

BUILDING MATERIALS AND CONSTRUCTION - IV

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MODULE I - WALL FINISHES

Plaster: Lime plaster and gypsum plaster. Fire resistant plaster, X-Ray shielding plaster and acoustic plaster. Plaster over masonry and ceiling.

Paints and varnish: Characteristics of an ideal paint and varnish. Classification – various types of paints. Painting process. Defects in painting works. Process of varnish.

Wall cladding- stone cladding, tile cladding, Wooden cladding and metal cladding. Stucco finish and other finishes.

Sketches : Stone cladding, Metal cladding

Paints and varnish



Paints

- Mixture of pigments and binders
- Used for Decoration and protection



Varnish

- Resinous substance in alcohol, oil or turpentine
- Used on wood surfaces



Distemper

- Water paints
- Used on plastered surfaces

Constituents of paint

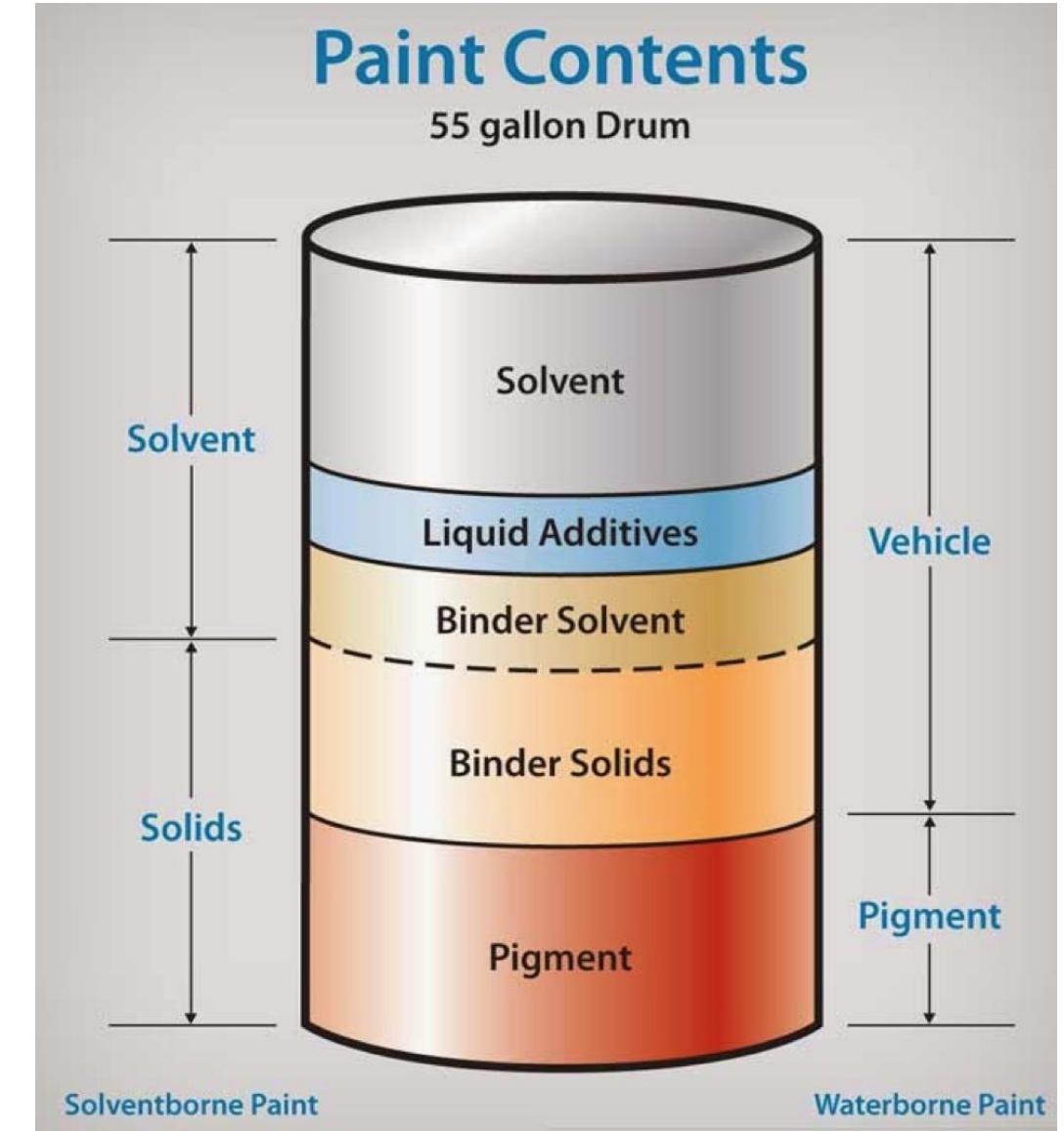
Base

Binder/
Vehicle

Drier

Colouring
Pigment

Solvent/
Thinner





Red Lead



Zinc Oxide

Base is solid substance in the form of fine powder

1. White lead
2. Red lead
3. Lead
4. Zinc white or zinc oxide
5. Iron oxide
6. Titanium white or titanium dioxide
7. lithopone



Binder is a liquid substance hat holds the ingredients together

1. Linseed oil
2. Raw linseed oil
3. Boiled linseed oil
4. Double boiled linseed oil
5. Poppy oil
6. Tung oil
7. Nut oil

Drier accelerates the process of drying

1. Liquid driers
2. Paste driers



Solvent is added to thin the paint for easy application

1. Turpentine
2. Alcohol
3. Ethyl acetate
4. Water

Colouring pigment are added to the base

- a. Black pigments : lamp black, vegetable black, graphite.
- b. Brown pigments :Raw umber, burnt umber.
- c. Blue pigments: Prussian blue, ultramarine blue.
- d. Yellow pigments: chrome yellow, yellow ochre.
- e. Red pigments: Indian red, red lead.
- f. Green pigments: Green earth, chrome green.

Characteristics of an ideal paint

1. It should stick well to the surface and should be able to seal the porous substrata.
2. Its consistency should provide easy workability .
3. The thickness of the paint film should be adequate for good protection and decoration of the surface.
4. The paint film should dry rapidly.
5. The dried paint film should be able to withstand the adverse weather effect for a long time without losig gloss.
6. It should offer resistance to failure by checking ,cracking and flaking.
7. It should posses good moisture resistance.
8. Its colour should not fade with the passage of time.

Classification of paints

Based on binder

1. Oil paints
2. Non oil paints
3. Water base paints
4. Cellulose paints
5. Miscellaneous paints

Based on use

1. General purpose paint
2. Acid resistant paint
3. Fire resistant paint
4. Fungicidal paints
5. Miscellaneous paints like anti condensation paints etc.

Types of paints

1. Aluminium paints
2. Anti-corrosive paints
3. Asbestos paints
4. Bituminous paints
5. Bronze paints
6. Cellulose paints
7. Casein paints
8. Cement based paints
9. Enamel paints
10. Oil paints
11. Rubber base paints
12. Emulsion paints
13. Inodorous paint
14. Plastic paints

1. Aluminum paints



- Aluminum in quick drying spirit or slow drying oil varnish
- Painting of wood work or metal surfaces
- Corrosion resistant, water proof, electrical resistant, visible in dark, high covering capacity, better appearance.

2. Anti-corrosive paints



- Protect metal structures against moisture, fume, acid, corrosion.
- Oil (linseed oil) and drier-color pigment is mixed with sand and added to paint.
- Its cheap and lasts longer

3. Asbestos paints



- Painting surfaces exposed to acid gases and steam, patch work and in roofing leaks
- Contain fibrous asbestos

4. Bituminous paints



5. Bronze paints



6. Cellulose paints



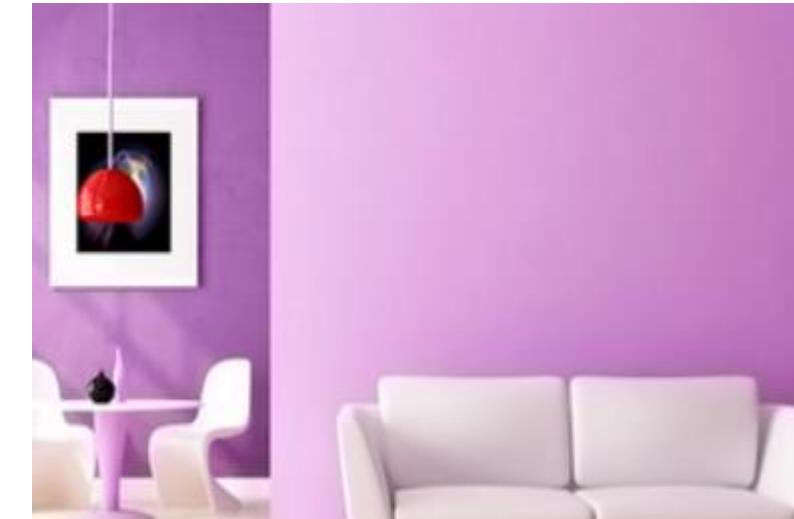
8. Cement based paints



9. Enamel paints



10. Oil paints



11. Rubber base paints



12. Emulsion paints



13. Inodorous paint



14. Plastic paints



Painting process

Painting on new wood

01. Preparation of surface



- Well seasoning of wood- 15% moisture
- Remove dust, foreign material
- Remove greasy spots
- Nails 3 mm deep

02. Knotting



- Killing knot- no resin coming out
- Ordinary knotting- 2 coats applied(glue, water ,red lead)
After 10 min (read lead, turpentine, linseed oil)
- Patent- coat of hot lime (24hrs)-scrapping- ordinary knotting

03. Priming



04. Stopping



- Rubbing with abrasive paper
- Fill pores
- 3 kg red lead + 3kg white lead + 3 ltr. linseed oil / turpentine

05. Surface coats or under coatings



- First prime coat applied
- Then under coating is applied

06. Finishing coat



- Rubbing with pumice stone or glass paper – filling putty- Rubbing with pumice stone or glass paper

- Final coating of paint
- Same as under coating paint

Repainting old work

- Paint removal or solvent
- 1 kg caustic soda + 5 ltr. Water- paint dissolves
- 1 part soap + 2 part potash + 1 part quick lime. After 24 hrs wash with hot water
- Surface is cleaned and Rubbed with a pumice stone
- Applying of 2-3 coats



Painting new iron and steel

- Done to prevent rusting
- Scrapping / brushing with steel wire brush
- Oil, grease removed with petrol, benzene , lime water
- Surface is treated with phosphoric acid
- Prime coat- 3kg red lead + 1ltr. Linseed oil
- 2 under coats- 3kg red oxide + 5 ltr. Linseed oil
- Final coating is applied

Repainting old iron and steel

- Oil, grease removed with petrol, benzene , lime water
- The old paint is removed by flame cleaning
- Scrapping / brushing with steel wire brush- caustic soda and lime
- Painting is done as for new surface

Painting plastered surface

- Only after 3-6 mts of plastering
- Cement plaster is alkaline in nature and liberates lime – hence alkaline resistant primer is applied
- Defects should be removed and prepared to receive paint
- If spots of efflorescence is present – brushed off and washed until it goes away
- Painting of surface is done



Painting defects



BLISTRING



BLOOM



CRAWLING / SAGGING



FADING



FLAKING



FLASHING



GRINNING



RUNNING



SAPONIFICATION

Varnish

Varnish' is a solution of resins or resinous substances prepared either in alcohol, oil or turpentine



Characteristics of an ideal varnish

- Dry quickly
- The film should be hard, tough, durable and resistant to water
- Exhibit glossy surface
- Not show cracks(elasticity)
- Colour should not fade away with time

Constituents of varnish

1. Resins or Resinous Substances:

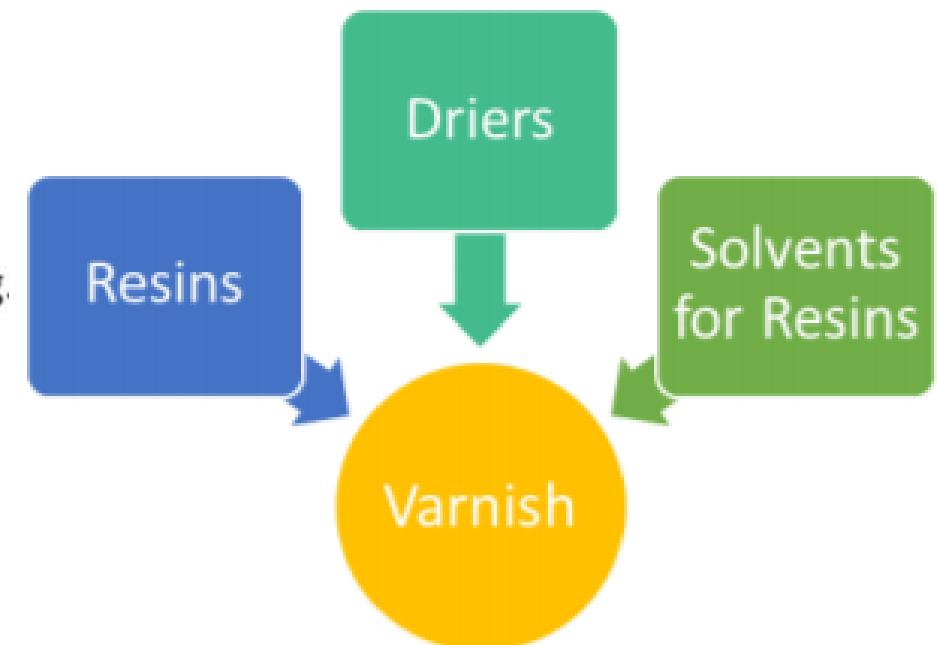
- The commonly used resins are copal, lac or shellac and rosin.
- The rosin is obtained from pine trees
- Other resins are Amber, mastic, gumdammer etc

2. Drier:

- The function of a drier in varnish is to accelerate the process of drying. exp- litharge, white copper, lead sulphate

3. Solvent for Resins

Solvent	Resin
1. Boiled linseed oil	Amber, Copal
2. Methylated spirit of wine	Lac or shellac
3. Turpentine	Mastic, Gum Dammar, rosin
4. Wood naphtha	Cheap variety of resins



Types of varnish based on solvent

1. Oil varnish
2. Spirit varnish
3. Turpentine varnish
4. Water varnish

Process of varnishing

1. Preparation of surface
2. Knotting
3. Stopping
4. Coat of varnish



Plastering

Process of covering rough surfaces of walls, columns, ceilings and other building components with thin coat of plastic mortars to form a smooth durable surface

Requirements of a good plaster

- Hard and durable.
- It should be possible to apply during all weather conditions.
- It should adhere to the background and should remain.
- It should be cheap and economical.
- It should offer good insulation against sound and high resistance against fire.



Objects of plastering

- Protect external surfaces against rain water and other atmospheric agencies
- Give smooth surface
- Protect surfaces against vermit
- Conceal defective workmanship

Types of mortar

LIME MORTAR

- Either fat lime or hydraulic lime
- Mix proportion(lime: sand)- 1:3 to 1:4 for fat lime - 1:2 for hydraulic lime • Addition of “gugal” can improve the binding properties of lime mortar



CEMENT MORTAR

- Being non-absorbant, it is best for external plastering work
- Preferred in damp rooms and damp climates Stronger and has sufficient plasticity
- Mix proportion (cement: sand)- 1:4 to 1:6



LIME-CEMENT MORTAR

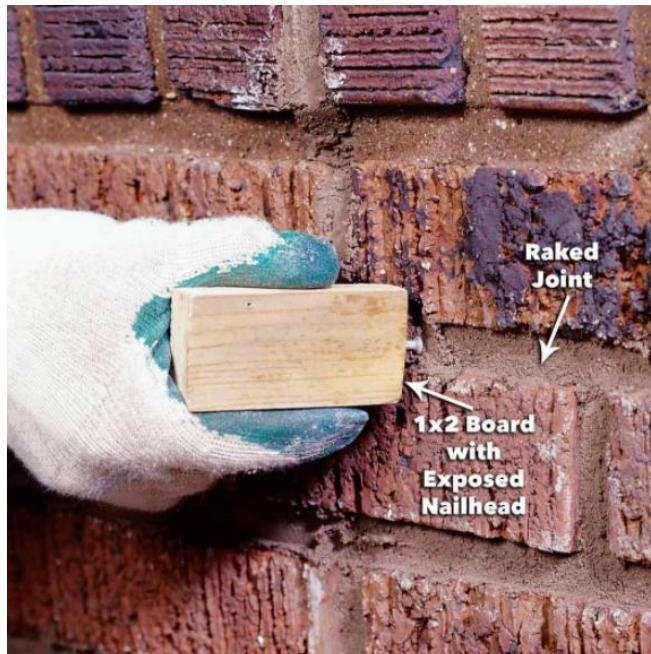
- Contains properties of lime mortar &cement mortar
- Addition of lime imparts plasticity
- Mix proportions (cement: lime: sand)- 1:1:6, 1:1:8 or 1:2:8



Process of plastering

Preparation of background

1. Masonry joints should be raked
 - 10 mm in brick masonry
 - 15 mm in stone masonry
1. Mortar droppings and dust should be removed with wire brush
2. Unevenness is levelled before applying mortar(3 coat- proj- 10mm & depr.- 20mm, 2 coat- proj- 5mm & depr.-10 mm)
3. Surface should be washed with clean water uniformly to produce optimum suction



Types of plasters

1. LIME PLASTER

Three-coat plaster

Application of rendering/first coat:

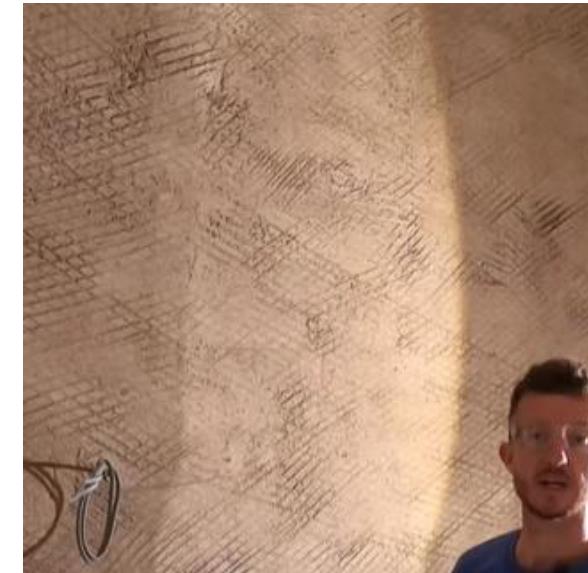
- Mortar is forcibly applied with mason's trowel and pressed well into joints and over the surface (Thickness-12mm)
- Surface is allowed to slightly harden and then scratched criss-cross; left to set for 7 days (curing and drying)

Application of floating/second coat:

- Rendering coat is cleaned off all dirt and loose material
- Lightly wetted; Patches (15cm X 15cm or strips 10cm wide);
- Mortar is then thrown with mason's trowel
- In case of lime-surkhi plaster, Surface is allowed to slightly harden and then scratched criss- cross; left to set for 10 days (curing and drying)

Application of finishing coat:

- lime-sand mortar, finishing coat is applied immediately after floating coat; (4:1)
- left for 1 day and then curing is done for atleast 7 days
- lime-surkhi mortar, finishing coat is applied after 7 days of floating coat, after cleaning the surface; Finishing coat is rubbed hard and finished smooth



Two-coat plaster

Rendering coat -combination of rendering and floating coats done under one continuous operation (except scratching of coats) Finishing coat is applied in a similar manner to that of three-coat plaster



2. GYPSUM PLASTER (plaster of Paris)

- Heating gypsum to about 300 °F (150 °C).
- The setting of unmodified plaster starts about 10 minutes - 45 minutes , fully set for 72 hours.
- Used for ornamental work, repairing holes and cracks
- Properties- fire-resisting, light in weight, sound-insulating, good adhesion to fibrous materials



3. ACOUSTIC PLASTER

- Applied as final coat- Contains gypsum mixtures
- Undergoes chemical reaction resulting in production of gas bubbles and tiny opening in coat - honey-combed openings
- Useful in interior walls of halls, auditoriums etc.
- Applied in two coats - 6mm THICK.



4. BARIUM PLASTER

- Made from barium sulphate- as a final coat of walls of X-ray rooms.
- Cement + Sand + Barium Sulphate
- Walls can be covered with lead to give any desired protection, provided lead has sufficient thickness and is properly laid.
- Barium plaster has been advocated as an X-ray protective wall material.



5. Fire / Heat resistant plaster

- Replace conventional gypsum-SIRA BITE
- Got by slackening plaster of paris with petroleum
- Heat resistant plaster should be used in cases where the wall is likely to exceed temperatures of 50°C .
- Used- coating walls and chimney breasts.

Wall cladding

CLADDING is the application of one material over another to provide skin or layer intended to control the infiltration of weather elements, or for aesthetic purposes.

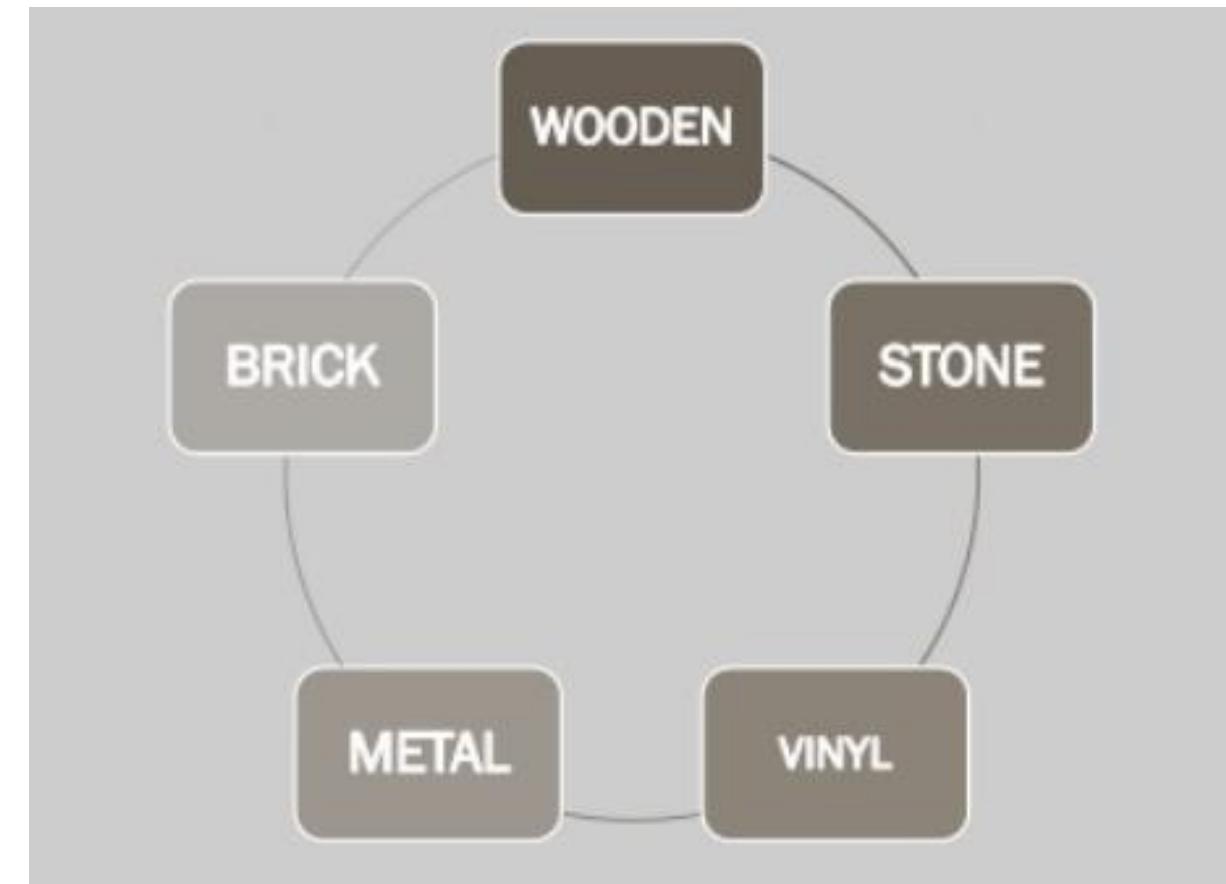
PURPOSE

- To alter the appearance of the property
- To provide additional weatherproofing & ventilation
- To match new parts of the building to old
- For interior design and acoustic purpose
- To disguise external wall insulation

ADVANTAGES OF CLADDING

- Low maintenance
- Durability & long-lasting
- Safety & protection
- Reduces water absorption
- Resistance to sunlight, air, sound & chemical pollution
- Aesthetic value

Types of cladding



DISADVANTAGES

- Cost
- Time
- Repair

Methods of cladding

Direct Adhered – This is one of the most common methods. It is thinner, less expensive and doesn't require any onsite drilling

Spot Bonding – similar to the direct adhered but epoxy is only applied to about 10% of the area resulting in gaps or pockets of air between the stone and the wall reduces the chances of water staining.

Mechanical Bonding - This method involves fixed or embedded anchors or ties being used to attach the stone to the surface

Aluminium/steel Backing – Aluminium panels are shaped to fit the project perfectly, and to interlock with each other, before being mounted to the surface using runner clips. (ext. cladding)

Stone cladding

Stone cladding brings a feel of **natural style and elegance**. It uses thin layers of **natural or simulated stone**. It is manufactured by **quarrying natural stone and milling** it into thin pieces. Range of **different sizes, thicknesses, shapes and patterns**.



Granite

Travertine

Marble

Slate

Limestone



Advantages of natural stone cladding

- Durability and long lifespan
- High level of insulation
- Weather and fire resistant
- Scratch and abrasion resistant
- Easy to maintain
- Aesthetics

Disadvantages of natural stone cladding

- Labour intensive
- Time-consuming installation
- Expensive
- Sealed for protection
- Can trap moisture in poor installation

Factors to consider before installation

1. The physical properties of the stone
2. Design loads
3. Expected wind loads
4. Effects of thermal expansion or contraction, seismic movement, wind sway, creep and shrinkage
5. The size, height and location of the project

Types of installation

Wet
installation

Dry
installation

Wet installation

Advantages

1. Cheaper
2. Eliminates cracks due to drilling.
3. Bonds perfectly from edge to edge leaving no space
4. Less waste.

Disadvantages

1. Buckling of natural stone
2. Stone can fall off
3. May change in colour
4. Time consuming procedure

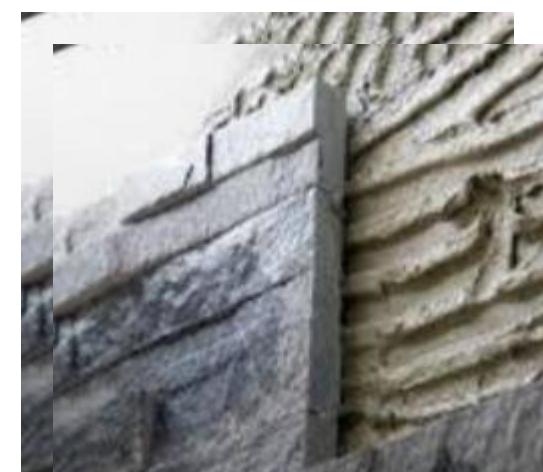
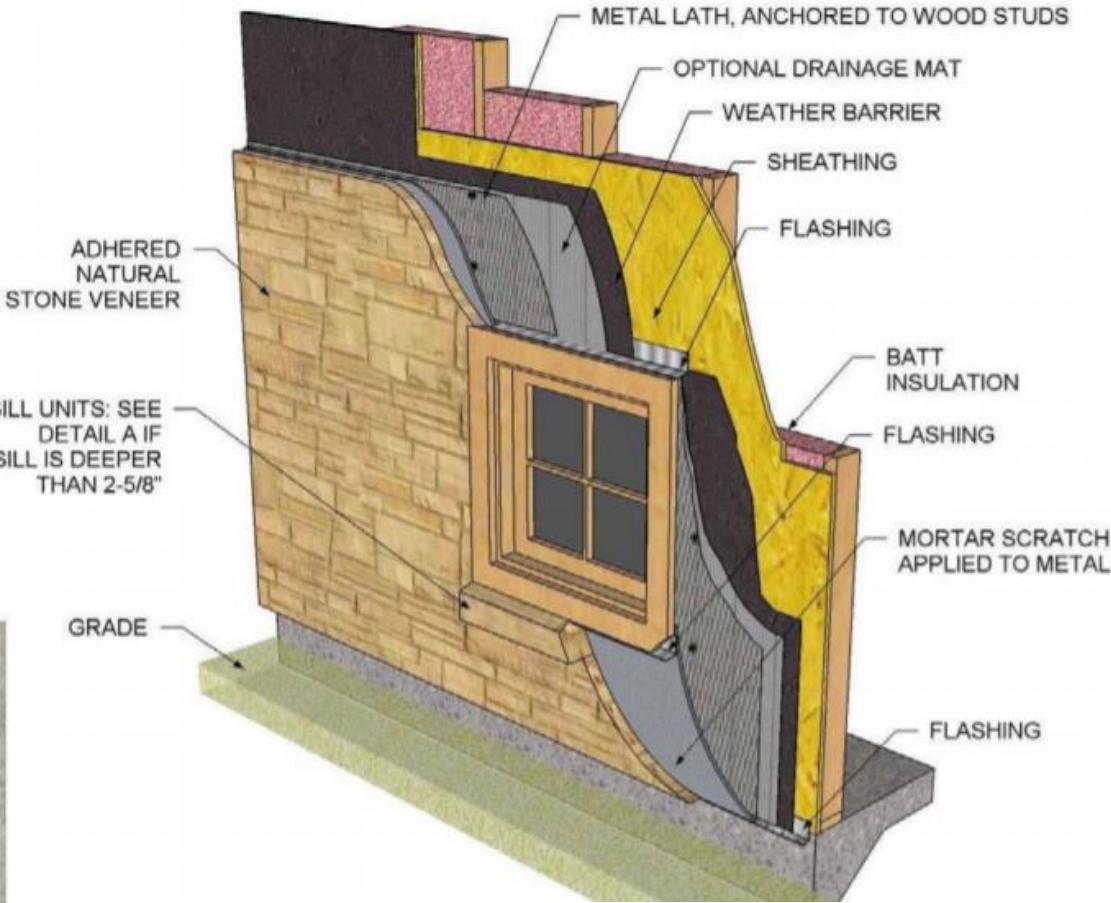
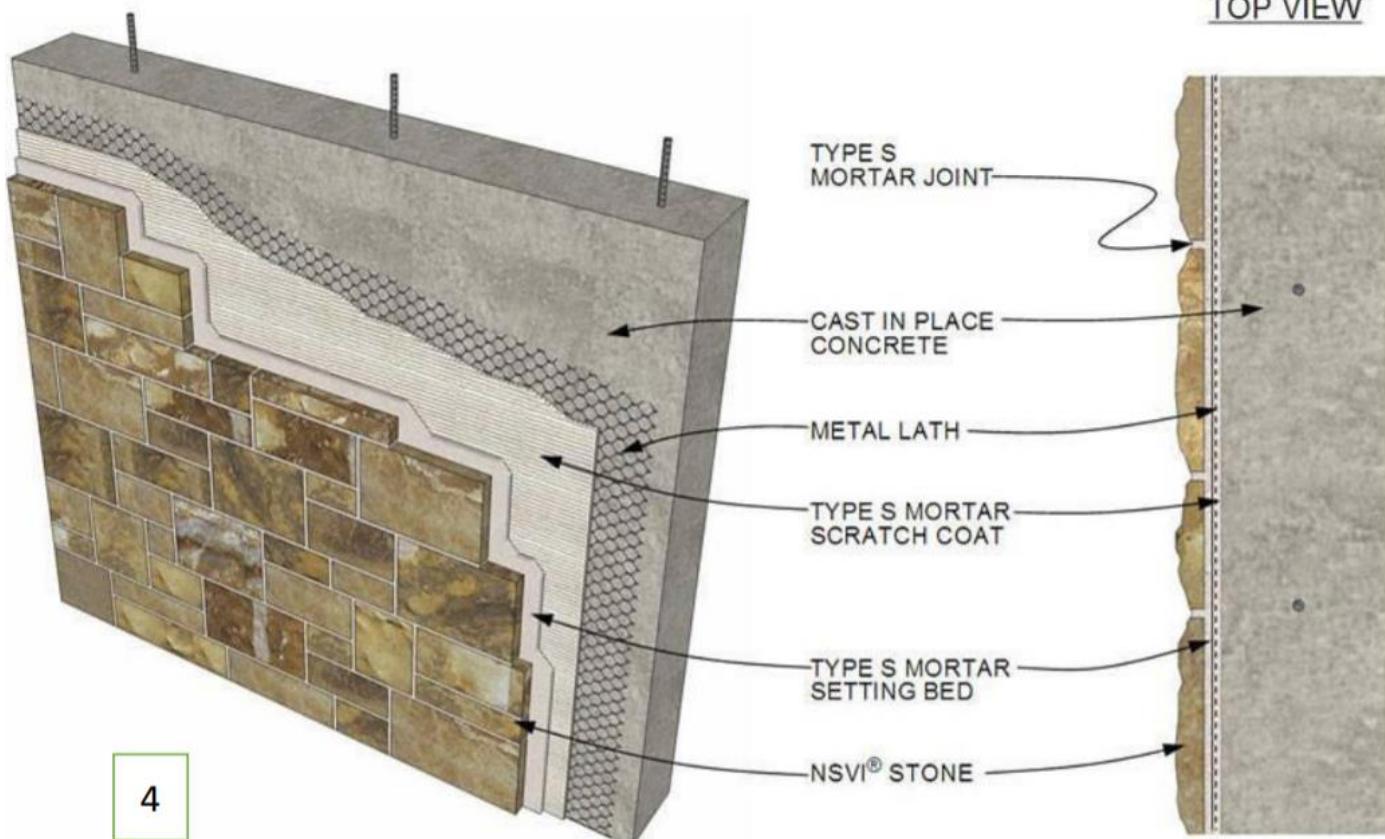
Methods of Wet Stone Cladding

Direct-
Adhered

Spot bonding

Direct-adhered method

- Uses a liquid latex, combined with a cement-based filler powder (thin bed mortar).
- Applied to a clean, substrate and underside of the stone.
- This includes dirt, dust, curing compounds, oils and sealers -- removed by mechanical scarification.



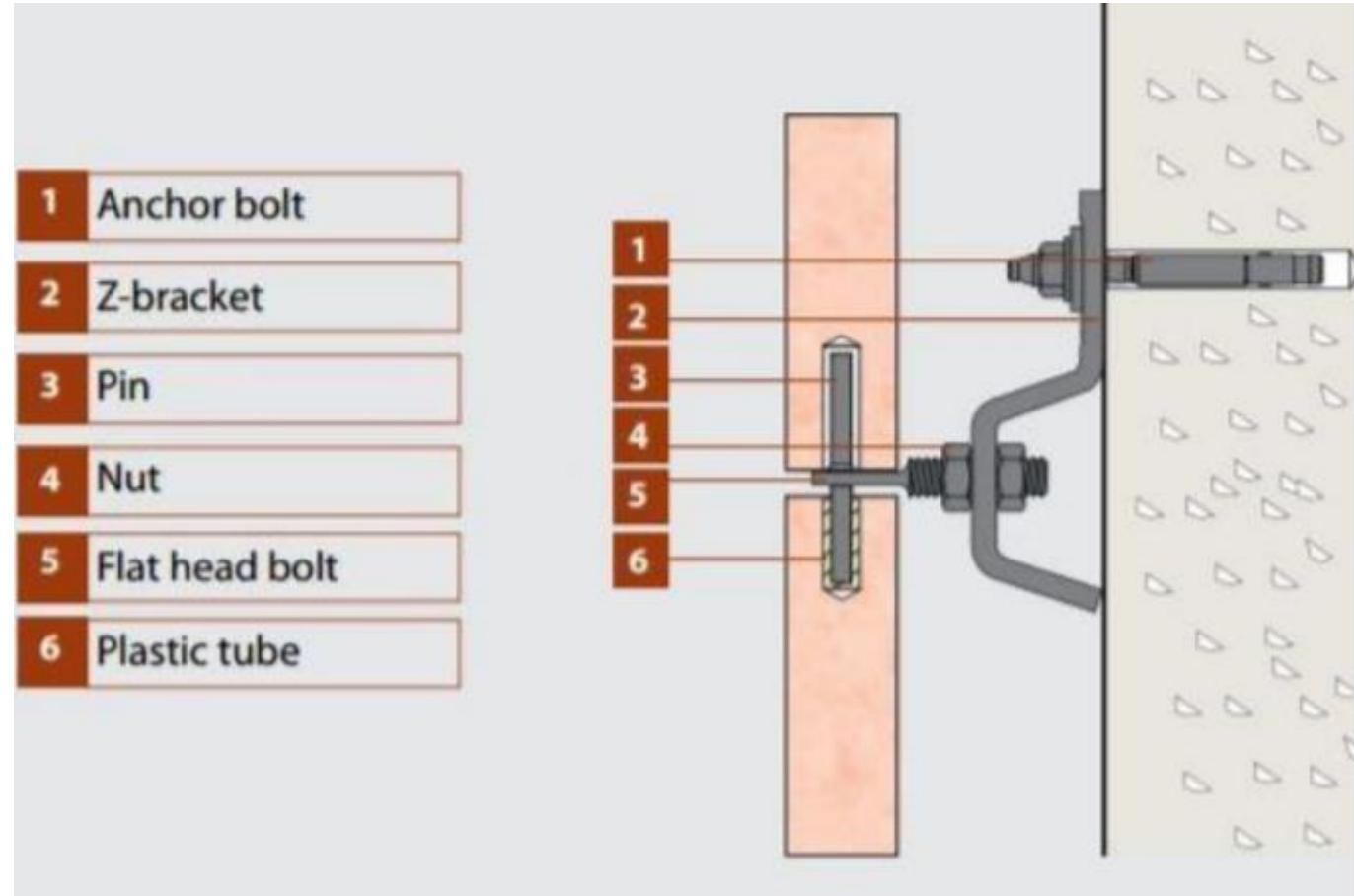
Spot bonding" or "dab" method

- The epoxy adhesive is used on approximately 10% of the surface area, thus providing a ventilation gap between the stone and the substrate.
- These specialized epoxies are strong and yet flexible enough to handle building movement and stress.
- It reduces the potential for water staining and efflorescence.
- For certain applications, this system has been used in conjunction with mechanical anchors to provide a "belts and braces" approach to successful wall cladding.



Dry installation

- Dry installation method also known as mechanical installation
- It uses embedded metal anchors and ties for the connection purpose.
- The stone required for this method must be thick because the method requires drilling which could increase the occurrence of cracks.

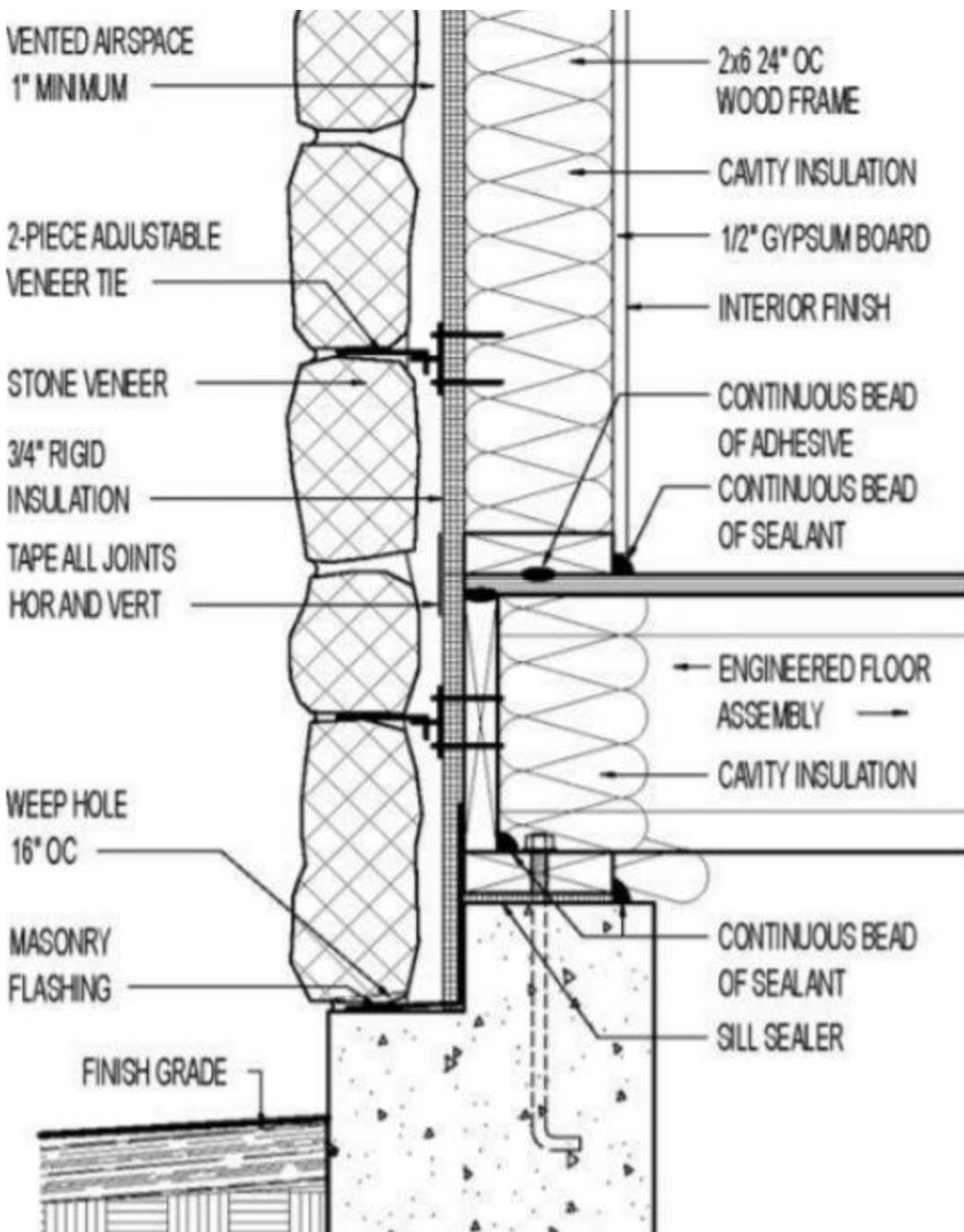
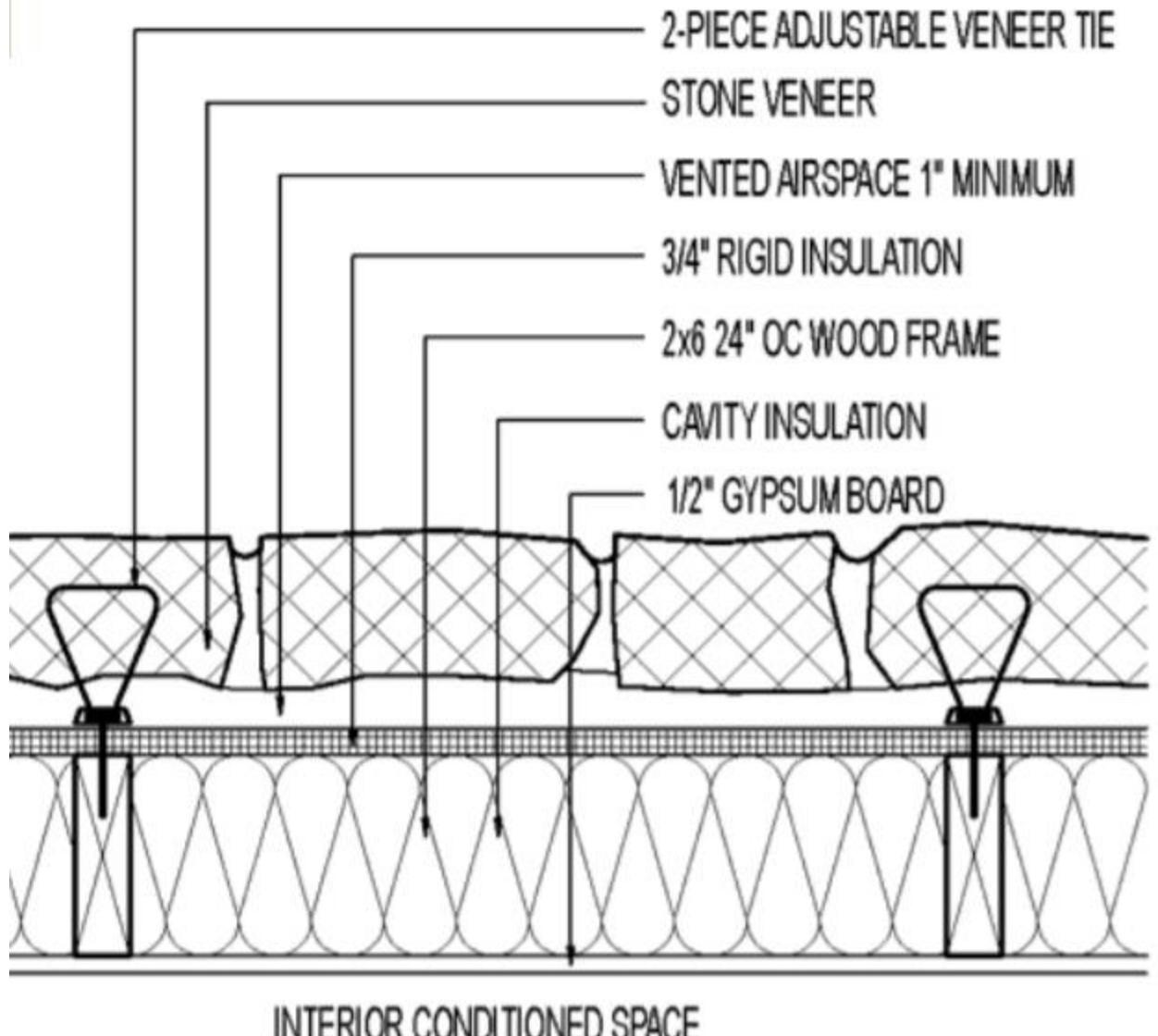


Advantages

- Prevents stone from falling off
- Allow for expansion and contraction
- 30 to 45 mm- layer of air cushion that acts as a thermal barrier.
- Time saving procedure

Disadvantages

- Requires perfection and alertness
- expensive method
- chances for the occurrence of cracks



Types of fixing systems

Load-bearing fixing

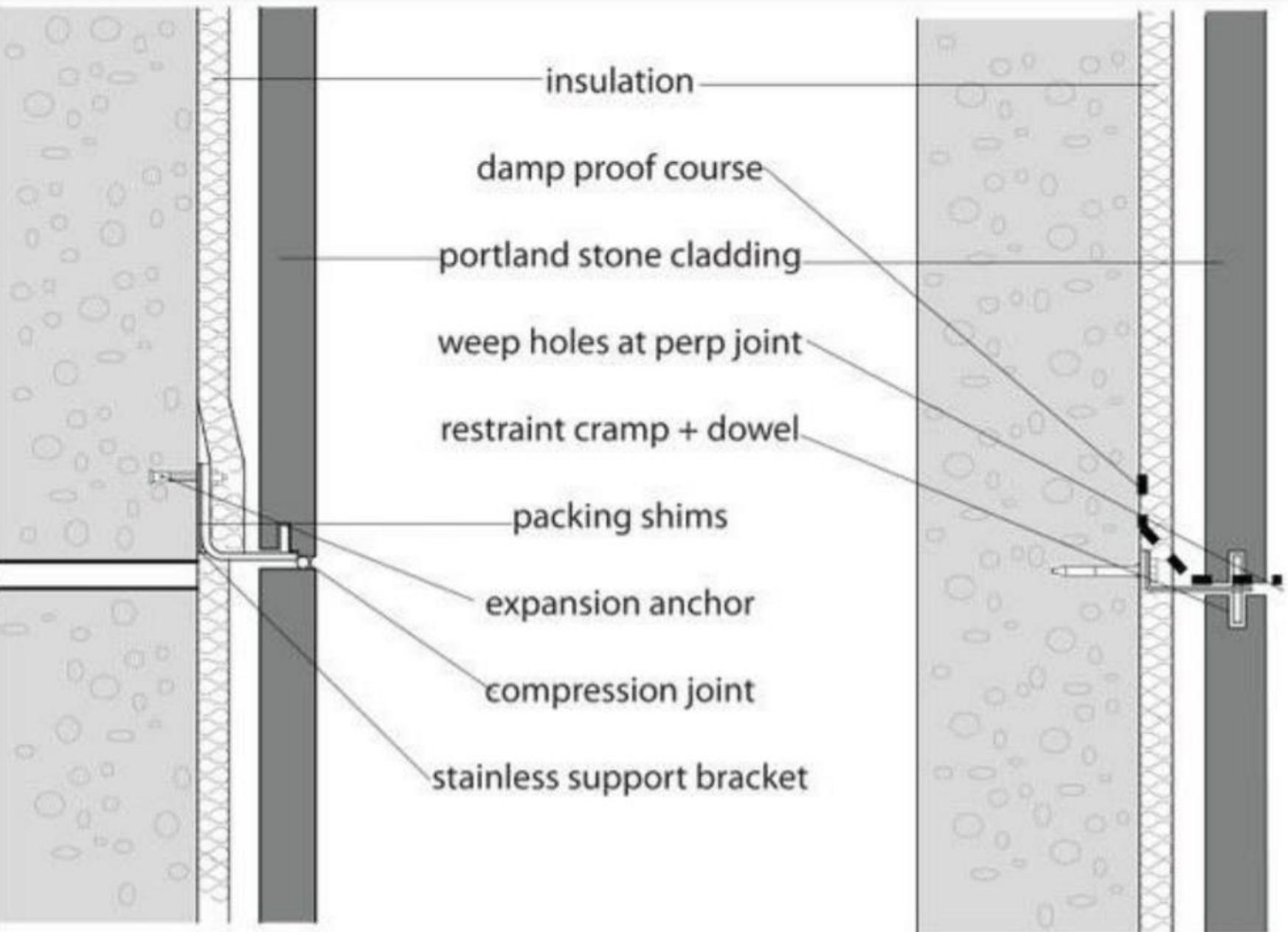
Restraining fixing

Supports the permanent load
the vertical components of the
variable loads

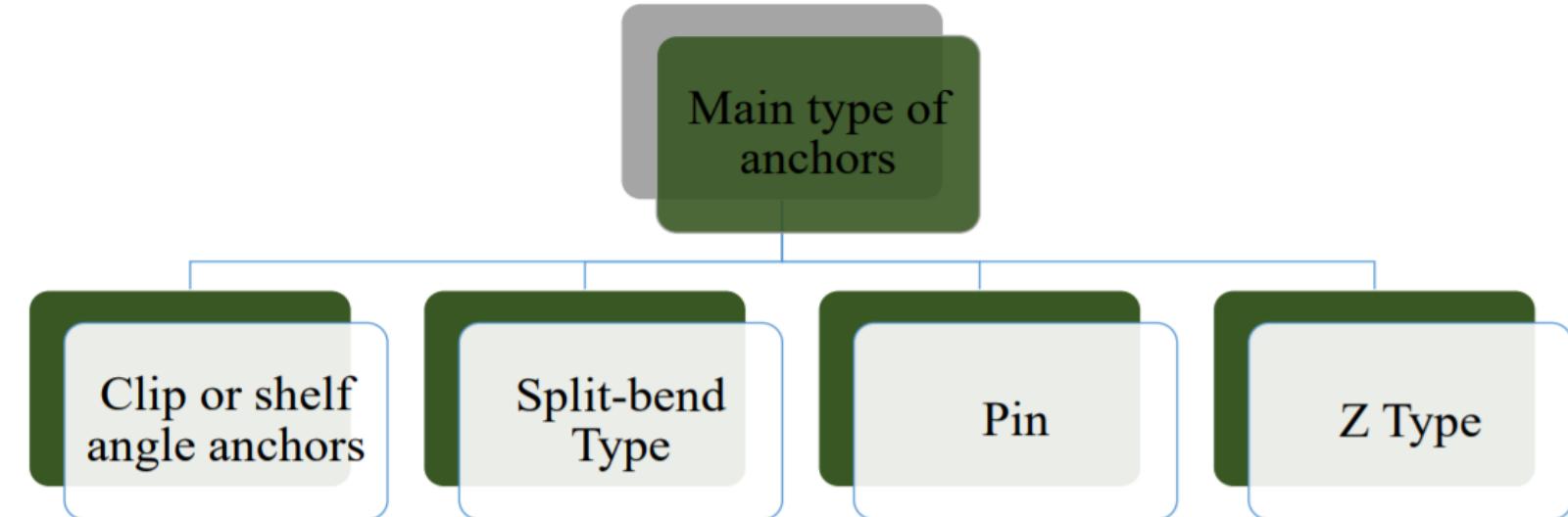
Supports the horizontal
components of the loads.

LOADBEARING FIXING

RESTRAINT FIXING



An **anchor** is a metal shape inserted into a slot or hole in the stone that provides for a transfer of load from the stone to the building structure. They resist both lateral and gravity loads.



Clip or shelf angle anchors

- Supports the stone's dead load via short, thick L-shaped metal clips.
- The vertical leg is anchored into the building frame, and the horizontal leg supports the stone cladding.

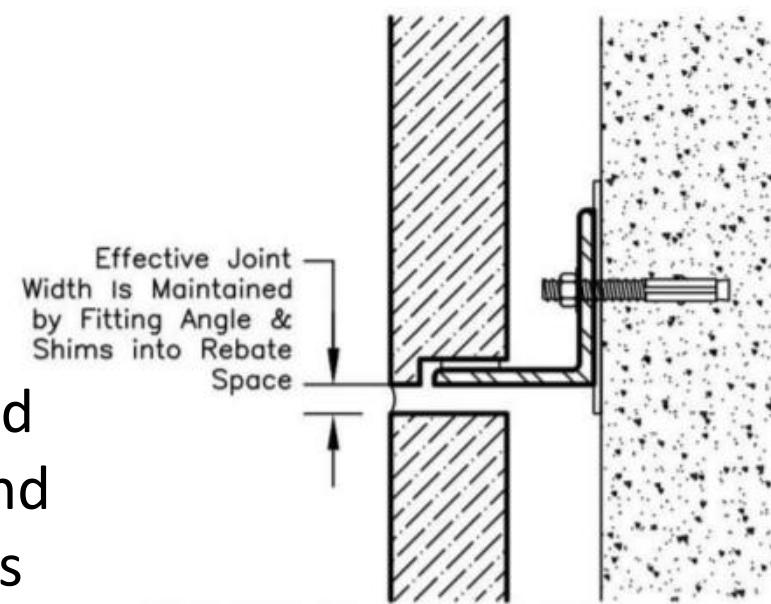
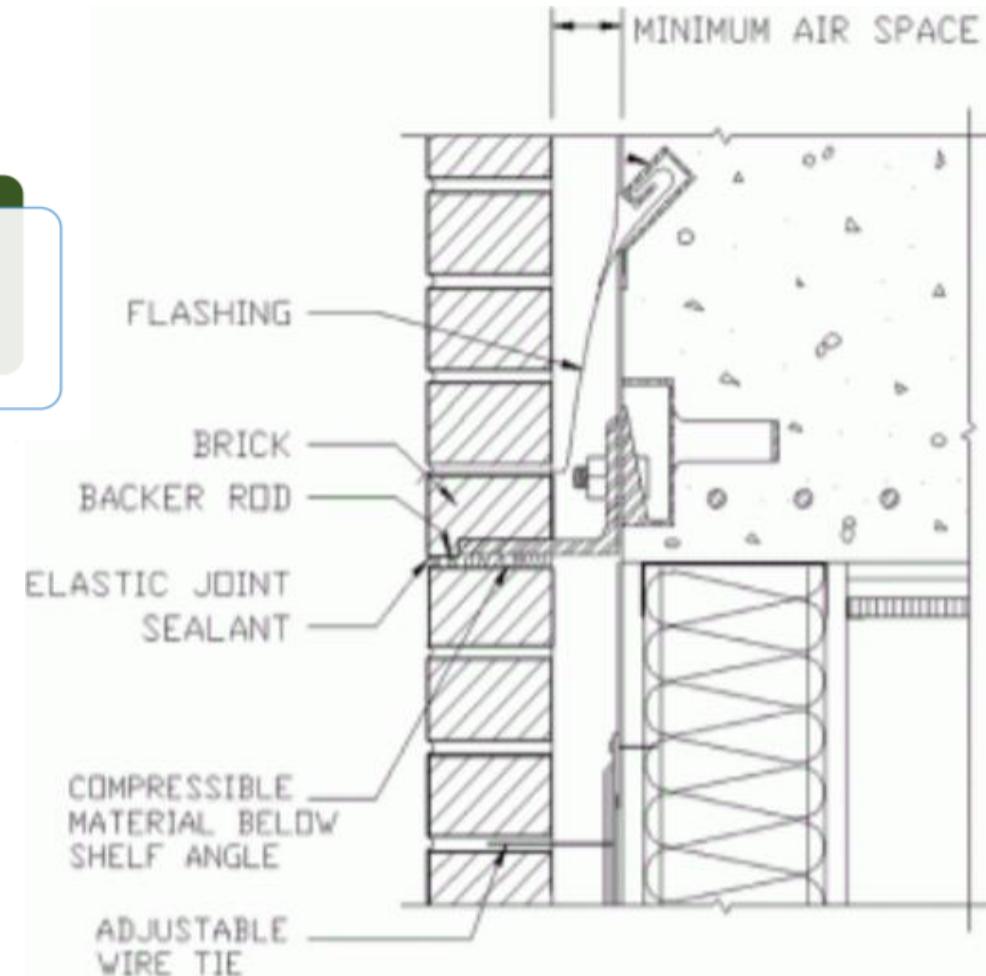
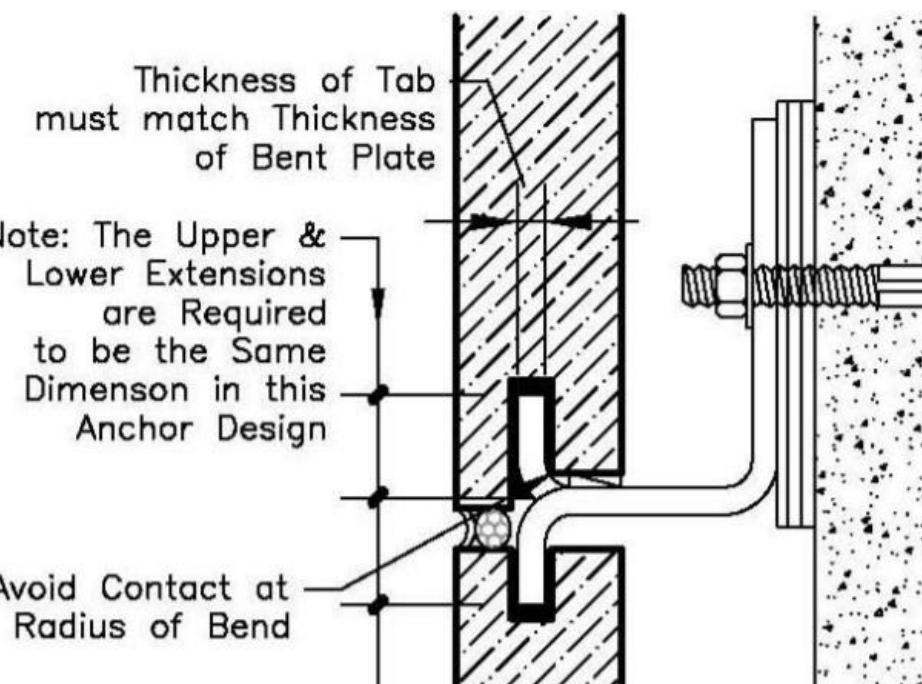


FIGURE 2B: SHELF ANGLE WITH REBATED STONE



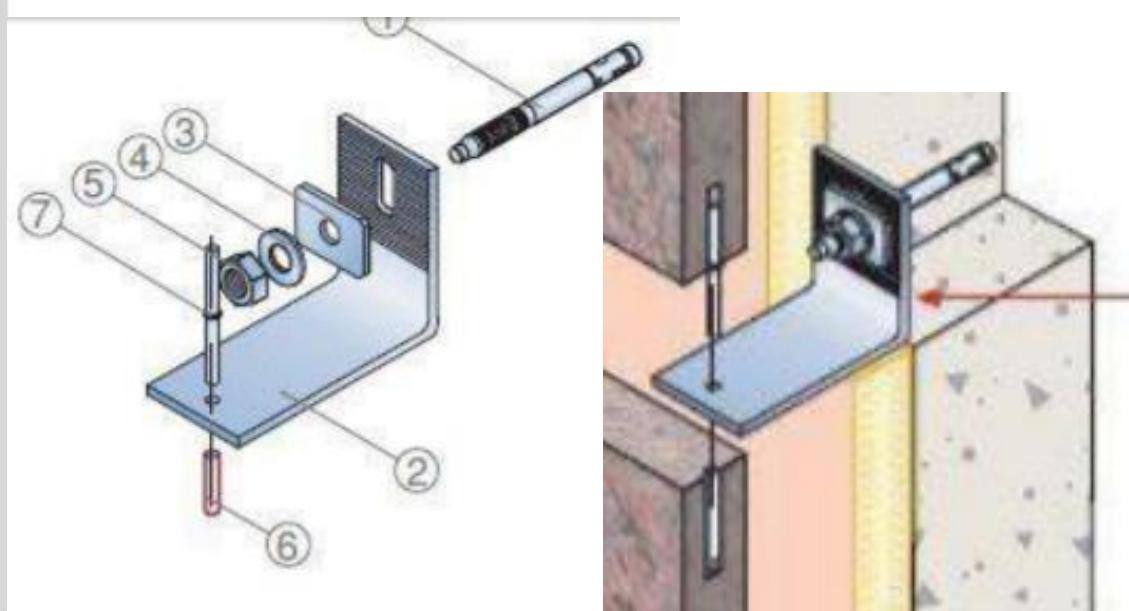
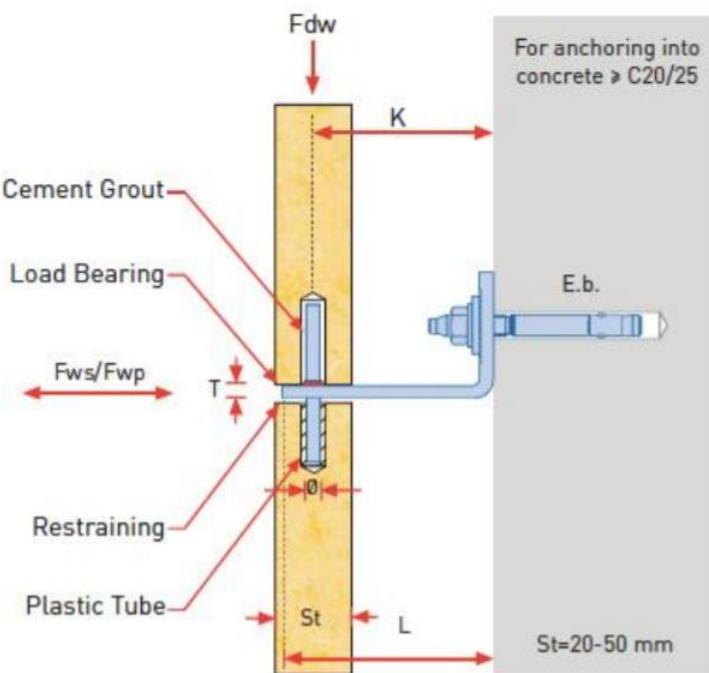
Split –Tail Kerf anchor

- Ideal for projects where corrosion may weaken the anchorage system.
- One tab points up and the other down to engage stones on each side of the joint –
- Type of slotting: Continues Kerf



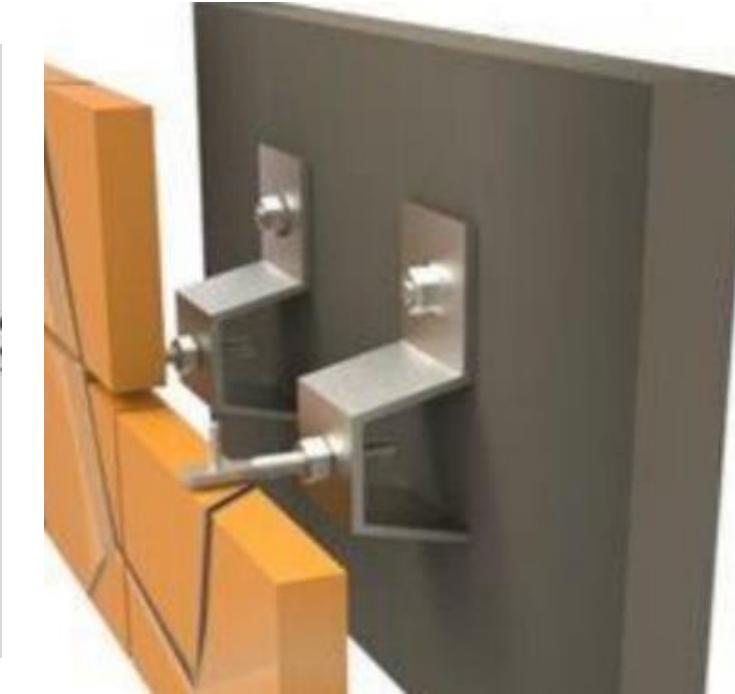
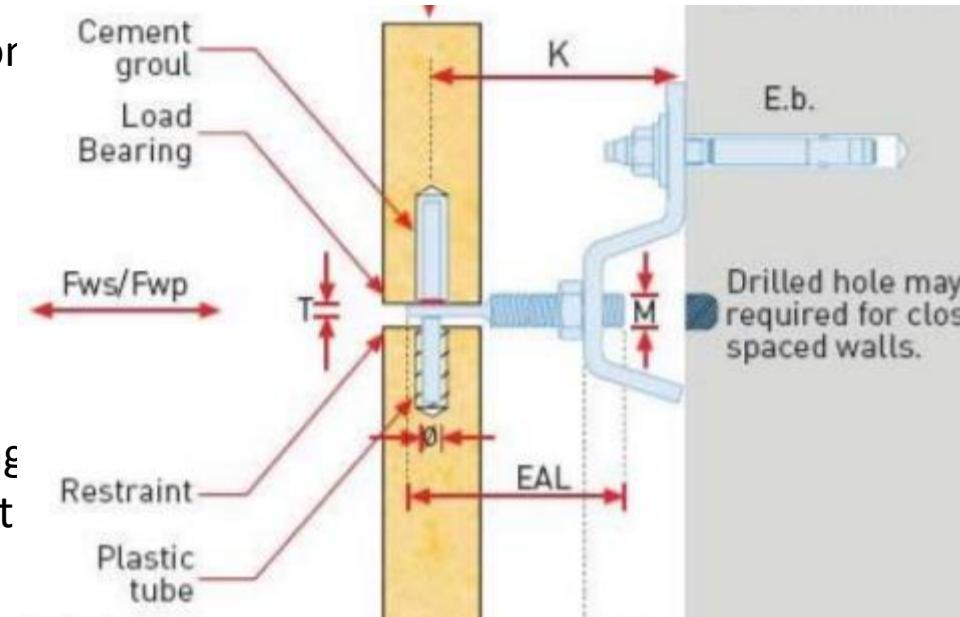
L-Kerf anchor

- Ideal for use in concrete walls.
- Anchors act as load bearing and restraint, carrying the slabs above and restraining the slabs below.



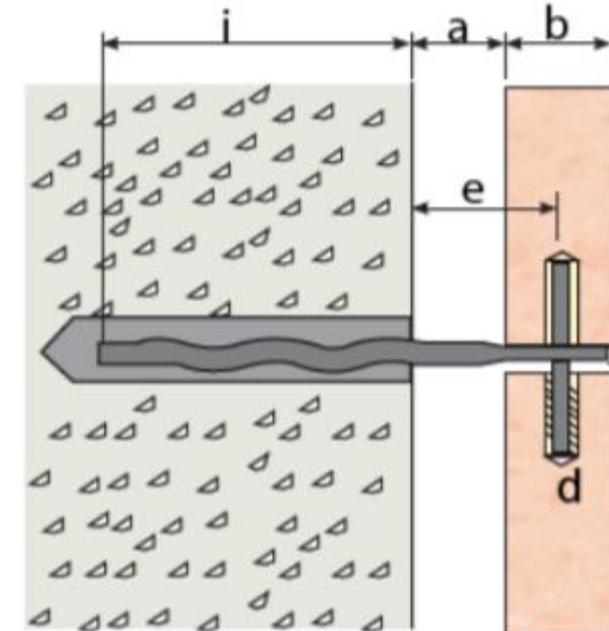
Z - anchor

- Z Anchors -conventional and common method of fixing systems used for natural stone installation.
- Direct fixing into concrete walls with expansion bolts
- Anchors act as load bearing carrying half the weight of the slabs above.
- Anchors also act as restraints, holding the slabs below and restraining against wind suction and pressure.



Rod/Pipe Anchor

- Suitable for both concrete and masonry walls.
- Stones with the same thickness, using round anchor holes
- Resist mechanical stresses better than stones with slots.
- Economical & easy fixing - Provides the advantage of less stone removal, and generally higher strengths.



Tile cladding

The first use – Babylonians - on the “Procession Avenue” leading to the Ishtar Gate.

Buildings by Antonio Gaudi in Barcelona demonstrate resists atmospheric attack from pollution, acid rain and smog.

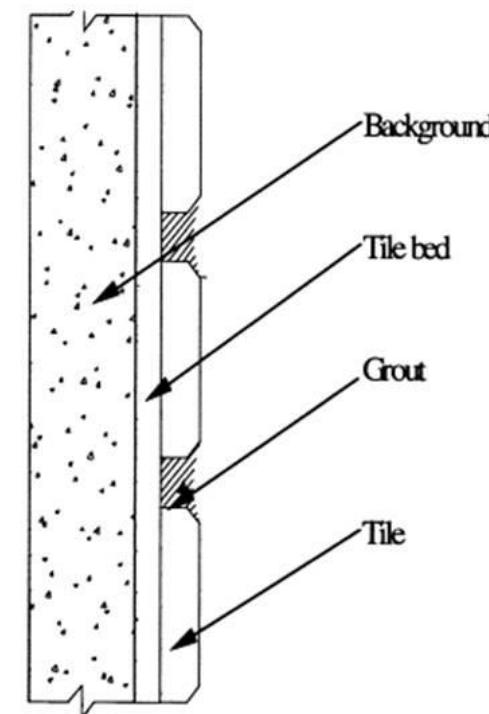
Cladding techniques that utilize ceramic tiles can take a number of forms.



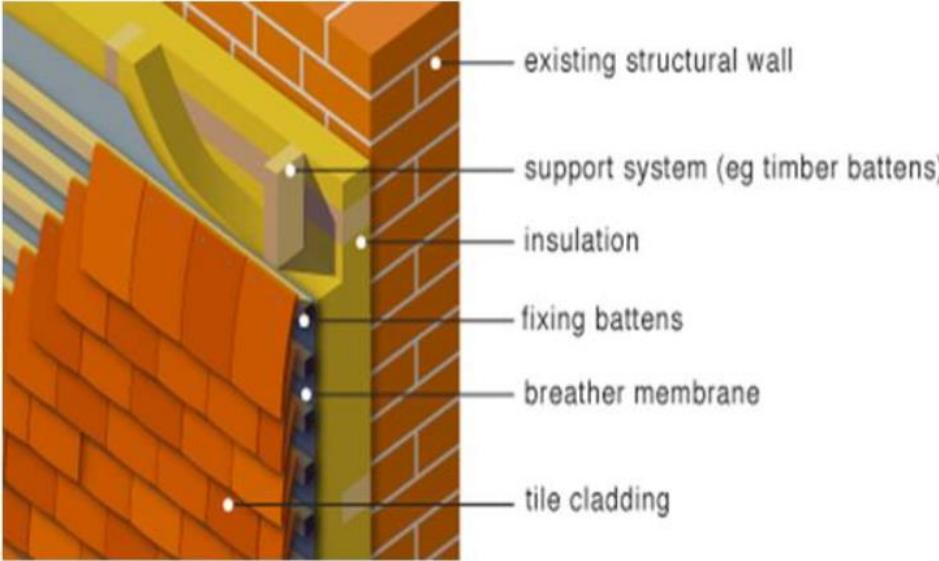
Cladding techniques

Applied Tile Cladding

- Using traditional methods, tiles are fixed to the building by an adhesive or cement mortar.
- The bond to the substrate is chemical.
- Tile size is generally limited to 300x300mm - above the first floor.



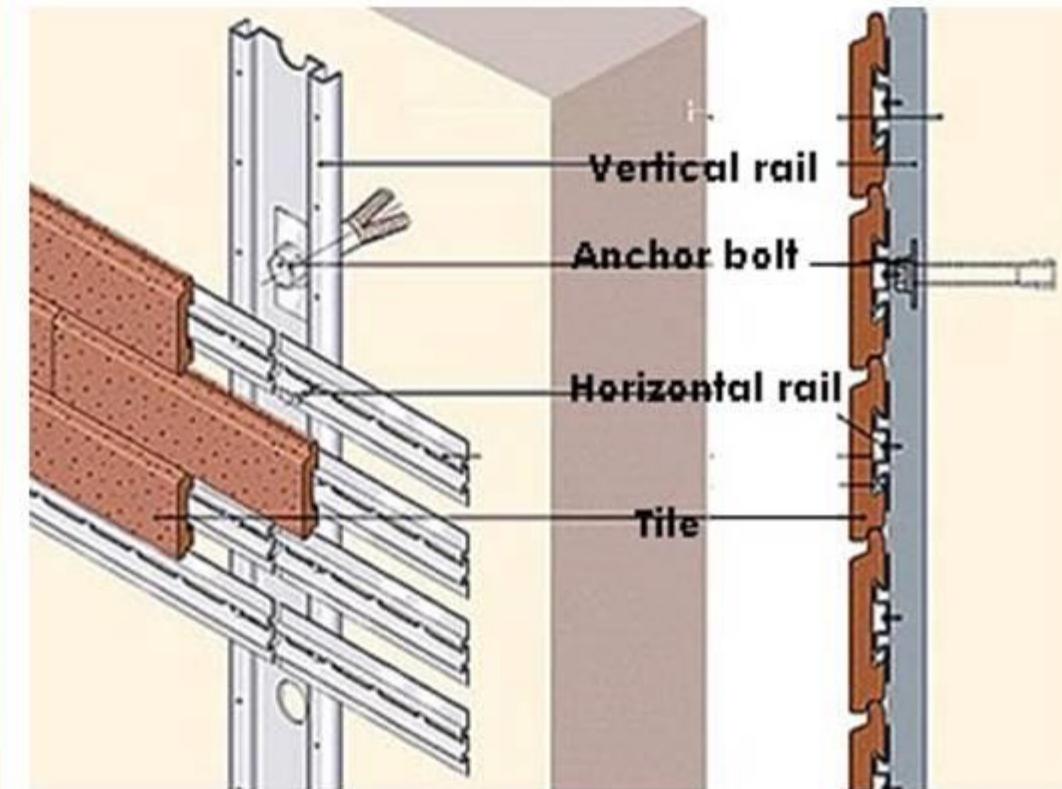
Vertical Tile Hanging



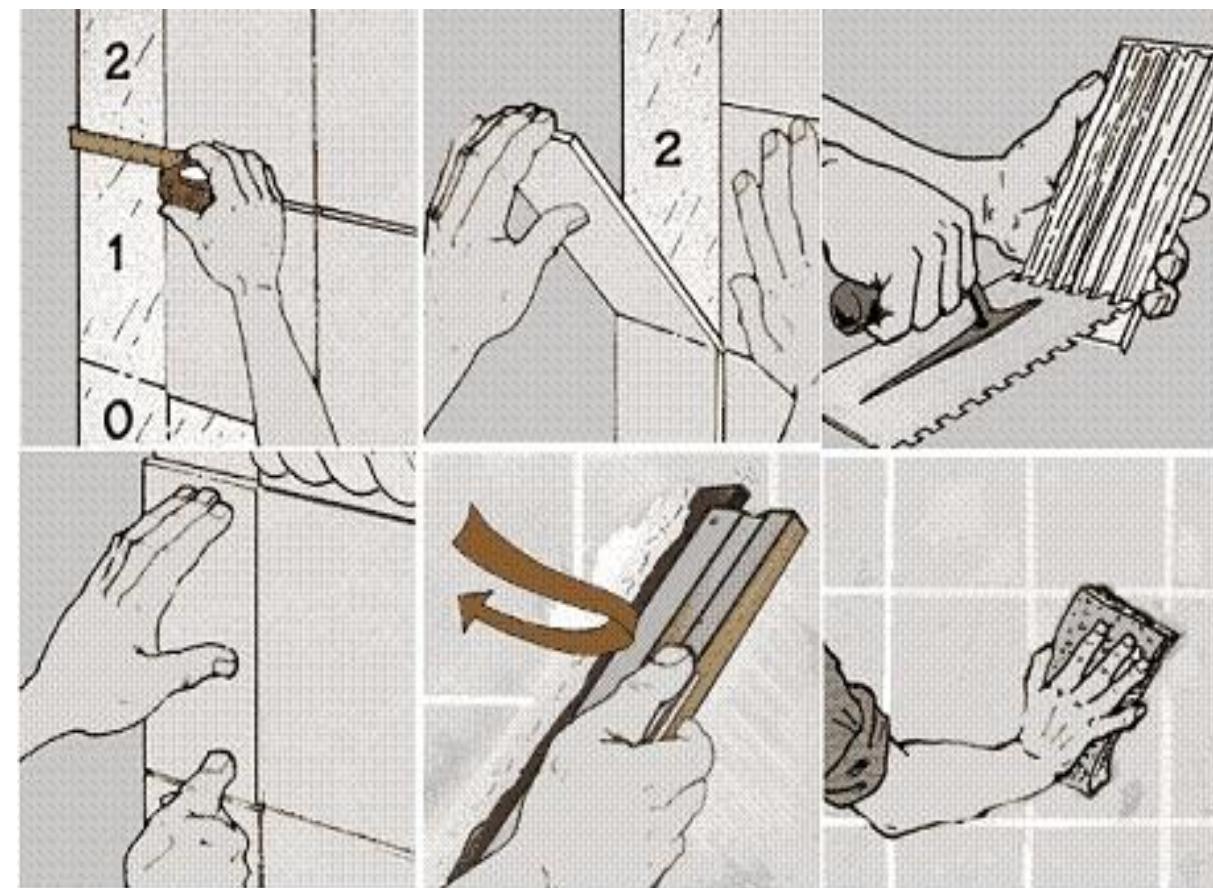
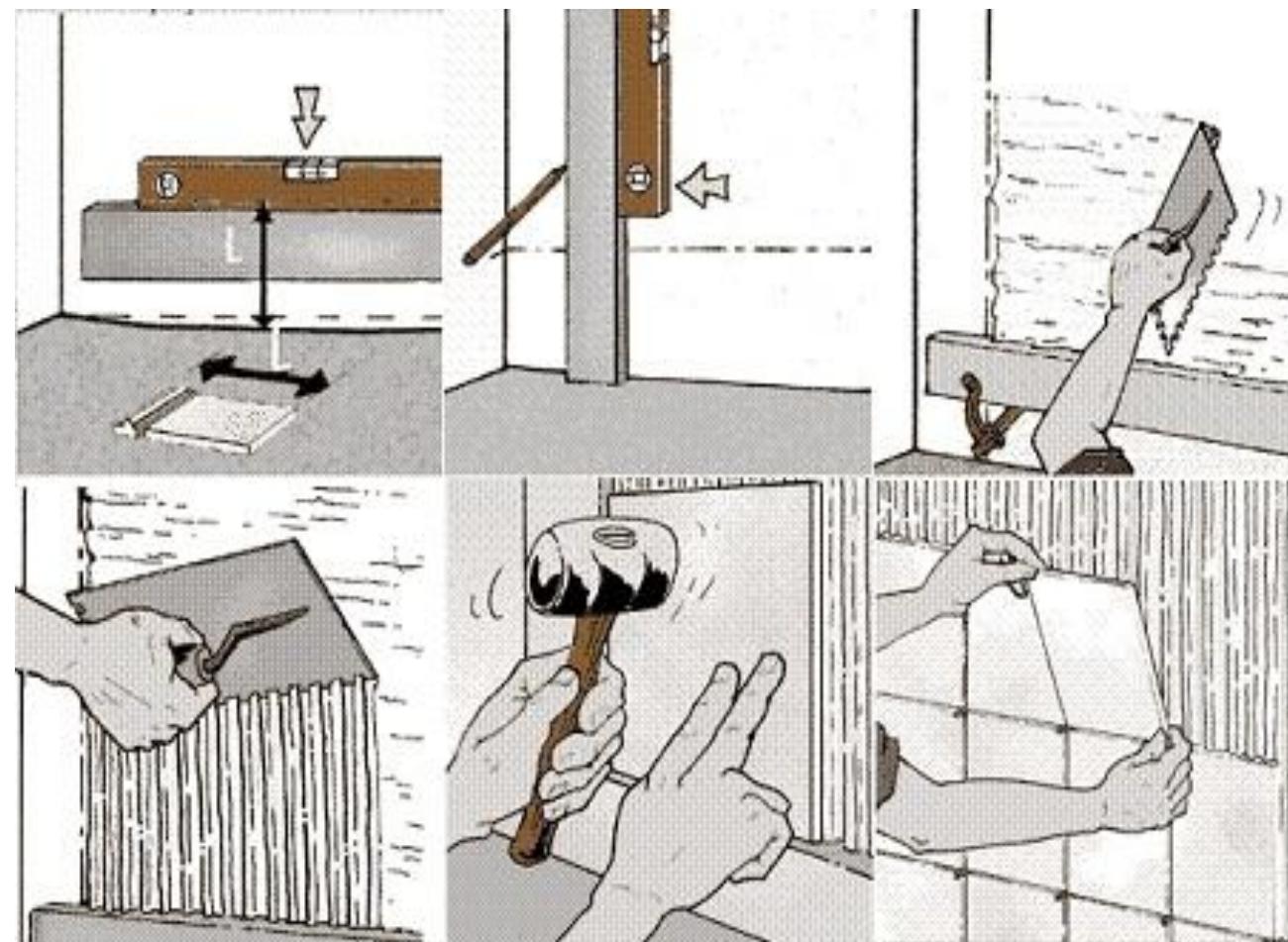
- Tile-hung buildings were timber-framed houses.
- Vertical battens are fixed to the outside face of the SIP wall panel, followed by counter battens and tile hung cladding

Rail Fixing or rib board mounted tile

- Has grooves that provides interlocking
- Each tile is placed along the horizontal railing system supported by vertical rails
- Used on steel and timber framed structures.
- Direct attachment to the structure



LAYING INSTRUCTIONS FOR WALLS



Wooden cladding

- Wood comes in the form of paneling , plank and veneer etc.
- It provides warmth and a good insulator but it tends to fade and flammable.
- Timber Cladding should be designed as a rainscreen.
- If there is a masonry wall behind the Cladding, a separate membrane is not usually necessary.
- The amount of moisture that penetrates will depend on the design of the cladding, an open-jointed system obviously allowing more moisture penetration than, for instance, a tongued and grooved design.
- Ventilating the cavity will also mean that both external and internal faces of the cladding are exposed to the same ambient humidity and consequently will have a similar moisture content.

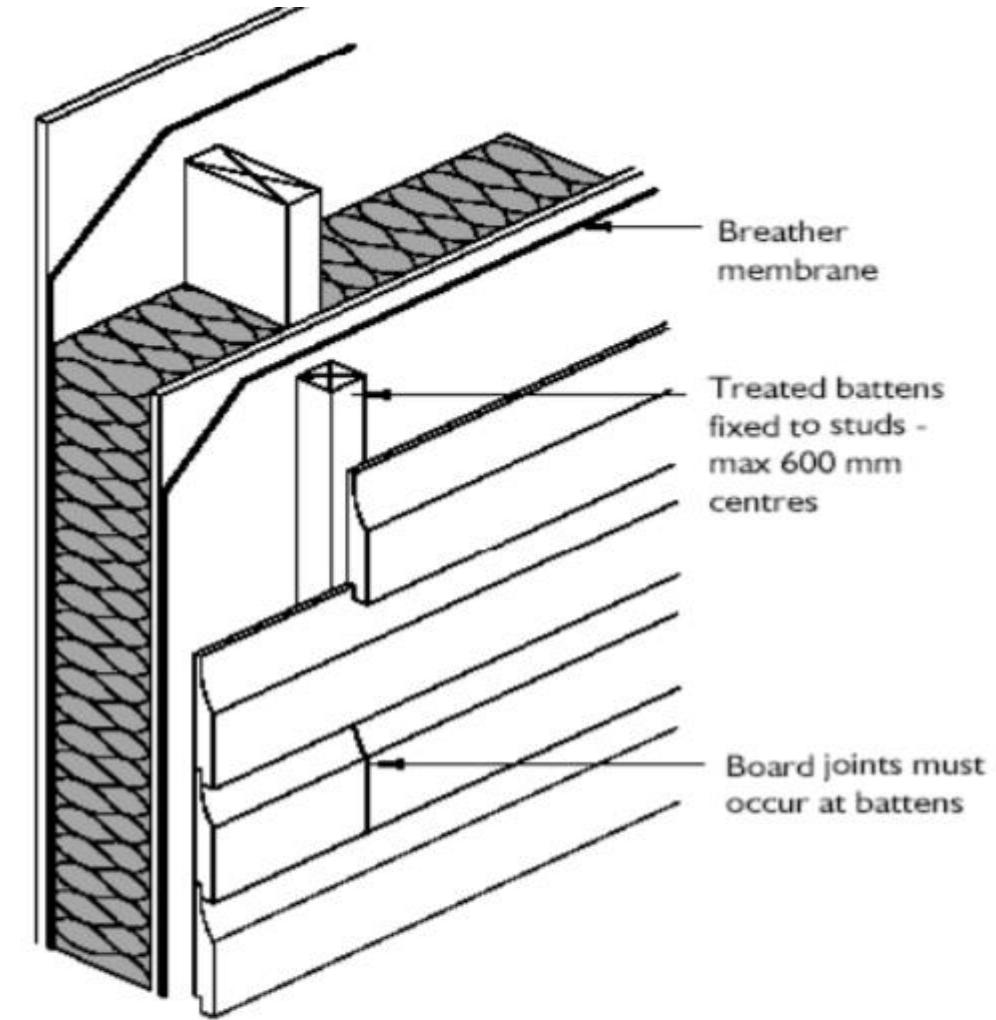


Figure 1 Typical construction: horizontal weatherboarding on vertical timber battens. Note: The drawings show cladding details on conventional timber frame construction. For other forms of construction, the details from the breather membrane out are the same.

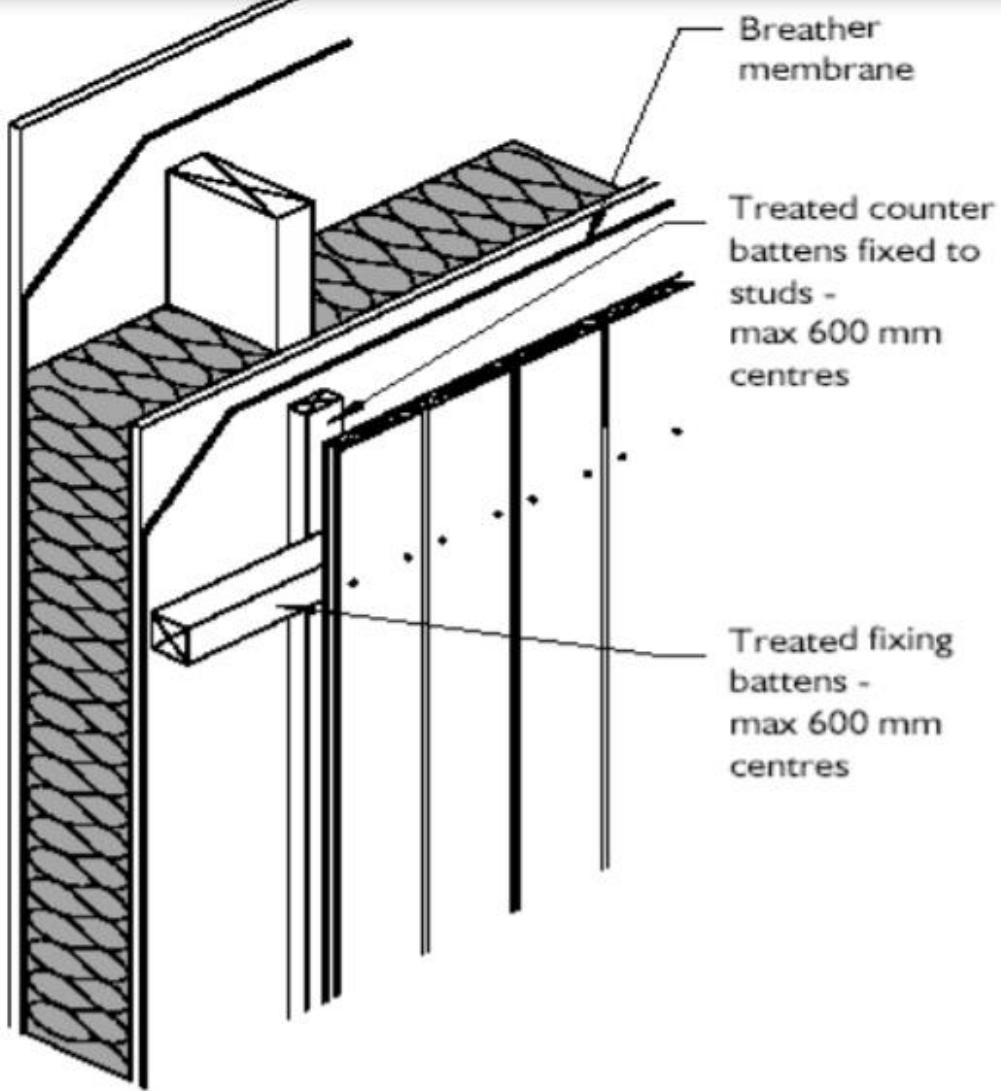


Figure 2 Typical construction: vertical tongued and grooved boarding on horizontal battens and counterbattens.

- The cavity behind the cladding - not be less than 19mm wide
 - Battens should be at least 2.5 times the thickness of the boards to be fixed
 - Horizontal boards only require to be fixed to vertical battens and these will not restrict either drainage or the vertical circulation of air in the cavity
-
- Vertical boards will be fixed to horizontal battens
 - vertical counter battens behind these horizontal battens which would otherwise prevent drainage and vertical circulation of air
 - Although a 12mm minimum gap would theoretically be adequate between the horizontal battens and the inner wall, counter battens of solid wood should be increased in thickness to reduce the risk of the wood splitting when the battens are nailed through to studwork or masonry behind.

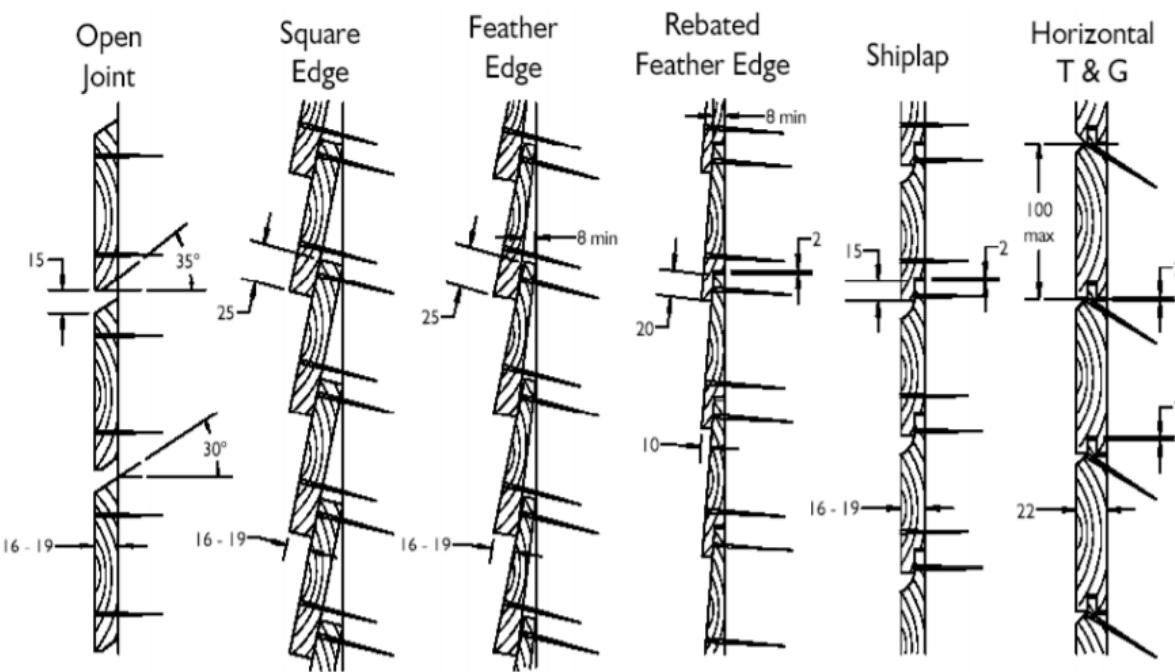
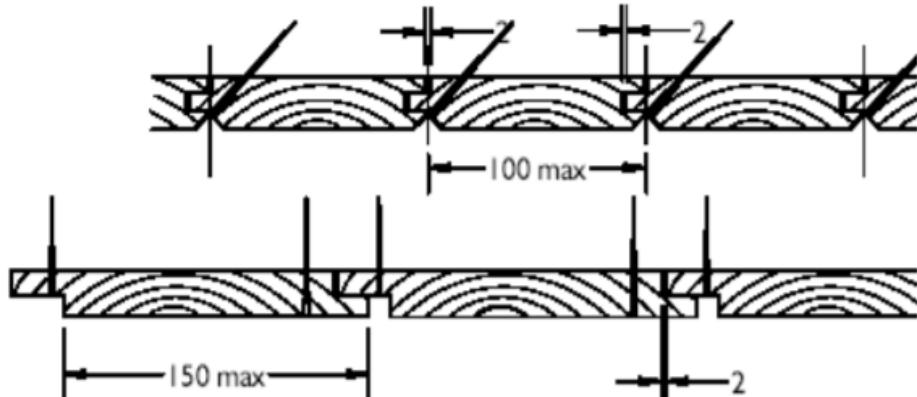
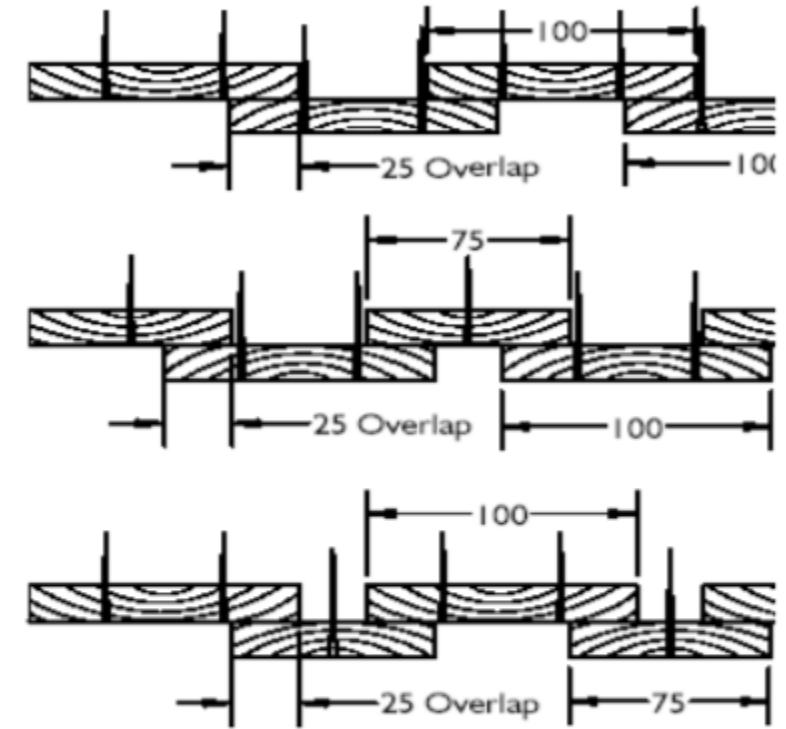


Figure 4 Horizontal boarding profiles.

Horizontal boards should preferably not exceed 150mm width



Tongued and grooved boards

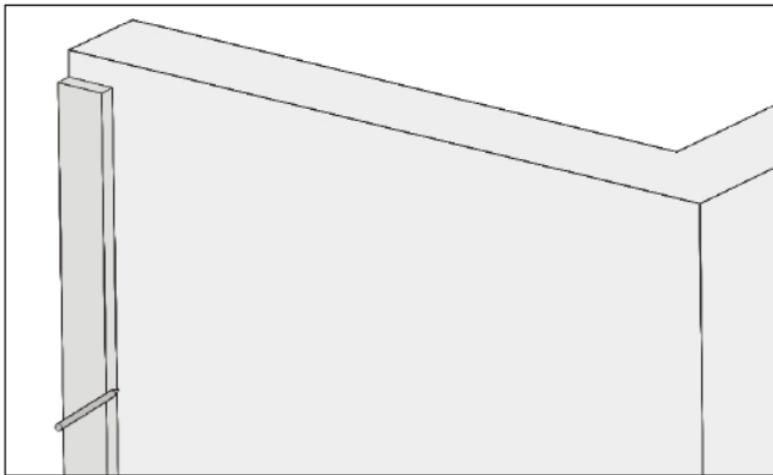


Vertical cladding - board-on-board

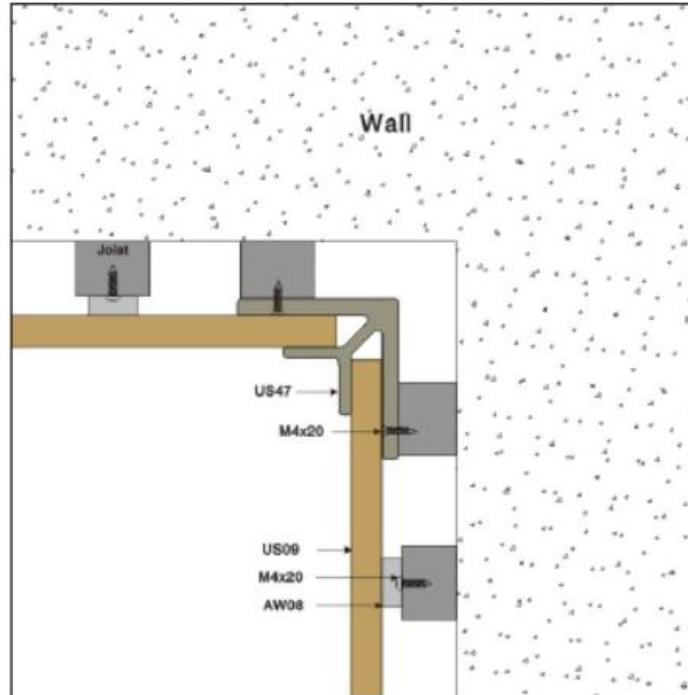
Figure 6 Profiles suitable for vertical boarding.

Overlap between outer and inner board should be approximately 25mm

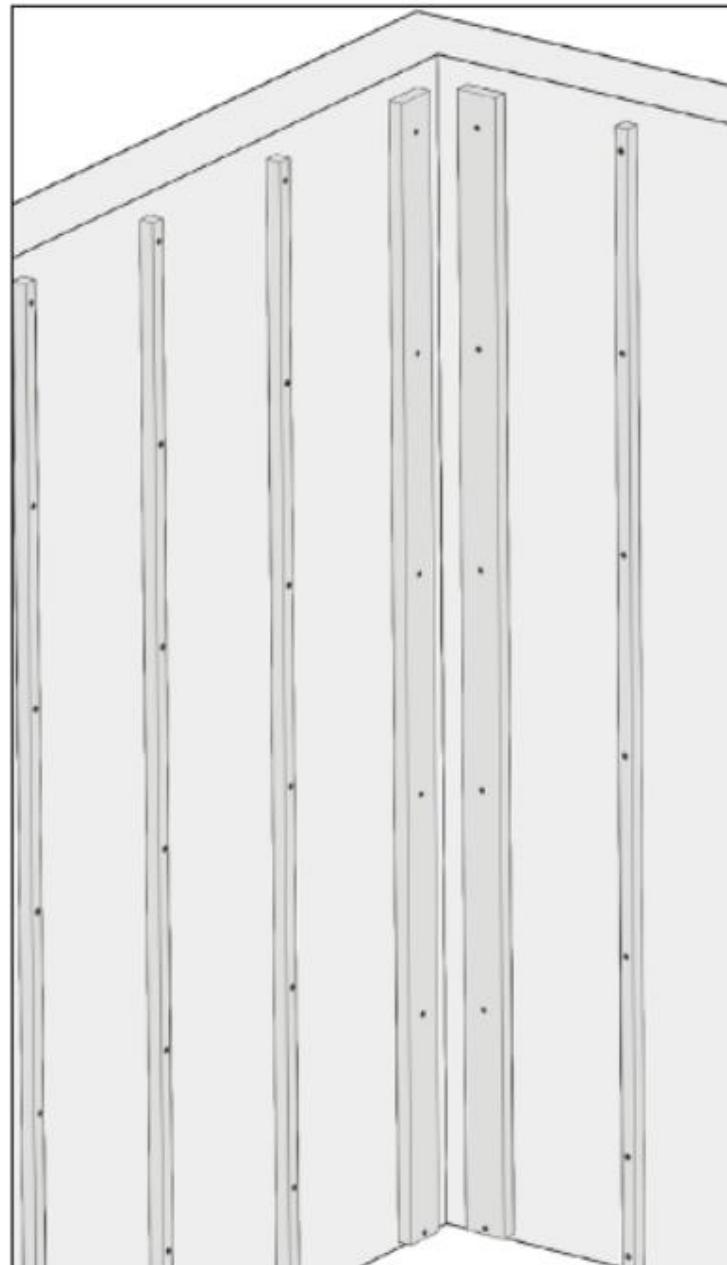
Wooden cladding installation



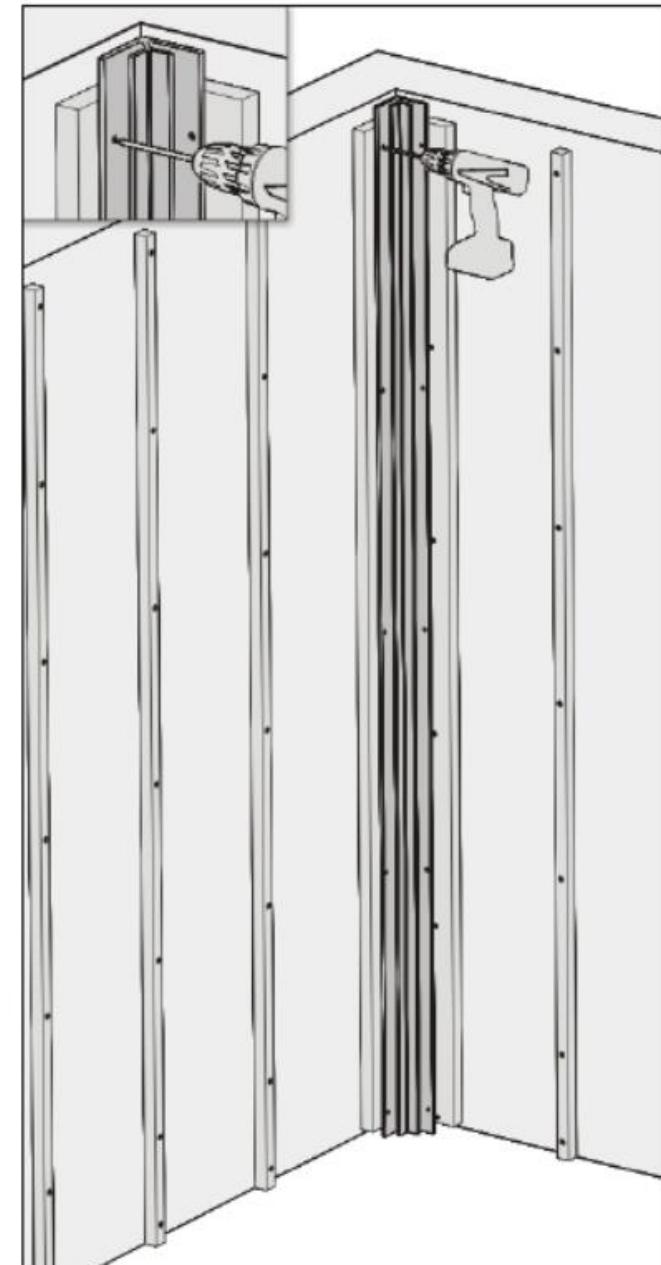
Fixing the first Joist

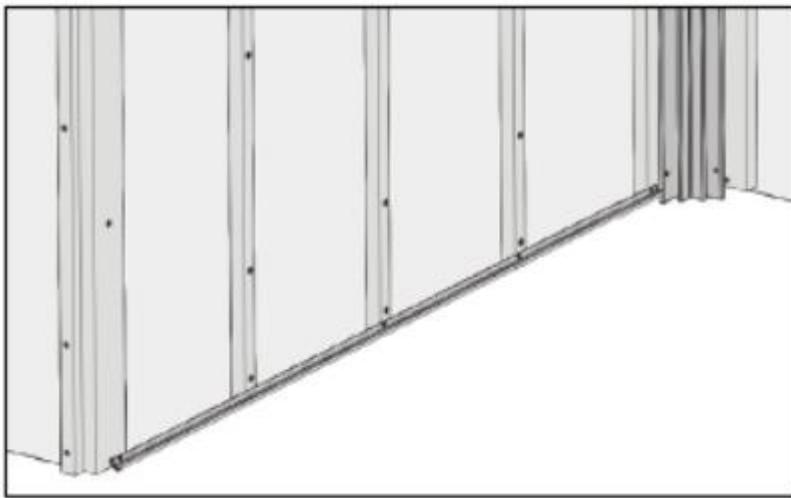


Equal spacing of Joist

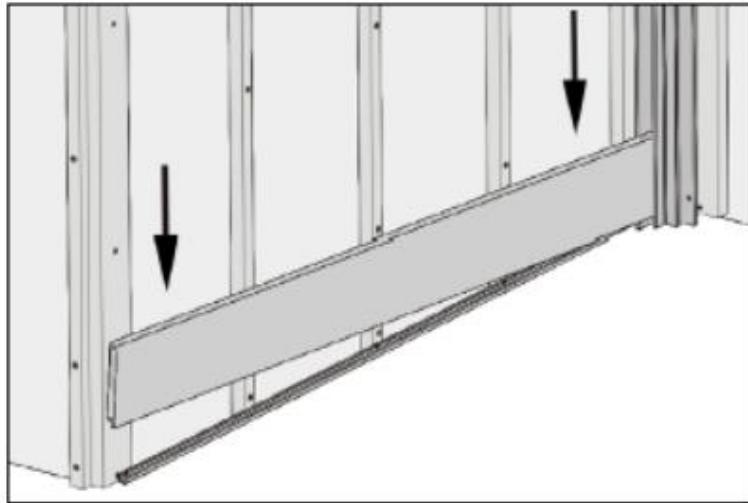


Installing the trims



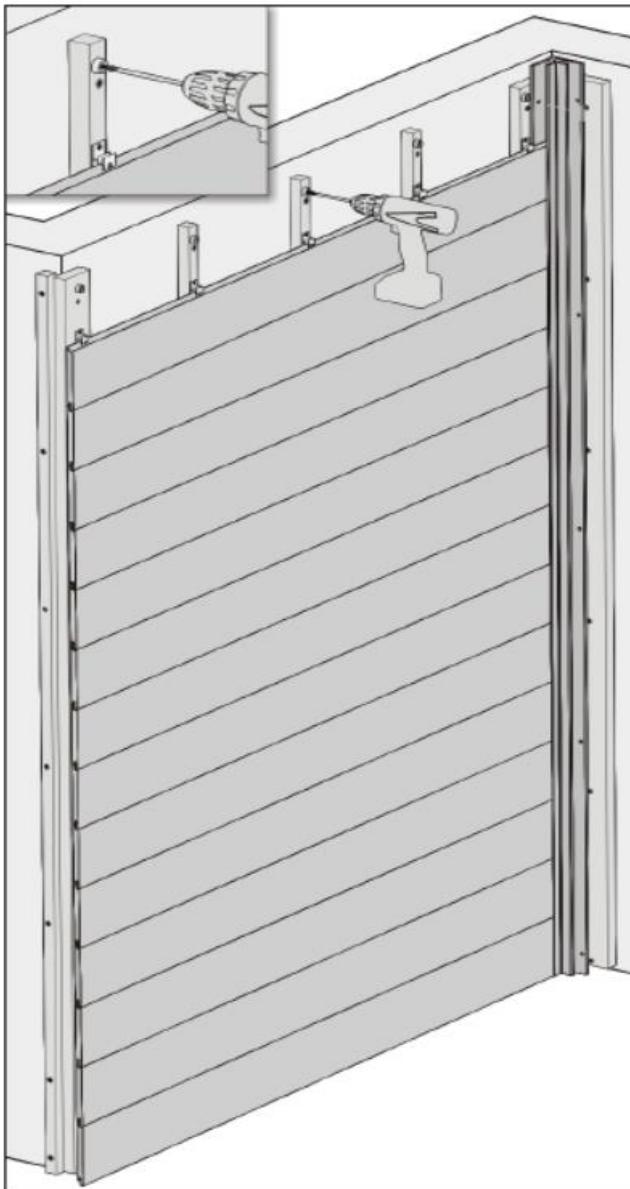


Starting strip is installed

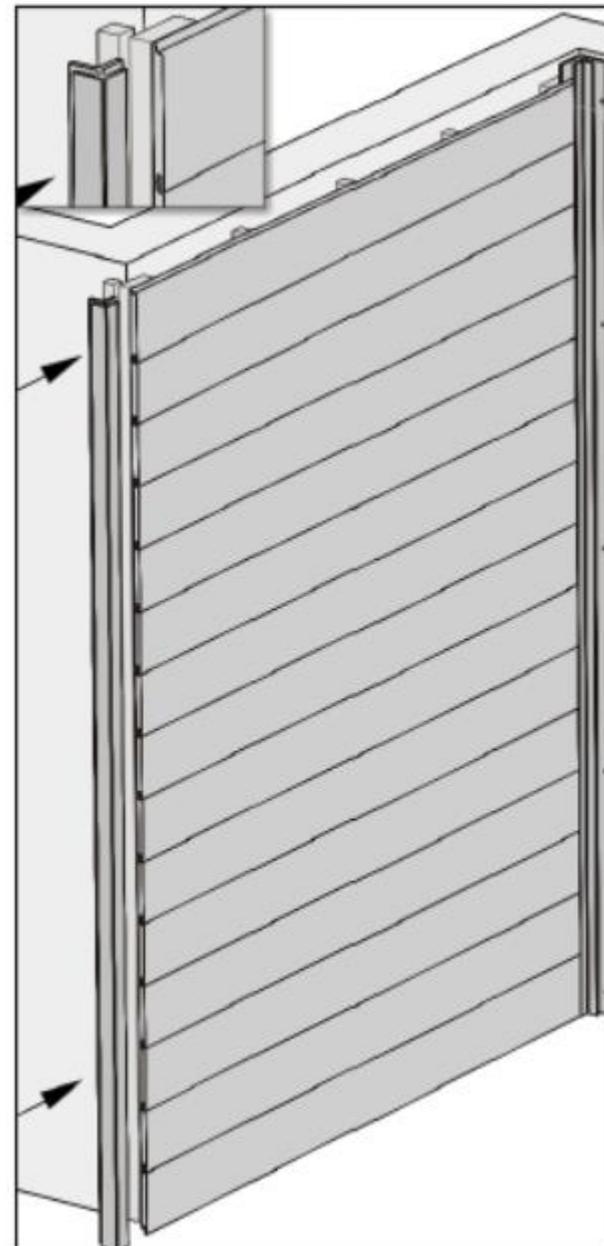


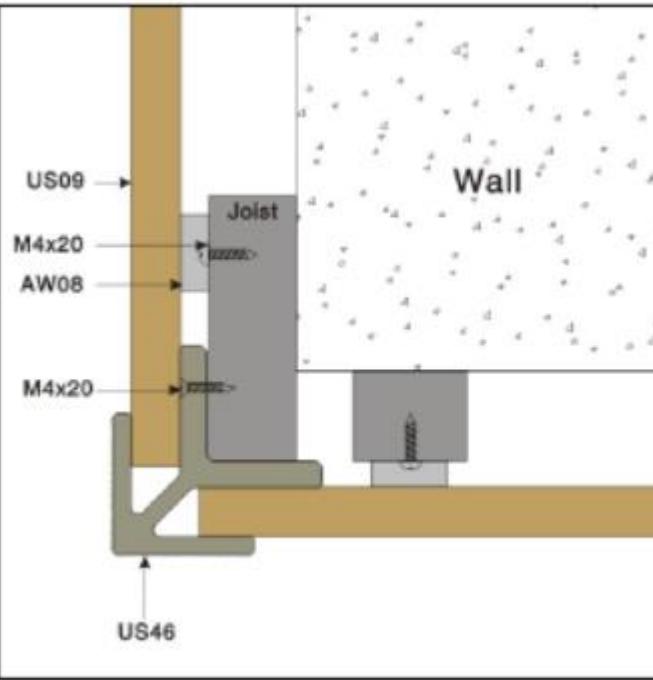
**Place wall cladding
board with lip down**

**T-7 screw is installed n
joist and then cladding**

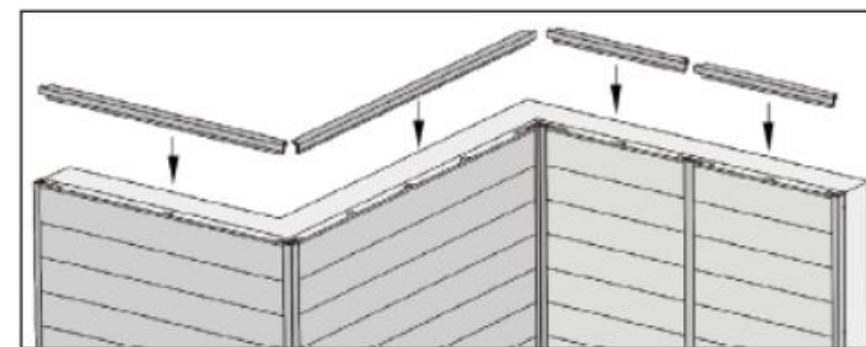


Outside corner installation

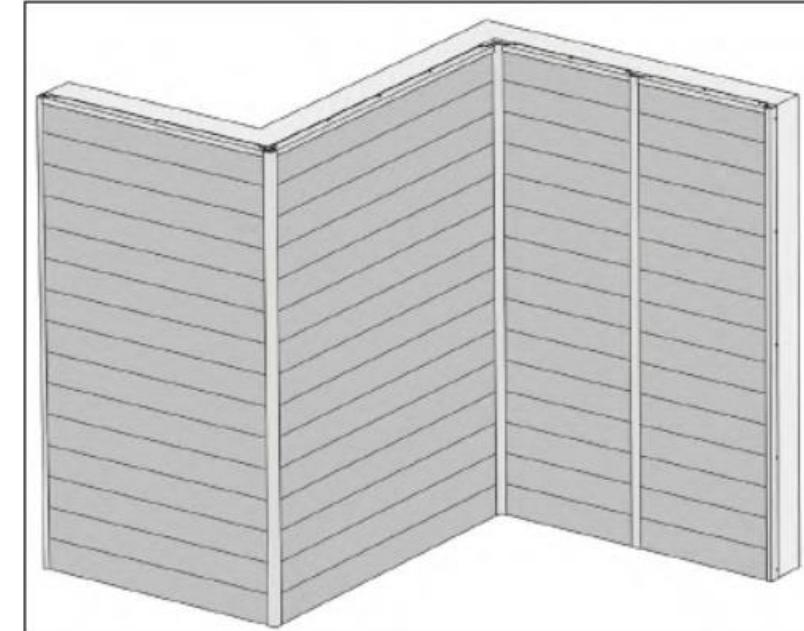




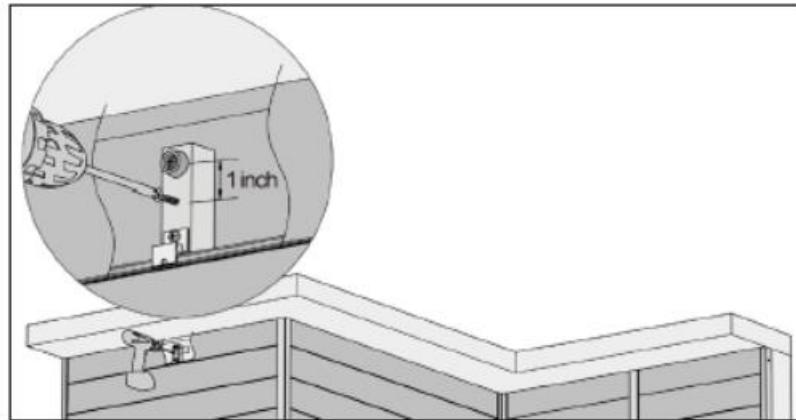
Corner trim



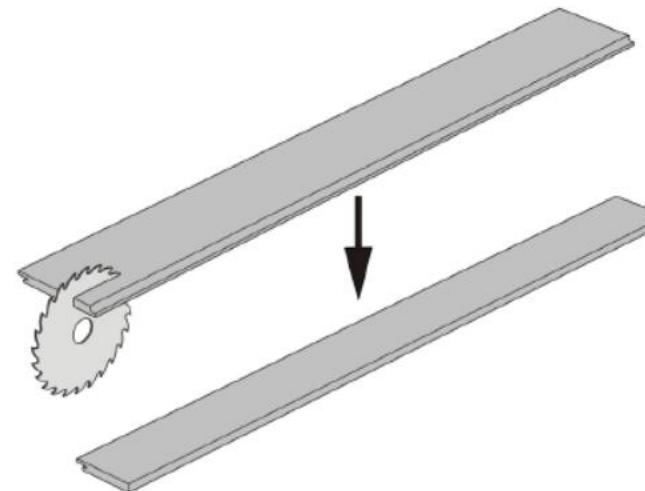
F trim and cut them to length



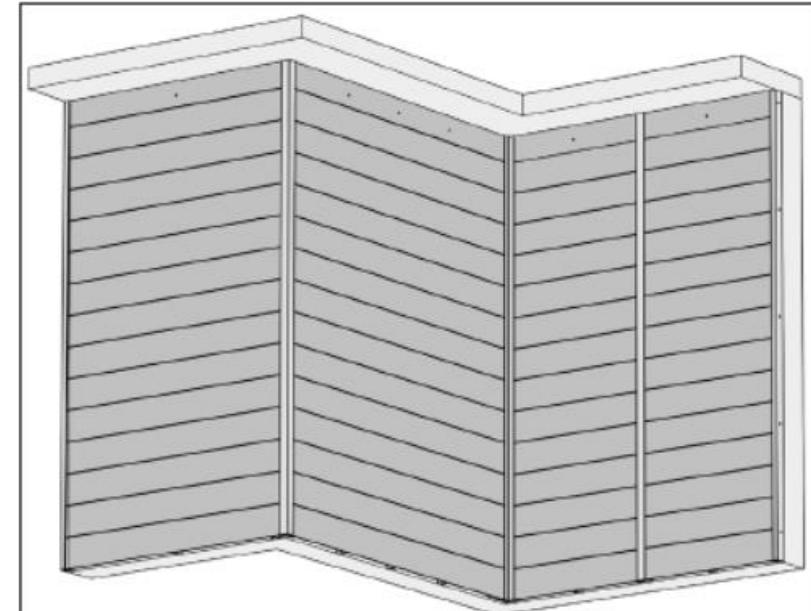
Fix cut pieces on top of Joist



**Install T-7 gasgert and
measure from the ceiling**



**Cut the board according
to measure**

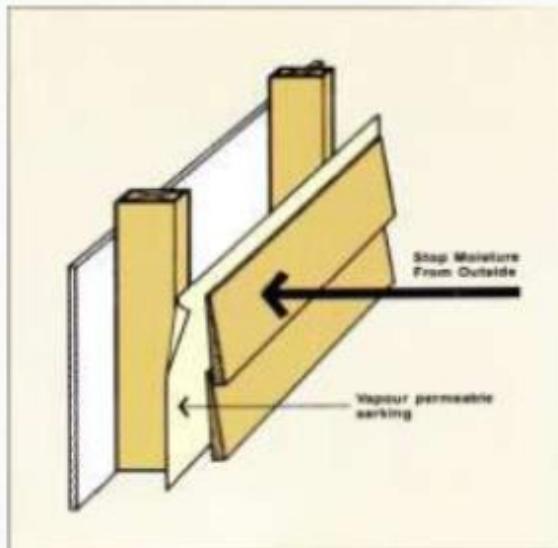


Finished installation

PROTECTION OF CLADDING

Sarking

Sarking is a waterproof but vapour permeable flexible sheet material that is fixed directly behind timber cladding. When water penetrates the cladding it serves by directing the water away from the structure to avoid it pooling and lodging within the frame.



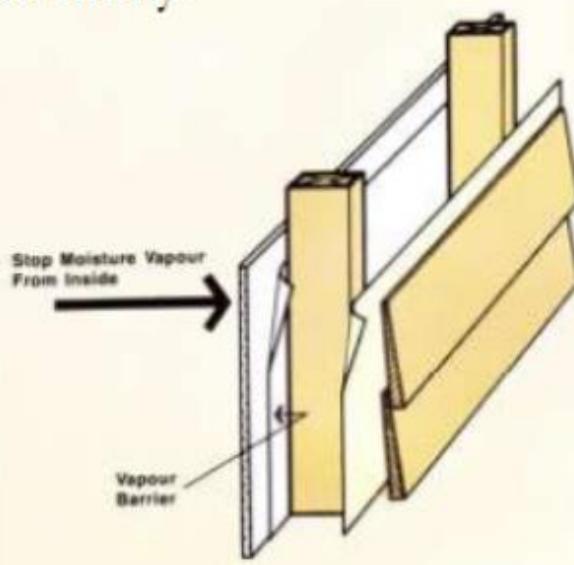
Flashing

While sarking is used for general waterproofing but is not always compulsory, **flashing is used at corners, vertical joints and around openings** and is essential for ensuring that water is prevented from penetrating the wall frame cavity.

Vapour barriers

Depending on the type of construction, the intended use of the building and the climate of its location, a separate vapour barrier may be required.

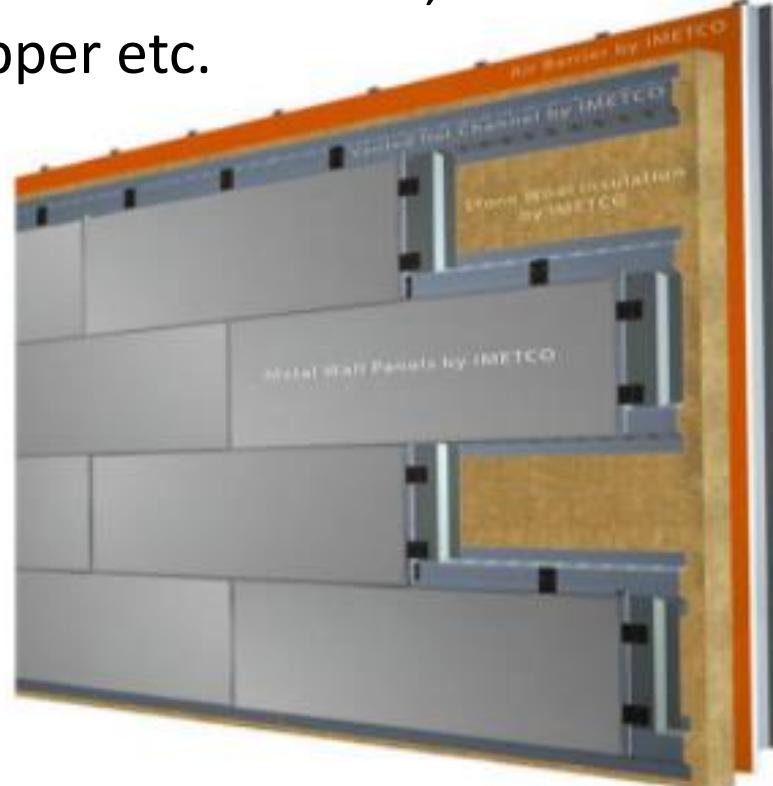
The potential for condensation of water vapour within a frame is high **when significant temperature differences exist between indoor and outdoor environments.**



Metal cladding

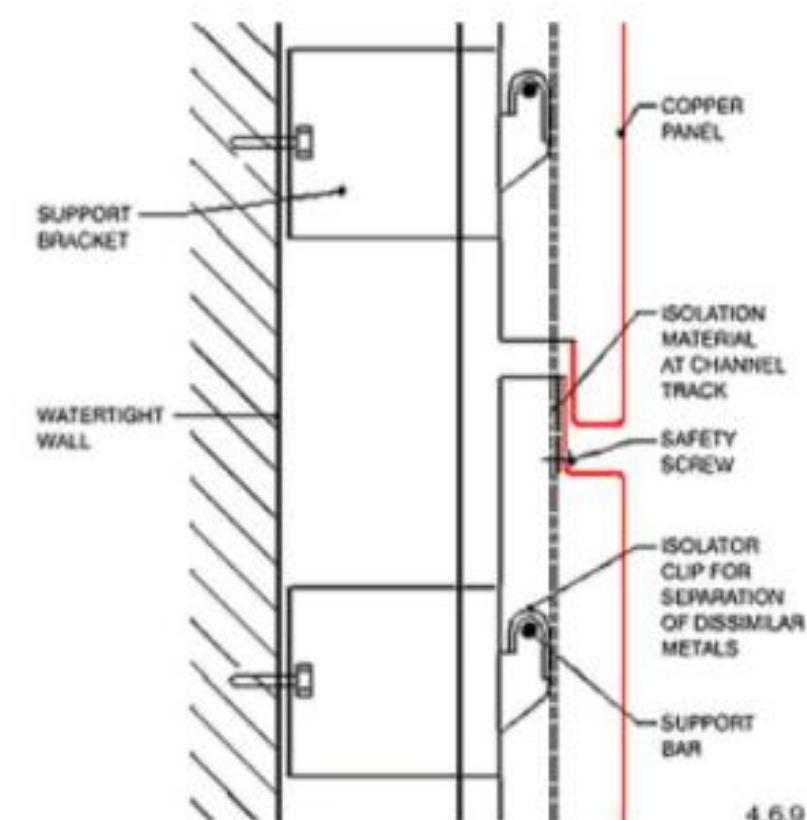
Metal cladding is a type of exterior cladding made of metal. Metal cladding can be very useful for both purposes, very strong and durable, and for aesthetic versatility. Unlike most other types of cladding, however, metal cladding can also be used for roofing

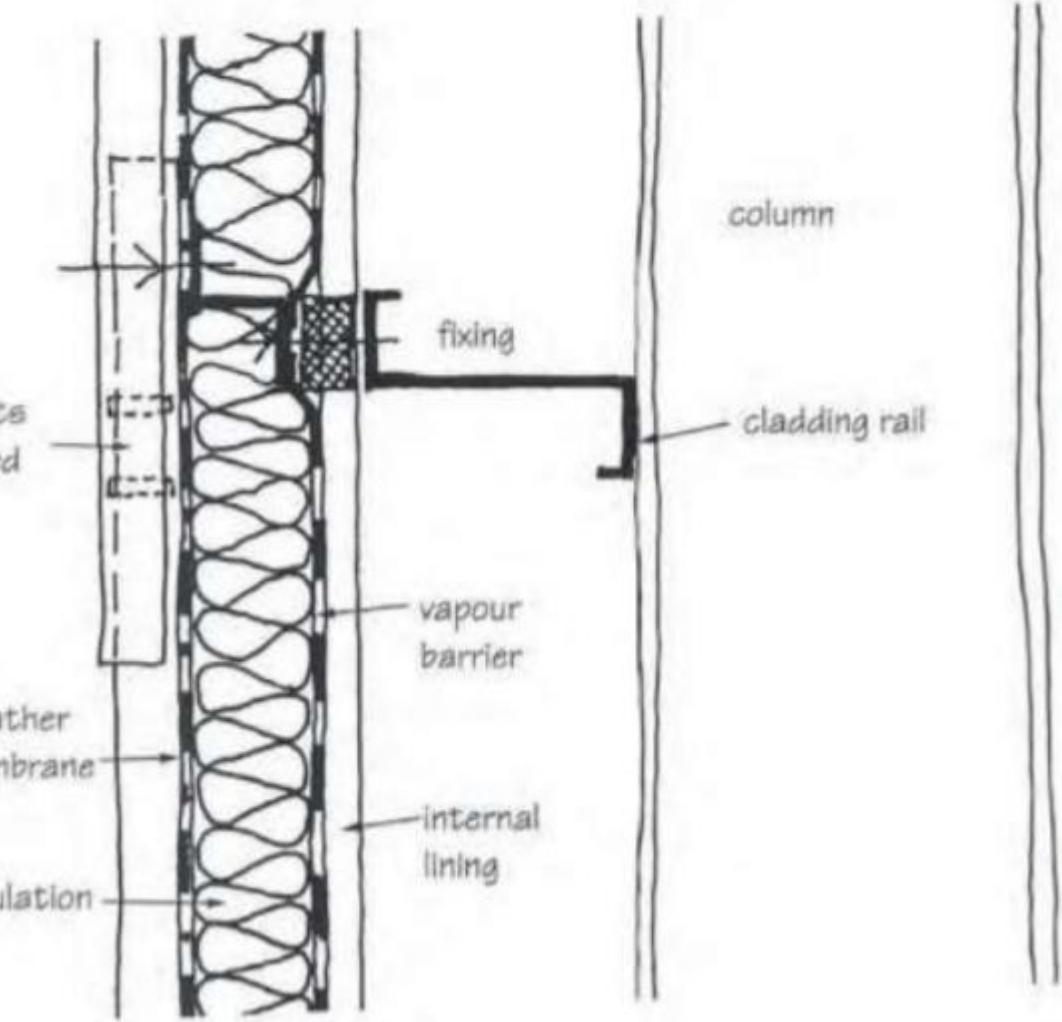
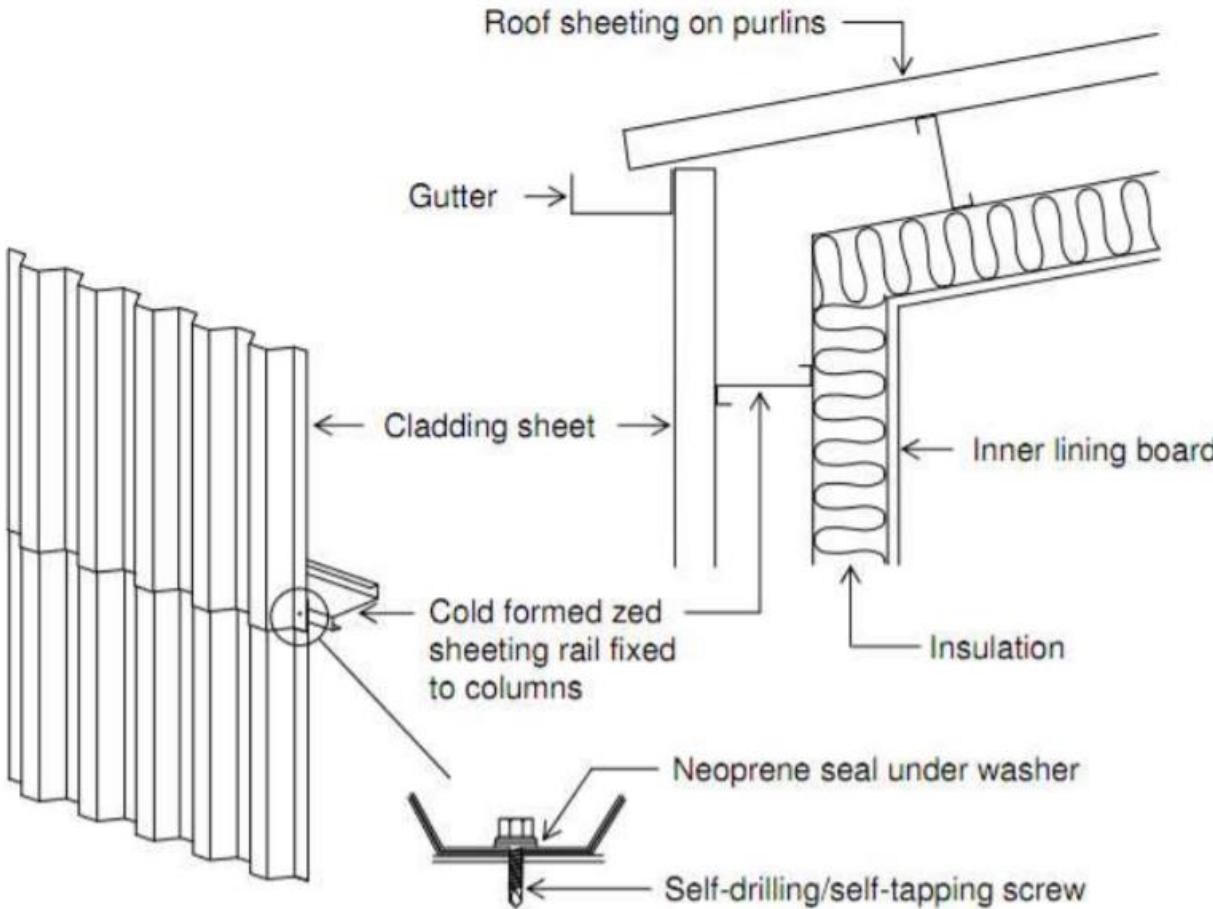
Types:- Composite Aluminum, Stainless Steel, Rheinzink, Copper etc.



Advantages

- Low maintenance
- Material flexibility
- New metal panels can be installed over any type of cladding – including brick, block, pre case concrete, stucco, or even existing metal systems.

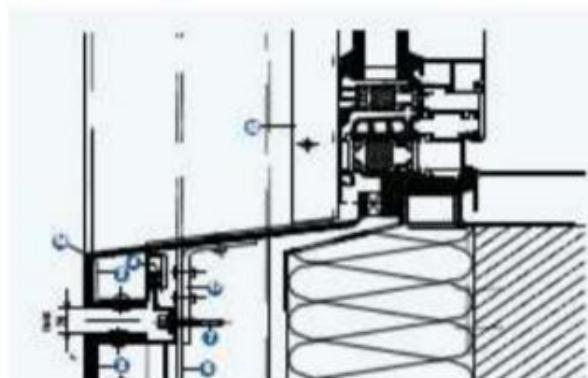
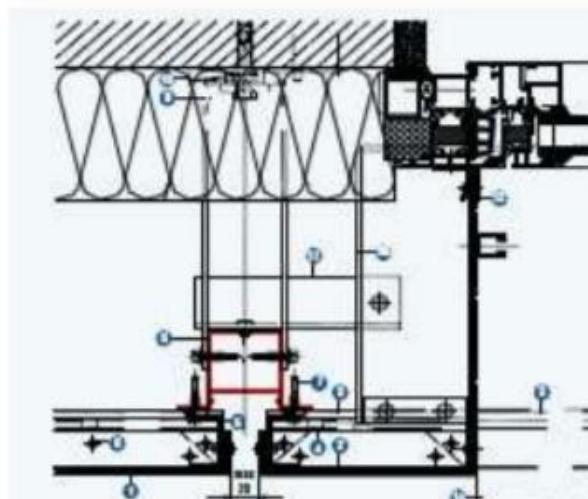
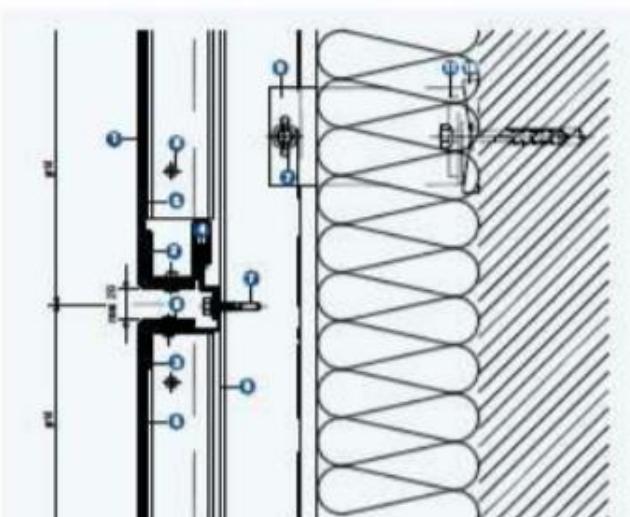
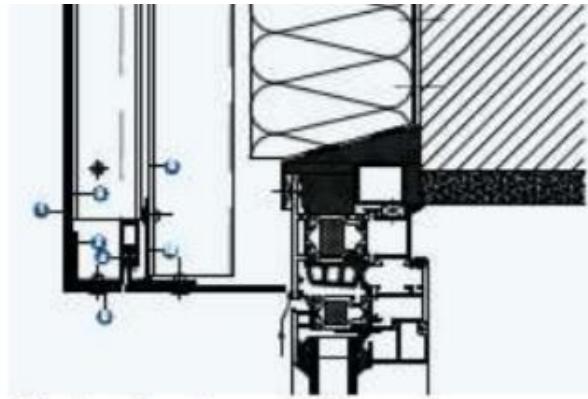
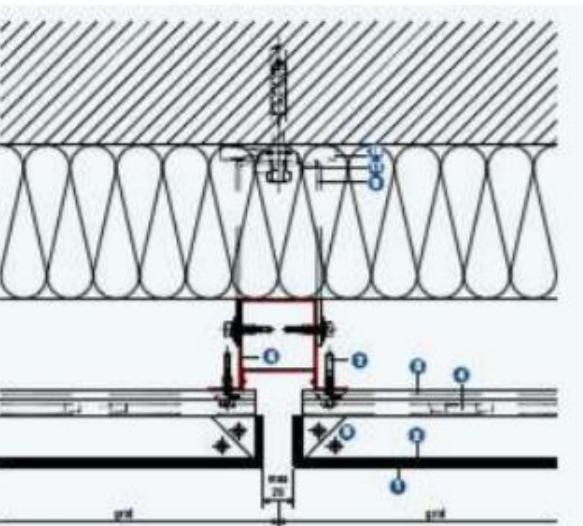
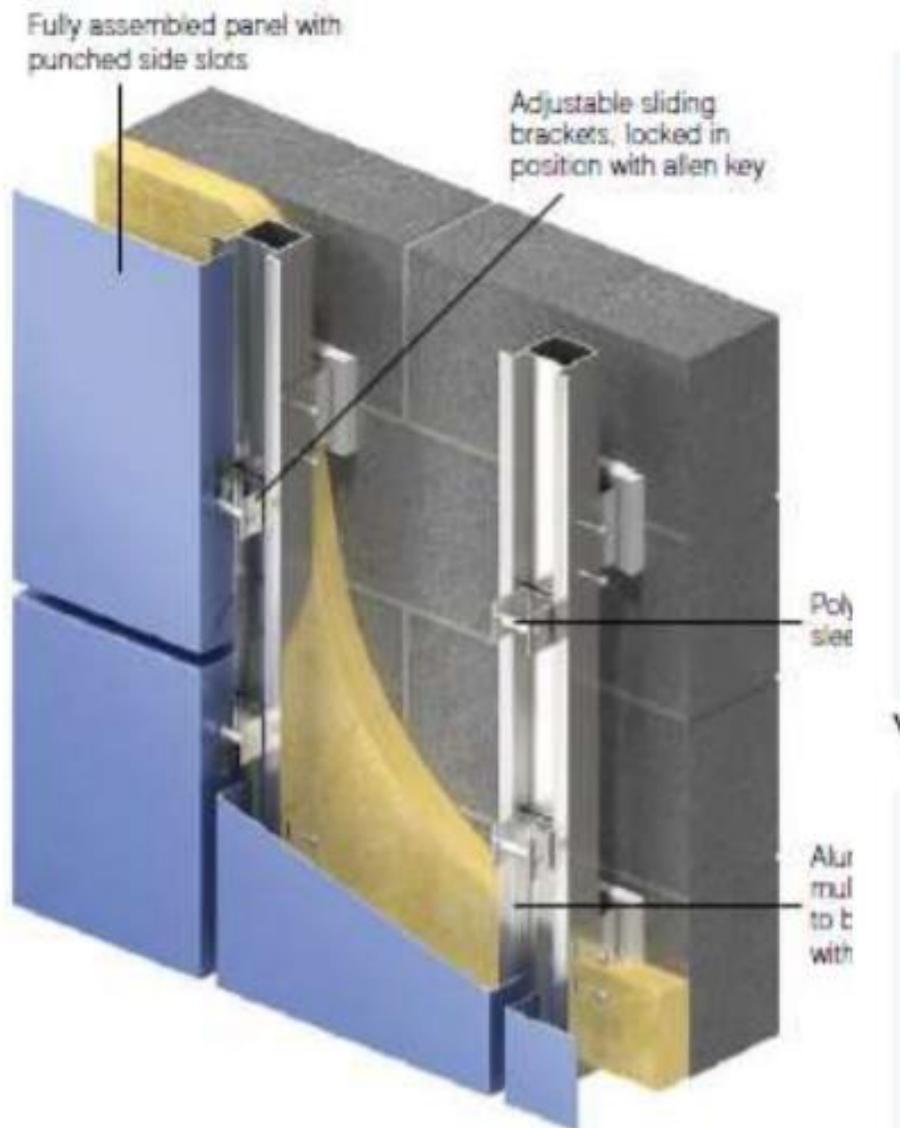




Components

- **External cladding** – steel or aluminium
- **Breather membrane** – sheet to allow water vapour
- **Spacer** – keep external and internal sheets apart
- **Vapour barrier** – prevent water from entering building
- **Acoustic absorption / internal lining** – prevent sound from reflecting back into the room

Rain screen PV cladding adds little weight to the building, provides space to improve insulation levels and creates a ventilated skin



Aluminium

- Cannot rust or corrode, making it highly desirable for buildings or other structures located close to an ocean. Aluminium is also very lightweight
- Can be painted nearly any colour.
- Not as strong as steel and may not provide the same level of protection in harsher environments

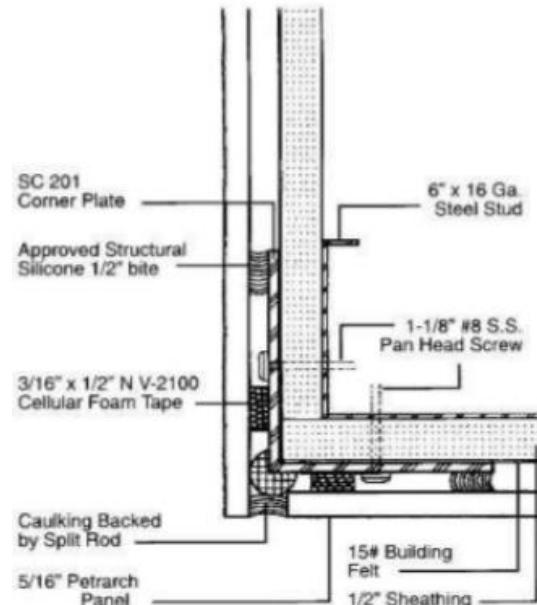
Steel

- High strength- used for industrial applications.
- Prone to rust. Galvanized steel- long-lasting strength.
- Stainless steel- more expensive –not for cladding purposes.

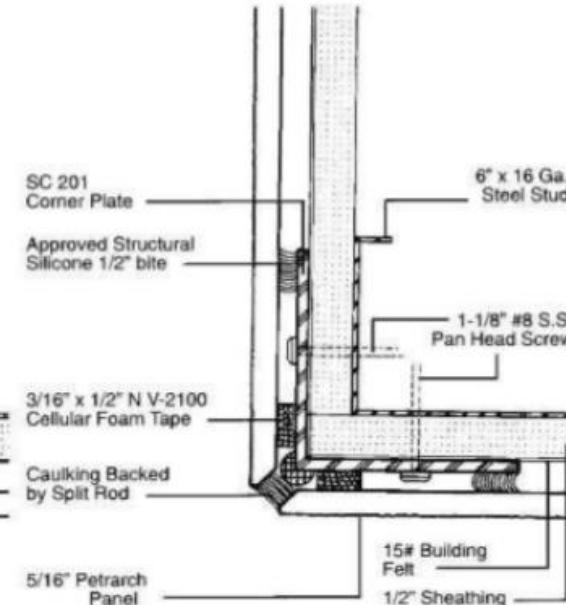
Copper

- Used only for roofs or other finishing work.
- Copper starts out as a bright, shiny orange, but eventually corrodes into a light green.
- Copper and other metals are chosen for sloped roofing applications because they allow for snow to slide off easily, unlike tile or shingles.

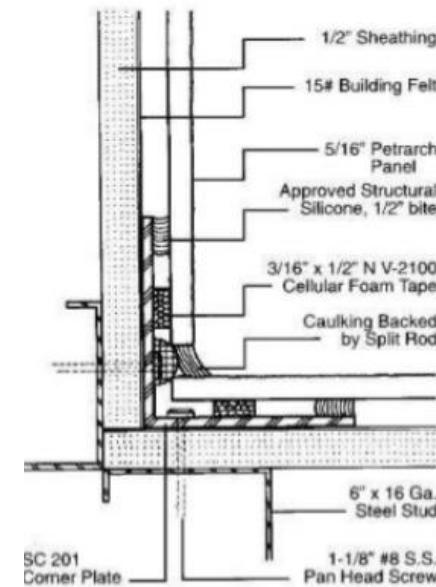
Section Through Standard Outside Corner



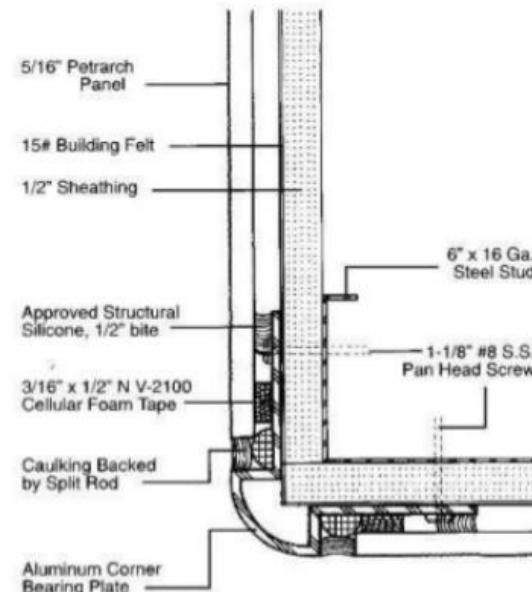
Section Through Mitered Outside Corner



Section Through Inside Corner



Section Through Trimmed Outside Corner



Surface Finishes

The art of treating the surface of building materials with a suitable covering material to make them weather resisting and decorative is called SURFACE FINISHING.

Types of Finishes

- Plastering
- Painting
- Wallpaper
- Cladding
- Tile finish
- Stone
- Wood
- Glass



Other types of Finishes

- Stained glass Finish
- Mirror Finish
- Flake Finish
- Pebbles Finish
- Coral Finish
- Canfor Finish
- Sand texture Finish
- Glass mosaic Finish
- Marble powder Finish
- Laminate Finish

Concrete Finishes

- Stucco Finish
- Rubbed Finish
- Brushed Finish
- Tooled Finish
- Sand-blast Finis
- Exposed Aggr
- Wood Float Finish
- Steel Trowelled
- Colored- Cement Finish

Stucco Finish

- Stucco is a mortar consisting of cement, sand and water.
- Hydrated lime is often added to make the mortar easier to work.
- 3 coats: **scratch** and **brown** coats (1part Portland cement to 3 parts of Coarse sand, with about 10lbs. of hydrated lime)
- The **finish coat** (1part of Portland cement to 2 parts of fine sand)

1. Surface should be roughened to ensure good bonding.

Old concrete surfaces - bush hammer or small pick.

New concrete surface - wire brush or a special scoring tool.

The scratch coat is then trowelled onto the wall surface. It is scratched with a small rake to form a key for the second coat.

2. Washed thoroughly with acid and water to remove all dirt and loose particles.

Scratch coat - 3/8" thickness

Brown coat - few days

Finish coat- 1/8" thickness



The finish coat should be kept damp and not wet for a few days, to prevent hairline cracks.

Rubbed Finish

This consist of grinding down the surface of the concrete a day or two after it is poured, using a brick of carborundum, soft natural stone. Rubbing is done with a circular motion, a thin grout of cement and sand is applied to the surface and well rubbed in to fill surface imperfections, and afterward washed down with clean water. If fine sand is used instead of a grout, the method is called a sand-float finish.



Brushed Finish

This type of finished is obtained by scrubbing or brushing the concrete surface with fiber or wire bristles and water to remove the surface film or mortar, leaving the coarse aggregate exposed. This should be done while the concrete surface is still green. appearance of a brushed finish can be improved with a diluted solution of acid applied with a brush. The surface should be thoroughly washed after the acid treatment as otherwise it will have a mottled, streaky appearance.



Tooled Finish

Concrete surfaces may be finished by tooling. Bush hammering, either by hand or by pneumatic tool, is the most popular method used in tooling concrete surfaces. The best results are obtained on surfaces which are thoroughly hard. The concrete should preferably be about 2 months old. Tooling cannot ordinarily be performed satisfactorily on gravel concrete, as the pebbles will be dislodged before being chipped.



Sand-blast Finish

A sand-blast finish is very much the same in appearance as that obtained by brushing the concrete while it is still green. Sand blasting produces a granulated finish somewhat similar to sandstone but not so uniform, because the aggregates are likely to be brought out irregularly. The concrete should be thoroughly hardened before sand-blasting. A clean, sharp, thoroughly dried silica sand or crushed quartz is most effective for sand-blasting.





Sand textured finish
It is used to give fine texture to wall



CANFOR FINISH/ Faux Finish. It comes in 6mm thickness. It is chosen when a false finish is to be given and gives a stone wall or brick wall effect.



Mosaic finish Glass mosaic are small 1" * 1" on a cloth to get a workable size 12" * 12" and tile is pasted with an adhesive on wall surfaces. It can also be pasted on curved surfaces.



Marble powder finish It is very smooth finish , looks like marble flooring. It is obtained by mortar of marble powder , white cement and water, it is applied manually.



Coral is a type of plastering material that gives a rough edgy finish



Stained glass finish

Glass is decorated with etching , frosting, glass pasting and finally coloring with suitable colors according to the theme- used on walls and ceiling



Pebbles finish This is a very simple and attractive finish obtained pasting small pebbles on walls with cement mortar as an adhesive.



Laminate finish It comes in various colors and designs and in the form of sheet. It is pasted with fevicol on plywood



Flake finish-
the flakes are applied with a trovel on walls over a coat of adhesive.



Wallpapers- have a paper face and a paper back. It is not -used in commercial - as it is subject to soiling , abrasion and fading

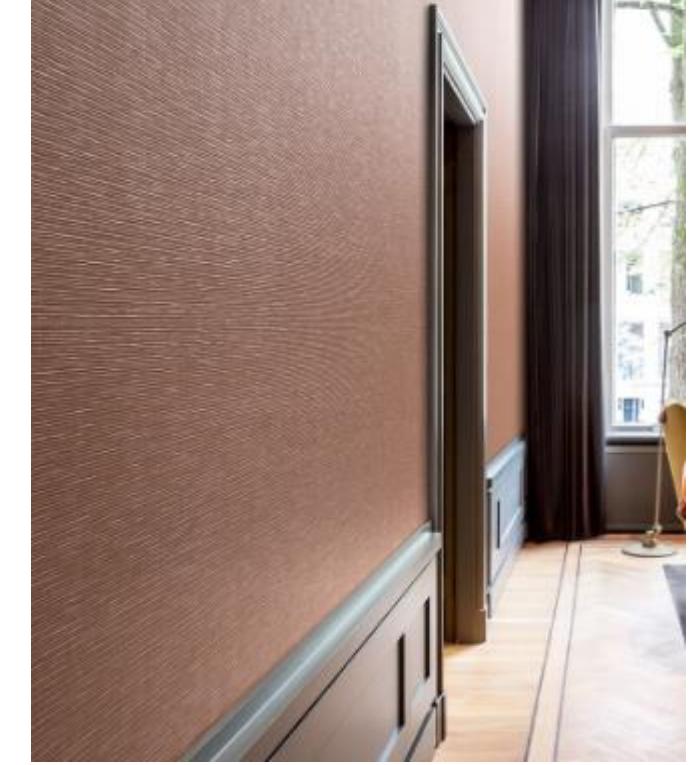


Designer mirrors

These are obtained by small pieces on wall to create mural like design.



Fabrics - like wool, linen, cotton, burlap and grass cloth are used. They require back coating as a barrier to prevent adhesive from bleeding through fabrics face and to improve dimensional stability



Vinyl wall covering

Designed for service ability and durability. It is flame resistant. Easily cleaned and resistant to fading and abrasion.