Training Course

- Waterproofing for External Wall
- Good Practices

- Reference : BCA publication 2004
- Waterproofing for External Wall Good Industry Practices

Building Envelope

Types of Building Envelope

Masonry

Precast

Curtain Wall / Cladding

External Wall – Performance Criteria

Withstand : Wind ; Rain ; Sun
Heat & Cold

Prevent : Access by intruder
Absorption of water vapour
Damage by fire

Control : Passage of heat ; Air ; Light
Sound

External Wall – Waterproofing

Focus : Water Penetration

Envelope Type : Precast & Masonry

External Wall - Waterproofing

WHY problem ?

Survey by BCA in 2003, found water seepage to be a common problem

About 90% of water seepage occurred through cracks in plastered brickwall

External Wall - Waterproofing

Objective :

To have a better understanding of the External Wall performance against moisture penetration, with reference to the

Good Practice publication

Topics for Discussion

- Design
- Material Selection
- Delivery, Handling & Storage
- External Wall Construction
- Testing

Design

Mechanics of Water Penetration :

Water

Opening

Force

All conditions must be present

Design

Factors :

Joints

Cracks

Absorption through material

Thickness

Surface Finish – tiles, render

Precast Walls

Advantage :

Impervious material [if well made]

Minimal joints [when large size is used]

Quality [better mfg control]

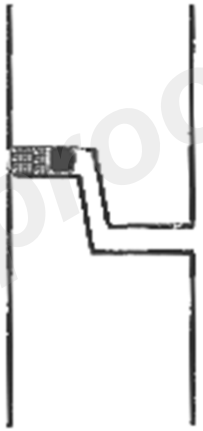
Buildability [when properly managed]

Durability [mix design, cover etc]

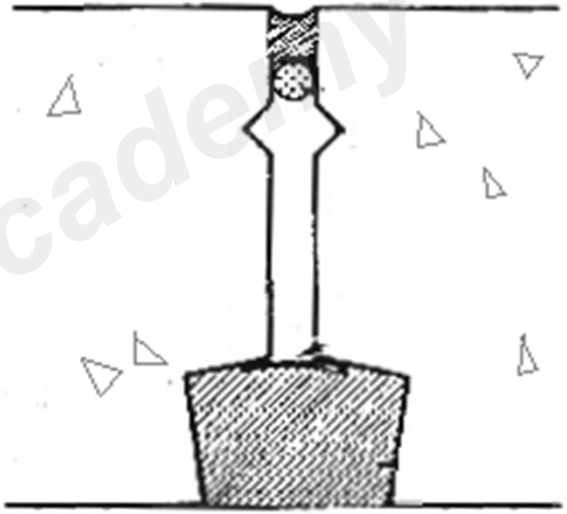
Precast Walls - Joints

Two-Stage Joint Detail

horizontal



vertical



Precast Walls - Joints

To consider :

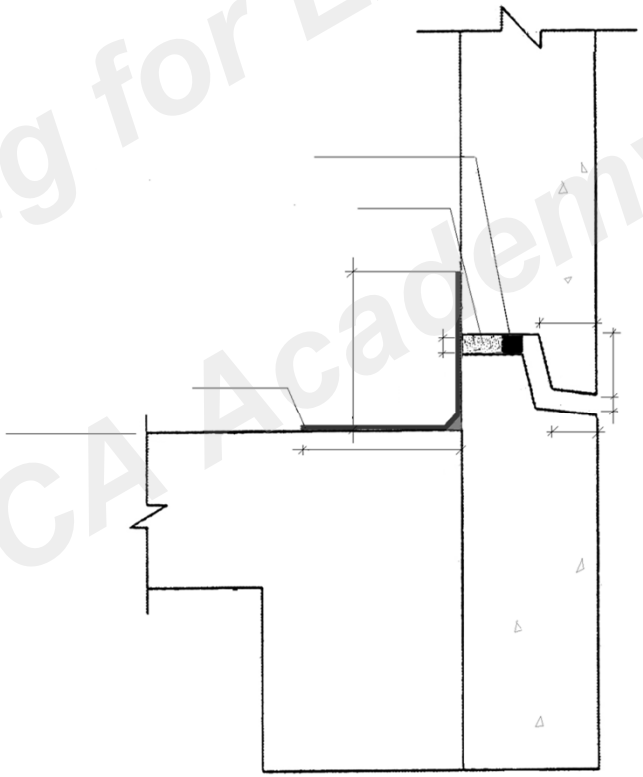
Joints between precast elements

Joints adjacent to structural elements

Interface with fittings - windows

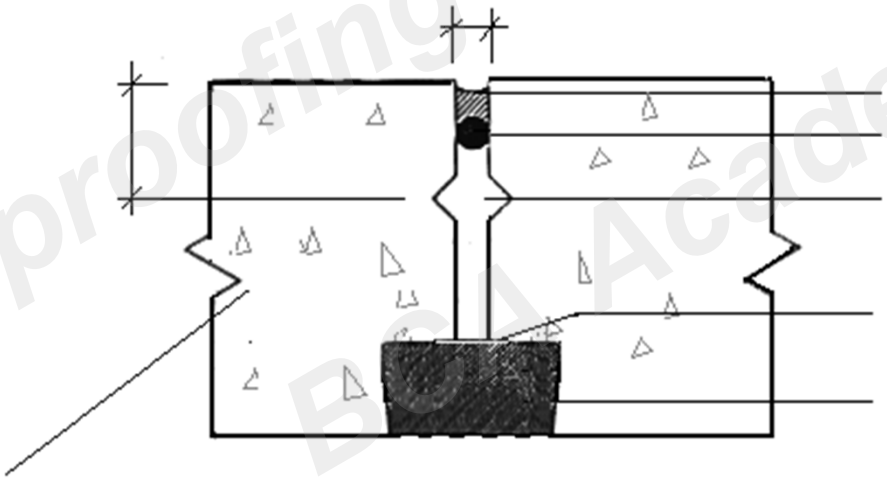
Horizontal Joints

External joint may be sealed or open

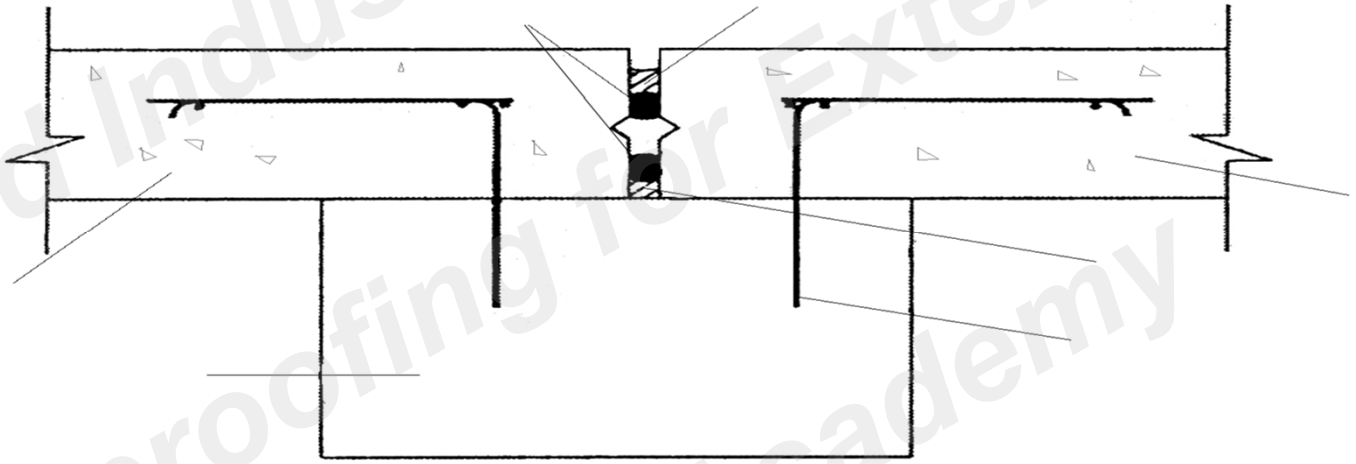


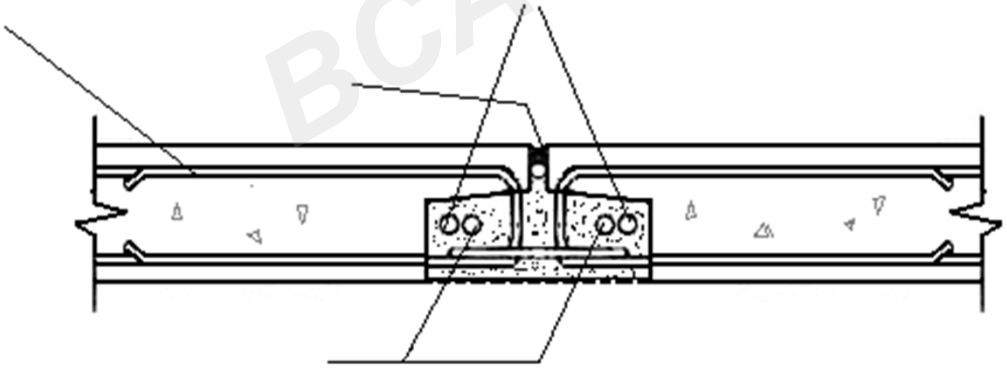
Vertical Joints

Two stage joint is recommended



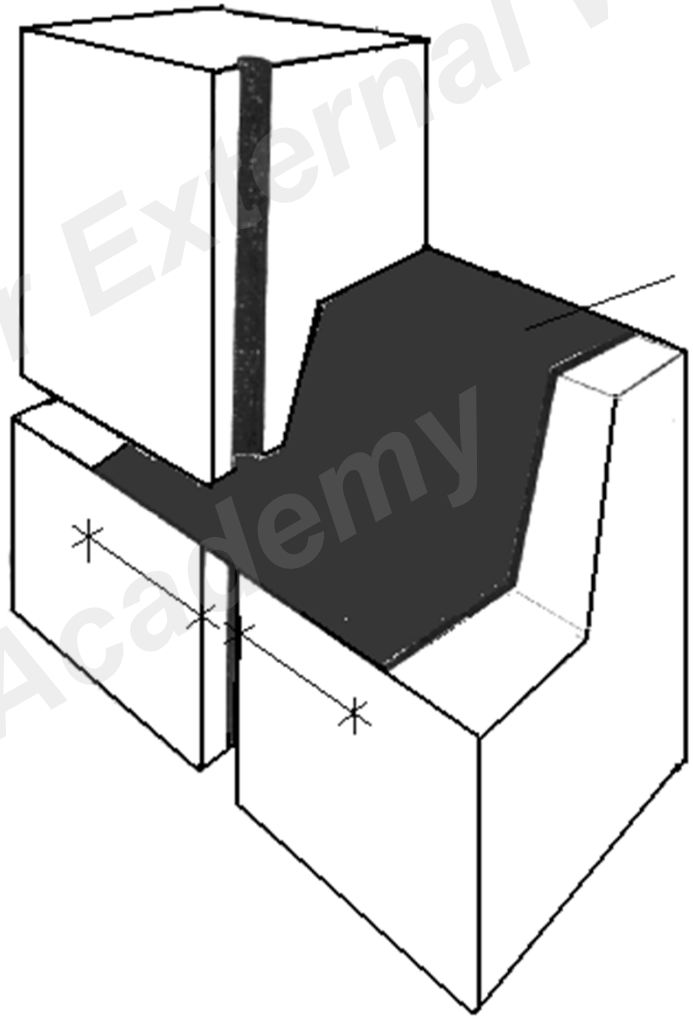
Vertical Joints with Cast-In Situ Stiffeners





Joint Intersection

Detailing



Joint Size

Joint Width :

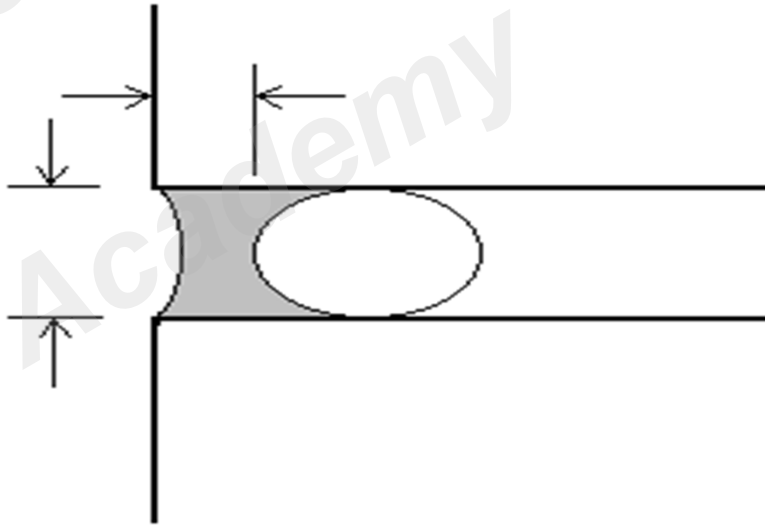
Accommodate movement

Practical size

Joint Depth :

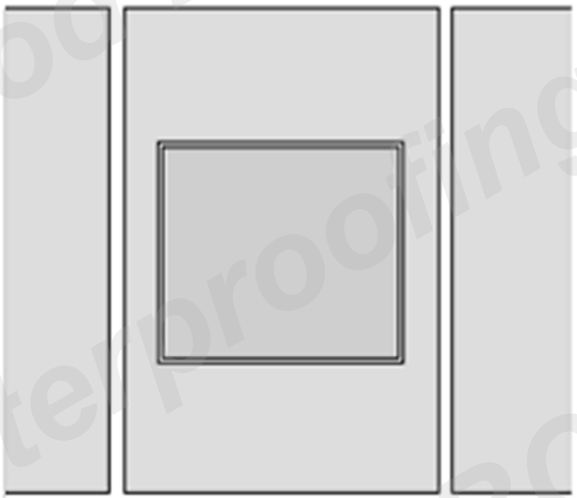
2-sided

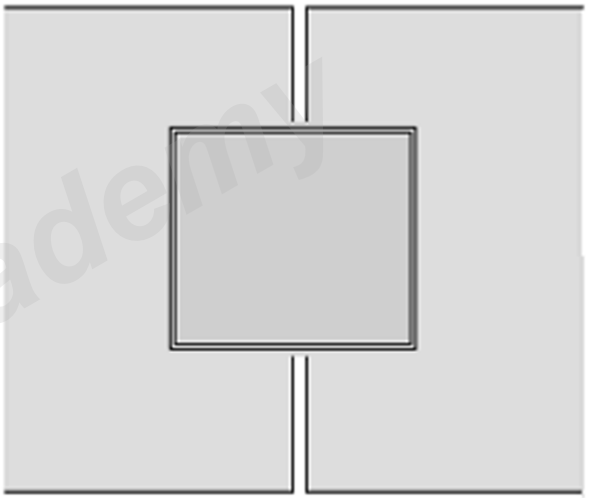
Half width



Location of Window Openings

And other Joint Break-up consideration





Integrated Precast Components

Fewer joints

Other Considerations

Maintenance & Repair

Inspection

Access

Masonry Wall

Wall Thickness

Full brick thickness recommended

Mortars for Joints

Cavity Wall

Surface Finish

Render :

Material

Thickness

Concrete Kerbs

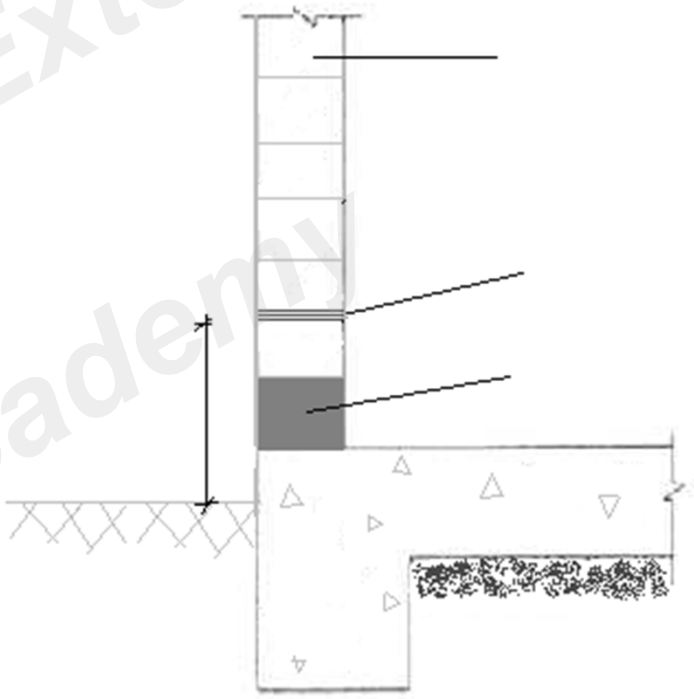
Concrete kerb :

Bridge level difference

Avoid joint at weak location

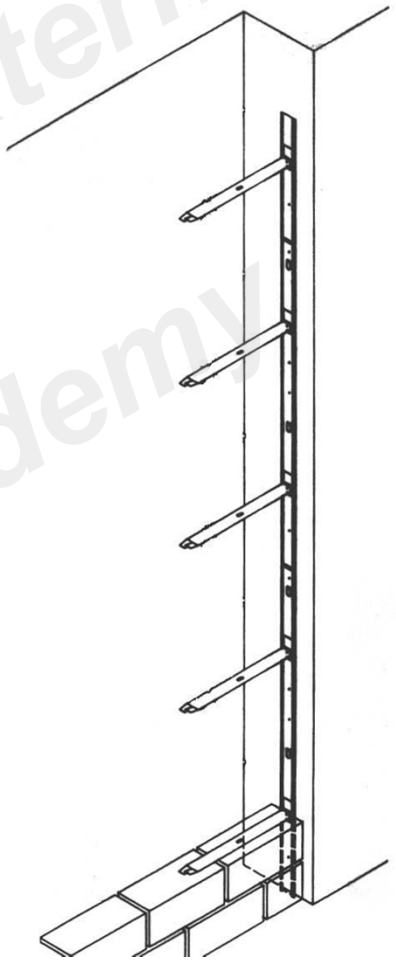
Damp Proof Course

Prevent moisture rising



Attachment to Structural Members

Bonding bar serves as tie

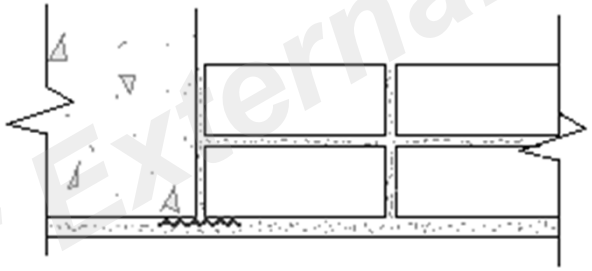


Mesh reinforcement

Joint material between

Brick wall and column

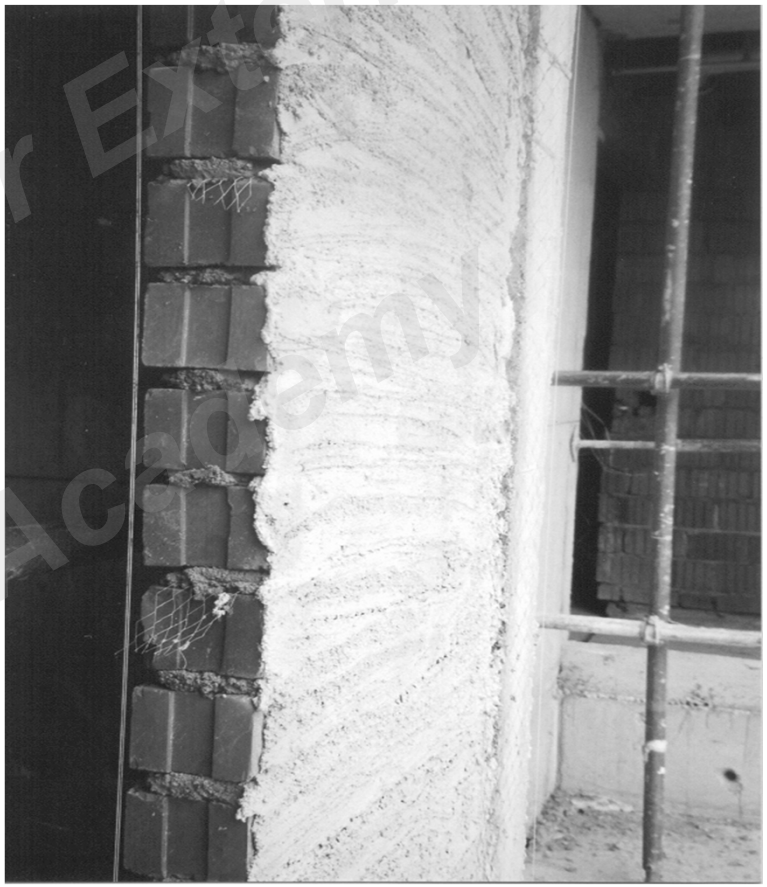
To be weak mortar



Mesh at surface

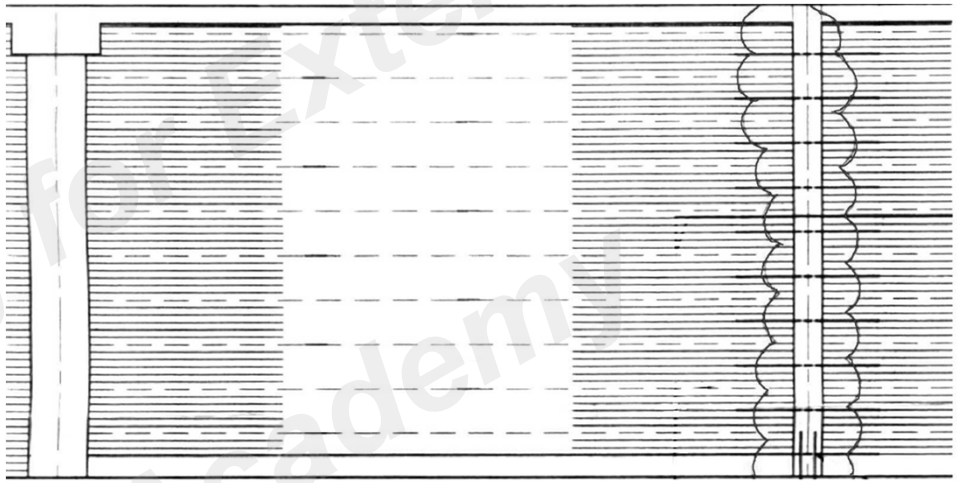
Mesh reinforcement

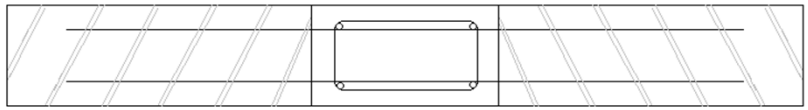
For resistance against vibration and thermal movement



Stiffeners and Movement Joints

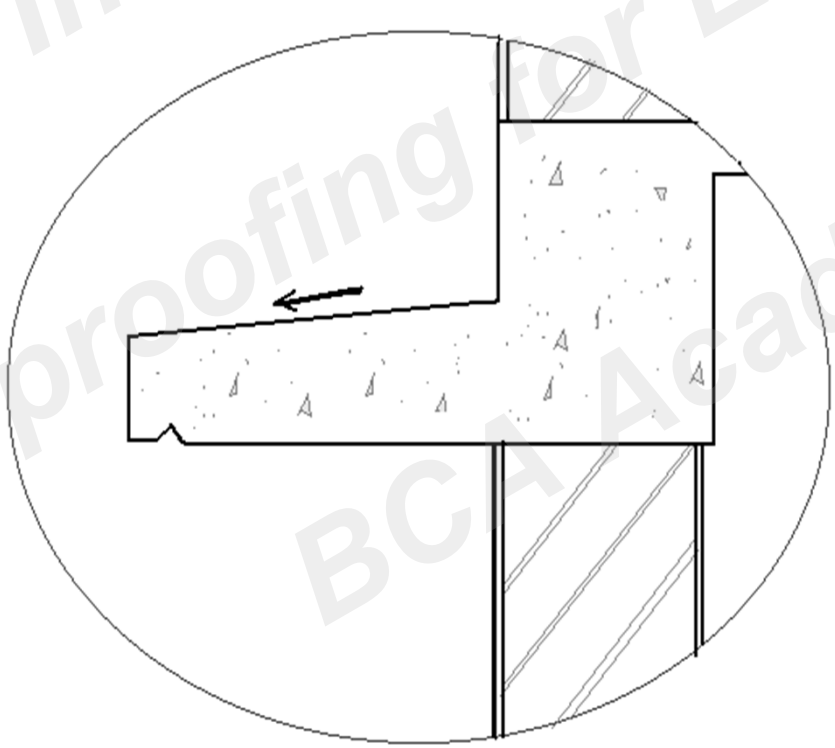
For large panels

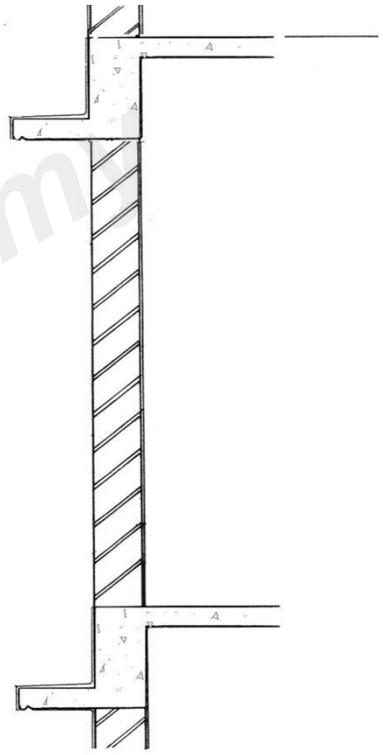




Other Considerations

Provision of overhang

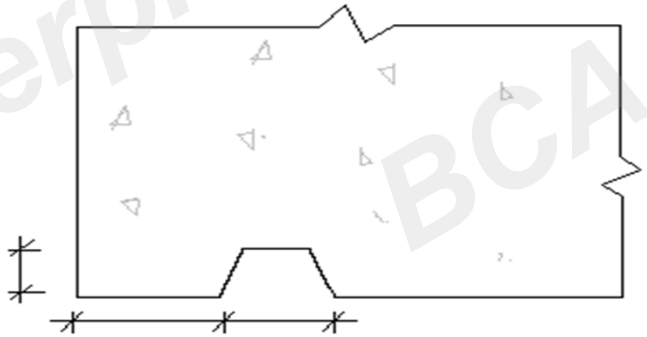




Other Considerations

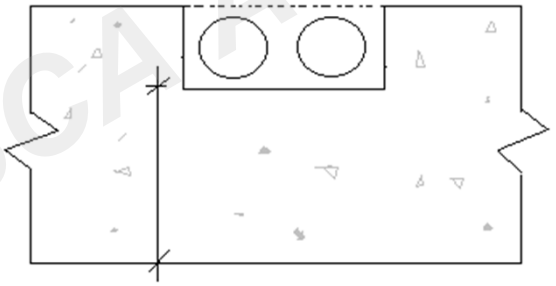
Provision for Openings

Drips



Other Considerations

Accommodate services require planning



Other Considerations

Waterproofing for perimeter planters