TOTAL PACKAGES OF FINISHES, DECORATION, (INTERNAL & EXTERNAL TO TURN-KEY IN CONSTRUCTION

OBADOYIN, S.J

UNIVERSITY OF ILORIN, ILORIN, NIGERIA.

ABSTRACT

The main importance of this study is to discuss the research topic that dealt with the fact to extracting facts; to inputting complete awareness to the decoding the title called TOTAL PACKAGES OF FINISHES, DECORATION (INTERNAL & EXTERNAL) TO TURN-KEY IN CONSTRUCTION. This invariably elucidates all procedures, technology used and different purposes in explaining the topic lucidly. At this point in-time: the researcher would like to point – out clearly that there are different finishes, Decoration that lead to Turn-Key in construction. Howbeit there are many types; just to mention a few: wall finishes, floor finishes, ceiling finishes, decors and paintings, fittings and fixtures, roof finishes, to turn key level in construction. The population for the studies is the main men and all female population in the studies; that are contractors, professionals in construction companies like Julius Berger Nigeria Limited. Conclusively, this research paper would be very invaluable for students, researchers, industrial concerns and generally construction concerns.

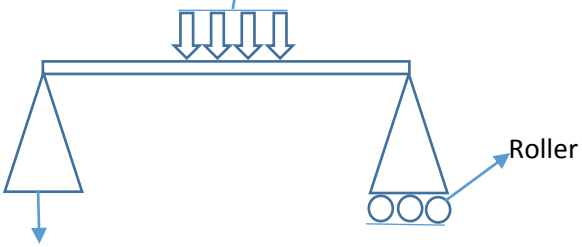
Constructions are multidimensional:

These elements could be in different shapes and sizes; ranging from Domestic Buildings, Public buildings, institutional buildings and storage buildings for the first classification. Furthermore, the second type of classification would constitute: Engineering buildings, industrial buildings, Residential buildings and Buildings for special purposes. Albeit, these types of buildings: There are other planar structures like space frame element commonly encountered in building construction. Further, the use of the term `Line Structure' to refer to the special case involving one or more line elements that lie in a straight subject to axial loading or toggle Typified examples of the aforementioned planar skeletal structures are:-

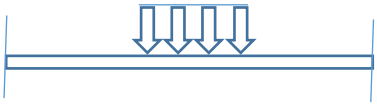
1. Beams: simply supported, fixed or continuous.
2. Plane trusses
3. Plane frames
4. Cables
5. Arches

Force acting on 1. Axial force, 2. Shear force, 3. Bending moments

or 1. Horizontal force, 2. Vertical Force, 3. Bending moments



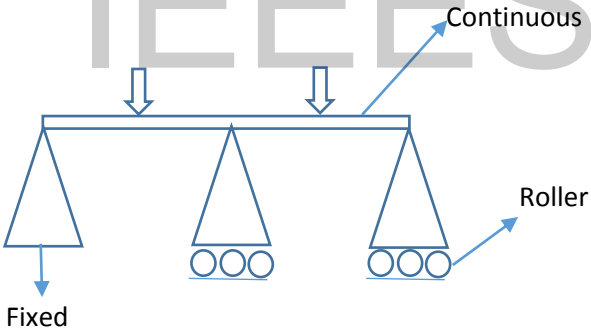
Simply supported



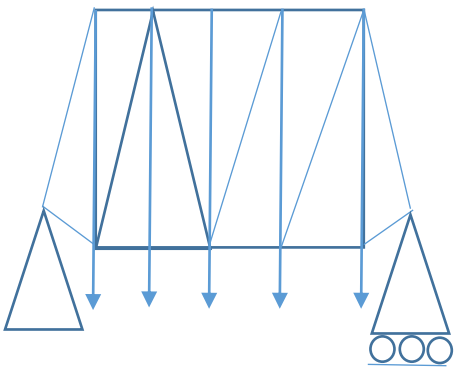
Fixed Fixed

FIXED BEAM

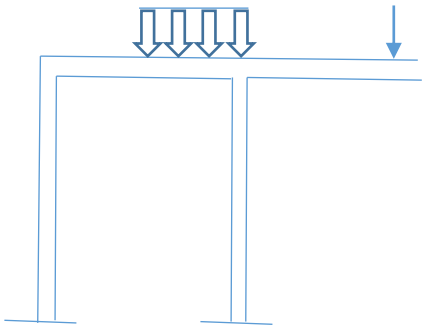
Example of simple cantilever beam



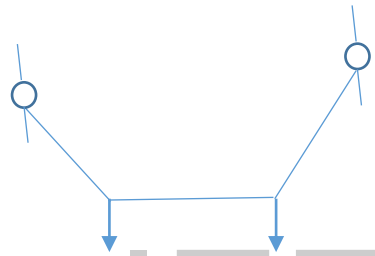
CONTINUOUS BEAM



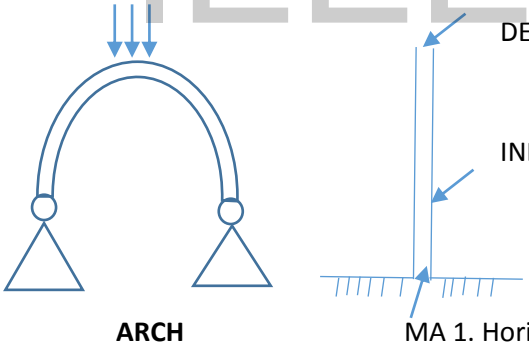
PLANE TRUSS



PLANE FRAME



CABLE



ARCH

MA 1. Horizontal (Rx^A)

2. Vertical (Ry^A)

3. Bending moments (Ry^A)

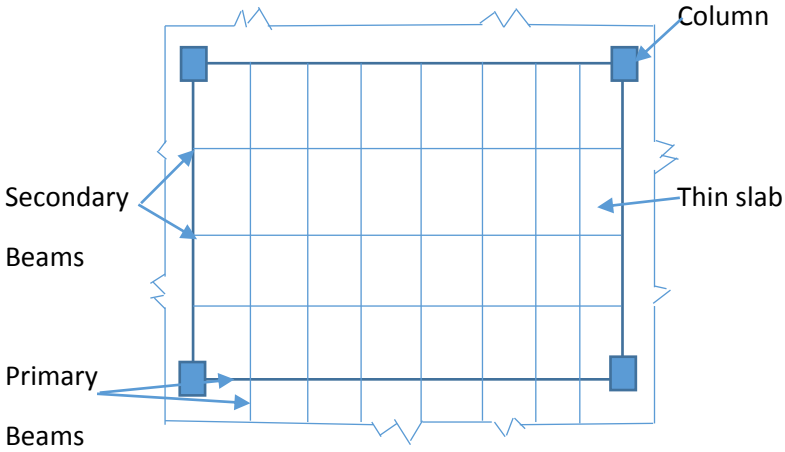
All the above are examples of typical skeletal (framed) structures.

Furthermore, typical examples of space skeletal structures are:

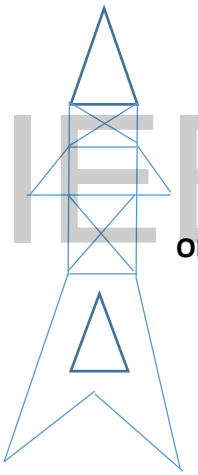
1. Grids
2. Space trusses
3. Space frames

Also, three typical bridge structural systems: a truss bridge, an arch bridge and a suspension bridge. In all cases, the gravity loading (dead load, live load, and vehicle load) acting on the bridge deck (usually made of reinforced concrete slabs) often times result to Bulb earing support. Howbeit, it is to the two (parallel) vertical framing system of `stringer' beams and floor beams. The method of load

transmission in the vertical framing system is predominantly through truss action in the first case, arch action in the second and cable action in the third case. The suspension bridge (suitable for large spans with no intermediate piers) a horizontal component of loading needs to be resisted at the foundation level through proper anchorage.



GRID FLOOR (PLAN VIEW)



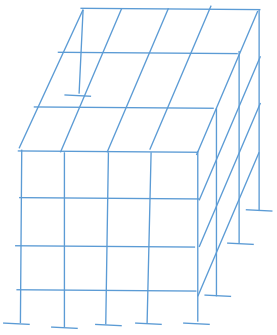
ORTHNOGRAPHIC

OR

SPATIAL

SPACE TRUSS (PIN JOINTED)

(TRANSMISSION LINE TOWER)



SPACE FRAME

(RIGID JOINTED)

All the above are space skeletal structures.

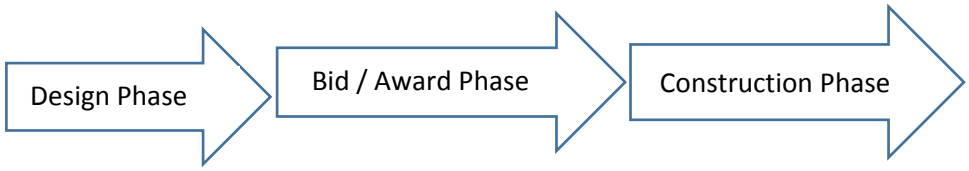
In the case of the truss bridge, the reactions from the floor beams are transmitted as concentrated loads to the bottom chord points in the truss, and thereby to the supporting piers and foundations. In the case of the arch bridge, the reactions from the stringer beams are transmitted as nearly uniformly distributed loads to the parabolic arch through the vertical suspenders (which act as tension members): the horizontal thrust in the arch is resisted by axial tension in the stiffening beam provided at the deck level, and only the vertical reactions are transmitted to the supporting piers and foundations. Such a 'tied arch' system is also referred to as a 'bowstring girder'.

In the case of the suspension bridge the reactions from the stringer beams are transmitted as nearly uniformly distributed loads.

Howbeit, construction of building continues from all aforementioned. After land acquisition, the owner begins to do some drawings and later excavation for construction.

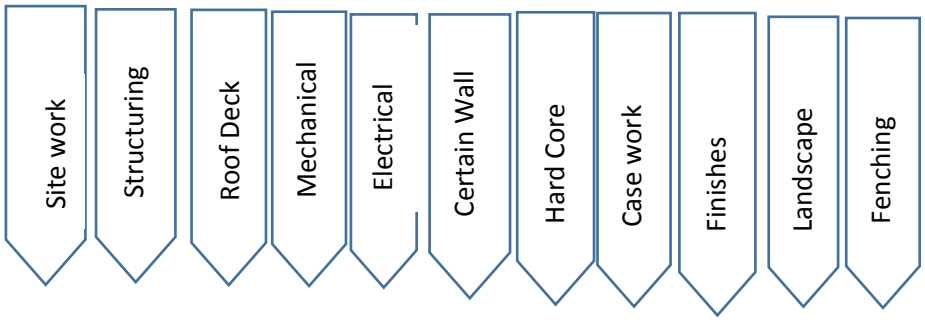
STAGES OF PROJECT IMPLEMENTATION

Construction Model (ADAPTED)



This is known as Traditional construction method (single Construction contract)

Architect, Engineers and Construction Manager lined concepts/construction brief.



Construction Phase

Variable separate construction contract

Hence, from the above description building/project construction continues to the stage of site organization and layout clearing, investigation and preparation levelling and setting out.

Similarly, the second phase of construction which is normally called ‘sub-structure’ contains the following stages:-

Excavation

Foundation

Ground floor

In addition, the third phase of construction is the ‘super structure’. This contains the following stages:

Walls

Doors and windows

Roofs

Ceilings

Staircases.

Similarly, the fourth phase of construction is the services stage. This constitutes the following stages:-

Drainage

Drainage installation

Plumbing

Electrical installation

In the same vein, the fifth phase construction is the Finishes. Hence, the followings are the main sub-headings:-

Wall finishes

Floor finishes

External works

Fenches and Fanching

Gates

Access Roads

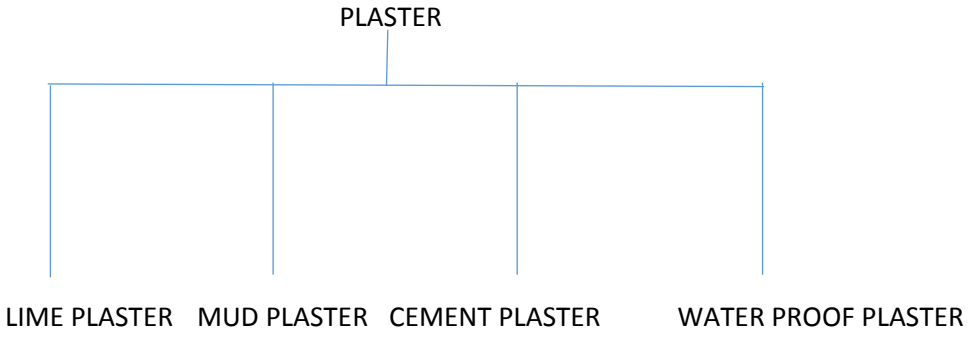
Landscaping work

Safety

Materials.

There are different types of walls finishes. Walls could load bearing and non-load bearing. This also could use these terms plastering and rendering – respectively. By plastering it means the process of covering rough walls, uneven surfaces in the construction houses and other structures with a plastic material, called plaster ore mortar. Sometimes, and all times, the term ‘Rendering’ is used instead of

plastering when the plaster or cement is applied to the external surfaces of walls either to improve the appearance or to protect them from weather agencies, such as rain, heat and so on.



Lime Plaster: is used in plastering may be fat lime or hydraulic lime. Fat lime makes best plaster as they yield good putty after slaking.

Hydraulic lime on the other hand yields harder and stronger plaster but it may contain some un-slaked particles which may slake slowly. (8 to 12 months). On absorbing moisture from atmosphere; and damage the plastering by forming blisters.

Mud plaster: - The mud plaster is prepared from equal volumes of well-tempered clay brick earth and chopped straw, hay, loose soil or hemp and cow dung. All these are thoroughly mixed for consistency.

Cement Plaster:- The cement plaster consist of one part of cement to four parts of clean, coarse and angular river sand by volume the materials are thoroughly mixed in dry condition before water is added to them.

Water Proof Plaster:- The water proof plaster is prepared by mixing one part of cement, two parts of sand and pulverized alum at the rate of 120N per m^3 of sand.

TOOLS FOR PLASTERING

1. Gauging Trowel
2. Floats
3. Floating Rule
4. Plumb bob
5. Miscellaneous tools

Gauging Trowel: This is ordinary trowel and is useful for applying plasters to moldings, corners. The ends of the steel blades of trowels are either pointed or bull-nosed.

Floats: This tools is used to spread the plaster and the surface. It is also known as the laying trowel. The float is known as the skimming float and is used for final or finishing coat of plaster.

Floating Rule: This tool is used to check the level of the plastered surface between the successive screads.

Plumb Bub: This tool is very much useful in forming screads (strips of mortar) in the same vertical place.

Miscellaneous Tools: The other additional tools like straight edges, brushes, set square, spirit levels, scratches, plumb rules and so on are used in plaster work at different stages of plastering.

DEFECTS IN PLASTERING

1. Blowing or Blistering of plaster
2. Falling out of plaster
3. Efflorescence: The soluble salts are present in plaster making materials as well as building materials such as bricks, sand, cement.
4. Cracks
5. Flaking: The formation of a very small lose mass on the plastered surface is known as the flaking and mainly due to bond failure between successive coats of plaster.
6. Peeling: The plaster from some portion of the surface comes off and a patch is formed such formation is termed as the peeling and it is also mainly due to bond failure between successive coats of plaster.
7. Popping: Sometimes the plaster mix contains particles which expand on being set. A conical hole in plastered surface is formed in front of the particle. This conical hole is known as the blow or pop.
8. Rust Stains: - Seen sometimes on plastered surface, especially when plaster is applied on metal lath.
9. Uneven surface: This defect becomes prominent only due to poor workmanship of the work.
10. Softness: The excessive dampness at certain points on the plastered surface makes that portion soft. The chief reasons for such softness are undue thinness of the finishing coat, presence of deliquescent salts, excessive suction (presence of the undercoat.

LIST OF DIFFERENT TYPES OF WALL 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

1. **Cement Plastered Finishes/Tyrolean:** It is prepared in the form of mortar with cement, sand and water in proper proportions and applied on Masonry manually to achieve a smooth finishes or sand faced finish.
2. **Cement Textured Finishes:** This is a decorative finishes and its mortar is prepared in cement based materials. It is applied with sand faced plaster with a trowel and after that is coloured with paint.

3. **Plaster of Paris Finishes (POP):** Plaster of Paris or 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.
4. **Gypsum plaster Finishes:** This 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.
5. **Glass Mosaic Finishes:** Glass Mosaic tiles are small 1" X 1" on a cloth to get a workable size 12" X 12" and these tiles are pasted with an adhesive on wall surfaces. It can also be pasted on curved surfaces.
6. **Laminate Finishes:** Laminate Finishes comes in various colours and designs. It comes in the form of sheet and is pasted with fewcol on plywood.
7. **Murray Wall Finishes:** This is a wall paintings decoration or drawn and elaborated with mortar on the walls.

ELEMENTS OF CONSTRUCTION

1. Durability: Strong (material Strength)
2. Stability: Sliding, overturning, settlement
3. Economy: Local materials not costly, easily accessible.
4. Flexibility: Structural changes or mendable.
5. Strength: Strength of materials, load bearing capacity.
6. Serviceability: Under intended must not be fractured brake, crack.
7. Aesthetics: Beautification, oceanic
8. Safety: Not easily fractured under stress, able to protect from destruction.

All the above, involve in structural analysis (materials and elements) while structural Design is plan/planning.

FLOOR FINISHES

Wooden finishes: This is the type of construction where wood or green finishes are applied for flooring. This could be used for suspended flooring. However, the following features would be seen there. The wall skirting close to the wall. Also, mud/Dung (cow) flooring or finishes is the one not prepared in commercial or professional buildings but only in residential buildings in rural areas or Fulani's residential buildings.

Furthermore, Brick floor-The floor whose topping is of brick. These are easy to construct and repair; but the surface resulting from there is not smooth and is rough, hence, easily absorbs and retain moisture which may cause dampness in the building concrete (1:4:16) is laid, compacted and cured. Over this base concrete well soaked bricks are laid in cement mortar (1:4) in any suitable bond. In case pointing is to be done, the minimum thickness of Joints should not exceed 2mm and the mortar in Joints is struck off with a trowel. When the pointing is to be done, the minimum thickness of joints is kept 6mm and the pointing may be done.

In addition, Tile flooring or finishes, whose topping is the tiles is called tile flooring or finishes. The tiles used may be of any desired quantity, colour, shape or thickness.

Tiles are manufactured by molding the prepared clay and then by drying and burning. There is the common Tiles like roofing (roof-tiles), flooring and drains (drain tiles) in building industry. Also, Encaustic Tiles, these are tiles known as coloured tiles. Friction tiles are the ones that have designs

on the surface to avoid slippery conditions. While patent Tiles are interlocking Roof Tiles. They are Rectangular in nature or plan. However, some of these earthenware could be used for internal or external decors. Terracotta are earthenware, made from superior clay(or refractory earth) by burning hollow terracotta blocks are used as substitute for stone in ornamental parts of building facing work, arches, cornices, wall copings, window sills, casing for columns, bases of pillars. Other kinds of floor finishes are flagstone floor finishes. The floors whose topping consists of stone slaps is called flagstone floor. The stone slabs used here may be more than75cm length and not less than 35cm in width and 3.8cm in thickness. Cement concrete floor finishes. The floor whose topping consists of cement concrete is called cement concrete floor or conglomerate floor. These floors consists of 2.5cm to 5cm thick concrete layer laid over 10cm thick base concrete and 10cm thick clean sand over ground whose compaction and consolidation is done. These floors are commonly used these days.

Following are the advantages of concrete floors.

1. They are hard and durable
2. Provide a smooth and non-absorbent surface
3. They are more fire resistant.
4. They provide more sanitary surface as they can be cleaned and washed.
5. They are economical as they require negligible maintenance cost.
6. They can be finished with a pleasing appearance.

Wooden floor partitions and finishes have three types

1. Single Floors
2. Double Floors
3. Framed Floors

The construction of timber floors, partitions, roofs and ceilings need some special technique of which framing and joinery works are important and interesting as well in all these floors, boards rest directly upon bridging joists. The timbers of upper storey floors are to carry a ceiling also. In ground floors where there is a space below and no ceiling beam or joists at intervals.

There must be wooden flooring normally called green building. Also to avoid moisture, there must be the application of Bituminous felt to avoid damping condition normally called Damp Proof Course (DPC). Oversight concrete to be laid as spread footing foundation or Reinforced cement concrete slab (R.C.C Slab) before putting or laying strip of wooden flooring.

TYPES OF CEMENT FLOORS

1. Non-Monolithic or bonded floor finish floor
2. Monolithic floor finishes

FLAGSTONE FLOOR FINISHES

The floor whose topping consists of stone slabs is called FLAGSTONE FLOOR. The stone slabs used here may not be of the same size but should not be more than 75cm length and not less than 3.5cm in width and 3.8cm in thickness.

STRUCTURAL SYSTEMS FOR TALL BUILDINGS

1. Frame
2. Frame–Shear wall
3. Framed Tube
4. Tube in Tube

5. Bundled Tube

CEILING

This is an interior decoration that comes immediately after the roof.

TYPES OF CEILINGS

1. **Drywall ceiling:** This is the conventional type; flat in nature; able to be decorated.
2. **Suspended ceiling:** Commonly known as dropped ceilings, these hang below, an existing flat ceiling. They are multipurpose and hide wiring plumbing and mechanical fixtures. These ceilings are commonly used in corporate/commercial buildings.
3. **Coffered ceiling:** This dramatic styled ceiling is aesthetically pleasing as it takes a commanding stance in a room. It has features sunken panels usually square shaped. It definitely adds to an interesting and stylish look.
4. **Cathedral ceiling:** Another dramatic ceiling as it can create an open feel to any room or entry being able to reach extra ordinary heights. It has an equal sloping creating a unique and dramatic feeling.

CLASSES OF CEILING

a. Plaster of Paris (POP)
b. Abestos
c. Plywood
d. Polyvinynl chloride (PVC)

DIFFERENT TYPES OF CEMENT USED IN CONSTRUCTION WORKS

1. Rapid Hardening Cement
2. Low Heat Cement
3. Sulfate Resisting Cement
4. White Cement
5. Portland Pozzolana Cement
6. Hydrophobic Cement
7. Colored Cement
8. Water proof Portland cement
9. Portland Blast Furnace cement
10. Air Entraining Cement
11. High Alumina Cement

1. **Rapid Hardening Cement:** This is very similar to Ordinary Portland Cement (OPC). It contains higher c3s content and finer grinding. Therefore, it gives greater strength development at the 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. The main advantage of using rapid hardening cement is that the formwork can be removed earlier and reused in other areas which save the cost of formwork. This cement can be used in pre-fabricated concrete construction road works etc.
2. **Low Heat Cement:** This cement is manufactured by increasing the proportion of c2s and by decreasing the c3s and c3A content. This cement is less reactive and its initial setting time is greater than OPC. This cement is mostly used in mass concrete construction.

3. **Sulfate Resisting Cement:** This is made by reducing c3A and c4AF content. Cement with such composition has excellent resistance to sulfate attack. This type of cement is used in the construction of foundation in soil where subsoil contains very high proportions of sulfate.
4. **White Cement:** This 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 day. This cement due to its white colour; is mainly used for interior and exterior decorative work; like external renderings of buildings, facing slabs, floorings, ornamental concrete products, paths of gardens, swimming pools and so on.
5. **Portland Pozzolana Cement** is produced either by grinding together Portland cement clinkers and Pozzolana with the addition of gypsum or calcium sulfate or by intimately and uniformly blending Portland cement and fine Pozzolana. It produces lower heat of hydration and has greater resistance to attack of chemical agencies than OPC. Concrete made with PPC is thus considered particularly suitable for construction in sea water, hydraulic works, and for mass concrete works.
6. **Hydrophobic Cement:** Hydrophobic Cement is manufactured by adding water repellant chemicals to ordinary Portland cement in process of grinding. Hence, the cement stored does not spoiled even during monsoon. This cement is claimed to remain unaffected when transported during rains also. Hydrophobic cement is mainly used for the construction of water structures such as dams, water tanks, spillways, water retaining structures and so on.
7. **Coloured Cement:** This cement is produced by adding 5-10% mineral pigment with Portland cement during the time of grinding. Due to the various colour combinations, this cement is mainly used for interior and decorative works.
8. **Water proof 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 and so on.
9. **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.
10. **Air Entraining Cement:** It is produced by air entraining agents such as resins, glues, sodium salts of sulfate with ordinary Portland Cement (ORC).
11. **High Alumina Cement:** 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.

TYPES OF CEMENT GRADES

The grade 43 and 53 in cement mainly corresponds to the average compressive strength attained after 28days (6724 hours) in mega Pascal's (MPa) of at least three mortar cubes (area of face 50cm squared). Composed of one part cement, 3 parts of standard sand (conforming to is650:1966) by mass and P/4 (p is the…)

CEMENT CLASSIFICATION

Type I General Purpose

Type II Moderate Sulfate Resistance

Type III High early Strength

Type IV Low heat of hydration (slow reacting)

DIFFERENT TYPES OF ROOFS

1. **Mansard Roof:** This type of roof is made up of four slopes, two on each side of the home. The lower slope is a steeper, more vertical slope than the upper slope. The upper slope may or may not be visible from the ground. This French style of roof allows for additional living space or storage space at the top of the house.
2. **Gambrel:** This type of roof is very similar to the Mansard Roof. The core differences are that the gambrel has vertical gable ends and the roof hangs over the façade of the home whereas the mandrel Roof does not.
3. **Saltbox:** This is one of my favorite roof types just because it looks so interesting from the exterior. It is an asymmetrical long pitched roof with one short side and one very long side.
4. **Pyramid Roof:** As the name suggests, there is a type of roof that is shaped like a pyramid. We see it here on two different portions of this extravagant home. This type of roof is usually used either on small portions, like this, or on small structures such as a garage or pool house.
5. **Hip Roof:** This roof is very similar to the pyramid roof. The difference is that instead of coming to a point at the top of the four sides meet at a ridge.
6. **Bonnet Roof:** This type of roof is similar to the pyramid roof or hip roof. The difference is that two of the slides slope out an angle. The most common purpose for this is to cover a varander or outdoor porch area.
7. **Flat Roof:** This type of roof is obviously easy to identify. The benefits of a flat roof include that it's easier to construct, safer.
8. **Cross Gabled Roof:** There are many types of gabled roofs (roofs that essentially look like triangles from the front of the home).
9. **Arched Roof:** The arched roof is typically only used on a portion of the home. It definitely adds a great aesthetic touch to the architecture of the house.
10. **Skillion Roof:** This type of roof is a single sloping roof surface. Is half of a triangular roof or it is a flat roof that has been inclined slightly.

TYPES OF ROOFING

1. Slate
2. Tiles
3. Abestos
4. Aluminium Zinc
5. Aluminium
6. Corrugated Poly Vinyl chloride (PVC)
7. Corrugated Zinc

TYPES OF DOORS (TIMBER AND STEEL)

As a rule, doors should open inwards from a person entering a room. The doors should be so placed as to conceal as much as possible of the room, when they are partly open. Vitruvius gives as a rule for internal doors that their height, to give the best architectural effect should be $4/7^{th}$ that of the room. The width of door opening starts from 600mm. When a door is more than 1.0m wide, it should as a rule be hung in two halves. Average size of doors in residential buildings is 1.1m X 2.1m and height of doors is given by thumb rule as: Height = Width + 1 metre. Doors are usually placed near the corner of a room or close to one end or side of a room at a distance of about 30 to 60cm from the corner. Doors receive their distinctive names according to the nature of their construction. Various types of doors that are most commonly used are:

1. Ledged door
2. Ledged and braced door
3. Ledged and framed door
4. Ledged, framed and braced door
5. Flush door
6. Panelled door
7. Panelled and glazed door
8. Panelled and venetian door
9. Wire gauged door
10. Iron monger door

PAINTS, DISTEMPERS AND VARNISHES

The paints are coatings of fluid materials and they are applied over the surfaces of timber, wall and metals. The varnishes are transparent or nearly transparent solutions of resinous materials and they are applied over the painted surfaces. The distempers are applied over the plastered surfaces. The protective power granted by 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 processes of painting varnishing and distempering will be discussed.

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 strainers.

VARIOUS TYPES OF PAINTS

1. Aluminium paint
2. Abestos paint
3. Cellulose paint
4. Emulsion paint
5. Oil paint
6. Silicate paint
7. Colloidal paint
8. Inodorous paint
9. Anti – corrosive paint
10. Bituminous and Tar paints
11. Cement paint / Tyrolean paint
12. Enamel paint
13. Synthetic Rubber Paint
14. Graphic paint
15. Luminous paint

REFERENCES

1. Authur H. Nilson, David Darwin & Charles W. Dolan (2004) : Design of Concrete Structures, 13th Edition, Singapore; ISBN 007-248305-9
2. Darwin, David, Dolan & Charles (2004); Reinforced Concrete Construction: 13th Edition, Singapore:ISBN TA683.2.N55

3. Devdas Menon, (2012); Structural Analysis: 4th Edition, Narosa Publishing House PUT. Ltd. New Delhi 110002:ISBN 978-81-7319-750-5