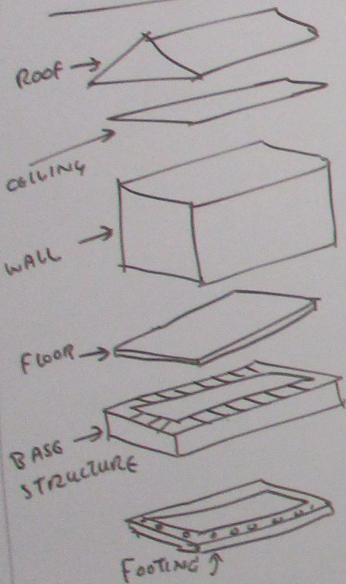


CONCRETE SLAB FOOTING





BASIC CONSTRUCTION OF HOUSE



FOUNDATIONS

THE FOUNDATIONS ARE THE ACTUAL GROUND ON WHICH THE BUILDING IS CONSTRUCTED.

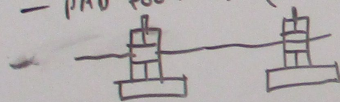
GROUND PREPARATION

- LEVELLING
- TRENCHING
- BACK FILLING.

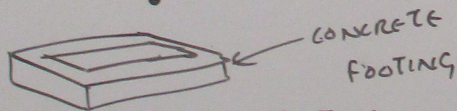
FOOTINGS

THE PART OF THE CONSTRUCTION THAT SUPPORTS THE LOAD OF THE HOUSE IN THE SOIL.

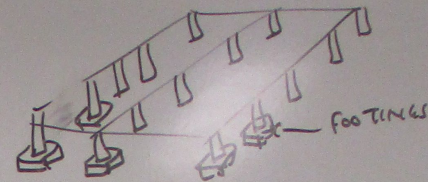
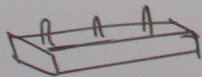
- PAD FOOTING (UNDER ISOLATED PIERS)



- STRIP FOOTING - CONTINUOUS REINFORCED CONCRETE POUR AROUND THE BUILDING AS A BASE FOR EXTERNAL WALL.



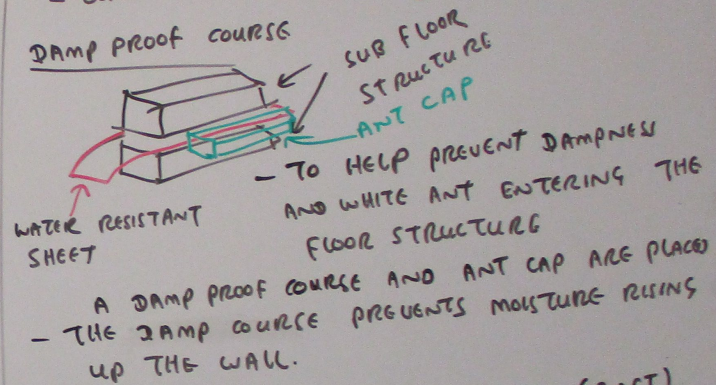
- CONCRETE SLAB FOOTINGS



BASE (OR) SUB FLOOR STRUCTURE

- CONTINUOUS MASONRY WALL
 - BRICK PIERS
 - CONCRETE STUMP
- CONSTRUCTION BETWEEN FLOOR FRAME AND FOOTINGS

DAMP PROOF COURSE



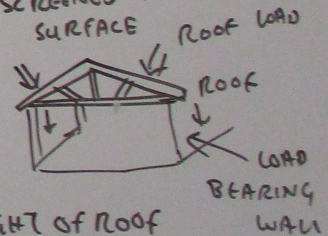
- A DAMP PROOF COURSE AND ANT CAP ARE PLACED
- THE DAMP COURSE PREVENTS MOISTURE RISING UP THE WALL.

FLOOR

- TIMBER FLOOR BOARD / CONCRETE SLAB (RAFT)
- SCREENED FOR SMOOTH SURFACE

WALL

- LOAD BEARING WALL
 - * TRANSFERS THE LOAD TO FOUNDATION
 - * SUPPORTS THE WEIGHT OF ROOF
- NON LOAD BEARING WALL (PARTITION WALL)
 - DO NOT CARRY THE LOAD
 - DIVIDE THE SPACE INTO PARTITION



BUILDING CONSTRUCTION DRAWING

BUILDING CONSTRUCTION METHOD

THE FACTORS THAT INFLUENCE THE HOUSE CONSTRUCTION

- CLIMATE
- SOIL CONDITION
- LOCAL, STATE, OTHER BUILDING REGULATIONS.
- ENVIRONMENTAL & HERITAGE AWARENESS
- COST
- GOVERNMENT SERVICES (SEWERAGE PIPES)

BUILDING TYPES

TIMBER FRAMED CONSTRUCTION



TIMBER FRAME

VENEER CONSTRUCTION

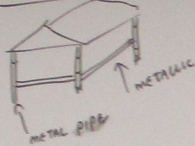


BRICK VENEER

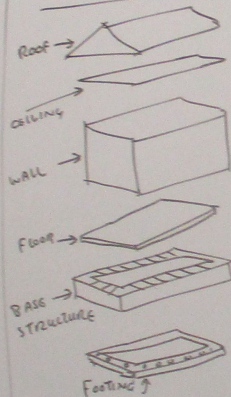
CAVITY BRICK CONSTRUCTION (CONCRETE BLOCK)



METAL FRAME



BASIC CONSTRUCTION OF HOUSE



FOUNDATIONS

THE FOUNDATIONS ARE THE ACTUAL GROUND ON WHICH THE BUILDING IS CONSTRUCTED.

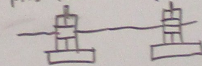
GROUND PREPARATION

- LEVELLING
- TRENCHING
- BACK FILLING.

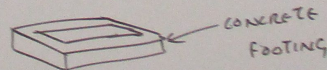
FOOTINGS

THE PART OF THE CONSTRUCTION THAT SUPPORTS THE LOAD OF THE HOUSE IN THE SOIL.

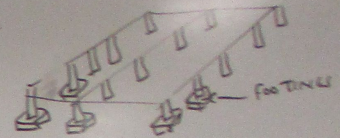
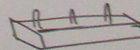
- PAD FOOTING (UNDER ISOLATED PIERS)



- STRIP FOOTING - CONTINUOUS REINFORCED CONCRETE POUR AROUND THE BUILDING AS A BASE FOR EXTERNAL WALL.



- CONCRETE SLAB FOOTINGS

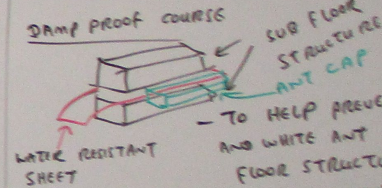


BASE (or) SUB FLOOR STRUCTURE

- CONTINUOUS MASONRY WALL
- BRICK PIERS
- CONCRETE STUMP

CONSTRUCTION BETWEEN FLOOR FRAME AND FOOTINGS

DAMP PROOF COURSE



- TO HELP PREVENT DAMPNESS AND WHITE ANT ENTERING THE FLOOR STRUCTURE

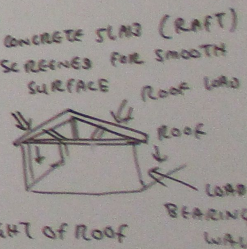
- A DAMP PROOF COURSE AND ANT CAP ARE PLACED
- THE DAMP COURSE PREVENTS MOISTURE RISING UP THE WALL.

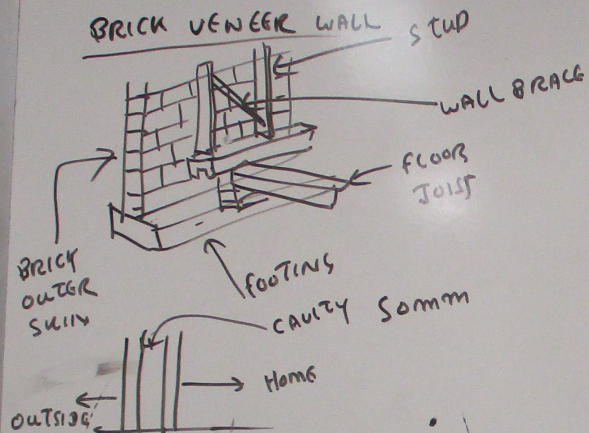
FLOOR

- TIMBER FLOOR BOARD
- CONCRETE SLAB (RAFT) SCREENED FOR SMOOTH SURFACE

WALL

- LOAD BEARING WALL TRANSFERS THE LOAD TO FOUNDATION & SUPPORTS THE WEIGHT OF ROOF
- NON LOAD BEARING WALL (PARTITION WALL) DO NOT CARRY THE LOAD DIVIDE THE SPACE INTO PARTITION





CAVITY BETWEEN INNER AND OUTER BRICK SKIN

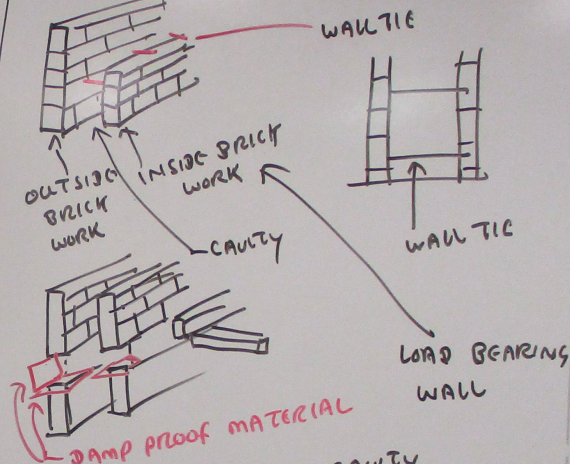
→ TO PREVENT THE TRANSFER OF MOISTURE

→ ALLOW MOVEMENT BETWEEN TIMBER FRAME AND BRICK WORK

BRICK VENEER WALL COMPLETE CONSTRUCTION DIAGRAM (SEE IN WORK BOOK / PRINTED OUT SHEET)

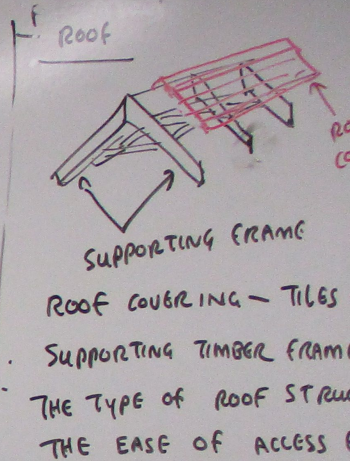
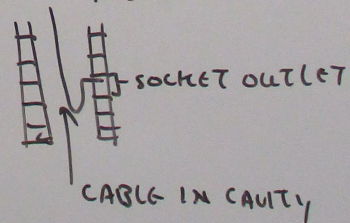
- NOTE THE TECHNICAL TERMS AND THEIR LOCATIONS IN THE DIAGRAM.

CAVITY BRICK WALL CONSTRUCTION



FUNCTION OF WALL CAVITY PROVIDE

- MOISTURE BARRIER
- AIR CIRCULATION
- THERMAL AND ACOUSTIC INSULATION.

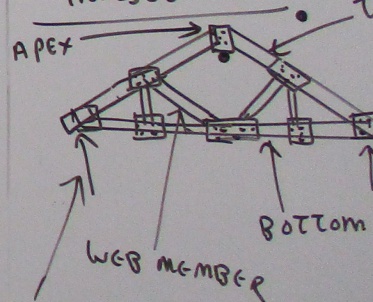


ROOF FRAME

CONVENTIONAL ROOF FRAME DIAGRAM (SEE WORK BOOK)

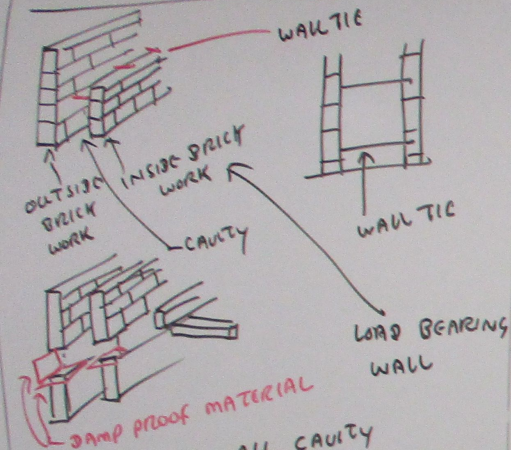
NOTE TECHNICAL TERMS

TRUSSED ROOF



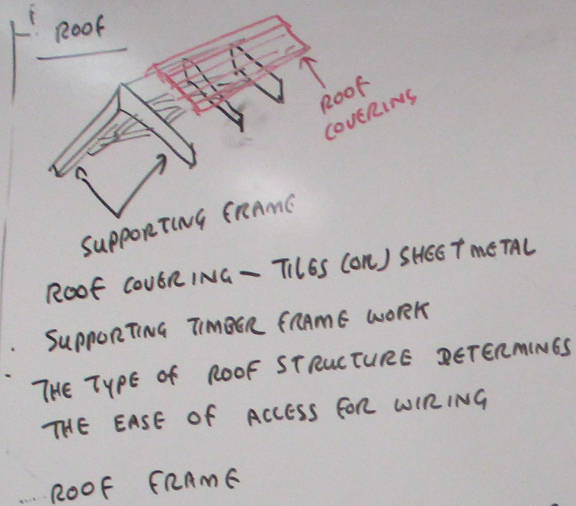
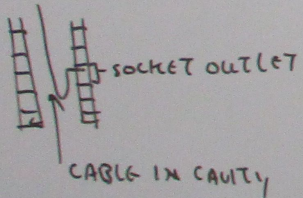
SUPPORTING WALL BATTEN

CAVITY BRICK WALL CONSTRUCTION

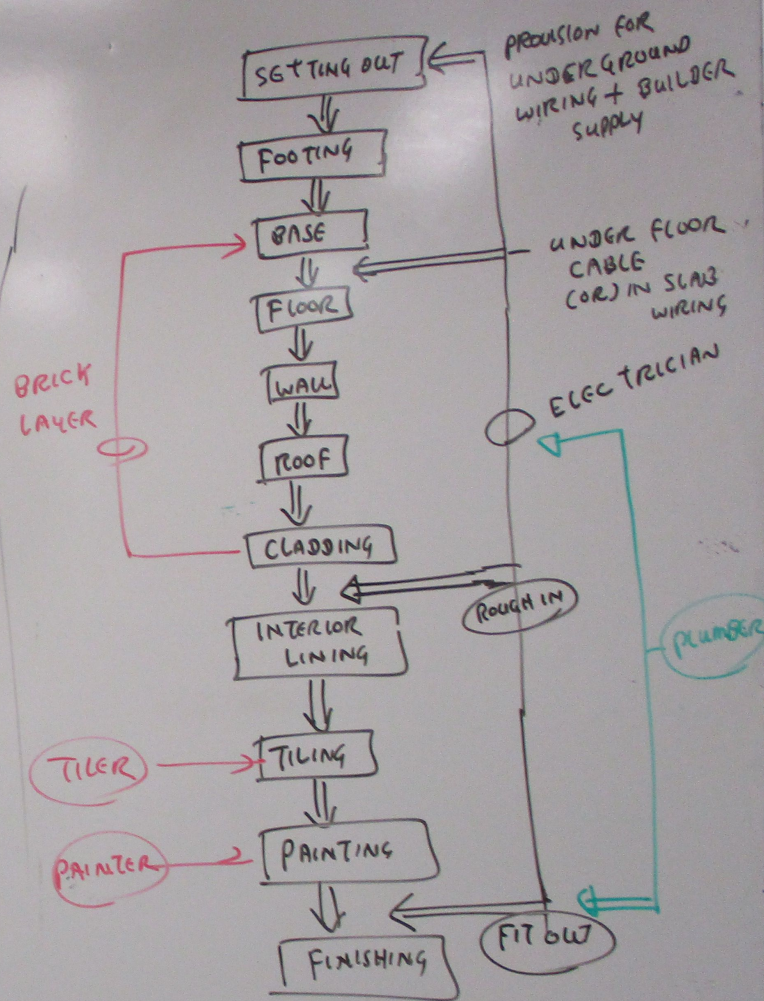
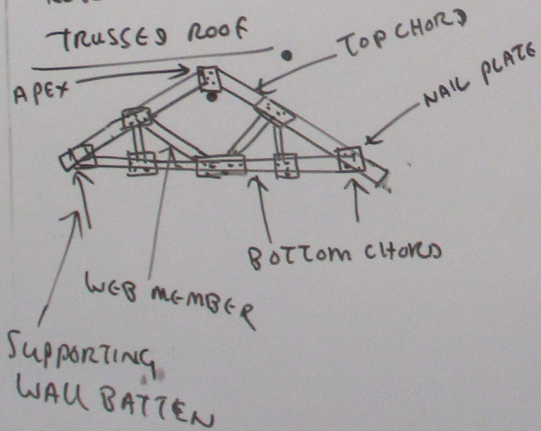


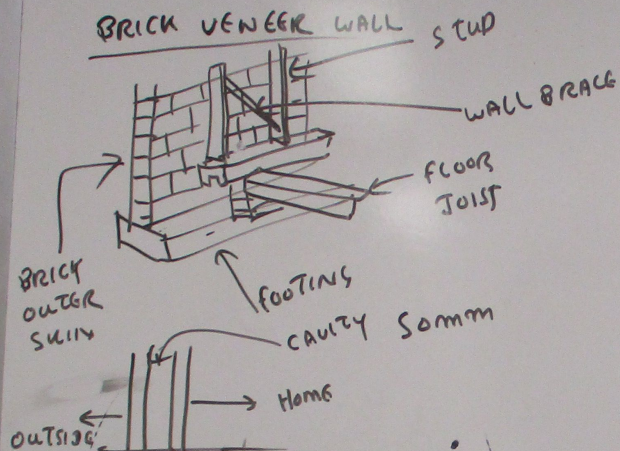
FUNCTION OF WALL CAVITY

- PROVIDE
- MOISTURE BARRIER
 - AIR CIRCULATION
 - THERMAL AND ACOUSTIC INSULATION.



CONVENTIONAL ROOF FRAME
 DIAGRAM (SEE WORK BOOK / PRINTED OUT SHEET /
 NOTE TECHNICAL TERMS AND THEIR LOCATIONS





CAVITY BETWEEN INNER AND
OUTER BRICK SKIN

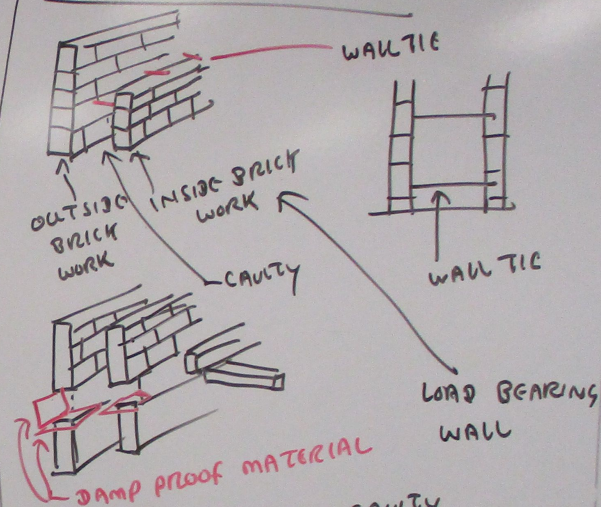
→ TO PREVENT THE TRANSFER
OF MOISTURE

→ ALLOW MOVEMENT BETWEEN
TIMBER FRAME AND BRICK
WORK

BRICK VENEER WALL COMPLETE CONSTRUCTION
DIAGRAM (SEE IN WORK BOOK / PRINTED OUT
SHEET)

- NOTE THE TECHNICAL TERMS AND
THEIR LOCATIONS IN THE DIAGRAM.

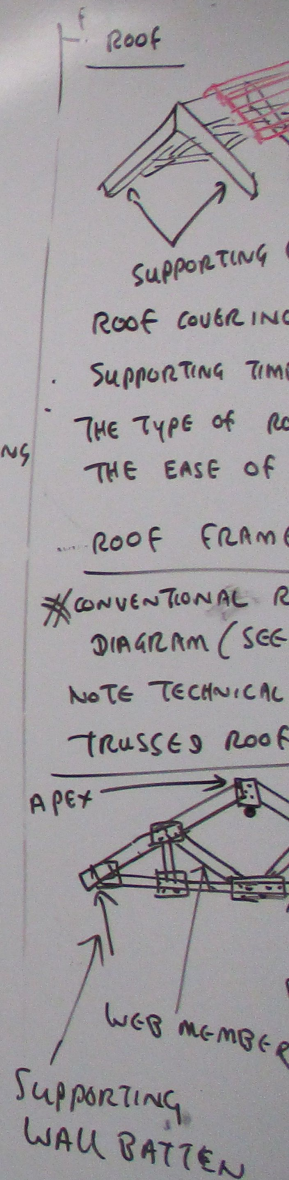
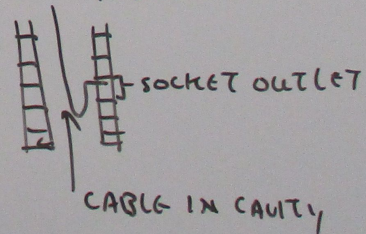
CAVITY BRICK WALL CONSTRUCTION



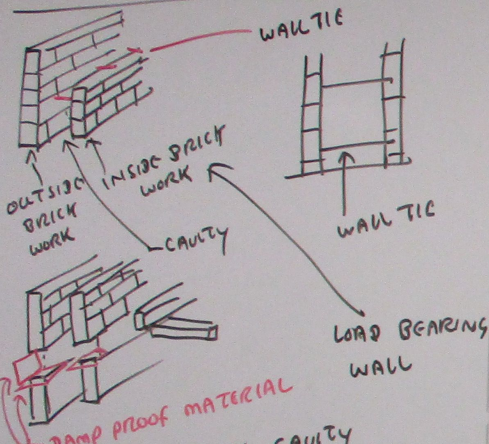
FUNCTION OF WALL CAVITY

PROVIDE

- MOISTURE BARRIER
- AIR CIRCULATION
- THERMAL AND ACOUSTIC INSULATION.



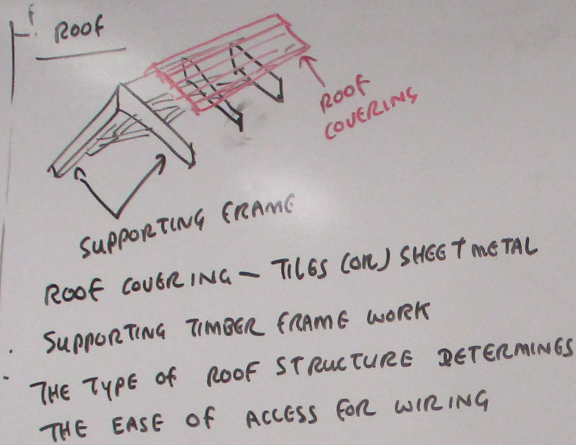
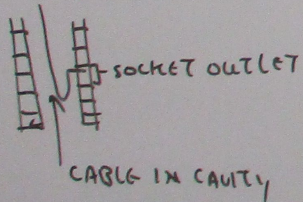
CAVITY BRICK WALL CONSTRUCTION



FUNCTION OF WALL CAVITY

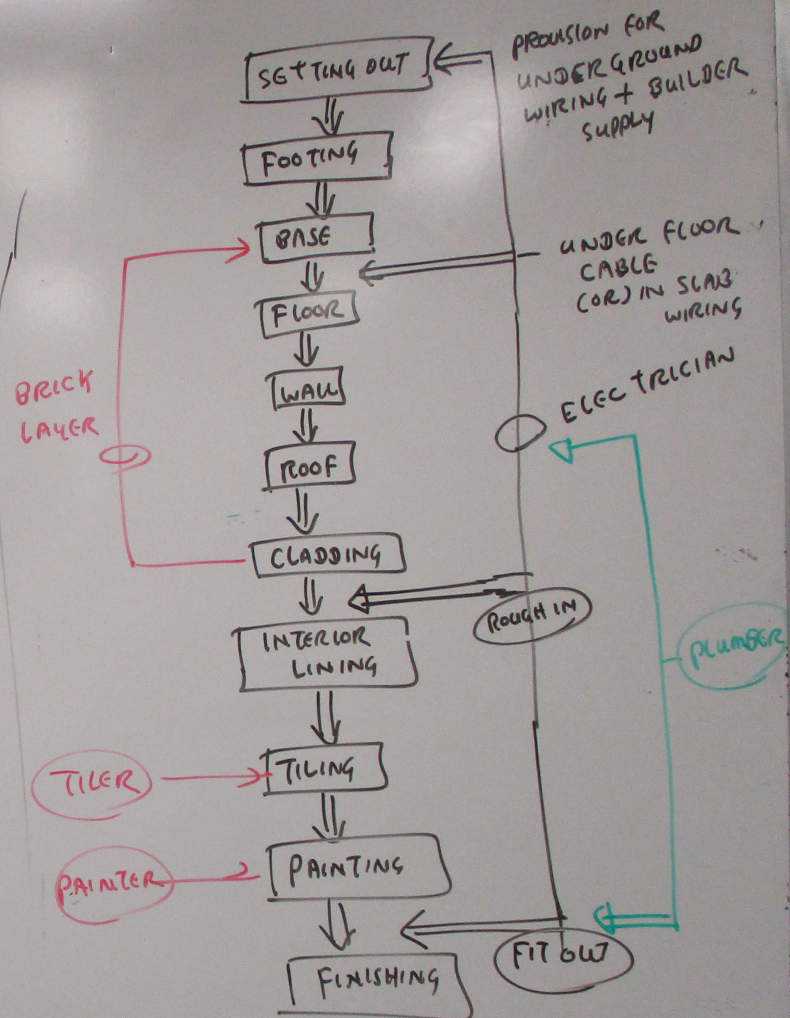
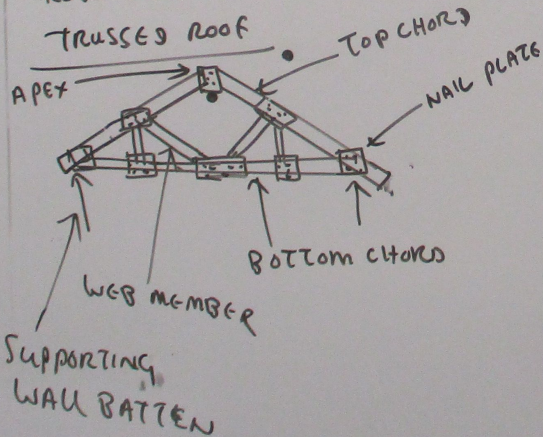
PROVIDE

- MOISTURE BARRIER
- AIR CIRCULATION
- THERMAL AND ACOUSTIC INSULATION.



ROOF FRAME

CONVENTIONAL ROOF FRAME
 DIAGRAM (SEE WORK BOOK / PRINTED
 OUT SHEET /
 NOTE TECHNICAL TERMS AND THEIR LOCATIONS



BUILDING CONSTRUCTION TERMINOLOGY
 SEE IN WORK BOOK / PRINTED OUT
 SHEET
 NOTE TECHNICAL TERMS AND THEIR
 LOCATIONS.

QUESTIONS

① NAME SIX MAIN PARTS OF A STRUCTURE

- ② ROOF ③ CEILING ④ WALL ⑤ FLOOR
⑥ BASE STRUCTURE ⑦ FOOTING

② STATE THE REASON WHY A CONCRETE SLAB FOOTING IS USED

- IT ACTS AS THE SUPPORT FOR THE STRUCTURE AS WELL AS BEING THE FLOOR

③ DEFINE THE TERMS

FLOOR JOISTS - ANY OF THE SMALL TIMBERS (OR) METAL BEAMS RANGED PARALLEL FROM WALL TO WALL TO SUPPORT A FLOOR (OR) CEILING

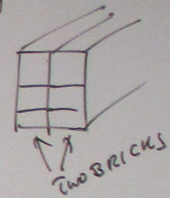
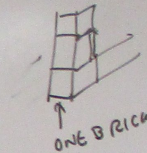
BEARERS - TIMBER (OR) STEEL THAT ATTACHED DIRECTLY TO THE STUMPS IN THE GROUND

④ DEFINE THE FOLLOWING TERMS THAT USED IN FRAMED WALL CONSTRUCTION

TOP PLATE - CONTINUOUS TIMBER BEAM ON THE TOP OF THE WALL THAT SUPPORTS THE ROOF STRUCTURE BY CARRYING THE VERTICAL FORCES FROM RAFTER TO WALL STUDS.

⑤ WHAT IS SINGLE BRICK WALL?

A LEAF IS THICK AS WIDTH OF ONE BRICK



⑥ WHAT IS COURSE IN MASONRY

CONTINUOUS ROW OF ANY MASONRY UNIT SUCH AS BRICK

⑦ WHAT IS FEATURIZED WALL?

IT IS DECORATED WITH PAINTING.

BRICK
LAYER

TILER

PAINTER

BUILDING

SEE

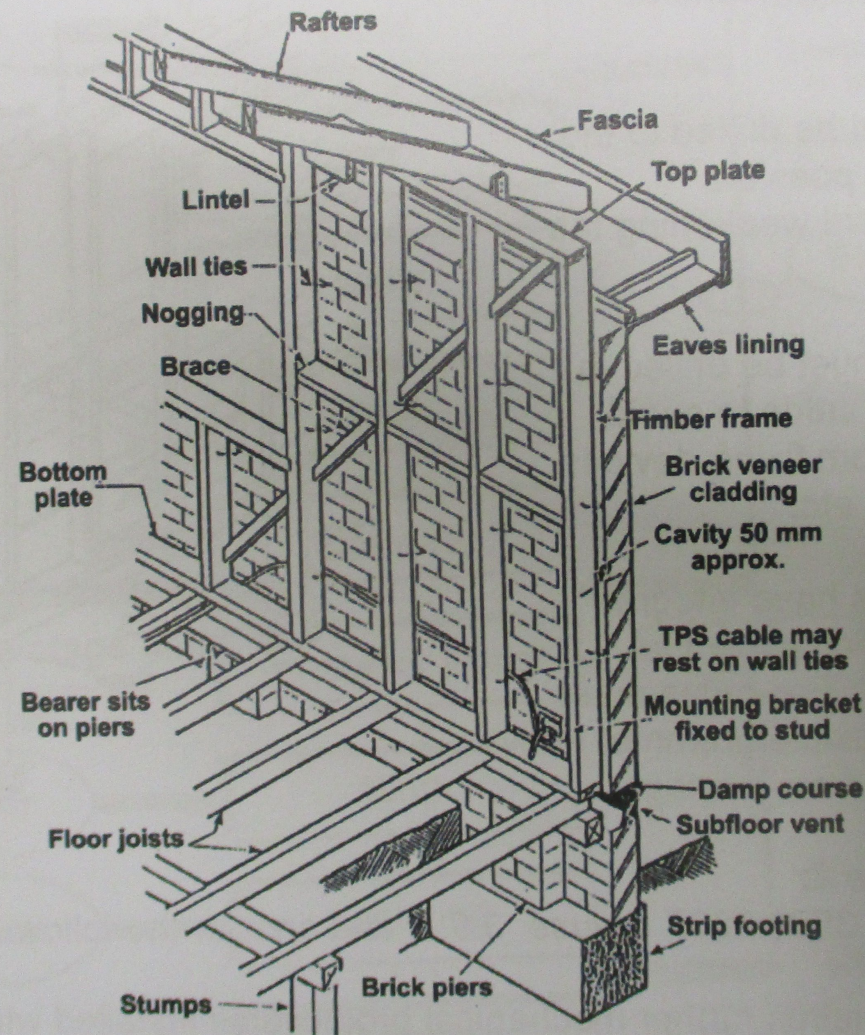
NOTE

LO

ii. To allow for movement between the timber frame and the brickwork

The outer brick wall is stabilised by tying it to the inner wall as in double brick construction, with _____ embedded in the mortar.

The cavity can be used as a route for electrical wiring and similar precautions to double brick construction need to be taken.



Brick veneer construction

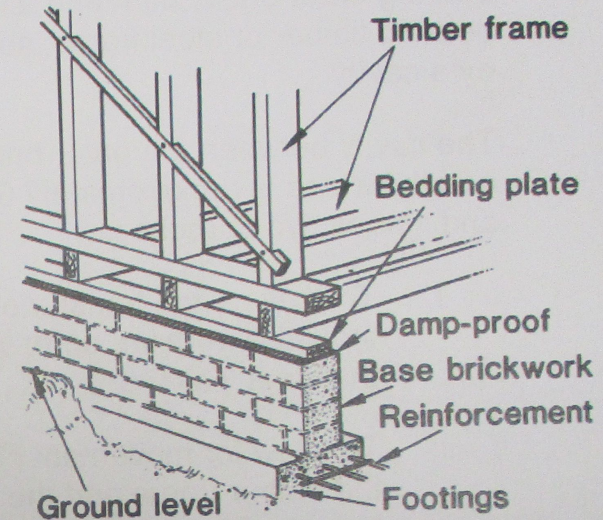
Timber or Metal Frame Construction
Timber frame construction employs a single timber frame, which forms the internal and external walls.

That is there is no cavity.

The internal wall is clad with normal internal cladding (Gyprock etc)

The outside of the frame must be covered with one of various types of waterproof cladding.
Some types of cladding include:

- ❑ Weatherboards (timber)
- ❑ Brick tile sheets
- ❑ Treated metal (aluminium or steel)
- ❑ Fibre cement (sheets or planks)
- ❑ Plywood
- ❑ Hardboard
- ❑ PVC (sheeting or planks)

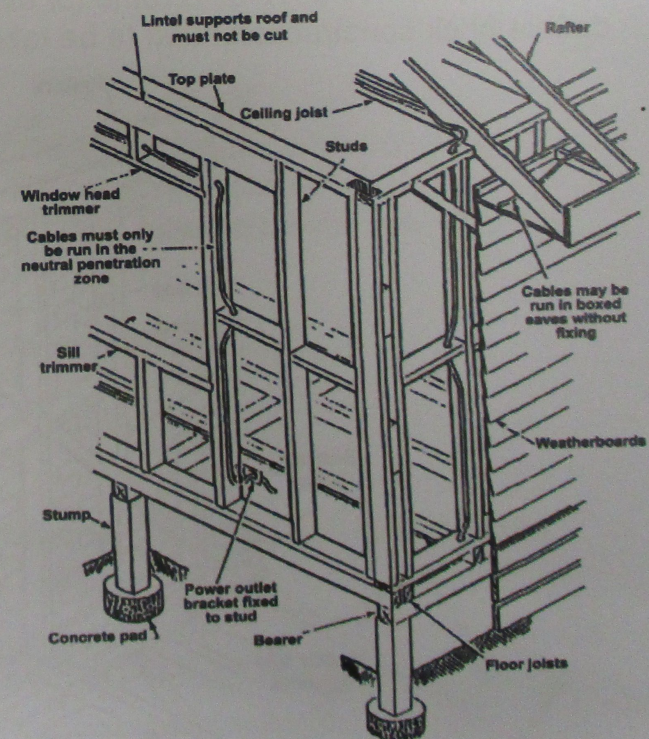


Electrical cabling is run through the timber frame by means of drilled holes.

The holes should be drilled to the _____ possible dimension to avoid weakening the timber structure.

The cable hole must be drilled in the centre of the studs to avoid cable damage from fixing devices, nails and screws etc.

Metal frame walls have integral holes in them which allow the passage of cable. The holes must be fitted with a flexible grommet to protect the cable from damage.

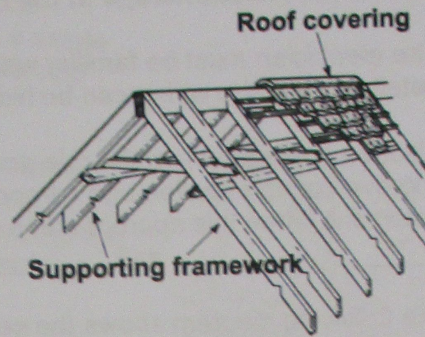


Roof

The roof may vary from steeply sloping to almost flat. It will consist of:

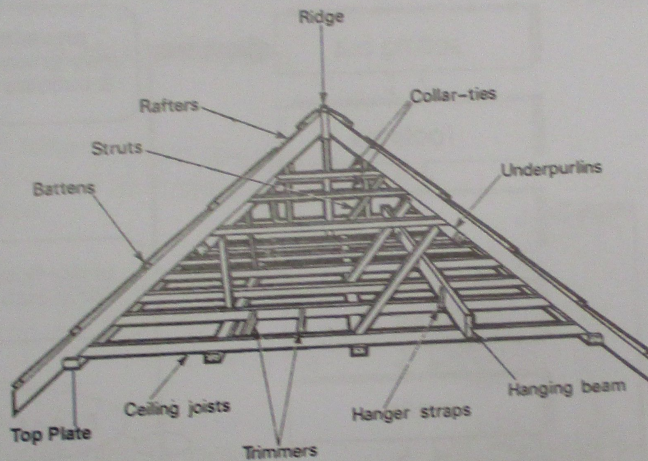
- Roof covering – Tiles or sheet metal material
- Supporting timber framework

The type of roof structure determines the ease of access for wiring etc.



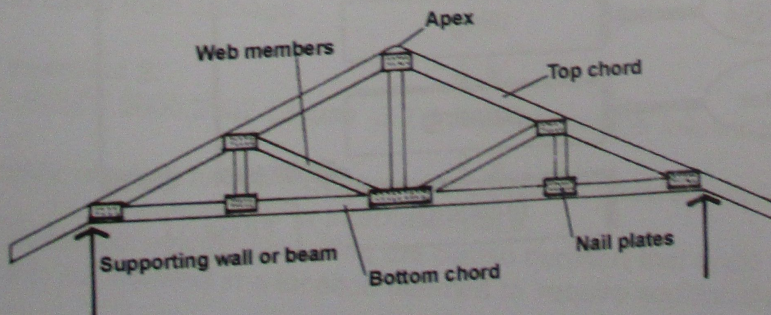
Conventional roof frame

A conventional roof frame is made up of rafters, battens, under purlins, struts, ridge(s) and collar ties to support the roof cladding. The ceiling is supported by ceiling joists, trimmers and hanging beams.



Trussed roofs

This is a pre-fabricated form of roofing frame. A trussed roof is a structural load bearing frame comprising a number of equally spaced trusses which span across the building and are supported on the outside _____ walls. When fixed in position the trusses are designed to support the roof and ceiling loads.



69

Building/Construction Terminology

Beam – A horizontal load-bearing structural member.

Bearer – A sub floor timber supporting the floor joists.

Brick veneer construction – In housing, a system in which a structural timber frame is tied to a single brick external wall.

Ceiling – The overhead internal lining of a room.

Concrete, reinforced – Concrete reinforced or strengthened by the inclusion of steel mesh, bars and rods.

Cladding – The outer covering of the external walls of a framed building.

Dampcourse – A waterproof membrane laid between courses of brickwork or masonry.

Eaves – The lower part of the roof that overhangs the wall.

Footing – The construction whereby the weight of the structure is transferred from the base structure to the foundation.

Gable – The triangular end of a house formed at the end of a pitched roof, from the eaves line to the apex.

Hip roof – A roof which is roughly pyramidal in shape with surfaces sloping upwards from all the eaves.

Joists, ceiling – Timber members spanning between walls or other supports, to which the ceiling is attached.

Joists, floor – Timber members to which the flooring is fixed.

Lintel – A horizontal load-bearing member spanning an opening.

Nogging – A horizontal piece of timber providing a stiffener between studs in wall frames.

Pier caps (Ant caps) – A membrane (usually galvanised steel) to prevent dampness and deter insect attack of sub-floor timber.

Purlins – Longitudinal roof timber giving intermediate support for rafters.

Rafter – In roof construction, a timber framing member providing the principle support for the roofing material.

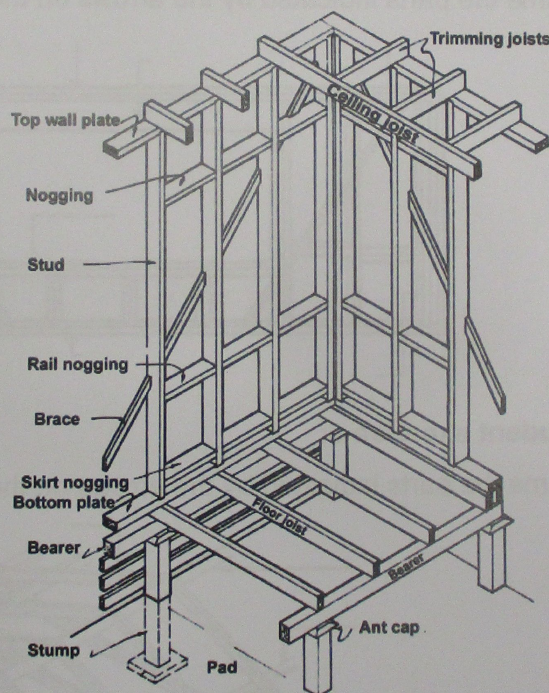
Sarking – A covering of waterproof building paper or boarding fixed on the top of the rafters beneath the external roof covering.

Skillion or lean-to roof – A roof sloping in one direction only with the rafters pitching or leaning against a wall.

Stud – A vertical timber forming part of a load-bearing external wall frame or of an internal wall partition.

Truss – A structural load-bearing frame. E.g. roof truss.

Wall brace – Provides lateral support for the wall frame.



FIRE RESISTANCE WIRING SYSTEM

HEAT RESISTANT / FIRE RESISTANT / HEAT AND FIRE RESISTANT

MIMS - MINERAL INSULATED AND METAL SHEATHED CABLE

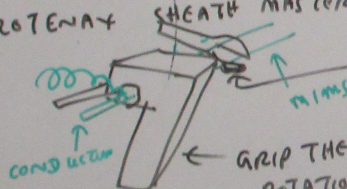
MORE DIFFICULT TO INSTALL

UTILIZED MAINLY THE CIRCUIT DURING FIRE
BREAKS OUT → FIRE PUMP, EMERGENCY LIGHTING
PASSENGER LIFT

TERMINATION

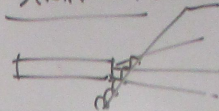
NEEDS SPECIALIZED TOOL

— PYROTEK SHEATH MASTER → TOOL TO STRIP
OFF METAL SHEATH
SPANNER TO HOLD THE
MIMS CABLE
GRIP THE CABLE AND BY
ROTATION, IT CUTS OFF THE
METAL SHEATH



- THE END OF THE CABLE SHOULD BE SQUARE TO BEGIN. USE FINE TOOTHED HACK SAW
- INSERT THE CABLE AND TIGHTEN ENOUGH TO ALLOW THE TOOL TO ROTATE ON CABLE
- ADJUST BLADE POSITION. IT SHOULD BE SET HALF WAY BETWEEN SHEATH AND THE CONDUCTORS
- HOLD THE CABLE WITH PLIER (OR) MULTI GRIPS
- ROTATE THE TOOL CLOCKWISE UP TO THE PLIER TO ACHIEVE A SQUARE END.

STRIPPING ROD

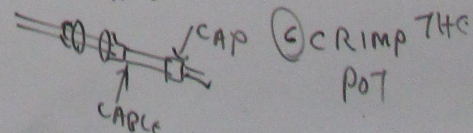
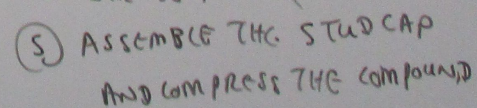
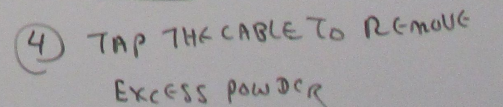
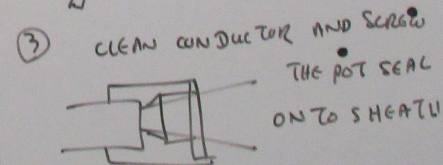
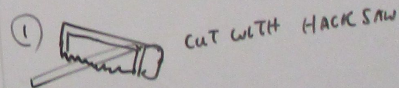


FIT THE SLOT TO A TAG OF SHEATH
LIFTED WITH SIDE CUTTERS

AT ANGLE OF 45° WIND THE ROD
WHILE TWISTING AROUND THE CABLE

SIDE CUTTER

CUT THE CHIPS



⑥ Test continuity

CONDUCTOR SIZE - 7

ERS - EARTH SHEATH

SUPPORT AND FIXING

SPACING BETWEEN
SHOULD BE SUCH

TOUCHING - SEPARATE
UP

TERMINATIONS

USE SPECIAL
INSULATION RESISTANCE
MOISTURE REMOVAL

INSULATION -
FIRE PERFORMANCE

BS 6387,

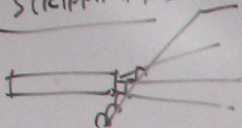
IEC 6033

SAFETY TESTING

AS 3000, CLAUSE

8.3.9 / 8.3.9

STRIPPING ROD

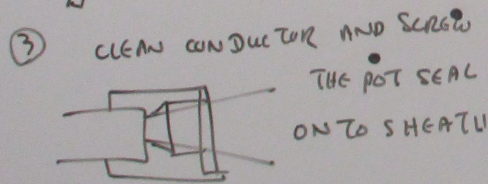
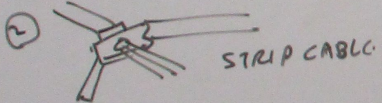
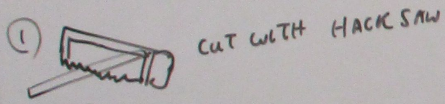


FIT THE SLOT TO A TAG OF SHEATH
LIFTED WITH SIDE CUTTERS

AT ANGLE OF 45° WIND THE ROD
WHILE TWISTING AROUND THE CABLE

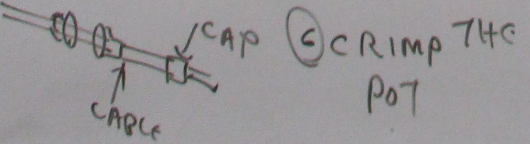
SIDE CUTTER

CUT THE CHIPS



④ TAP THE CABLE TO REMOVE
EXCESS POWDER

⑤ ASSEMBLE THE STUD CAP
AND COMPRESS THE COMPOUND



⑥ TEST CONTINUITY

SEE THE DIAGRAM PAGE 2 OF 18 SECTION 7
G106 WORK BOOK

CONDUCTOR SIZE - 7 STRANDS $1\text{mm}^2 \rightarrow 2.5\text{mm}^2$

ERS - EARTH SHEATH RETURN $\rightarrow$ COMBINE THE NEUTRAL AND
EARTHING CONDUCTOR

3.16 AS 3000

SUPPORT AND FIXING

SPACING BETWEEN FIXINGS AND SUPPORT FOR MIMS CABLE
SHOULD BE SUCH TO PROTECT THE CABLE FROM SAGGING.

TOUCHING - SEPARATE MIMS CABLE FROM TPS CABLE AND
UPVC CONDUIT AT LEAST 25mm

TERMINATIONS

USE SPECIALISED TOOL

INSULATION RESISTANCE - AT LEAST 100 MΩ

MOISTURE REMOVAL - MOISTURE MUST BE REMOVED BEFORE
THE CABLE IS SEALED AS THIS WILL
AFFECT INSULATION RESISTANCE.

INSULATION - MAGNESIUM OXIDE - MELTING POINT 2800°C
FIRE PERFORMANCE TEST COPPER - 1080°C

BS 6387, BS EN 50200, BS 6491
IEC 60331

SAFETY TESTING

AS 3000, CLAUSE 8-3.8 / 8-3.6 / 8-3.7

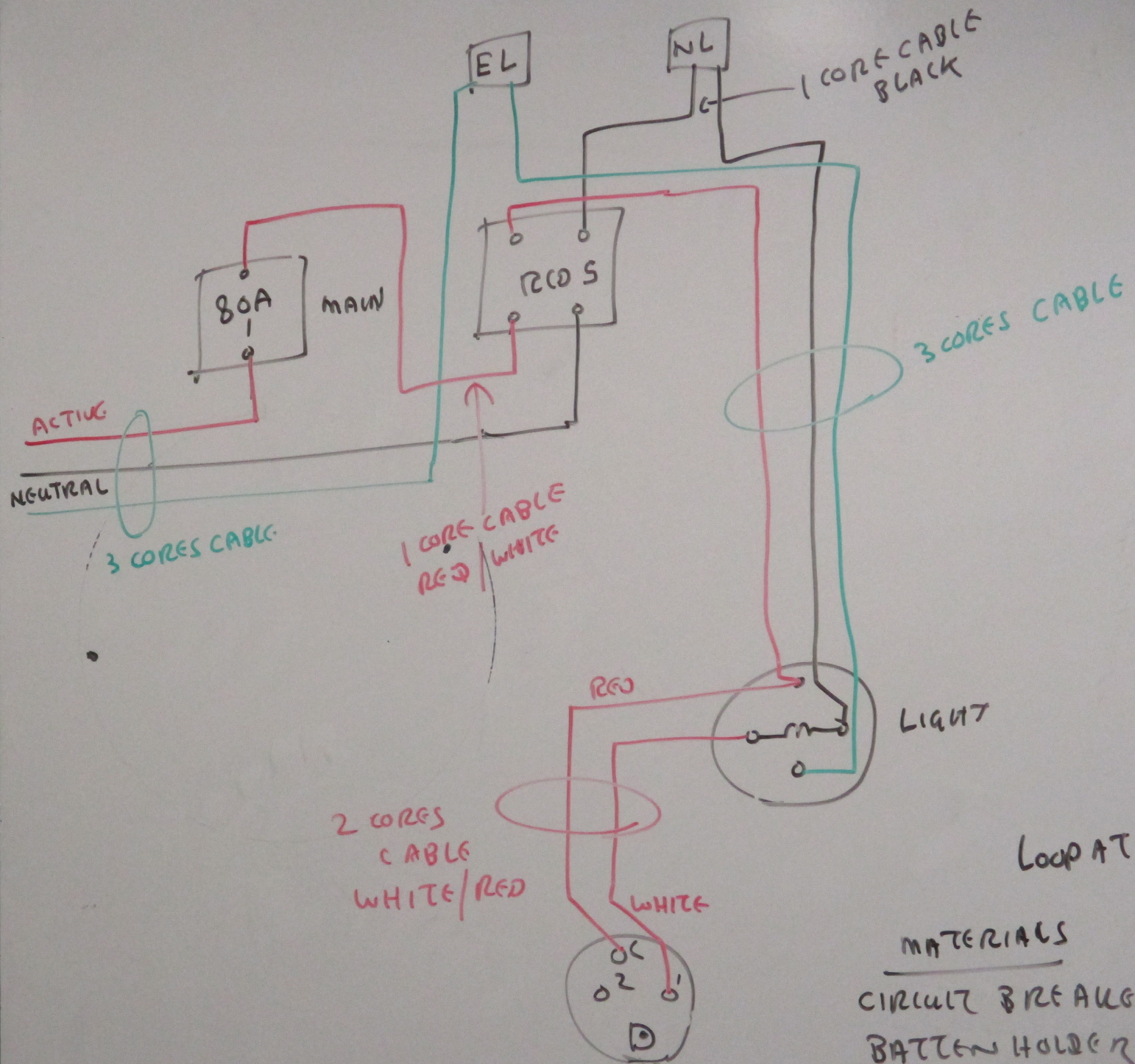
8-3.8 / 8-3.9 / 8-3.10 / 2-9.5

INERT

IT DOES NOT

PRODUCE THE

TOXIC GAS



MATERIALS
 CIRCUIT BREAKER PANEL
 BATTERY HOLDER
 CABLE SPLITTER