

WALLS, FINISHES AND APPENDAGES TOWARD COMPLETE CARCASS

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ABSTRACT: In the twenty-first century building construction has since changed from the rudimental, old traditional system of construction; to conventional method of construction, which metamorphosed to modern building construction. Today, we are talking of 'Kit' or package building which could be built like a 'pagoda'. Howbeit, the aforementioned do not need special masonry walls but none the less, walls effectiveness and efficiency could not be over-emphasize. In this context, walls, (different types) Finishes, appendages toward complete carcass has been enunciated with some calculations to depict number of blocks and other materials, equipment need for final Turnkey construction.

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In the twenty first century building construction has since changed from the old traditional system of construction, to conventional method of construction, which later metamorphosed to modern building construction that could take inform of portable structure basically built on pagoda kind of building.

Howbeit, walls effectiveness and efficiency could not be over-emphasized. Depending upon the type of building units used, masonry walls may be the following types:-

1. Stone masonry
2. Brick masonry
3. Hollow concrete blocks masonry
4. Reinforced brick masonry
5. Composite Masonry
6. Green masonry wall.

Stone masonry wall could be divided into groups for building construction. The two basic divisions are: - Random Rubble Masonry and Ashlar Masonry wall. Consequently, Random Rubble Masonry wall could be divided further as the followings:-

1. Uncoursed rubble masonry
2. Random Rubble Masonry
3. Coursed rubble masonry
4. Dry rubble masonry

As such, uncoursed rubble masonry; is the roughest and cheapest form of stone walling. Further, Random Rubble Masonry; is the form superior to uncoursed rubble masonry. The stone used here are hammered used in the work, the face type or chisel dressed. Similarly, coursed Rubble Masonry- is the form of masonry that could be used in building residential and finishing of the stones.

In addition, dry rubble masonry; is used for erecting other like mortar, consequently, ashlar rough is the type of masonry exposed faces of stone, they are part of 'cinemas'.

b. Ashlar Rock, or quarry faced. In this the type of masonry.

c. Ashlar Rock, rustic or quarry faced. Also, Ashlar facing is the type of masonry, roughed tooled and chamfered and the stones are provided in face work.

d. Ashlar chamfered; is special form of rock-faced ashlar masonry in which the strip provided around the perimeter of the exposed face is chamfered.

LIST OF DIFFERENT TYPES OF WALL FINISHES

Below are different types of wall finishes. This implies that what are kinds of internal and external decoration are expected to take place on any construction or infrastructural developments. Such, the followings are the aforementioned finishes:-

1. Cement plastered finishes / Tyrolean
2. Cement Textured Finishes
3. Plaster of Paris (POP) Finishes
4. Gypsum Plaster Finishes
5. Glass Mosaic Finishes
6. Designer Mirror Finishes
7. Murray wall Finishes
8. Laminate Finishes
9. Marble Powder Finishes

To further enunciate what have been listed above:-

Cement Plastered Finishes / Tyro-lean is prepared in the form of mortar with cement, sand and water in proper proportions and applied on masonry wall manually to achieve a smooth finishes on the rough surfaces of walls either internally or externally (plastering/Rendering). Or sand faced finish.

Similarly, Cement Textured Finishes is a decorative finishes and its mortar is prepared in cement based material. It is applied with sand faced plaster with a trowel and after that is coloured with paint.

Also, plaster of Paris finishes (POP). Simply plaster is a type of building material based on calcium sulphate hemihydrates. This is a smooth finishes achieved by plaster of Paris generally applied on internal walls.

Further, Gypsum plaster finishes; is just like plaster of Paris finishes but gypsum based material is used to prepare mortar. It is more durable and finer as compared to plaster of Paris finishes.

In addition, Glass mosaic finishes are tiles and are small 1" X 1" on a cloth to get a workable size 12"X12" and tiles are pasted with an adhesive on wall surfaces. It can also be pasted on curved surfaces.

Also, laminate finishes comes in various colours and designs. It comes in the form of sheet and is pasted with fevicol on plywood.

Another one, is the Murray wall finishes: This is wall paintings decoration or drawn and elaborated with mortar on the walls. As part of wall finishes: paints, Distempers and varnishes are generally applied to walls, wood and iron coated materials. However, the application of paints, varnishes and distempers decreases with the passage of time and hence they are to be periodically applied at the intervals of about 2 to 5 years. The under listed are Basic constituents of paints:-

1. A base
2. A vehicle or carrier
3. An inert filler or extender or ADULTERANT
4. A drier
5. A solvent or thinner

6. Colouring pigments or stainers

However, to define them a little bit further: - A Base is a solid substance of metallic oxide in fine state of division. It is principal ingredient in a paint and performs much more jobs. In addition, vehicle or carriers is a liquid substance which keeps the ingredients of a paint in liquid suspension. The vehicle is the principal liquid ingredient of a paint. Also, an inert Tiller or Extender or Adulterant. These are the cheap inert materials or pigments, used as adulterants with the base, to extend help performing as increase or decrease the weight of paint and hence to prevent too rapid setting of the ingredients.

Furthermore, Drier is a substance of accelerate the process of drying. A drier absorbs oxygen from the air and transfer it to the linseed oil; which in turn gets hardened. Similarly, a solvent or Thinner is a liquid which is mixed in a paint to make the paint thinner or of desired consistency so that it can be easily applied on the surface. Consequently, colouring pigments or stainers are desired to have a different colour than the base of paint, a colouring pigment is to be added. The pigments are available in the form of fine powders in various colours and quantities. There are different types of paints:-

Aluminum paint

Asbestos paint

Cellulose paint

Emulsion paint

Oil paint

Silicate paint

Colloidal paint

Inodorous paint

Anti-Corrosive paint

Bituminous and Tar paints

Cement paint

Enamel paint

Synthetic Rubber Paint

Graphic Paint

Luminous Paint

Howbeit, their are different types of cement that could be used for interior and exterior decoration known as plastering and rendering respectively. These are:-

1. Rapid Hardening Cement

2. Low Heat Cement
3. Sulfate Resisting Cement
4. White Cement
5. Portland Pozzolana Cement
6. Hydrophobic Cement
7. Waterproof Portland Cement
8. Colored Cement
9. Portland Entraining Cement

10. High Alumina Cement

In details, Rapid Hardening Cement is very similar to Ordinary Portland Cement (OPC). It contains higher c_3s content and finer grinding. Therefore, it gives greater strength development at an early stage than OPC. The strength of this cement at the age of 3 days is almost same as the 7 days strength of OPC – with the same water – cement ratio. Also, low Heat Cement is manufactured by increasing the proportion of c_2s and by decreasing the C_3S and C_3A content.

This cement is less reactive and its initial setting time is greater than OPC. This cement is mostly used in mass concrete construction. Similarly, Sulfate Resisting Cement is made by reducing C_3A and C_4AF content. Cement with such composition has excellent resistance to sulfate attack. It is used in the construction of foundation in soil where subsoil contains very high proportion of sulfate. Again, white cement is a type of ordinary Portland cement which is pure white in colour and has practically the same composition and same strength as OPC. To obtain the white colour the iron oxide content is considerably reduced. The raw materials used in this cement are limestone and china clay. It is mainly used interior/exterior decorative work; like external renderings of buildings, facing slabs, floorings ornamental concrete products, paths of gardens swimming pools and so on.

Furthermore, Portland Pozzolana cement is produced either by grinding together, Portland cement clinkers and pozzolana with the addition of gypsum or calcium sulphate or by intimately and uniformly blending Portland cement and fine Pozzolana. Similarly, Hydrophobic Cement is manufactured by adding water repellent chemicals to ordinary. Hence the cement in the process of grinding.

Hence, the cement stored does not spoiled even during Monsoon. This cement claimed to remain unaffected. When transported during rains also hydrophobic cement is mainly used for. Any water structure such as dams, water tanks, spillways, and water retaining structures. Further, water proof Portland cement is prepared by mixing with ordinary or rapid hardening cement, a small percentage of some metal stearates (Ca, Al) at the time of grinding. This cement is used for the construction of water retaining structures like tanks, reservoirs retaining walls, swimming pools, dams, bridges, piers.

Albeit, coloured cement is produced by adding 5-10% mineral pigments with Portland cement during the time of grinding. Due to the various colour combinations, this cement is mainly used for interior and exterior decorative works. Similarly, Portland blast furnace cement; in this case, the normal cement clinkers are mixed with up to 65% of the blast furnace slag for

the final grinding. This type of cement can be used with advantage in mass concrete work such as Dams, foundations and abutments of bridges, retaining walls, construction in sea water.

Similarly, Air Entraining cement is produced by air entraining agents; such as resins, glues, sodium salts of sulfate with ordinary Portland cement (OPC)

Additionally, High Alumina Cement (HAC) is a special cement, manufactured by mixing of bauxite (alumina ore) and lime at a certain temperature. This cement is also known as calcium Aluminum cement (CAC). The compressive strength of this cement is very high and more workable than ordinary Portland cement.

CEMENT CLASSIFICATION:-

TYPE I	General Purpose
TYPE II	Moderate Sulfate resistance
TYPE III	High early strength
TYPE IV	Low Heat of hydration (slow reacting)

FUNCTIONAL REQUIREMENTS

The main functional requirements that an external wall finishes need to satisfy are the followings:-

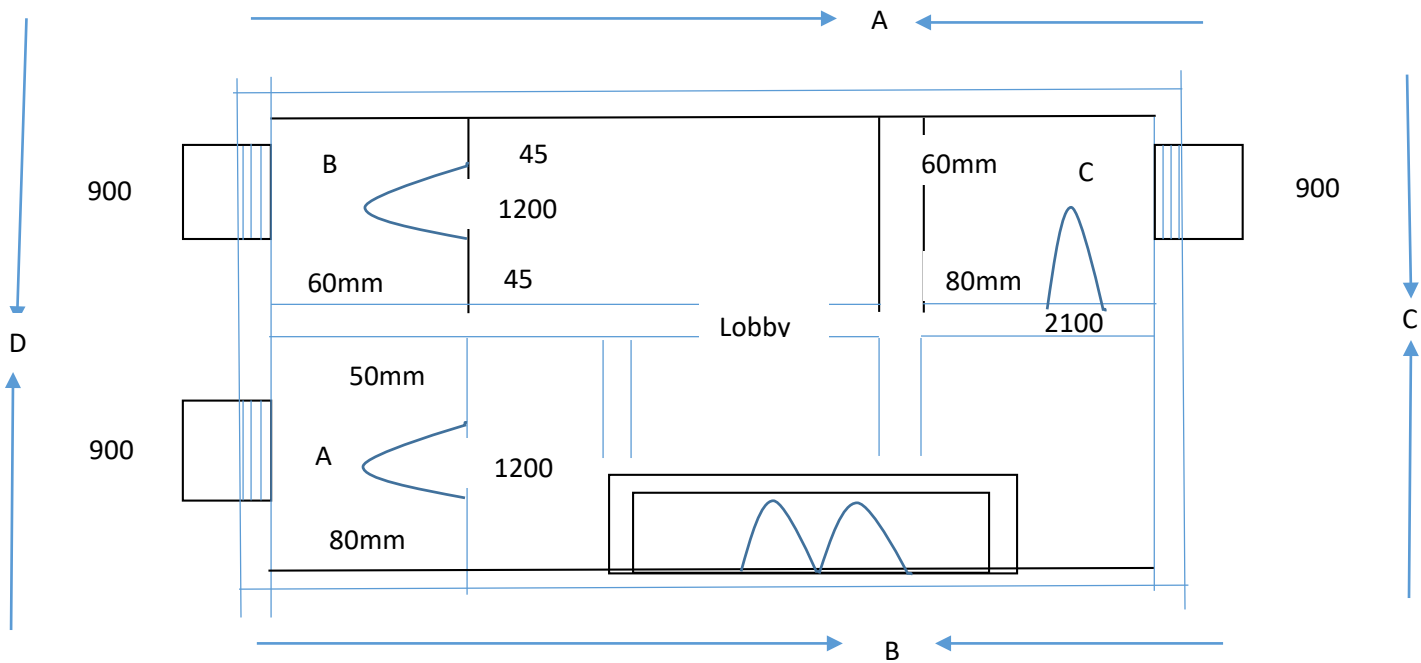
1. Weather resistance
2. Appearance
3. Durability
4. Fire resistance

THE TEXTURED OF THE SURFACE

Five different textures are normally available for rendered finishes:

1. Smooth
2. Textured
3. Rough cast
4. Pebble dash
5. Tyrolean

ESTIMATING NUMBER OF BLOCKS



CONSTRUCTION BRIEF/SKEMATIC DIAGRAM OF A THREE BEDROOM FLAT

The enclosure of a building is of walls A, B, C, D. The building has the following dimensions: wall (A) has 160mm by 118mm, while wall (B) has 125mm by 110mm; wall (C) has a dimension of 125mm by 116mm with opening in wall as window of area 113mm^2 . Also wall (D) has a total dimension of 114mm by 108mm with 2 openings in walls as windows of areas 130mm^2 and 120mm^2 .

Howbeit there are three Rooms in the house. The first room (A) has an area of 80mm by 50mm with an opening in wall as door with an area of 25mm. The second room (B) has an area of 60mm by 45mm also having an opening in wall as door with an area of 38mm^2 . The last room (C) has an area of 80mm by 60mm with an opening in wall as door with an area of 45mm^2 .

Given that a block is 390mm by 90mm by 190mm. Height of window is 2.5 times the breadth of window;

Width of Room= 60mm; Height of Room=90mm; hence,

Calculate:-

- i. Area of window
- ii. Height of window
- iii. Number of blocks

a. (i) If light in a house is 80 cubic content of the Room. Find the area.

Area of walls: A: $160\text{mm} \times 118\text{mm} = 18,880\text{mm}^2$
B: $125\text{mm} \times 110\text{mm} = 13,750\text{mm}^2$
C: $125\text{mm} \times 116\text{mm} = 14,500\text{mm}^2$
D: $114\text{mm} \times 108\text{mm} = 12,312\text{mm}^2$

Room A: $80\text{mm} \times 50\text{mm} = 4,000\text{mm}^2$

Room B: $60\text{mm} \times 45\text{mm} = 2,700\text{mm}^2$

Room C: $80\text{mm} \times 60\text{mm} = 4,800\text{mm}^2$

$70,942\text{mm}^2$

Area of Block = $390\text{mm} \times 90\text{mm} \times 190\text{mm}$

$= 6,669,000\text{mm}^3$

Deducing Area of walls left in walls:

C = $14,500 - 113$
= $14,387\text{mm}^2$

D = $12,312\text{mm}^2 - (130 + 120)\text{mm}^2$
= $12,312\text{mm}^2 - 250\text{mm}^2$
= $12,062\text{mm}^2$

Room A = $4,000 - 25\text{mm}^2$
= $3,975\text{mm}^2$

Room B = $2,700 - 38\text{mm}^2$
= $2,662\text{mm}^2$

Room C = $4,800 - 45$
= $4,755\text{mm}^2$

TOTAL OF NEW WALLS:

A: $18,800\text{mm}^2$

B: $13,750\text{mm}^2$

C: $14,387\text{mm}^2$

D: $12,062\text{mm}^2$

Room A: $3,975$

Room B: $2,662\text{mm}^2$

Room C: $4,755\text{mm}^2$

$70,391\text{mm}^2$

Given that A block is dimensioned as 390mm by 90mm by 190mm

$= 6,669,000\text{m}^3$

(i) Area of window:

If breadth of window is $1/8$ (width of Room + Height of Room)

$1/8 (60+90)$ mm

$1/8 (150)$ mm

$= 18.75\text{mm}^2$ (Breadth of window)

Hence, if Area of Window

$= (b \times h)$

$= (18.75\text{mm}^2 \times 2.5)$

$= 46.875\text{mm}^2$ (Area of window)

(ii) Height of window:

(2.5×90) mm

225mm

(iii) Number of blocks

New Area of walls divide by Area of Blocks:

$70,391 / 6,669 (000)$

10,554.9

10,554 blocks

B. (i) Formular

$$\begin{aligned} &= \text{Area of Light} \sqrt{\text{cubic content of A Room}} \\ &= \sqrt{80^3} = \sqrt{80^3} \\ &= \sqrt{512,000} \\ &= 715.54 \end{aligned}$$

= Area of Light is approximately 716 sq.m (cc)

RECOMMENDATIONS

Conclusively, this research work will be most invaluable for so many scholars, Engineers, Builders and a host of professionals.

1. It is highly recommended to follow couches and conduct when erecting structures.
2. It is highly recommended that all building professionals to stage lots of colloquium to let prospective Builders or clients to do their works to standard.
3. It is recommended also that professionals to educate their clients to build houses to specification.
4. Their must be strength of material.
5. The method of building strength of material, cost, labour, life span, the bearing capacity of the intended land to be developed.
6. Meetings of professionals or association with clients must be in corporate. Their will be input.

REFEERENCES

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